

TOOLS AND OTHER PARTS NEEDED FOR ASSEMBLY

Hammer	Assorted "C" Clamps
Hack Saw & Blades	Knife
Pliers	Screwdrivers - Plain & Phillips
Wire Brush	Electric Drill
Cold Chisel	Set of Drills 1/8th to 1/2"
Tape Measure	Sabre Saw
13 & 17 mm Sockets	Flat File & Round File
Metric Wrenches inc. 8 & 14 mm	Vice Grips
Rotary Wire brush (for a drill)	Jack stands
Caulking Gun	Can of Penetrating Oil
Tube of caulking - Acrylic latex	Mineral Spirits
Putty Knife	Large tube of contact cement
Sandpaper - 60, 80, 220 grit	2 Spray cans of flat black paint
Rags	1 qt. of Rust Retardent Paint

Gallon of polyester fiberglass resin
(and hardener) to suit

4 square yards of 1½ oz. fiberglass mat

1 quart of Acetone or any safe resin
solvent for brush cleaning

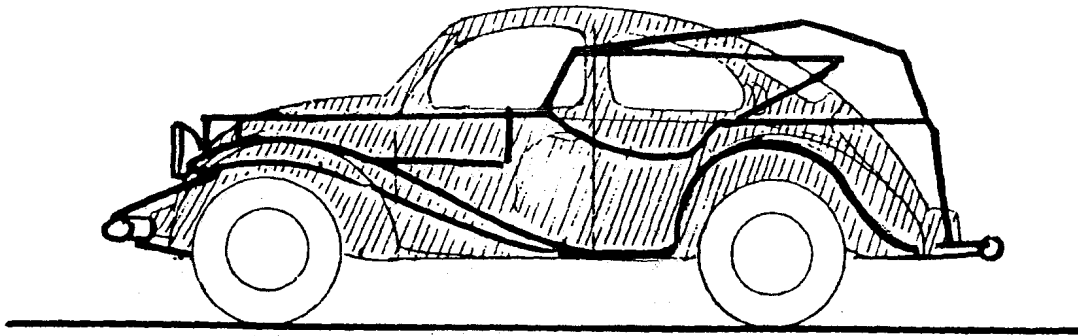
2 2" brushes (throw away type)

30" 3/8" inside diameter neoprene
gas line.

CONSIDERATIONS WHEN BUYING A VW CHASSIS AND ENGINE

The first step in building your Gazelle is to obtain a good, used VW. We recommend that you look through the classified ads in your local newspaper or check your local wrecking yards. A damaged car is ideal if the bottom pan is not bent. Stay away from cars that have possible front or rear axle damages. To make sure that your chassis is straight and that the front axles are not damaged, carefully measure the wheel base from the center of the front wheels to the center of the rear wheels. It should be the same on both sides, 94½". If straightening is required on the pan, consult a competent VW body shop, or look for another VW.

Other factors worth a closer look are the front end in general for signs of collision damage inside the lower trunk area, rust, anything bent or obviously distorted. Check the front and rear wheels for bearing play, worn shocks, etc. The gear-box differential unit (transaxle) should not be noisy or have any "whine", and the gear change should feel free and precise. Excessive oil dripping around the engine area is not good and should be investigated. Low compression, smokey exhaust and sloppy brakes can all be fixed, but it will mean a lot of extra work at the chassis preparation stage.



GAZELLE SUPERIMPOSED OVER BEETLE
(same wheel base)

The Gazelle body will fit only the standard VW Beetle, of any year, no Super Beetle, Karmann Ghia, or Fast Back, etc., only a Beetle. If, however, you already own a Karmann Ghia it is possible to modify it, but, it takes quite a bit of work, and we, quite frankly, do not recommend it, although we know it has been done.

When shopping for a beetle, if you know the chassis number and engine number, these will give you the year the car was manufactured.

To acquaint you with the changes VW has made on its Beetle through the years, here is a brief history:

1960	and earlier sedans are 36 hp and employ a 4 speed non-syncro gear box.
1961	Chassis No. 3192507 - 4010994 Transmission improved (stronger, synchromesh) Anti-sway bars, a king pin on front suspension and also HP increased from 36 to 40.
1962	Chassis No. 4010995 - 4846835
1963	Chassis No. 4846836 - 5677118
1964	Chassis No. 5677119 - 6502399

NOTE: Beginning in 1965, VW incorporated the year and model in the chassis number. The first two digits identify the model as a Beetle (11) or a Karmann Ghia (14). The third digit is the last digit of the year, e.g. 5 would indicate 1965 and 2 would indicate 1972. The last 6 to 7 digits are the chassis serial number.

1965	Chassis No. 11500001
1966	Chassis No. 116000001 - 1161021298 HP increased from 40 to 50 and changed to a ball joints on the front suspension.
1967	Chassis No. 117000001 - 117844892 12 volt system. Increased HP from 50 to 53. Dual brake system
1968	Chassis No. 118000001 - 1811016098 Automatic stick shift, introduced raised bumper height, modified front and rear shock arrangement.
1969	Chassis No. 119000001 - 1191093704 Double joined rear axle.
1970	Chassis No. 1102000011 - 1103096945 HP increased from 53 to 57.
1971	Chassis No. 1112000001 HP increased from 57 to 60. Super Beetle introduced.
1972	Chassis No. 1122000001
1973	Chassis No. 1132000001
1974	Chassis No. 1142000001
1975	Chassis No. 1152000001

IN SUMMARY, the 1967, 1968, 1969 sedans are 1500 cc, 53 hp, have ball-joint front-ends and a 12 volt system (earlier ones are 6 volt). The 1967 was the last year to have a wide 5 bolt pattern on the wheels. In 1968, they were changed to the 4 bolt pattern.

Starting with the 1968 automatic-stick and continuing through the 1969s and newer sedans, a redesigned transaxle with a double U-joint type independent rear suspension was introduced and raised bumper height etc. The 1970 engines are 1600cc with single-port heads. The 1971 thru 1975 engines are 1600cc with dual-port heads. The 1970 engine is rated 57 hp, 1971-1972 at 60 hp. Later (1973+) engines have decreased hp ratings due to emission equipment.

When looking for a chassis, remember that what you need consists of four major pieces; floorpan, front suspension with steering unit, transaxle complete with rear suspension and engine.

You can buy pieces separately, however, it is usually better to buy a complete unit, as many bits and pieces of VW hardware can be reused. Be sure you get a title and/or bill of sale, if you purchase an entire unit or pieces. ALWAYS KEEP IN MIND THAT, IF THE FOUR MAJOR ITEMS ARE INTACT, THE WRECK IS USABLE. DO NOT LET A RUSTED OR MANGLED BODY FOOL YOU.

A VW that has been rolled-over would be acceptable, assuming no engine, pan or axle damages has occurred.

It is our recommendation that you use the newest chassis you can afford and, as a rule, use a 1969 chassis, or newer, due to higher HP and superior transmission.

We ourselves prefer 1969-1971 VW's due to the double jointed rear axles and basic lack of smog control equipment. However, we have had many of our customers build cars on VW's as old as 1961 and they turn out just fine.



REMOVING THE VW BODY

Removing the body from your Volkswagen is very easy; for this operation you will need to have a 13mm and 17mm wrench and a socket in each of these sizes would also be helpful.

SAVE ALL BOLTS REMOVED DURING BODY REMOVAL PROCESS.

Because of slight differences between VW's construction and modifications, the exact location of parts to be removed may vary slightly.

First step will be to remove the battery and the battery hold downs. Then open the trunk and remove the gas tank covering, also disconnect the cable to the fuel gauge and then remove the hose that connects the fuel tank to the fitting that comes out of the frame. This hose should not be disconnected from the gas tank itself, but rather should be broken open at the end where it connects with the fitting going into the frame. You will then plug this hose or clamp a pair of vice grips onto the end of it to prevent the fumes or gas leaking out.

Remove, and save the sender unit to use with the kit.

We would like to caution you here, that the fuel tank with gasoline or gasoline fumes in it is a potential fire hazard and since you will not need it in the construction of your Gazelle, it would be a good idea to dispose of it immediately.

With a 1961 to 1967 tank, you will need to remove the breather pipe. On 1968 and newer tanks, you must remove the large clamp from the breather pipe boot, then remove the boot and pipe. Remove the 4 bolts holding down the tank and lift it out.

Right under where the front edge of the tank was, you will find 2 bolts each about 6" from the center line of the car. Remove them and the 2 bolts from the round steering column lower coupling flange just aft of the steering box. Remove the rear seat. Beneath where the rear seat was, there are 6 bolts which must be removed. 2 of these are about 8" out from the center of the hump, towards the sides, two are out about 15" from the center and the last two, are back a little further and closer to the body sides, later models do not have these. Now block up the chassis, then remove the rear wheels. Remove the bolts in the rear fender well on each side. These are located about 5" forward and a bit lower than the top of the rear shocks. Underneath the car, in about 6½" from the edge of the running board you will find a row of 9 bolts and 2 more just forward of them. Remove these 11 bolts from each side of the car. Next you will disconnect or cut the speedometer cable (it is too short for use in the Gazelle). You will eventually replace it with a VW Bus Cable Part #211-957-801E.

Remove and save the brake fluid reservoir which is located in the trunk. Disconnect the wires going to the voltage regulator and then cut the wire that goes from the coil into the loom of wires that runs into the car.

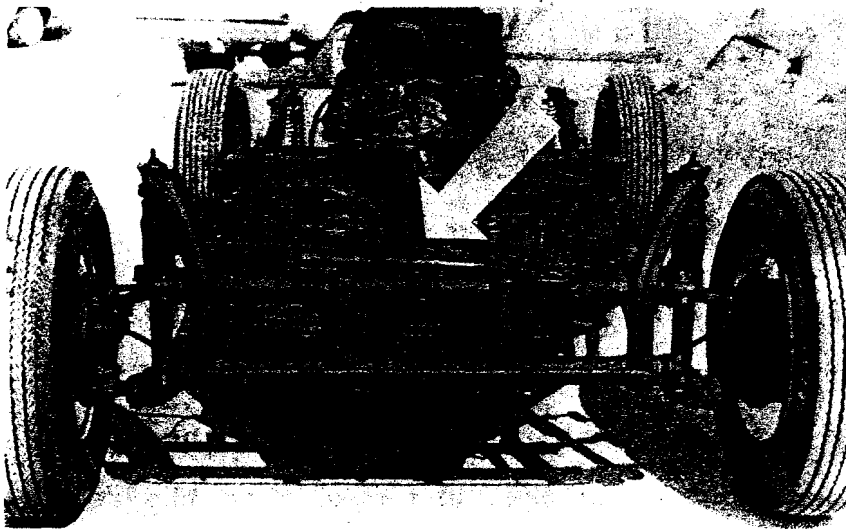
NOTE: The voltage regulator on later models is mounted inside the body, behind the driver's door, be sure to save it. Earlier ones are mounted on the generator which is on the engine. It is advisable to save all undamaged parts, in as much as you may want to use them later, (or sell them). You may now lift the body off the chassis.



The front seats will remain on the chassis on older cars and can be removed later, but on late model cars you must take the seats out before the body will lift off. Slide the seats fully forward, disconnect the springs, and take them the rest of the way forward off and out. If you have a block and tackle, move the car under a strong tree or beam and lift the body off, if not, three or four friends can grab the bumpers or fenders and lift it off the chassis. You should now store the body with all the instruments and steering wheel etc. Many of these parts will be used in the construction of your Gazelle and those that are not can generally be sold off to people with wrecks and others looking for parts. This recoups much of the money you spent in obtaining the VW.

LOCATION OF STATION 0-0

Since many measurements start from this point, it is most important that you know where Station 0-0 is. This point is located on the center of the "tunnel," right on the bracket that is about 14 inches behind the center of the front axle. It has a little hole in it in the center (or sometimes a rivet, or on certain VW's, nothing.) You must understand where this point is, as many measurements start here.



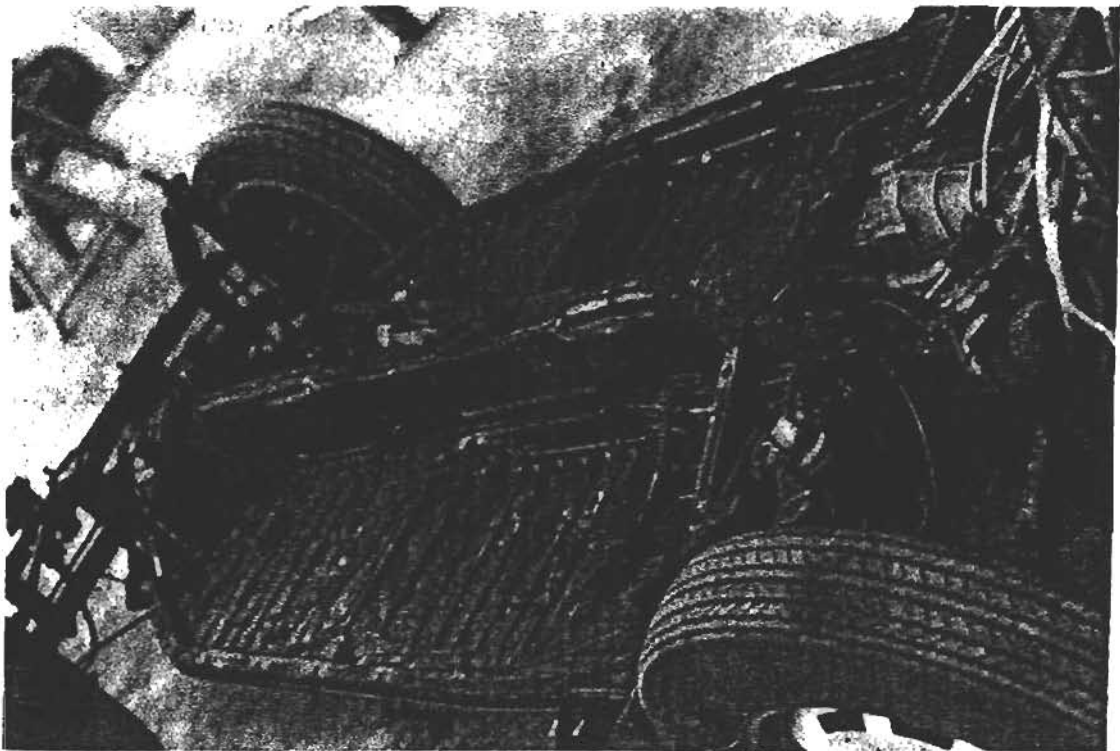
CHECKING THE PAN

Before you start to build your Gazelle kit, you must make sure that your chassis is straight and that the front axles are not bent. To do this, carefully measure the wheel base from the center of the front wheels to the center of the rear wheels. It should be the same on both sides, $94\frac{1}{2}$ ". Also, diagonal wheel measurements should be made from left front wheel to right rear, etc.

PREPARATION OF CHASSIS

Clean entire chassis thoroughly.

Remove all unwanted material from the floor. Remove all the tar and insulation material. Remove the seats, seat track and battery anchor points. This can be done by using a hand chisel. The pan might suffer a few holes which can be patched at a later time with fiber glass or equivalent. (Patching is not essential, however.) If there are guide tubes from the heater cable on the pan, remove them. Remove the jacking points as these protrude beyond the body sides. (Jacking up the completed Gazelle is done with a "scissors" type jack).



REMOVAL OF THE CLUTCH, BRAKE AND GAS PEDAL ASSEMBLY

This assembly is easily removed by just taking out the 2 bolts which secure this assembly to the tunnel. The clutch brake and gas pedal assembly will come out in one unit. Disconnect the cables and remove the assembly.

REMOVAL OF THE MASTER BRAKE CYLINDER ASSEMBLY

Disconnect the brake lines and remove the 2 bolts securing the assembly, take out the cylinder towards the front of the chassis. Mount this assembly on the assembly bracket provided by Classic (metal part #42). Use 1/4" bolts with lock nuts. The bracket may need to be bent upwards at a point under the area where the pedal casting bolts thru; this lines the holes up and lifts the complete pedal assembly high enough, (1/4") for the underside of the brake pedal to clear the floor pan. Now bolt the pedal assembly on with the original bolts. From where the master Cylinder was mounted measure 16" towards the rear of the chassis (16-1/2" from point 0-0) and mark the location of the new pedal cluster hole, which will be 3 inches back from this position.

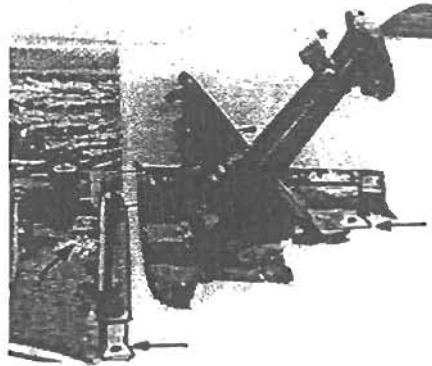
NOTE: The dimension given for relocation of the pedal assembly and gear shift lever are those which this company have found to be the most suitable for average purposes. Obviously it is possible to relocate these items in any other position to suit your own personal requirements.

You can check this if you wish by placing one of our seats on the floor pan in the final assembly position, and try the pedals for size.

Remember that the seats can be made adjustable, as we will explain later, so a difference of an inch or so in the positioning of the seat or the pedals is not a problem.

Cut out the new pedal cluster hole, using either a drill, saber saw or hole saw.

Pedal assembly
installed



NOTE: When cutting or drilling hole in the tunnel section please be careful not to damage the tubes or cables associated with the gas, clutch or brakes!

Place the pedal assembly in its new position and mark the location of the 3 mounting bolt holes. Drill 5/16" holes and mount the assembly bracket, using 5/16" bolts and lock nuts. You will now reattach the throttle cable. Cut an access hole in the right side of the tunnel 18" to the rear from point 0-0

2nd
Access hole



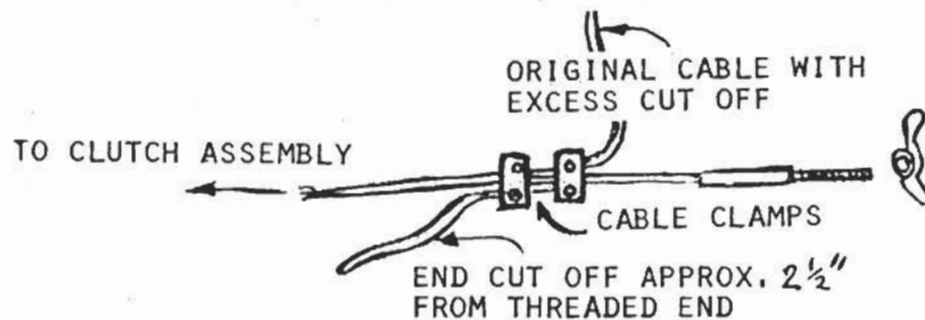
Finally there will be 4 new holes

- 1st On the left for the end of the pedals.
- 2nd On the right for access to 1st.
- 3rd For the gear lever on top of the tunnel.
- 4th On the left for access to 3rd.

Cut this opening 8" long and about 4-1/2" high, using the same method as the cluster hole. Then cut a hole for the throttle cable, in left side of tunnel. Pull the throttle cable out of its tube. Cut the throttle cable tube back so that it will just reach the new throttle cable hole and put tube through the hole just like it was when it was in its forward position. Insert the throttle cable through the throttle cable tube and reattach to the bracket on the carburator, tighten the set screw, cut off excess cable.

CLUTCH ADJUSTMENT

To reattach the clutch cable, disconnect the clutch cable from the clutch operating lever (at the engine), by removing the wing nut. Remove the clutch cable from its tube at the pedal end. Using access hole, cut the cable tube so that its end is 3" from the lever on the clutch pedal to allow for movement of the clutch cable. Insert the clutch cable back into the clutch cable tube. Pull the excess clutch cable through the tube at the engine end and cut off the small threaded adjustment rod, leaving enough cable to allow for the clamping of the cable.



Reattach the cut ends of the clutch cable by using cable clamps (available in any hardware store). Then tighten the clutch cable using the wing nut. Cut off excess cable ends.

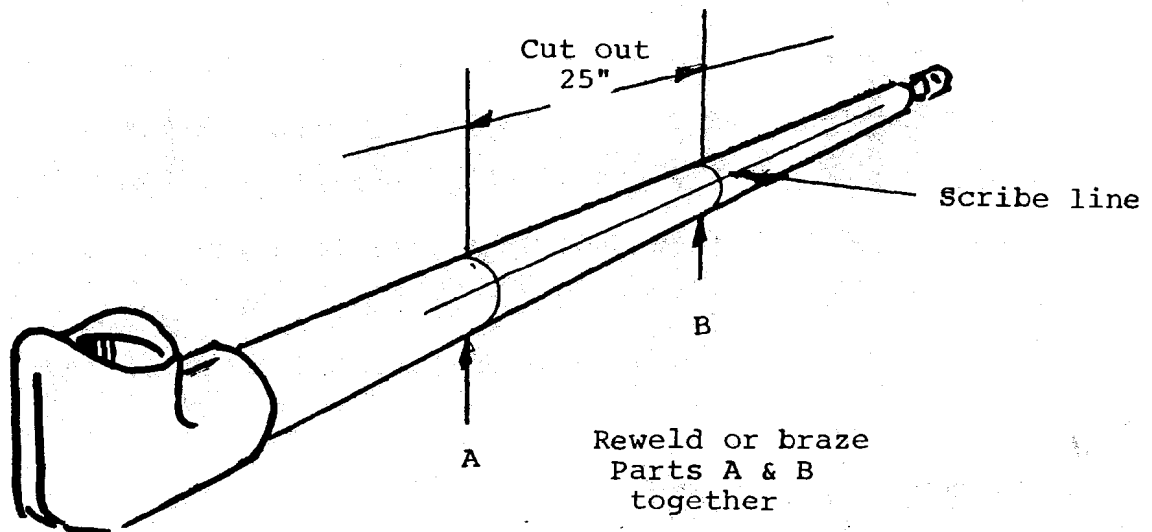
NOTE: Adjust clutch cable for 1/4" play, at the pedal which is shown as "A" below.



REMOUNTING THE GEAR SHIFT LEVER

This is also moved toward the back of the car 25", from its original position, or it is 48" from point 0-0. There are two bolts that hold the gear shift lever onto the "tunnel". Remove them and then very carefully remove the plate, spring, etc. under the gear shift. Make sure that you note the way the plate came out. It must be replaced exactly as it was removed. Do not turn it over or reverse it.

The shifter rod is removed from the front of the tunnel. You will find a little plate over the front of the tunnel just in the back of the front axle. Remove this, now disconnect the end of the rod from the transmission at the rear end of the tunnel and then you can pull the shifter rod out through the hole in the front. You are now ready to shorten this rod.



Insert short length of tube before welding to keep rod straight



If you have no welding facilities, you can take it to a competent welder and have him scribe a line down the length of the tube then cut 25" right out of the center, and reweld together with the scribe marks in line again.

NOTE: Be careful to insure that the two tube pieces will fit together exactly the same way they originally were. Do not change the angles on them, the realigned scribe marks should ensure this. You must now reinstall the shift tube and attach all items as removed.

Up to year 1966 or 1967, when the shift lever is moved back 25", (48" from point 0-0) it will not quite line up with the recess in the fiber glass inner liner. It will be a few inches ahead of it. Instead of moving shift lever back further, (Unless you want to) you should cut the inner liner so the shift lever will fit. The carpet will cover this area so any corrections will not show.

NOTE: Rather than removing the assembly under the original shift lever location, it is suggested that VW Parts No.

111701255B and No. 111701259A be purchased from your local VW dealer and installed under this new location. This will save you a lot of time and give you a new nylon bushing.

TIP: Order this part immediately as most VW dealers do not stock it.

RECONNECTING THE BRAKES

You have already mounted the brake master cylinder. You must now connect the brake lines. We recommend that you go to your VW dealer and buy some new brake lines. These are VW Part No. 211, 611-724A and Part No. 211,611-723A.

These will be your new front brake lines. For the rear brake lines you can use your old original lines providing that they are in good shape.

NOTE: The Emergency Brake and Heater controls are left unchanged. This is very important. Why? Because it is a major operation to change and it is quite satisfactory right where it is.

Attention should be given to any mechanical work indicated as the chassis is easy to work on with the body removed. Regular VW mechanical service should be done, for instance: - Engine reconditioning, tuning and performance modifications, paint and detailing with chrome extras, lubrication and grease job.

You are now just about ready to mount your body, but before you do, we suggest that you paint the chassis.

First you must clean the chassis, using either mineral spirits or lacquer thinner. The really bad areas should be cleaned with a rotary wire brush in your drill.

We suggest that the entire chassis be painted with a good quality paint such as Rustoleum. When you are completely finished painting the chassis, we recommend you buy a spray can of undercoater and cover the entire bottom pan on the surface that would be exposed to the highway salt and water.

NOTE: The chassis is now ready for its body. Check all work at this point. Touch up any areas and clean where necessary.

SUGGESTIONS FOR WORKING WITH FIBERGLASS

To build our kit you will have to do a very minimal amount of fiberglassing. However, we want to reassure you that it is a very simple job. We, therefore, want to explain how it should be done.

Fiberglassing, is a simple process and when done correctly it will do jobs that no other material can achieve.

Polyester resin and its hardener, (MEK), must be used when fiberglassing the Gazelle. It is easy to work with and readily available in any boat supply house and some hardware stores.

The first step in fiberglassing is setting up the parts to be glassed, in the correct positions and cutting the matting (fiberglass) material to size and shape.

The next step is mixing the resin and the hardener as per the manufacturer's instructions. Normally you will have 20 minutes or so before the resin has hardened to a point that it cannot be worked. Therefore, plan accordingly.

Caution: A mixture with too much catalyst will "cure" very fast, and should not be used. In every step requiring fiberglassing in this manual, we recommend the following procedures:

Cut 5" squares of fiberglass matting material (1½ oz. type) or buy 6" fiberglass cloth tape (approximately 45 feet will do and a gallon of resin should be adequate with the hardener to suit.)

Pour a quantity of mixed resin and hardener on a piece of cardboard.

Put the 5" square into the resin mixture and saturate the top with a small brush.

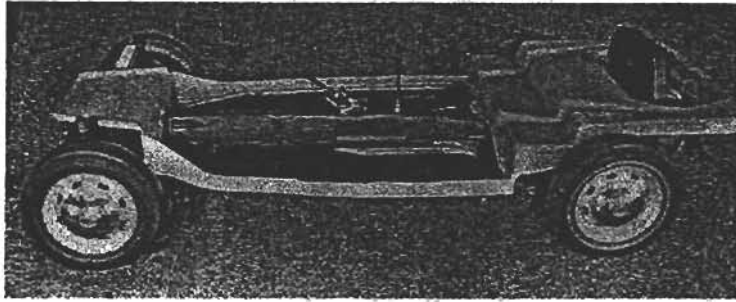
Pick up the saturated material and apply it to the work area. Use the brush to saturate the work area, after the materials are in place.

NOTE: IT IS ESSENTIAL that when applying new fiberglass to fiberglass or metal that the mating surfaces be prepared by sanding with a medium grit sandpaper to roughen the surfaces for better bond. Be sure you carefully sand all smooth gel coat (colored) areas to insure a good bond. This sanding removes mold wax left on your kit from our production process.

Use only a grease marker pencil when marking the gel coat outer surface of the body. Felt pens can stain and discolor the lighter body colors, other marking devices can scratch, a grease marker is safe, and wipes off easy.

THE FIBERGLASS BODY FRAME

Place the frame assembly on the chassis as shown.

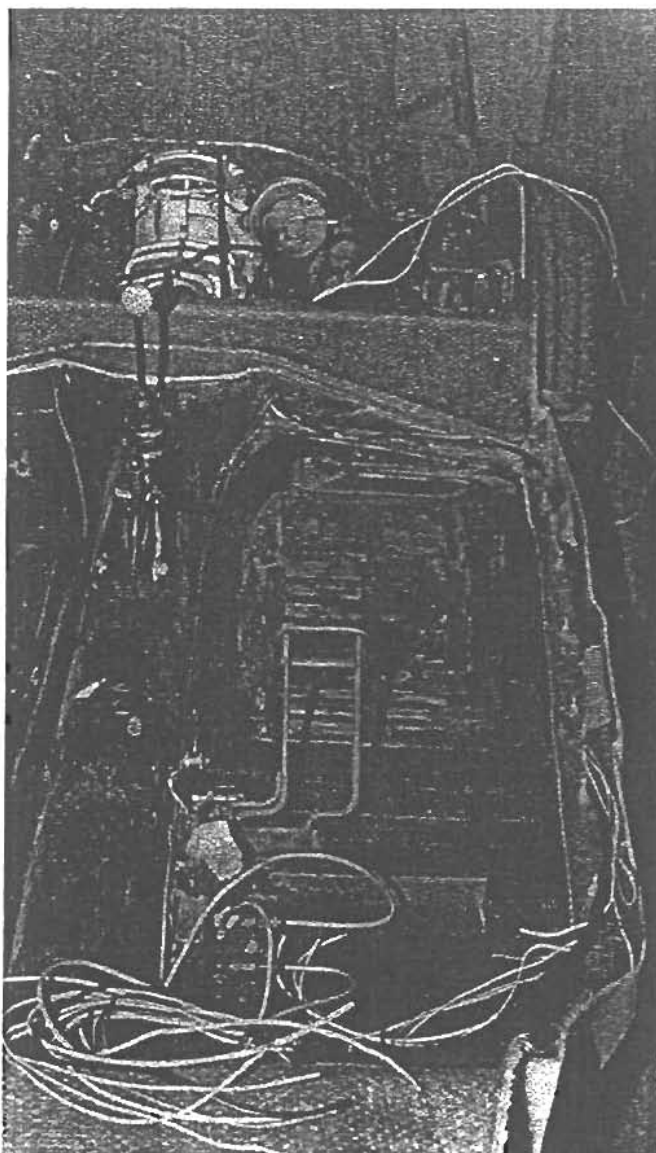


(Part No. 11)

You cannot put this on in a wrong position as it fits only one way and you will quickly see how it goes. Cut out the area, as marked, to clear the steering box. Use two spacers 1-5/8" in length, which are to be placed on top of the bolt towers of the torsion tube to level the front of the fiberglass frame.

You will now have to lay underneath and drill up through the fiberglass frame, through the 22 existing holes that run around the perimeter of the pan. Also drill the 2 holes on the rear shock brackets where they meet the fiberglass frame. Use 2 large washers under the bolt heads at assembly. It is therefore a good idea to use a clamp to hold this fiberglass frame to the chassis while you are doing this drilling. After you have drilled the holes, you lift the fiberglass frame assembly off the pan a little bit and dust away the fiberglass drillings. You will then caulk around the under side of the frame assembly with a good household caulking, such as acrylic latex. This caulking will secure the frame to the chassis and will help prevent squeaks as well as water leakage.

You will now bolt the frame assembly to the pan using 22 5/16 x 1-1/2" Hex bolts and lock nuts with the original washers that came with your VW when you remove it from this area.



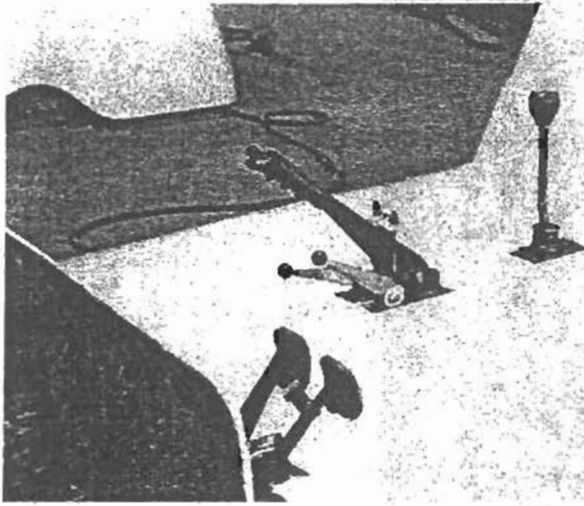
NOTE:

If the battery is to be put up front then run the battery cable thru along with the harness.

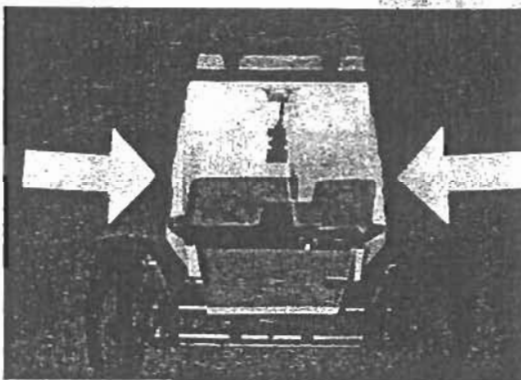
See battery location instructions

As a further guide to identification the illustration above shows the larger rear harness already taped in. The front, or forward part, of the rear harness has the most wires coming out of the end of it. The majority of these go to the back of the dashboard. The smaller harness is for the front of the car, and we deal with this later on in the manual.

Next you will mount the interior liner assembly (Part #7). Cut out the holes in the liner as shown below for the gear shift lever, emergency brake lever and pedal assembly. You will now place the liner on top of the frame assembly.

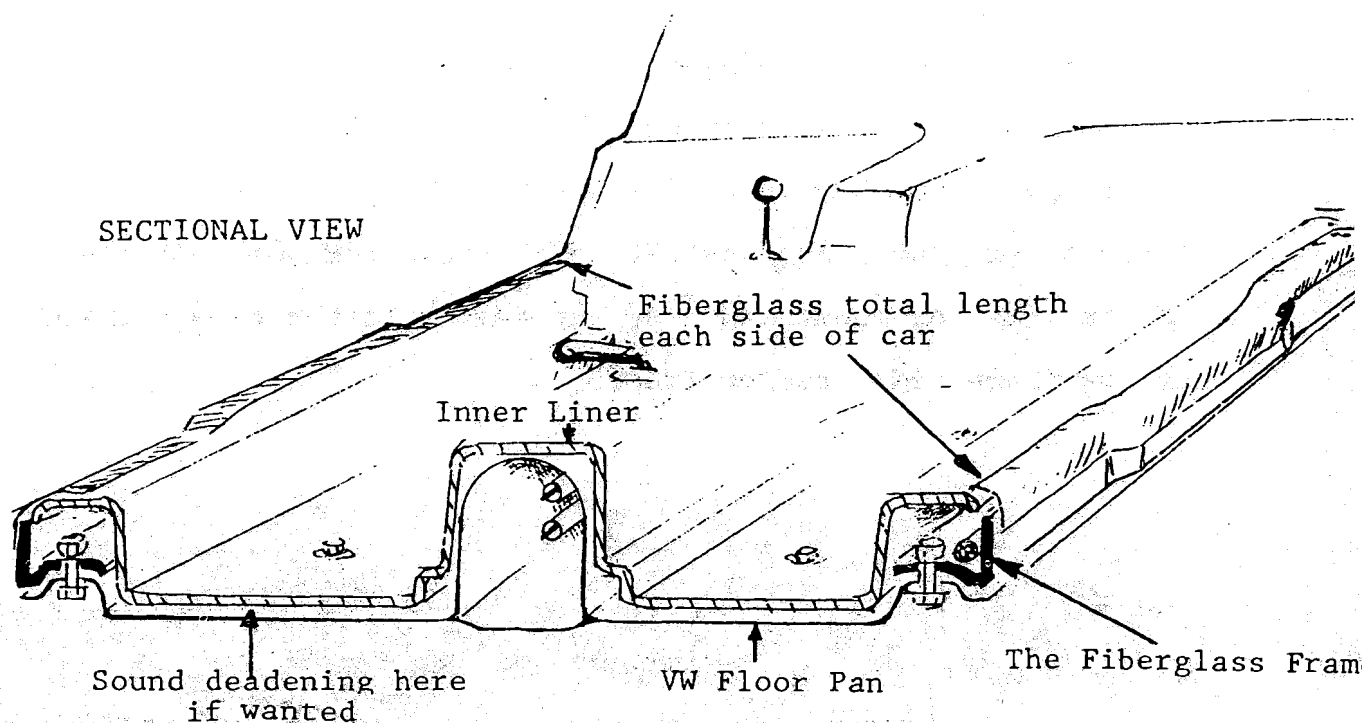


Before you can do this you should look at both the frame assembly and interior liner assembly and note that along the edge of these assemblies, there are some protrusions, one on each side of the assemblies. These protrusions are approximately 12" long. On the picture below, you will see these with a white arrow pointing towards them.



These have been provided so that your interior liner will properly meet up at this area. You cannot make a mistake if you place these protrusions into the notches on the body frame.

FIBERGLASSING INNER LINER

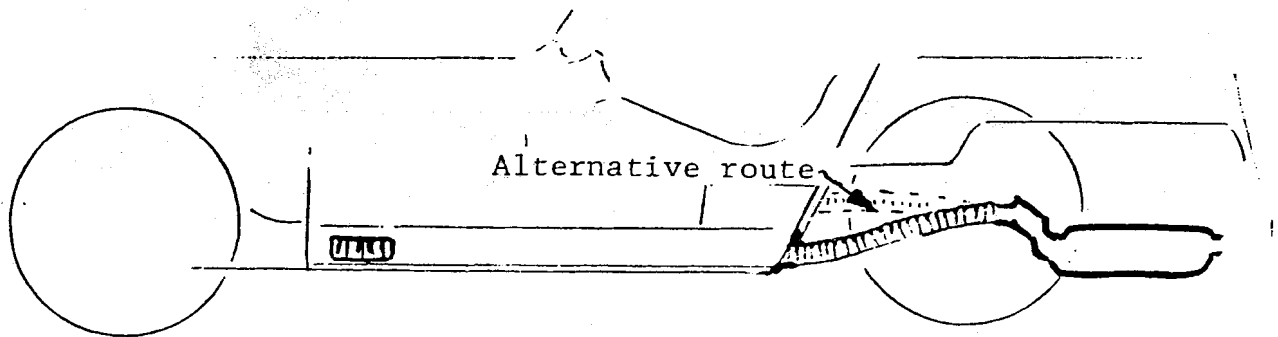


Mark the location of the throttle cable, remove the liner and cut a slot for this cable. Sound deadening felt can be placed into the pan at this stage if desired. You will then place the liner on the chassis and drill four holes through the fiberglass interior liner and into the bottom of the chassis and using 4-5/16" x 1-1/4" nuts, bolts and washers, secure the liner to the chassis. We recommend that the interior liner be fiberglassed to the body frame to eliminate rattles and to form a good heat duct. Study the drawing above. You can see how we fiberglass ours here in the plant, and we sincerely recommend this.

HEATER CONNECTION

The next step is attaching the heater. This is certainly optional, but we feel that even if you do not need the heater where you live, it will add to the cars value.

Connect the heater hose outlet to the rear upright bulk-head of the interior liner and duct the heat into the area created by the frame and interior liner.

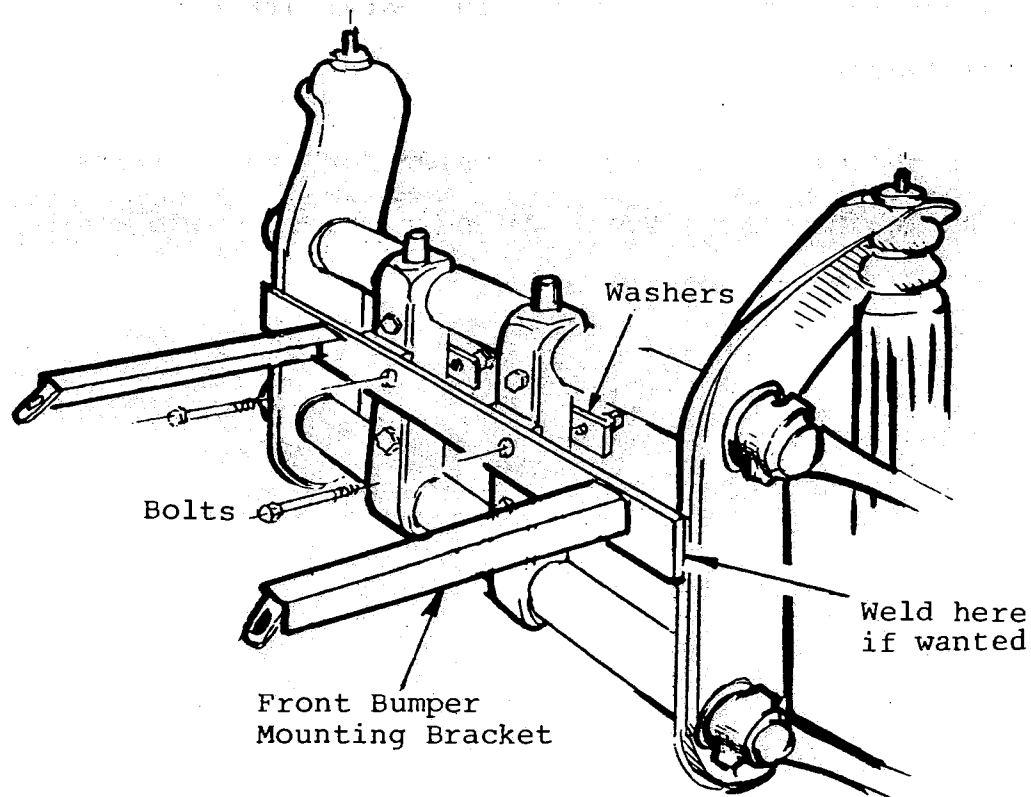


Cut an opening into the interior liner in a suitable position of your choice to let heat come into the passenger compartment. You must block off the small open area created between the interior liner and the frame at the front end to stop the heat escaping through into the trunk. Alternatively, "or additionally" you can also run a duct through the rear bulk head and right through where your glove box is between the seats and cut a hole in the front of it, this will give you additional heat. Many of our customers have done this and covered it with a grill that is used over a radio speaker which you can get in a local automobile accessory store. However, when you run this heat duct through in this method, you will obviously lose the glove box.

FRONT BUMPER BRACKET ATTACHMENT

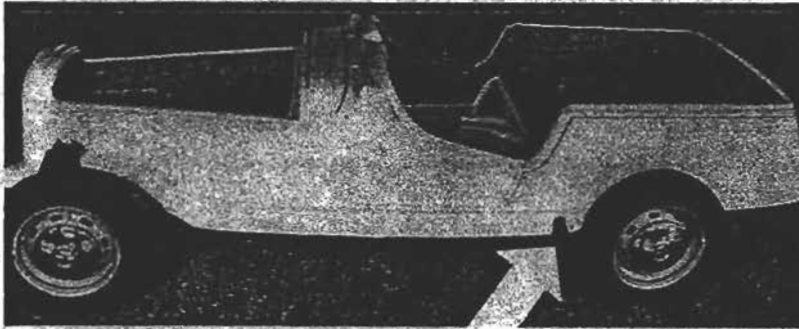
The first step before mounting the Gazelle body is to attach the front bumper bracket. We mount the bracket by drilling two holes between the existing front end bolts and bolt it through using two 3/8" x 1-1/2" nuts and bolts. As an alternative you could use longer bolts with a small plate across the back of the VW member.

Do not use the existing bottom bolts as they are too short. If you have welding facilities available you can weld on this bracket.



MOUNTING THE MAIN BODY SECTION

If your chassis is a 1968 VW or later, it is necessary to cut a 2" hole on both sides of the main body for the rear torsion bar to protrude through. Cut the holes at the location shown. For your convenience, we have a circle scribed in the mold.



But an inverted "U" shaped slot is ok if you prefer.

Do not cut out the door opening until after the body is on the chassis.

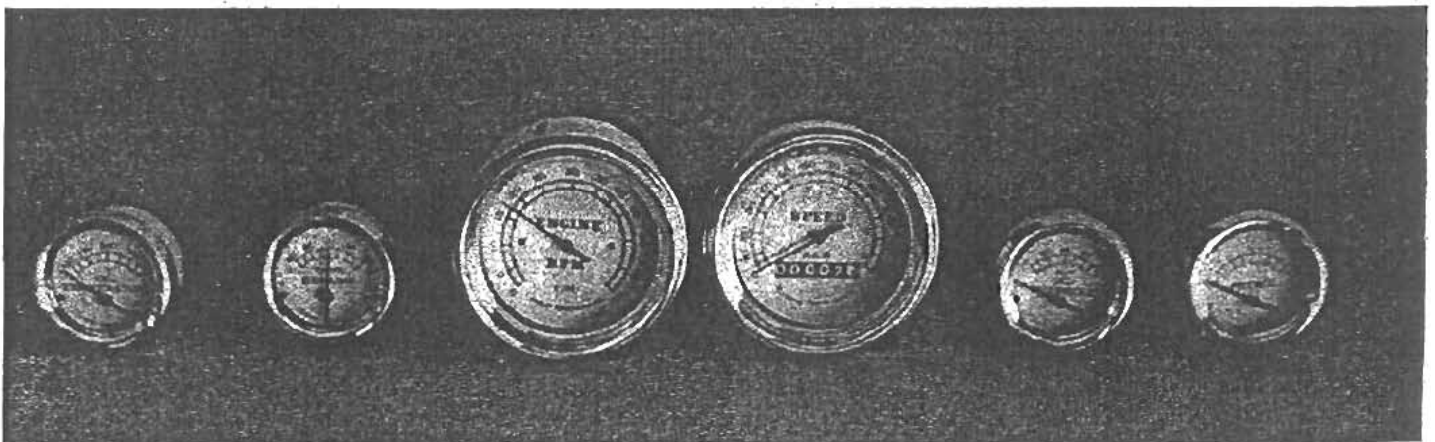
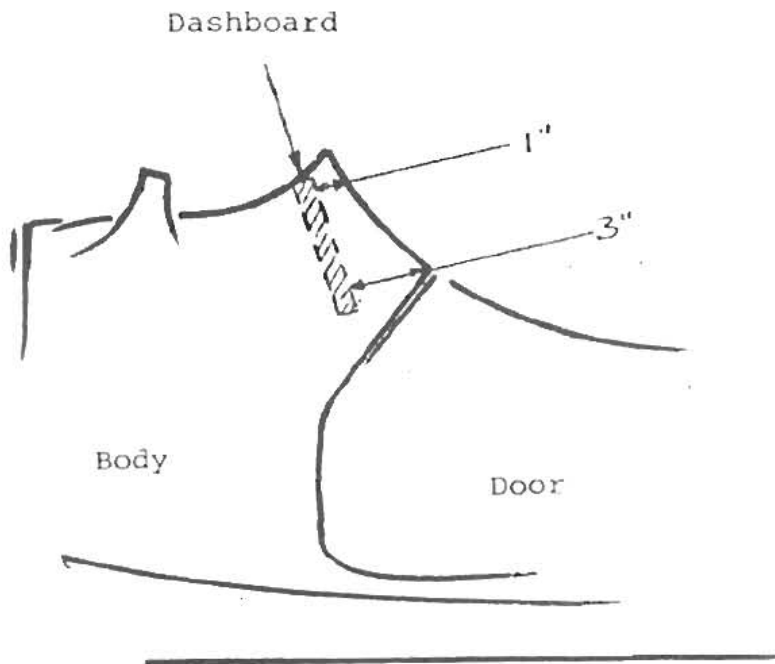
Turn the main body section upside down to facilitate mounting the dashboard. Do not put it on concrete! Use padding to protect the body.

INSTALLING DASHBOARD AND INSTRUMENTS

Decide on what instruments you want and their location. There are various instrumentation alternatives open to you which would be of your own choice. Classic Motors offers as an option a complete set of Classic instruments and senders specifically selected to match your kit. Our speedometers are calibrated for 14" wheels. Cut the mounting holes in the dashboard. Sand the dashboard, going with the grain, then apply three to four coats of a good grade marine varnish, and mount the instruments. Install all gauges and dashboard wiring. Place finished dash in main body (which is still upside down). Position it approximately 1" from the top edge and 3" from the bottom of dashboard to the edge.

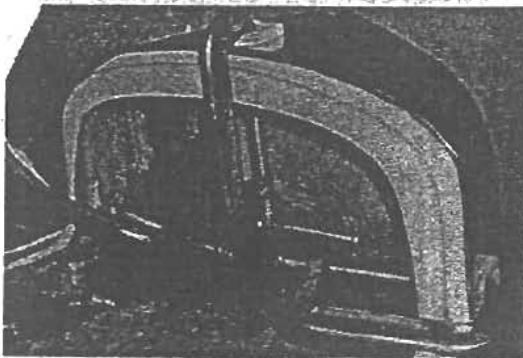
Fiberglass dashboard to body applying fiberglass cloth to rear side of dashboard. When you use the resin here, be certain that you do not put it on all at once or make too hot a mixture. We recommend that you use a minimal amount of catalyst and let it cure slowly even if it takes several hours. Also, before you start the fiberglassing process, be sure you put some masking tape over the front of your dashboard where it meets the fiberglass body. This should be masked carefully, to prevent any resin coming through and possibly leaking down on to your varnished surface.

If you are well above average height and need more "reach", it may be worth considering gaining an increase in arm length room by positioning the dashboard forward a little further than we recommend. This will allow the steering column to move forward, so use a seat again to try it for size.



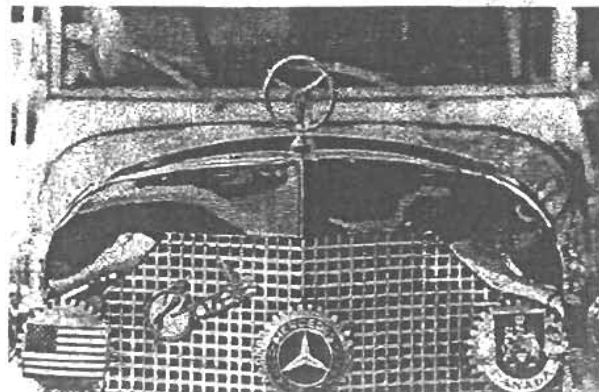
MOUNTING RADIATOR SHELL

After the dashboard is mounted to the body and dried, you can now turn the main body over and mount the metal radiator shell. To do this, lightly sand the front surface of the main body where the radiator is to be mounted. This is the flat area directly behind the radiator shell and the reason for sanding it, is to take off the wax and provide a proper surface for painting on some flat black paint. This gives the appearance of "depth" behind the shell and stops the body color showing through from behind the grill perforations. Now position the radiator shell on the main body and secure it using two of the 6 Chrome carriage bolts supplied. There are two stamped out holes in the radiator shell for this purpose



If you have purchased our Gazelle emblem which is an optional extra, it is better to fit it later, after all the major work is completed, in order not to accidentally break it.

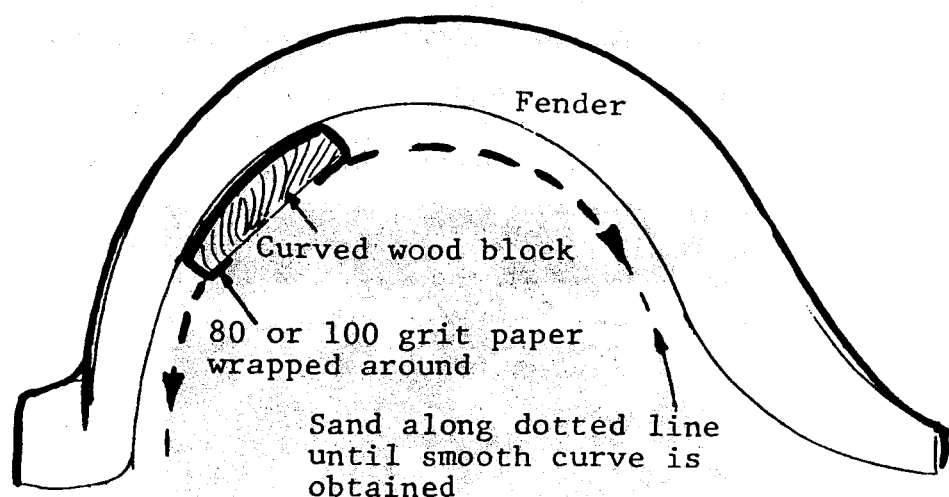
NOTE: Be very certain before you start drilling that you center punch the radiator shell so that the drill does not (walk) or spin across the chrome and damage the shell.



PREPARING FIBERGLASS PARTS

Since you will be starting the placement of various fiberglass parts onto the car, the exposed edges should be sanded smooth. To properly do this, simply get a small block of wood and some 80 or 100 grit sand paper, and sand it down with paper around the block. Straighter edges are achieved with longer blocks. Along the hood, you should sand the 2 long flat edges that will be on either side of the car. Take care not to roll the block of wood around so that the sandpaper sands directly onto the shiny finished surface. (This finished surface of the fiberglass part is referred to as the gel coat).

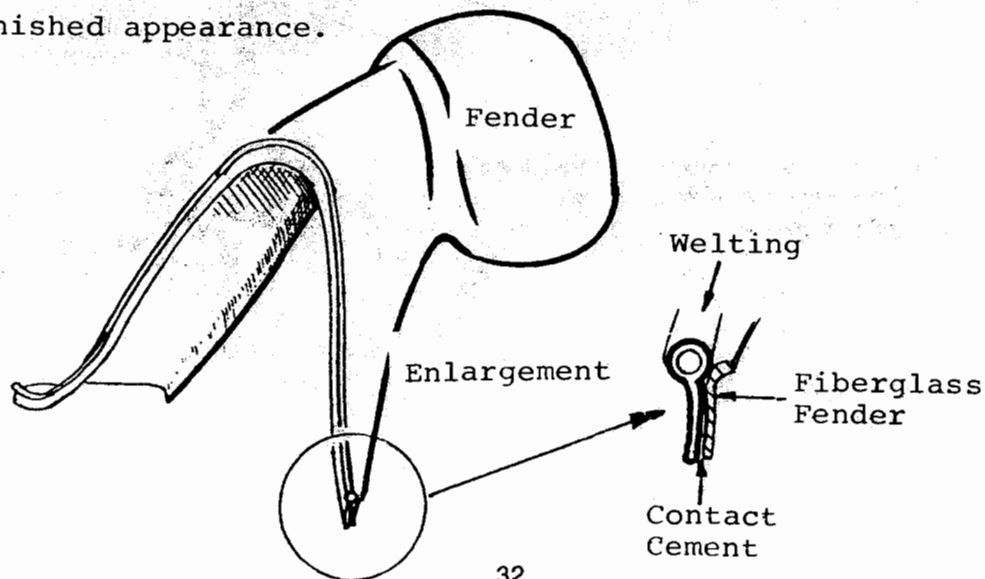
All unfinished edges of your fiberglass parts should be given a light sanding in the same manner; DO NOT SAND ANY GEL COAT SURFACE! Pay special attention to the edges of the fenders, especially the rear fenders, so shape a curved block and follow the procedure suggested below.



FENDER MOUNTING

Our next step will be to mount the front fenders to the body. Simply attach the welting which is provided, along the inside edge of the fenders, as shown, using contact cement. Position the fender so that the frontmost tip of the fender is even with the frontmost part of the body extensions and at the very front end, the top of the fender should be even with the top of the body extensions. The bottom of the rear-most end of the fender should be even with the bottom of the fiberglass body. Once you have this alignment your fender is positioned correctly. You can then take a clamp or vice grips and clamp the fender to the body. Drill $3/16$ " holes right thru the fender lip, the welting and the body, spaced approximately 5" apart and secure fenders to the main body using $3/16$ " x $3/4$ " pop rivets, or you can use nuts and bolts, if you prefer.

When the car is finished we like to spray the underside of the fender with either undercoating or black paint. We spray this not only on the fender, but also on the joint and onto the lower edge of the body and this gives the car a real finished appearance.

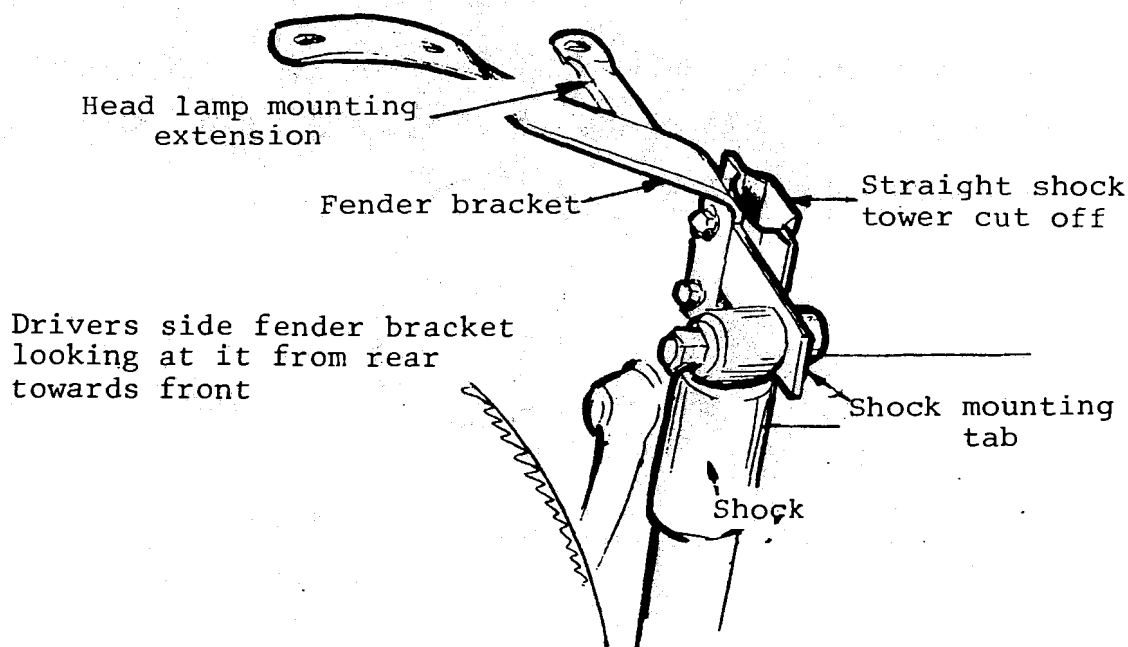


MOUNTING THE FRONT FENDER BRACKETS FOR 1965 AND OLDER VW's
WITH "STRAIGHT" SHOCK TOWERS

Cut 3 inches from the top of the shock tower as shown.

NOTE: It is necessary to cut this 3 inches off the top end of the shock towers on 1965 and older Volkswagens to allow for clearance for the front fenders and the chassis. Since the cut will be below the mounting holes on the tower where the shock absorbers are attached, it is necessary to remove the top bolt of the shock absorber. The new fender bracket has a mounting tab for remounting the shock absorber. Place the main body onto the chassis.

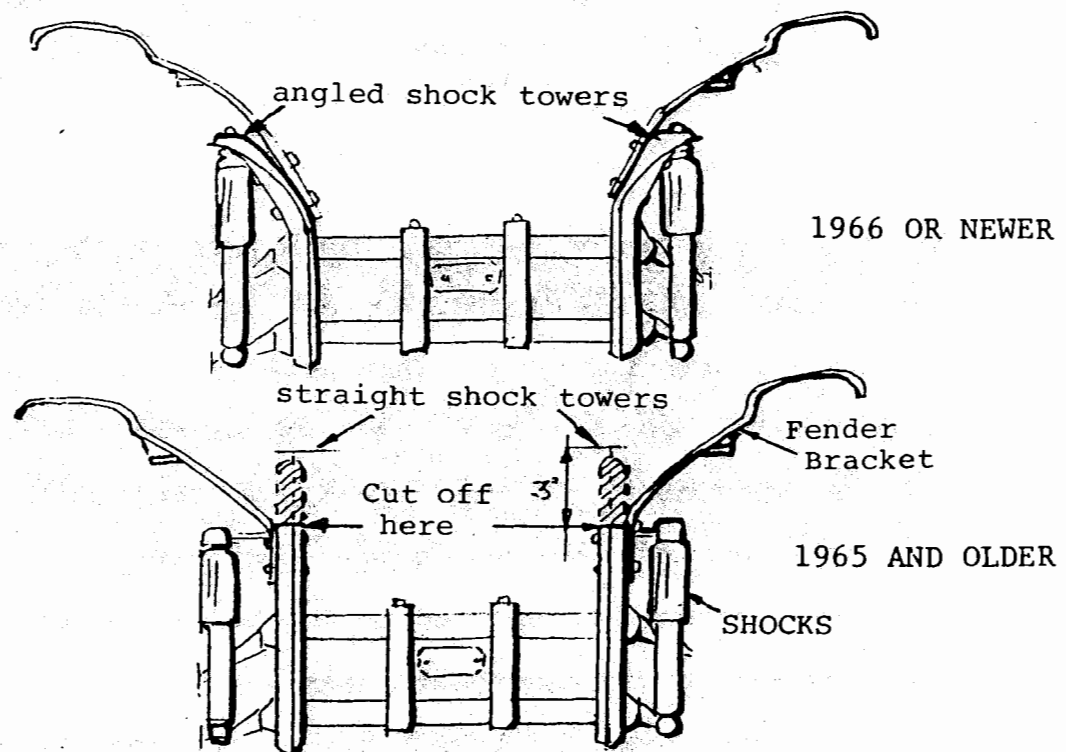
Position the fender bracket on the outside of the shock tower under the fender so that it is straight (not leaning forward or backwards) and that it fits the contour of the fender. Mark the location of the bracket mounting holes on the shock tower. Drill two 3/8" holes in each of the shock towers where previously marked and mount the brackets using 3/8" x 2-1/4" bolts and locking nuts. Bolt the shock absorbers to the shock absorber mounting tab shown, using a 1/2" x 1-1/2" bolt and locking nut.



MOUNTING THE FRONT FENDER BRACKETS

The procedure for this will vary according to the year of your chassis. For a 1966 and newer chassis with "angled" shock towers, you will proceed as follows:

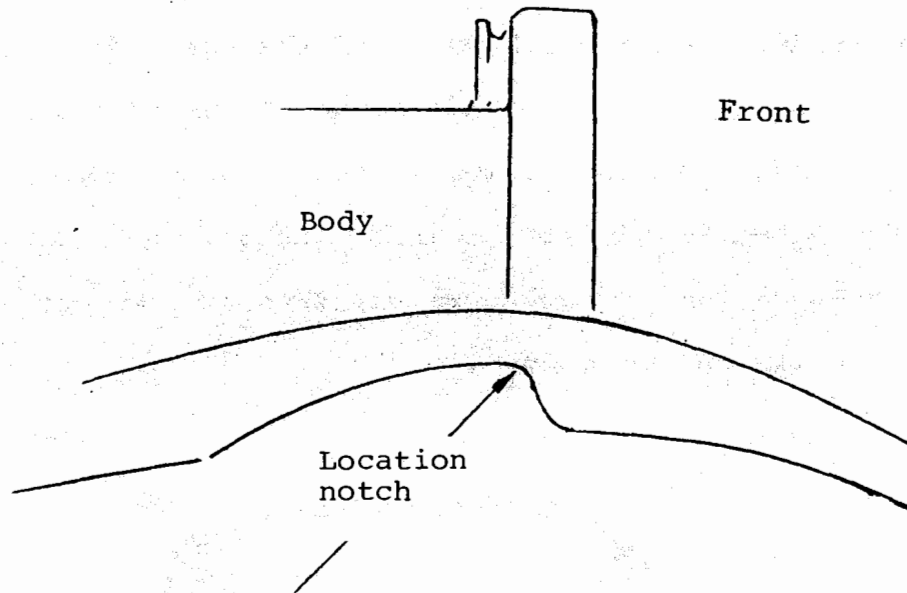
Place the main body onto the chassis. Position the front fender bracket (Metal Parts 40-41), inside the fender, on top of the shock tower, slide the bracket for best fit to the contour of the fender. When you have found the best fit, clamp the bracket onto the shock tower with a clamp. Then mark through the bracket holes onto the shock tower at the location where you will secure the bracket to the shock tower. Remove the main body again. Dr and secure the front fender brackets to the shock tower, using 3/8" bolts and lock nuts.



To maintain the correct distance between the head lamp mounting points we recommend that you temporarily bolt on the badge bar across the two brackets, also make sure that both points are the same height above the ground.

MOUNTING THE MAIN BODY TO THE BODY FRAME

When setting the main body section onto the frame and chassis, there are two "notches" in the front lower edge that go over the upper front axle tube. This will position your body fore and aft and adjust it to the proper height at the front of the car.



To correctly position the body for height in the rear end, you should take the fiberglass rear seat assembly (Part No. 9) and position it onto the body. This assembly has a flange that goes over the body. Secure it with four sheet metal screws (do not worry about the holes from the sheet metal screws as they will be covered by the upholstery later).

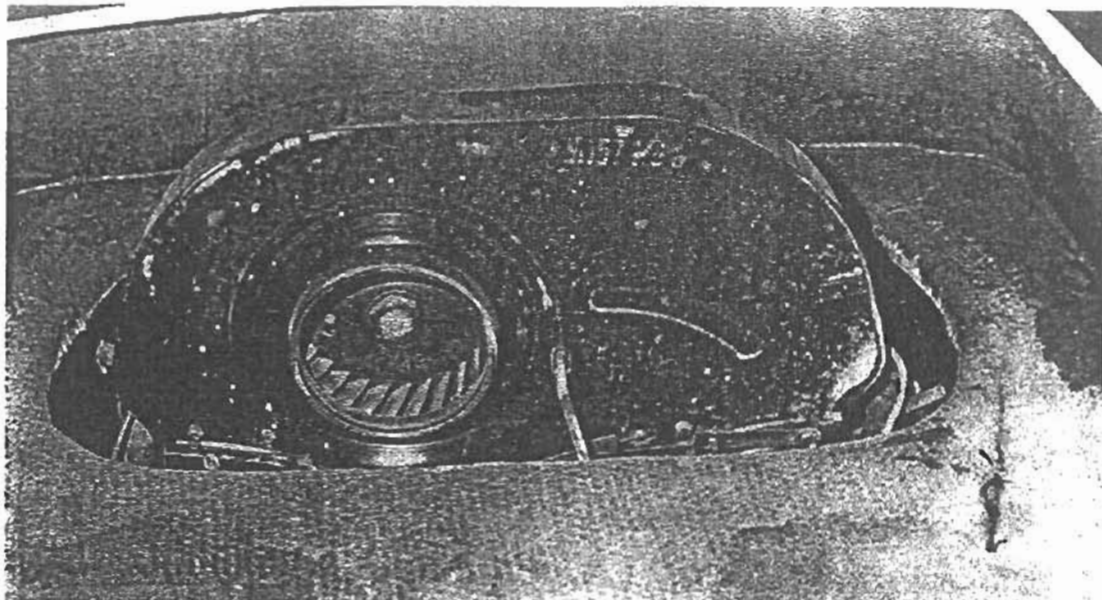
Once this assembly is secured to the body, you can now take the body and put it onto your chassis.

You will then lower the body until the bottom flange of the rear seat liner touches the fiberglass frame.

This position should also have your rear deck lid clearing the top of the engine by about an inch or so. The body is now in its proper position, but remember you must try to maintain the correct height from the top of the rear body flange down to the upper surface of the inner fiberglass frame around the engine access hole. This dimension is approximately $8\frac{1}{2}$ ". Make sure that the fiberglass frame is level, now use temporary spacing blocks or struts from 1" x 2" lumber or similar, then the two pieces can be stationed in the correct relationship to each other and fiberglassed together. It is essential that this $8\frac{1}{2}$ " dimension is maintained or difficulty may occur with the rear deck lid. Check all around for level and equal height on both sides of the car, make any adjustments where needed, to correct any discrepancies with ply packing under the seat flange and then continue with the glassing.

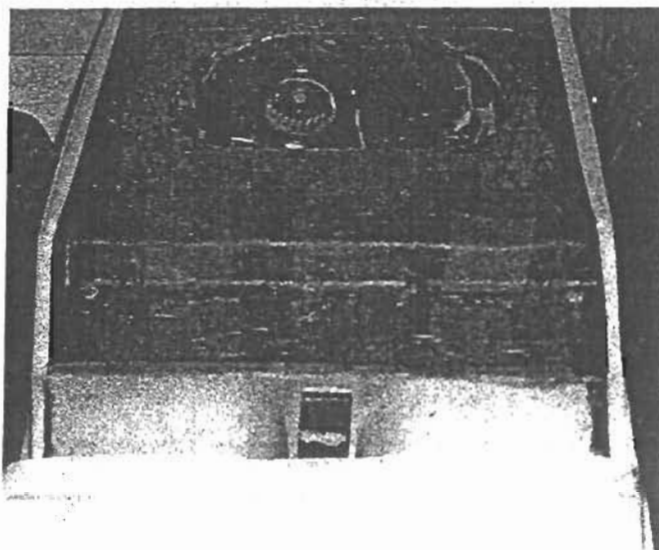
NOTE: On some late model VW's, the transmission housing, and the throttle cable guide tube may come into contact with the underside of the fiberglass frame. If so, it is quite OK to cut away the fiberglass, keeping the hole as small as possible to clear the area effected.

It may be necessary to cut and retrim other small areas of the fiberglass to fit your particular chassis irregularities depending on small variations year to year by the manufacturer etc. This is normal and should cause no problems.



Take a small piece of fiberglass and glass the body to the body frame. When the fiberglass has hardened, remove the rear seat liner.

Illustration is of a 4 seater model.

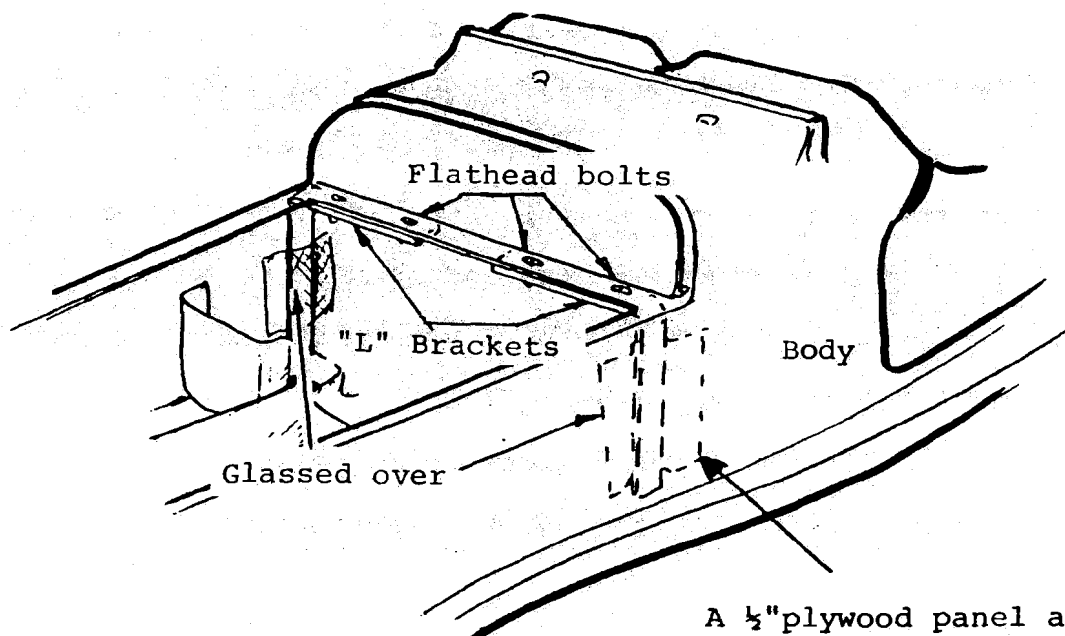


The body must now be securely glassed to the body frame and the interior liner. You will go around the entire perimeter of both the liner and frame securing them to the body with fiberglass. The stiffening depressions in the frame just forward of the engine should be "bridged" over with glass cloth or mat.

ASSEMBLY PERFORMED AFTER THE BODY IS MOUNTED

BODY SUPPORTS (Part #52)

We supply two inverted "L" shaped metal brackets for body reinforcement and stiffening. These are glassed on the inside of the body just aft of the hood opening. The flat portion bolts thru the under side of the flange that the trunk liner sits on, at the back edge. Do the bolting thru first, using 5/16" x 1" flat head bolts counter sunk into the body flange to allow the trunk liner to fit down flat. Should the metal brackets not fit exactly flush against the body side, this slight gap can be ignored and you can go right ahead and glass over the metal brackets.



A $\frac{1}{2}$ " plywood panel approx. 5" wide should be glassed in between the metal and the inside of the body.

SECURING FRONT FENDERS

Now secure the front fenders to the fender mounting brackets. Should there be any space between the top of the bracket and the bottom of the fender, put in a plywood shim (spacer). Drill two evenly spaced holes in the fenders through the plywood and steel bracket approximately 2" from the outside edge and 5" between centers. Bolt the fenders to the fender bracket using chrome plated carriage bolt $\frac{1}{4}$ x $1\frac{1}{2}$ ", with locknuts. (Supplied with deluxe kits). Part # 68

NOTE:

IF YOU ARE INSTALLING THE OPTIONAL EXHAUST STACKS, REFER TO PAGE: 73, BEFORE MOUNTING FENDERS.

BATTERY LOCATION

There are two positions where the battery can be mounted, one in the engine bay at the rear, and the other, which we would prefer, in the space on the floor pan just forward of the brake master cylinder, under the trunk liner. If you choose to locate your battery in this position it would be a good idea to put the long battery lead thru with the wiring harness. The battery can be held down with a length of plumbers strapping or any correct sized clamping frame.

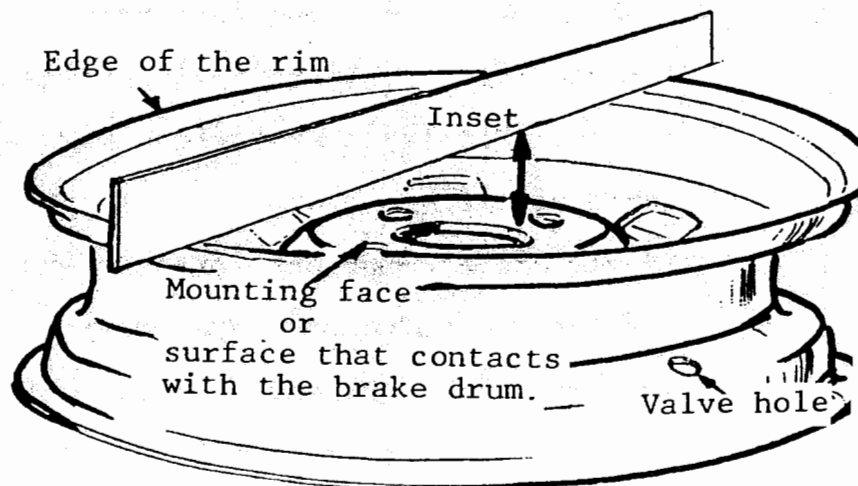
Our choice of the forward location is to keep it out of the heat and to help with the weight distribution.

TIRES AND WHEELS

The primary consideration in choosing the right tire and wheel combination is that they should allow enough clearance between the wheel and the inside of the rear fender. Tires letter coded "C" give more clearance on the rear. The original VW wheels are not suitable to use on the rear because they are inset too much and will rub on the inside of the body and fender. Spacers would have to be too wide to get the wheels outwards far enough to clear.

So we recommend one of the following alternatives: Either buy any custom type of wheels from a specialty wheel shop which meet the measurement requirements shown below. Or purchase wheels and adaptors from us which have been designed and manufactured specifically for our kit. The adaptors convert the VW 4 bolt lug pattern to the regular 'chevy 5 bolt lug pattern. Our wheels are then the 5 hole pattern with a 3/8" thick center web which has been machined on each side to receive the taper on the lug nuts, for reversed mounting. They are then fitted with the larger offset facing outwards on the rear axle, and fitted the other way around on the front. Our optional wire wheel hub caps then can be attached, for a really high class appearance.

1961 to 1967 VW's will require a wheel with a 1" inset.
1968 and newer will require a wheel with a 2" inset. By the word "inset" we mean as follows:



If your car has the old VW 5 lug arrangement, you can purchase 5 VW bus wheels and mount them reversed, or use your old VW wheels, with a spacer and perhaps decorative hubcaps, the choice is up to you.

We would like to recommend that you send to the following company for their catalog. It is free of cost and has many many parts and accessories that you will be able to use including wheel adaptors that will enable you to use virtually any American wheel on the VW.

J.C. Whitney & Co.
1917-19 Archer Avenue
Chicago, ILL. 60680

SUGGESTIONS ON REAR SPRINGING

431-6200

NOTE: The extra leverage on the drive shafts caused by fitting spacers and offset wheels on the rear, increases the load on the torsion bar springing and can sometimes have the effect of lowering the car at the back and putting negative camber on the wheels (spread out at the bottom). If so, the top inside edge of the tires can rub on the body or inside of the fender on full bounce or with a full load. To cure this problem, we suggest fitting air shocks to the rear suspension and pressurizing them sufficiently to bring the wheel back in line and vertical.

Alternatively "Helper" coil springs can be fitted onto the shocks. Fitting instructions come with these from your local dealer.

If you are a competent mechanic and familiar with the VW torsion bar suspension system you can move the suspension trailing link down one spline on the torsion bar (or about 9 degrees) and this gives you the extra lift needed.

MOUNTING THE REAR FENDERS

The rear fenders position on the car bodies so that the front and rear bottom edge of the fender is even with the bottom edge of the body.

We recommend that the back wheel and fender have a clearance of at least 4" from the top of the wheel to the underside of the fender top.

If your VW chassis is a 1968 or newer model and has a torsion tube protruding through the chassis, it may be necessary to file away some of the fiberglass flange on the inside of the fender in order to enable your fender to do down on the body.



REFIT BRAKE FLUID RESERVOIR

The brake fluid reservoir can now be mounted onto the vertical surface of the inner liner above the master cylinder unit and reconnected.

RUNNING BOARDS

The running board brackets are a bolt on item, and can be readily attached to the frame with a minimum of drilling and aligning. The running boards should be marked and cut to shape before installing them. Hold them up under the bottom edge of the fenders. In this way the line that you mark around the various curves will be absolutely accurate and will leave the minimum amount of gaps after you have cut them to shape.

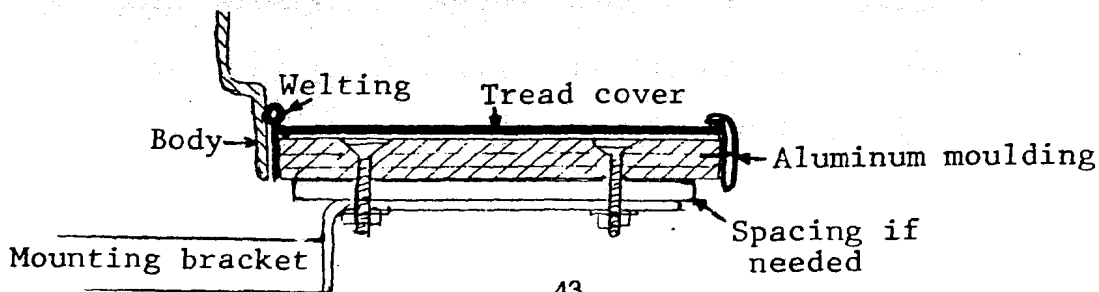
The long metal brackets which fit across the underside of the floor pan must be drilled and bolted thru the steel, and fiberglass and bolted on with 5/16" bolts and large flat washers on the inside to spread the load.

The rear bracket should be about 63" from point 0-0 (or 5½" from the back end of the floor pan) - and the front bracket about 49½" from 0-0 (or 19" from the back end of the floor pan).

After the wooden running board is cut to shape, welting can be stapled on to the inside edge adjacent to the body before bolting onto the mounting bracket. Use flat head bolts counter-sunk into the top surface of the running board.

The rubber tread cover cements on with contact cement. Finally attach an aluminum edging strip to seal the edge of the running board.

If any packing pieces or spacers are required between the underside of the board and bracket, then either plywood or metal is suitable and can be glassed on or undercoated later to protect the boards from the elements.



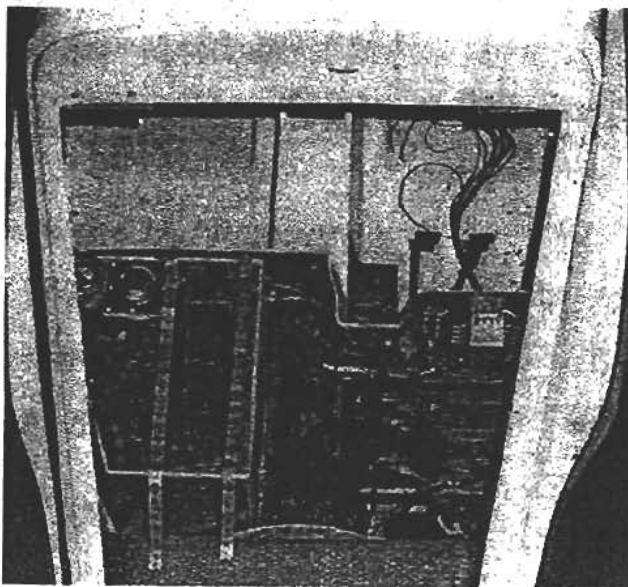
INSTALLING THE GAS TANK

The gas tank mounts on the floor pan forward of the inner liner at the front of the chassis just ahead of the passenger compartment.

The tank should be secured with two straps preferably nut and bolted thru the top edge of the inner liner bulkhead, then across the top of the tank and down the front to the top surface of the fiberglass frame.

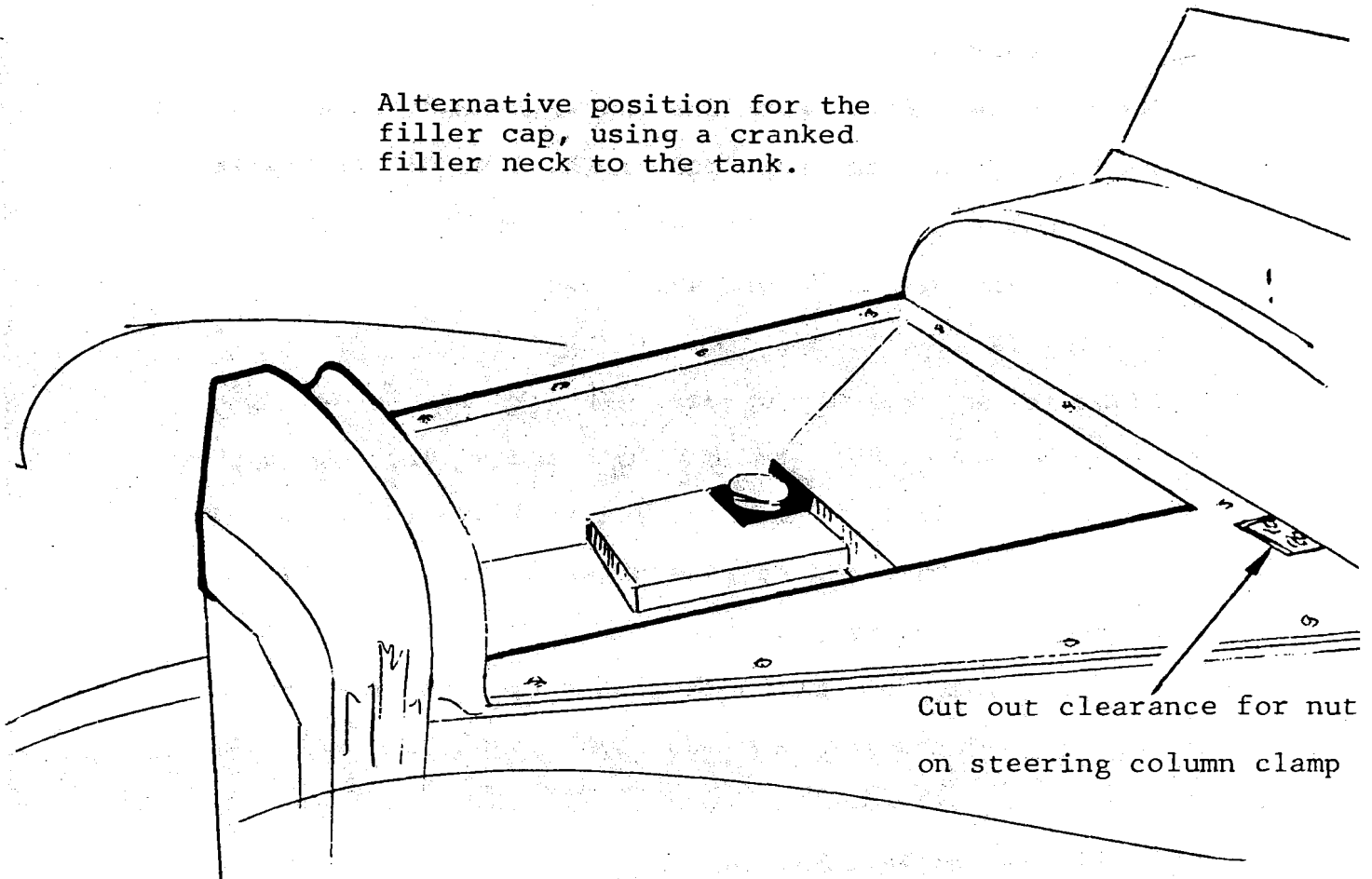
The gas line is reconnected to the original with a 30" length of a 3/8 I.D. gashose. The bottom of the trunk liner may have to be cut out to shape around the top of the tank so about an inch of the tank protrudes thru into the trunk. This can be fibreglassed over if required or covered with carpeting.

If you choose to rebuild the cut-away area in fiberglass, it can be done "in-place" using the tank as a mold but covered with cardboard and sheet plastic first to allow for clearance and releasing.



TRUNK LINER (Part #8)

Alternative position for the
filler cap, using a cranked
filler neck to the tank.



Cut out clearance for nut
on steering column clamp

After the trunk liner has been tried for size and fit then it can be screwed down around its outer edges with 1/4" x 1" Hexagon headed self tapping screws and washers.

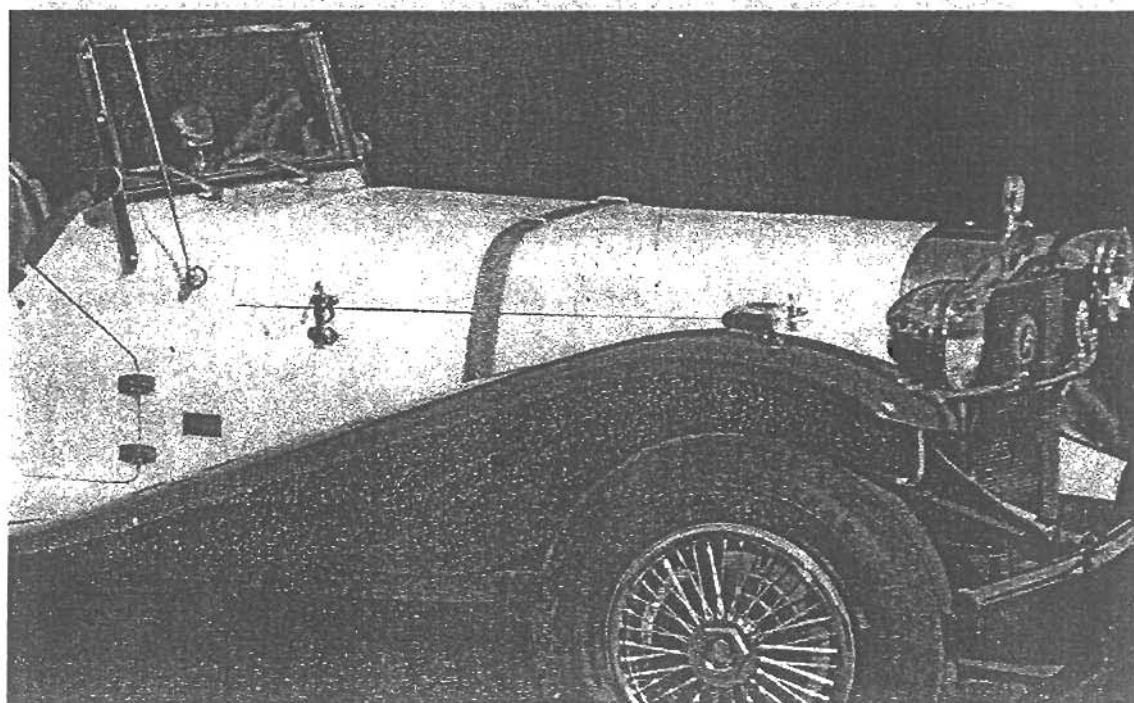
This helps stiffen the body considerably and it also allows the trunk liner to be removed to allow access for the brake reservoir. For battery servicing, a small detachable panel could be cut in the bottom for this purpose, but this is up to you.

MOUNTING THE HOOD

The next step is mounting the hood to the main body. Simply place the hood on the main body section and align it with the top of the radiator shell for an even fit.

Temporary spacing pieces may be required to raise the hood up to the level of the radiator top. You will now use the hinges provided and mount them 6" (6" to center of hinge) from either end of the hood using 8/32 round head chrome bolts and nuts.

The final step would be to place some 5/8" x 3/8" sponge rubber sealing strip under the hood around its seating surface on the body. Some hoods may vary slightly in fit, when first placed on loosely, but all hoods correctly fitted and closed with the catches and strap in the normal way will pull into alignment with the body perfectly.



REAR SEAT LINER

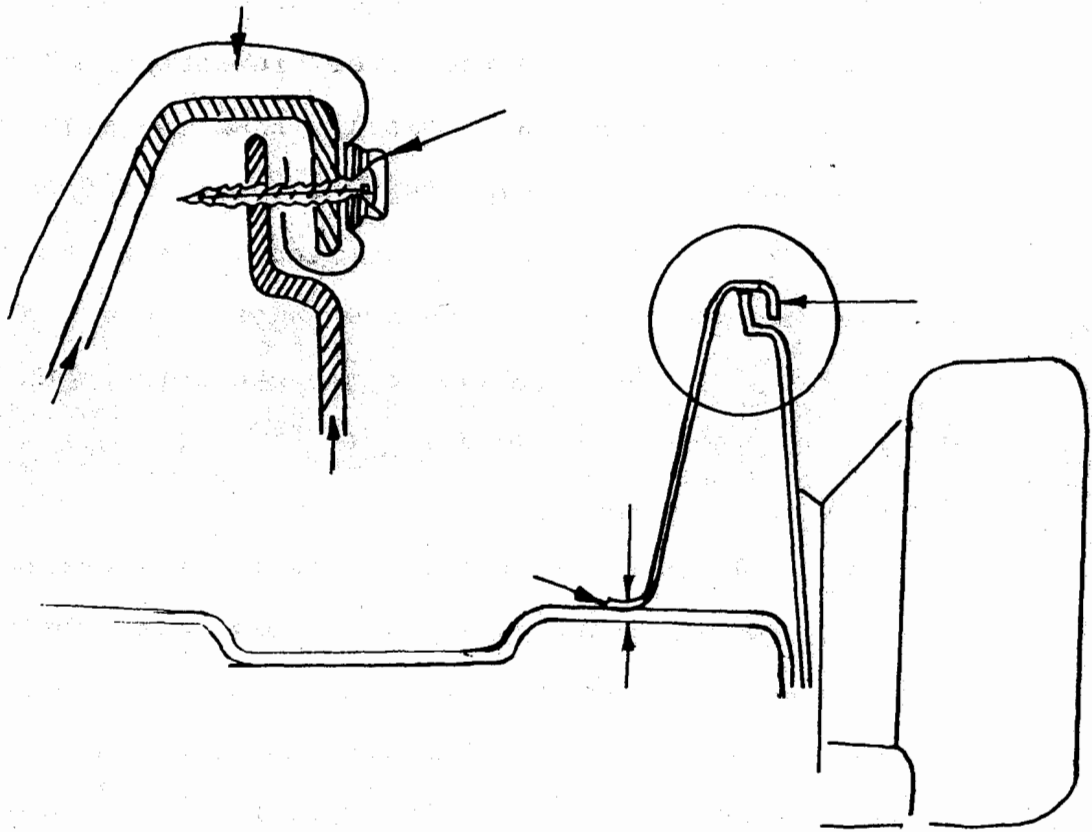
The rear seat liner and rear deck lid assembly of the Gazelle comprises of 2 pieces, the pieces being the engine cover lid and the actual rear seat liner unit. Place them on the car and file to align and fit; that is when all outer surfaces are as closely in line with the body surfaces as possible. Now upholster the rear seat liner. The upholstery provided has been tailored to fit and can be easily attached with contact cement.

The rear seat liner that you have upholstered should now be placed into the car along with the engine cover lid.

Then drill through the bottom flange and into the fiberglass frame and fix with six self-taping sheet metal screws, 1/4" x 3/4" with hex heads, fastening the bottom of it to the fiberglass body frame. The top of the rear seat liner can be clamped in place temporarily. Later, when you put the convertible top on, drill 1/8" holes horizontally through the upholstery and seat liner outer edge and into the body.

You will run long self-taping sheet metal screws through convertible top fixing studs and through the rear seat section, and screw them into the main body, thereby fastening them together.

SECTIONAL VIEW



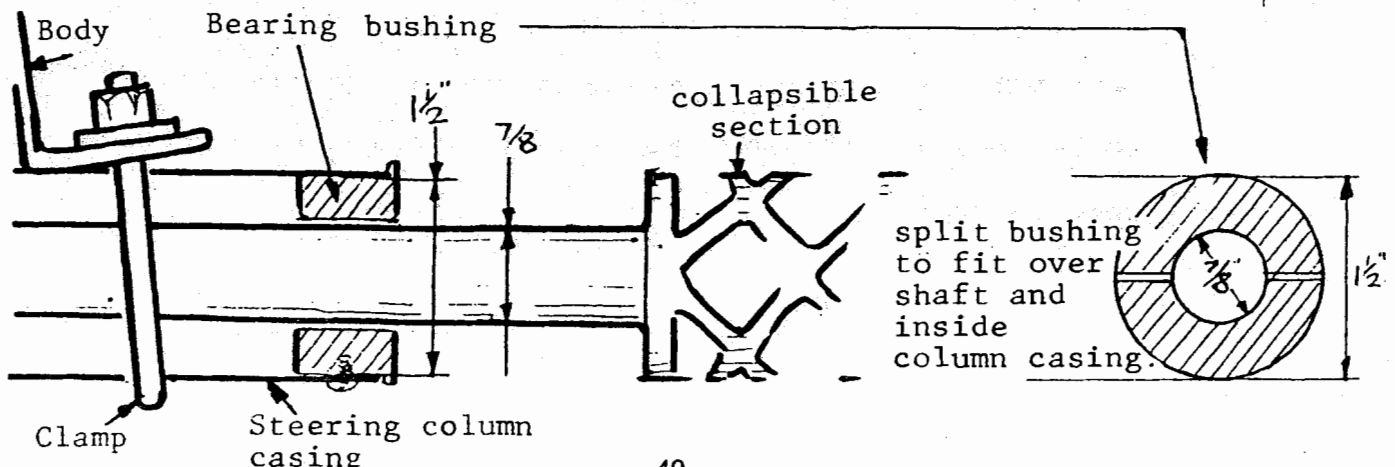
These self-taping screws will actually be holding the snap-stud which the convertible top buttons to.

Next put the hinges on the engine cover lid and the final job to be done in this department would be attaching the two rear deck latches.

INSTALLATION OF THE STEERING COLUMN AND SHAFT

Remove the steering column and shaft from the VW body. The bolts in the steering box clamp can be loosened from the top front axle tube and the box rotated slightly backwards and downwards to realign with the lower "repositioned" steering column, (you will see that a small pin on the axle tube locates into a "notch" in the clamp, this notch may need to be filled out to allow for this small adjustment). When the column and steering box shaft are in line the bolts of the clamp must be re-tightened. Slide steering column and shaft tube through the hole in the dash and under the firewall, where it must be supported by a clamp.

From the trunk compartment side, insert the steering shaft extension supplied, (Part #49) (17" of 3/4" dia. shafting) into the lower end of steering shaft and clamp both ends. The inner steering shaft must have a bearing inserted over it, and into the end of the outer steering column casing. This bearing, or bushing, can be made from various materials, brass, bronze, etc. but nylon is more suitable as it can be drilled and shaped by hand. Obviously it will have to be cut in half to position it in place. It can be held there by epoxy glue on the outer surface only or by a small screw threaded into the outer casing.



NOTE: Use the original clamp and bolt to fasten the upper end of the extension. The lower end clamp and bolt coupling sleeve must be purchased from a local VW dealer. Part No. 111-415-409.

Bolt the steering shaft to the steering box coupling using the original bolts and nuts.

Position the steering column firmly into the dashboard.

It is recommended that a section of tubing be placed around the steering shaft in the luggage compartment, to avoid objects being lodged in the collapsible section (if your car has this). Attach steering wheel.

INSTALLING THE WINDSHIELD WIPER MOTOR

Remove the wiper mechanism from the VW Beetle body. Save all hardware.

Drill two 3/8" holes just below the windshield in the recesses provided for these holes. Check the distance between centers on your wiper spindles. They should be 15-3/4". Drill to suit. After drilling the holes, insert the wiper post through the cowl and tighten the original nuts back on. Use Trico arms AL-225; and blades TAU-8-1/4" or ANCO 325-8-1/4".

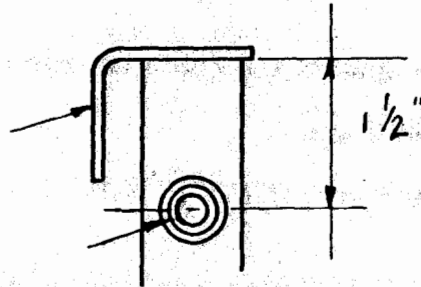


Windshield wiper assembly (Dashboard omitted for better view)

FITTING THE WINDSHIELD FRAME

Before attaching the frame to body it is convenient to fit 2 studs for buttoning the front outer corners of the convertible top.

These 2 studs, one on each side, should be attached with 1/8" pop rivets. Anything bigger may damage the glass further inside the frame.



To prepare the base, a weather sealing strip of self adhesive foam rubber, (or a glued-on piece of 1/2" dia. thin wall rubber tube), should be attached to the underside of the bottom frame member. This will be squashed between frame and body to form a water-proof seal.

Place the complete windshield assembly onto the raised portion of the body with the squared top. The frame assy' should have the side curtain flanges facing the rear and the convertible top mounting lip, on the top of the frame, facing forward. Press the frame assembly down as far as it will go to squash the seal strip for a tight fit. Lean the frame back until the measurement between the front edge of the top of the frame and the back edge of the lid of the body is as shown. Now drill the upper hole thru the side mounting bracket and into the fiberglass of the body.

Place a 5/16th x 1" chrome carriage bolt into the first hole to stabilize the bracket. The complete windshield assembly should be left with only the top fixing bolt in, and not over-tightened, so that the assembly can be pivoted forward at the top to tighten the convertible top when it is being installed. The lower bolt is only fitted after the convertible top is on. See instructions for "TOP" installation.

INSTALLING THE HEADLIGHTS AND BADGE BAR (PART NO. 60)

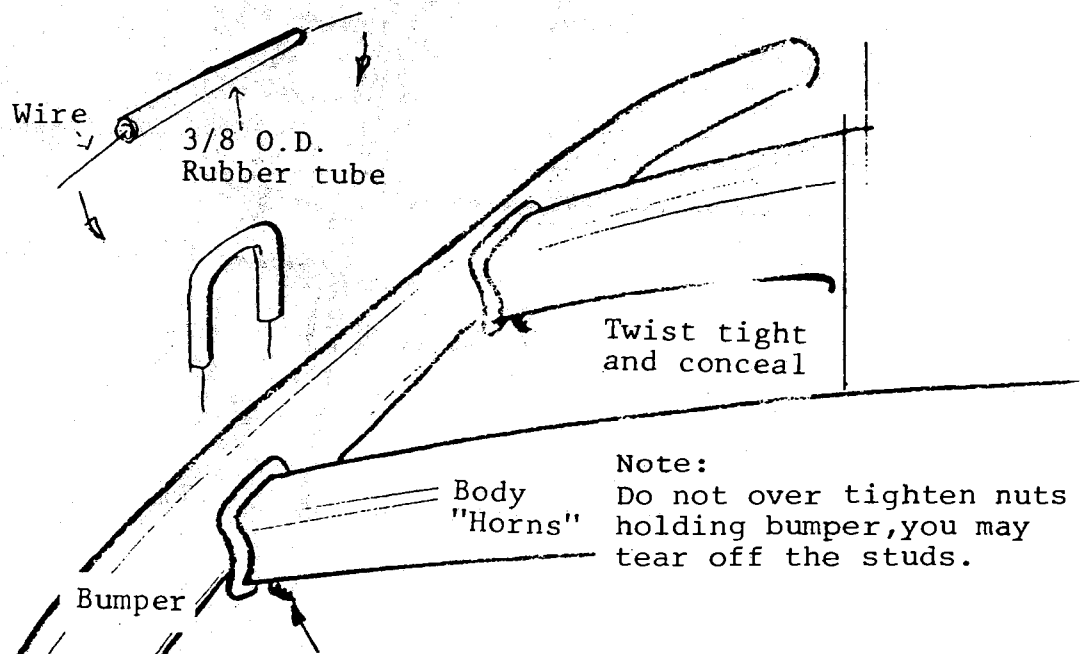
The headlight badge-bar combination now mounts onto the front fender mounting brackets. This is done by placing the bar in location on top of the fender brackets and putting the threaded tube that extends from bottom of headlights through the hole in the ends of the headlight badge-bar and also through the holes in fender bracket forward extension pieces. Put the nuts on and tighten. This will secure not only the headlight, but also the bar to the fender bracket.

MOUNTING THE FRONT BUMPER

File and sand the fiberglass extensions, (the 2 "Horns" that protrude from front of body), to fit snugly around the bumper. Place bumper onto the bumper bracket.

Locate the two 3/8" bolts through bumper bracket, and screw nuts on.

Short lengths of welting or 3/8 O.D. rubber piping with wire thru it can be wrapped around into the gap between the fiberglass extensions and bumper, for a better "finished" appearance.

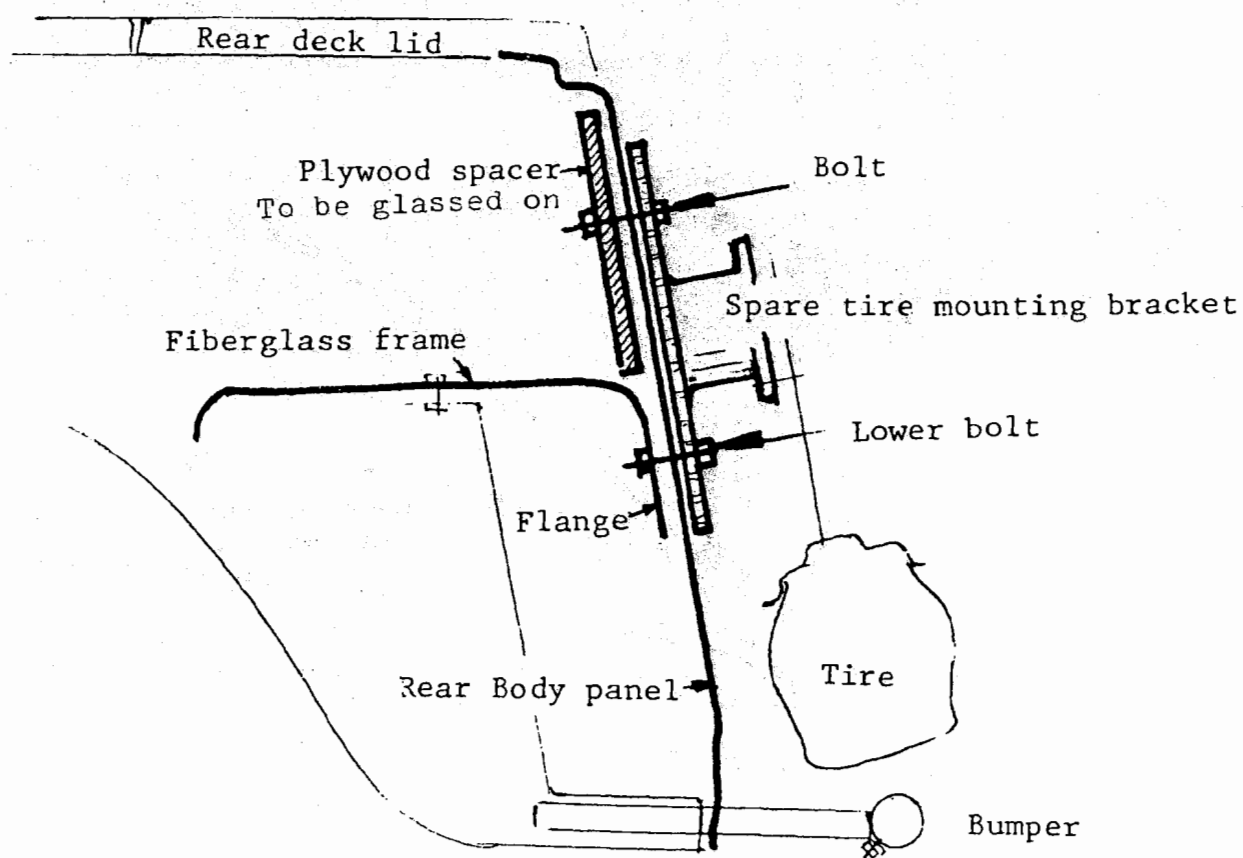


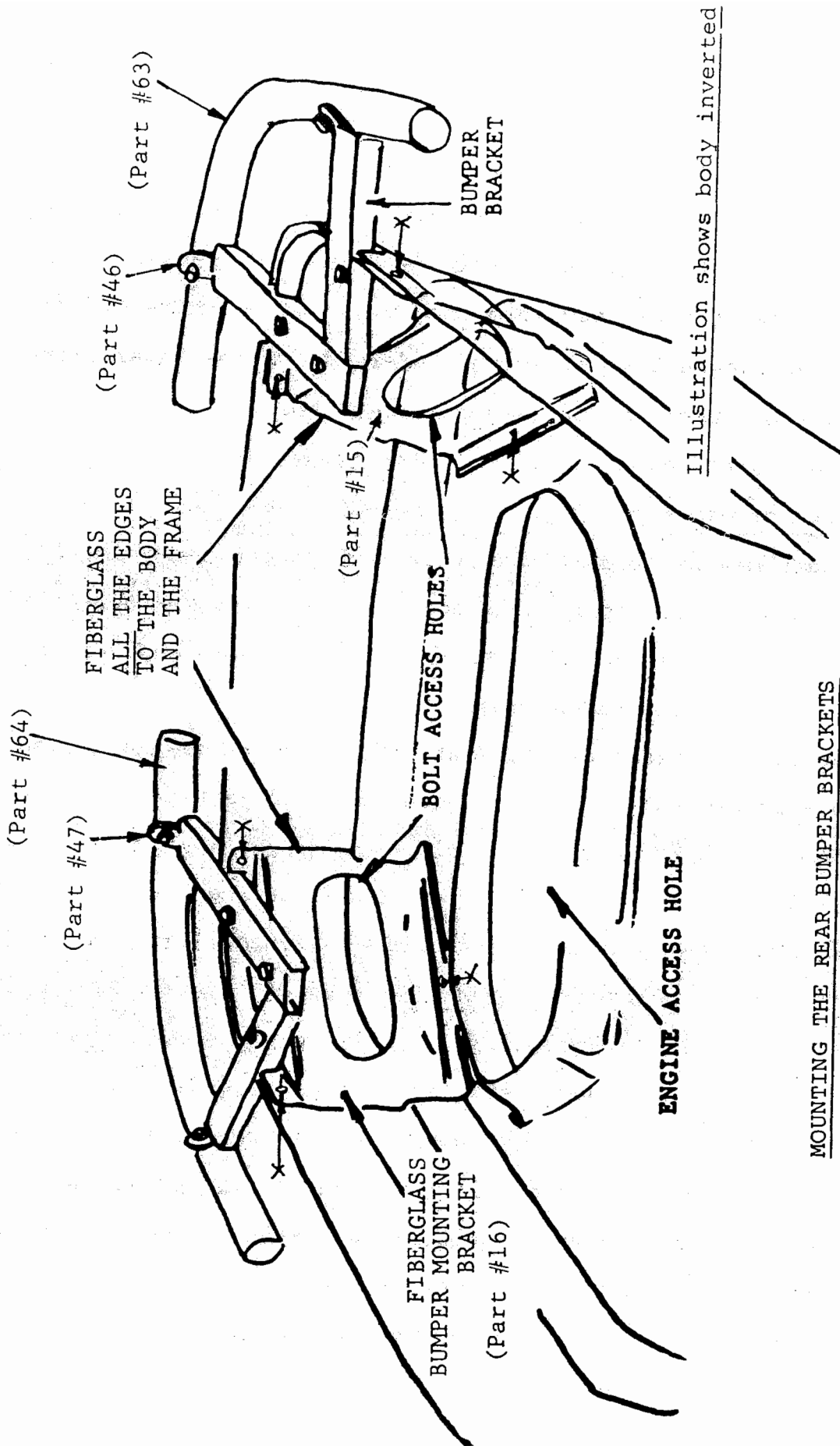
INSTALLING THE SPARE TIRE BRACKET (Part #43)

First drill the two 3/8" holes to bolt the bracket to the car. Then drill stud size holes, at the suitable bolt circle diameter to match the wheels that you are using.

You can fix bolts into the wheel mounting face with lock nuts.

The spare tire bracket is bolted on directly through the fiberglass body and then into the rear of the fiberglass frame assembly. This assembly has a flange that will have the lower bolt through it. Also you must place a plywood spacer behind the fiberglass body as a load spreader under the top bolt. You will then bolt on the spare tire bracket through the fiberglass body and plywood. The plywood can then be glassed on later. Look at our pictures for the correct location of this entire mount, obviously it must be high enough for the mounted spare not to touch the rear bumpers.





MOUNTING THE REAR BUMPER BRACKETS

NOTE: For additional security 4 carriage bolts with chromed heads can be put thru the bottom edges of the fiberglass bracket and body, and two 5/16" or 3/8" x 1" bolts with large washers can be put thru the top of the fiberglassing up near the engine.

MOUNTING THE REAR BUMPERS

Your kit is supplied with "V" type brackets, (Parts #46 & 47) and there are two additional fiberglass brackets, (Parts #15 & 16) supplied that must have the bolt access hole cut out of them. The mating surfaces must be ground and sanded to fit before they are glassed into the outer rear corners of the body and diagonally across the underside of the inner frame below the corners of the engine access hole.

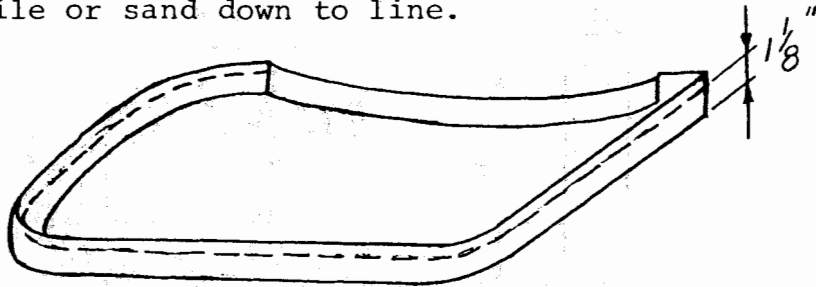
When the glassing is complete on all four sides of the small fiberglass brackets and it has "cured", then the steel "V" brackets can be held in place for marking the body "cut-outs" or "notches", to clear the bracket tubes. The brackets are "left and right" handed. The tabs on the outer ends of the tubing should face downwards.

After the "notches" are cut out, the brackets should be located with approximately 7-1/2" of both tubes projecting outboard of the body with the rearward facing tubes running parallel to the central axis of the car, then the holes are marked through the steel brackets and onto the fiberglass for drilling and bolting with 3, 5/16" bolts. - Place bumper studs thru the tabs and tighten with 3/8" locknuts. The same welting treatment could be done on the rear bumpers similar to that suggested for the front. As an option we can supply bumper bracket covers that gives the rear area a real finished off appearance. If you intend to use these, then it is best to attach the bumper to the bracket first and then fit the cover over the bracket and put the inner edge of the cover against the body for perfect alignment to mark the bracket fixing holes.

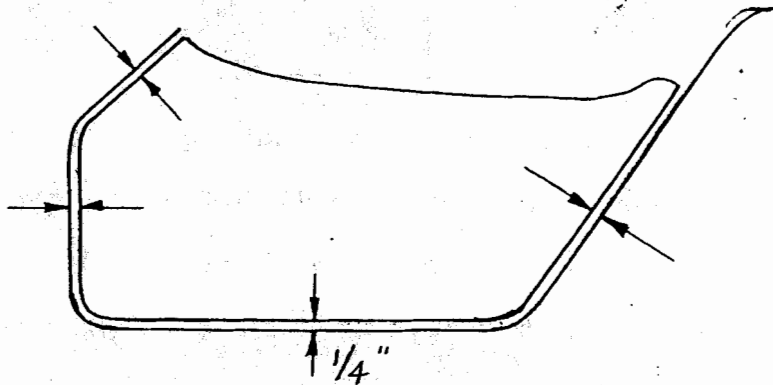
DOORS

DOOR PREPARATION

The doors must be trimmed to size before any fitting. Mark or scribe a line 1-1/8 all around door, except top edge. Grind, cut, file or sand down to line.



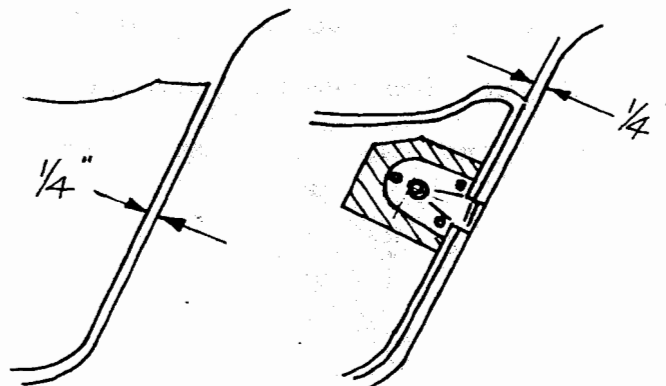
Place door into body recess before door opening is cut out of body. Even up gap all around door with small spacers.



It is not always possible to achieve these optimum gaps.

Modifications may have to be made, filing and flattening down the striker plate.

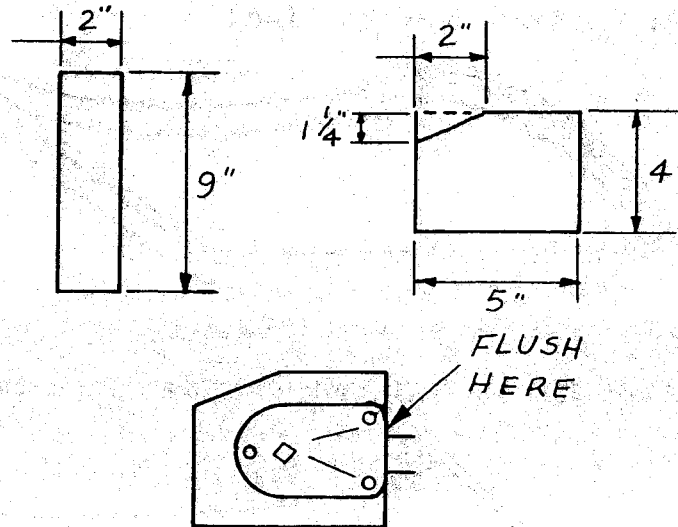
Measure gap at the rear edge. Whatever that measurement is, then that is how far that the spring-loaded bolt in the door latch must protrude beyond the door back edge.



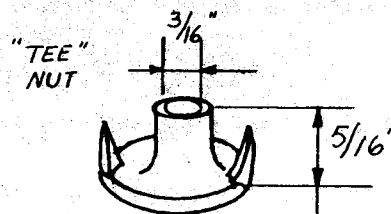
Lightly mark measurements on doors (to rub off later).

Remove door from body.

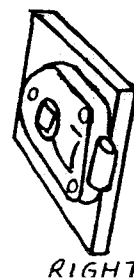
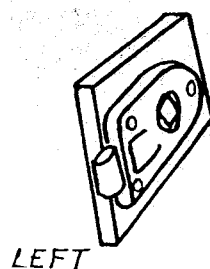
Now make door latch and hinge mounting reinforcements. These are 2 pieces of $\frac{3}{8}$ " ply, 2" x 9" for the hinges, and 2 pieces of $\frac{3}{8}$ " ply, 4" x 5", with one corner cut off for the latch.



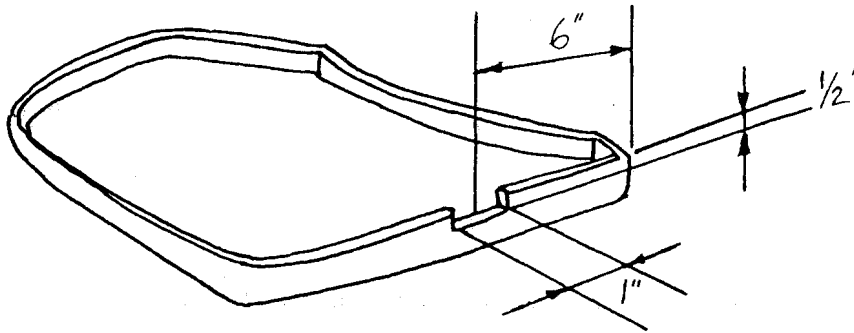
Place latch onto ply, mark through square hole (handle shaft) onto ply, remove latch and drill $\frac{5}{8}$ hole through ply, at point marked. Place latch back on with raised boss located into $\frac{5}{8}$ hole and drill $\frac{3}{16}$ through the remaining 3 holes. Remove latch. Redrill out the $\frac{3}{16}$ holes to $\frac{1}{4}$ diameter, then fit $\frac{3}{16} \times \frac{5}{16}$ tee nuts from the underside (Atlas brand are suitable from any good hardware store) and are hammered in.



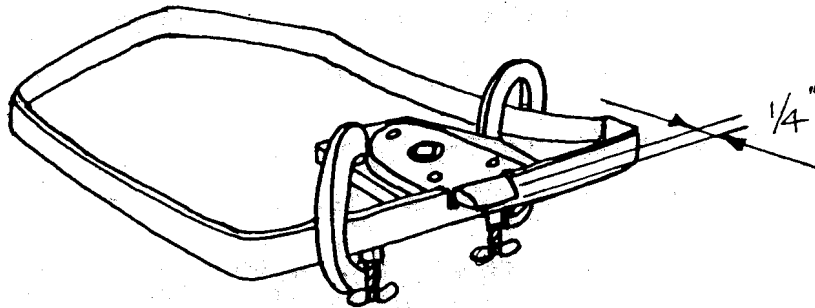
Bolt the latch back onto the ply with $\frac{3}{16} \times 1$ " flathead screws. Repeat operation for the opposite door, remembering to make one set left hand and the other right hand.



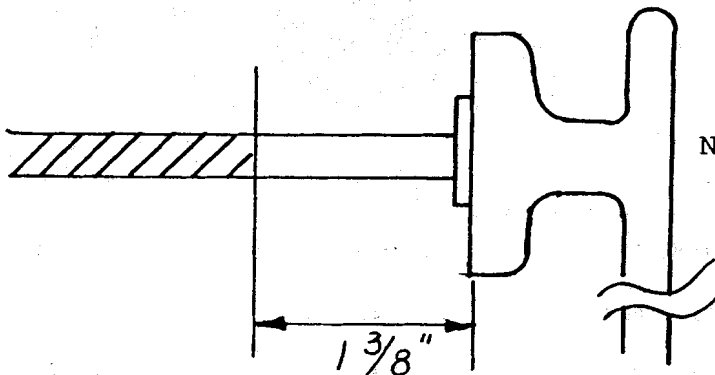
Now cut a notch 1" wide x 1/2" deep in the rear edge flange on the door.



Place latch and ply assembly onto the inside of the door with the spring-loaded bolt projecting through to the premeasured distance that you have marked on the door. Make sure that the spring bolt doesn't rub on the edge of the fiberglass. Clamp the ply onto the door, maintaining your correct position for the spring-loaded bolt.



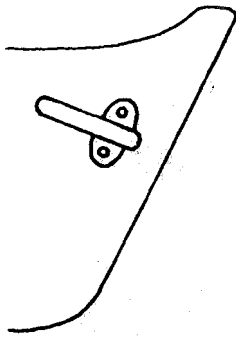
Drill a 5/16 hole through the fiberglass, using the square hole in the latch for a guide. Now unscrew and remove the latch, leaving the ply clamped on.



NOTE: There are no inside handles supplied with slam locks, if you want to fit inside handle: then this measurement will need to be at least 5/8 longer.

Cut the 3/8 square handle shaft to 1-3/8" long. (sketch).

Open up the 5/16 hole in the fiberglass door to allow the handle to fit in, and turn, with the fixing flange on the handle flush tight up against the outside door surfaces.



Drill $3/16$ holes through the fiberglass door and ply, using the holes in the fixing flange as a guide.

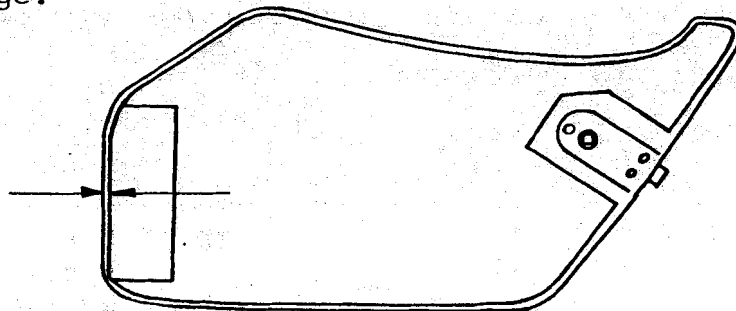
Now unclamp and remove the ply, open up these two $3/16$ holes in the p. to $1/4$ inch and hammer in 2 more $3/16$ " x $5/16$ " "T" nuts from the opposite side to the 3 other "T" nuts already in it.

Repeat operation for other door.

Place a small quantity of grease into the "T" nut threads to stop resin from running in later. Screw the latch back on to the ply; now screw the ply and latch assembly back onto the inside of the door, using $3/16$ " x $3/4$ " screws through from the outside, leave the handle off at this stage.

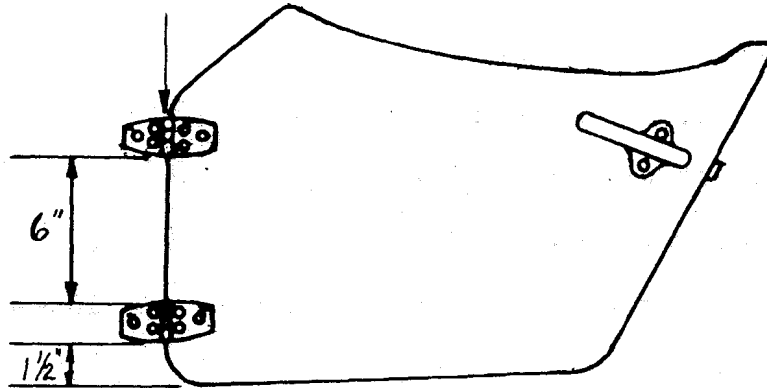
It is now ready for glassing on. But to save time, you can now prepare the hinge reinforcement for glassing as follows:

Shape the edge of the ply reinforcement to fit the inside surface of the door flange.



Now glass on both ply pieces, one for the latch--one for the hinges. Put a little resin and fiberglass mat under the hinge ply (this could be lightly clamped down if required, but it is not necessary) and remember not to get any resin and mat over the top of the latch, as this latch is left on the ply during the glassing on process to further protect the "T" nuts threads from being fouled with resin. Repeat for other door.

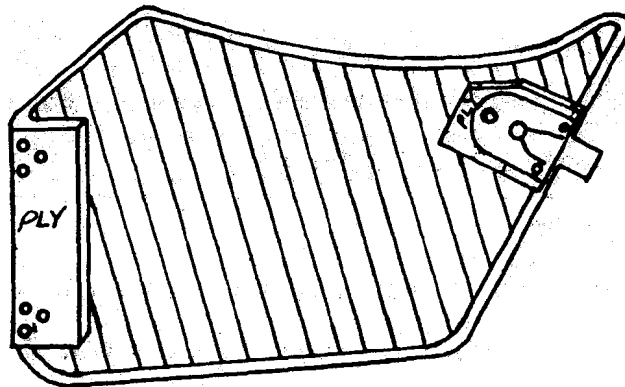
When the glass is fully hardened, install hinges. The lower hinge approximately $1\frac{1}{4}$ " up from the bottom, and a 6" space between it and the top hinge.



Keep pivot axis of both hinges in line, and have the center line of the pivot axis in the center of the gap. Drill through the fiberglass door panel and ply reinforcement, using the holes in the hinges as a guide. Nut and bolt the hinges on with $\frac{3}{16}$ " x 1" oval head screws, using lock nuts on the inside. The nuts will come very close to the fiberglass on the inside. This is normal.

Cut 1" rigid styrofoam sheet to fit inside the door and to clear around the hinge and latch ply areas.

Repeat for both doors.



Glue in with 3M Brand 77 spray adhesive. Press the foam panels down by hand immediately to follow the curve of door.

When glueing is complete and dry, sand or grind the styrofoam down this time $1\text{-}1\frac{1}{8}$ " thickness over all the door.

Glue the upholstery panel on the inside of the door with the same 3M 77 cement.

Repeat for other door.

The handles can now be screwed onto the outside of the doors, using 3/16" x 1" oval head screws.

The doors are now ready to fit to the car. If you have not yet cut out the door opening from the body, now is the time to do it, as follows:

Check that all fixing points and attachment areas between the body and frame are secure and then cut out the panel in the door opening. File and sand the edge of the fiberglass all around the opening and make it approximately 1" wide and about 3/16" to 1/4" thick.

A channel section, capping strip can be press fitted over the edge or applied with adhesive before fitting, or a 2" wide x 55" long strip of upholstery material can be glued over the edge instead, this is supplied with the kit.

Hinge the Door

A 1/2" plywood backing stiffener should be glassed into the inside of the body behind the door hinge area for reinforcement. To hinge, place the door into its opening in the body and space it equally around all sides with small "shims" of 1/8 ply or "masonite".

Lightly clamp the door in this position. Hold the hinges across the front vertical door/body gap with the center pin of the hinge in line with the center of the gap and the center of the other hinge. Mark

through the holes in the hinges and drill the body.

The holes for the bolts holding the hinges should be slightly undersize for a tight fit, to allow the bolts to literally screw into the holes. This cuts down the probability of the doors "drooping".

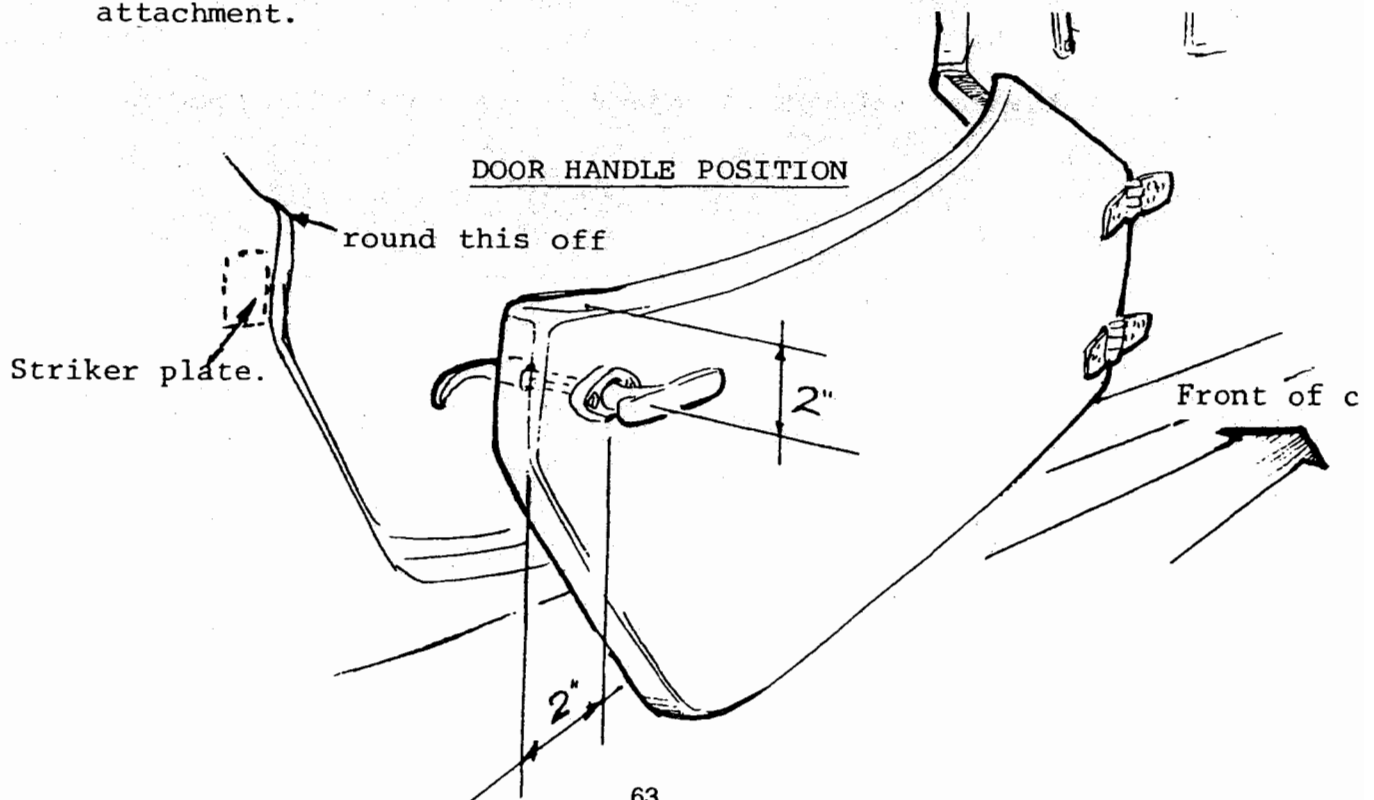
Nut and bolt each hinge on with 3 3/16" x 1" chrome oval head bolts. The nuts (with washers) should be tightened sufficiently to "sink" the nuts into the wood or plywood frame inside the body then cut off flush any remaining portion of the bolt.

The correct position for the striker plate is determined by gently closing the door and marking the point where the spring-loaded bolt touches the body. This will give you the height. When the door is fully closed the distance in from the outer edge can be established.

The padded roll can be put on the top edge of the door now, or later when the rest of the upholstery is fitted. Instructions for the assembly of the padded roll are in the upholstery section.

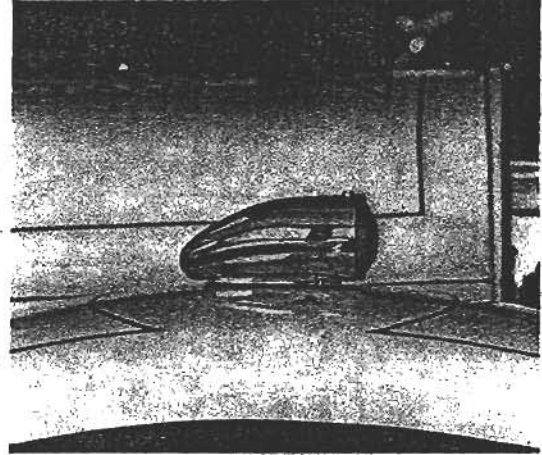
INSTALLATION OF THE STANDARD DOOR HANDLE ASSEMBLY

The standard door handle assembly supplied with the kit comprised of an outer handle with mounting flange attached, an inner handle that doubles as a latch and a striker plate. Fit the outer handle on the door in the position shown in the illustration, with a backing plate of plywood reinforcement on the inside of the door. Nut and bolt through both, with 3/16" x 1" oval head bolts. Place the inside handle over the end of the shaft with the handle pointing rearwards. Rotate the handle until it locates inside of the seat liner; this point will be the position for the striker plate. Screw on the plate with 3/16" x 1" self-tapping screws. It may be necessary to shorten the square shaft to get the end of the inside handle to press tightly onto the striker plate; this is necessary to keep the door tightly closed. The inside handle can come off to allow the door to be filled and lined for the upholstery in the same manner as the accompanying instructions for the optional slam latch attachment.



FINISHING AND PERSONALIZING THE GAZELLE

The license plate bracket and tag light are in one unit and bolt on the rear body surface 12" up from the bottom edge, (this distance is not critical). Use 1" x 1/4" nuts and washers. Keep it outward far enough so it is not concealed by the spare tire.



INSTALLING THE TAIL LIGHTS

The Gazelle tail lights are mounted as shown. Mark the location of the mounting holes on the rear fender. Drill the 1/4" mount holes and secure the tail lights using four (2 each) 1/4" x 1" bolts with locking nuts.

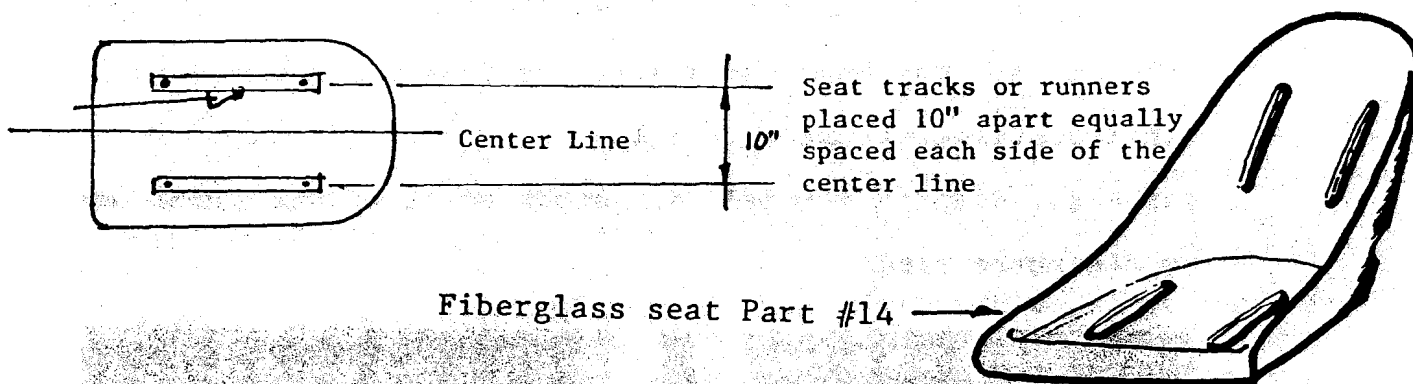
INSTALLING THE FRONT FENDER PARKING LIGHT

The Gazelle parking lights are mounted as shown in illustration. Position the parking lights on the fender and mark the location of the mounting holes. Drill the 1/4" mounting holes and secure the light.

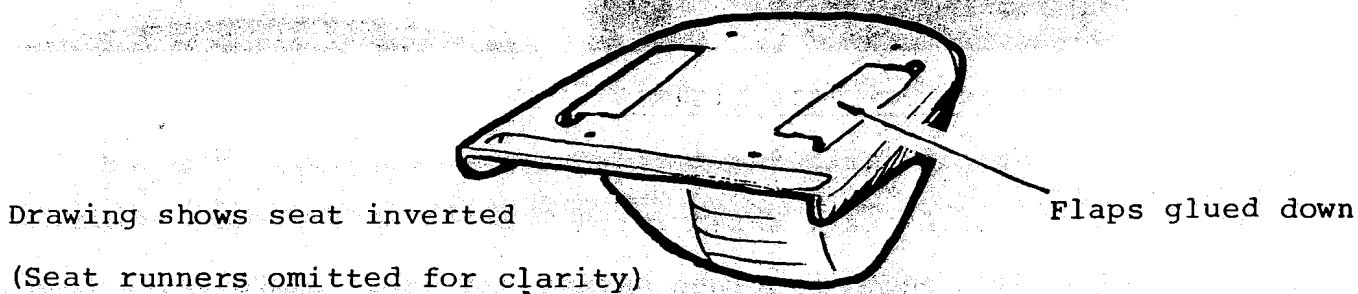
Plan the holes to miss the fender bracket.

UPHOLSTERING THE FRONT SEATS

The fiberglass part of the front seats must have four slots cut into them for the upholstery to pull thru.



The seat runners supplied should be bolted to the underside of the seat so that the upper half of the runners with the release handle will move with the seat. The steel cup spacers are to be fitted between the runners and the seat. Use 5/16" x 1" carriage bolts and large washers on the inside of the seat.



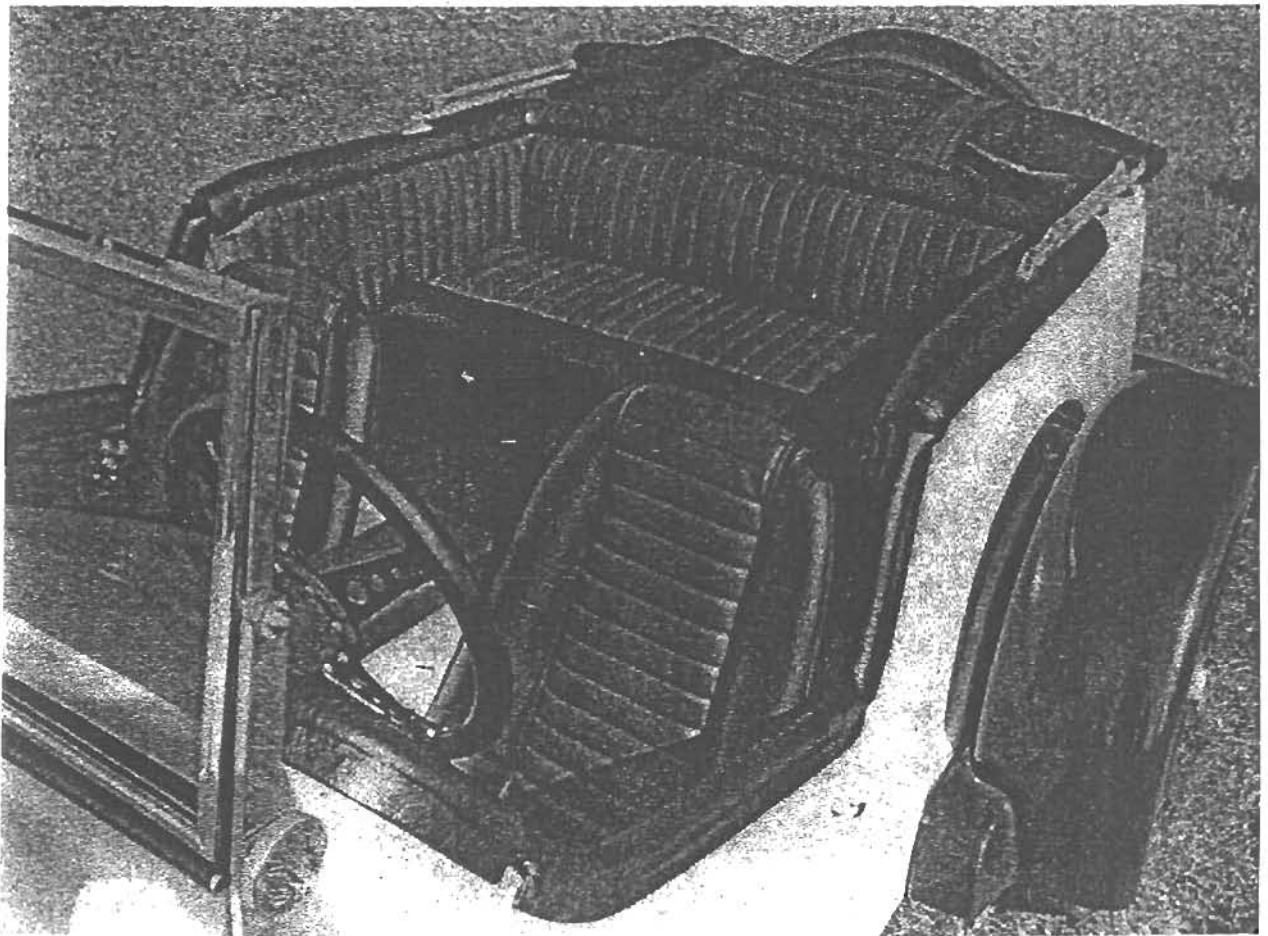
The seat upholstery has four flaps sewn into the reverse side of each seat cover. These flaps pass thru the slots in the foam rubber and fiberglass seat and can then be pulled tight and glued to the seat at the back and bottom. The rest of the cover pulls over the seat and pulls to a tight fit, and is then glued to the underside of the seat. The back of the seat where the fiberglass is showing can now have a piece of carpet, from the left-overs supplied, glued over it with the edge tucked underneath the cover.

NOTE: If the flaps are too big to go thru the slots then cut the flaps down, do not enlarge the slots as this would weaken the seat.

INSTALLING THE INTERIOR SEATS (INCLUDED IN DELUXE KIT)

Place the seat into the car. Sit in the seat and position it for most comfort. Make sure that the seat is free to move the full distance back and forth on the runners without jamming against the door fittings or service tunnel. Mark the places where the runner studs touch the floor. Drill thru these points with 5/16" clearan drill. Push the runner studs thru the holes in the floor and secu from the underside with large washers and 5/16" lock nuts.

SEAT AND SEAT TRACK MODIFICATION



INSTALLING THE UPHOLSTERY KIT (INCLUDED IN DELUXE KIT)

All of the various pieces of upholstery and carpet materials are easily identifiable as to fit and function. Unless otherwise state all of them should be glued in with contact cement.

Side Panels: Secure the side panels into the inner liner sides using contact cement.

Carpeting: Lay the carpeting in place to check it for fit, cut out for pedals, gear shift, emergency brake and glove box, and trim where necessary. Take it out and dust off the underside of the carpet and fiberglass liner then coat both surfaces with contact cement. Let them dry first before putting together. The padded roll (coaming) for around the cockpit must be upholstered first and simply press fits on and secures with studs by screwing the side curtain and tonneau cover studs through and into the body.



The studs are supplied with the kit and must be fixed into the body to match the positioning of the snaps that have already been attached to the convertible side curtains and tonneau cover. You should position these snaps on all of the weather equipment in such a manner that any item, the convertible top, side curtains, tonneau cover and the boot will fit on to the same studs.

Further instruction on stud placement is under convertible top installation.

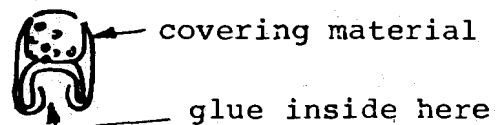
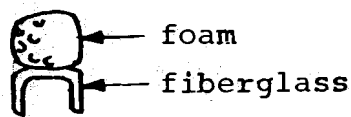
DOOR TOP PADDED ROLL PREPARATION AND ASSEMBLY

Trim and smooth the fiberglass bottom edges. Cut to fit and glue on the 2" foam on the top of the fiberglass molding, with 3M contact cement.

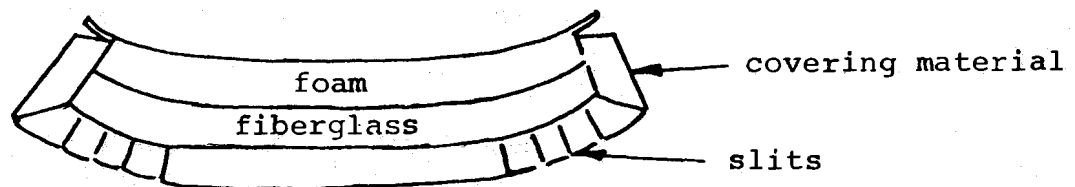


Glue on the fiberglass only. The next step will be to glue on the covering material, center first, gluing onto fiberglass only and snipping short cuts into the ends to allow them to curve around.

Sectional View



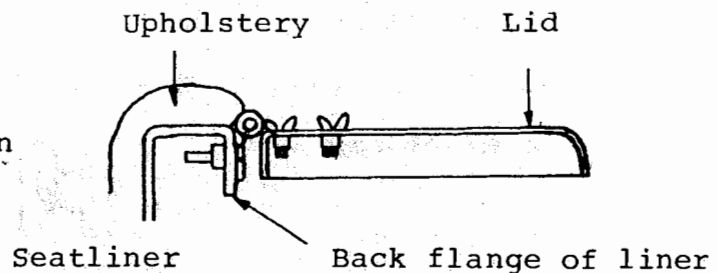
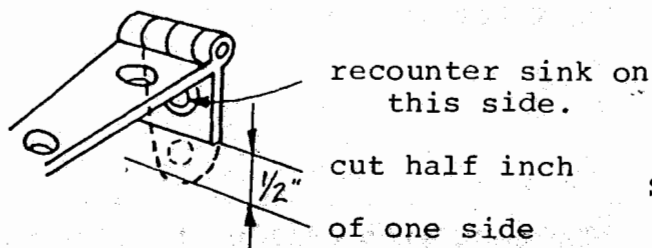
Pull the edges around and up under the inside of the fiberglass channel section.



The padded roll across the top of the dashboard and the 2 smaller portions for the body at the back of the doors are all handled in the same manner as the foregoing instructions for the door top padded roll. The dash top padded roll is attached with 5 studs that are used to secure the tonneau cover. The studs still look best in this application, even if you have decided not to use a tonneau cover.

INSTALLING THE COUPE CONVERTIBLE TOP (OPTIONAL)

Prepare hinge

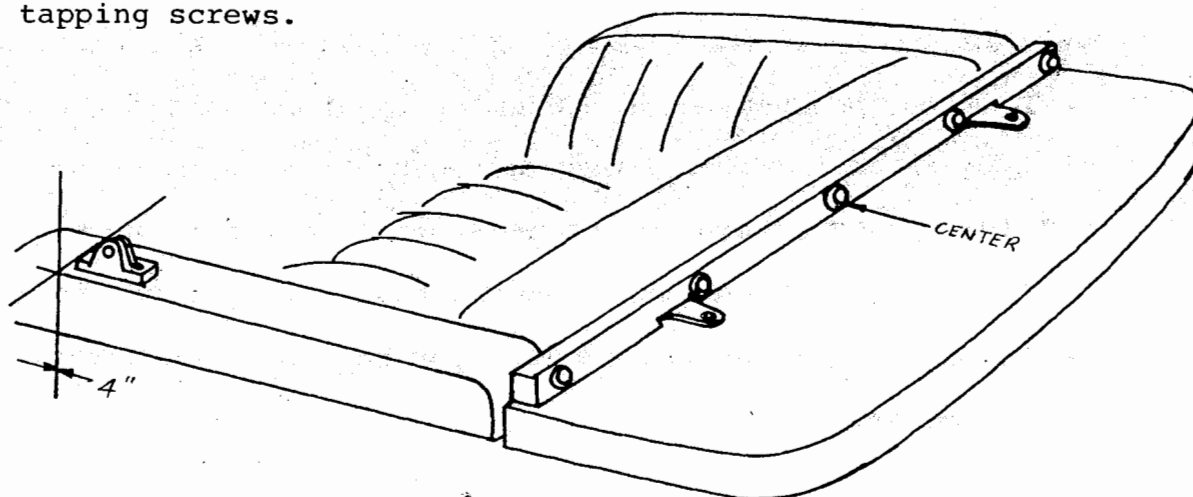


With hinges on trunk lid first, mark holes into back flange of liner. Drill $\frac{3}{16}$ " and bolt hinges on with $\frac{3}{16}$ " x 1" flat head screws.

Make wooden strip $\frac{3}{4}$ " x $\frac{3}{4}$ " x 42" long, almost full width of trunk lid, with notches cut for the hinges. Cover the wood with upholstery material.

5 snap studs equally spaced onto wood with one dead center.

Take off the lid. Drill through from the bottom of the trunk lid, along the front top surface, with 7 holes at $\frac{3}{32}$ " diameter. Screw wood onto trunk lid, using $\frac{3}{4}$ " x No. 6 round head self-tapping screws.



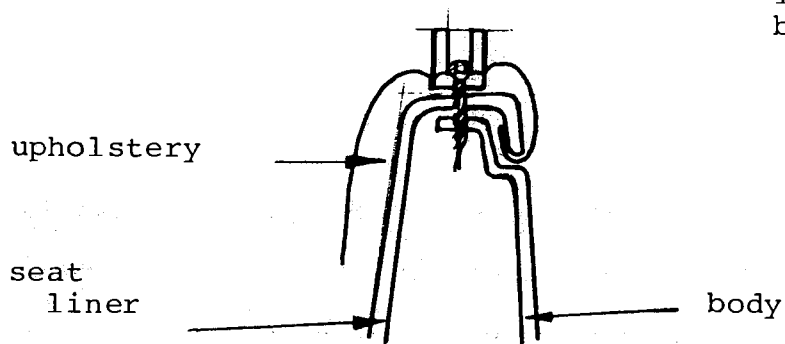
If you have the optional trunk rack now is the time to fit it. Mark for position of the holes, drill $\frac{9}{16}$ " and bolt on with $\frac{3}{4}$ " x 20 bolts with a flat washer under the heads.

Fix the lid back on the car again.

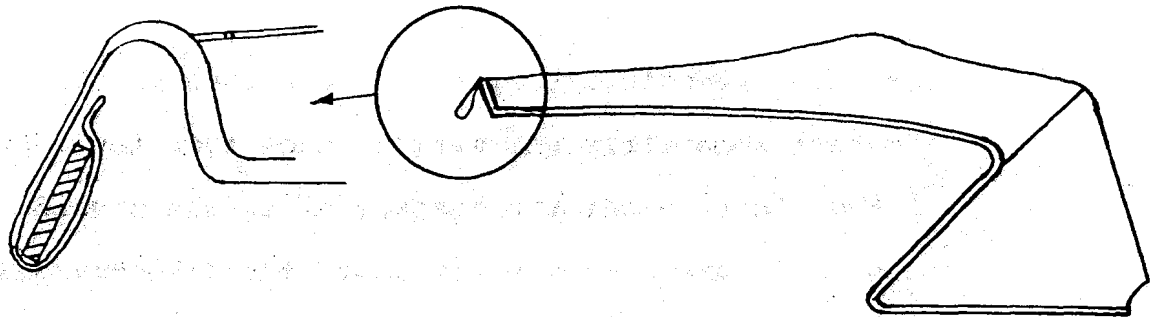
Get the convertible top, bows and chrome brackets. Take the brackets separately and mark 4" back from the front corner of the liner, press the bracket on to the padding at this point and make sure you are above the fiberglass liner; drill through the padding and fiberglass liner 3/16", using the holes in the bracket as guide.

Screw the brackets down with 3/16" x 2" oval head self-tapping screws.

Try to get the 2" screw to tap into both fiberglass pieces--the body and the liner. This is desirable but not essential.

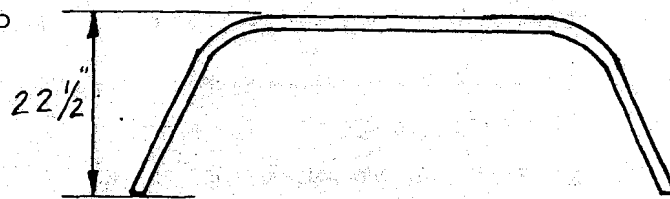


Stiffen the seam in the front edge of the convertible top with 1/8" x 1" aluminum strip, 37" long.



Cut the long bow down to

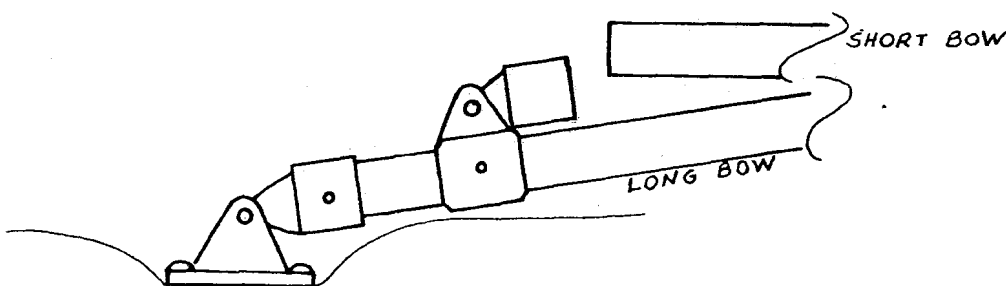
22½"



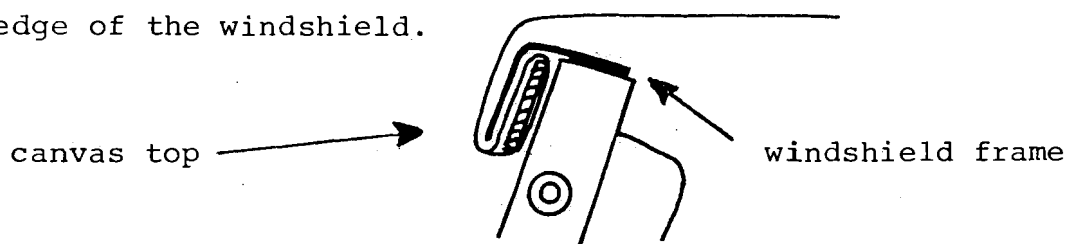
Lay the top onto the car and even it up across the back edge with the center of rear seam in line with the center stud fixed to the center of the wood strip. Now fix the first button snap into the center of the rear button edge of the convertible top, to snap onto the stud in the wood. Now work from the center outwards, fixing in one snap at a time onto the canvas, fit each snap until the 5 connections across the wood strip are completed.

Fold the top back, exposing the inside surface uppermost, to reveal the seams for the bows to house in. Thread the bows through the seams with the larger bow in the back seam.

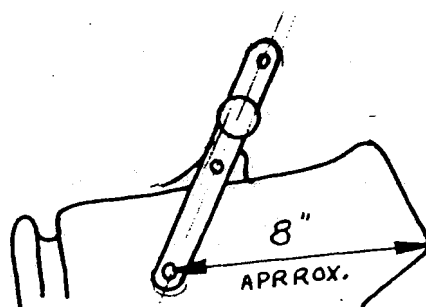
Connect bracket mechanism to the long bow only and attach long bow chrome fixings to bracket on liner, leaving short bow free.



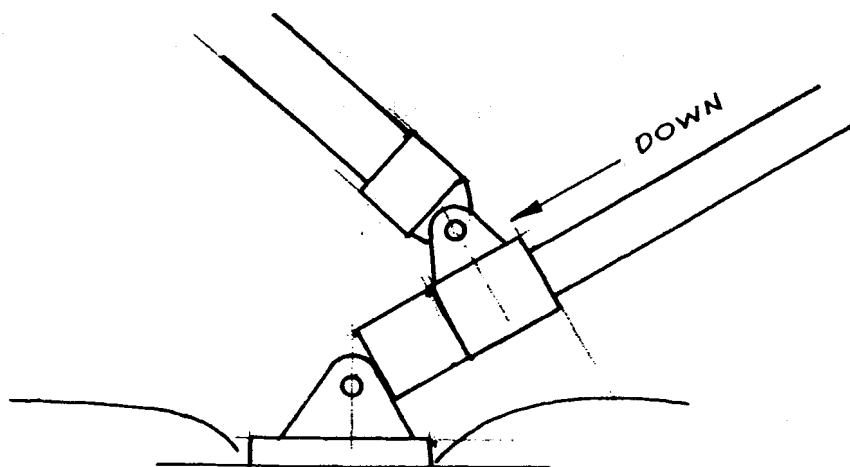
Take the front edge of the convertible top with the aluminum stiffener strip inserted in the seam and wrap the strip and seam up under the top forward edge of the windshield.



Now, with the help of a second person, push the windshield forward at top, pushing equally from both sides until the back and upper surface of the convertible top is tight, while the tension is still being maintained, drill a 5/16" hole through the bottom hole in the windshield mounting bracket. As a rough guide, when the windshield is in the best position, the lower hole and bolt center should be approximately 8" from the top corner of the door opening.



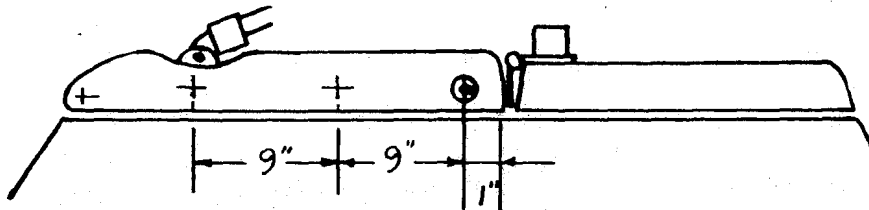
Fit the free end of the small bow into the adjustable bracket and slide the bracket down the long bow right to the bottom, until all the brackets are in contact with each other.



This will slightly raise and further tension the upper surface of the top.

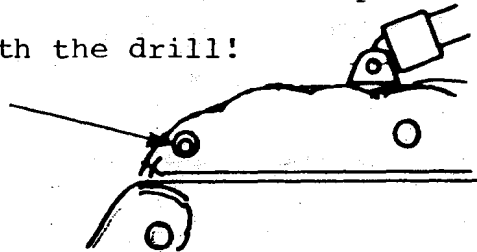
Pull tightly outwards on both top corners at the front, above the windshield, folding down the sides of the soft top, and fix in a snap to button onto the existing stud, on the windshield frame.

Do the same on the side and the lower rear sides of the canvas, pulling downwards and forwards, and mark through for the first stud about an inch forwards from the back edge of the seat liner.



Drill $\frac{1}{8}$ " and screw in the stud; now fit the button snap into the canvas to match and snap it onto the stud.

Now measure 9" forward for the next stud and another 9" forward for the third stud, and drill and fit them, fitting the snaps into the canvas as you go, keeping it pulled tight down and forwards at all times. Put the last stud as far as possible forwards, but don't miss the fiberglass with the drill!

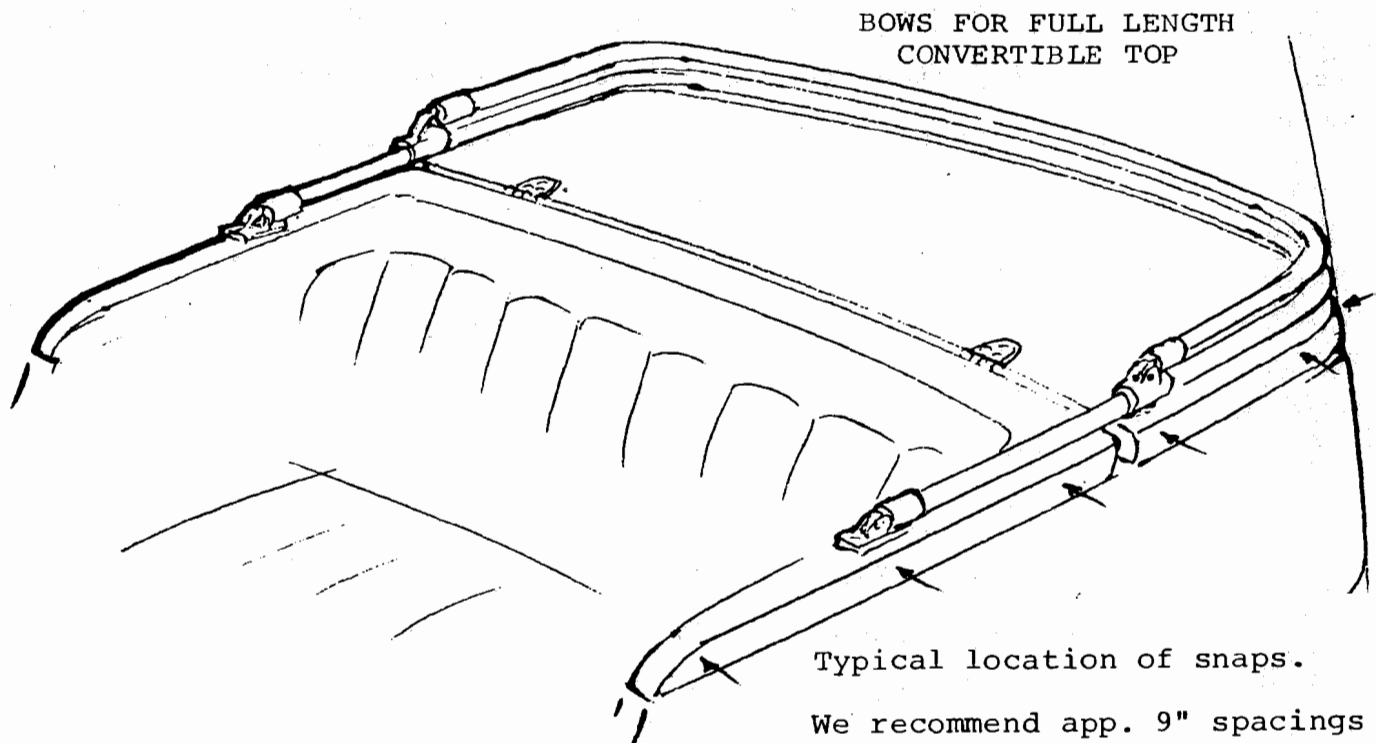


Fit the snap into the canvas to match and snap it on.

Move up to the flap on the side of the canvas and wrap it tightly around the long bow; secure with studs and snaps.

INSTALLING THE STANDARD CONVERTIBLE TOP, SIDE CURTAINS AND TONNEAU COVER

Assembly of the top edges of the two bows should be level with each other. After fitting the assembly together, place it on the rear deck lid, so that the bows outline the rear and sides of the body. This gives the position of the top bow brackets onto the rear deck lid (approx. 1/3 of the way back) mark the location of the bolt holes, or; install the bow brackets using a cardboard template to mark hole positions. Mark hole positions and then secure top bows. You should use sheet metal screws.



TOP: BOWS ALIGN WITH BACK OF BODY

NOTE: The whole convertible top assembly fits on top of the upholstery, and the screws for the brackets screw thru the trim into the fiberglass below. Be careful not to "strip" the threads, when tightening the screws. - Also, you may need to adjust the smaller bow up or down, at its fixing point on the large bow, to tighten the top or to remove any possible wrinkles.

Remove brackets and sockets from top bows.

Slide bows through soft top sleeves; small bow in the front sleeve. The sleeves are the large open ended seams sewn into the underside of the top.

Replace ends of bows into sockets and tighten "setscrews", and refit to the brackets. Hold the center snap in bottom back edge of the soft top so that it aligns with a stud that you should have already fitted to the center back edge of the rear deck.

Slide front reinforced seam into slot in top of windshield frame and fasten the center snaps together at the rear, then push the top of the windshield forwards following instructions as for coupe. Do not under any circumstances install snaps in the convertible top to fasten it to the windshield. Should you do this, you will ruin the water tight integrity that has been carefully designed for your car.

Our unique top has been cleverly designed to allow fast and easy removal of the convertible top as well as making it 100% water tight, along the front edge.

Pull top forwards and downward from right then left over sides of rear deck and install the rest of the studs pulling top smooth at all times.

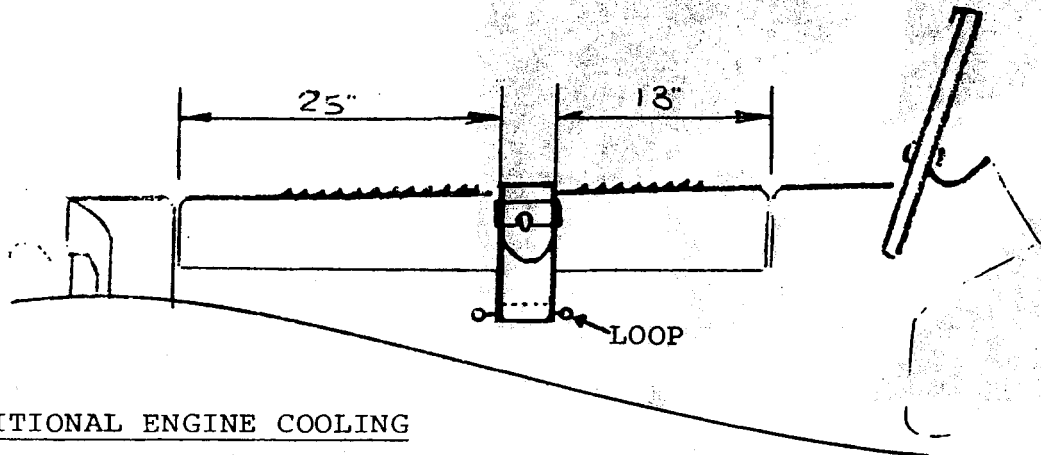
Place the side panel in place and mark the additional screw snaps locations on the flange at back of screen pillars.

Drill an 1/8" hole at each location and attach the screw snaps.

The tonneau cover and boot cover are designed to use the same snaps used by the convertible top and side curtains.

INSTALLING THE LEATHER STRAP FOR THE HOOD

Position the leather strap as shown. Mark the location of the loop holes. Position the strap loop on the side of the body, pull the strap down firmly over the hood, and mark the location of its holes. Drill the marked locations and secure the leather strap and its loops using 8/32" x 1/4" bolts and locking nuts.



ADDITIONAL ENGINE COOLING

Some engines, under certain conditions, have been known to get over heated. For instance, under heavy load, or continued high speed use, both in hot weather. If you feel that you may be in need of additional ventilation for any of the reasons stated or just to be on the safe side, it is perfectly o.k. to cut two large holes of 4" or 5" diameter in the back body surface above the fiberglass frame liner and behind the spare tire, this way the holes will not show. Also glass in a vertical ply panel isolating the cooling fan intake.

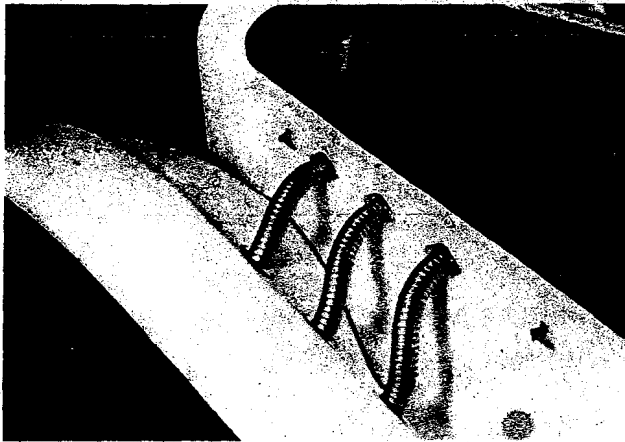
MIRRORS

It would be wise to check the requirements of your State with regard to rear view mirrors. In any event, an interior mirror mounted in the center, above the dashboard on the body between the two humps, is functionally adequate, but sometimes exterior mirrors are mandatory. These are best positioned just forward of the door and a little below the windshield bracket. In both cases suitable mirrors are readily available from parts houses.

OPTIONAL EXHAUST STACKS

The optional outside exhaust stacks are fitted on each side of the body below the hood opening.

The position can vary fore and aft to your choice; but we prefer two pipes in front of the strap and one behind.



Screw the oval retaining rings onto the body at approximately 5-1/2" spacings, center to center, and 1-1/2" down from the edge of the hood opening, keeping the strap in the middle of the two rear ones. Mark or scribe circle thru the rings onto the body then remove the rings and cut out the circle.

If you are careful you could leave the rings on. Now put the rings over the upper ends of the pipes, put the pipes about 1/2" or so thru the holes in the body and screw or nut and bolt the rings back on.

Arrange the angle of the pipes in a manner that appeals to you most, and then scribe carefully around the lower ends of the pipes on the fenders for the position of circles to be cut. Move the pipes out of the way and cut out the circles.

Put the remaining rings over the bottom ends of the pipes, push the pipes thru the holes and screw down the rings.

For additional security the pipes can be glued to the rings with epoxy glue.

WIRING HARNESS FOR VW GAZELLE

X #1 -- green to low beam left side ✓
red to high beam left side ✓
white to park light left side ✓
yellow to signal light left side ✓
black to park light left side and to ground ✓

X #2 -- purple to horn ✓
green to low beam R. side ✓
red to Hi beam R. side ✓
white to park light R. side ✓
brown to signal light R. side ✓
black to park light R. side and to ground ✓

NOTE -- GROUND BLACK WIRE FROM SEAL BEAM SOCKET TO HEADLIGHT HOUSING ✓

X #3 -- 2 white wires to P.L. on terminal strip ✓
2 green wires to L.B. on terminal strip ✓
2 red wires to H.B. on terminal strip ✓
purple to .H. on terminal strip ✓
brown wire to #6 on lucas relay ✓
yellow wire to #2 on relay ✓

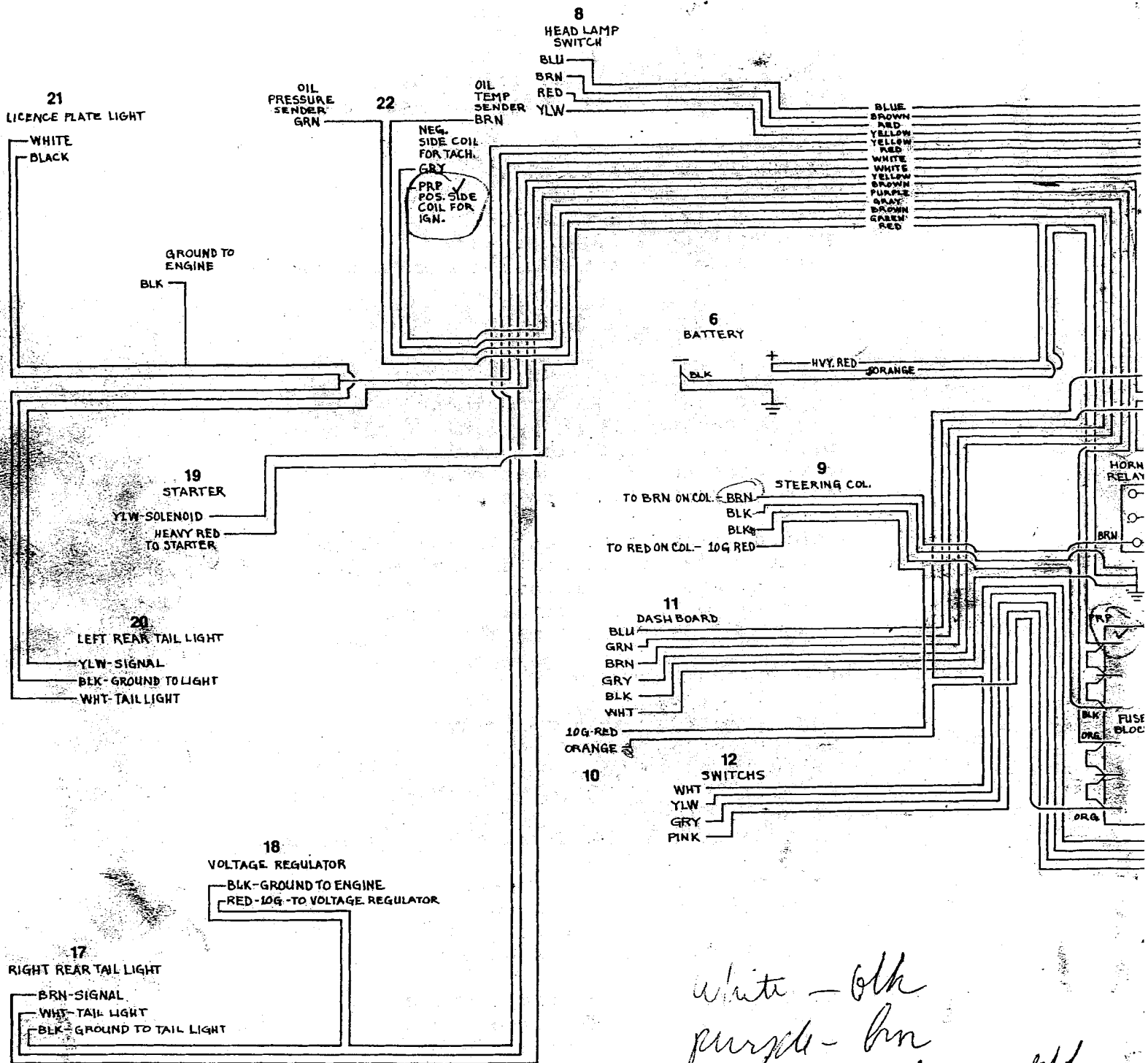
#4 -- 3 white wires to P.L. on terminal strip ✓
green wire to L.B. on terminal strip ✓
2 red to H.B. on terminal strip ✓
purple to H. on terminal strip ✓
blue to gas tank sender ✓

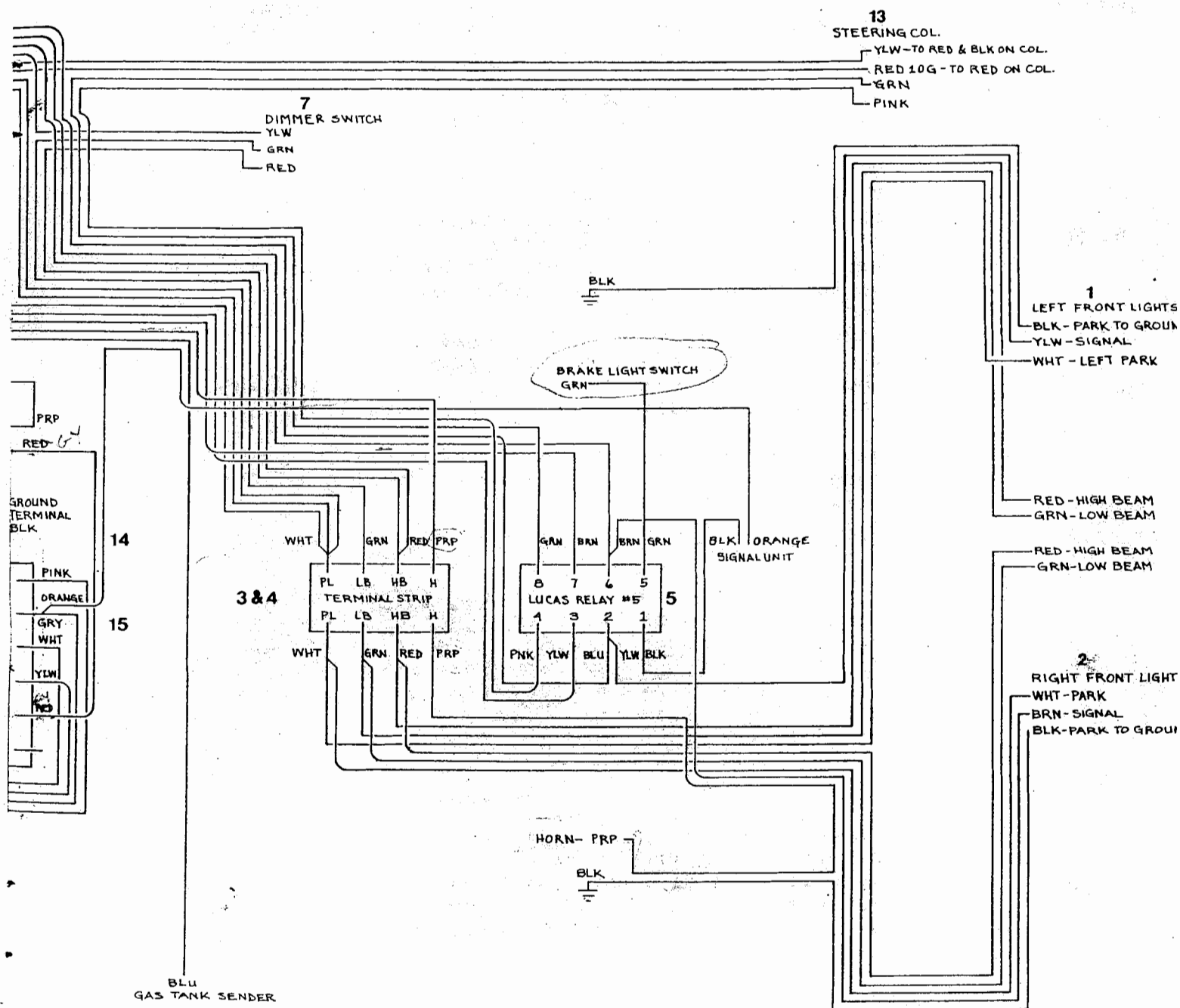
X #5 -- green to #8 on relay ✓
brown 16 gauge to #7 on relay ✓
brown 16 gauge to #6 on relay ✓
pink to #4 on relay ✓
yellow to #3 on relay ✓
Lt. blue 16 gauge to #2 on relay ✓
-orange to Flasher ✓
Lt. green to #5 on lucas relay from brake light switch ✓

X #6 -- red batt. cable to + on batt. ✓
orange 16 gauge to + on Batt. ✓
short red batt. cable to ground on batt. and ground on frame ✓
black 16 gauge to minus on batt. ✓

X #7 -- red to high beam on dimmer switch ✓
green to low beam on dimmer switch ✓
yellow to center of dimmer switch ✓

NOTE -- This harness was designed to use a Ford Pinto floor dimmer switch for the headlights. The original dimmer switch in the signal light lever is used to operate the horn using a universal horn relay.





Switch
gauge

- #8 -- yellow to head light switch
brown to R. side signal light on dash ✓
blue to L. side signal light on dash ✓
red to high beam light on dash ✓

steering

- #9 -- 10 gauge red to red wire on steering col. ✓
10 gauge black to green, black & white wire on steering col. and to 12 gauge black wire on steering col. ✓
- 16 gauge black wire to brown & white wire on steering col. ✓
- 16 gauge brown to brown on steering col. ✓

gauge

- #10 -- 10 gauge red to ampmeter S. ✓
16 gauge orange to ampmeter -- I ✓ OK

gauge

- #11 -- 16 gauge black (grounded wire to be used for common ground
gray to tach. from sender ✓
green to oil pressure gauge from sender ✓
blue to gas gauge from sender ✓
white, hot wire to instruments from ignition switch ✓
brown to temp. gauge from sender ✓

switch

- #12 -- pink wire to acc. switch from fuse ✓
gray wire to wiper switch from fuse ✓
yellow wire to headlight switch for head lights ✓
white wire to headlight switch for park lights ✓

steering

- #13 -- 10 gauge red to red wire on steering col. ✓
16 gauge yellow to red & black on steering col. -- from
starter solenoid ✓
green to green & black on steering col. -- R. turn to relay ✓
pink to black & white on steering col. -- left turn to relay ✓

front

- #14 -- 10 gauge orange - Hot wire to fuse case from batt. ✓
10 gauge black - Hot wire to fuse case from ignition switch ✓
black wire to ground terminal from steering col. ✓
brown wire to horn relay from steering col. ✓
10 gauge orange wire to fuse from signal flasher ✓
purple to horn relay from horn ✓
black wire to ground terminal from battery ground ✓

front

- #0 -- Purple to ignition side of fuse case from ignition coil ✓
#15 -- 10 gauge orange to fuse case from ampmeter ✓
black wire to ground terminal ✓
white wire to fuse from instruments ✓
yellow wire to fuse from headlight switch ✓
gray to fuse from windshield wiper switch ✓
pink to fuse from acc. switch ✓

- #17 -- brown to right rear signal light
black, ground to R.R. tail light
white, to right rear tail light

- X #18 -- 10 gauge red to voltage regulator ✓ OK
black. ground to engine ✓
- X #19 -- red batt. cable to starter ✓ OK
16 gauge yellow to starter solinoid ✓ OK
- X #20 -- yellow wire to left rear signal light ✓
white to left rear tail light ✓
black, ground wire for left rear tail light ✓
- X #21 -- white wire to Lic. plate light ✓
long black wire, ground for light ✓
short black wire to be grounded to engine ✓
- #22 -- gray wire to minus side of coil for tach. ✓
purple to plus side of coil for ignition ✓
green to oil pressure sender ✓
brown to oil temp. sender • ✓

*can
prep*

Lucas Relay Part #33117 -- 12 volt

Brake light switch --- 5

Brown #8
Brown #2 Right front 6

Brown #17 Right rear-- 7

Right turn from switch-8
Light green # 13

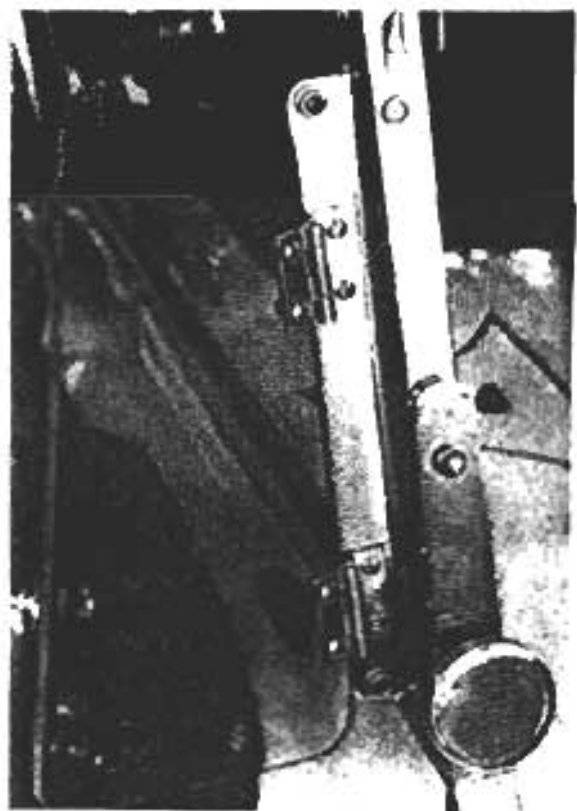
1 -- Flasher black to flash
signal unit

2-- left front Lt. blue # 8
Yellow # 1

3-- Left rear Yellow #1

4-- Left turn from switch pink #13

OPTIONAL WIND WINGS



Wind wings attach to the windshield frame as shown. The top hinge must have the center pin removed and replaced with a nut and bolt. This nut and bolt can be tightened sufficiently to stop the windwing flapping backwards under wind pressure while driving. The windshield side bracket will have to be removed or loosened and the windshield tilted forwards and the bracket tightened. The windwing can now be held in place on the frame with the top of the glass level with the top of the frame. Mark the position of the holes onto the frame through the hinges. Remove the wings. Carefully center punch before drilling.

You will only drill the outer frame not the inner that is holding the glass. Thread the holes for 5/32" x 1/2" chrome oval head screws. Screw the wind wings on and restore the windshield to its original position.

GENERAL PERFORMANCE

The well built Gazelle can be equal to, or better than, any average sports car of equivalent engine size. Naturally its performance will relate directly to the way you have built the car and to what you have put into it. Not just in time and effort alone but in tuning and preparation. One thing is certain, you will have a head start with the Gazelle as its basic concept has tremendous potential inherent in the design. For example, brisk acceleration, the power to weight ratio is a vast improvement over the original VW from which it was built. The lighter weight means it will stop quicker with less braking effort. The lower center of gravity with the Gazelle increases it's cornering capabilities.

Nothing is lost in fuel economy. It is even possible to gain a slight improvement in miles per gallon.

In fact, everything is all gain with the Gazelle, and the inevitable "challenge" from a fellow sports car driver, can be "taken on" with the smug confidence that you have hidden reserves to spare.

The best part of all is, that as you are thoroughly enjoying yourself, throwing it into corners with near abandon, booting the gas to max revs, etc. you know that you are not going to spoil a fantastically expensive, highly temperamental piece of foreign sports equipment that you can't get parts for.

Go to it! Have fun,
and when it is all done, do us a favor, send us a picture and a report, we love 'em.

SAFETY AND LICENSING CONSIDERATIONS

Our cars will pass inspection in virtually all states and countries when equipped with the head lights, turn signals, stop lights, horn, license plate light and windshield wipers.

Many people ask us about insurance. This is no problem.

Consult your local agent. The rates are about the same as for a Volkswagen.

In most States, to license the car you simply move the license plate from the Volkswagen over to your new Gazelle and use the same registration. BUT CHECK FIRST. In some states, you can get a rebuilt title and have the car registered as rebuilt and get a new title showing it as a rebuilt new Gazelle-Volkswagen.

Check with your local license bureau.

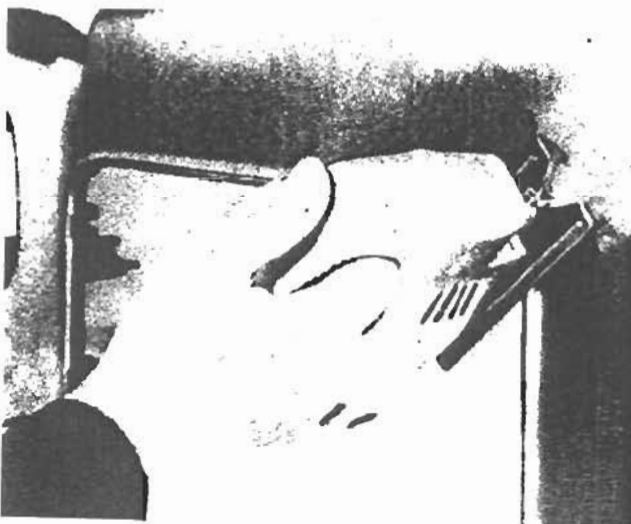
WARRANTY

THE COMPANY EXPRESSES AND MAKES NO WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE MERCHANDISE SOLD, EXCEPT THAT IT WILL REPLACE, UPON REQUEST OF THE PURCHASER, ANY DEFECTIVE PARTS OR MATERIALS SOLD BY THE COMPANY TO SUCH PURCHASER SHOWN TO BE DEFECTIVE WITHIN 90 DAYS OF PURCHASE. THE COMPANY SHALL NOT BE RESPONSIBLE FOR DAMAGE, LOSS OR OTHER INJURY TO PERSONS OR PROPERTY, DIRECTLY OR INDIRECTLY, IMMEDIATELY OR SUBSEQUENTLY ARISING OUT OF THE USE OF OR INABILITY TO USE THE PRODUCT SOLD. PURCHASER HEREBY ASSUMES ALL RISK AND ALL LIABILITY ARISING OUT OF THE PURCHASER'S CONSTRUCTION OF A VEHICLE FROM THE KIT HEREBY SOLD AND ALL PRESENT AND FUTURE LIABILITY WITH RESPECT TO SAME DURING CONSTRUCTION OF THE VEHICLE OR DURING OR WITH RESPECT TO USE OF THE VEHICLE OR FINISHED CAR UPON ITS COMPLETE MANUFACTURE BY THE PURCHASER. THE BUYER RECOGNIZES AND UNDERSTANDS THAT THE BUYER IS PURCHASING ONLY A KIT FROM WHICH THE BUYER HIMSELF SHALL MANUFACTURE A VEHICLE. THE COMPANY IS NEITHER THE MANUFACTURER OF SUCH VEHICLE NOR THE SELLER OF A FINISHED VEHICLE. ANY ACTION BROUGHT UPON THIS WARRANTY OR AGAINST THE COMPANY FOR BREACH OR ALLEGED BREACH OF ANY WARRANTY, EXPRESSED OR IMPLIED, MUST BE BROUGHT WITHIN ONE YEAR OF THE SALE OF THE KIT BY THE COMPANY OR THEREAFTER BE BARRED, THE PARTIES INTENDING TO SET A ONE-YEAR STATUTE OF LIMITATIONS, AS PERMITTED BY FLORIDA STATUTES 672. 725. IN NO EVENT SHALL THE BUYER BE ENTITLED TO DAMAGES GREATER THAN THE RETURN OF THE GOODS AND THE REPAYMENT BY THE COMPANY OF THE PURCHASE PRICE, IN THE EVENT THAT THE GOODS ARE PROVED TO BE DEFECTIVE.

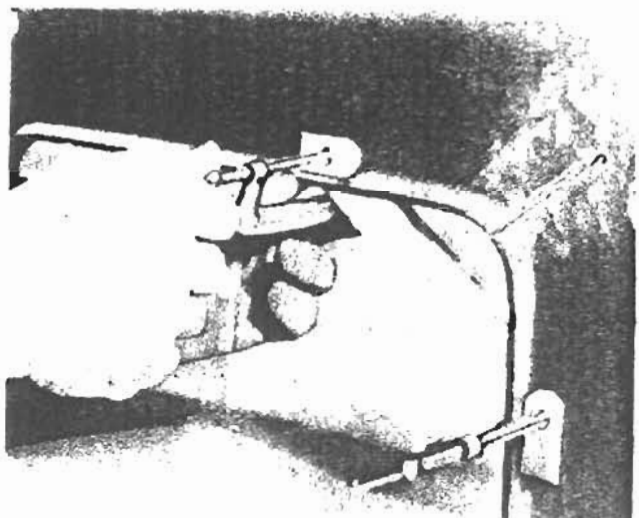
The right way to **repair fiberglass**

We hope that you never have an accident with your car, but in case you should damage it, it can easily be fixed and the repair will not be noticeable to anyone.

The following instructions are the newest "State of the art" from Owens/Corning Reinforced Plastics Laboratory and we think that by following them, your job will be equal to the best professional job that you could buy.



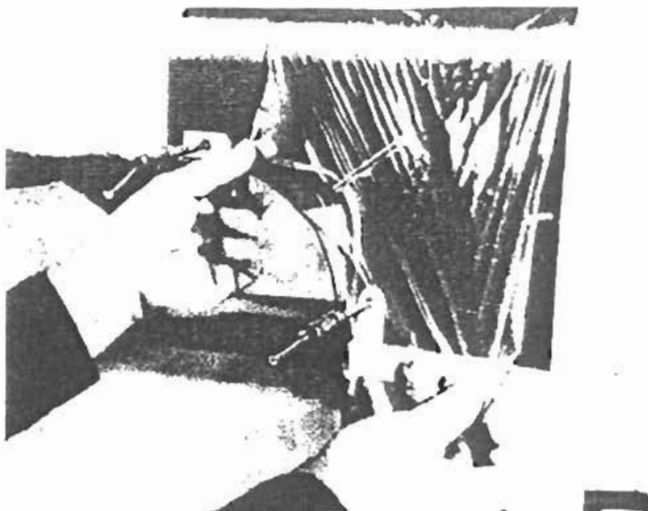
1 Run a saber saw or keyhole saw through the full length of the crack to clear out all flaked fiberglass and chipped resin. The crack should be at least $\frac{1}{8}$ -inch wide after you have completed this operation.



2 Realign the panel if necessary, by clamping a wooden brace across the panel. Generally, damage in the center of a panel will not cause alignment problems, but cracks near a panel edge may require realignment.



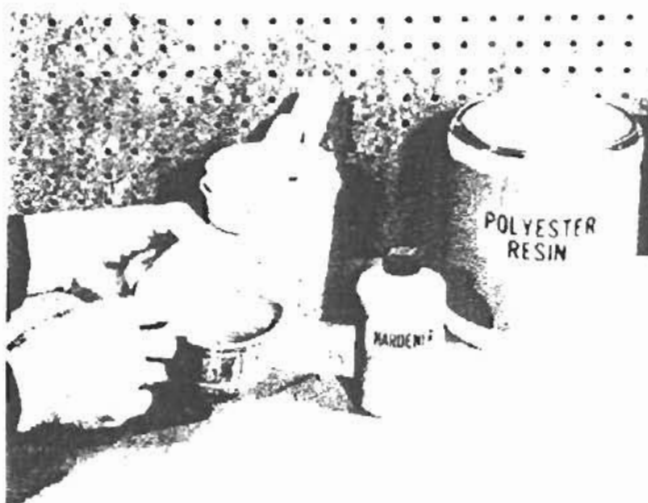
3 Mask off the undamaged area around the crack leaving about five inches of working space all around the damage. The masking will protect the undamaged area while you patch the damage and refinish.



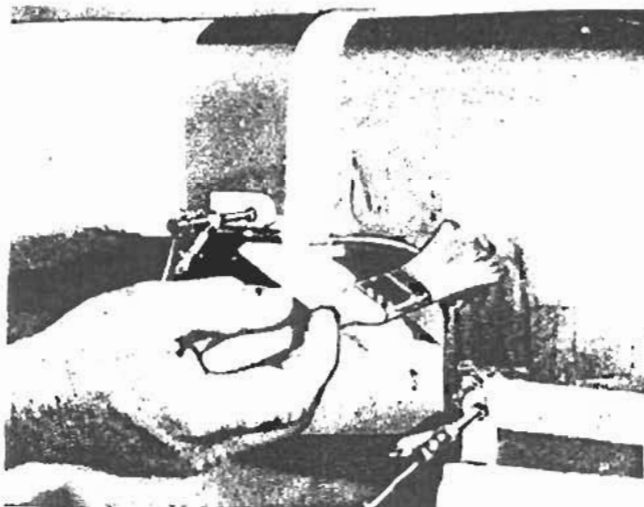
4 Cut a piece of plastic freezer wrap or cellophane large enough to extend three inches beyond the crack. Tape it over the area to be patched. This film lets you remove the patch you are about to lay up.



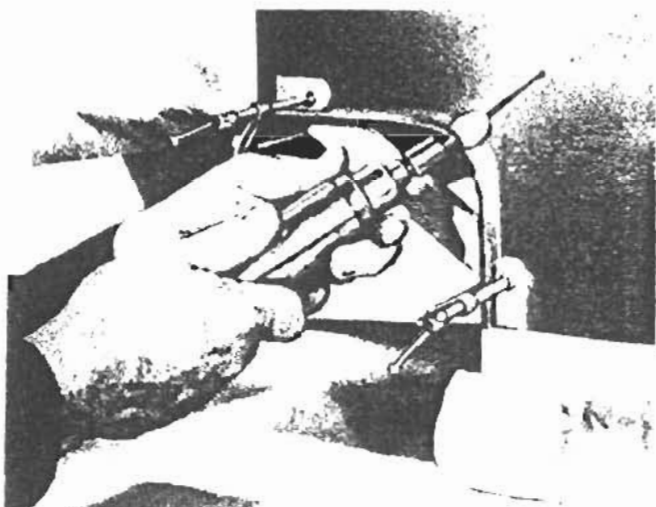
5 Using a cardboard template, cut enough glass mat to make the repair (see the table with this article). The mat should be sized to extend about two inches beyond the crack in all directions.



6 Mix up some polyester resin (available at auto and marine supply stores) according to the maker's instructions. You'll need enough resin mixed to cover the area being patched and to soak a layer of mat.



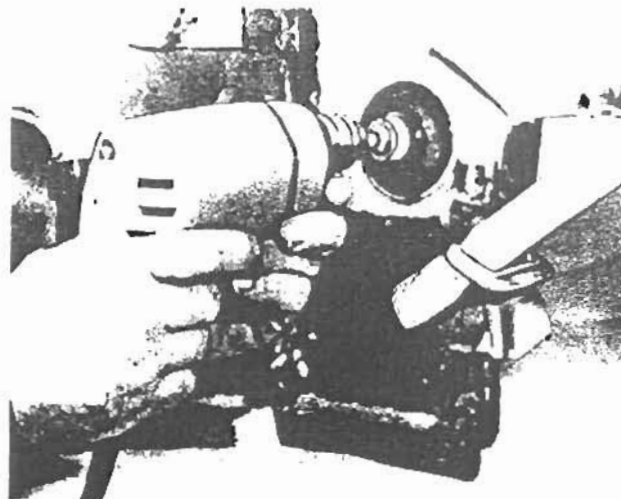
7 Brush some resin onto the plastic film. Then soak a layer of mat in resin and apply it over the repair area. Let set slightly, then mix fresh resin and lay up the remaining layers of mat over the first.



8 Remove this patch once it has set, and peel off the piece of plastic film. Set the backing patch aside. Using a grinder or file, taper the edges of the crack at an angle of no more than 45°.



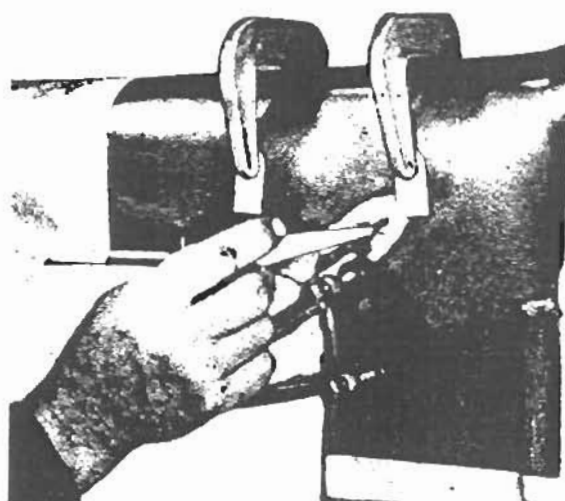
9 Sandpaper the repair area with 360-grit paper to remove flakey edges and to feather the painted surface back at least $\frac{1}{2}$ inch from the edge of the crack. Wipe the area carefully with a clean cloth.



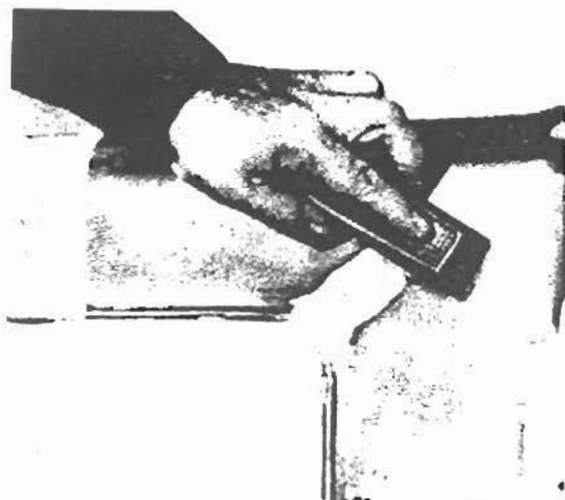
10 Sand the back side of the repair area with coarse paper (80-grit or lower) to roughen the surface for good adhesion. The roughened area should extend back about two inches from the edges of the crack.



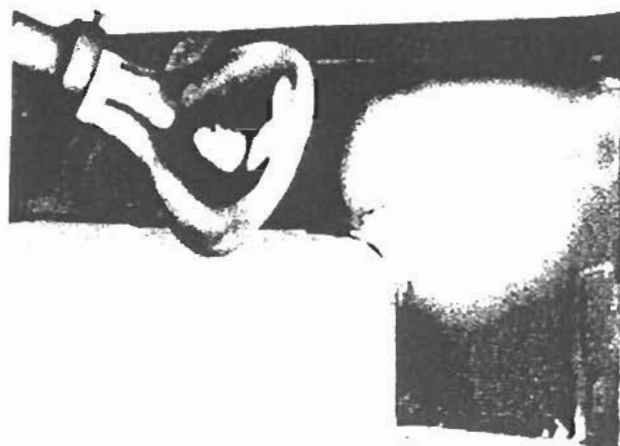
13 Mix epoxy adhesive according to instructions. Owens/Corning recommends 3M's 1751, Chell's Epon 828 with Versamid 125, Sherwin-Williams Kemak Celanese Epi-Rez with Epi-Cure 861-M, or Ren Plastics RP-1258.



14 Apply the epoxy to the back of the repair area and to the front of the patch. Clamp or screw the patch in place. If epoxy adhesive oozes out into the tapered crack, wipe or scrape it away before it sets up.



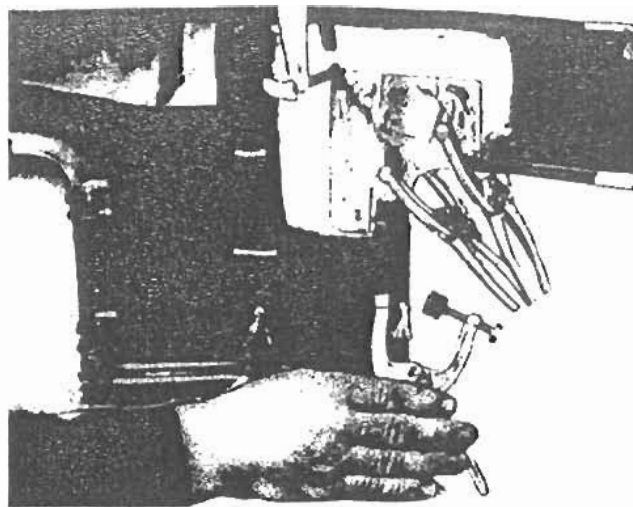
17 File off most of the excess filler when it has set firm to the touch. Leave the level of the filler slightly above that of the panel. Do not file it level with the panel—just get it smooth and near-level.



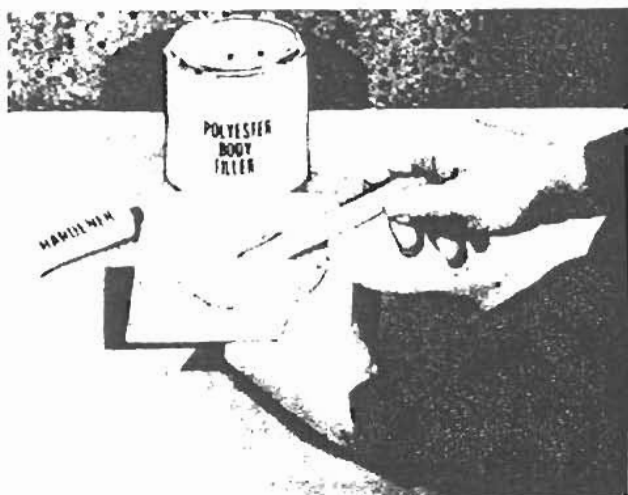
18 Pre-shrink the filler using a heat lamp or a heat gun. You'll need a temperature of at least 120° F for effective shrinking, but don't get the heat source too close (no less than a foot away).



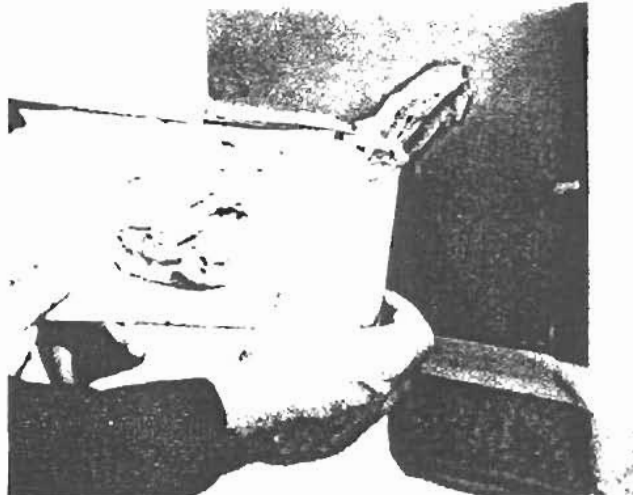
11 Sand the front surface of the backing patch you have made. This patch will be cemented to the back of the damaged area, so sand it for a smooth fit to the damaged area. Wipe the mating surfaces clean.



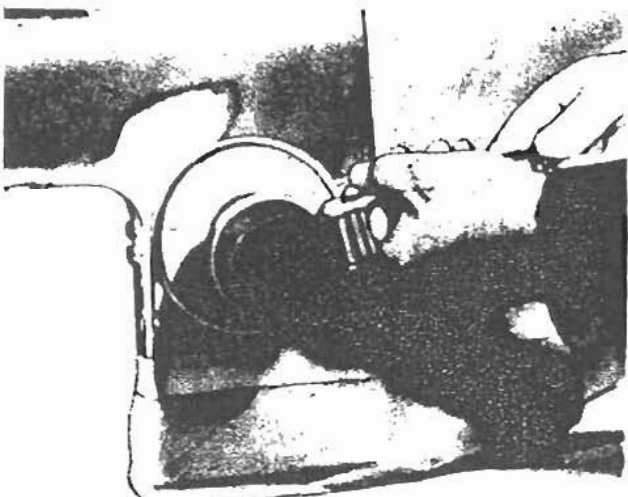
12 Check the sanded patch for a good fit to the back side of the damaged area. Determine the best way to hold the patch in place. Usually clamps will work near panel edges, self-tapping screws near the center.



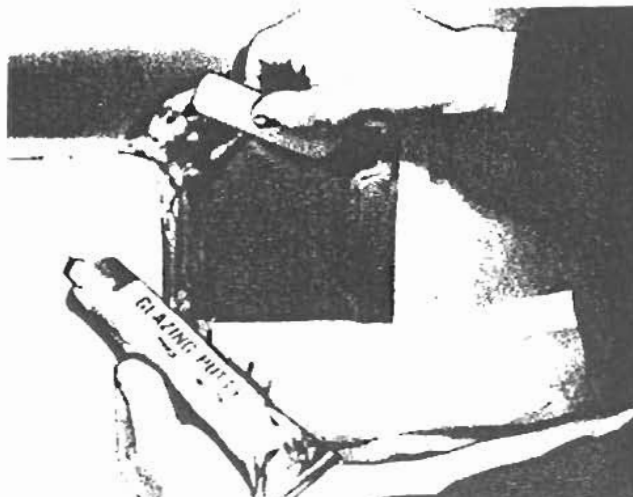
15 When patch has set, remove clamps or screws and resand the tapered edges of the crack with 360-grit paper. Mix up polyester body filler (auto stores sell it) on a nonporous surface such as a piece of glass or plastic.



16 Work the filler into the tapered crack. Use a putty knife or squeegee to press the filler into all voids. Apply the filler to a level above that of the surrounding panel. The filler will shrink below level if you don't.



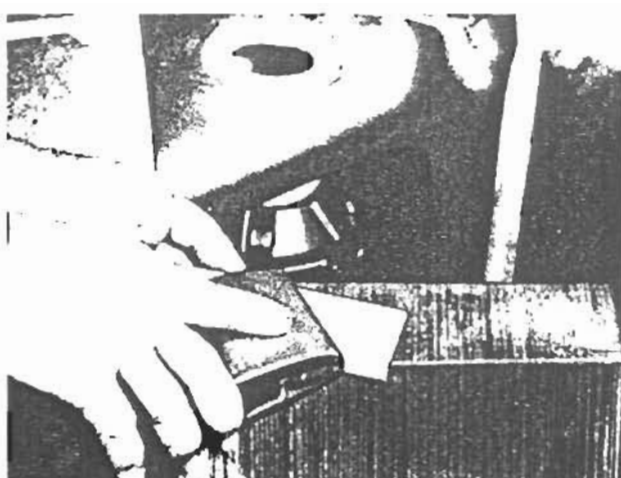
19 Power or hand sand the filler with 360 paper until it is smooth and level with the surface of the panel. If you hand sand, wrap the paper around a sanding block or a block of wood padded with felt or inner-tube rubber.



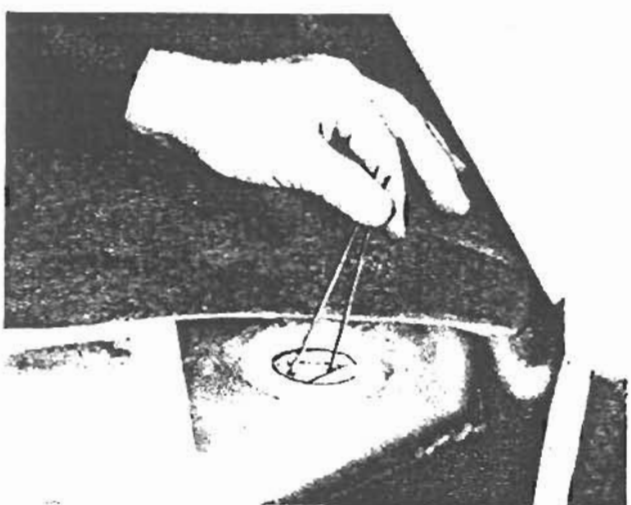
20 Fill any pinholes in the body filler with glazing putty (also sold at auto supply stores). Let dry, then hand sand with 360-grit paper on a sanding block. Spot prime with primer surface, then apply finish coats.



Prepare a backing patch as described in steps 4 to 8 above. Then prepare the damage as for a crack, cutting away flakey fiberglass. Reach through the hole and roughen the underside with 80-grit sandpaper.



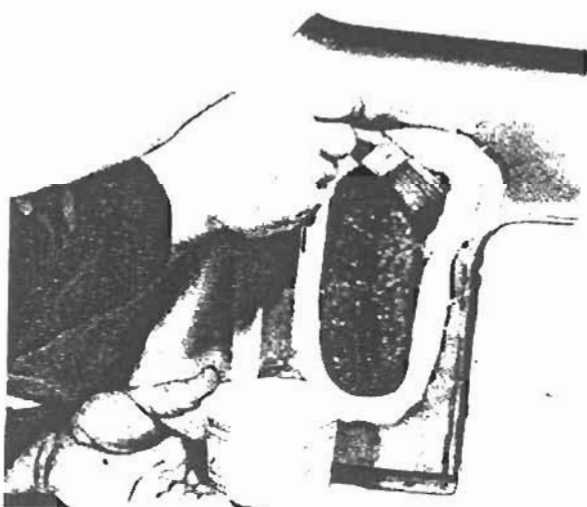
Rough-sand the backing patch with 80-grit paper. Drill a pair of holes through the patch and thread a length of wire through the holes. This wire will serve as a handle and will hold the patch while its cement sets.



Mix epoxy resin and apply to the underside of the panel and to the mating side of the backing patch. Slip the patch back through the hole and by gripping the wire, pull the patch up tight against the damaged panel.



Wrap the wires around a piece of wood and twist to pull the patch up tight while the cement sets. When the epoxy has set, remove the wires and finish as described in steps 16 to 20 in the preceding sequence.



On very large fractures you may have to lay up a layer or two of mat in the hole after the backing patch is in place. This mat is just to fill the hole, and it should set just below the level of the panel. Finish as above.

How much glass will you need?

Your backing patch must be as strong as the original material surrounding it, or the repair won't last. The table below tells you how much fiberglass mat you need to do the job.

Thickness of original laminate (in.)	Layers of glass mat
0.10	3 (1½ oz. mat)
0.11	3 (1½ oz. mat)
0.12	2 (1½ oz. mat) plus 1 (2 oz. mat)
0.13	1 (1 oz. mat) plus 2 (2 oz. mat)
0.14	3 (2 oz. mat)
0.17	2 (1½ oz. mat) plus 2 (2 oz. mat)

