

**KNOWLEDGE BASE**Article Type: **Instructions**

Installation Procedures for Stripper and Compression Cylinders on HF Models, 22, 16 & 1600 machines

Description:

Instructions for; Installing Compression and Stripper Cylinders on Floor Model machines. The proper installation for stripper and compression cylinders is very important to ensure good life of the cylinders and their components. It is also important to check the front end of your machine for front-to-back play and side-to-side play as this can lead to shorter life of your cylinders. Service Tip # 2053

WARNING

Never work on, clean or service this unit, control panel or any machine or open or remove any protective cover, guard, grate, door, or maintenance panel until the power or energy sources has been turned off, locked out / tagged out, and all moving parts have come to a complete stop and or blocked to prevent movement. Machinery is dangerous - avoid personal injury and or death by following manufacture, Local, and OHSa safety procedures. Contact Columbia Machine for safety decals, guards, horns and beacons.

INSTALLATION PROCEDURES FOR STRIPPER AND COMPRESSION CYLINDERS FOR FLOOR LEVEL MACHINES MODEL 22, 16 AND 1600

Safety first: Always follow your safety guidelines for system lockout/tagout of electrical panels and the hydraulic system.

The proper installation for stripper and compression cylinders is very important to ensure good life of the cylinders and their components. It is also important to check the front end of your machine for front-to-back play and side-to-side play as this can lead to shorter life of your cylinders.

Upon receiving your compression cylinders or stripper cylinders they should be checked for any damages that may have occurred during shipping. Check the bottoms of the stripper cylinders for nicks or scratches. If noticed, use a flat file single cut fine to remove nicks or scratches.

Only remove raised area. Also check for rust at the bottom of the stripper cylinders or any additional rust on the rod ends of the stripper or compression cylinders due to water damages. If light rust is noticed on the bottom of the stripper cylinders, you should use either of the following two hand pads listed below:

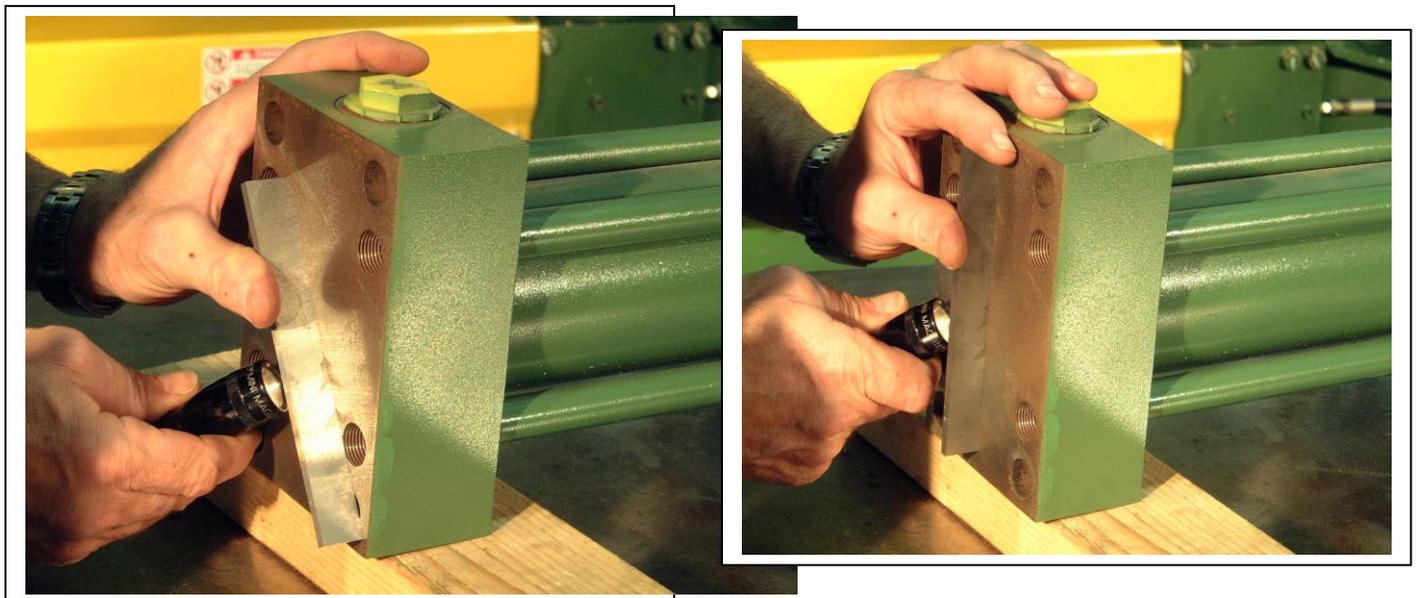
Hand pad made by 3M Scotch-Brite general purpose color (Maroon) or Bear-Tex made of non-woven nylon web perfect for hand cleaning general all purpose color (Gray)

These pads will remove rust and oxidation, and will clean & polish with gentle action and no effect on dimensions. Once cleaned if your not installing them on the machine at this time and will be placing them in the store room, make sure that you coat the base and cylinder rods with a light coat of grease to protect the bare surfaces. Also make sure that either plastic plugs or O-ring plugs are installed in all ports.

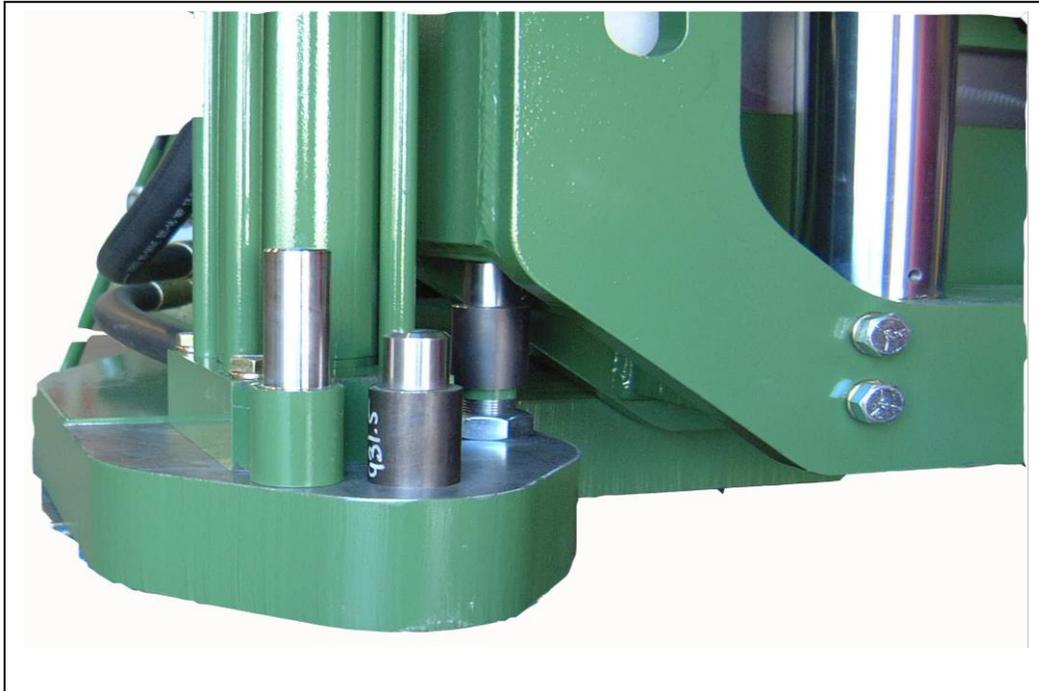
Please see pictures below for referencing:



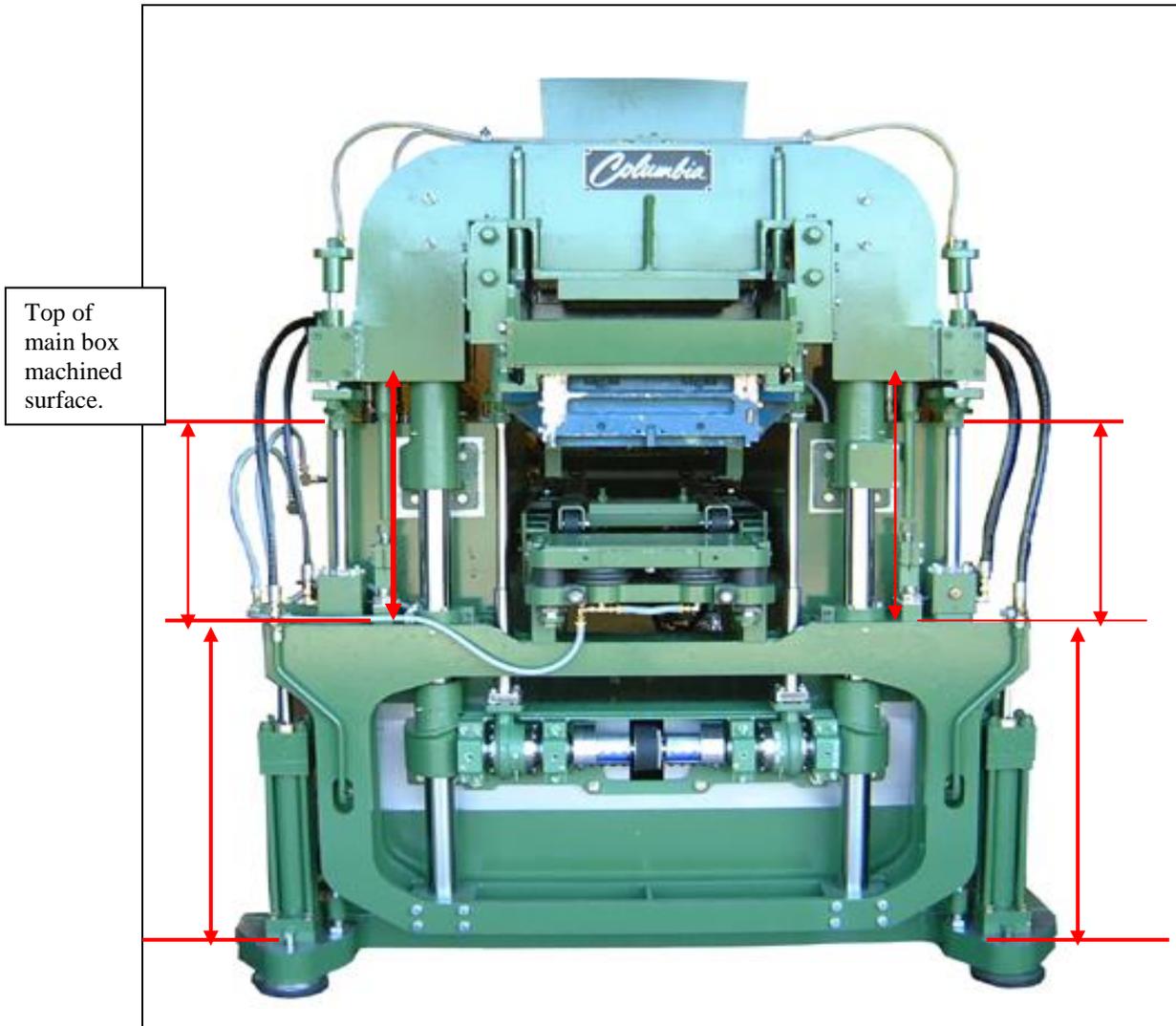
Clean stripper cylinder base with Scotch-Brite or Bear-Tex hand pads. Using a flat fine tooth file remove any scratches or nicks raised areas only.



Use a straight edge to check the cylinder base for flatness across in three areas: up, down, and diagonally. Check the base foot area of the machine box where the stripper cylinder will mount. Ensure that there are no scratches or nicks and that the surfaces are flat for mounting the cylinders. Make sure to clean all threaded holes thoroughly. Apply a small amount of anti-seize lubricant to the bolts or threaded holes.



Check machine base foot for flatness and that correct stripper beam stops are in good condition. Check dimensions from the top of the stripper beam or main beam top machined surface to the machine foot surface area on both sides to ensure the beam is level from side-to-side. If beam is off by more than 1/16 from side-to-side it may be necessary to make further inspections. For compression cylinders it is advised to check alignment of the compression beam in relation to the stripper beam to ensure beams are in alignment with one another. If compression beam is off by more than 1/16 inch from side-to-side corrections must be made before connecting cylinders. Corrections should be made or cylinder damages will occur.

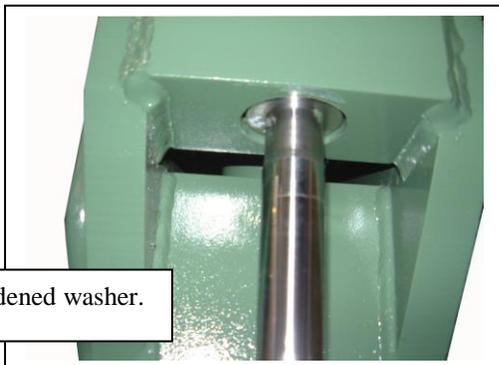


You can also verify dimensions by using a straight edge on the top machined surface of the main box and measuring down to the top of the stripper beam. Again these dimensions should be within 1/16 inch from side-to-side. Front end alignment problems could be caused by worn main shafts, bushings, guide tubes, column brackets or stripper beam worn due to guide tube clamp rings not holding guide tubes tight in beam. Lower height stops set incorrectly causing beam to rack or possibly area where stops contact lower stripper beam. For information on adjustment, front end alignment and stripper beam repairs, contact Columbia Machine service department at 1-800-628-4065 for assistance.

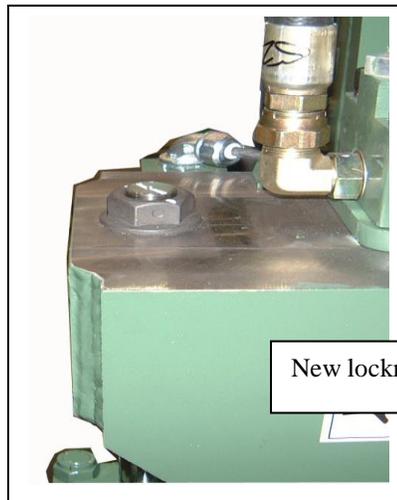
Stripper cylinder installation:

Once you have confirmed the beam is level with the main machine box and the cylinder base and machine foot area is ok cleaned free of scratches or nicks threaded holes cleaned, you are ready to install your stripper cylinders. Make sure you have installed the hydraulic fittings in both the base and rod cap and install the hardened washer on the rod.

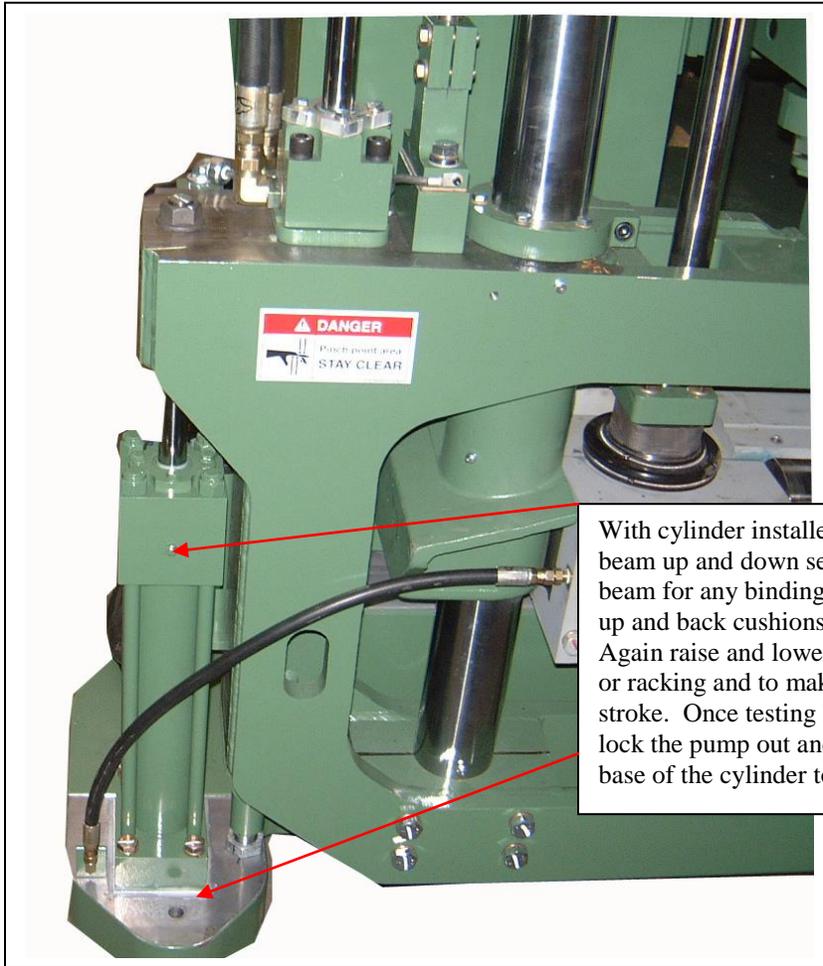
With stripper beam resting on lower beam stops install the cylinder on machine foot rest area and using anti-seize apply a small amount to either the “new grade 8 bolts or threaded holes”. Always use new bolts and lock washers when changing out cylinders. Make sure the hardened washer has been installed on the rod assembly. Install the bolts by hand, threading them down as far as possible. Using either a box end wrench or ratchet wrench, snug the bolts down in a cross hatch pattern watching the alignment of the rod to the stripper beam where the rod will pass through the beam. Using a torque wrench, tighten the bolts up to torque in three equal settings using a crosshatch pattern. For floor level machines model 22, 16 & 1600, the bolts are a 5/8-18 NF Grade 8 bolts. Full torque is 187 foot pounds lubed. With all bolts torqued to specs, the cylinder rod should pass through the beam without touching the sides of the beam. With the hydraulic hoses attached and the machine slow valve closed for slow operation, begin to raise the rod through the stripper beam making sure the rod does not touch the side of the beam as this can damage the rod seal or cause misalignment with the cylinder causing failure. If the rods move up through the beam without touching, continue to raise the cylinder until the beam is raised to full stroke. Place enough beam stops on the lower height stops and begin to lower the cylinder allowing the rod to disengage from the beam. Make sure the rod, again, is not touching the sides of the beam as it leaves the beam. In the event that the rod is being forced over either when it leaves the beam or will not enter the beam without forcing, back the bolts off at the base and try to move the cylinder over slightly taking up any gap between the holes in the base of the cylinder. Again using a crosshatch pattern begin torquing the bolts down in three equal settings. Once the cylinder has been aligned and the rod can pass through the beam in either the full up position or down position, you are ready to install the locknut on the rod. Torque the rod locknut to 600 foot pounds on a model 22, 16 or 1600. Columbia Parts has a new locknut that has more surface area locking against the main beam. The locknut part number is 100155.16.



Hardened washer.



New locknut.

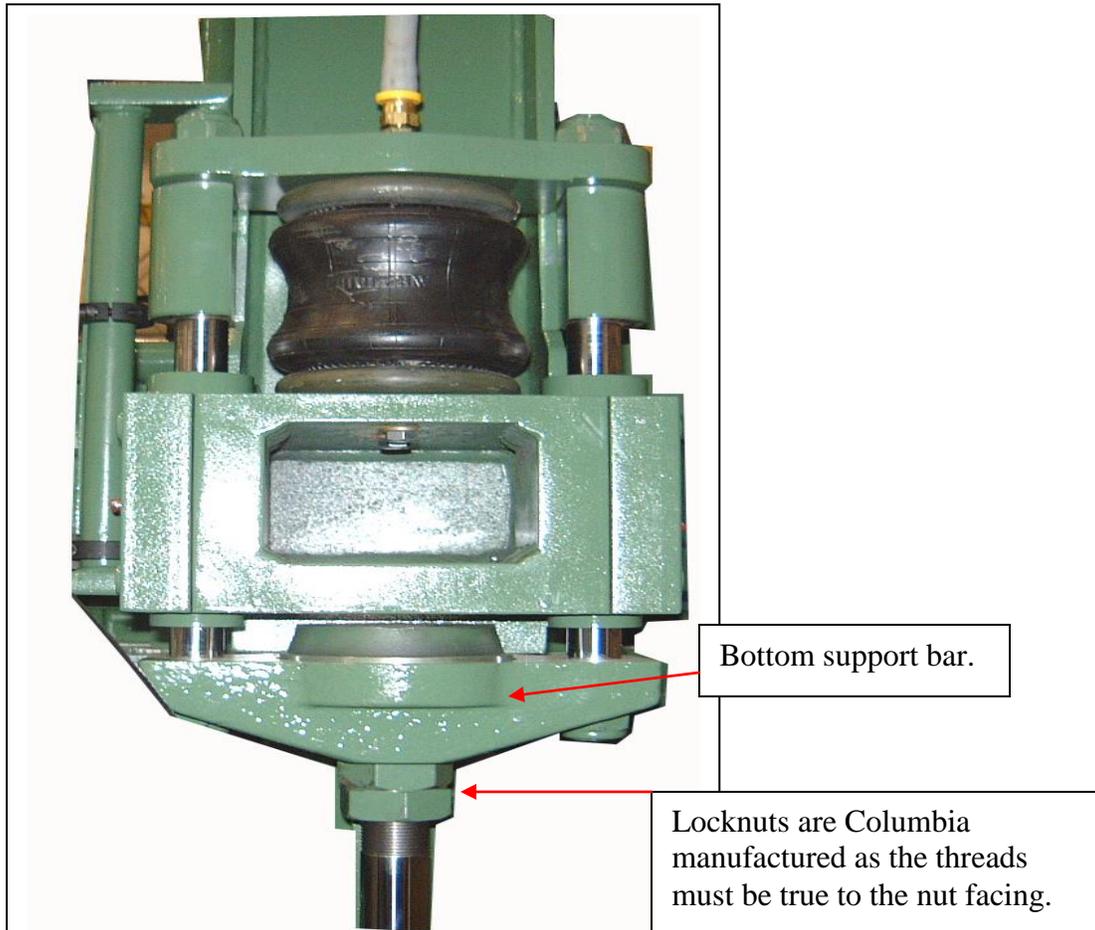


With cylinder installed and air evacuated from the cylinder, raise beam up and down several times, watching both cylinders and beam for any binding or racking. If all works fine open, slow valve up and back cushions out 1 ½ turns. This is the initial setting. Again raise and lower the beam several times, watching for binding or racking and to make sure you have a good cushion at the end of stroke. Once testing has been completed, shut the system down, lock the pump out and apply a small bead of silicone around the base of the cylinder to the base of the machine foot.

Once oil has reached operating temperature, you may need to adjust cushions for smooth cushioning at end of stroke or racking of the beam.

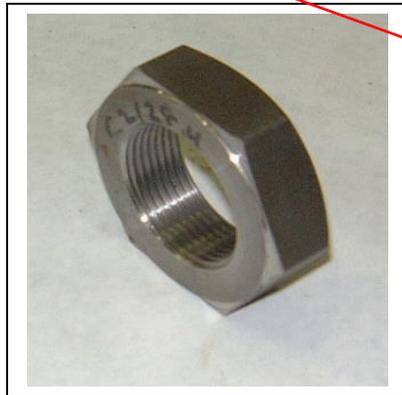
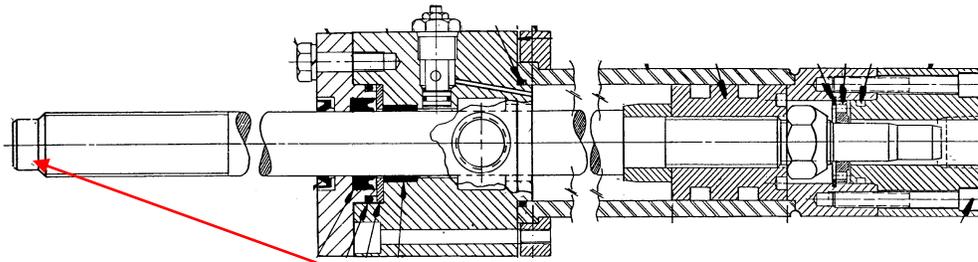
Compression cylinder installation:

When changing out a compression cylinder or stripper cylinder you should always try to figure out what may have caused the failure. Contamination to the hydraulic system due to parts failure or binding of the compression beam or stripper beam, worn or loose front end allowing the beams to move too much, breaking the rod assembly or damaging the rod seal or piston seals. What about the air stroke assembly? Does the air stroke assembly move freely? What's the condition of the guide rods, bottom support bar, bumper rubber, bushings air bags? Due to the costs of these parts and the lost production down time repairs, these questions should be answered as you could possibly lose another cylinder in a very short time.



The compression cylinder rod is attached to the compression beam through the air stroke assembly. These components must be in good condition and move freely. If binding occurs in the air stroke assembly, this could cause racking of the compression beam which could break the rod assembly or damage the cylinder seals along with other damages that may occur. Inspect these parts and replacement of worn or damage items should be done when replacing a compression cylinder.

Prior to installing the cylinder into the stripper beam, install the hydraulic fittings and position them in the right orientation at the base of the cylinder. Clean the threaded holes out in the stripper beam and apply a small amount of anti-seize to the threads or on the bolt threads. Remove the shipping bolt and nut holding the rod cap and bottom plate together. Once removed, be careful not to allow the cylinder tube and cap to separate and slide the compression cylinder down into the stripper beam. Make sure that you position the cylinder so the rod cap porting is facing in the correct orientation to hook up the hoses. Install the (4) socket head bolts threading them into the stripper beam. Using a crosshatch pattern snug the bolts down, but do not torque at this time. Hook up the tube assembly at the base of the cylinder and hose at the rod cap.



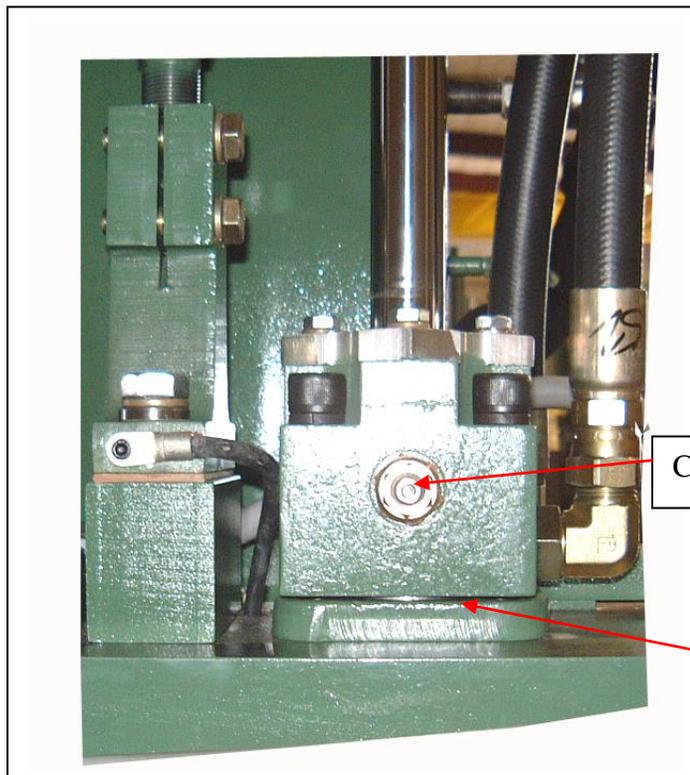
Columbia manufactured jam nut & compression cylinder rod end.

In the picture above you will notice that the compression rod has a nipple at the threaded end of the rod. When threading the rod into the air stroke assembly bottom support bar, it must be bottomed out in the support bar. This ensures that the mating threads of the rod and support bar are seated. Never adjust the cylinder rod out to correct any racking of the beam. The rod must be bottomed out in the support bar. Always use Columbia Machine special jam nuts as they are manufactured with the threads true to the facing. Standard jam nuts are not true 90 degrees to the face. Cylinder rod breakage can occur if not using the Columbia manufactured jam nuts.

With bolts installed and hydraulic hoses and tubes hooked up, you are ready to align the rod to the air stroke assembly. As we discussed for stripper cylinder installation, please follow the same procedures for checking beam alignment. Once you have confirmed that the stripper beam is level, true to the block machine main box and you have checked from the top of the stripper beam to the bottom machined surface of the compression beam and both sides are within 1/16 from side-to-side, you can begin to torque the bolts using a crosshatch pattern. Torque the cylinder down to the stripper beam using three equal torque settings. For model 22 socket head cap screw 1/2 -13 UNC torque to 70 to 80 foot pounds max. Model 16 and 1600 floor level machine 5/8 - 11 UNC torque to 90 to 100 foot pounds max.

As you are torquing the bolts, watch the rod move around at the top. When you get to your final torque setting, the rod should be aligned with the bottom retainer bar threaded hole. With the jam nuts installed on the rod, run them down to the bottom of the threads and lock them together. Apply anti-seize to the threads. Check to make sure the hydraulic connections are tight. Remove your locks from the pump and main panel making sure the machine slow valve is set for slow operation. Turn the pump on and raise the cylinders just enough so that the nipple of the rod enters the bottom retainer bar. Turn the pump off and lock out the system. Turn the air off the head air bags. With the air off, the air stroke assembly should drop down slightly when the air is evacuated from the air bags. This will allow you to start threading the rod into the bottom retainer bar by hand or with the use of an open end wrench. You should not have to force the rod in or push the rod from side-to-side to start threading the rod in. If you have aligned the rod correctly when you were torquing the cylinder bolts down to the stripper beam you should be able to thread the rod into the bottom retainer bar. Once the rod is bottomed out give a couple hard jerks with the wrench to set the rod tight into the retainer bar. Break the jam nuts loose and tighten each one against the retainer bar and jam nut.

On some compression cylinders, rather than a built in cushion on the rod end cap, we have adjustable cushions installed. For initial settings screw the adjusting screw in clockwise until it bottoms out and back out 1 ½ turns. During setup you may need to adjust one side more than the other to eliminate beam racking from side-to-side. Once the oil has warmed to operating temperature you may need to adjust the cushions a little more. Screwing the cushion in clockwise increases cushion out and counter clockwise decreases cushion. Adjust cushions so that the beam does not bang hard at the end of stroke when going up and eliminate side racking of the beam.



Cushion adjustment.

NOTE: A gap must be maintained to properly seal rod cap to tube assembly. Over tightening will result in damage to the tube flag.

With the cylinder or cylinders installed you, are ready to make your final settings. Remove locks from system and start pump. Again keeping the slow valve in position for slow operation raise and lower compression beam several times watching for any leaks. Turn head air back on. Place the slow valve in fast operation and run the compression beam up and down. Make sure the stripper beam is in the up position so that full stroke of the cylinder is made. Check for side to side racking of the beam and make adjustments to the cushions. Also adjust cushions just enough so that you have a good cushion at end of stroke going up without the beam banging at end of stroke. Check the down stroke for racking as well. If the beam lags behind on the right side as you begin to start down, back out the cushion slightly. Run the beam up and down several more times. Once the beam can travel to its full up position and down position without racking or banging, you have completed the adjustments. Remember, once the oil warms up to operating temperature, it may be necessary to make adjustments to the cushions again.

With both compression and stripper beams in the down position, turn the power off and lock out the system. As an added protection to keep contamination from getting into the threads where the cylinders have been bolted down, it is suggested to apply a small amount of silicone around the base of the cylinders and lock washers. This will aid in keeping the bolts and threads clean from contamination.

This completes the stripper and compression cylinder installation. For additional information or service help, please call Columbia Machine Inc. at 1-800-628-4065.

Please review information on next page for Safety Beam Stops application for compression beam and stripper beam for added safety during mold changes, adjustments and repairs.

SERVICE TIP ***SAFETY BEAM STOPS***

COMPRESSION BEAM STOPS FOR FLOOR LEVEL MACHINES MODEL 22, 16 AND 1600

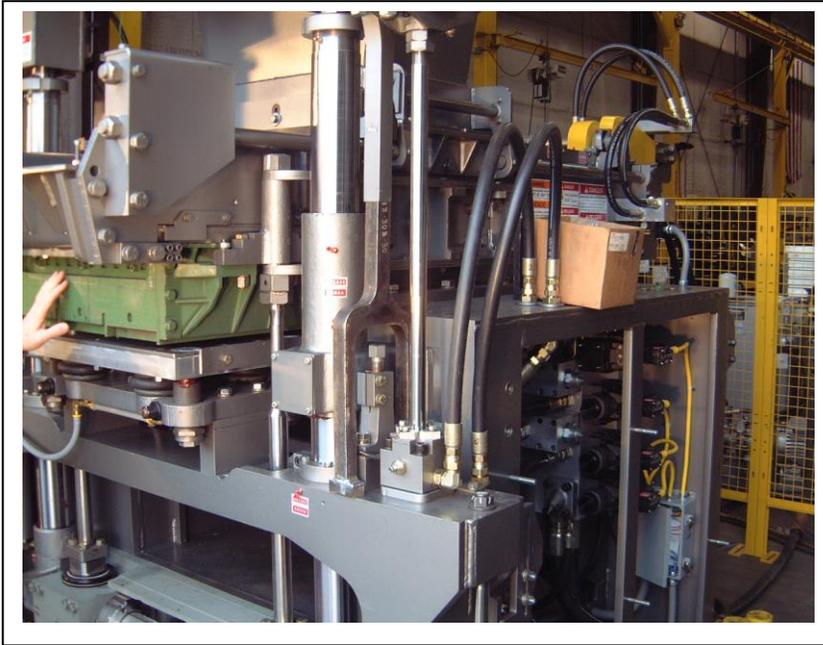
Safety first: Always follow your safety guidelines for system lockout/tagout of electrical panels and the hydraulic system.

The installation and use of the new compression beam stops is to maintain compression beam up during mold change, feed drawer strike off plate adjustment or additional repairs or adjustments that require plant personnel to be working in and around the machine with the beam in the up position. The hydraulic circuit for the compression beam on some machines has a P.O. check valve and on others you have a P.O. counterbalance valve. Both these style check valves hold pressure on the base end of the compression cylinder until the valve is energized down which uses pilot pressure to open the check valve or counterbalance valve. In the event that one or both compression cylinders are allowing hydraulic oil to bypass the piston seals the beam will drift down slowly or fast depending on the condition of the seals. Other hydraulic failures can cause the beam to not stay up which could include failure to the P.O. Check valve or P.O. counterbalance valve.

The beam stops are a positive stop between the compression beam and stripper beam which in the event that either loss of hydraulics, failure to the compression cylinder or P.O. check valve, P.O. counterbalance valve the beam stops will maintain beam in up position.

The following pictures below show the installation of these new positive beam stops:

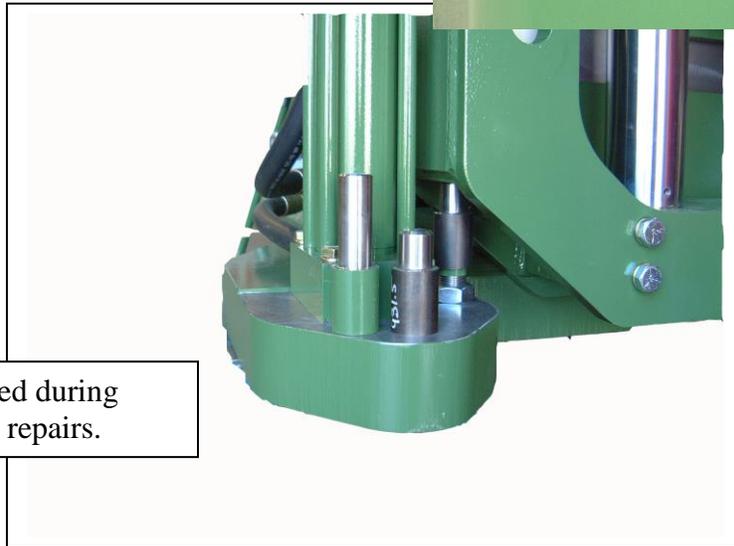
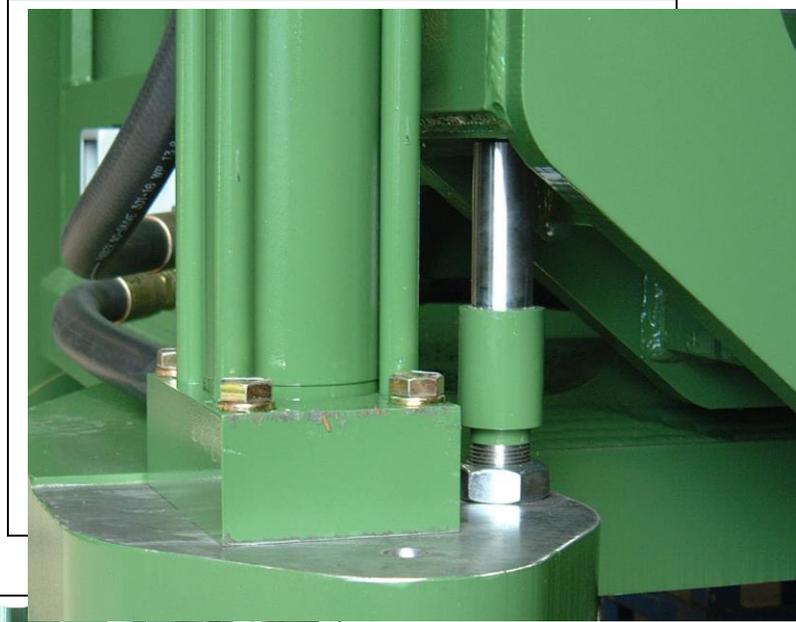
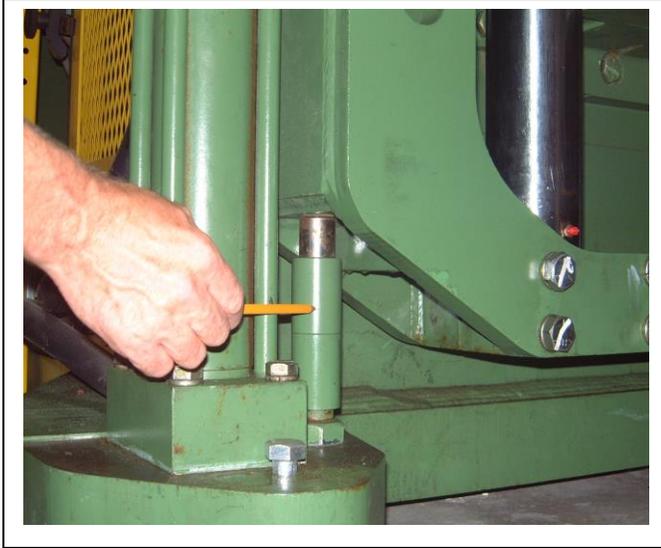




**LOWER STRIPPER BEAM STOPS FOR FLOOR LEVEL MACHINES
MODEL 22, 16 AND 1600**

In addition for mold installation, adjustments or repairs use your lower stripper beam stops to aid in holding the stripper beam in the up position install additional stops as required. The stripper hydraulic circuit also has either a P.O. check Valve or P.O. counterbalance valve that maintains hydraulic oil to the base of the cylinders. The same failures can occur on the stripper circuit as with the compression beam. The mechanical stops are an added safety for maintaining the beam in the up position during mold changes, cylinder replacements, vibrator & shaker shaft repairs or replacement where you will be required to have your hands in and under the beams.

Please see pictured below stripper beam stops:



Use additional stops as required during mold changes, adjustments or repairs.

For more information or to order a set of beam stops please contact Columbia Machine, Inc. parts department 1-800-628-4065.