

## **POOR FACE AND HOLLOW SLUG**

The following (15) Fifteen Steps Instructions are for checking Ludlow when Poor Face and Hollow Slugs are being cast:

### **1 – Clean Plunger and Well.**

After three to five years of use, Well Reamer may need replacing. Due to the heating and cooling of Reamer, the four segments will become set to size of Well. Spreading these apart with a Screw Driver may help, but, square or cutting edges may become worn. Therefore it is best to replace Well Reamer. This can be decided by the amount of pressure needed to turn Reamer when immersed in Well. If a light pressure is needed to turn Reamer, then replacement is necessary.

When cleaning Plunger, be sure to check Side Walls for nicks and burrs. Check for Ring left by Metal Height in Crucible, as this may slow Stroke of Plunger. Use a Fine Grit of Emery Cloth for cleaning, or, a piece of Brass can also be used.

### **2 – Remove Mouthpiece and Clean Throat.**

Obtain a Hand File one inch wide and ten to twelve inches long, Grind a wood Chisel edge at one end. Use this file for scraping and chopping Dross off Side Walls inside of Throat area. To clean farther down into Throat Opening, use a 3/16 x 3/8 x 15 inch long piece of Bar Stock. Bend one end so that it can reach down underneath the Side Wall on Left Side of Throat opening.

After cleaning Throat as mentioned above, install Mouthpiece. Set a line of Type, using the largest size available, cast about (12) twelve slugs, then remove Mouthpiece again to clean out Dross that has been pushed up to top of Metal in Throat.

Clean Mouthpiece Slot with ( 2 pt. ) two point blade, scrape outer walls of Funnel, scrape and clean inner walls of Funnel.

Do not put Funnel in Vise, clamp Mouthpiece in the Vise, using a rag and then scrape the Mouthpiece. First one side, then the other to clean the sides of the Funnel. To clean the slot, use the Slot Scraper or if you can get one, a broken Rouse Band Saw Blade. Break it in pieces about 7 or 8 inches long, these Blades are thin and flexible and can be twisted without breaking and they are ideal for cleaning out the Slot. There is just enough set to the Teeth to do a good job of cleaning out the Slot.

If Slot is wider than two points, replace Mouthpiece. If Air Vents appear shallow, send Mouthpiece in to Factory for Cleaning and Re-Venting.

Be sure to use Wire Brush on Mouthpiece to keep Air Vents clean and open for proper escape of Air at time of casting. If Air Vents become filled with Dross, Air will not be able to be pushed out of casting area and the result will be Hollow Slugs.

### **3 – Check Plunger Connecting Lever #274A.**

Holes in Connecting Lever in time will become Oval shaped, Pins #280 become worn, hole in Connecting Lever Bracket #276 also become Oval Shaped. Connecting Rod #271 will also need replacing. These conditions give a delayed action and bounce to Plunger Stroke, and should be replaced before trying to set or check Plunger Height.

At this point, check hole in Plunger Link Shaft #253. This also may have to be replaced. In some cases, it is best to replace Plunger, for removal of Plunger Link Shaft is more trouble than it appears to be.

### **4 - Check Height of Plunger.**

Set with 1/16” drill Rod, as instructed in Ludlow Manual, “Plunger Height Adjustment.” Turn Plunger Connecting Lever one full turn down. Then cast about (12) twelve to (15) fifteen slugs with largest Type available to check Plunger Height for Metal flow into Well. If Metal does not flow properly into Well after casting some slugs. Plunger will hit bottom of Well. Raise Plunger Level one full turn to allow proper flow of Metal into Well.

### **5 – Check Plunger Spring Pressure.**

Set distance between Plunger Connecting Yoke #278 and Plunger Spring Plug #264, at (11) eleven Picas. The distance or space of (11) eleven Picas should be figured from the top of Plunger Spring Plug to the underside of Plunger Connecting Yoke. Set Plunger Spring Adjusting Lever in front of Machine at Medium, or one Notch above Medium.

## **6 – Make New Table Top Lock-up.**

*1 – Rear Table Latch Adjustment.*

*2 – Main Slide Height Adjustment.*

*3 – Stick Locking Mechanism Adjustment.*

*4 – Crucible Compression Adjustment.*

The above adjustments are described in the Ludlow Manual.

If a swelling occurs after making a new Lock-up, check Main Slide Height Adjustment. When Mouthpiece and Mold are in casting position, in other words, locked up, then top of Mold should be about 4 pts. below the Table Top. Also, try reducing Plunger Spring Pressure one notch by lowering Adjusting Lever in front of Machine. Sometimes Main Slide Cam is worn and too much play will swell “T” Head part of Slug. This is caused by separation of mold to Mats Lock-up when cast is made. To compensate for this, raising of Main Slide about one or two points will give a tighter Lock-up.

If Main Slide Cam Roller has a flat side, the same condition will exist. Removal of Main Slide is necessary to check and replace Roller.

## **7 – Check Plunger Cam Level Stroke.**

Cam #A254A, controls the Stroke of the Plunger. That is, when the Plunger strikes for a cast and when it is raised back up to Normal Position. The Cap opening should be set to Four and one-half (4½) Picas, and no wider than Seven (7) Picas.

If the Lock Bolts become loose, Cam may open or close. Plunger will then strike before Lock-up of Mouthpiece to Mold, or, may still be casting after breakaway of Mouthpiece from Mold.

## **8 – Check Crucible Temperature.**

Gas or Electric, set at 560 to 580 Degrees.

Electric Crucible – Before setting Crucible Temperature, be sure to set Rheostat #A310EB, to #6. This will allow for extra heat in Throat and Mouthpiece if moved to #5 or above.

Gas Crucible – Lower Throat Flame to normal height. If, after setting Crucible Temperature and more heat is needed in Throat Burner, removal of Throat Gas and Air Mixer Spud Adapter #392, will be necessary. A larger Spud #300, may be needed. Gas Spud #300 Holes are figured to Wire Size Regulations.

## **9 – Check Throat Heat.**

On Electric Crucible, set Rheostat at #5 or #6 for 12 pt. Molds. When using a 6 pt. Mold, set Rheostat at #2 or #3.

For Gas Crucible, a larger spud #300 may be needed. Gas Spud #300 Holes are figured to Wire Size Regulations.

## **10 – Check Water Pump.**

Enough Water must be pumped through Mold to solidify each cast property for a solid slug. A drop in Water supply may change the Face and cast a hollow slug.

After a few years of use, the Rubber Hoses should be changed, as a swelling of the Rubber is caused by the Oil and Water.

The Water Cooling Holes in the Ludlow Mold can become clogged with Rust or Sludge deposits. Returning Mold to Factory for cleaning is the best solution. Contact Ludlow for a Loaner Mold.

As for the Water Pump, a repair job and cleaning by the Factory is recommended, or, a new re-packing job with Water Pump Packing #M293C.

Check V-Belt, it may be loose and need adjusting. Loosen Water Pump Adjusting Plate Screw #M215A, this will allow Water Pump to be raised or lowered. After adjusting, tighten Screw.

## **11 – Raise Front Legs of Machine about 24 to 36 pts.**

Most floors, Concrete or Wood, are uneven. The front of the Ludlow may pitch too low, causing Metal to flow out of Mouthpiece Slot and cause squirts before casting. Raising front Legs of Machine 24 to 36 pts. can correct this trouble.

A low pitch in Metal Crucible will cause an uneven touch of heat by hot Metal to Mouthpiece Funnel. Raising of front Legs will give a more even touch to Mouthpiece Funnel.

## **12 – Check Height of Metal in Crucible.**

A drop of more than (3/4”) three-quarters of an inch of Metal in Crucible will leave more Air Space below Mouthpiece in Throat area or Well. This will mean more Air has to be pushed out through Air Vents at time of casting. Raising Metal Level in Crucible will result in a more solid and better slug face.

*(See Check-up #11)*

## **13 – Check Three Crucible Adjustments.**

*1 – Mouthpiece to Mold Adjustment.*

*2 – Centering Mouthpiece Opening with Mold.*

*3 – Crucible Adjustment.*

To level off Crucible, insert equal amount of space at bottom of Crucible Swivel Bracket where Crucible Swivel Bracket Adjusting Screw #237 touches Crucible Swivel Bracket. After leveling off Crucible, make a Paper impression to see how far away or close to Mold at time of lock-up Mouthpiece will be. Determine at this point whether to raise or lower Crucible.

*(See Plate 15 – Place equal amount of spaces in area E)*

#### **14 – Check for water Leak in Mold.**

Make sure Motor is not running, raise Table Top, remove Felt Mouthpiece Wiper and clean away dirt from underside of Mold where contact is made by Mold and Mouthpiece. Be sure Safety Finger #753A is in position. Start motor and push Clutch Release. When Crucible starts to swing to the Right to make contact with underside of Mold, bend down and listen for a sizzling sound of Water touching a hot surface. If this is heard, contact Ludlow for a Loaner Mold and send your Mold in for a repair of Water Leak.

Also, with Motor running, remove Mold, but do not remove Water Connection. Turn Mold upside down and see if there is a leak that can be seen, the Water must be circulating at the time.

#### **15 – Check Plunger Connecting Rod #272.**

This part has a hole drilled through it, and hole should point from Front to Rear of Machine for proper setting. Rounded and Elongated Head should point from Left to Right.

Check Plunger Cam Lever, part #A258 to see if a deep groove has been scored by Head of Plunger Connecting Rod #272. These two parts come together under Crucible. *See Plate 15.*

If Plunger Cam Lever has a deep groove worn in it, this will change the Plunger Height. Changing Plunger Cam Lever is recommended. To replace Lever, remove Water Tank.

## **THIS IS A SYNOPSIS OF ATTACHED INSTRUCTIONS**

- 1 – Clean Plunger and Well.**
- 2 – Remove Mouthpiece and Clean Throat.**
- 3 – Check Plunger Connecting Lever @274A**
- 4 – Check Height of Plunger.**
- 5 – Check Plunger Spring Pressure.**
- 6 – Make New Table Top Lock-up.**
- 7 – Check Plunger Cam Lever Stroke.**
- 8 – Check Crucible Temperature.**
- 9 – Check Throat Heat.**
- 10 – Check Water Pump.**
- 11 – Raise Front Legs of Machine.**
- 12 – Check Height of Metal in Crucible.**
- 13 – Check Three Crucible Adjustments.**
- 14 – Check for Water Leak in Mold.**
- 15 – Check Plunger Connecting Rod #272.**

Where this document refers to **(FACTORY)** you can replace with **HOT METAL SERVICES** or whomever your local service person is.

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All of these pages had the initials (EPF) at the bottom. I have been told these are the initials of Edward P. Forman a former employee of Ludlow Typograph.