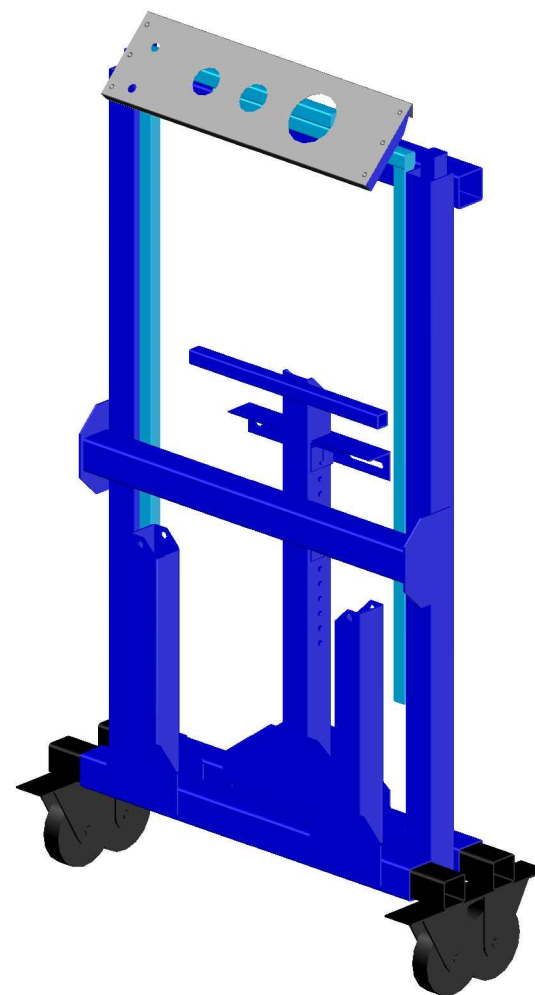
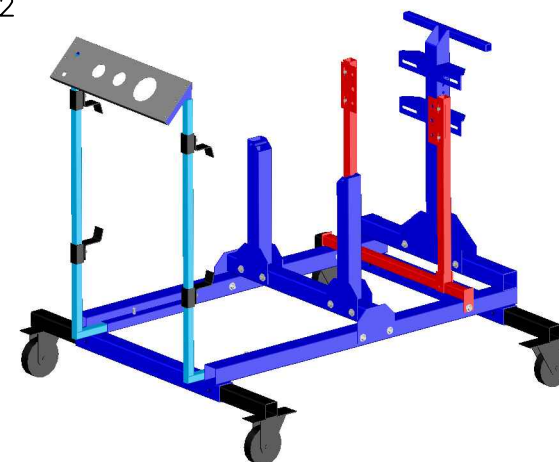
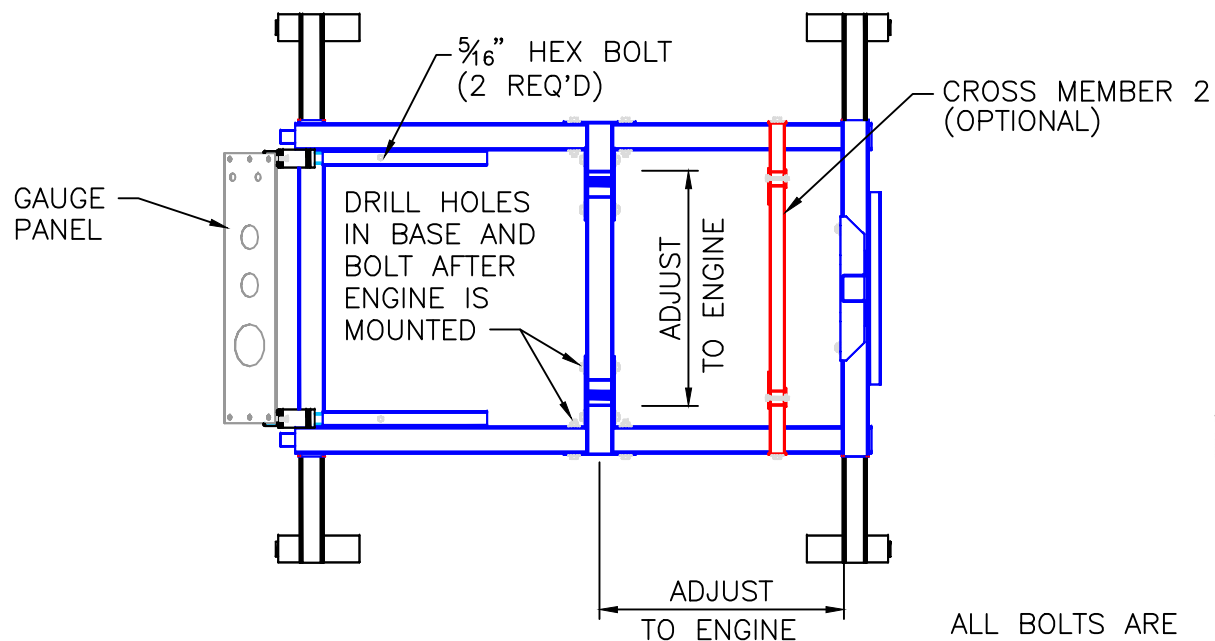


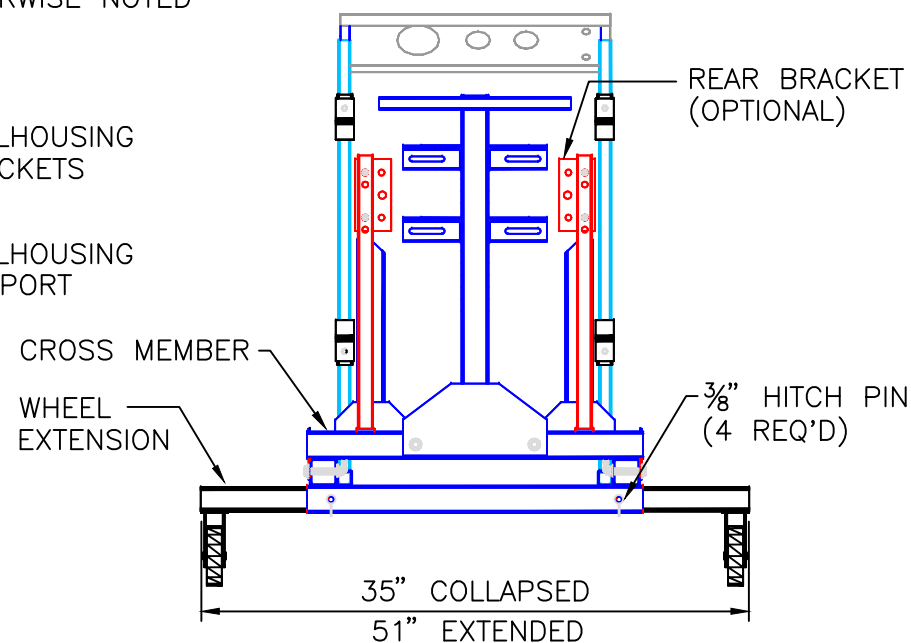
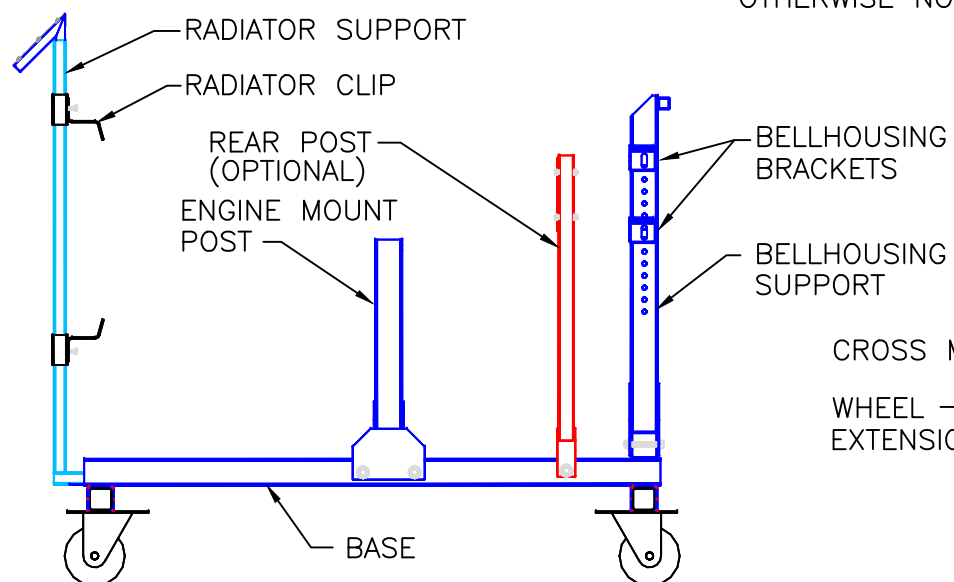
**ENGINE STAND**



**ASSEMBLED AND COLLAPSED**

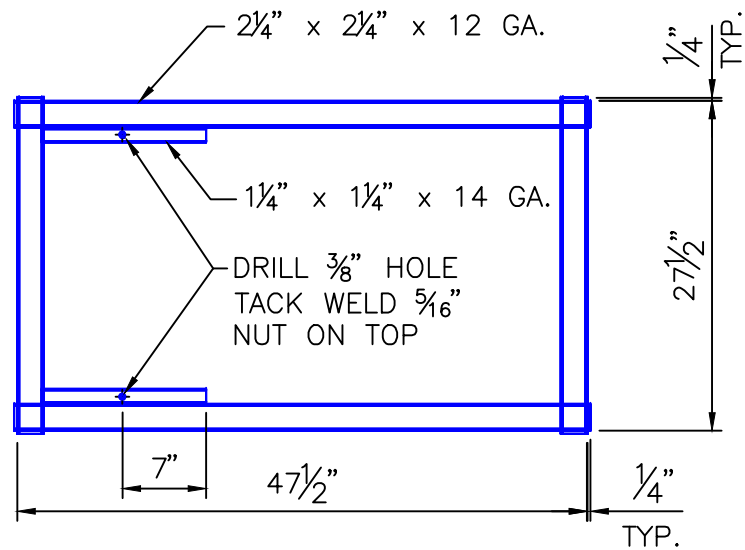


ALL BOLTS ARE  
3/8" x 3" UNLESS  
OTHERWISE NOTED

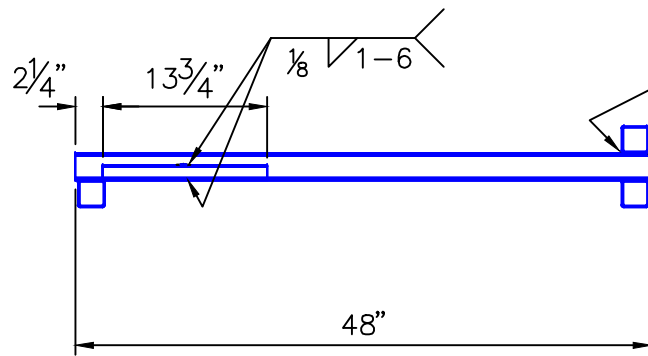


**ENGINE STAND**

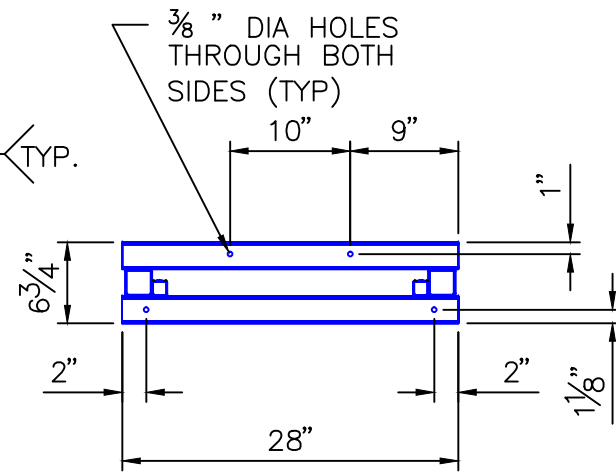
**ASSEMBLY**



TOP



SIDE



END

MATERIALS:

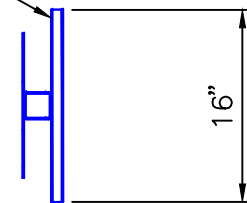
15'-0" -  $2\frac{1}{4}" \times 2\frac{1}{4}" \times 12$  GA.  
TUBE STEEL

2'-4" -  $1\frac{1}{4}" \times 1\frac{1}{4}" \times 14$  GA.  
TUBE STEEL

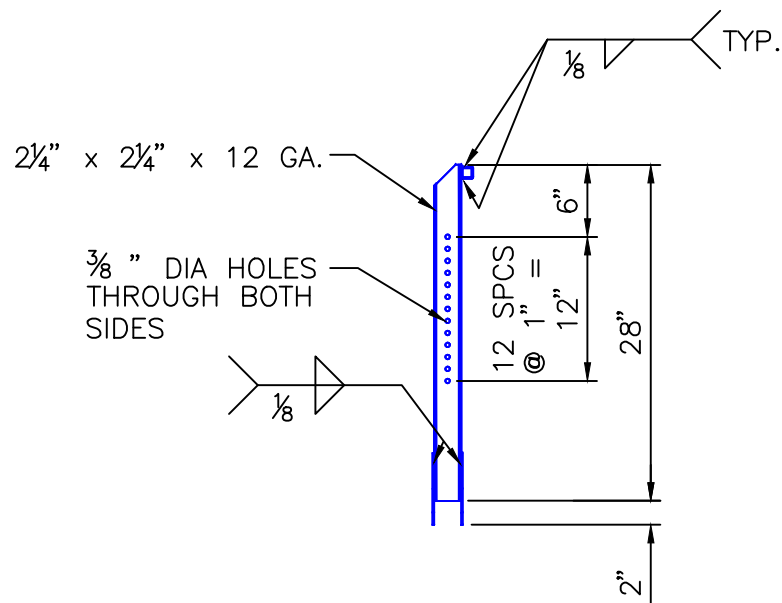
**ENGINE STAND**

**BASE**

1 1/4" x 1 1/4" x 14 GA.  
 NOTE:  
 IF A ROUND HANDLE IS  
 PREFERRED, THE 1 1/4"  
 TUBE CAN BE REPLACED  
 WITH A LENGTH OF 1"  
 PIPE



TOP



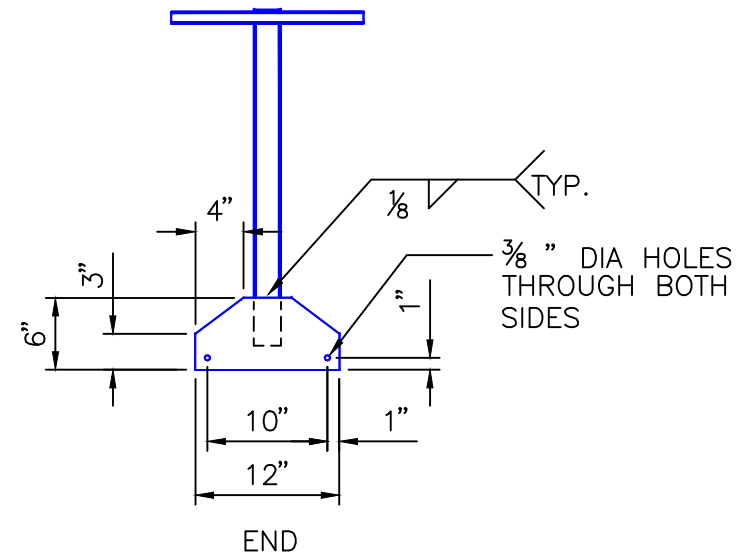
SIDE

MATERIALS:

2'-4" - 2 1/4" x 2 1/4" x 12 GA.  
 TUBE STEEL

1'-4" - 1 1/4" x 1 1/4" x 14 GA.  
 TUBE STEEL

(2) 1/8" x 6" x 12" PLATE STEEL



END

**ENGINE STAND**

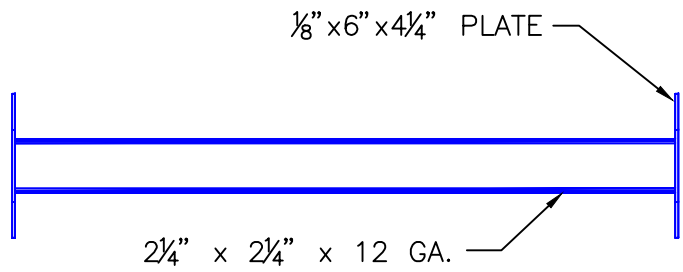
**BELLHOUSING SUPPORT**

TYP.

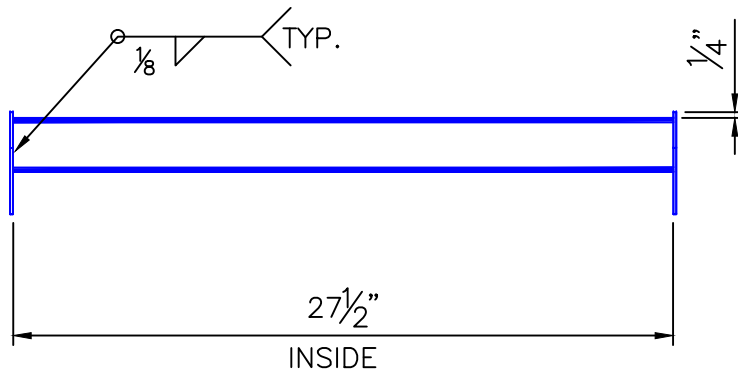
(MATERIALS LISTED ARE FOR ONE PART.  
TWO PARTS ARE REQUIRED)

END

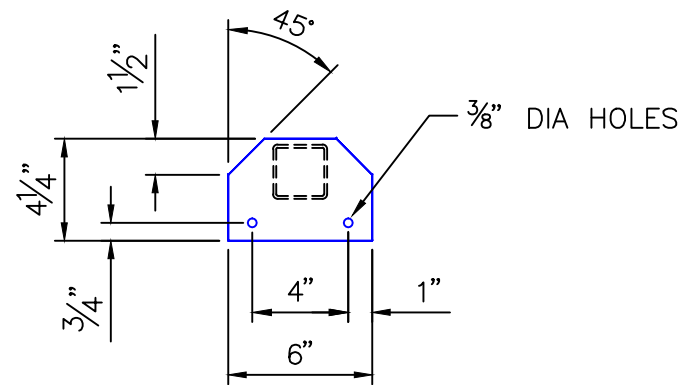
## BELLHOUSING BRACKET (2 REQ'D)



TOP



SIDE



END

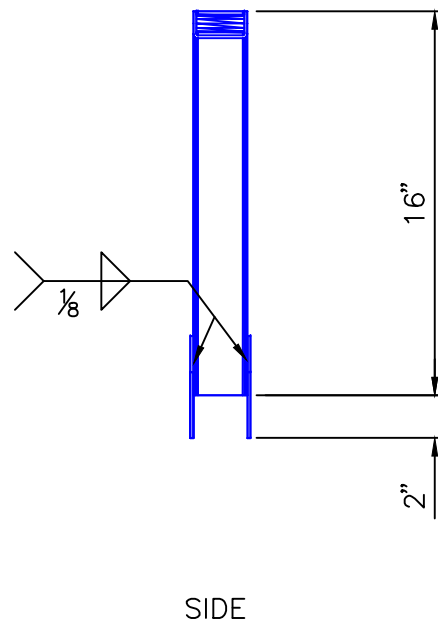
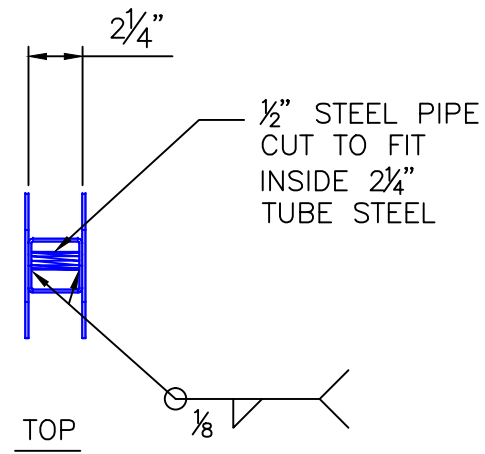
MATERIALS:

2'-3 1/2" - 2 1/4" x 2 1/4" x 12 GA.  
TUBE STEEL

(2) 1/8" x 6" x 4 1/4" PLATE STEEL

**ENGINE STAND**

**CROSS BAR**



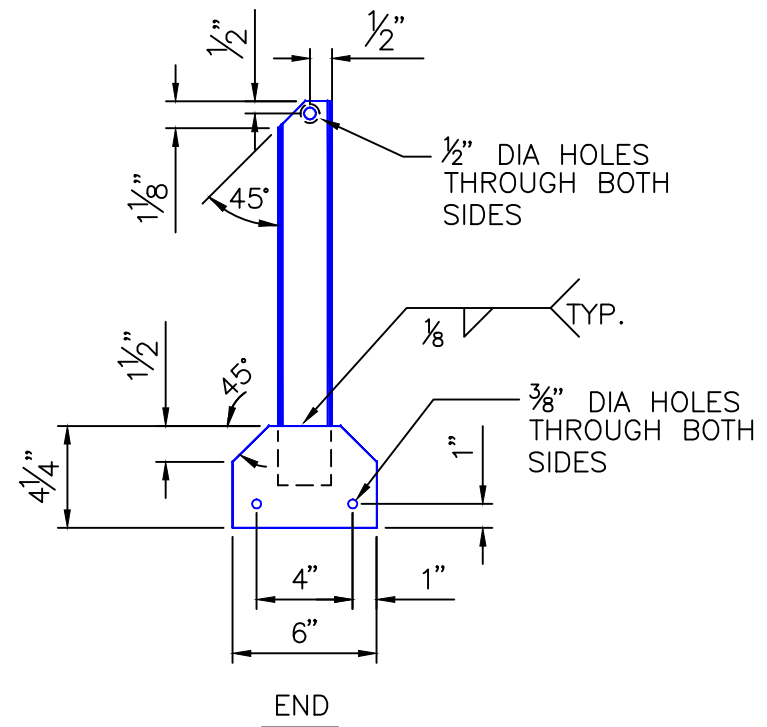
#### MATERIALS:

1'-4" - 2 1/4" x 2 1/4" x 12 GA.  
TUBE STEEL

(2) 1/8" x 6" x 4 1/4" PLATE STEEL

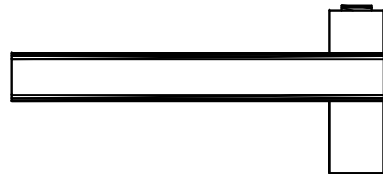
2" LENGTH OF 1/2" STEEL PIPE

(MATERIALS LISTED ARE FOR ONE PART.  
TWO PARTS ARE REQUIRED)

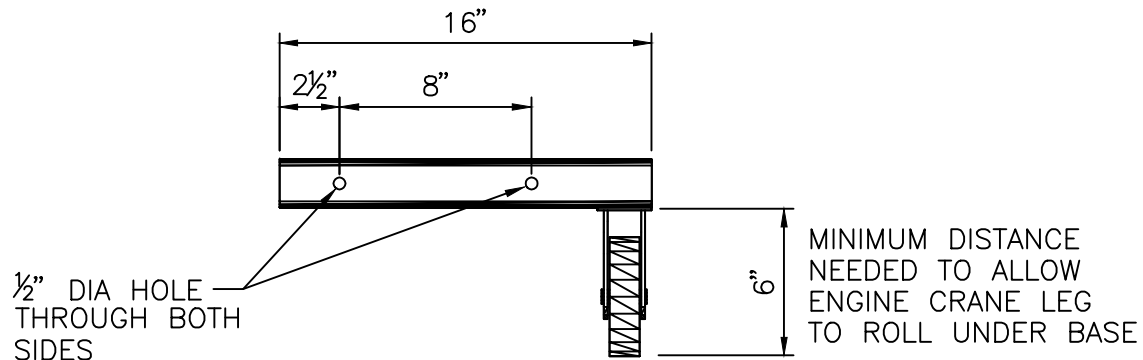


**ENGINE STAND**

**ENGINE MOUNT POST (2 REQ'D)**



TOP



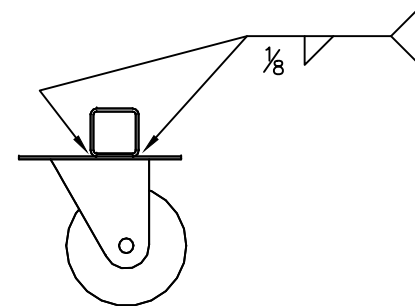
SIDE

#### MATERIALS:

1'-4" - 2" x 2" x 10 GA  
TUBE STEEL

6" SHOP WHEEL - SWIVEL TYPE  
CAN BE PURCHASED AT HARBOR  
FREIGHT ON-LINE

(MATERIALS LISTED ARE FOR ONE PART.  
FOUR PARTS ARE REQUIRED)

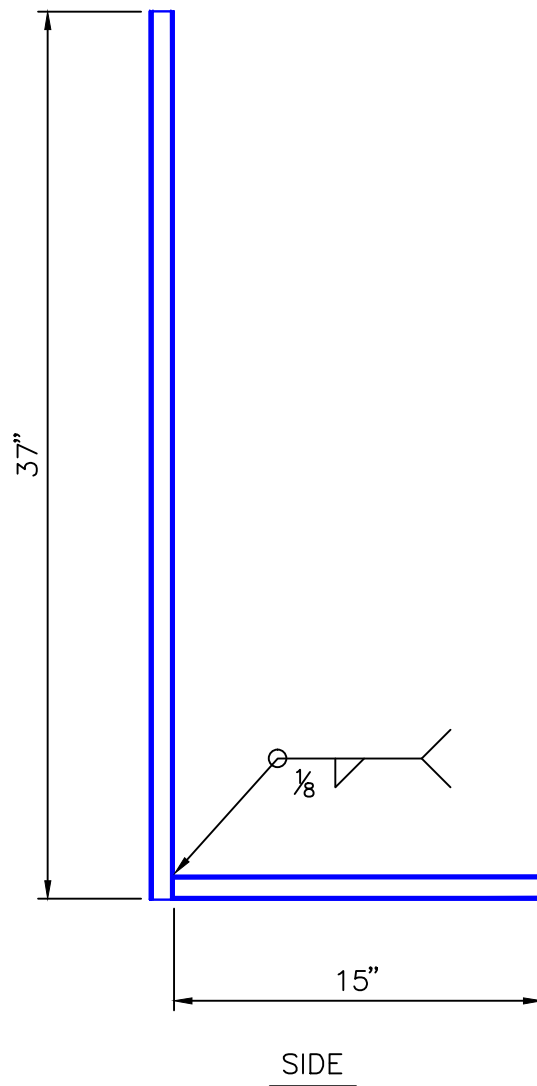


END

**ENGINE STAND**

**WHEEL EXTENSIONS (4 REQ'D)**





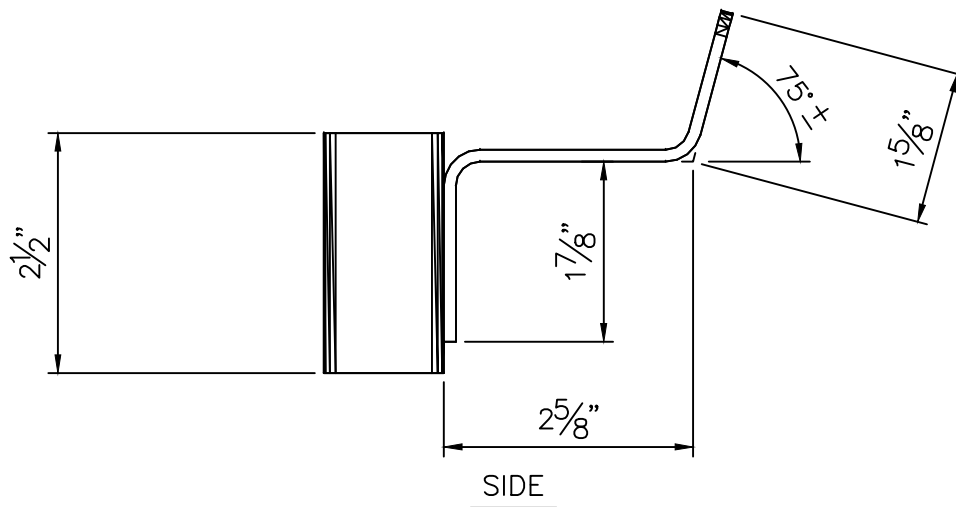
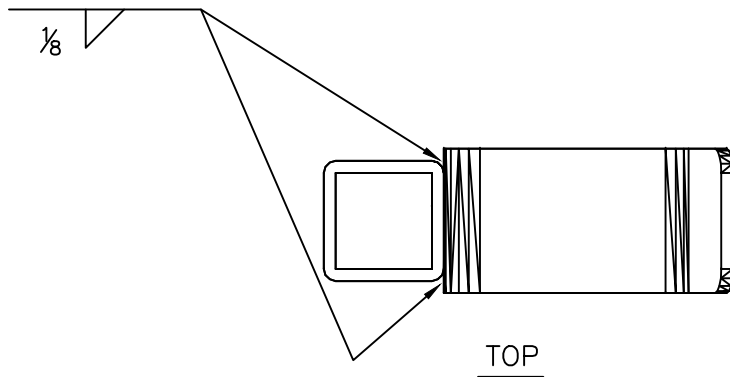
MATERIALS:

4'-4" - 1" x 1" x 14 GA.  
TUBE STEEL

(MATERIALS LISTED ARE FOR ONE PART.  
TWO PARTS ARE REQUIRED)

**ENGINE STAND**

**RADIATOR SUPPORTS (2 REQ'D)**

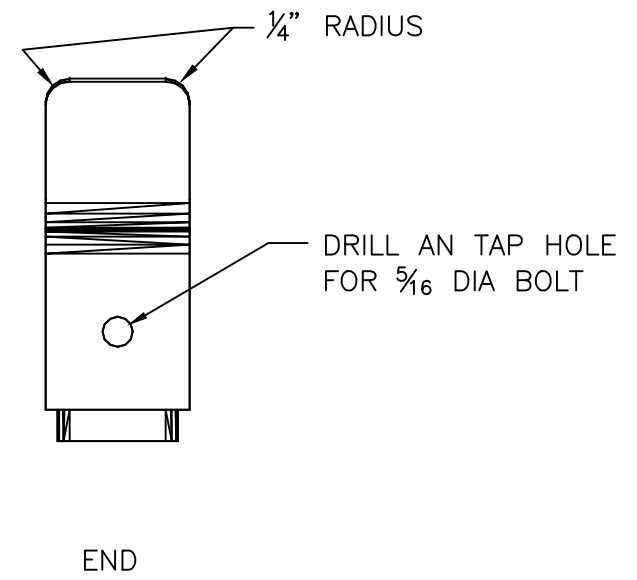


MATERIALS:

2 1/2" - 1 1/4" x 1 1/4" x 14 GA.  
TUBE STEEL

2" x 1/8" x 6" LG. PLATE STEEL

(MATERIALS LISTED ARE FOR ONE PART.  
FOUR PARTS ARE REQUIRED)



**ENGINE STAND**

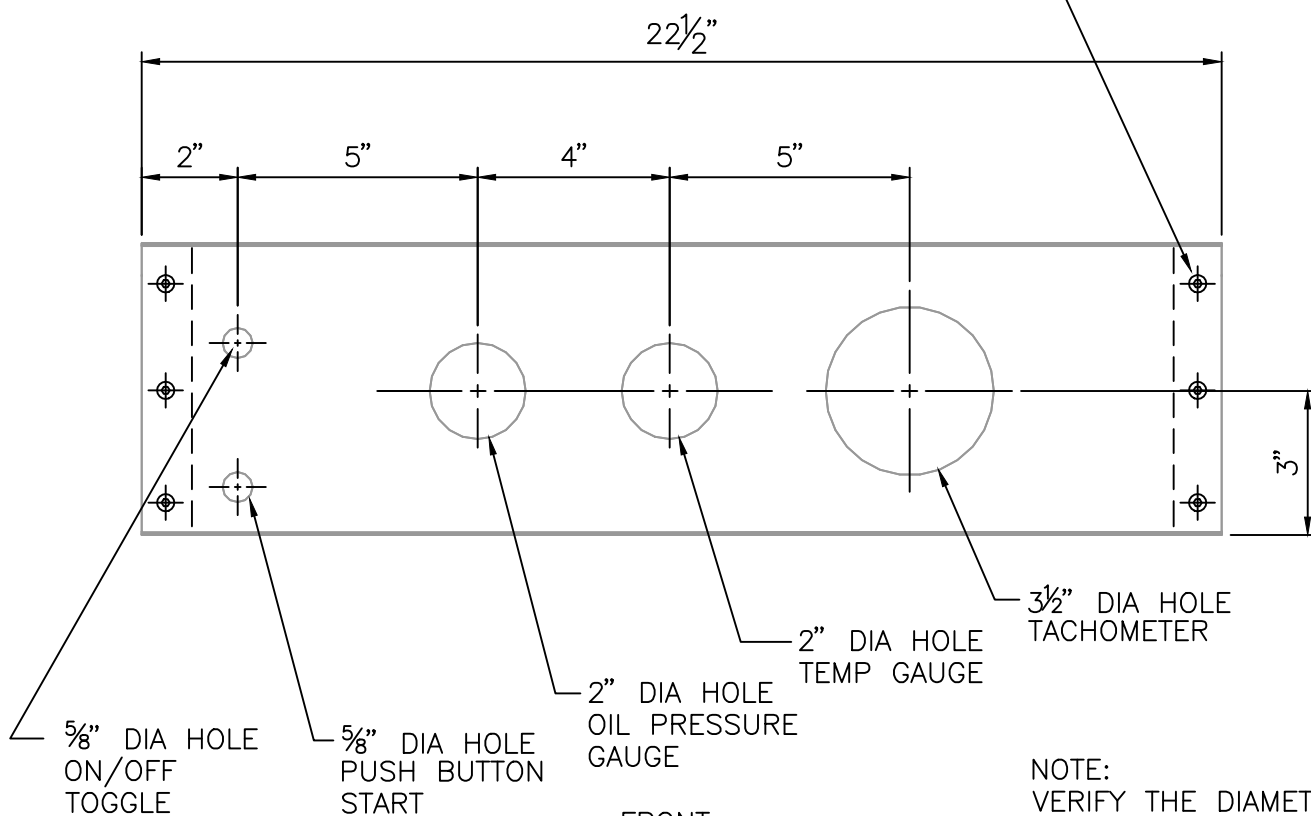
**RADIATOR CLIP (4 REQ'D)**

MATERIALS:

1'-8" -  $\frac{3}{4}$ " x  $\frac{3}{4}$ " x  $\frac{1}{8}$ " ANGLE

1'-10 $\frac{1}{2}$ " x 8" x 18 GA.  
ALUMINUM PLATE

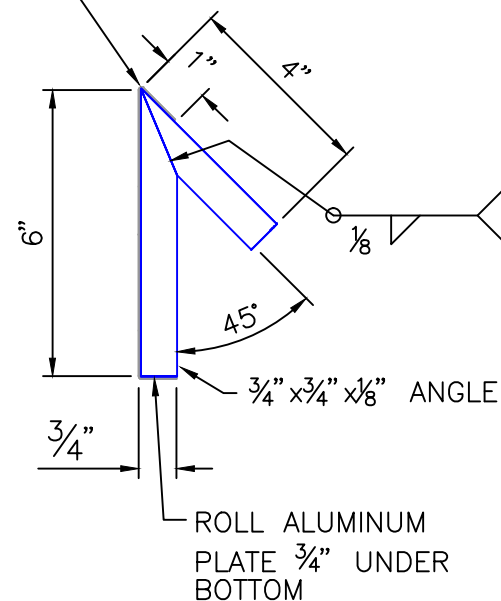
FASTEN PLATE TO ANGLE  
WITH 6 SELF-TAPPING  
BUTTON HEAD SCREWS



FRONT

NOTE:  
VERIFY THE DIAMETER OF  
YOUR TACH AND GAUGES  
BEFORE CUTTING HOLES

ROLL ALUMINUM  
PLATE 1" OVER  
TOP



END

**ENGINE STAND**

**GAUGE PANEL**

2'-3½" - 1¼" x 1¼" x 14 GA.  
TUBE STEEL

Diagram illustrating a beam-to-column connection. The connection consists of a  $\frac{1}{8} \times 1\frac{1}{2} \times 3$  PLATE and a  $1\frac{1}{4} \times 1\frac{1}{4} \times 14$  GA. (Gusset Plate).

Technical drawing of a bracket with the following dimensions and notes:

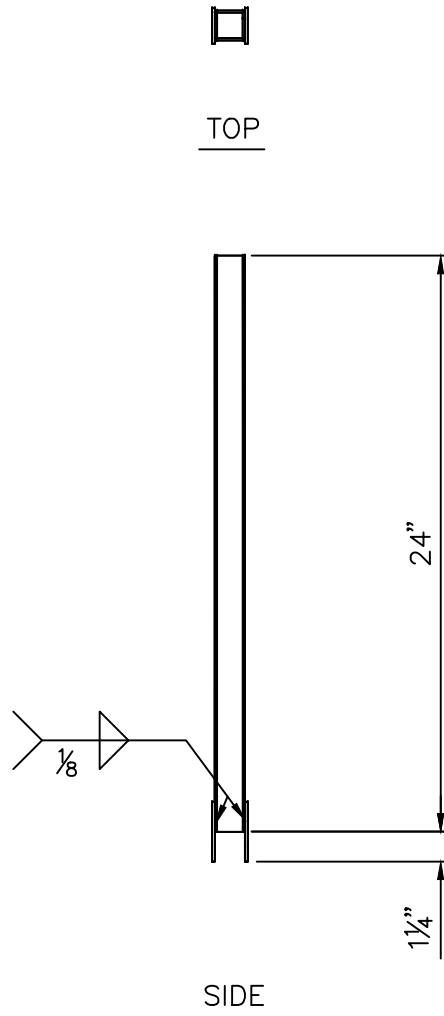
- Overall length:  $27\frac{1}{2}"$  INSIDE
- Distance from left end to first hole:  $5\frac{5}{8}"$
- Distance between holes:  $1\frac{1}{4}"$
- Distance from right end to second hole:  $3"$
- Distance from bottom flange to hole center:  $1\frac{1}{2}"$
- Notes:
  - $\frac{5}{16}"$  DIA HOLES
  - $\frac{1}{8}"$  TYP.
  - ADJUST TO ENGINE

Technical drawing of a mechanical part showing dimensions and a  $\frac{3}{8}$ " DIA HOLES.

END

## CROSS BAR 2

FOR SUPPORTING REAR OF ENGINE WITHOUT BELLHOUSING

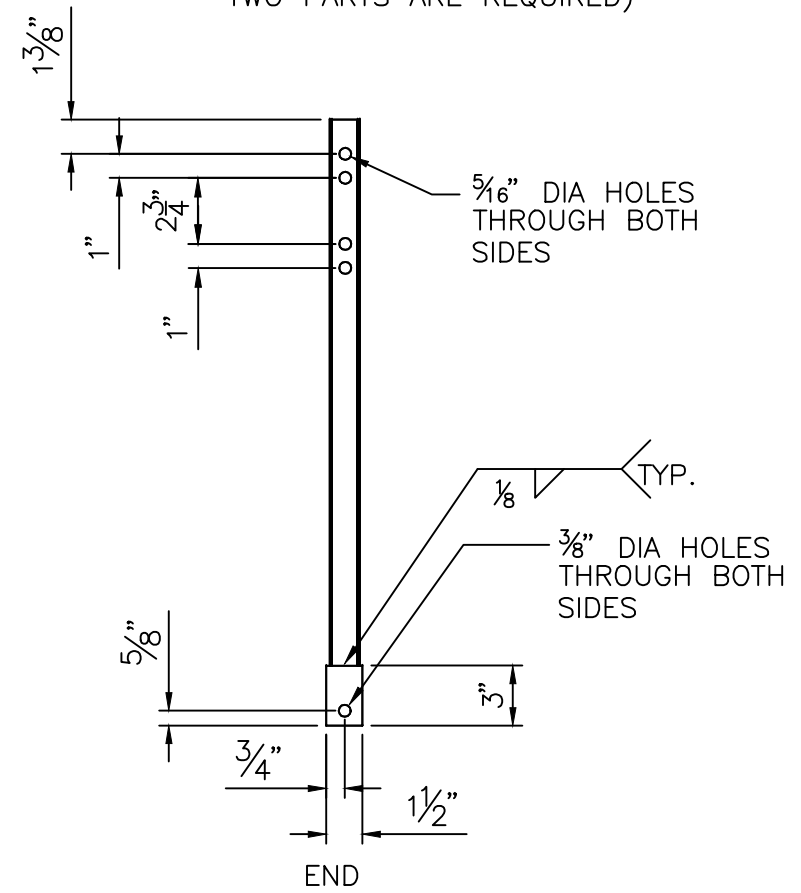


# MATERIALS:

2'-0" - 1 1/4" x 1 1/4" x 14 GA.  
TUBE STEEL

(2) 1/8" x 1 1/2" x 3" PLATE STEEL

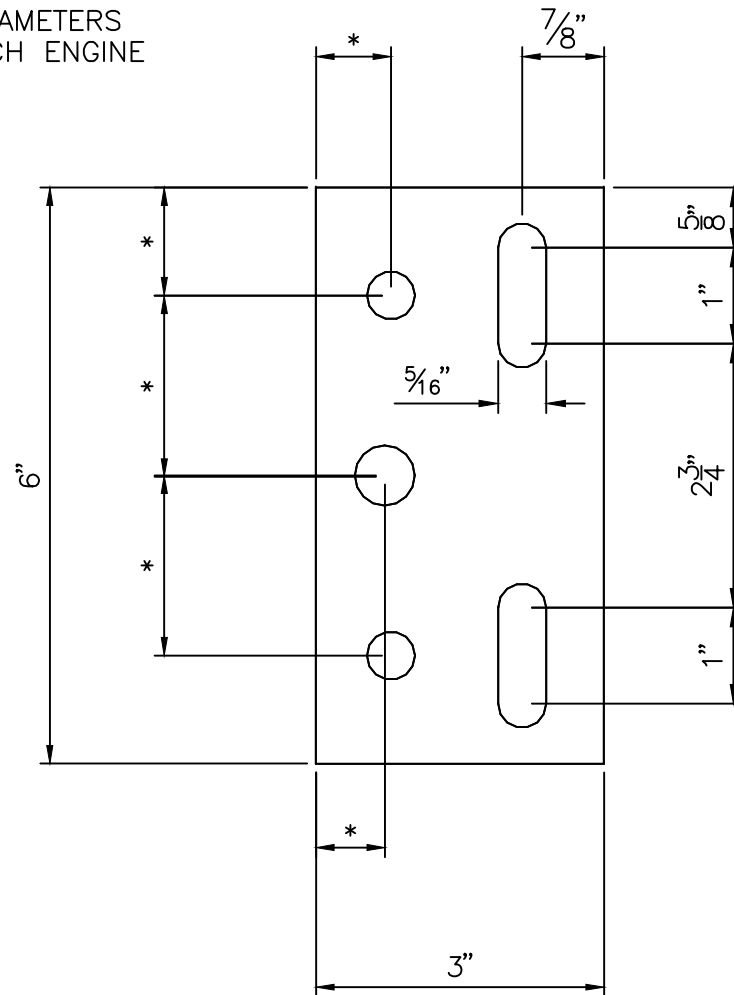
(MATERIALS LISTED ARE FOR ONE PART.  
TWO PARTS ARE REQUIRED)



**ENGINE STAND**

**ENGINE MOUNT POST 2 (2 REQ'D)**  
FOR SUPPORTING REAR OF ENGINE WITHOUT BELLHOUSING

\* DETERMINE THESE  
DIMENSIONS AND  
HOLE DIAMETERS  
TO MATCH ENGINE



MATERIALS:

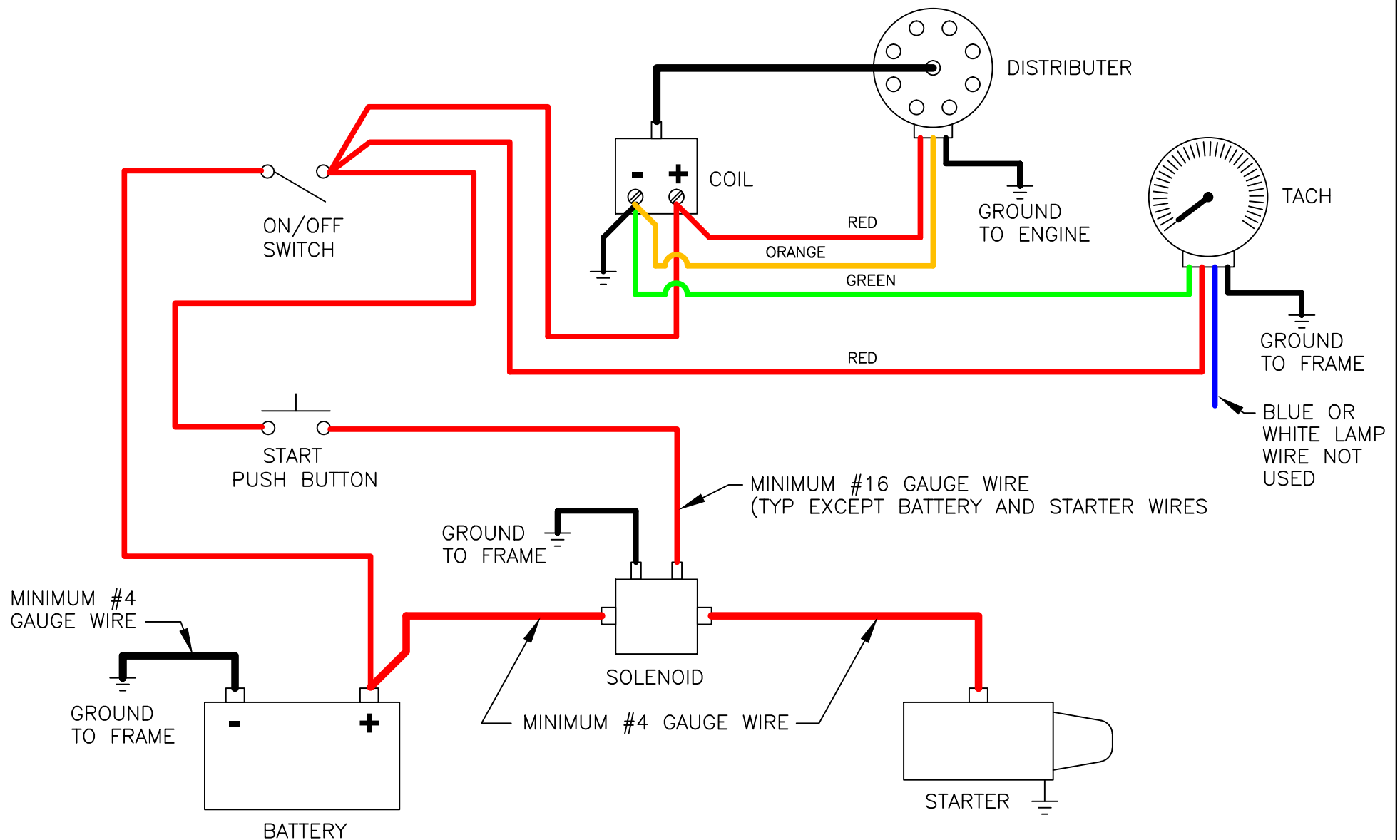
1/8" x 3" x 6" LONG PLATE STEEL

(MATERIALS LISTED ARE FOR ONE PART.  
TWO PARTS ARE REQUIRED)

**ENGINE STAND**

**REAR ENGINE BRACKET (2 REQ'D)**

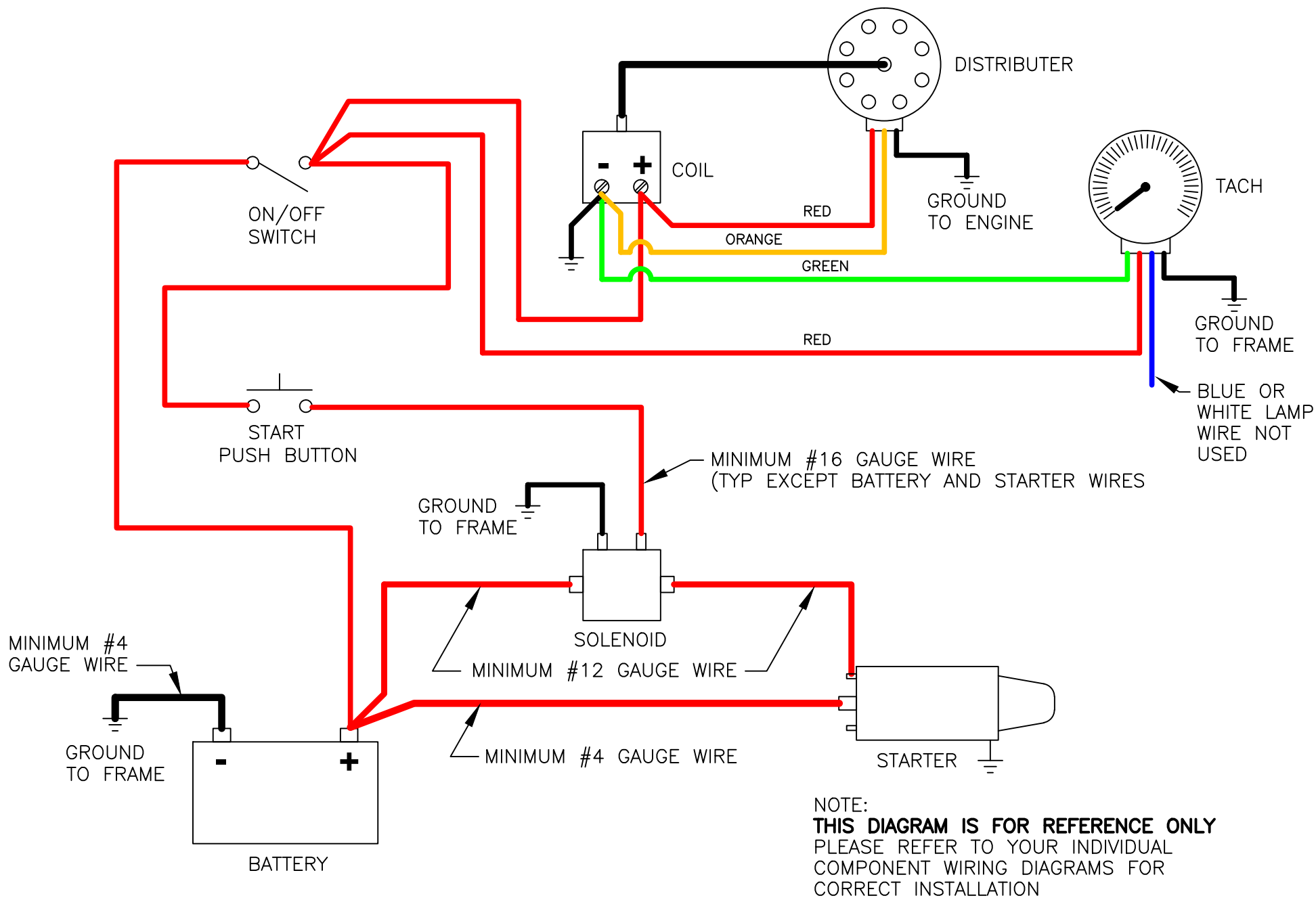
FOR SUPPORTING REAR OF ENGINE WITHOUT BELLHOUSING



NOTE:  
**THIS DIAGRAM IS FOR REFERENCE ONLY**  
 PLEASE REFER TO YOUR INDIVIDUAL  
 COMPONENT WIRING DIAGRAMS FOR  
 CORRECT INSTALLATION

**ENGINE STAND**

**WIRING DIAGRAM (FORD STARTER)**



**ENGINE STAND**

**WIRING DIAGRAM (GM STARTER)**



### MATERIALS FOR ENGINE STAND

<u>ITEM</u>	<u>SIZE</u>	<u>QUANTITY</u>	<u>OPTIONAL SIZE *</u>
TUBE STEEL	2¼" x 2¼" x 12 GA	23 LINEAR FEET	2" x 2" x 12 GA
TUBE STEEL	2" x 2" x 10 GA	6 LINEAR FEET	1¾" x 1¾" x 11 GA
TUBE STEEL	1¼" x 1¼" x 14 GA	5 LINEAR FEET	
TUBE STEEL	1" x 1" x 14 GA	9 LINEAR FEET	
PLATE STEEL	⅛" x 6" x 4¼"	6 PIECES	
PLATE STEEL	⅛" x 6" x 12"	2 PIECES	
ANGLE	¾" x ¾" x ⅛"	2 LINEAR FEET	
ANGLE	2" x 2" x ⅛"	3 LINEAR FEET	
STEEL PIPE	½" x 2"	2 PIECES	
STEEL BAR	⅛" x 2" x 6"	4 PIECES	
ALUMINUM PLATE	8" x 22½" x 18 GA	1	
SHOP WHEEL	6" (SWIVEL TYPE)	4	

### MATERIALS FOR OPTIONAL REAR SUPPORT (WITHOUT BELL HOUSING)

TUBE STEEL	1¼" x 1¼" x 14 GA	7 LINEAR FEET
PLATE STEEL	⅛" x 1½" x 3"	6 PIECES
PLATE STEEL	⅛" x 3" x 6"	2 PIECES

\* IF 2¼" TUBE STEEL IS UNAVAILABLE IN YOUR AREA, YOU MAY SUBSTITUTE 2" TUBE STEEL FOR THE FRAME AND POSTS, AND 1¾" TUBE STEEL FOR THE WHEEL EXTENSIONS

## Engine Test Stand Steel Piece Listing

<u>Material Size</u>	<u>Length</u>	<u># of Pieces</u>	<u>Application</u>
2-1/4" Sq Tubing 12 ga Or 2" Sq Tubing 12 ga	28"	3	Base
	48"	2	
	28"	1	Bell Housing Support
	27-1/2"	1	Cross Bar
	16"	2	Engine Mount Post
2" Sq Tubing 10 ga Or 1-3/4" Sq Tubing 11 ga	16"	4	Wheel Extensions
1-1/4" Sq Tubing 14 ga	13-3/4"	2	Base
	2-1/2"	4	Radiator Clip
	16"	1	Bell Housing Support Handle
	27-1/2"	1	Cross Bar 2 (* optional)
	24"	2	Engine Mount Post 2 (* optional)
1" Sq Tubing 14 ga	15"	2	Radiator Supports
	37"	2	
2 x 2 x 1/8" Angle	12"	2	Bell Bracket
	2"	4	
1/8" x 6" Plate Steel	4-1/4"	6	Cross Bar & Engine Mount Post
	12"	2	Bell Housing Support
	3"	2	Rear Engine Bracket (* optional)
1/8" x 1-1/2" Plate Steel	3"	2	Cross Bar 2 (* optional)
	3"	4	Engine Mount Post 2 (* optional)
1/2" Steel Pipe	2"	2	Engine Mount Post
1/8" x 2" Plate Steel	6"	4	Radiator Clip
3/4" x 3/4" x 1/8" Angle	4"	2	Gauge Panel
	6"	2	
Aluminum Plate 18 ga	22-1/2" x 8"	1	
1/8" Diamond Plate	27-1/2" x 12"	1	Stand Floor (optional)

\* - Optional – required for rear engine support when not using bell housing for support

## Engine Stand Building Instructions

Congratulations on the purchase of these Engine Start/Test Stand plans. This stand is designed to be adaptable to many different V8 engines. With some ingenuity, you may be able to adapt it to 4 and 6 cylinder engines as well.

The quality of this stand is dependent on the quality and craftsmanship you put into building it. Build a good stand and it will provide you many years of use.

Included in these plans are provisions for an optional rear engine support, for those engines that have an automatic transmission and no separate bellhousing. I recommend, though, that if possible you acquire a bellhousing for your engine to use with this stand, as it will provide protection from the spinning flywheel or flexplate.

Let's get started with building the stand. Once you have purchased the required materials (see the Materials List), you are ready to start cutting the materials for the weldments (welded assemblies). It's best if you have metal chop saw or a metal band saw to cut the tubing and angles. I made all of my cuts with a reciprocating saw with a metal cutting blade. If using this method, take care to make your cuts as square as possible to avoid the need to grind your ends square.

If you are unfamiliar with weld callouts, the 1/8 indicates the size of the fillet or radius of the weld. The arrows indicate which sides require welds. A circle on the weld symbols indicates that you should weld all around the joint. The fillet triangle on both sides of the line indicates the weld is required both sides (front and back). A "TYP" in the reference flag on the weld symbol indicates the weld is typical for all joints on the weldment unless otherwise specified.

Be sure you have your welder set to get proper penetration on your welds.

It's good practice to check component fit-up before welding.

### Base Weldment

Weld the side members to the lower front and rear members. Overhang the members  $\frac{1}{4}$ " in each direction as shown on the top view to allow sufficient welding area. Be sure to square all pieces before welding.

Weld on the upper rear member as shown.

Weld on the 1  $\frac{1}{4}$ " radiator support guide tubes on the position shown. The 1-6 on the weld symbol indicates a 1" long weld every 6" along the piece. Clean all welds and set the piece aside for painting.

### Bellhousing Support

Start by drilling the bracket attachment holes through both sides of the vertical tube as shown in the side view. Use a drill press to drill the holes to assure a straight alignment of the holes through the tube.

The bevel cut on the top of the tube for aesthetics only. You can leave this cut square if desired. If left square, you could possibly secure a plate to the top of it for mounting ignition components or an engine computer (see reference pictures on my web page).

Weld the T-handle to the top of the post. This handle is to assist in moving the stand when an engine is mounted to it.

Cut and weld the two 1/8" plates to the post as shown. Drill the 3/8" holes in the plate before welding. When welding the plates to the vertical tube, use two 3/8" bolts to align the holes in the plates.

### **Bellhousing Bracket**

Two bellhousing brackets are required. Each one is made from one 12" long piece of angle and two 2" long pieces of angle. Cut the slotted holes on the 2" pieces first. Do this by drilling two 7/16" diameter holes. I used a Dremel cut-off wheel to cut the material from between the holes. You could also use a handheld jig saw with a metal blade to cut it out. Use a small flat file to dress the slotted holes so that a 3/8" bolt slides easily back and forth in the slots.

Cut the two long 1/2" slotted holes in the 12" piece in a similar manner.

Cut the 2 1/4" slot in the top of the long piece (the side **without** the slotted holes) as shown in the top view. **Note:** If you are using the optional 2" tube size (see Materials List), the dimension for this slot is to be 2" instead of 2 1/4".

Weld the two short pieces to the long piece as shown in the side view, aligning the legs with the slotted holes with the 2 1/4" slot in the top.

This piece should fit snugly on the vertical bellhousing post, with the slotted holes aligning with the 3/8" holes on the vertical post.

### **Cross Bar**

Cut and weld the 1/8" plates to the tube as shown. Drill the 3/8" holes in the plates prior to welding.

The cross bar should fit snugly on top of the Base.

### **Engine Mount Post**

Two engine mount posts are required. Drill the 1/2" diameter through-holes in the top of the post before cutting the bevel on the end. After cutting the bevel on the end, use a flat file to remove burrs from the holes on the inside of the tubes.

Cut the 1/2" steel pipe to fit snugly inside of the tube. *Do not use galvanized pipe.* Welding galvanized steel releases poisonous vapors. Put the pipe inside of the tube and use a 1/2" diameter bolt to align the pipe and the holes in the tube. Weld around each the pipe inside of the tube as much as you can.

Cut and weld the 1/8" plates to the posts as shown. Drill the 3/8" holes in the plates before welding, and align the holes with 3/8" bolts as you did with the bellhousing support.

## Wheel Extensions

Weld the four shop wheels to the 2"x2"x16" extension pieces as shown. **Be sure that the overall height of your shop wheel is at least 6"**. This is required to allow the legs of most engine cranes to roll under the stand for setting your engine on the stand. If you already own an engine crane, verify the height required to clear it's legs.

These wheel extensions should slide into the lower front and rear members of the base. **You may need to grind some of the front and rear base tubes inside weld seam for these extensions to slide in smoothly.** I did this with a grinding stone attached to a 12" drill extension.

## Radiator Supports

Two are required. They are fairly simple. Just weld the two pieces together as shown. Be sure to square them before welding.

## Radiator Clips

Four are required. Use your vise or a metal break if you have one to bend the 4 1/8" bars. Weld the bars to the tubes as shown.

Drill and tap a 5/16" threaded hole as shown in the end view. If you do not have access to a 5/16" tap, you can drill a 3/8" hole and weld a 5/16" nut over the hole instead.

## Gauge Panel

First, cut and weld the two side support angles as shown in the end view. Use a sheet metal break to bend over the top and bottom of the aluminum panel as shown in the end view.

Determine the hole sizes needed for the gauges you intend to mount on the panel. The hole size and pattern is for your reference. You can design your own gauge and switch arrangement if you desire. Mark and cut the gauge and switch holes in the panel.

Clamp the 3/4" angle panel supports under each side of the panel. Drill three holes in each end of the panel and through support angles. Fasten the panel to the support angles with self-tapping pan head screws or pop rivets.

## Paint

Paint all steel components to prevent corrosion. For good result, prime all components with a good primer before painting.

For best results, have components powder coated, though this can be more expensive. Be sure the components do not fit so snugly that powder coating will prevent you from assembling them afterwards.

## Assembly

Refer to the assembly drawing.

1. Insert the wheel extensions into the base as shown.
2. Center the bellhousing support on the upper rear base member. Align the holes and install two 3/8" x 3" bolts with washers and nuts.
3. Set the cross bar member on the base.
4. Set the engine mount posts on the cross member.
5. Using an engine crane, lower your engine (with bellhousing installed) slowly onto the stand so the bellhousing is against the bellhousing support.
6. Move the cross bar member on the base to align the engine mount posts with the engine mounts.
7. Position the engine mount posts under the engine mounts and lower the engine slowly onto the posts. Insert an engine mounting bolt through the engine mount and the engine mount post on each side of the engine. Center the engine on the base.

The engine mount posts should be exactly vertical and equally spaced from each side of the base. The bellhousing should be centered on the bellhousing support.

8. Level the engine on the engine mount posts.
9. Slide the bellhousing brackets up between the bellhousing and the bellhousing support post. Attach the brackets to the bellhousing first with the appropriate size bellhousing bolts. Check the engine again for level and secure the bellhousing brackets to the bellhousing support post with two 3/8" x 3" long bolts.
10. If this is the first time you've mounted this engine on the stand, you will need to drill the 3/8" holes through the base at each of the four cross bar mounting holes and install 3/8" x 3" long bolts. Now drill the four 3/8" holes through the cross bar to secure the two engine mount posts with 3/8" x 3" long bolts.
11. You should now be able to release the rest of the weight from the engine lift and remove the engine lift. Check that the engine is securely resting on the engine stand.
12. Install the radiator supports and clips, and set the gauge panel in place by inserting the legs of the support angles into the top of the radiator support tubes.
13. Now, connecting up the engine and making it run is up to you. A wiring diagram is included for your reference.

## **Collapsing the stand...**

1. Remove the bolts on the upright pieces (rear bell support and 2 mount posts) and then lift them off the base and slide them on to the rear cross members horizontally.
2. The control panel just lifts out of the radiator supports.
3. The two radiator supports slide out of the 1 1/4" tubes and slide back in long tube first as seen in the photo.
4. The two rear wheels slide out and slide back in horizontally (wheels facing back).
5. The two front wheels slide out and slide horizontally into the upper rear cross member (also wheels facing back).
6. You should now be able to stand the engine stand up on the wheels in its two rear members. The control panel slides back into the radiator supports.

You can view my engine stand reference pictures at:

[http://russ.green.home.comcast.net/~russ.green/ENGINE\\_STAND/Ref\\_Pics/index.htm](http://russ.green.home.comcast.net/~russ.green/ENGINE_STAND/Ref_Pics/index.htm)

Good luck with all of your projects.