

ASSEMBLY
AND
SERVICE MANUAL
FOR THE
Era Replica Automobiles
427 ROADSTER
Chassis 758 on



Revision 10b
6/08

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SECTION A -PARTS NEEDED-

ENGINE



Remember! All piston engines have a limited torque spread. If you decide to build a fire-breathing monster, expect to suffer at the lower RPMs. Because the E.R.A. 427SC is light, every hiccup is felt.

Very high octane gasoline is becoming scarce, and octane boosters can be a pain to deal with. If you're going to do a lot of street driving, use a conservative compression ratio: E.R.A. turnkey cars are usually built with 9.5:1 or 10:1, maximum.

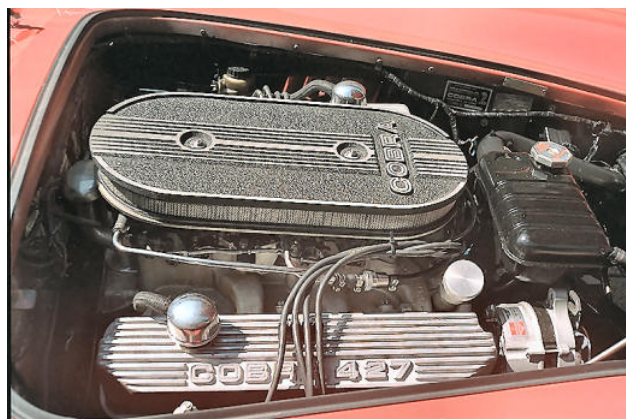
COOLING

Always use a thermostat in your system for street use. If the engine fails to reach normal operating temperature, it may affect driveability and lubrication. In warm climates, a 165°F to 180°F thermostat works the best. Use a restrictor plate for racing conditions only.

The thermostat should be modified as shown on page 38.

EMISSIONS

Requirements vary from state to state. Most states require that your car meet the specifications of the year of your engine. Check with your local authorities. Side pipes with catalytic converters are available but we have no experience with them.



FORD FE SERIES

CID	Bore	Stroke	BHP net	Torque net lb-ft
390	4.05"	3.78"	320up	427
427	4.23"	3.78"	410 up	480
428	4.13"	3.98	325+	475

The original Cobra used the 427 CID "Side Oiler" engine in the first cars intended for competition. The remaining cars were equipped with a mix of 427s and 428 "Police Interceptor" engines. Both engines are logical for use in an "authentic" car. The E.R.A. was designed around these engines.

The Ford FE series is not especially heavy, with the all-iron version weighing only slightly more than 600 lbs. We have seen complete engines with aluminum heads, intake manifold (w/ 2 x 4bbl carbs) and water pump scale at 522 lbs. Simply adding an aluminum intake will bring the weight on a stock 428 to 585 lbs.

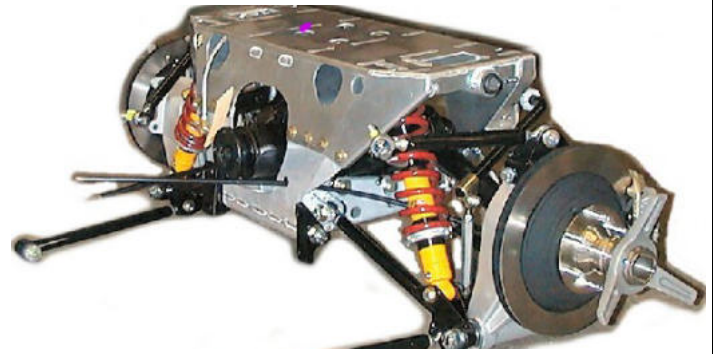
The best engine depends on your driving style and your budget. If you are not experienced in the FE series engine, be wary of building your own "exotic" engine. The FE series is a bit quirky and you may make some very expensive mistakes. Before you buy anything, get a good Ford engine building book, available from Autobooks, etc.

Ford production of major 427 and 428 parts ceased in the 1980s. Fortunately, most FE engine parts are being reproduced. You can still find original 428 cores that were used in many full sized Fords. Using a vintage engine may have an advantage when registering your car. **When you buy parts, keep the receipts.** See *Inspection*, page 152.

In general, the 428 is much cheaper and easier to find than the 427. The later vintage 428 Cobra Jet (CJ) or 428 Super Cobra Jet (SCJ) engine is fine for all-around street use, offering from 325HP to 425HP with very good low RPM response and tractability. Most 428 cores can have their performance "updated" by the addition of new heads from Edelbrock and Shelby at reasonable cost. With an appropriate intake manifold and carburetor, a 428 will put out over 400 streetable bhp.

REAR DRIVE/SUSPENSION ASSEMBLY

Jaguar-based Suspension



Custom ERA Rear Suspension

The E.R.A. 427SC is designed to use either the **Jaguar** rear suspension (in an E.R.A. subframe) or a custom **E.R.A. suspension unit** with outboard brakes. The E.R.A. unit is available as a kit with all our conversion parts ready for your differential and brake parts, or as a complete assembly. See page 43 for details.

JAG PARTS 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. Gears wear is not normally a problem even in well-used assemblies, but always replace seals.

The vintage of the Jaguar differential is punched in the casting at the lower right corner of the cover. The top number is 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 and buying a used rear end, look for:

- **Completeness** - You don't need the Jag trailing arms, but you do need everything else.
- **Limited Slip Differential** - Many XJ differentials were open. A new limited slip may be retrofitted 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.
- **Gear ratio** - There should be a tag on one of the rear cover bolts (for example, 43/13 on the tag = 3.31 ratio). If there is no tag, mark the input shaft flange and the half-shaft or brake disc for reference and rotate the axles by turning the input shaft. For every time the axles and brake disc turns over once, the input flange should rotate approximately $3\frac{1}{3}$ turns (3.31:1 ratio) or $3\frac{1}{2}$ times (3.54:1 ratio). See the chart on page 12 for the best ratio for your engine/transmission combination.

- **Dampers** (coil-over shocks): All E.R.A. rear suspensions require 4 dampers and coil springs (coil over shock absorbers). Specifications are the same as for stock Series II Jaguar XKE. **XJ dampers cannot be used.** See page 23 for part numbers and page 53 for length specifications. Dampers with adjustable spring seats and externally adjustable damping are available from E.R.A.

USING THE E.R.A./JAG SUBFRAME:

The stock Jaguar XJ control arms and half-shafts will be **exchanged** for shortened pieces when you buy the subframe from us. Series II XKE parts will not have to be modified, although Series III parts will.

All XKE lower control arm mounting brackets (that bolt to the sides of the differential) must be exchanged for XJ units.

All mounting bushings and hardware are included with the E.R.A. subframe.

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 E.R.A. subframe requires **XKE style** coil-over dampers. While not necessary, special **height** and **damping-adjustable** units are available from E.R.A. Springs can be changed to ones of higher rate. See page 53.*

STEERING GEAR

Starting with chassis 759, the car requires a Flaming River gear, FR1502-3x3, with modified tie-rod adapters. This is similar to a Mustang II unit, but shortened by 3".

Modifications are shown on page , and complete units are available from ERA.

FRONT ROTORS AND CALIPERS**WITH BOLT-ON WHEELS**

Most mid-sized GM cars from 1970-1978 used the correct pieces, with $2\frac{3}{8}$ " piston calipers. *Station wagons may use different parts.* Chevrolet lists the same rotor and calipers for all sedans.

SECTION B -PARTS PREPARATION-

ENGINE/COMPONENTS

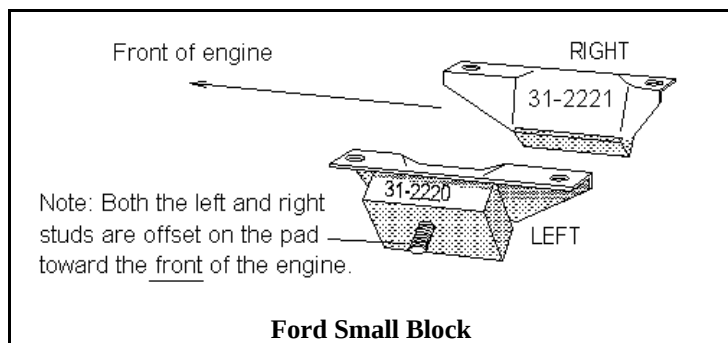
We cannot give complete rebuilding instructions here. What follows are the **E.R.A.-specific requirements** for your engine. General torque specifications for typical bolts are found on page 151. Good reference books for Ford engines are listed on page 153.

BASIC PREPARATION

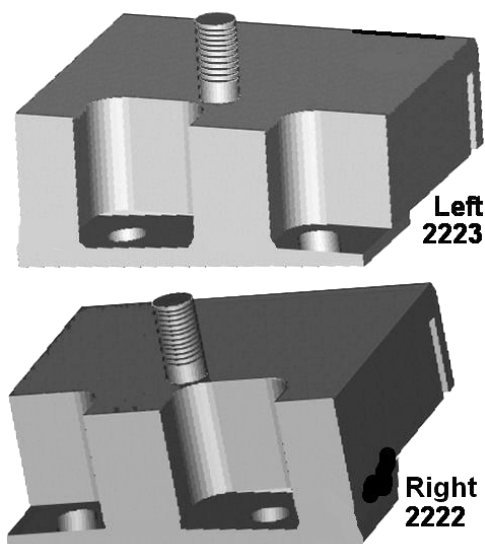
Remove cooling fan from engine water pump pulley.

Install the fitting for the water temperature gage in the intake manifold adjacent to the distributor. Note that some manifolds must be tapped $\frac{1}{2}$ " NPT. If your manifold is tapped $\frac{3}{8}$ " NPT, you may be able to adapt with a Weatherhead fitting, 3200 x 8 x 6 available at your local jobber.

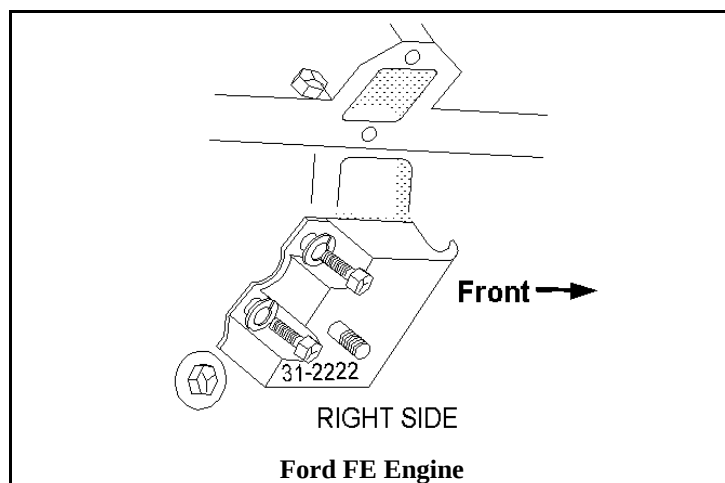
Install the mounts onto the Ford **small block** as shown below



The FE mounts look similar but they cannot be exchanged from side to side. Note that the stud surface is angled slightly from the engine side.



Install the engine mounts onto the **FE block** as shown below.



Note: If you have excessive engine motion or a very high-torque engine, go to www.erareplicas.com/427man/engine/mountmod/ for mount modification details.

SECTION B -PARTS PREPARATION-

CLUTCH

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

CLUTCH THROW-OUT FORK

Forks for small and large spline transmissions are available from E.R.A.

The standard Ford small-spline fork (see page 25 for part number) can be left stock or bored through for easier adjustment. Drill (remember that the part is hardened) the indentation to $\frac{5}{8}$ " id.

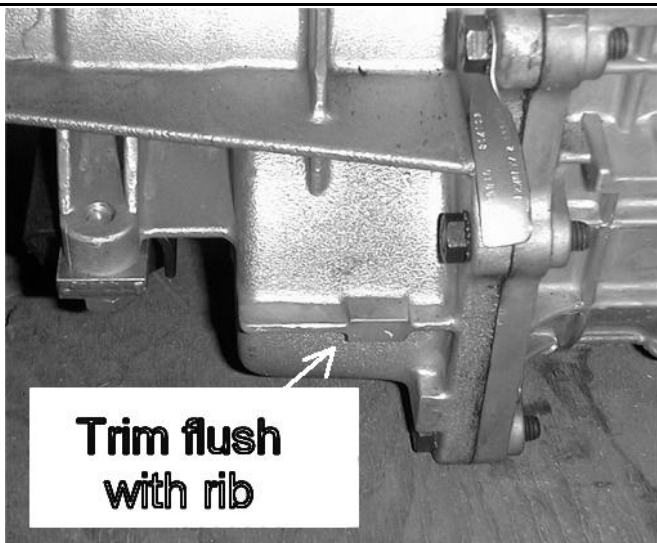


Fork installed in TKO 600

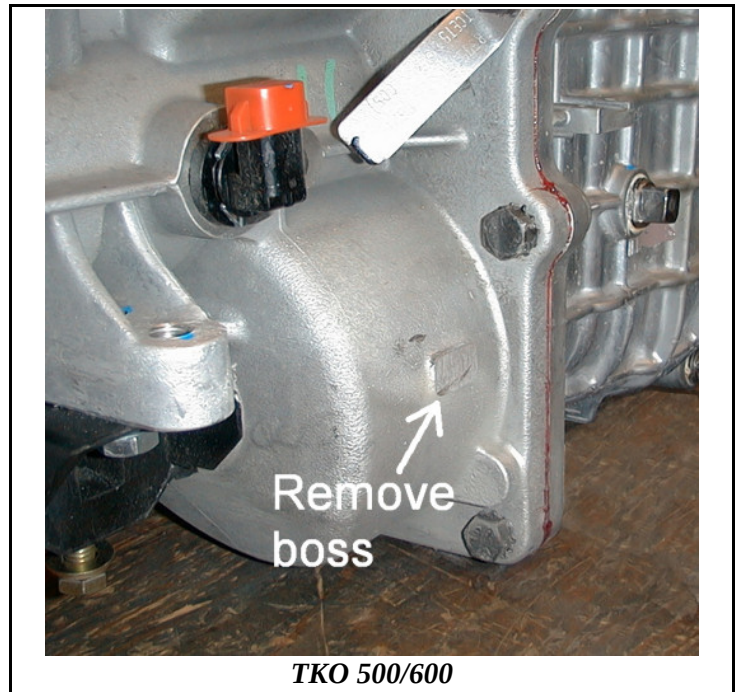
TRANSMISSION

TREMEC

The Tremec TKO series has a boss on the right side that must be trimmed back flush in order to clear the chassis X brace.

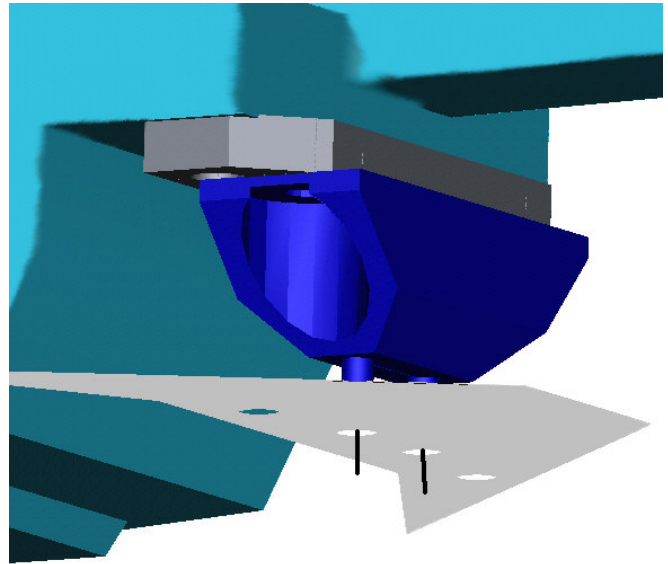


TKO 3550, TKO II



TKO 500/600

Install the spacer between the mount and the mounting boss. The offset (standard length input shaft) goes toward the rear.

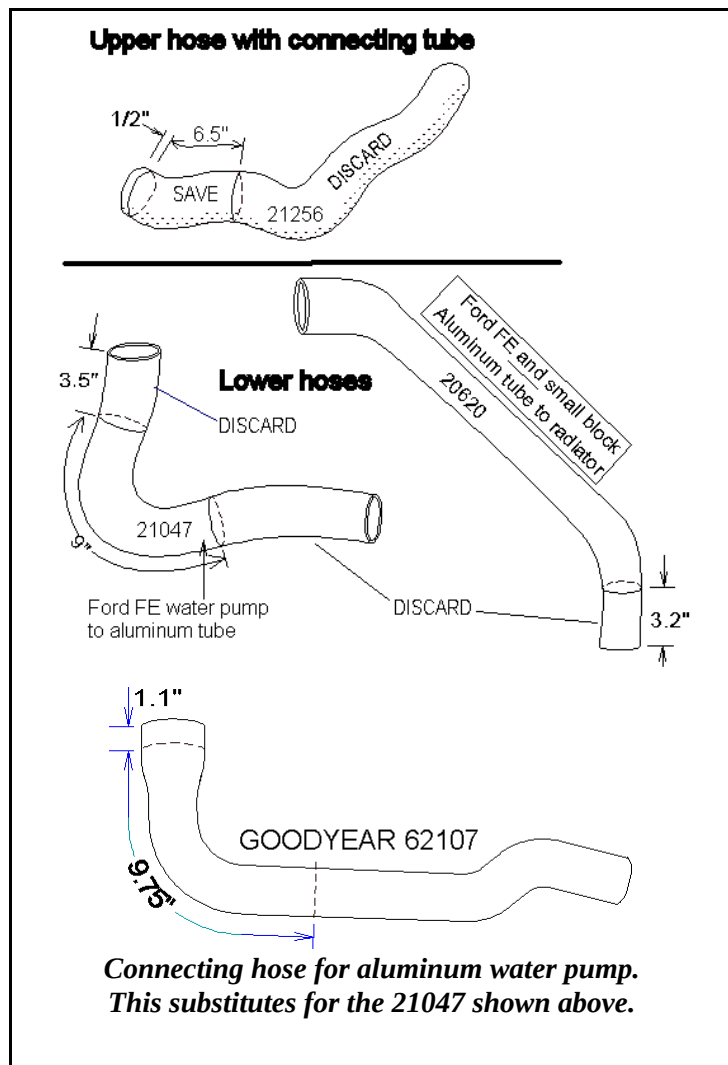


Note that the TKO 600 is metric-threaded (10 x .15) on the inner holes, $\frac{1}{2}$ -13 on the outer holes.

SECTION B -PARTS PREPARATION-

HOSE TRIMMING INSTRUCTIONS

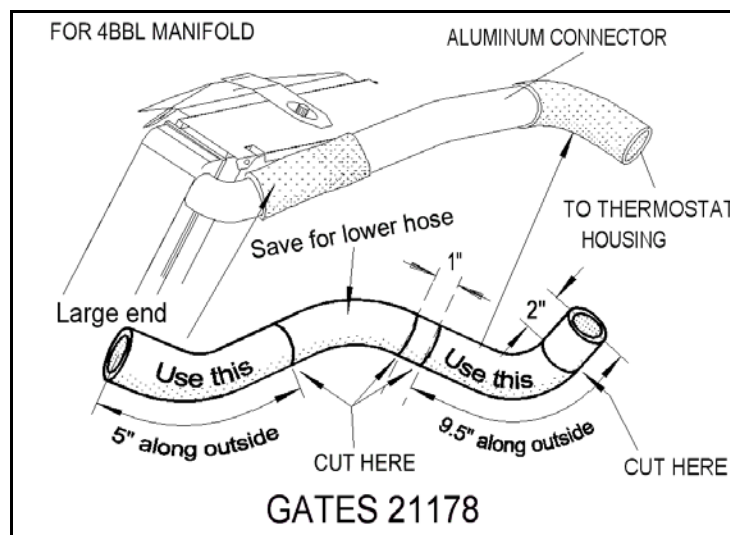
The two lower radiator hoses must be modified to fit. After checking fit, cut and trim the hoses as shown.



SMALL BLOCK FORD

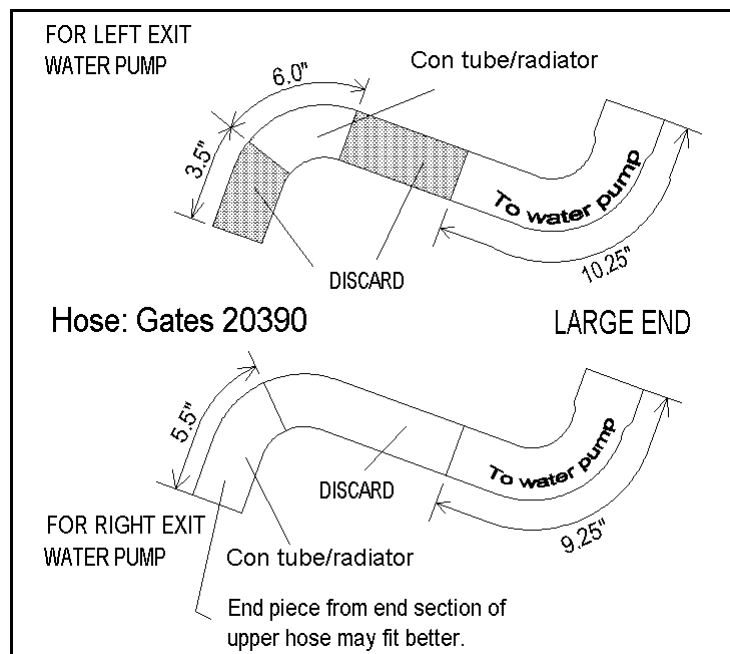
Use the center portion from the radiator to the lower connecting tube. (You must tell us that you're using a small block when you order.)

Upper hose



The long leg of the aluminum connecting tube goes toward the radiator.

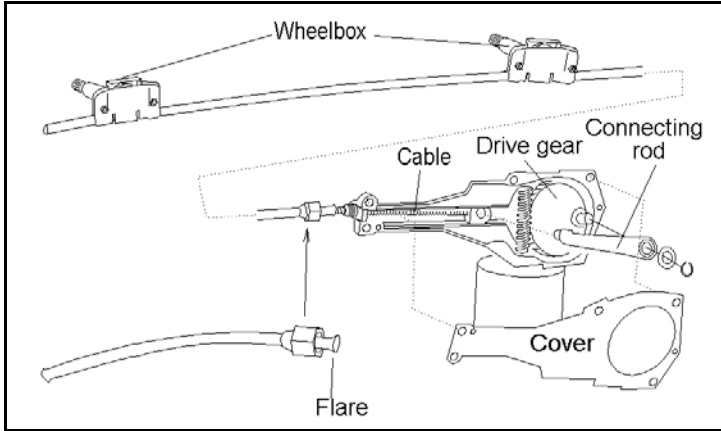
Lower Hose, Ford small block



Pad the "X" member if the upper hose touches it.

SECTION B -PARTS PREPARATION-

CONNECTING TUBES



Undo the large nut and remove the cable tube/wheelbox assembly from the motor.

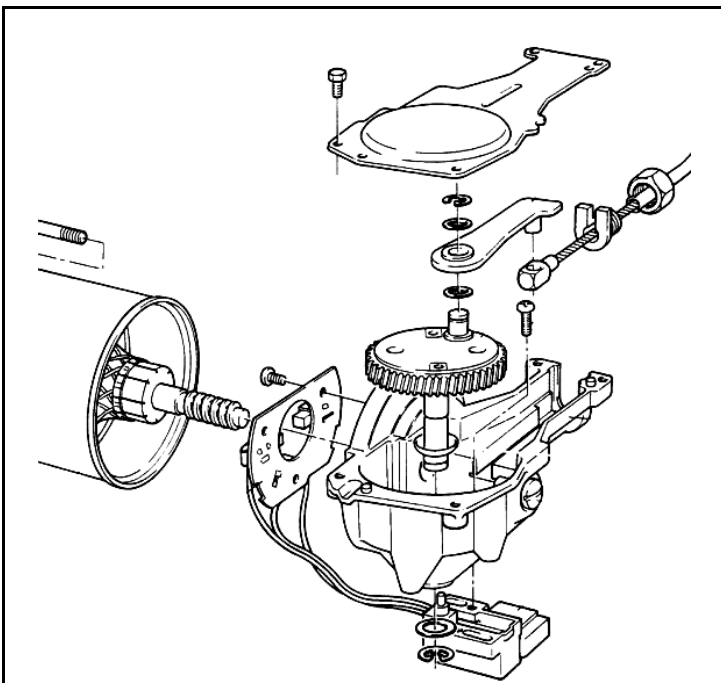
Remove the wheelbox backing plates and remove the tubes from the wheelboxes.

Using a tubing cutter or hacksaw, cut off approximately 2 $\frac{3}{4}$ " from one end of the original tube between the right wheelbox and the motor. Save the nut and the piece of tubing. Use the short tube for the guide at the end of the second wheelbox.

Slide the nut onto tube shorter tube supplied (the one with just one end flared).

Flare the end of the tube with the nut. Slide the drive cable through the tube. If the cable is tight at the new flare, use a $\frac{1}{4}$ " drill bit to "clean" the inside of the tube.

MOTOR PREPARATION



If you are sure that the wiper motor functions correctly and don't want to disassemble the wiper motor itself, skip steps 4 through 8.

Take out the 4 screws holding the **cover** to the gearbox, and remove the cover.

Remove the **circlip** and **washer** from the connecting rod big end, and remove the connecting rod. Note the bottom washer.

Remove the circlip and washer from the back side of the crankshaft, and push out the crankshaft from the housing. Retain all the parts! Note the **thrust washer** on the inside of the crankpin.

Mark the relative position of the round motor housing to the aluminum gear reduction housing. Remove the two long screws holding the motor housing to the frame. Separate the two (with gentle soft hammer taps if necessary). Do not lose the felt washer and thrust washer in the bearing cup at the bottom of the housing.

Inspect the **brushes** for wear or sticking, the commutator for excess wear and arcing, and the lower bearing. Clean the parts with a solvent if necessary. Work the brushes in and out to insure free motion.

Install the **armature** carefully into the gear housing until it contacts the sides of the brushes. Using a hook shaped wire or other appropriate tool, retract each brush in turn so that the commutator can slide past the edges of both brushes and continue into the gear case

Put 1 or 2 drops of oil in the lower bearing of the armature housing. Excess oil will contaminate the brushes later on.

Install the **armature housing**, aligning the marks on the housing and the frame. Reinstall the long retaining screws.

STROKE CHANGES

Remove the plastic gear from the crankshaft by supporting the edge of the gear and tapping the shaft with a soft hammer. Be careful not to damage the circlip groove.

The **position of the crankpin** must be changed in order to increase the stroke of the cable: Punch the underside of the crank plate exactly opposite the center of the crankpin. Use a $\frac{3}{8}$ " Blair spotweld cutter to cut the pin from the plate, drilling from the back side at the punch mark. The pin will be removed, together with a small piece of the plate.

SECTION C -CHASSIS PREPARATION-

Body pre-mounted on chassis option

Most of the time-consuming items listed in this section are already done, although it couldn't hurt to check critical fasteners. You can skip all the Section C items except removing the windshield, bumpers, lights and fuel filler cap in preparation for paint.

BODY REMOVAL

The body must be removed to paint the chassis, but is not necessary to remove the body from the chassis to paint the body. All E.R.A. turn-key cars are painted **with the body already bonded to the chassis**, but without mechanicals installed. This requires careful masking to minimize overspray, but guarantees good body panel fit. **Installation of all the mechanical components is easy with the body on the chassis.** It is, in fact, much **harder** to install the body over the mechanical components.

When doing any disassembly, note any adjusting shims and their location. Mark each for reassembly.

DOORS, HOOD AND TRUNK LID

Note the location of the hinges and the number of shims for all pieces.

Remove the door hinge covers.

Remove the doors, hood, and trunk lid from their hinges. Note that the basic kit is shipped with short pieces of half-round rubber taped to the door openings. This is put there to prevent rattles and wear when the car is shipped. You may discard the rubber, etc. Lengths of new gasket are included in the parts boxes shipped with the kit.

Remove the door hinges and metal closing panels behind door hinges.

Remove the hood and trunk hinges, noting their location. "L" and "R" are stamped into the hood hinges. The trunk hinges are the same from left to right and are stamped with "T".

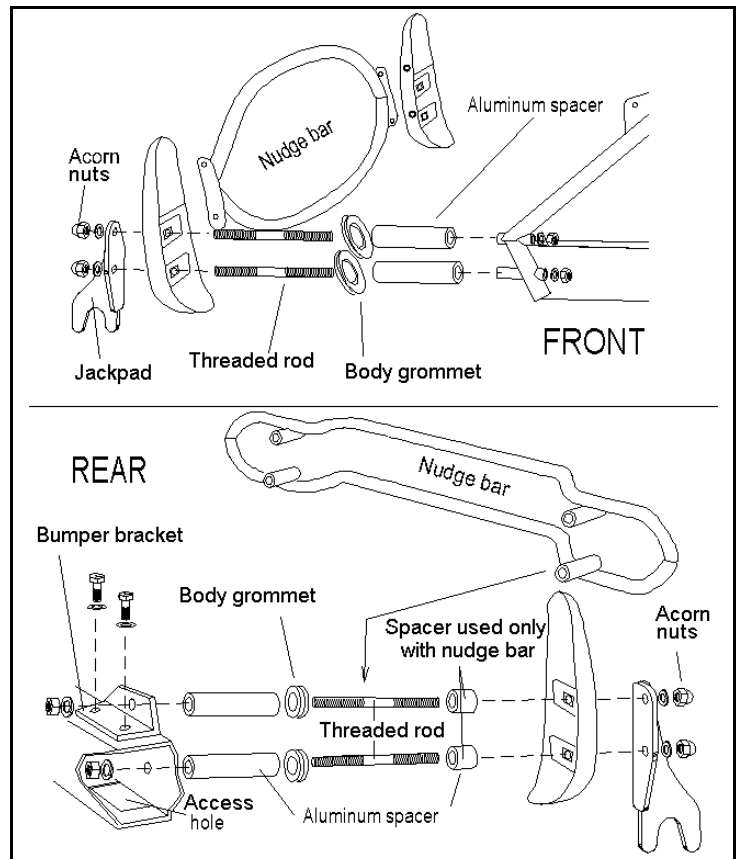
BUMPERS, BUMPER BRACKETS:

Front: If you have the optional nudge bar(s), detach them from the overrides.

Remove both fresh air inlet ducts and screen from the front body.

Remove each bumper/tube assembly from its mounting point. The upper nut is accessible from inside the nose. The lower nut is accessed through a hole in the inner splash panel.

Rear: Unbolt the bumpers from their mounting brackets (upper bolt) and chassis (lower bolt). The nuts on lower bolt are reached through the access holes on the bottom of the rear chassis cross member. If nudge bar is fitted, remove as a unit.



ROLL BAR:

Remove the center access panel from the rear bulkhead. See page 83.

Remove the bolts from roll bar brace, one at each leg, and at the top and bottom end of the rear brace.

Remove the shim washers from the lower end of the brace and slide the brace down to disengage the upper slip joint.

Pull the roll bar hoop up and out from the chassis.

Remove the rubber grommets from the body. Doors, etc:

Remove the filler panel below the door opening.

Remove latching hardware from the main body, including the hood firewall latches..

Remove the aluminum interior panels that are below the door openings and the aluminum firewall.

RADIATOR AND SHROUDING:

Remove the (optional) oil cooler and shrouding. See page 90.

Remove the (optional) front fan assembly. See page 89.

Remove the rear fan on its bracket. See page 88.

Remove the side and lower shrouding (3 pcs.) from inside the grill opening.

Remove the upper radiator mounting tab and gently lay the radiator back against the chassis. Soft padding will help insure that nothing is damaged.

Remove the top radiator shroud. See page 88.

SECTION D - BODY/CHASSIS ASSEMBLY

More chassis and body ID numbers

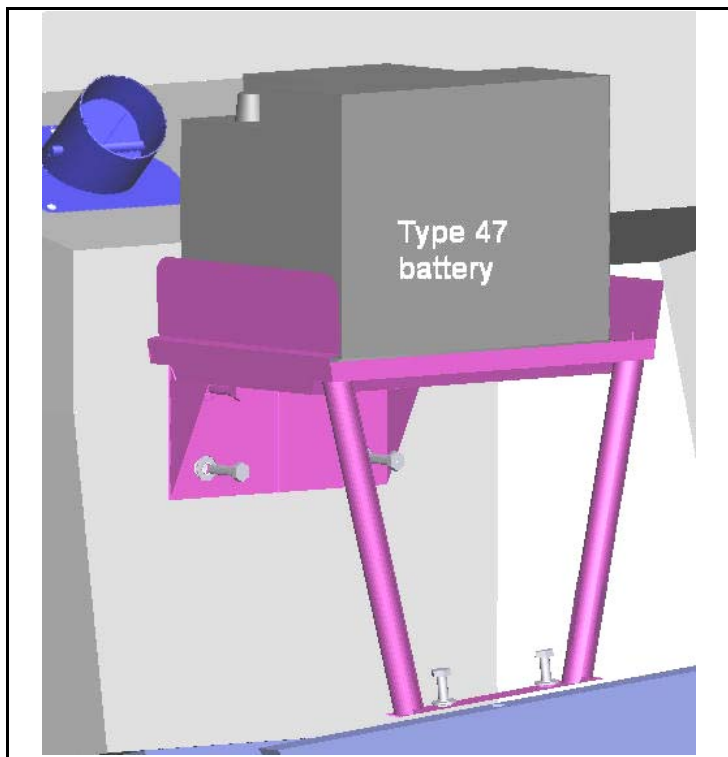
The **chassis** is stamped with the ID number in three places:

- The left front X member, inside the top shock mount.
- On the transverse tube behind the engine(usually covered by the aluminum firewall panel. On the outside of the frame just inside the right rear tire.

The **body** is marked inside the hood opening, on the left return lip about a foot from the front of the opening.

BATTERY TRAY

(Pre-installed) The standard front-mounted battery is bolted in place onto the front of the right foot box and to the top of the front outrigger. It's pre-installed on every chassis, so the holes are already in place.



d\battery_mount

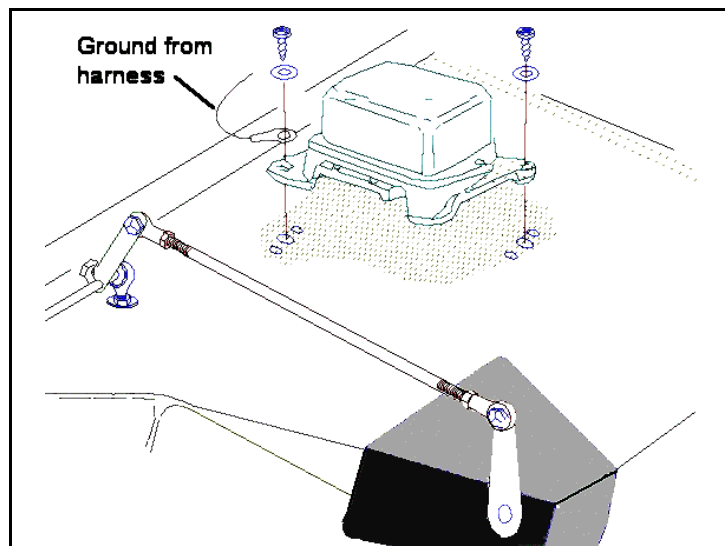
BATTERY REMOVE AND REPLACE

The engine-compartment-mounted battery is accessed by removing an access panel at the rear of the right front wheel.

- Remove the hose from the fresh-air valve.
- Note that the top panel screw and the three lower screws are removed from the engine-compartment side and the lower screws from inside the wheel well. The bottom edge is secured to the chassis outrigger with sheet metal screws.

VOLTAGE REGULATOR

The regulator (part number on page 26) installs with #10 sheet metal screws bolts on top of the left foot box into captive speed-nuts.



d\voltreg

SECTION D - BODY/CHASSIS ASSEMBLY

From inside the grille opening or engine compartment, lift the hinges assemblies into place. Align and bolt to the body and hood with the shims used earlier. Tighten all bolts.

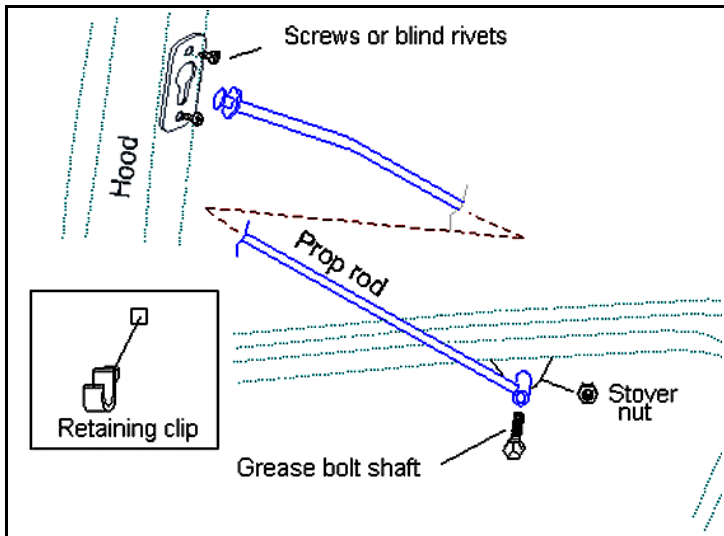
Carefully lift the hood, checking the front edge clearance. Adjust and/or change shims if needed.

Adjust the **hood strikers** on the firewall so that the hood is flush with the body. The hood seal will be compressed slightly, eliminating rattles.

HOOD PROP

(Pre-installed)

The upper and lower stay brackets are (factory) attached as shown.



HOODPROP

Note the orientation of the keyhole slot and the bend in the rod.

TRUNK LID

Tape the gasket to the main body as shown on page 78 for bodywork alignment prior to painting.

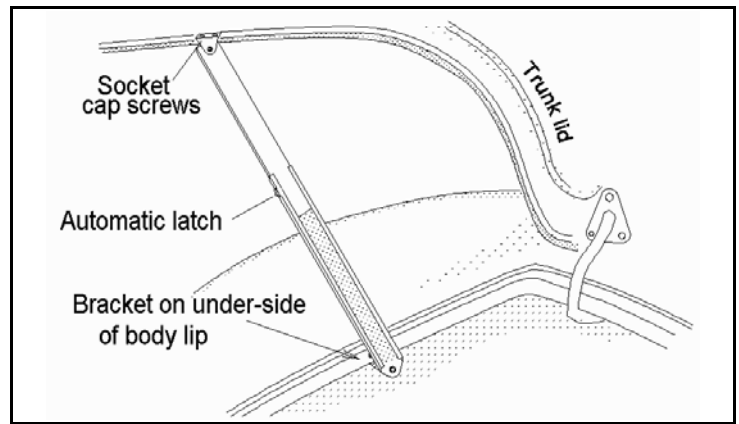
Bolt the trunk hinges (they are marked with a **T** on the lid side) loosely onto the body with any shims found earlier.

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

(Pre-installed) 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.



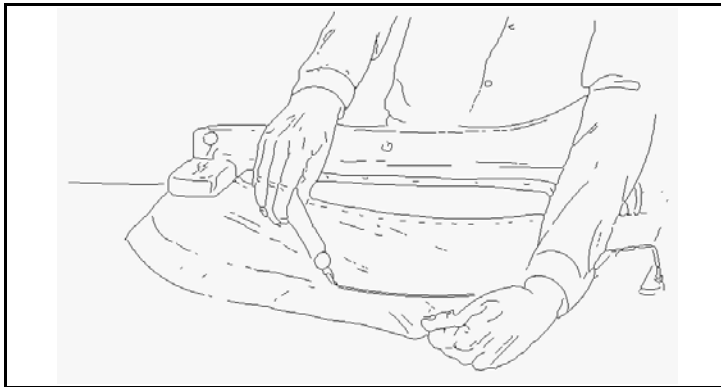
ebod/trnkstay

SECTION E -BODY PREPARATION-

Stretch the door pocket into place with its forward edge even or slightly past the front edge of the door frame and $\frac{2}{3}$ of the way up from the hinge bottom mounting holes. Hold the top of the pocket in place with masking tape.

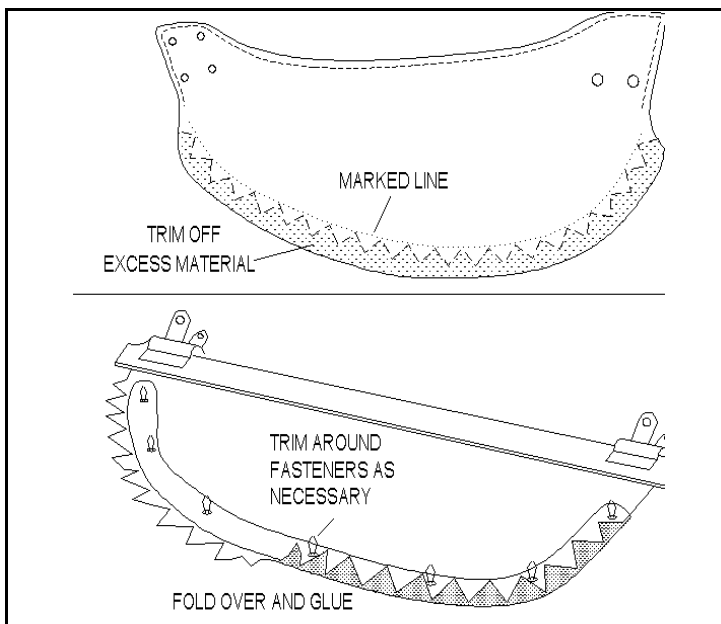
Attach the hinge loosely with the two upper bolts. Mark and punch holes for the two lower bolts through the door pocket. Attach the bottom of the hinge and snug the bolts.

Gently and evenly pull the bottom edge of the door pocket down over the bottom edge of the door. Stretch only enough to eliminate any wrinkles. Hold in place with several pieces of tape. With a temporary marker, trace the profile of the lower edge of the attaching plate onto the pocket. Also, mark where both ends of the plate fall.



eint\doorpn13

Remove the door pocket from the door and trim the edge of the door pocket approximately 1" outside the marked line. Cut wedges out of the edge of the material almost up to the marked line.



eint\DOORPANL1

Re-install the pocket onto the door. Apply contact cement to the edge and backside only of the attachment plate and the back side of the pocket material. Let dry to a tack-free condition.

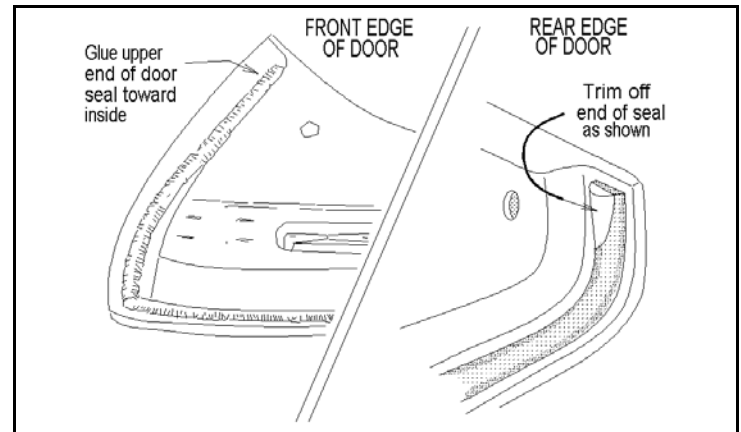
Carefully stretch the material over and partially around the attachment plate.

Remove the attaching plate from the door. Tape or clamp the upper edge to a flat surface and finish gluing the edge.

Before attaching the pocket to the door, glue the rug (items 7 and 15 in the rug installation diagram on page **Error! Bookmark not defined.**) to the inside of the door with contact cement. Install the door pocket and the latch onto each door.

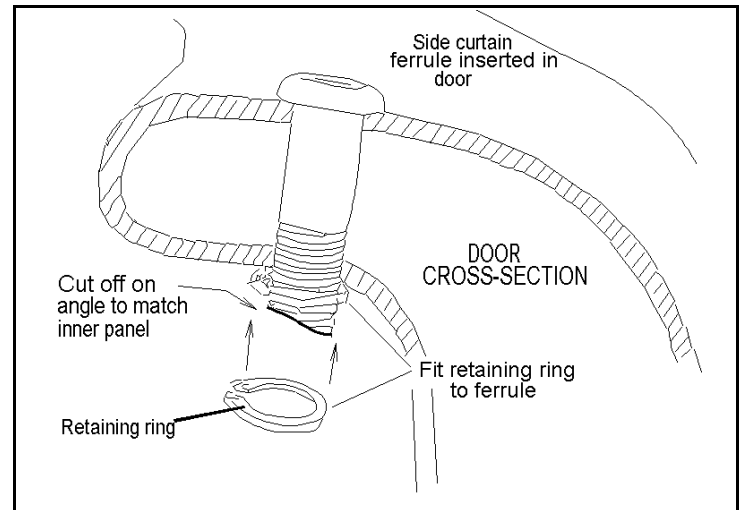
DOOR WEATHERSEALS

Lay the doors, outer surfaces down, on a soft surface. Clean the door edge and rubber with a mild solvent. Glue the door weatherseal (start with about 60" - trim the ends later) provided onto door lip about $\frac{1}{8}$ " from the door edge using contact cement or weather-strip adhesive. Don't stretch the weather-stripping: It will eventually shrink to its original shape, pulling away from the corners. Trim the ends of the weather-stripping as shown.



E\DOORGASK

SIDE CURTAIN FERRULES



FERRULE

Slip the ferrules into the holes on the top of the doors and note the length that each extends past the inner panel.

SECTION E -BODY PREPARATION-

Mark each ferrule so there are no more than 2 or 3 threads showing between the mark and the door surface on its shortest side,

Cut off the excess at the mark, and slightly round off the edges with a file or sander.

Hold the ferrules in place with the retaining rings provided. Seat the retaining rings against the door surface tightly.

DOOR PULL STRAP (OPTIONAL)

Drill a hole (#30 bit) just to the rear of the side curtain ferrule. Loop the strap over the latch ball and use the screw and countersunk washer at the front.



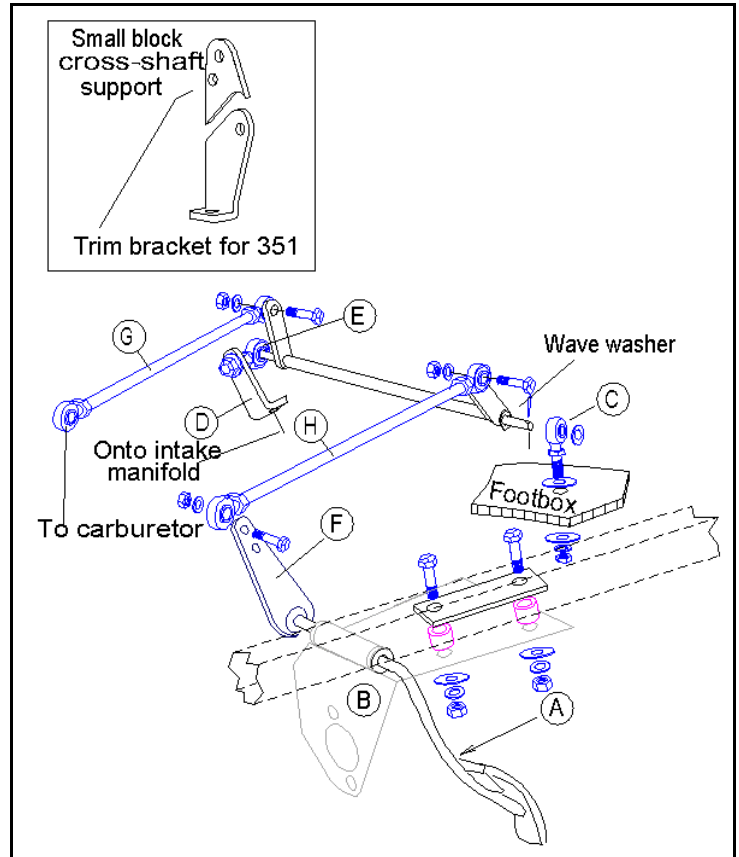
DOOR INSTALLATION

The doors can be installed now, but to make other operations easier, it's best to wait until near the end. See page 123 for installation details.

ACCELERATOR PEDAL AND LINKAGE



All components are pre-installed on every kit.



Fit the rod end (C) through the footbox using a large washer on either side of the hole.

Install the pedal assembly (A) with the linkage bracket (B) onto the foot box. At the back, secure to the fiberglass with bolts through the brace bracket and spacers. At the front, secure with the front steering flange bearing bolts.

Loosely bolt the bracket (D) onto the engine using the rear-most intake manifold bolt. The final object is to have the cross-shaft as parallel to the firewall as possible, so the orientation of the bracket may be changed so that the vertical and rod-end support are toward the firewall. Adjust the placement of the rod end in the bracket so that the cross-shaft is roughly horizontal.

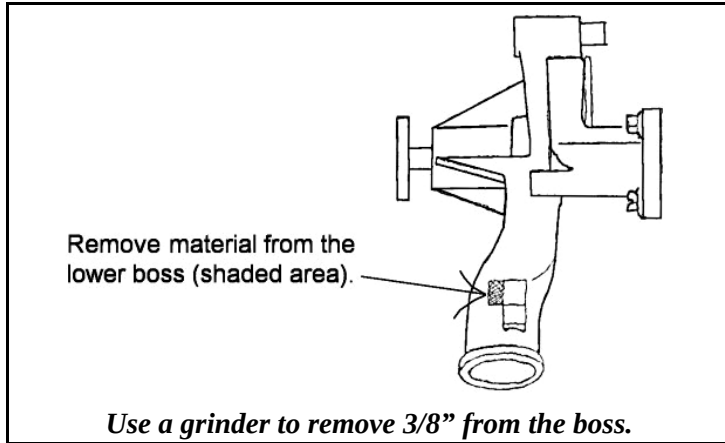
Fit the left end of the transverse link (F) to the rod end on bracket (B). Secure with a cotter pin. Slide a rod end (E) onto the transverse link and bolt to the bracket (D).

Note: This linkage can be adapted to most engines. If yours requires something different, please call us. The FE dual-quad setup requires an additional linkage assembly.

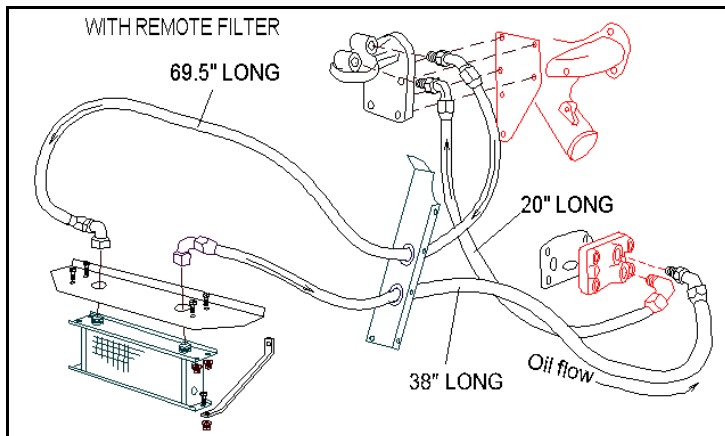
SECTION E -BODY PREPARATION-

COOLER WITH REMOTE FILTER

Mount the remote filter on the water pump with the E.R.A. adapter bracket. Some modifications to the pump might be necessary.

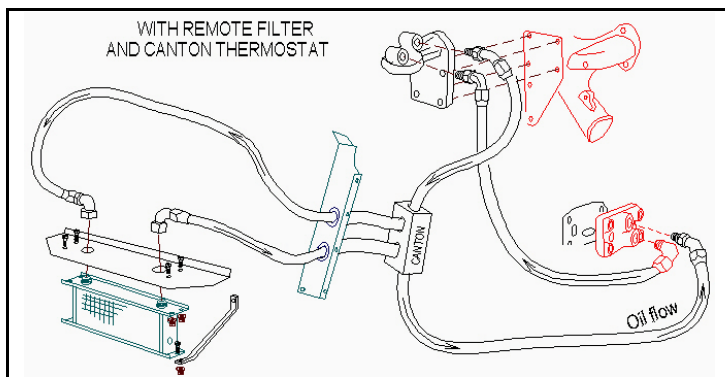


Assemble the other components as shown. The water pump may require modifications to the bottom mounting boss (instructions included with cooler kit).



ebod\oilclr5

WITH IN-LINE THERMOSTAT



oilclr7

FUEL TANK

The 19-gallon aluminum fuel tank is baffled, with one-way doors separating the volume into four sections, capturing the fuel toward the front/center of the tank during cornering and acceleration.

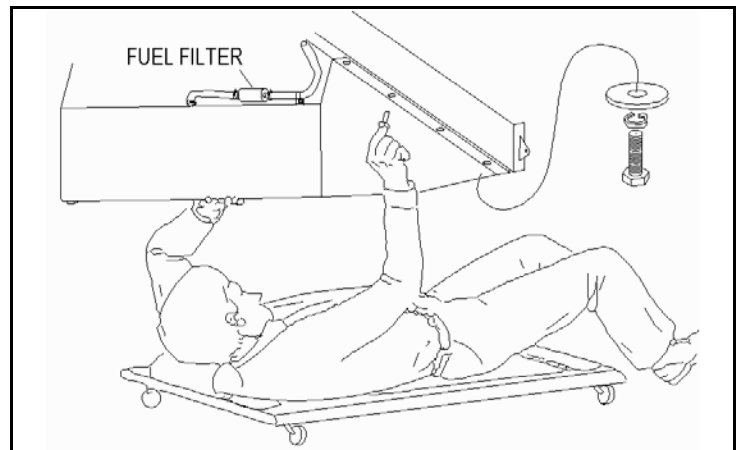
A **drain plug** is at the right front of the tank bottom.

The **fuel sender** is in the center-front section of the tank, and installed at E.R.A. If you find it necessary to remove the sender, use a fuel-resistant sealant like Versachem Gasket Sealant #3 Aviation. A jumper wire is taped to the top of the tank that mates with the connection to the rear harness.

INSTALLATION

Place the tank under the car and connect the sending unit wire(s).

Raise the tank between the frame rails, guiding the filler neck through the body hole. Hold in place with one ($\frac{5}{16}$ " USS) bolt per side. Install the rest of the bolts and washers.



Ebod\FuelTank

Connect the fuel outlet on the center rear of the tank to the steel line on the chassis (both $\frac{3}{8}$ " OD) with a length of rubber fuel line. An in-line fuel filter can be conveniently installed within this section of line. Use clamps on all connections.

Slide the seal plate over the fuel tank neck and secure with the screws. See the filler cap illustration.

SECTION E -BODY PREPARATION-

FUEL FILLER CAP

The cap and outside flange are indexed with punch marks (or a common number) on the outside edge of the upper mounting flange. This corresponds to where the latch of the filler cap falls when the cap is fully screwed onto the flange.

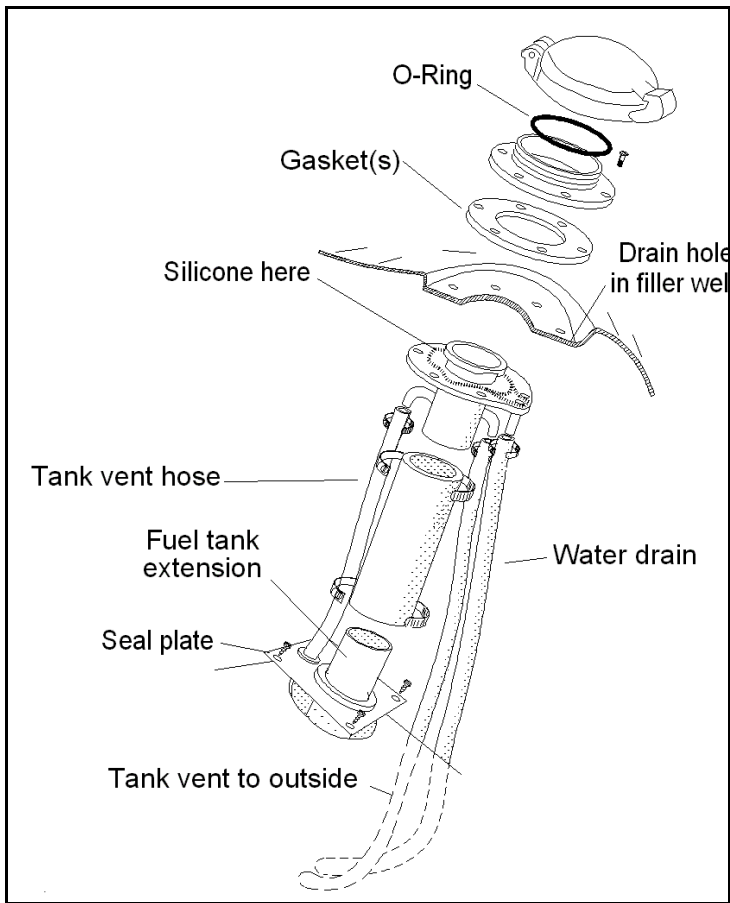
Note the odd hole falling just outside the upper flange on the body and lower flange. A water drain for the filler well is integrated into the bottom flange of the filler cap. The tube in the lower mounting flange channels water out of the well, through a hole in the trunk.

FLANGE

Put a generous amount of RTV silicone gasket sealer on the top surface of the flange.

Line up the drain hole on the flange and the body. Hold the lower mounting flange in place on the underside of the fender.

INSTALLATION



Place the gasket and upper flange on top of the fender, with the flange markings toward the right side (at 3 O'clock as viewed from above). Hold everything together with the stainless steel screws provided.

Remove excess RTV and clear the drain hole with a wire, etc. Install the vent and drain hoses to the lower flange as shown. Run the drain hose through the hole in the bottom corner of the well at the side of the trunk.

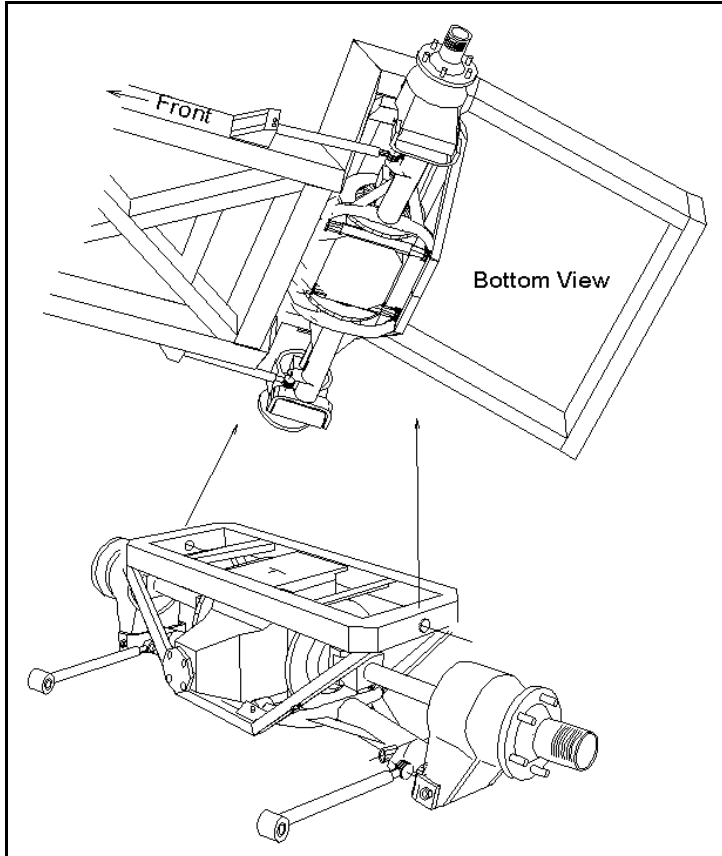
Pass the vent hose through the seal plate and connect to the aluminum tube that comes through the hole in the tank's mounting flange.

SECTION F -SUSPENSION ASSEMBLY-

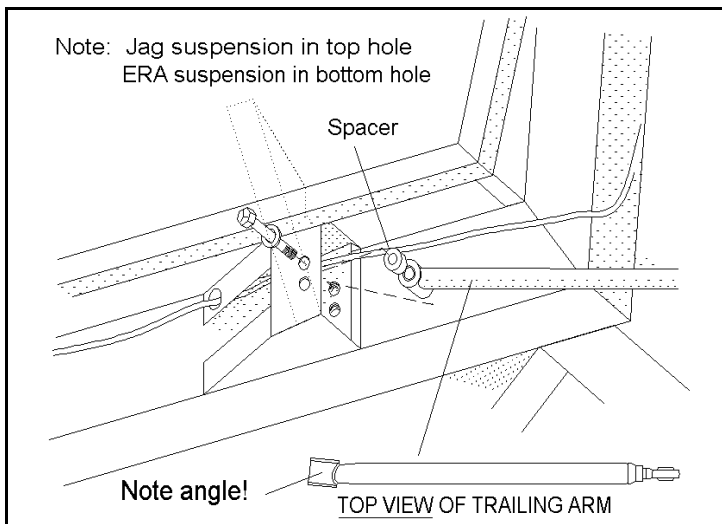
REAR SUSPENSION, JAGUAR-BASED

XJ COMPONENTS IN E.R.A. SUBFRAME

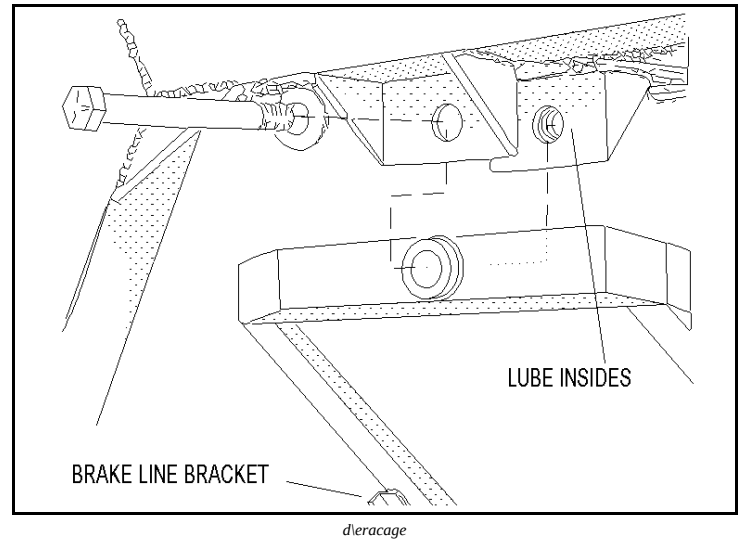
Thread the trailing arms onto the rod ends (with jam nuts) already installed on the lower control arms. Thread on until one or two threads show. Leave the jam nuts loose.



Raise the rear suspension assembly into position with a floor jack, guiding the forward ends of both trailing arms into the brackets on the sides of the frame. Don't install the bolts yet.



Lubricate the insides of the upper chassis brackets with lithium grease so that the sides of the rubber bushing will slide into them. Guide the suspension assembly into the chassis brackets. Using a little light oil on the threads, install the $\frac{5}{8}$ " bolts with flat washers, but don't tighten yet.



Note that the trailing arm bushing is **angled** slightly relative to the trailing arm tube. See the bottom of the illustration on page 99.

On one side of the car: Rotate the trailing arm so that the bushing angle matches the chassis bracket. Hold the bushing against the inside of the chassis bracket and sight through from the outside hole. Use a large screwdriver to move the assembly so that the sight is straight into the threaded portion of the chassis bracket.

Slip the aluminum spacer between the outside of the trailing arm bushing and the chassis bracket. See the illustration above. Slide the $\frac{1}{2}$ " x 3" bolt through the flat washer, upper hole in the bracket, spacer and trailing arm bush, engaging the (locking) threads in the chassis. No lock-washer is necessary.

Move to the trailing arm on the other side of the car. Sight through the hole in the chassis and determine whether the length of the trailing arm will have to be adjusted. Screw the trailing arm in or out on the rod-end as necessary.

If the assembly does not line up perfectly, pry or pull on the hub carrier to shift things around while installing the spacer and bolt. If the holes do not exactly line up, grinding a taper on the bolt may make it easier to get the threads to start. Torque the bolts on both sides to 45 lb-ft.

Tighten the upper pivot bolts to 90 lb-ft.

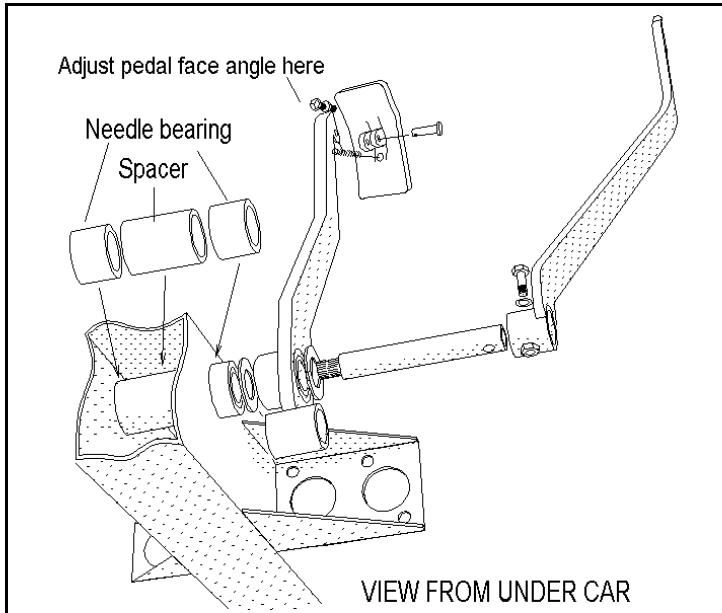
Connect the brake flex-line to the bracket on the chassis.

XKE HANDBRAKE LEVER AND CABLE

You can use then entire XKE handbrake cable linkage as shown below.

SECTION F -SUSPENSION ASSEMBLY-

BRAKE AND CLUTCH PEDAL



d/brpedal

INSTALLATION

If necessary, clean and grease the needle bearings in the chassis and in the brake pedal.

Slide the pivot shaft through the chassis bearings with the splined end toward the inside. If the engine is installed, the shaft must be installed from the outside of the chassis.

Install the thrust washer(s), brake pedal, and clutch pedal onto the shaft. Secure the clutch pedal with the shoulder screw.

Install the clutch throw-out arm onto the splined end of the shaft. Orient the throw-out arm approximately opposite the pedal. See the illustration on page 137.

To adjust the orientation of the clutch arm, change the length of the connecting rod between the clutch pedal throw-out arm and the clutch master cylinder:

Remove the retaining clip and the clevis pin.

Loosen the jam nut at the clevis. Turn the threaded rod to change the length as necessary.. When finished, tighten the arm set screw.

For **balance bar** parts installation, see page 142.

Clutch height adjustment is covered on page 104.

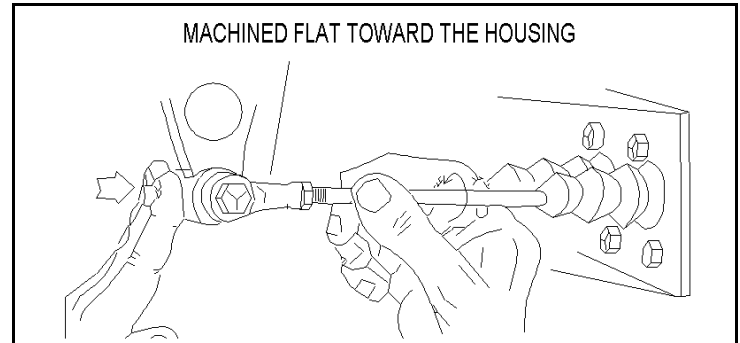
BRAKE PEDAL HEIGHT

Master cylinder installation is described on page 61.

For people of average height, set the distance from the rear of the pedal face to the forward part of the foot-box to about 7". If you are much taller or shorter, you may move the pedal up to $\frac{3}{4}$ " forward or backward as needed.

If even **more adjustment** is required, a $\frac{7}{8}$ " bore Tilton cylinder can be substituted for the BMW **clutch master** cylinder. A new clutch hose is also required. Special Order Only.

ADJUSTMENT



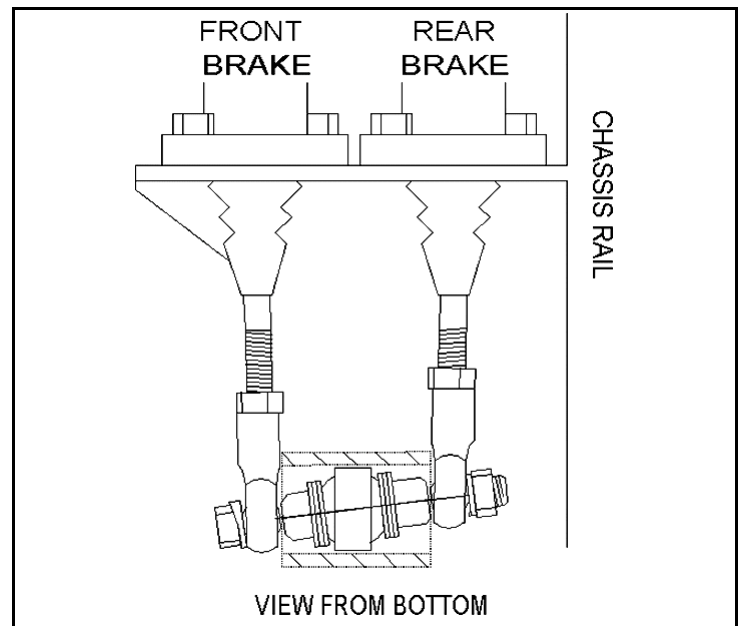
d/braklink

Because the front brake wheel cylinders require more fluid than the rears, the balance bar is always set up with the outside push-rod $\frac{1}{4}$ " longer than the inside one. There are flats machined on the one side of each connecting rod end. Install the rod ends on the balance bar with the **flats toward** the balance bar housing. See above and page 143.

NOTE ON THE BRAKE BALANCE ADJUSTMENT

*The rod **length** has no effect on the front/rear brake bias (which brakes lock first). If necessary, **the bias can be adjusted** as described on page 142.*

For a preliminary setting, adjust the outer rod so that there are $\frac{3}{4}$ " of threads showing on the outer master cylinder rod, $\frac{1}{2}$ " on the inner rod (with the jam nuts against the rod end.)



To change the **brake pedal height**, turn both threaded rods equally in or out.

Check the tightness of the brake lines and switch fittings.

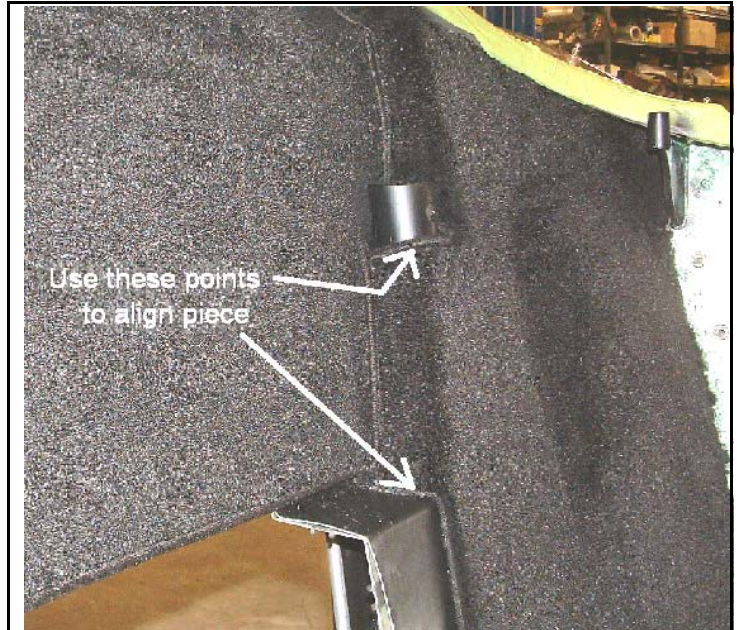
CARPETS

INTERIOR

REAR PANEL



After masking the body, spray or brush contact cement on the panel areas and the back sides of the vinyl and carpet.



Install the side carpets, starting by lining up the corner(s) as shown.

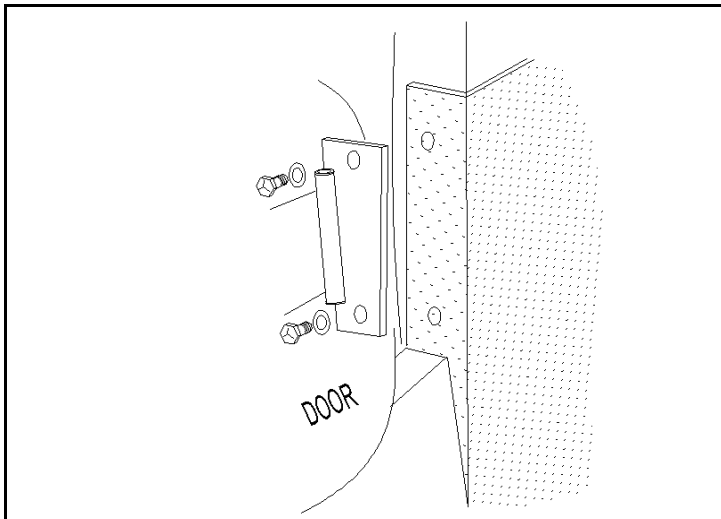


Install the vinyl on the central aluminum side panels. Trim even with the vertical edges and leave a short amount at along the floor.



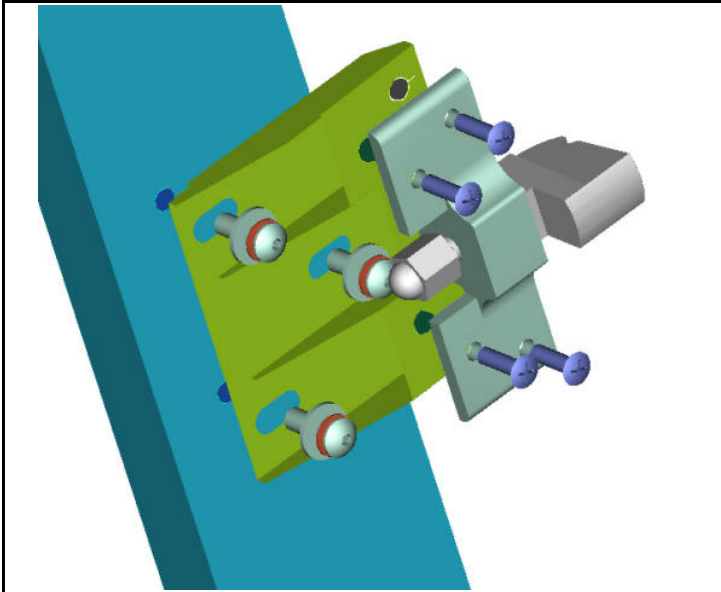
Carefully form the carpet over the wheelhouse bulge and push into the side and top areas. Trim off the excess material.

SECTION G - BODY/INTERIOR



eintdoorrug1

Replace the door strikers as described on page 123. The added thickness of the carpet should make the rear edge of the door flush with the body. If not, add or subtract shims.



The door should latch on the second catch without being slammed. If it doesn't shut all the way with a solid "chunk", check for latch/striker misalignment or an interference fit between the two parts

To check for misalignment, hold the latch lever in the open position and shut the door without putting any pressure on it up or down. The door latch should seat into the striker without resistance or sharp contact sounds. Re-align vertically if necessary.

Open and shut the door several times, then check the striker receptacle of the latch for shiny spots. File these spots, being careful to hold the file flat. Recheck fit, and repeat the process if necessary.

Install the dead pedal over the carpet.

Attach the tunnel carpet (#17) with about 1" extending past the front edge, allowing the carpet to be folded over to the backside and glued. Cut out for the shifter, ashtray and hand brake lever. Screw the tunnel into place.

To make cleaning easier, the two-piece floor carpets are held in place with snaps and Velcro. Fit the carpets in place and mark the floor where the snaps are to go. Drill $\frac{1}{8}$ " holes and screw the snap bases into place. Remove carpets to fit seats.

FRESH AIR CABLES

Lubricate the rubber grommet located midway up the front of the driver's footbox on the left hand side, with silicone spray or petroleum jelly.

Push the cable through the grommet and install the cable loop on the fresh air control valve as shown on page 63.

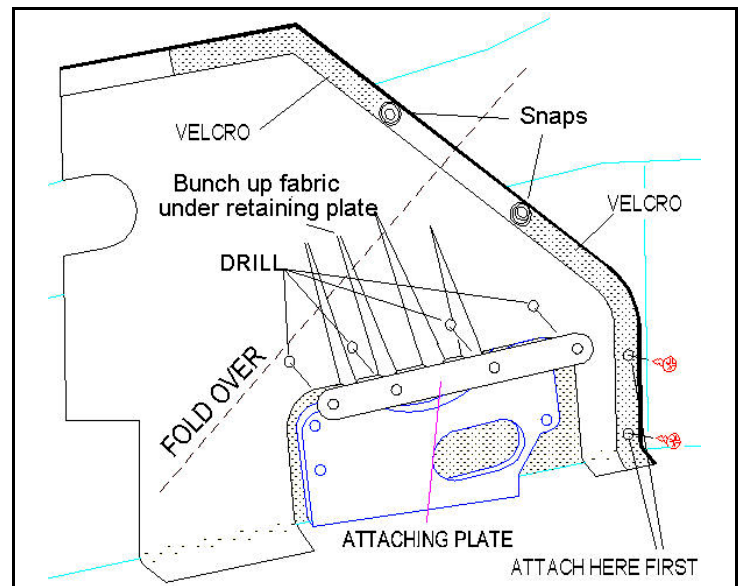
Attach the cable to the side of the footbox with a cable clamp.

Also see the illustration on page **Error! Bookmark not defined.**

HAND BRAKE LEVER COVER

Using the figure below as a guide, open up the hand brake lever cover and align the cut-out section on the inside flap around the hole in the transmission tunnel behind the lever, bunching it up as necessary in the center. Attach the front edge of the boot by drilling holes through the fabric into the tunnel.

Hold the attaching plate against the cover and tunnel. Drill four $\frac{1}{8}$ " holes into the tunnel. Attach the plate and cover to the tunnel.



eintebtrim1

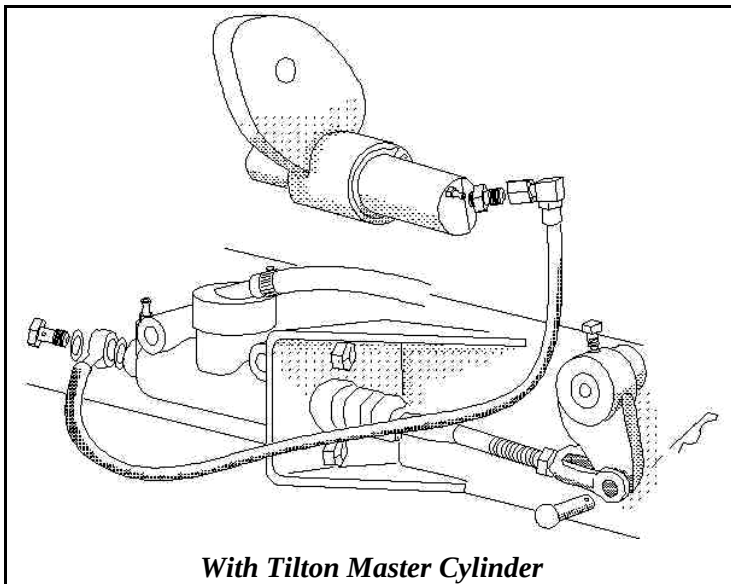
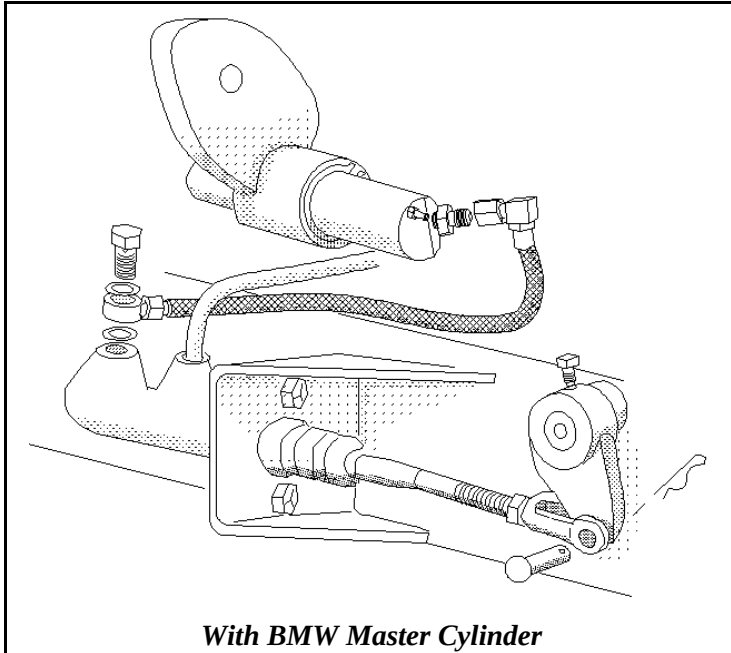
Re-bolt the hand brake lever in place.

Fold the outer flap of the cover over the lever and attach to the inner flap with the Velcro and snap.

CLUTCH HYDRAULICS

PRESSURE HOSE INSTALLATION

See page 35 for an illustration of the slave cylinder.



Check the tightness of all fittings before bleeding.

BLEEDING

The car must be level or with the front end slightly higher for this operation

Fill the brake/clutch reservoir with DOT 3 or DOT 4 fluid. Silicone fluid is not recommended.

Attach a small hose to the slave cylinder bleeder nipple, immersing the other end of the hose in a small cup of fluid. Loosen the nipple about $\frac{2}{3}$ turn with a $\frac{9}{32}$ " or 7 mm wrench.

Work the arm on the clutch pedal shaft (instead of pushing on the clutch pedal itself) until only clear fluid comes out of the hose.

Close the bleeder nipple and pump the clutch pedal several times. If there is more than 1" travel at the pedal before resistance is felt, repeat the bleeding procedure.

ADJUSTMENT

The slave cylinder has an internal spring that keeps a small amount of pressure to extend the piston at all times. Most throw-out bearings will operate with the small constant pressure involved. Those that cannot must use a return spring and be adjusted periodically.

If you wish, you can use this preload to automatically keep the clutch adjustment at "zero" clearance. This will, however reduce the life of the throwout bearing. Since clutch wear will be most seen when the driven disc is being broken in, you may want to keep the "automatic mode" during the first couple hundred miles and then install a return spring.

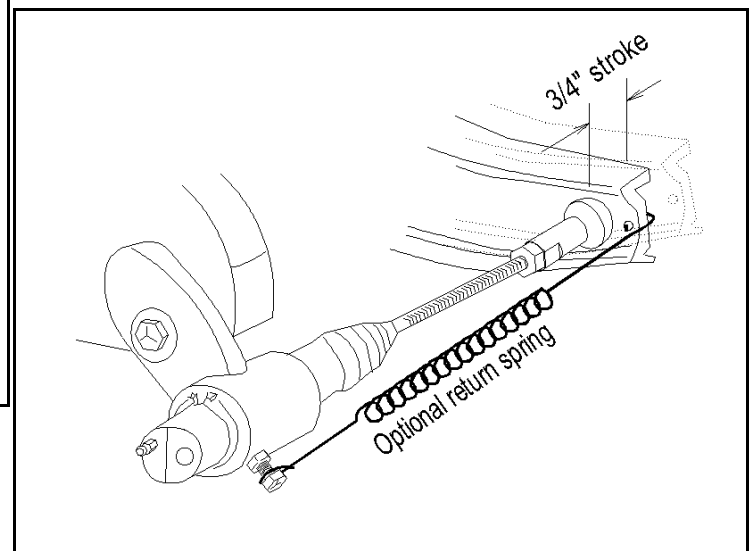
See page 104 for clutch pedal height adjustment.

WITHOUT RETURN SPRING

Increase the length of the throw rod by unscrewing the ball end, forcing the piston in the cylinder to just bottom out.

Note that the cylinder is spring loaded to the fully extended position.

Decrease the length of the adjusting rod so that there is about $\frac{1}{4}$ " movement when you push the transmission arm toward the front of the car.



fcltchadj

COOLING SYSTEM

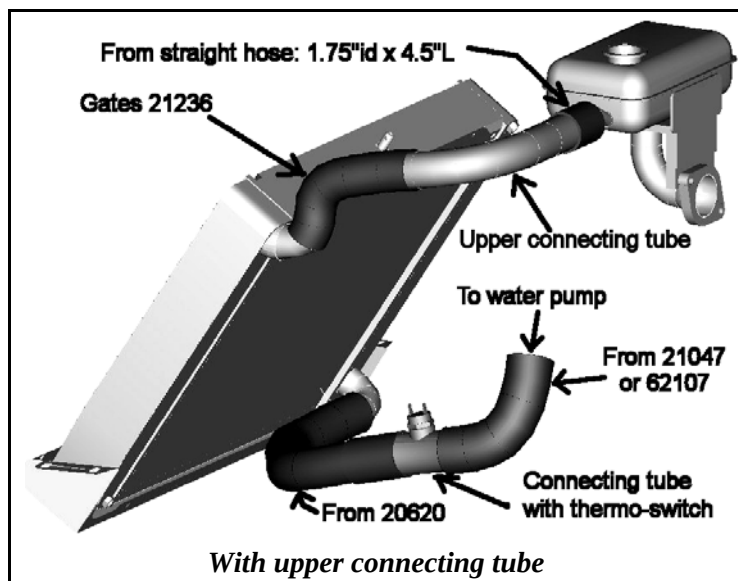
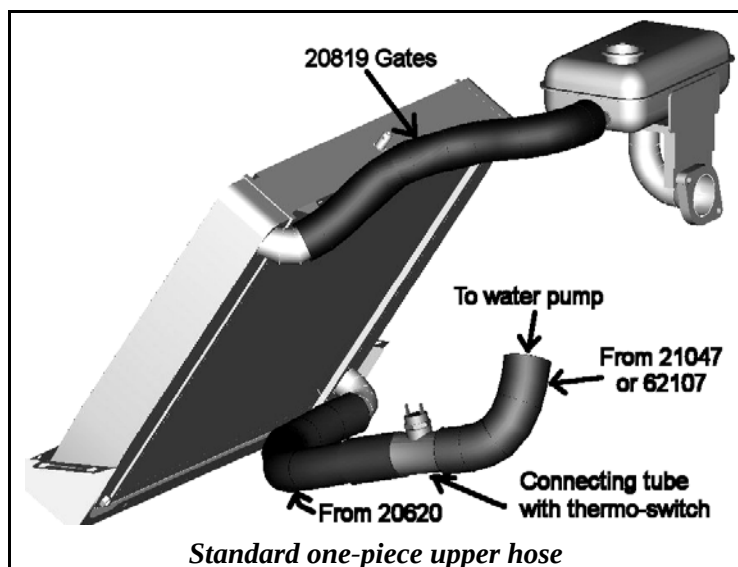
WATER HOSE LAYOUT (FE)

Install the radiator hoses (and optional top tube connector) and lower hose connector. The hose part numbers and instructions for modifying the front lower hose are covered on page 39.

The radiator cooling fan thermostatic switch is in the lower hose connector. Connect the harness wires as shown on page 81 and detailed in the wiring instructions. (There is also an over-ride switch on the dashboard).

See the diagrams below for the cooling system circuits.

Do NOT remove the spring from inside the long lower hose. It prevents the hose from collapsing at speed.



SETUP

The optimal operating temperature for most FE engines is about 185°F (85°C). This will keep water condensation in the oil to a minimum and allow adequate oil flow. We do not recommend using a restrictor plate in place of a thermostat unless the car is used exclusively for track use.

See page 150 for your best mix of water and anti-freeze. With a 15psi pressure cap, the boiling point will be raised to about 240°F.

Fill the system through the expansion tank, leaving about 1½" of expansion space above the coolant level.

*With some engines (especially the FE Ford), air tends to be trapped in the intake manifold and cylinder heads. **To remove the trapped air:***

- Drill the thermostat as shown on page 38.
- **Open** the bleeder at the upper right of the radiator. **Fill** the system with the cooling mixture. Once water flows bubble free from the radiator bleeder, shut the valve. Actually, we usually fill the system with water first and pressure test for leaks, then drain half the water out. We can also tell the condition of the cleanliness of the cooling system by the drain water.
- With the expansion tank full, **loosen** the water temperature fitting on the intake manifold. Air will be expelled. When nothing comes out but fluid, tighten the fitting. If you have a **heater**, it may be necessary to bleed air from the system by disconnecting a hose at the heater nipple.
- **Repeat** the bleeding process after the car is run. More air will usually come out.
- Check the hoses and **retighten** all the hose clamps.

OVERHEATING:

Use a 165°F -180°F thermostat for street use. Leaving the thermostat out will cause overheating. The boiling point of a water/anti-freeze mixture with a 15 psi cap is **over 230°F**. It is not harmful (and normal) for the water temperature to rise to 210°F - 220°F with the car not moving.

We do **NOT** recommend using an underdrive waterpump pulley on the street..

AT SPEED

The E.R.A. 427SC uses an oversized radiator made by Griffin, rated for 600 bhp. Overheating at speed is almost always the result of incorrect engine settings, usually retarded ignition timing. Check your dynamic timing at idle and 3000-3500rpm, or as recommended by your engine builder. Sometimes an extremely tight (new) engine can cause overheating.