



THE BODY



There are any number of approaches to painting an automobile. It is best to have all bodywork completed before you lay paint anywhere on the body. With this restoration, we've chosen to get the front end in paint before beginning bodywork. The front end will be wrapped in plastic to protect the paint while Scott Brideau of Car Concepts works the rest of the body.

Your efforts must begin with good body preparation in order to achieve a great paint job. Before you even begin, assess body condition and whether it is worth the investment. Any rust-through issues must be dealt with first and can get expensive.

One of the most important elements to remember when choosing paint and paint prep materials is compatibility. You must choose materials that work well together or you can wind up with a flawed paint job that can be recognized immediately or months down the road when a nice paint job gradually begins to go bad. Paint issues can multiply in short order when it begins to lift, wrinkle, crack, or fade. Few things are worse than paint job failure because from

a time, money, and materials standpoint it gets very expensive.

During the planning stage of your restoration, check with manufacturers and paint supply stores on compatibility, which begins with your foundation base epoxy primer coat and continues with fillers and spot putties, primer/surfacer, paint, and clearcoat.

Rust Repair

Weak spots for Fox bodies are rocker panels, A- and B-pillars, lower rear quarters, torque boxes, and the cowl vent assembly. In northern climates where there's a lot of salt on the roads, these areas have been especially vulnerable to rust.

However, never discount damp climates, such as the tropics, lake and river regions, and the Deep South, where humidity levels waste a lot of Mustangs. I laugh whenever I see a Mustang for sale and the ad says "Rust-free Southern car," because rarely does that exist. It's damp down there.

Fox Body Mustangs had good factory corrosion protection right from the beginning of production late in 1978, which means rust is less of a concern than it has been for classic Mustangs. Ford's electrostatic E-Coat protection program began with the 1974 Mustang II and continues to this day as an excellent form of corrosion protection. Ford fully submerges the body and related parts in the electrostatic E-Coat liquid, which finds its way into all portions of the body and "sticks" to the steel. E-Coat is an exceptional corrosion prevention system, which also begins with better steel than we had a half-century ago. Coatings have vastly improved in the past four decades to the point that rust is of little concern. You would have to have lived in an exceptionally harsh climate to experience rust-through in a Fox Body Mustang.

Patch or Panel Replacement

Rust repair, depending upon severity, can be a patch or complete panel replacement. National Parts Depot, as one example, has repair panels and full replacement quarter panels depending upon your budget and severity of the damage. You can go the replacement panel route or find a donor body to reclaim parts. Damaged panels can be pulled and straightened by a qualified professional. Even a kinked frame rail can be pulled out on a frame table. What you do depends upon budget and the car's ultimate value restored.

Christopher Bibb of Florida has restored several Fox Mustangs and has seen some pretty bad examples. "A big problem for Fox Mustangs is the triangular area just above the taillights. I've seen a lot of Mustangs rusted there. The last five I restored myself were all Florida cars and every one had various levels of rust in the cowl area. Some range from a few small holes to others completely rusted through." Christopher goes on to say, "Rust has nothing to do with a Mustang being a northern car, but more from sitting outside or being a daily driver and subject to the elements where it rains a lot or in a damp climate."



Bibb told me that these are chronic rust areas for Fox Mustangs. You will have to find a donor body and carefully separate these stampings at the factory welds before transferring them to your Mustang. (Photo Courtesy Christopher Bibb)

Christopher adds, "I parted out an '89 GT a few years ago and told every potential buyer that came by about rust issues. I had several say 'not my car, my car has zero rust.' I suggested they hang on to my number and if they ever tore their car down as I described to let me know what they found. Several were completely shocked with what they found. One said he had no idea how his door was not falling off, and that he could see no signs of rust whatsoever with the car together. None of the rust was visible with the car together."

Rust and accident damage are often hidden until you begin to tear the car apart. And this is why you shouldn't get overly committed to a project car until you've stripped it apart and can see everything. The dicey areas are where several structural members come together and overlap, such as the A- and B-pillars, trunk opening, and the cowl area. Although Ford came up with a better cowl vent "balloon" assembly for the Fox Mustangs, the issue of water and contaminant collection at the cowl and drains remains a huge problem because they still cause rust even with factory E-coat protection.



This is the bottom of the A-pillar below the cowl vent drain. Water and debris collect here and rust evolves over time. You shouldn't see this problem in a desert environment. However, humidity will find its way between the layers of steel, allowing electrolysis to set in. The result is rust. (Photo Courtesy Christopher Bibb)



This is the 1979 Mustang "Pace Car for a Cure" Fox in the heart of Wisconsin being restored by the directors of the Great Lakes Region of Team Shelby. Because this Fox spent most of its time in the frozen north, it has its share of rust issues. These guys looked to Dynacorn International for sheet metal, including a full floorpan. The old, rusted out floorpan has been removed and mating surfaces cleaned up for the new pan. These are the front frame rail extensions.



The firewall (also called a dash panel by Ford) and frame rail extensions have been cleaned up in preparation for the Dynacorn floorpan. A good primer-sealer you can weld through has been applied to the contact surfaces.

Paint Preparations

How much time and money you pour into a paint job depends on the caliber of paint you desire. Fox body paint quality from the factory was quite the evolution from 1979 to 1993. Quality wasn't that good in 1979, with a sizable amount of orange peel early on. By 1993, paint technology had evolved considerably, and these cars just got better.

Because paint technology has only gotten better, you don't have to settle for a mediocre finish from your repaint. It can easily be said that a show-quality finish has never been easy, quick, or cheap to obtain. If you're paying a body shop for a show-quality paint job, expect it to be expensive and time consuming. Most body shops put crash and insurance jobs first because that's what keeps the lights on and that's where the real money is for body shops. Your show-quality paint job is what eats up precious time and the shop's best talent.



Scott Brideau of Car Concepts outside of Boise, Idaho, employs a very disciplined approach to body repair and paint preparation. He suggests an organized plan in which the body is disassembled as far as possible to make his job as a body professional easier. Keep this in mind if you are using a body shop rather than doing the work yourself. Do everything you can before heading to the body shop to make their job easier. And remember, unnecessary labor means unnecessary expense.



New and used body parts are available for 1979–1993 Mustangs. Here's a rear bumper cover and reproduction fascia for a 1985–1986 Mustang. These need to be prepped and painted off the body. You will also want to use a flex agent in the paint for urethane body parts.



These are good used front fenders ready for the body shop. It's a good idea to check with your body professional to see which they prefer (installed or off body). Good used Fox body parts are getting harder to find, though the aftermarket is making more and more reproduction pieces available.

Scott Brideau of Car Concepts in Boise, Idaho, is one of the best car builders in the country. He's methodical with strict attention to detail. He's a craftsman, and he is a paint and body chemist. He has applied what he has learned over a lifetime and career as a paint and body professional. Bruce Couture of Modern Driveline, a few miles away from Scott, knows and understands Scott's regiment, which is why Bruce chose Scott for the paint and body segment of his Fox Mustang restoration.

Like a lot of talented paint and body professionals, Scott believes that the quality of a paint job depends upon strict preparation, which is where the greatest labor and cost is when you get a car painted. It takes far less time to paint a Mustang than it does to prepare it for paint. And paint these days is nothing you want to waste because primer and paint are both very expensive.

Having the right facility in which to work a body and ultimately paint is also very expensive due to tougher environmental legislation in all areas

of the country. You must have a legal downdraft paint booth just for starters. And because bodywork tends to be very dusty, you also need a shop that's large enough for you to perform all bodywork segments before you even think about paint.

Paint Removal

Your paint job should begin with complete paint removal, which can be performed by sanding, soda blasting, or even chemical stripping. If you're dealing with the factory finish, sanding is probably the easiest and fastest method of paint removal and all it costs is sandpaper. You may also strip the body down and haul your Fox to a media blaster, which is faster.

You don't want a harsh media, such as sand or glass. Soda or dry ice blasting will notpeen and distort the metal the way sand or glass will. Walnut shell blasting is also user-friendly and won't harm the metal. Once paint removal is complete, be sure all media has been eliminated from the nooks and crannies, or it may haunt you when it's time to paint later.

Another paint stripping option is chemical dipping, which is discouraged because these cars were E-Coated from the factory and should not be chemical dipped and stripped.



Because today's automotive finishes are very toxic, you need protective clothing and air filtration to protect your lungs. A dust mask works fine for sanding, but you must have a respirator designed for these toxic finishes. What's more, you want dust-free protective clothing that will limit contaminant contact with the paint.

Chemical dipping will remove the E-Coat, leaving the body vulnerable to rust. If you feel you must chemical dip, be fully prepared to pressure blast the body with hot water and a degreaser to get rid of all contamination. Some chemical dippers will dip the body in an acid-etch solution to further prevent corrosion.



A media blasting gun like this works very well because it captures the media and debris, leaving less fallout. It concentrates the media where it belongs. Different forms of media can be used. Soda and walnut shells are among the better ones for sheet metal components because they generate less heat and won't distort sheet metal like hard abrasives, such as aluminum oxide and even glass bead, can. Soda and walnut shells are well-suited for paint and primer removal, but less effective at rust removal, where more aggressive media is better.

According to Scott, the original factory finish is often the best foundation for new paint because there's no better surface prep than the original electrostatic E-Coat process in which the body was dipped to begin with. It provides good primer and paint adhesion using the factory finish as the foundation.

Choosing a Color

One of the more challenging aspects of a repaint is choosing the right color. You may opt for an original Fox generation Mustang color or go with something entirely different. Choosing the right color for your project is a matter of personal taste. Color choice directly affects the color primer you need to use, according to Scott.

Lighter colors call for a white or light gray primer because a dark primer finish would require more paint

to get the final finish right. Opting for a nonmetallic color allows you to paint panels separately without variations in color. By the same token, darker colors call for darker primer. Metallic finishes call for extreme discipline and a lot of experience. If you've never worked with metallic finishes, you're going to need a lot of practice. If you're not confident, it is best to leave metallic to professionals. ■

Primer

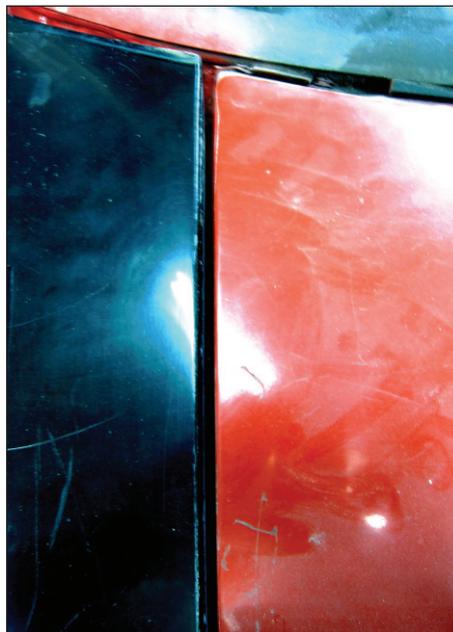
With raw metal at your disposal, a good self-etching epoxy primer-sealer should be applied to protect surfaces from the atmosphere. Even if you're opting for the factory paint as a foundation, you still need an epoxy primer-sealer to make the surface pure. Every auto body professional has paint brands they are loyal to. Scott prefers Southern Polyurethanes (SPI) epoxy primer as a foundation with Glasurit finishes on top. Glasurit yields a hard surface when fully cured, which makes it an excellent finish for the show car or daily driver.

After Scott has applied the epoxy primer-sealer, he allows it to cure overnight. He then applies three coats of Feather Fil polyester primer, which is a working primer used as a final primer coat before paint. Once polyester primer has cured, Brideau sprays the panels with a guide coat, typically black in color, and begins initial block sanding with 80-grit paper. This process of black and gray shows high and low spots in the panels and enables Scott to cut the panels straight. Low spots are identified by the guide coat that remains; they are then filled and sanded. Scott advises you to be prepared for a lot of filling, cutting, and sanding as you address irregularities. It is an agonizing process of working surfaces over and over until they are smooth.

Once Scott gets the body panels straight they are sanded with 180-grit paper and two wet coats of the epoxy primer are applied to the area, allowing 60 minutes to pass between coats. Scott stresses allowing the epoxy primer-sealer to cure for two days, then a blocking



A straightedge is used to confirm uniform surfaces between the fender, door, and quarter panel. This, along with a tape line, will make all the difference in your work. You want perfectly flush doors and panels when the door is closed.



Now is the time to confirm door, fender, hood, and decklid gaps. All should open and close with plenty of clearance to avoid paint chafe. You want all gaps uniform so that they segue smoothly from one gap to another. Begin adjustments at the B-pillar and get the door aligned at the jamb; then take your adjustments forward to the front fender.

with 400-grit wet or dry 3M sandpaper. Scott uses different shades of epoxy primer to help him see how



Be prepared to shim hinges and body panels to get gaps and alignment true. Under normal circumstances (no accident damage) you should be able to adjust doors and panels without shims. Some shims, like the one shown, must be fabricated. They can also be found at auto body supply stores.



This quarter panel has been worked with short and medium boards to reveal low spots that need to be filled.

much epoxy remains while sanding. The epoxy coat will produce an excellent base for a final coat of epoxy primer-sealer and paint.

Scott has chosen Glasurit for its durability and easy application. His preferences among primers and fillers are based on years of experience with these products and how well they have performed. The materials are ever-evolving thanks to improved technology, he notes, but also tougher environmental laws

that make it more challenging to paint a car in places, such as California, where waterborne paints are the only allowable finishes.

The key to a successful paint job is understanding paint and paint prep chemistry. Scott stresses your close attention to manufacturers' instructions and following them to the letter. Because finishes are typically two-part, they must be mixed exactly as instructed. Too much hardener and you risk a cure that's

too fast. Not enough and the paint never cures and you wind up with a sticky mess. The same can be said for fillers, which must be mixed per instructions to avoid cracking or filler that won't cure. Scott uses Evercoat fillers as a rule, with a tremendous amount of experience with them over the years. Scott isn't afraid to change product when it doesn't measure up to his standards. Then, it's trial and error until he gets the result he wants.



Scott uses Glasurit urethane automotive finishes. On this project he is using Glasurit 22 single-stage paint, which yields a more single-stage OEM finish like Ford did in the 1980s.



Components, such as the hood and decklid, have been fully prepped and are in the final primer coat before paint. Scott stresses cleanliness, meaning before you lay down primer/sealer wipe down surfaces with a tack cloth and blow off with compressed air.



This is what fresh Glasurit primer/sealer looks like after it has been applied. When it cures, it will be a satin finish. This is a two-part primer/sealer when a catalyst is mixed with the paint, and in that case it cures like body filler does.



In addition to wiping down surfaces with a tack cloth to catch any dust and other fallout before laying down a final primer coat and paint, Scott notes, the floor in your paint booth should be wet to reduce static electricity and minimize dust particles.

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Glasurit is adamant about proper mixing when using its finishes. Getting a great finish, along with durability, boils down to good chemistry. Follow Glasurit's instructions closely.



Glasurit primer/sealer has been applied and allowed to cure. Once the primer cures, Scott closely examines the surfaces for any remaining low or high spots.

Surface Prep

Scott stresses methodical surface prep, which involves infinitesimal details few of us ever think about. He will focus on low spots and work them until they're invisible. Scott has been known to drill out factory spot welds and rework the steel to get gaps just right. He massages steel panels to get the exact fit he is seeking. If you want a high-caliber paint job this is what you do, too.



These are the body tools of the trade: sand paper, sanding blocks, and long and short boards. Dowel rods are used for concave areas. Keep Scotch-Brite pads available for cleanup work and minor scuffing.



Unless you're repainting in the same color, plan to strip and paint the door-jamb. Doorjamb that don't match the body defeat the purpose of a repaint. You want the jamb and body to match. This goes for the engine compartment and trunk areas too. A pristine restoration has to have a perfect color match bumper to bumper.



Scott has taken this four-eyed 1986 Mustang GT down to the steel with traces of the factory finish still

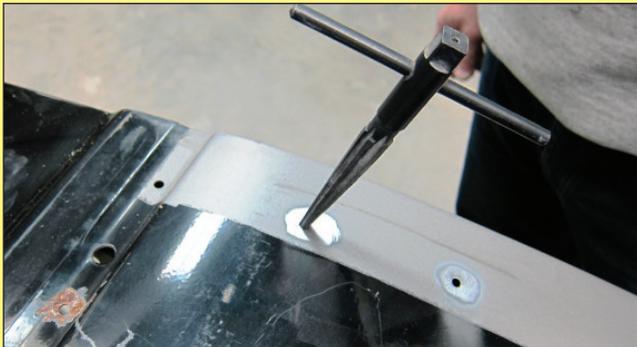
there. He will lay down a good self-etching primer-sealer for good paint adhesion, then get to work on imperfections and repairs.



Working the body with short and long boards brings out the imperfections. Long boards reveal broad surface low and high spots. Short

boards and blocks catch the smaller areas. It takes a lot of time and practice to develop a feel for these imperfections and how to handle them.

Filling the Holes



To fill a hole or holes, begin by countersinking the holes for a plug-and-fill weld, also known as a rosette weld. Countersinking the hole gives you more surface area for contact.



Holes we want to eliminate are MIG-welded closed. You want just enough heat to get good penetration

without distorting the sheet metal. If you've never welded before, take your sheet metal body panels to a qualified body professional.



Fender holes have been rosette-welded and have cooled. The next order of business is to grind these welds smooth.



The rosette welds are ground smooth without getting the metal too hot. Excessive heat distorts the steel, resulting in warpage. Grind the

welds a little at a time until the surface is smooth. These areas must be filled once primer-sealer is applied.

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Because 1983–1993 Mustang convertibles were bucked and built at the Dearborn, Michigan, plant, then shipped to Cars & Concepts many miles away in Brighton for convertible completion, the bodies aren't always what they could be. Be prepared to see a lot of irregularities in Fox convertibles because each was a one-off unit despite mass production. With Bruce's convertible, Scott had to rework some of the sheet metal to get fitment where it needed to be. Expect reworks of this kind with all Fox body types.

Enough body filler should be applied to fill the affected area. The first pass over body filler should be a cheese grater, which removes the excess, followed by a course paper and a long or short board depending upon the area. If you're faced with having to apply excess amounts of filler, either work the damaged surface and minimize the damage or replace the panel. Sometimes it's less work to replace

the panel than it is to repair. Much depends on how easy it is to find a replacement.

When working body filler, be prepared to do it again and again until the surface is perfected. Making irregularities vanish takes a lot of

time. This is where you must decide whether to further repair a panel or replace. With filler, it is best never to get in a hurry, but instead allow the filler time to cure before going to work. Spot putty can be used to fill minor imperfections in filler.



This front frame rail/strut tower assembly suffers rust-through. Spot welds on the inside of the frame rail are being drilled out for removal of the inside skin, which will be replaced and rosette-welded back together.



The inside of the frame rail has been replaced and rosette-welded together. A rosette weld, also known as plug-and-fill welding, works wonderfully when you cannot spot-weld these parts together.



The new floorpan has been seated and clamped to the frame rail extensions and both the fore and aft pans. This full pan is the only way to go if you want solid structural integrity. This way there are no welded seams and the associated weaknesses.



As Scott Brideau works the "Bruno" Mustang, he discovers one of the many irregularities of these 1983–1993 Mustang convertibles. It seems no two were done the same way. Convertibles were fitted with external decklid hinges as shown. Note the silicone sealer where the hinge meets the header panel.



These guys are doing a terrific job of grafting in the new pan using rosette welds. Holes, approximately 1/2 inch in diameter, are drilled in the pan at the frame rail extensions and the fore and aft pans where seams overlap. These holes are rosette-welded and filled, then ground smooth until they vanish.



Can you see the 1/2-inch-diameter holes at the frame rail extensions for rosette-welding? This process makes the seam more solid than the factory seam.



The Dynacorn floorpan has been completely welded into place and isn't going anywhere. You're going to want to scuff and primer-seal the new pan, then run body sealer around all of the seams.



Not all Fox Mustang sheet metal is available, and you may need to hone your fabrication skills. If you have to patch rust holes, make sure all rust is gone; otherwise you're burying an issue that will bite you later. Make sure the patch makes sense and that it will blend nicely.



Make sure the body is adequately supported during the structural repair process. If you're doing floorpan, frame rail, or rocker panel replacement, properly support and jig the structure. Everything must be spot on. If it's not, doors, fenders, hoods, and decklids will not line up.



Make sure your patch repairs make structural and aesthetic sense. Although floor repairs typically cannot be seen, they should make structural sense.



Masking tape is used here to define edges that must be finished in a straight line, because this is one of the first things you see getting into the car.

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The body in primer is worked again and again to remove irregularities in each panel. These areas have been worked with long and medium boards to expose the high and low spots that need attention.



Here's an item that bites a lot of painters. Surfaces that are chipped like this must be taken down to the primer or steel. Forget featheredging these areas because they will still be visible in the final finish.



Can you see what Scott has accomplished here? Low spots have been filled and worked smooth. It is remarkable how irregular the undamaged factory sheet metal is on this very original Fox body. The greenish/gray areas have been filled, and there are a lot of them. This is the difference between a factory finish and a show car finish.

Preassembly

Scott suggests a mock-up (preassembly) be done before paint, like street rodders do with hot rods before they put the body in paint. Street rod builders assemble their primed body panels before paint is applied to make sure everything fits together well. Even with mass-produced Fox Mustangs, fitment should always be checked before paint, because no two stampings are identical, which can

affect gaps. Irregular gaps are easier to correct when body panels are in primer than when they are in paint.

When you get into front fascia and rear bumper cover fitment, not to mention ground effects, spoiler, and the like, you're going to find even more irregularities where these pieces don't fit against fenders and quarter panels the way they should. The variations are stunning even with original Ford parts. Make sure fitment is true before paint goes on.



Scott had to break the factory spot welds and rework the seam where the quarter panel meets the header. He found the factory fit to be sloppy and in need of a rework.



Once Scott broke the welds and moved the quarter panel, he was able to rosette-weld the two back together as shown.



Look at what you can get for a Fox restoration: fenders, doors, and decklids. Not many know there's a difference between 1979–1990 front fenders and 1991–1993 fenders. And it is important to your restoration.

One way to ensure fitment is to drill a very small 1/8-inch pilot hole in a hidden location through the fender, door hinge, hood, and decklid into the inner structure. You can do this during disassembly if all body panels are a perfect fit, which is unlikely in most cases because factory fit was generally poor. Get the body panels and gaps spot on and snug the bolts; then drill the pilot holes. Don't be afraid to make adjustments and drill again. Allow for paint thickness and the weight of door mechanicals when you're setting gaps. Ideally, you will hang the doors assembled with glass and mechanical installed. Don't be afraid to use shims as necessary to get gaps right. Just make sure shims are not visible when you're setting gaps.

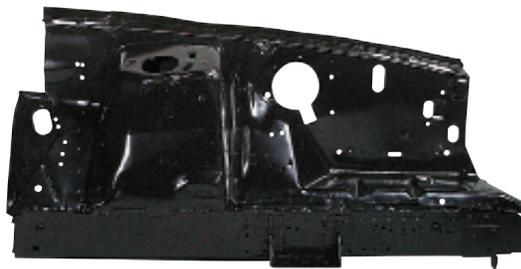
Scott suggests snuging body panel bolts, but not tightening them down, during the fitment process. You might even want to use flat washers between bolt flanges and the panel during fitment and temporary installation to prevent damage. Tighten bolts once and be done with them after the paint has cured.



National Parts Depot offers full floorpans for 1979–1993 Mustangs. Although floorpan replacement seems overwhelming, it really isn't that hard to perform. The main thing to remember is to fully support the body and lock your support in place so nothing moves.



The 1991–1993 front fender has a flared fender lip to clear the larger 16-inch five-spoke wheels that came in 1991. That's the difference from 1979–1990.



It is remarkable what's available for Fox Mustang body structure. National Parts Depot has complete front end assembly substructures available for your Fox project. You can get sheet metal and you can get the entire assembly. This is good for accident and rust repair.

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Scott Brideau uses a straightedge to find low spots in doors and panels. This is not noticeable to the naked eye. Lay down a straightedge and check out this low spot.



When you study this straightedge across the door into the fender it is obvious how significant the low spot is.



Scott grinds the low spot to prepare for minor filling and sanding. Roughing up the metal provides space that a very thin application of filler can hang on to.



Do you see how rough the steel is? This is what you want for good primer and filler adhesion. (Photo Courtesy Directors of the Great Lakes Region of Team Shelby)



Scott grabs a long board to work the hood as shown. This brings out the obvious low and high spots. You can see the low spots here. Low spots are filled with a polyester filler and worked until they are gone.



As broad surfaces are worked with long and short boards the low spots become apparent in dark gray. These areas are filled and worked again. Door-to-quarter panel and fender gaps are adjusted at this time.



Scott mixes the body filler and catalyst (hardener) carefully prior to application and sanding. He stresses proper mixing, following the manufacturer's instructions to the letter. Too much hardener and it cures too quickly. Not enough hardener and it never cures. Either way, you wind up with a mess you will have to remix and reapply.