So You Want To Restore a Falcon!

By Dick Harrington

PART 1

It all started in 1967 when I bought my first car, a black 1963 Falcon Sprint; V8, 4-speed, broken rear spring perch, broken seat frame, but a solid lifter cam, duel point distributor and a *cool* factor that any teenager would love.

April 2001 the youngest child is in her final semester of undergraduate college, the last tuition bill has been paid and it is time to find a 1963 Falcon Sprint. The next three months were spent looking on eBay, Hemmings and a continuous internet search. Initially only hardtops were considered, convertibles were then included, then the years were expanded to include 1964 and 1965. It was decided that 1964 and 1965 Comet hardtops could also be an option. On July 4th weekend an ad was found for a 1965 Comet hardtop in Buffalo, NY. A phone call to the owner went very positive and a road trip was on. Bought it! One year later, the need for a Falcon Sprint had returned and the search was on again. One evening, a buy-it-know came up on eBay for a Falcon Sprint convertible. A quick call to the owner and an instant decision to buy was made. Well, the Comet drives and runs great, having a convertible can't be beat on a warm summers evening, but there was still a need for that *first car*. The search continues! In October, 2003 and Sprint hardtop was located in New Jersey. On Columbus Day weekend, my wife and I went and got what should have been found first. It looked pretty good (they always do when you have lust clouding your vision), but a full restoration was in order. Two and one half years later the car was mostly finished and on the spur of the moment it was decided to head to Indianapolis for the Falcon Convention.

Now, you would think that this was the lead in to restoring the Falcon Sprint hardtop, not quite! Since 2001, my Falcon knowledge base has gone from zero to a good solid understanding of Fords early sixties compacts. The knowledge includes how to do a restoration at home in its entirety; body work, paint, mechanical, interior, you name it and it has been done. After the Sprint hardtop was completed, the time, money and effort was painful enough that this would never happen again. Well, as visits were made to Falcon Club of America and Comet East events a social life has emerged that has turned out to be very pleasant pastime. One question seems to get asked frequently, would you restore another? The answer, absolutely not! Well, time tends to dull the memory instead of saying no, *"if the right car came along"* became the answer. Guess what? The right car came along! A 1963 Falcon Ranchero with a 260 V8 and a 4-speed. A rare combination, particularly since it was built in August, 1963 (plant change over to the next years model usually happen in early July).

So, over the next two years, a monthly update on the progress will be presented. Restoration progress, costs of restoration, tips on how and why, the tricks of finding parts, where to find help and recommended tools required to do it yourself.

Mid December, 2007

The Ranchero was found through TFFN (The Ford Falcon News) for sale ads. It was in Modesto, California, over 3000 miles away. It was not even considered initially, but the price was very good and the owner was a regular on TFFN and an officer in the FCA Sonoma chapter. A quick review of the data plate indicated that indeed, the vehicle was a numbers matching rare bird.

The Ranchero sitting in Modesto, CA.

How does one get a Falcon from the left coast to the right coast? An internet search led to a site where you can list your need for a vehicle transport. Emails and telephone messages arrived by the dozens. Cost was about $900 on the low end and $1500 on the high end. Of course, being a state worker, you accept the low bid. A check was sent to the owner and the wait to get the car picked up began. Well, eight weeks goes by and nothing has happened. Repeated calls to the broker for the transport company go unanswered. Finally, a letter, email and a phone message was left to cancel the deal and another broker was selected. Of course, the car immediately gets picked up by the first broker's carrier and the second broker refuses to refund a $200 deposit. The first lesson: Deal with a carrier directly, never use a broker. The Ranchero arrived in Delhi, NY on February 4, 2008

The Ranchero arrives in upstate, NY. Burrr…….

Next month: Initial Inspection

So You Want To Restore a Falcon!

By Dick Harrington

PART 2

Initial Inspection

When you first get a vehicle home you will probably want to drive it. In this case, with the right front fender crunched (not to mention winter time) it was not possible, it did get driven from across the street and up the driveway into the garage. The engine starts, the clutch and transmission work (at least in first and reverse).

The bed was full of organic matter and other debris, fortunately, a 50º February day occurred shortly after the Ranchero's arrival and it got a good pressure washing inside and out.

A good cleaning was one of the first requirements.

The Ranchero came with Torque-Trust-D aluminum wheels with BF Goodrich Radial TA Tires, an extra set of tires and rims were included (original 13 inchers). The nicest surprise was an extra 4-speed shifter but that was offset by some of the bed trim being missing.

The left front fender, doors, hood, frame were rust free, the bed looked good, but there was some paint bubbling around the rear wheel wells. The vehicle had bend repainted at least three times so there would be four layers to strip off.

The interior was toast! The bucket seats were not original, the door panels, arm rests, headliner, sunvisors and radio were gone. A hole was cut in the rear package shelf for a CD player. Speaker boxes were fastened below the shelf and a large subwoofer box was placed in the center between the seats. An amplifier was fastened to the top of the subwoofer. The floors had been repaired but at a substandard level.

The engine had chrome aftermarket valve covers and air cleaner (all rusty), a Ford cast iron 4 barrel intake with an Edelbrock carburetor and a Pertronix ignition module had replace the originals components. Because of the right front fender damage, the battery had been located to the foot well in the bed. A duel exhaust system, glass packs and short tail pipes that exited in front of the rear tires were fastened to the stock exhaust manifolds.

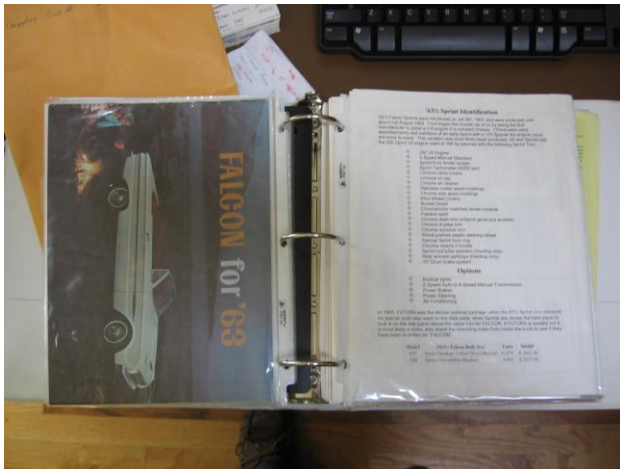
The door data plate matched the driver's side inner fender VIN number. The 260 V8 engine, 4-speed Borg-Warner T-10 transmission and 3.25 8" rear axle were all date coded correct. Indeed this was a rare Falcon! According to Larry W. Blum, Jr. of Ford

Falcon Ranchero Registry the estimated number of 1963 V8, 4-speed Ranchero's is about 135.

Developing a plan

After completion of the initial inspection a plan should be established. What is your objective for the finished vehicle; mostly original, custom, resto-mod? Once an objective is established, a list of parts required is a good idea. Divide the list into divisions that include exterior, interior, engine, suspension, brakes, tires and wheels, and paint and body. List the required parts under each division. Identify which parts are available from local parts stores, which parts are in reproduction and sold by Falcon/Ford antique car parts vendors and which parts have to be found used. Some parts will need to be sent out for refurbishing. Bumpers and exterior trim may need to be sent to a re-platter. This requires lots of lead time, the bumpers for the Ranchero will be gone for at least 4 four months. Assess what work that you can do and what is beyond you skill level. After analyzing what parts are needed, what labor is required and what you can do yourself, add up the costs. Can you justify the investment? Finally, if you are committed, get yourself a three ring binder to keep track of all you gather about your vehicle. A large envelope to put receipts in is also a good idea.

Each of my cars has a 3-ring binder. Notice the manila envelope sticking out, that's where all the receipts go.



Each 3-ring binder contains original brochures, magazine articles, instruction sheets that come with new parts, etc.

Next Month: Let the Work Begin

So You Want To Restore a Falcon!

By Dick Harrington

PART 3

Let the Work Begin (Interior and Exterior Trim Removal)

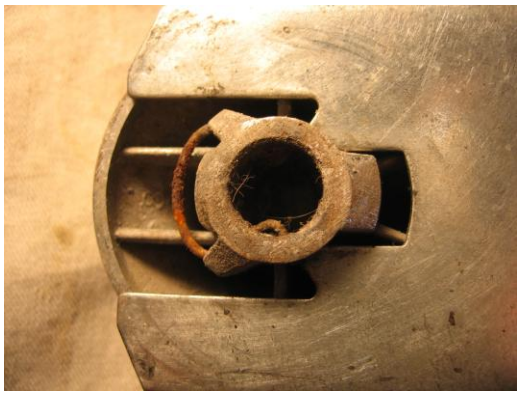
The chances are that anyone doing a restoration of a Falcon will have a different idea of how to do it and more than likely a different starting point. There is so much dirty work involved in a ground up restoration that disassembling the vehicle is probably one of the first steps. The first problem is where to store the parts that come off. Secondly, remembering how to put it back together. This is why a plan has to be developed. You must take pictures and lots of them. There is no manual that shows the level of detail necessary to get all the pieces back in the right place. Keep a digital camera in the tool box. Label every nut and bolt. Zip lock bags, compartmentized containers, Sharpie magic markers (at least 3 colors), peanut butter jars, numerous boxes are all excellent for parts storage. Having a parts car also is a wonderful accessory, not only will it be a source of parts, it will provide a reference when assembly begins. Try to package fasteners and parts together.

The first items removed are all the exterior trim. Great care has to be used in removing aluminum and stainless steel moldings. Windshield trim is imbedded in the gasket and it can not be removed without glass and gasket removal from the body. Most people use a knife and cut the gasket. Drip rail and side glass moldings are snapped over the body, they need to be gently prided off inch by inch. An old fashioned bottle opener (church key) wrapped in masking tape works well. Side moldings are snapped on and bolted on. On a 63 Falcon, they are bolted at each end and then snapped over a molding clip through the center. Rocker molding trim is similar to side moldings. A shop manual is pretty specific as to how side moldings are fastened. None of these moldings are reproduced, so if you ruin it, finding good used is probably your only option. Die cast emblems are usually held on with barrel nuts. These are set into the sheet metal and then the emblem is pressed into them. A putty knife gently slid under the emblem might pry it out. Gently move from one side of the emblem to the other gradually working the emblem out. The good news here is that most of the emblems are reproduced. Some emblems are bolted on, again check the manual if you can not see the emblem from the back side.

Diecast emblems are held in by barrel nuts. Emblem on left, emblem removal in center and an example of the different size barrel clips on the right.

Grills, headlight bezels, taillight and parking light housing are held on with Phillips head screws and/or bolts. Soak the fasteners in a rust penetrant for 24 hours before attempting removal. If the screw heads strip, sometimes you can get on the back side of the screw with vice grips to get it loose. A cut off wheel on a die grinder can cut through nuts when all else fails. It is best to remove the bumpers and mounting brackets together. Just unbolt the mounting brackets from the frame. Bumper bolts more often than not will break, worse is when the bolt turns in the bumper, new bolts are readily available, so don't worry about trying to save them.

Once the exterior trim is removed, gut the interior. Start with removal of the seats. The front seats are bolted through the floor and more that likely cutting maybe the only solution. Seat tracks are hard to find, so use caution, cut the bolt or the floor (particularly if new floors are in the future) if necessary. The back seat bottom is removed by pushing back and then lifting. The back rest of the rear seat is held by two bolts at its base. It then needs to be pulled forward and pushed up to disengage it from the rear package shelf. You may need to remove the arm rests on two door models to get it out of the car. The arm rests are held on by two screws accessed from underneath. Door panels are held in by top and bottom channels as well as wire mold clips on each end. The window crank needs to be removed first and a door handle removal tool is a must. They can be had at most automotive stores for around $5.00.

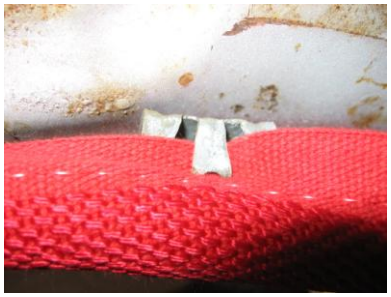


To save yourself lots of frustration, buy a window/door handle removal tool. Door handle removal tool can be seen on the left, with a door handle above. The right photo shoes a door handle with the tool pushing on the wire clip that holds the handle on the post.

The wire mold clips need to be pried out, a stiff putty knife will work. The door panel then needs to be bowed outward to remove it from one of the channels. A 1x2 piece of wood that is inserted in from the open end of the door will help to get the panel bowed.

Wire mold clips. The small one on the left is for dash pad trim, the other two are for door panel retention.

Remove the inner windshield trim, sunvisors and rear view mirror all held on with Phillips screws. Pull the headliner and windlace out. The headliner bows are specific to their location, so be sure to note where each bow goes. They are color coded on their ends. Be sure to save the wires that attach the rear most bow to the top of the rear window. The windlace is held on by clips; carefully pry the windlace out of the clips.



You will probably buy new windlace, cut the windlace out to salvage the clips. Clips are expensive!

To remove the carpet, the door sills and the kick panels have to come out, Philips screws hold them in. If the dash pad needs replacing, remove the lower stainless trim which is retained by wire mold clips, use a putty knife to gently pry them out. Remove the speaker grill, speaker and defroster hoses. Defrosters hose usually break do to age, new ones are available. The dash pad maybe glued; a sharp putty knife will usually cut it free.

Next month: More Part Removal

So You Want To Restore a Falcon!

By Dick Harrington

PART 4

Engine and Transmission Removal

If you are contemplating a ground up restoration, sooner or later the driveline has to come out. Trim removal requires patience, driveline removal requires grunt. Driveline removal also requires a heavy investment in tools. *NOTE: Hopefully you have a good solid concrete surface to work from, if not, it may be smart to not attempt this.* A 2-3 ton floor jack and four - 6 ton jack stands will get the Falcon in the air so the dirty work can begin. Loosen all the lug nuts with vehicle on the ground and then jack the rear axle up by the center section of the axle. I prefer to support the vehicle with a jack stand under each side of the rear axle, the higher the better. Once the rear axle is stable I move to the front and place the floor jack under the frame rail next to the transmission. Jack the car about 6" and place a jack stand under the frame just before the frame bends upward toward the engine bay. Switch to the other side and jack and support about 9". Switch back to the other side and repeat until you have the front close to even with the back. Before sliding under the vehicle for the first time, gently rock the car to be certain that it is secure.

The driveshaft is first to be removed. Place a drain pan under the transmission tail housing and then unbolt the driveshaft at the rear axle pinion. Two U-bolts secure the universal joint to the pinion, remove the four nuts securing the universal joint and gently pry the shaft away from the pinion. Have a roll of tape handy to wrap up the universal ends so they do not fall off. A tube from a paper towel roll will provide protection for the input shaft. A heavy duty plastic bag and a rubber band can be placed over the transmission tail shaft to contain the transmission fluid and prevent dirt from getting in.

I prefer to pull the transmission before the engine is removed. On a standard transmission the shift linkage will need to come off as well as the speedometer cable and starter. Be sure to take a picture before removal. With a standard transmission, loosen the bell housing bolts and rear transmission cross member. The emergency brake cable will need to be unfastened from the rear transmission support also. When everything is loose, place the floor jack (a transmission jack would be a nice item to have in the inventory) under the transmission running parallel to the vehicle (handle pointing toward the rear axle). Remove the rear transmission support and the 4 bolts holding the transmission to the bell housing. Carefully wiggle the transmission free and roll the jack backwards gradually lowering the transmission to the floor at the same time balancing the transmission on the jack pad. A friend will definitely make things easier.

Automatic transmissions will also need kick down linkage, cooling lines and dip stick tube removed. The front inspection plate needs to be removed to gain access to the torque converter bolts that hold the torque converter to the flexplate. Have plenty of kitty litter around for absorbing spills.

If the engine is not going to be pulled soon after the transmission is removed support the rear of the engine.

The engine will need to have all the fluids drained, the wiring harness, throttle linkage, radiator hoses, wiring, air cleaner, carburetor, fuel lines and exhaust removed. Unbolt the intermediate engine mount from the frame mount. On a V8 engine, I attach a chain to the intake manifold bolts kitty corner to each other. Before lifting the engine out, the front of the vehicle will need to be lowered back to the ground. An engine hoist will make quick work of lifting the engine out. Have an engine stand ready to mount the engine to. Most engine stands do not come with bolts or spacers to attach the engine with, so have some scrap ½" steel pipe to fabricate them.

Next month: Suspension Removal

Correction: In *Part 1, So you want to Restore a Falcon*, I mentioned that I bought the Ranchero from a member of the Sonoma Chapter, Jim Simmons (#11598) actually belongs to the River City Chapter. Dealing with another member of the FCA when purchasing a Falcon brings a level of confidence when purchasing site unseen. Thanks Jim.

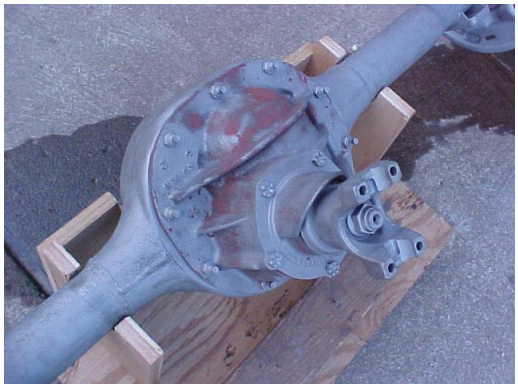
So You Want To Restore a Falcon!

By Dick Harrington

PART 5
Suspension Removal

Open up all the brake bleeders and drain out the brake fluid. Removal of the brake lines is always a challenge as the soft line and hard line connection usually do not part easily. It makes sense to just cut the hard lines. Brakes should be taken very seriously, meaning new hard lines and soft lines. Place the front back up on the jack stands and dismantle the front suspension. The shocks have to come out first, followed by the coil springs. I start shaking when ever I hear coil springs and removal in the same sentence. A coil spring under compression is a loaded weapon! Buy a good coil spring compressor, I prefer and internal type. Read and understand how the coil compressor is to be used. I also try to run a length of chain through the spring and loop the chain around the shock tower, if something slips, the chain will contain the coil spring. Once the coil springs are removed, the front suspension can be removed. Be prepared to have a battle with the front strut nuts. I find that heating them and melting paraffin wax helps with their removal.

The rear axle is a snap compared to the front suspension. The jack stands under the rear axle will need to be moved to the rear frame rails. Take the axle, leaf springs, wheels and tires out as one. Unbolt the front of the leaf springs and the rear spring shackles and roll the axle out. I built a wooden dolly and placed castors on it for the rear axle. The dolly makes it easy to move the axle around and also provides a holder to work on the axle.



Two views of the axle sitting on the home made dolly. This saves the back and also provides a platform to make any repairs.

Glass removal

Side glass removal is done by a standard disassembly method. The tracks and stops are bolted in place (real good idea to take lots of photos before removal). The glass comes out through the top, so removal of the fuzzies (furry stuff at the top edge of door) is a must. Pry the fuzzies out and figure on replacing them.

Front and rear glass is held in with a gasket, it many cases, there is stainless trim around the windows. This trim is imbedded into the gasket and can not be removed until the gasket is out of the car. If the gaskets are going to be replaced, cut the gasket out with a utility knife. If the gaskets are in good shape, I have had success in taking the glass, stainless trim and gasket out in one piece. I start at an inside upper corner and pry the gasket lip down. I place Popsicle sticks in the gap between the body and the gasket and work my way around a corner. Once you have gotten about 9 -12" in each direction from the corner, you can begin to push the whole assembly out. Use caution at this point and do not force it. If the gasket has been glued in, you may need to work the top edge with the Popsicle sticks all the way across. So far I have been successful with this approach. Even though I always plan on replacing the gasket, I like to have the old gasket to protect the glass edges during storage.

At this point you probably have taken up every square inch of your garage space with parts strewn all over. I have not found a good solution to this dilemma and a divorce might be imminent (kidding here, my wife is a real keeper).

Next month: Repairing the damaged right front corner

So You Want To Restore a Falcon!

By Dick Harrington

PART 6
Repairing the damaged right front corner

Before the Ranchero even arrived from California, a plan of attack was being developed to deal with the crunched right corner. From the photos of the car, it could be seen that the headlight bucket, right front fender, grill, headlight surrounds were gone. The radiator support and the inner fender around the battery were obviously bent. Frame or suspension damage would have to be determined after the vehicle arrived. The missing items were no problem since I hand those parts left over from restoration of my hardtop. Thank goodness I did not sell the extra parts! The right front fender, that I had, had a little rust repair required, so that was taken care of while waiting for the Ranchero's arrival.

An NOS radiator support was obtained through eBay. The seller would not ship the support, but I had a car buddy that lived about 45 miles away and he was willing to pick it up. The plan was to get it at Ford Carlisle. A search for the inner fender at the battery tray area was futile. Everybody wants one of those because of battery corrosion.

Radiator support pretty well crunched.

The good news was the frame was fine. The upper control arm upper shaft was bent, so it would need replacing, to bad since it was fairly new. The shock tower was also straight. So, the first step was to remove the front inner fender. The spot welds were drilled out carefully since more than likely some of the inner fender would need to be reused. The Mustang inner fender is re-popped, so the possibility of using parts of the Mustang and the salvaged Falcon inner fender was a strong possibility.

Inner fender damage

To begin reconstructing the inner fender, the radiator support needed to be straightened as much as possible to provide a guide. (It would be three months before the NOS radiator support would come into my possession.) A hammer and

dolly was used to bring the radiator support back into its original shape. There was some rust were battery corrosion had taken place and that actually helped in reshaping the area in front of the battery. The inner fender was also hammered out using a welding bench as a flat surface to hammer against. It began to look like both the radiator support and the inner fender could be saved.

Radiator support un-crunched! Missing paint indicates where the creases were. If you look close, you can see where some metal patches were stitched in to replace the rusted portions.

The inner fender straightened and welded back into its proper place.

Having another Falcon available to take measurements from was extremely helpful. A lot of cardboard templates were made to transfer different contours. The front fender was installed and removed and re-installed numerous times to be certain that everything was in alignment. The hood was also left in place as a guide to fender location. The hood was re-gapped at the cowl since it was tweaked a little from the impact.

A lot of scraps of sheet metal get used up in repairs like this. I visit a local body shop and get all the free damaged sheet metal I need. American made pick-up truck box sides provide excellent pieces with the metal gauge as heavy as the Falcon sheet metal.

I had never done this much straightening before and I surprised myself with the results. *Where there is a will there is a way.*

Next month**:** Repairing the rust damage

So You Want To Restore a Falcon!

By Dick Harrington

PART 7
Repairing the Rust Damage

RUST!!!!! Chances are rust damage is going to be part of the restoration process. Of the four classic cars in my collection, each has had rust issues. The 65 Comet (from Tennessee) had some lower quarter work and driver's floor work. The 63 Sprint convertible (from Indiana) had new floors, lower quarters, lower doors and under hood rust replacement. The 63 Sprint hardtop (from Los Angles via New Jersey) has new floors, rear quarters, under hood repairs and worst of all a rusted out cowl. The Sprint hardtop was my first experience at serious rust repair and it took the better part of a year to just to replace the rusted portions of the car. The illusions of a vehicle that spent its whole life in California along with all the stories of California rust free cars made me overly optimistic concerning the Ranchero.

Examination of the Ranchero (once it arrived in Delhi) showed the floors already replaced as well as patched lower quarters. In both cases the quality of the work was poor. The floors had significant patching over the top of rusted metal. The quarters had as much as ¾" of bondo in some places. In other areas, bondo was placed over the top of rusted through sheet metal. Before you begin rust repairs, the first thing you need to understand is paint is expensive (the Sprint Hardtop has $1500 worth of paint, no labor). The second thing is paint is only as good as what it is stuck to. Paint does not hide defects, paint does not stop rust (if it already exists) and a good paint job takes way more preparation than actually spraying the paint.

Replacing the Floors
Since Rancheros are basically two door station wagons with the back half of the roof removed, the front portion of the pickup box is where the footwell of the back seat would normally be. The footwell is covered with a steel floor that allows water to get underneath it. This water eventually gets into the passenger area and there goes your floors. It would have been easier to replace the original floors than it was to remove someone else's idea of a floor repair. The floor patches were brazed in and overlapped over the original floors (what was left of them).

In a uni-body design the floors are part of the structural integrity of the vehicle, so it is important to the strength as well as the appearance to get them done correctly. My preference is to only replace what is damaged. Floor panels are available for the front toe boards, front floors and rear floors. There are also half panels that combine the front and rear panels. In all cases, they take extensive reworking to make them fit, edges are not folded and seams are often in the wrong place. There are no replacement panels for the area under the rear seat or for the drive shaft tunnel. Making your own replacements is possible with a little ingenuity; a heavy piece of angle iron that sandwiches the floor pan metal to a steel work bench can be used as a brake

to fold seams. An inexpensive ($100) bead roller will provide the beads to stiffen the pans. Cut scraps of cardboard for templates, it saves a lot of time and frustration.

Before beginning removal of the existing floors, it is a good idea to have the vehicle well supported on jack stands and sitting as level as possible. Work one quarter of the floor at a time (i.e. front passenger side) and fully complete the repair before moving on to another quarter. This will minimize the chances of a twisted chassis. I butt weld all my panels rather than overlap them (except when duplicating original factory assembly). The reason for butt welding is the fear of water getting trapped between two sheets of metal with the obvious consequences. All of the welding is done with a Lincoln SP 135 MIG welder using .023 wire and Argon/CO2 gas. MIG welders are easy to master with just a little practice. Sheet metal will warp from the heat of welding, the standard practice is to weld a short distance, ½", skip about 4" and repeat a ½" weld, skip 4 " and so on.

The floor patch behind the driver has been removed; if you look close you can see sealant and brazing.

New right toe board is welded in place

New right floor pan is in place.

All the floor pans finished and coated with epoxy primer.

Torque Boxes

While the floor pans were out, some repairs were made to the torque boxes. (Torque boxes are additional bracing added to V-8 powered Falcons to stiffen the uni-body for the additional horsepower of the V-8). It is much easier to repair the torque boxes from above than below. The torque box on the right side of the Ranchero had about five pounds of sand in it. There is a body plug on the torque box just behind the front tire. It was missing leaving an opening for the sand to enter through.

When it comes to sheet metal to repair the torque boxes, scraps of structural steel studs (10 gauge) work great. If there are any commercial construction projects nearby, ask for some scraps.

Warning: the structural studs are galvanized and welding galvanized metal produces toxic fumes. I grind the galvanizing off at the area where welding will take place. To be extra safe be sure to wear a welding respirator and provide plenty of ventilation. Before welding the torque box shut, a heavy coat of paraffin based rust proofing was brushed on the inside surfaces.

Rust damage at right front torque box

A rusted section of torque box is cut out. Notice the sand that collected inside.

The right floor of the torque box repaired

The back side of the torque box is repaired; the toe board patch is next.

Frame Rail

A small rust through had taken place inside the torque box on the frame rail, it was patched with a piece of the structural steel stud. Again, before welding the floor pan, a heavy coating of paraffin based rust proofing was brushed on the inner surfaces of the Frame rails. All the rest of the Ranchero uni-body frames were in great condition.

The only frame damage was inside the torque box

The frame rail is repaired prior to patching the torque box.

The lower unibody of Ranchero is structurally sound again. It is quite satisfying to stand back and look at the finished floors. I would estimate that there are over 200 hours of labor to complete these repairs.

Next month**:** Repairing the rust damage on the body.

So You Want To Restore a Falcon!

By Dick Harrington

PART 8
Repairing the body rust damage.

Rear Quarters
At first look, the rear quarters looked to be in pretty good shape, the photo's sent indicated few problems and when it was sitting on the delivery truck it also looked pretty good. Looking through the inspection panel holes on the inside of the bed did indicate some previous repairs had been made. A little exploration with a pick hammer left no doubt, serious repair was required at the quarters. In some spots the Bondo was ¾" thick covering sheet metal patches that were brazed in place. There was no choice but to chip off the Bondo, grind through the brazing and remove the metal patches.

Left side also leaves room for optimism.

Right side looks ok in this photo. It is not a close up, but it leaves plenty of room for optimism.

Once removal of the previous repair was completed, an analysis of what was required was done. New quarters would be nice, even good used would be welcome, but NOS is more than likely non existent and shipping for used quarters would be exorbitant. Lower rear patch panels were the best option! Rear lower quarter patch panels were ordered, like the replacement floor panels, the patch fit was vague. There was no clue where they should attach and because so much original metal was gone, this area ground to a halt. I needed a good original Ranchero to get some reference dimensions and photos from. A perfect 1962 Ranchero was found at the all Ford show in Syracuse, NY. The owner was nice enough to let me masking tape some heavy Kraft paper to the back side of his fender and I traced the lower quarter and wheel well opening. Plenty of photos of both the outside and underneath were taken to provide references later. This is another example of the need to make contacts with other Falcon owners.

The inner quarter panels were repaired first. The patch panel was temporarily hung with sheet metal screws and the inner patches were matched to fit the outer panel.

Gradually the each rear quarter began to take shape. There are no words that can describe the feeling of accomplishment as you go from a rusty, floppy quarter to a solid rust fee one. It is a slow process; I would estimate that each quarter took 2-3 weeks of intensive labor to patch.

Rear view of left rear quarter after the Bondo and overlapped metal patch was removed. The original paint was underneath the patch.

This is a view looking at the back side of the left rear quarter. If you look close, you can see the brazing puddles left

The wheel lip on the driver's side was also showing serious decay, so the damaged area was cut out. Again the inner panel was repaired first. Shaping the patch required making a wooden buck to use as a form. The pattern that was made at the Syracuse Ford show was used to make a heavy cardboard pattern of the wheel well shape. It was then transferred to a 2x10 to make a wooden buck. A piece of sheet metal was cut to the rough shape of the buck, clamped to the buck and gradually hammered to fit the buck.

The wooden buck and a piece of sheet metal are clamped to the work bench. The yellow plastic mallet is the tool for hammering with. The cardboard wheel well template can be seen in the background.

The wheel lip patch has been MIG welded into place.

As each patch panel was completed, it was temporarily clamped or screwed to the vehicle and a 4”x 1/16 inch cut off wheel was used to cut both the patch and the original sheet metal simultaneously, creating a butted seam. It was then stitch welded in place with a MIG welder. Every inch of the weld is then checked with a light held behind the seam to be sure that no light passes through. A missed hole in the weld is a place that moisture will get through. There is no greater fear than having a perfect paint job ruined by a blister due to a flaw in the welding.

The lower quarter panel patch is clamped in place using vice-grips and seam spacers. A series of 3/8” long welds are placed about 4” apart. This is to reduce heat build-up that may warp a panel.

Lower quarter panel patch is welded into place.

The left rear quarter sheet metal is repaired, the paint has been stripped (stripping paint will be discussed in a future installment), and is ready for primer. After each area is repaired, the area was stripped and painted with an epoxy primer to prevent any further rusting.

Next month**:** More rust damage repair.

So You Want To Restore a Falcon!

By Dick Harrington

PART 9
More rust damage repair.

Engine Bay
All three of my Falcons share one thing in common; rust at the center-top of each inner fender. The most likely cause for rust in this area is a reinforcement piece behind the inner fenders. It sits in the wheel well and moisture that the tire kicks up gets trapped between the inner fender and this reinforcement. Of course no paint gets on the inner surfaces and it doesn't take many years for the damage to be done.

The other common engine bay rust issue is around the battery, often referred to as the battery box area. In both engine bay rust areas, fabrication of patches is probably the only option. I cut out as little area as possible trimming until all the rusted metal is removed. Once the rusted metal is removed, a cardboard pattern is made (cereal boxes work well). The pattern is then transferred to sheet metal. For small patches like these, discarded sheet metal from a body shop works well. As in the other rust repairs, the pieces are butted and stitch welded.

Typical inner fender rust. Notice the inner fender and the reinforcement plate underneath. Both will get patched.

The reinforcement plate is removed and the rusted inner fender material is cut out with a 4" cut off wheel in a pneumatic grinder.

The patching is completed and the reinforcement plate is clamped on for a trial fit.

Be sure to save the VIN number if possible. Fortunately there was no rust near the VIN.

Front Fenders

Two typical problem areas in Falcon front fenders are over the headlights, often referred to as the eyebrow, and the lower rear behind the wheel. Patches are manufactured for both of these areas. The Ranchero had no right fender; fortunately I had one that I had picked up for the Future trim piece (arrow). It had a little rust that was cut out and patched. The left fender had taken a small hit in the front that needed a patch. If shipping wasn't so expensive, the better option might have been to seek out good used fenders. A search was made at Ford Carlisle, but most "rust free" fenders for sale had more rust than the ones I already had.

Notice the dent in the front edge of the fender.

Dent is repaired; fender is stripped and is ready for primer.

Doors

The doors on the Ranchero were near perfect. The only issue was the dreaded fatigue crack. This is not a rust issue per say, but since the welder is out; it is a good time to fix the problem. Falcon doors are made up of an inner shell and an outer skin. The two pieces are well bonded (spot welds) across the sides and the bottom. On the upper edge, there is little room left to attach the two pieces because of the window glass

channel. There is only one middle attachment point and that is between the front vent window and the side door glass. This joint fatigues from the closing of the door and the harmonics it causes. The Ranchero was worse than any other Falcon door I have seen. It must have been slammed shut often, more than likely by someone using the vent window post as a handle.

The dreaded fatigue crack! This is on the driver's door.

This is the view from the inside of the door. It took a lot of door slamming to create this much damage.

The fatigue crack is welded back together.

The inner door panel crack is welded shut. The vent window was re-inserted to check the fit around the repair.

It took seven to eight months to repair the rust damage. There were many weeks that had more than 50 hours of time spent on the crusade of rust elimination. This was a California fairly low rust vehicle! As I look back on the rust elimination process, all I can say is I've got to be crazy. Falcon fanatic maybe?

Next month**:** Stripping Paint

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So You Want To Restore a Falcon!

By Dick Harrington

PART 10
Stripping Paint

Paint is very expensive! Paint sticks to what ever it hits first! Whatever the paint hits first must be stuck to the vehicle, if not, the paint falls off!

If you are thinking about painting your Falcon, remember, the paint job is only as good as the foundation it is placed upon. With that said and the cost of a gallon of good paint in the $500 plus range taking a chance on painting over existing paint is risky at best.

Removing the old Paint
There are a few options when it comes to removal of the old paint: sandblasting, soda blasting, chemical dipping, sanding or chemical paint strippers. Living in the boondocks eliminates the first two (for me) for the most part. The difficulty in transporting a body shell a hundred or so miles, once in each direction, eliminated professional sandblasting, soda blasting and chemical dipping. Sanding is a partial option and when combined with a chemical paint stripper is the best option for me. None of the options are ideal and all of them present problems. Paint dust is toxic, chemical strippers are toxic so caution is a must. Rubber gloves, respirators, disposable hazardous material suits, and plenty of ventilation is a number one priority.

A typical gallon of paint stripper is about $25.00 and it took about 3 gallons to strip the Ranchero. Since the Ranchero had at least five layers of paint (original primer, original white, then red, followed by white again and then gray) it took repeated applications of stripper. Once applied, the paint will lift and it can be scraped off and disposed of. Plastic garbage bags are used to contain the paint; this is done by placing a small garbage can with the bag under the

portion of the vehicle being stripped. One section of the Ranchero was done at a time. When a section was completely

The driver's door chemically stripped, but not sanded. Notice that the rear quarter and the front fender are already stripped and primed.

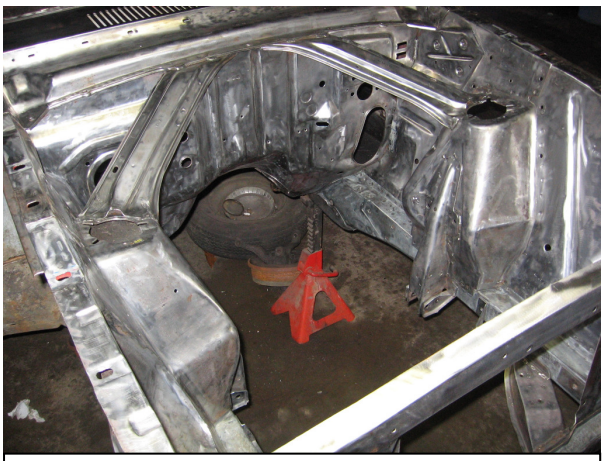
stripped of paint, the panel was sanded to remove any remaining paint residue. The bare metal then had a self etching epoxy primer applied. Priming the section quickly eliminates flash rust which could contaminate the future paint job.

The process of stripping the Ranchero to bare metal and priming is a long process, at least six months. It is a miserable job but is also the most important part of the overall final appearance of the vehicle.

This is a view of the cowl after the first coat of stripper was applied and then scrapped off.

The right rear quarter after multiple coats of stripper and scrapping. The original red oxide primer indicates it is almost totally stripped.

Yes, every square inch needs to be stripped including the inside surfaces.



This is the goal, shiny metal surface.

The arsenal of tools used to defeat the ugly paint demons.

A beautiful site is a panel or section in fresh primer.

Next month**:** Leveling the body

So You Want To Restore a Falcon!

By Dick Harrington

PART 11
Leveling the body

Paint does not hide imperfections, if anything it will magnify them. So, beauty lines need to be straight and panels need to be level. In 1963 Ford did not worry about a perfectly straight panel. When I sight body lines on Falcons it is easy to pick out the vehicle that is an original rust free car. There are certain waves that are original equipment.

Ford use to use lead as filler to somewhat level their bodies, today synthetic fillers are used; they are less hazardous to the environment and are easier to work. A clean surface is a must. The common wisdom is that fillers should be applied over a primer coat of paint for proper adhesion. Fillers should be as thin as possible; straightening the sheet metal to keep fillers to a minimum thickness is a good objective. Fillers sink, so minimizing the depth of filler is also strived for. When the rust repairs were being completed, getting the sheet metal as straight and level as possible was part of the goal. A lot of hammer and dolly work was done to knock out as many dents as possible. The ranchero, being a pickup truck had seen a rough life. The bed and rear wheel wells took a lot of hammer and dolly work to get *close* to level. In many places, metal reinforcing prevented getting to the back side of the body sheet metal forcing a purchase of a stud welder. A stud welder does just that, it welds a stud on to the sheet metal. Once the stud(s) are welded in to the dent, a side hammer is used to pull the dent out. The stud is then ground off.

Short kitty hair filler has been applied and sanded.

There are a lot of different types of fillers, but I tend to use only two; short kitty hair and lightweight. The short kitty hair filler is waterproof and dries very hard (difficult to sand) but it resists sinking and if a pin hole was missed in the sheet metal repair, the waterproofing quality will hopefully stop water from getting to the back side of the paint. The sheet metal imperfections are smoothed as close as possible with kitty hair filler and then light weight filler is used to finalize the surface. Light weight filler sands more easily, but is not as hard. It is probably a good idea not to use light weight filler around edges since it would not resist a ding very well.

Three heavy coats of high-build primer have been applied.

Guide coat applied.

Guide coat sanded off. The dark spots are either the base primer showing through or the guide coat sitting below the level body surface. The lighter shade is filler.

Close up view of a low spot (green) that will require more filler.

Once the sheet metal is close to level, two to three heavy coats of high-build polyester filler (another type of primer) is sprayed on. Before sanding a contrasting color paint is misted over the high-build polyester filler and the surface is block sanded. This is referred to as a guide coat and will be removed in the high and flat areas of the body during the sanding process. The guide coat will not be removed in the low areas. More light weight filler is applied in the low areas and this process is repeated until the body is straight and level.

Once the body is level, a final coat of high build polyester filler is applied followed by a light sanding. Lastly a sealer is applied to the paint. The body is now ready for final painting. Did I say paint is expensive yet?

Next month**:** Restoration decisions

So You Want To Restore a Falcon!

By Dick Harrington

PART 12
Restoration decisions

You have been reading about the progress of the Ranchero restoration for a year and only the disassembly and body preparation have been completed. During this process, no final decisions have been made that will affect the outcome of the Ranchero. It is time to start finalizing the vision. Should it be restored to stock, after all, how many 1963 V8, 4 speed Rancheros were built? Speculation is less than 200. Restomod? Hot Rod? Decisions have to be made so the progress can continue. The thinking has been going on since the beginning, but the vision was constantly evolving. At some point final decisions have to be made.

The Ranchero made many of the decisions for me. Mechanically (engine, transmission and axle) it was recently gone over, the engine and transmission were both rebuilt shortly before my purchase. The brakes and front suspension were also relatively new. The body was bent and had typical Falcon rust, but was easily restorable to the stock configuration? The interior was gone!

How was the Ranchero going to fit into my life? Daily driver, trailer queen, weekend sunny day driver? I have one trailer queen and two sunny day drivers. All of them get driven to local car shows. Two of them are driven long distances, neither are as comfortable as driving the F150 with a trailer in tow. So, if driving a long distance, modern comfort features would be nice.

What types of car shows and what class would it be entered in at car shows? Answering questions like this will help in finalize the restoration choices. AACA requires as close to showroom new as humanely possible, FCA has multiple classes from mostly stock to completely modified, local mix brand car shows are anyone's guess as to what will draw attention.

If trophies are part of the goal, the types of judging at the shows can have an influence.
Shows that use skilled judges require a special vehicle that spends it life riding to shows in an enclosed trailer.
Amateur judging is anyone's guess as to what is required! Cleanliness, excellent paint and good chrome are important. It also helps to have a big block engine and lots of mirrors reflecting the underside. Shows where the participant's judge often times

The sculpting around this tail light is way beyond what it left the factory with. Exquisite!

require having lots of friends. Are you building a car to please the judges or yourself?

It also is a good idea to examine similar cars. The Ranchero was missing the interior, so looking at other Rancheros assists in eventually getting it back together. There are also a lot of good ideas that you may want to incorporate into your car.

This is the emblem on the tailgate of the Ranchero. It covers the hole for the roll up window used on the station wagon. The diecast emblem was die ground out around the bulls head so a third brake light could be inserted. This is over the top!

The same Ranchero (owned by Tom and Shirley Washburn) had a number of very clever ideas. Look closely at this picture and see if you can identify what is unique. Answer next month.

The Plan

So, the plan is mostly stock, but also a comfortable driver! We want to be able to drive across the country and not feel like we were rolled down a hill in a 55 gallon drum. The body will be stock and in the original Corinthian White exterior paint. The interior will be stock 1963 Falcon Futura Viking Blue with bucket seats and console (a few custom features are in the planning stages). Bucket seats are not original to this Ranchero, but not to far from what may have been available. The engine will be modified slightly, a Ford 4100 4-barrel carburetor will replace the Weber 4 barrel (the same as a Edlebrock) it came with, a Pertronix ignition module was already installed and a Ford alternator will replace the generator. An original Ford add on air conditioner will be installed eventually. A Ford cable driven accelerator pedal will replace the bell crank mechanism. Dual exhaust with stock type mufflers, as quiet is important on long drives. Changing the rear axle ratio from the original 3.25:1 to 3.00:1 will improve economy on the interstates. Brakes will be upgrade to discs in the front and maybe the rear. Halogen headlights are a must for these old eyes. A quality sound system that will work with an I-pod. Sound deadening will be an important addition. Three-point seat belts for a little better safety. A day and night inside rear view mirror along with two outside mirrors. Four way flashers are a nice feature in case of a road side break down.

I became interested in cars in the mid sixties, what I referrer to as the Ford *Competition Proven* years. That means that it will sit up like the Ford drag cars or the NASCAR racers, no cutting springs or lowering blocks.

Tires and wheels are still up in the air. I like the look of 65-66 Ford steel styled wheels, but the aftermarket reproductions have had some run-out issues. Stock 13" wheels will not clear the disc brake upgrade; maybe 14" steel wheels with wire wheel covers. All this is subject to change at any given moment. I am open to your thoughts, email me at rharringto2@stny.rr.com.

Next month**:** Engine Detailing

So You Want To Restore a Falcon!

By Dick Harrington

PART 13
Engine Detailing

You may be expecting the finish paint this month, but the monthly articles have caught up with my progress. The summer has been spent getting ready to finish the painting. It is now mid September and the Ranchero is finally ready for final painting. It has taken all summer to straighten and level the body. Hopefully next month you will see the results of all the tedious body work. So here is what happened last winter when it was to cold to do any painting.

During the Ranchero disassembly, there are numerous subassemblies that get set aside. Cold weather shifts the attention to those subassemblies. The engine is the largest project that goes on outside of the vehicle and in all honestly I was expecting to replace the engine with a 1989 302 Mustang GT roller motor. It has been sitting in the garage for awhile and the best part is it has about six miles on it.

Engine pulled. Under all the grease were three paint jobs, original semi-gloss black, then red and finally Ford blue.

The Ranchero motor looked beat, it was leaking oil from many locations and the odometer was reading about 98,000 miles. It probably would have gotten tossed aside if it were not for the rarity of this Ranchero (1963 V8, 4-speed). So before giving up on the motor, it was thoroughly cleaned and partially disassembled.

It turns out the engine is a 289. Most all of the parts (block, heads, cam, harmonic balancer, water pump housing, exhaust manifolds) are dated coded correctly for the Ranchero. Rancheros did not come with 289's in 1963, but 289's were used in Fairlanes that were also assembled in San Jose. Was it a replacement engine? Was it an assembly line mistake? I doubt it was a rebuilt engine because of all the correct date codes, particularly the heads (both the same date code). Before doing a complete disassembly, I pulled the oil pan and inspected the rotating assembly. It turns out the engine had a recent rebuild. The crank and rods were all .010" undersized. A quick check of the clearances with plastigage indicated that the clearances were right on specification. The cross hatch honing was still visible in the bores; the cam was stock for the 260 V8 and in very nice condition. So the plan changed and the engine would get re-gasketed, cleaned up and reinstalled. The engine oil leaks were due to no O ring on the distributor, sucked in intake end gaskets and broken oil pan bolts.

The engine got degreased and repainted. Most all the gaskets and seals were replaced. The engine had a cast iron Ford 4-barrel intake (1965 date code) with a Weber 4-barrel (same as AFB or Edlebrock). The carburetor was replaced with a Ford 4100 - 1.08 venturi. Competition Cams steel roller tip rocker arms and push rods were substituted. The engine was returned to its original colors and correct year Ford chrome valve covers were used to dress the engine up some. The generator was replaced with an alternator to save weight and provide more amperage to energize all the additional power robbing accessories that will be added.

Roller tipped rockers will reduce the friction and also cause less wear in the valve guides.

Engine ready to go back to work.

Answer to last month's teaser: The uniqueness is the steering wheel; Tom removed 2" of diameter changing the wheel from the stock 15" to a more modern 13" steering wheel. Tom took photos of the process and it will appear in a future issue.

Next month**:** Hopefully the finish paint!

So You Want To Restore a Falcon!

By Dick Harrington

PART 14
Finished Paint

After a long and grueling summer of preparing the Ranchero for paint, the finish painting began during the first week of October. Painting continued for three weeks. The paint choice was the original Corinthian white, single stage hardened urethane. A lot of people ask why not a two stage base coat clear coat (what is used on most new cars). Two stage paint has a wonderful wet look to it and is somewhat easier to apply, but to me, it is just too shiny. It looks like new car paint, not the original paint that our trusty old Falcons originally came with.

Painting began with application of two full wet coats on the complete vehicle. After twenty four hours the paint was sanded with 600 grit and then a third coat of color was applied. While still wet, a fourth coat of a 50/50 mix of color and clear were shot. The 50/50 coat gives it a little more depth of shine and is a recommended step by the paint manufacturer. The ranchero was divided into sections for the last two coats. The reason for this is it is too difficult to apply the whole vehicle in one session and then polish it out before it gets super hard.

This is what it looks like after two coats of Corinthian white had been applied. The only masking at this point was to keep overspray off of the underside and engine bay.

After each section was finish coated, within twenty-four hours it was wet sanded with 1000 grit, 1500 grit and 3000 grit and then polished with a wool pad with polishing compound. At this point it looks pretty good, but once it is rolled out into the sunlight, there are sure to be areas that will need additional work. As the vehicle gets re-assembled there are sure to be scratches and nicks that happen. They will all get touched up before a final polish in the spring after the Ranchero is back on its feet and can be moved outdoors,

In between the first two coats and the final two coats, the interior blue paint was applied. The thinking here was to reduce the chance of getting blue overspray on the exterior final paint.

The anxiety that the final painting produces is almost unbearable. Any mistakes in the body work will now rear their ugly little heads. Minor dents, sanding marks, non-straight beauty lines and other imperfections stare back at you. Do you live with the flaw or do you stop and fix it? There are few choices at this point; fix-it, ignore-it, or maybe it is so small no one will see it but you. The reality is most people do not look at the finish with the same level of scrutiny as the person doing the painting. Just remember, finish paint hides no defects, it only magnifies them.

The interior blue finish coat was applied before the final two exterior coats. Notice all the additional masking to keep blue off of the white.

The front fenders and the hood were finish painted first. They were then carefully wrapped up in packing blankets and stored in the attic.

The doors and rear quarters were finish sprayed at the same time. Notice the additional masking.

It is highly recommended to stay with one paint manufacturer from start to finish. The last thing you want is incompatibility of product, remember paint is expensive! More money was spent on paint than the Ranchero purchase price.

There is probably no greater satisfaction then when the painting is completed. Removal of the masking is like Christmas morning, finally, the anxiety ends. For the painting part anyway!

All painted and unmasked. It is a relief to have the painting done. Now the fun part begins.

Next month**:** Let the Assembly Process Begin

So You Want To Restore a Falcon!

By Dick Harrington

PART 15
Let the Assembly Process Begin

Putting the Ranchero back together is fun, or should be fun anyway. There are three areas that will be focused on in the beginning or reassembly. First is to get the Ranchero sitting on it wheels. For this to happen, the suspension and the brakes have to be installed. While it is sitting up in the air on jackstands, it makes sense to install the underneath parts including the gas tank and fuel line. Once it is on its wheels the installation of the engine, transmission and drive shaft will complete the drive train. The third area is the front and rear glass. Unfortunately, before the glass can be installed, the headliner has to go in. Having an interior finish material installed so early in the reassembly is risky (protecting the new paint is also risky).

The first part to go back on was the gas tank, mostly just to get it out of the way. The fuel sender was removed to inspect the tank for corrosion, none was found, so the sender was checked to be sure it was working and reinstalled. The fuel filler neck was also installed so the left rear quarter would look completed with the gas cap in place. A new 5/16" fuel line (from the gas tank to the engine bay) was fabricated to replace the original and attached with the original fasteners. It took a half a day to duplicate all the bends in the fuel line. Bending fuel line and brake line in three dimensions is quite the mental challenge.

The gas tank has the fuel sender and vent hose installed prior to being lifted into place.

The upper control arm, lower control arm and the strut rod install first.

The front suspension assembly starts with the upper and lower control arms. The upper control arms are shimmed to align the vehicle, during the disassembly process, the shims that were on the upper control arms were taped together and marked so they could be correctly returned to the same location. This will have the alignment close enough so it can be driven to the alignment shop. Once the control arms are in place, the spindles are attached. The front strut rod is next and attaches to the lower control arm and the front of the frame.

Since the strut rods are adjustable in length, the rearward nut has to be set to factory specification for proper lower control arm location.

Getting the Ranchero painted was stressful, installing the coil springs is scary. Compressed coil springs are dangerous! I use an internal coil spring compressor; the threaded rod needs to be greased as the heat build up on the threads from the force of compressing the spring will gall the nut and threads. Tension runs high once spring compression begins until it is in place and the pressure is released. It is a ballet with a floor jack under the lower control arm and the ratchet on the spring compressor. I don't relax until the shock absorber is in place insuring that the spring is safely contained.

It doesn't look dangerous! Even with the threads greased on the spring compressor, the screw gets hot from the force of compression.

Spring is in place but still compressed. A floor jack is placed under the lower control arm and slowly the spring compressor is released.

To finish up the front suspension area, the steering box, tie rod ends, pitman arm, idler arm and centerlink installed. As discussed previously, the steering components were upgraded from 1963 V8 parts to 1965 V8 parts, the parts upgraded were the centerlink, inner tie rod ends, pitman arm (1967 Mustang), and idler arm and bracket. Lastly, the sway bar assembly was installed.

We are definitely having fun now!

Next month**:** Rear Axle and Rear Brakes

So You Want To Restore a Falcon!

By Dick Harrington

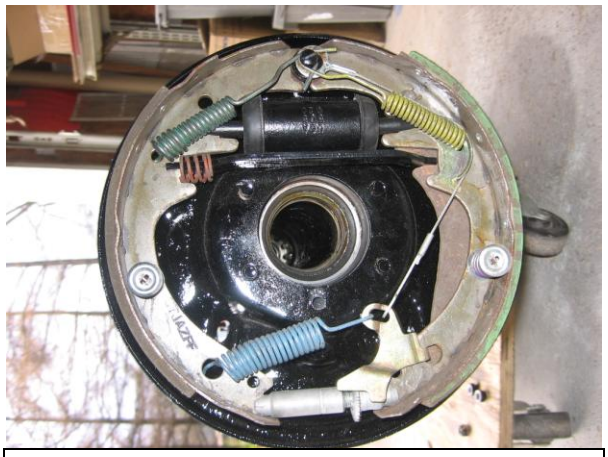
PART 16
Rear Axle and Rear Brakes.

The rear axle was the last major item needing restoration. Once it was removed from the vehicle, it sat underneath the Ranchero on its cart. It got push around whenever it got in the way waiting its turn. Finally it was pushed outside and was stripped with a sand blaster. After it was stripped, it was disassembled and degreased inside and out. One wheel seal and the pinion seal were leaking, so it made sense to replace all the seals. Since the axles were out, new outer axle bearings were also replaced. The center section (pumpkin) was changed from the original 3.25:1 rear gear to a more fuel friendly 3.00:1 ratio. All the pieces were painted with epoxy primer and hardened enamel paint. The axle housing is painted gloss black with and the center section was painted red. Re-assembly was uneventful. New stainless steel brake lines were bent and flaired while the axle was still on the cart to minimize future time on a creeper.

The grease seal is history! Much easier to replace while it is on the cart then on the Ranchero!

The axle freshly sand blasted waiting for disassembly and a new coating of paint.

The brakes were recently replaced so only a little clean up was required. The shoes, wheel cylinders and all the brake hardware were like new. The only restoration work required was the parking brake link. A quick blasting in the bead blast cabinet and they were painted with the rest of the axle parts. The wheel cylinders were taken apart and thoroughly cleaned since the plan is to use synthetic brake fluid. The only new parts for the rear brakes were all the hard and soft brake lines and new brake drums. The original brake drums were turned well beyond their recommended limits.



The brake shoes and hardware were in like new condition. Clean it up and put it back together.

The axle fully assembled and ready to go back into place.

The plan had been to also restore the leaf springs. As it turned out new springs were not that expensive ($225.00 delivered) and that included the rubber bushing front and rear. New front bushing were going to cost about $90.00 (delivered), spring pads needed replacing ($40.00 delivered) and spring clamps were needed (another $20.00). Include sand basting and painting and the new spring price was a bargain. The new springs were coated with rust proofing rather than paint for a more original look.

The completed axle assembly is re-installed.

Installation of the rear axle was a major milestone. No more pushing the axle out of the way. It took me about two weeks of full time work from sand blasting the axle to installation. That was the last dirty job that needed to be completed. Nothing but clean grease ahead!

The front emergency brake cable location ranks right up there with the fuse panel location as NOT one of Fords better ideas. Trying to weave the cable down through the torque box and through the frame rail requires small hands and lots of dexterity. (My hands are not small enough and I don't have the dexterity I once had.) Not all of the assembly can be fun!

Next month**:** Front Brakes and Brake Plumbing.

So You Want To Restore a Falcon!

By Dick Harrington

PART 17
Front Disc Brakes

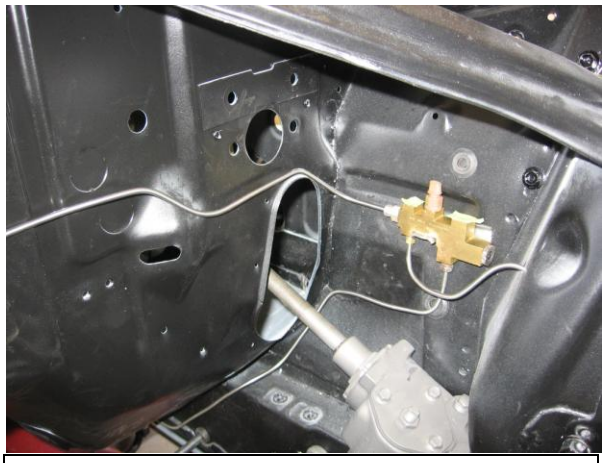
The ultimate objective for the Ranchero is being able to drive it to the 2011 Falcon Nationals in Denver. Mountain driving requires stopping power! My 63 Sprint convertible has the original brakes, well maintained, but they do fade on long down hill runs, downshifting helps, but I like it to stop when I ask it. So front disc brakes are a requirement! I have done the Granada swap on my Falcon and Comet hardtops. They both stop very well. I wanted to do something different on the Ranchero so I started searching for a disc brake kit that was reasonably priced and would bolt on to the original spindles. The decision was made to go with Classic Services Restoration Parts (CSRP). The kit had the lowest price and also the most complete of any other kits I considered. In addition, the CSRP kit is a copy of the original Kelsey Haynes disc brakes that were used on early Mustangs which add to being somewhat period correct. It was a simple bolt on and all the parts are new reproductions. I did not use the CSRP master cylinder, proportioning valve or residual pressure valve. I prefer the original Ford distribution block for proportioning and brake fluid distribution. I also wanted an aluminum master cylinder so I would not have to worry about rust.

The brake installation went very quickly, less than a day. Getting the brake lines run was another matter. It took a couple of days of work to bend and flair all the brake tubing. The brake line that runs from the soft line for the rear axle to the front distribution block probably took longer to bend and flair than the entire front disc brake install. Fortunately I had original brake line to use as a pattern. The brake lines were stainless steel, which is harder and stiffer than regular brake lines, so that added to the extra time required. Stainless steel was used for the brake so they will look pretty for a long time.

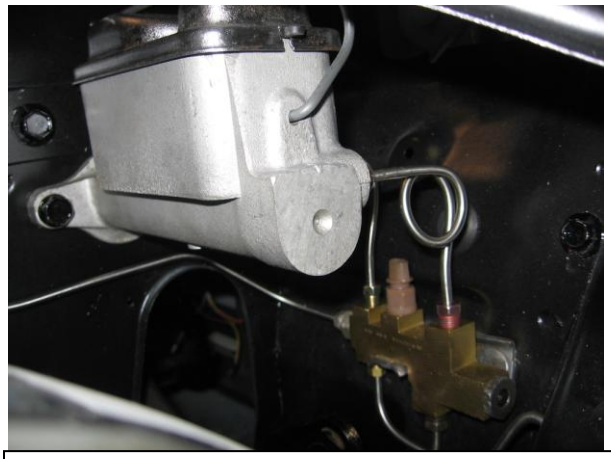
Two views of the completed front disc brake assemblies, notice the rotors are even slotted.

The CSRP brake kit includes everything you need including grease, thread locker and anti-seize.

The master cylinder came from a 1984 Ford Ranger. I have a 1983 Ford Ranger that had an aluminum master cylinder that is the same basic casting that Ford has used for years. For a couple of years Ford cast them in aluminum, to save weight. I tried every automotive parts store trying to get a new or remanufactured aluminum master cylinder. They are only available in cast iron, so the only option was to get one from a salvage yard. I was very fortunate to find one that looked like new. Disassembly of the master cylinder for cleaning and inspection was done and it was put back together with the same parts as the inside also looked like new. I consider that a stroke of luck. All the used or original brake parts were cleaned thoroughly as the brake fluid is going to be silicon based (DOT 5). I have never used silicon brake fluid and want to give it a try. It does not absorb moisture and I am hopeful that the wheel cylinders will last longer between rebuilds.



Ford distribution block with the stainless steel brake lines installed.



Two views of the master cylinder, notice the loops in the brake lines going from the master cylinder to the distribution block. The loops serve two purposes: 1. they make it easier to tweak the alignment and 2. they allow some flex to minimize stress at the fittings.

Completion of the front brakes is a nice mile stone as it allows the Ranchero to become a roller. After sitting on jack stands for well over a year it now can be moved.

Next month**:** Installation of the Drive Train

So You Want To Restore a Falcon!

By Dick Harrington

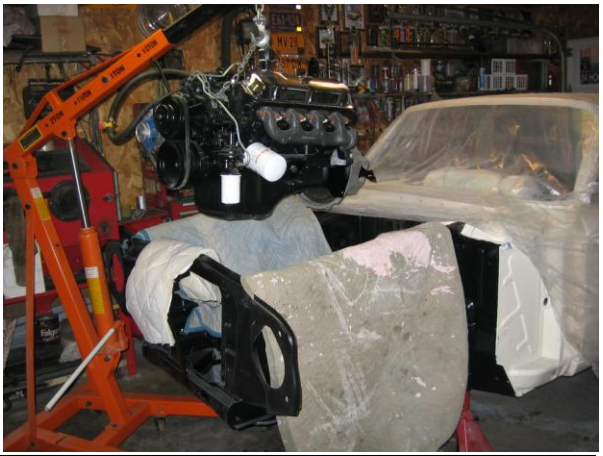
PART 18
Installation of the Drive Train

The best part of installing all the parts is reclaiming storage space. Nothing is more in the way then the engine. Before the engine goes back home, make sure that all work that takes place in and around the engine gets done first. That's why the brake lines and steering assemblies were done previously. Putting the engine in place requires a bit of finesse, particularly since I am doing it with no help. Once the engine came off the engine stand and was hanging from the crane, the flywheel, clutch disc pressure plate and bell housing were installed. It is much easier to do them sitting down than on your back.

The engine is hanging from the engine crane and ready to go back home.

The flywheel bolted and torqued in place.

The flywheel, clutch and bell housing were installed while the engine was hanging.



The engine is on the way home. Notice the packing quilts to protect the paint.

Falcons and small block Ford V8's are a tight fit! The engine would not go in with the oil filter and alternator on. In addition, the exhaust manifolds were removed for additional side clearance. No use scratching any paint if it could be avoided.

Once the engine was resting on the motor mounts and before the engine lift was removed the transmission had to go in. Stabbing a T-10 (four speed transmission) into the bell housing while lying on your back can prove to be a challenge. Not only is the T-10 heavy, it is pretty awkward to maneuver and then align with the clutch disc and input shaft bushing on the flywheel. I balance the transmission on a floor jack so it can be rolled forward and into the bell housing. I jack it up and get the input shaft as close to home as possible and then use a few 4x4 wood blocks to support the tail shaft. The jack is repositioned on the front of the transmission case to raise it to the correct height. Getting the last inch is the real challenge! Of course the splines on the input shaft did not want to align with the clutch disc. To solve the problem, the drive shaft was slid in place to rotate the input shaft. Once a slight rotation was made the transmission slid into place.

After bolting the transmission to the bell housing, the floor jack was repositioned under the transmission so the rear transmission mount could be positioned. After the rear transmission mount was installed, the engine hoist was removed. The drive shaft was then put back into the transmission and bolted up to the rear axle. Finally the shift linkage was installed and adjusted.

The engine is back where it belongs, it looks pretty happy don't you think?

Drive shaft installed, the orange and white stripes duplicate the original factory markings.

The feeling of accomplishment, having the drive train back in place, is what makes restoration rewarding. Taking the Ranchero to Dearborn is beginning to look like a possibility rather than wishful thinking.

Next month**:** Windshield and Backlight

So You Want To Restore a Falcon!

By Dick Harrington

PART 19
Glass:

Installing the windshield, back glass and door glass is pretty straight forward except for the fact that the headliner has to be installed before the front and rear glass goes in. Headliners are no fun! Not only are they difficult to install without ending up with wrinkles; not damaging the headliner as you install the glass adds to the complexity. The Ranchero compounds the issue with the fact that the rear window is installed from the inside, not the outside like most back windows.

So, the headliner was laid out a couple of days before so the wrinkles could settle out and the garage was heated to help with stretching the fabric. Initially the headliner was stretched fore and aft so the glass could go in. The front and rear glass was installed and then the headliner was stretched to each side. It was far more difficult then the above description. The back window was a heck of a battle as it is a tight fit between the roof and the package shelf. Lots of bad words were uttered before it was finally was in place, fortunately the windshield went much easier!

Placing a rope in the weatherstrip window channel allows you to pull the lip over the body flange to seat the glass.

The windshield was installed before the hood and front fenders were for obvious reason.

The door glass went in without a hitch. The weatherstripping for the doors and windows was installed and also went smoothly. The door lock and window mechanisms were installed and adjusted and the doors functioned perfectly, windows go up and down and doors open and close with a nice solid clunk.

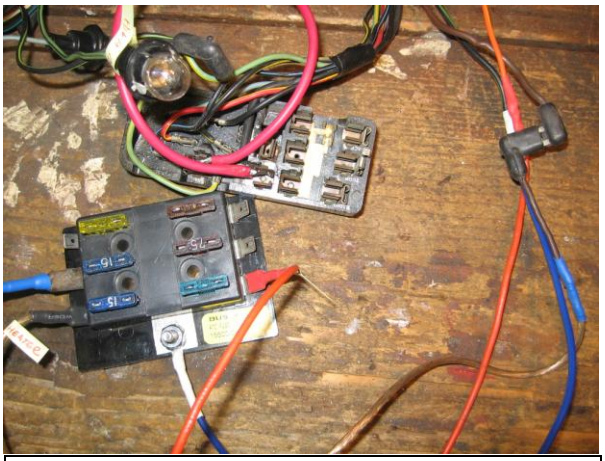
Door glass installed and operational.

The back window was extremely difficult as its design required installation from the inside.

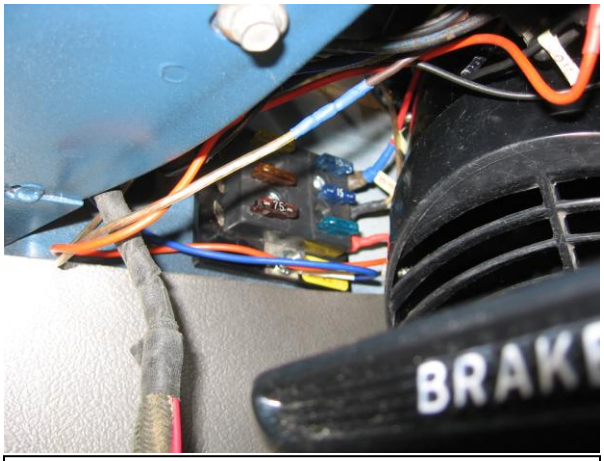
Wiring Harness:

The entire wiring harness was removed. This was done so it could be modified and repaired. It also is nice to have it out of the way during the painting process. The harness going back to the taillights had been melted together and a three foot section had to be replaced. The engine harness was modified for an alternator with a mini regulator attached to its backside. The headlight harness was converted to a relay system since the original circuit breaker in the headlight switch can not handle amperage required to operate Halogen headlamps. The under dash harness was modified to accommodate emergency flashers, intermittent wipers and the instrument cluster got an additional warning lamp for the high beam indicator so the left and right directional signals each have their own indicator lamp. A Secret Audio system and inflatable lumbar in the seats also required a significant investment of time to tie into the wiring. Lastly, the fuse block on the light switch was replaced with a new fuse block that is mounted above the drivers kick panel. A lot of time and effort was put into these modifications, but they make a big difference in the electrical performance and convenience.

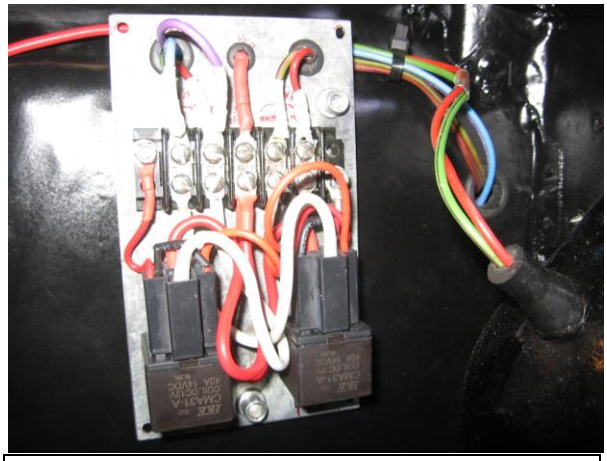
The taillight harness that got melted, this was over the left rear wheel well.



The process of bi-passing the light switch fuse panel to a remote fuse panel.



The new fuse block fastened to the left kick panel. You can also see the top of the 64/65 remote control fresh air vent in place of the original 63 air vent.



The headlight relay panel is mounted to the back side of the battery box area under the right fender. The cover was removed to show the relays and the wiring.

Next month**:** Wrapping up! Interior and Exterior Trim

So You Want To Restore a Falcon!

By Dick Harrington

PART 20
Wrapping Up! Interior and Exterior Trim

The fun part of any restoration is finishing the vehicle.

Interior:
The interior on the Ranchero was upgraded to a Futura bucket seat trim level. The most difficult part of the Futura upgrade was the dash pad and dash trim. Having two Sprints up in the barn made the task somewhat easier as they provided the trim hole locations. That meant that one of the Sprints had to be disassembled so templates could be made. The holes were drilled before any final painting was started for obvious reasons. Fitting the dash pad was very tedious and great caution has to be exercised. Dash pads need to be trimmed to fit and the old adage "measure twice, cut once" is not cautious enough. Measure many times and then once more before trimming! A miss cut could cost you $200.00 plus shipping, not to mention the cost of the vinyl dye.

Dash pad and Futura dash trim holes were marked and drilled very early in the restoration process.

Use a stick to bow the door panel; this will help get the panel in the channels.

Door panels went on after a plastic water barrier was installed, a stick inserted the length of the door panel aids in warping the panel to fit it into the top and bottom tracks. Windshield and back glass trim were all fastened with stainless steel screws that were available at the local hardware store.

The carpet goes in before the kick panels, scuff plates and console. The carpet requires many cuts and holes. A fresh blade in a utility knife does a nice job of cutting the carpet. Seat track, seat belt, floor shifter trim and the high beam switch holes are all done with a soldering iron. Man made carpet melts quite nicely (does give off noxious fumes so ventilation is a must), using a drill for carpet holes could cause a snag. The Ranchero has cut and sewn carpet rather than molded. The Sprints both have molded

Masking tape, a sharp utility knife and a straight edge are used to cut slots in the carpet for the center console.

carpet so a different approach was taken with the Ranchero. Neither type fit perfectly and requires a lot of fiddling to get a somewhat nice fit.

One of the major objects for the Ranchero project is drive ability. A good sound system is a must if one is planning a trip to the Denver Nationals. A hidden audio system was the choice, finding a good location for it proved challenging. The location selected was in the bottom of the console. It was a perfect fit. A small CPU fan was also installed to keep the circuits cool. Speakers were installed under the rear shelf and in the dash speaker area. AM/FM, MP3, IPOD and Sirius capable with remote control, what more could you ask for. Once the sound system wiring was completed the kick panels were installed.

The hidden audio system is mounted to a sheet of aluminum which is then fastened to the console mounts. Notice the small fan at the right of the unit that will help keep the electronics cool.

The console hides the unit. There is a lot of wiring running under the carpet, so a lot of pre-planning is required. There is still plenty of room above the audio system for storage.

The only thing not completed on the interior as we go to press is the front bucket seats. Hopefully that will get completed in the near future (like before Dearborn).

The interior is mostly complete in this picture. The bucket seats are still missing; the window cranks have been installed.

Exterior:

The exterior trim has been going on over a long period of time. As the paint was polished on each body panel, trim items were installed. The deluxe door window trim and drip edge stainless were carefully hammered home (I hate this part because it always shaves some paint). Bed trim was screwed into place capping the raw edges. The back tail lights, Ranchero bull medallion and F-O-R-D letters went on the tailgate.

Deluxe window trim installed around door glass.

The Ranchero bull medallion and F-O-R-D begin to provide a finish look.

The faux hood scoop and F-O-R-D letters were installed on the hood, the 260 V8 emblems and Ranchero Script went on each front fender. The grill and headlight trim gave the Ranchero its smile back. The final trim bolted on was the bumpers and the truck now had a finished look (still a lot of odds and ends left).

The Ranchero smiles once more.

With vintage license plate in place the Ranchero looks ready to go.

The Ranchero sees the light of day again, on April 19, 2010. The F150 looks on jealously at all the attention the Ranchero has been getting.

This is how the Ranchero looked sitting in Modesto. California

The Ranchero arrives in Delhi, New York on a cold and dreary February 4, 2008

The last five weeks have proven to be very frustrating. The wiring harness had a few issues and a newly remanufactured Ford alternator was missing an isolation washer causing a short. It took two weeks to sort out all the issues. Even worse was the engine would not start. It took three weeks of off and on work sessions to sort out those issues. It is now ready to get a front end alignment and then a final paint touch up, polish and wax. The bucket seat frames are still bare and it is five weeks until Dearborn. I believe we will make it. See you all there.

Future**:** Working out the bugs

This is the last part of *So You Want To Restore A Falcon*. Late this year or early next year I will do a follow-up on all the issues that will need to be worked out to make this into a driver. The Ranchero needs to prove itself to me so I will have the confidence to drive across country next summer. A cruise control and air conditioning are planned projects for this coming winter.

I have had many very nice comments concerning these tech articles. Thank you for reading them and thank you very much for telling me you enjoyed them.

If there is a desire for details on any of the processes involved in this restoration, let me know, and I will be happy to answer questions. If there is enough demand, I would be happy to do an article explaining specific parts of the restoration in further detail. I do plan on continuing to write more tech articles, the Ranchero still has plenty of tech stories to be told. In the mean time, there has to be many good tech stories lurking in the minds of other FCA members. Send them in! I am going on vacation.

Dick