

When the publisher asked me to write a column about restoration I thought "What would the first article deal with? After some consideration, I thought that it would be best to discuss restoration work in general and let specific questions be addressed in later issues. I welcome questions and commentaries so please speak up.

The first question should be: Why do a restoration? Well, I think that the most obvious reason to do a restoration is for the desire to restore a particular car you are in love with and for the love of the work itself. Without this, the restoration would, at best, be second rate. Even though I do not own most of the cars we restore, I

always love doing them. When I no longer love doing restorations then I will stop doing them.

A second reason for doing restoration is for the respect of the marque and for the respect of the particular automobile in question. Even though I don't share the same love and enthusiasm for every marque and model, I can respect the importance of it and thereby give it a proper restoration. However, for certain models, this philosophy may have an economically unsound disadvantage (at least for the present) when weighing the cost of the restoration against the value of the car.

This leads me to the third reason for doing a restoration: to protect or increase the value of the vehicle. The cost of a total restoration is very high today, but I have seen time and time again that a really thorough and complete restoration inevitably repays the owner. Let me make it perfectly clear here that I don't consider painting a car and/or re-doing or re-dying the interior a restoration. Many people believe that efforts such as these infer a true restoration when they advertise their car for resale.

A 99+ point restoration will always bring *at least* fifty percent more than an average car when it comes time to sell. I have seen this number go to as much as 100 to 200 percent-inflation notwithstanding. So, even though initially it may not seem economically sound to do a restoration, in most cases it will payoff. Of course, try to find out the projected value of the car in question from as many sources as possible before you begin. Obviously, it doesn't pay to do a total restoration on a '71 Ford Pinto-or even a '72!

So, on that note I will close, leaving for future issues questions such as: to what level should I take this restoration-to perhaps a level as good as the day it left the factory?-or maybe even better? Should I do the restoration myself or let a professional do it? How do I choose a shop?

We'll also get very specific about things such as: Paint, Primers, Leathers, etc.

Now that you have decided that your car is worthy of a restoration, you must address the following three questions:

- 1) Do I need a total restoration? If so, what does that mean exactly?
- 2) Do I use the identical materials that were used when my car was originally manufactured, or do I use more modern and superior products.
- 3) When I restore the car, do I take the level of finish and fit on the bodywork, paint, chassis, upholstery, chromework, etc. to the same level as when it left the factory; or do I make it better? What about materials used in the engine? Old metals that were used to make valves, seats, and rings do not last long as newer, more durable materials.

These are very sensitive issues. I don't think that anyone will ever come up with only one correct answer. I suppose it's like many other things in life. You must decide what is "correct" for you.

#### QUESTION ONE:

How extensive a restoration should I do? You must now ask yourself "How original do I want the car to be?" This has become the big issue at Ferrari Concours these days. The National Advisory Council for the Preservation of the Ferrari Automobile (NAC/PFA) stated that originality is the most important consideration. I agree that originality is very, very high up on the list. But, if originality is the most important aspect of the Concours then I say perhaps it shouldn't be called a Concours d'Elegance. Maybe it should be called an originality show. My point being: if you want to keep everything as original as possible, and if the car has never been restored, then don't

touch it. Don't do a restoration. Just clean it as best you can. When a great painting is restored, it is not repainted! It is taken down to the original layer that was applied when the artist painted it. So, again I would say that if originality is of the utmost concern then don't restore — just clean it.

Okay, so we have decided that we just can't stand to look at the old grand lady sitting there in her faded, cracking paint and her tattered interior with split seams and worn corners. So we embark on the journey. If you decide that you can't stand the paint but the interior looks pretty good, then just do the paint. If the engine compartment is rusty and its paint is chipped and hardware is rusty, then by all means do it. If it looks pretty good and very original, then leave it if originality is more important than aesthetic and cosmetic beauty. Again, it's what is correct for you that ultimately matters. It's always hard for me to give advice on this point of total originality vs. cosmetic appearances to someone who asks me, "What do I have to do to win?" It has been my experience that a totally redone car — one that is done to perfection — usually ends up beating everything else. Why is this? Well, after all it is a contest of elegance, is it not? I don't think that anyone would want to see a worn and tattered car, or one which has had a mediocre restoration done on it, win a first place or a best in show award if it is not elegant. So, again we are back to what is correct for you. *You* have to live with it. How do *you* envision your pride and joy?

Let's start with question number one. If originality is of utmost importance, then restore as little as possible. If you want it to look like new (or maybe better than new —

we will discuss this further), do a total restoration. Total means just what it says, total. In our shop we generally do total restorations, especially on older cars. We find that it is usually impossible to do only one area of the car to perfection and not the rest. The areas that do not get done usually end up looking terrible compared to the parts that have been done.

Total restoration means paint, engine, engine compartment, suspension, wheels, exhaust system, interior, trunk, transmission, rear axle, window mechanisms, lights, accessories, etc! Some items may need to be replaced (if available) while others may only need to be cleaned. Some may have to be fabricated from scratch. Be prepared!

#### QUESTION TWO:

Should I use original materials? If your car was manufactured prior to 1980, it most likely has some materials that date back to the early 1900's. Especially the paint and primers. It is probable that the engine also has some antique materials used in the valve seats and piston rings.

The older paints and primers were usually nitrocellulose lacquer base, or synthetic enamels. Nothing looks better than lacquer, especially nitrocellulose, when properly block sanded and compounded to a high lustre. The brilliance is incomparable. Modern urethane enamels can come very close but they can never equal lacquer. That's because lacquer becomes a very hard, brittle surface when it dries. The microscopic image of its surface therefore can become very, very level with proper finishing and compounding. This is why it reflects more perfectly and will subsequently appear deeper, just like a real mirror. Urethane enamel is very soft com-

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pared to lacquer. Thus, it does not produce a hard mirror-like surface. However, this is why urethane enamel is far more durable and less susceptible to cracking than the harder, more brittle lacquer. The original primer on your car is probably a nitrocellulose lacquer type. This means that it is brittle and that it probably has a lot of cracking in it. Lacquer also has to be re-compounded every six months or so because it is continually shrinking. This shrinking occurs because the drying process in lacquer lasts up to five years or more. It's a good bet that the same type of paint and primers that were used on the exterior of your car were also used in the engine compartment and interior. For a show car I prefer to use modern urethane enamel primers for the undercoats, and lacquer paint for the color topcoats because of its superior brilliance. What do you want, durability or originality?

The same question comes up for the materials used in the engine. For example, the original valve seats in your engine are either steel or bronze. They are relatively soft materials and will wear rapidly compared to a modern stellite valve seat. A valve seat made of stellite is hard, and valve adjustments will not need to be done as often. If it is a V-12 Ferrari engine that you are rebuilding, that could be an important point since a valve adjustment on a 12 cylinder engine can be a very time consuming affair! The same goes for valve guides. Old bronze ones wear out fast and start letting oil by, which results in your exhaust pipes billowing big clouds of blue smoke. It's original, but not very elegant.

#### QUESTION THREE:

I save this question for last since it is the most sensitive and controversial

issue, at least in the Ferrari Club of America.

As the value and importance of older cars becomes greater and greater, the issue of over restoration comes more to the forefront. Judges are confronted with the car whose paint finish and panel fit is better than it ever was when it left the factory. I find it very difficult or even impossible to strip and repaint a car to the same poor standard to which it was originally done. Some of the original finishes on some cars are atrocious. How do you bring yourself to refinish a car's paint with orange peel or make panels purposely fit poorly when doing a thorough, high quality, expensive restoration; just to make it look as poorly as it originally did? I cannot convince myself or the owner that this what should be done. Especially since on the scoring card of the Ferrari Club judging sheets points are taken off for poor panel fit or paint finish.

Points are taken off for "over restoration". A perfect finish and panel fit can be considered by the judges to be not original and therefore points must be taken off for "over restoration". There seems to be a contradiction here that must be addressed soon. I for one am in favor of performing a job to the highest level that I can. The only reason that the factory didn't do this is because they could not afford to, both in terms of dollars and time. I don't think that Enzo Ferrari or Ferdinand Porsche, given the opportunity to choose between mediocre paint and panel finish to superior fit and finish would choose the former. I am sure that, when conceived in the mind of the designer, the automobile was envisioned with a perfect mirror finish and precise panel fit. These are how the cars were presented by the manufacturer at the unveiling of

a new model at the auto shows. A model example — a show car.

I also believe that when we show these cars we are putting them up on a platform for admiration by the visitors and for critiques by the judges. After all, a judge's job is to criticize and point out the aspects of a car that are inferior. We want these cars to be admired because we feel that they are important and different and, therefore, we want them to be exceptional in appearance. This can mean, "better than when they left the factory". I feel that it is impossible to "restore" a car to how it originally was. It can never be the same as it once was. Do you put dirty undercoating and cosmolene overspray on the chassis and engine to make it "as it left the factory"? It is a very difficult point. Of course originality is very, very important. Yet, I feel that this need not be sacrificed in terms of original equipment, original color schemes, original types of plating and hardware, original type of leather, vinyl, carpet, etc.

As the owner of a car undergoing a restoration, you must ask yourself these questions.

We will be getting more specific in future issues. Stay tuned.

*Doug Pirrone attended the University of Michigan, and then worked as an engineer for Grumman Aerospace Corporation. He is now the President of Berlinetta Motorcars, Ltd. in New York and a Chief Team Judge for the Ferrari Club of America. His restorations have been recognized nationally and internationally, including a First in Class at the Pebble Beach Concours d'Elegance and Best in Show at the Ferrari Club of America Annual Meet.*

## Starting A Restoration

### *Guidance On What, And What Not, To Do*

Are you ready for your total restoration? Well, here we go. It is an immense commitment, mentally and physically. Physically, not only because of the strong effort that is needed for some of the actual operations such as lifting heavy objects, block sanding, sanding and sanding...but also because of the long hours that you will be putting in. These long hours will be even more taxing if you are doing your restoration as a part time hobby, since this will mean long evening and weekend hours. After working all day, you will find that it will be tough dragging yourself out to the garage after dinner. However, it can also be tremendously therapeutic. The end result and the work itself is well worth it. The gratification is immense.

To complete a total restoration project within a reasonable time — two to four years! — it is helpful to have a very understanding wife or girlfriend. Or, no wife or girlfriend. Divorces and breakups can be used to your benefit. You get involved in your project, and feel much better than if you were bar hopping.

We will start with disassembly and go through each phase as we progress from this *Carrozzeria* column to subsequent articles.

*PHOTOS!* I cannot emphasize enough the importance of taking photographs as you go. Color photos. Black and white pictures do not show enough detail. You may think that you will remember how or where something fits, but in two or three years when you

are putting it all back together you won't even recognize certain pieces. So, step one is: photograph the car from every angle, inside an out. That way, when you are putting it back together you will save a lot of time by not having to stare and wonder, "Now what went here?"

If you have purchased a car that is not running, I would recommend the following: if you are going to rebuild the engine and other mechanicals, I would strongly advise that you take a ride in the car first. Even if this means that you must get the engine running, or that you have to make parts for the brake system that has been sitting and rusting for the last ten years. It is very demoralizing to put the last piece of chrome on the car, be ready to start up your finished product and go for a ride, only to find that the steel fuel line that runs through the chassis vibrates terribly in its old position. Perhaps someone may have enlarged the counterbore on your Porsche 356 Normal flywheel so that it would accept a 200mm clutch instead of the old 180mm clutch, but they forgot to also add the proper depth to the counterbore to accept the Super 90 clutch. Or, the chassis tube in your Ferrari 250 LM that carries water from the engine up to the radiator might be rusted through and now leaks, meaning that you may now have to unrivet that beautifully restored belly pan to get at the rusty chassis tube and repair it.

After you have driven the car and you are satisfied that everything that is

wrong with the car (e.g. a hum in the differential) has been noted, you can begin disassembly.

Having a neat, well organized, well lit and warm (in the winter months) workplace is half of the battle. Have plenty of storage shelf space. Label all of your containers and shelves. While you are taking apart the car, make a lot of notes and diagrams. Take photos as you go. However, sometimes photos are not as clear in showing important details and sequences as drawings and sketches are. *Do both.*

I usually start with the engine and driveline removal. It makes it easier to push the car around for degreasing and other work. It also gives you something to do while you are waiting for the paint remover to work. Take off things that are liable to get broken while leaning over the car, such as the side view mirrors and lights.

After you get the engine and transmission out, and you have degreased the chassis, you will want to set up the car in a place where it can stay for awhile because you will be taking off the suspension. If you really want to do a 100 point restoration, you should make some type of rolling platform to set the car on. Preferably a "rotisserie" stand that you can mount the car upon and then turn it at different angles. You can then mount the car and work on the difficult areas easily, rather than ignoring them. We use one of these stands, and they are invaluable. I have seen them advertised, or

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you can have a local welding shop make one. You will use it to roll the car outside to sandblast the underbody and chassis. After removal of all of the mechanicals, body trim, lights, etc., you will want to remove all of the articles on the dashboard, because the sand from the sandblasting will get into *everything*.

After sandblasting and cleaning up, be ready to put a light coat of primer on all of the bare metal. Rust begins immediately! If you are going to use a urethane type of paint (either the color of the car for the body or a shade of flat-to-glossy black for the engine compartment) you must use a urethane type of primer. It is more durable and, some urethane topcoats are not compatible with lacquer undercoats. Most manufacturers make a urethane primer that is particularly good for underpanels. They are called etching primers, and they are good for steel or aluminium. The German company "Glasco" makes a product called "Glassurit Etching Primer". All manufacturers products are comparable. Chemistry is not the exclusive territory of any one company. However, I do recommend that you stick with one brand of materials because they tend to be more compatible within the different types of materials that you will be using from one stage to the next. It is also less expensive than buying six different types of hardeners, reducers, etc. You should also treat bare metal with the appropriate type of metal conditioner if it is going to sit around for more than half a day

unprotected.

There is a new process of blasting that uses plastic beads as the blasting medium. This can be used to paint strip the body and the chassis as well, since it will not harm glass and most rubber. There are companies that will do plastic beadblasting for you. They bring a truck with beadblasting equipment, and a plastic bubble tent that covers the car. The car sits in the enclosed tent while the paint is being blasted off. We have used the process, and it is quite efficient. It also will not cause warping to exterior steel body panels. However, I don't think that I would use it on aluminium. I haven't tried that yet. Under any circumstances, *do not sandblast exterior body panels with sand!* They will surely stretch and warp. Also, a glass beadblasting cabinet is invaluable in cleaning millions of little parts.

If you have straightening or rust repair to do on the exterior body panels, it is usually better to treat the bare metal with the appropriate type of metal conditioner rather than priming, because you can then weld and lead with body solder, or fill the minor irregularities with plastic fillers without having to remove the primer first. There are also urethane epoxy primers that will accept plastic body fillers over them. Don't be afraid to use plastic body fillers because someone told you that "real bodymen" don't use them. Sure, it is possible to do an entire car without using any, but do you have the time to pick and file, weld and file?

If you are doing it for someone who is paying you, is he willing to pay for all of the extra hours? If so, fine. Bring on the money. I assure you, it is an exercise in self righteousness. It is not necessary. Modern body fillers are fine if used in small *thin* layers. Do *not* use them on edges or corners. They will chip and break off. Use welding or body solder (lead). Anyone who tells you that they use absolutely no filler is either: 1) Lying; 2) Has infinite amounts of time; 3) Has a customer with infinite amounts of money who is willing to pour it into his car; 4) Is using ten coats of epoxy primer (or featherfill) instead, which is the same thing except that it is sprayed on instead of squeegeed on by hand; or 5) Is not really concerned about some waves or irregularities in his body panels.

That ought to keep you busy for awhile. Till next time, make sure that you have plenty of midnight oil!

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