

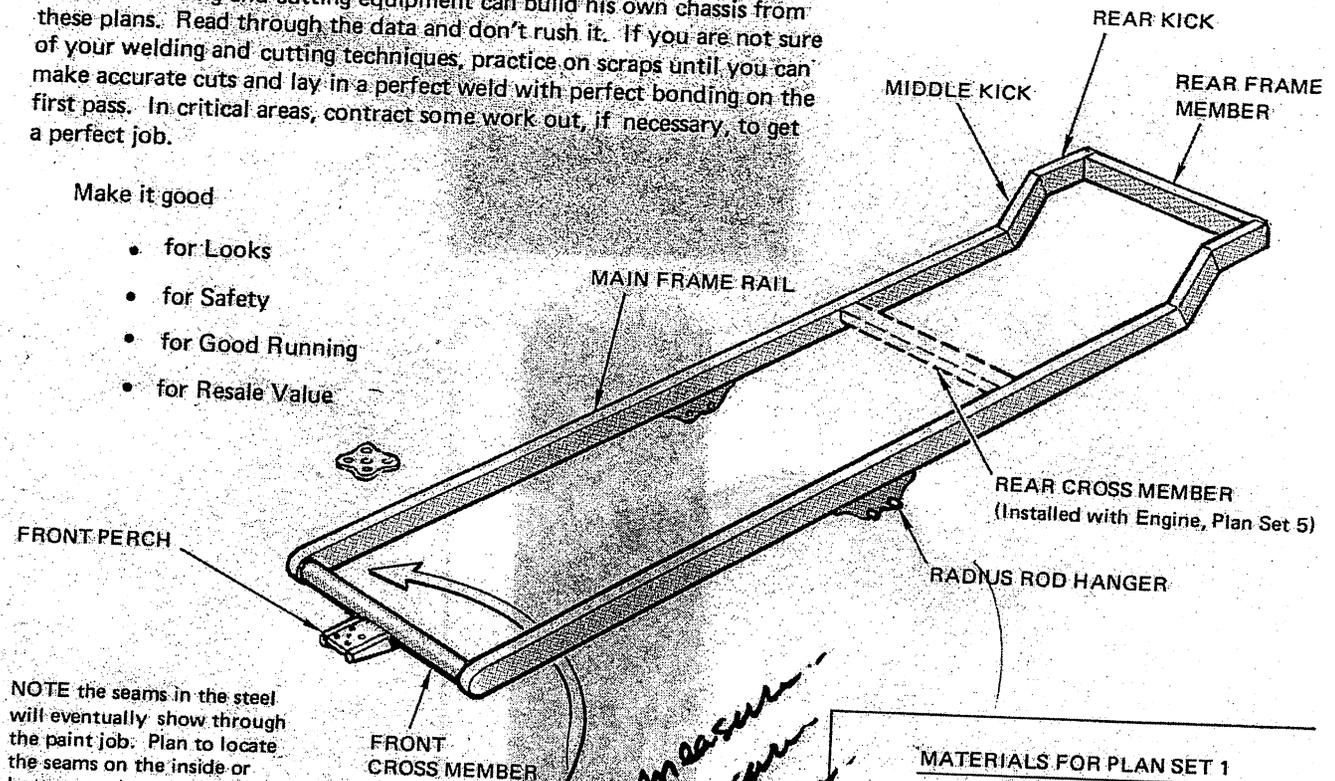
# SET 1 - BUILDING FRAME

(7 sheets)

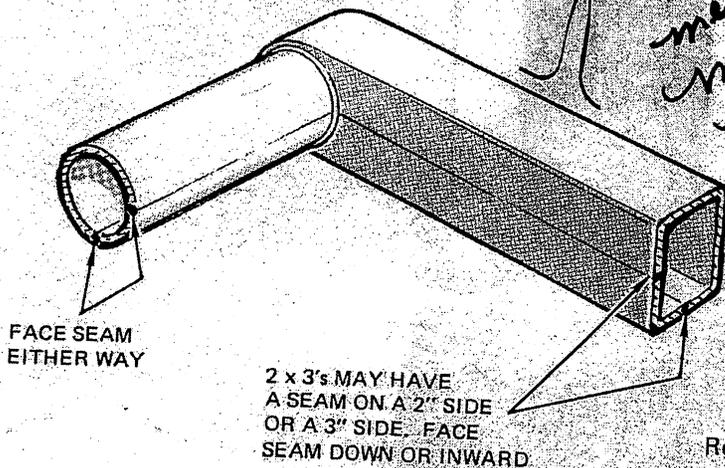
This chassis design and its production techniques were developed over a six year period of building hi-performance custom cars. These are constant trophy winners at auto shows. A good craftsman who has access to welding and cutting equipment can build his own chassis from these plans. Read through the data and don't rush it. If you are not sure of your welding and cutting techniques, practice on scraps until you can make accurate cuts and lay in a perfect weld with perfect bonding on the first pass. In critical areas, contract some work out, if necessary, to get a perfect job.

## Make it good

- for Looks
- for Safety
- for Good Running
- for Resale Value



NOTE the seams in the steel will eventually show through the paint job. Plan to locate the seams on the inside or bottom so they won't show.



*Measure  
Measure  
Measure  
Measure*

## MATERIALS FOR PLAN SET 1

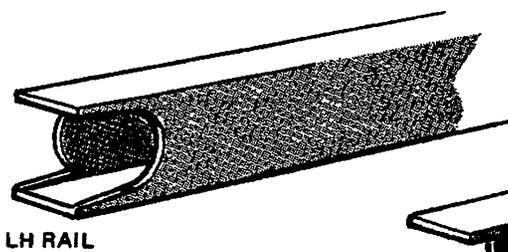
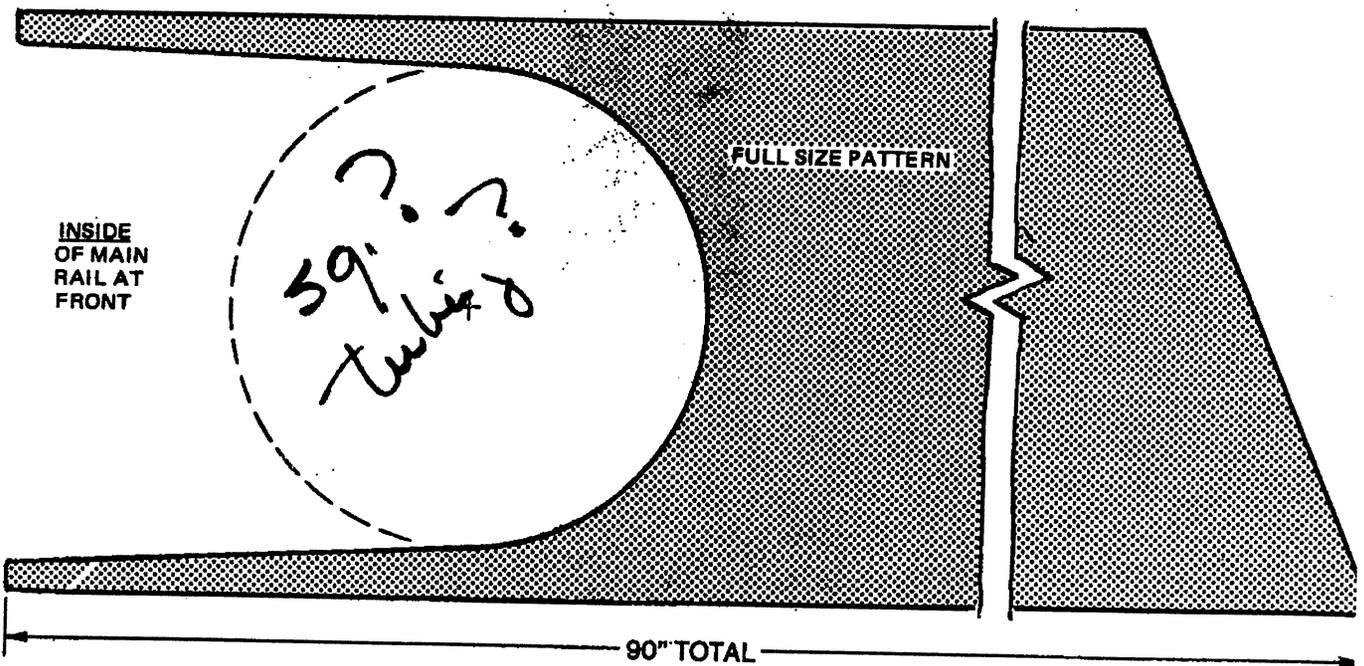
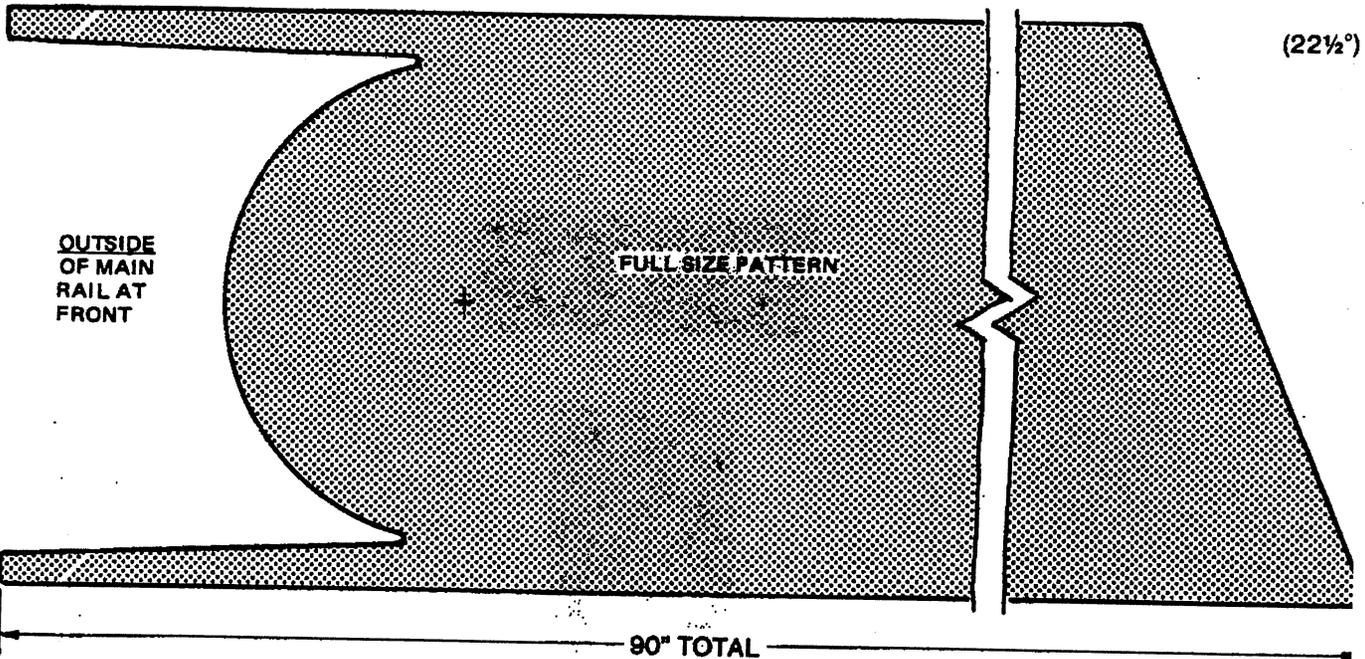
- 24 feet of 2 x 3 x .188 rectangular structural steel tubing
- 3 feet of 2 1/2 x .125 round, mild steel welded tubing
- 3/8" plate (see perch patterns, step 15)
- 3/8" plate - see step 26
- 5" of 3/4" x .188 tubing, see step 27

Re. cutting the 2 x 3 tubes - A hacksaw is the cheapest way, but that's a lot of work. A bandsaw is more accurate. An abrasive cut-off saw is the best and most accurate way. Torch cutting is quite practical if you have a steady hand and a grinder, and if "the man knows the torch." Torch cutting is the only way to notch the front end of the rails to fit the round crossmembers. At CCR, we now flame cut perch parts, hangers, etc. on an automatic flame cutting machine. In the early days, we cut them free hand with a torch. If this proves difficult, have a machine shop cut these parts, or order them from the CCR catalog.

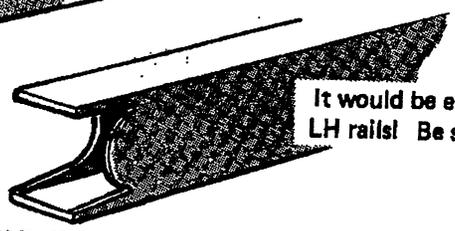
Re. welding - Our cars are now all heli-arc welded throughout. Arc welding is possible if you do not allow the large heat volumes to build up and warp the material.

# SET 1 - BUILDING FRAME

① Cut 2 main frame rails from 2 x 3 x .188 as shown



AT FRONT



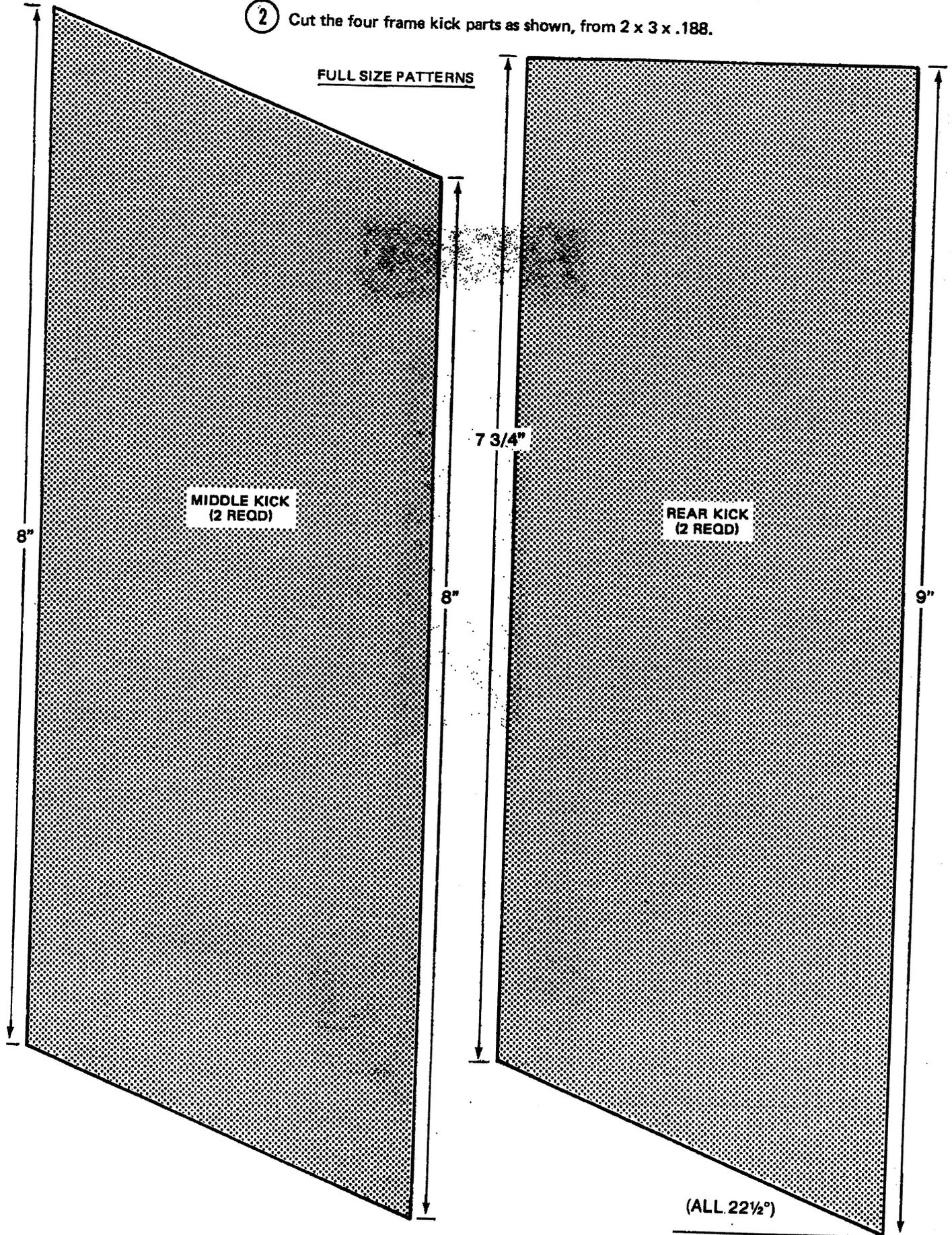
Don't cut your plans up. Trace and transfer patterns down carefully onto the steel through carbon paper or onto heavy paper if you prefer a cut-out pattern. Or use heavy vellum to trace off and cut out.

It would be embarassing to make two LH rails! Be sure to make a R & L

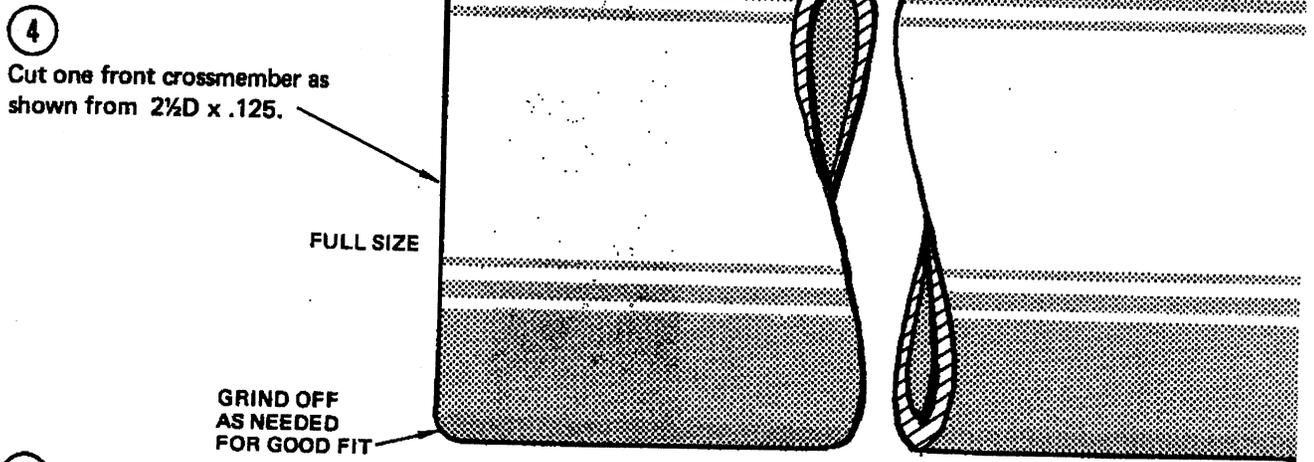
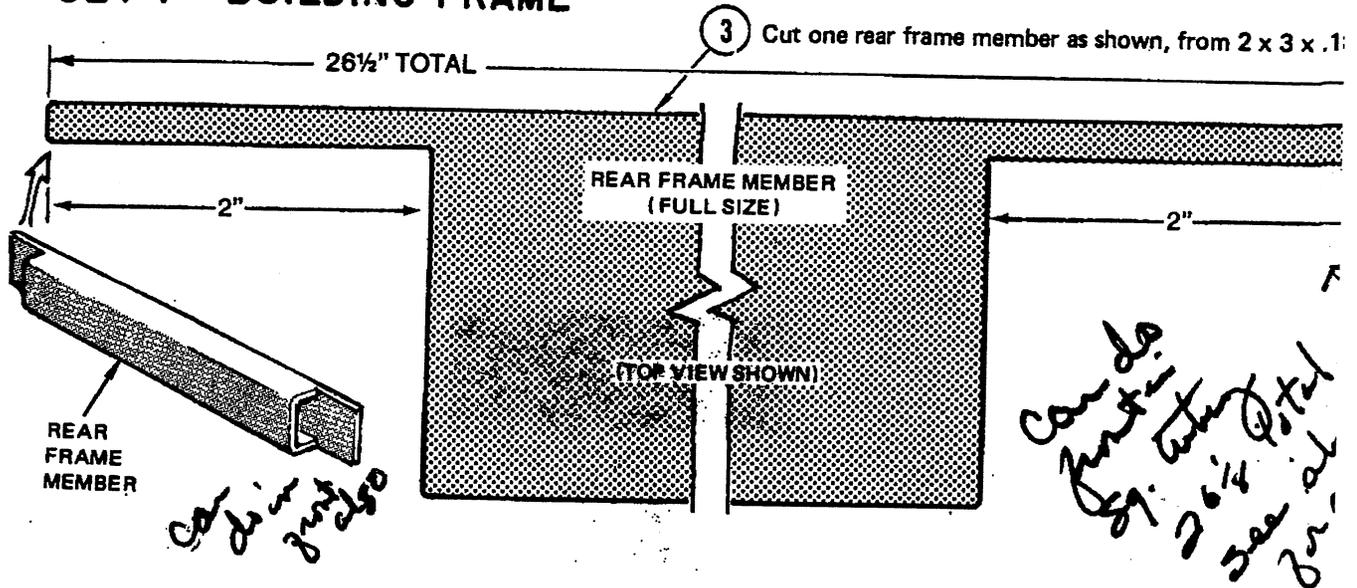
# SET 1 - BUILDING FRAME

② Cut the four frame kick parts as shown, from 2 x 3 x .188.

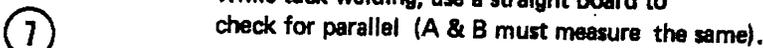
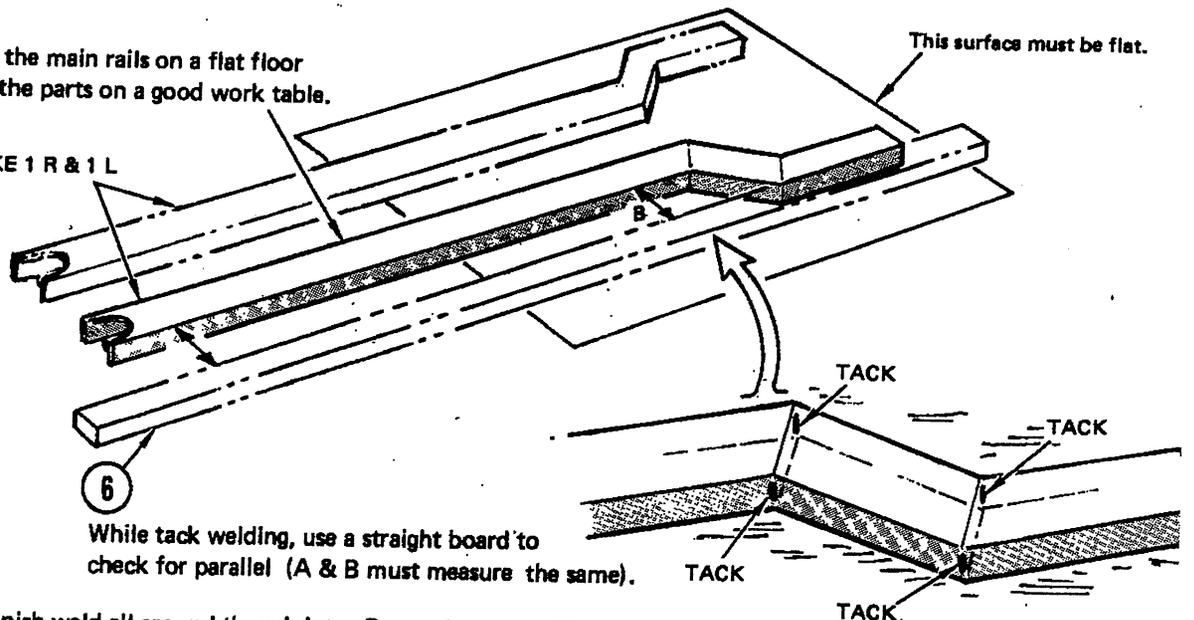
FULL SIZE PATTERNS



# SET 1 - BUILDING FRAME



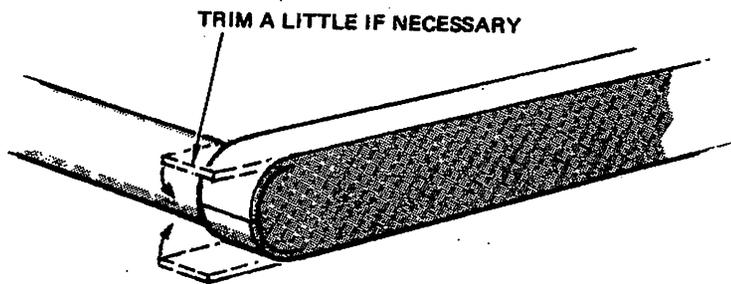
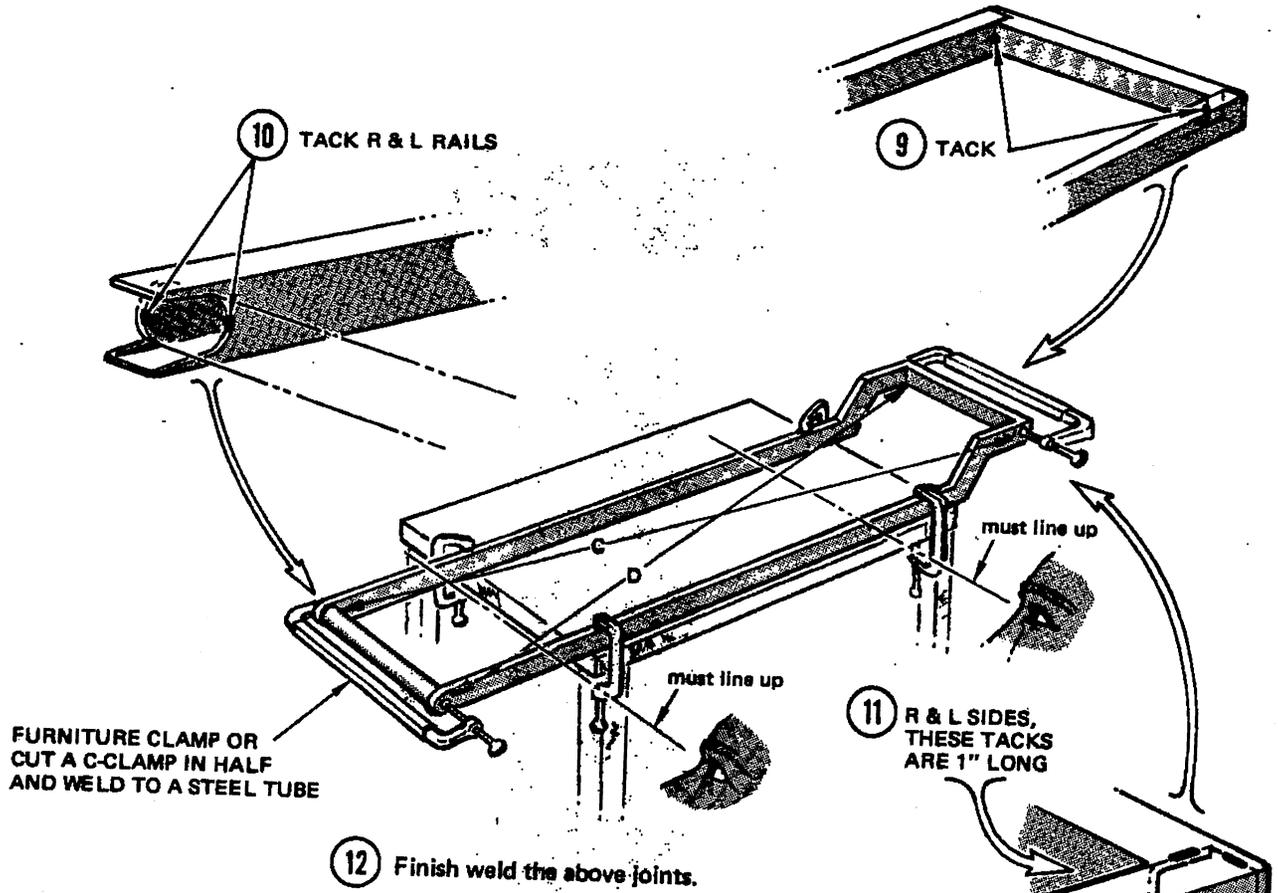
MAKE 1 R & 1 L



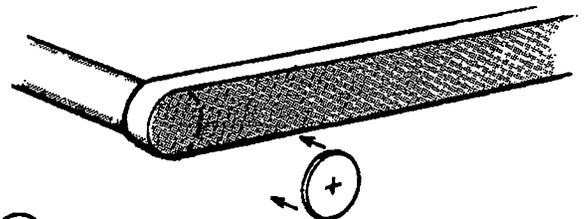
⑦ Carefully finish weld all around these joints. Remember the weld pulls. Keep checking alignment for parallel and make sure the rails match each other.

# SET 1 -- BUILDING FRAME

- 8 Clamp frame parts together as shown below. Then check that C and D measure the same (to get a square frame). Then tack weld as follows. Remember the frame will twist on finish welds if tacking isn't adequate.



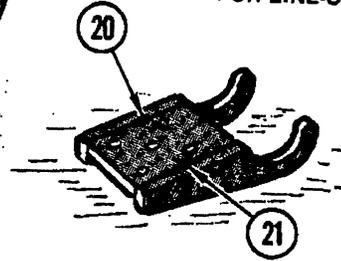
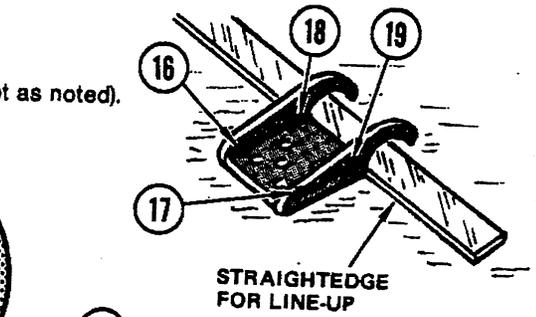
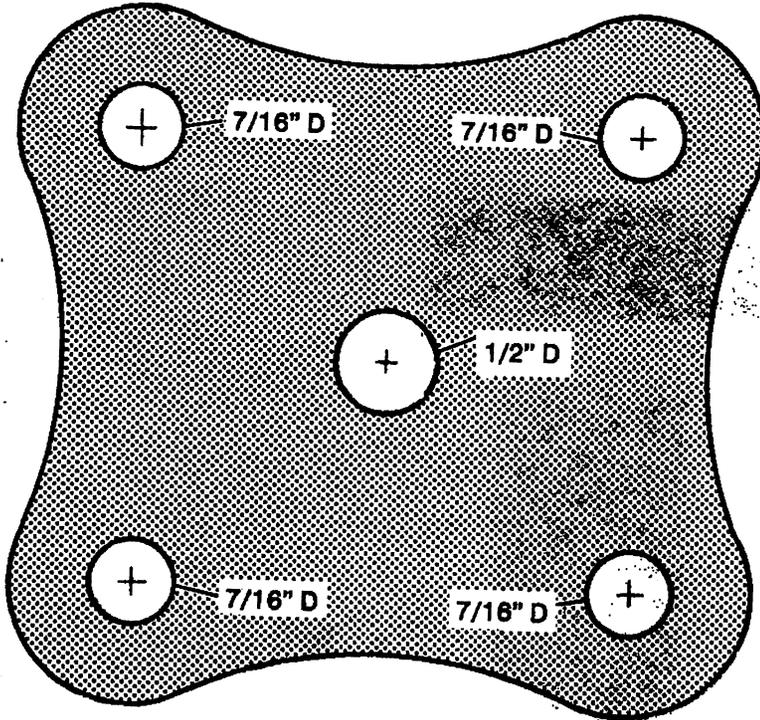
- 13 Apply heat to wrap the nose, then weld.



- 14 Then give the nose a smooth finish so lots of bond won't be necessary. Cut a 3" disk from stiff paper and grind until nose matches disk.

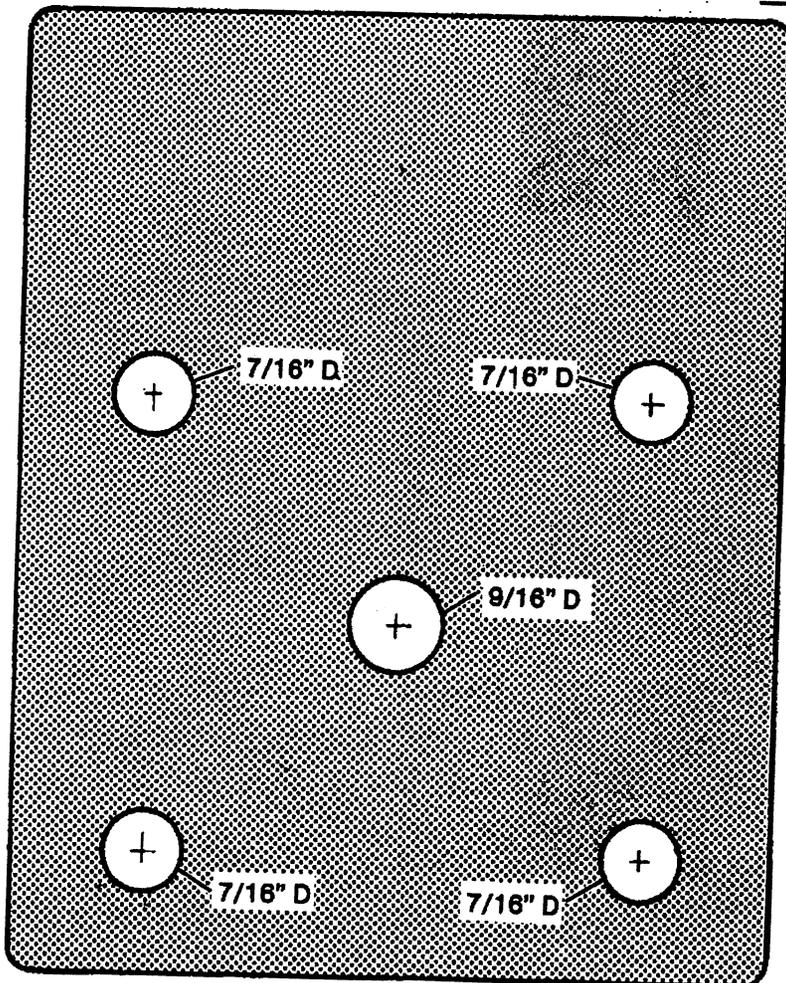
# SET 1 - BUILDING FRAME

15 Cut these front perch parts from  $\frac{3}{8}$  plate (one each reqd except as noted). Then tack as follows, and finish weld.



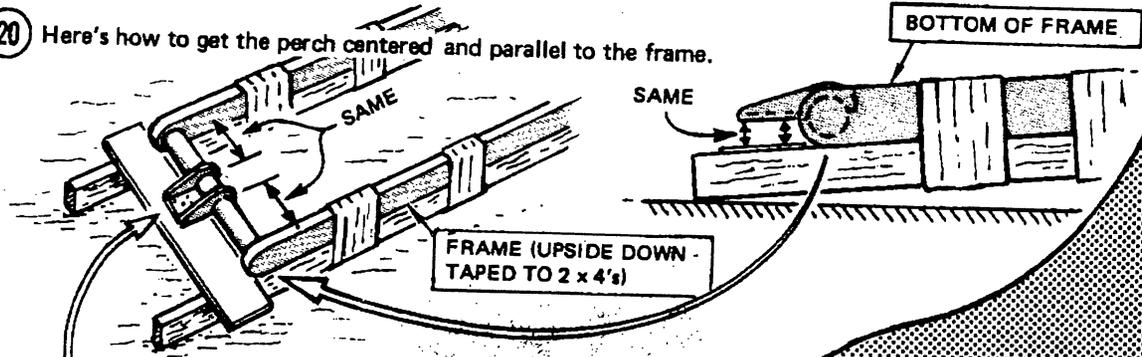
*2 x 3 in.  
you use for  
staying*

FULL SIZE PATTERNS

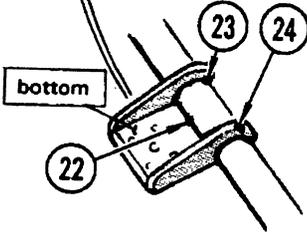


# SET 1 - BUILDING FRAME

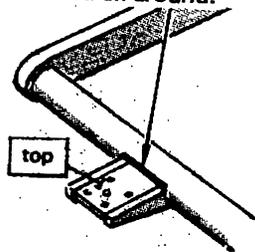
20 Here's how to get the perch centered and parallel to the frame.



21 Tack perch in place as follows.



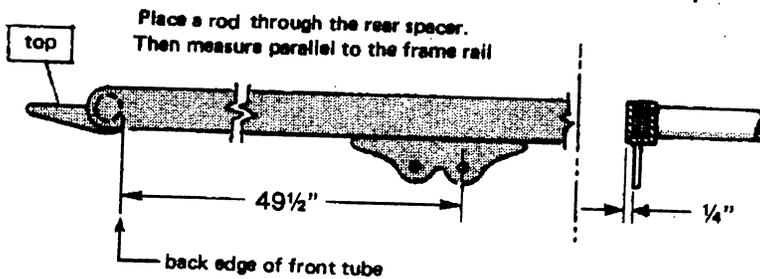
25 Weld across, then finish weld all around.



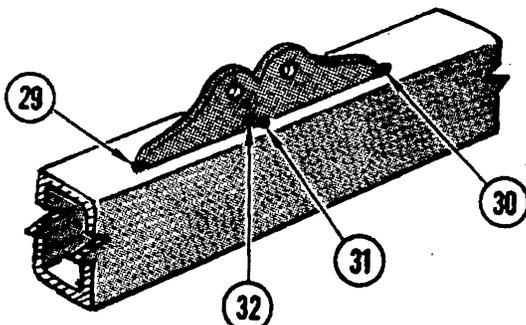
26 Cut 2 radius rod hangers from 3/8 plate.

*then found  
at Chicago  
Engineering*

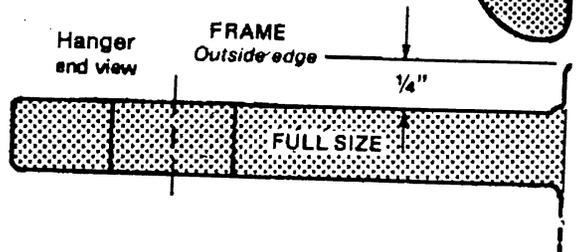
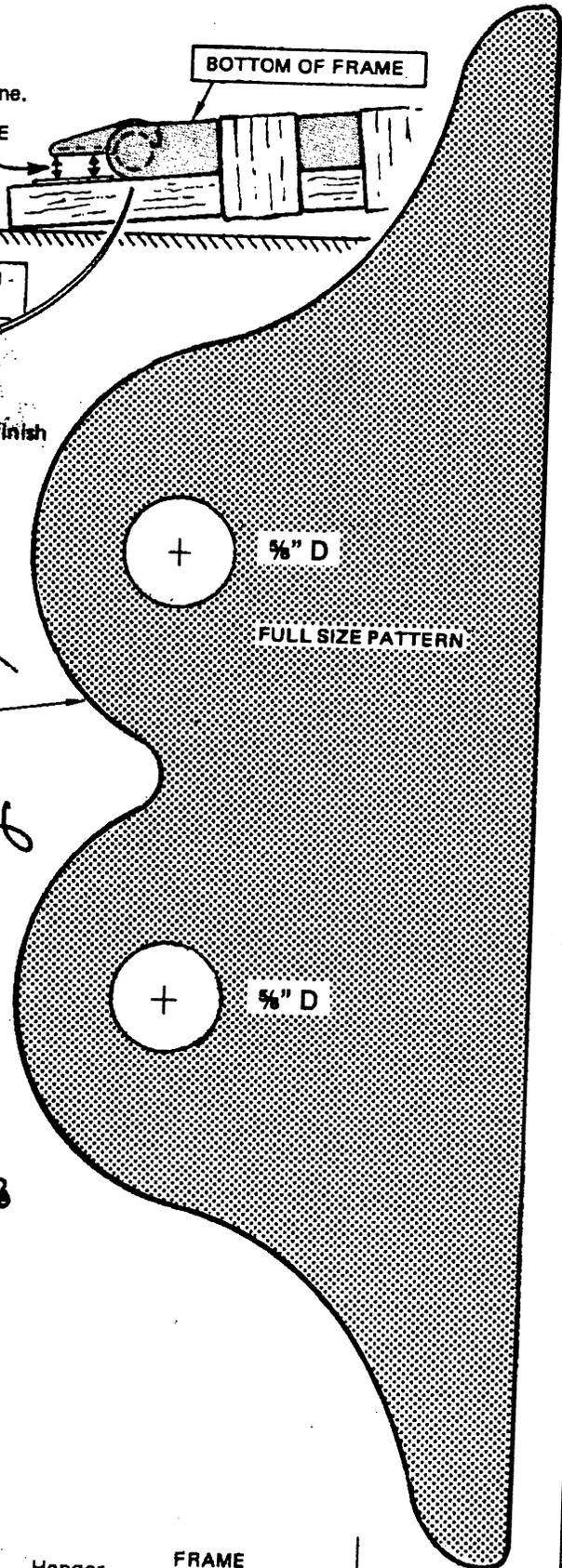
27 Locate the position for mounting these hangers accurately.



28 Invert frame and tack as follows.



33 Then finish weld all around.

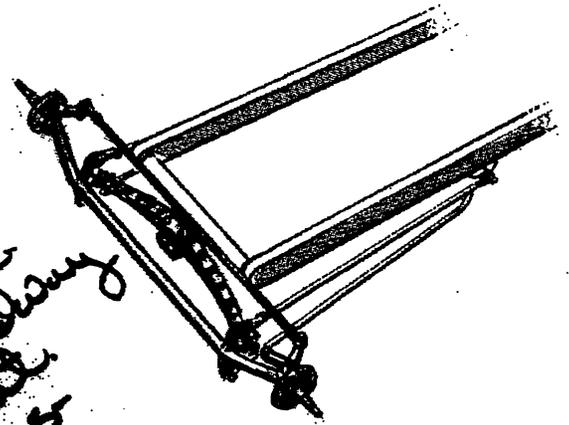


# SET 2 - FRONT END

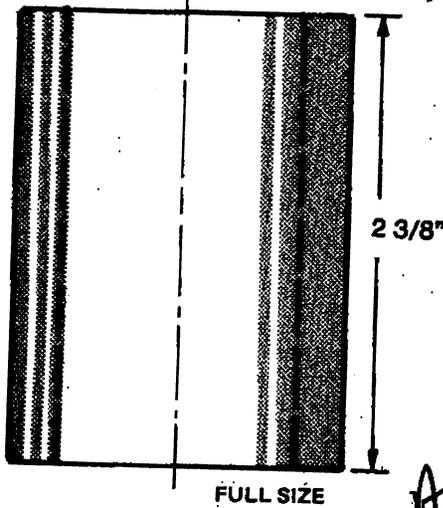
(6 sheets)

Complete front axles may be ordered from CCR and other sources. If you plan to make your own, note that the bending must be done right, using a mandrel bender. Variations from our dimensions are not critical. Some builders will drop the axle 5" to lower the car more. Place all parts in position before welding on radius rod hangers, and before cutting radius rods, to check that you have a good working layout. You can leave the axle straight with no drop.

*Axle  
speeding  
trip  
mas*



① Make 2 bosses from 1 3/8 OD x 13/16 ID tubing.



*At Ro. Heavy  
150 2-5101  
43 2-5101*

## MATERIALS FOR PLAN SET 2

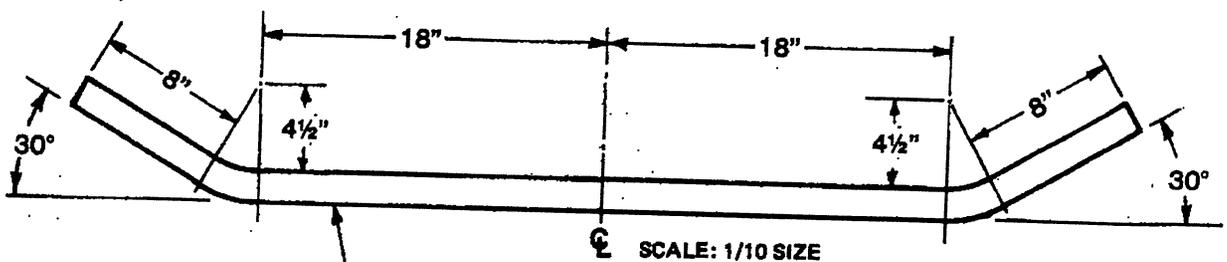
*Rob*

- 28 ft. of 7/8 dia. x .156 wall mild steel tubing (seamless)
- 6 ft. of 1 3/4 x .250 wall seamless tubing
- 6" of 1 3/8 OD, 13/16 ID tubing
- 4" of 1" OD x 1.20 wall tubing
- 1 set of 1 3/4 W, 9/16 pin shackles
- 1 spring, 1 3/4 W, 6-Leaf 1 3/4, 16 x 16, 32 OA  
*16" 16"*
- 3/8 steel plate (see patterns)
- 4 male heim ends
- 4 clevises - see step ⑭

*Small  
25x-2694  
Wall  
42x-5796*

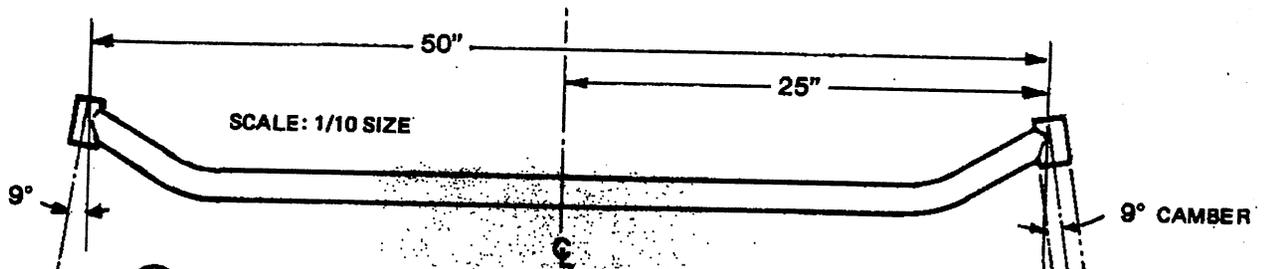
*RT has  
Welding  
255-6471*

② Bend axle as indicated, using a mandrel bender.



1 3/4" OD x .250 WALL SEAMLESS TUBING

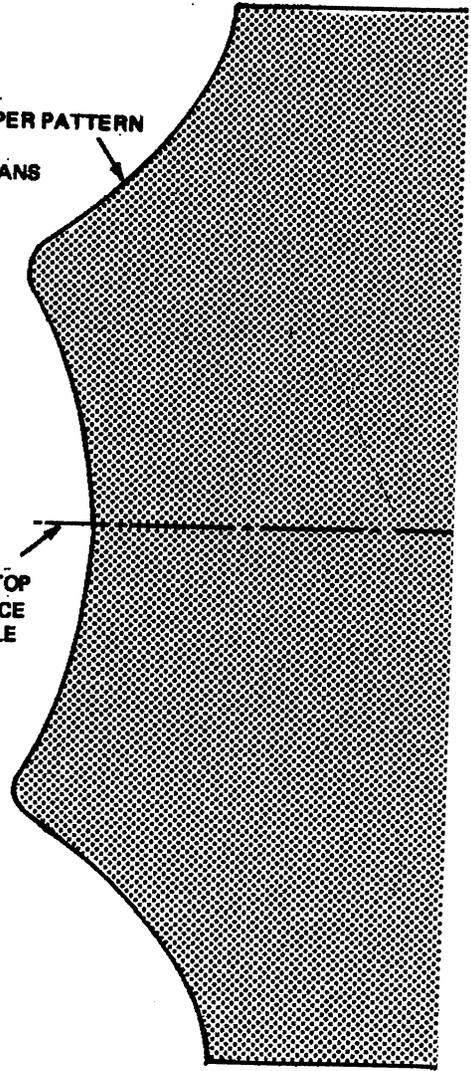
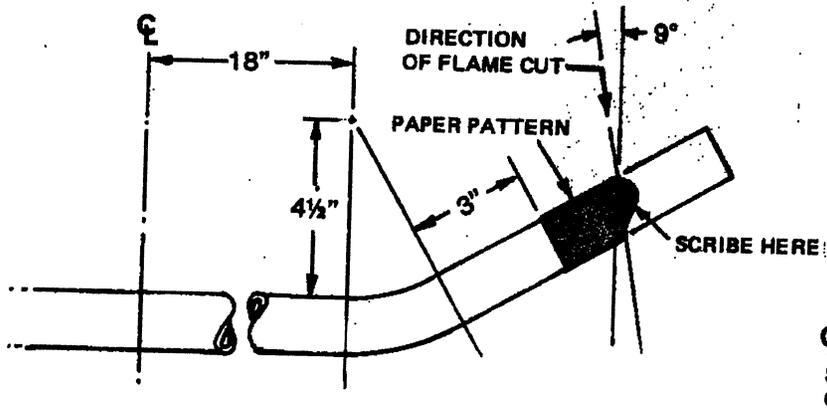
# SET 2 - FRONT END



3 The bosses may be fitted to match this layout. We recommend that you have a machine shop do this. However, it can be done with a flame cutter and rotary file, by scribing the axle as shown.

USE A LONG PIECE OF 1 3/8 OD PIPE AND KEEP CHECKING WHILE FITTING BOSSES

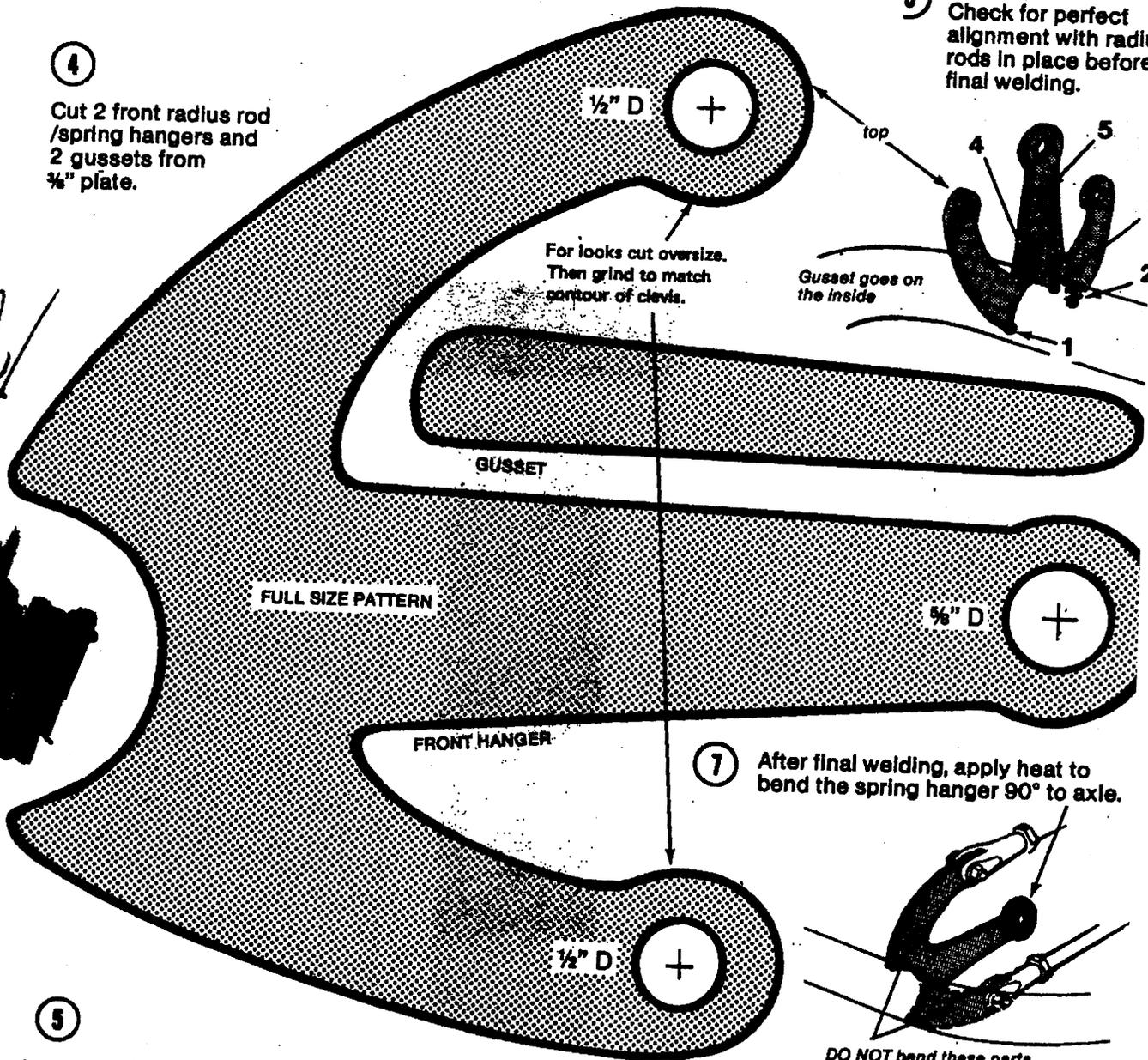
FULL SIZE PAPER PATTERN  
TRACE OFF -  
DON'T CUT PLANS



# SET 2 - FRONT END

④ Cut 2 front radius rod /spring hangers and 2 gussets from  $\frac{3}{8}$ " plate.

⑤ ~~Next~~ as follows: Check for perfect alignment with radius rods in place before final welding.



*Don't work*

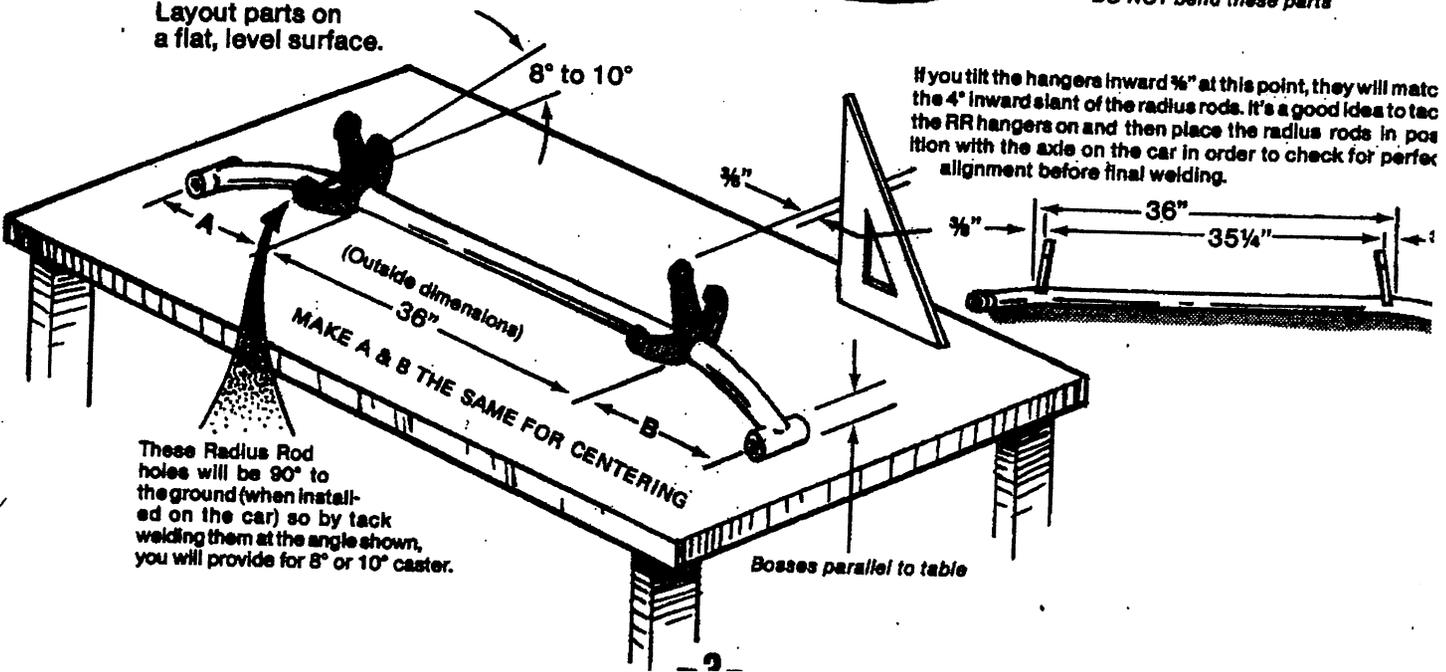
For locks cut oversize. Then grind to match contour of clevis.

Gusset goes on the inside

⑦ After final welding, apply heat to bend the spring hanger 90° to axle.

DO NOT bend these parts

⑤ Layout parts on a flat, level surface.



These Radius Rod holes will be 90° to the ground (when installed on the car) so by tack welding them at the angle shown, you will provide for 8° or 10° caster.

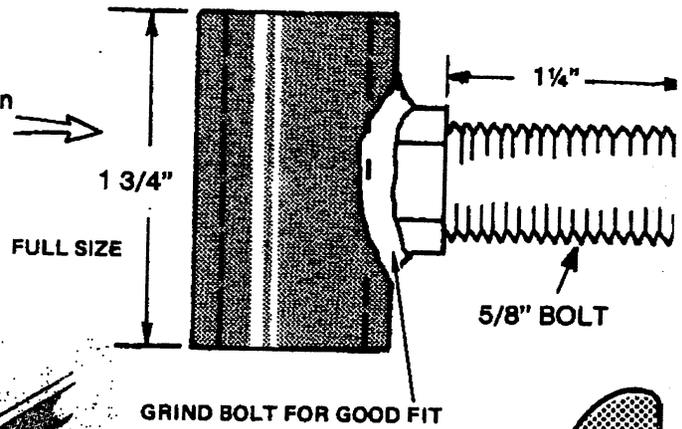
If you tilt the hangers inward  $\frac{1}{8}$ " at this point, they will match the 4° inward slant of the radius rods. It's a good idea to tack the RR hangers on and then place the radius rods in position with the axle on the car in order to check for perfect alignment before final welding.

MAKE A & B THE SAME FOR CENTERING

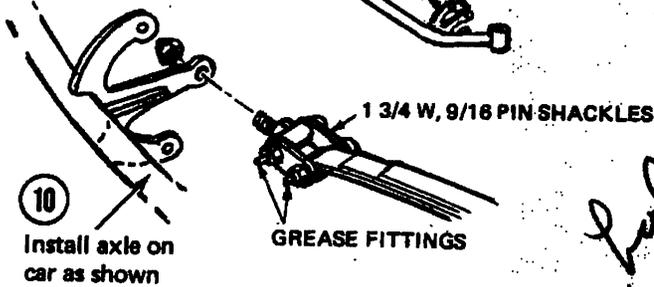
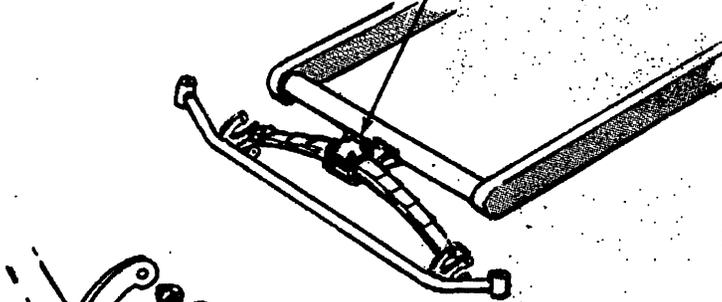
Bosses parallel to table

# SET 2 - FRONT END

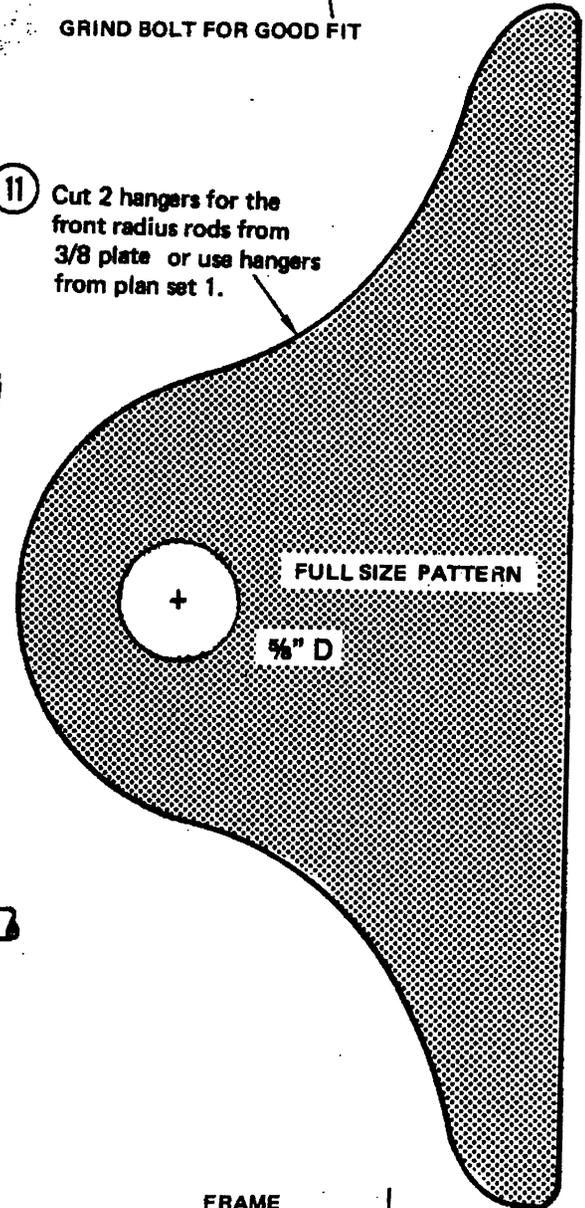
8 Make 2 shackle hangers as shown from 1" OD x .120 wall tubing



9 Install the spring on the front perch (the front perch is part of Plan Set 1)

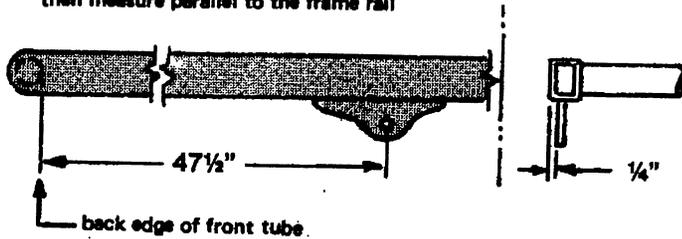


11 Cut 2 hangers for the front radius rods from 3/8 plate or use hangers from plan set 1.

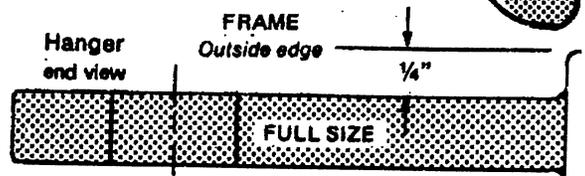
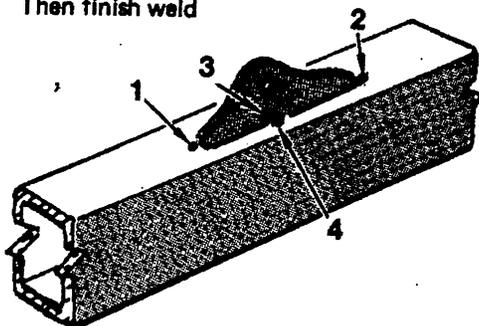


*can be had from Cherry*

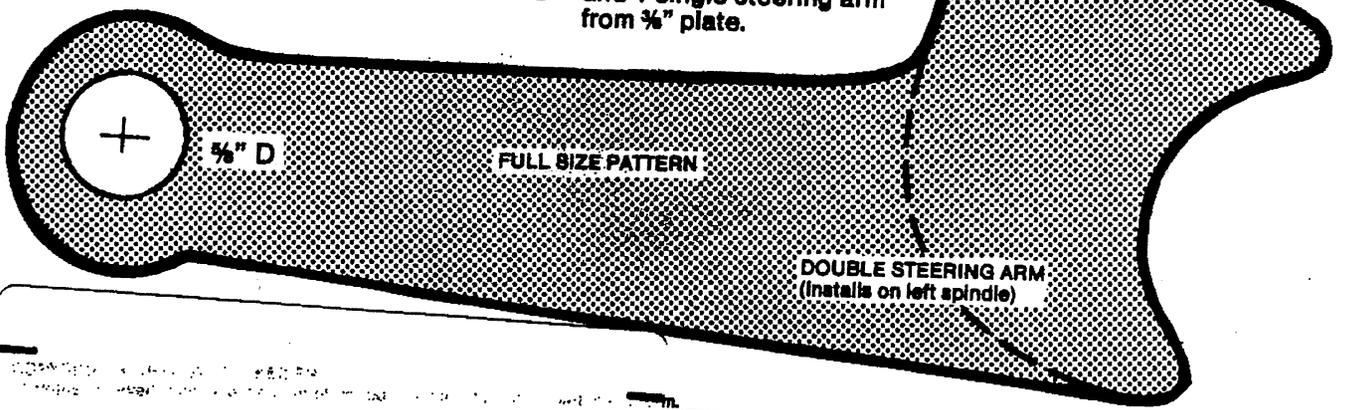
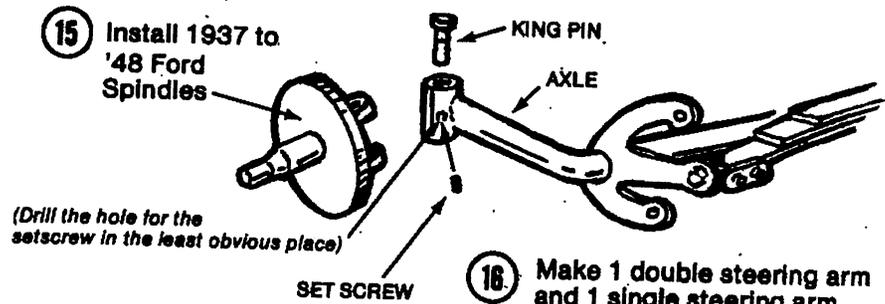
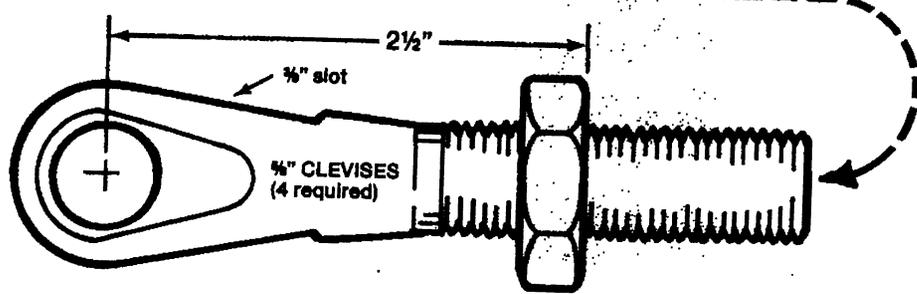
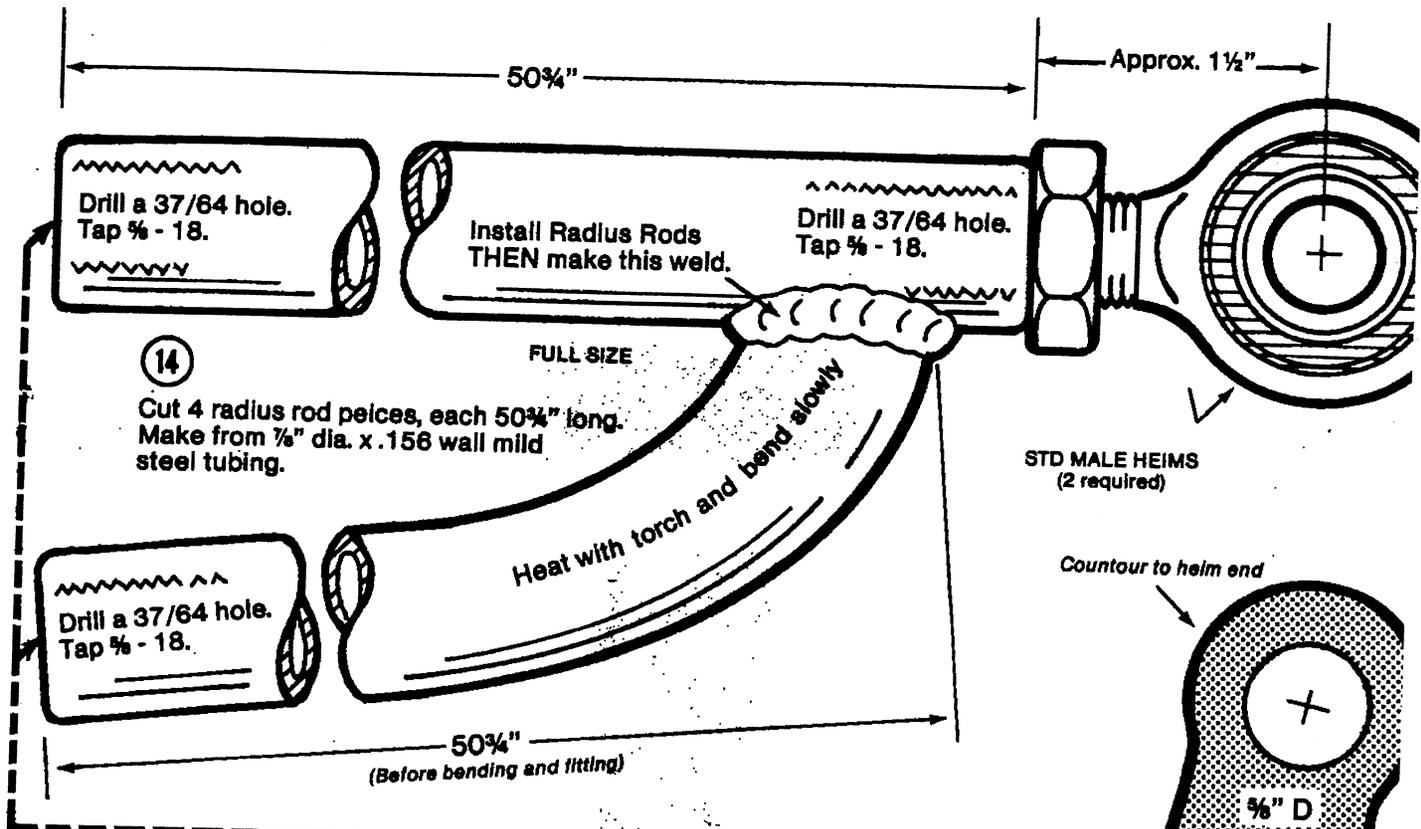
12 Locate the position for mounting the radius rod hanger accurately  
Place a rod through the spacer, then measure parallel to the frame rail



13 Invert frame & tack as follows: Then finish weld



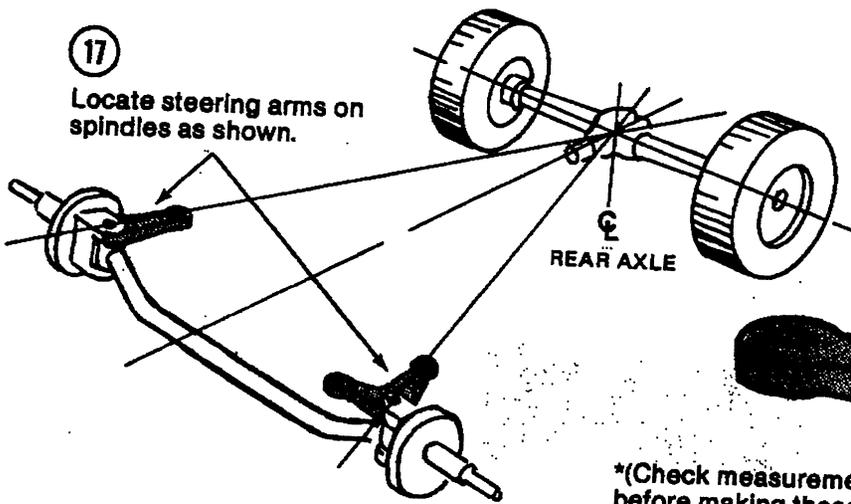
# SET 2 - FRONT END



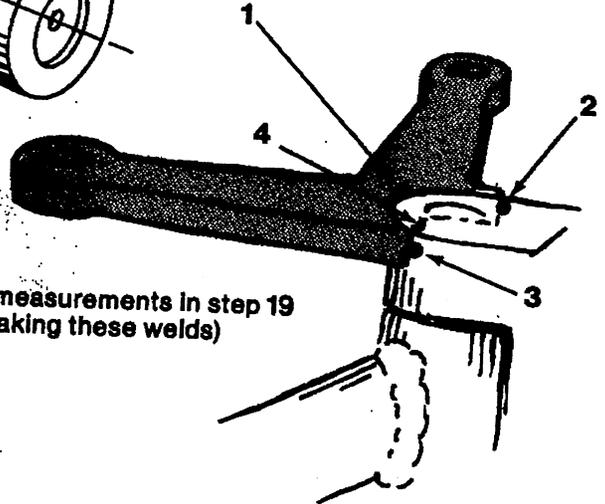
# SET 2 - FRONT END

↑ Insert this end in typewriter. ↑

**17** Locate steering arms on spindles as shown.

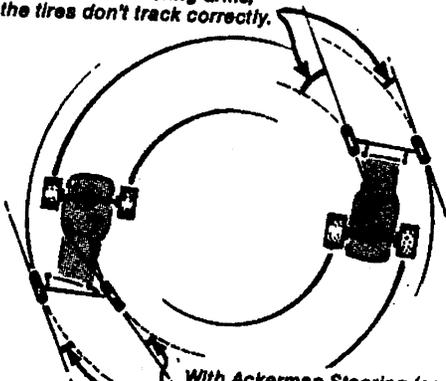


First tack here allows adjustment. Then tack in sequence.\*



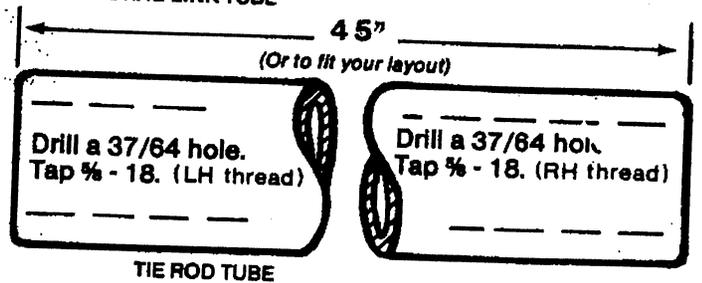
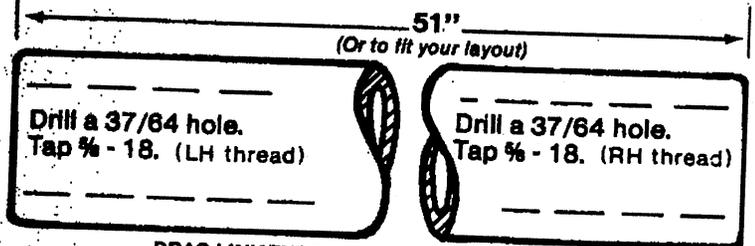
\*(Check measurements in step 19 before making these welds)

With parallel steering arms, the tires don't track correctly.

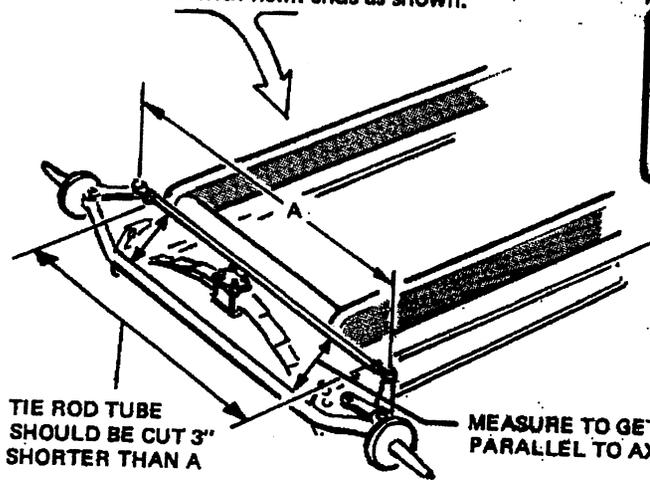


With Ackerman Steering (as per our installation) the tires will track perfectly.

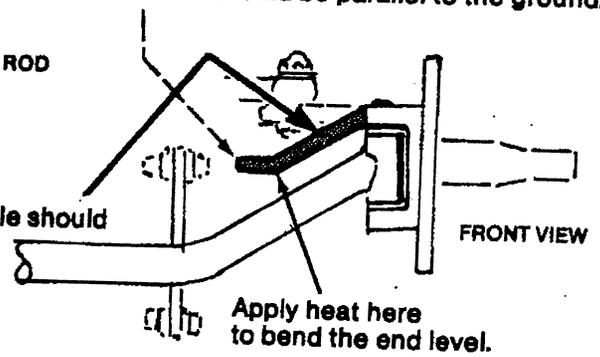
**18** Make one tie rod and one drag link from 3/8" x .156 wall mild steel tubing.



**19** Attach tie rod with heim ends as shown.



End of arm should be parallel to the ground.

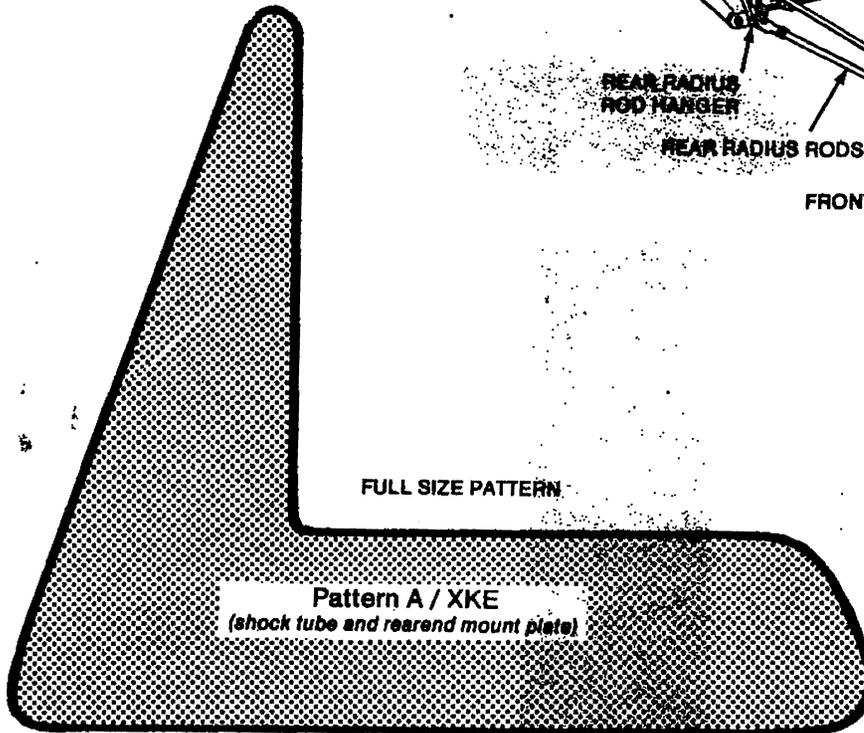
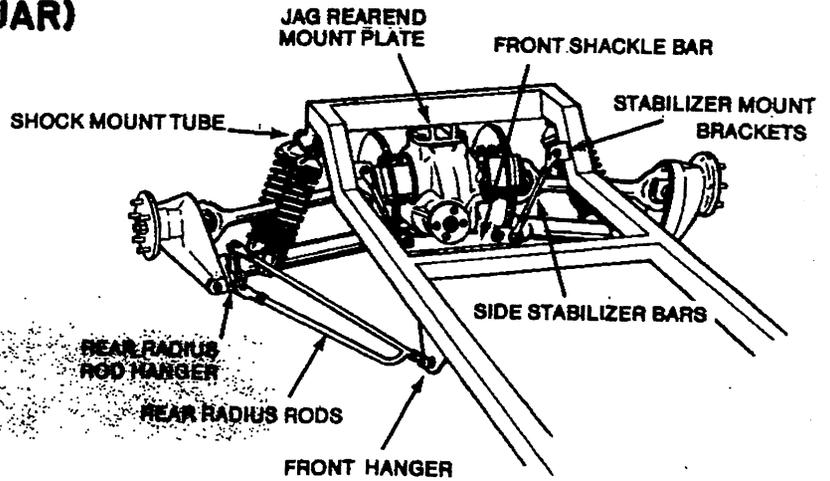


**20** With the wheels straight, this arm on the left spindle should be parallel to the axle (both when viewed from above and when viewed from the front).

**21** If needed, take the car to a F.E. Alignment shop. They will chain the F.E. down and use jacks to tweak axle for perfect alignment.

# SET 3 - REAR END (JAGUAR)

(7 sheets)

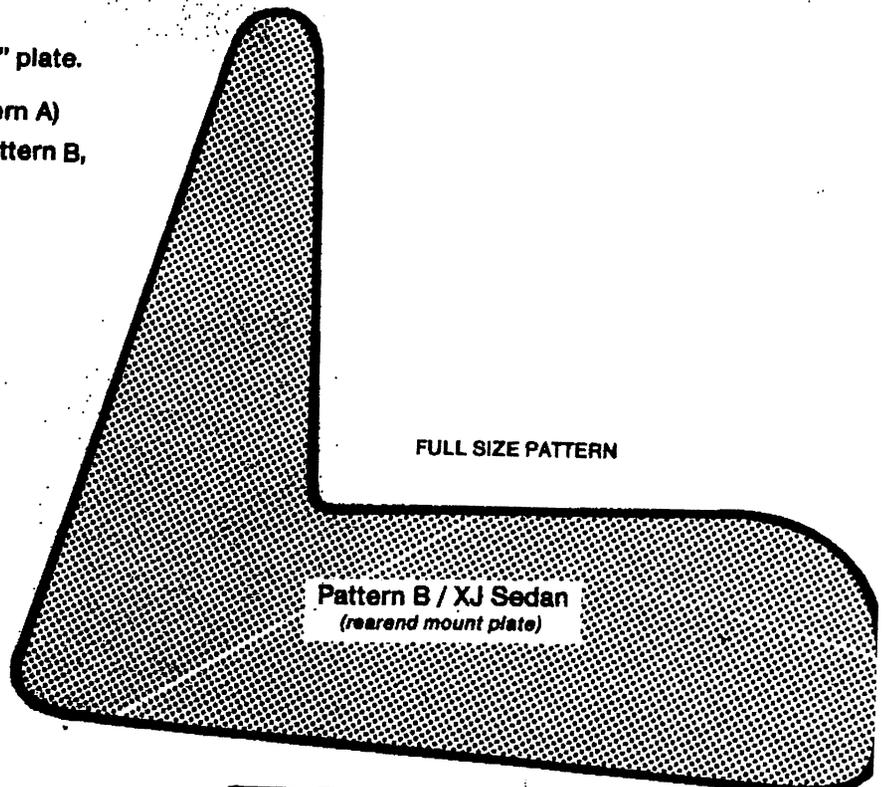


## MATERIALS FOR SET 3

- 3/8 plate (see patterns)
- 17 ft. of 3/4" x .156 wall mild steel tubing (seamless)
- 1 ft of 7/8 OD x 5/8 ID tubing - step ②
- 6 clevises - steps ①① & ②②
- 2 Heim ends - step ②②
- 4" of 2" OD x .083 ID mild steel tubing — step ①⑥

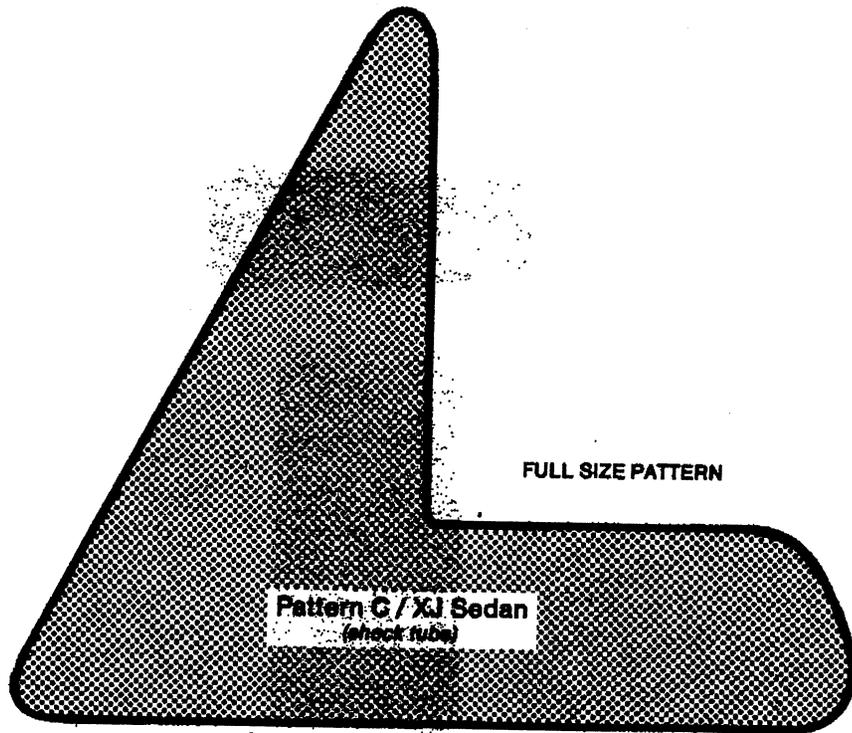
① 4 brackets required from 3/8" plate.

- XKE rearend (all 4 from pattern A)
- XJ Sedan rearend (2 from pattern B, and 2 from pattern C)

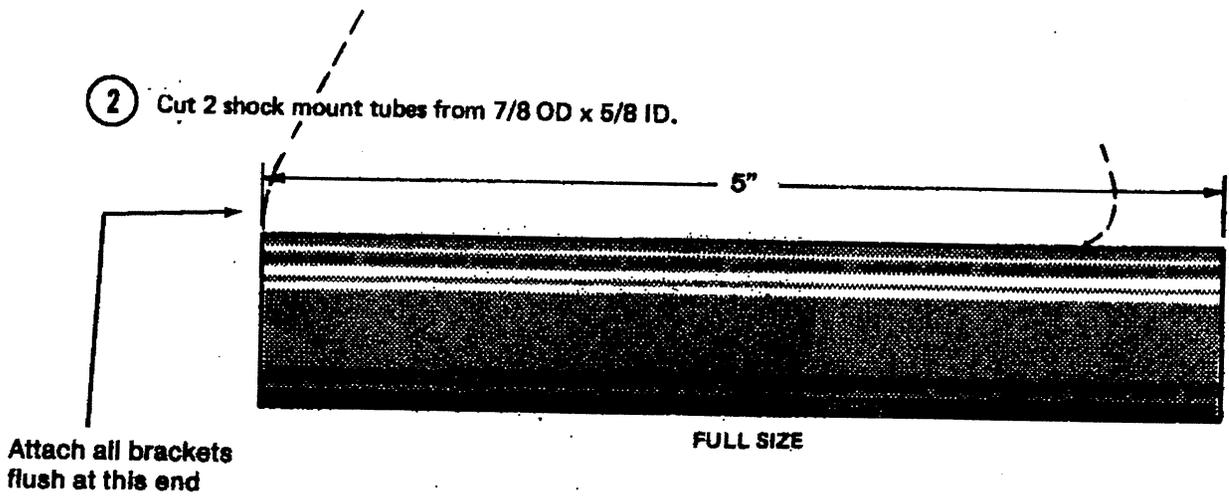


↑ Insert this end in typewriter. ↑

# SET 3 - REAR END (JAGUAR)

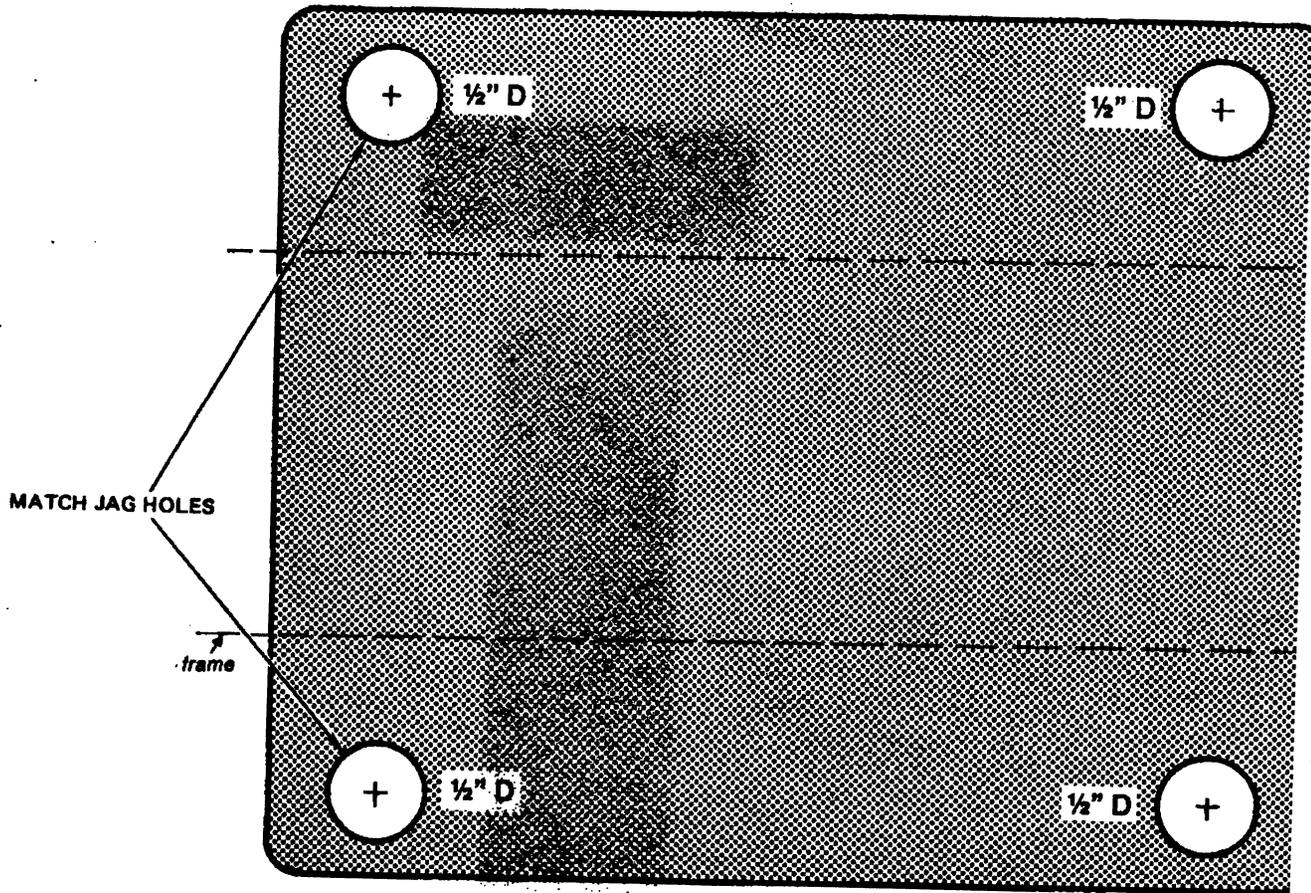


② Cut 2 shock mount tubes from 7/8 OD x 5/8 ID.



# SET 3 - REAR END (JAGUAR)

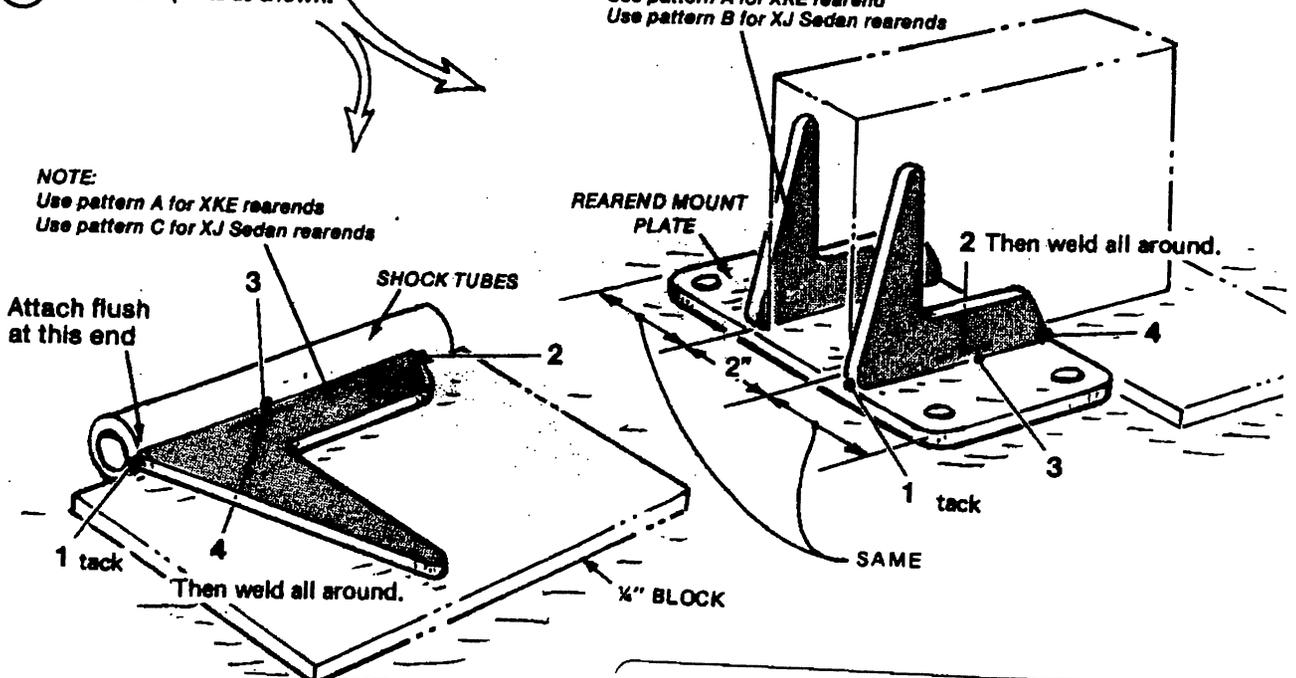
③ Make 1 mount from 3/8 plate.



④ Assemble parts as shown.

NOTE:  
Use pattern A for XKE rearend  
Use pattern B for XJ Sedan rearends

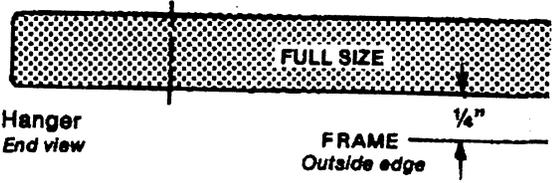
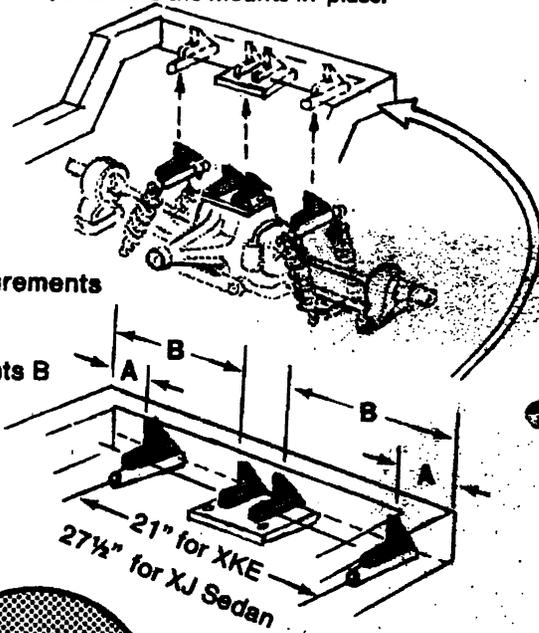
NOTE:  
Use pattern A for XKE rearends  
Use pattern C for XJ Sedan rearends



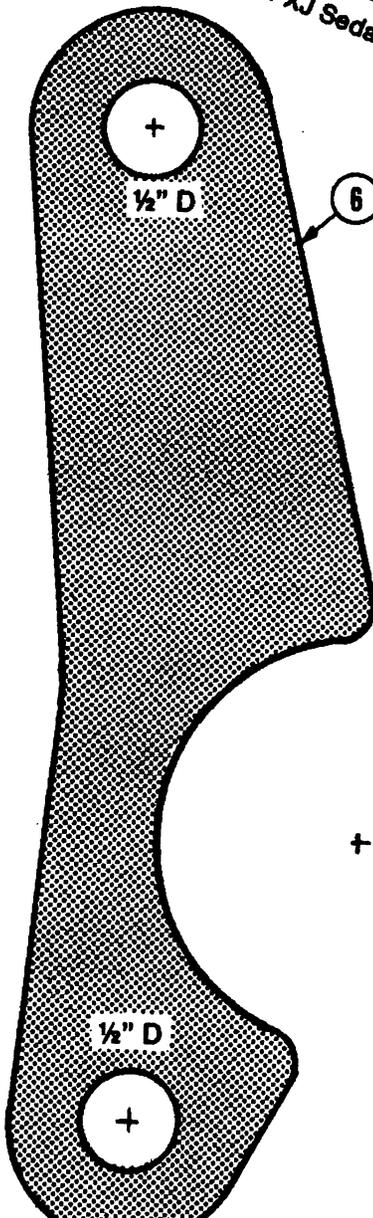
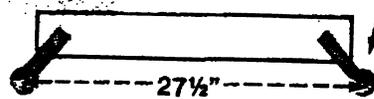
### SET 3 - REAR END (JAGUAR)

5 Bolt the mounts to the Jag parts, jack the rear end into position, and weld the mounts in place.

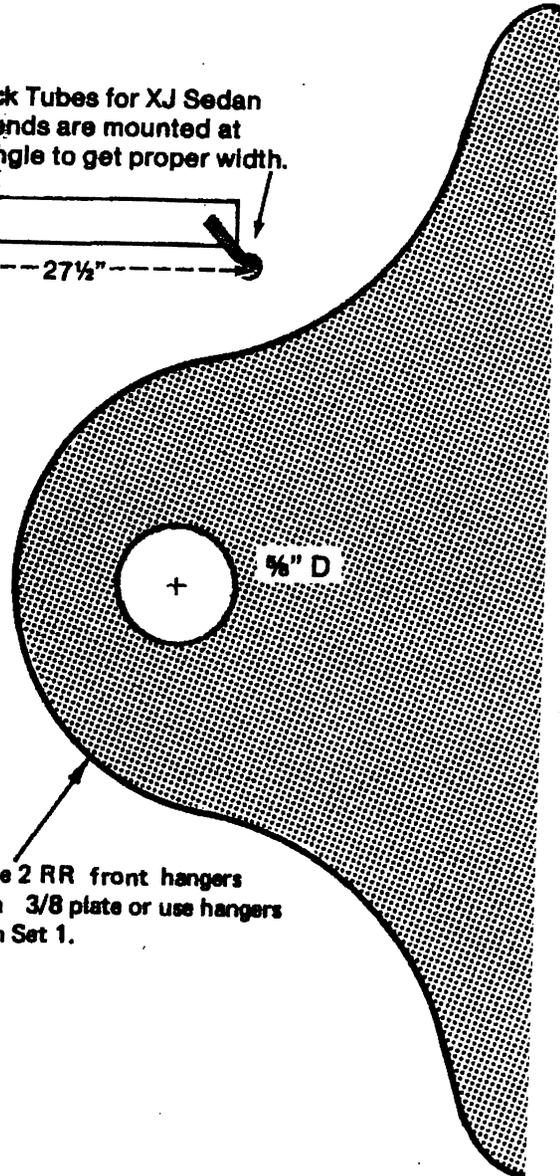
Make measurements A the same, and make measurements B the same for exact centering.



Shock Tubes for XJ Sedan rear ends are mounted at an angle to get proper width.

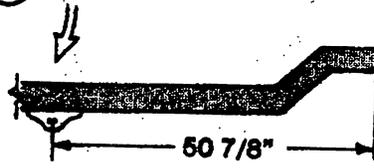


6 Make 2 rear RR hangers from 3/8 plate.

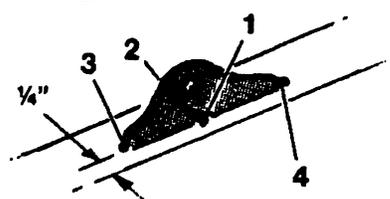


7 Make 2 RR front hangers from 3/8 plate or use hangers from Set 1.

8 Locate hangers on frame.

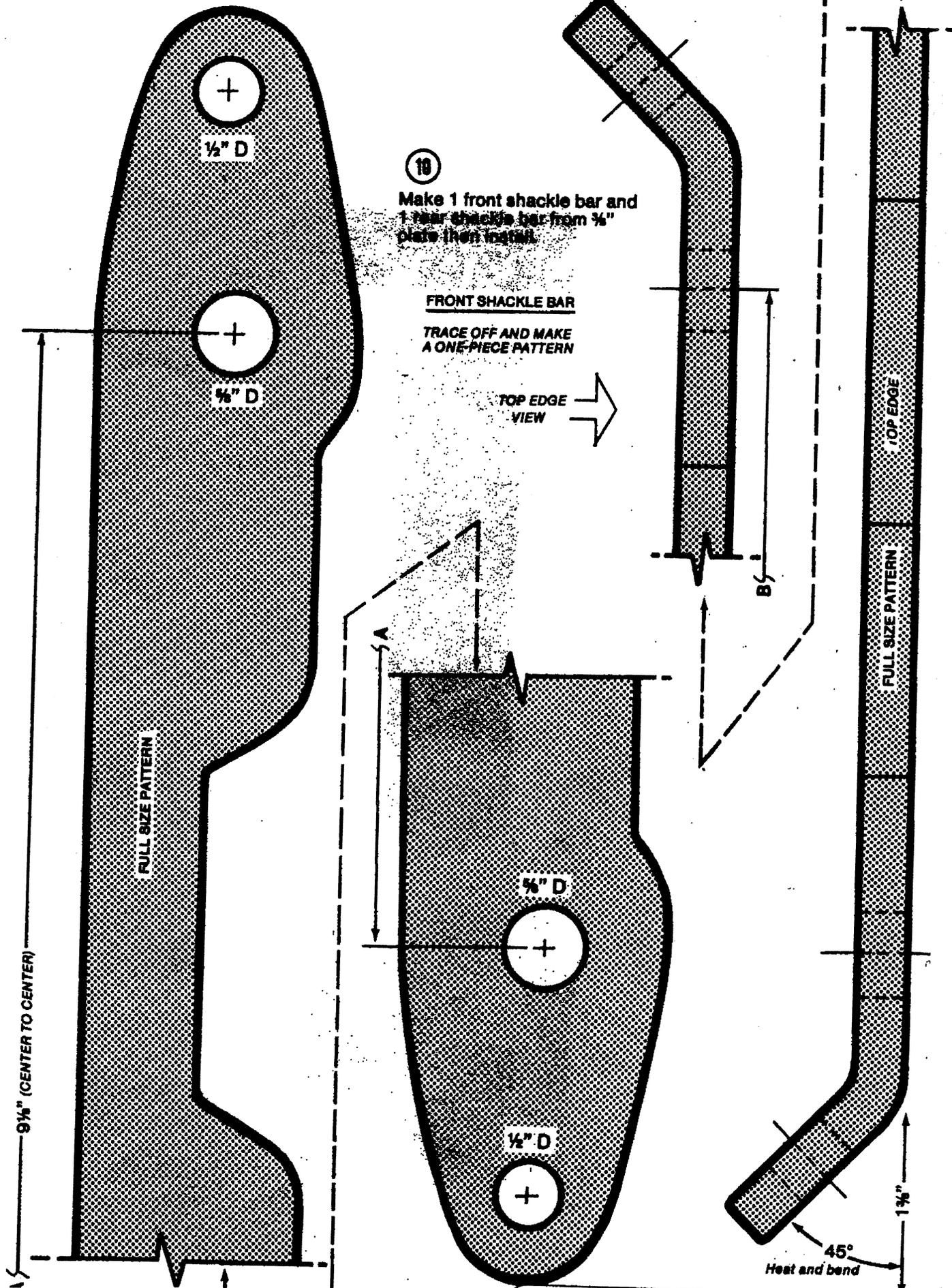


9 Weld as follows.



Then all around

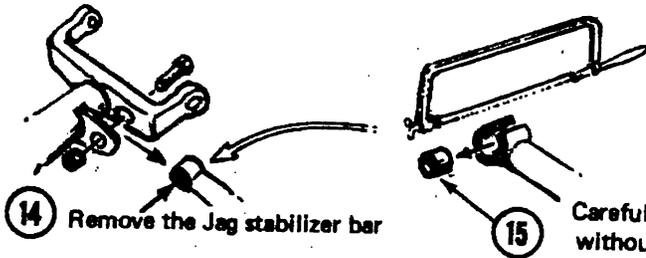
# SET 3 - REAR END (JAGUAR)



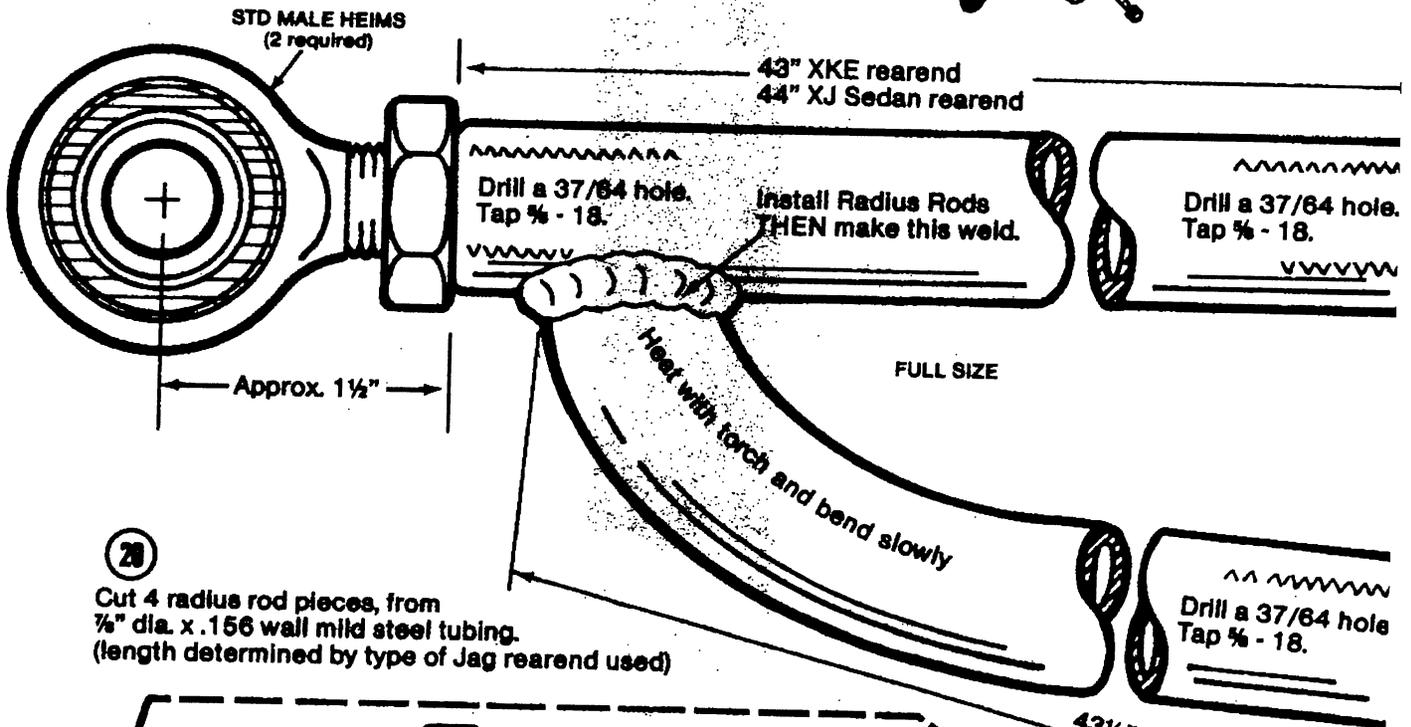
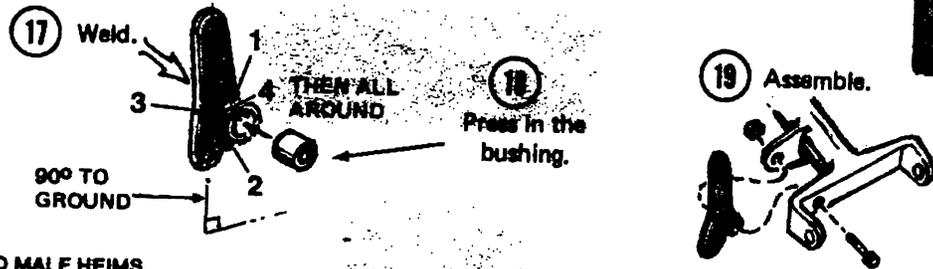
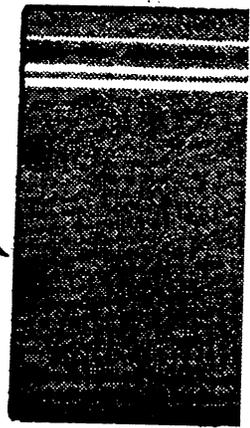


1 5/16"

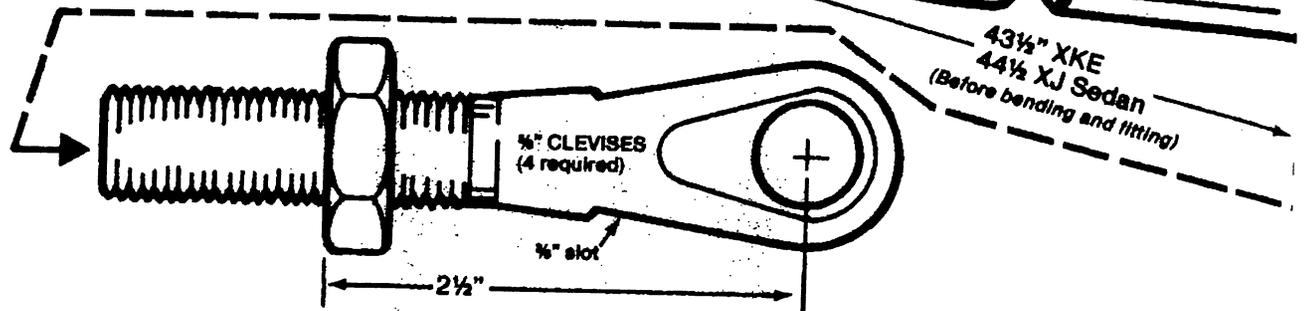
# SET 3 - REAR END (JAGUAR)



16 Make 2 new RR adapters from 2" OD x 1.083 ± .003 ID

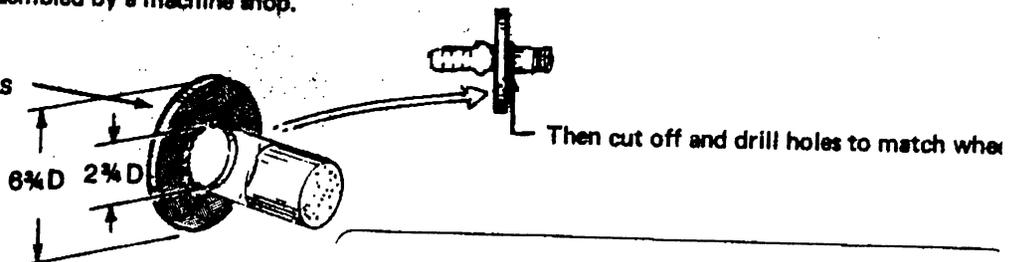


20 Cut 4 radius rod pieces, from 3/8" dia. x .156 wall mild steel tubing. (length determined by type of Jag rearend used)



21 If jag wheels are not used weld the Jag hub to an adapter. These should be assembled by a machine shop.

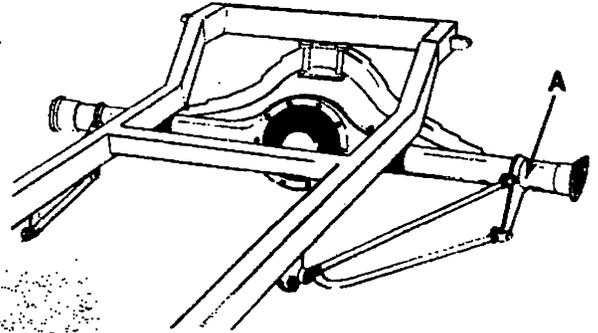
5/8 MILD STEEL PLATE  
HOLES TO MATCH WHEELS



# SET 4 - REAR END - (CONVENTIONAL)

(5 sheets)

We use the 70 Charger RE, because it is more ruggedly built, has larger bearings, and the 3rd member is located on the centerline.



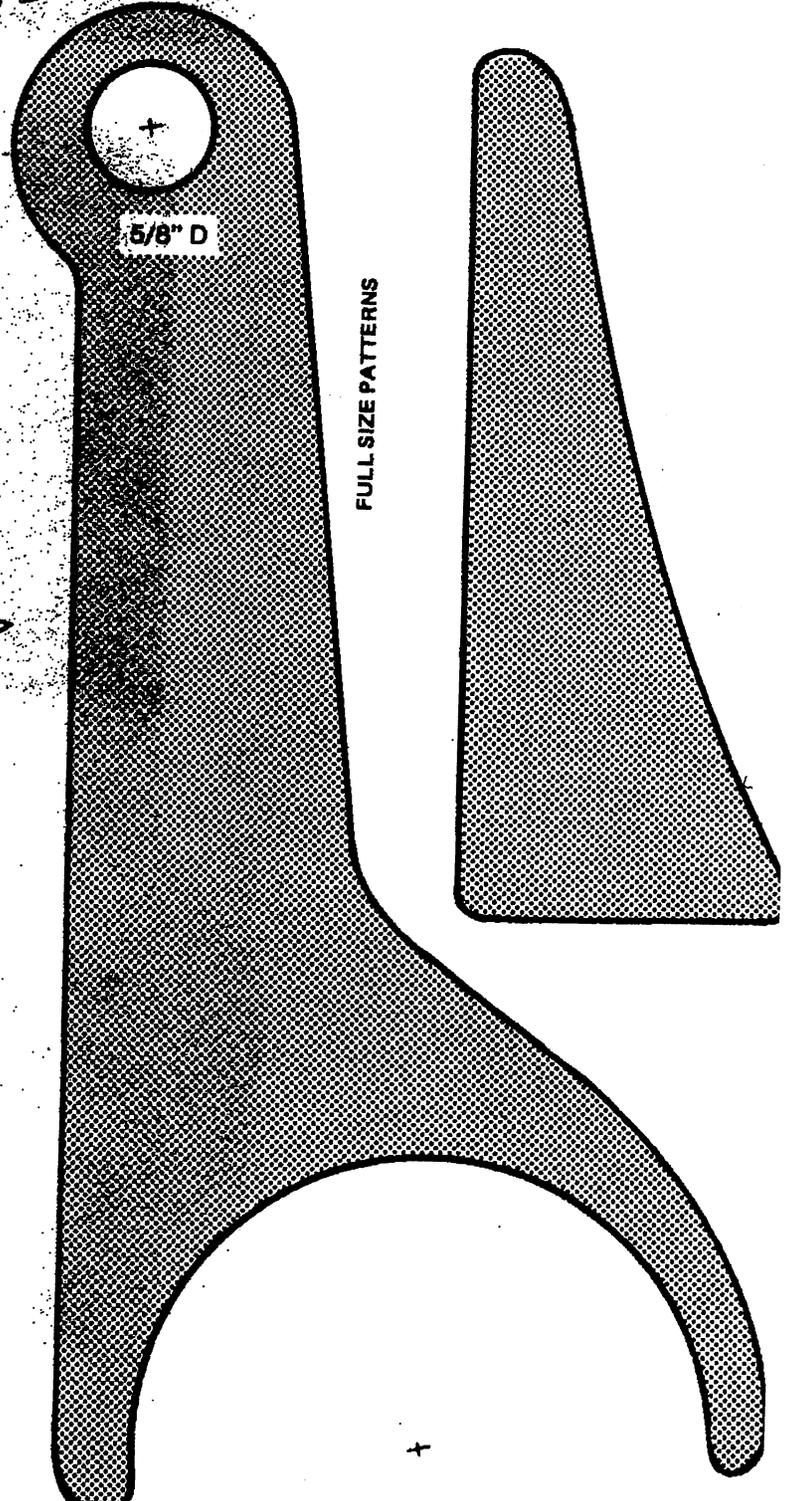
On Chevy RE's the 3rd member is off center, and this looks bad next to our transverse leaf spring.

Also on Chevys, the housings are thin at **A**, and the RR hangers tend to rip loose.

①

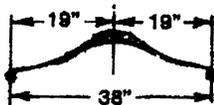
Before starting your installation, plan ahead to get the rear end, the drive shaft, and the engine crankshaft to line up as much as possible so as to put less wear on your universal joints. It's a good idea to dummy everything together with tack welds, and install your wheels and tires, and simulate the body weight in order to check this out while it's still easy to make changes.

② Make 2 each, spring hanger parts, from 3/8 plate.



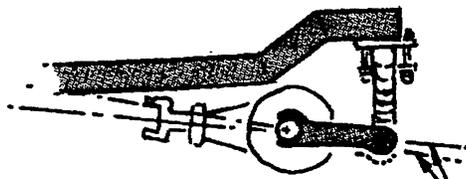
## MATERIALS FOR SET 4

- 3/8 plate (see patterns)
- 13 ft. of 3/4" x .156 wall, mild steel tubing (seamless)
- 2 Hiem ends - step ⑭
- 4 clevises - step ⑭
- 1 rear spring, 1 3/4 W, 8 leaf, 19, 19, 38 OA, center to center.



- 4" of 1" OD x .120 wall tubing
- 1/4 plate, see patterns

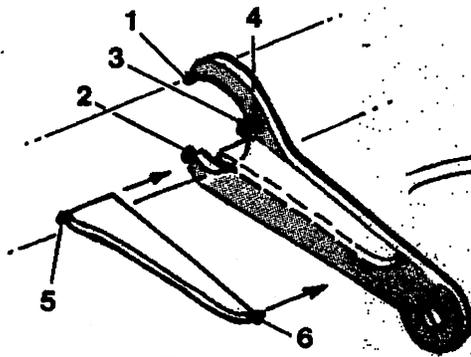
# SET 4 - REAR END (CONVENTIONAL)



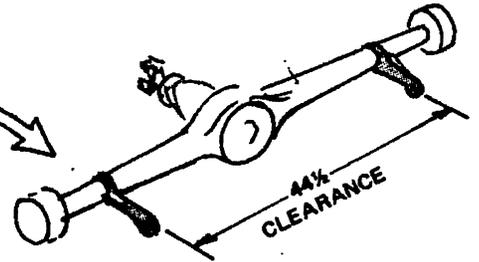
3 Mount the arms on the RE so as to get the best drive shaft angle as per step 1.

CHANGING THE ANGLE OF THE SPRING HANGERS CHANGES THE DRIVESHAFT ANGLE

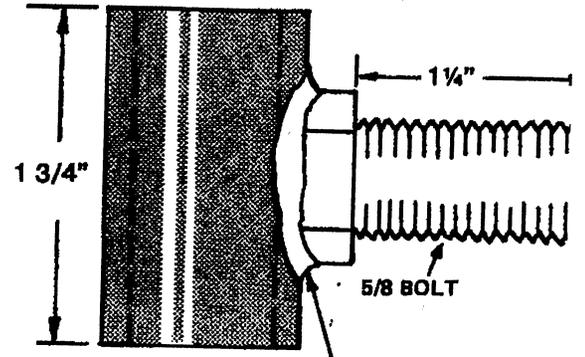
4 Welding sequence.



Then weld all around.



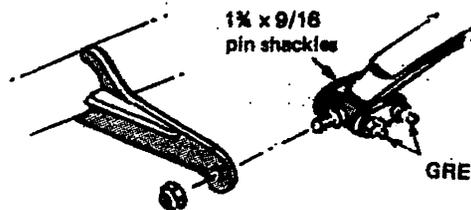
5 Make 2 Shackle Hangers as shown, from 1" OD x .120 wall tubing.



FULL SIZE

Weld carefully. This supports the whole car.

6 Use a bumper jack to spread the spring ends, then attach as shown.



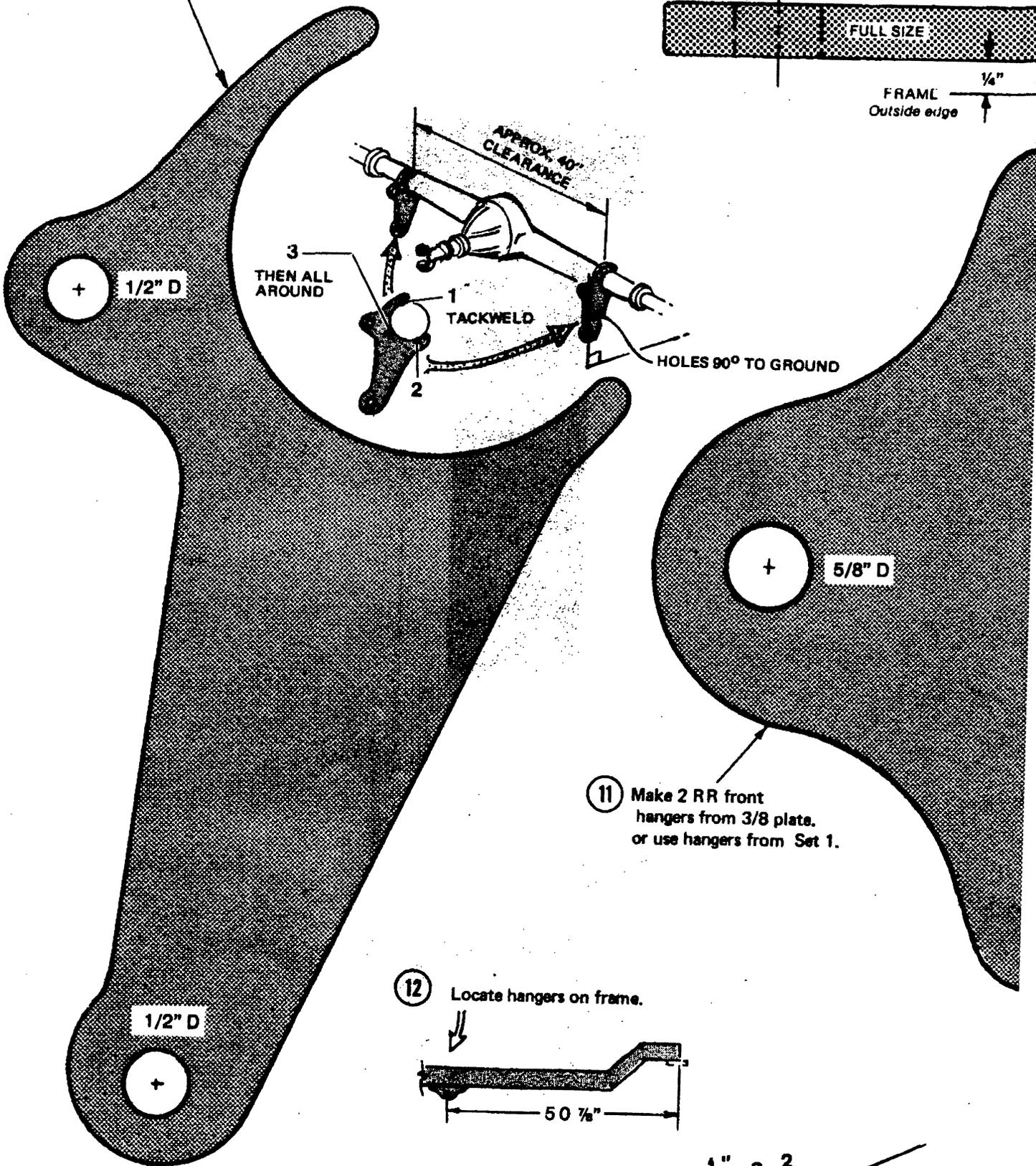
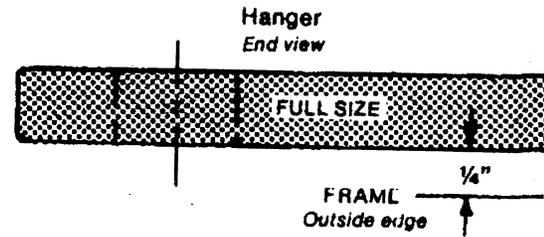
1 1/2 x 9/16 pin shackles

GREASE FITTINGS



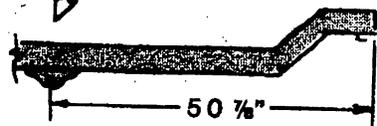
# SET 4 - REAR END (CONVENTIONAL)

10 Make 2 radius rod rear hangers from 3/8 plate.

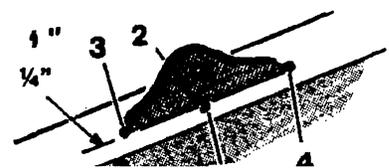


11 Make 2 RR front hangers from 3/8 plate, or use hangers from Set 1.

12 Locate hangers on frame.

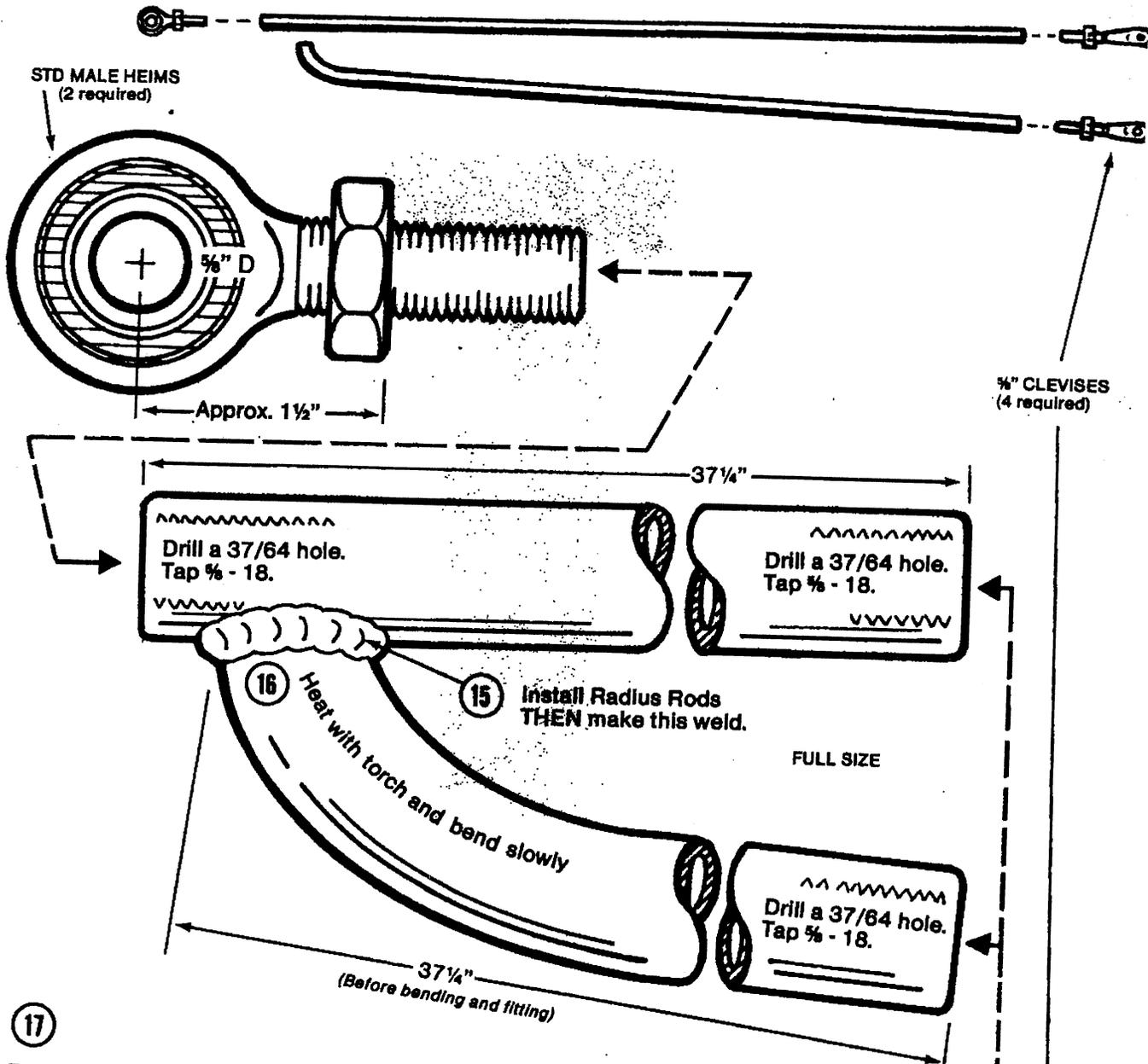


13

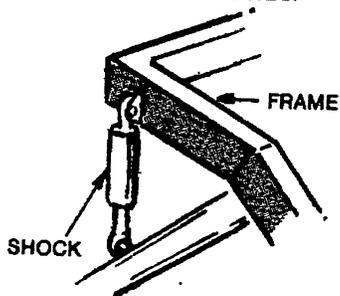


# SET 4 - REAR END (CONVENTIONAL)

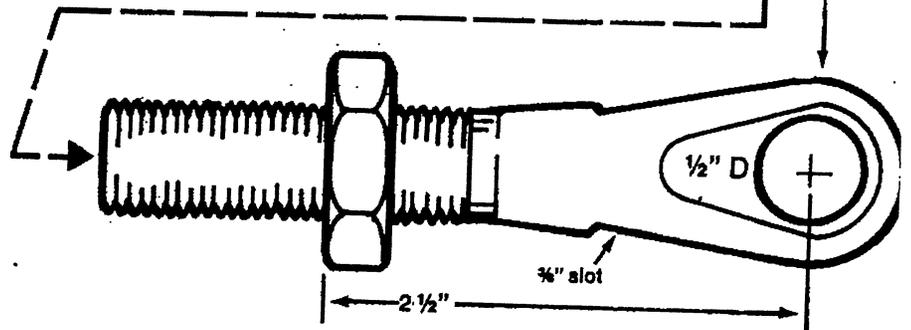
- 14 Cut 4 radius rod pieces, each 37 1/4" long.  
Make from 7/8" dia. x .156 wall mild steel tubing.



- 17 Recommended shock installation for a safe ride.

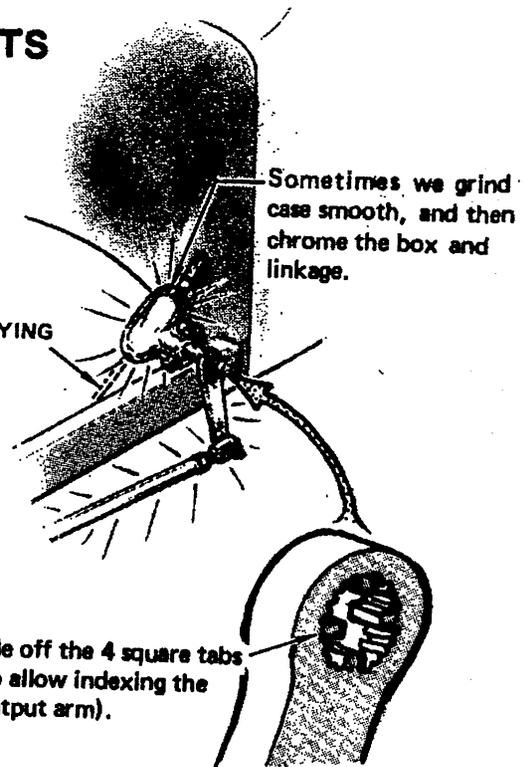


(shock kits available from CCR)



## SET 5 - STEERING AND MOTOR MOUNTS

Corvair steering is ideal for street rods. It's low in cost, and parts are easy to get. (Over one million Corvairs were manufactured). This installation is light in weight and good looking. You don't have to notch the body of the car or make holes in the side. Everything runs parallel to the frame. There is good leg room to get in and out of the car.



INPUT SHAFT BEFORE MODIFYING STEERING UNIT

**2** Remove parts as shown.

**1** File off the 4 square tabs (to allow indexing the output arm).

**3** Drill an oversize (5/8) hole on center.

**4** File these gussets back for good clearance.

**6** These parts are all re-installed in their same order, but going the opposite direction.

**5** Tap a 15/16 freeze plug in, not too tight, or it will interfere.

**7** Watch them mesh, and see that the first tooth on the worm gear goes into the first notch in the sector gear.

**8** Adjust the steering box, as you would any Corvair or similar type steering unit.

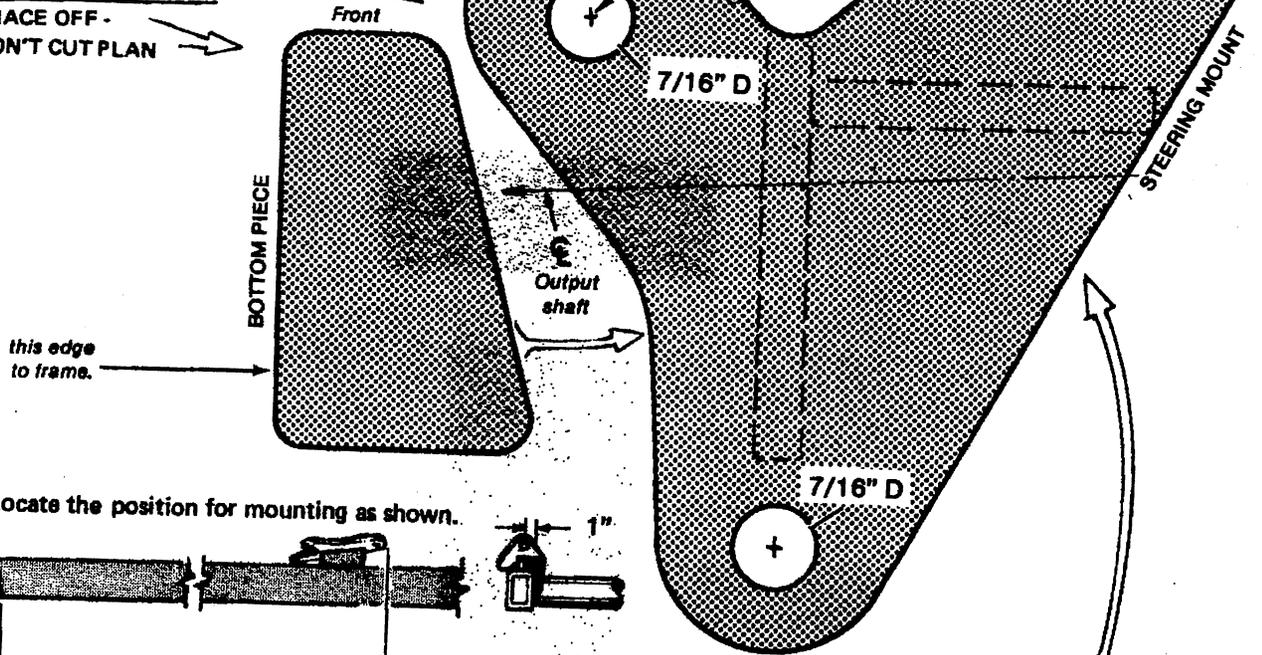
SEAL

FIRST TOOTH

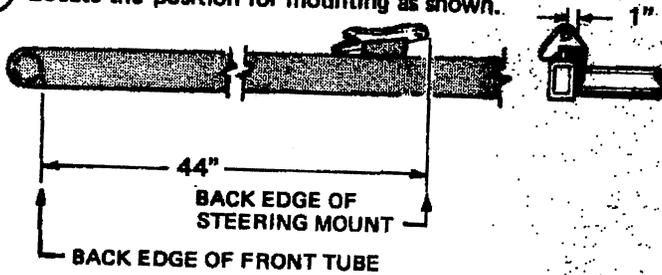
# SET 5 - STEERING AND MOTOR MOUNTS

9 Cut steering mount parts from 1/4 plate.

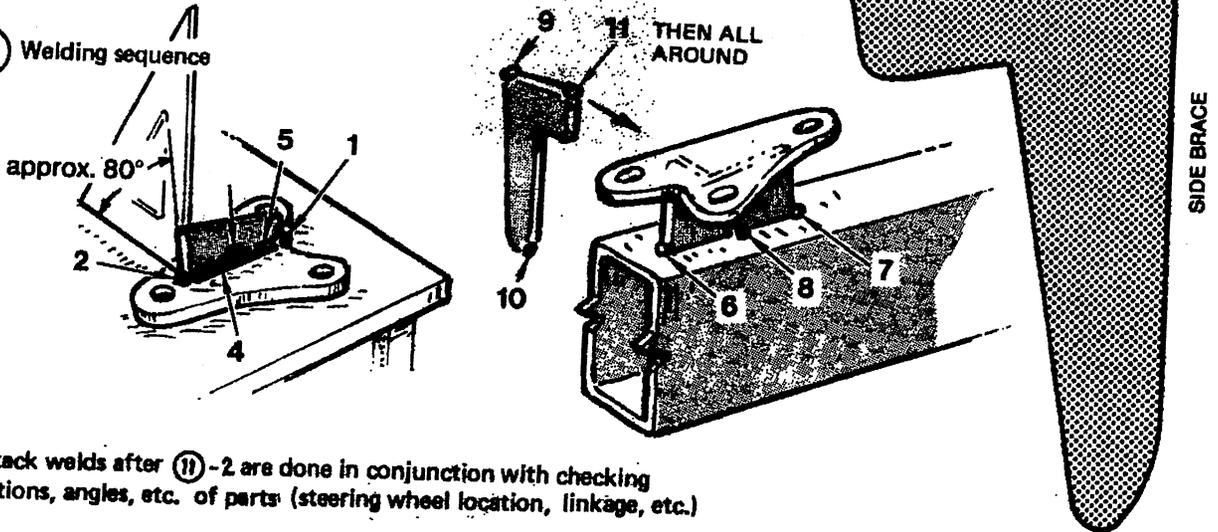
FULL SIZE PATTERNS  
TRACE OFF -  
DON'T CUT PLAN



10 Locate the position for mounting as shown.



11 Welding sequence



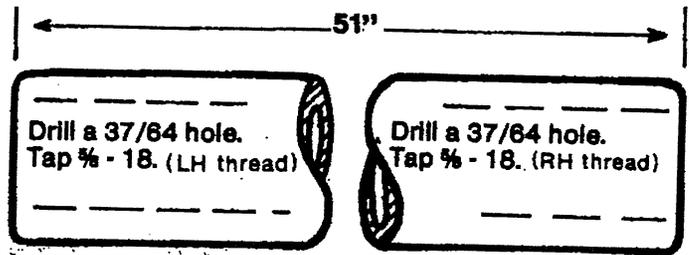
All tack welds after 11-2 are done in conjunction with checking locations, angles, etc. of parts (steering wheel location, linkage, etc.)

## MATERIALS FOR SET 5

- 1 Corvair steering box
- 1/4 plate, see patterns
- 3/8 plate, see patterns
- 2 Heim ends - step 13
- 2 biscuit mounts step 18
- 48" of 3/4" x .156 wall, mild steel tubing (seamless)

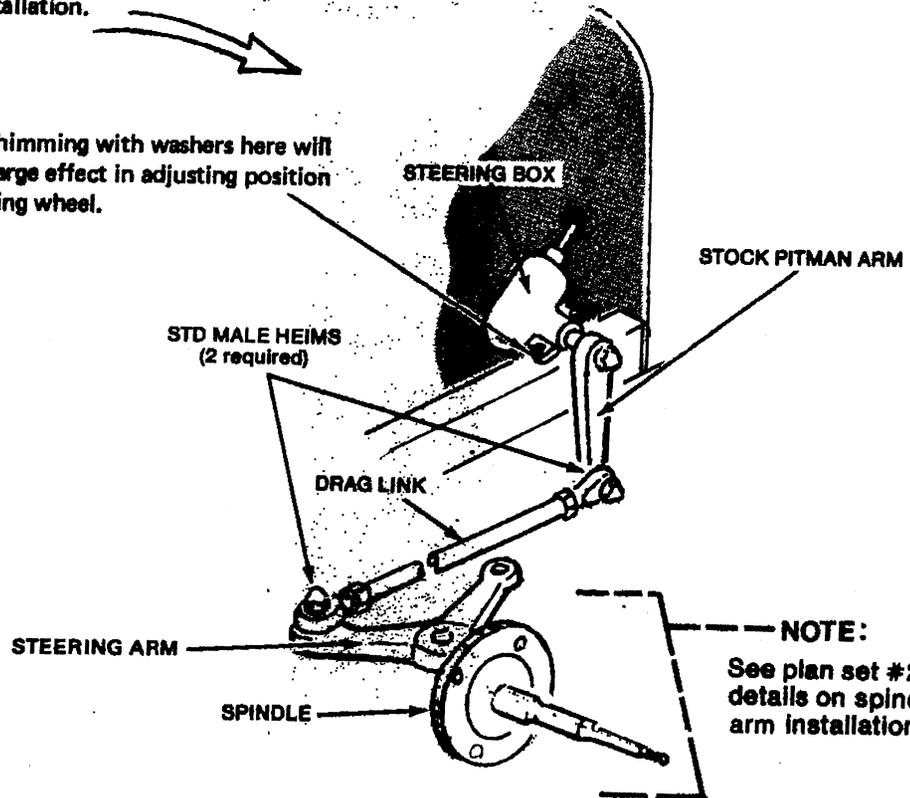
# SET 5 - STEERING AND MOTOR MOUNTS

12 Make one drag link from  $\frac{3}{8}$ " x .156 wall seamless tubing.

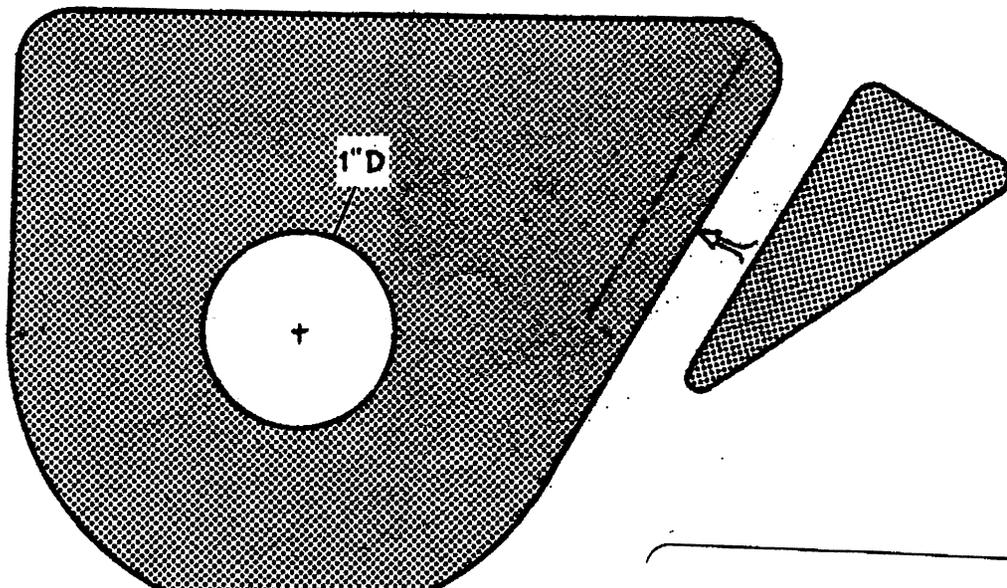


13 Finish installation.

Slight shimming with washers here will have a large effect in adjusting position of steering wheel.

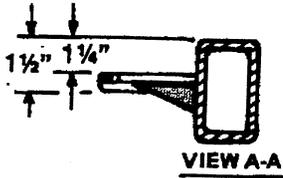
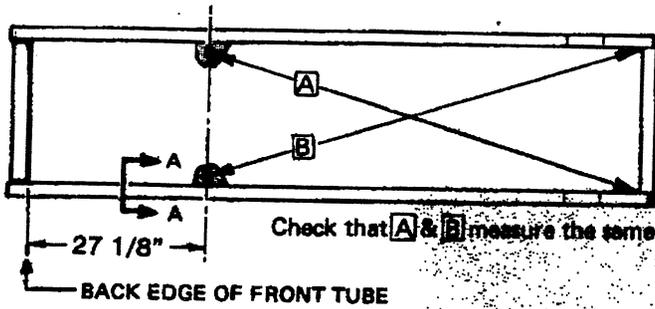


14 Make 2 ea. motor mounts from  $\frac{3}{8}$ " plate.

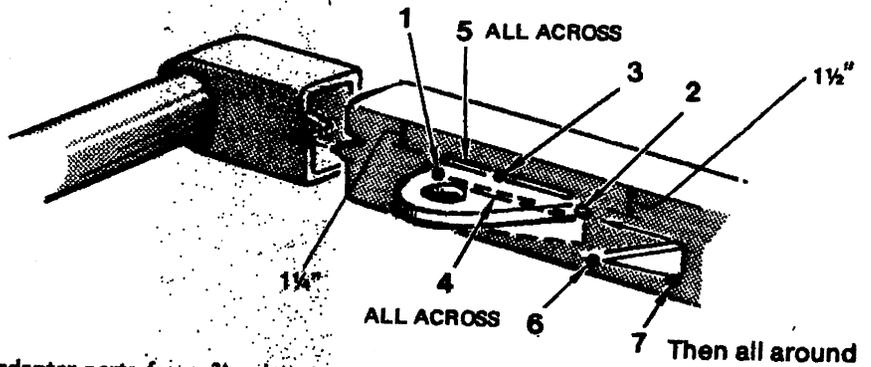


# SET 5 - STEERING AND MOTOR MOUNTS

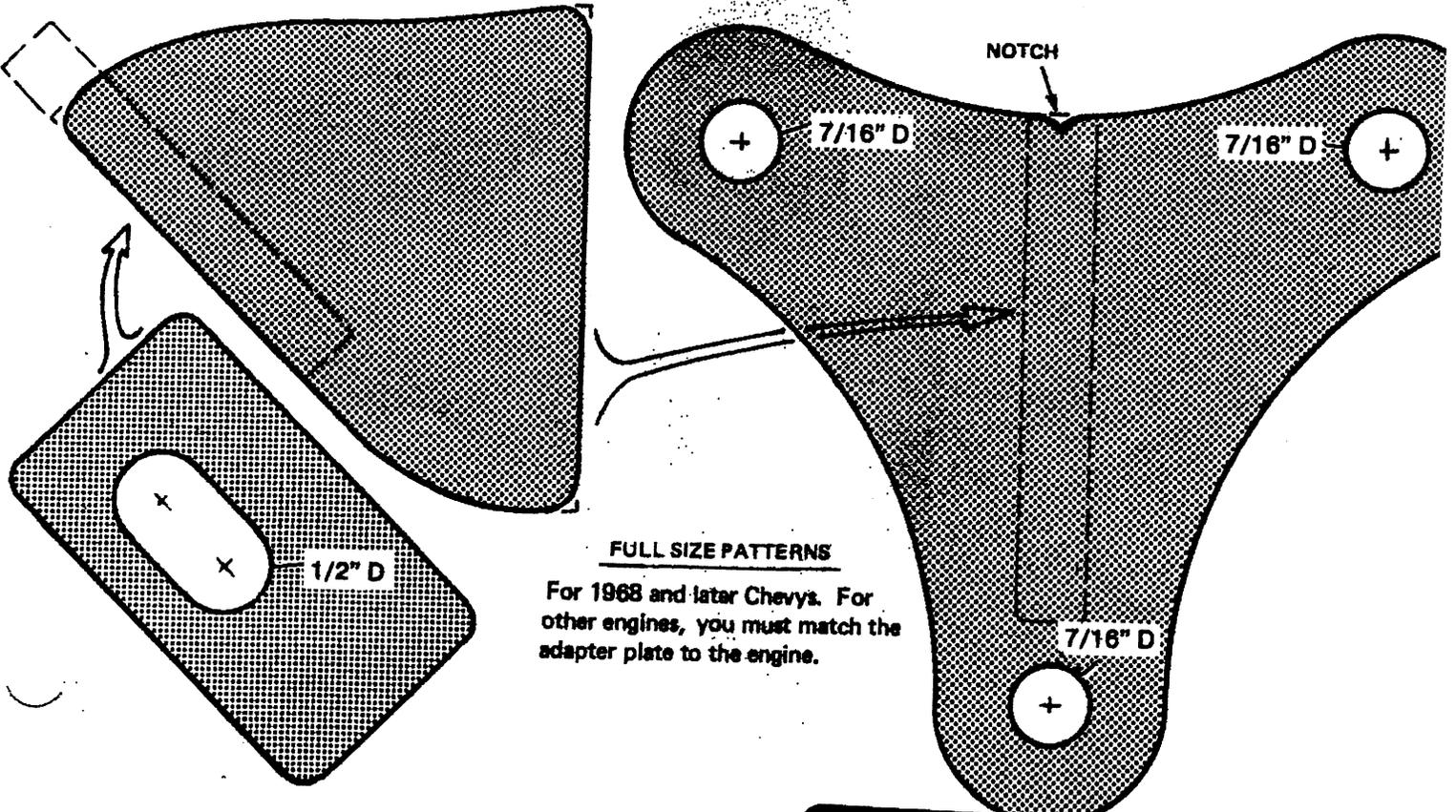
15 Locate the position for mounts accurately.



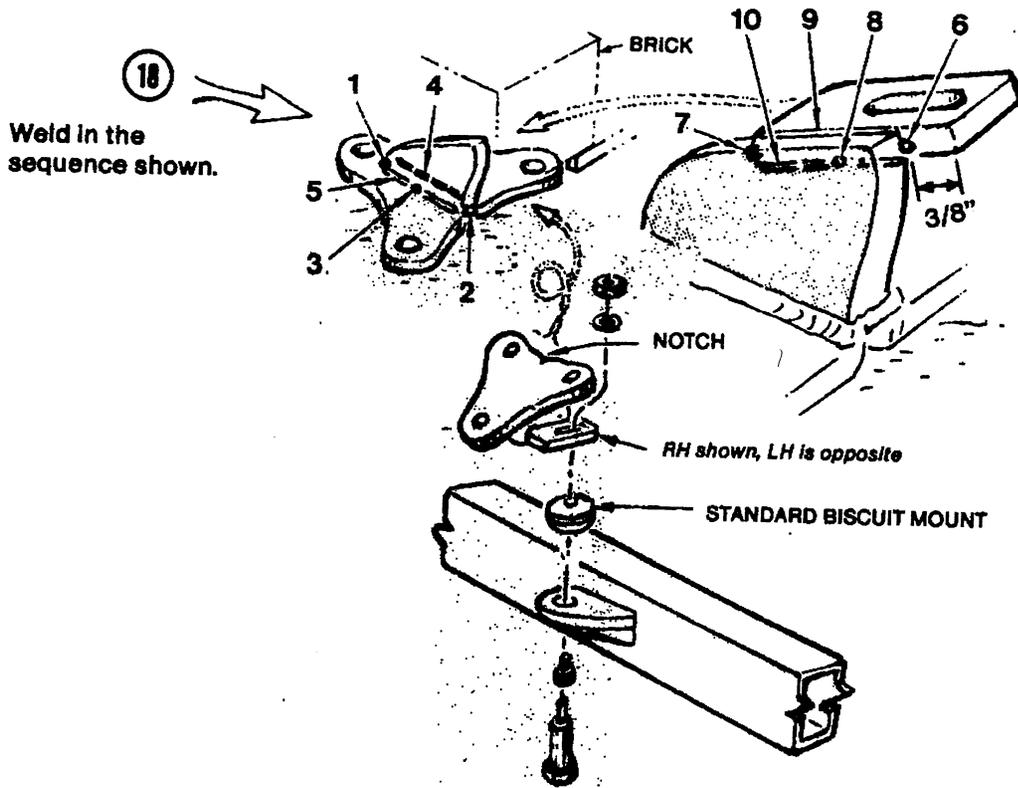
16 Sequence for welding.



17 Make 2 ea. motor mount adapter parts from 3/8" plate.



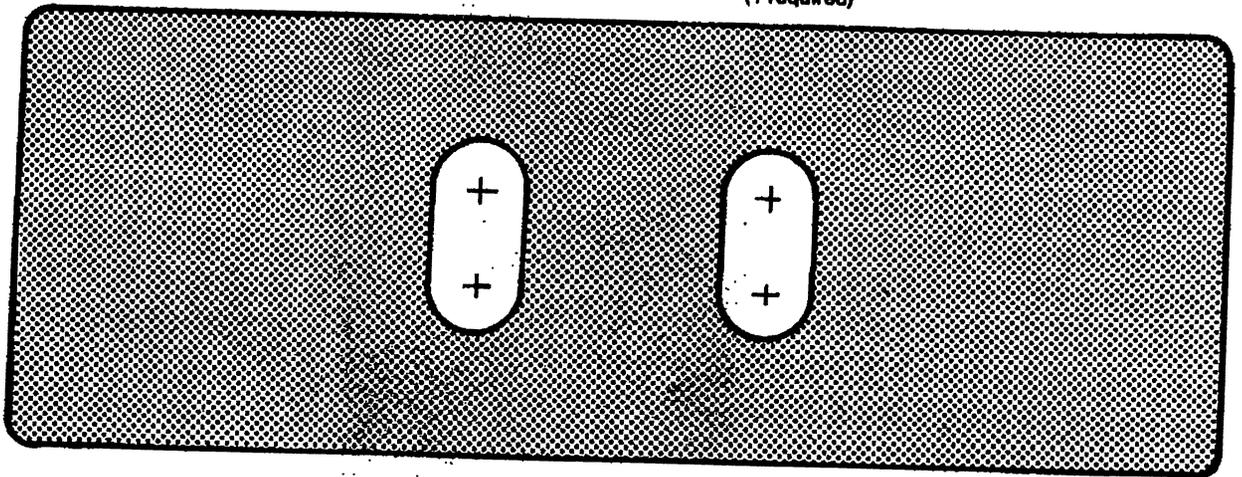
# SET 5 - STEERING AND MOTOR MOUNTS



19

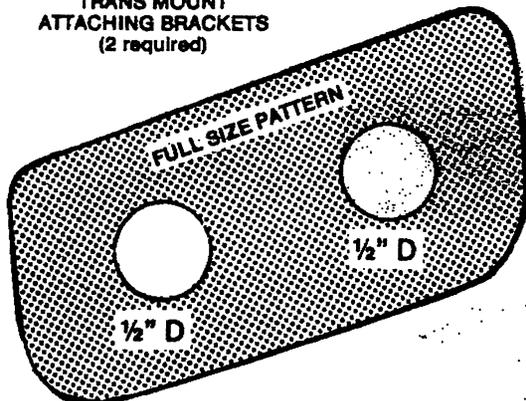
Make the rear trans mounting parts from 3/8 plate.

TRANS MOUNT  
CENTER PLATE  
(1 required)

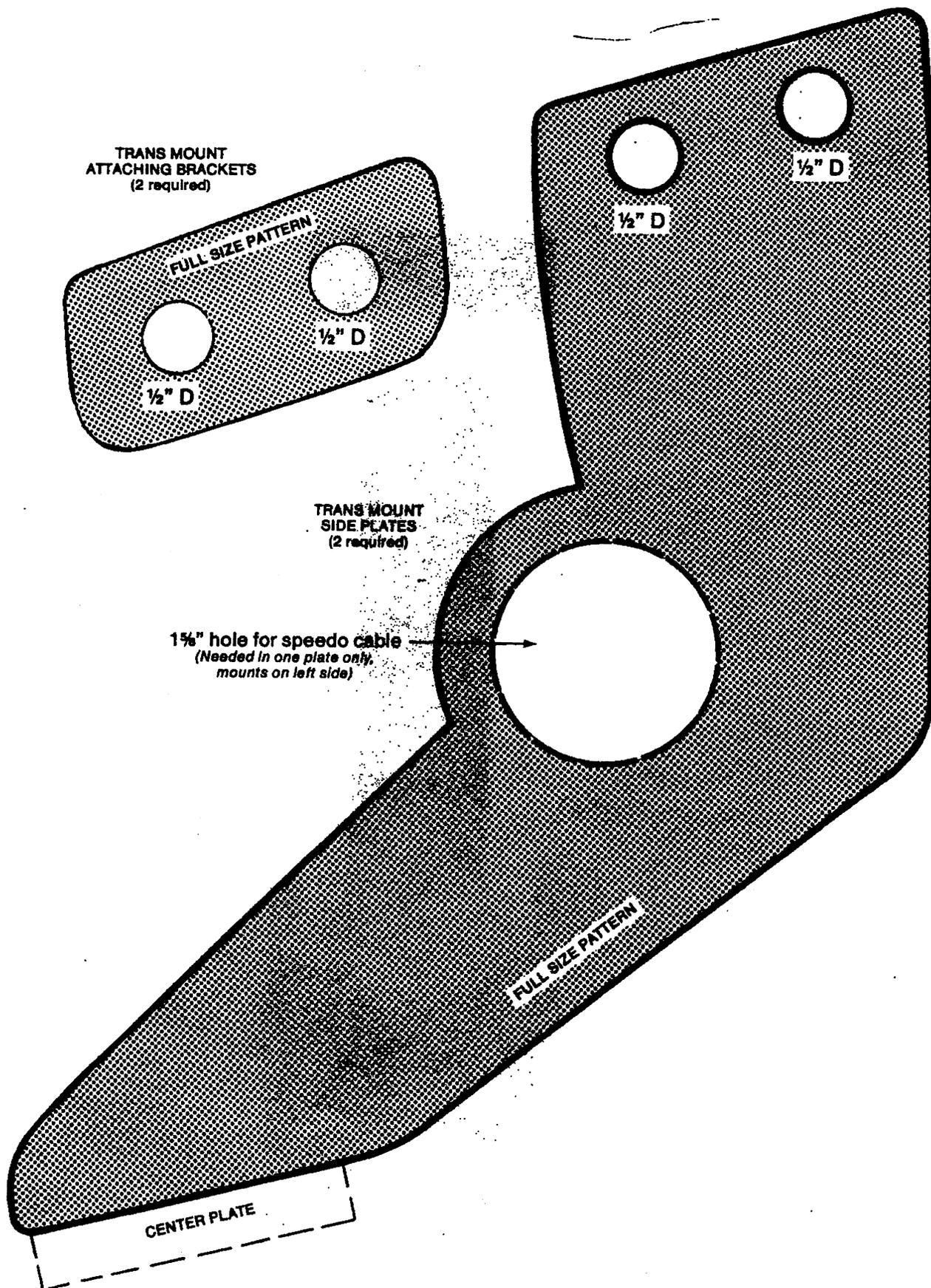


# SET 5 - STEERING AND MOTOR MOUNTS

TRANS MOUNT  
ATTACHING BRACKETS  
(2 required)

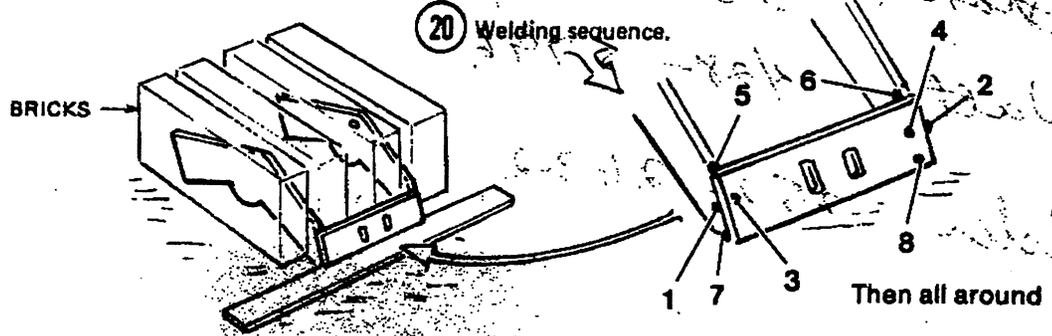


TRANS MOUNT  
SIDE PLATES  
(2 required)



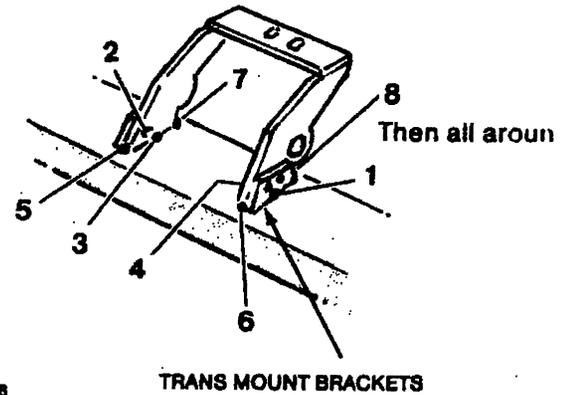
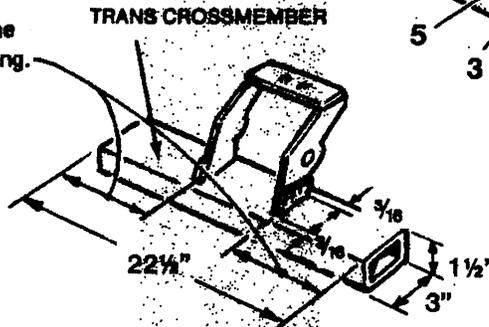
1 $\frac{1}{8}$ " hole for speedo cable  
(Needed in one plate only,  
mounts on left side)

# SET 5 - STEERING AND MOTOR MOUNTS

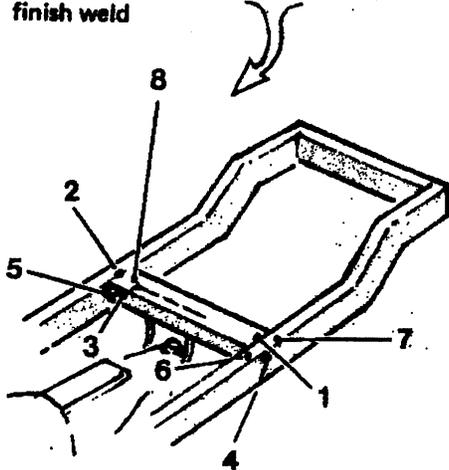


- 21
- A. Make one Trans Crossmember from  $1\frac{1}{2}$ " x 3" x .188 steel tube to dimensions shown.
  - B. Bolt Trans Mount to Trans Mount Brackets and position on crossmem. as shown.
  - C. Tackweld Trans Mount Brackets to crossmember on the outside edges. Unbolt and remove Trans Mount and finish welding brackets as shown.

Make these the same to get exact centering.



- 22
- With the engine (with transmission) loosely installed on the front mounts, bolt the trans. mount to your transmission. Then jack up the engine and tack weld as shown. Then finish weld



Alternate procedure:

First weld crossmember to frame. Then bolt the tra mount to the trans. Then jack up the engine and weld the mount to the crossmember.

