Construction Tips

This is going to be a project that will take several nights and or weekends to complete. Don't try to rush through it and the end result will be a grinder that works better than you ever imagined.

- Begin by making sure that all of the cuts on your metal pieces are square, both laterally and longitudinally. This will play a major role during assembly if they aren't. Use a file, grinder or belt sander to ensure their squareness.

- Make sure that all of your steel pieces are cut to the correct length. This will make hole location and measuring go much smoother.

- Make sure that your drill press is square, that is that the quill and table are square, otherwise the holes that you drill will not be square. Consult you drill press manual to see how this is checked and adjusted.

- Don't force the drill bits through the metal. This will cause them to over-heat and they will dull very quickly. Use adequate cooling, either a light water mist or some sort of cutting oil.

- When tapping the required holes, take extra caution to ensure that the tap goes into the hole absolutely square. It is very difficult to line things up later if the holes are tapped crooked.

- Use either a set of dial calipers or a digital version to layout all the holes and cuts, if you don't, nothing will line up correctly.

- Don't radius any of the corners, on any of the pieces until ***AFTER*** all of the holes have been drilled and tapped and you have assembled the grinder to make sure everything fits right.

- Try to keep tolerances as tight as possible, this will help make a nicer, smoother running grinder when it is complete.

- Be sure to use a center punch to locate all holes to be drilled.

KNIFE GRINDER MATERIALS LIST & CONSTRUCTION TIPS

by Michael Clerc
mike.clerc@cox.net

Materials List

- ***Minimum tools required:***

  - ✓ Drill press & Drill bits ("#7", "F", $^{5}/_{16}$", ¼", 17/64", ½", "O", 1")
  - ✓ Tap Handle & Taps (¼-20, $^{5}/_{16}$-18, ½-13)
  - ✓ Hacksaw
  - ✓ Flat file
  - ✓ Dial or Digital Calipers
  - ✓ Center Punch & Hammer
  - ✓ Scribe
  - ✓ Square

- ***Steel & Aluminum***

  1 - ¾"x5"x6" **Cold** or **Hot** Roll Steel Rectangle (Rear Support)
  1 - ¾"x3"x6" **Cold** or **Hot** Roll Steel Rectangle (Front Support)
  2 - ¾"x5"x5" **Cold** or **Hot** Roll Steel Rectangle (Bearing Supports)
  1 - ¾"x1½"x2" **Cold** Roll Steel Rectangle (Tracking Pivot/Roller Mount)
  1 - ¾"x2"x9" **Cold** Roll Steel Rectangle (Tension/Tracking Arm)
  1 - ¾"x2"x5" **Cold** Roll Steel Rectangle (Tension/Tracking Arm Support)
  2 - ½"x2½"x12" **Cold** Roll Steel Rectangle (Upper & Lower Main Arm)
  2 - ½"x1½"x12" **Cold** Roll Steel Rectangle (Main Arm Sides, L & R)
  2 - ½"x1"x2" **Cold** Roll Steel Rectangle (Tracking Pivot Mounts)
  1 - 1½"x1½"x20" **Cold** or **Hot** Roll Steel Square Bar (Tooling Arm)
  1 - ¼"x18"x18" **Cold** Roll Steel Plate (Base Mounting Plate)

  Optional Items If Desired
  1 - ½"x4"x6" **Cold** Roll Steel Rectangle (Work Rest)
  1 - ½"x1½"x12" **Cold** Roll Steel Rectangle (Work Rest Support Arm)
  1 - .375" (or .500") x6"x12" Aluminum 6061-T6 Rectangle (Platen or Slack Belt Attachments)
  1 - ¼"x2"x2"x6" **Hot** Roll Steel Angle (Platen Mount)
  1 - .375"x2"x8" **Cold** Roll Steel Rectangle (Platen)

  *The steel and aluminum I purchased initially from Online Metals because they had reasonable prices and they would cut the stock to the length I needed. I've since acquired a small metal cutting bandsaw and now buy my metal from a local supplier. You can use either **Cold** or **Hot** roll steel, which ever is available. The main difference in the two is strictly appearance. **Cold** roll is smoother, **Hot** roll will have some scale, as a general rule.*

  Online Metals
  1138 West Ewing
  Seattle, WA 98119
  (800) 704-2157 OR (206) 285-8603
  Fax: (800) 533-6350 OR (206) 285-7836
  http://www.onlinemetals.com/

- ***Rollers, Pulleys and Contact Wheels***

  Rob Frink
  Beaumont Metal Works
  362 Beaumont Rd.
  Columbus, OH 43214
  (614) 263-5656 - Phone
  (614) 261-0094 - Fax
  http://www.beaumontmetalworks.com

  Once you have decided on a motor to use, contact Rob Frink and talk to him about the size of the drive and idler wheels you will need to achieve the proper belt speeds. Rob is an excellent resource and is very willing to help in any way that he can. Rob is also an excellent source for drive pulleys and motors if you don't have any other source.

- ***Knobs, Handles, Bearings and Drive Shaft Material***

  McMaster-Carr Supply Company
  9630 Norwalk Blvd.
  Santa Fe Springs, CA 90670
  (562) 692-5911 - Phone
  http://www.mcmaster.com

Quantity	Part No.	View Page	Description	Unit Price	Ext. Price
1 EA	62385K43		Phenolic Fluted Tapered Handle 3/8"-16 Steel Threaded Stud, 4-61/64" L Handle	$2.96 EA	$2.96
2 EA	5967K52		Cast Iron-Mount Steel Ball Bearing 4 Bolt Sq Flange For 3/4" Shaft Dia, 3-3/8" Base Lg	$24.98 EA	$49.96
1 EA	6271K31		Die Cast Zinc Adjustable Handle W/Ball Knob 3/8"-16 Thread X .78" L Stud, 3.15" L Handle	$7.62 EA	$7.62
1 EA	6117K55		Partially Keyed Steel Shaft 3/4" Shaft OD, 1/8" Keyway Width, 24" Length	$25.40 EA	$25.40

I'm sure that these items are available from other sources; I just have found this company excellent to deal with and do business with them with my "regular" job.

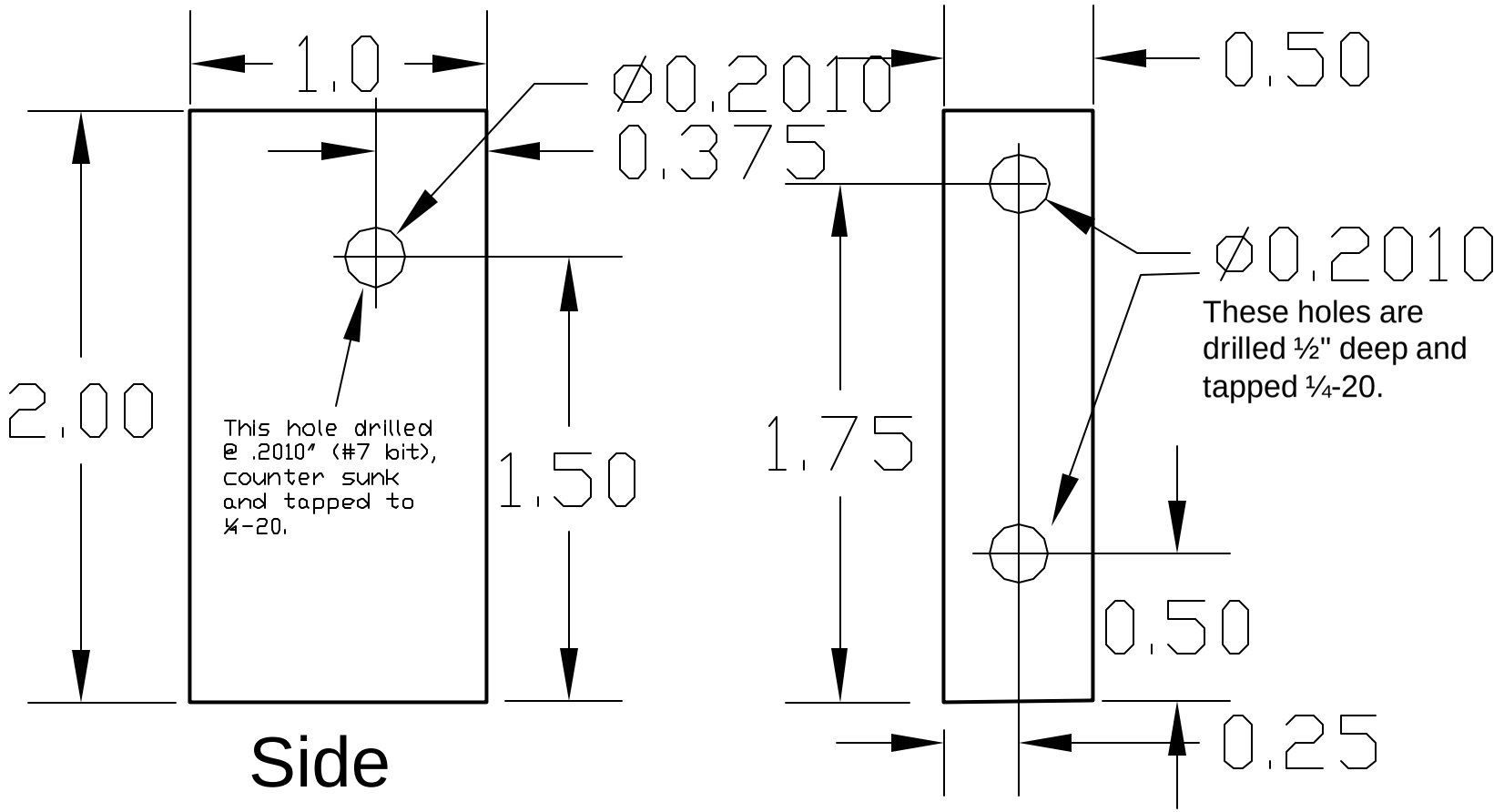
- ***Bolts, Springs and Miscellaneous Hardware***

  Most of the bolts, nuts, washers, springs and miscellaneous parts I purchased from my local *Ace Hardware Store*.

  1 - ½-13x24" Ready-Bolt
  12 - ½-13 Nuts
  1 - $^{5}/_{16}$-18x12" - Ready-Bolt
  14 - ¼-20x¾" - Flat head bolts
  14 - ¼-20x1" - Flat head bolts
  6 - ¼-20x1½" - Flat head bolts
  1 - $^{5}/_{16}$-18x2½" - Cap Screw
  8 - ¼-20-x1" - Cap Screws
  4 - ¼-2-x2½" - Flat head bolts
  4 - ¼-2-x3" - Flat head bolts
  1 - Spring (Tracking Control)
  1 - Spring (Tracking Support)
  8 - ¼" Flat Washers
  1 - $^{5}/_{16}$ -18 NyLok Nut

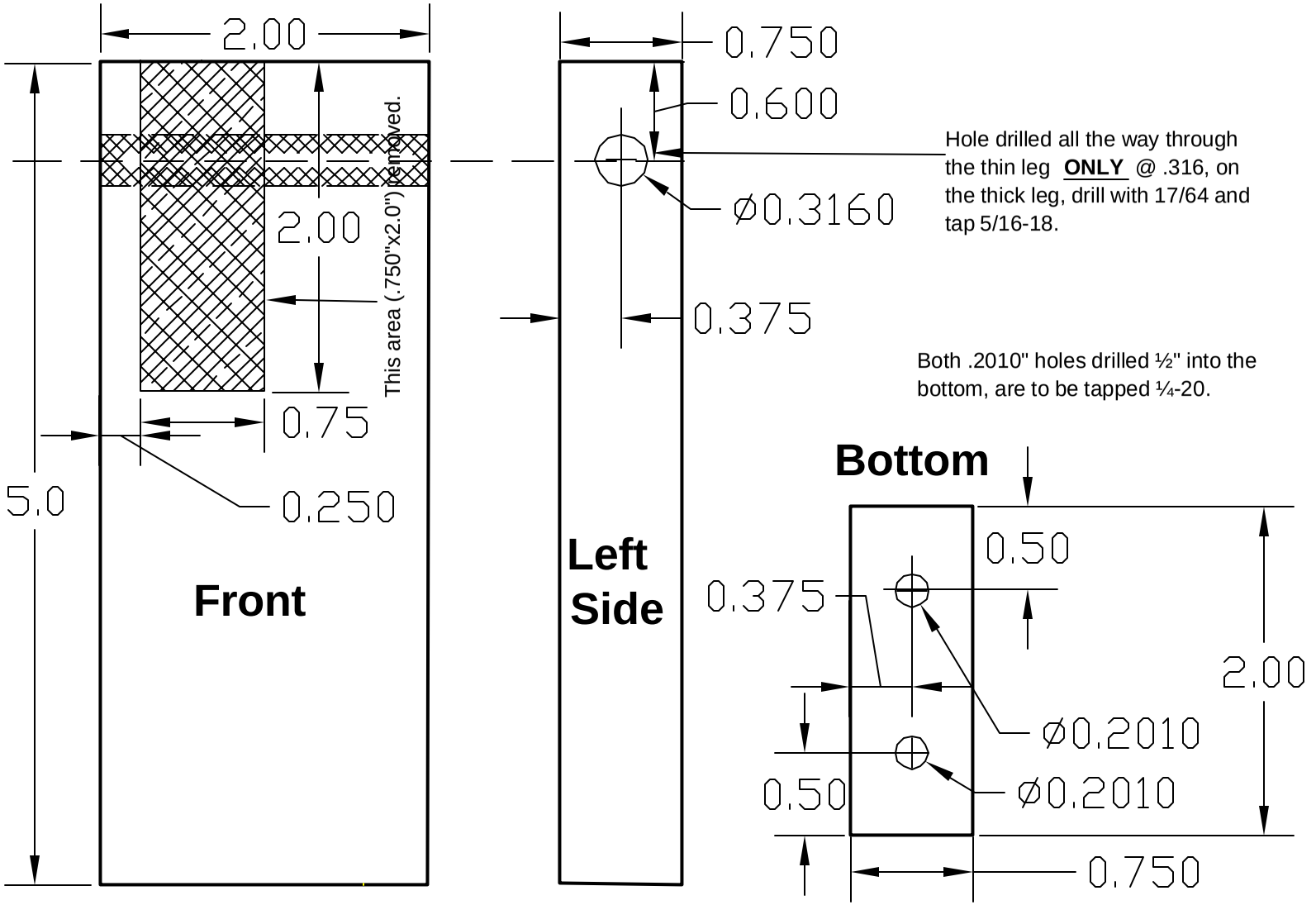
Tracking Pivot Mounts

Each piece (2) is ½"x1"x2" - Cold Roll Steel

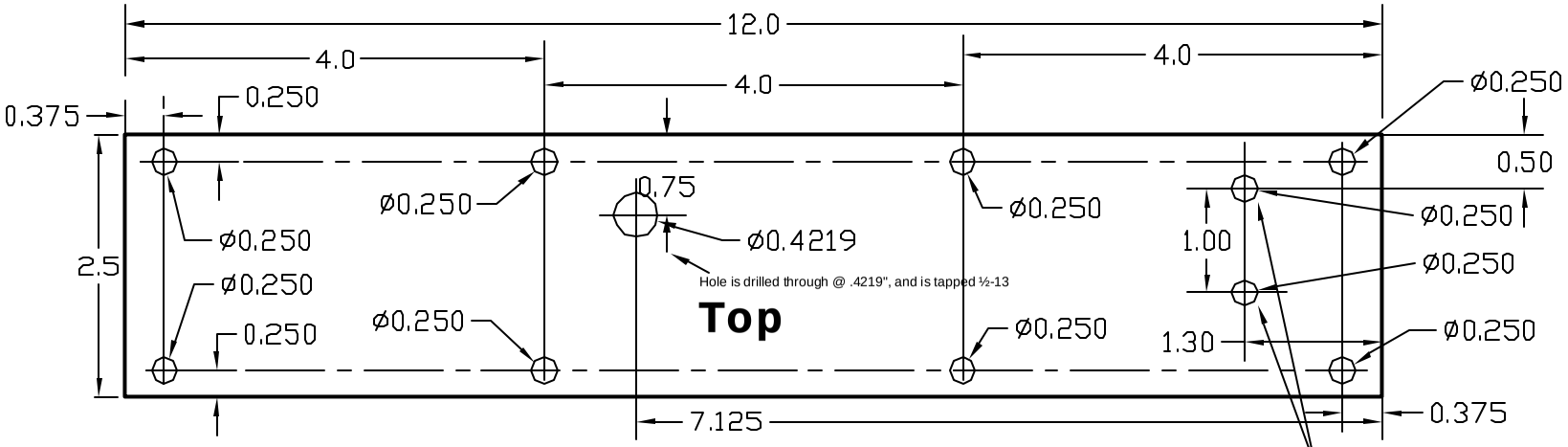


Tracking & Tension Arm Support

This piece is made from ¾"x2"x5" cold roll steel



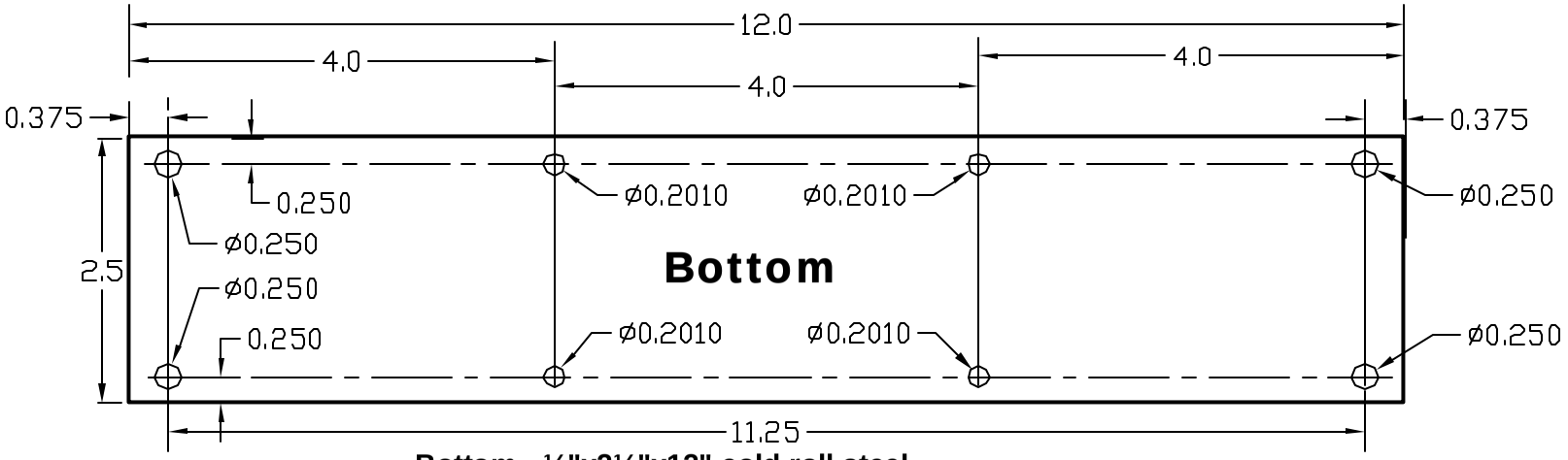
Grinder Main Arm - Top & Bottom Support



Top - ½"x2½"x12" cold roll steel

TOP ONLY *- All of the .250" holes are drilled all the way through, and can be countersunk if so desired on the top side to accomodate ¼-20 flat head bolts.*

These two holes are drilled all the way through, but are countersunk from the underside, to accommodate ¼-20 flat head bolts.



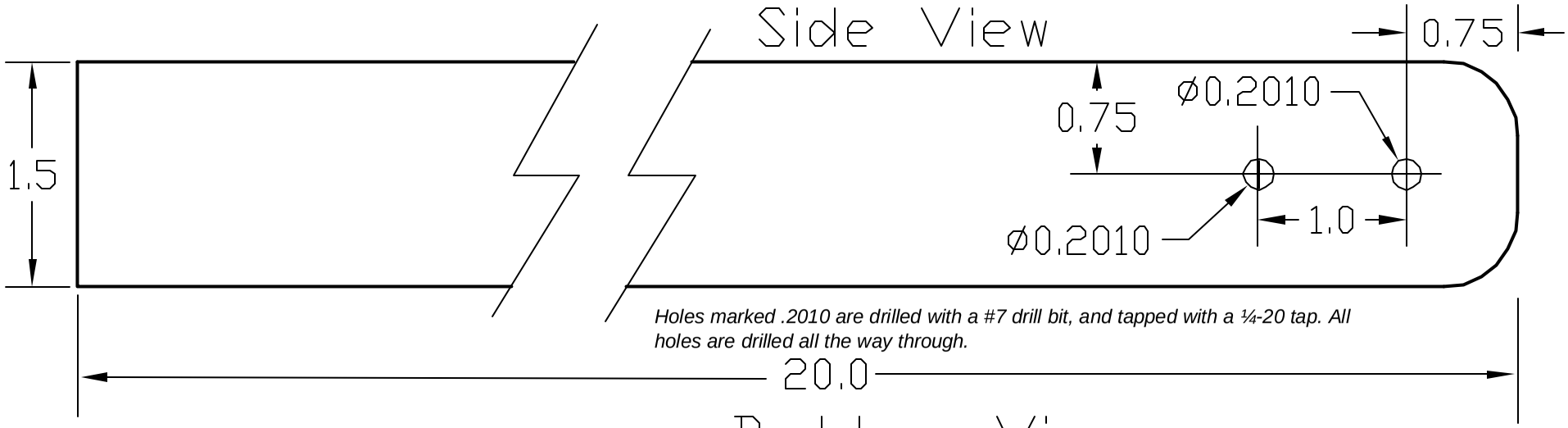
Bottom - ½"x2½"x12" cold roll steel

BOTTOM ONLY *- Holes marked .2010 are drilled with a #7 drill bit, and tapped with a ¼-20 tap. All holes are drilled all the way through.*

Tooling Arm

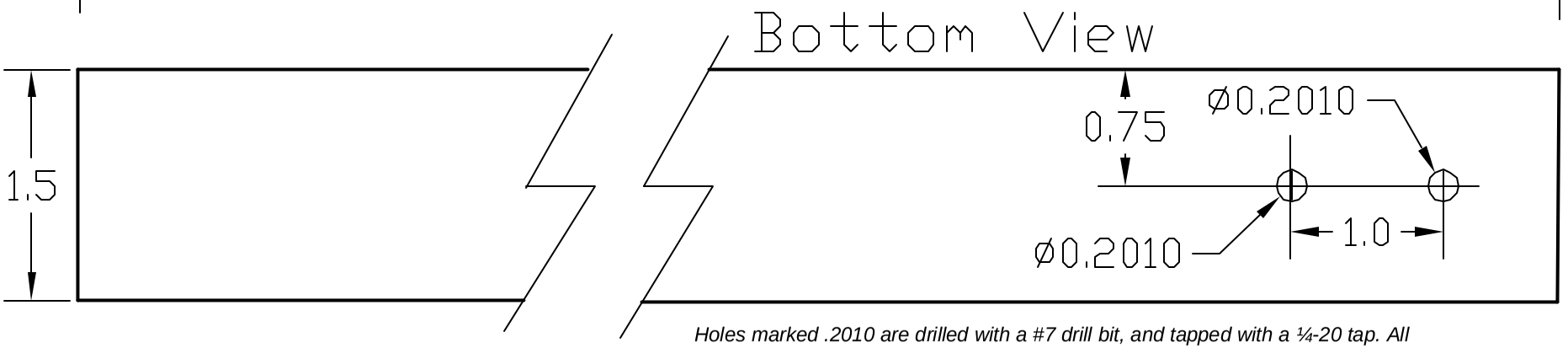
Material is 1½"x1½"x20" cold roll steel

(This hole configuration is for the flat grind platen and the work rest.)



Holes marked .2010 are drilled with a #7 drill bit, and tapped with a ¼-20 tap. All holes are drilled all the way through.

20.0

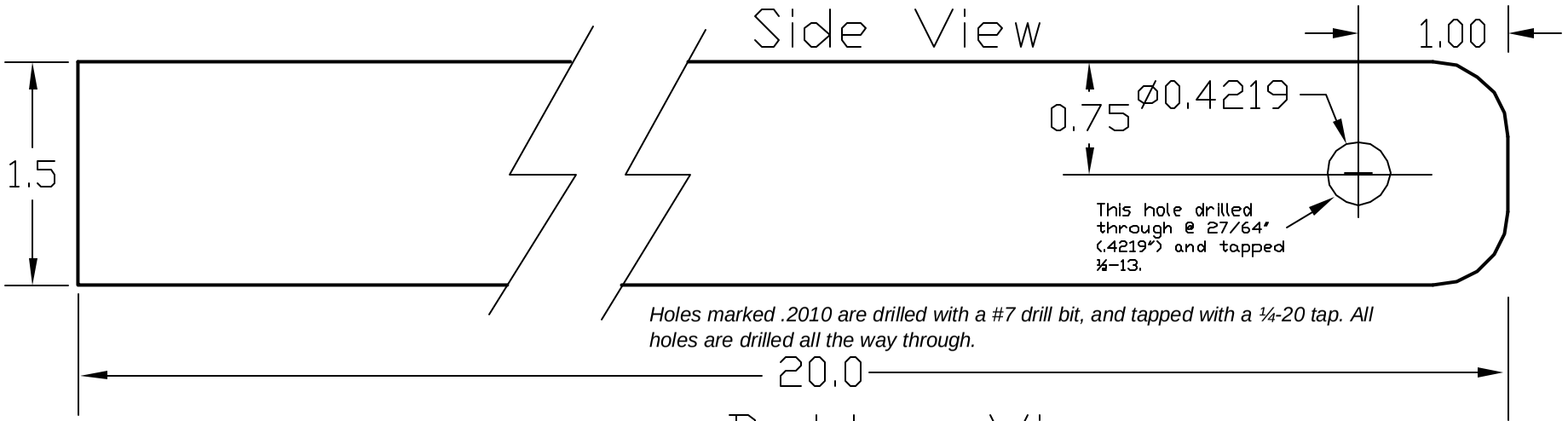


Holes marked .2010 are drilled with a #7 drill bit, and tapped with a ¼-20 tap. All holes are drilled all the way through.

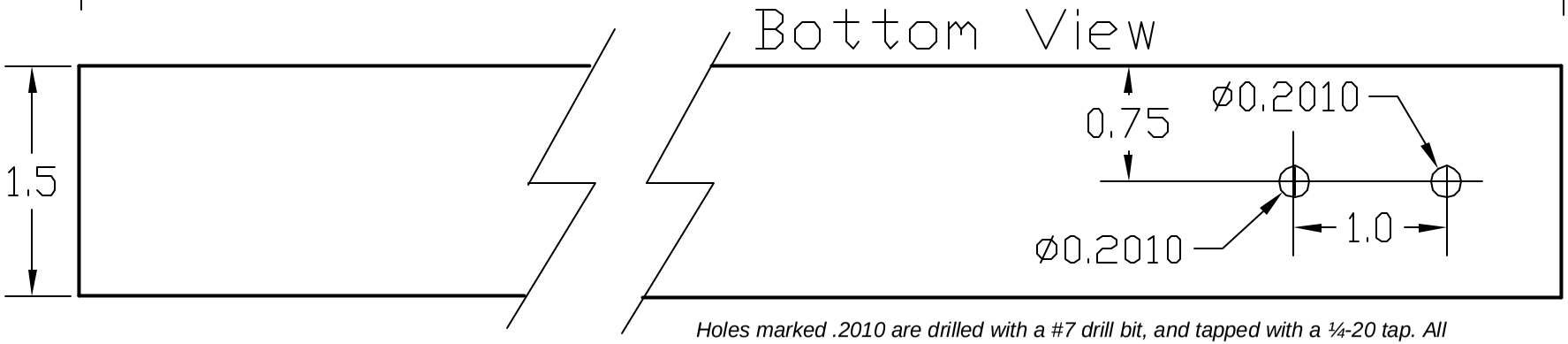
Tooling Arm

Material is 1½"x1½"x20" cold roll steel

(This hole configuration is for the large wheels.)



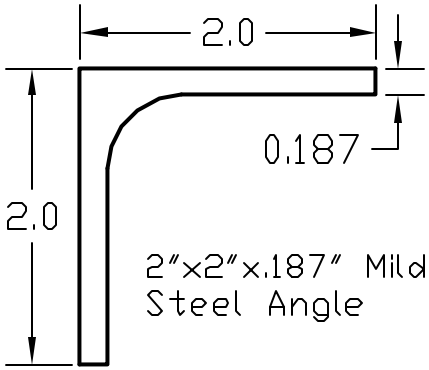
Holes marked .2010 are drilled with a #7 drill bit, and tapped with a ¼-20 tap. All holes are drilled all the way through.

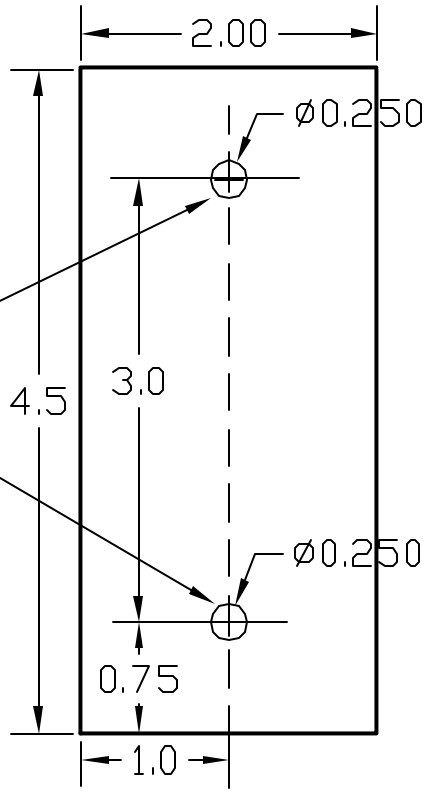


Holes marked .2010 are drilled with a #7 drill bit, and tapped with a ¼-20 tap. All holes are drilled all the way through.

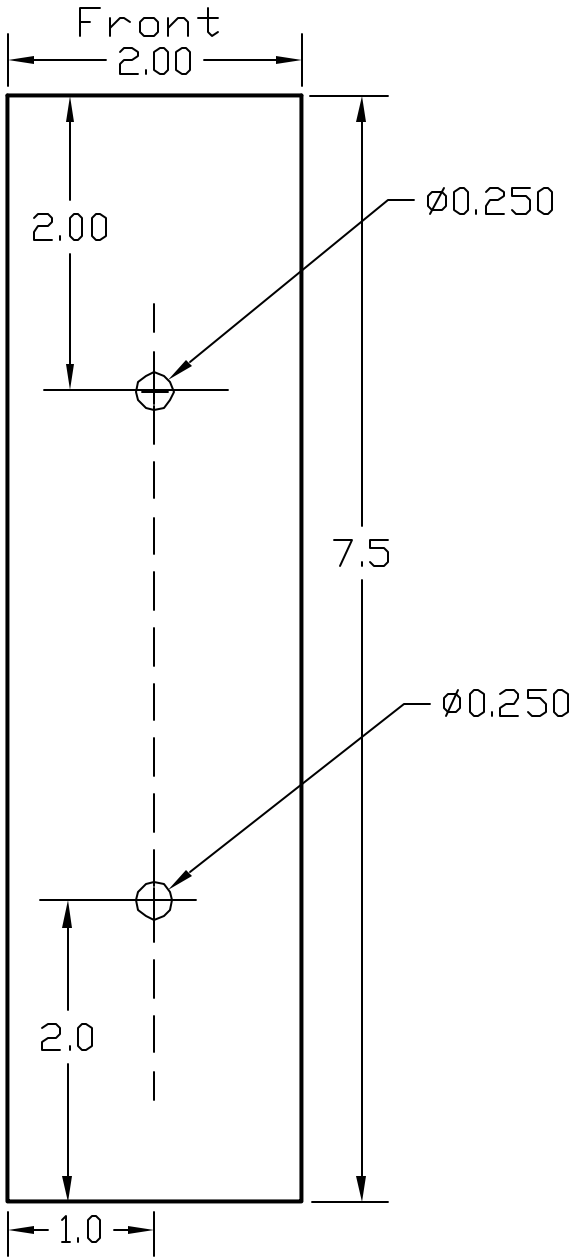
Platen Mount & Platen

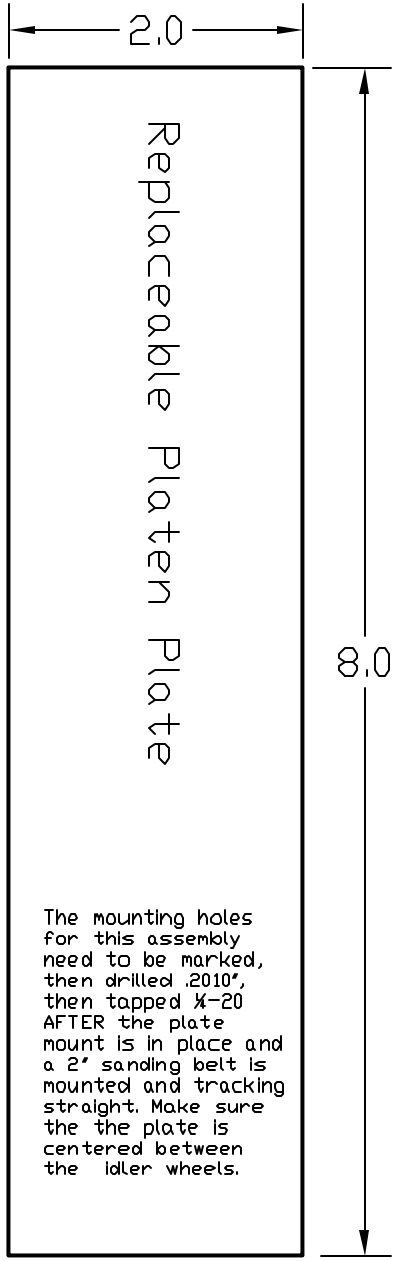
Material is cold roll steel





These holes can be elongated towards the side to allow for quicker removal of the work piece.

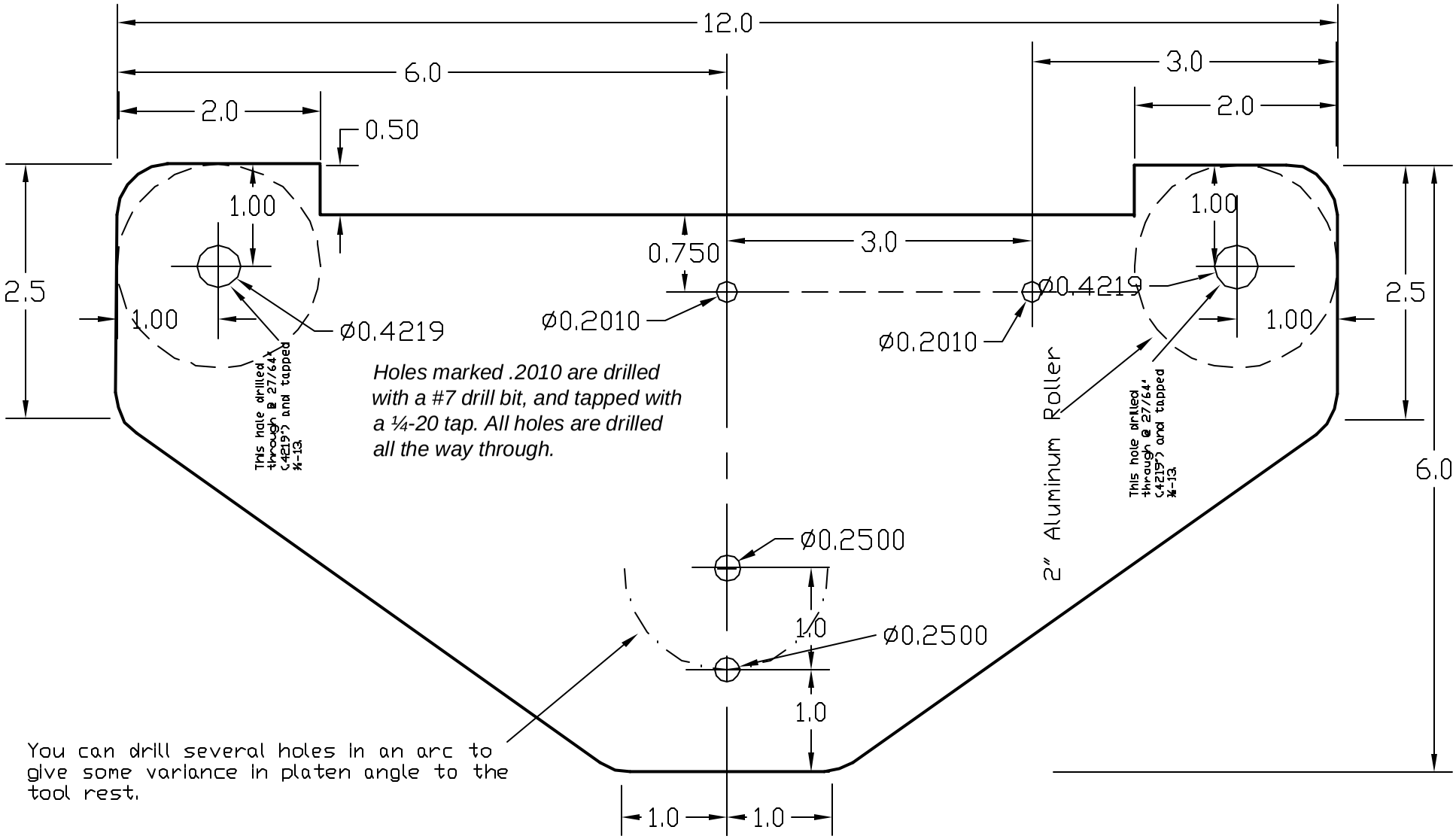




The mounting holes for this assembly need to be marked, then drilled .2010", then tapped ¼-20 AFTER the plate mount is in place and a 2" sanding belt is mounted and tracking straight. Make sure the the plate is centered between the idler wheels.

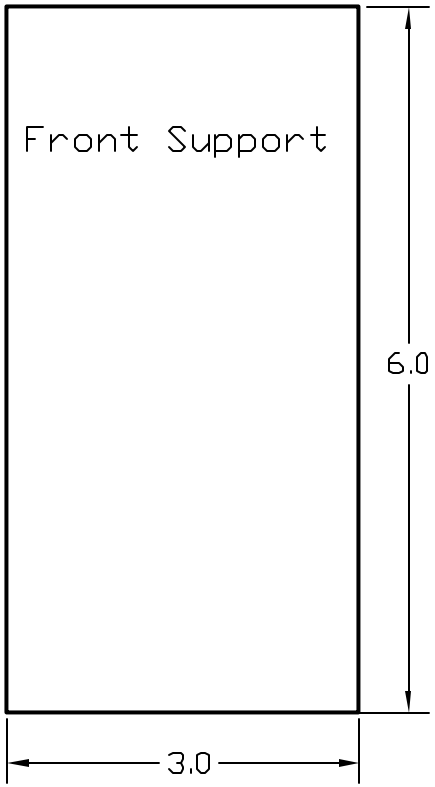
Platen Attachment

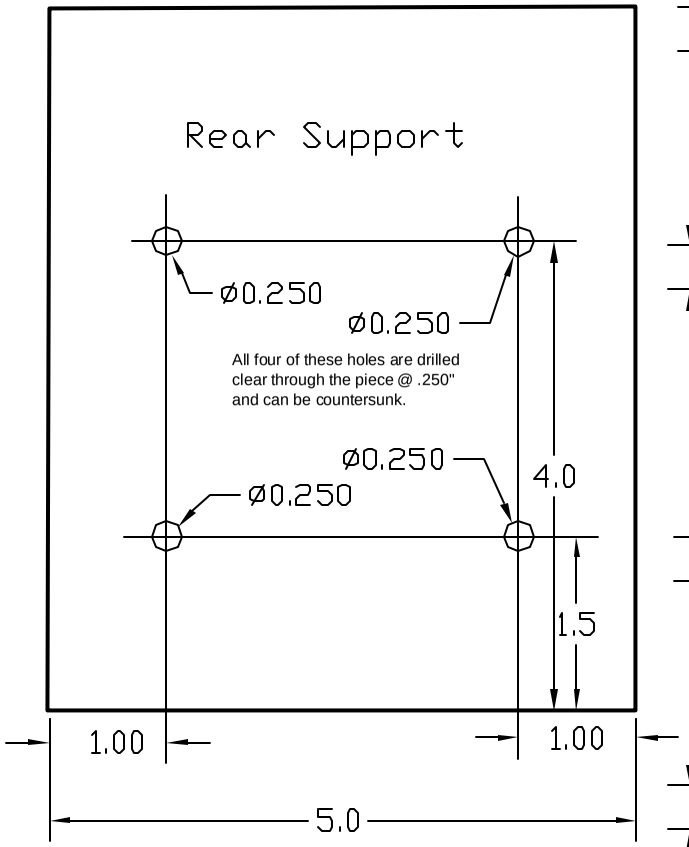
Material is .375" or .500"x12"x6" Aluminum Plate



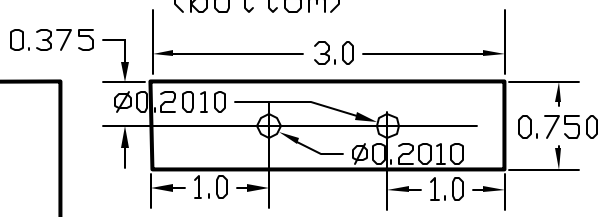
Grinder Main Support Uprights

Front Support is ¾"x3"x6", Rear Support is ¾"x5"x6" and both are Cold Roll Steel.

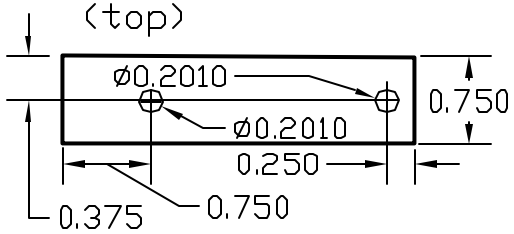




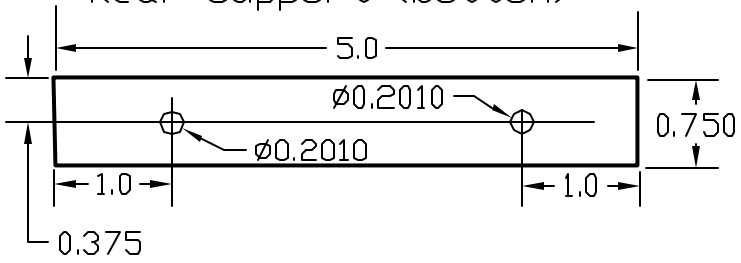
Front Support (bottom)



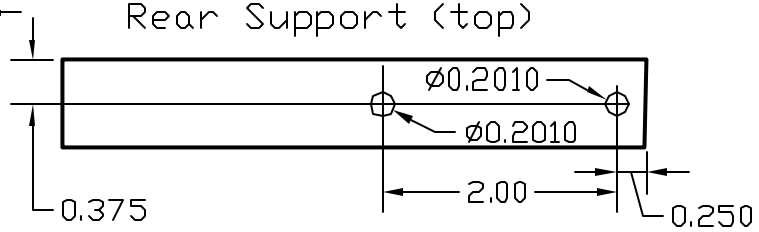
Front Support (top)



Rear Support (bottom)



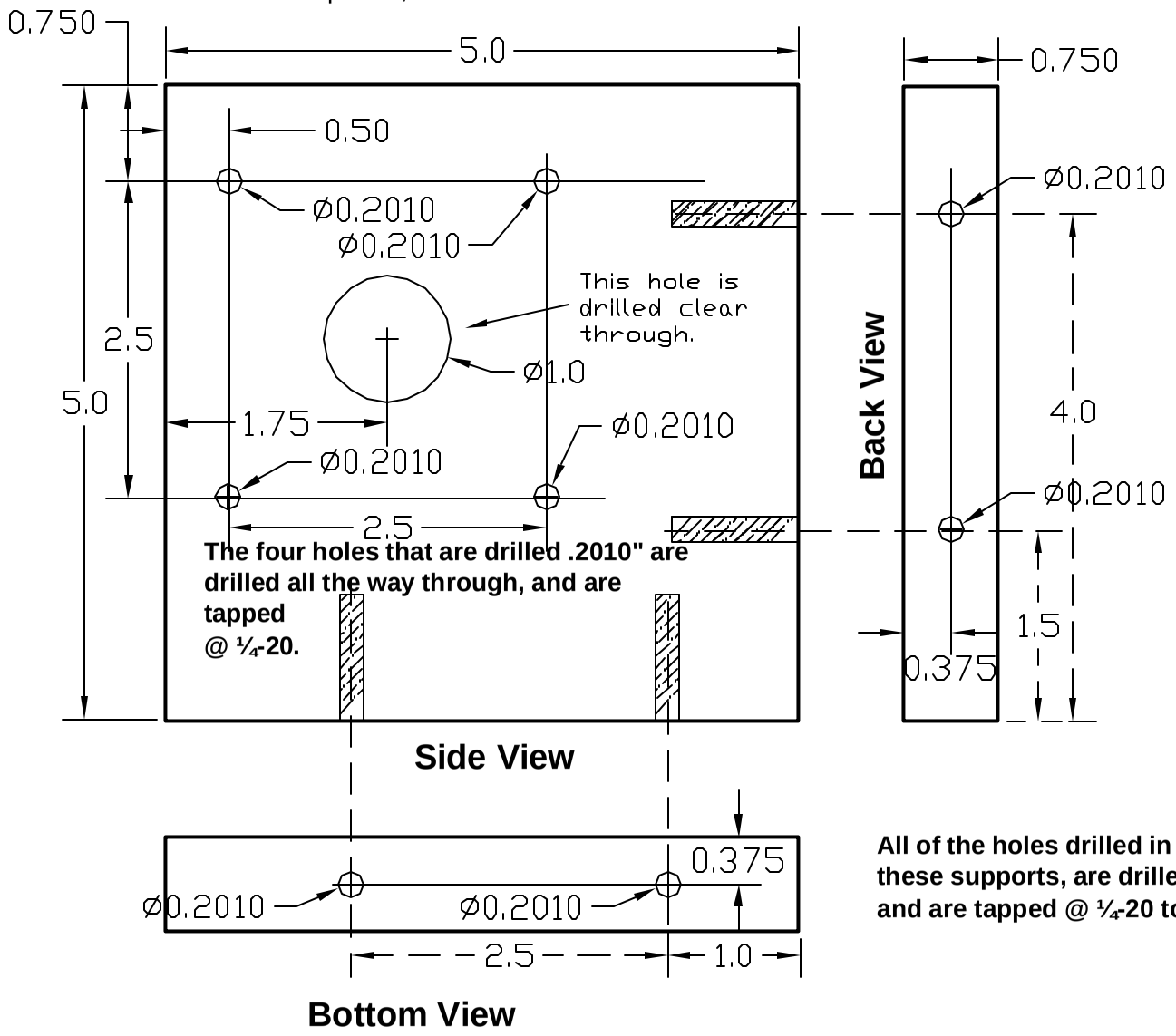
Rear Support (top)



All holes drilled in the bottom and top of these supports, are drilled ¾" deep, and tapped ¼-20 to that same depth.

Grinder - Bearing Mounts (2)

Two pieces, ¾"x5"x5" cold roll steel



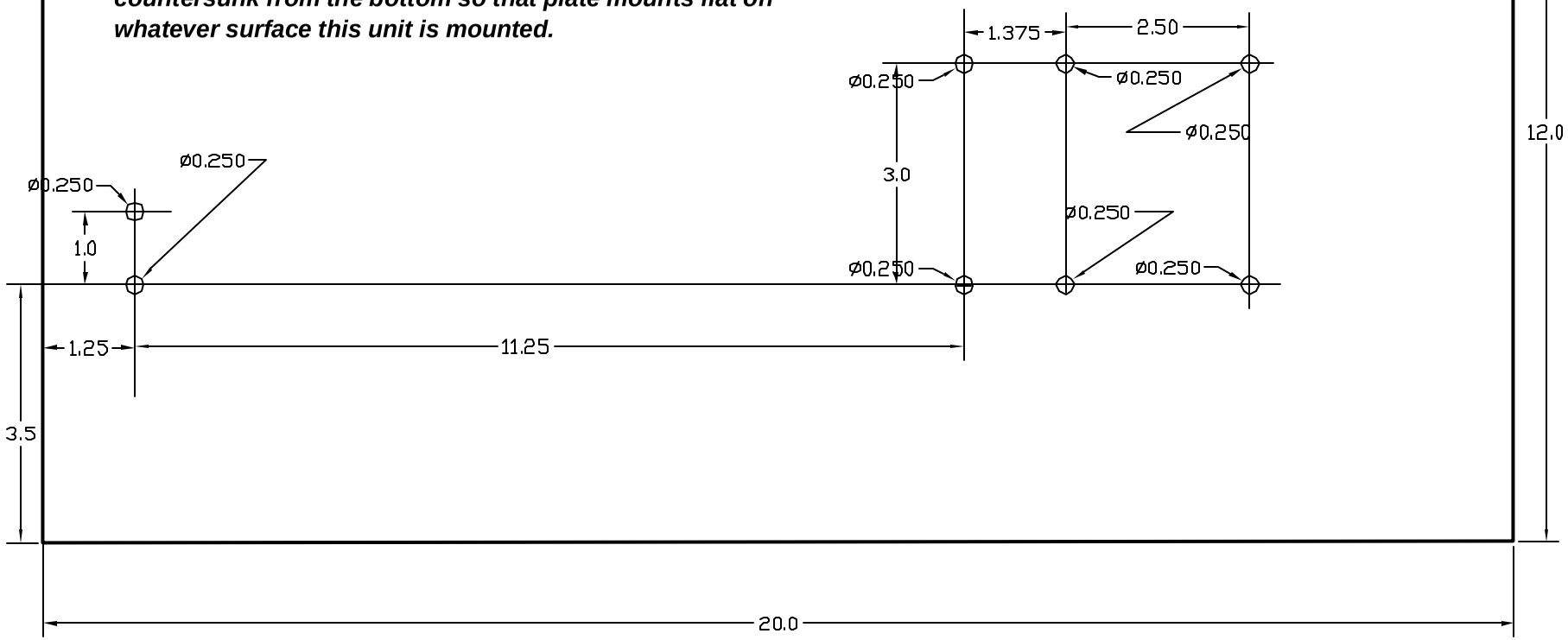
All of the holes drilled in the *bottom* and *side* of these supports, are drilled @ .2010", are 1" deep, and are tapped @ ¼-20 to that same depth.

Grinder – Base Plate

Base plate made from ¼"x12"x20" cold roll steel.
(can be made larger if desired to facilitate mounting the motor, this is a minimum)

All holes drilled all the way through, but should be countersunk from the bottom so that plate mounts flat on whatever surface this unit is mounted.

Top View



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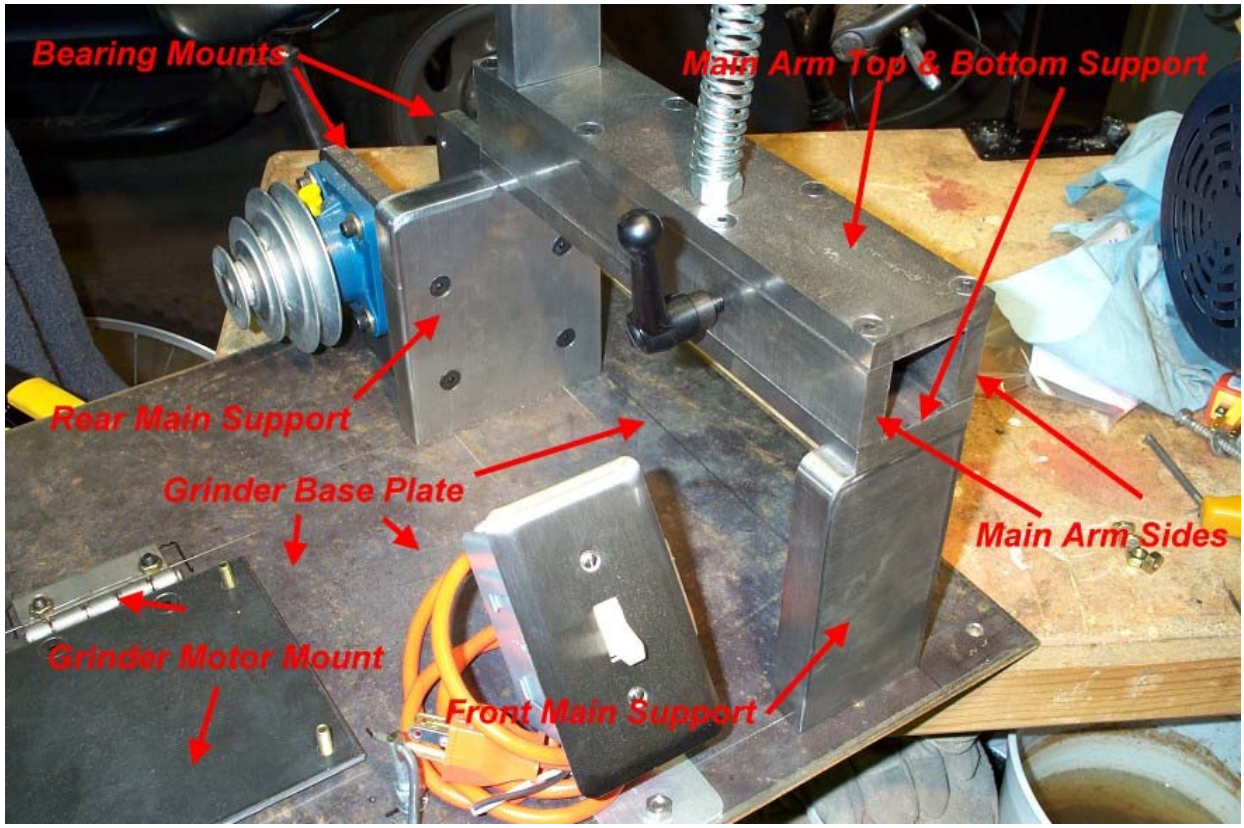

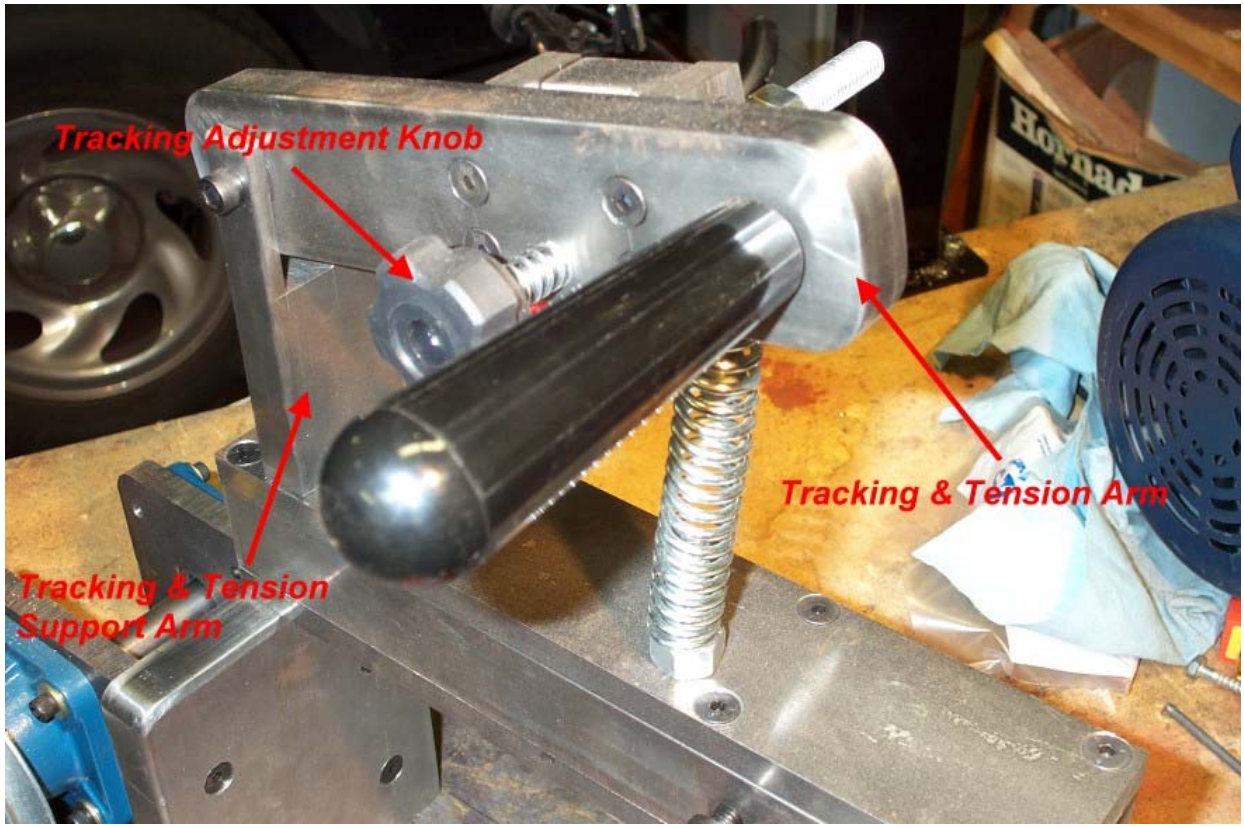

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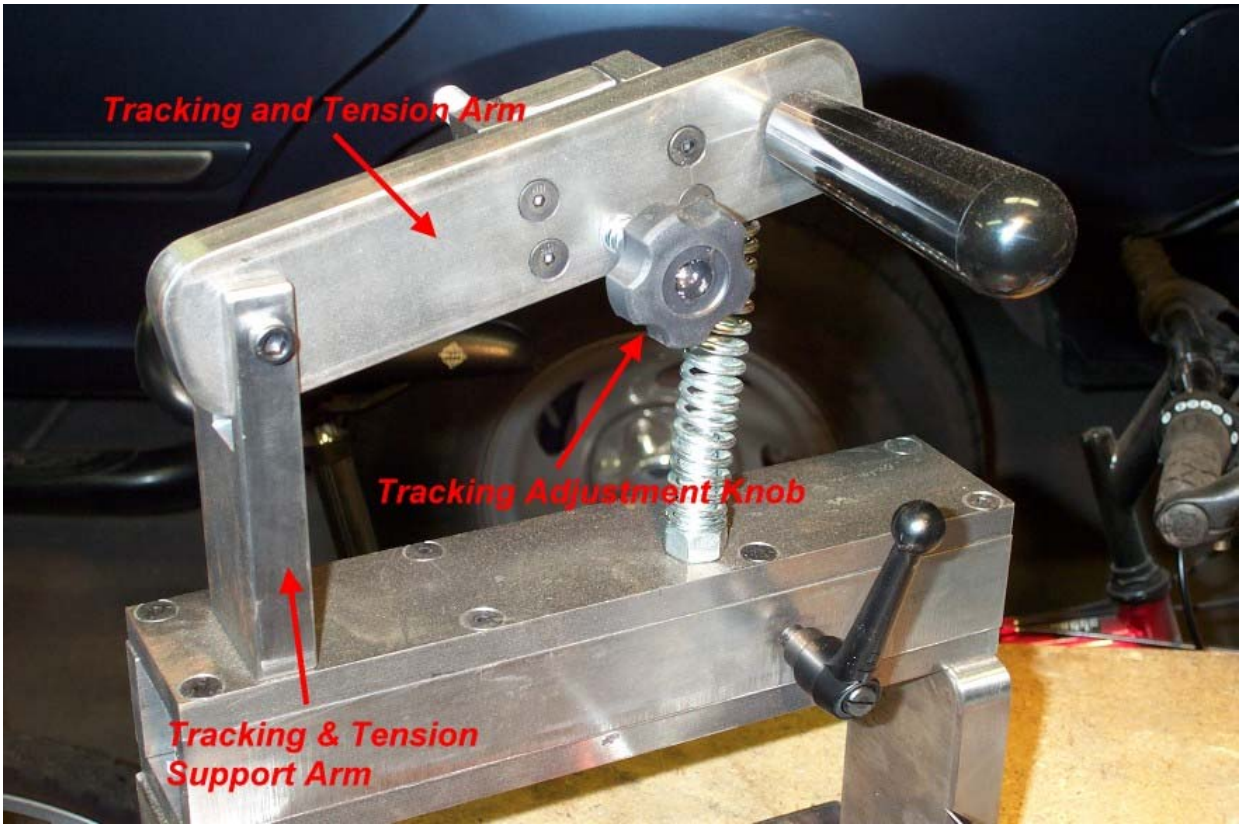

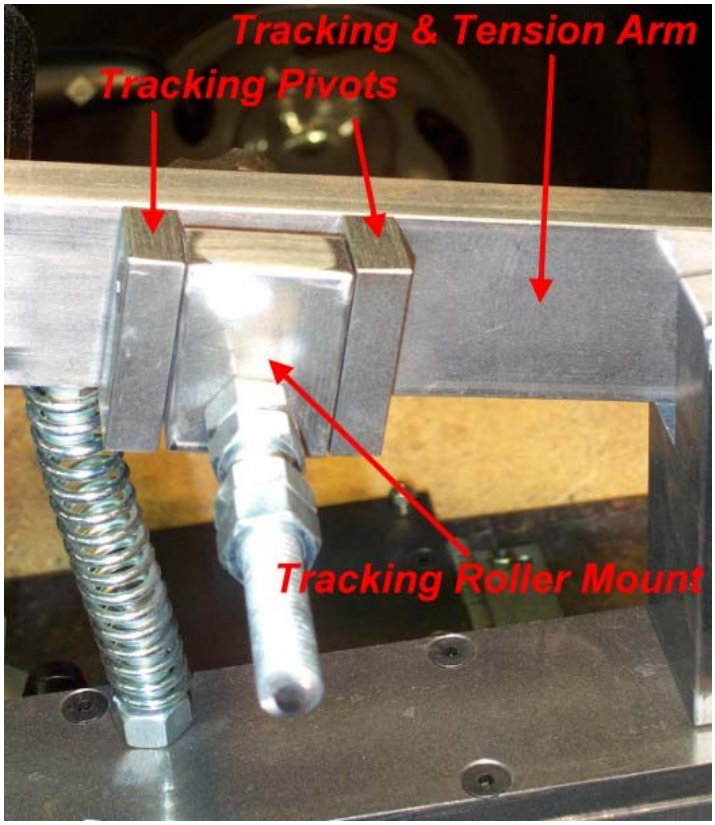

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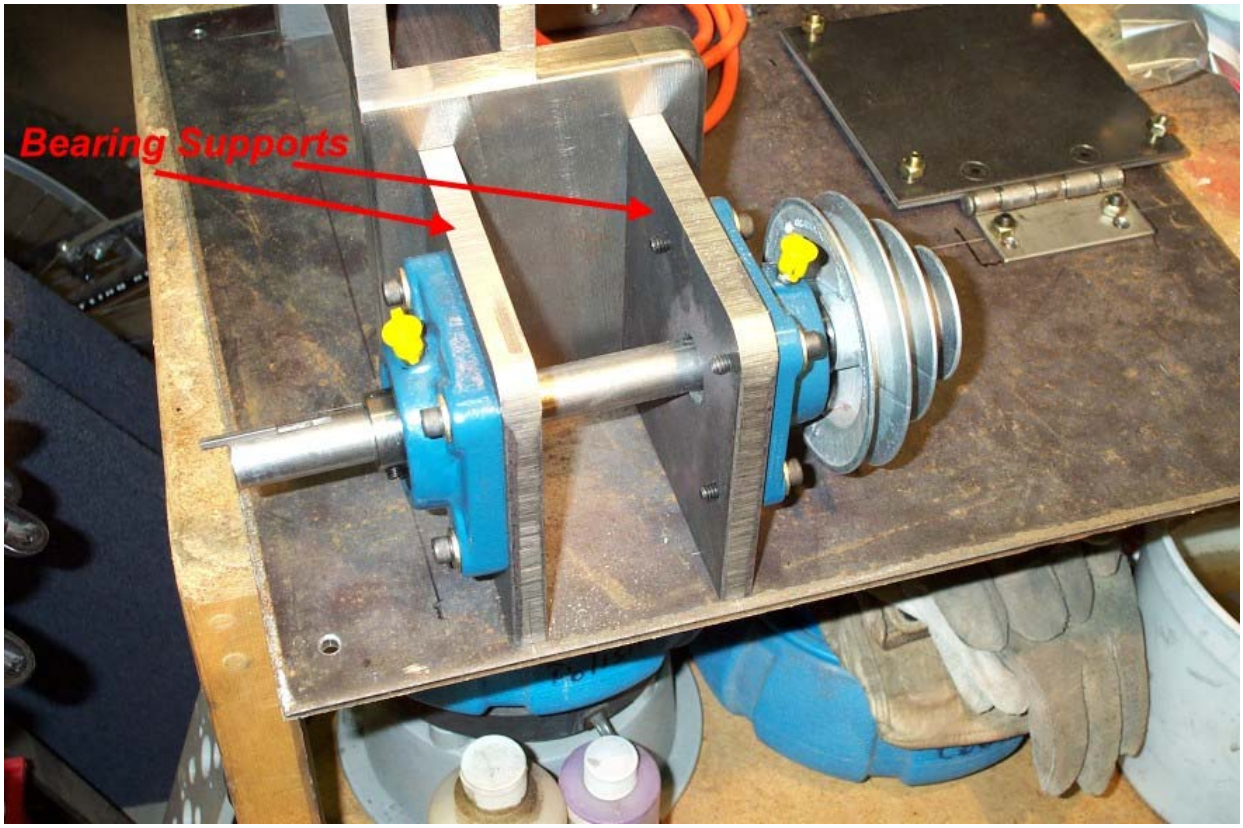

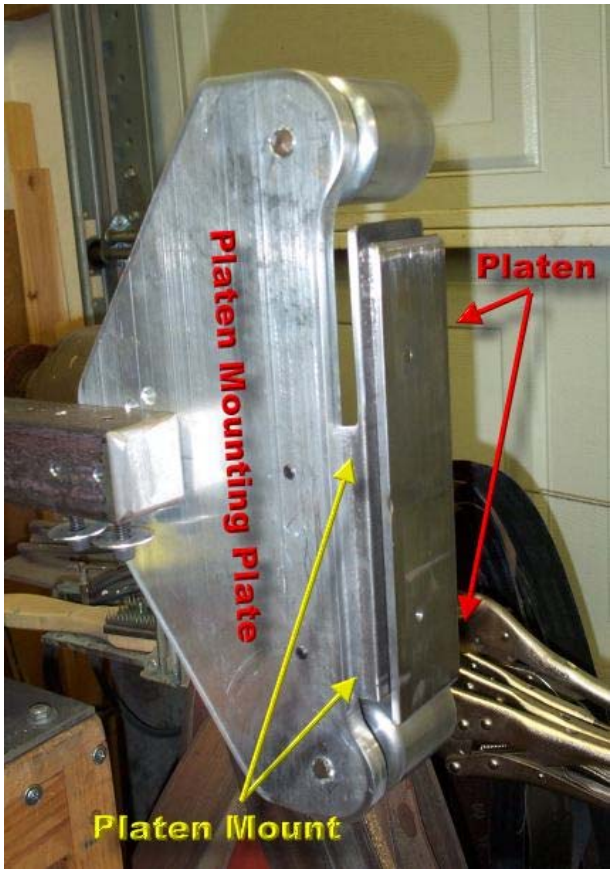

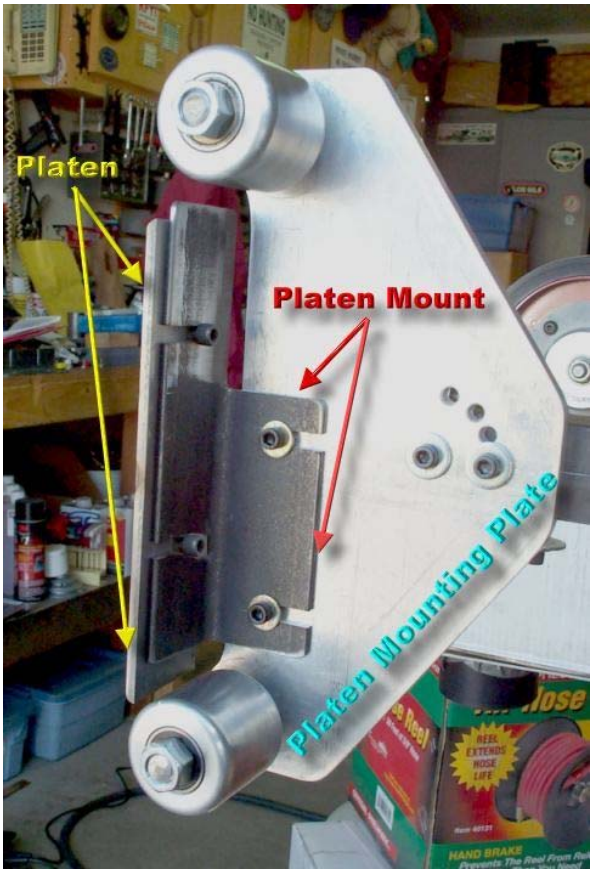

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