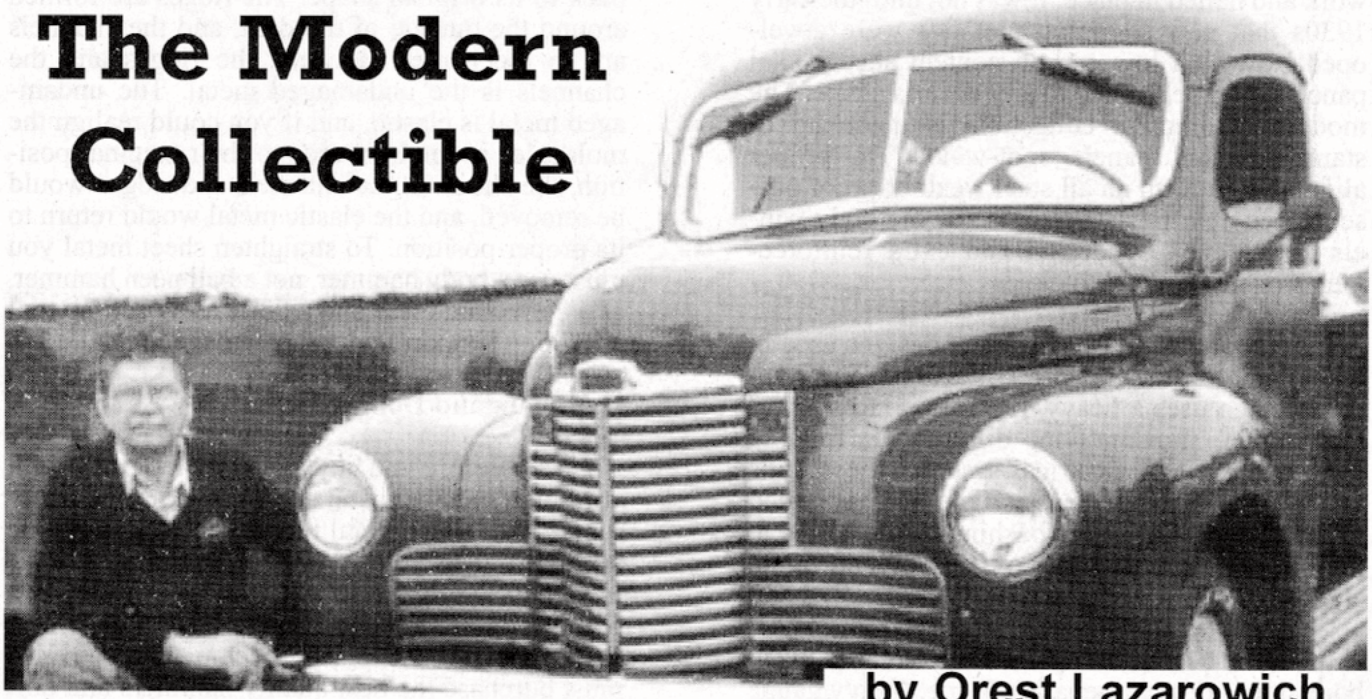
The Modern Collectible



by Orest Lazarowich

A DETAILED TECHNICAL COLUMN INTENDED TO TARGET MANY MAKES AND MODELS OF POST-WAR CARS AND PICK-UP TRUCKS

Easy Bodywork

In this article we are going to deal with minor sheet metal damage that you can repair and then prepare the metal for painting. It will require the purchase of some body tools. Painting will be done with an aerosol spray paint so you don't have to invest in any painting equipment. If the damage is beyond what you can comfortably manage, and it is possible to remove the crumpled, torn, and damaged or rusted parts (front and/or rear fenders, grills, doors, hoods, trunk lids, bumpers), replace them with good used parts or new reproduction metal. Parts from a recycler may not be the correct color. Visit a body shop and see if they will paint the part(s) for you. Ask how they want the preparation done, and ask if they will paint the part(s) before they are installed on the vehicle or after.

Rusted floor pan assemblies (front, center, rear, and trunk) should be cut out and new pans welded into place to maintain the body strength. Pop rivets and body filler is not a good repair for floor pan replacement. Rusted corners on truck cabs should not be fixed with screen and body filler. On rear quarter panels replace the removable rear fenders, and cut the rusted sections out. A damaged rear quarter panel can be repaired by welding in new material or replacing the entire panel. Your goal should be to restore the sheet metal as close to the original build as possible. We will cover welding and replacing rusted metal next month, but see the previous article, *What Is MIG Welding*? If you do not have a welder, and a community college is nearby, take a night course on Metal Inert Gas MIG welding, and then consider the purchase of a welder. Check the local library for information on MIG welding, or purchase an instructional video or DVD that can help you understand MIG welding principles. There are other welders available that will join mild steel together, but the MIG welder is the easiest to use.

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The bodies of early automobiles used sheet metal panels formed over a wooden frame-

work and nailed in place. It was not until the early 1930s that new stamping methods were developed by which low carbon content sheet metal panels could be formed to any desired shape. The modern automotive collectible is made up of stampings and panels spot-welded in proper alignment to form an all steel weather-proof passenger compartment. Strength for the body panels is achieved by design and extra reinforcements or more metal thickness.

There are two different designs used in manufacturing the modern collectible. The standard design uses a heavy, rigid frame to support the engine, transmission, differential, running gear, control, and electrical system. These units are referred to as the chassis. The body is bolted to the frame, and rubber bushings are inserted at the body mounts to insulate the body and frame and to prevent squeaks and rattles.

The second design known as the unitized body does not use a separate frame. Heavy gauge steel box-sections are welded to the lower part of the body structure to produce a reinforced body shell. The body and the box-section members support the engine, transmission, and running gear assemblies. The lower reinforcing members carry the driving, braking, and suspension loads, and distribute the major road forces to broad areas of the body structure.

Sheet Metal Damage

When sheet metal is damaged it goes through some type of bending action. Whenever bending takes place there is a physical change in the area of the metal surrounding the bend. Steel is made up of molecules of metal bonded together to form a solid sheet. When metal is bent the outer surface is stretched, the inner surface is shortened, and the center remains unchanged. As the metal bends, heat is generated, and a condition known as work hardening occurs. This makes the bent area harder than the surrounding metal, and the metal in the bent area will not straighten out.

For example let's examine a rear quarter panel that has been damaged in a parking lot by the sharp corner of a shopping cart. The bends in the dented area take the form of raised ridges, and the unindented areas are channels. Since the ridges and the channels are harder than the rest of the metal they prevent the dent from springing back to its original shape. The ridges are formed around the outside of the dent, and the channels are in the center. Between the ridges and the channels is the undamaged metal. The undamaged metal is elastic, and if you could realign the molecules in the bent area to their original position, the strain on the channels and ridges would be removed, and the elastic metal would return to its proper position. To straighten sheet metal you must use a body hammer, not a ball peen hammer, as a correcting force and a dolly as a back-up tool providing support under the damaged metal.

Hammers and Dollies

Before you buy any body tools talk with your club members and see who had some experience with sheet metal repair and who might be willing to help you. Ask them how they use the tools that they have. If you are far away from a body shop or anyone doing restoration work, order a DVD that explains sheet metal repair. You must purchase the best quality hammers and dollies that you can afford at the time. Start with a medium weight bumping hammer that has a round face with a high crown on one end and a square face on the other. You will also need an all purpose dolly. A small hammer spoon will come in handy where a dolly will not fit to support the metal.

Start with a bumping hammer, an all purpose dolly, and a hammer spoon.

Hammer Technique

You will need some scrap metal to practice on. Ask a body shop for a damaged hood. You should be able to get it free because hoods are generally replaced instead of repaired. Wear your safety glasses. Cut out and discard the inner reinforcing panel, and you have a piece of metal to work on. Remove any sound deadener. The panel must be clean on both inner and outer surfaces. Forget the damaged area for now, and put a small dent into the panel. Press the dolly against the inside of the panel near the inner edge of the dent. The hammer blow should strike the metal just off the dolly with a slapping blow. Do not follow through as if you were the village blacksmith. Move the wrist in a swinging action with

the force exerted on the hammer downswing. This is called the hammer-off technique, and should be repeated 80 to 120 strikes a minute. The hammer will rebound and be in position for the next blow. The dolly creates a lifting action on the metal. It will rebound away from the metal and return with an impact force caused by the arm pressure held against the dolly. Work from the outside of the dent inward. Use the palm of your hand to locate the low and high parts of the dent. Tap down the high spots, and lift up the low spots. Do not raise the repaired metal any higher than the original contour. Leave a sixteenth of an inch space for lead or plastic body filler. It takes a lot of skill and practice to bump metal up to the point where you do not use any filler material.

Make a bigger dent in the hood and practice bumping the metal up until you develop a dolly and hammer coordination. This is not easy at first, but if you watch what you are doing and use the correct amount of force on the hammer, the metal will come back to its original position. Practice and try to develop a good eye and feel for a repaired body panel. If too much hammer force is used, you will stretch the metal, and it will have to be shrunk back in place.

Go to the original damage on the hood. If there are ridges that are folded, you will have to use a technique called hammer-on. Place the all-purpose dolly under the ridge, and use the hammer to concentrate the hammer blows directly over the dolly. This will flatten the ridge and stretch the metal. The force of the hammer blows and the amount of arm pressure on the dolly will determine the amount of stretching that will occur. Each time the hammer blow is struck, the dolly rebounds from the metal and creates a secondary lifting action on the metal. This method can be used to lift up a low spot. Do not stretch the metal beyond its original limit. Use the dolly and the square end of the bumping hammer to straighten out the damaged flanges on the sides of the old hood. Practice. There is a lot of metal in an old hood. Keep the faces of the hammer and the dolly clean and smooth.

Removing a Minor Dent in a Quarter Panel

Bring the vehicle into a well lighted repair area. Wash the outside of the quarter panel, and examine the damage very carefully. This dent was caused by a shopping cart, and the panel will have buckled inward, and there might be a very slight ridge at the edge of the damaged area. If the paint is not cracked, you might be able to work the dent out without having to paint it. Open the trunk, and if the dent in the quarter panel can be reached from the trunk area, remove any undercoating from the inside of the panel. Scrape it clean. Otherwise, the force of the dolly and hammer blows will be absorbed by the undercoating.

Do not bump the low area out until you have relieved the tension along the ridges. Use the hammer on the outside of the panel and the general purpose dolly inside to tap the metal up. Use the hammer-off method, and work around the dent and toward the center of the undamaged metal. This low area will come up as you relieve the tension. Examine your work. Feel for surface imperfections with your hand. Hold your hand flat so that the fingers, palm, and the heel of your hand are all touching the repaired area. Feel for high or low spots, and tap them into position. If the paint is not cracked or chipped away and the surface is level in relation to the rest of the panel, leave it alone. If you are satisfied, prepare the metal for finishing and painting.

If the dent is located in a spot where you can not get behind it with a dolly, try the hammer spoon or a pry bar. Do not use too much force because you will pry the metal out too far. There are suction cups that can be used to pull a dent out. You can also drill a number of holes in the dent, screw a sheet metal screw into the hole, and pull on the screw with a pair of locking pliers to pull the dent out. Use the bumping hammer to tap around the high edge of the dent to bring the metal back into place. If you use this method, you must weld the holes shut to prevent any moisture from entering the back of the filler material.

Surface Preparation

When you have done the best you can to straighten the damaged metal and bring it back as close to its original shape, you must now get it smooth and prepare the repair for painting. This

is a minor dent, but the procedure is the same for all sheet metal finishing. The old paint must come off the repaired area, and the surrounding paint must be blended smoothly (feathered) to the repaired area. You will need some type of filler in the low areas of the repair, and then the repaired area has to be smoothed. You can use solder, plastic filler, or a combination plastic and metal filler. We will use plastic filler for this repair.

If this vehicle has not been repainted, copy the paint code from the VIN, and visit the local auto body supply store. If it has been repainted, bring along some paint chips. Buy a quart of plastic body filler and a tube of hardener. You will also need a flexible rubber squeegee to apply the body filler. Buy a tube of glazing putty to fill the sanding scratches and also the pinholes that will be caused if you mix air in with the body filler. The sandpapers used in bodywork are of the open coat design. This means that the open coat paper is covered 60 to 80 percent with abrasive particles. Buy good quality aluminum-oxide for dry sanding, silicon carbide for wet sanding, and at least two sheets of each grit. You will need 60 grit and 100 grit to shape the plastic filler and smooth the feather edge. The higher the number the finer the grit. Buy a couple of face masks to filter out the plastic dust when you are dry sanding. To smooth the body filler you will wet sand starting with 180 grit, then 240 grit and end up with 320 grit. Using water as a lubricant prevents the sanded particles from sticking and plugging the sandpaper. After you apply the glazing putty, wet-sand with 400 grit paper. The paint will fill in any of the scratches that are left.

Paint will not adhere to bare metal so you must use a primer on the bare metal and the body filler. Use a light-colored primer with light colors and a dark primer under dark paint. Vehicles were painted in both enamel and lacquer so you must match the primer to the paint: lacquer primer for lacquer paint and enamel primer for enamel paint. Lacquer will not adhere to enamel. There are sealers that make it possible to apply any paint regardless of the paint used first. Discuss this with the paint salesperson as there are many new products on the market to make your work easier. Buy at least two spray cans of primer and two cans of paint that match the vehicle paint code or the paint chips. Some stores will mix the paint and put it into a spray can. You will need about a pint of wax/grease remover and a roll of ¾ inch masking tape. For masking paper you can use newspaper, but double the newspaper over because the paint can bleed through.

Removing Paint

You will need a grinder to remove all the paint around the repaired area. If you do not have a grinder and are not sure if you want to continue with bodywork after you finish this minor repair, you can use a regular drill. Purchase a 6 or 8 inch backing pad with a mandrel that will fit the drill. Use a 16 or 24 grit open coat sanding disc against the backing pad, and grind the repair area down to bare metal. The disc scratches will provide added grip to which the plastic filler will bond. Wear safety glasses to keep metal particles and paint chips out of your eyes. Grind the damaged area about 1½ inches into the surrounding paint, and try to feather the paint edge. Keep the disc moving to avoid grinding through the metal and/or overheating the metal and causing distortion.

When grinding, hold the drill so that only the top 1½ to 2 inches of the disc contacts the metal, and keep the back of the disc is 10 to 20 degrees away from the metal. Move the disc back and forth along the repaired area so that you develop an X scratch pattern on the metal. Never use a torn disc as it may catch and twist the drill away from you. If there is any paint left in the creases, attach a rotary brush to the drill, and remove all traces of paint because the plastic filler will not stick to painted surfaces. Allow the metal to cool, check the surface for smoothness with your hand, and gently tap the low spots up and the high spots down with the dolly and the bumping hammer.

Applying Plastic Body Filler

To prepare the body filler follow the manufacturer's recommendations for mixing. Remember that the plastic filler is being used to surface-fill irregularities, not to fill deep dents. Mix enough body filler to cover the entire repair area with one thin coat. Apply the body filler with the squeegee, and for smooth results work the body filler in one direction only. Do not get any body filler on the paint. Apply the body filler quickly. If you have a Surform file, you can use it to shave the plastic filler smooth while it is still rubbery. Do not let it dry longer, if you are going to file it down. If you are going to dry-sand the

body filler, start with the 60 grit and finish up with the 100 grit. Wear a face mask. Use a flexible sanding block, and dry sand the area until the body filler is smooth and level with the surface. Feather edge the painted area. Check the repair with your hand. If the bare spots are high, gently tap them down. You may need a very light (skim coat) layer of filler to cover any imperfections. Make it very thin because you already know how hard it is to sand body filler. Dry sand the skim coat with 100 grit paper. Check for smoothness with your hand. Any imperfection is magnified after applying a coat of fresh paint. Wet sand with the silicon carbide paper to smooth the body filler. Wash the area down with water, and blow it clean with compressed air.

Apply the body filler with a flexible squeegee.

Preparing for Painting

Wash the area around the repair with wax/grease remover. Tape off the area that will not be painted, and allow about two inches for overspray. Now tape the newspaper to this tape. Wipe the repaired area down with a clean cloth. Shake the spray can to mix the primer. Wear a face mask. Spray several coats of primer, and wait 3 to 4 minutes between coats. Let the primer dry completely. Apply a thin coat of glazing putty over the primer with the squeegee. Move the squeegee in only one direction, and overlap the strokes keeping the coat smooth. Glazing putty dries quickly, and it is difficult to apply a second coat. Wet sand the glazing putty with 400 paper. Dry the surface, and check for pinholes and scratches. Use your hand to make sure the surface is smooth. The high spots will show up as bare metal, and you will have to prime the repaired area again. Make sure the repaired area is dry before you spray the primer. Let the primer dry at least 15 minutes. Lightly dry sand with 400 paper to give the primer some 'teeth' so the color coat will stick better. If you cut through to the bare metal, you will have to spray the bare spot with primer. Clean the area with compressed air.

Apply the Color Coat

Start painting at the top of the repaired area, and move downward to the bottom. Keep the spray can 8 to 12 inches away from the metal surface, and apply the spray paint. Move the can in a back-and-forth motion. Do not keep it in one place because you will cause runs and sags. Apply 4 or 5 light coats, and let each coat dry 4 to 5 minutes before applying the next coat. When the paint is dry to the touch remove the tape and newspaper. Allow the paint to dry at least 24 hours. Use very fine rubbing compound to blend the old oxidized paint with the new paint. Do not wax for at least 3 months.

There is a lot more to body work than fixing a minor dent. If you like this kind of work, register for an evening program at a community college or order a DVD that covers body work. It takes time to develop the skill, and proper instruction is very important. No matter how well you have done the mechanical work it is the outside of the vehicle that every one will see. If the body work is poor, they might think the same for the rest of the vehicle. Happy motoring.

S.K.

Next month:
Removing and Replacing Rusted Panels

ARE SWAP MEETS STILL IMPORTANT?

Several months ago I did an editorial on swap meets. Although I recognized the ease and the importance of auction sites like eBay for obtaining parts, I still hold with my conviction that there are factors beyond merely locating parts at a swap meet.

I (personally) really enjoy most swap meets. Sure, we get several new subscribers (and we are thankful for that), but more importantly, I love sitting with car collectors and swapping ~~lies~~ stories about cars, restorations, people, experiences and so much more. Even if you are not a subscriber (shame on you!) I love chatting with car guys - especially car guys who share my passion for authentic restoration.

The 'hot rod crowd' is welcome to do the swaps as well, but what they are trying to do holds no interest for me.

Southern California has four major 'antique car' swap meets. I discount the 'hot rod' and 'high performance' events. One swap is quickly losing appeal due to legislative red tape. Two are primarily Model T events, but the fourth, the April Bakersfield Swap Meet, encourages all makes and models as long as they are pre-war. It is filled with 'old guys' (my age) who have done it all and love talking about it. We need more events like this one.

S.K