

Hydra-Jaws™ Quick Mold Change System
with
Model 212L, 661L, 825L, or 835L Clamps

INSTALLATION INSTRUCTIONS

and

USER GUIDE

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1. Introduction

The QMC System with Model 212L, 661L, 825L, or 835L Clamps is intended to clamp molds into molding machines with the PFA Hydraulic Control Module as a complete system. It may be shipped from the factory with the Hydra-Mechanical clamps and hydraulic system assembled onto the platen mounted clamp plates, or with the clamps loose for installation after the plate is mounted.

2. Cautions

This user guide is written for the knowledgeable user. It presupposes that the user organization has a thorough understanding of hydraulic pressure and the loads and forces which are encountered during molding operations including the force necessary to secure a mold with an adequate safety margin. If your organization lacks such knowledge contact PFA before proceeding.

These instructions are guidelines only. Customers should review the guidelines for understanding of the product and develop internal procedures and plans for proper installation of the systems within developed plant safety standards.

As a part of a broader safety and maintenance program the user organization must ensure that:

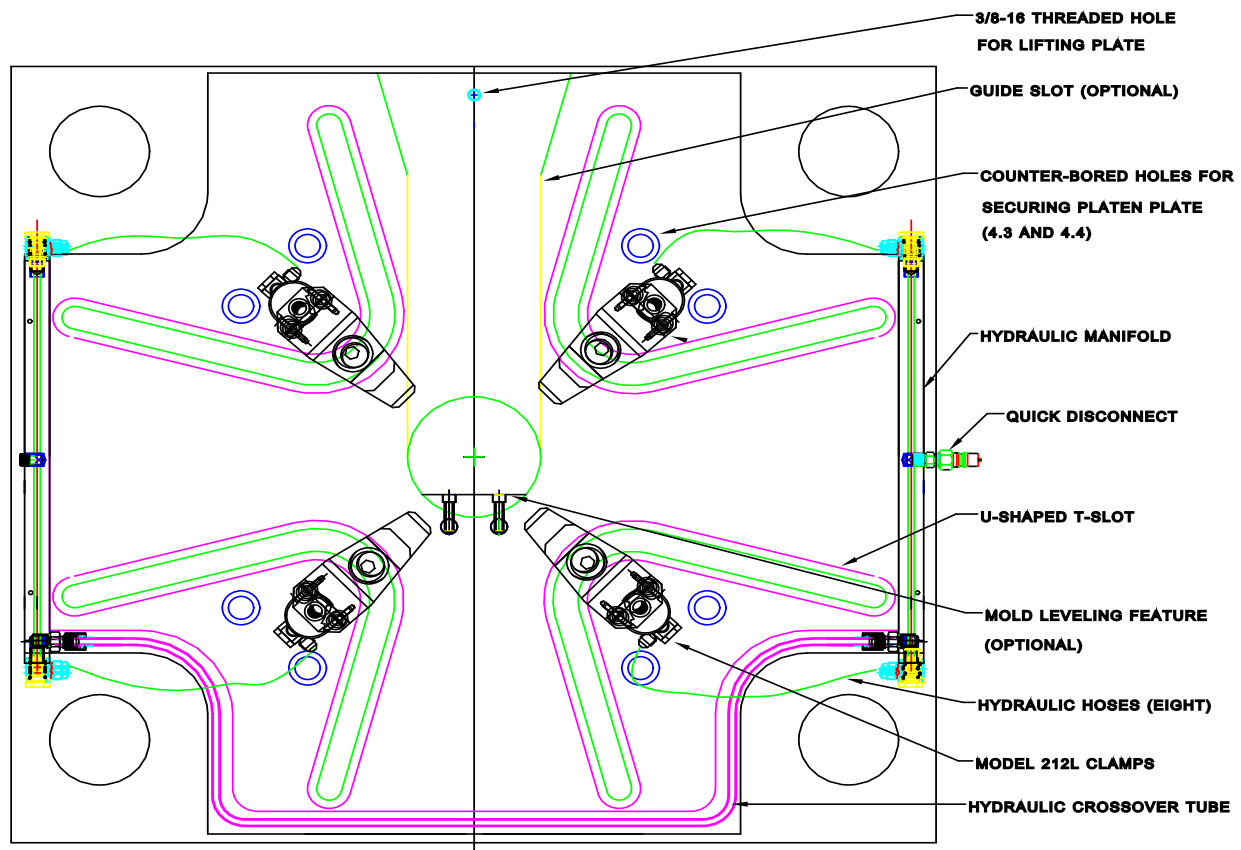
- 1) Each mold to be secured by the hydraulically powered clamping system is in safe operating condition and that the holding force required for safe operation is within the capabilities of the system.
- 2) Set-up personnel and machine operators are familiar with all of the requirements for safe operation of the clamping system.
- 3) Adequate air pressure is made available to the hydraulic power supply as required.
- 4) Periodic maintenance is performed, and
- 5) Individuals other than operators inspect the clamping system at a frequency which is consistent with assuring safe and effective molding operations.

3. Hydraulic Power Supply

The *Hydra-Jaws™ Quick Mold Change* System can be used with any of PFA's recommended air input/6,000 psi hydraulic output power supplies. The most common hydraulic power supplies used for this application are Models HC-125C-HM "2 Zone Carriable with Booster", HC-120R-HM "2 Zone Roll-Around with Booster", or the HC-130R-HM-KO "3 Zone Roll-Around with Booster and KO" circuit" hydraulic power supply.

For proper operation and maintenance of the hydraulic power supply selected, refer to the respective User Guide for that hydraulic power supply.

4. Installation



The diagram above shows 212L clamps installed, however the systems all have similar arrangements for inserting clamps in slots. The 661 clamp plates typically have an installation cover at the center of the plate and larger plates have holes at the end of the curved slots for clamp install.

- 4.1 Secure a lift chain to the front of the platen plate utilizing the threaded hole provided (center/top of plate). Use an appropriate lifting eye (preferred) or a grade 8+ bolt and flat washer screwed all the way down to secure the chain (alternate method).

Caution: Follow proper safety procedures for your plant to ensure safe handling of the plates. A lifting eye is the only recommended way to lift the plates. If a long bolt is used the chain may slip to the head of the bolt and it may break - Use a washer or other methods to ensure that the chain does not slip off the bolt.

- 4.2 Using a hoist, lift the plate from the shipping crate (or pallet).
- 4.3 Lower the plate into the machine and **loosely secure** the plate with the bolts provided.

- 4.4 Align the Fixed "A" Platen plate to the locating ring in the platen using the cylindrical alignment ring tool provided. Square the plate to the edges of the machine platen. Tighten the mounting bolts securely using a torque wrench or similar device to assure that the plate will not move.
- 4.5 Repeat steps 4.1 through 4.4 for the Moving Side 'B' Platen, except that the platen plate is visually aligned. Align the knockout holes in the plate with the knockout holes in the machine platen.

5. Model-212L Clamp Operation (See other section for larger clamps)
(Note: New sales of this clamp was halted in 2005 and replaced with the 661L clamp)

(Please refer to Drawing 212LPD)

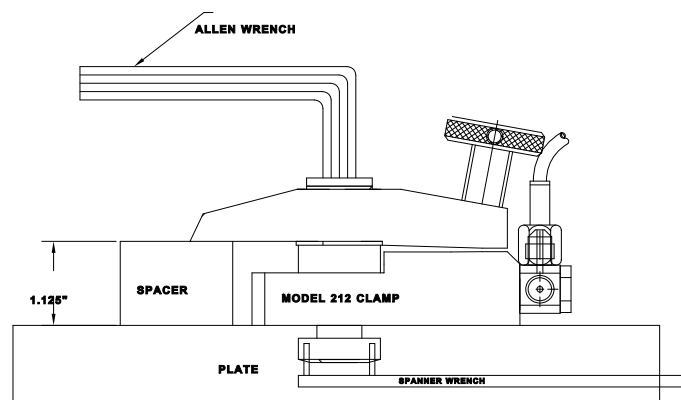
- 5.1 The Model-212L is a rocker clamp powered by one piston, **Item 3** located in the rear of clamp body **Item 1**. When hydraulic fluid flows through hose connection to swivel fitting, **Item 6** the piston rises causing the rear of the clamp lid, **Item 2** to elevate. The clamp lid pivots about screw, **Item 16** causing nose of clamp lid to exert clamping force on mold or die. When the clamp is fully powered, the lock screw, **Item 4** must be screwed firmly against the clamp body in order to be mechanically locked.

Two springs, **Item 5** located at rear of clamp are extended when the clamp is actuated. When the lock screw is turned away from the clamp and hydraulic pressure is shut off, the springs pull the rear of the clamp lid down.

The Model-212L is secured by the T-nut, **Item 15** which in mold clamping applications is usually round. The T-nut is secured to the screw with Loctite or similar thread locking compound.

Caution: Read entire procedure carefully before performing any installation, adjustments or maintenance.

5.2 Installation

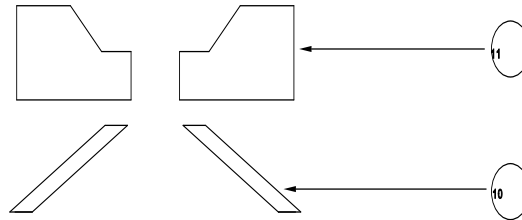


When sold as part of mold clamping system the clamp is factory installed on the platen plate. The rocker screw, **Item 16** with breakable thread locking compound already applied is screwed into nut, **Item 15** through the platen plate. Spanner wrench holes on the bottom of nut, **Item 15** are used to provide counter rotation while the rocker screw is turned. When assembling the clamp on the plate, be sure that the lock screw, **Item 4**, is unscrewed to allow the maximum clamp opening. Tighten the screw using an allen wrench and spanner wrench as shown until the clamp nose comes into contact with a 1.125" spacer. This will properly set the clamp height.

Note: If the clamp is not installed on a platen plate when received, then use the above procedure to install the clamp. If over time, friction is reduced and it is desirable to increase friction, then use the above procedure to adjust tension. Remember to apply fresh thread locking compound.

Caution: Check to make sure that the 5/8-11 UNC screw is of the proper length. When installed the tip of the screw should be about flush with the bottom of nut. Use only PFA supplied rocker screws.

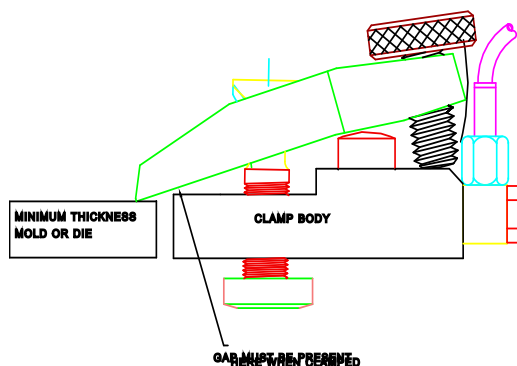
If screw is separated from the clamp make sure that **Items 9, 10, 11, 14, 17 and 19**, are installed properly. Please note that spring washer, **Item 10** is installed with the orientation as shown:



Grip Height -Use with molds or dies with grip heights from .75 to 1.125".

Caution: Do not attempt to clamp molds or dies which are too thin. There must always be a gap between the clamp lid and body when the clamp is securing a mold or die.

Caution: Do not attempt to use the clamp on greater clamping heights by loosening the rocker screw, ITEM 16. Two problems will occur. The piston O'ring will reach the edge of the clamp body and blow out and/or the screw will tear out of the T-nut as thread engagement is decreased.



5.3 Clamp Maintenance

If maintenance becomes necessary disassembly can be accomplished as follows:

- 5.3.1 Remove nut **Item 15** from Screw, **Item 16**.
- 5.3.2 Extend spring, **Item 5** with a small curved tool and remove roll pin, **Item 13**.
- 5.3.3 Remove set screw, **Item 18**, if spring **Item 5** is being replaced.
- 5.3.4 Separate clamp body and lid.
- 5.3.5 For seal replacement, remove piston, **Item 3** and replace O'Ring, **Item 8** and backup ring, **Item 7**. Follow flag note 1 and carefully insert piston into body.
- 5.3.6 Perform other maintenance steps as necessary.
- 5.3.7 Reassemble as per drawing and instructions provided in this manual. Remember to apply locktite as specified on drawing 3866-TAB.

5.4 Spare Parts

When ordering spare parts use drawing 212LPD to find specific part numbers.

6. Model-661L, 825L, and 835L Clamp Installation and Operation

Installation of Clamp in Platen:

- Insert the T-Nut through the access hole in the center (access plate removed) or at the end of the T-slot (plug removed from hole).
- If the molding machine platen has T-slots insert the T-nut in the T-slot and check fit.

Note: To insert the T-Nut it will be necessary to compress the clamp support plate against the clamp elevation compression spring. Refer to clamp PD drawing.

Clamp Operation:

1. Please refer to drawing 661PD (or others as appropriate)
2. These are adjustable rocker clamps with the piston, **Item 4**, located at the rear of the clamp and pushing downward on a support plate, **Item 14**.
3. The mechanical locking ring, **Item 5**, is threaded on the piston, and when screwed tightly against Body, **Item 1**, retains clamping force when hydraulic pressure is shut off.
4. The clamp height adjustment knob, **Item 8**, is located on top of the clamp and is threaded on the Stud/T-nut Assembly, **Item 10**.
5. A compression spring, **Item 12**, located at the front of the clamp pushes against the support plate and keeps the clamp body, **Item 1**, elevated to the position set by the height adjustment knob.
6. When the height adjustment knob is turned clockwise, the front of the clamp moves downward.
7. When the height adjustment knob is turned counter clockwise, the front of the clamp is elevated until the full upward stroke is achieved.
8. At the full upward position, the stud must be still fully engaged in the height adjustment knob.

NOTE: When the clamp is adjusted in the full upward position, do not turn the knob any further unless the clamp is being disassembled.

7. Mold Exchange Procedures using:

Model HC-120R-HM Hydraulic Power and Control Module
Model 661L Rocker Clamps-Mechanically Locked

Note: It is assumed that the reader is familiar with the terminology used to describe the equipment noted above.

Note: The following should be integrated into your company's mold exchange procedure. Starting point is completion of a molding run.

Preparing for Mold Exchange:

- 7.1. Prior to finishing the molding run, bring the HC-120R-HM to the machine.
- 7.2. At the completion of the run connect shop air to the HC-120R-HM and connect the two hydraulic disconnects to the machine mounted manifold.

Note: The hydraulic hoses are color coded at the female disconnect and the male disconnects are color coded at the manifold. Make sure that the colors are matched when connections are made. Normally the clamps located on the 'B' (moving) platen are powered with the Blue Valve Control Knob.

Removing the Mold

- 7.3 Secure the mold halves together and connect crane or other approved mold lifting device which is able to support the entire mold weight.
- 7.4 Apply Hydraulic Force to the B Clamps to "reclamp" by turning the blue color valve (blue knob) on the Model HC-120R-HM to CLAMP. (This will supply hydraulic pressure to the clamps located on the "B" Platen, and the "B" clamp gauge should read 5000 psi).

Note: If the locking ring is difficult to turn push the Booster Button on the Model-120R for a few seconds. This will increase hydraulic pressure about 500 psi and should allow easy opening of the clamp locking rings. (Opening difficulty means that the hydraulic pressure at time of unlocking was lower than the pressure at locking. This could be caused by the use of two or more Power and Control Modules set at slightly different pressure levels or shop air pressure fluctuations.)

Note: Make sure the crane is ready to carry load.

- 7.5 Disengage the mechanical locks on the "B" platen clamps by turning the mechanical locking ring away from the clamp body. Rotate the locking rings all the way to the stop.
- 7.6 Turn the blue knob to RELEASE position. The clamps will now relax and can be

moved away from the mold. Slightly loosen the adjustment nut on top, as desired, to make movement easier.

- 7.7 If Hydra-Latch Quick Knock Out system is installed, release the KO Bars and remove.

Note: It is assumed that the “B” platen is moved up to mold for stability/support when the “A” platen clamps are released.

- 7.8 Prepare to release A side Clamps.
- 7.9 Turn the yellow color coded valve control knob (yellow knob) on the Model HC-120R-HM to CLAMP the clamps and disengage the mechanical locks on the “A” platen clamps by turning the mechanical locking ring away from the clamp body. Rotate the locking rings all the way to the stop. (Use the HM booster button if needed to clamp more and allow the nuts to spin freely).
- 7.10 Again ensuring the mold is secured by the crane and the system is ready to accept the mold free, Turn yellow knob to RELEASE.
- 7.11 Move the “A” clamps away from the mold.
- 7.12 Remove mold from machine.

Installing the Mold

Note: Make sure clamps are correctly positioned on the “A” and “B” platen for left/right or top/bottom clamping.

- 7.13 Lower next mold into machine using the guide slot feature on the “A” platen plate. Level mold. (It is assumed for this procedure that the “B” platen is moved up to the mold for stability/alignment.)
- 7.14 Move the “A” Platen clamps to the mold and make any required adjustment to the clamp elevation. The nose of the clamp should be touching the bottom of the clamping slot and be fully engaged in the slot.
- 7.15 Turn the yellow knob to CLAMP and observe the clamps actuate and 5000 psi pressure shown on the gauge. Then set all mechanical locks by turning the locking ring firmly against the clamp body.
- 7.16 While the crane is still engaged and providing support move the “B” platen away from the mold. Insert KO Bars through platen clearance holes and screw into back of mold.

- 7.17 Move the “B” platen to the mold and make any required adjustment to the clamp elevation. The nose of the clamp should be touching the bottom of the clamping slot and be fully engaged in the slot.
- 7.18 Turn the blue knob to CLAMP and observe the clamps actuate and the pressure climb to 5000 psi. Then set all mechanical locks by turning the locking ring firmly against the clamp body.
- 7.19 Turn the blue knob and yellow knob to RELEASE and inspect the setup. **Verify that all clamps are secured by attempting to move each one.**
- 7.20 Secure KO Bars at the KO Plate.
- 7.21 Remove mold straps and chain.
- 7.22 Open mold and dry cycle ejector system to verify that the KO Bars are properly connected.
- 7.23 Remove the Model-120R by disconnecting air and hydraulic connections from the machine mounted manifolds.
- 7.24 Perform other required hookups and commence molding when ready.

8. Maintenance

- 8.1 Periodically check hoses for signs of wear.
- 8.2 Replace hoses if necessary.
- 8.3 Examine clamps for damage.
- 8.4 Check mechanical locking wheels for ease of operation.
- 8.5 Chase any damaged threads if necessary.
- 8.6 Check for hydraulic leaks. Tighten fittings or replace hoses as necessary.
- 8.7 See Section 5.3 for clamp seal replacement procedures.
- 8.8 If a pipe thread fitting is removed, apply new thread tape before reassembling fitting.