NOTICE

This manual or booklet is published for informational use only. Use of this information or repairs and/or modifications performed using information contained herein is solely at the risk of user.

REPLACEMENT BONNET RELEASE CABLES

The inner (603468) and outer (603469) cables from The Roadster Factory, and I presume other sources, are not as original. While the daily driver will be very happy with them, many of you purists will not be. The outer cable is sheathed in plastic (good for us every day drivers since it keeps the water out). Secondly, the flat side on the threaded mounting end is off 90^0. Instead of the pull handle being vertical it is horizontal, which means there isn't room for the handle between the mount and the scuttle. The solution for this is simply to bend the mounting bracket (which is at an angle to the scuttle) straight, thus moving the mounting hole out enough to allow the handle to be horizontal.

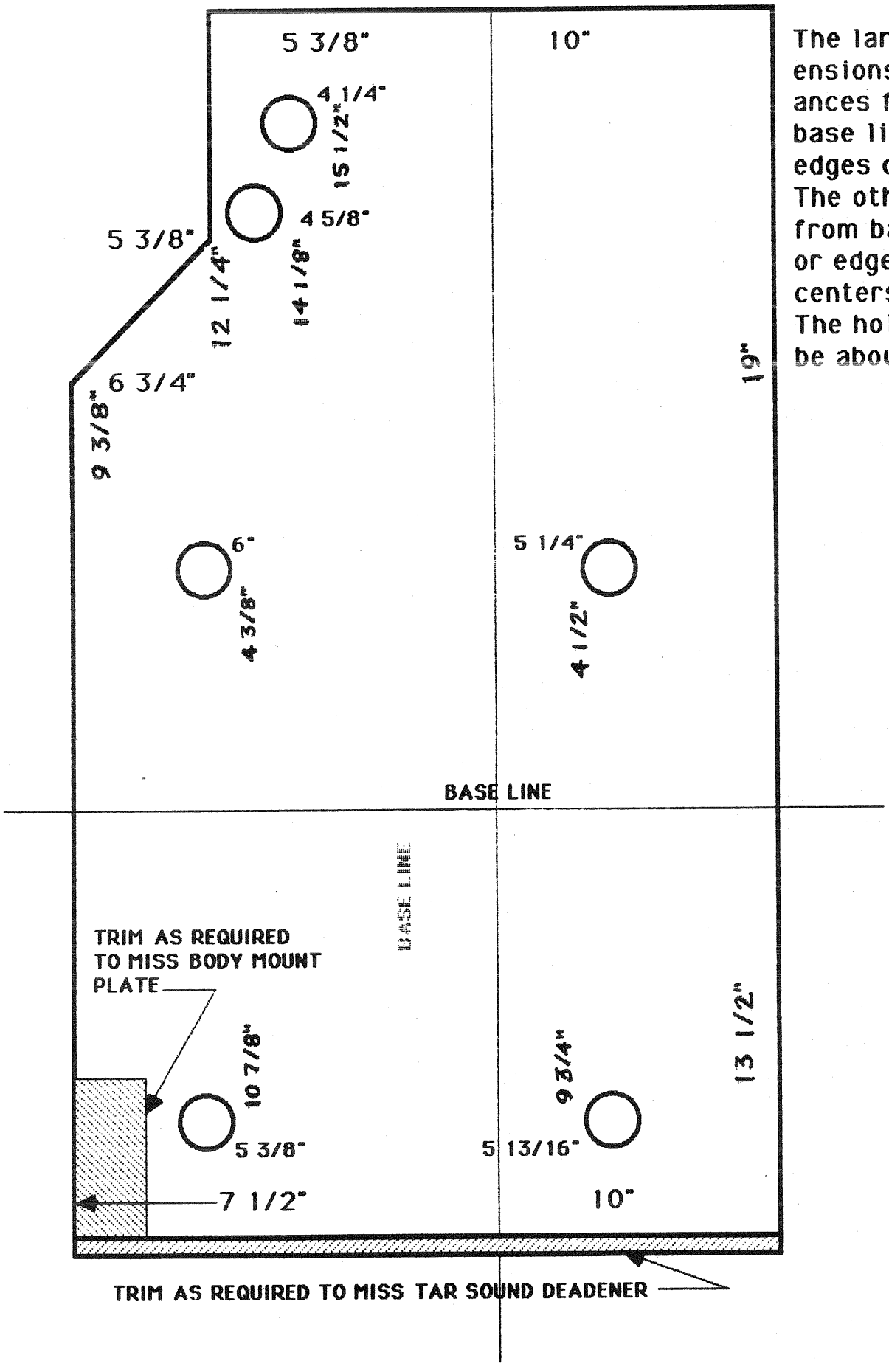
FLOORBOARD FIX FOR THE NON-WELDER &/OR A TIGHT BUDGET

Skill Level C

The time to stop severe floor rust is before it gets too serious. If you've developed a few small holes it does not mean it is necessary to replace the whole floor, especially since this is a major job which involves cutting into the sills, etc. The first step is to clean all the rust possible off the floor with a 1/4" drill and wire brush wheel.

Method 1: Better but hazardous ! Wash with muriatic acid (do this in the summer outside with lots of ventilation. The fumes are corrosive and will also burn your lungs) until all rust is removed. Cover the floors with at least 3 layers of fiber-glass mat or fabric well saturated with resin, making sure you have no air bubbles under it. Using 12" to 18" square pieces makes the job easier but you must overlap all edges by 6".

Method 2: Paint with Permatex "Extend" or other product which converts rust to a protective coating. Caulk all holes with a waterproof, not water resistant, caulking compound or silicone sealer. Make a new floor (Japanese cars make good patches) as shown on the next page and install with pop rivets at 4" on center each way. Caulk all edges.



The larger dimensions are distances from the base lines to the edges or offsets. The others are from base lines or edges to centers of holes. The holes should be about 1" diam.

FRONT END WEAR DIAGNOSIS AND HOMEMADE ALIGNMENT EQUIPMENT

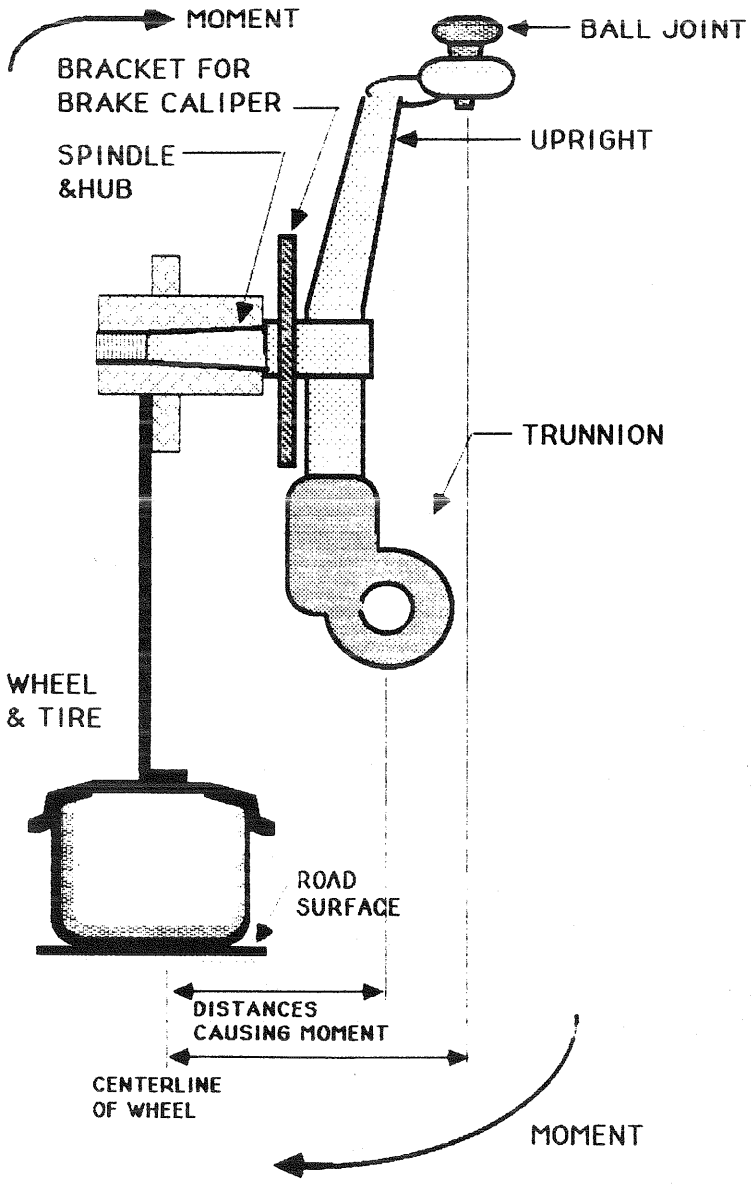
Skill Level B

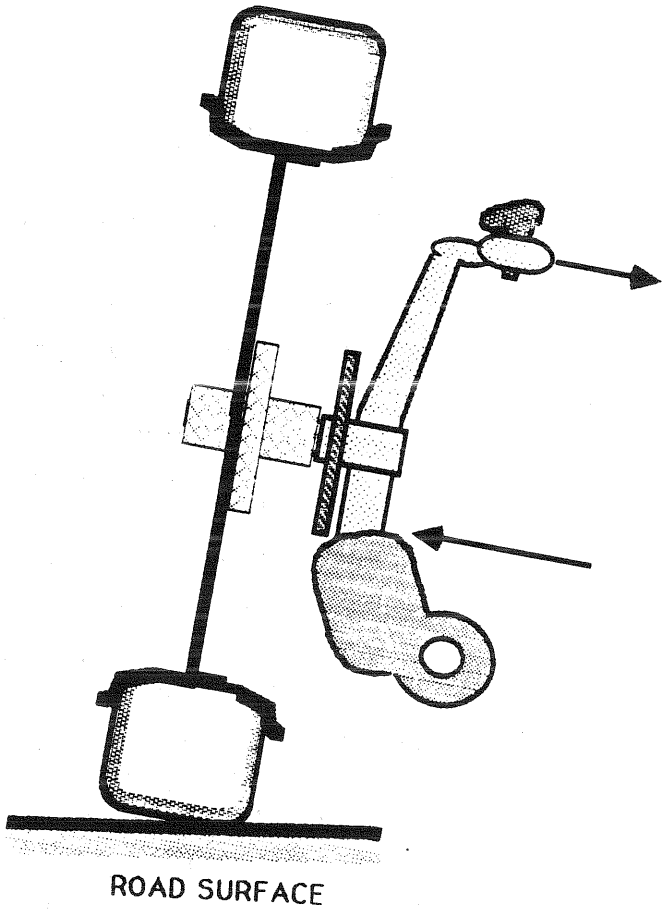
First, "read" the tires. This requires a brief description of the design of the suspension first, but here's what the tires should tell you and why.

The wheel is mounted on the hub and spindle which, in turn, are mounted on the upright or vertical link; which, in turn, is held by a ball joint at the top and an ancient device called a trunnion at the bottom. Because the trunnion is threaded inside it can turn right and left and because it has a bolt through an offset which mounts it to bushings in the lower control arm it can go up and down. Because the upright and spindle are outboard of the mounting points, and the wheel rotates on the spindle, the distances between the center of the wheel and the center of the ball joint and trunnion bolt become "moment arms" rotating about the mounting points. (moment is an engineering term meaning force rotating about a point at any distance. The distance being the "arm", or lever). Shown below is a drawing of the normal position of the upright and the position with worn ball joints or trunnions. Supplement these with the drawing on page FS 8 and your shop manual.

Any wear in upper suspension (ball joints at the outer end of the upper control arm and rubber bushings at the inner end) lets the top of the wheel move in. Conversely, wear in the lower parts (nylon outer bushings, bronze trunion, or inner rubber bushings) lets the bottom of the wheel move out. This will cause wear on the inner side of the tire. The wear will be proportionately greater from inside to outside. Toe out (wheels pointing away from each other at front) or conversely toe in (wheels pointing toward each other) will cause uneven wear on the inside in the first case and outside in the latter.

Worn steering parts like steering rack or rubber mounts, tie rod ends, ball joints, and trunnions usually cause vibration on braking, steering wheel jiggle at varying speeds, and uneven (or chunking) wear on tires.

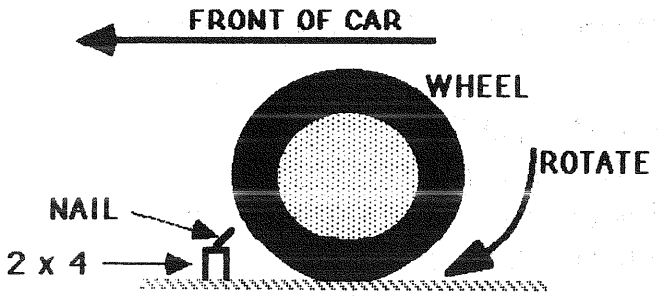




There are 3 basic front end alignments: (1) Camber, or tilt of the wheel from vertical in the left/right direction, (2) Toe in as explained above, and (3) Caster, or lean of the top of the upright in the front/rear direction. Caster is pretty much beyond our scope here but if all parts are good it shouldn't change (for that matter neither should anything else). Here are a couple of fairly close methods to check camber and toe-in. Do toe-in first and then go back and do it again if you change camber.

On as flat and level a surface as you can find, move the car back and forth to make sure the steering is on straight ahead. Use a straight 2x4 about 6' long as a toe-in gauge by driving a

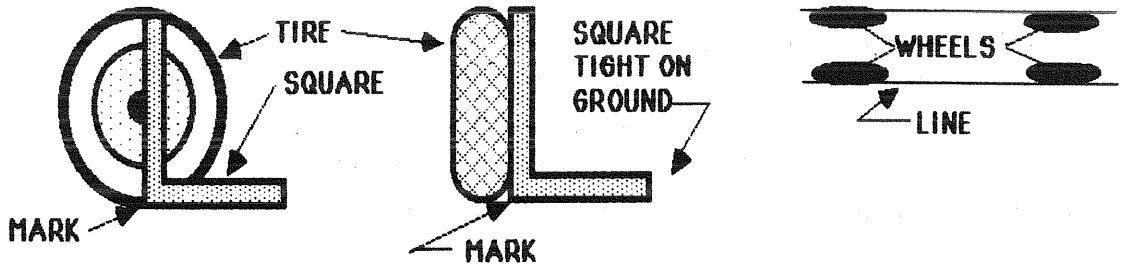
10 penny finishing nail in about 1/2" near one end. Pull the nail out and drive it into the 2 x4 with the point out. Jack up the wheel and rotate the tire in the "backing up" direction. Place the 2x4 so the nail point is as close as possible to the center of the tire and against the tire. You'll see the nail will scribe a line on the tire. Do the same on the opposite wheel. Back the car up about 4' and then pull forward about the same. This returns the tires to normal after being let off the jack. Position another nail at the other end of the 2x4 so that the nails are on the scribed lines when the 2x4 is placed in front of the tires.



Move the 2x4 to the rear of the wheels and check the nails against the lines. If the nails are inside the lines, move both tie-rods out a turn (or in if the nails are outside the lines), then repeat the back up and forth and test procedure until the nails are on the line both front and rear or less than 1/2 the thickness of the lines inside the lines at the rear of the tire.

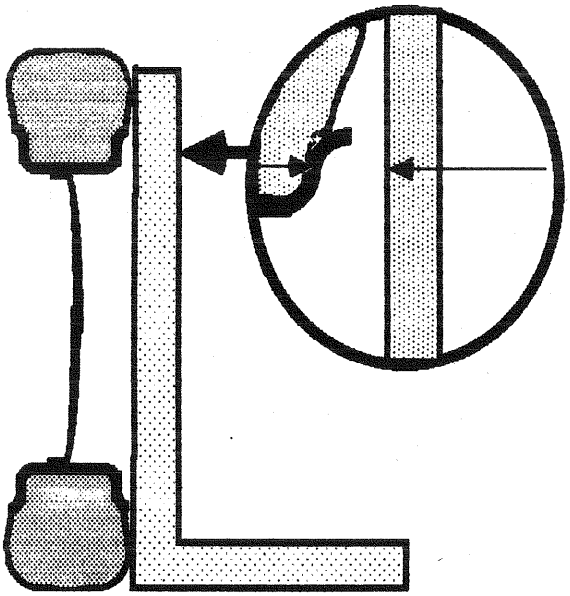
To check the camber, again make sure the wheels are in the straight ahead position and the tires are normally set on the ground. You will need a carpenters metal square with 24 inch sides to establish a line from the outside of the rear tire to the outside of the front tire and, finally, as your camber gauge.

Use the square with one leg pointing toward the front or rear of the car (parallel to tire) to make a mark on the ground at the front to rear center of the wheel using the hub cap medallion or wire wheel knock-off as a guide. Turn the square pependicular to the wheel, hold it as vertical as possible and tight on the ground. Mark the inner corner of the square. Use a 2x4, chalk line, or other means to strike a line between these last two points (the outside of the rear tire to the outside of the front tire).



MARKING LINE BETWEEN OUTSIDE OF FRONT AND REAR TIRES

Now lay the square on the ground with one leg on the front/back line. Move the square to the vertical center reference point. Mark another line at this point perpendicular to the front/rear line. Place the square vertically on the new reference line, as in the center drawing above, against the bottom of the tire.



Measure the distance to the rim at the top and bottom where shown, not at the very edge. Measurements should be equal or 1/16 inch less at the bottom, NEVER MORE. To move the bottom of the wheel out add shims equally at the front and rear lower inner control arm mounts. A word of caution - clean and oil the mount bracket bolts, they will be rusty and will strip easily.

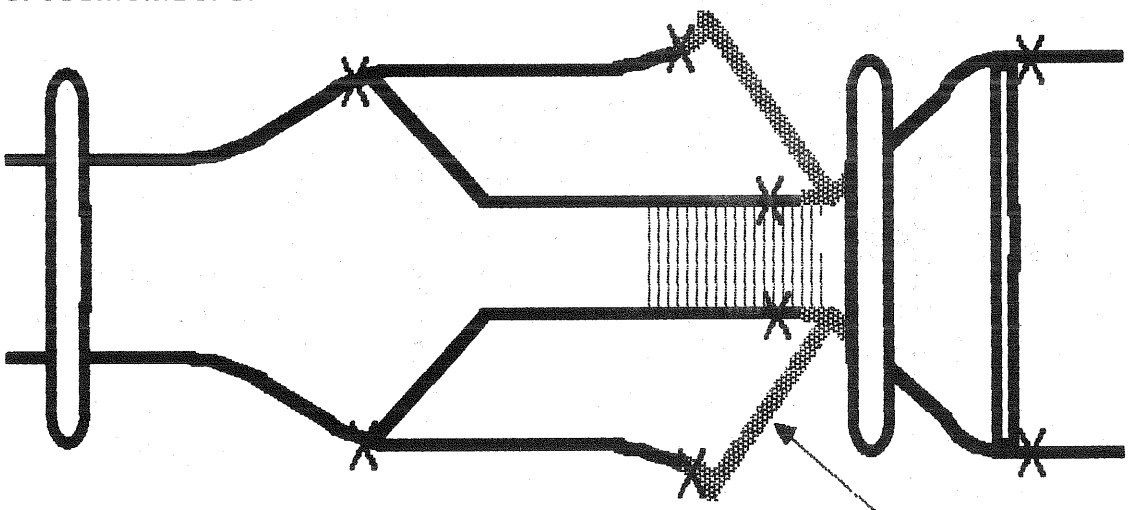
See page FS 3 for a recommended mount reinforcement.

Don't forget to go back over the toe-in, and be sure never have positive camber. This same principle can be used at the rear end but rear alignment is much more sensitive so it is not recommended.

REAR SUSPENSION CROSSMEMBER REPAIR

Skill Level B

Many TR 6s, TR 250s, and TR 4 IRSs are needlessly junked or parted out because of frame rot. The rear crossmember can be repaired or replaced depending on your skills, budget and if you want a show car or a street car. A professional replacement that is virtually undetectable will cost about $1000 because there is a lot of labor involved to remove the suspension and differential in addition to skillful metal work. However, if you are just looking to make the old heep strong and safe again you can get by for a couple hundred or less by encasing the rusted crossmembers.

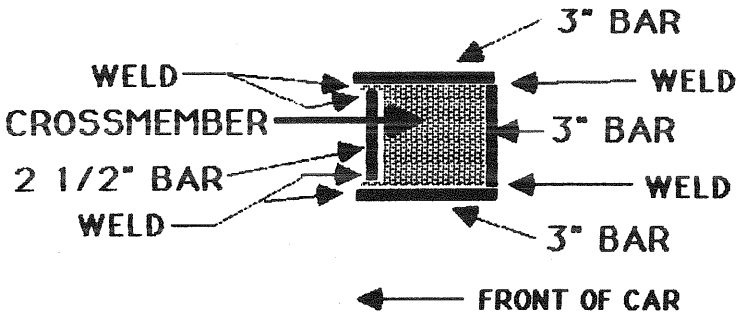


At the minimum you will need a good floor jack, a hard level surface and 8 jack stands or some solid concrete blocks (never place a car on blocks with open cells) and some wood 2x8s about 8" long to put on top of the block. Place where indicated by Xs above. Whatever you use for support make sure it can't topple in any direction. The car needs to be as high as possible, but safety first. You can get by with a lot of labor and a 3/8" drill and a good hacksaw - I've done it several times, but really a drill press and an air driven cut off tool are needed. Get a 20' bar of 3"x 1/8" steel from a steel supplier (see structural steel and fabricators in the yellow pages). They will usually shear it for you at little or no cost to 2' 0" lengths. Now the tough part- two of these sections need to be trimmed lengthways to 21/2".

Remove the axle, then the suspension, by the manual except disconnecting the brake line. You'll have some difficulty doing it, but loosen the lock nut on the aluminum suspension arm where the flex and solid brake lines join. Pry the clip loose and move the brake assembly free of the suspension arm. Pull the shock link through the hole in the center of the backing plate and hang the brake assembly over the shock arm.

Get new 3/8" x 3 1/2" grade 5 or grade 8 bolts for the mounting brackets. Make the front and back pieces as shown below. The front is easiest made in two pieces and should have vertical 1" x 1/8" stiffeners made up and welded about 1/2" each side of the nuts at some time. The back doesn't need stiffeners because of the large bearing area of the suspension brackets. The hole positions should be carefully measured on your car. You may have to make them 1/16" bigger to get the bolts through, but too large of holes will cause the bracket to move and cause alignment problems. I'd suggest enlarging only one of each pair of holes. Fit the front and back pieces and clamp in place. I strongly suggest making pieces to go forward and to the rear at the main frame rails at each end. The length will depend on your frame condition. Also, cover the large hole at the outer end of the main frame rail. Make the top from 3" bar and as long as possible. The inner end can be angled for maximum length on the rear side. Tap it in between the floor and the frame. Make a bottom from 3" bar. Remove the carpet from the car and your'e ready to call the welder. Two cautions (1) welding makes heat and the heat can cause interior smouldering fires hours later (2) TR frames are thin, especially rusty ones, a MIG or wire welder is recommended on the frame rails. An arc welder can be used but it will burn through unless the welder is really good. On the crossmember it doesn't matter because it is all 1/8".

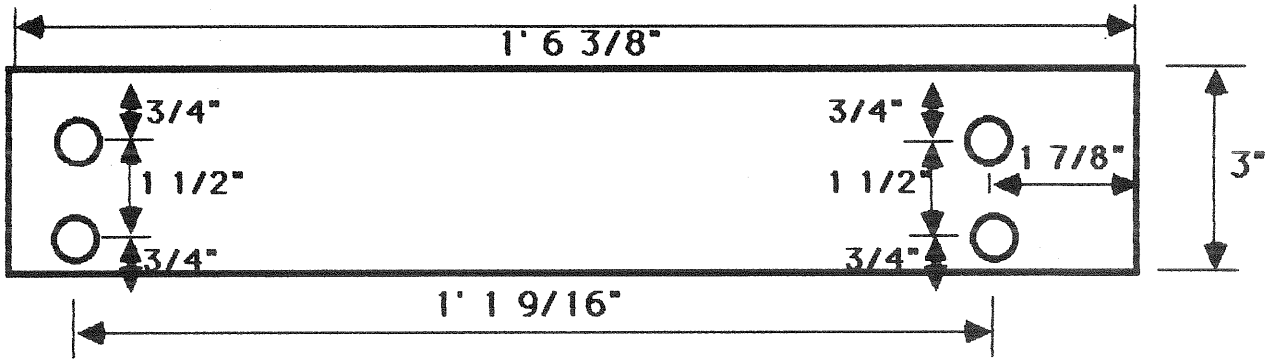
If you trim the bolt for the inner suspension bracket bushing to just the length of the nut it can usually be reversed (nut toward the frame) allowing you to remove the suspension arm at a later date without removing the bracket. The bushings should be replaced while you're doing this job (see page RS 4 in SIX TECH).



SECTION THROUGH CROSSMEMBER

NOTE: ALL WELDS SHOULD BE CONTINUOUS.

BACK - LEFT SIDE SHOWN FROM REAR



FRONT - LEFT SIDE SHOWN FROM FRONT