COMPLICATIONS

Problems will arise occasionally when straightening a wheel. Most are time consuming but are easy to solve. As you become more experienced you will encounter fewer difficulties and setbacks.

It is impossible to prepare you for every problem but there are four common issues to watch out for and they are as follows:

False Feedback

Either the wheel is ready to crack under pressure, or the Ram has reached the end of its stroke.

Ram will not retract

Loose connection at the hose and Ram coupler is common cause.

Chasing a bend and irreparable runout

Understand why and know when it is time to quit trying to get a better results.

Using the Roughing Attachment

Keeping an eye on Ram Housing position is important.

PROBLEM 1
FALSE FEEDBACK

FALSE FEEDBACK

RAM STROKE

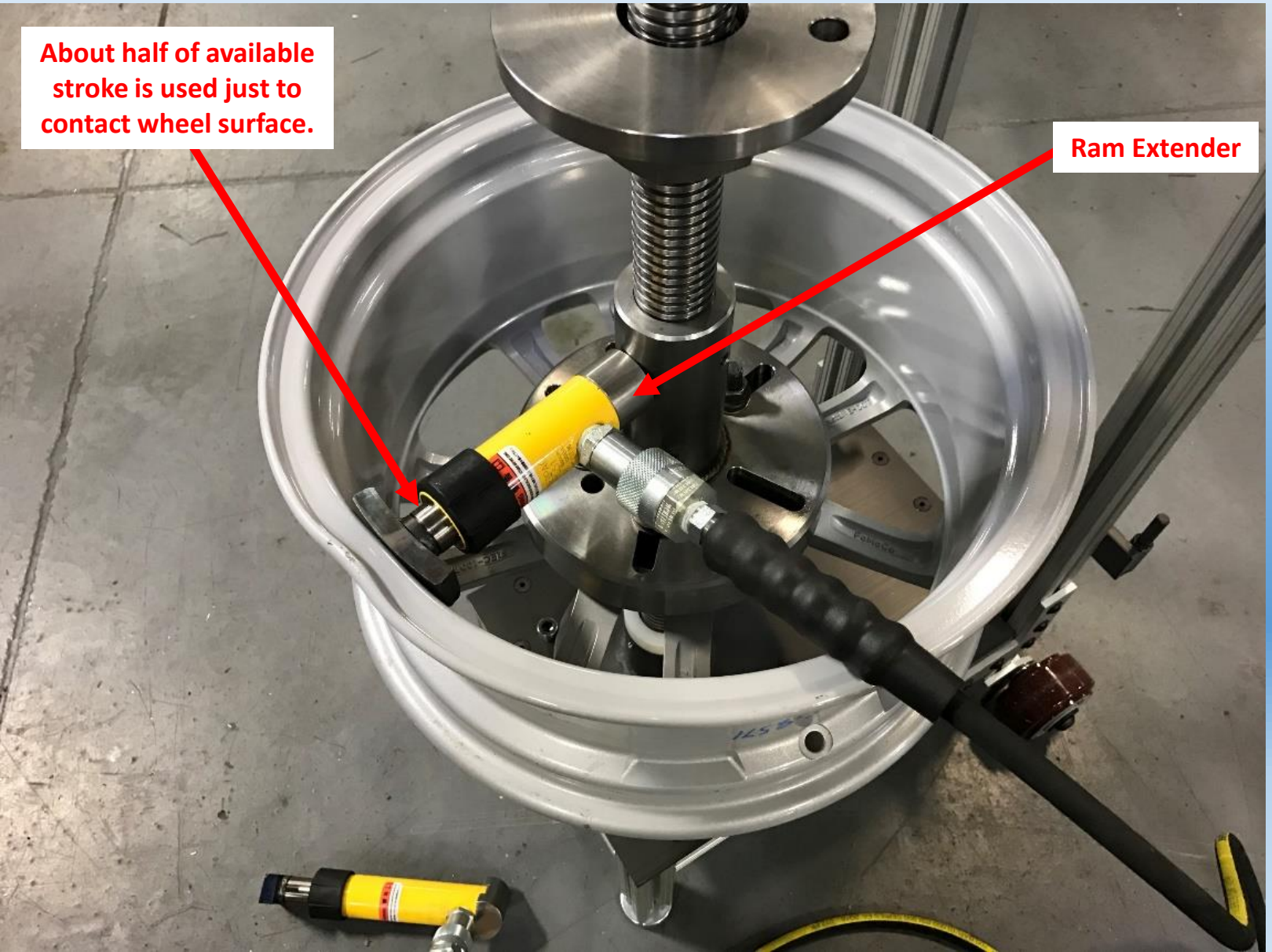
If you are approaching very high pressure and are **sure** the Ram has not run out of stroke, it is time for you to change your straightening strategy.

You might want to do one or more of the following:

- Reheat the wheel
- Reposition the lower ram
- Employ a second axis
- Add some heavy impact.

Remember, if the Ram has reached the end of its stroke you might be thinking the wheel is on the verge of cracking when it is not. That's "False Feedback".

FALSE FEEDBACK



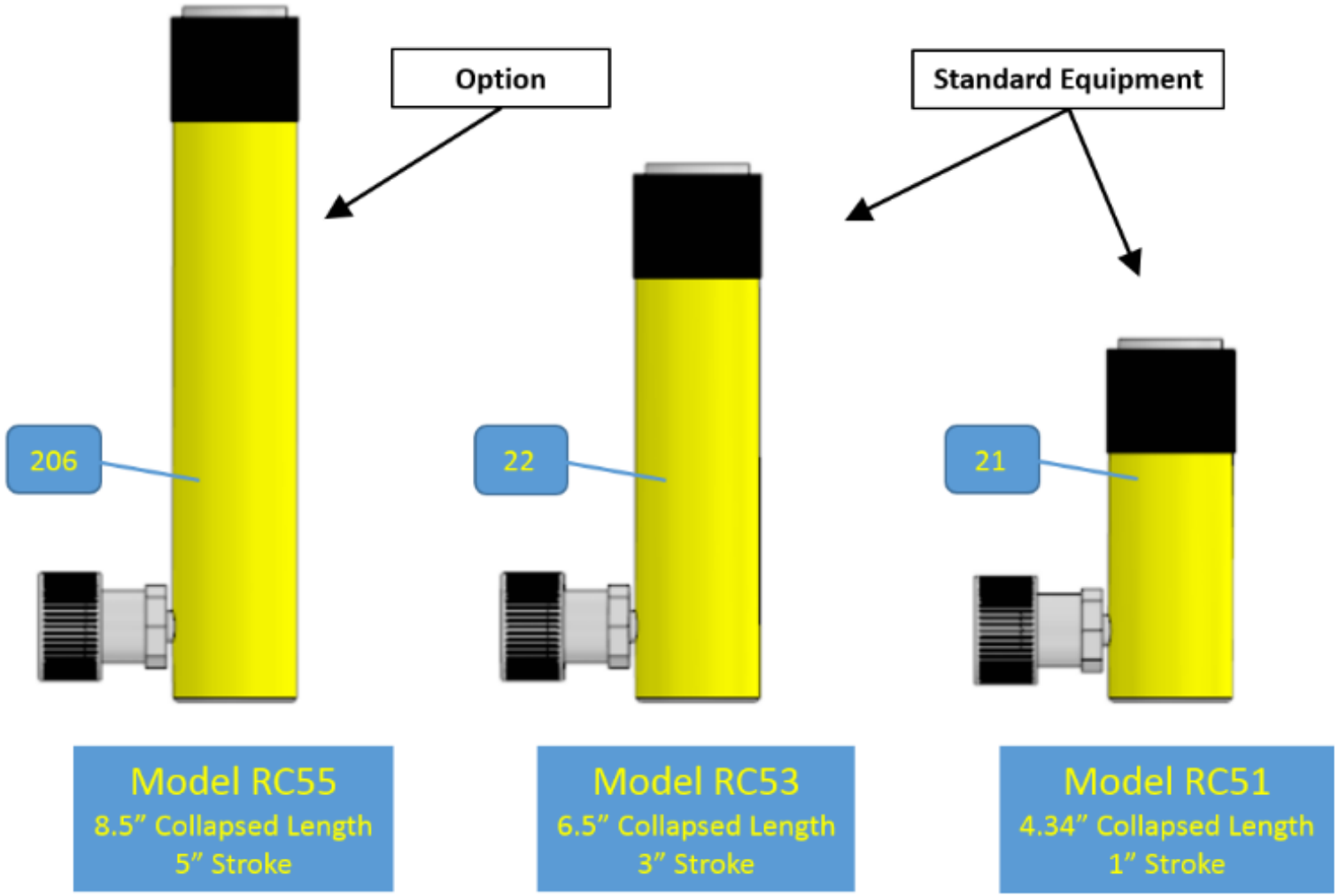
The first of the three most common problems is “False Feedback”. The single axis setup shown here is using the standard Enerpac RC51 Ram, which has a 1” stroke. Notice that a Ram Extender has been bolted on the end of the Ram. A magnetic Pusher Spacer could also have been used. Either of those components extend the collapsed length of the Ram by 1”.

Without an extender there would not be enough stroke to reach the wheel let alone do any effective pushing. This photo illustrates this fact clearly.

When the Straightening Die contacts the bend area, the Ram tube appears to be extended about ½”. This leaves enough stroke to move the bend outward another ½”, which should be enough to true the wheel.

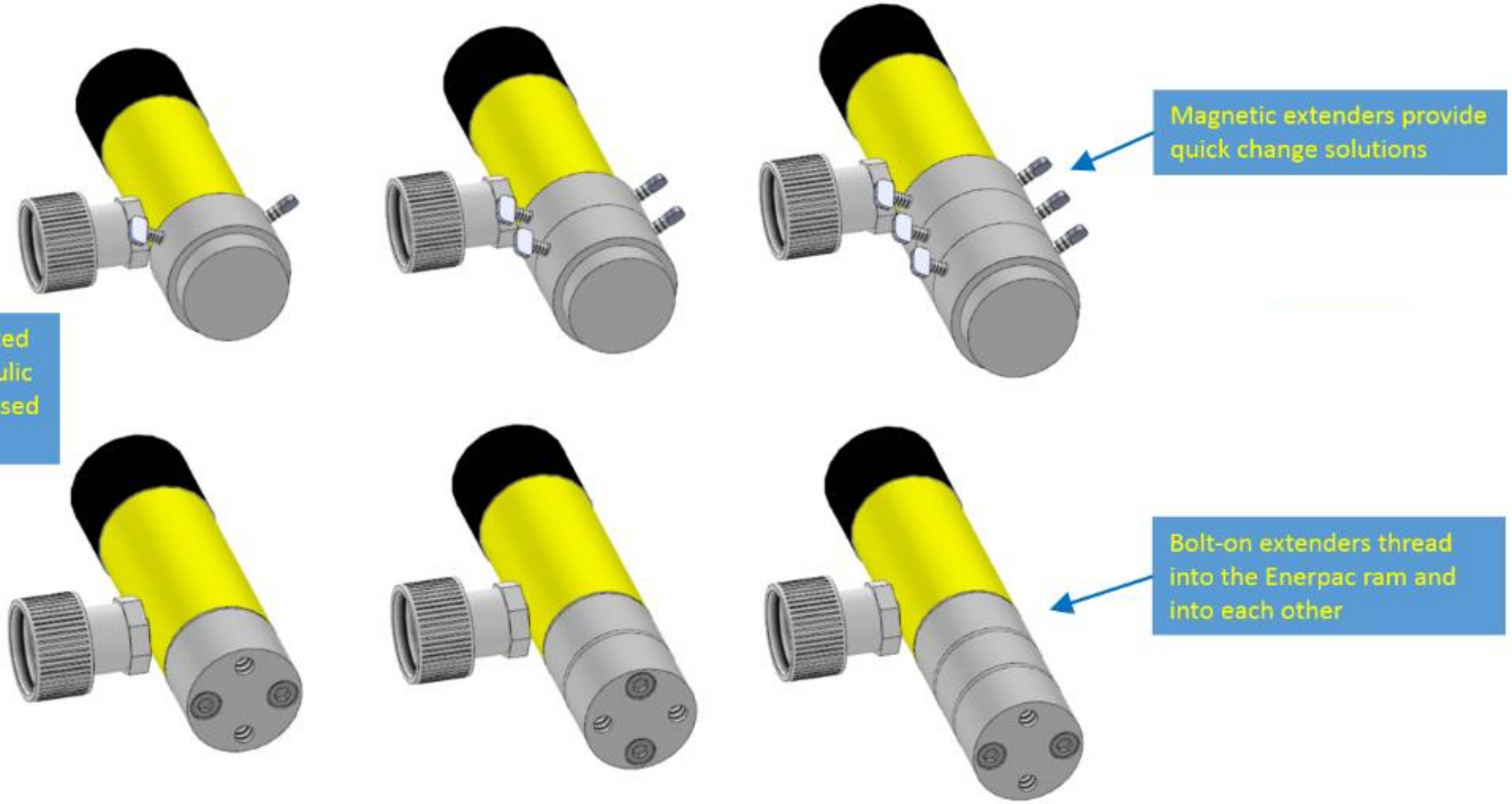
The illustrations on the next two pages review the stroke and collapsed length for all three of the RC series hydraulic cylinders and show the differences in the Ram Extenders

ENERPAC 5 TON RC SERIES RAM COMPARISONS



All NewArc™ parts and accessories are interchangeable with any 5 Ton Enerpac RC Series Hydraulic Cylinders

Stackable Pusher Spacers and Ram Extenders



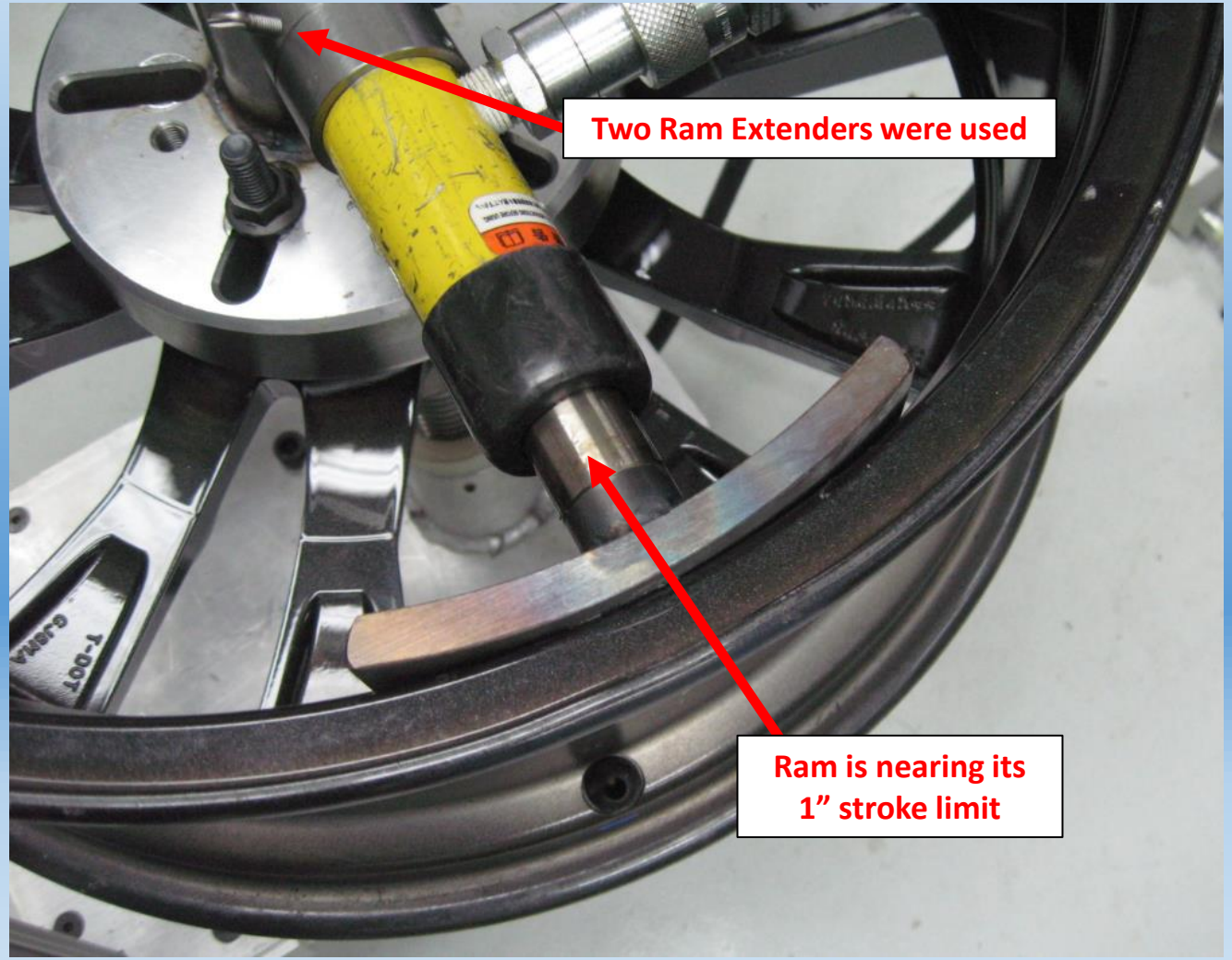
Magnetic extenders provide quick change solutions

Stackable Ram Extenders are depicted on the ends of Enerpac RC51 hydraulic cylinders, which have a 4.34" collapsed length and a 1" stroke.

Bolt-on extenders thread into the Enerpac ram and into each other

Ram Extenders can be used with any Enerpac 5 Ton RC series hydraulic cylinder, they are most commonly used with the RC51 in wheel straightening setups. Each extender increases the collapsed length of the assembly by 1". The magnetic extenders can be changed quickly and can be used with or without the thumbscrews, which improve setup support slightly. The bolt-on style extenders provide a more permanent and stable assembly.

FALSE FEEDBACK



Here a RC51 is being used on a larger rim. Even though two extenders are being used, the Ram has nearly used all of its stroke.

During normal straightening you will be able to tell things are going well in three ways. You will:

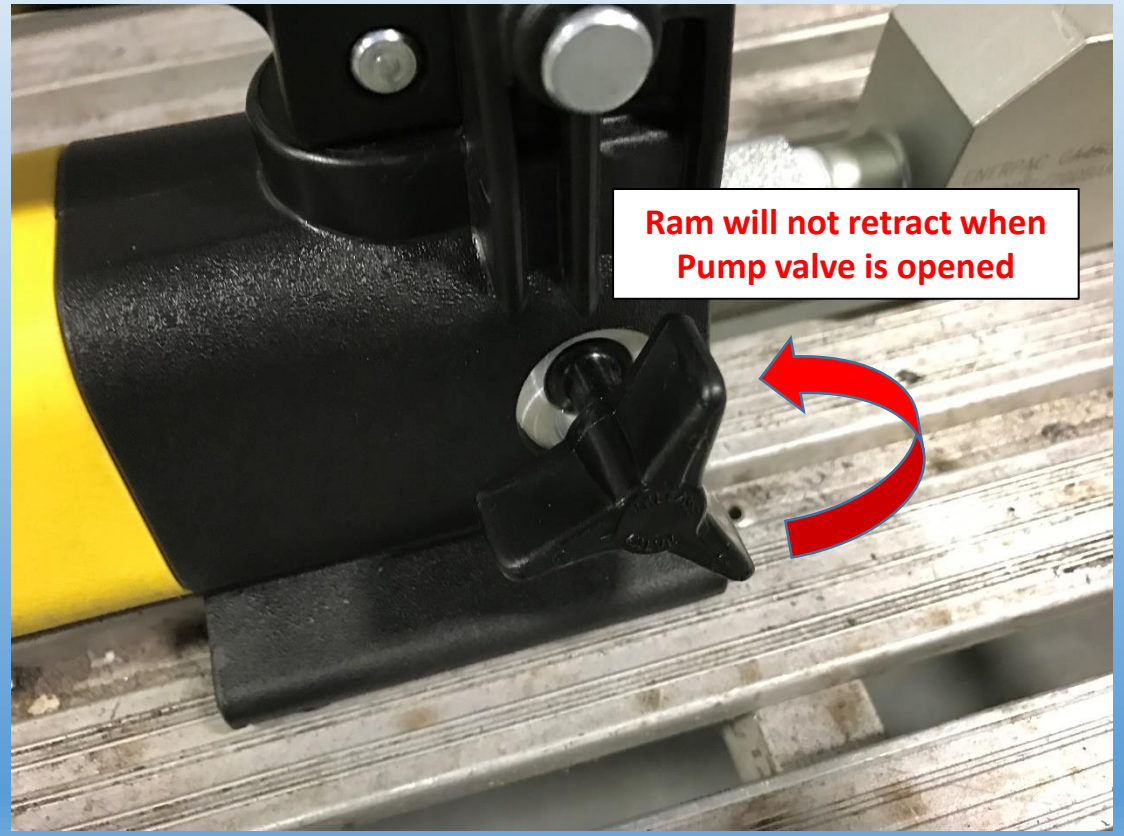
- See the metal moving
- See the pressure going up on the gauge.
- Feel a “mushy” feedback in the pump handle

It is the “Feedback” that is most important. As the pressure increases, the feel from the pump handle will also get stiffer. But that is normal as long as you continue to see the metal moving.

Here is where “**False Feedback**” comes in. If the pressure on the gauge is getting higher ***AND*** the feeling in the pump handle is getting stiffer, but you ***DO NOT*** see the metal moving, one of two things is happening. 1. The wheel is about to crack or 2. The Ram has reached the end of its stroke. It’s the exact same feeling for both conditions.

PROBLEM 2
RAM WILL NOT RETRACT

RAM WILL NOT RETRACT



If the Enerpac Ram will not retract, one of two things is happening:

1. The inner return spring has broken. If that's the case, you can manually push it closed when you open the Pump valve.
   If that is the cause, you must have the Ram repaired at any Enerpac Service Center
2. The threads on the female hose coupler have backed off of the male coupler and the check valve in the Ram has closed.
   By far, number 2 is the most common cause of this condition, which is explained on the next page

RAM WILL NOT RETRACT

When the male coupler on the end of the Enerpac hose is tightened securely into the female coupler in the Enerpac Ram, the check valve in the Ram is held open so oil can travel both to the Ram from the Pump and back to the Pump from the Ram. The knurled nut needs to be only finger tight to keep the connection secure.

Sometimes, during normal use, the knurled nut will back off a few threads as shown in the above photo. When this happens, the check valve closes, the oil is trapped in the Ram and it cannot retract when the Pump valve is opened. If this happens, simply press the hose coupler downward into the Ram coupler. As you do, you will feel the spring pressure of the check valve opening. Then just spin the knurled nut on again, making sure it is finger tight. Do not use tools to tighten this connection.

PROBLEM 3
CHASING A BEND

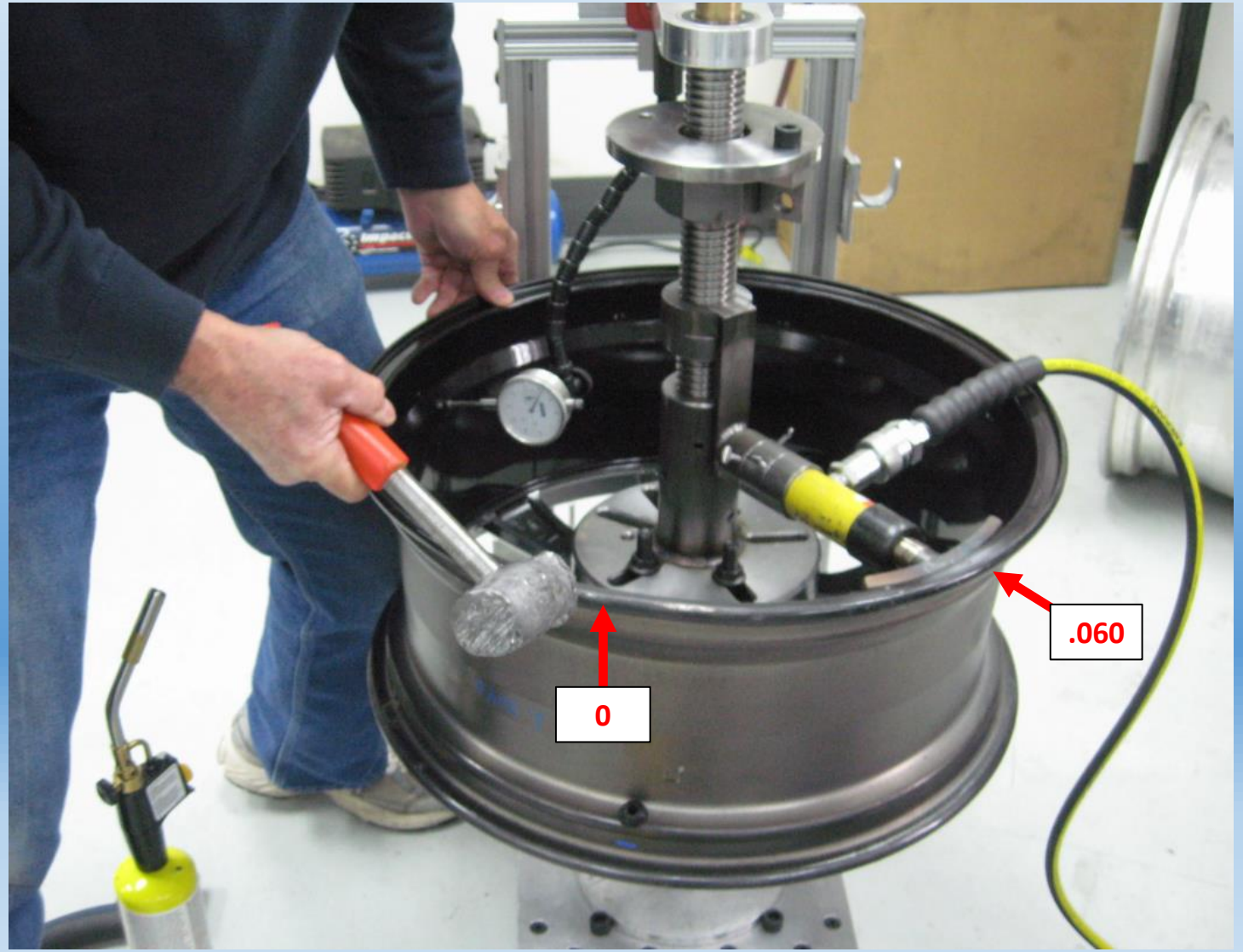
CHASING A BEND

It is usually not necessary to use a dial indicator until the final steps of the repair. Most of the time, you just look at the bent area until it starts to appear as round as the rest of the wheel. Then you are ready to tweak the wheel, using the dial indicator.

When you get to the indicating stage of your straightening repair, it is always proper to mark the spots on the wheel each time you take new readings. Then pressure against the high points, coupled with strategic impact, should progressively improve the total runout. Usually the high spots, or plus readings, will continue to be in the area of the original bend and the negative readings will continue to be in the areas on each side of the bend. As long as this is the case, you must continue with the same strategy you have been using (heat, pressure and impact) until the runout improves. However, that is not always what happens.

Sometimes when you are close to acceptable runout, the plus and minus indicator readings seem to be moving to other locations on the wheel. If that is the case, then it's time to do the 180 check.

CHASING A BEND



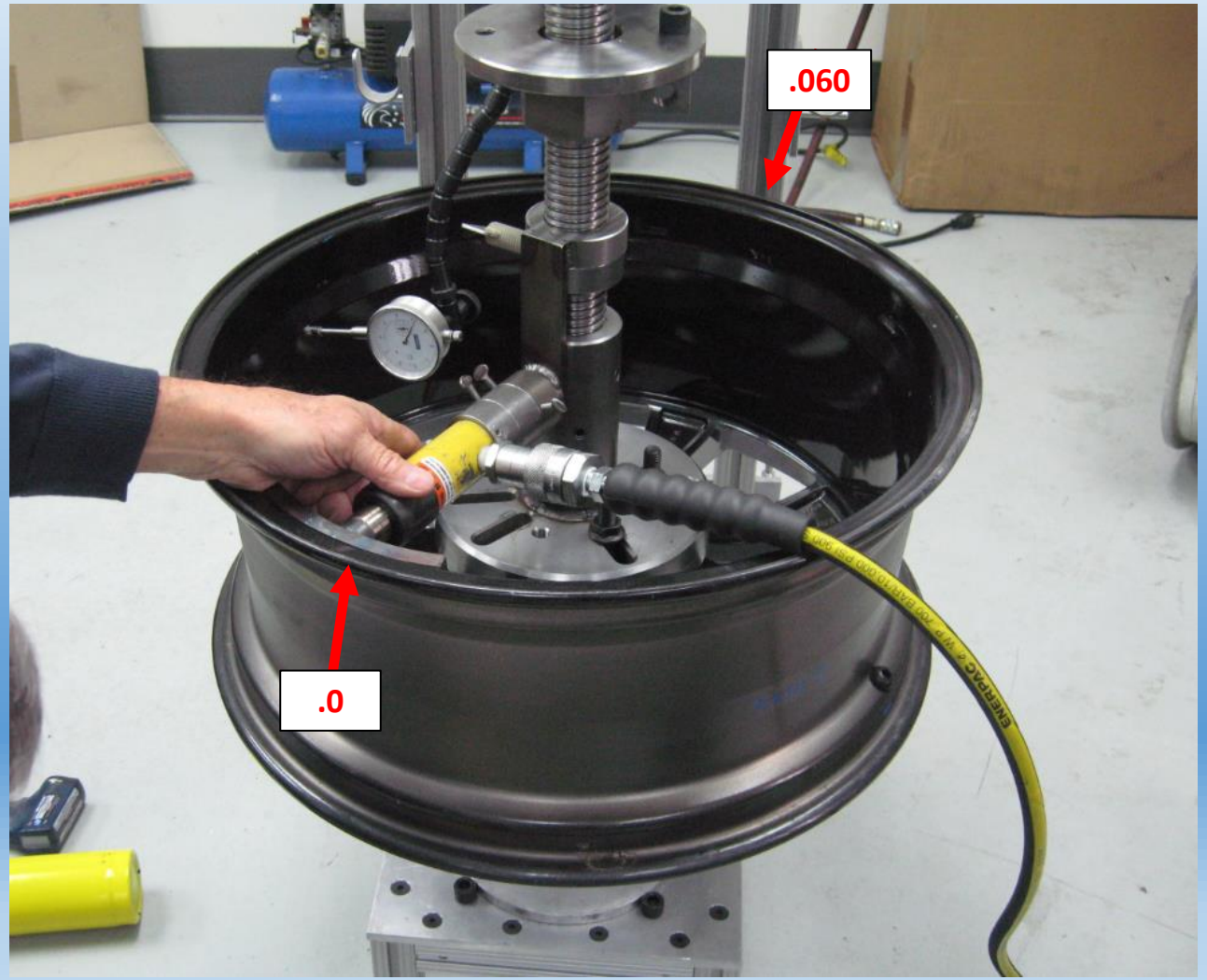
Typical straightening procedures concentrate outward forces at the bend site while using inward impact forces on each side of the bend. Dial indicator measurements will confirm the most positive readings will be at the original bend and the most negative readings will be on each side of the original bend.

When you have reached a point where there are just two dimensional variations, it seems logical to use pressure at the positive reading location while impacting the most negative location.

In the example shown here, indicator readings at the bend site show .060” with the ZERO reading at around 90 degrees from the original bend. Impact at the ZERO location will move that area inward while the .060” area is under outward pressure. The goal is to reduce the difference between the two readings.

As the distance between the two measurement extremes gets larger, sometimes it will seem as though the bend is moving away from the original location. If that happens it will seem as though you are “chasing” the bend.

CHASING A BEND

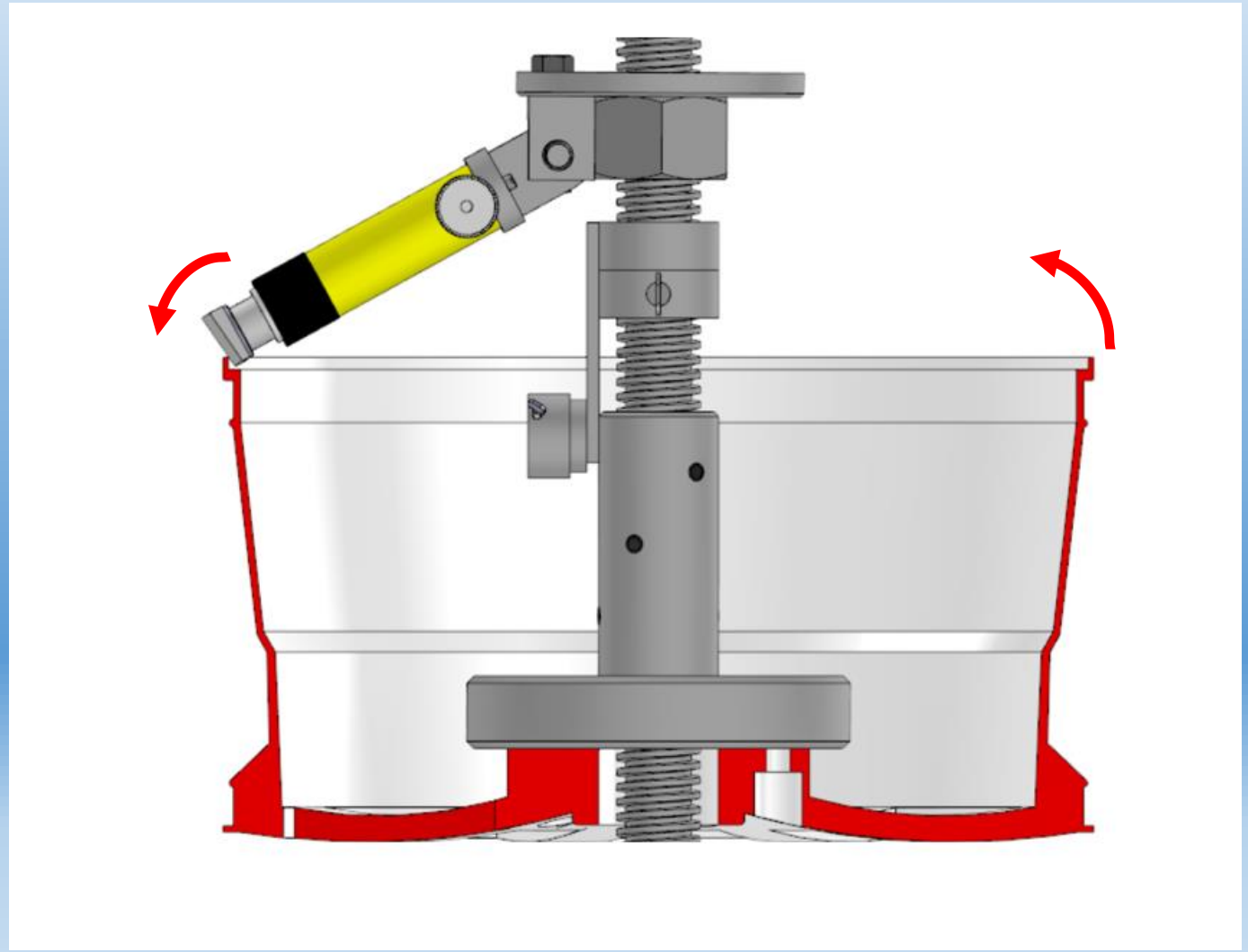


Remember that, when straightening forces are concentrated in the bend location, the wheel is also being torqued downward. This causes the opposite side of the wheel to come up and in slightly, as shown here.

In this example, the .060” reading had been at the pressure point. When indicator readings are taken following pressure application, there is still a .060” variation but the .060” reading has moved to the opposite side of the wheel or 180 degrees away.

Instead of “chasing” the bend back and forth on the wheel, the best solution to this problem might be to set up a steep upper axis angle at the .060” location and gently push it downward. Very little pressure should be used with the goal of reducing the difference between the two locations to .030” or less.

CHASING A BEND



If using 4,000 pounds of pressure to correct a .060" runout at one location has resulted in the .060" moving to a location 180 away, the simplest solution is to set the upper axis at a steep angle and use lighter pressure to press the wheel downward.

As little as 1,000 pounds of pressure may be all that is needed. Remember your goal is to reduce the difference as much as possible between the two dimensional variations. So, if you have a total runout of .060" with 180 degrees to the ZERO, then you should easily be able to end up with .030" total runout.

If the ZERO is less than 180 degrees away and normal straightening procedures cannot reduce the difference between the two dimensional variances, the wheel could be bent in the barrel or in a spoke. If that is the case, the damage is probably irreparable.

Another strategy to use if lateral torqueing seems to be a problem is to use the Pusher Support Attachment. If it is set up as shown above, it mirrors the position of the upper axis and prevent lateral upward movement of the wheel at the spot 180 degrees from the bend site. The nut only needs to be finger tight at setup, just enough to hold it in position. This attachment will also help support the mainshaft from straightening forces.

CHASING A BEND

With just these three components, along with a little strategic impact, you should be able to straighten a wheel with maximum efficiency.

And after repairing only a few wheels, you will be able to accomplish the task in only a a few minutes.

PROBLEM 4
USING THE ROUGHING ATTACHMENT

TIPS WHEN USING ROUGHING ATTACHMENT

Freefall Bolt - Once you have mounted the attachment on the Mainshaft, you can leave it in place permanently. It will not interfere in straighten setups, even when you don't use it. It is there simply to prevent the Ram Holder from free-falling when the shaft is turned upright. It is not necessary to use this bolt for any other reason so it can be backed off or removed entirely if desired.

Brass Set Screw – Tightening this set screw with an Allen Wrench locks the Sliding Ring to the Mainshaft. Since the screw is recessed, it will not interfere with the rotation of the Ram Housing, allowing it and the wheel to spin freely while the Ram is held stationary. This allows the Ram to be, used as a reference indicator. In some cases the need for a dial indicator setup can be eliminated.

The Ram Housing position shown here is above the Mainshaft Hub. If you are working on an unusually wide wheel and need to position the Hydraulic Ram high on the rim edge, you will need to place a shim, about 3/8" thick behind the flat platen to support it *during pressure applications.* Otherwise, there is a risk of bending it.