

# GRANT'S ADVICE

## Rust Removal and Body Repairs by: GRANT LESOINE

**May/June 1989**

I was prompted to write this by what I found on a nice looking (from a distance) 71 or 72 E on a local used car lot plus what I found on my 67 S when I started what I thought would be some minor cosmetic restoration.

ANYWAY - LOOK FOR HIDDEN DAMAGE!

First the "E." I just had to stop and look at the bright and shiny red 1800. Even as I got close, it still looked good (new paint). I did notice a layer of fiberglass on the rocker panels with no attempt to even smooth it out. Then I opened the door. It scraped as it opened. At that point I decided to look at the jacking struts. There were NO jacking struts -- not even floor pan or rocker panel connections where they used to be. A crude plate had been welded across the hole in the main frame. I feel sorry for anyone who buys it and hits a bump hard. It is still restorable but sure needs a lot of work!!

On my 67, I thought that it needed jacking struts and some rocker panel covers. Then I removed the splash panel behind the driver's side front wheel -- it had some small holes in it. After shoveling out about a gallon of crud, I found the real problem. The main vertical frame member was holed. Did you know that six layers of metal come together there? They were all damaged. I started by cutting out the lower part of the quarter panel, then working my way in until I had removed all the bad metal. The bottom of the rocker panel was in poor shape in places, so I started the rebuild by inserting a roughly 1/2" x 1-1/4" steel channel (former door guide to a 'dishwasher). This was fastened at the ends where I still had good metal by high tensile bolts, then welded along its length where possible. I then fabricated sections to rebuild the various layers -- from both sides (18 gauge one-sided galvanized steel). These were all welded to the channel as well as together. I then finished the inside with one of Bob Stein's 16 gauge jacking struts and the outside with one of his rocker panel sections modified to close the quarter panel opening as well as the rocker panel.

The sheet metal work is well within the range of the home craftsman with a small break. The welding is more tricky and probably not suitable for the usual sputterbox -- even though you might try it with an Eastwood Stitchwelder. I did most of the sheet metal welding at 35 amps reversed current DC with a high frequency arc stabilizer using the 1/16" "Easy Strike" sheet metal rods recently introduced by MG Industries. I think it is now as stiff as when new. I also located mounting points for the replacement splash guard on both sides of the opening to make it stronger and tighter. I can now turn the car around and check the other side (narrow garage) but that is another story.

NOTE: In a recent newsletter someone referred to using latexbased rust converter in a restoration. My experience is that these leave a weak interlayer for your top coat, plus not being sandable. I recommend attacking the rust with a phosphoric acidbased rust converter such as Oxysolve or the du Pont metal conditioner system or even Navel Jelly. Then follow this with either an aggressive primer like POR 15 or a zinc rich primer such as Eastwood's "Cold Galvanizing Compound." This will allow you to use any finish with assurance that the rust has been contained. Follow the directions carefully with any of these.

NOTE 2: Someone was looking for the webbing used in the seats. I have just received a shipment of "Texweb" from The Woodworkers Store, 21801 Industrial Blvd., Rogers, MN 553749514. It is 2" wide, seems to be an exact match for the seat webbing, and costs \$1 per foot. I have not had a chance to install it yet - that can also be another story.

## **November/December 1989**

### TIPS AND EXPERIENCES

Let one start with a comment on the letter from Bob Foltz in the recent issue. His offer of 35 floor plugs for \$2 is a good buy. When he runs out, you can get them from hobby supply houses. They are used to stop salt shakers, banks and various toys. For example, Meisel Hardware (P.O. Box 70, Mound, MN 55364) sells 3/4" plugs (tight fit for the floor holes) for \$1.69 for 10 and 1" plugs (perfect fit for the, inside rocker panel holes) for \$2.49 for 10. they do have a minimum order, but I had no trouble reaching it.

Next, let me reinforce the comments of Paul Provencher in the MAY-JUN issue about the splash panels. Not realizing that mine had been penetrated during the winter caused a good deal of the work I am now doing in restoring my 67S. I am not happy with the single side mount for the panel either. Mounts on both sides will make a tighter seal. Also, the bottom mount was in bad shape. My solution to replacing and adding new mounting tabs was to glue them in place. I preformed and fit the new tabs. Cleaned them well and coated them with POR15 This is a cyano-acrylate and, as such, is related to the super glues. The tabs are solidly attached. (I coated the adhesive with acrylic enamel to protect it and also rustproofed the cavity inside with a commercial rustproofing compound.) Have not replaced the splash panels as yet, but when I do, I plan to use fiberglass so it will not rust out again.

This may not be on an 1800, but I also found another use for the POR-15. My daughter's 79 242 was losing a lot of power steering fluid -what a mess, all over the engine compartment caused some secondary damage too to rubber parts. Anyway, two different garages out in Indiana, where she was attending college, were not able to fix the problem - one of them quite expensively. When she got the car home, I discovered that the leak was from the pump housing, apparently the rolled seal. I cleaned the area well, sanded it, and gave it two coats of POR15 followed by a coat of enamel. It has not leaked since.

Incidentally, on the trip out there to attend her graduation, I blew a 15-month-old radiator hose on my 77 245 driver. Since I carry belts, hoses, etc., it was only a short pause to change it at a rest area. It is a small investment to carry them and they have come in handy several times.

Finally back to the reason I am in this club. The 1800. Since my last letter, I have finished the body and mechanical rebuild on the driver's side. The body is in primer/sealer but must still be bored, sanded, etc. to get it ready for painting. On the mechanical side, I replaced all the rubber bushings, tie rods and ends, ball joints, shocks, etc.; rebuilt the brakes and cleaned derusted and painted all the running gear (du Pont Certron acrylic enamel - Jet Black). I have not reinstalled the brakes as I will refill the system all at once when the other side is done. All hoses and outside tubing are being replaced.

I hit one complication with the body. The inside of the rear wheel wells looked in good condition until I removed the undercoating and some paint. Then I found that part of the fender to body seam had rusted internally. Not enough to weaken it significantly mechanically, but enough so that it had to be fixed. I decided to use some modern chemistry. Yes, I am a chemist. Hence, my trust in the materials. I cleaned

the area top and bottom with a mechanical wire brush, degreased it, finishing up with spray cans of carb cleaner - a good method for hard to reach areas. When this was dry, I coated both sides with POR-15. (No, I don't work for POR-15.) Just before this lost its tack, I embedded a strip of fiberglass mesh in the POR-15 and -coated it lightly with polyester resin. When this had hardened, I had a porous but stiff mesh over the whole area. Where there were voids in the metal, the fiberglass made a base for the next coat. (If I had had large holes in the metal, I would have used fiberglass mat and treated it like a normal fiberglass repair - or stood on my head and welded in metal.) For the next coat, I used what we call kitty hair Bond - actually Permatex fiberglass reinforced filler. This stuff is tough and it sticks well. A layer of this on each side was followed by rough shaping and a layer of the topcoating type. The seam is now encapsulated in plastic. In effect, it has a plastic wear layer on the underside over the tire. The underside has since been primed and painted the final car color, and the car turned around so I can do the other side next.

I am sure the other side will also give me a few new challenges. If not, I have just made an offer on a 72E that needs much the same treatment.

## **January/February 1990**

### **FENDER SPLASH GUARD TROUBLE?**

I see someone else has also had trouble with the fender splash guards (Nat Smith Houston). My suggestion is, if you do not want to go to all the trouble I did (see last issue), remove the guard, fix or replace it, and coat the area behind it with a good rustproofing. The Permatex product in spray cans goes on well and seems very similar to the professional product I use in my rustproofing guns. Also, inside on the A pillar, you will find a plug. It is a good practice to remove this and give the inside a good coat of rustproofing. Inner panel rustproofers are also available in spray cans but harder to find. Coating the new guard with the rustproofer (both sides) is also a good move. (I recently noticed that the front ends of our 244 and 245 were showing some rust. So after cleaning up the rust, I went over the area with the Permatex product. Don't get in on the shaft of the shock. Seems to be holding up well.)

Recently a friend of mine, who also has several Volvos, had to replace some front bushings on a 145. He was unable to get the old ones out and went to his local gas station where they attacked them with a torch. I seem to remember that someone in a recent issue of the mag also used a torch. I do NOT recommend applying a torch to running gear. Too easy to take the temper out of the steel. It is not hard to cut them out. In fact, the worse shape the rubber is in, the easier they come out. When I replaced the ones in the A arms of the 18005, I removed the arm from the car. Then I took a drill bit about the size of the rubber of the bushing I planned to replace. A series of holes was drilled through the rubber. I then put a saber saw with a medium blade in the holes and cut the remaining rubber. If the rubber is bad, as my 1800's was, it will cut very easily. If it grabs, the rubber is still good--wrong time to find out about it, of course. This removes the rubber bushing and the center steel sleeve. Any remaining rubber is easily cleaned out. Next I slit the outer steel sleeve with a metal cutting blade. Since you will probably nick the arm, cut towards the thick portion, not the thin web. A fine (1/4") cold chisel can now be driven between the arm and the sleeve at the cut and break it free. In only one case did I have to really fight with it. Next clean up the arm and smooth up any nicks, etc., coat it with oil or antiseize compound and press in the new bushings. I buffed mine with a porting tool.

I would like to add one thing to Bob Stein's suggestion for drilling out a window hinge pin. I recently had to do the same thing to a door hinge pin; also started with a 1/8" bit. I found that the standard steel bits did not want to drill out the pin easily or straight. I went to a cobalt steel bit, which I had purchased for some hard stainless steel. It did the job much better.

As for my project, I found a loose right front bumper attachment turned out to be a rust damaged right front frame section. I cut off the front splash pan (to the bumper holes) and also cut out the complete front plate of the front crossframe. Luckily the only damage was to the front of the main frame and that near the bottom. I made a part of 16g galvanized steel (left over from one of Bob Stein's rocker panels) that just fit inside and went around the bumper nut that was loose. A series of holes was drilled in the side of the frame, the new part was riveted in place and welded in through the holes. The nut was also welded onto it.

Then two small pieces of angle were welded to each side of the bottom of the frame for support --sized to line up with the depression in the frame member. Finally, a piece of 18g was formed to cover the outside to hide the holes and give additional support. All five bolts go through this piece. It has also been welded into the crossframe member. Everything has been rustproofed using holes that I left in the new parts. Tonight I will weld the splash panel back into place. Then onto the passenger's side frame - but that will be another story.

It does not look like I am going to get the 72E I have been bargaining for. But as the end of the current project gets in sight, I am looking for another project car. Have made an offer on another 67 which only needs engine work to run, but that is not the project I mean.

## **May/June 1990**

### **PROJECT PROGRESSION, ETC.**

Hi: Before I continue the saga of the 67 restoration, let me make a couple of plugs. The first is for Bob Foltz's Tech Articles reprint. I had a chance to see it at the recent 'holiday party of the Hudson Valley Volvo Club. It is very well done and will be useful for any of us who work on our own cars. I sent in my deposit the next day. The second is for Hemp's getting on the bandwagon against the use of latex (water based) rust converters (Hemp's Hints, last issue). I am not sure the problem is because they are water based, for the metal conditioners and converters that you should use before refinishing steel are also water based (based on phosphoric acid mostly). With good rust eaters like Oxysolv available, I can see no reason to use the latex types. I am not familiar with his primers, but I would like to tell you about an experiment that a friend of mine is running with POR-15. Two years ago he coated half a piece of steel with POR-15 and put it into a jar of salt water. The coated side looks like it did when coated. The uncoated side is rusted away. My experience with the latex converters, on the other hand, has been adhesion failure and more rusting.

On my project, there has been a diversion from the reconstruction of the '67. We now have his and her's 18005. Her's is a 71E I bought on New Year's Day. It has spent a lot of its life in California so I do not have to fight major rust damage. The car even had a San Francisco parking ticket under the seat. It is VIN 184353-037538. Since there is a VSA sticker in the window, you probably know more about it than I do. It has seemed like late Christmas around here as packages have been arriving for the restoration. I already have boxes from Don Thibault, Duane Matejka, Bob Stein, JC Whitney and Woodworkers Supply. The latter the Texweb for the seats. This time I bought a full roll, which puts the price at 80d/foot, and split it with a friend who is working on a 122. One note on the webbing. It should be mounted with fairly light tension. I was lucky as I found a piece of each size on the 67 that were in good condition and used them for a pattern. I then made one of each, tried them, made the rest a little tighter and installed them. (I have only done the seat bottoms of the 71 to date, but I just got a supply of aluminum pop rivets with backing washers for the backs.)

Work to date on the 71 besides the webbing has only been removing paint and Bondo -- and I mean removing Bondo. I have never seen so much of it. The car had been hit in the tail -- looks like the trailer may have come loose from the ball and the tongue acted like a battering ram until the car was stopped -- it had a trailer hitch, which I cut off. Anyway there had been no effort to fix the dents -- just fill them up. It took me less than an hour to remove the larger ones with a hydraulic jack. I am now in the process of smoothing the large ones and removing the small ones with hammer and dolly. It is going so well that I cannot figure why it was not done before. I also found Bondo on the left rear fender. Similar problem A minor crease and some dents. It looks like an attempt may have been made to help the dents but not very successfully. There are some marks as if a torch had been used. Also one area had been drilled and pulled even though it was reachable from the rear: The crease was just filled. I also found some metal pieces brazed in near the wheel wells and below the rear bumper. Nice neat brazing but it was not ground down - - just lots of Bondo?? I give up! A clear case of slap-dash body work. Anyway I am in the process of going over the whole car. Then I will repaint it. It 'was originally gold. At sometime it was repainted a dark metallic gray -- a real good paint job, too--inside all openings, in the trunk, under the hood, etc. -- even stained the door panels black. Since the rear trim had paint on it as well as under it, I could tell the repairs had happened after the repaint job. We will paint it Guards Red. The interior is the real challenge. It needs everything. Joan came home with three cowhides in a deep maroon, so soon you will hear the story of the new seats. Will also be doing the dash and door panels. Hope to have it ready for summer. I am going to replace the clutch and go over the brakes next. Then at least Joan can drive it as I work on it. (It already has one of the 67'5 seats in it.)

Now back to the 67. Before it was pushed out under the deck, I had finished all the structural welding and repairs. It still needs some cosmetic work before I paint it. The first problem was the right "A" pillar. It was missing about the bottom 2" inside along with the total inside rocker panel and some floor. In order to strengthen the bottom of the rocker area before I started repairs, I made a Z shaped length of 16 ga steel and slipped it into the (now) opening between the rockers and the fender. This was welded to the good remaining metal and serves as a base for the rest of the work. Next I made a section for the bottom of the A pillar from 19 ga steel. This was originally a hat section in shape. I added more welding tabs including a bottom tab that I bent to go over the Z section. The top overlapped the original pillar by about 2". I drilled two rows of welding holes in it (about 12 holes) and welded it to the pillar. The bottom was edge welded and three high-tensile bolts were inserted through it and into the Z section. Tightened to 20 ft lbs. -- does not sound like a lot, but it is spec for 5/16 bolts.

Next I made a section to repair the inner rocker panel. After cutting out the bad metal, I needed over a foot of replacement. This was a flat section except for bending it over the Z section for stiffening. I made a 3/4" x 3/4" angle of the same 19 ga material and spot welded it to the inner rocker panel (Eastwood single sided spot welder) to support the replacement floor pan. Then I also made a roughly 4" x 4" angle the width of the -jacking strut and spot welded it on to reinforce the area where the new strut would go. Finally, the new inner rocker section was drilled and welded into place. The next repair was the main frame section where the jacking strut attaches. The outer side and half of the bottom of this was gone. I cut out about a foot of the bad. Then I took one of Bob Stein's frame sections and cut out a piece to fit. It was designed to go into the frame to the rear and fit against the remaining original material to the front. I allowed about 1/2" overlap on each end. If I do it again, I will allow more. The new part was drilled for welding to the front and the original to the rear (so that the holes are on top) then it was welded in place. Finally, one of Bob's jacking struts was welded in between. That section of the car is as solid as new!

The last repair was to the rear crossmember. The inner rocker panel here and about the end 4" of the crossmember were gone. I welded a scrap from the frame section to replace the rocker panel. I then cut the second half of one of Bob's rear crossmember sections to fit over the original section after cutting out the bad metal. Here I allowed about 4" of overlap. It only took some minor bending to the top flange to get the new part to fit over the old. I drilled two rows of weld holes about 1-1/2" apart on the overlap structural welding, not just tacking on sheet metal. The same basic rule applies as for bolting two parts, together. "To get equivalent strength to the original, your bolts or welds must have an equal cross sectional area of metal to the original." This is not considering stress concentrations, bending moments, etc. Therefore, I used the double rows of welds plus edge welding. The enclosed photo shows them.

Finally, before rolling out the car, I replaced a section of outer rocker panel and repaired the floor pan. All the welds were cleaned and primed with Eastwood's cold galvanizing compound. Now to get the E on the road so I can get back to it.

I notice that we are having a March event at Eastwood. I have given them several plugs. I find them not inexpensive, but a good house to do business with. I even gave my new Eastwood shrinking dolly a workout on the fender I mentioned. It worked well.

## **July/August 1990**

### **ANOTHER UPDATE!**

Well, it's time for a project update. I guess 'that my hopes to get the 71E on the road this month are gone, but maybe June. Anyway, let me make a couple of comments before I continue:

1. I have recently run into two people who thought that the only purpose of the jacking struts is to put the jack on when changing a tire, etc. Therefore, they were not concerned with rusted out struts. I hope no one else has the same misconception. They are an integral part of the chassis stiffness system. When gone, they can lead to body sag, cracked windshields, stiff doors and worse.
- 2, My friend, who drives the 122, fought a front end clunk for several months. Nothing that either of us could think of or find in our references solved the problem. Then he noticed when going down a steep rough hill, he did not get the clunks when the brakes were applied. Yes, the right caliper was loose. A wrench and a little locktight and the problem was gone.

Now, back to the E. - The back is all red now, the trunk lid has been put back on, but the lock and gas filler cap, trim, etc. are still to go. It looks fairly good with two coats of primer surfacer and two coats of primer sealer followed by two coats of duPont Certron acrylic enamel. Very few spots to buff out. (Some day I hope to give it another coat or two all at once, but for now, it will be a section at a time.)

The surprises were up front. I noticed a section of cracked Bondo under the left headlight. After stripping, I found that the splash panel had been replaced. On the passenger's side, they did a good job. But on the driver's side, they had cut beside the old seam and tacked the new section on. Of course it was too big to fit, so they left it stick out 3/8" and filed the gap with Bondo?? They also did not prime or treat the weld inside so it was rusty. I cut out the whole seam and welded in a new section. I also had to do some welding and straightening around the headlight mount.

Finally, the area under the grill was not straight so I had to break several brazes and straighten that out too. It is now ready to reweld this weekend afraid we will not make Carlisle, too much to do. With good weather, the next section of paint will also go on doors, jambs and rocker panels. I found rust under the door locks when I removed them that did not show at all from the top; it pays to take all the hardware off when refinishing. On the positive side, the inner rocker panels have been repaired, the jacking struts replaced along with one frame section and some floor pan repairs completed. At least on this car, no inner repairs were required on the A pillars, etc. This is all in primer (Eastwood cold galvanizing compound) awaiting the seam sealer, etc. I am actually writing this while waiting for glazing compound to harden on the headlight area before final sanding to 150 grit. The Eastwood curvature sander is a very handy tool for all the compound curves on the 1800.

The rear bumper had two good dents in it where I think a trailer tongue hit it. To remove them, I disassembled the bumper and put the dented end sections in the shop press with a bar of metal inside pressing onto a heavy metal plate. The dents came out so well that you have to look carefully to see where they were. The rubber strips hide the few pressing marks nicely. I am going to try a similar technique on the trim only using soft wood for the forms.

The car has been treated to three new Gislaveds, and those boxes of parts are still waiting for installation. I may actually start the clutch and front end work next week. I hope I don't get more surprises. Then comes the interior. Leather seats are new for us. The new industrial sewing machine is ready and waiting and I will let you know how we make out. We will also be redoing the door panels in leather. Have not decided yet what to do with the dash top.

## **November/December 1990**

### **GENERAL TIPS**

Most of my tips and suggestions have been in the areas of body work, welding, etc. that would only interest the more advanced hobbyists. (And I have enjoyed the calls from several members who wanted more details.) This time I will go into an area of more general interest: what I used to get the Lady Bug ready for the trip to the Falls. Getting it ready involved replacing the trim, interior, lights, etc. Here's the breakdown.

Hot Melt Glue Gun - probably the handiest tool for reinstalling the interior panels. Where the fiberboard has split, the seam can be filled with the hot melt, held a few minutes and it is repaired. I also used it around the openings for the retaining clips. It was used to refasten the vinyl to the boards too. As a final step, I used it to fasten a polyethylene liner to the panels for moisture protection. In one case, I repaired a slit in the vinyl by spreading the seam, putting the gun tip inside, laying a bead of glue and shutting it with my finger.

Double-Sided Tape - used for holding the carpeting in place. I also put it under the metal trim in an attempt to keep moisture out.

Pop Rivet Tool - used to mount the door glass wipers and trim back on. Also had many previous uses for sheet metal prep.

Electrical Compression Fitting Pliers the new tail lights had the bullet connectors. All the old lights had the spade connectors. In either case the tool and a supply of the various connectors is a must for restoring the lights. Also handy for installing radios, etc. NOTE: the spade fittings come in two sizes.

Silicon Spray - for lubricating the door weather strip if you are replacing it; also for inserting the vinyl strips into the IPD and other new side moldings.

Weather Strip Cement - for holding the new or old - rubber weather strips in place. Bob Stein gives detailed instructions for installing the new trunk lid weather strip. I just glued it in place and it seems to work well.

Shoe Goo - a thick, sticky glue originally intended to repair sneakers. I used it for some of the repairs to the inside panels when you need something that dries more slowly than the hot melt.. Also used for electrical insulation, filling holes, etc.

Vinyl Repair Iron and Plastisols - I'm sure you have seen these things advertised for repairing vinyl. They look like a small soldering iron with a tip the shape of a quarter. They come with a selection of graining papers and various colors of plastisols. You put the plastisol on the split or tear, cover it with the graining paper and melt it together with the hot iron. Yes, it works - with limitations. Can you make an invisible repair? I doubt it, but with care (and carefully following the directions) you can repair vinyl. I find that the plastisol is properly heated, just where the graining paper scorches.

The graining paper must be left in place until the seam has cooled. Luckily I only had to work with black. Trip Screw and Washer Assortment - Before starting the assembly I had purchased one of the commercial kits of stainless steel trim screws and trim washers. Highly recommended, as the original screws come in various sizes and are probably no longer useful. Of course you can always just buy the sizes you need from the local hardware store.

Heavy Scissors - for cutting carpet. At the last minute we purchased a 6'x61 piece of "car carpet" from a local carpet store. Cut off a 2' strip. Then cut the remainder in half. Finally we stuffed the long piece behind the seats and the more square pieces at each footwell. Then we each got on a side of the car and cut to fit. Some doublesided tape to hold it and it looks fairly good. (Over the winter we plan to make carpets to fit using the originals as patterns, but for a last minute "fix" this worked well.) '

Door Panel Removal Tool - looks like a screwdriver with a split end. You insert it under the edge of the panel until you feel a fastener, then pop it out. Actually you needed this when you first took the interior out, but considering the number of times I had the door panels on and off, it is also needed for reinstalling. (The door panels of the Lady Bug are in bad shape, so I used the ones from my 67 and the holes are not all in the same location. I actually had to drill a hole in each and use a trim screw to hold them in place. So, I guess a drill and bits are also useful.)

The other thing you need to replace interiors and trim is time. It took much longer than I had anticipated and it cannot be rushed. It will all be redone over the winter as we refurbish the original parts.

## JOAN'S LADY BUG

The saga of the Lady Bug, as Joan's 71E has been dubbed, continues. She is now all red -- bright "Guards" red -- apologies to Porsche. Don't look too close or you'll see that she was painted at four different times. A job for later is to remove all the trim, etc. again, color sand it, and give it a total spray in a cleaner room than I have. For now she is about ready to drive to the Falls, even if not ready to show. Tomorrow I will renew the registration and then spend what time I have this week installing interior parts from my 67 where the 71's need to be reworked.

There may not be many tips in this part of the job, but there is a warning! I was not very surprised to find the slap-dash body work under the previous repaint, as the motivation of most body shops seems to be 'get the job out the door.' However, I was not prepared for the absolutely incompetent mechanical work I found under the car. When changing the clutch, I found only the bottom two of the four Allen head bolts that hold the trans onto the bell housing were in place. Yes, the top ones are a little awkward to get to, but there is no excuse for leaving them out. It could easily cause a cracked bell housing - or worse. I replaced them all with grade 8 standard cap screws. Since the previous worker had not replaced the clutch - and it needed it I wonder what they worked on. Maybe I now have a botched-up rear oil seal?? Time will tell.

Unfortunately, this is not all. The rear brake pads were worn unevenly, so I decided to tear them down and see what was wrong. The driver's side had a frozen caliper, which probably caused the uneven wear, but the real surprise was that the rotor had been turned 50 thousandths below spec. It was a recent turning, too, as the surface was still in good condition. Onto the passenger side. Here the rotor was pitted and needed turning, but it was only 10 thousandths above minimum, so it also had to be replaced. The next surprise! The lower bolt on the caliper came out very easily. IT WAS COURSE THREAD BOLT, which had been forced into the fine threads on the car. Luckily it was a soft bolt so I was able to run a tap into the hole, clean the threads and install the proper one. I am saving the bolt for some kind of a "what if" collection. I do not know how to tell you to identify the kind of person who would do that kind of work, but they are out there. I wonder what I'll find next? Anyway, with two new rotors, a new caliper and the handbrake shoes adjusted ....for the first time (the adjusters were on dead minimum, only the cable had been tightened) ...we have confident feeling brakes again.

I have little to offer in the form of suggestions on replacing trim, lights, etc. except that it takes time. I am using double sided adhesive tape under the trim. It is both a dirt seal and an additional support. It comes in various thicknesses so select the proper one for the application. Joan even cut up small pieces and filled the V O L V O letters across the trunk. I'll let you know how my refinishing of the emblems turns out as soon as I complete the job.

## January/February 1991

### GAS TANK CLEANING AND COATING

This month's topic was totally unplanned but I guess that is common with the age of our cars. I knew that at some point in the restoration, I would have to do something with the 67' since it had sat drained but not sealed for about 10 years, but the, job on the Lady Bug (Joan's 71E for those who have not been following this continuing saga) caught me by surprise.

On the way back from the Falls, the Lady Bug had been performing well considering that I had not even had time to complete a full tuneup. Then about 10 miles past Bob Stein's place coming down Rt. 17, it started to sputter. For the rest of the way home it ran like it was really starved. I had to run one gear lower to complete the last 40 or so miles. The next day I called Duane and told him of the problem. He immediately asked if I had used octain booster. I told him that I had. The car ran much better up the hills with it too. He then explained that it had probably loosened up all sorts of crud in the gas tank and plugged the fuel filter.

I took off the fuel line going into the fuel filter and let the filter drain into a glass. Needless to say, all sorts of rust, etc. came out. That meant that I had a job to do now. I ordered two pints of Eastwood gas tank cleaner and a gallon of their sealer.

The directions for the cleaner tell you to pour it into the tank, seal the openings and run it around until all the surfaces are wet. NOTE: VOLVO tanks have baffles so you must be sure to coat both sides of them. I started with the tank from the 67S since it was out of the car. I poured in the cleaner and started to slosh it around. Soon it stopped sloshing. I shook harder and it sounded like sand running around the tank. The cleaner had loosened a lot of material from the walls of the tank. I continued to run this around the tank and let it sit for the specified time to react. Then I ran the garden hose in the level sender hole and let it run out of the filler hole. It looked like rust for awhile, then ran clean. This had not completely cleaned the tank since I could still see rust in the sender hole. After it had dried, I poured in a second pint of cleaner. This time it sloshed like it should. I let it react much longer than the half hour they suggest. I let a puddle sit on a rusty spot on the bottom of the tank where condensate had apparently sat until it looked clean. This was done over several days. Then I drained it out and dried it by letting a hot air gun run into the filler spout. There was one small pin hole in the bad spot on the bottom, but the rest of the metal seemed sound. I put a selftapping screw into the hole before coating the tank.

The Eastwood coating is applied much like the cleaner. You pour two quarts into the tank, run it all around, then open it so it can partly dry, leaving the puddle in the tank. This is repeated several times. They specified 3, I did more. Finally you leave it air dry. I used the heat gun a little. You do not want to damage the coating with the hot air. Also the solvent is highly flammable. Again, I let them dry for several days before reinstalling. The tank from the Lady Bug was much easier than the one from the 67 as it showed no rust and had no pin holes. It went much as the directions on the cans led you to expect. I coated the outside of the bottom of the 67'9 tank with 2 coats of POR 15, sealing in the screws, sealed the tank openings and set it back into the car. The Lady Bug's has been reinstalled and is back in use, of course with a new fuel filter.

The tanks come out and go back into the 1800 easily. The only real problem I had was with the rubber gasket around the filler neck. I still do not have it on right on the 71. For sealing the holes in the tanks prior to treating, I used aluminum foil held on with masking tape. I had to make a new sender gasket for the Lady Bug, and I have a new sender from Duane for the 67. The Eastwood directions are brief but clear, and they work. The tanks must be dry before putting in the coating. I don't think anyone who works on cars should have any trouble doing it. The gallon of sealer (\$50) did both tanks and I got enough back to do a third. If you have reason to expect a dirty tank, I recommend getting an extra pint of cleaner; I had to reorder in the middle of the job.

Now when I get done with some rust repairs on our drivers ('77 240), I'll get back to the restoration of the 1800.

## March/April 1991

### TIPS AND NEWS

I'm running a little late. That is also a good description of the Lady Bug project. Very little has happened for the last two months. On the other hand, our 244 and 245 now have renewed rocker panels and quarter panels, and I learned that there is a place in the rocker panels where you cannot reach with a rust-proofing gun from the wheelwells. You must remove the carpet and get to the inner spaces through the openings in the inside of the rockers. The same thing applies to the 1800s. All the inner spaces are accessible for rustproofing, but you must remove the inner plugs, the panels in the front wheelwells, and the interior side panels. I will make one suggestion on record keeping. I have been keeping a general log as I have been restoring the 1800s, but I have also been keeping a separate rustproofing log. As I finish a section, I rustproof the section. Then I put the details of that in the rustproof log. Later it is very easy to tell exactly what has and what has not been done.

Another tip from the 245. In the tech session at Niagara Falls, Bill Dougherty emphasized that only the bolt-on type of fuel hose clamp should be used on fuel injected cars as the typical worm gear clamp can damage the hose. I recently smelled gas after stopping my 245. When I looked under the ear, I found a loose damaged hose with one of the worm clamps. The latest JC Whitney catalog listed fuel injection hose clamps so I ordered a selection. I will report on how they work in the future. I will also replace all the hoses at the same time. It is probably even more important to use only high pressure hoses for FI. All the FI hose that I have used has a smooth inner layer. If you have single layer hose, it is probably not FI hose.

Someone in SEES suggested that you not jack up your 1800 with the jacking struts as they might fail and damage the ear. This is certainly good advice, but I would like to repeat what several of us have said in the past: "the jacking strut is NOT just for jacking up the car. It is an important member of the car frame." Without the stiffness of the strut the doors may sag or the windshield may break. Eventually the A pillar could collapse. My recommendation is to inspect the struts as much as the other frame members and replace them if they are not solid.

Those of you who watch Motorweek on public TV may have seen Pat Goss review a recommended list of tools for persons starting into auto restoration. I thought that it was a good list. I would only disagree on one point. He listed a 1/2 inch drive air wrench as a first tool to get. I confess that I did get an air wrench first and now almost never use it -- DO NOT EVEN THINK OF USING ONE ON MAG WHEELS! Much more useful is a 3/8 inch drive air ratchet wrench. It will reach into tight spots and run nuts off and on that are very hard to get to by hand. Even more useful is an impact screwdriver. The kind that you hit with a hammer. Removing the trim and the gas tanks from the 1800s would have been a much tougher job without an impact driver. The hammer blow drives the bit into the screw as it is turned giving much better hold than you can ever get any other way.

Now for the Lady Bug! I did get a chance to dig further into the FI system. The water temperature sensor looked corroded so I got a new one from Duane. I measured the resistance of the new one and the old one at room temperature and in boiling water. They were quite different. The new one was above the curve in the manual cold and below hot. The old one was the reverse. Since the place where they would have crossed the curve would be about the operating temperature, they are probably both OK. (They are based on thermistors which are not very precise devices.) I then removed the manifold pressure sensor and measured its resistances. They were right on the spec. Of course, this does not tell you if the core in it

moves or is stuck. I recently purchased a CO meter and I will check it out as soon as we get some better weather. I will also report on this later.

The main activity underway now is interior work. I am preparing to recover the arm rests and door bolsters with leather. So far I have removed the covers from the bolsters using a heat gun to soften the old vinyl and its adhesive. They came off easily. Since they are formed vinyl, they are of no use as patterns. First, I cut a paper pattern over the form. Then I cut out a cover of heavy cloth to the paper pattern. Joan then sewed the 3 short seams that will be necessary. Next the cloth cover was fitted to the form. A few adjustments were needed. I am about to redo the paper pattern and make another fabric cover. Only when I am satisfied with the fit will I cut the leather. Once I have patterns that fit, I will make them available to other club members who may wish to do the same job. The same pattern should work for leather, vinyl or upholstery fabrics.

I enjoyed Bob Stein's comments on the Sun Visors. Since I was unable to get the visors in the Lady Bug to come clean, I had thought about changing them. What I did was dye them black using Eastwood's vinyl and leather dye. It worked fine. I did replace the hooks for them with ones from my '75 parts car -they fit.

## **May/June 1991**

### **ARM BOLSTER PATTERN, ETC.**

Another two months have passed and very little has been done to get the Ladybug ready for the road when nice weather gets here. Our younger daughter is getting married in two weeks out in Indiana. It is amazing how much time it takes to plan a wedding long distance, plus several trips out. In fact, one more trip and my 77 245 driver will top 200,000 miles. A long way from Irv's 1800, but still going strong.

Anyway, some progress has been made. The pattern for the door arm bolster is finished, and a good trial sample has been made from upholstery weight laminated corduroy. This is about the same weight as the leather we will use on the car. If you use lightweight vinyl, as in Duane's arm rest covers, you would need to adjust the seams and the tuck. (This is a sew to fit pattern -- not heat shrink as in the original vinyl cover.) If anyone would like a copy to try, just let me know.

The Ladybug and the 67 also now have some more company in the drive. The latest is a 68 18005. It is complete, runs, but is rusty in about all the places that our cars are known to rust. It will be a longer term project. I will try to strip some paint, etch and prime and do some of the underbody welding this year just to halt further deterioration. The interior is in fairly good shape but is not original. The seats look like 144 seats, the steering wheel is from an "E", etc. It has a rear sway bar that is attached to the body sheet metal -- not IPD style to the trailing arms. I will leave it in, but will reinforce the attachment points. The previous owner had lost a 66 in a head-on crash and had bought this one to restore with the parts. He also has a 67 driver which needs some work, so he sold the 68. (Not a club member either.) I got all the remaining 66 parts with it, but he had sold the drivetrain. One of the parts was a set of good sunvisors. I was scrubbing them with soap and a brush and getting nowhere trying to restore their white color. There was a can of PARKS water washable paint remover where I was working. Figuring that I had nothing to lose, I tried it. IT WORKS!! The visors came out like new. It also works on the headliner, but do it out of the car. If you try another paint remover, try it in an out of the way spot first, but this one worked okay. No damage to the vinyl.

The J.C. Whitney FI hose clamps have also arrived. They are not very heavy duty, but they work well. The two sizes fit the 1800E and the two smaller hoses on the 240 series. They are too small for the 240 suction hose, but it is not a high pressure hose anyway.

Hemp, may I suggest that you use antiseize compound on your cables instead of axle grease. It sticks on better.

Bob Stein, I would love to see you follow-up your report on the sunvisors with one on the mirrors. I have found some carryover of mirror mounting hardware even when the mirrors are different. The Ladybug's mirror kept falling off. I discovered that one of the spring wires which holds it in place was missing. My 75 245 parts car had a different mirror mount, but the springs were the same. Therefore, the problem has been solved with the 75 part.

## **July/August 1991**

### **Progress Report**

Here it is report time again. There is only a little progress to report, but the Ladybug is running much better. Getting ready to drive her to Virginia. I finally got around to pulling the distributor and examining it. The shaft had about 3/16" of up and down play and you could open and close the points by pushing it to the side. A quick call to Duane and a new one was on the way. Needless to say, the car now runs much better, but still not as smooth as it should be. The other significant difference is in the appearance of the spark plugs. Before all plugs were wet and oily. Now none of the plugs are wet and only no. 3 is oily. This narrows my look for the next step which is to pull the valve cover and go over the valve train. At this point, I am prepared for any kind of surprise(s). The tip of the month then is -OIL YOUR DISTRIBUTOR! The lower oil fitting did not look like it had seen oil since the car was new. I have just learned that there are two types of the lower oil fittings. The Ladybug (71 E) and my 67S have a fitting that is turned around to open a hole for oil. The 68S that I just got has a hollow plug that is pulled from the distributor, filled with oil and reinserted. Maybe we could talk Bob Stein into doing a review of 1800 distributors?

Let me also cast one more vote for Duane's wiper post seals. The floor of the car was wet after each rain and I could not find the leak. I had the seals off during painting and they looked okay, but I had Duane send a pair of the new ones with the distributor. With both the new and old ones to compare, I could see that the old ones were distorted and not sealing properly. We have just had several hard showers and the floor is dry-a bargain price - \$12.75 for dry floors!

One other tip relates to why so little was done on the 1800s this period. I recently lost a rear oil seal on my '77 245 driver (@ 198,000 miles). In order to replace the oil seal you must also replace the bearing and bearing retainer. The manual states that if you don't have a shop press to remove the retainer, you should drill a 1/4" inch hole in it and break it off with a cold chisel. Well, my shop press would not budge it, so I tried to drill the hole. I keep a selection of specialty hardened cobalt bits for just such purposes - they would not touch the bearing keeper. I then went to the air driven cut off tool and cut both the retainer and the bearing almost all the way through. They came right off. The metal was so hard that I had to redress the edges of the chisel after splitting the parts. The cut off wheel is clearly the way to do it. Just be careful not to nick the axle. This also applies to 1800's with rear disc brakes

## September/October 1991

### The Ladybug Says...

Let me start with a couple of product reviews. First "BLACK AGAIN", a product that is advertised to clean, rejuvenate and protect exterior vinyl and rubber. The rejuvenate part caught my attention, so when it appeared in an IPD flyer, I ordered a bottle. I was a little surprised to find that the instructions call for weekly applications for 8-12 weeks. I had a set of 1800 rear quarter windows in the garage with the rubber stiff, badly oxidized and starting to show some small splits. I have been treating one of them each week for the last 8 weeks. The other I kept as a control. I can report that the treated one is darker in color, softer and generally looks much better than the untreated one. The small cracks are still there, but they do not show as much. This seems to be a winner, and I have started to put it on the outside rubber of all three 1800s.

I have recently had to do an extensive brake overhaul on Joan's '77 244. I usually have someone to help with the bleeding, but this time I didn't. This gave the opportunity to try two one person brake bleeder attachments. The first one was a hose with a one-way valve in the center. The idea is that the valve lets the brake fluid out when you pump the brakes, but not let air in when the piston retracts for the next stroke. There were a few adapters included. I found that none of the adapters fit the Volvo fittings, but that when I put the hose (which looked like clear vinyl - TYGON-tubing) over the fitting, it held. This worked for one brake fitting, then the brake fluid swelled up and lubricated the tubing so that it no longer held. A good concept, but poor product NOT RECOMMENDED. I then purchased a brake bleeder attachment for my "MITYVAC" hand vacuum pump. This was a collection jar with similar looking tubing, but a set of well made fittings for the wheel cylinders. One fitting fit well onto the Volvo valve. Here you hook the tubing to the wheel bleeder valve, then to the jar, then to the pump and suck out the fluid. In one case, I had to press the brake to start the flow, but the process worked well. It was also easy to see the condition of the fluid coming into the jar; this I RECOMMEND! It is somewhat expensive if you have buy the pump, but I find the pump very useful for testing all the vacuum attachments on the 240's etc

In Bob Foltz's column, last issue, he mentioned the oil filter experiment conducted by the Hudson Valley Volvo Club and that we did not have an IPD filter to test. I am happy to report that I found an IPD filter on the back of a shelf in my garage and gave it to Elaine for the test. Hopefully someone will report on it soon.

I would like to emphasize some comments made by Dennis Hultay in the same issue about water in compressed air when painting. I recommend a final water absorbing filter at the Eastwood (about \$8/ea.). They change color when saturated so you know it is time to change the filter. I just had one change while painting the heater of the Ladybug and the very last section painted had water marks. Luckily it was the inside bottom. (Don't forget to drain the water separator each time you use it too.) He did not mention it, but the acrylic enamel should be chemically cured for best results. DuPont 793S is the recommended hardener, but I find that 1050 WEET LOOK hardener from Supergrit works the same and sells for half the price of the DuPont product. (Supergrit, P.O. Box 4234 Gettysburg, PA 17325. Also a good source for sandpaper, tack clothes, and other body finish products.)

Now back to the Ladybug - Joan's '71 E for those who have not been following this story. I just installed the new heater control valve, refinishing the heater in the process. It would have been much simpler if one of the mounting studs had not broken off. I drilled it out and replaced it with a cap screw and a second nut. The gaskets in the heater were shot. Between the two sections of the heater, I used 3/8"

x 3/16" closed cell weather-stripping. Under the heater on the fire wall I used 1/8"x3/4" weatherstripping felt held down by weather-stripping cement. Duane is sending me some real hoses so that I can discard the 1/2" copper tubing and copper shut-off valve that the car came with. My real goal for Virginia is to get the a/c working. I took out the York compressor, got one of Bob Foltz's brackets and a Sankyo compressor out of a recent VW. Then I have to make a control unit for it as the original was removed by a previous owner. Will report next time.

## **November/December 1991**

### **TECH TIP**

My first tip may sound like a broken record, but I must remind the members to check the hoses, etc., under the hood. On several of the cars that I was judging there were hoses in bad shape. One had an almost collapsed vacuum hose going to the power brake booster. Another had hoses with split ends. There was a very nice CIS fuel injection conversion in an 1800E that used the low pressure worm screw clamps on the fuel injection hoses. This cost this car points, but more importantly- IT IS DANGEROUS! Fuel injection hoses should have the bolt type FI clamps - particularly the higher pressure CIS system. They are readily available from J.C. Whitney and others.

My next tip comes directly from last years' FI tech session. I recently had the fuel pump fuse blow in my 245 driver. Remembering from the session that the current draw of the fuel pump is about 5 amps, I put the ammeter on the pump when I returned home - it showed 15 amps. To double check my memory, I then checked Joan's 244 - 5 amps as it should be. Needless to say, I changed the fuel pump. The message is, if the fuel pump fuse blows on ANY FI car, check the current draw of the pump. If it is high, a new pump is indicated.

The news on the LADY BUG (Joan's '71 1800E) is mixed. The new distributor and general tune-up reduced the oil consumption from one quart per 1,000 miles to one pint. This is still unacceptable, so the engine will be pulled at the start of winter and sent to the shop for a total rebuild. This will give me a good opportunity to clean up the engine compartment, and get it ready to show.

The leather is all cut-finally-for the door panels, but we still have to do the installation. I guess it will be a winter project. The design for the new headliner is mounted full size to a wall, and Joan is looking for ultrasuede to make it from -another winter project! I have enough leather to cover the dash, so that will also be done.

The glass is all out, and the paint stripping has started on the '68S. At least I did not find any more holes in the body. I hope to get it inside and do the welding at the front of the body over the winter. The jacking struts, frame, etc. require rocking the car over to its side and must be done outside ...spring projects.

COMING EVENTS. . . The trip to Virginia convinced us that the Ladybug needs work on sound deadening. I have recently purchased two types of glue-on panel deadening compound and two types of foam-type sound deadening. I will report on the results in the future. Recently I acquired an Eastwood Stitchwelder. I got it to use as a more portable welder. I will report on it as soon as I compare it to my larger unit.

## March/April 1992

### Ladybug Update

I just came in from putting another coat of "Black Again" on the rear quarter window rubbers of the 68S and a spare set. The one that I had used in the test I reported a few months ago is still softer than the others, but they are gaining. I am pleased enough with the product that when I ordered a street grind cam for the Ladybug from IPD that I ordered another bottle.

One other item that has taken some of my time recently was a complete brake rebuild on Joan's 244. When replacing shoes, it is essential that the new shoes move freely but not loosely in the calipers. Since the new shoes are thicker than the old ones, they will be rubbing on a different section of the caliper. This area will probably be corroded. I take a fine file and clean it up. On the recent job, I had two new Repco pads that had a enough edge that also needed smoothing. This helps get squeal-free operation with the new pads. The Girling antisqueal strips - as sold by IPD and others, also help. They are much better than the anti-squeal goop that is widely advertised.

I have been cleaning up bumpers getting them ready for the platers. The ones from my original '67 were a pleasure as they only had one small ding. It took the bumpers from the '68 and two parts cars to get a set good enough for it. The Ladybug's bumpers will be off by the time this letter is printed, I will report on this later. Then the engine comes out of her, and goes to the shop for a complete winter overhaul.

There is now a fourth 1800 sitting in my drive. This one is another 67S, but in sad condition. I bought it for a good engine with Weber conversion and headers that canto into the '68. While not impossible to restore, I think it will be a parts car. If you open the driver's door, the complete left side of the car moves I(???) Jon, you say that we should never be surprised in what we find in these cars. Here is another good example for you I Someone had cut the front bumpers off with a torch at some time by burning off the welded in nuts - a real PRO! On the one section that I plan to use, I cut out the brackets with a cutoff wheel and will weld in a good set of brackets from a bad bumper section.

Bob Foltz recently gave me a good tip that I have not seen written up in his columns, so I will pass it along. At some time in its history, the Ladybug was hit in the front and the splash panel was replaced. (The sheet metal section below the grill that the bumpers pass through.) The new section is the 73 type, for the larger bumper brackets so that normal rubber seal does not fit. Bob told me that Volvo makes and still has a special rubber seal for that case. I have ordered and received them from my local dealer (Morehead Volvo). They will be installed when the bumpers go back on.

I have started to strip paint and bondo from the front of the 68. Hopefully, I will get it into the garage in a week or so-as soon as the floor is cleared of bumper parts. The bumpers for five 1800's take over in one garage. The first step will be to cut out the splash panel and repair the frame sections where the bumpers attach. Hopefully, I will be able to report real progress next time. I am also going to weld the hinges back into the hood. If this does not come out well, the hood from the second '67 will be used.

A recent issue of "Cars & Parts" reported that the two-part epoxy primer of PPG can be welded through and they recommended it for priming repair panels. I have been using Eastwoods cold galvanizing compound with good success, but since I can get the PPG locally, I am going to give it a try. I will report the results here.

**May/June 1992**

## LADYBUG REPORT

Let me start with what I got for Christmas. The first is the Moss Motors video tape on rebuilding and tuning the SU carbs. (As someone else pointed out in the last SEES, Moss is a major British car parts supplier and we have a lot of common parts.) It is long (2+ hours) and detailed covering all SU models. Other than that, the author does not think that the average rebuilder can replace a throttle shaft bushing, it is excellent. The sections that apply to our cars alone would make a good tech session item. One of our local club members has already made plans to borrow it. The other gift is a pair of 300W halogen lights that sit on low bases. Aimed under the car, they put a lot of light where the usual trouble light cannot. There is also a 500W version available, but considering how bright and how HOT these are I do not see the need for them. Another useful tool that I just got is the Eastwood welding helper. It is a heavy copper spoon on a handle. You put it under thin sheetmetal that you are welding on and it helps prevent burn-through. I have only used it once, but it really helps - highly recommended.

Here's another recommendation: today the UPS man delivered a pair of Duane's new repro floor panels. 18 gauge sheet steel with the stiffeners and inner rocker built in - nice work! Not primed, but they will be before they go into the car.

Before I get to the most recent project, let us continue with the saga of the Ladybug. The engine is in the shop. As of this writing, it has not been taken down and cleaned, so I do not know what we will find. On taking it out of the car, I found one broken and one missing exhaust stud but no other surprises. There is a new IPD street cam etc. ready to go into it. Before it comes back, I have some major detailing to do inside the engine compartment. It, of course, must be ready to go to Stone Mountain.

The more recent project is a 68S that I am restoring for my daughter. It is currently in my garage with the front end sheet metal removed. At some time it had been hit in a manner that forced the bumpers up, crushing the sheet metal and tearing out two of the captive nuts that hold on the bumpers. On the passenger's side this was not too serious, and I made an insert similar to what I did to my 67S a few years back. The driver's side was a mess! Repairs were needed for the bottom, top and outside of the frame. The insert that I made was 9.5" long and covered all three sides with 1" down from the top on the inside for welding. (If I had made a complete section, I could not have inserted it.) This carries both captive nuts for the bumper plus two additional ones on the bottom that I used to hold an additional reinforcement piece that covers the area where the stiffening dimple is located on the front of the frame. It was all 16 gauge galvanized. (It was actually made from a leftover section of one of Bob Stein's rear crossmembers.) I just welded in two sides of the reinforcing plate tonight before writing this. The other will wait until I have removed the suspension hardware. If you are contemplating a similar repair, do not be concerned about putting in captive nuts. Measure carefully, run a bolt into the nut and weld on at least two faces. The bolt both holds it in place and keeps the heat from distorting the nut. If anyone facing the same problem has any questions, give me a call. I have done it three times now - all successful!

We financially joke about not being surprised by what we find in and on these cars so I shall propose a "can you top this". The top 1" of the sides of the driver's side shock tower are covered with bumps about 1/4" high. When I first saw them, I thought they were dirt and/or rust and tried to remove them. They are spots of weld! I cannot imagine what split, crack or other failure needed that kind of repair. It is not bead of weld but a surface covered with weld! Anyway, I shall have to remove the crossmember and replace it. Luckily I got another 67 from the same man that had the 68 and it has a good front (so far), but nothing under and basically no driver's side - thanks to rust and an accident. Two shall make one here stay tuned.

**July/August 1992**

Lady Bug Update

Progress at last! Let me start with steering wheels. The one on the Ladybug (all hard rubber type) was cracked at the end of each spoke and had several large splits near the hub where the spokes joined. I got the Eastwood combination how-to book and epoxy filler. The instructions were straight forward and made sense. First, I cleaned all the cracks down to the metal core. I started with hand tools, but soon switched to dental bits in Moto Tool. This worked very well, allowing me to clean out the cracks and make holes and undercuts to hold the epoxy. I mixed the epoxy according to the instructions - you need to mix it a lot! - and applied it with a variety of tools. Finally a small old kitchen knife proved to be the best for packing the cracks. After it hardened, I rough sanded the wheel to 100 grit. It pays to use a rubber pad under the sandpaper to keep it even. The book described power sanding. I did it all by hand and it was very easy. Finally I coated the wheel with the "Feather Fill" primer described in the book. In order to hold the wheel for painting, I mounted it on a 2' long piece of threaded rod with two nuts and two large washers, and held it in a portable vise. Then I turned it from the center, which I had masked to keep paint out of the mounting threads, etc. At this point, I had to remount the wheel on the car to move it, but I will report next time on the final sanding and painting. I think that anyone who is reasonably handy could make such a repair.

The '68 has reached the point where it could be moved back outside to allow the Lady Bug into the garage. This means that the passenger side inner rocker panels, rear x-member, jacking strut, lower A pillar, mainframe section, front and rear floor pans have all been repaired or replaced. All the new metal and any old metal that was cleaned to a bare surface was treated with DuPont metal conditioner followed by DuPont conversion coating. Then the whole area was primed with the PPG two part epoxy primer. This will protect everything until I can return to that project this fall.

Meanwhile, the Lady Bug's engine has had a total rebuild. I am currently cleaning the engine compartment. It will be primed and painted before I return the engine. Even with the heavy oil coating, I found some rust under it.

Clearly, it pays to clean everything on a 20-year old car! Hopefully, the new IPD oil seals will cure the oil leaks that it had. The rings and cylinder bore were also bad, indicating abuse in the past. I gave it the works, basically replacing everything that moves except the crank which was reground. It should be better than new with the stainless valves and the IPD street cam.

Joan is starting on the new interior, so by the Georgia meet, the Lady Bug should be ready to show.

Interesting to note that several recent publications (ours and IPD) have described the symptoms of bad injector seals on FI cars, but did not indicate a quick and easy test for such leaks. If you suspect a seal leak, spray a small squirt of starting ether at each injector in turn. If you have a leak, the sound of the idle will change. I recently tried it on my '77 245 driver which was idling rough. As soon as the ether hit #2 injector the idle smoothed out. New seals are on the way!

## **January/February 1993**

### Insulation & Noise

We missed you at Atlanta and you sure missed a rainy weekend! In fact, if there were any leaks in the Lady Bug, that was the time to find them. The only ones we found were at knee level on both doors. During one downpour we were keeping paper towels against the door to stem the flow. I have since added more weather stripping to the area. Now all we need is another storm like that one to try it out.

More seriously, we were somewhat concerned since we started-out with only 150 miles on the newly rebuilt engine. I took it easy the first 200 miles, then let it roll naturally. We made the trip without a hitch 1,945 miles round trip. The biggest disappointment was not being able to get the swap meet going. Buy thanks to Rob Baylor, whom we stopped to see on the way home, the Lady B Bug has a nice new hood ornament. (I bought my first 1800 from Rob's father back in '67, I hope to continue the tale of its restoration in these pages next year.)

For the tip of the month, I will describe insulation and noise reduction treatment of the Lady Bug. We used two different products. The first layer was the asphalt based self-sticking black sheets about the size of floor tiles. These were put on the floor and the lower part of the fire wall. They can be cut to shape with a shop knife and bent to conform to the panels with heat gun. We followed this with mylar faced foam. For the firewall and front of the transmission tunnel, we used the heavier type with a vinyl lining. For the rest of the transmission tunnel and the very top of the firewall, we used the 1/2" single layer. These are easily cut with the shop knife. We used spray adhesive to hold the foam in place. I have used several brands including Permatex. The important point is to use the heavy duty heat resistant type. This treatment made a real improvement, but we are still not satisfied with either the heat or sound reduction. I have since obtained a mylarbased felt product which I shall put under the carpet and also more of the other varieties which shall go under and behind the jump seat and in the door and wall panels. I am also considering getting the Einassi kit for the center console-which only fits the E and ES models. I will keep you informed as we progress. The insulation is available from Whitney and other sources. We got the felt material from Moss Motors. We are still using the lightweight temporary carpets that we installed before the Niagara Falls meet. The permanent carpets that we plan to install next year should also help both heat deflector shield for the muffler like the 240 models have.

## **May/June 1993**

### Ladybug Update

It's been a while since you have heard from me, but it has been a slow winter for the restoration projects and I have come up with a few tips. I did get a set of Bill Webb's trunk liner panels for the Lady Bug and I highly recommend them. They are certainly nicer than the originals in my 67S. I have also recently purchased a small (lower cost) low pressure high volume sprayer. The small one was not recommended for auto use, but I will be trying it and will let you know how it works. (It is the Campbell Hausfeld HV 2000.) Its first job will be refinishing a set of painted wire wheels for which low pressure painting should be ideal.

I have also picked up a set of MG/ Triumph headlight wiring harnesses. They are going into the '68S I am restoring for my daughter and look like a good fit. This is another case of common parts with the British sports cars.

## **November/December 1993**

### Post-Meet Tech Session Talk

It was good to see you again in Gettysburg. Since the meet, we have put 6,003 miles on the Ladybug going to the West Coast meet in Flagstaff. It was our first WC meet, and it was nice to put faces to some names and voices on the telephone. The staff at the Ramada in Gettysburg could also have taken lessons in running a hotel from the folks at the Woodlands Plaza - a much more professional operation. We did not feel like we were in a tourist trap in Flagstaff.

Part of the fun of the trip was the response we got to the Lady Bug all along the way. There was no day in which several people didn't come over nosin' around the car. The most common question: "what year is it?". I gave a membership application to a 245 driver in the Denver area who wants to get an ES. I was surprised at the amount of power loss at high altitudes. We came over Vail Pass (10,000+) in third gear. There was also quite a difference in gas - for whatever reason, it did not like Texaco at high altitude!

The Tech Session went over well at both meets. At the West Coast Meet, I actually went through it twice. I will accept your suggestion that I put a set of tips from it in these letters so that you can publish them. It will take several letters to cover it all. This time, I will try to answer some of the questions that come up during the sessions.

What is rust? Rust is the northeast equivalent for metal to what the sun does to rubber, paint, leather and all other soft materials on southwest cars. No, this question did not come up in the tech session, but it was asked in "jest" at the banquet. I thought it needed an answer. I can speak with some authority since the Lady Bug was a California car with the only original rubber left-exactly what I have not gotten around to changing yet.

Where do we find reference materials for restoration? Car restorations are a popular hobby, so try the local bookstore. I like "Cars & Parts" magazine as a useful reference both for ads and how-to stories. Hemmings Motor News is best source for vendors, J.C. Whitney and the Eastwood catalogs also list many books on restorations. DuPont and PPG publish data sheets on all their auto finishing products, so ask your dealer for the data sheet before using their products. These give much more info than just what is on the can! I wrote to Eastwood and asked if they had similar data sheets for "Oxysolve" and "Cold Galvanizing Compound", but I didn't get an answer-so remember, when it comes to Eastwood, you are stuck with the info that only comes on their cans.

Where do we start? I have to ask a question before I can answer one. If the car is to be driven at all, you must start with the brakes and running gear - the safety items. But if the car is just a project, then start with structural frame members - frame sections, jacking struts, "A"pillars - the parts that give the car its structural integrity. The cosmetic parts come in later. One exception is, in some cases, it is easier to replace floor pans if the jacking struts are out of the way.

I recommend rust-proofing. Of course, it does not make sense to rustproof over contamination that is already in the body cavities. Any body cavity that is opened should be cleaned, treated and primed before being reclosed; while most other cavities just need cleaning before rustproofing.

One item of discussion was access to the body cavities. On 1800s, all the cavities are accessible through holes already in place, except the box section that the hood closes onto. Here you have to drill holes. The 140/240 series has even better access, even though you also have to drill some holes at the hood closure area. I have no experience with other models.

What is MIG welding? I stated that nothing but MIG welding should be used for external body panels since it is now so widely available, and superior to other welding methods. (Hammer welding is also a good technique, if you can find someone who can do it well.) MIG (Metal Inert Gas) is an electric welding technique in which a fine welding wire is rapidly melted into a puddle with a small electric arc under a blanket of inert gas -usually 75% argon and 25% CO<sub>2</sub>- The weld is formed by moving this puddle along the joint. There are several advantages. Thinner metal can be welded without distortion. There is a minimum of slag since the gas shields the hot metal from the oxygen of the air so that slag forming fluxes are not required. My own experience is that I get a better weld faster with much less grinding and rework. (It did take a fair amount of practice to get the feel of the new technique.) Brazing should never be used, as it sets up damaging electrochemical cells.