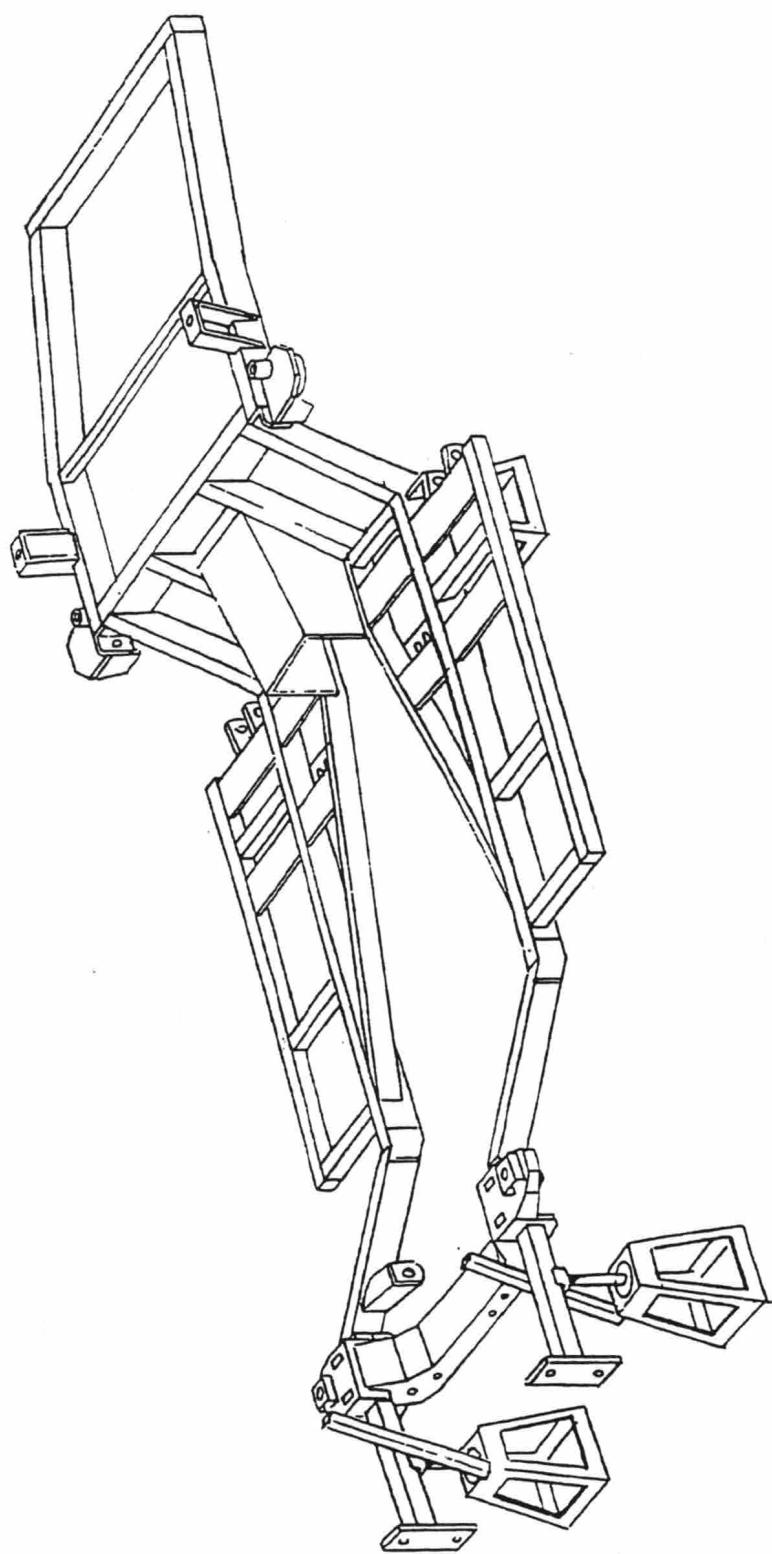


Figure 2  
2-1



## CHAPTER 2 CHASSIS ASSEMBLY

### SECTION A FRONT SUSPENSION

Place the frame up on four jack stands so you can install the front and rear suspensions. SEE FIGURE 2.

**NOTE:** Frame should be level and high enough off the ground to mount wheels and tires on it.

At this point you may want to detail the frame.

### RACK AND PINION INSTALLATION

**CHECK:** Inspect all parts before assembly for the following: torn boots, stripped threads, bad bushings, missing clamps, binding gears, cracks, and loose fasteners. Replace as necessary and paint as desired.

Align the rack and pinion with the front crossmember and bolt it into place. SEE FIGURE 2-1. Use the 5/8" holes in the crossmember towards the ends of the crossmember. If your rack and pinion has three bushings, you may want to use the center mount. If so, you will need a third set of mounting hardware, although two sets are adequate. It is a matter of personal choice.

**NOTE:** If using the center mount, install center hardware first due to limited access.

FRONT SUSPENSION - COMPONENTS CHECK LIST		
QUANTITY	ITEM	SOURCE
<input type="checkbox"/>	Manual rack & pinion (or)	Mustang II 1974 - 1978
<input type="checkbox"/>	Power rack & pinion	
<input type="checkbox"/>	Tie rod end	Mustang II
<input type="checkbox"/>	Rack bushing	Mustang II
<input type="checkbox"/>	5/8 x 1 1/2 large hex head grade 8 bolt	Nut & Bolt Kit Supplied with kit
<input type="checkbox"/>	Long outer spacer	Nut & Bolt Kit
<input type="checkbox"/>	Short inner spacer	Nut & Bolt Kit
<input type="checkbox"/>	5/8 flat washer	Nut & Bolt Kit
<input type="checkbox"/>	5/8 lock nuts	Nut & Bolt Kit
<input type="checkbox"/>	Steering flange, manual, or steering flange, power	Mustang II 1974 - 1978
<input type="checkbox"/>	Steering flange bolt	Mustang II
<input type="checkbox"/>	Steering universal	D9BZ-3B676-B
<input type="checkbox"/>	Upper control arm bolts	3857323101
<input type="checkbox"/>	Upper control arm nuts	3857323100
<input type="checkbox"/>	Lower control arms	Mustang II D5FZ-3B82-A
<input type="checkbox"/>	Spindle, right hand	Mustang II D7FZ-3078-A
<input type="checkbox"/>	Spindle, left hand	Mustang II D5FZ-3105-A
<input type="checkbox"/>	Right hand brake caliper	Mustang II
<input type="checkbox"/>	Left hand brake caliper	Mustang II
<input type="checkbox"/>	Right hand brake caliper mount	Mustang II
<input type="checkbox"/>	Left hand brake caliper mount	Mustang II
<input type="checkbox"/>	Caliper bolts	Mustang II
<input type="checkbox"/>	Caliper bolts	Mustang II
<input type="checkbox"/>	Disc brake rotor	Mustang II
<input type="checkbox"/>	Inner wheel bearing	Mustang II
<input type="checkbox"/>	Outer wheel bearing	Mustang II
<input type="checkbox"/>	Dust cap	Mustang II
<input type="checkbox"/>	Inner dust seal	Mustang II
<input type="checkbox"/>	Left hand brake shield	Mustang II
<input type="checkbox"/>	Right hand brake shield	Mustang II
<input type="checkbox"/>	Left hand lower control arm stud	Mustang II
<input type="checkbox"/>	Right hand lower control arm stud	Mustang II
<input type="checkbox"/>	Lower control arm stud nut	Mustang II
<input type="checkbox"/>	Lower control arm stud nut	Mustang II
<input type="checkbox"/>	Lower control arm stud bushings and washer	D5ZZ3A187A
<input type="checkbox"/>	Lower control arm bolts	385925-\$100
<input type="checkbox"/>	Lower control arm nuts	383577-\$100
<input type="checkbox"/>	Spring	Mustang II V-8
<input type="checkbox"/>	Spring pack	Mustang II DAZZ-5415-A
<input type="checkbox"/>	Shock absorber	Gabillet PN#48327 or equivalent
<input type="checkbox"/>	Lower shock bolts	Mustang II 384375-S
<input type="checkbox"/>	Nut for shock bolts	Mustang II
<input type="checkbox"/>	Castellated nut for tie rod end	Mustang II
<input type="checkbox"/>	Nut for ball joints	382826-\$

Insert the 5/8" bolts and washer's through the front of the rack and pinion bushing. Slide the outer spacer onto the bolt on the back side of the bushing. The angled side of spacer faces the crossmember. Place bolts into crossmember holes. Slide inner spacer onto end of the bolt inside crossmember and install flatwasher and lock nut at this time.

**WARNING:** Rack mount bolts must be torqued to Ford specifications. Consult a Mustang II service manual for appropriate torques.

Align the spacer as follows: the outer spacer has the small section up and the inner spacer has the large section up. SEE FIGURE 2-1.

**NOTE:** Spacers may be tack welded to prevent them from shifting.

## UPPER CONTROL ARM AND SPINDLE INSTALLATION

**NOTE:** This manual covers installation of parts as originally used on Ford Mustang II. Because of the popularity of this front end, there is a growing number of after-market parts, i.e.: larger disc brakes, tubular upper control arms. If you plan to go this route, use this manual as a basic guide and refer to the manufacturer's instructions for specifics.

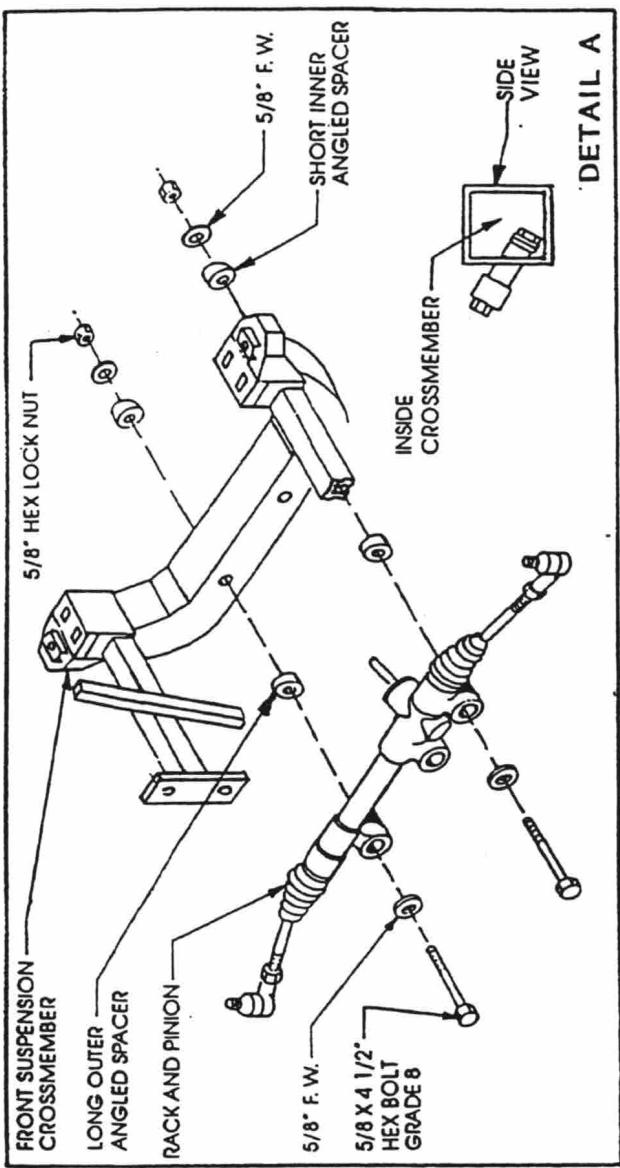


Figure 2-1

**CHECK:** Inspect upper control arms and spindles for the following: torn or damaged ball joint boots, missing grease fittings, damaged or worn bushings, bent or cracked parts. Clean and paint as necessary.

Insert the bolts into the slots in upper crossmember with the threads pointing up. You can use tape to hold the bolts in position while installing the upper control arm. Position the bolts so they fit the slot in the upper control arm and install the nuts. Position the control arm so that it is centered in the slots and tighten the nuts. Do not torque at this time. The nuts should be tightened enough to prevent the upper control arm from sliding in the slots. **SEE FIGURE 2-2.**

## LOWER CONTROL ARM AND STRUT INSTALLATION

**CHECK:** Inspect the lower control arm and strut as already covered. Clean and paint as necessary.

**WARNING:** As with all suspension components, original factory bolts should be used. Care should be taken to prevent over torqueing the lower control arm bolt.

Insert the lower control arm bolt through the front of crossmember and lower control arm. Install the nut on the thread exposed at the rear of the crossmember, but do not tighten at this time. SEE FIGURE 2-3.

Attach lower control arm strut rod to strut rod bracket with original rubber bushings, washer and nuts. Place the strut rod studs through the holes in the lower control arm and fasten with original hardware. SEE FIGURE 2-3.

Repeat procedure for the other side.

## SPRING AND SHOCK INSTALLATION

**CAUTION:** The springs should only be installed with the use of a spring compressor tool.

**CHECK:** The springs must be the same height with the same number of coils. The spring pads should not be torn or damaged. Ensure that the shocks have snubbers on them and that they are in good condition.

**NOTE:** NAPA replacement springs Part #277-3039 may be used instead of the stock Mustang II front springs.

Glue the spring pads on the underside of the upper crossmember. Using a spring compressor, install

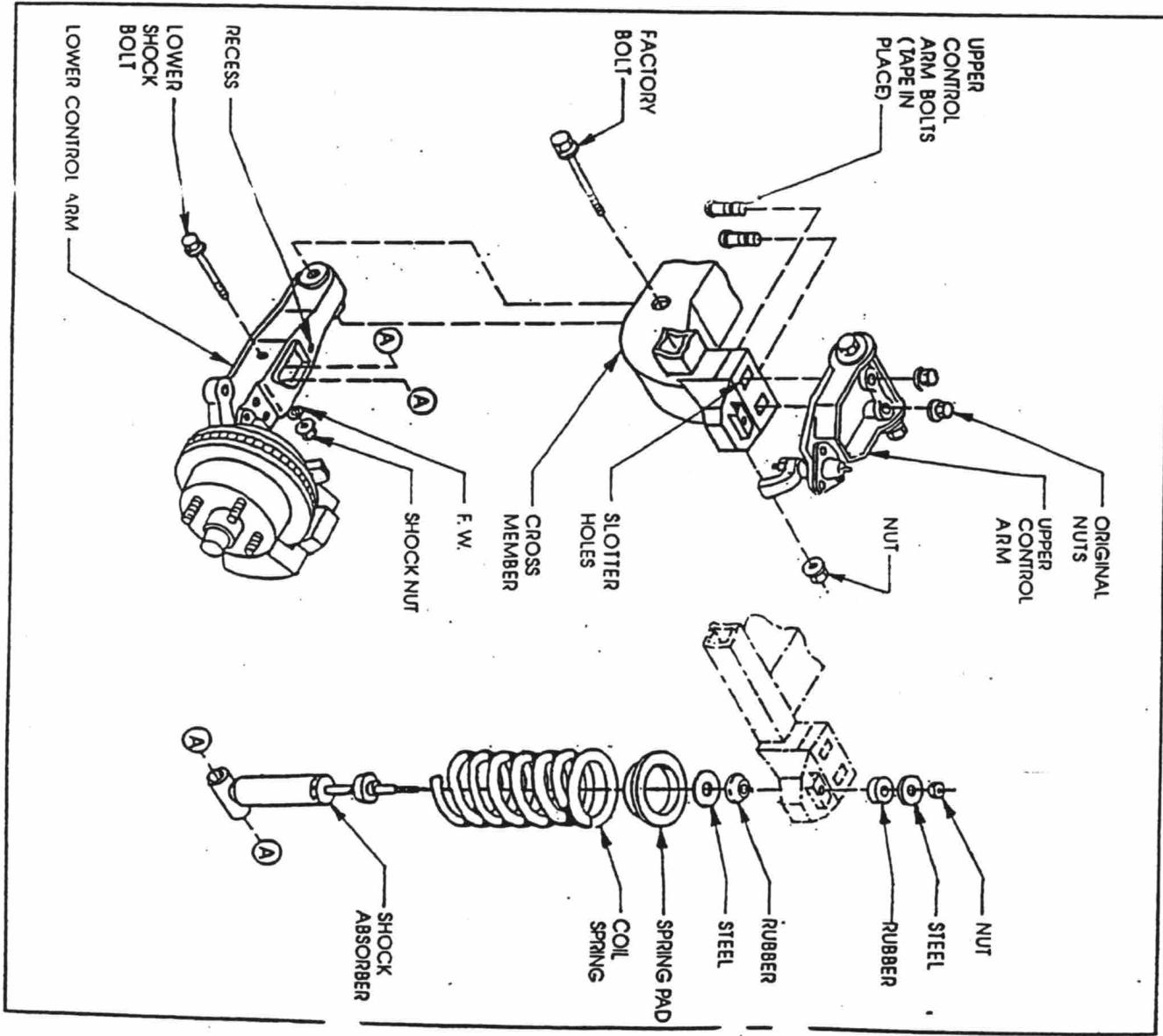


Figure 2-2

the spring into the upper cross-member. Raise the lower control arm and align spring with indentation on the lower control arm. Attach the lower control arm ball joint to spindle and tighten the nut. Remove the spring compressor.

**NOTE:** In the previous step a floor jack and additional help may be required.

Extend the shock to its full length. Install lower washer and bushing on the shock stud. Insert the shock through the bottom of the lower control arm and through the spring to the hole provided in the upper crossmember. Attach the upper bushing, washer and nut at this time. Leave the nut loose to allow the lower shock bolt to be installed.

Insert the lower shock bolt through the front of the lower control arm. A screw driver may be inserted in the rear of the lower control arm to assist in the installation of the bolt. Attach the nut and tighten the lower shock bolt. Tighten the upper shock nut at this time. Repeat for the other side.

**NOTE:** Tighten all nuts and bolts except upper control arm bolts to Ford torque specifications at this time.

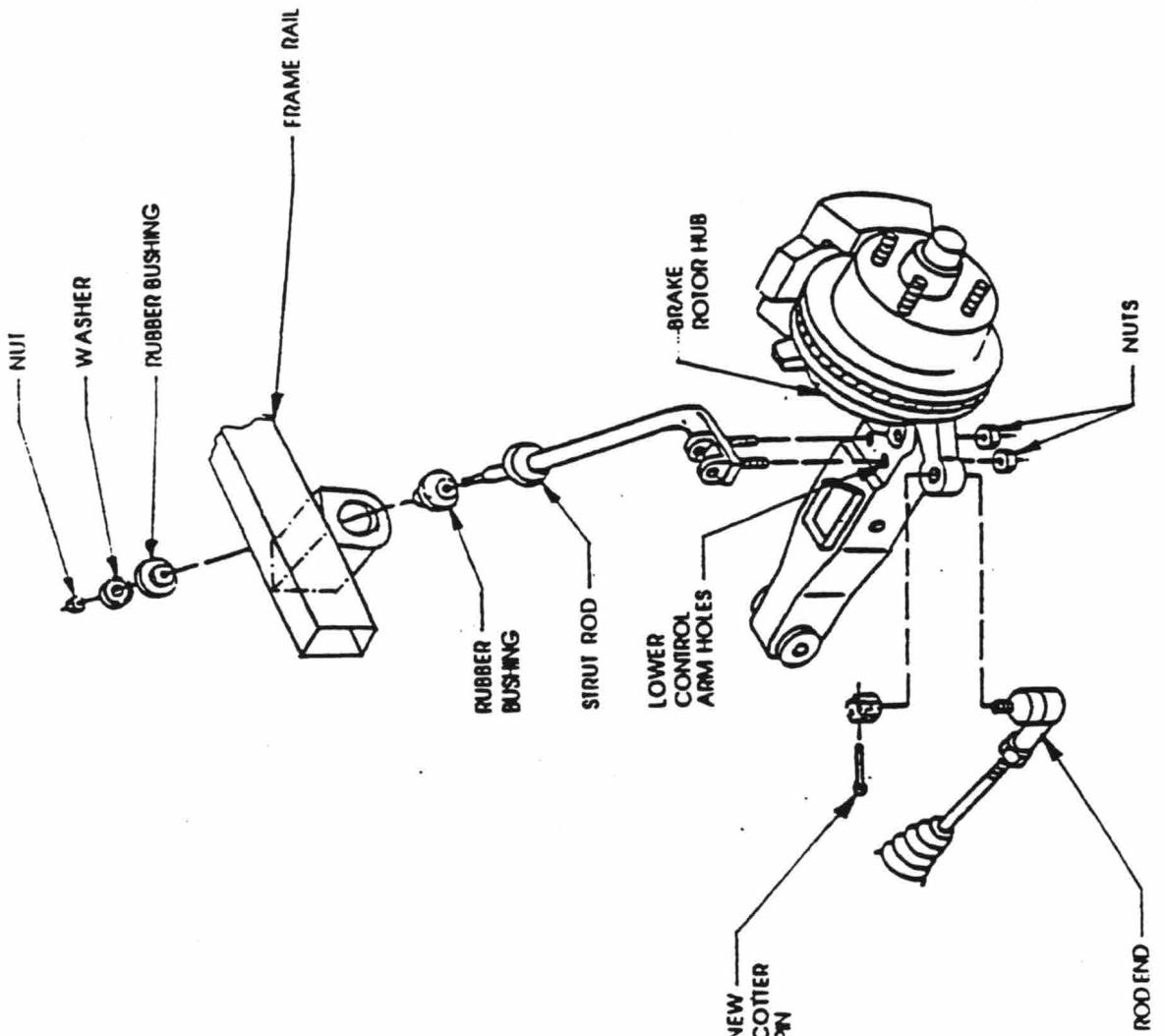


Figure 2-3

## SECTION B REAR SUSPENSION

The Ford rear suspension used on the Classic Cobra is a triangulated four bar type. The frame is specifically engineered for this type of suspension. The upper control arms must be from a late model Mustang only; Cougar, Thunderbird and full size Ford or Lincoln Mercury use longer upper control arms, which will place the rear axle out of alignment with the engine. The rear axles come in various widths; to standardize the rear wheel offset, we recommend that your rear axle measures 59 1/2 inches from outside to outside of the rear drums.

Because the Classic Cobra is designed to use a small block Ford V-8 engine, the 6 3/4 and 7.5" light duty axles are not recommended for use. The 8.5" and 8.8" medium duty rear axles are recommended, although the 8.8" is preferred. These rear axles can be either locking or non-locking differentials. A Ford sway bar can be used but the lower controls arms must have provisions for the sway bar. The quad shock rear axle may also be used. There are brackets that mount the rear stabilizer shocks to the frame. No additional modifications are necessary for installation.

**NOTE:** Additional help may be required to mount rear axle.

REAR SUSPENSION - COMPONENTS CHECK LIST		
QUANTITY	ITEM	DESCRIPTION
<input type="checkbox"/> 1	Rear end	Late model Ford (see text)
<input type="checkbox"/> 2	Upper control arm bolt, Ford	Pr #N-800933-S (AB-210-R)
<input type="checkbox"/> 2	Lower control arm blot, Ford	Pr #N-800933-S (AB-210-R)
<input type="checkbox"/> 4	Upper and lower control arm nuts, Ford	
<input type="checkbox"/> 2	Upper spring pads	Mustang D9BZ5536A
<input type="checkbox"/> 2	Lower spring pads	Mustang D9BZ5500A
<input type="checkbox"/> 1	Upper control arm Spring <sup>s</sup>	E7SC-5540-GA
<input type="checkbox"/> 2	Sway bar	Late model Ford (must have correct lower control arm)
	Shock <sup>s</sup>	NAPA 2162 or equivalent

**CHECK:** Carefully inspect rear axle for the following: leaking seals, damaged brake line, dented differential cover, missing or damaged hardware, stripped bolts or studs, gear oil level, and binding axles. Clean and paint as necessary.

**WARNING:** Over servicing rear axle oil can cause seal failure.

After installing the bolts, check the exposed threads against the thickness of the nut, allowing for at least 1/4 inch of exposed threads when the bolt is in place. Shorten the bolt if necessary. Install the nut and tighten.

**NOTE:** For added security, you may want to tack weld the nuts to the bracket.

### UPPER CONTROL ARM INSTALLATION

After painting, reinstall upper and lower control arms. SEE FIGURE 2-4. Using a movable floor jack located under the center of the rear axle, roll the rear axle assembly under the frame. Mount the lower control arm to the brackets on the side of the frame. The bolts are self-aligning so they may have to be tapped through the bushing. The bolts

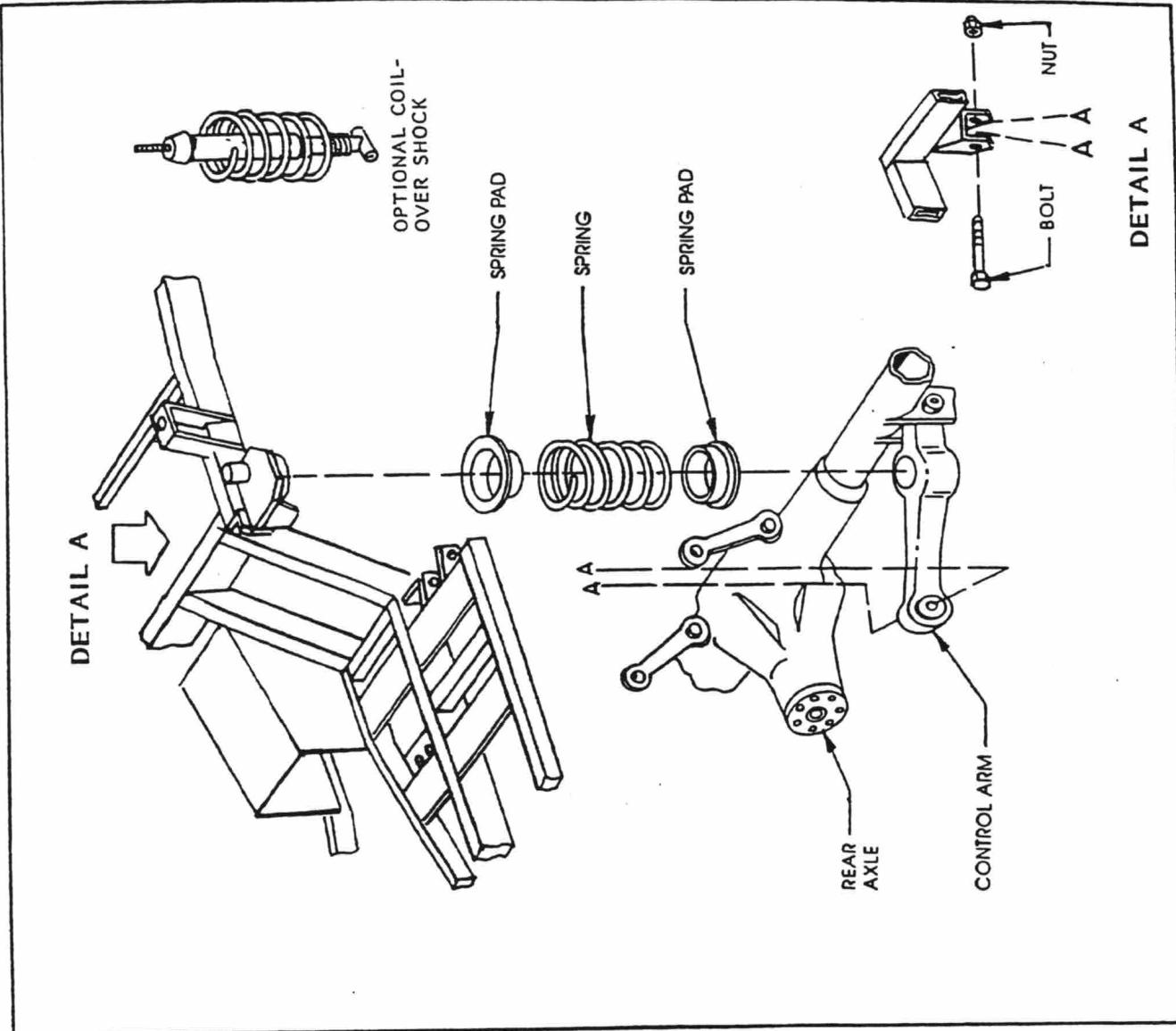


Figure 2-4

threads point outward from the center line of the frame. Install the nuts, but leave them loose at this time. Lower the jack until the rear axle is ready to hang free.

### SPRING AND SHOCK INSTALLATION

**CAUTION:** The springs should be installed with the aid of a spring compressor.

Glue large spring pad to upper spring mount on frame. Glue small pad to lower control arm. Install shock on rear axle, and extend to full travel. Install washer and lower bushing onto shock stud. Compress spring with spring compressor and position spring on lower control arm spring pad. Slowly jack up the rear axle, while aligning the spring and the shock into position in the mount.

**NOTE:** Additional help is suggested for this procedure.

Attach the bushing, washer and nut to the shock stud at this time. SEE FIGURE 2-5. Tighten the shock nut and remove spring compressor. Repeat procedure for the opposite side. Once the spring and shocks have been installed on both sides, torque all the upper and lower control arm bolts to Ford torque specifications.

## OPTIONAL COIL-OVER SHOCKS

For improved performance it is recommended that Carrera coil-over shocks be used in place of the original Ford shock absorbers. If you are using the quad shock rear end, the two Carrera shocks will replace both upright Ford shocks. The other two original Ford shocks will be retained. The optional Carrera shock kit is available from our Parts Department or may be purchased separately from Carrera. The following parts will be required for installation:

- 2 Stud adapters P/N1947
- 2 Adjustable spring mounts P/N1951RV
- 2 8" shocks P/N3285E
- 2 1 $\frac{1}{4}$ " springs P/N14CS150

## CARRERA SHOCK ASSEMBLY

Remove the upper eyelet from the shock rod and install the stud adapter in its place. Attach the adjustable spring mounts retaining ring onto the upper groove on the shock body. Install the adjustment nut onto the threaded section of the spring mount and run it down to the bottom of the spring mount. Slide the adjustable spring mount onto the shock body. Fully extend the shock rod. Slide the coil spring over the shock absorber and onto the adjustable spring mount. Install the upper spring mount between the stud adapter and the top of the coil spring.

**NOTE:** It may be necessary to force the spring down in order to install the upper spring mount.

Tighten the adjustment nut to allow some tension on the spring and install the assembled shock in the same manner as the Ford shock described previously.

**NOTE:** Upon completion of the car, to achieve the desired height, tighten or loosen the adjustment nut as necessary.

## QUAD SHOCK MOUNT INSTALLATION

If you are using a rear axle equipped with the quad shocks it will be necessary to attach the quad shock mounting brackets to the frame. Clamp the quad shock plate to the frame mount with the shorter section of the frame mount towards the front of the chassis. Position the frame mount along the center of the frame rail, and lightly clamp the mount to the frame rail. Measure the length of the shock from the center of mounting bolt on the rear axle to the center of the mounting bolt on the quad shock plate. Move the mounting bracket, so that this measurement is 15 ~~16~~ inches. Tightly clamp the mount brackets to the frame rails and drill four 3/8" holes through the frame rails.

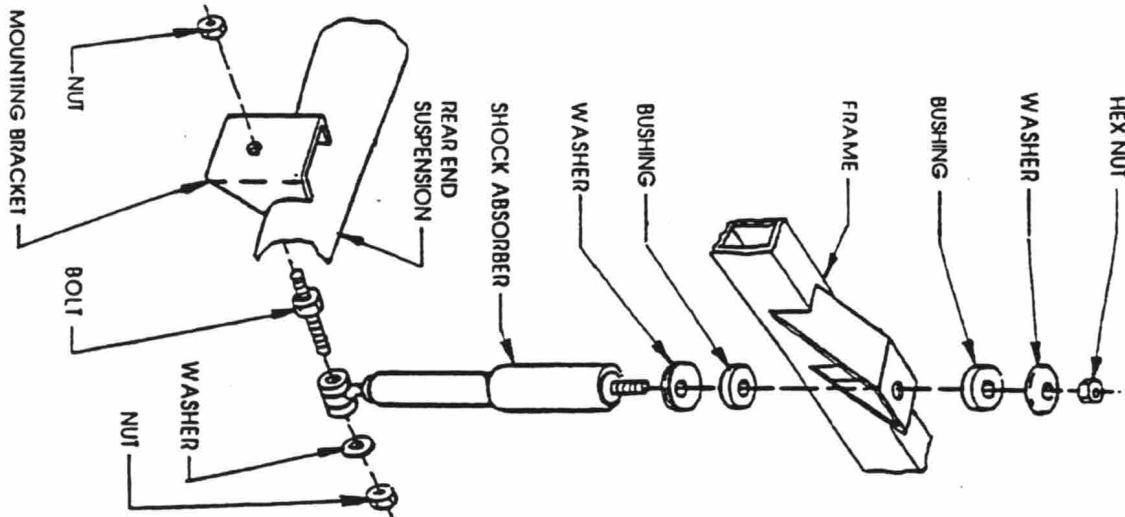


Figure 2-5

Attach the frame mounts to the frame rails, using four  $3/8 \times 3"$  hex bolts, eight  $3/8"$  flat washers, and four  $3/8"$  lock nuts. Make sure that the threaded end of the bolts are on the mount side of the rail. This will allow the fuel tank to be installed later. Drill four  $3/8"$  holes through the frame mount and attach the shock plate to the frame mount bracket, using four  $1 1/4"$  hex bolts, eight  $3/8"$  flat washer, and four  $3/8"$  lock nuts.

**NOTE:** The frame mount bracket may be welded to the frame for additional security.

## SECTION C - ENGINE AND TRANSMISSION INSTALLATION

### ENGINE INSTALLATION

**NOTE:** It is recommended that you clean, detail, and assemble all accessories on your engine and transmission prior to installing them.

### MOTOR MOUNT BRACKET INSTALLATION

**CHECK:** To insure that the motor mount brackets are installed on the correct side, check the position of the tube for the motor mount bolt. It should be angled up slightly at the front. If the tube is angled up more than the frame, then the mount brackets are reversed.

Take the right motor mount bracket (See Figure 2-7) and align the two forward holes on the bracket with the two pilot holes on the right frame rail. Mark and drill the two rear holes to  $3/8"$  diameter through the frame rail. Also drill the two front pilot holes out to  $3/8"$  diameter. Be sure that while drilling the holes in the frame, that the drill bit is perpendicular to the frame rail and parallel to the top. See Figure 2-7, Detail A.

Secure the motor mount bracket using four  $3/8 \times 3"$  hex head bolts, eight  $3/8"$  flatwasher and four  $3/8"$  lock nuts. Bolts and hardware must be at least grade 5. Repeat the same steps for the left motor mount bracket.

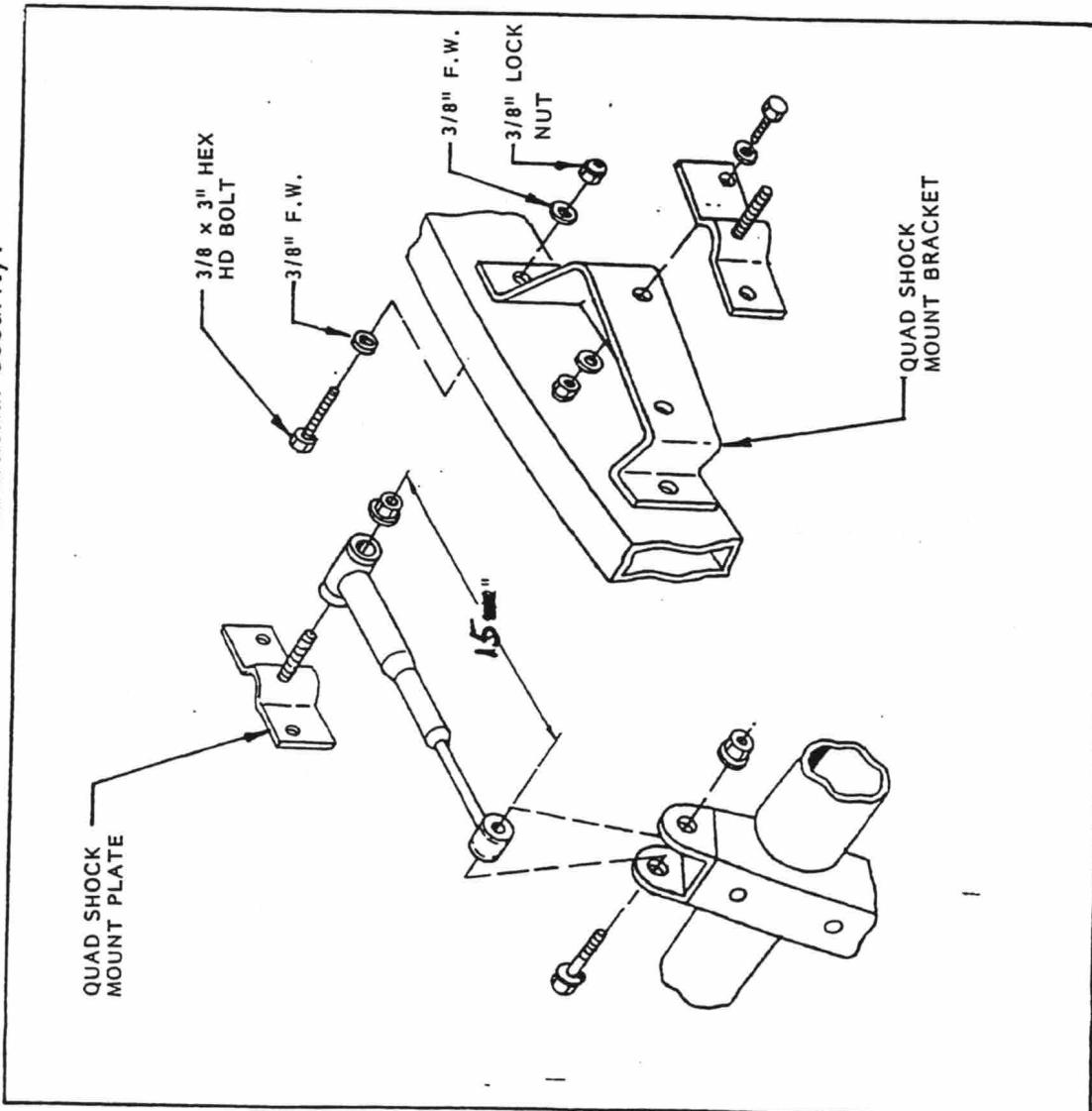


Figure 2-6

## MOTOR MOUNT AND TRANSMISSION

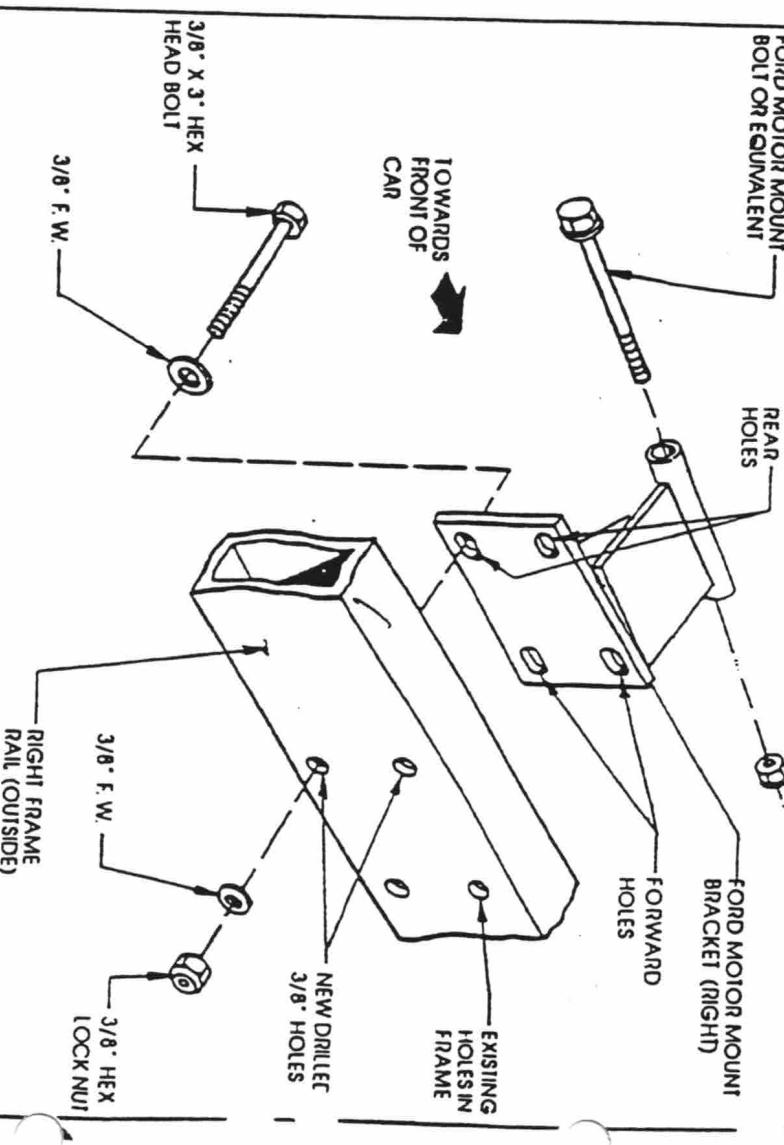
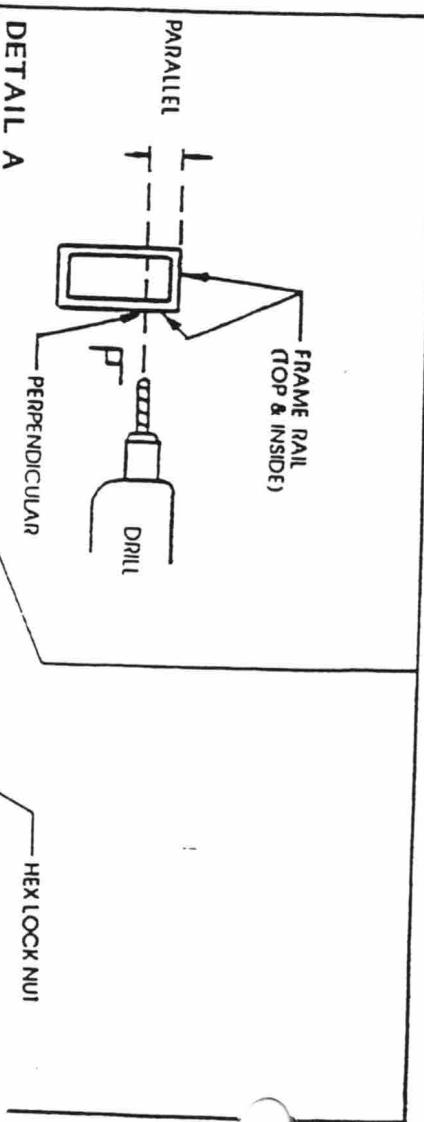
Throughout the production run of their small block V-8 engine, Ford has used a variety of motor mounts.

To simplify the assembly of your Classic Cobra, use the following Ford motor mounts: Right hand motor mount Part Number D7ZZ-6038-A; left hand motor mount Part Number D7ZZ-6038-B. These are the motor mounts that were used to make the frame and motor mount brackets.

If you are using the Ford RAD 4 speed transmission, use the Ford transmission mount Part Number D7ZZ-6068-A. If you are using a C-4, C-6, AOD, or a T-5 transmission use a Ford transmission mount NAPA Part Number 620-1040. Even if the engine and transmission already has the correct mounts it is recommended that you replace them with new mounts.

Install the new motor mounts to the engine using the original factory bolts. Hand tighten only. Attach the transmission mount to the transmission using the original mounting hardware. Hand tighten only.

The engine and transmission are now ready to install into the frame.



## ENGINE MOUNTING

Attach the engine and transmission as a complete unit to an engine hoist and carefully lower onto the motor mount brackets.

**NOTE:** To assist you in this operation, it is suggested that you utilize a movable floor jack to support the transmission. The transmission drive shaft yoke or a suitable plug should be inserted into the rear of the transmission to prevent transmission fluid or oil leakage.

**CAUTION:** This is not a one person operation. Get additional help. Care must be taken to prevent the engine hoist from tipping under the load.

Carefully line up the motor mount brackets with the motor mounts and install the original motor mount clevis bolt. If the original bolt is not available, replace it with a comparable one with equal or greater rating.

Secure into place using four  $7/16" \times 1 1/4"$  grade 5 hex head bolts, eight  $7/16"$  flatwashers and four  $7/16"$  lock nuts. Lower the transmission onto the transmission support and attach the original mounting hardware.

**NOTE:** The mounting plates on the frame have three slots in them and only the two forward slots are used at this time.

If you are using the T-5 transmission lower the transmission support and attach the transmission support to the transmission mount. Jack the transmission up into position and check the position of the holes on the transmission support. It may be necessary to drill additional holes. Secure the transmission support into place using the same hardware.

If you are using the larger C-6 transmission, install transmission support so that the center mounting plate points toward the rear. Refer to **Figure 2-8**.

## TRANSMISSION MOUNTING SUPPORT

Raise the tail section of the transmission to enable you to install the transmission support. If your small block Ford has either the C-4 or AOD automatic transmission see **figure 2-8** for proper location. The center mounting place should face toward the front of the car.

Secure into place using four  $7/16" \times 1 1/4"$  grade 5 hex head bolts, eight  $7/16"$  flatwashers and four  $7/16"$  lock nuts. Lower the transmission onto the transmission support and attach the original mounting hardware.

**NOTE:** The mounting plates on the frame have three slots in them and only the two forward slots are used at this time.

If you are using the T-5 transmission lower the transmission support and attach the transmission support to the transmission mount. Jack the transmission up into position and check the position of the holes on the transmission support. It may be necessary to drill additional holes. Secure the transmission support into place using the same hardware.

If you are using the larger C-6 transmission, install transmission support so that the center mounting plate points toward the rear. Refer to **Figure 2-8**.

If you are using the RAD 4 speed found in the 1974 through 1978 Mustang II, you must use the transmission support specially made for its transmission mount. Attach it in the same way as the normal transmission support using the same hardware. Refer to **Figure 2-8**.

**WARNING:** Once the engine and transmission are installed, tighten and torque all nuts and bolts to original factory specifications.

## TRANSMISSION LINES

Transmission lines should be made from  $5/16" \times 60"$  steel line. They should be installed after the installation of the radiator. Transmission lines must be bent to conform with the radiator you are using. All transmission lines should be run under the engine using a bracket to mount the lines underneath the engine. This bracket may be fabricated from a piece of flat steel with the transmission line clamped to it.

**WARNING:** Rubber hose should never be used to make transmission lines. Serious damage to the transmission will occur when the hose starts to deteriorate.

## SECTION D -EMERGENCY BRAKE INSTALLATION

There are two types of emergency brake handles that may be used on your Classic Cobra. The first is used on Mustang II's. It is 15" long and painted black. The second one was used on early Pintos. It is 13" long and chrome plated. Both handles work and mount the same way. The shorter Pinto brake handle is recommended, because it will not interfere with the operation of the shifter.

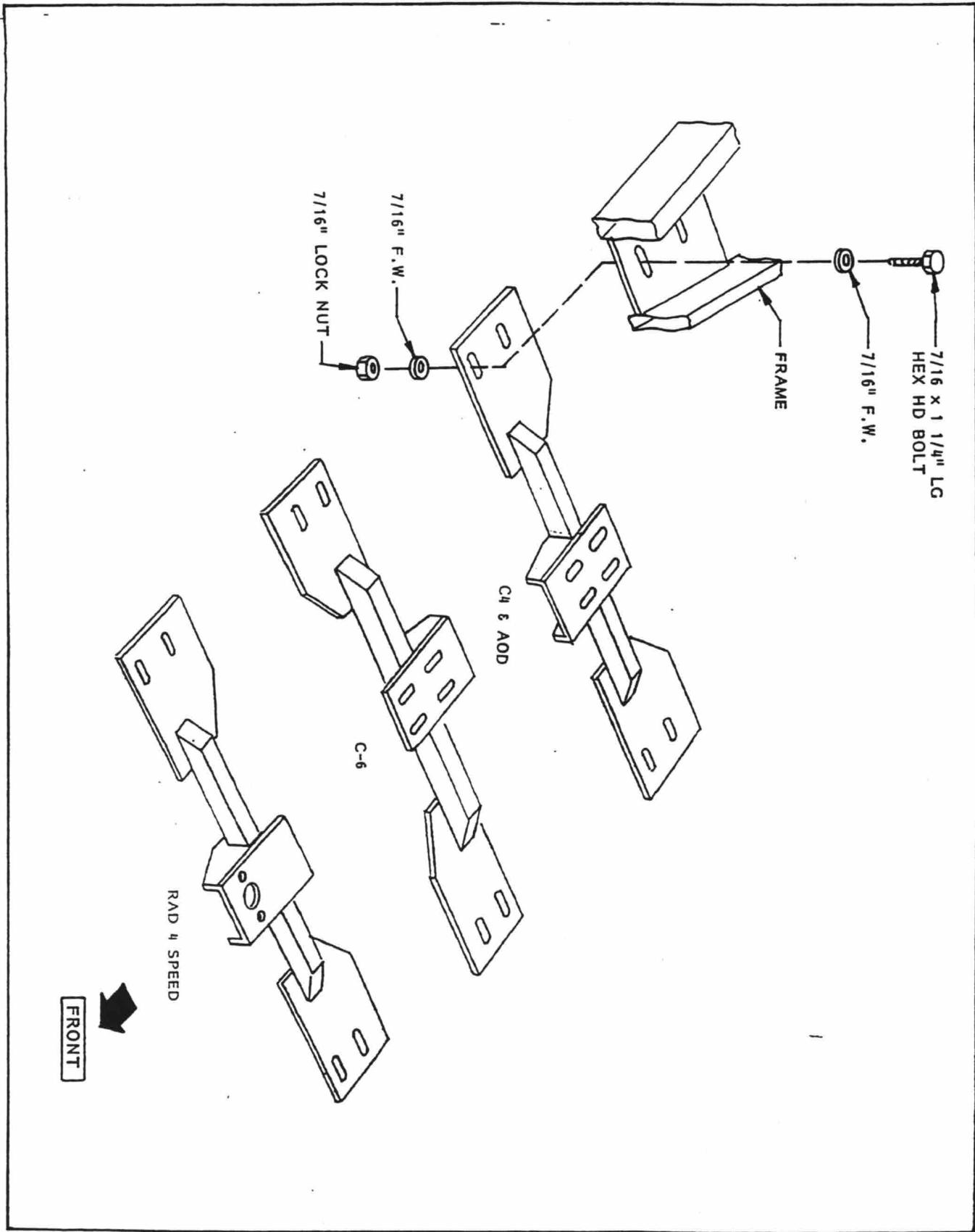


Figure 2-8  
2-12

Mark a line along the top of the frame's drive shaft, 1 3/8" from the left hand edge. From the rear edge of the tunnel, lace two marks along this line. The first mark, 5 1/2" from the rear and the second, 9 1/2" from the rear. Using a 5/16" drill bit, drill a hole through each mark. See Figure 2-9, Detail A.

Mark a line across the front of the frame tube at the rear of the tunnel, 7/8" above the weld. Measure from the diagonal frame tube on the left side and place two marks on the line; the first mark 1 1/2" from the tube and the second mark 3" over from the first mark.

Drill a 1/4" hole through the frame tube at each mark. Redrill the front of the frame tube using a 1" hole saw. Drill the back side of the frame tube, using a 9/16" drill bit.

Take the emergency brake spacer, a 5" long piece of 1" square tubing, and drill two 5 1/6" holes through it, 4" apart.

Insert two 5/16 x 2 1/4" hex head bolts, with washers, up through the holes in the frame tunnel. Plate the spacer onto the bolts, then attach the emergency brake handle to the bolt using two 5 1/6" flatwashers and two 5/16" lock nuts.

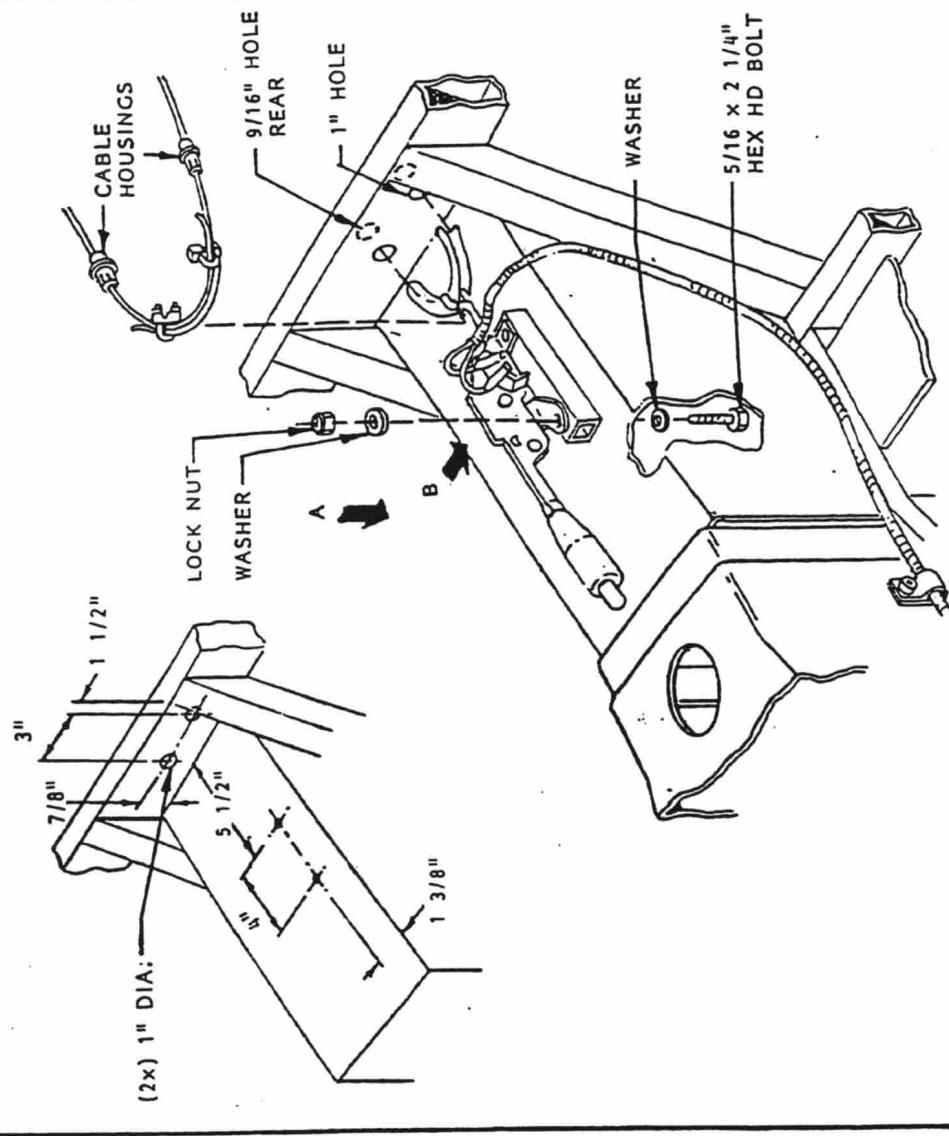
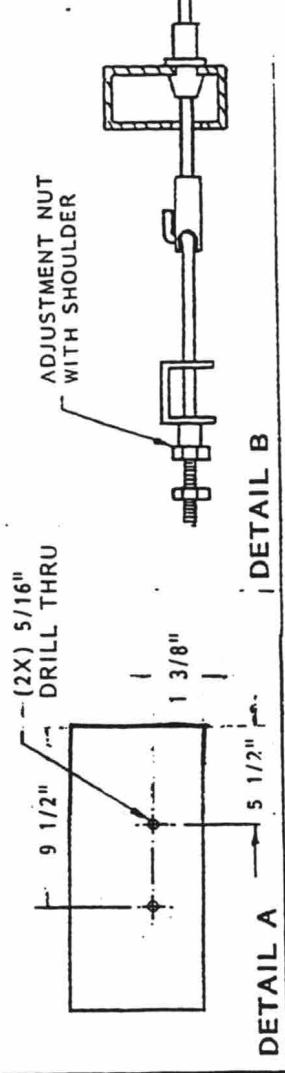


Figure 2-9

Install the adjustment rod on the brake handle with the jamb nuts on the very end. Install the cable yoke onto the adjustment rod. The cables will have to be cut and clamped together. Cables may be cut with either a torch or a bolt cutting. The cables are less likely to fray if cut with a torch.

Insert the cables into the back side of the frame. Push the cable in all the way, until the fingers of the cable housings lock to the frame.

**NOTE:** It may be necessary to trim  $1/8"$  off of each finger because of the added thickness of the frame tube.

Slip the cables through the yoke and tightly clamp the cables together, using cable clamps. The cables should have clamps by the yoke. Mark and remove any excess cable by the cable mounts.

**CHECK:** Test the operation of the emergency brake. Tighten the adjustment rod as required. Ensure that the emergency brake cables are routed so that the suspension will not damage them when it moves thorough its travel. The cables may be attached to the lower control arms using a clamp to prevent them from rubbing against the tires.

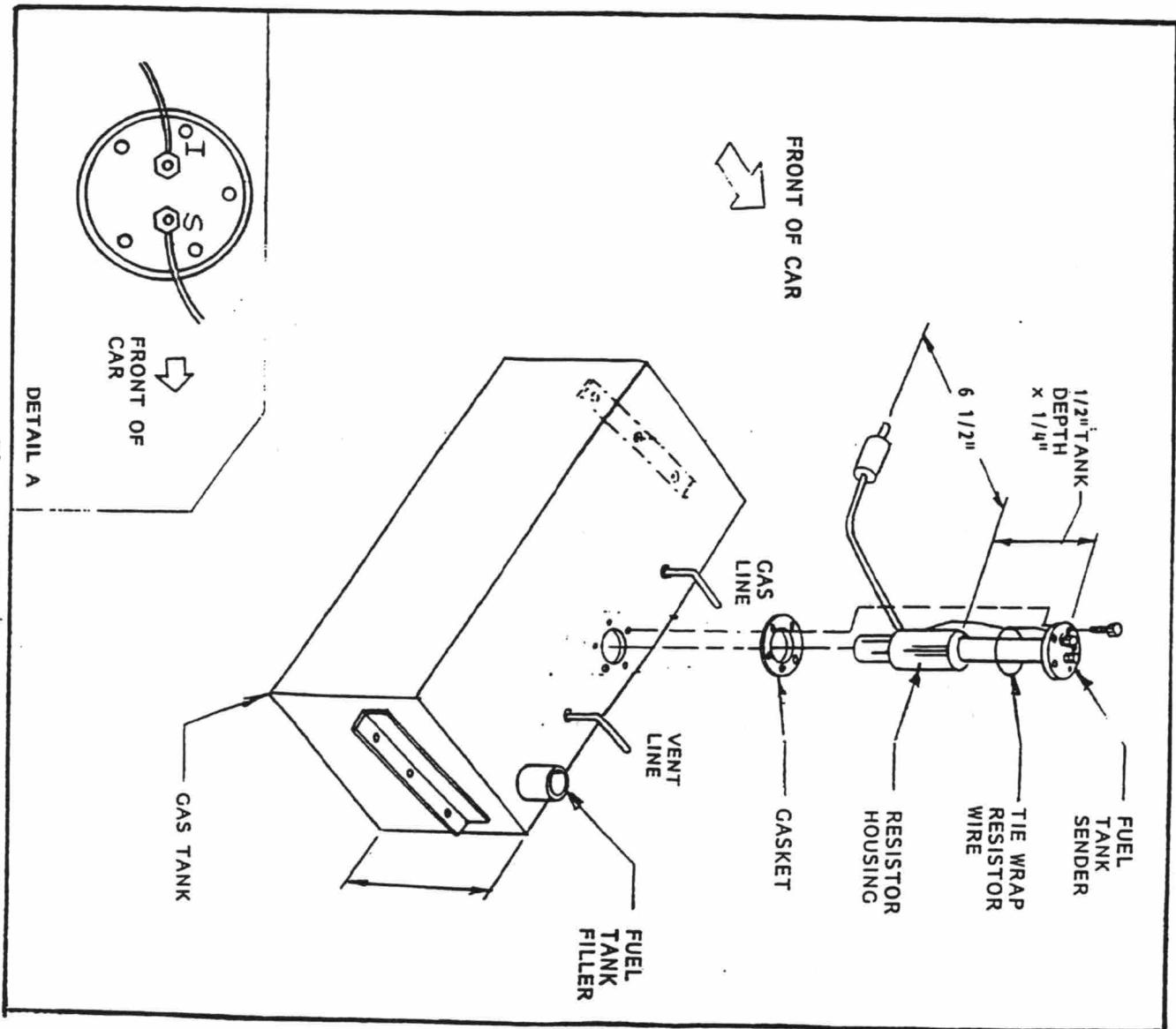


Figure 2-10

## SECTION E FUEL TANK AND FUEL LINE INSTALLATION

### FUEL SENDER INSTALLATION

**NOTE:** The fuel gauge and the fuel sender are a matched set. Fuel gauge Part No. 06-1075-XX must be used with the fuel sender Part No. 06-1083-00.

Place the fuel tank sender gasket on top of the fuel tank. Measure from the bottom of the tank to the top of the sender gasket. This measurement will be about 9 $\frac{5}{8}$ ". Add 1 $\frac{1}{4}$ " to this measurement. Use half of this measurement to position the center of the resistor housing on the support arm. After the resistor housing has been moved to its new position, tie wrap the wire to the support arm. See Figure 2-10.

Cut off the support arm 1 $\frac{1}{2}$ " below the bottom of the resistor housing.

Measure from the center of the float 6 1 $\frac{1}{2}$ " along the arm. At that mark bend the arm 90 degrees towards the float. Cut off the excess 1 $\frac{1}{4}$ " away from the arm.

Remove the float tank sender and drill five 5/32" holes on the marks from the mounting flange. Vacuum out the tank to remove any shavings that may have fallen into it. Reinsert the fuel tank sender and attach it with the five hex head screws provided with the sender.

Remove the threads holding the sender.

**CHECK:** To insure that the float arm moves freely inside the tank.

Carefully slide the gasket over the float arm and the resistor housing until it is flat on the mounting flange. Align the holes on the gasket with the holes on the mounting flange.

**NOTE:** The holes on the gasket and the mounting flange are off spaced. Line up the groove on the gasket with the dot on the mounting flange.

Using two pieces of thread, to hold the gasket in place, insert the float arm and sender into the tank.

With the float arm pointing towards the rear of the tank, mark the location of the holes on the mounting flange onto the tank.

Remove the float tank sender and drill six 1 $\frac{1}{4}$ " holes through gas tank mounting flange and the mount angle (three per side).

Clamp the fuel tank back into position and attach the fuel tank to the frame using six 1 $\frac{1}{4}$  x 1" hex head bolt, twelve 1 $\frac{1}{4}$ " flat washers and six 1 $\frac{1}{4}$ " lock nuts. Remove the clamps.

### FUEL TANK INSTALLATION

Position the fuel tank into the frame. Make sure that it is centered from left to right and that the front of tank is 19" away from the inside of the rear frame rail, and clamp it into position. See Figure 2-11.

**NOTE:** If you do not have the fuel tank mount angles welded onto your frame then loosely clamp the angles to the frame rails and clamp the tank to them. Position the tank so that it is level and that at the rear it does not extend above the top of the frame Rail. Tighten up the clamps on the mount angle and remove the tank. Drill six 3/8" holes through the frame and the mount angles. Attach the mount angle to the frame using six 3/8 x 3 $\frac{3}{8}$ " long hex head bolts, six 3/8" flat washers and six 3/8" lock nuts.

Drill six 1 $\frac{1}{4}$ " holes through gas tank mounting flange and the mount angle (three per side).

Remove the threads holding the

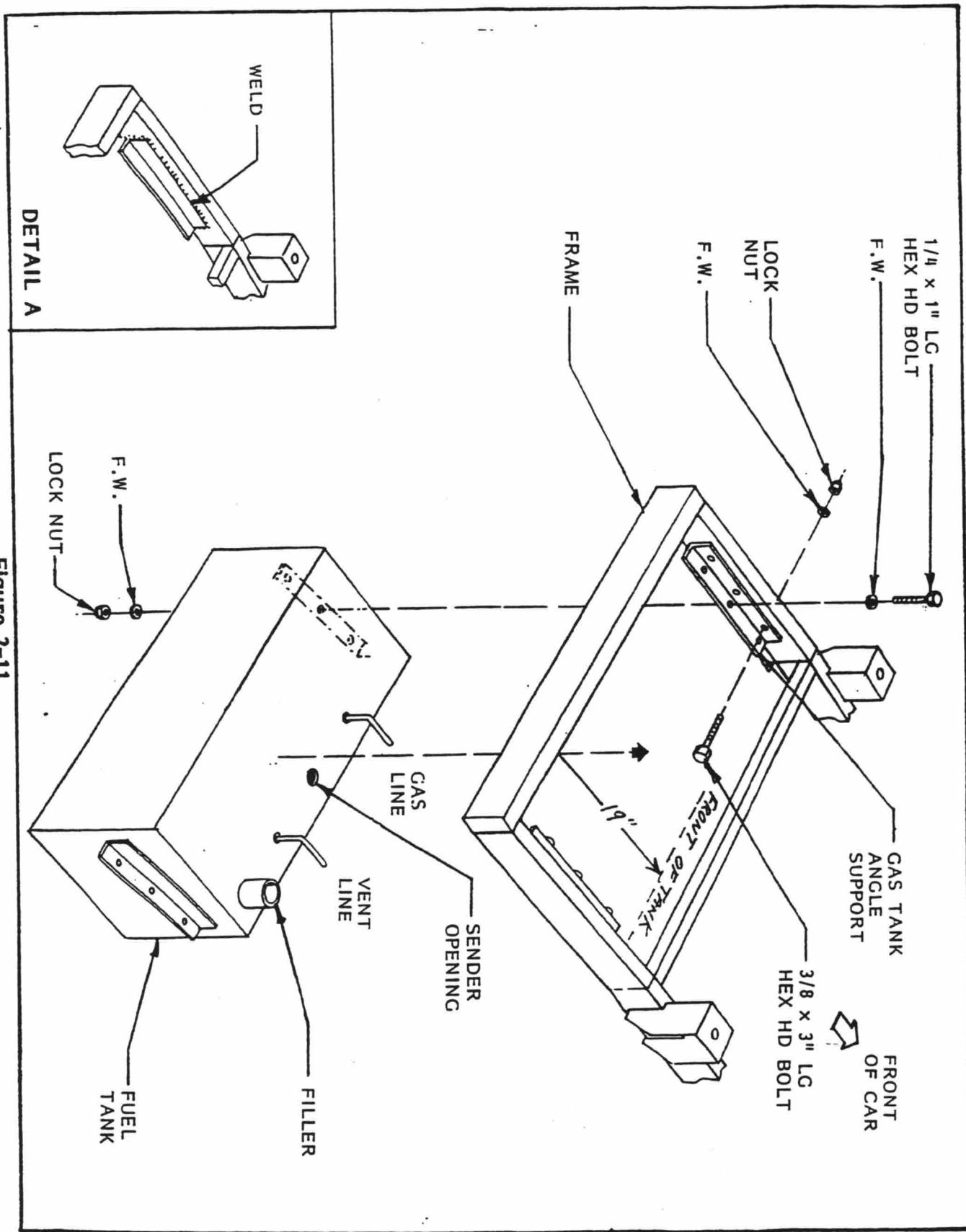


Figure 2-11

## FUEL TANK VENT HOSE INSTALLATION

Attach a 40" long piece of 5/16" rubber fuel hose to the fuel tank vent on the right of the sending unit. Clamp it to the front side of the square tubing using a 3/8" padded clamp and a self-tapping screw. Coil the excess and tie wrap it to the frame for now. The fuel vent hose will be completed after the mounting of the body.

## FUEL LINE INSTALLATION HINTS

Use a tubing bending on oil lines.

Plan out the way your line will run along the frame. Avoid areas where vibration might rub a hole in the lines.

Make your installation look professional. Remember to make allowance for parts not yet installed, i.e.: fuel pump, fuel regulator, engine mount and steering shafts, and exhaust pipe.

## FUEL TANK VENT HOSE INSTALLATION

Take care not to overtighten lines. Use care when bending line to avoid crimping.

Support couplings with clamps.

Check all connections for leak during initial running of the engine. Don't run fuel lines below frame rails.

## COBRA FUEL LINE- COMPONENTS CHECK LIST

QUANTITY	ITEM	SOURCE
3	3/8 x 60 steel lines	Auto Parts Supplier
3	3/8 line couplings	Auto Parts Supplier
10	3/8 padded line clamps	Auto Parts Supplier

## SECTION F FORWARD FLOOR LINER INSTALLATION

The forward floor liner consists of the following elements: the foot wells, the fire wall, the transmission tunnel and the forward floor area. The gel-coated surface of the floor liner is marked in certain areas where holes must be opened prior to installation.

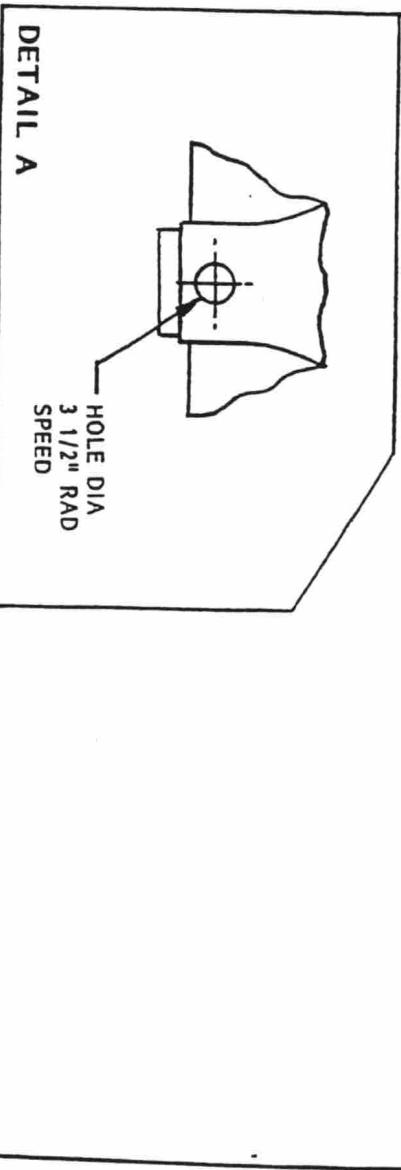
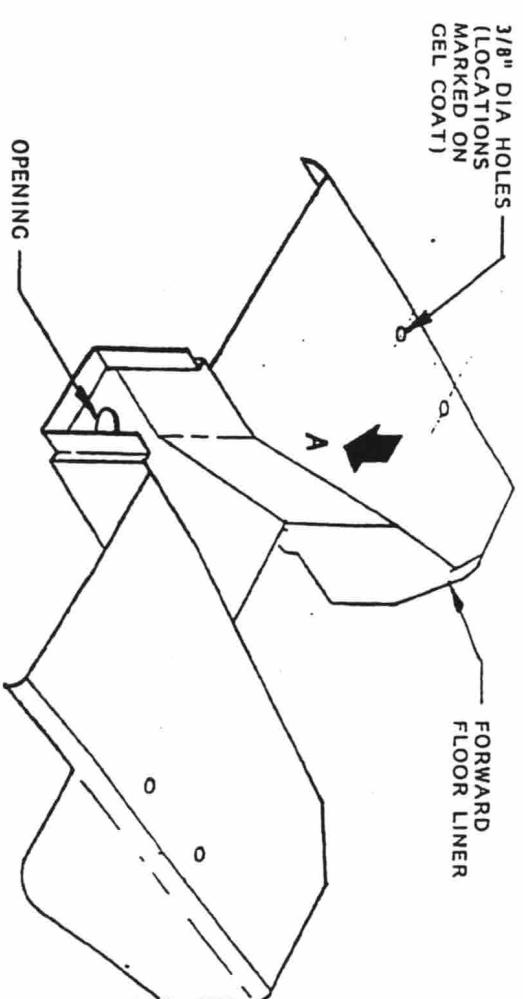
### SHIFTER OPENINGS

Turn over the forward floor liner so that the gelcoat surface is facing up. At the rear of the transmission tunnel there is a 3 1/2" circular mark. This area must be cut out if you are using the Rad 4 speed. Remove this area using a 3 1/2" hole saw. See Figure 2-12.

If you are using an automatic transmission or another type of manual transmission, such as the T-5 5 speed, it will be necessary to mark the locations for the shifter opening.

On each of the outside frame tubes there are two pilot holes drilled for the location of the steering column support. Using a 3/8" drill bit redrill these holes. Near the edge of the floor liner there are four marks in the gelcoat at the same locations as the 3/8" holes. You just drilled through the frame tubes. Drill through the floor liner

at each mark, using a 3/8" drill bit. If you are using the Rad 4 speed skip ahead to the shifter modifications. If you still need to make your shifter openings, continue on.



If you have an original style shifter that mounts to the transmission, remove the shifter from the transmission. Place the floor liner into position by aligning the holes on the floor liner with the holes in the frame tubes. Place bolts through the holes to hold the liner in position, and mark the rear edge of the floor liner onto the frame using a white grease pencil.

Remove the floor liner and reinstall the shifter. Measure from the pivot point of the shifter to the grease pencil line on the frame using this measurement. Mark the shifter hole location onto the top of the floor liner.

Measure the shifter pivot point to each outer frame tube. If the shifter is centered, mark the center of the tunnel on the previous mark. If the shifter is off center, mark the tunnel with the offset.

Measure the pivot point to find the diameter of the hole to be drilled in the floor. Drill the hole in the tunnel of the floor liner. Position the floor liner onto the frame.

**CHECK:** Move the shifter through the gears several times. Make sure the shifter or its linkages do not make contact with floor liner. If the linkage does make contact, bend and reposition it away from the floor liner. If the shifter handle makes contact with the floor liner, mark where it does, and file the floor liner for additional clearance.

## FORD AUTOMATIC SHIFTER OPENINGS

not contact the inside of the floor liner tunnel. If it does, bend the shifter arm in to clear the tunnel.

Position the floor liner onto the frame. Attach the shift linkage rod to the transmission shift lever. Move the transmission shift lever to the forward most position. Mark the floor liner where the center of the adjustment slot on the linkage rod is located. See Figure 2-13.

**NOTE:** When marking the floor liner, position the linkage rod so that it is the same distance away from the floor liner as it would be if it was connected to the shifter.

Move the transmission shift lever to the rearward-most position and mark the floor liner where the center of the adjustment slot on the linkage rod is. Remove the floor liner and transfer the two marks to the top of the floor liner. Mark the center between the two marks.

Use the center mark to mark an opening 3 inches wide and 3 1/2 inches long on the top of the floor liner tunnel. Drill a hole the size of a sabre saw blade inside one corner of the opening location and use a sabre saw to make the opening.

Use the center mark to mark an opening 3 inches wide and 3 1/2 inches long on the top of the floor liner tunnel. Drill a hole the size of a sabre saw blade inside one corner of the opening location and use a sabre saw to make the opening.

**CHECK:** Before mounting the shifter lever assembly to the floor liner, make sure that the shifter arm does

**NOTE:** When marking the floor liner, position the linkage rod so that it is the same distance away from the floor liner as it would be if it was connected to the shifter.

**CHECK:** Move the shifter lever through the gears several times, and make sure the linkage rod and the transmission lever does not contact the floor liner. Once the shifter and linkage have been checked, move onto the mounting of the floor pan.

## AFTER-MARKET SHIFTER OPENINGS

A cable operated after-market shifter can be mounted on the floor liner tunnel. Refer to the manufacturer's installation instructions. A rod actuated after-market shifter may also be used. However, it may require more modification than a Ford shifter. See Figure 2-13.

**NOTE:** Remember that whatever shifter you decide to use, always check your linkages carefully to insure smooth, safe operation of the shifter.

## SHIFTER MODIFICATIONS

Because shifter handle for the RAD 4-speed and the T-5 5-speed are mounted at the very rear of the transmission, you may want to modify the shifter handle to move the handle forward.

The RAD 4-speed shifter handle is not removable from the shifter mechanism, therefore in order to modify the shifter handle so that it angles forward, the handle must be cut.

Mark the shifter handle 1" up from the nylon washer on top of the spring. Mark a vertical line through the 1" mark on the front and the rear of the shifter handle. These vertical marks will be used to realign the shifter handle on the shifter mechanism.

**NOTE:** The shifter modification described here are guidelines on how the shifter handle may be modified if you need to change the shifter handle. There may be other ways to modify the handle to best suit your needs, or you may not need to modify the handle at all.

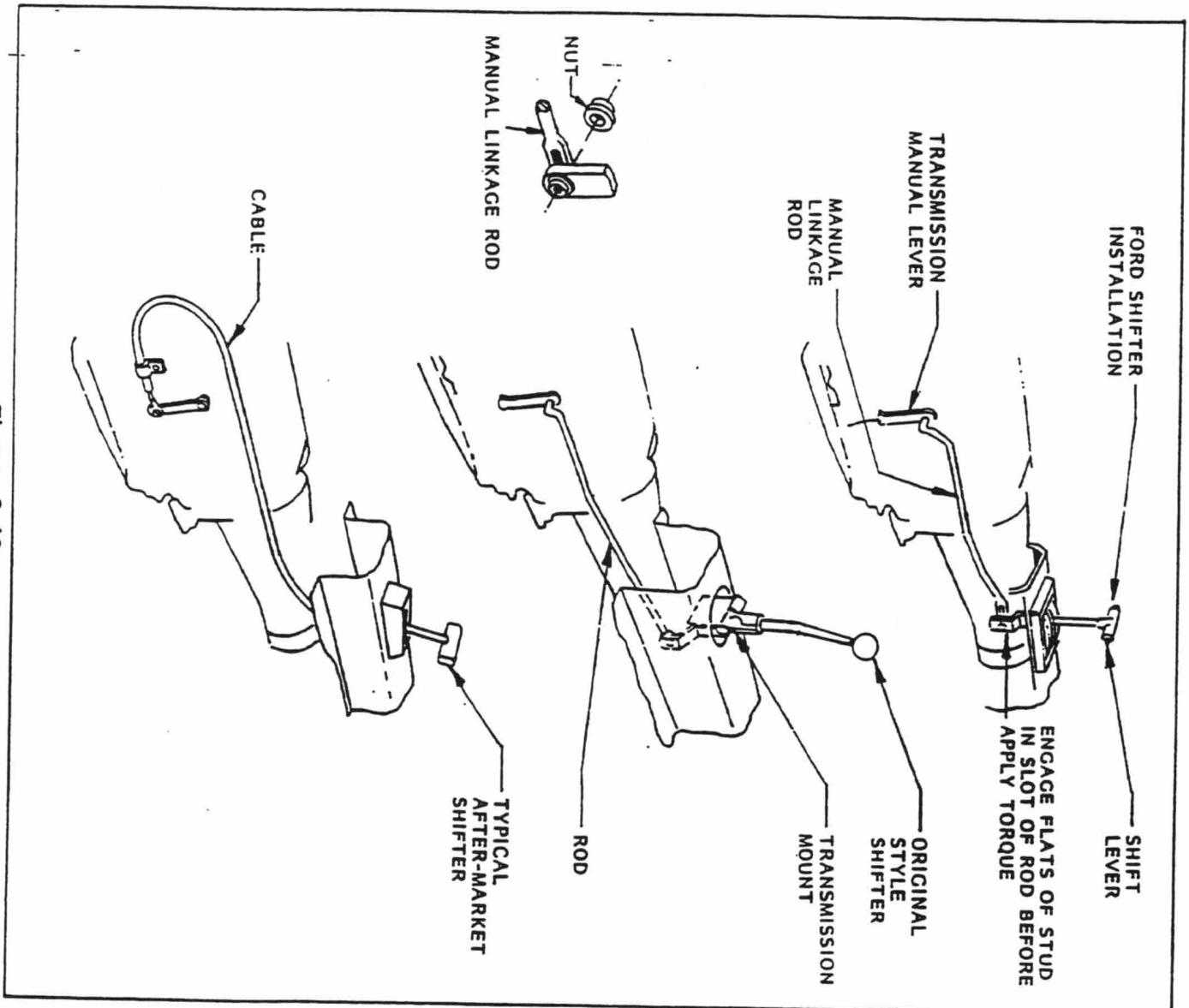
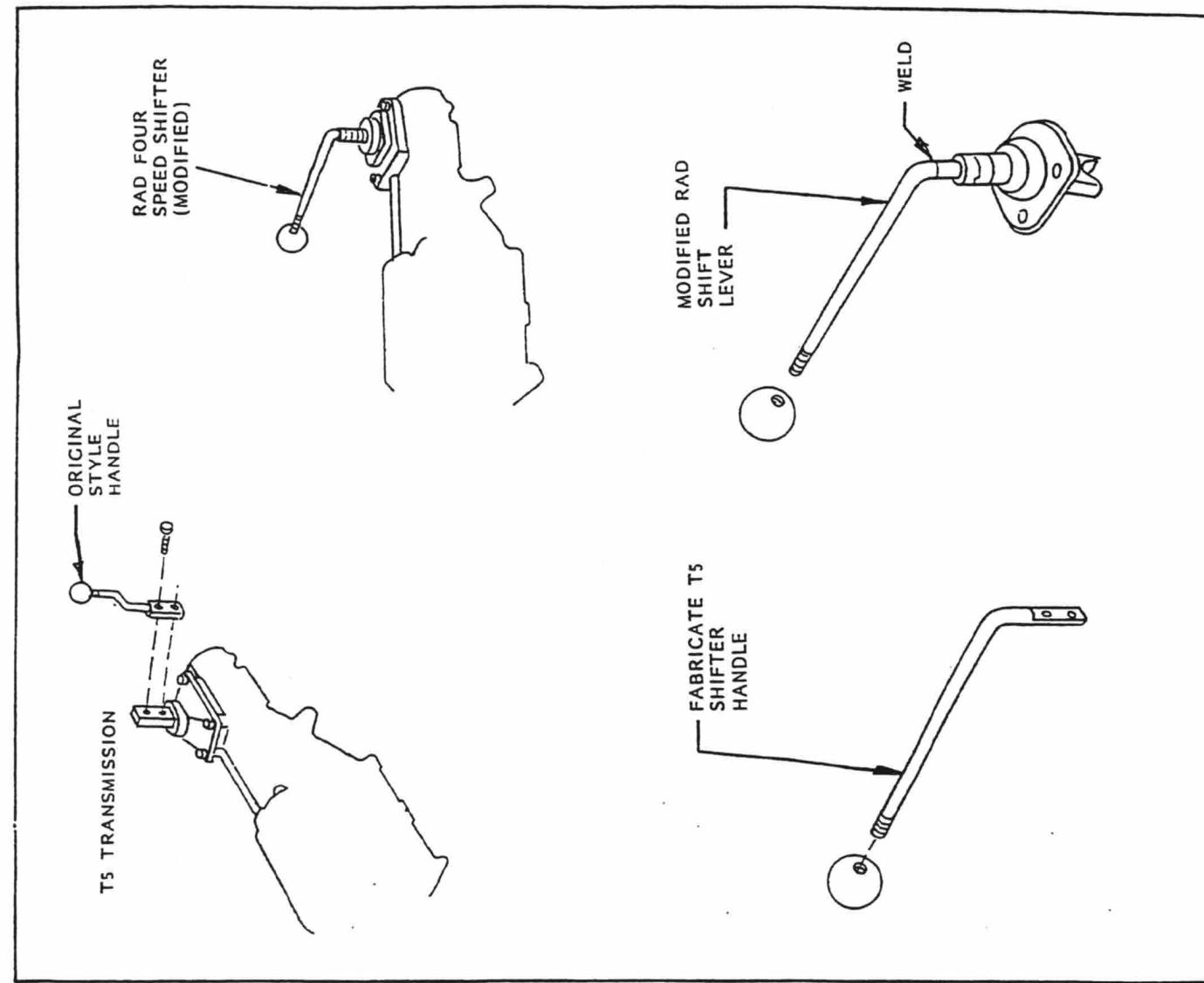


Figure 2-13



Cut the shifter handle off at the 1" mark. Place the shifter handle pointing forward. If necessary the handle may be bent forward further by placing the cut end in a vise and heating the handle with a torch to allow it to bend.

**CAUTION:** Do not try to bend the shifter handle without a torch. It is hardened steel and will break. Do not try to bend the shifter handle while it is still attached to the mechanism. This could damage the shifter fork, the nylon bushings, or the mount plate.

Once the shifter handle is modified to a better position have it welded back on in the new position.

**NOTE:** The shifter handle should only be welded on with either a mig or an arc welder to prevent damage to the nylon washers and bushings.

If you prefer the shifter handle to resemble a Cobra shifter cut the shifter handle off at the 1" mark, as previously described. The new handle may be made two different ways.

The first method is to use either a three or four speed shifter handle from a 1965 or '66 Ford Mustang. The four speed handle has a reverse tee on it. It may be left on but cannot be made functional. Cut the rectangular block off the bottom of the handle and position the handle on the mechanism and weld it into place.

Figure 2-14

The second method is to fabricate a new handle using  $5/8"$  solid rod. Start with a section of rod  $14"$  long. Take it to a machine shop and have the first  $3/4"$  of the rod turned down to  $13/32"$ . This will allow the rod end to be threaded with a  $10\text{mm} \times 1.5\text{mm}$  die which is the same thread as the shifter knob on the original handle from a Mustang II.

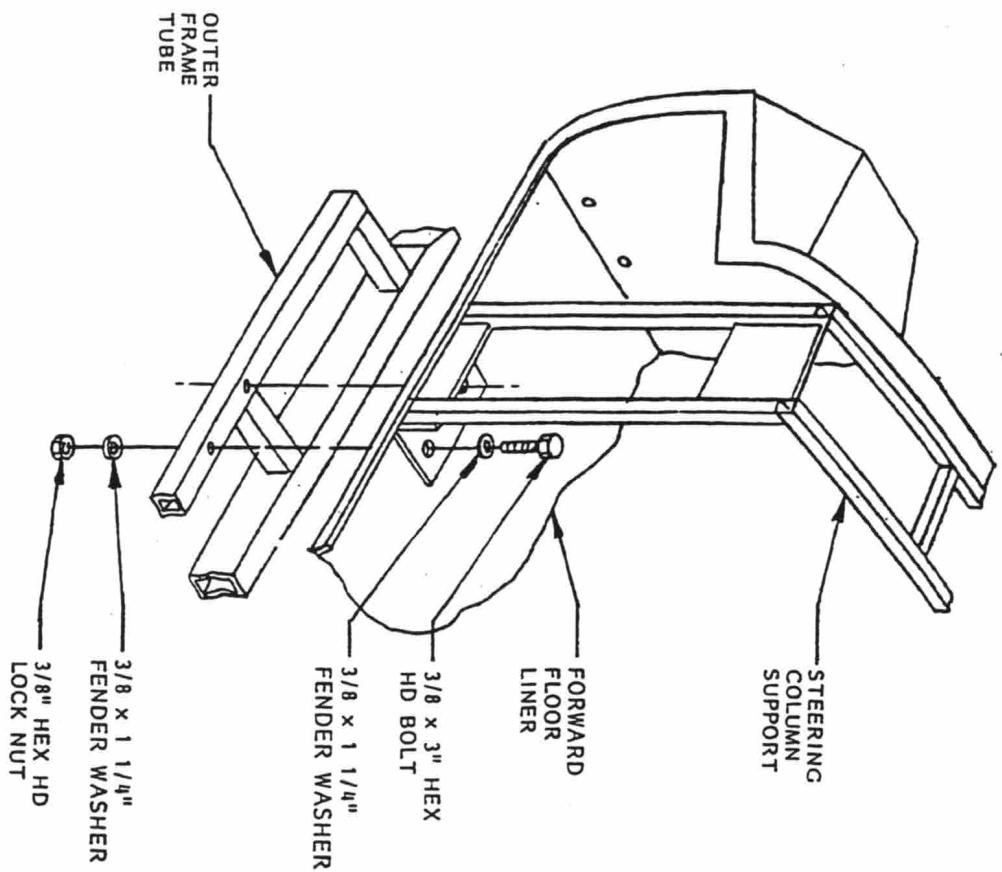
Taper the next  $7$  inches with the threaded end  $1/2"$  in diameter to  $5/8"$  diameter at the  $7"$  mark.

Place the rod into a vise with the jaws at the  $7"$  mark and the tapered section straight up. In order to keep the tapered section straight while bending the handle, insert the tapered section into a section of pipe or tubing. Use the pipe to bend the rod to a  $45^\circ$  angle and remove the rod from the vise. Cut the rod  $1"$  below the bend.

**NOTE:** If you wish to have the new handle chrome plated, it should be done before welding it to the shifter mechanism.

Position the new shifter handle on the mechanism with the knob facing forward and weld it into place.

The T-5 shifter handle bolts to the shifter mechanism. If you choose to fabricate a new handle for the T-5 mechanism, extend the length of the rod below the bend so that the new handle may be bolted to the mechanism. Drill and grind the end to match the T-5 mechanism.



**CHECK:** Upon completion of the modification to the shifter handle, check the shifter to insure smooth, safe operation of the shifter mechanism.

## FORWARD FLOOR LINER INSTALLATION

**PEDAL CLUSTER MODIFICATION**  
The Classic Cobra is designed to use the same pedal cluster as the 1974 through 1978 Mustang II, but

**CHECK:** From now until the completion of the body and door installation the frame must be kept level at all times to insure the proper installation of all body parts. Place a leveling device on the frame and check that it is level on the jack stands, from side to side and front to rear. Use paint sticks or spacers to level the frame on the jack stands. Check the level each time you start working on the car and especially if the car is taken off the jack stands.

If you have not already done so, place the forward floor liner back into position on the frame. Align the four holes on the floor liner with the four holes on the outer frame tube. Place the steering column support into position with the four holes on the support bases aligned with the holes in the frame tube and the liner. See Figure 2-15.

Attach the steering column support to the frame tubing using four  $3/8 \times 3 \frac{1}{4}$ " hex head bolts, eight  $3/8 \times 1 \frac{1}{4}$ " fender washers, and four  $3/8$ " lock nuts. Hand tighten only. Adjust the steering column support so that it is equally spaced from side to side on the forward floor liner. Tighten the bolts.

**PEDAL CLUSTER MODIFICATION**

The Classic Cobra is designed to use the same pedal cluster as the 1974 through 1978 Mustang II, but it must be trimmed to attach it to the steering column support. See Figure 2-16.

**NOTE:** When removing the pedal cluster from the donor Mustang II or from a Mustang II in an auto salvage yard, insure that you have all the bushings, retaining washers, pins, and the brake light switch for the pedal cluster.

Using a jag saw or a hack saw, trim the pedal cluster as shown in Figure 2-16.

## PEDAL CLUSTER INSTALLATION

On the gel coat side of the driver's foot well, the following hole locations are marked: the master cylinder, the clutch cable, and the master cylinder plate bolts. Using these marks as a guide, drill these locations to the appropriate sizes.

Power master cylinder	2 1/4" hole saw
Manual master cylinder	1 3/4" hole saw

Master cylinder bolts	3/8"	drill bit
Clutch cable	1 1/8"	hole saw
Clutch cable bolts	1/4"	drill bit

Once all the holes are drilled place the master cylinder mount plate over the cylinder.

into position on the gel coat side of the foot well. Attach the mount plate to the foot well and the mount plate angle using two  $3/8$  x  $1\frac{1}{2}$ " hex head bolts, four  $3/8$ " flatwashers and two  $3/8$ " lock nuts.

**CHECK:** After insuring that the frame is level, check the mount plate to insure that it is level also. If it is not, adjust the mount plate to level and tighten the bolts. It may be necessary to file some hole locations.

Drill two  $3/8"$  holes through the floor and the frame. Attach the mount angle to the frame using two  $3/8$  x  $3"$  long hex head bolts, four  $3/8$ " flat washers and two  $3/8"$  lock nuts. The additional mount angle is in the passenger's foot well. Use the same hardware as the driver's side.

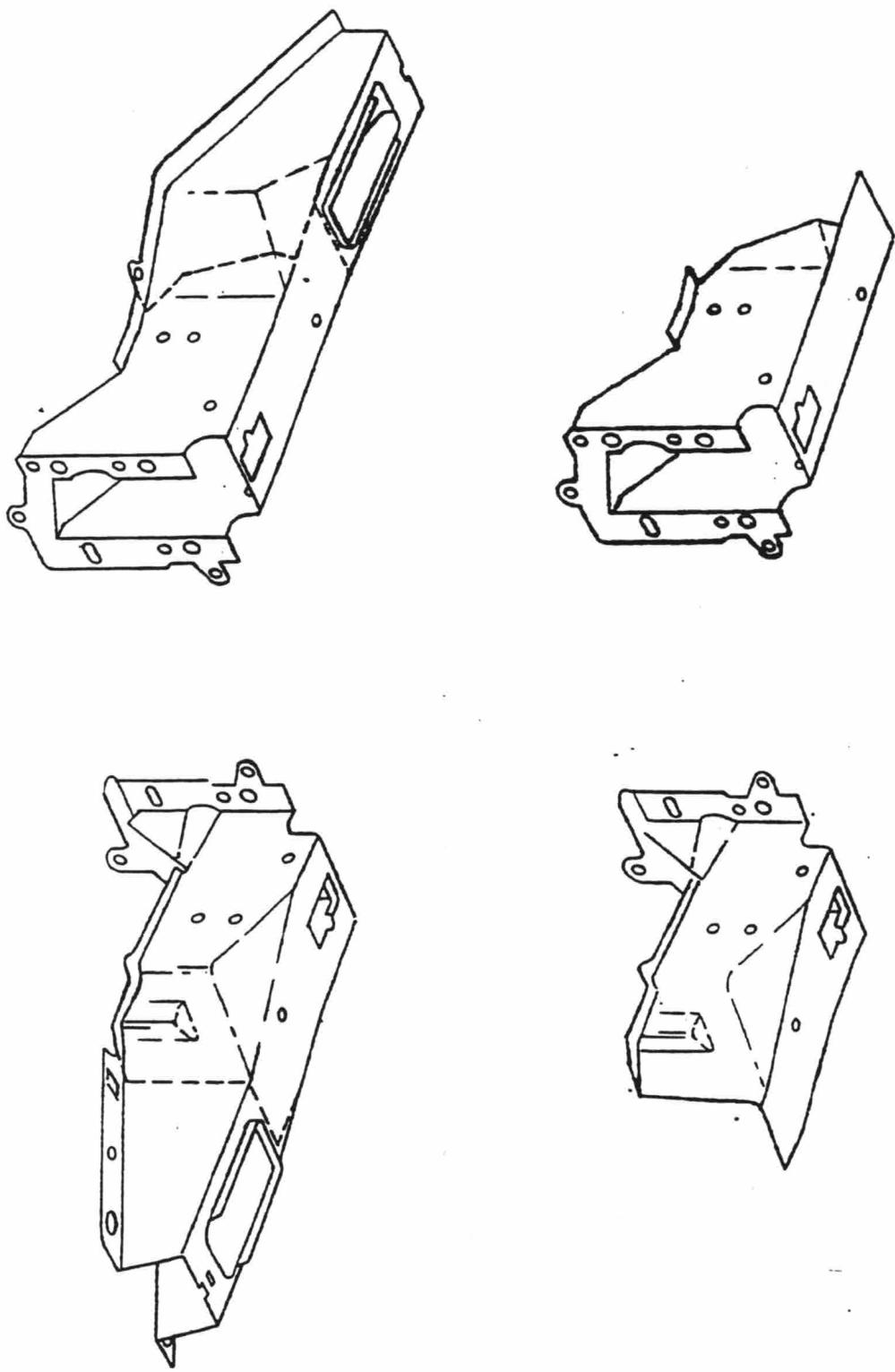
Place the pedal cluster into the foot well and clamp it to the steering column support. Align the holes on the pedal cluster with the holes on the mount plate.

**NOTE:** If you are using the manual master cylinder, you will need to drill two additional holes to mount the master cylinder.

Once the pedal cluster is aligned, drill two 5/16" holes through the pedal cluster and the support. Attach it to the steering column support, using two 5/16 x 1" hex head bolts, four 5/16" flat washers and two 5/16" lock nuts. See

Figure 2-16

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## CLUTCH CABLE INSTALLATION

Gently remove the studs from the clutch cable housing by tapping them out with a hammer. Insert the cable into the hole in the mount plate and attach it using two  $1\frac{1}{4}$  x  $2\frac{1}{2}$ " hex head bolts, four  $1\frac{1}{4}$ " flat washers, and two  $1\frac{1}{4}$ " lock nuts. Connect the cable end to the clutch pedal, using the original hardware. See Figure 2-18.

**CHECK:** Test the operation of the clutch pedal for binding and that the upper end of the pedal does not rub against the fiberglass in the upper foot well. It may be necessary to grind off some of the upper end so that it does not touch the fiberglass.

## SECTION G MASTER CYLINDER OPERATION

**NOTE:** The Classic Cobra was designed to use either a manual or power master cylinder from a Mustang II 1974 through 1978, along with the brake proportioning valve from the same. It is recommended that you get the fittings that connect the brake lines to the master cylinder and proportioning valve from a donor car or an auto salvage yard. This will eliminate the need for special adapters. If you are using a power master cylinder you will need to run a vacuum line to the engine.

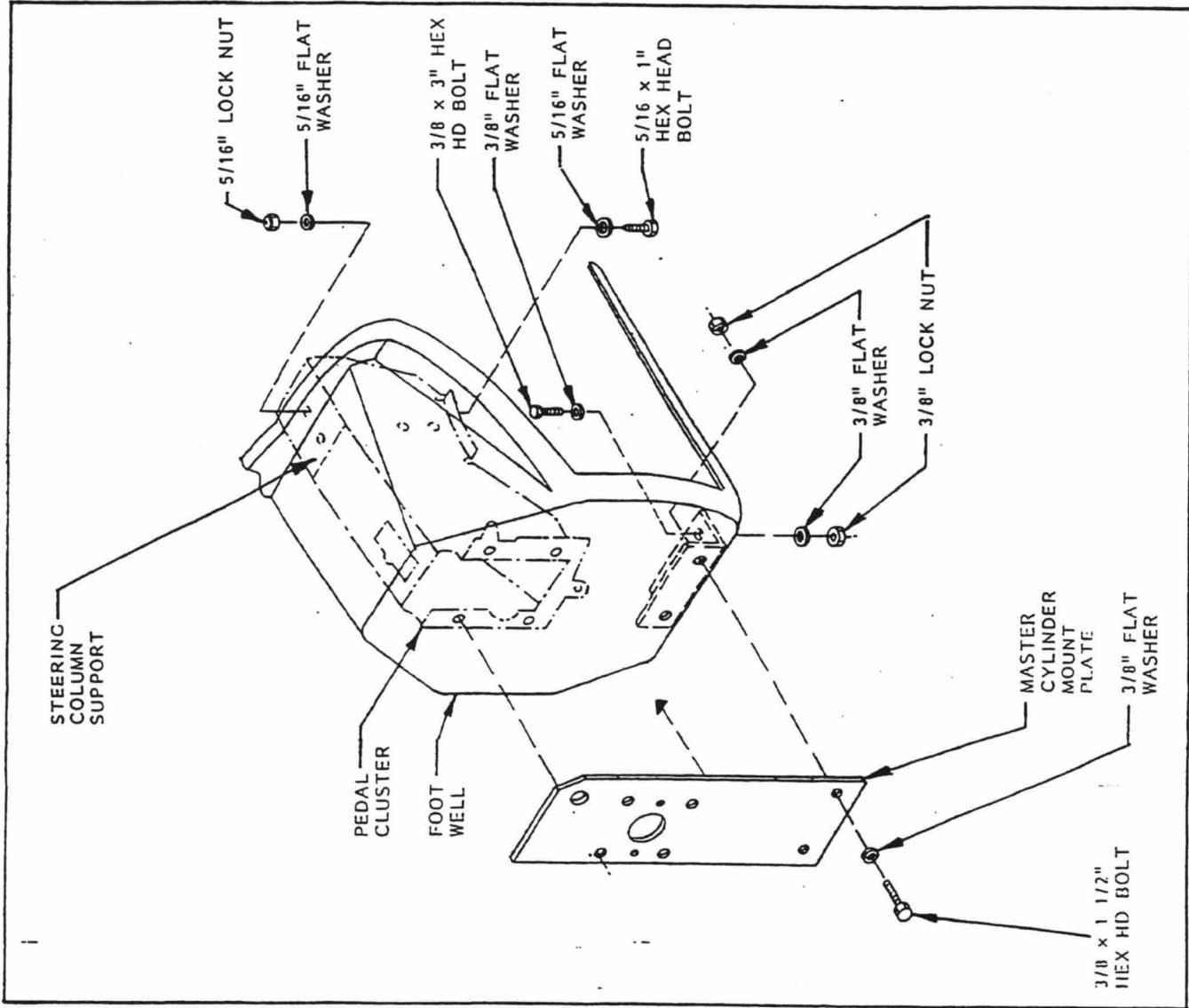


Figure 2-17

## BRAKE PROPORTIONING VALVE INSTALLATION

Mark the mount plate 9" up from its bottom edge; place a mark 1  $\frac{3}{4}$ " over from the outside edge of the mount plate at the 9" mark. Place another mark 7/8" above the 1  $\frac{3}{4}$ " mark. The last two marks are the hole locations for the proportioning valve. Drill two 5/16" holes through the marks and attach the proportioning valve to the foot well, using two 5/16" flat washers, and two 5/16" lock nuts. See Figure 2-20.

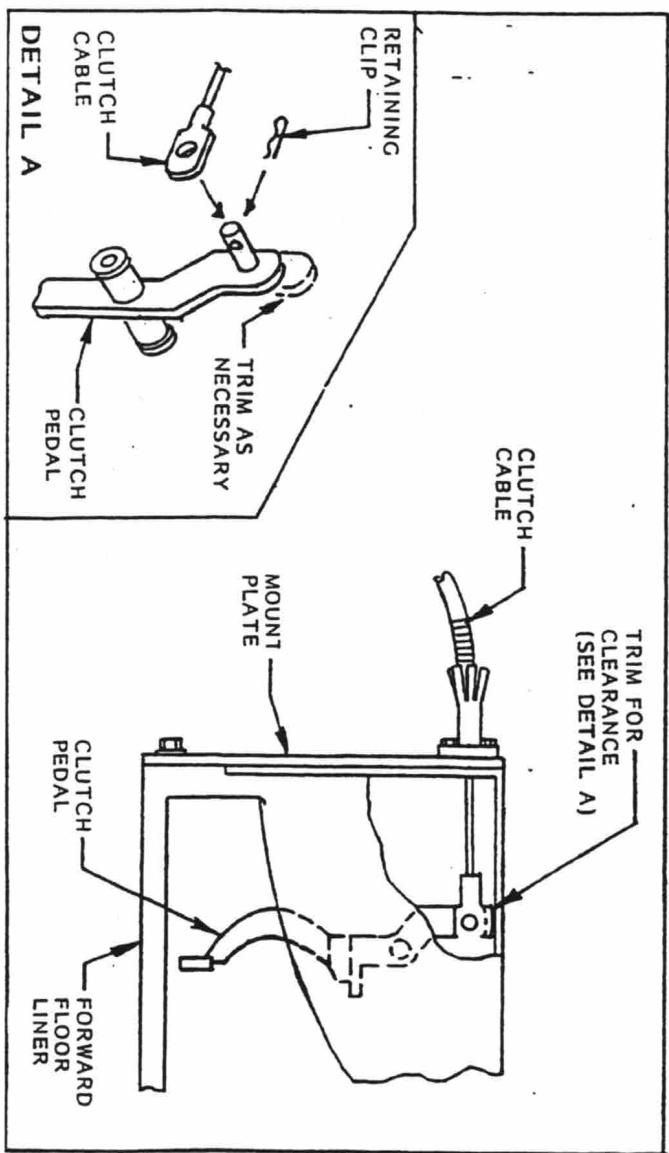


Figure 2-18

Slide the master cylinder mounting studs through the holes in the mount plate and the pedal cluster. Attach the master cylinder using four 3/8" lock nuts and four 3/8" flat washers. See Figure 2-19.

Install the brake light switch onto the master cylinder push rod and attach the push rod to the brake pedal, using the original hardware.

**WARNING:** If the nylon bushing and washer for the brake light switch are installed incorrectly or not installed, the brake light will be intermittent or will not work at all. The original brake light switch hardware must be reused or replaced with the correct hardware from Ford.

**NOTE:** This section covers the basic installation of the brake lines using the Mustang II components. Alternate brake set-ups for the Mustang II front suspension and the late model Ford Rear Axle are available from after-market manufacturers, but are not covered in this manual.

**CHECK:** All brake components should be thoroughly inspected before installation. All brake pads and brake shoes should be replaced at this time. All rotor and drum braking surfaces should be checked for wear, grooves and warping of the rotor. Replace, as necessary, and paint as desired.

If you are using a manual master cylinder, attach the pedal cluster to the mount plate using four 3/8 x 2" hex head bolts, eight 3/8" flat washers, and four 3/8" lock nuts. Install the master cylinder using two 3/8 x 2" hex head bolts, four 3/8" flat washers, and two 3/8" lock nuts.

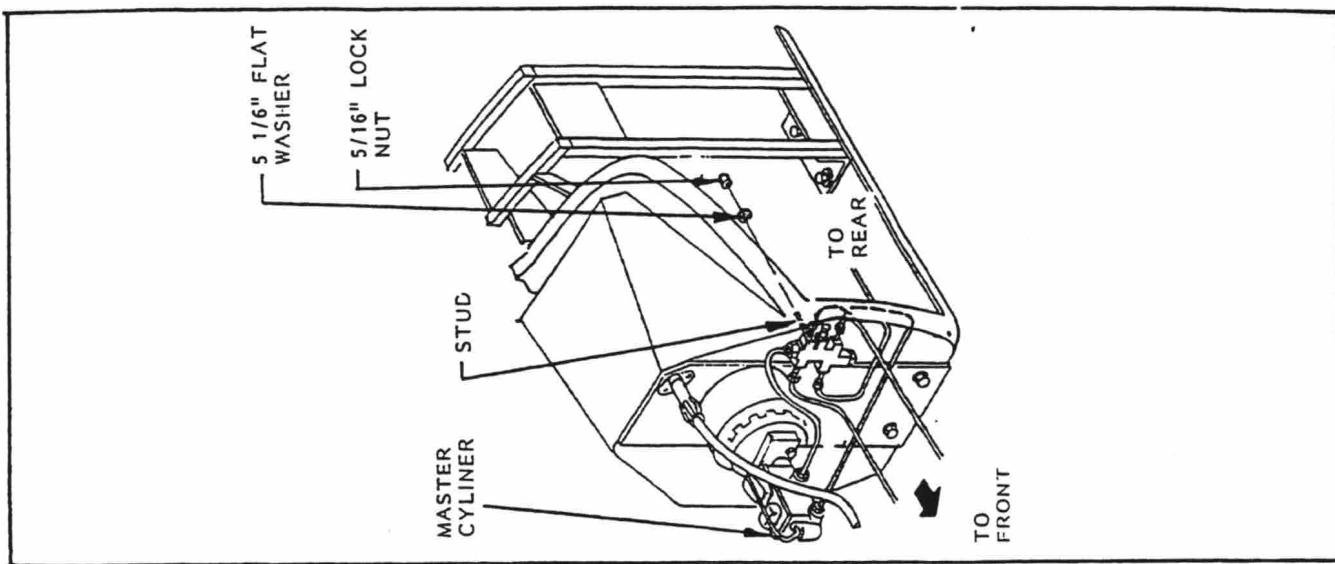


Figure 2-20

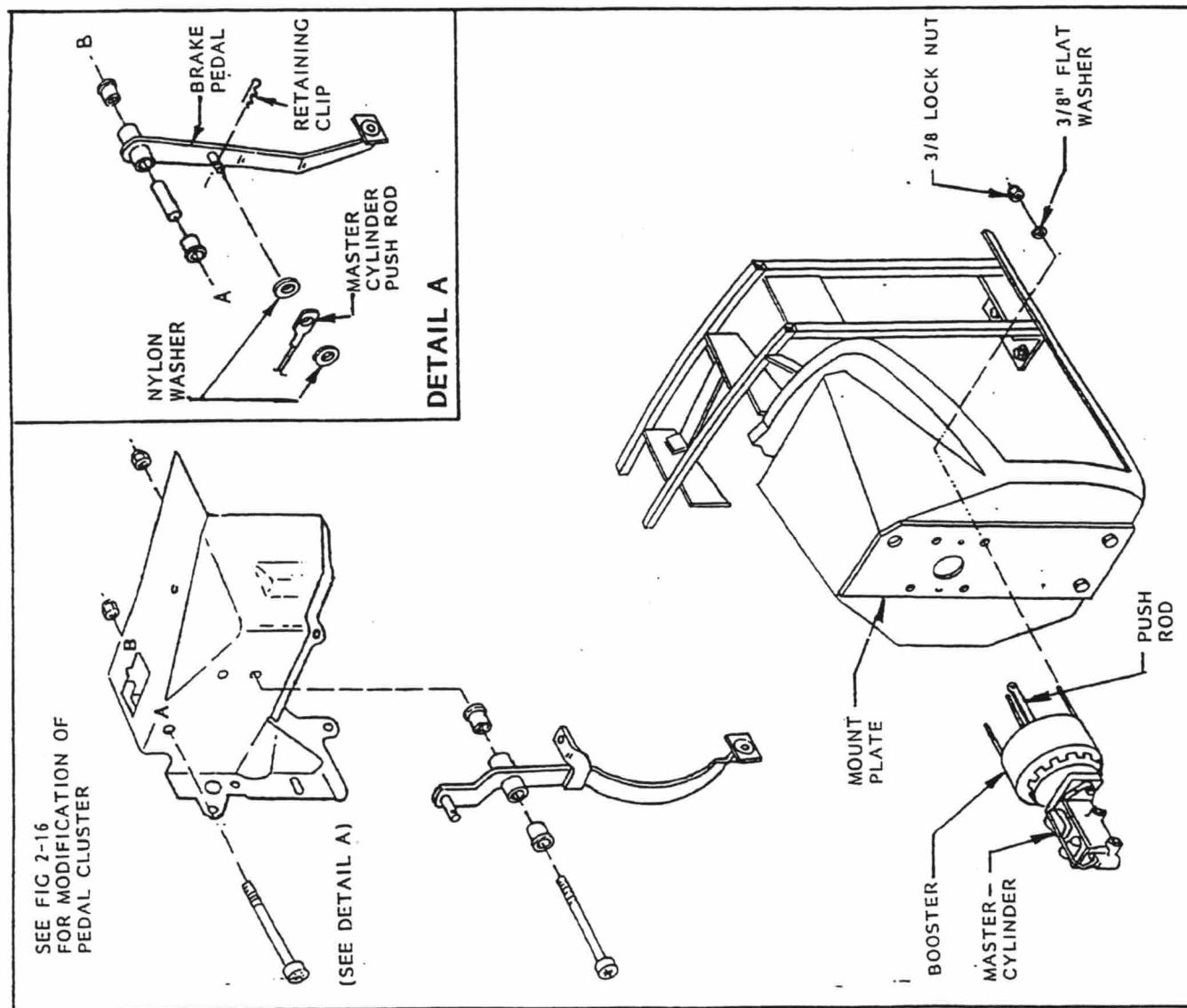


Figure 2-19

2-27

## BRAKE LINE INSTALLATION HINTS

Use a tubing bender to bend all lines.

Plan out how the lines will run along the frame. Make your installation look professional.

Remember to make allowances for items not yet installed i.e: exhaust, steering and radiator.

Always use padded clamps.

Use the longest possible brake lines you can find. Keep the number of couplings to a minimum. Remember, the more couplings you have, the more chances for leaks. Couplings should have clamps positioned on either end to prevent vibration from loosening them.

Never run lines between the frame and the ground.

Avoid getting Grease or paint on the braking surfaces. Clean with denatured alcohol or an appropriate disk brake cleaner.

When bending, do not crimp or pinch the lines.

Never loop the lines. Looping the lines will create an air trap that is very hard to bleed out of the lines.

## FRONT DISK BRAKE AND BRAKE LINE INSTALLATION

Grease and install the inner and outer wheel bearings on the rotor disk. Install the inner dust seals and the brake shields on the spindles. Install the rotor on the spindle and tighten the rotor hub nut to Ford specifications. Install the cotter pin and the dust cap. Install the caliper and the caliper mount as one unit and torque the caliper mount bolts to Ford specifications.

**WARNING:** Care must be taken to avoid damaging the brake pads during the installation of the callipers.

Once the calipers have been installed, attach the brake hose to the callipers. Attach the tie rod ends to the spindles and position the brake hose mount so that the steering can be moved from lock to lock, without putting any strain on the brake hoses. Mark their position onto the frame. Drill  $7/32"$  holes and attach the mounts to the frame, using two  $1\frac{1}{4} \times 5\frac{1}{8}"$  self-tapping hex washer head screws. Clip the brake hoses to the mounts. For suggested installation see Figure 2-21.

The rear axle brake hose is installed in the same manner. Make sure that the brake hose will not be put under any strain during the up and down movement of the rear suspension. Mark the hose mount position and drill a  $7/32"$  hole and attach the mount to the frame, using one  $1\frac{1}{4} \times 5\frac{1}{8}"$  self-tapping hex washer head screw. Clip the brake hose to the mount.

The brake lines should be made starting from the outermost point. i.e.: the brake hose mounts, starting at the rear axle hose mount, bend the line so that it travels along the back side of the upper control arm frame tube until it reaches the gas line. Then bend the line so that it is positioned alongside the gas line until it reaches the front of the driver's foot well. Bend it up and across the front of the foot well and master cylinder mount plate and connect it to the proportioning valve. See Figure 2-21, Detail A.

Starting with the right hand front brake hose mount, bend the brake line so that it travels along the top of the crossmember. Bend it again to travel along the top of the frame, just behind the left hand upper control arm, until it reaches the rear brake line. Bend it alongside the rear brake line and attach it to the proportioning valve.

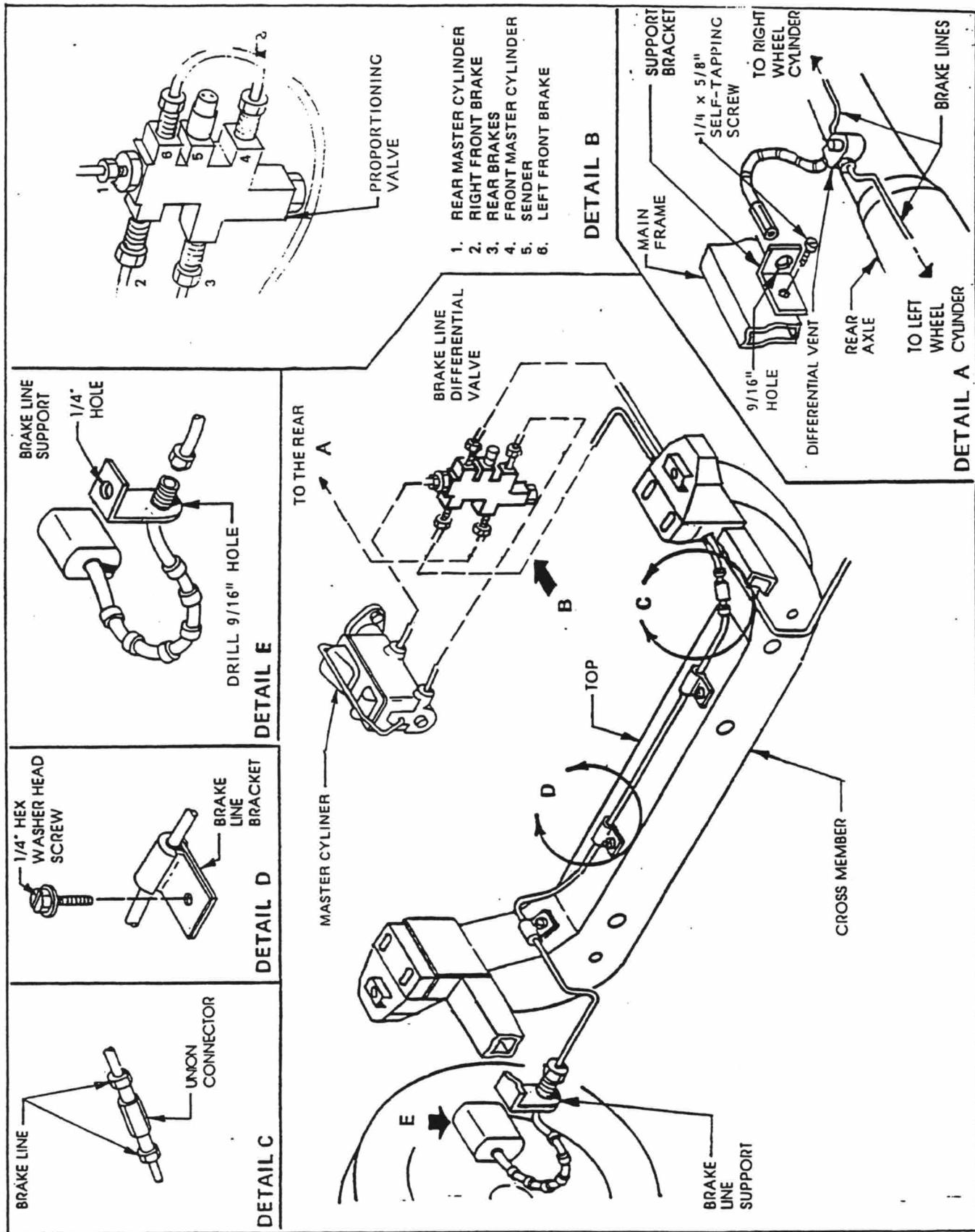


Figure 2-21

2-29

Bend the left front brake line alongside the right front brake line alongside the right front brake line and connect it to the brake proportioning valve.

Clamp all lines along the frame, using 3/16" padded line clamps. The clamps should be equally spaced along the frame at 12" intervals. The clamps should support a coupling, while not actually touching it. The clamps should be attached, using 8 x 1/2" hex washer head self-tapping screws. Attach the clamps on the foot well, using #8 x 1/2" philips head machine screws, #8 flat washers, #8 lock washers, and #8 hex nuts.

Run two brake lines from the master cylinder to the brake proportioning valve. The small reservoir is for the rear brakes, and the large reservoir is for the front brakes. See Figure 2-21, Detail B.

#### BRAKE BLEEDING

Loosen all brake nipples and fill the master cylinder with brake fluid. Close the brake nipples on each wheel when the brake fluid starts to come out of them. Some pumping may be required to move the brake fluid to the individual wheel cylinders.

NOTE: To complete the brake bleed process, additional help is required. It is also suggested that a container be used to catch all used brake fluid.

Starting with the right rear brake cylinder, have your assistant gently pump the brake pedal until it starts to feel firm. He should then hold the pedal down, while the brake nipple is opened and the air bubbles are held out; then close the nipple before pumping again. This process should be repeated several times to ensure that all air is purged from the system. Once you have completed the right rear, repeat the process with the left rear, the right front, and the left front. After all four brakes have been bled, check the brake pedal.

It should feel firm, not spongy, nor should it go down to the floor when the pedal is pressed. If the pedal is spongy, or goes to the floor, check the lines for leaks and repeat the process for all four brakes, until the pedal is firm. CHECK: Monitor the brake fluid level in the master cylinder throughout the process to ensure that you have enough brake fluid at all times.

#### CHEVETTE STEERING COLUMN MODIFICATION

#### CHEVETTE STEERING COLUMN

The Chevette steering column requires only three modifications to allow it to be used in the Class-Cobra. The first of these is to remove the tab on the bottom of the steering column cover. See Figure 2-22, Detail A.

Second, cut off the white plastic ring around the steering shaft at the bottom of the steering column cover. The final modification is to cut off the tapered section at the very end of the steering column shaft. Once the tapered section has been removed file or sand the end of the shaft to allow it through the fire wall bearing.

#### CAMARO/FIREBIRD STEERING COLUMN

Once this has been completed, check the rear brakes for adjustment. This should be done by slowly turning the wheels and listening for the brake shoes lightly dragging on the wheel drums. Some adjustment may be necessary. See Figure 2-22, Detail B.

#### SECTION H STEERING COLUMN INSTALLATION

The Classic Cobra has been designed to use either the

Chevrolet Chevette tilt or non-tilt steering column or the late model Camaro/Firebird tilt column. This will allow you to take advantage of the many after-market accessories available for these type

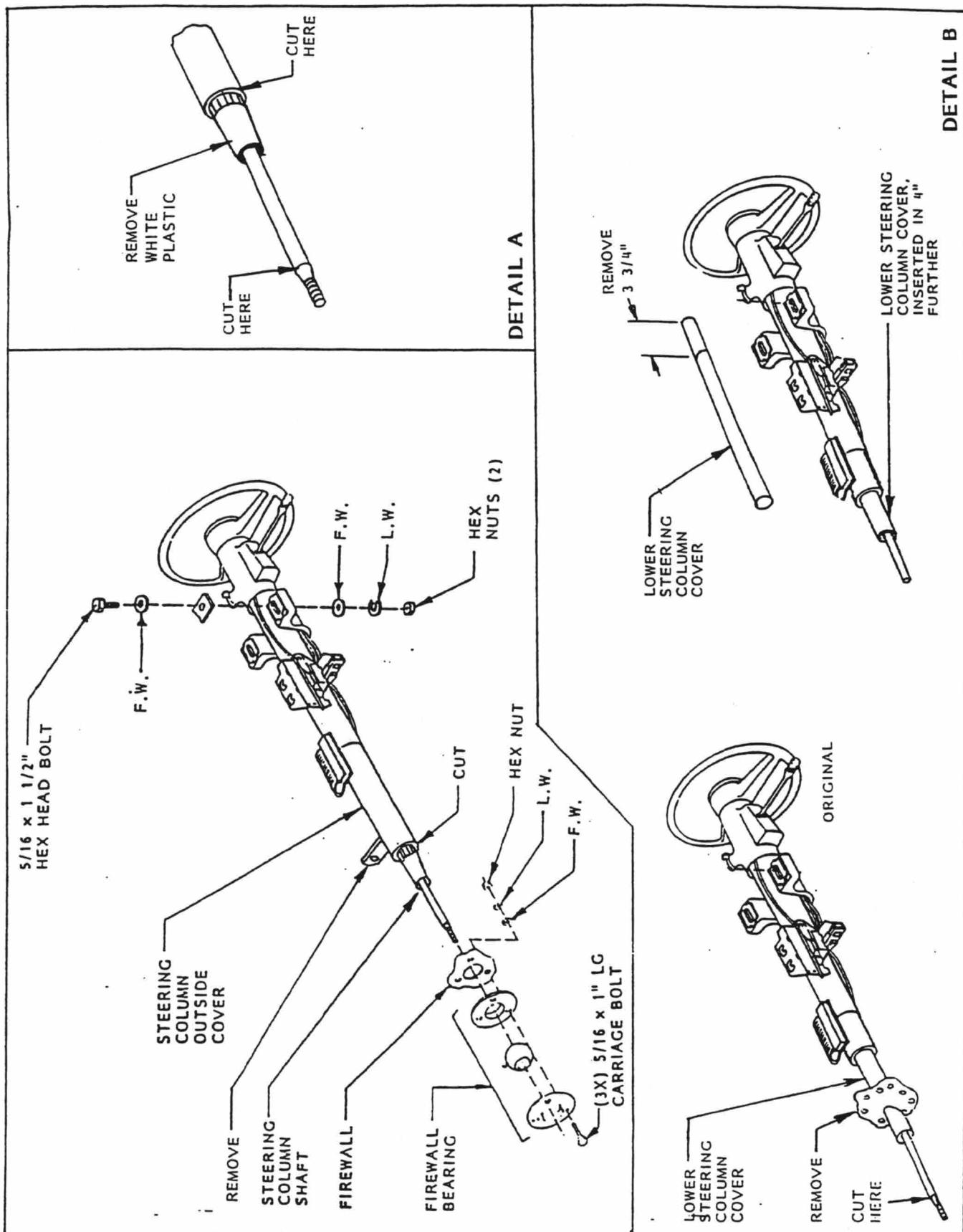


Figure 2-22  
2-31

First take off the ring that holds the bearing on the cover. Then use a common screwdriver to gently pry the bearing from the lower cover. Mark a line along the lower cover and the upper cover so that they may be aligned later.

The lower steering column cover has a large flange that is used to attach it to the fire wall in a Camaro or Firebird. Place a wooden block against this flange and hit the block to slide the lower cover out of the steering column.

**WARNING:** The lower cover is held in place with a bearing. Care should be taken to avoid damaging the bearing while removing the lower cover. Work in a clean area so that any ball bearings that may fall out, can be recovered quickly. Once the lower cover has been removed, mark the upper section  $3\frac{3}{4}$ " from the upper end. Use a hack saw or a pipe cutter to make a straight cut through the cover. File or sand the complete cut to allow it back into the upper section bearing.

Use a hack saw to remove the mounting flange from the lower cover, trimming it as close to the cover as possible. You may wish to grind or file the flange area to remove any sharp edges. Insert the lower cover back into the steering column and gently tap it back into the bearing. Continue

to tap the lower cover in until the end is 4" from the upper section bearing. Align the marks on the two sections and reinstall the lower cover bearing onto the steering shaft; then install the bearing retaining ring.

On the gel coat side of the foot plate, the location of the fire wall bearing is marked, using a  $2\frac{1}{8}$ " hole saw. Drill out the location for the fire wall bearing. See Figure 2-22.

**NOTE:** The fire wall bearing flanges will extend past the right edge of the foot well. The area of the flanges should be trimmed off for a neater appearance.

Assemble the fire wall bearing and both flanges. Install it on the gel coat side of the foot well, with the grease fitting facing forward and upward. Mark the three flange hole locations onto the foot well; also mark the area of the flanges that extend past the gel coat edge.

Drill three  $5/16$ " holes through the marks for flange bolts. Trim the flange with a hack saw or grinder and file or sand to remove any sharp edges.

Install the fire wall bearing using three  $5/16 \times 1$ " carriage bolts, three  $5/16$ " flatwashers, three  $5/16$ " lock washers, and three  $5/16$ " hex nuts.

## STEERING COLUMN INSTALLATION

**NOTE:** The bracket welded to the steering column support is for the Chevette column. If you are using the Camaro/Firebird column, attach the additional steering column bracket to the steering column, using two  $3/8 \times 1\frac{1}{2}$ " hex head bolts, four  $3/8$ " flat washers, and two  $3/8$ " lock washers, and two  $3/8$ " hex nuts.

To insure that the steering column is installed correctly, the blank dashboard must be installed at this time. The installation of the dashboard is covered in Chapter 2, Section J. See Figure 2-33.

Insert the steering column shaft through the fire wall bearing and attach the Chevette column to the steering column support, using two  $3/8 \times 1\frac{1}{2}$ " hex head bolts, four  $3/8$ " flat washers, two  $3/8$ " lock washers, and two  $3/8$ " hex nuts. Adjust it to the dashboard opening and tighten the bolts.

If you are using the Camaro/Firebird column, attach the additional steering column bracket to the steering column, using the same hardware as the Chevette column.

## STEERING LOCKS

Place one of the steering column shaft locks onto the steering column shaft. See Figure 2-25.

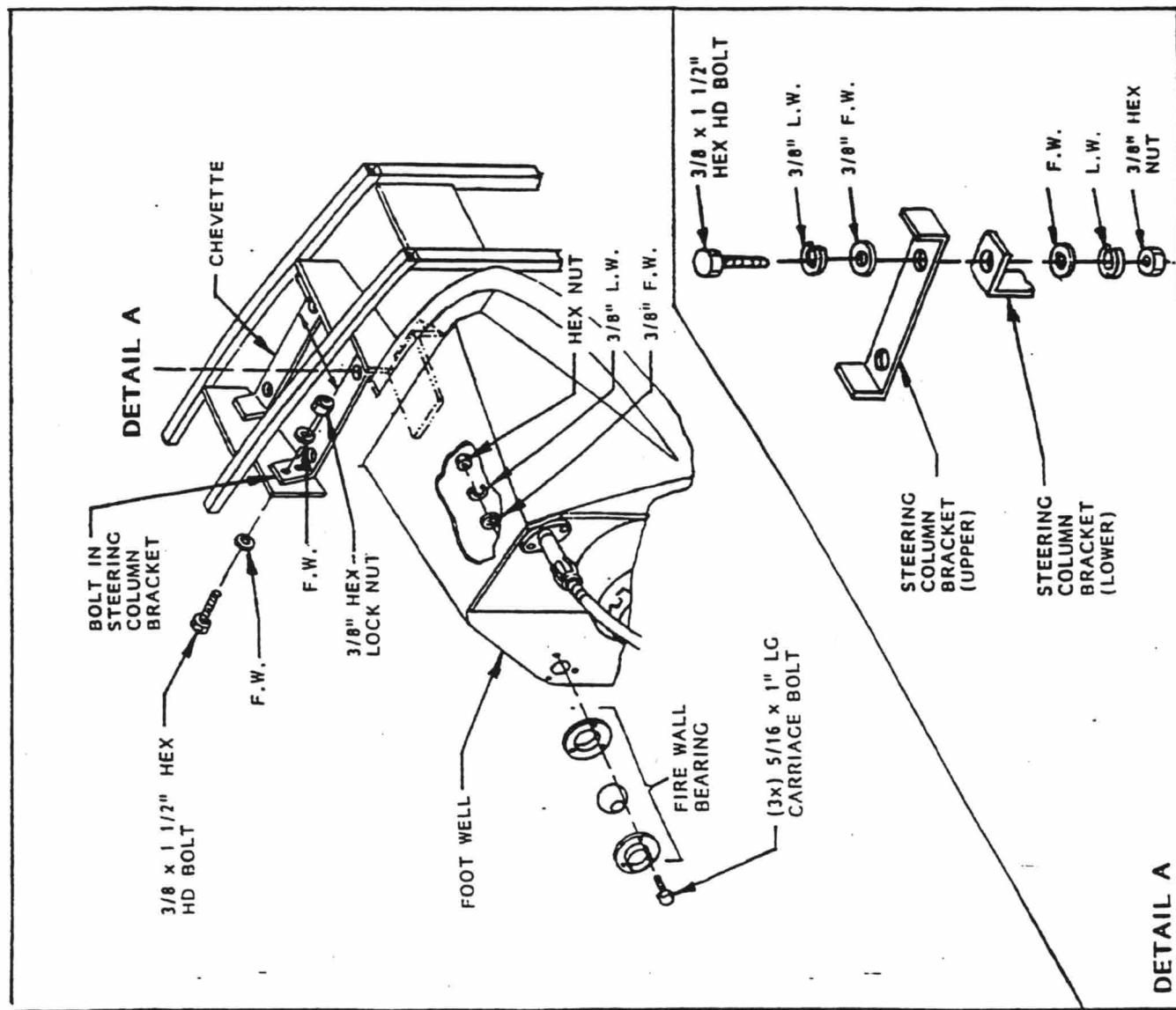
Insert the steering column shaft through the fire wall bearing and place the other steering column lock onto the steering column shaft.

Tighten the allen set screw on each lock just enough to hold them in place. Raise the steering column into position in the dash board opening and tighten the bolts on the steering column bracket.

After the steering extended link is installed and the steering has been checked, place each lock against the fire wall bearing and securely tighten the locks onto the steering shaft.

Measure from the rear edge of the Camaro steering column bracket to the rear edge of the Chevette steering column bracket. Slide the column in or out of the fire wall bearing until that measurement is 15 1/2".

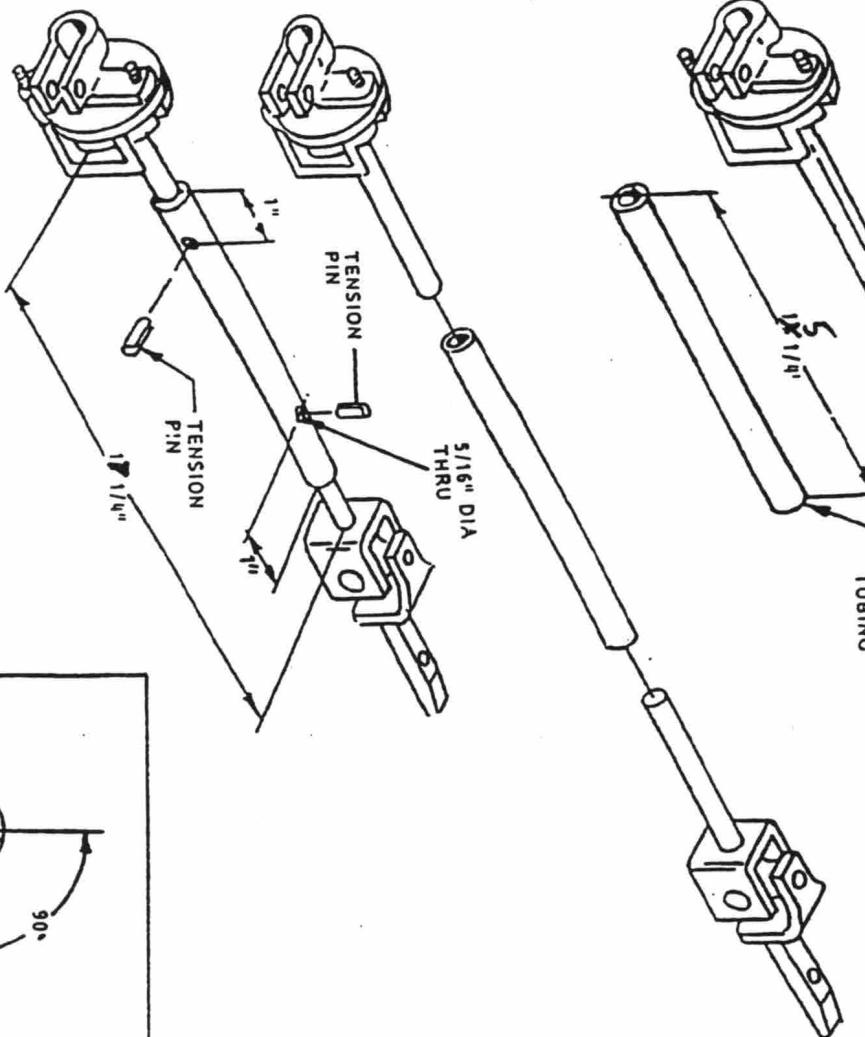
Clamp the steering column bracket securely into place and drill four 3/8" holes through the bracket and the plates. Then attach the bracket to the steering column support, using four 3/8 x 1 1/2" hex head bolts, eight 3/8" flat washers, and four 3/8" lock nuts.



LINK  
ASSY

SCRIBE  
LINE  
CUT  
HERE

5/16" I.D.  
TUBING



#### EXTENDED STEERING LINK FABRICATION

**NOTE:** Use a center punch to mark the hole locations and to prevent the drill bit from walking. Start with a smaller bit, such as 1/8", and work up to a 3/8" drill bit. This will make it easier to drill through the bracket and plates. If you have access to a mig or arc welder the bracket may be welded into position instead.

**NOTE:** The extended steering link is available as an optional part, so that you will not have to fabricate your own.

Attach the steering flange to the rack and pinion unit. You will need to purchase the following parts to fabricate the extended steering link:

- 1 Ford link assembly  
Pt. #D9BZ-3B676-B
- 1 15 1/4" long 3/4 I.D. steel tubing with at least an 1/8" thick wall
- 2 5/16 x 1 1/4" tension pin
- 2 ft. of .040 safety wire

DETAIL A

Figure 2-24  
2-34 (0941-01)

Measure the length of the steering shaft that comes out of the fire wall bearing. Mark the exposed steering shaft  $3\frac{3}{8}$ " from the fire wall bearing. Cut off the excess shaft.

Mark the Ford link assembly with a straight line from a tab for the rubber coupling to the universal on the opposite end. This is your alignment line and must not be removed until the link is completed.

Cut the link assembly in half, and attach the section with the rubber ring to the steering flange on the rack and pinion assembly. Slide the steel tubing onto the lower section of the link assembly. Insert the universal section of the link assembly into the upper section of the tubing. Slide the insert side of the universal into the steering shaft.

Position the upper and lower sections of the Ford link assembly so that they are in perfect alignment. Measure from the tab for the rubber coupling to the bottom of the universal. See Figure 2-24.

Slide the upper section up until this measurement is  $1\frac{1}{4}$ ". Position the tubing so that it is equally spaced between the two sections. Once you have the ends

aligned, the tubing equally spaced and the correct length, tack weld the tubing to the ends of the link assembly.

**NOTE:** A mig or arc welder should be used to tack weld the tubing to the ends. The tack welds must be good enough to hold the end in position while checking the straightness of the extended link and installing the tension pins.

Install a wheel onto the left front rotor. Turn the wheel from lock to lock, so that the rack and pinion moves the extended link.

**CHECK:** Insure that the end on the extend link are straight and aligned. You may notice a slight wobble where the universal enters the steering shaft.

Once the extended link has been checked for straightness, remove the extended link from the chassis by disconnecting it from the steering flange on the rack and pinion.

Place the link into a vice and drill two  $5/16$ " holes through the tubing and the end of the links. Rotate the link 90 degrees and drill two more  $5/16$ " holes through the tubing and link ends. See Figure 2-24, Detail A.

Using a vise or a hammer, insert a tension pin through each of these holes.

After the tension pins have been installed, cut or grind off the exposed section of the tension pins. Cut four pieces of safety wire, 8 inches long. Insert the safety wire through the tension pins until there is about 1 inch on one side. Wrap the safety wire around half of the tubing and insert it through the tension pin again. Wrap the safety wire around the other half of the tubing and twist the two ends together.

**NOTE:** Start twisting the ends together as close to the tension pin as possible. A pair of needle nose pliers or vise grip pliers may be used to twist the safety wire together. Do not twist the ends tighter than 12 twists per inch or the safety wire may break.

**NOTE:** Cut the twisted ends off an inch from the tension pin and bend the cut end back towards the tension pin so that the sharp edges are not exposed. Repeat for the other pin.

Once both pins have been safety wired the extended link tube should be fully welded, prior to being installed.

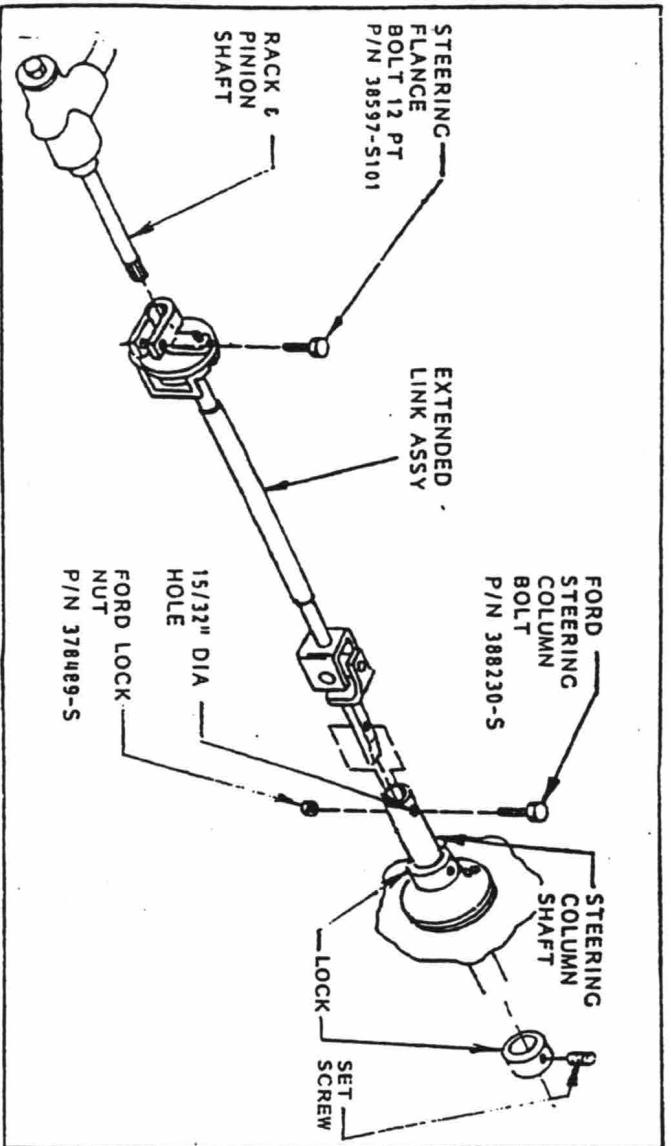


Figure 2-25

#### EXTENDED LINK INSTALLATION

Mark the hole location, using a center punch, and remove the extended link.

Measure from the universal flange to the center of the bolt hole or the steering column connector.

Insert the steering column connector into the steering column and attach the extended link assembly to the rack and pinion flange. See Figure 2-25.

Place the steering wheel and the front wheel or rotor disc, as if the car was going straight ahead. Mark the steering shaft with location for the connecting bolt, using the previous measurement. The location of the bolt hole on the extended link connector and the steering column shaft should be facing straight up.

Substitute bolt and lock nut, that is grade 8 or stronger. Reattach the rack and pinion flange to the extended link and tighten all nuts and bolts to Ford specifications.

**CHECK:** Move the steering wheel from lock to lock to check for any binding and for straightness of the link.

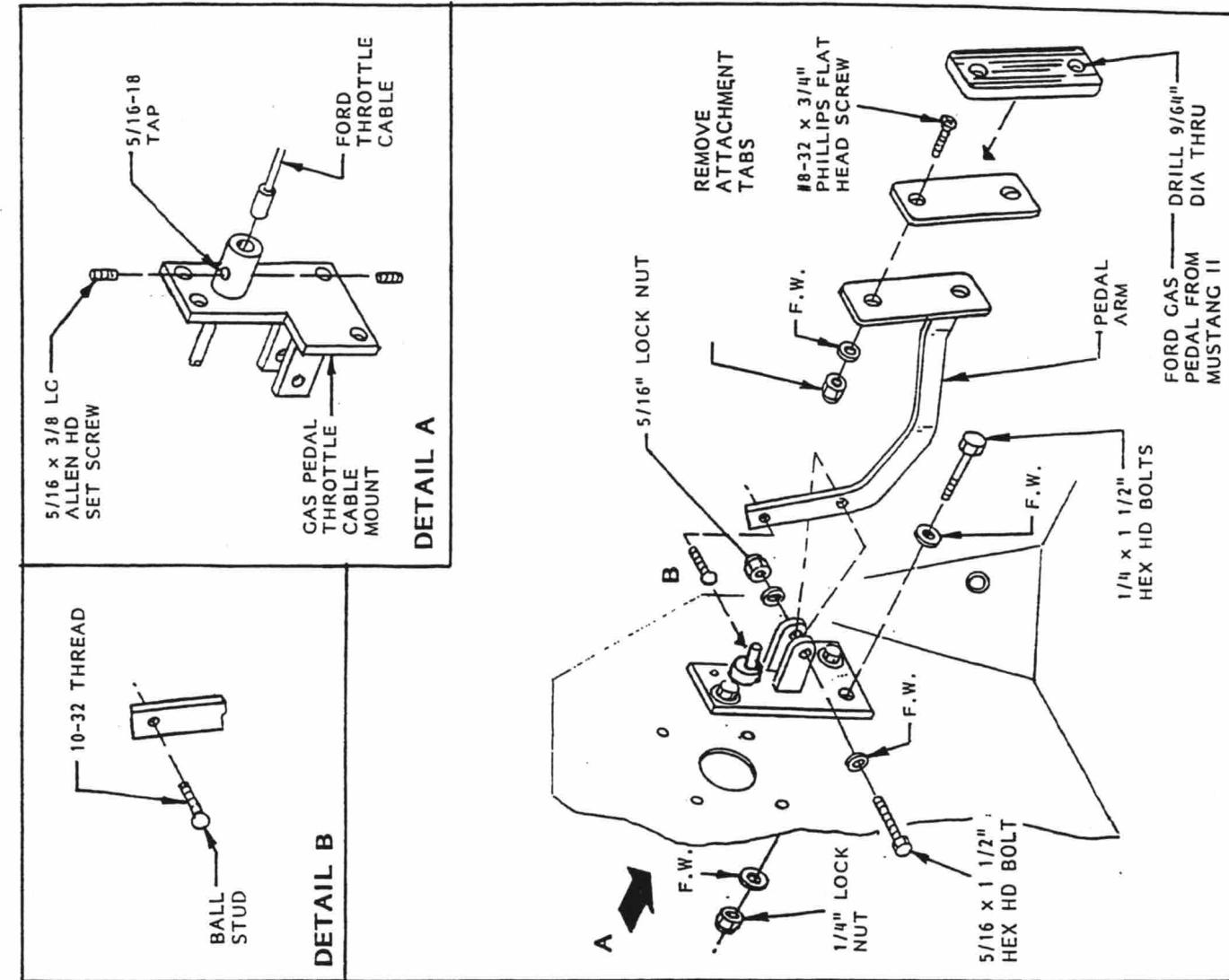
To correct the slight wobble on the universal end of the link assembly, tack weld the steering column shaft to the link assembly's steering column connector. Tack weld in at least four places, while insuring the connector is centered in the shaft.

**NOTE:** The connector may be fully welded if you do not plan to remove the column later. There will be no need to remove the column or the link assembly during the assembly process.

#### ACCELERATOR INSTALLATION

Because of the locations of the foot well and engine, it is not possible to use the Mustang II throttle cable and accelerator pedal assembly. Instead your kit has an accelerator pedal arm and mount. You will need an accelerator cable from Ford, Part No. C8UZ-9A758-A, and the pedal pad from the Mustang II pedal assembly.

Remove the gas pedal pad from the Mustang II pedal assembly, by tapping the retaining pin through the pedal arm. Cut or grind off the mounting tabs from the gas pedal pad. Position it onto the



pedal arm supplied with your kit and drill two 1/4" holes through the pad and the plate on the arm. Countersink the holes on the pad and attach the pad to the plate, using two 1/4 x 1" flat head allen machine screws, two 1/4" flat washers, and two 1/4" lock nuts.

Attach the pedal arm to the throttle cable mount, using one 5/16 x 1 1/2" hex head bolt, two 5/16" flat washers, and one 5/16" lock nut. Tighten enough to allow the pedal to swing freely. See Figure 2-26.

Have an assistant hold the pedal/throttle cable mount against the forward foot well.

Sit in the chassis and have your assistant position the mount to the location that feels the most natural for you. Mark the location of the throttle sleeve and drill a 1 1/8 inch hole at that location, using a hole saw.

Drill a 1/4" hole straight through the throttle sleeve on the gas pedal mount, using a 5/16-18 tap. Thread each hole on the throttle sleeve. Install two 5/16 x 3/8" allen head set screws into the holes.

Mark the top end of the pedal arm 3/8" down. Drill a 5/32" hole through this mark. Thread this hole using a No. 10-32 tap. Install the throttle cable ball stud into the hole.

Slide the throttle sleeve through the hole in the foot well and drill three 1/4" holes through the hole on the mount plate.

Figure 2-26

Attach the mount plate to the foot well, using three  $1\frac{1}{4} \times 1\frac{1}{2}$ " hex head bolts, six  $1\frac{1}{4}$ " flat washers, and three  $1\frac{1}{4}$ " lock nuts.

The throttle cable suggested for use has two similar ends. The end with the tab mounts to the throttle cable mount, on intake manifold. Slide the other end into throttle sleeve and tighten the  $5/16$ " allen set screws to hold it in place. Attach the cable end to the ball stud on the top of the pedal arm. Attach the tab to the throttle cable mount on the intake manifold and the cable end to the ball stud on the carburetor linkage.

**CHECK:** Test the operation of the throttle cable. Ensure that the carburetor linkage moves freely throughout its travel, from wide open, down to idle. It may be necessary to modify the cable mount to allow the carburetor linkage to move freely and completely through its travel.

**NOTE:** Because of the various types of manifolds and carburetors that may be used on the small block Ford engine, it may be necessary to fabricate a throttle cable mount to fit the carburetor/ manifold combination you are using.

## AUTOMATIC KICKDOWN LINKAGE INSTALLATION

The Classic Cobra has ample space between the engine, transmission

and the front cockpit liner. This will allow the use of most stock automatic kickdown rods.

## SECTION I

### RADIATOR AND HOSE INSTALLATION

The Classic Cobra uses the same type radiator as the 1974-78 Mustang II originally equipped with a 302 V8. This radiator requires no modifications for installation and has sufficient cooling capacity for all small block Ford engines. An electric fan is recommended for use with this radiator and basic installation instructions for the fan are located in the following section.

Remove the original bolts and clips from the radiator and slide the radiator down onto the radiator mount tubes located forward of the front suspension cross member. The upper radiator mounting flange must be positioned on the rear of the mount tubes. Clamp the upper flanges to the mount tubes and adjust the radiator so that the upper edge of the tank is  $16$ " from the top of the cross member. See Figure 2-27.

Drill two  $1\frac{1}{4}$ " holes through the mount tubes, using the bottom holes on the mounting flanges as guides. Attach the radiator to the mount tubes, using four  $1\frac{1}{4} \times 1\frac{1}{2}$ " hex head bolts, four  $1\frac{1}{4} \times 1$ " fender washers, four  $1\frac{1}{4}$ " flat washers and four  $1\frac{1}{4}$ " lock nuts. The fender washers must be on the flange side of the bolts.

## RADIATOR HOSE INSTALLATION

For the lower radiator hose use NAPA hose, Part No. FF305 or its equivalent universal hose,  $27$ " long, with a  $1\frac{3}{4}$ " ID at the water pump end and a  $1\frac{1}{2}$ " ID for the radiator.

### RADIATOR HOSE MOUNT

An optional lower radiator hose mount is available from our Parts Department. This mount is used to secure and protect the radiator hose underneath the front suspension cross member.

Slide the lower radiator hose mount over the lower radiator hose. Connect the lower radiator hose to the radiator and position the hose mount on the underside of the cross member. Attach the mount to the cross member, using four  $1\frac{1}{4} \times 5/8$ " hex washer head self-tapping screws.

**NOTE:** On most early small block Ford engines the water pump outlet is on the passenger side of the engine. The Mustang II water pump can be installed on most of these engines. If it cannot, the radiator may be modified to relocate the lower outlet to the correct side.

**WARNING:** An electric fan is suggested for use on the Classic Cobra. If you choose to use an engine driven fan, ensure that it will not come in contact with either the upper radiator hose or the front suspension crossmember.

## SECTION J WIRING INSTALLATION

After a careful study of the wiring harness schematics, lay out your wiring harness onto the chassis and flag and mark the eventual locations of all the wires. Additional wiring may be required for the following items:

- Power antenna
- Radio
- Speakers
- Windshield washer pump
- Alarm system
- Battery safety switch
- Electric fuel pump
- Fuel pump shut-off switch

**NOTE:** Some of these items appear on the wiring schematic to show how they might be installed. Radios and alarm systems are not covered in this manual due to the variety available.

Be sure that any additional wiring added is long enough to reach the locations of the items that you plan to install. When installing additional items, a ground wire may be required when mounting the part to the fiberglass.

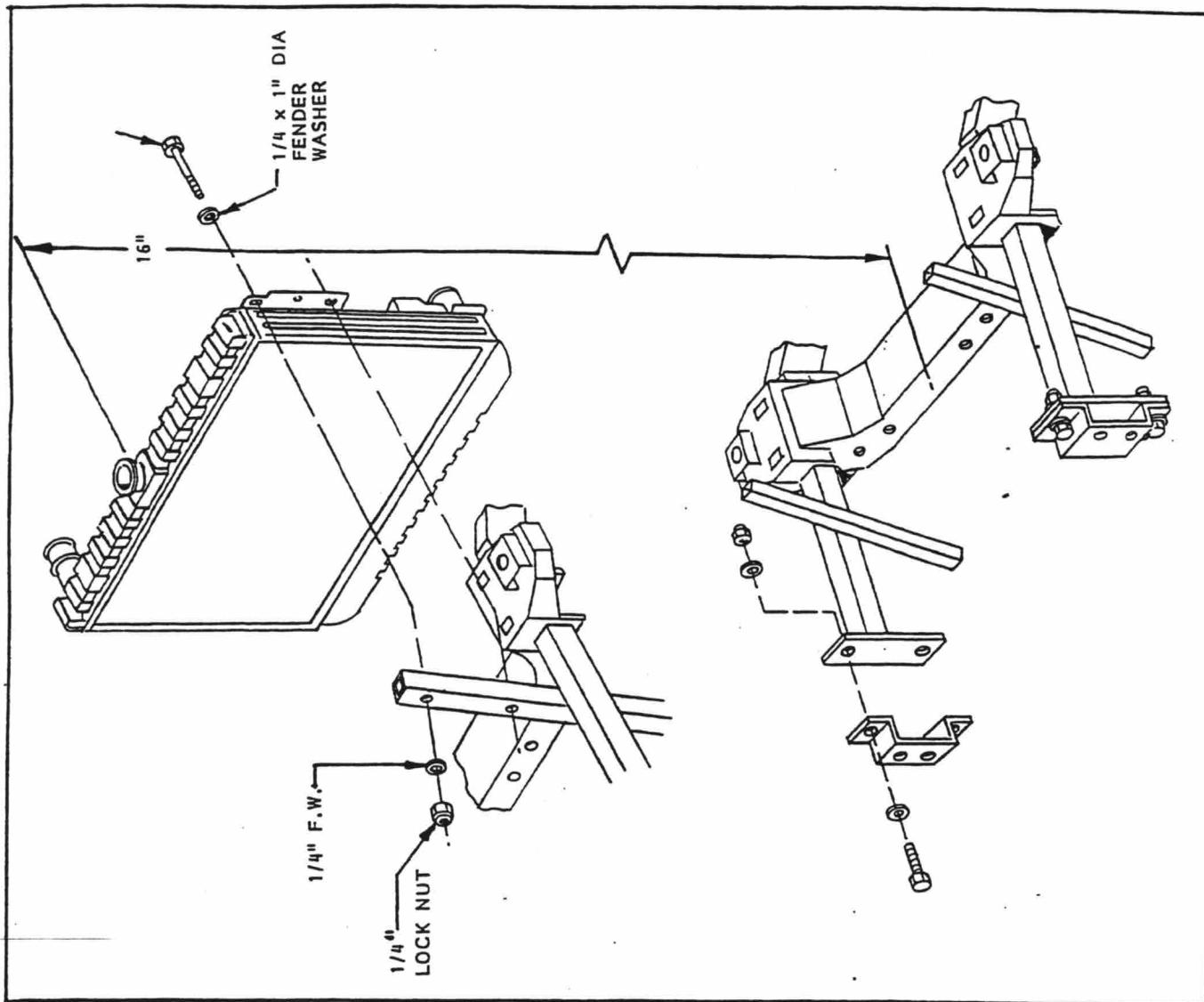


Figure 2-27

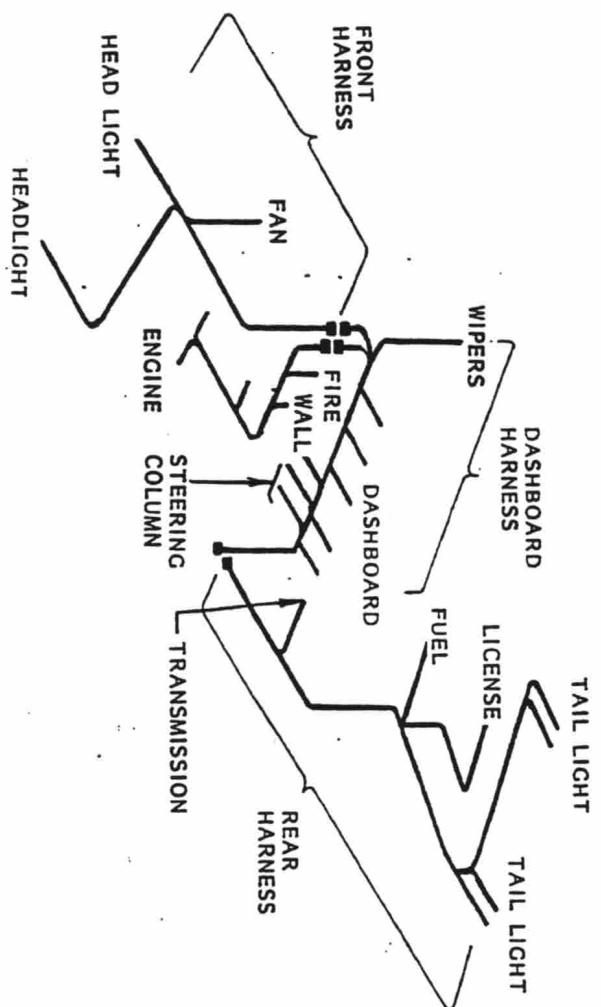
## WIRING HARNESS ROUTING

There are three basic sections to the Classic Cobra harness. The front harness, which is connected to the engine, electronic ignition, front lights, and the starter solenoid. The dashboard harness, which is connected to the steering column, all the gauges, wipers, relays and the fuse panel. The rear harness connects to the fuel sender transmission, hand brake, and rear tail lights.

Lay the front harness out along the top of the passenger side frame rail, at the front suspension crossmember. There are two leads that will be connected later to the lights and the horns. Using padded line clamps, and self-tapping screws, secure these leads to the top of the crossmember and to the top of bumper mount tubes that extend past the radiator. Roll up and tie wrap the ends of the light leads to prevent them from any damage during the installation of the body. See Figure 2-28.

## ELECTRIC FAN INSTALLATION

There are many types of after market fans available today. The optional electric fan for the Classic Cobra is one of the best ones made to date.



Attach the fan to the front of the radiator, using the hardware provided. Connect the fan to a battery to ensure that it blows through the radiator. If it blows away from the radiator, reverse the wires and mark the positive wires. See Figure 2-29.

Connect the ground wire for the fan motor to the chassis or splice it to the ground wire in the harness.

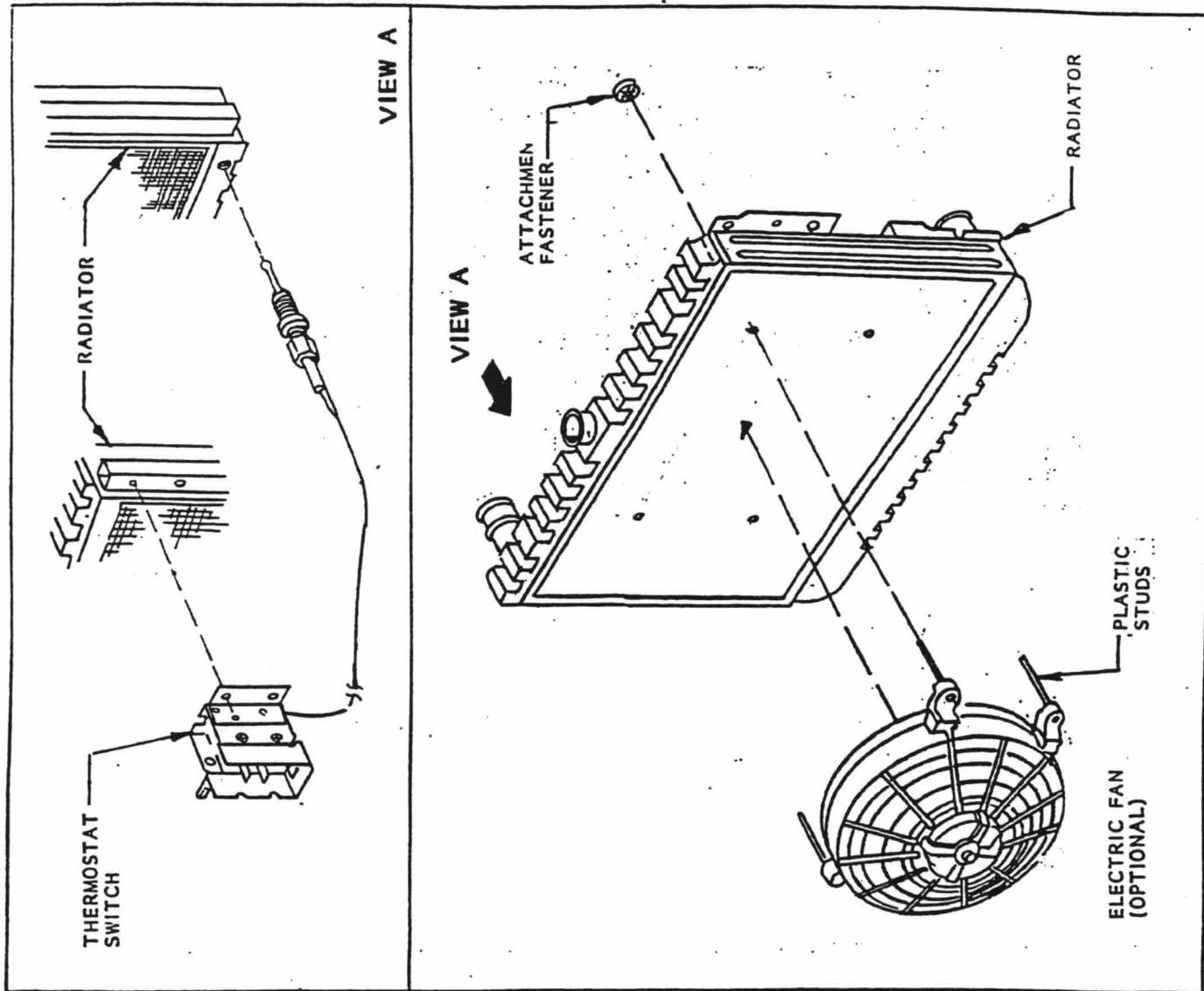
Connect the positive fan motor wire to the yellow 12 GA wire on the fan lead on the front harness.

Attach the adjustable thermostat switch to the petcock bung, using its installation hardware.

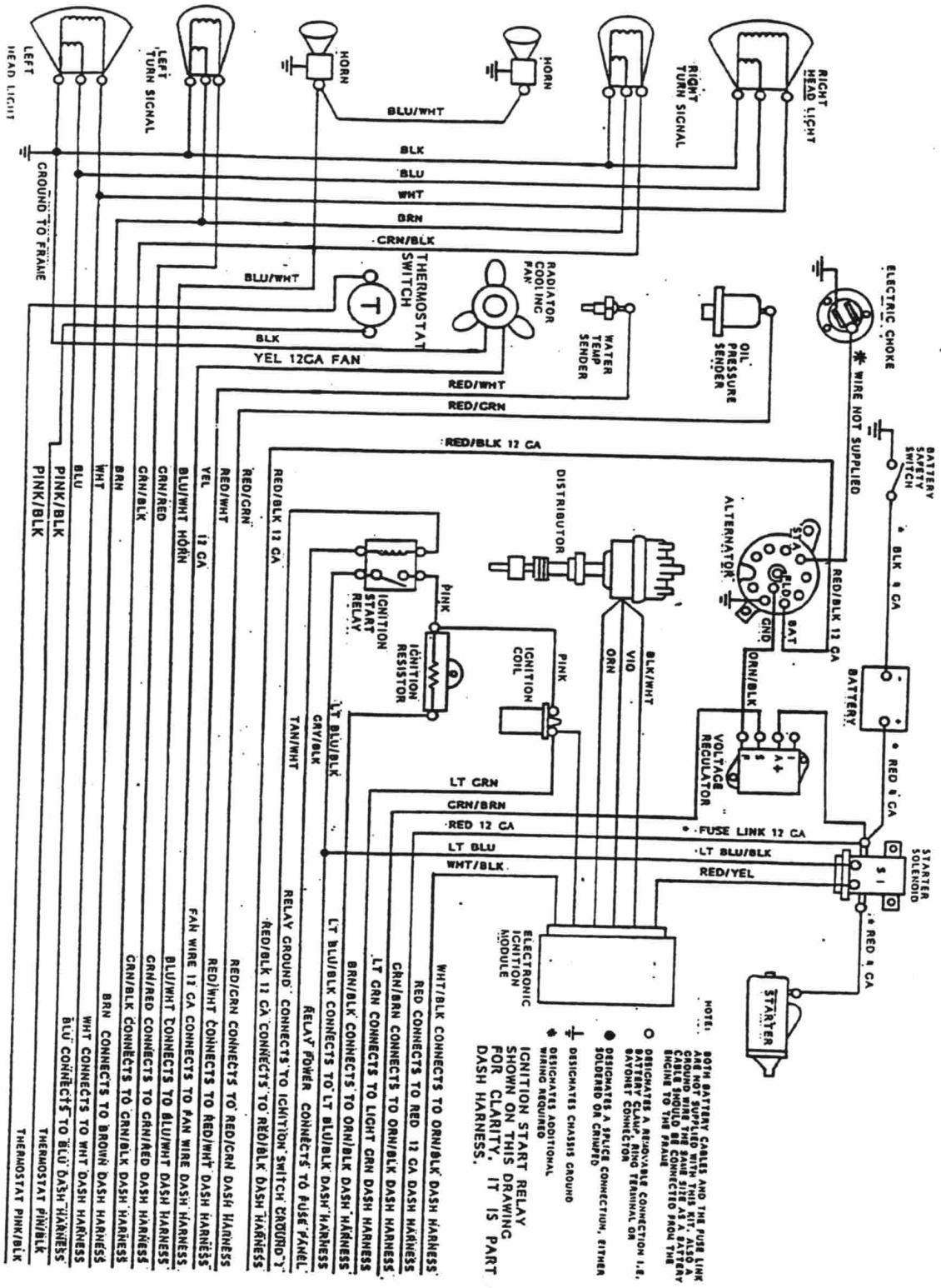
Cut the middle of the pink/black loop on the fan lead and connect these two wires to the thermostat.

The adjustable thermostat switch may be attached to the radiator mount tube or may be installed on the fender liner after the fender liner installation.

The thermostat switch should only receive when the engine is on.



**Figure 2-29**



## FRONT WIRING HARNESS

**Figure 2-30**

The relay and fan switch connection are located with the instructions for the dash wiring.

## ENGINE WIRING

See Figure 2 for front harness schematics. See Figure 2-30.

Continue to clamp the front harness along the top of the frame rail from the front crossmember to the passenger foot well.

**WARNING:** The engine exhaust system you choose will determine how the harness must be routed in this area if you use the stock Mustang II manifolds. It is preferable to route the harness on top of the frame rail if you use the optional Classic Cobra headers. Route the harness along the inside edge of the frame rail and under the motor mount bracket.

Open a 3/4" hole for the harness in the triangular area of the passenger foot well near the frame rail. Run the harness through the hole and along the inside corner of the foot well, using No. 8-32 2 x 3/4" Phillips machine screw, No. 8 flat washer, No. 8 lock washers, and No. 8-32 hex nuts. See Figure 2-31.

At the corner of the battery step clamp the harness and route it back along the tunnel wall to the corner of the tunnel and the lower edge of the fire wall. The lead for the engine, electrical and ignition

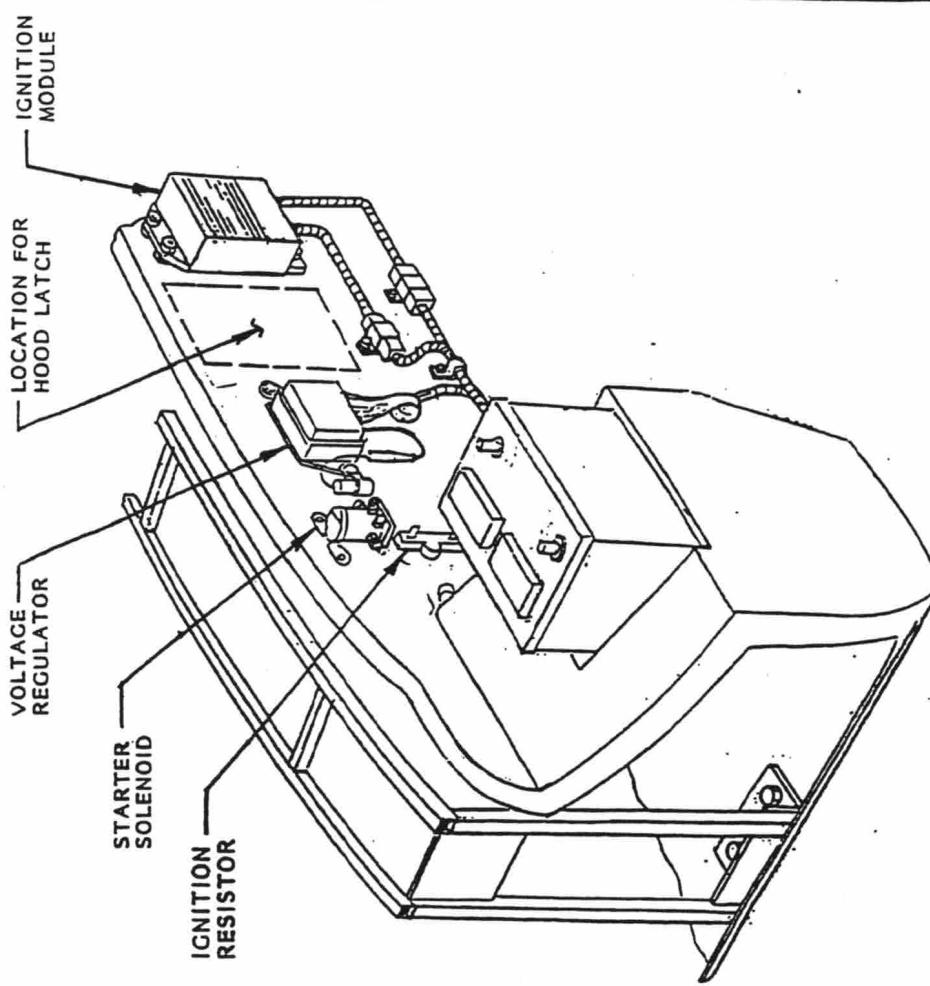
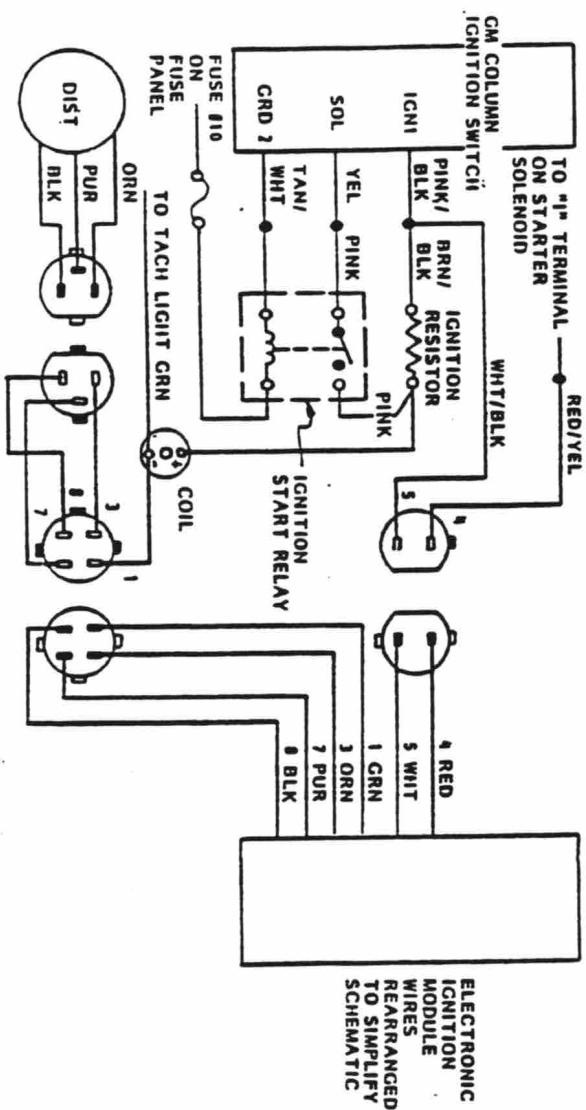
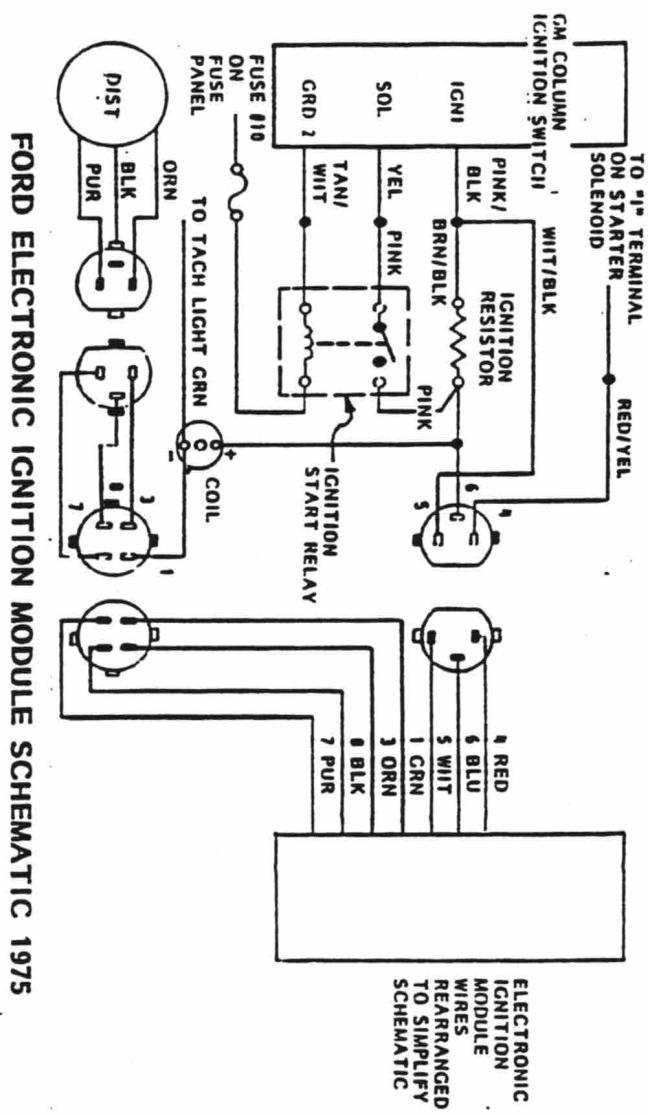


Figure 2-31



**FORD ELECTRONIC IGNITION MODULE SCHEMATIC 1975 OR LATER**

wiring will be here. Open a 3/4" hole to route the lead to the engine. Route this lead out of the foot well to the engine. Make sure that only the end of the harness remains inside the front cockpit liner.

The connections for the alternator, distributor, coil, voltage regulator, and ignition module are not included with the harness kit. If your small block Ford engine did not have these connector plugs, we recommend that you purchase them from your local Ford dealer or from an auto salvage yard.

Attach the plugs by soldering and using heat shrink to cover the solder joint.

**NOTE:** There are no set locations for the electric components on the fire wall. Therefore you may place them to suit your need and trim the wires to fit. See Figure 2-31.

The starter solenoid has two large studs, the one on the left is for the positive cable from the battery, the yellow 16 gauge wire and the 12 gauge fuse link connected to the red 12 gauge wire. The large stud on the right side connects to the cable for the starter. There are two small studs on the front. The left hand one is marked "S" and connects to the light blue/black wire. The right hand stud is marked "J" and connects to the red/yellow wire.

**WARNING:** The starter solenoid relay, the voltage regulator and electronic ignition module must be grounded. Additional ground wires should be run inside the fire wall to the steering column support.

#### BALLAST RESISTOR

The ballast resistor should be mounted below the starter solenoid relay, using a single 1/4 x 1 1/2" hex bolt, two 1/4" flat washers, a 1/4" lock washer and 1 1/4" hex nut.

#### STARTER SOLENOID RELAY

The first set of wires on the engine lead is for the starter solenoid relay. Attach the starter solenoid relay to the fire wall, using two 1/4 x 1" hex bolts, four 1/4" flat washers, two 1/4" lock washers, two 1/4" hex nuts, and two 1/4" hex nuts.

a connector. If both ends are not used, your Classic Cobra will not run. The early electronic ignition module's blue wire will also need to be installed in the same connector as the pink wires. See Figure 2-32

#### VOLTAGE REGULATOR

The second set of wires on the engine lead is for the voltage regulator. The voltage regulator should be installed with the connector at the bottom, so that the letters for the connectors are readable. Attach to the fire wall, using two 1/4 x 1" hex bolts, four 1/4" flat washers, two 1 1/4" lock washers and two 1/4" hex nuts.

**NOTE:** To suppress noise in the radio from the alternator most Ford cars have a suppressor connected to the A+ connector on the plug. The suppressor should be attached to the same mounting bolt as the additional ground wire inside the fire wall.

From left to right the voltage regulator terminals are marked "I" for indicator output, "A+" for alternator output, "S" for ignition switch, and "F" for field. A Ford connector plug should be used because it also has these marks on it, along with the connection for the suppressor and will lock onto the voltage regulator.

The wires on the connector should be spliced to the following wires on the harness: "I" green/red is not used; "A+" yellow/white dot to the harness yellow "S" is either green/red or white/black to the harness green/brown; and "F" orange/light blue to the harness orange black. These splices should be soldered and covered with heat shrink to provide a better connection.

**NOTE:** The voltage regulator connector comes two ways. Although the internal parts are the same, the wires are different. On a Ford with an indicator light, there are four wires: "I" green/red, "A+" yellow/white, "S" white/black and "F" orange/light blue. On a Ford with an ammeter "I" is not used so there are only three wires. "A+" yellow/white, "S" green/red, and "F" orange/light blue. Make sure that you know what was in the car you got the connector from because code changes.

Position and clamp the wiring harness into place just above the edge of the fire wall and the tunnel. Place the engine lead on the rear of the manifold. The other lead is for the electronic ignition module.

#### IGNITION MODULE

Place the ignition module on the driver's side of the fire wall clear of the outline of the latch box. With

the connector plugs facing the left, mark the location of the bolts onto the fire wall. Drill a 1/4" hole at each location and attach the ignition module to the fire wall, using three 1/4 x 1" hex bolts and three 1/4" flat washers. An additional ground wire must be connected to one of the bolts.

There are two basic types of ignition modules. They are identified by the type of connectors on them. The first type has two connectors, one with three pins, out of the ignition module. This type of ignition module was used until 1975. See Figure 2-32.

The second type of ignition module was introduced in 1976. This type also has two connectors, one with two pins and the other with four pins, for a total of six wires.

**NOTE:** There is a third type of ignition module that was manufactured in 1978. This type is equipped for either an altitude sensor or an economy modulator.

No provisions have been made in the harness for the use of this ignition module, so if you live in an area where this module would help the performance of your classic Cobra, additional wiring and parts would be necessary to use it. This module is easily identified by the three connector plugs, instead of the two normally used. Refer to a Ford manual to assist you when installing the additional wiring required to use this module.

While both types of ignition modules can be used with the harness, the early module requires one additional wire to the ballast resistor. The harness connections are as follows: the three pin plug; red to the harness red/yellow, blue to the coil side of the ballast resistor (additional wire) and white to the harness white/black; the four pin plug, green to the harness light orange, purple to the harness light purple, and black to the harness black/white.

The later ignition module connects to the harness in almost the same way, only it does not require a wire to be run to the ballast resistor. All the other connections remain the same.

When you are splicing the ignition module to the wiring harness, use the original style Ford connector plugs. This will allow you to replace the module without having to resolder the wires should the module fail. The harness splices should be soldered and covered with heat shrink.

Run the engine lead along the passenger side of the intake manifold. Clamp it into place using padded line clamps and the valve cover bolts.

**Alternator:** Connect the orange/black wire to the "F" (field) terminal and the red/black wire to the "B" (battery) terminal on

the alternator. Connect a ground wire to the "Gnd" (ground) terminal on the alternator. The "sta" (stator) terminal may be used to power the electric choke on the carburetor. (An additional wire will be required)

**Distributor:** The Ford electronic distributor has a male connector plug. The female connector plug should be soldered to the engine harness as follows: connect the harness orange to the Ford orange; connect the harness purple to the Ford purple; and connect the harness black/white to the Ford black.

**NOTE:** If you are not using the Ford electronic distributor, run the distributor wire to the negative side of the coil. You may need to eliminate the ballast resistor. If you are using an after-market distributor, refer to the installation instruction's wiring diagrams to adapt the engine harness to your needs.

the oil light switch on the driver side of the engine with an oil pressure sender. The Ford Part Number for the oil pressure sender extension is D1UZ-9B339-A

#### WIRING INSTALLATION HINTS

All connections should be soldered and covered with head shrink or spliced with a butt connector and covered with tape.

Always allow some slack in the wiring harness. Don't cut your wires so short that they pull against a connection.

Use clamps. Not only do clamps make the wiring installation look professional, but they also prevent chafing.

Multi-plug connector plugs should be used to allow components to be removed without having to cut or disconnect individual wires.

When using heat shrink, it is best to use a hand held hair blow dryer. A match or a lighter may damage the wires insulation. Care should also be taken to avoid the plastic wire loom when using the dryer to shrink the heat shrink.

**Coil:** Connect the pink wire to the positive terminal and the light green wire to the negative wire.

**Sending units:** Connect the red/green wire to the oil pressure sending unit and the red/white wire to the water temperature sending unit on the engine.

**NOTE:** Unless your Ford Engine originally had an oil pressure gauge, you will need to replace

DASH HARNESS INSTALLATION  
The second section of the wiring harness is the dash harness. This harness connects with the front and rear harnesses, the steering column, the fuse panel, all relays and flashers, gauges and switches. In order to complete the installation of this harness the dashboard will need to be installed.

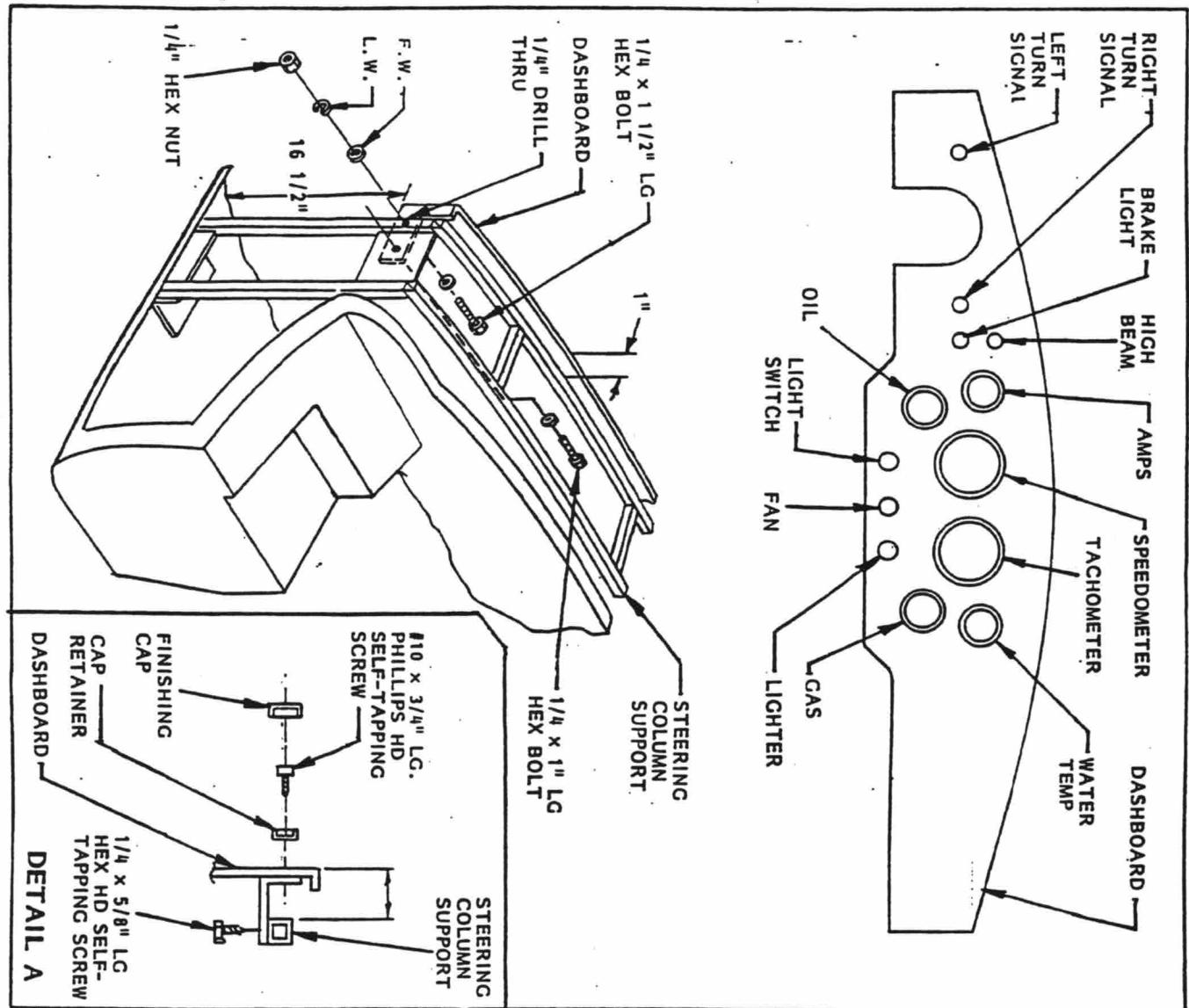
#### DASHBOARD INSTALLATION

The dashboard will be bolted to the steering column support, instead of fiberglassed to the body. This will allow it to be easily removed for trouble shooting or repairs.

Position the dashboard into place with the two mounting tabs on the inside edges of the steering column support uprights. If you are using a tilt column you will notice that the steering column opening on the dashboard is right at the end of the fixed section of the tilt column.

Measure from the bottom of the dashboard face to the floor mount plates on the steering column support. Clamp the dashboard mounting tabs to the support and adjust the dashboard so that the measurement is 16 1/2" on each side. See Figure 2-33.

Measure from the rear face of the upright to the face of the dashboard and adjust the dashboard so both sides are at 1". Drill two 1/4" holes through each tab and



each upright. One hole through the tube and one hole through the windshield mount plate. Attach the dashboard to the steering column support, using two  $1\frac{1}{4} \times 1\frac{1}{2}$ " hex bolts, two  $1\frac{1}{4} \times 1$ " hex bolts, eight  $1\frac{1}{4}$ " flat washers, four  $1\frac{1}{4}$ " lock washers and four  $1\frac{1}{4}$ " hex nuts.

Measure and mark the centers of the dashboard and the rear bow on the steering column support. Mark the rear bow 8 inches to the left and right of the center mark.

Position the two dashboard angle brackets on the bottom side of the rear bow at each eight inch mark. With the slotted leg of the bracket against the bottom of the bow, mark the slot onto the bow. Drill a  $7/32$ " hole through the bottom side of the bow at each slot location and attach the angle bracket to the bow, using two  $1\frac{1}{4} \times 5/8$ " hex washer head self-tapping screws.

Loosen the screws and slide the brackets against the unfinished side of the dashboard. Tighten the screws and mark the position of the blank leg onto the gelcoat side of the dashboard. Measure 1 inch down from the upper edge of the dashboard and drill a  $1/8$ " hole through the dashboard and each bracket. Loosen the bracket screws and move the bracket away from the dashboard. Enlarge the  $1/8$ " pilot hole in the dashboard, using a  $3/16$ " drill bit.

Figure 2-33

Slide the brackets back against the dashboard and secure the dashboard to the brackets, using two #10 x 3/4" phillips pan head self-tapping screws, two #10 plastic cap retainers, and two #10 plastic finishing caps.

Mark the position of the rear bow on the steering column support onto the dashboard. The position of the gauges and the indicator lights must be below the rear location.

#### INSTRUMENT INSTALLATION

Remove the screws and bolts holding the dashboard to the steering column support. Do not remove the dashboard brackets from the rear bow. Place the dashboard on a padded surface.

The Classic Cobra dashboard is molded without any marks to designate the locations of the gauges and the switches. This was done to allow you to mount the gauges and switches in positions that work best for you.

The recommended positions for the gauges are shown in Figure 2-33. These positions were chosen because they allow excellent visibility. The optional wiring harness is designed to fit this layout. It may, however, be modified to fit other layouts. The following measurements are the hole sizes that must be drilled to

mount the gauges in the dashboard: large gauges are 3 1/2"; small gauges are 2 1/8"; indicator lights are 1 1/2"; switches are 3/8" and the lighter is 3/4". Once you have marked the locations of the gauges, switches and indicator lights, drill the holes in the dashboard.

**CAUTION:** When using a hole saw to drill the openings for the instruments, the dashboard should be clamped down to a padded surface to prevent it from moving should the hole saw bind or stick. If it is not secure and the hole saw sticks, the drill will turn the dashboard, resulting in possible damage to the dashboard and to the person using the drill.

Once the holes have been drilled, test fit the instruments. It may be necessary to file the holes so that the gauges slide in and out easily. One hole that must be filed is the speedometer hole, because the speedometer case has an alignment key located on it. Install gauges using the "U" shaped clamps and nuts supplied with each gauge.

#### BEHIND THE DASH WIRING

Place the dashboard face down on a padded surface. Mark on tape or write on the unfinished side with the location of each gauge, light or switch. Take the dash wiring harness and flat with a piece of masking tape the function of each wire. Refer to the wiring diagram Figure 2-34..

With the exceptions of the indicator lights, the lighter, the ammeter and the speedometer light, all the wires on the dashboard are connected using ring terminals for 14 to 16 gauge wire, with a hole sized for a number 10 screw. All indicator lights use female bayonet-type quick disconnect terminals. The ammeter uses 10 gauge wires that require ring terminals for 10 to 12 gauge wire, with a hole for a number 10 screw. The cigar lighter uses a female bayonet type quick disconnect and a butt splice; both are for 14 to 16 gauge wire. The speedometer light uses a butt splice for 14 to 16 gauge wire.

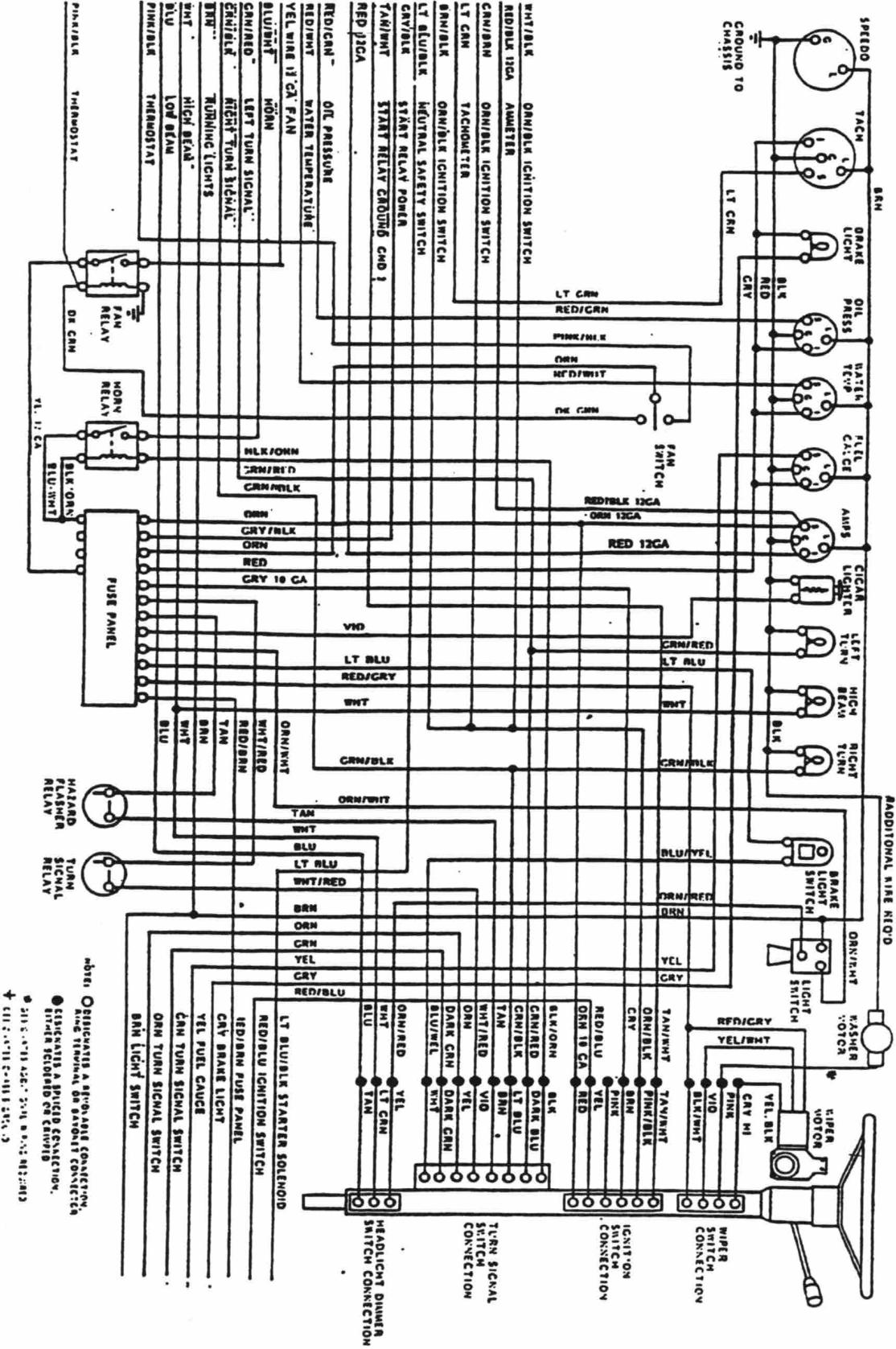
#### INSTRUMENT INSTALLATION HINT

The inside of the dashboard and fire wall may be painted gloss white to increase visibility. Do not paint any gelcoated surfaces.

**NOTE:** Chapter 5 has additional copies of all the wiring diagrams included in it. You may use these copies to color in the wiring diagrams with felt tip markers. This will do three things for you; first by coloring in the wire you will become more familiar with their layout and connections; second, they will allow you to make notes

## DASHBOARD WIRING HARNESS

2-50



If you do not want to mark in the manual, and finally, they can be kept with the car when completed, to be used as a trouble-shooting guide should you have any electrical problems on the road.

The first lead to the dash is for the left hand turn signal indicator. It connects a black wire and a green/red wire to the indicator light.

The next lead connects to the right hand turn signal indicator with a black wire and a green/black wire. The hand brake light lead is next. The wires connect to the light are a red wire and a grey wire. The ground for this light is located in the rear harness on the hand brake switch.

The high beam light connects to the lead with the white wire and the black wire.

The oil pressure gauge lead has four wires on it. The red wire connects to the "I" (ignition) stud. The red/green wire connects to the "S" (sender) stud. The brown wire connects to the "L" (lights) stud and the black wire connects to the "G" (ground) stud.

The ammeter lead is next. It has five wires on it. It is the only gauge that uses 12" gauge wires. Two wires are connected to the "S" (sender) stud. They are a 12 gauge orange wire and a 12 gauge red/

black wire. The 10 gauge red wire connects to the "I" (ignition) stud. The brown wire connects to the "L" (lights) stud and the "G" (ground) stud.

**WARNING:** On the ammeter the "S" (sender) stud is connected to the "I" stud for the alternator and the "G" stud is connected to the wire to the battery. If these wires are reversed or installed incorrectly the ammeter will not work correctly. The "I" (ignition) stud should only have the 10 gauge red connected to it. If you connect a 16 gauge red wire to it, as on the other gauges, it will power the other gauges until the battery is totally discharged.

The speedometer has two wires connected to it. The brown wire butt splices to the light wire and the black wire is attached to one of the mounting studs to ground the case.

**NOTE:** If you are using the electronic programmable speedometer additional wiring will be required for the sender and the speedometer. Refer to the installation instructions.

The light switch has a three wire lead connect to it; orange/white from the fuse panel for power brown, which goes to all the instrument lights, as well as the gear shift light, and all the running lights; and orange red, which goes to the dimmer switch.

on the steering column for the head lights.

The tachometer lead is next. It has four wires, light green to the "S" (sender) stud; red to the "I" (ignition) stud; brown to the "L" (light) stud and black to the "G" (ground) stud.

The water temperature lead connects to the gauge in the following order: the red/white wire to the "S" (sender) stud, the red wire to the "I" (ignition) stud, the brown wire to the "L" (lights) stud and the black wire to the "G" (ground) stud.

The lighter lead has five wires. The black wire connects to the case and the purple wire splices to the lead from the center contact of the lighter. The other three wires may be connected to the fan switch. The orange wire is power from the fuse panel. The dark green wire is to the fan relay. The pink/black wire goes to the thermostat.

The last lead goes to the fuel gauge. The yellow wire goes to the "S" (sender) stud, the red wire to the "I" (ignition) stud, the brown wire to the "L" (lights) stud, and the black wire to the "G" (ground) stud.

**NOTE:** If you are using any additional switches on the dash board, such as a fog light switch, they should be installed at this time and connected to the additional wiring added to the harness.

## DASHBOARD WIRING INSTALLATION HINTS

Wires should be tagged or flagged with their function and the gauge they connect to. This can be done using self-adhesive file folder labels which can be used in a typewriter. Once the function has been typed on the label, it may be cut down to fit onto the wire.

To prevent screws and nuts on the gauges and switches from vibrating loose, use fingernail polish to paint a thin strip on the threads. The military and the airlines use this procedure. Fingernail polish works better than paint because it dries harder.

When attaching the wiring to the gauges, the wires should be laid out so that the gauges may be removed individually and so that the harness does not cover the back of any gauge.

Allow enough extra length on each lead so that a gauge may be removed through the dash with the wires still attached. This will allow you to replace a gauge without removing the dash.

**CHECK:** Before installing the dashboard and wiring into the car, check all the connections on the gauges and switches to make sure they are properly connected and that the terminals are properly crimped or soldered.

## STEERING COLUMN WIRING

There are five connector plugs on the GM steering column. There are: two connector plugs on the ignition switch, one for the turn signal switch, one for the dimmer switch, and one for the wiper switch. Make sure that you have both sides of the connector plugs, as well as 12 inches of wiring to be spliced into the dashboard wiring harness. See Figure 2-35.

**NOTE:** If the color code on the wiring from the switches is different from the colors listed in this manual, refer to the GM manual for the type of car you got your steering column from and flag the wires with their function.

## IGNITION SWITCH

There are two connector plugs on the ignition switch. The first plug has one clip on it and is held in place by the second lug. The second plug has two clips on it and must be removed first to remove the first plug.

The ignition 1 connection has a pink/black wire and a pink wire coming out of the connector. These wires are spliced to the orange/black wire.

The battery 2 connection has a red wire coming out of the connector. The wire is spliced to the 10 gauge orange wire from the harness.

The accessory connection has a brown wire coming out of the connector. This wire is spliced to the 10 gauge grey wire from the harness.

It will be necessary to use the ground 2 connection on the second plug. This wire is colored tan/white and will be spliced to the ignition start relay tan/white wire. This provides a ground for the ignition start relay which bypasses the ignition resistor during start. This allows 12 volts directly to the coil for quicker starts.

## TURN SIGNAL SWITCH

The turn signal switch connector is a flat in-line connector plug that mounts forward of the ignition switch. The first two wires on this connector are a light green wire and a tan wire. These wires are for the key alarm switch. No provisions have been made in the wiring harness to use these wires. They may be removed if you do not plan to use a key buzzer. Refer to the GM manual for more details on the function of these wires.

The horn connection has a black wire coming from the connector. This wire is spliced to the black/orange wire from the harness.

The left front turn signal connection has a light blue wire coming from the connector. This wire is spliced to the green/black wire from the harness.

The right front turn signal connection has a dark blue wire coming from the connector. The wire is spliced to the green/red wire from the harness.

The hazard flasher connection has a brown wire coming from the connector. This wire is spliced to the tan wire from the harness.

The turn signal flasher connection has a purple wire coming from the connector. This wire is spliced to the white/red wire from the harness.

WIRING HARNESS :	COLUMN :	FUNCTION
BLACK/ORANGE	BLACK	HORN BUTTON
GREEN/BLACK	LIGHT BLUE	LEFT FRONT TURN SIGNAL
GREEN/RED	DARK BLUE	RIGHT FRONT TURN SIGNAL
TAN	BROWN	HAZARD FLASHER
WHITE/RED	PURPLE	TURN SIGNAL FLASHER
ORANGE	YELLOW	LEFT REAR TURN SIGNAL/BRAKE LT.
DARK GREEN	DARK GREEN	RIGHT REAR TURN SIGNAL/BRAKE LT.
BLUE/YELLOW	WHITE	BRAKE LIGHT SWITCH
TURN SIGNAL SWITCH		
ORANGE 10GA	RED	BATTERY 12
ORANGE/BLACK	PINK/BLACK	IGNITION 11
RED/BLUE	YELLOW	SOLENOID
GREY 10GA	BROWN	ACCESSORY
TO LIGHTER RELAY	TAN/WHITE	GROUND 12
IGNITION SWITCH		
ORANGE/RED	YELLOW	HEADLIGHT SWITCH
WHITE	LIGHT GREEN	HIGH BEAM
BLUE	TAN	LOW BEAM
HEADLIGHT DIMMER SWITCH		
NOT SUPPLIED	PINK	WASHER SWITCH
YELLOW/WHITE	GRAY	WIPER SWITCH LOW
YELLOW/BLACK	PURPLE	WIPER SWITCH HIGH
RED/GRAY	BLACK WHITE OR WHITE*	POWER
WIPER SWITCH		
* GREEN NOT USED * CAMERO COLUMN		

Figure 2-35

The left turn signal/brake light connection has a yellow wire coming from the connector. This wire is spliced to the 16 gauge orange wire from the harness.

#### WIPER SWITCH

The right rear turn signal/brake wire coming from the connector. This wire is spliced to the dark green wire from the harness.

The windshield wiper washer switch connector is not attached to the column. The connector is in the middle of a lead that comes out the back of the steering column housing.

The brake light switch connection has a white wire coming from the connector. This wire is spliced to the blue/yellow wire from the harness.

#### DIMMER SWITCH

The dimmer switch is located on the left side of the column next to the Ignition switch.

The light switch connection has a yellow wire coming from the connector. This wire is spliced to the orange/red wire from the harness.

The high beam connection has a light green wire coming from the connector. This wire is spliced to the white wire from the harness.

The low beam connection has a tan wire coming from the connector. This wire is spliced to the blue wire from the harness.

#### BRAKE LIGHT SWITCH

The wiper high speed connection has a purple wire from the connector. This wire is spliced to the yellow/black wire from the harness.

The wiper low speed connection has a gray wire from the connector. This wire is spliced to the yellow/white wire from the harness.

The washer switch connection has a pink wire from the connector. This wire is spliced to the power wire from the windshield washer motor. This wire is not part of the harness and must be added to the washer switch to work.

NOTE: Because the Classic Cobra is a fiberglass car, the importance of ground wires cannot be stressed enough. Any electrical part that is not grounded properly will not work! Additional ground wires may be installed to ensure that your electrical parts work correctly.

On the same lead as the column wires, there are three other wires separate from the rest. The first two are the brake light switch wires. They are colored blue and blue/yellow. These wires are connected to the brake light switch attached to brake pedal.

These wires may be spliced to the Ford connector plug or attached on the Camero column. Using female quick disconnect terminals. It does not matter which wire connects to which connection on the switch.

The third wire on the column lead is a black ground wire. It is very important that this wire is grounded to steering column support. Remove the paint from the area where the wire will be attached to the frame. Crimp a ring terminal for a #10 stud to the wire. Drill a 9/64" hole through the area where you removed the paint and attach, using #10 x 3/4" hex head self-tapping screw.

NOTE: Because the Classic Cobra is a fiberglass car, the importance of ground wires cannot be stressed enough. Any electrical part that is not grounded properly will not work! Additional ground wires may be installed to ensure that your electrical parts work correctly.

**STANDARD GAUGES FUSE BLOCK LAYOUT**

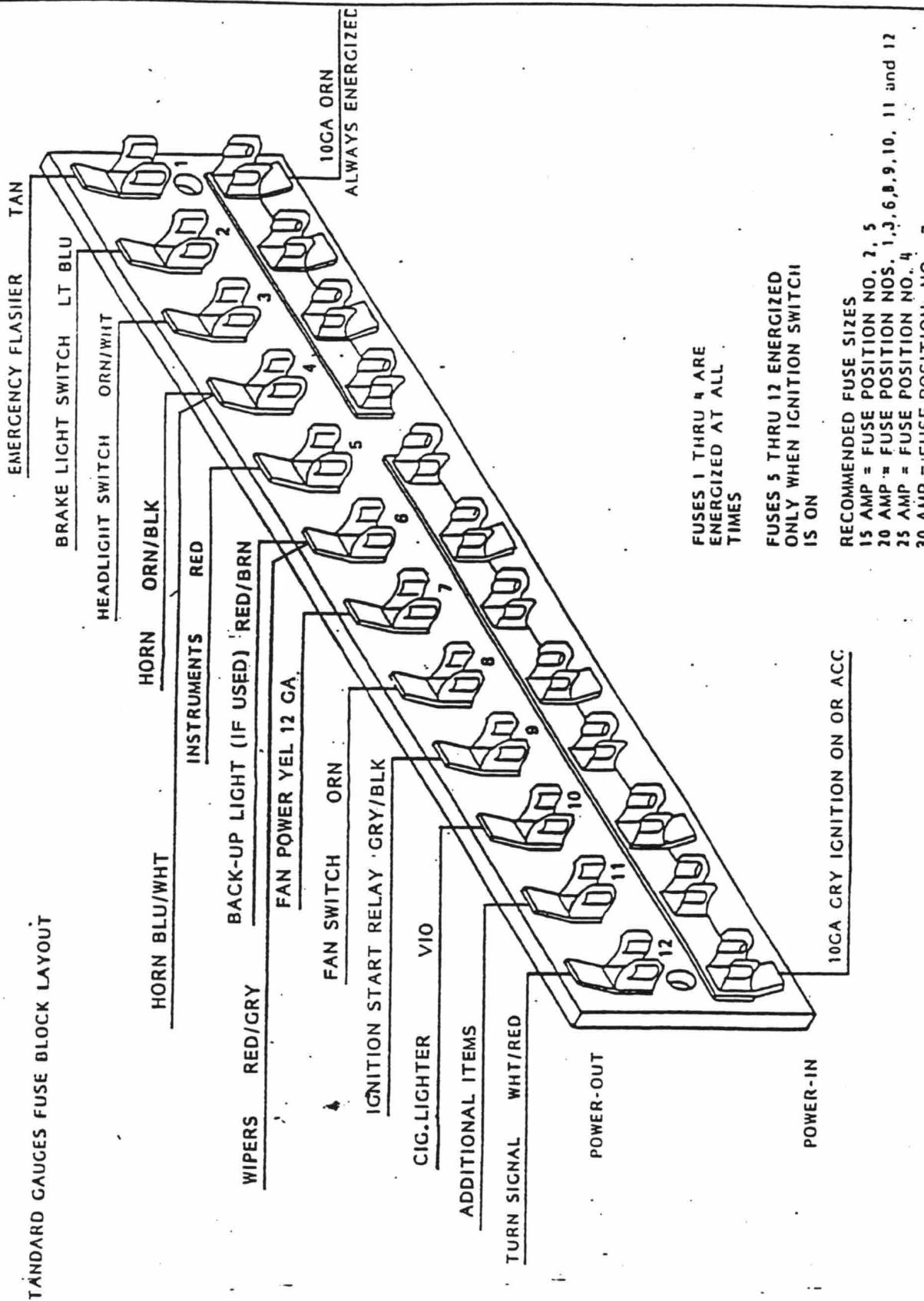


Figure 2-36  
2-55

## FUSE PANEL WIRING

Place the fuel panel just above the corner of the tunnel and the fire wall and centered below the outline of the hood latch box.

Mark the two mount hole locations onto the fire wall and drill a 3/16" hole through each of the marks. Attach the fuse panel to the fire wall, using two #10-24 x 1" phillips machine screws, four #10 flat washers, two #10 lock washers, and two #10-24 hex nuts. The individual connector should be along the top. See Figure 2-36.

The fuse panel uses glass "buss" type fuses. It has twelve individual connections on top. These are for power to the electrical components. There are two buss bars on the bottom. These are for power distribution through the fuses. All connections on this panel should be made with female quick disconnect terminals for the appropriate gauge wire.

The short buss bar powers the four right fuses. These fuses are powered all the time and are not controlled by the ignition switch. The 10 gauge orange wire is connected to this bus box. The first fuse on the right is for the emergency flasher. This lead was made longer for this reason.

using a 1 1/8" plastic or aluminum P clamp. Cut a short section of the tan wire from the fuse panel lead. Using the short tan wire, connect one end to the first fuse on the right. Connect the other end to the X terminal on the flasher relay. The remaining tan wire in the fuse panel lead is connected to the L terminal of the emergency flasher relay.

The second fuse from the right is connected to the light blue wire from the brake light switch.

The third fuse from the right is connected to the orange/white wire from the light switch.

The fourth fuse from the right is connected to the blue/white and orange/black wires for the horn relay. The horn relay may be mounted next to the emergency flasher relay. The horn relay may be either a Hella relay Part #87106 or Radio Shack relay Part #275-226. Unlike most horn relays, these do not require the case to be grounded.

The blue/white wire on the fuse panel lead connects to the Power Out of the horn relay. The wire from the fourth fuse to the Power connected to this bus box. In on the horn relay may be made from a short section of blue/white wire cut from the fuse panel lead. This lead was made longer for this reason.

The black/orange wire on the fuse panel lead connects to the coil ground of the horn relay; the wire from the fourth fuse to the horn relay coil power may be made from a short section of the black/orange wire cut from the fuse panel lead. The long buss bar powers the remaining eight fuses. These fuses are powered when the key is in the run or accessory position. The 10 gauge grey wire is connected to this buss box.

The fifth fuse is connected to the red wire from the gauges.

The sixth fuse is connected to the red/brown wire for the backup light switch, if required.

The seventh fuse is also connected to the red/grey wire for the wiper motor.

The eighth fuse is connected to the Power In on the fan relay. The fan relay may be mounted next to the horn relay. The fan relay may be either a Hella relay Part #87106 or Radio Shack relay Part #275-226.

The yellow 12GA wire on the fuse panel lead connects to the Power Out of the fan relay. The wire from the seventh fuse to the Power In on the fan relay may be made from a short section of yellow 12GA wire cut from the fuse panel lead. This lead was made longer for this reason.

The eighth fuse is connected to the orange wire that goes to the fan switch. (See fan wiring.)

The ninth fuse connects to the gray/black wire for the ignition start relay.

The tenth fuse from the right is connected to the purple wire from the cigar lighter.

The eleventh fuse is used for additional items such as a radio. The twelfth fuse is connected to the turn signal flasher relay. This relay should be installed to the left side of the fuse panel the same way as the emergency flasher relay.

Connect a short section of the white/red wire to the fuse and the turn signal relay "X" terminal. The remaining white/red wire from the fuse panel lead connects to the turn signal relay "L" terminal.

#### WIRING INSTALLATION TIPS

Take your time and plan out the layout of the wiring. Make sure it won't interfere with anything inside the fire wall.

Use clamps or tie-wrap to route the wires.

Always leave some slack in the wiring. This is commonly called a stress release.

When connecting the wiring to the fuse panel, start at the right side

and work toward the left. Bend the wire bundle toward the left.

Bend the wire bundle 90 degrees to the left every time you connect a wire. Bend that wire 90 degrees so that it goes straight down to the fuse panel. On the fuse panel, the 10 gauge orange and grey wire should continue down from the 90 degree bend and then to the left below the bottom of the panel before making their own 90 degree bend to the left. The wire bundle should be tie-wrapped before each wire is bent toward the fuse panel.

**IGNITION START RELAY**  
If you are using the Ford electronic ignition module with your engine, an ignition start relay should be used to bypass the ballast resistor while starting the car. This relay can be either a Hella relay Part #87106 or a Radio Shack relay Part #275-226 and should be mounted next to the horn relay on the fire wall.

The relay coil ground connects to the tan/white wire from the ground connection on the ignition switch. The coil power connects to the gray/black wire from the ninth fuse.

#### ELECTRIC FAN RELAY INSTALLATION

Because of the power required to run an electric fan, it is recommended that you use a relay to supply power to the fan motor.

The optional fan for the Classic Cobra comes with the same type relay as you used for the horn relay and the Ignition start relay. Attach this relay along with the other two. Connect the yellow 12GA wire to the power out connector on the relay. Connect the yellow 12 GA wire from the seventh fuse to the power In connector on the relay. The fuse for the fan motor must be rated at 30 amps.

If you do not intend using a thermostat override switch on the dashboard, connect the relay coil power to the orange wire from the eighth fuse. Connect one of the pink/black wires from the thermostat to the relay coil ground. The other pink/black wire from the thermostat should then be grounded to the frame. This will allow the relay coil to be energized when the thermostat contact reaches 170° F.

If you prefer to use an override switch to manually activate the fan, install the switch on the dash. Connect the orange wire from the eighth fuse to the center contact on the switch. Connect the dark green wire to the upper contact

on the switch and to the relay coil power connection, but do not make the connection yet. Connect one of the pink/black wires from the thermostat to the bottom contact on the switch. The other pink/black wire from the thermostat and the dark green wire from the upper contact on the switch will be spliced together and connected to the relay coil power. Run a ground wire from the chassis to the relay coil ground.

**WARNING:** The switch has three positions; up for manual operation; down for automatic (thermostat) operation and centered for off. Always have the fan switch in either the manual or automatic positions whenever the engine is running to ensure that the fan is

A fan tell tale light may be used to indicate when the fan is on. This can be done by installing an additional indicator light in the dashboard above the fan switch. Connect two wires to the light, one to a chassis ground and the other to the relay power out.

#### WIRING HARNESS CONNECTIONS

The only connections of the dash harness left to be connected are the leads to the front harness, the rear harness, and the wiper motor lead. The wiper motor lead will be connected upon completion of the wiper installation.

These wires should be soldered together and covered by heat shrink tubing to form one complete harness. When soldering a number of wires together it is better to stagger the connections so that there is no large lump in the harness where all the connection were made at the same spot.

#### FRONT HARNESS TO DASH HARNESS CONNECTIONS

Connect the orange/black wire from the dash harness to the green/brown wire, white/black wire and brown/black wire of the front harness

Connect the green/brown on the front harness to the other orange/black on the dash harness.

Connect red 12CA front harness to red 12CA dash harness.

Connect red/black 12CA front harness to yellow 12CA front dash harness.

Connect red/green front harness to red/wht dash harness.

Connect blue/white front harness to blue/wht dash harness.

Connect green/red front harness to green/black dash harness.

Connect brown front harness to brown dash harness.

Connect light green front harness to light green dash harness.

Connect light blue/black front dash harness to light blue/black front dash harness.

Connect the pink/black front dash harness to pink/black front dash harness.

Connect the other pink/black front dash harness to the pink/black front dash harness.

Connect white front harness to white dash harness.

Connect blue front harness to blue dash harness.

#### REAR HARNESS TO DASH HARNESS CONNECTIONS

The rear harness should also be solder spliced to the dash harness in the same method as the front harness.

Connect light blue/black on the dash harness to light blue/black on the rear harness.

Connect red/blue on the dash harness to red/blue on the rear harness.

Connect red/brown on the dash harness to red/brown on the rear harness.

Connect gray on the dash harness to gray on the rear harness.

Connect yellow on the dash harness to yellow on the rear harness.

Connect green on the dash harness to green on the rear harness.

Connect orange on the dash harness to orange on the rear harness.

Connect brown on the dash harness to brown on the rear harness.

**WARNING:** The battery should not be connected until all connections have been made. It is connected earlier, the possibility of electrical shorts or fire exists.

#### REAR WIRING

See Figure 2-37 for schematic.

Because the rear harness is run through the trunk liner and the rear cockpit liner it should not be clamped into place until after the body has been installed.

#### FORD TRANSMISSION WIRING

The Ford neutral safety switch is located on the left side of the transmission. On the C4 and C6 transmission it is attached to the gear selector shaft. On the AOD transmission there is a connector plug above the selector shaft for the neutral safety switch.

Drill a 3/8" hole above the corner of the tunnel and the floor, at the location of neutral safety switch. Run the lead through the hole to the switch.

blue and red/blue to the other Ford red/light blue for the neutral safety switch. For backup light switch, connect red/brown to Ford white/purple and pink to Ford black/plink.

Both the T-5 and RAD manual transmissions have only a back-up light switch. Splice the red/blue wire to the light blue/black wire to complete the circuit for the starter solenoid.

The gear shift light wires (brown and black) are used with the automatic shifter. The grey and black wire goes to the emergency brake handle and must be connected after the body has been installed.

#### BATTERY INSTALLATION

**NOTE:** Due to space limitations, it is recommended that the battery used has the following dimensions: 6 inches tall, 6 1/2 inches wide, and 9 inches long. This is a 58 series battery, and the same type that is used in a late model Mustang GT.

You will also need a battery hold down kit and both positive and negative battery cables.

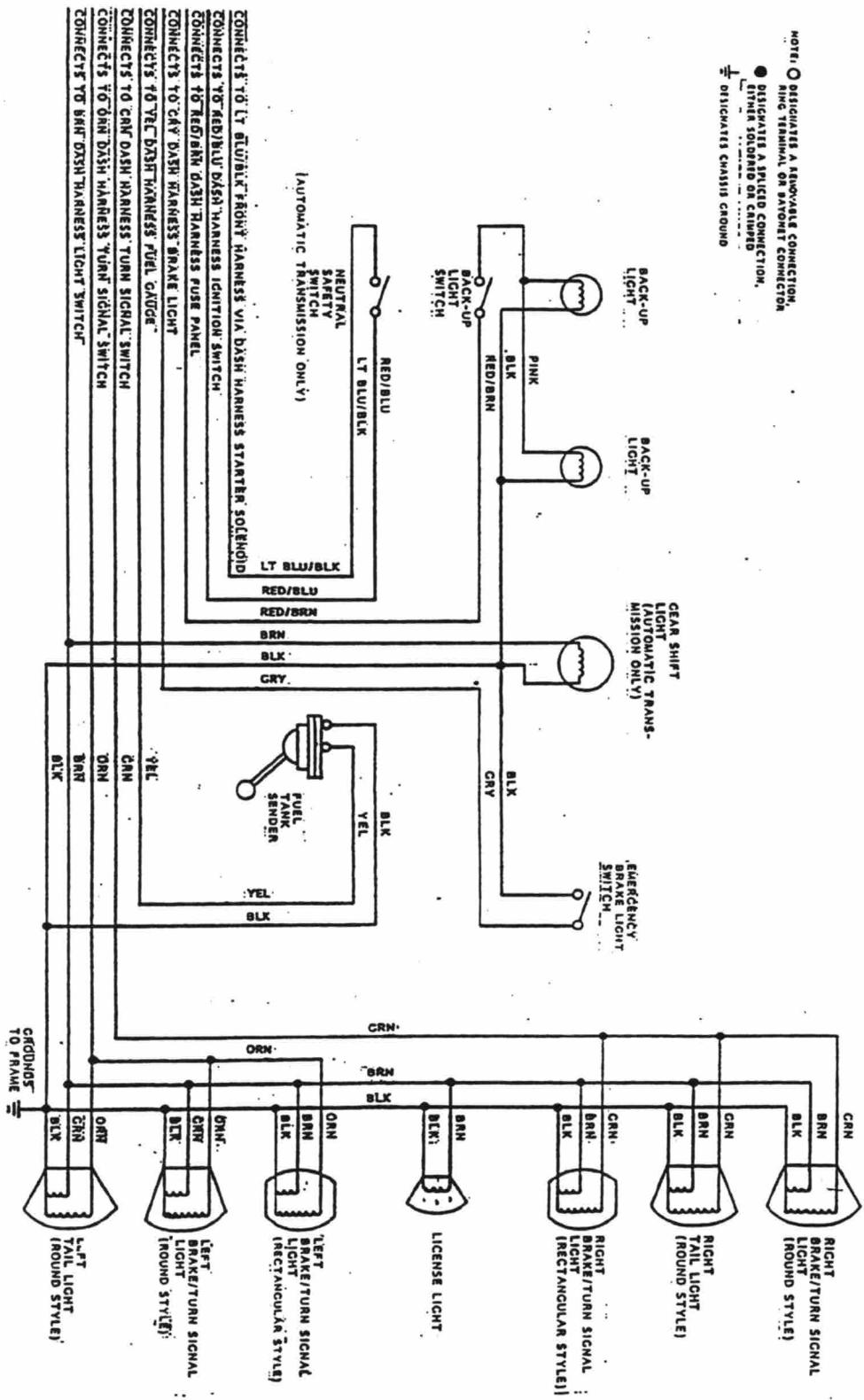
Place the battery onto the shelf on top of the passenger's foot well. Clamp the battery into place using a NAPA universal cross bar Part No. 730-2403 or 730-2406 and two NAPA battery hold down bolt Part No. 730-2382.

For the AOD transmission, connect light blue/black to Ford red/light

For the C4 and C6, connect light blue/black wire to Ford blue/red and red/blue to Ford red/blue for neutral safety switch. For backup lights, connect red/brown to Ford purple/blue and pink to Ford purple/white.

For the AOD transmission, connect light blue/black to Ford red/light

NOTE: O DESIGNATES A REMOVABLE CONNECTION  
 RING TERMINAL OR PLUG/OUT CONNECTOR  
 ● DESIGNATES A SPliced CONNECTION,  
 INNER SOLDERED OR CRIMPED  
 $\frac{1}{2}$  DESIGNATES CHASSIS GROUND



REAR WIRING HARNESS

Figure 2-37

**NOTE:** To attach the bolts to the foot well, use two pieces of flat steel, 1/8" thick, 1" wide, 3" long. Drill a 5/16" hole 1/4" from each end and bend in half, 90°. Attach to the foot well, as shown in Figure 2-38.

Route and attach both battery wires. Attach the ground wire to the frame. A ground wire should also be run from the engine to the frame. The engine ground wire must be the same gauge wire as a battery ground wire. Once the wires to the battery have been routed and attached to the frame, the battery cable clamp should be disconnected.

**WARNING:** The battery must be disconnected during all electric installations.

#### SECTION K DRIVESHAFT INSTALLATION

A late model Ford drive shaft is recommended.

Measure the original drive shaft from the center of the U joint yoke at the transmission end of the drive shaft to the U joint yoke at the rear axle end. See Figure 2-39. Call this measurement "X".

After the engine is installed position the rear axle so that it is in line with the end of the transmission.

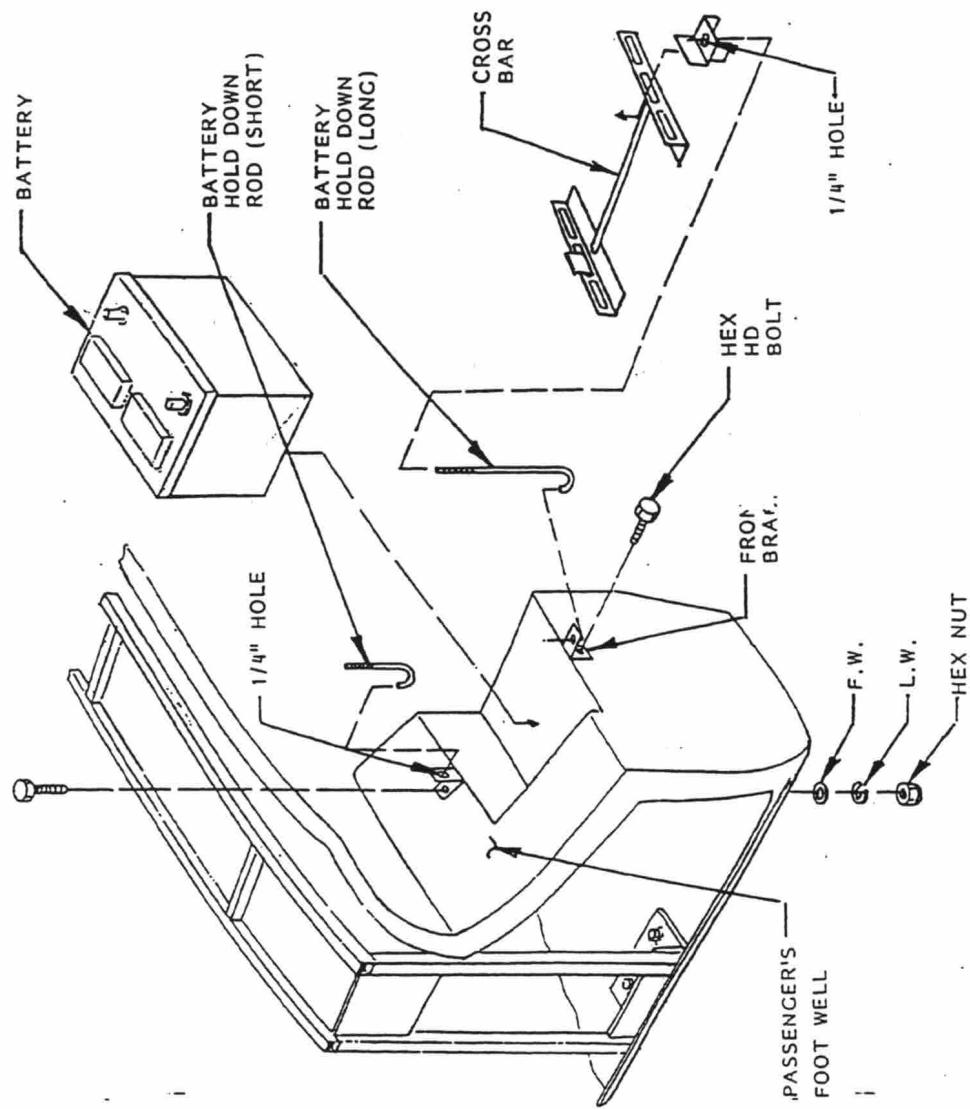


Figure 2-38

**NOTE:** It will be necessary to remove the springs during this step in order to get an exact measurement.

Insert the transmission yoke into the transmission until the wear mark from the rear seal is  $3/8"$  from the rear seal.

Measure from the center of the transmission U joint yoke to the center of the differential coupling on the rear end. Call this measurement "Y". Subtract "Y" measurement from "X" measurement and you will have the length that your drive shaft should be shortened. Scribe a reference mark along the drive shaft so that the U joint yoke can be reinstalled at the same relative position. This will assist you in having your drive shaft balanced. Take the shaft to a professional drive shaft shop or a machine shop, equipped to do the work. They will shorten, rework and balance the finished shaft.

### DRIVESHAFT SHORTENING

Insert the transmission yoke of the drive shaft into the transmission tail section. Using the original factory bolts, secure the rear axle flange of the drive shaft to the flange on the differential. Tighten and torque to factory specifications.

