

ASSEMBLY  
AND  
SERVICE MANUAL  
FOR THE  
E.R.A. 289FIA/USRRC



**Chassis 2126 on**

**Revision 4b  
March 2009**

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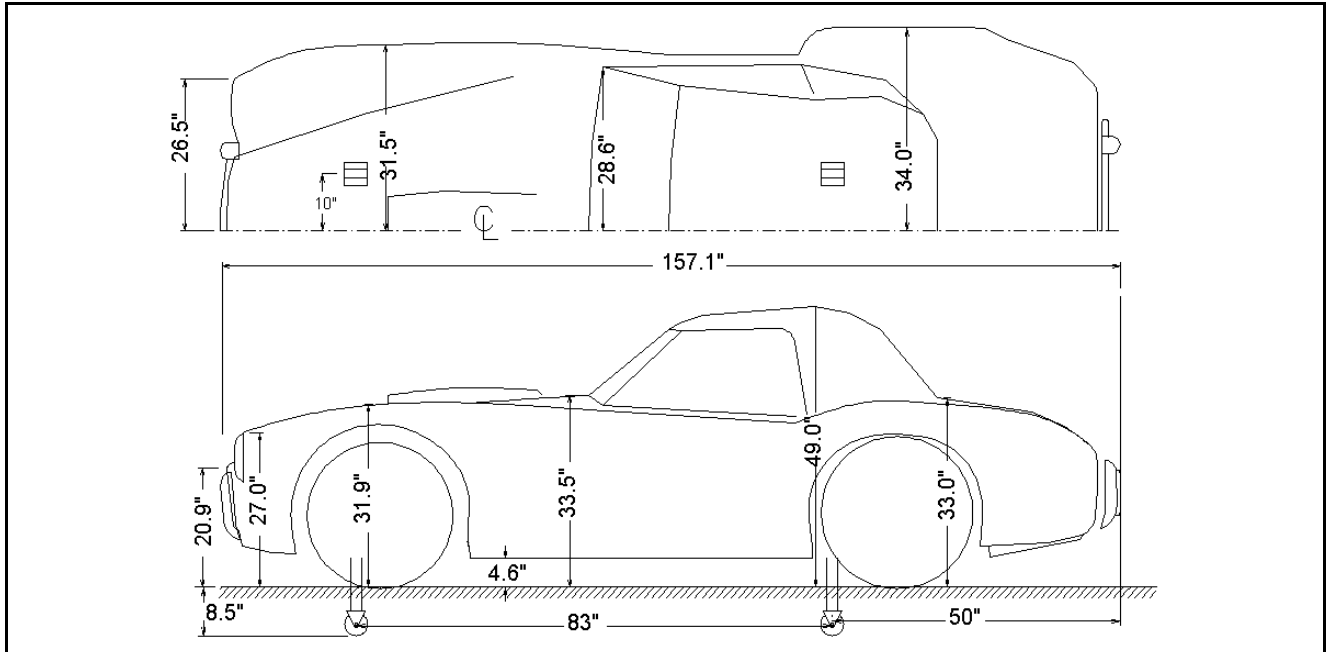
## SECTION A - PARTS NEEDED

### PICKING UP YOUR KIT

The kit can be transported from our factory in an enclosed trailer, standard automobile trailer or rampback hauler. Shipping space for the parts in cartons will also be required, although most will fit inside the kit. We have used several shipping commercial companies with excellent results. See page 27 for names.

### DIMENSIONS AND WEIGHTS

800 lb. bare + 200 lb. of boxes + 600 lb. for roller



a\shipdim

### TRAILER REQUIREMENTS

If you didn't buy a "roller" from us, the kit is usually shipped on the dolly wheels that we use for assembly if your trailer is well sprung. The dolly wheels require a \$300 **refundable** deposit. Many people keep the wheels until their kit is completed - it's very convenient for the kit to be mobile (and at the correct height) during construction.

The track of the Cobra dolly wheels is only about 20". Your trailer may require additional boards to support the dolly wheels. Without tires or dolly wheels, you can put tires as buffer between the chassis and the trailer. The kit will have to be lifted on and off the trailer manually. Have 3 strong friends to unload! If you're coming on a weekend to pick up your kit, please warn us if you aren't coming with extra people too. **Don't tie down the dolly wheels to secure the kit. Tie to the chassis or suspension.** In the absence of suspension pieces to tie to, wrap soft tie straps around the front crossmember and the upper mounting bolts for the rear subframe.

### TIE-DOWNS

You or your shipping agent will require ratchet tie-downs, come-alongs and/or strong straps. We recommend either 4 diagonal connections or 2 longitudinal and 4 lateral ones for a total of 6. Don't forget that the **trailer must have anchor points to tie to**.

To avoid scratching the paint on the chassis, use 2" wide loops (or double 1" wide loops) or ratchet straps, 5000 lb. minimum rating. Make sure that your trailer has places to tie to. If you use chains or a come-along, bring padding or nylon straps for intermediate connections to the chassis.

### INCLEMENT WEATHER:

A plastic cover will quickly shred at highway speeds. A high quality cloth car cover can be used to cover up the plastic, but it must be held down with rope all over. Looseness will allow any cover to quickly beat itself (and your paint job) to death.

## SECTION A -PARTS NEEDED-

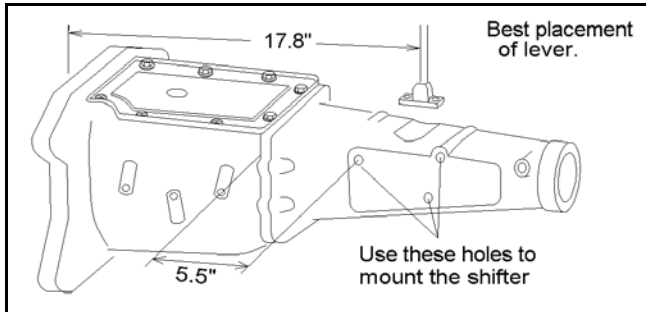
### SHIFT LINKAGE

All shift linkage is available from E.R.A.

### TOP LOADER

#### SHIFT LINKAGE

Both the original Ford 4-speed shift linkage and Hurst linkage work well. The linkage is mounted at the forward location on the transmission. Not all top-loader tail shafts have the casting bosses for the front mount but the tailshaft can be replaced. Some may require drilling and tapping.



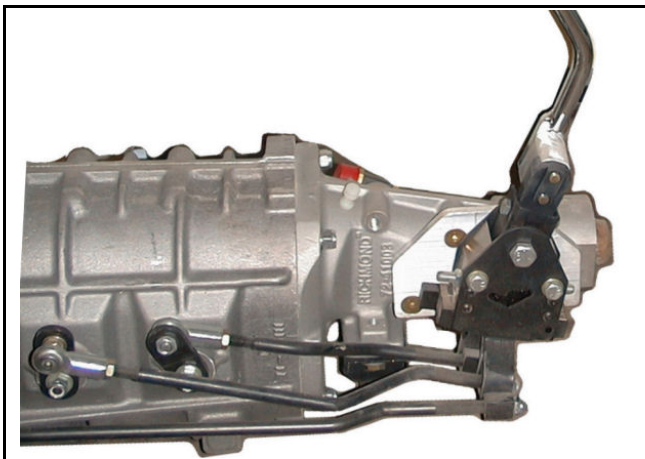
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#### LEVER

If you don't want to modify the Mustang lever yourself (see page 40), E.R.A. manufactures a duplicate the original shift lever to fit the Top-Loader, Richmond Gear and Tremec transmissions.

### RICHMOND GEAR

E.R.A. modifies a Long shifter and rods for the 5-speed, using the Ford lever for control. The lockout "T" handle is there for looks, but no longer is functional. Inquire about available parts.



### REAR DRIVE/SUSPENSION ASSEMBLY

The **289/FIA** is designed to use either the **Jaguar** rear suspension (in an E.R.A. subframe) or the custom **E.R.A. suspension unit** with outboard brakes. The E.R.A. unit is available as a kit or as a complete assembly.

### JAGUAR-BASED



### SELECTION

See page 23 for application list.

The Jaguar differential is the same Salisbury unit that was used in the original Cobra with only some casting changes. It is adequate for 500+ BHP, and can be made even stronger by using stub axle parts from Concours West. Gear wear is not normally a problem even in well-used assemblies, but always replace seals.

**Do NOT** replace the control arm roller and needle bearings with aftermarket urethane bushings! The net result will be wheel hop and generally sloppy handling.

The vintage of the Jaguar differential is punched in the casting at the lower right corner of the cover. The top number indicates the year, the bottom number is a special code. (Translation: we don't know what it's used for). A simple way to determine whether a post-1980 unit will work is the presents of inboard brakes. The later (inappropriate) assemblies have brakes mounted on the hub carriers.

#### When selecting/buying a used rear end look for:

- **Completeness** - You don't need the Jag trailing arms or emergency brake compensator, but you do need everything else.
- **Limited Slip Differential** - Note that some XJ differentials were open. A limited slip may be retrofitted at the time of rebuild for about \$700
- **Brakes** - Try to get serviceable hydraulic and emergency brakes. There were no major changes in XKE rear brake until 1968 when both the calipers and rotors were updated. The later units are cheaper and easier to rebuild than the early units.

## SECTION B - PARTS PREPARATION

### ENGINE COMPONENTS

Because of the likely variation of your components, we obviously cannot give complete enging rebuilding instructions here. What follows are the **E.R.A.-specific requirements** for your engine. General torque specifications for typical fasteners are found on page 132. Good reference books for Ford engines are listed on page 134.

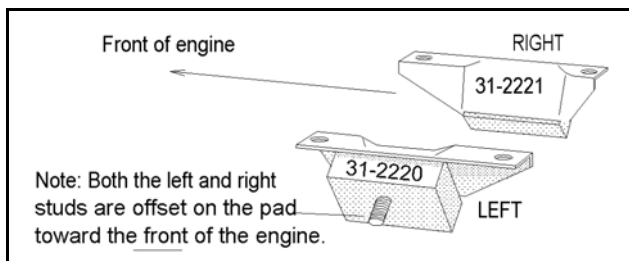
### BASIC PREPARATION

Remove cooling fan from engine water pump pulley.

Install the fitting for the water temperature gage in the intake manifold adjacent to the distributor.. Some **Smiths** temperature gages require a 1/2" NPT hole. If space permits, you may adapt with a Weatherhead fitting, 3200 x 8 x 6. Otherwise, drill and tap the manifold to 1/2" NPT. You may remove the heater fitting in the manifold too. Plug the hole.

If necessary, install a 1/2" NPT fitting in the oil pan. Most Canton and Aviad pans already have this fitting.

Install the engine mounts onto the block as shown below.



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### ALTERNATOR MOUNTING:

**Serpentine belt engines** must change to the following components:

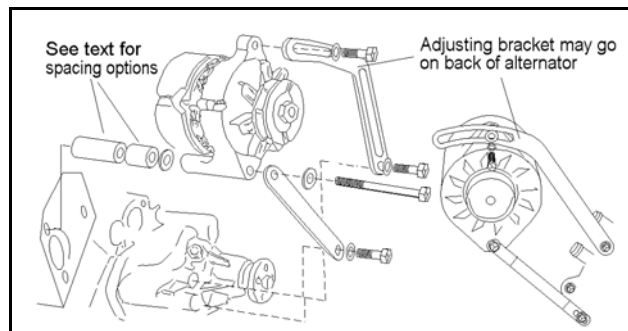
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980 lower pulley - modify by removing the outside groove.

1980 upper pulley

1979 water pump

The **alternator** pivots in the outer mounting hole in the head as shown below. Some aftermarket heads require a threaded insert (Ford # F4ZZ-6E086-A) to reduce threads to 7/16" USS. The adjusting bracket between the alternator and the upper right water pump bolt is included in the kit. If you use both spacers, an external brace should be put between the outside end of the alternator mounting bolt and the water pump. Because there are so many possible combinations of water pump, pulley and heads, this brace is not included in the kit. Use a straight-edge to figure what combination of spacers (and possibly washers) will be required for all the pulleys to line up.



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Install the long bolt through the (reinforcing bracket), alternator and spacer tube.

Bolt the assembly onto the cylinder head.

Install the top adjusting bracket as shown.

Loosely secure the inner end of the reinforcing strap to the water pump bolt as indicated.

Tighten the alternator pivot bolt.

Tighten the reinforcing strap bolt.

Check the alignment of the pulley grooves with a straight-edge. Add washers or shorten the spacer as needed.

## SECTION B - PARTS PREPARATION

### CLUTCH

Install the clutch pilot bearing,, driven disk and pressure plate.

### TRANSMISSION

#### ALL

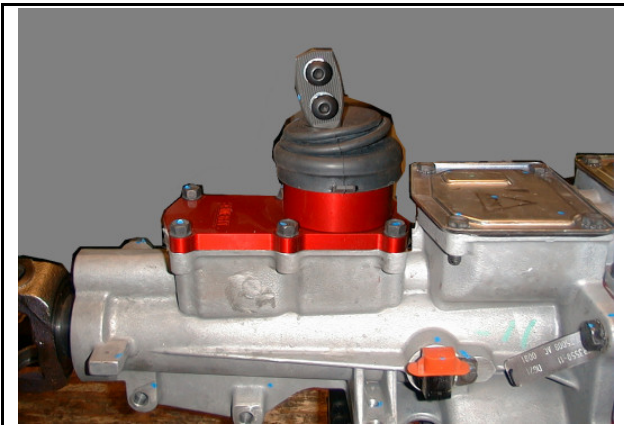
Install the rear mount onto the transmission.

#### TREMEC

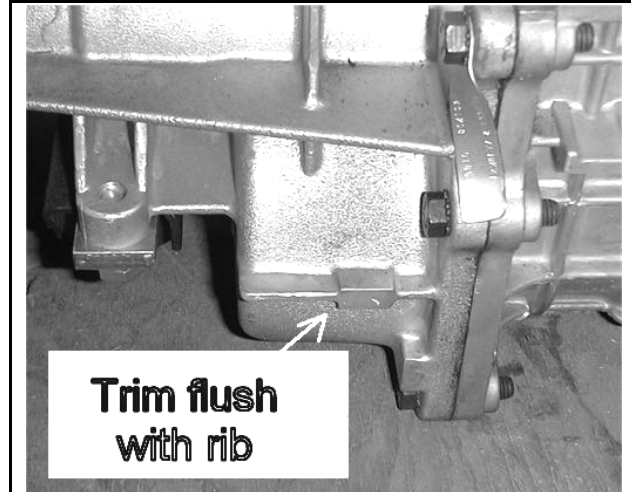
Stock series 600 transmissions have an input shaft that requires a spacer between the transmission and bellhousing. A transmission with a shortened input shaft is available from various sources and obviates the need for the spacer.

The Tremec TKO series have a boss on the right side that must be trimmed back flush with the adjacent rib. See at right. The passenger's side floor may also require some trimming where the transmission comes close.

The TKO 600 shifter can be moved forward from the stock for better positioning:



Some Tremec transmissions require an aluminum adapter between the transmission and the mount. In addition many people prefer to use a concentric throwout bearing with the Tremec. If you do, McLeod (and ERA) recommends that you remove any centrifugal weights from the clutch pressure plate.



TKO 3550



TKO 500/600

### CLUTCH THROW-OUT FORK

We recommend that you use the fork listed on page 24 for all bellhousings. Call us for special instructions for the T-5. See the bell housing notes following.

## SECTION B - PARTS PREPARATION

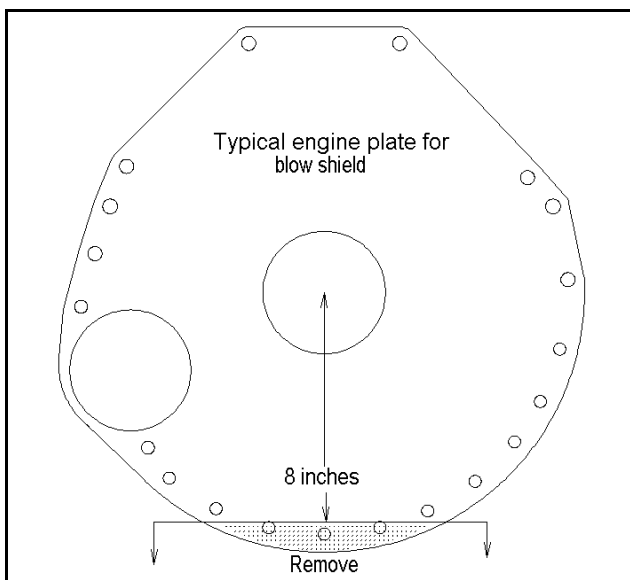
### BELL-HOUSING

#### Notes:

The bell housing **depth** (face to face) for the **T-5** is about 6.8". If you are using a push-type release lever, the pivot must be spaced about  $\frac{5}{8}$ " forward.

The **Tremec** transmission also requires a deep bell housing or a bell housing with a  $\frac{5}{8}$ " spacer for the input shaft not to interfere with the pilot bearing.

Many blow-shield type bell-housings have a large bottom flange that will extend below the chassis. Trim the engine plate as shown and use it as a template to trim the bell-housing flange. This dimension applies to all engines, although the trimming operation may not be necessary for some.



*b\belltrim*

The optional E.R.A./Lakewood blow-shield from ERA is already trimmed.

For other engines, trim the bell-housings similarly, using the distance from the centerline of the crankshaft to the bottom edge of the flange.

### CLUTCH SLAVE CYLINDER

We recommend the following combinations (with small block Ford) for easiest installation:

|  |                             |
|--|-----------------------------|
| <b>T-5, Tremec</b>                     | Concentric throwout bearing |
| <b>Top-loader, Richmond Gear 5 spd</b> | External slave cylinder     |

Details for using the concentric bearing are available from ERA and on the internet. Inquire.

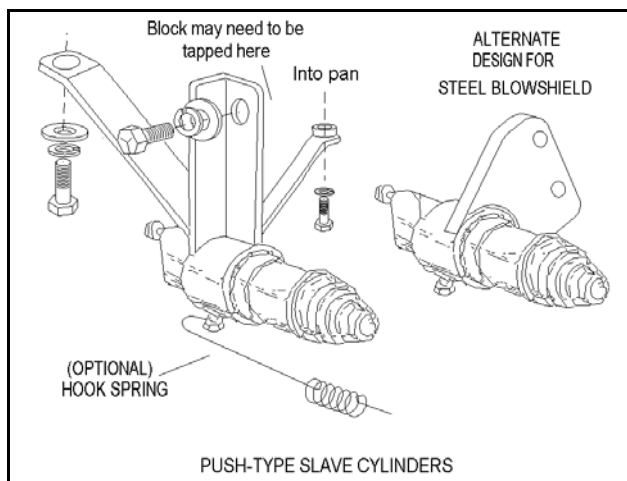
### (PUSH TYPE)

See page 118 for hose installation and other details.

The bracket and slave cylinder assembly is fastened in three places:

- The tapped hole on the left side of the block bell-housing flange (where the original clutch shaft pivot ball went).
- The rear bolt of the left engine mount..
- The left rear oil pan tapped hole.

**Note!** When the slave cylinder is installed in the bracket, the bleeder must be at the top.



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### **BLOWSHIELD MOUNT:**

Use the appropriate holes to line up the slave cylinder axis with the throwout fork.

### **CLUTCH THROWOUT ROD**

E.R.A. supplies two threaded rods with the push-type slave cylinder to link with the throw-out fork in the bell-housing. If your throw-out lever has a hole in it, use the long threaded rod. If there is just a socket, use the short rod. See page 119 for assembly.

Install the correct link either by shortening the adjustment or loosening the adapter bracket from the block. A return spring is optional.

### CLUTCH SLAVE CYLINDER

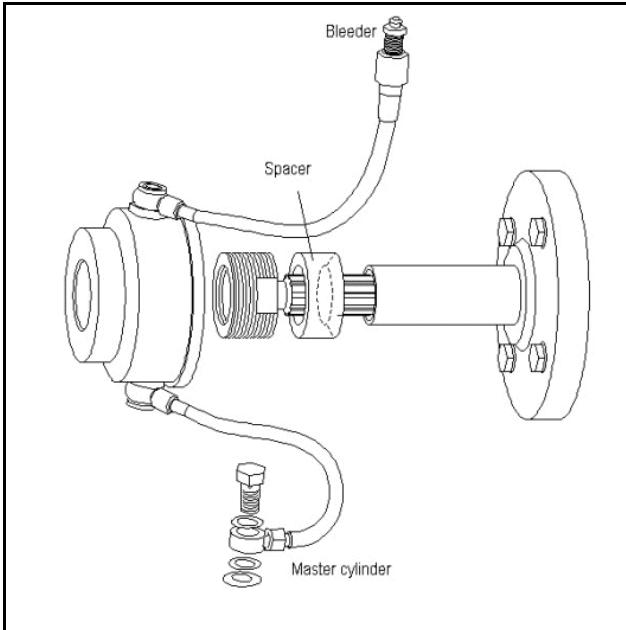
#### (T-5 -PULL TYPE)

Inquire at ERA

## SECTION B - PARTS PREPARATION

### SLAVE CYLINDER, INTERNAL

Some clutch/transmission combinations work best with an internal (concentric) clutch slave cylinder. This type of clutch release is self-adjusting, but requires careful initial adjustment to compensate for different clutch finger heights. It is very **sensitive to proper setup**.



We typically use Weber brand, and have found them to be reliable if properly done. When you assemble your car, it is essential to follow the installation guidelines. Pictures and procedures shown here are particular to Weber - yours may be different. Always read and follow the instructions for your installation.

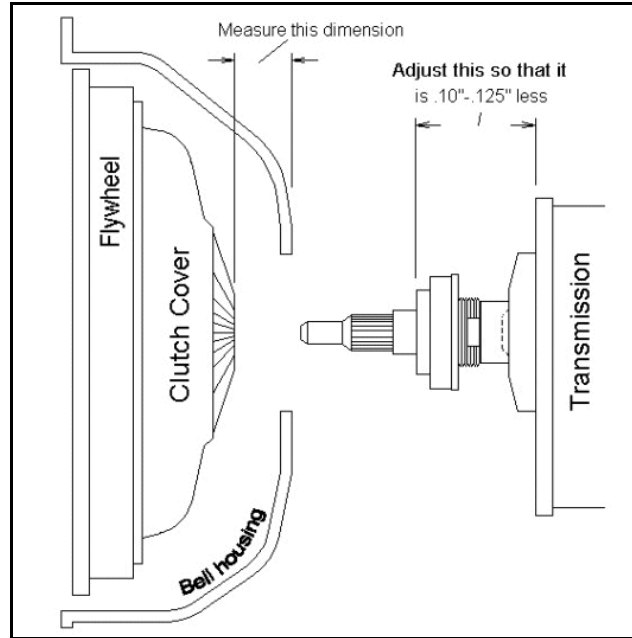
Weber brand cylinders (and most others) have no system to keep the "piston" from being pushed too far out of the cylinder - and puking fluid all over the floor. The ERA requires a pedal stop so that the master cylinder stroke is limited.

#### **NOTE!**

McLeod recommends that you remove any centrifugal weights on the clutch pressure plate when you use a concentric throwout bearing.

#### **ADJUSTMENTS**

"Permanently" install all the clutch components onto the flywheel, using an alignment tool for the driven disc.



Install the bell housing. Using a straight-edge across the bell housing opening, measure the height of the fingers below the opening. Make sure that the cylinder piston is pushed all the way into the housing.

Adjust the height of the bearing on the transmission by screwing the threaded adjusting sleeve in or out of the slave cylinder so that when the transmission is installed, there will be the indicated clearance.

After the transmission is installed permanently, recheck the clearance and connect the pressure hose to the clutch master cylinder.

Attach the bleed hose to the bellhousing flange at a conveniently accessible location.

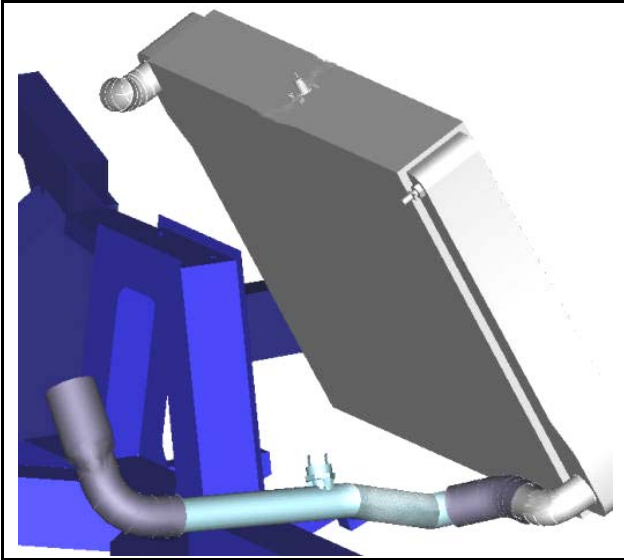
### OIL PAN:

There are several aftermarket pans and OEM Ford designs listed on page 22. If the pan does not have an oil temperature bung, weld the oil temperature adapter fitting (packed with the auxiliary instrument pieces) onto the left side.

### STARTER

Because Ford ringears have several offsets, the starter must be matched correctly. Measure the distance from the plane of the rear face of the engine to the near edge of the ring gear teeth. "A" varies from  $\frac{1}{4}$ " to  $\frac{5}{8}$ ", so you might have to visit your jobber for the correct unit.

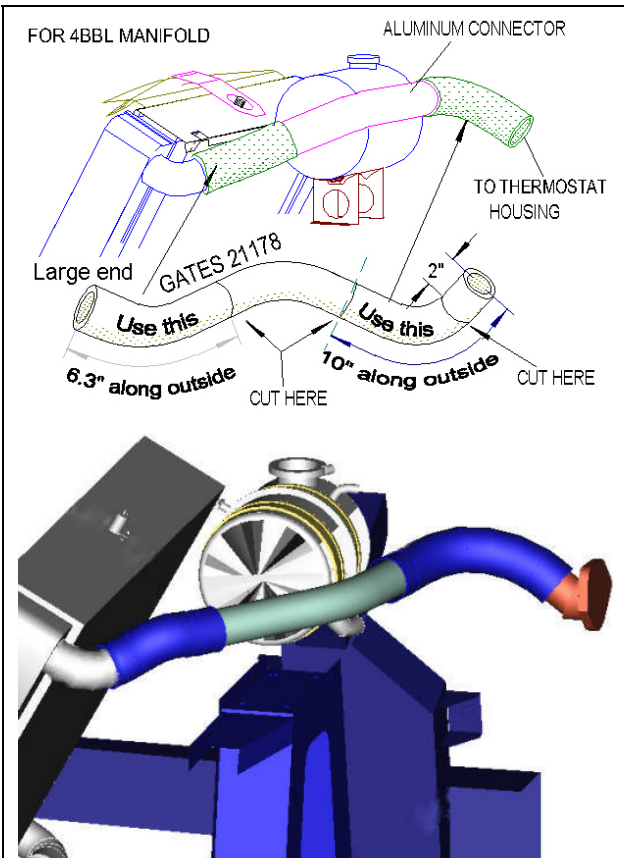
## SECTION B - PARTS PREPARATION



Right exit water pump

### UPPER

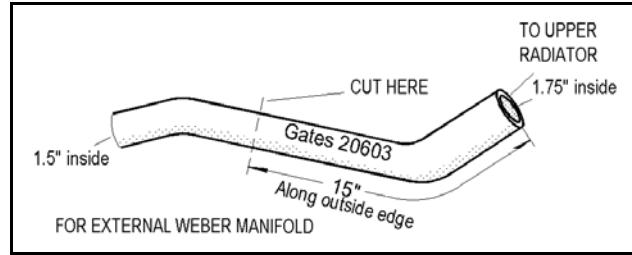
4 bbl and single outlet Weber manifold



Use a short neck thermostat housing (20° up) on the intake manifold. Cut and trim the hose as shown:

### Weber Manifold (two outlets)

Use a drilled freeze plug in the upper hose to restrict flow.

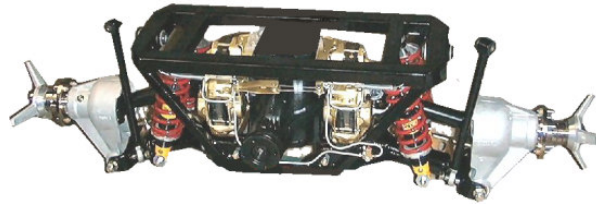


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### SMALL HOSES:

If you are not using a heater, connect the water pump inlet to the expansion tank.

## REAR SUSPENSION - JAGUAR



### DISASSEMBLY

Components must be thoroughly checked and rebuilt if necessary: brake calipers, emergency brake pads and linkage, universal joints on half-shafts, hub carrier and lower control arm bearings. Bearings, etc. are listed on page 129. We have found that the **Spicer®** U-joints listed are the only brand that meets the standards required of the Jaguar half-shafts (and we've tried quite a few).

Replace any corroded or damaged brake lines. Be sure to use lines with the proper end flare and fittings. Note that some British fittings have a convex (bubble) flare that mates with a concave receptacle in the caliper. While this is similar to some metric fittings, the threads are SAE. It is not possible to make these flares with a conventional flaring tool. Aftermarket suppliers and Jaguar dealers have these British style lines.

Mount the brass junction block on the left front of the cage, with the fitting for the flex hose up. If your rear suspension core has the junction block pointing forward, fabricate a small bracket from 1/8" steel strap. Install the hose (mounted on the chassis, originally) onto the junction with a copper "0" ring.



## SECTION B - PARTS PREPARATION

### ASSEMBLY

#### AXLE ASSEMBLY

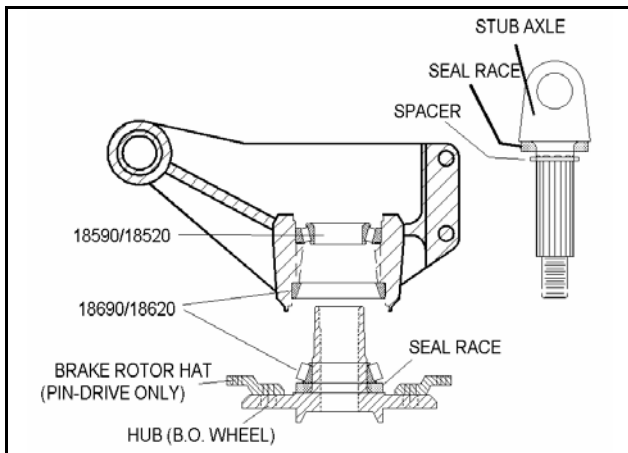
The stock Jaguar XJ inner axle must be shortened to XKE Series I/II length. Alternately, you may build the axle from scratch. Specifications are available from us. Complete assemblies and parts are available from E.R.A.

Clean and deburr the axle splines.

Assemble the stub and inner axle together, replacing the universal joints with genuine Spicer units (5-160X).

#### Hub Carrier

Note that the lower pivot shaft is a **shrink fit** into the aluminum casting. It may be removed by heating the assembly or, less preferably, by using a press. Generally, removal is not necessary.



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Clean the hub carrier casting of any machining debris, especially on the inside.

Press the inner and outer bearing races and outer seal only into the carrier.

Install the seal race and the outer bearing onto the hub. Make sure that both are completely seated.

Install the seal race onto the stub axle.

#### ADJUSTING HUB END FLOAT

When the hub carrier is assembled, the end float of the axle/bearing assembly should be adjusted with shims to between .002" preload and .004" float. Aim for zero. You can change the end float with the correct size of spacer from Jaguar, SICP, Concours West, or E.R.A. See the list of available shims below.

Pack the inner and outer bearings with good wheel bearing grease. Also fill (about half-way) the cavity in the hub carrier. Install the inner oil seal.

#### Technique One

Insert the hub with outer bearing into the hub carrier.

**Moderately** press the outer bearing onto the small end of the hub so that the bearing seats into the bearing cup. Check that there is no axial play of the hub, but it still rotates freely.

Measure the distance from the hub end to the bearing surface with an accurate dial indicator.

Find the next size larger spacer in the chart.

Assemble the spacer onto the stub axle, install the axle assembly into the hub, lining up the cotter pin holes in each. Install a flat washer and nut. Tighten the nut to 140 lb-ft.

Check the end-play with a dial indicator. If it is correct, tighten the nut to the next near hole and install the cotter pin.

#### Available shims:

| Jag part # | Thickness |
|------------|-----------|
| CAC3818/10 | 0.110"    |
| CAC3818/12 | 0.112"    |
| CAC3818/14 | 0.114"    |
| CAC3818/16 | 0.116"    |
| CAC3818/18 | 0.118"    |
| CAC3818/20 | 0.120"    |
| CAC3818/22 | 0.122"    |
| CAC3818/24 | 0.124"    |
| CAC3818/26 | 0.126"    |
| CAC3818/28 | 0.128"    |
| CAC3818/30 | 0.130"    |
| CAC3818/32 | 0.132"    |
| CAC3818/34 | 0.134"    |
| CAC3818/36 | 0.136"    |
| CAC3818/38 | 0.138"    |

#### Technique Two

Hold the hub carrier vertically in a vise with the inner end of the hub uppermost. Place the special collar tool (Jag tool No. J15) on the hub end. Place the inner bearing inner race on the hub and press the race onto the hub until the inner face is flush with the special collar. This will provide end flat bearings. The end float should then be measured with a dial test indicator. A spacer should then be fitted in place of the Special collar to give end float of .002"-006". Spacers are supplied in the thicknesses shown below.

## SECTION B - PARTS PREPARATION

For example, assume the end float measured to be .025". Subtract the nominal end float of .004" from the measured end float giving .021". Since the Special Collar is .150" thick, the thickness of the spacer to be fitted will be  $0.150" - 0.021"$  i.e. .129". The nearest spacer is 0.128" or 0.130". For competition, use the spacer yielding more end float.

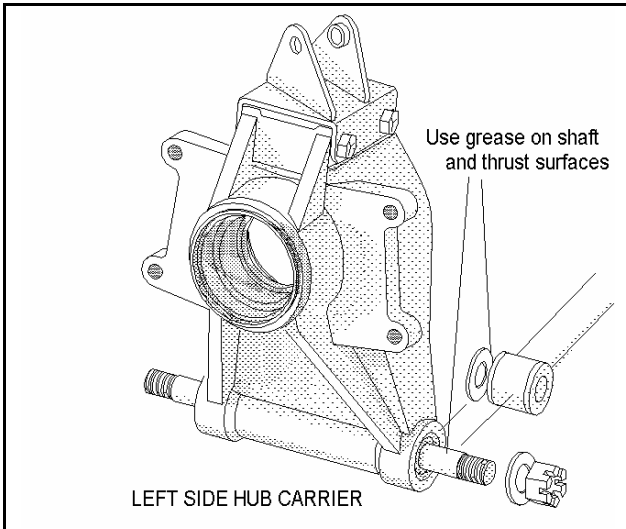
When the axle shaft has been fitted and nut tightened (140 lb.ft.), check the end float with a dial indicator. If it is correct, tighten the nut to the next near hole and install the cotter pin.

Install both the seals into the hub carrier.

Re-assemble the hub carrier with hub and axle.

Install the washer and retaining nut. Tighten the nut to 225 lbft. Without an air wrench, you may want to wait until the car is on the ground for final torquing.

**Install** the upper bracket onto each hub carrier and torque the bolts to 75 lb-ft. Note the orientation below for the left hub carrier. The right is the mirror image.

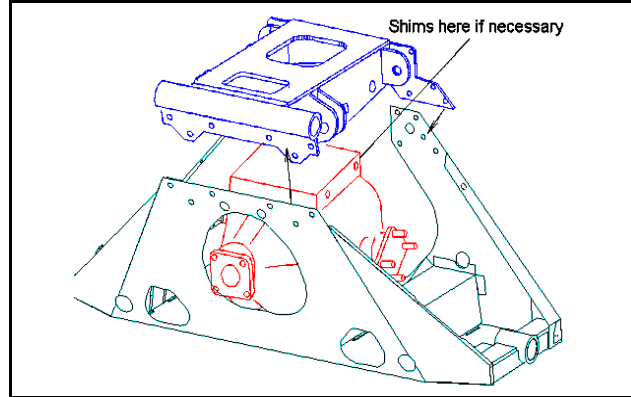


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### ASSEMBLY INTO SUBFRAME

Rebuild the differential as necessary. Some units have a separate caliper mounting bridge on the side bearing housing. This bracket and the original Jaguar rotor can be left off.

Place the differential on the bench, right-side-up. Allow the snout to extend over the edge of the bench several inches. Raise the back up about  $\frac{3}{4}$ " with a block of wood, etc. Loop the front of the subframe over the nose of the differential. *Loosely* bolt the top of the subframe to the top of the differential with (4)  $\frac{1}{2}$ "USS x  $\frac{1}{4}$ "L bolts, flat washers and lock washers.



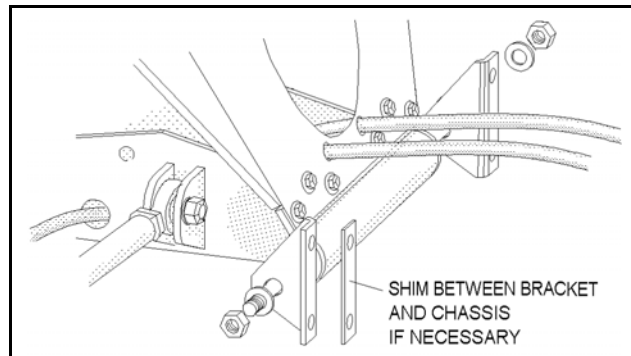
Turn the assembly upside-down. Install the **bottom** section of the subframe by inserting the *rear ears* just in front of the rear flanges of the top. Rotate down in the front to match the front holes and loosely attach the front with  $\frac{5}{16}$ "USS x  $\frac{3}{4}$ "L hex cap screws and flat washers. Align the rear flanges of the upper and lower sections with the  $\frac{5}{8}$ " lower radius arm bolts. Insert the  $\frac{5}{16}$ "USS x  $\frac{3}{4}$ " bolts (flat washers on both sides) and secure with stover nuts.

Use Grade 5 torque specs on page 132 for all fasteners

Loosely fasten the bottom of the subframe to the differential using  $\frac{1}{2}$ "USS x  $\frac{1}{4}$ " bolts, flat and lock washers. Shims may be necessary between the channel and the casting, so don't tighten the bolts yet.

Tighten (in sequence) the top differential bolts, the bolts between the top and bottom subframe pieces. If the clearance between the differential and the bottom section of the subframe is greater than .040", insert shims to fill the gap. Use a medium grade threadlocker on the bolts.

Install the bushings and side brackets on the front mount tube. Tighten one castle nut to 5 lb-ft and back off so that the slot aligns with the nearest hole in the shaft. Tighten the second nut to 15 lb-ft and back off to the nearest hole.



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## SECTION B - PARTS PREPARATION

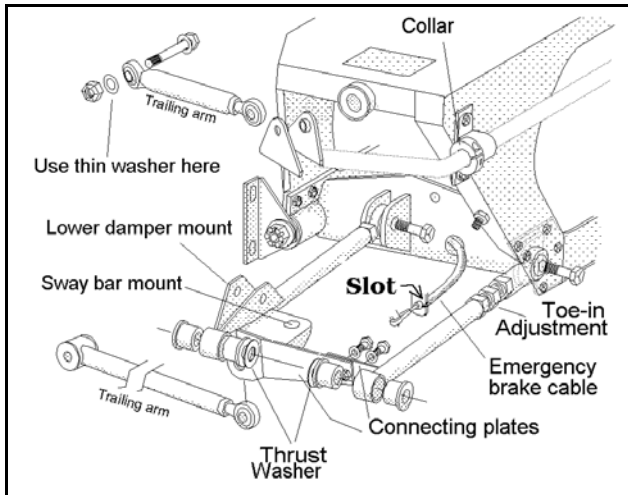
### CONTROL ARMS

Install a male (right-hand-thread) rod end onto each front lower radius arm so that the bushing center to rod end center distance is 16". Leave the jam nuts loose.

Install the steel brake lines onto the subframe.

Install the front lower radius arms onto the lower differential bracket as shown, leaving the inner bolt loose.

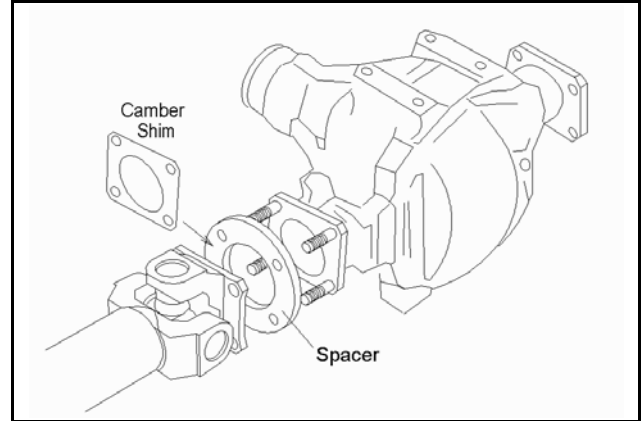
Install the coil-over damper onto the upper mount using a  $\frac{1}{2}$ " x  $2\frac{3}{4}$ "L bolt with flat washers and stover nut. Install the coil-over onto the lower arm (spacers, too), tightening the top and bottom bolts.



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Insert the thrust washers and inner bushings into the hub carrier assembly. Lightly lubricate the inside with heavy grease (silicone or moly base is best). Install the hub carrier onto the front radius arm. Loosely install the second bush half, washer and castle nut.

Install the rear radius arm onto the hub carrier in the same manner. Slide the other (inside) end into the bracket on the subframe and temporarily secure with a bolt. Insert the  $\frac{3}{8}$ "-16 x  $\frac{5}{8}$ "L bolts through the connecting plates. Tighten each castle nut to 15 lb-ft and back off to the nearest hole. Secure with a cotter pin.



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Bolt the half-shaft inner ends and spacer onto each differential output flange. If you wish, install Jaguar shims with about .060" total thickness between the half-shaft and the spacer. This will make minor camber adjustments easier after basic alignment has been done.

Slide the axle into the hub carrier, using a small amount of light grease on the splines. For competition, you might want to use a little shaft-and-bearing mount on the splines, but be aware that disassembly requires heat. Secure with a flat washer and castle nut.

Tighten all the lower hub carrier pivot shaft nuts to 20 lbft, back off  $\frac{1}{3}$  of a turn to the nearest cotter pin hole and insert cotter pin. Insert any shim washers necessary between the rear flank of the rod ends and the cage bracket. Install a flat washer and lock nut.

Install the caliper using M10 x 30 allen screws and ribbed lock washers.

Install the upper trailing arm bracket with bolts, flat washers and lock nuts so that the bracket angles in toward the front.

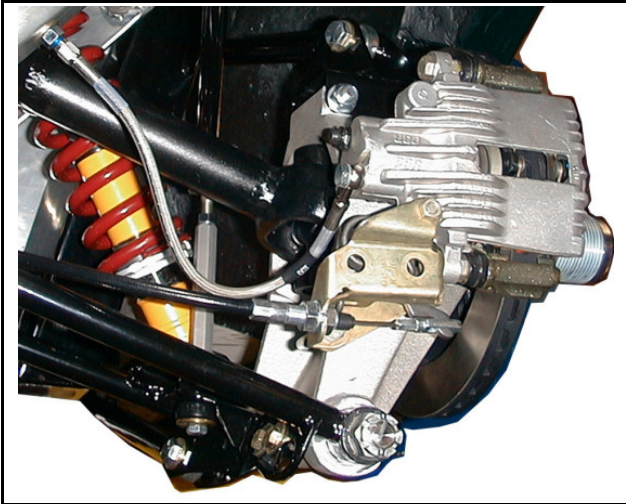
Install the upper trailing arms onto the hub carrier bracket.

Install the lower trailing arm onto the lower radius arm with flat washers and lock nut. Tighten nut to 35 lbft. The front of the trailing arm is attached the same as the Jag suspension.

## SECTION B - PARTS PREPARATION

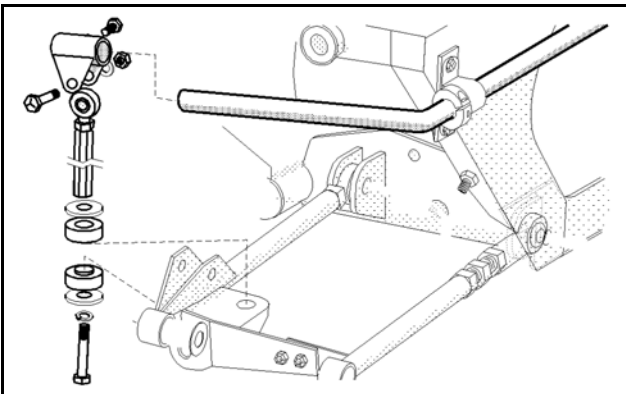
### EMERGENCY BRAKE CABLE

Route the long cables through the hole in the subframe as shown above. Pass it through the internal holes, the holes above the front mount (page 38), and into the balance bar shown on page 35. If you supplied the calipers, cut a slot in the cable mount big enough for the cable to fit through.



### ANTI-SWAY BAR

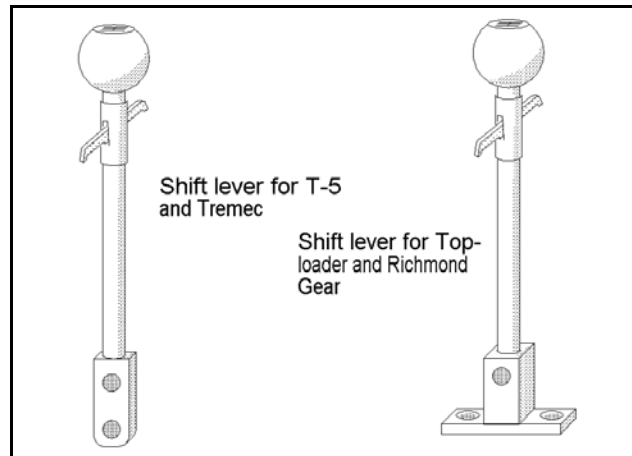
Install onto the rear of the subframe with  $\frac{5}{16}$ "-USS nuts, flat and lock washers as illustrated.



*b\rerasbmt*

### SHIFT HANDLE

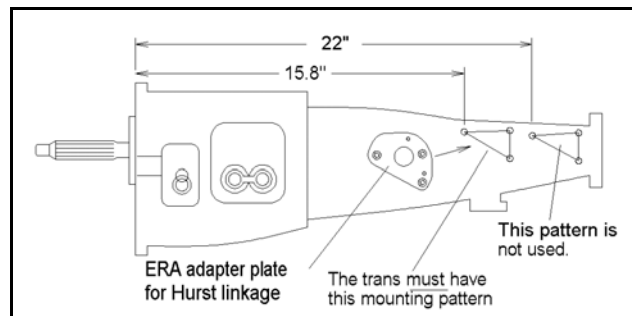
Handles are available from E.R.A. and Finish Line



*b\shftlev*

### SHIFT LINKAGE

E.R.A. has complete **linkage** and **adapters for Hurst linkage** for those who don't want to do the modifications required. Inquire for details.



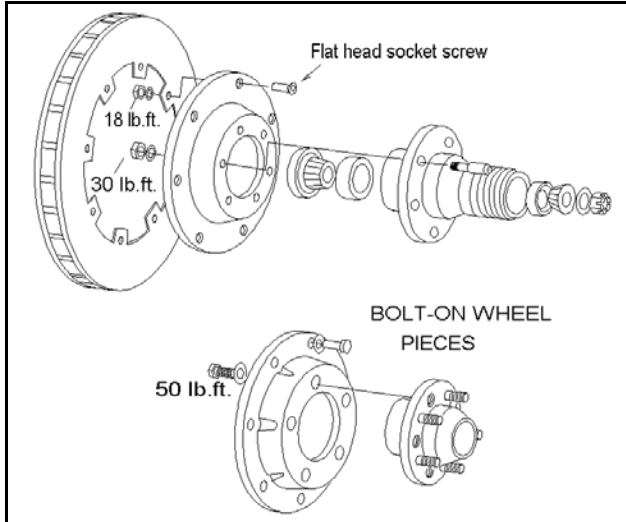
*b\shftlink*

### TREMEC 5 SPEED TRANSMISSIONS

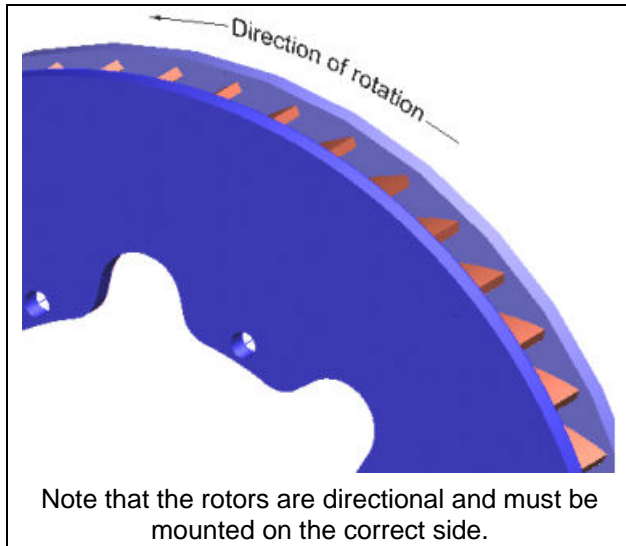
All Tremecs except for the 500 and 600 retain the stock shifter location. On the 500 and 600, the rear plate can be turned 180 degrees, moving the lever about 3" forward.

## SECTION F -MECHANICAL COMPONENTS-

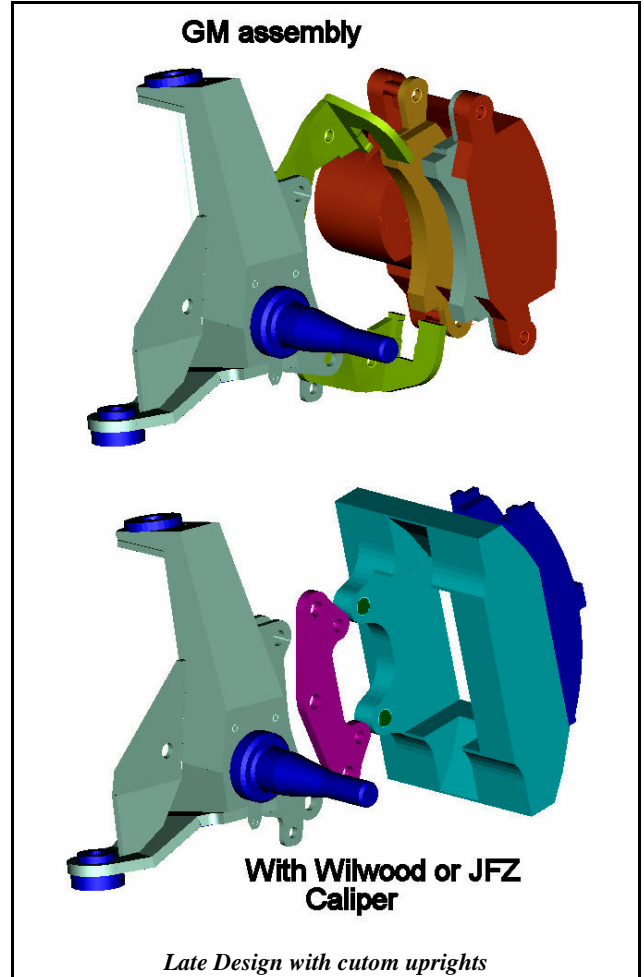
### 12" BRAKES: HUB AND ROTOR MOUNTING



f/jjfz2.gif



### OPTIONAL WILWOOD CALIPER MOUNTING



### GENERAL INSTALLATION

Replacement parts are listed on page 129.

**Pin drive:** If the rotor is not already installed on the pin drive hub, **torque** the drive pins to 35 lb-ft (with high-strength thread locking compound, i.e. Loctite® red) and the nuts to 35 lb-ft.

If you ever need to remove the pins, they will have to be heated to 300 deg. to weaken the bond.  
**Excessive heat** will weaken the pins.

**Always grind the rotor** after installing the wheel bearing races. If you don't have a special driver for the races, let the auto machine shop install them.

Clean off the **grinding dust** thoroughly before putting grease in the hub and installing the bearings and inner seals.

Install the **dust shields** onto the steering knuckles if desired.

## SECTION F -MECHANICAL COMPONENTS-

Install the hub onto the stub axle with a special (tanged) washer and castle nut.

With new wheel bearings, torque the **axle nut** to 20 lb-ft. Loosen the nut and re-torque to 15 lb-inches, then tighten to the nearest cotter pin hole. Install the cotter pin through the access hole in the side of the pin-drive hub.

Note that the calipers are handed. Install them with their bleeder nipple at the top.

Install the brake calipers and pads using new hardware kits. Use **silicone grease** on all sliding surfaces.

Connect the brake line to the caliper, using the supplied banjo bolt and copper washer. If you still get seepage past the copper washer but the seat is not too bad, you may use a special sealing washer available from Earls or E.R.A.

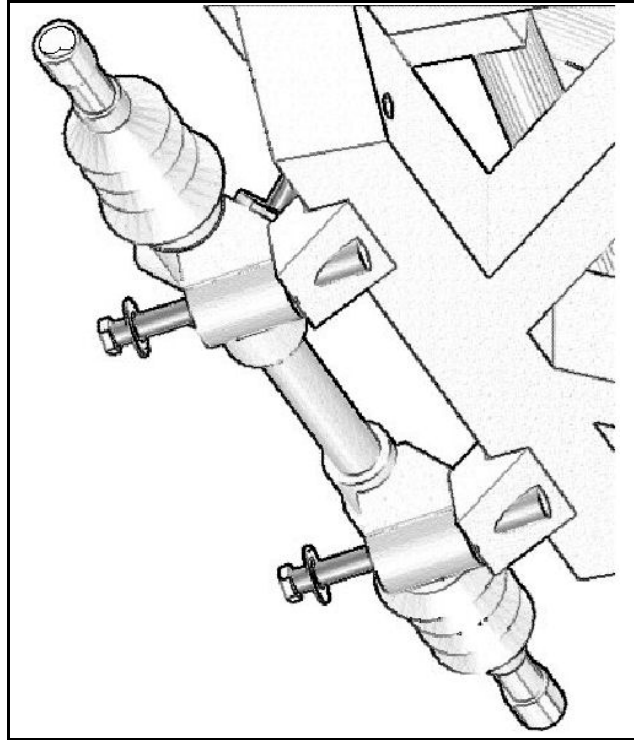
### COIL-OVER DAMPER

See page 68. **Spacers** for the lower mounts are provided with the dampers. Orient the damping screw adjuster toward the centerline of the car. Use a washer on either side of the top mount. Secure the top with a 2 <sup>3</sup>/<sub>4</sub>" long bolt in from the back. A 2 <sup>1</sup>/<sub>2</sub>" bolt is supplied for the bottom attachment. Again, slide the bolt in from the back.

### STEERING GEAR

The lower steering column must be installed before the steering gear. See page 79.

Prepare the rack and pinion assembly as described on page 41.



*g\steeringgearmt*

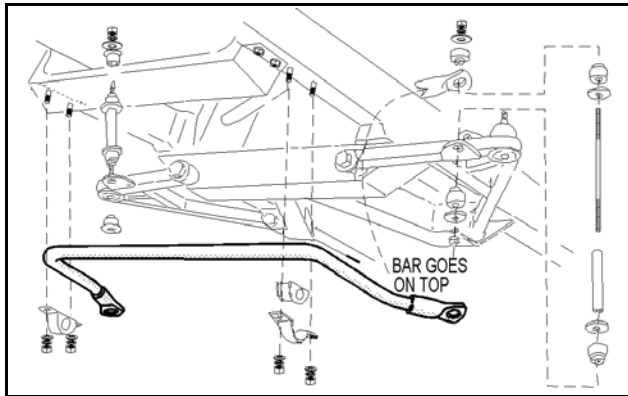
After putting a small amount of blue Loctite® (or similar thread locker) on the bolt threads, torque the bolts to 65 lbft.

## SECTION F -MECHANICAL COMPONENTS-

### ANTI-SWAY BAR

Threaded holes are already on the chassis. Chase any paint in the threads before installing the ( $\frac{5}{16}$ -18) bolts, washers and nuts. The  $\frac{15}{16}$ " front bar is mounted under the front frame extensions, just behind the radiator.

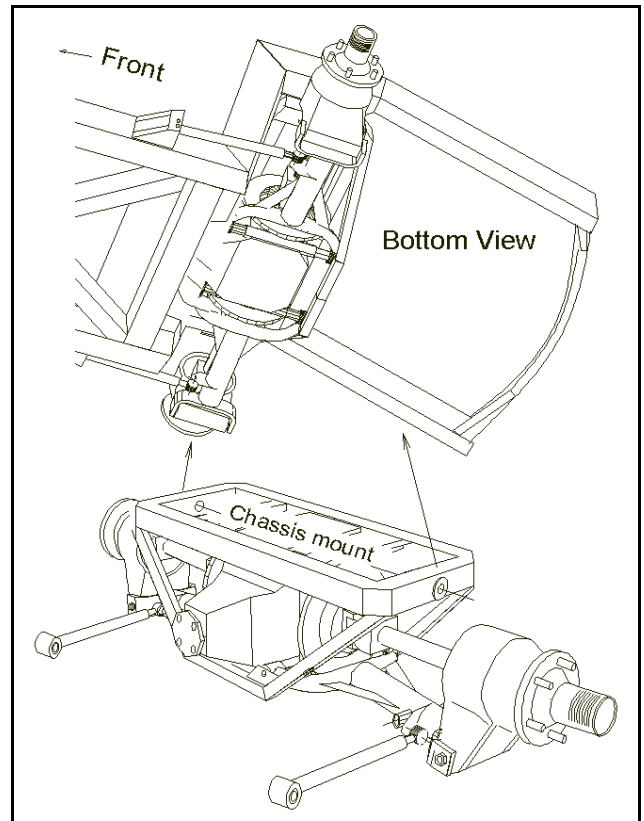
- Bolt the bar in place with the rubber/urethane bushes and clamps. The ends slant up slightly toward the outside.
- Install the connecting links between the tab on the lower control arm and the pads on the ends of the sway bar.
- Tighten the link bolts so that the rubber bush expands to the diameter of the cupped washer. Do not over-tighten.



*dfswayb*

### REAR SUSPENSION, JAGUAR

#### INSTALLATION

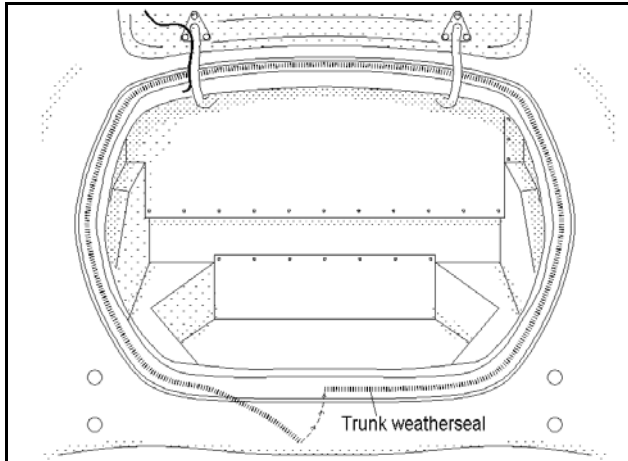


*djagrs*

Thread the trailing arms onto the rod-ends (with jam nuts) already installed on the lower control arms. See page 36. Thread on until two or three threads are left showing, but leave the jam nuts loose.

Support the chassis with jack-stands so that there is at least 19"-20" between the spare tire well bottom and the floor. This will allow you to fit the assembly on the jack and still slide it under the car from the back.

## SECTION G - BODY II



*ebod\TRNKSEAL*

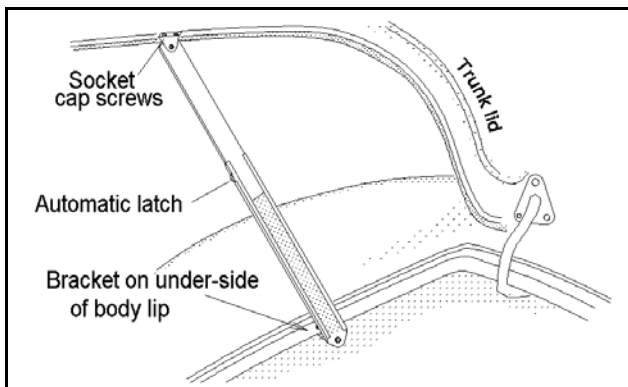
Bolt the trunk hinges (they are marked with a **T** on the lid side) loosely onto the body with any shims found earlier.

Loosely bolt the trunk lid (with factory shims) onto the hinges. Carefully close the lid, not letting the front edge contact the body. Center the lid in the opening. Slowly lift the lid just enough to get your arm (and a wrench) inside and snug the bolts on the lid part of the hinges. Remember to check the front edge while lifting lid.

The lid can be adjusted further by moving the lid and hinges in unit at the connection on the inner panel. Tighten bolts and recheck fit.

### TRUNK STAY

Attach the trunk stay to the trunk lid as shown, using the sheet metal screws at the bottom, stainless steel dome head screws at the top.



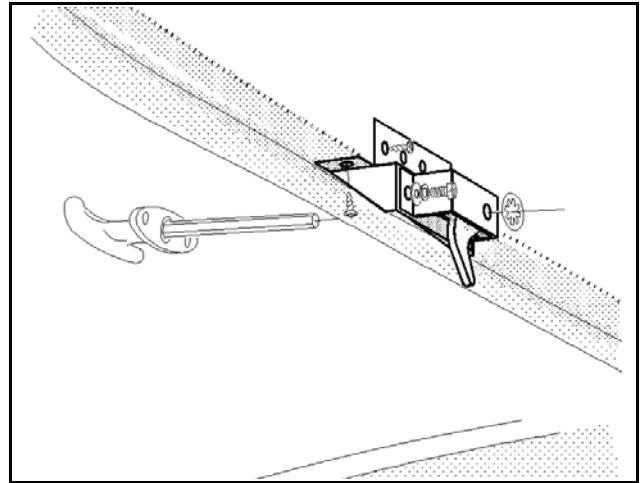
*ebod\trnkstay*

### TRUNK LATCH

Attach the trunk handle and latch to the trunk lid as shown. Don't forget the gasket under the handle.

Attach the latch striker and bracket to the trunk floor.

Adjust the striker on the bracket so that when latched the lid slightly compresses the gasket and sits flush and centered on the surrounding body.

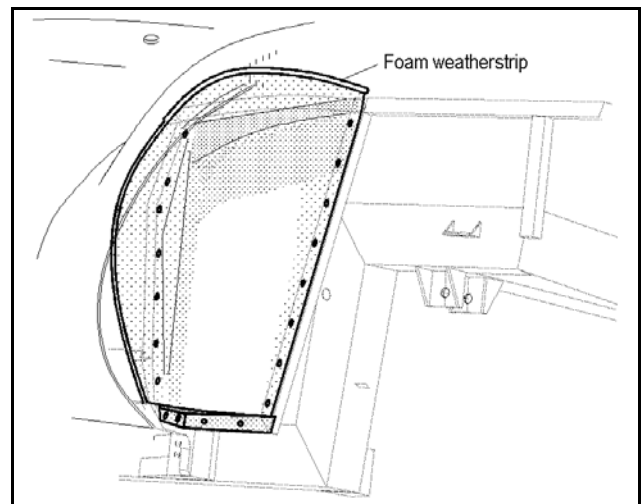


*fiat\man\etrnkltch*

### REAR CLOSING PANELS

Install the panels that seal the rear wheel area from the passenger compartment with sealant and rivets.

Hold the panels in place with the original screws and drill ( $\frac{9}{64}$ " holes) for  $\frac{1}{8}$ " rivets into the chassis vertical tubes and the bottom outrigger. The closing panel with the bulb trim should contact the outer body lightly. If you want, complete the seal with urethane or silicone sealer.

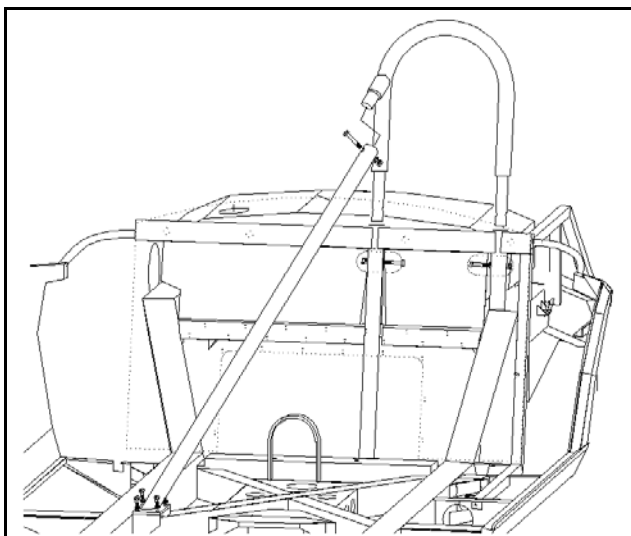


*fiat\man\erCLSPANL*



## SECTION G - BODY II

### ROLL BAR

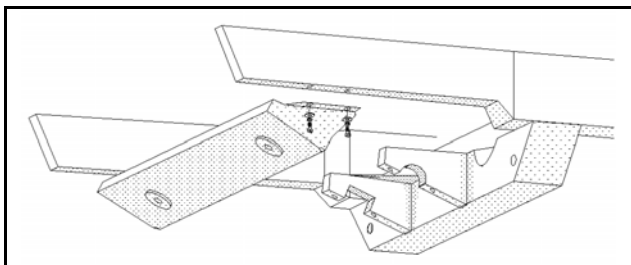


*E*rollbar

When installing the bar (after paint), partially slide the rear hoop into the chassis. About an inch before fully seating the hoop, install the front brace.

### RADIATOR, FANS

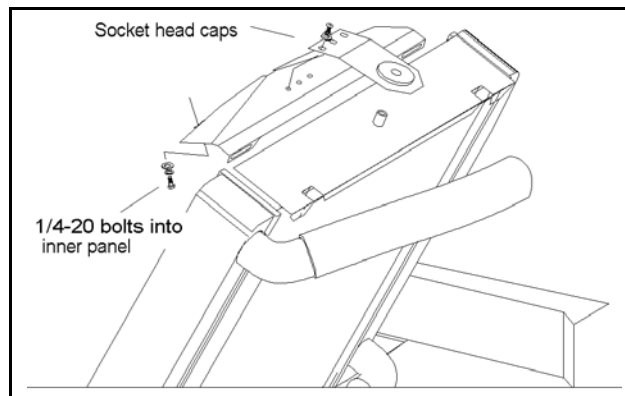
The radiator can be installed from underneath the car or from the top if the hood is not installed. Insert the rubber radiator grommets into the holes in the radiator support tray.



*f*iat\man\e\lradmt

**From the bottom:** Raise the radiator/fan unit and tray up into place over the **front chassis studs**. Hold in place with nuts, lock washers and flat washers. Check that the radiator is centered in its mounts. **Gently** let the radiator lean back against the chassis.

**From the top:** Install the bottom tray onto the chassis. Carefully slide the radiator down into grommets.



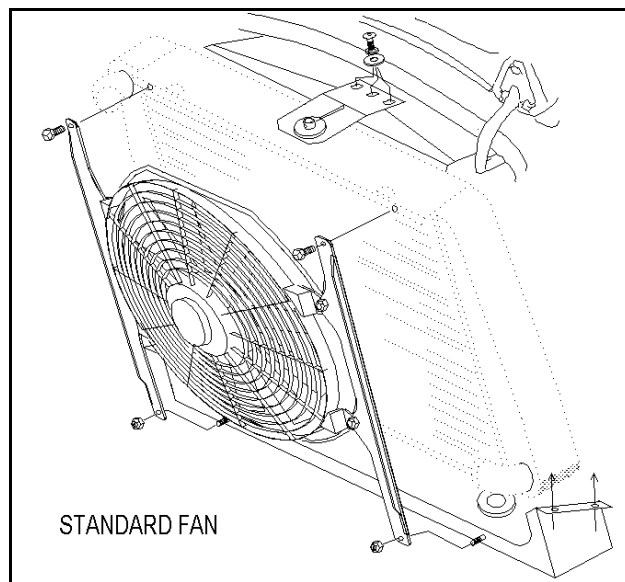
*f*ia\man\e\radmt

Fit the rubber grommets and steel sleeves to the upper radiator support. Install the support over the studs on top of the radiator with the large washers, lockwashers and nuts.

Move the radiator forward and attach the support to the body. Attach the support straps (or optional rear fan, see below) between the upper and lower radiator supports.

### OPTIONAL FANS

#### STANDARD



STANDARD FAN

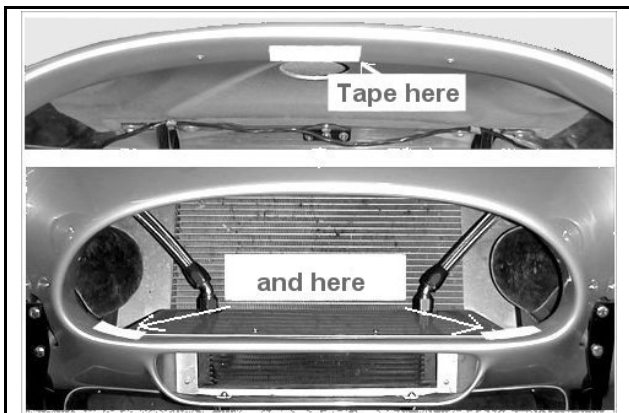
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## SECTION G - BODY II

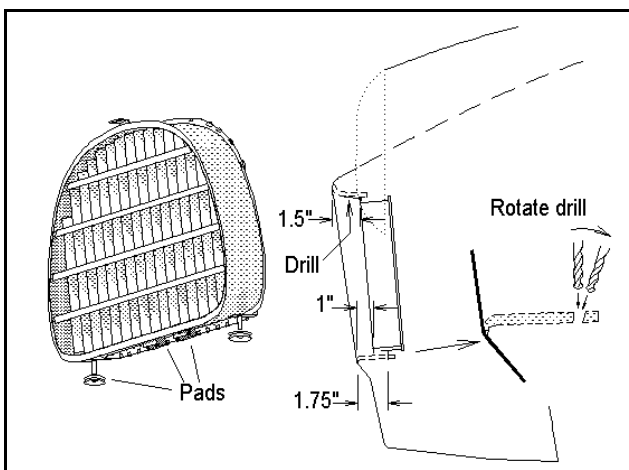
### GRILL

If ordered with the kit, the grill is already installed. Retrofitting can be done as shown below:

Apply masking tape to the body lip along the inside (rear) edges as shown. If the body is already painted, use tape all around the inside of the opening to prevent damage while fitting.



Locate the lower holes by trial-fitting the grill in the body hole. Insert the grill past the likely mounting location and hold in the center of the body opening. Mark the pin locations onto the lower pieces of tape as a line projected directly forward. Check that the center-to-center distance between the holes in the body matches the pin spacing on the grill.

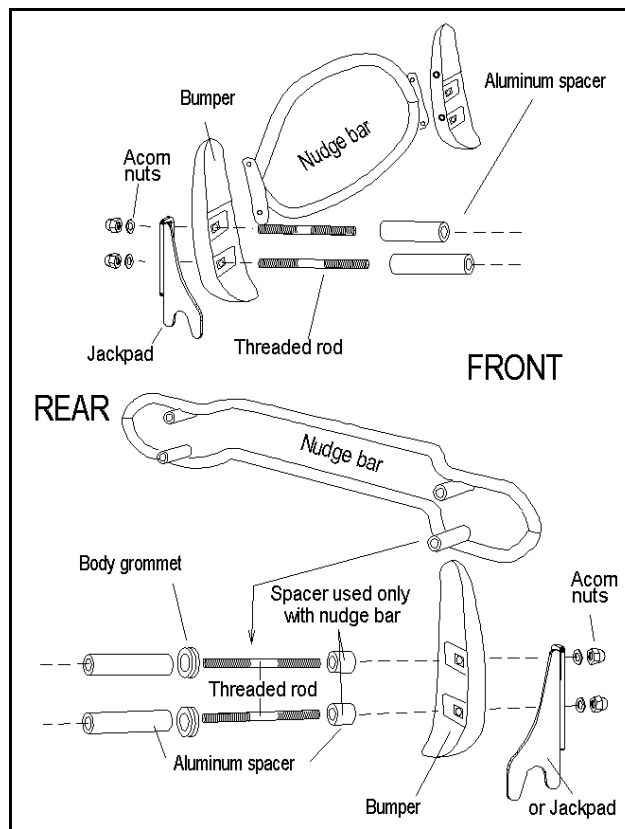


Measure back from the front edge of the body opening  $1\frac{3}{4}$ ” and mark where that dimension intersects with the pin line. Check again, because that’s where you’re going to drill into the body. Use a small pilot drill and then finish with a  $\frac{7}{32}$ ” drill bit. Drill straight down first, and then tilt the drill back about 20 degrees to make a tapered hole. Typically, the holes will fall about  $\frac{1}{2}$ ” from the lip edge.

Install the grill lower pins into the holes and rotate the top forward so that the top mount goes under the top body lip. You will have to push the grill down against the rubber cushions to do this. Once in place, adjust the tilt of the grill to the top distance shown and drill two  $\frac{1}{8}$ ” or #30 holes for the top #8 screws. Remove the tape and install permanently.

### BUMPERS/JACK-PADS

The bumpers or jackpads are factory fit and installed. The aluminum spacer sleeves can be easily **polished** with very fine steel wool and/or car polish.



*fiat\man\e\bumpers*

### INSTALLATION

Install the front and rear bumper mounts onto the chassis. Front mounts should have locating marks that were made when you disassembled the kit. Leave the mounting bolts slightly loose.

Fit the rubber grommets to the body. Be sure the lip is seated on both side of the fiberglass.

## SECTION G - BODY II

Fit the studs and spacers onto the **bumper uprights or jackpads**. Note that the upper spacers and studs are **longer** than the lower ones on both front and rear of the car. Leave the nuts loose if the nudge bars (hoops) are to be fitted.

Insert the bumper/jackpad assembly through the body grommets and secure onto the frame/bracket with a lock washer and nut.

If you have a rear **nudge bar**, the bar and uprights must be installed as a unit. The **front** nudge bar can be fitted separately or in unit with the uprights.

Align and tighten nuts and bolts.

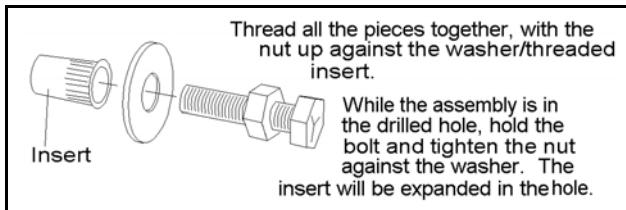
### RETROFITTING THE FRONT NUDGE BAR

Tape the sides of the front uprights to prevent scratching and facilitate marking.

With the front uprights installed as shown above, hold the nudge bar between them, aligned with the body opening and with about  $\frac{3}{4}$ " clearance between it and the body.

Transfer the hole locations from the nudge bar to the uprights.

Drill  $\frac{3}{8}$ " holes in the uprights and install the threaded inserts with a special tool or a nut and bolt.

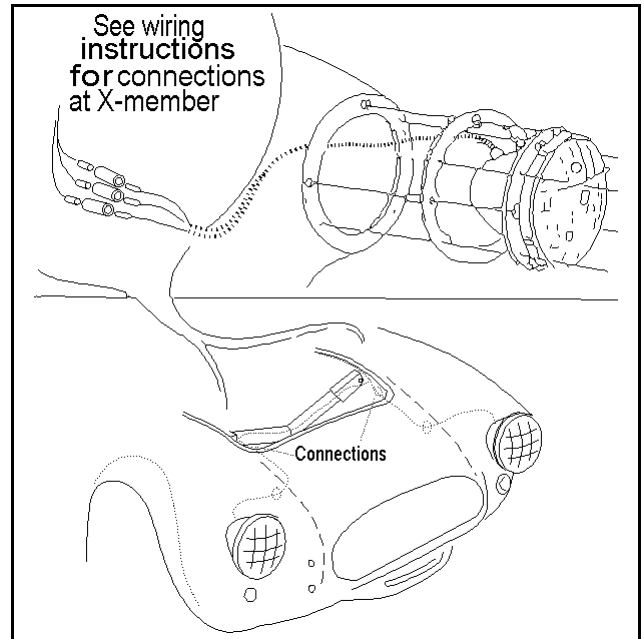


*ebod\rivnut*

## LIGHTS

### HEADLIGHTS

All holes for mounting the lights are pre-drilled at the factory. The headlights can only be installed with the correct orientation.

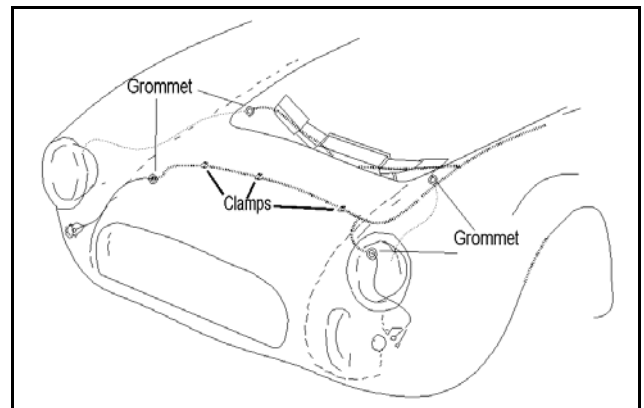


*e\lights1*

Mount the headlight assembly and gasket with four #10 Phillips pan head tapping screws.

Pass the headlight wires (with the parking light wires) through the rubber grommet in the inner panel and rearward to the top of the spring perches. Connect to the wiring harness and ground as shown in the separate wiring instructions. Leave the rims off till the headlights are adjusted.

### SIGNAL LIGHTS

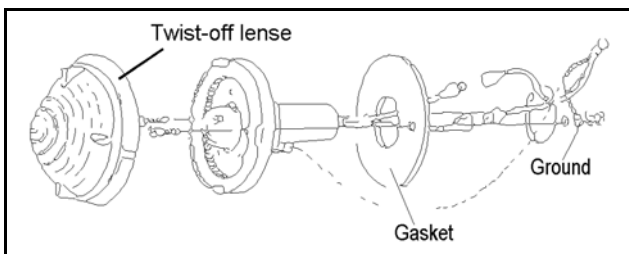


*fiat\man\sparkwir*

## SECTION G - BODY II

Install the parking light harness along the inside of the inner panel, above the corner of the radiator, securing it with the clamps on the top inner panel.

Connections are as shown in the following illustration. Check the wiring instructions for further notes.



*g\lights2*

When making the wiring connections and inserting the bulb, use a light electrical grease to prevent corrosion from water and road salts.

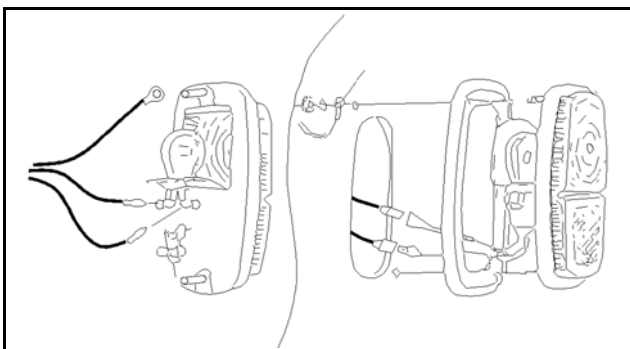
Mount with the supplied #10 stainless nuts and bolts. The lights have male and female terminals which mate with the harness only one way. Connect the black (ground) wire (with the eye terminal) to one of the light mounting bolts.

On some **twist-off lights**, it is possible to insert the bulb two ways. If the signal light is dimmer than the parking light, remove the bulb, turn it 180° and reinsert it

### **TAIL-LIGHTS**

The lenses of the lights are mounted with the lettering on the lens right side up.

Taillights may have pigtails with female connectors. Otherwise connections are made directly to the small receptacles on the light socket.



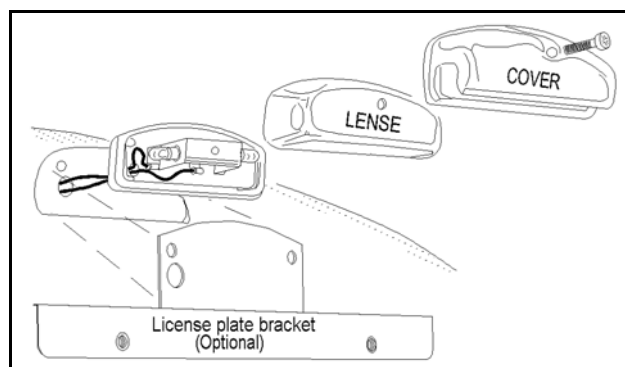
*g\tailites*

To make the tail light connections:

- Make sure that the rear harness black ground wire is connected to the light stud or ground receptacle.

- With the parking lights on, the red wire should be live. Touch the red wire to each pigtail (or connector loop). Connect that wire to the dimmest filament.
- Connect the other wire to the remaining receptacle at the bulb bottom.

### **LICENSE PLATE LIGHT**



*ebod\liclite*

### **INSTALLATION**

Remove the attachment screw, lens and cover.

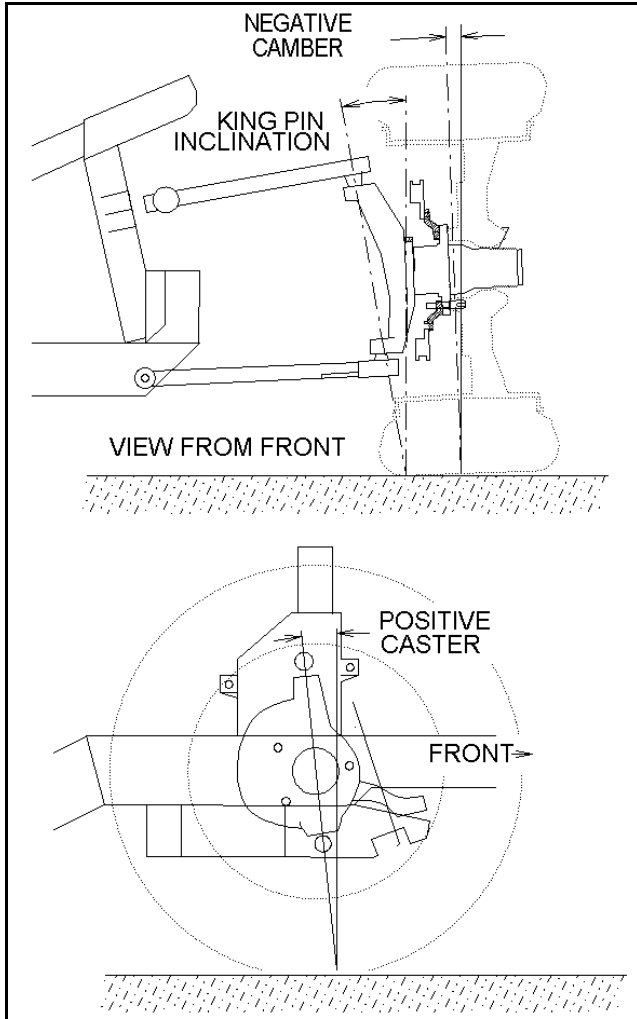
Insert the red wire through the larger of the 3 holes in the deck lid and through the back of the light gasket.

Connect the black wire to the case and the red wire to the loop on the bulb holder.

Attach the light to the deck lid and refit the lens and cover.

**ALIGNMENT**

See pages 68-71 for suspension assembly. The **chassis height** should be within the specifications given above. Inquire for recommended starting settings for **all-out track work**.



*h\camber*

**FRONT:**

**Camber** 0 deg. +/- 1/4

We've included (12) 1/8" shims with the kit which, when distributed equally usually results in the approximate correct camber.

Adding a 1/8" shim between each bracket and the chassis will increase camber by approximately 1/2 deg. Use standard 1975 Chevrolet Camaro shims or their equivalent.

All ball joints, outer tie-rod ends and wheel bearings are Chevrolet. The upper control arm pivot shaft is an aftermarket part for the same application, but is offset for more camber adjustment. Replacement part numbers are on page 129.

**Caster** 4 deg. +/- 1/2

- The caster value of the left and right sides of the car should differ by less than 1/2 deg., and the **right caster** should always be equal or greater than the left to compensate for road crown.
- Shifting a 1/8" shim from the front of the bracket to the rear will decrease the caster by about 1 1/4 deg.

**Toe-in** 1/16"-1/8"

- Loosen the jam nut on each tie rod. Rotate the inner tie rod inside the rack boot to adjust. Each turn of the tie rod relative to the end will change the toe by about 3/16". With the **ERA steering gear**, equalize the distance between the tie rod center and the end of the inner sleeve.
- Once the toe is correct, remove the steering wheel/hub from the splines and re-install so that is centered. Temporarily install the large washer, wave washer and nut, torquing to 10 lb-ft. Final adjustment of the wheel can be done after the car is test-driven. When the steering wheel orientation is correct, tighten the column hub nut to 25 lb-ft. Install the hub center cap as described on page 101.

**REAR****Jaguar w/inboard brakes**

**Camber** -3/4 deg. +/- 1/4

**Toe-in** 0.0" +/- 1/16"

Adjust **Camber** by adding or removing shims from between the brake rotor and the inner drive-axle flange. A 0.02" shim will change camber by 1/4 degrees. Most setups will require only one shim, less than is normally used in the original car so you will have extra ones left over. New shims are available from us or your local Jaguar dealer or one of the Jaguar specialists listed on page 26.

The rear wheel toe-in is not individually adjustable. If the toe is out of range, the lower control arms must be bent or replaced. Tracking (longitudinal alignment of the front and rear suspensions) may be changed by adjusting the length of the trailing arms at the rod end to shift the assembly in the chassis.

**E.R.A. w/ outboard brakes**

**Camber:** -3/4 deg. +/- 1/4 deg.