Greenwood "Sebring 75" IMSA Corvette

Building a 1/12th scale replica of the first C3 Corvette widebody road racer.

By Randy Derr

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Pete Biro Photo

1) Origins/Motivation

photo courtesy of Fred Cady

My first encounter with this car was during the summer of 1975, when I saw it race at Elkhart Lake Wisconsin in the "Road America Handicap" race. For that race, the livery was different than the version I am building, but it was the same car otherwise. After seeing this wide-body, big-block monster lap that beautiful four-mile race course, I was smitten! I don't know how anyone could see one of these outrageous race cars in action and not be completely taken by it.

Through the years, I always have kept a mental list of models I would like to build, and of course this wide-body Greenwood Corvette has been on that list since that fateful summer day in 1975.

photo courtesy of Fred Cady

2) Research

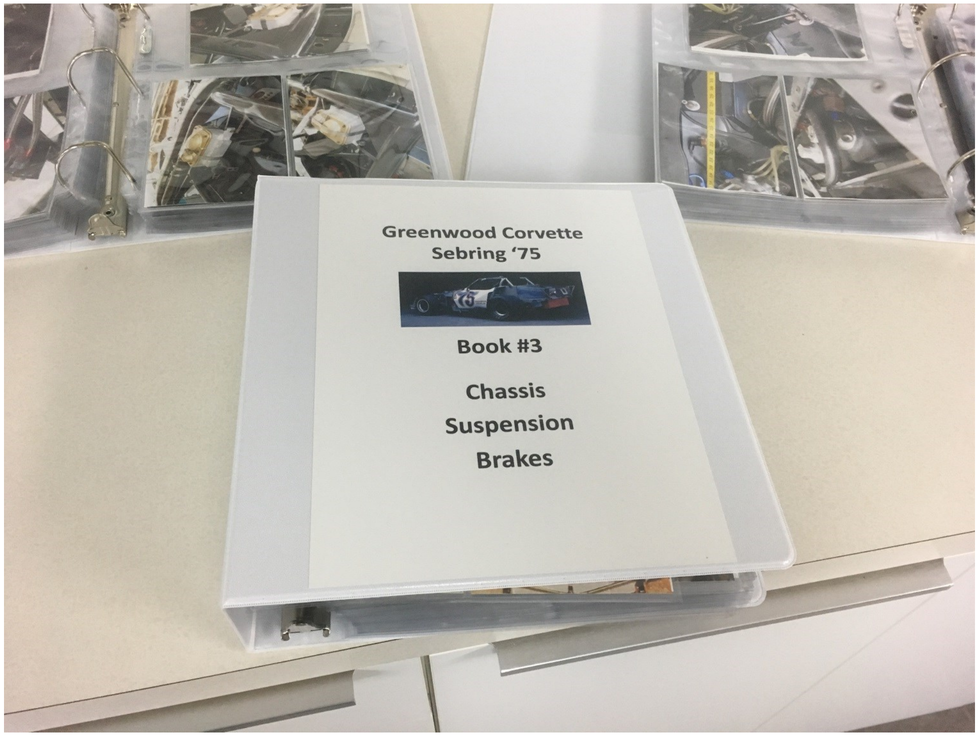
Fast forward to 2016 and I was planning what could be my next large scale, fully detailed project when I attended the NNL East show and ran into an old acquaintance, Jan Hyde. Jan is a model builder that I met in the 1980's and is also a Corvette vintage racer. I shared my plans to build a replica of the Greenwood Corvette in 1/12th scale and he suggested he may be able to help me locate the full-size car. Later on he did just that and provided me with contact information for Lance Smith, who owned the Sebring 75 Corvette in the late 1990's/early 2000's, plus the name and phone number for the broker consigned to sell the car most recently. In late 2017, after a few phone calls, I was able to obtain a nice set of detail photos from Lance Smith of the car when he owned it, and I also learned from the broker that the car had just been sold and was now residing in the south of France, at a race shop near the Paul Ricard F1 racing circuit.

2) Research (continued)

The broker was kind enough to provide me with the e-mail address and phone number of the present caretaker of the car, Patrick Caldenty. I gave Patrick a call, and he was very willing to help me in any way he could, but of course it was not clear how that would work out, given the great distance between our two locations. He did extend an offer to me that if I was ever in France, to let him know and I would be welcome to stop by the race shop and see the car.

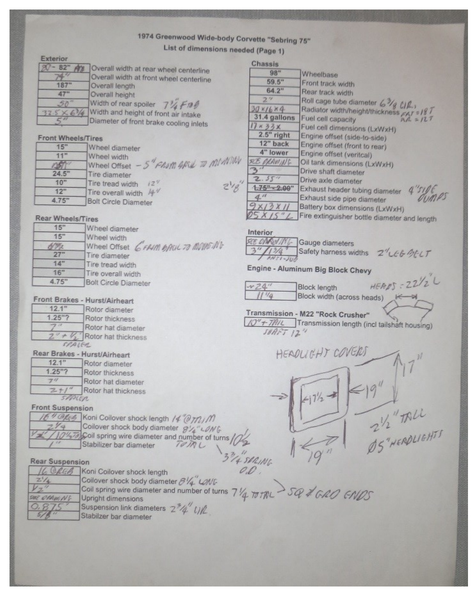
Early in 2018 I learned I needed to travel to Germany for a work-related set of meetings, and began thinking that even though my home in Ohio was not very close to France, where I was going in Germany was a whole lot closer! So I made plans to extend my European trip and after finishing up my work assignment, I flew to Marseille France, rented a car and drove to the race shop to spend two full days measuring and photographing the car.

2) Research (continued)



After spending those two full days with the car, I returned home and started sorting through the 1000+ photos I had taken, as well as the hundreds of measurements and dozens of sketches I had made of the various aspects of the car. In addition to storing all of these images electronically, I also printed out the photos, measurements and sketches, organizing them into four large binders, sorted by the following categories: ***Exterior, Graphics, Wheels/Tires, Interior, Chassis, Suspension, Brakes, Engine Bay, Front of Dash, Engine, and Injection System.***

This allowed me to more readily sort through all of those photos a bit more efficiently when I was working on a particular component or sub-system of the car. The dimensional summary and the sketches were also printed out for ready reference.



1974 Greenwood Wide-body Corvette "Sebring 75"

List of dimensions needed (Page 1)

Exterior

80 - 82"	Overall width at rear wheel centerline
74"	Overall width at front wheel centerline
187"	Overall length
47"	Overall height
50"	Width of rear spoiler
32.5 X 6¾	Width and height of front air intake
5"	Diameter of front brake cooling inlets

Front Wheels/Tires

15"	Wheel diameter
11"	Wheel width
[illegible]	Wheel Offset
24.5"	Tire diameter
10"	Tire tread width
12"	Tire overall width
4.75"	Bolt Circle Diameter

Rear Wheels/Tires

15"	Wheel diameter
15"	Wheel width
[illegible]	Wheel Offset
27"	Tire diameter
14"	Tire tread width
16"	Tire overall width
4.75"	Bolt Circle Diameter

Front Brakes - Hurst/Airheart

12.1"	Rotor diameter
1.25"?	Rotor thickness
7"	Rotor hat diameter
2" + ½"	Rotor hat thickness

Rear Brakes - Hurst/Airheart

12.1"	Rotor diameter
1.25"?	Rotor thickness
7"	Rotor hat diameter
2+1"	Rotor hat thickness

Front Suspension

16" @ REG	Koni Coilover shock length
2¼	Coilover shock body diameter
[illegible]	Coil spring wire diameter and number of turns
1"	Stabilizer bar diameter

Rear Suspension

16 @ REG	Koni Coilover shock length
2¼	Coilover shock body diameter
½"	Coil spring wire diameter and number of turns
SEE DRAWING	Upright dimensions
0.875"	Suspension link diameters
5/8"	Stabilzer bar diameter

Chassis

98"	Wheelbase
59.5"	Front track width
64.2"	Rear track width
2"	Roll cage tube diameter
30 × 16 × 4	Radiator width/height/thickness
31.4 gallons	Fuel cell capacity
17 × 33 ×	Fuel cell dimensions (LxWxH)
2.5" right	Engine offset (side-to-side)
12" back	Engine offset (front to rear)
4" lower	Engine offset (veritcal)
SEE DRAWING	Oil tank dimensions (LxWxH)
3"	Drive shaft diameter
2.35"	Drive axle diameter
~~1.75" - 2.00"~~	Exhaust header tubing diameter
4"	Exhaust side pipe diameter
9 X 13 X 11	Battery box dimensions (LxWxH)
Ø5 X 15" L	Fire extinguisher bottle diameter and length

Interior

SEE DRAWING	Gauge diameters
3" / 1¾	Safety harness widths

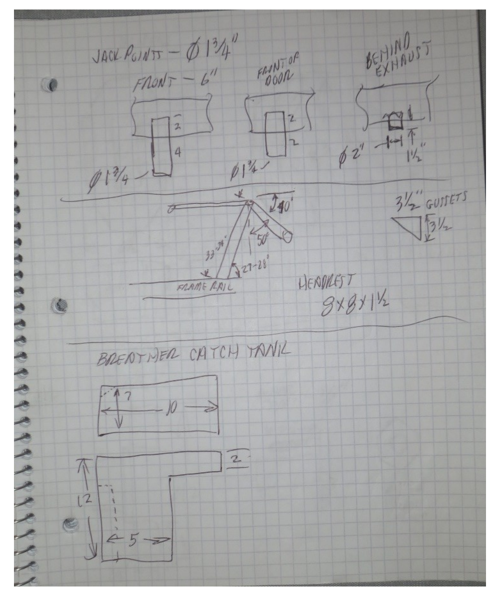
Engine - Aluminum Big Block Chevy

~24"	Block length
11¼	Block width (across heads)

Transmission - M22 "Rock Crusher"

10" + TAIL SHAFT 12"	Transmission length (incl tailshaft housing)

HEADLIGHT COVERS

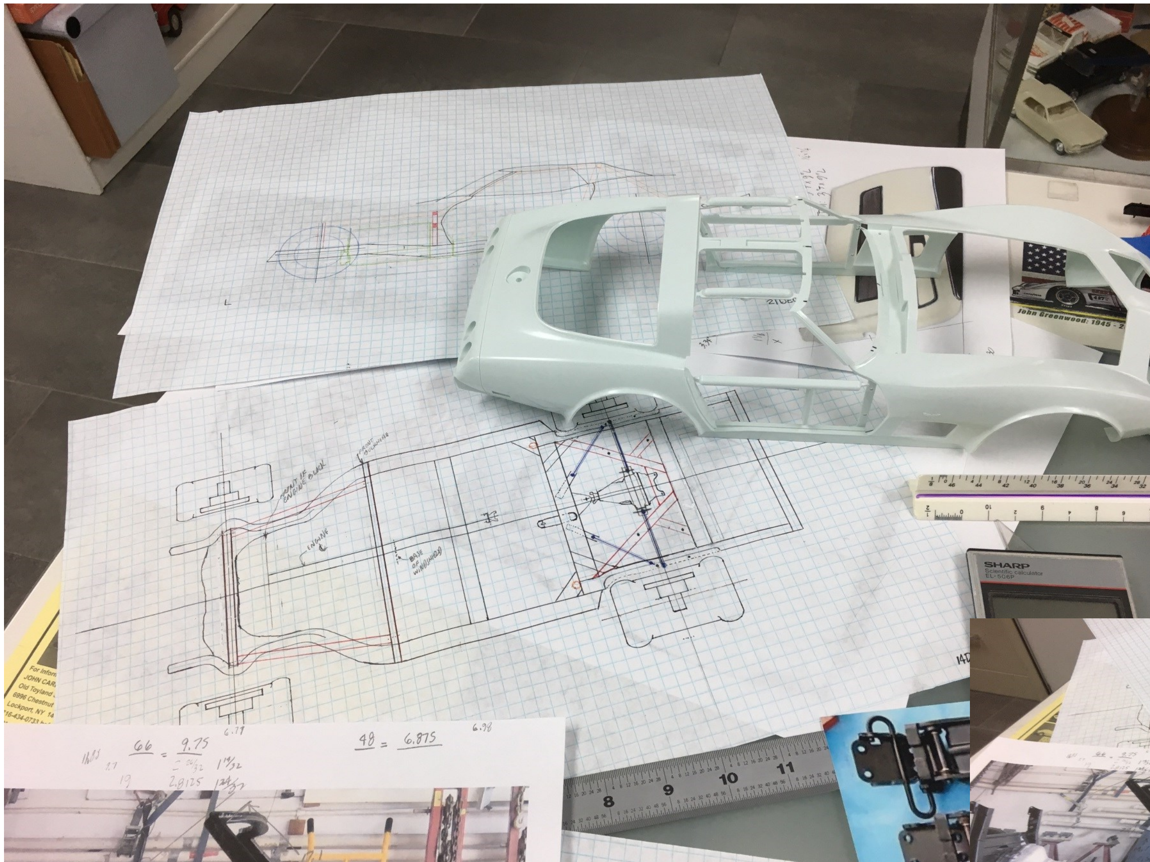


3) Challenges

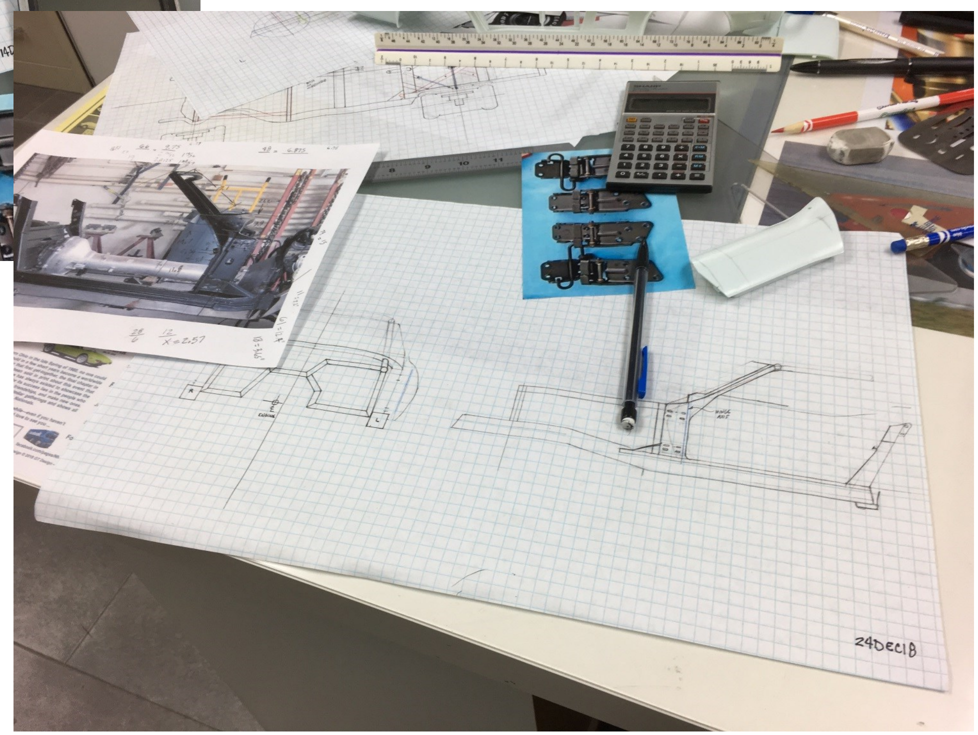
Building a replica of an actual vehicle is always inherently challenging, but this specific subject presented several unique challenges:

1) **Even though I had spent many hours already collecting information on the full-size Sebring 75 racer and had literally thousands of photos, hundreds of dimensions and dozens of drawings, it still was an incomplete data set from which to construct this replica. Significantly missing were detailed photos of the car as it originally raced in 1975. So I was forced to use the photos I had of the restored vehicle, plus the few photos I found from various sources of the car as it existed originally. Very late in the project, I was led to an archive of photos from the 1975 Daytona 24 Hour race, which included over two dozen of the Greenwood Corvette. These were invaluable in finishing the model accurately, even though it meant revising some aspects of the model previously completed.**
2) **Since this racer was based heavily on a production Corvette, many of the features/components of the car were also based on production components. This required additional research to track down dimensions and details of all of those stock Corvette pieces so they could be fabricated for the model. Fortunately, the Internet provided much of this information, and I also had photos and measurements of stock C3 Corvettes taken at various car shows.**
3) **However, the biggest challenge in building this model, was that this particular racer was the development car for the Greenwood brothers, John and Burt. As a development vehicle, this car was modified regularly, sometimes even during the course of a race weekend. It also meant the car was not a pristine show car, but rather a "rough around the edges" racer of the time period. This condition presented itself on the car as somewhat haphazard wire and plumbing routings, dull/scratched paint, brackets/components left behind from earlier testing, and just a general "roughness" to the car compared to the sterile race cars of today. Duplicating that "less than perfect" condition in scale, without it seeming messy or rushed, was particularly challenging.**

4) Chassis/Suspension

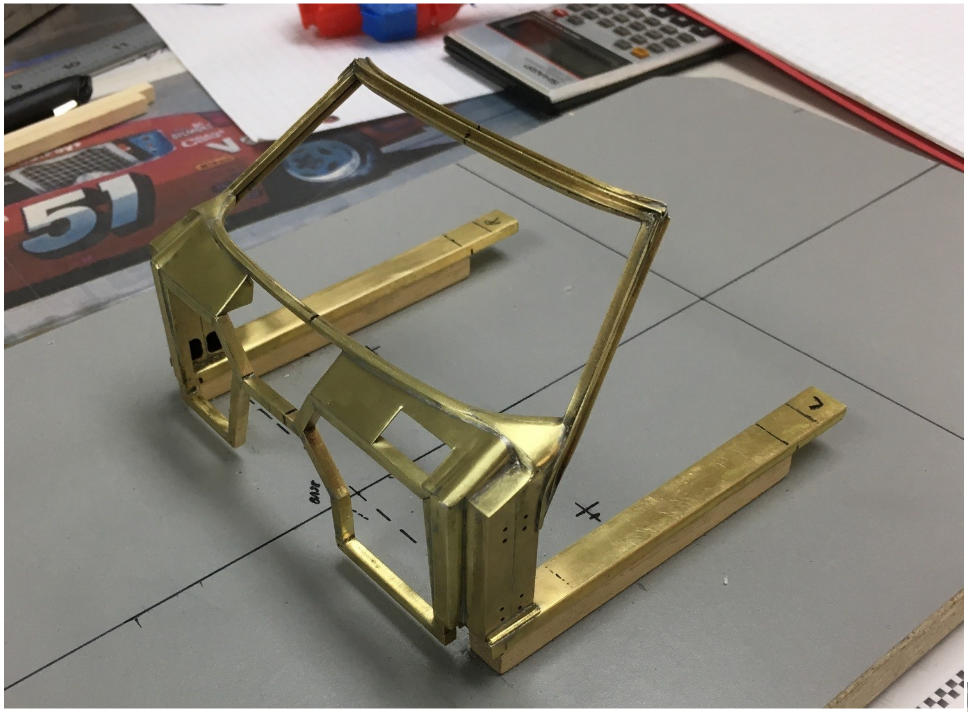


After organizing the reference information, it was time to begin the build. I always like to start by constructing the chassis so I have the foundation for the vehicle. However, before I could cut the first piece of plastic or brass, I needed to make some scale drawings so the chassis would fit the body and have the correct dimensions , such as wheelbase, track width, etc...



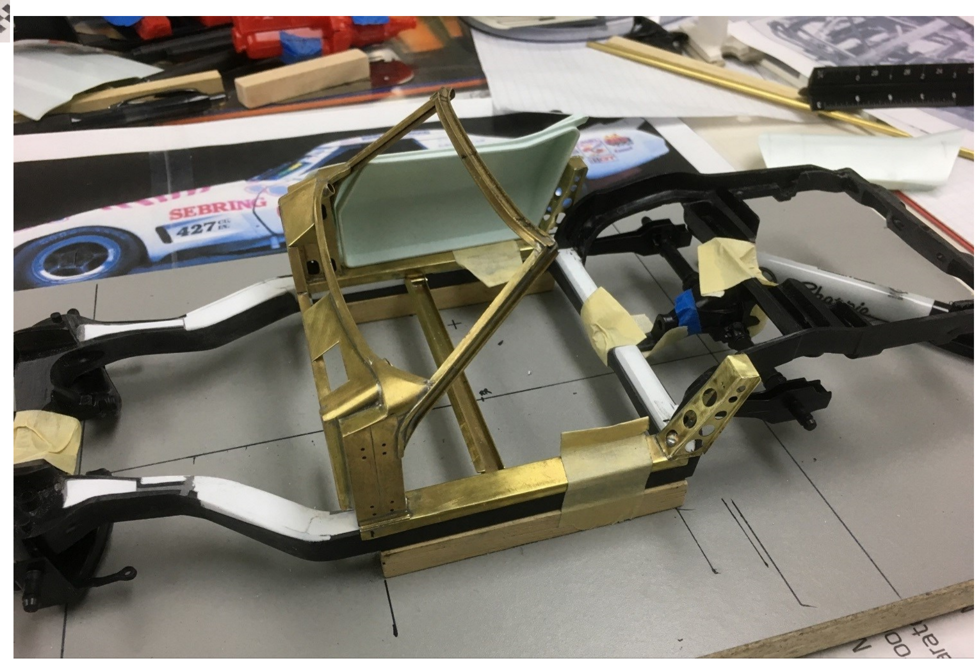
For this model that meant generating top, side and front views of the chassis and suspensions. As the build progressed, additional drawings were made to detail any specific areas needing to be clarified prior to building.

4) Chassis/Suspension (continued)

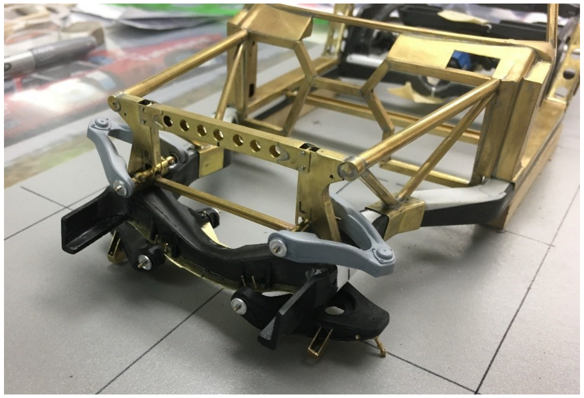


Since the Sebring 75 car was based on a production C3 Corvette, the basic construction of the chassis needed to begin with the stock frame rails and "birdcage". These elements form the foundation for the chassis, with the "birdcage" being the assembly of the door sills, door posts, windshield frame and front of dash. The dimensions and shape of this portion of the car was critical to everything else fitting correctly, so a great deal of time was spent measuring, mocking up, and finally construction. Brass tube, channel and sheet was used for strength.

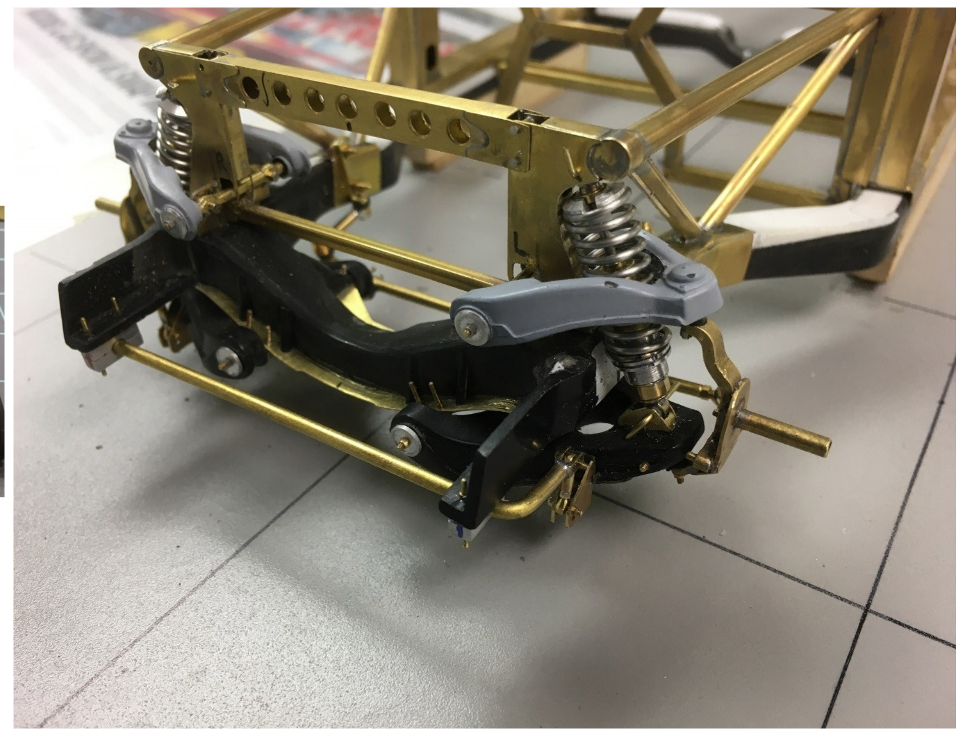
This assembly was configured in a manner to allow it to be a press-fit to the plastic frame rails so the two sections could be separated for further construction/modification. Numerous photos and dimensions found on-line and in Corvette restoration books were used to help guide the construction of this core structure piece of the car.

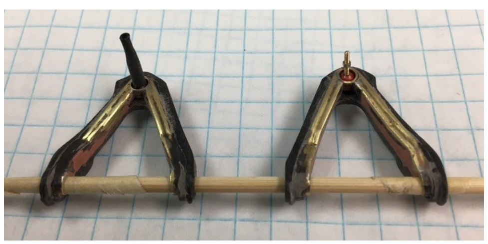


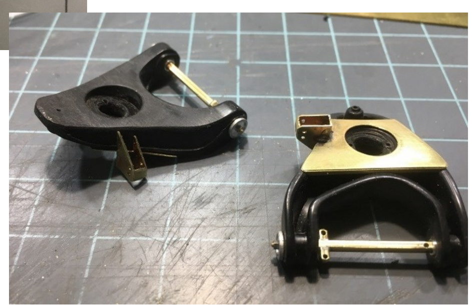
4) Chassis/Suspension (continued)



Once the basic "birdcage" was completed, work continued on the front section of the car, adding the bracing and suspension mounting features. The distinctive front cross-brace with its lightening holes was fabricated and installed. The upper and lower control arms from the Monogram '65 Corvette kit were modified with brass for added strength and to better represent the prototype components on the full-size vehicle. Functioning ball joints, steering linkage, stabilizer bar, front uprights and coil-over shocks were also fabricated from brass, aluminum, and stainless steel and then fitted to the front suspension.

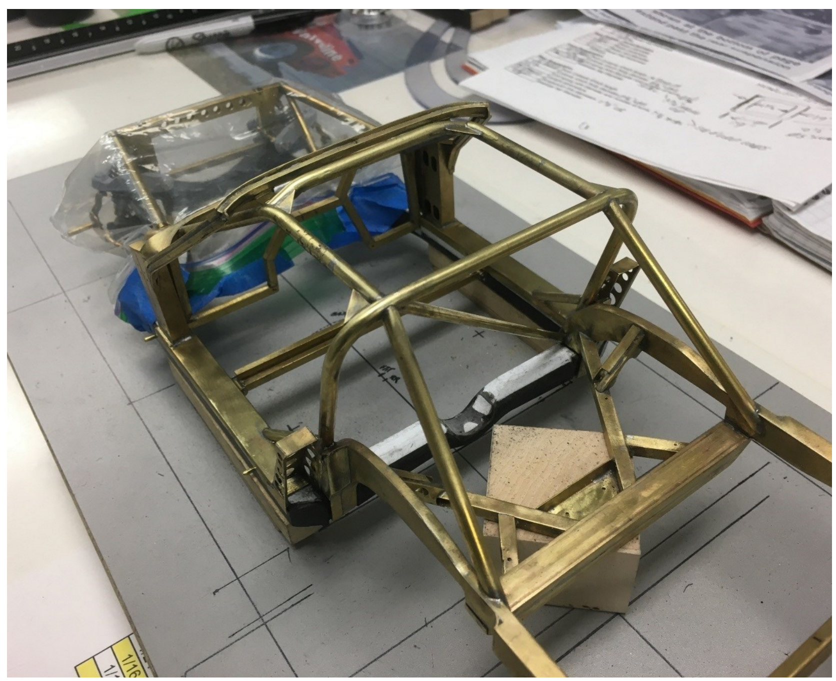


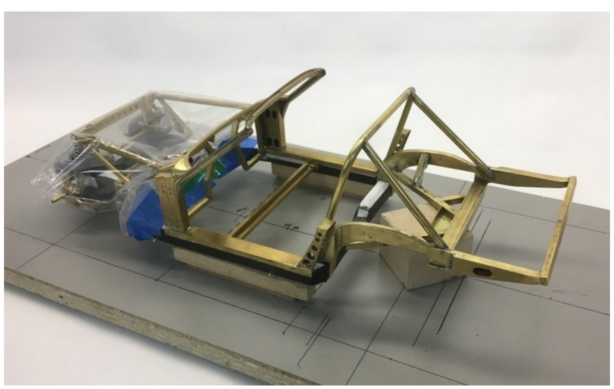




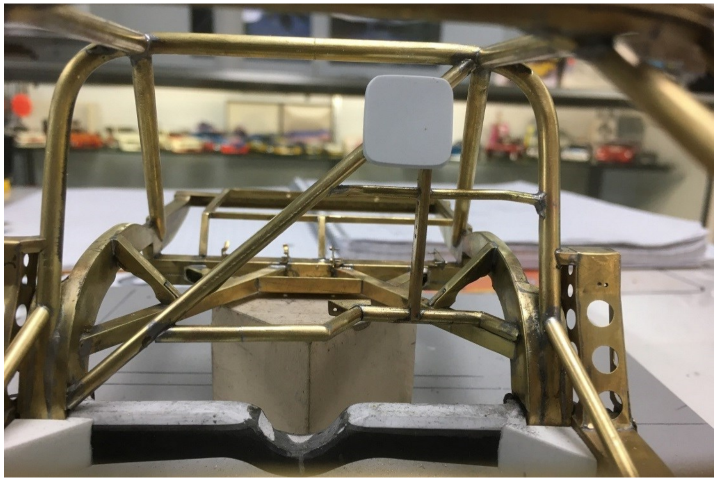
4) Chassis/Suspension (continued)

With the front suspension nearly completed, I turned my attention to the rear of the chassis. After initially spending a fair bit of time modifying the plastic kit rear frame rails, I concluded the plastic components would not be strong enough to support the vehicle, and adding other components to these plastic parts would be complicated as well. So the plastic rails were removed and replaced with ones made from brass sheet and strip. This rear frame assembly was made to be easily removed from the plastic side frame rails so as to facilitate further fabrication, painting and assembly. The rear suspension mounting structure was also fabricated from brass and added to the chassis. The basic roll cage structure was then made and installed.

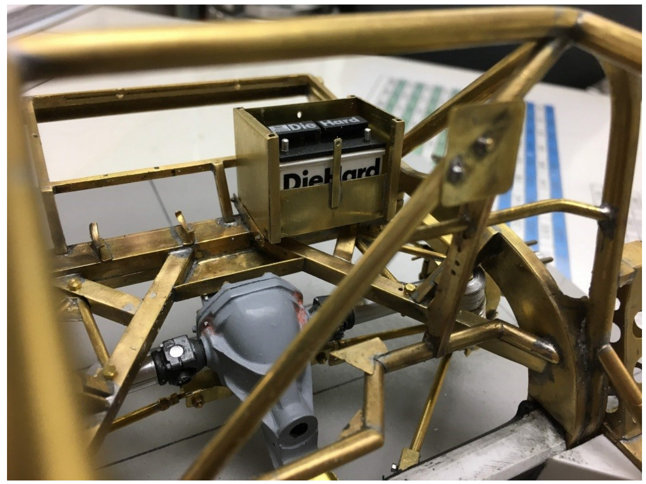


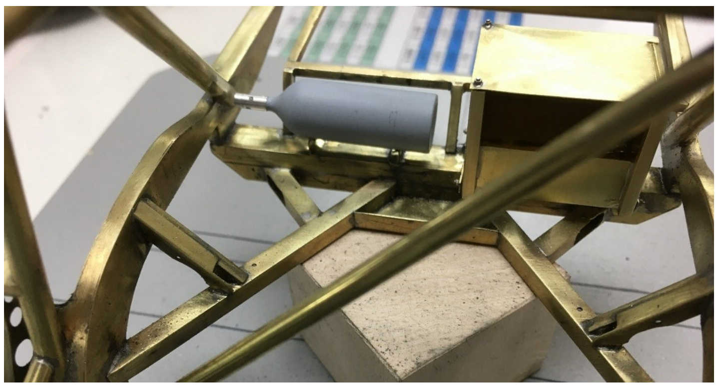


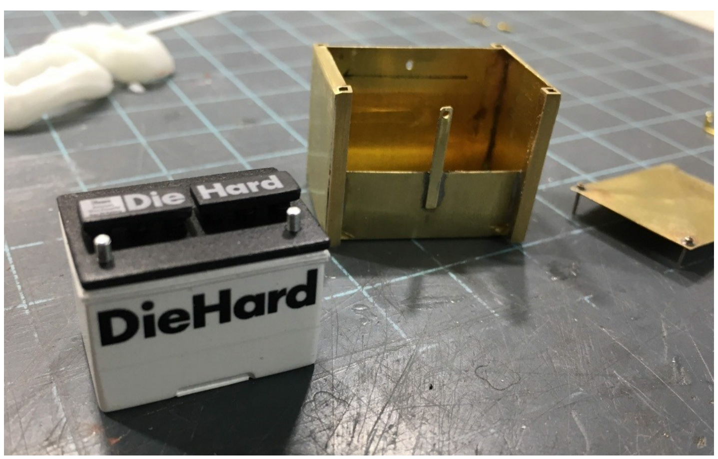
4) Chassis/Suspension (continued)

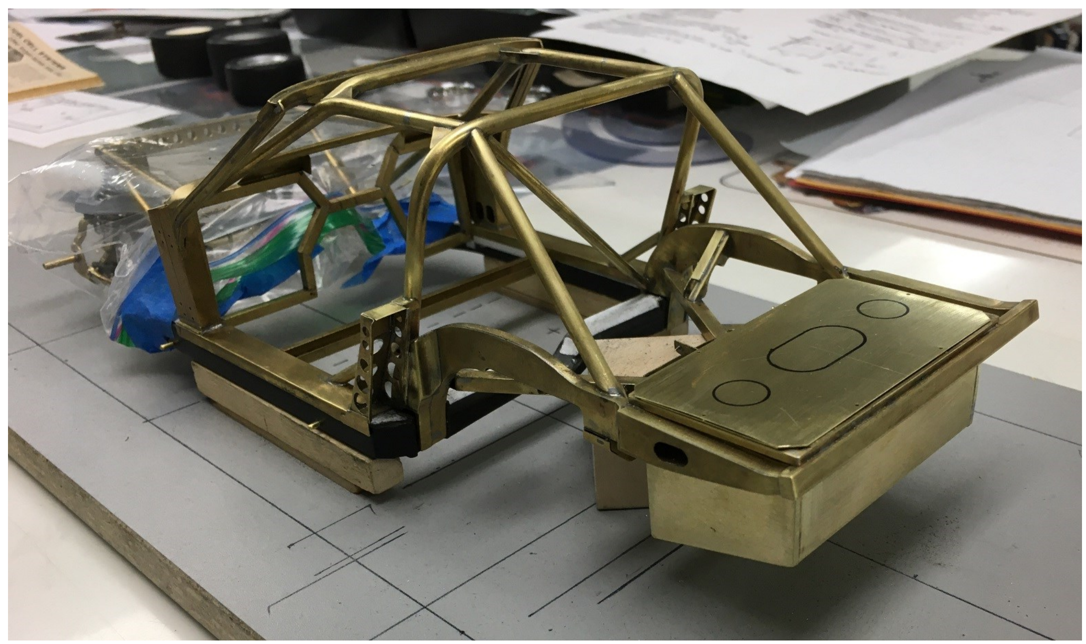


Work continued on the roll cage, with the addition of the seat support, and head rest. The battery box and fire extinguisher were fabricated and fitted to the area behind the driver compartment. A battery was made from sheet plastic, and detailed with laser printed decals. Additionally, the fuel cell can was made from brass sheet and added to the rear frame area.



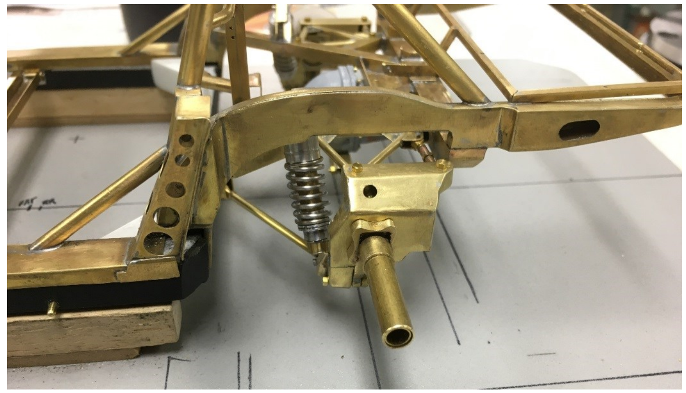


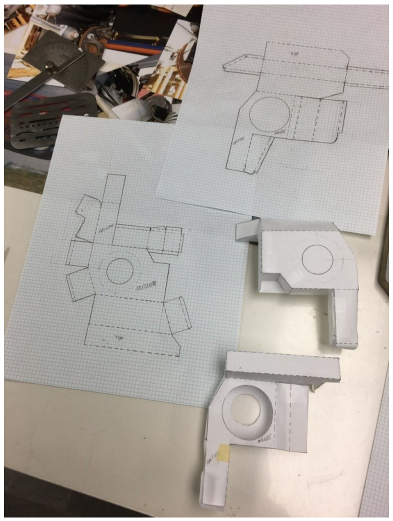


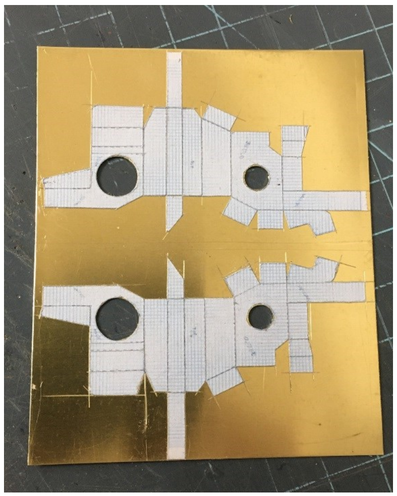


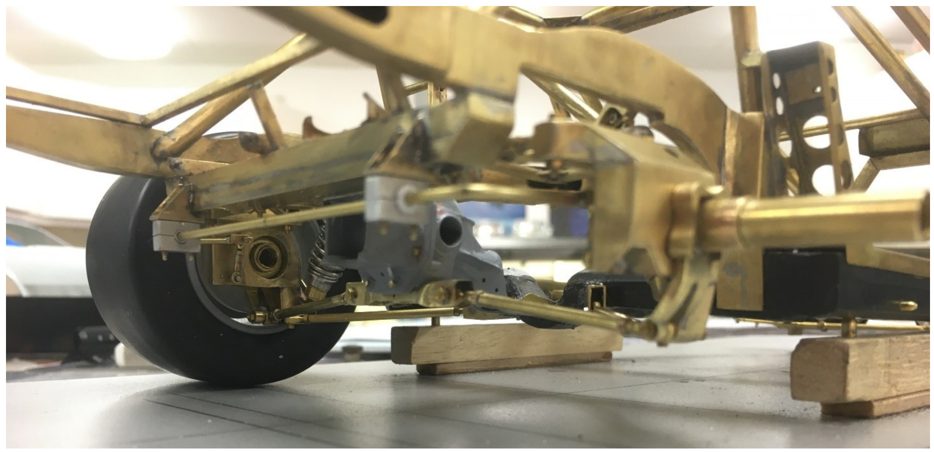
4) Chassis/Suspension (continued)

The next area of focus was the rear suspension itself. The rear differential from the Monogram kit was modified/detailed with plastic ribs, machined bolts and a mounting bracket made from brass sheet. The rear uprights were next and after creating a paper template for the structure, this was transferred to brass sheet, cut out and folded/soldered into the final shape. Brass origami! Hub carriers were machined from brass and added to the uprights. Rear control arms, suspension links, shock absorbers and a stabilizer bar were fabricated and fitted to the rear frame structure to complete the basic rear suspension.

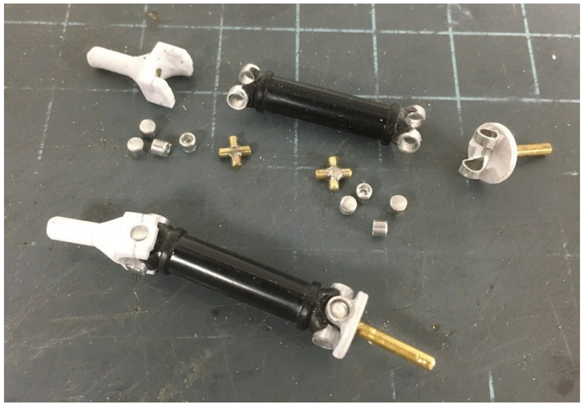




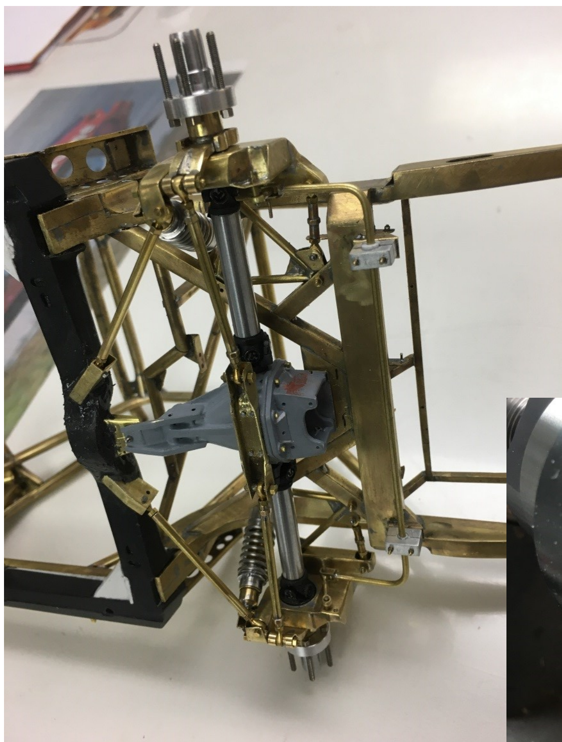


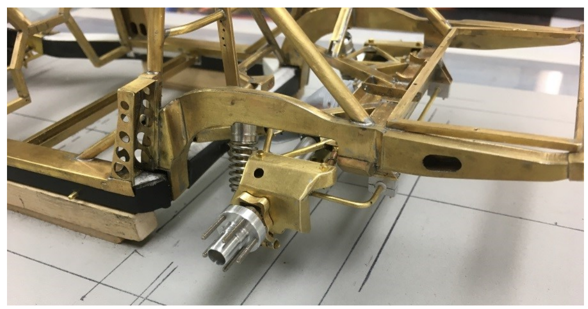


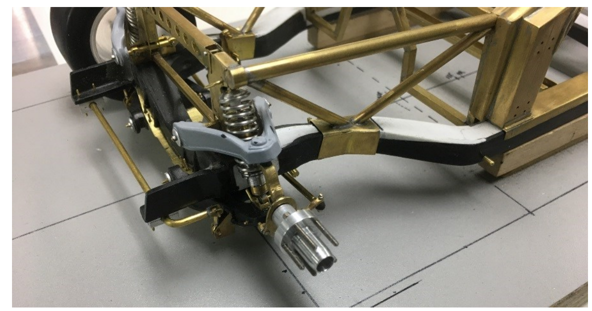
4) Chassis/Suspension (continued)

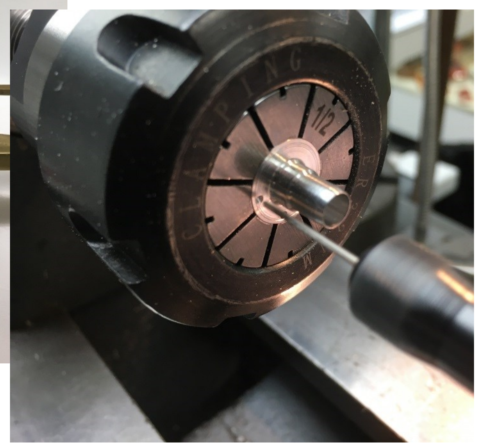


Continuing with the chassis work, rear axles were made by modifying the axles from the Monogram kit with aluminum tubing, and adding scratch-built yokes and universal joints. Wheel flanges were machined from aluminum, and wheel studs added using M1.4 mm bolts to replicate the 5/8" heavy-duty studs used on the race car. These flanges were added to the front and rear suspensions, along with simple machined set-up wheels and tires, allowing the chassis to stand on its wheels for the first time since construction began nearly 18 months earlier.

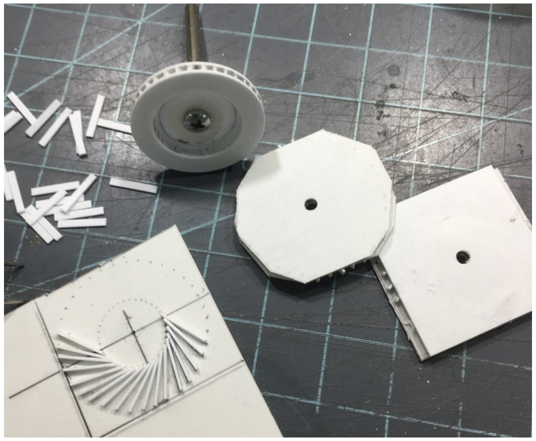




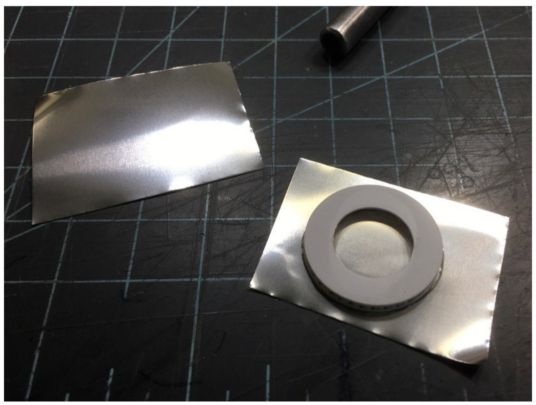


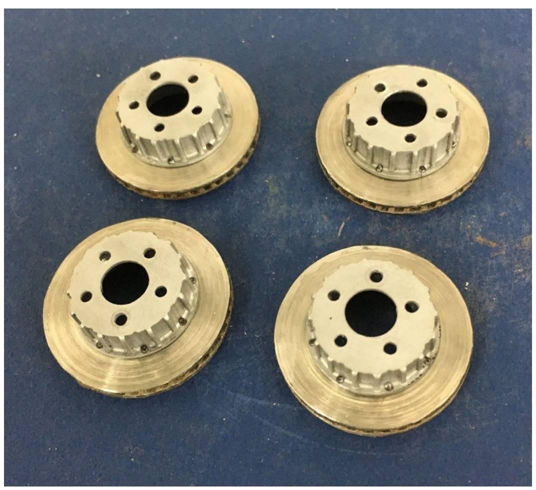


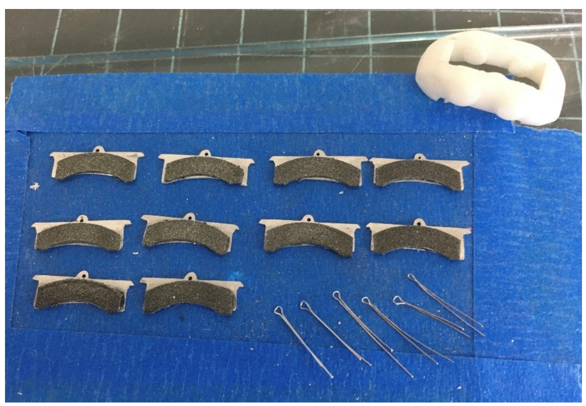
4) Chassis/Suspension (continued)

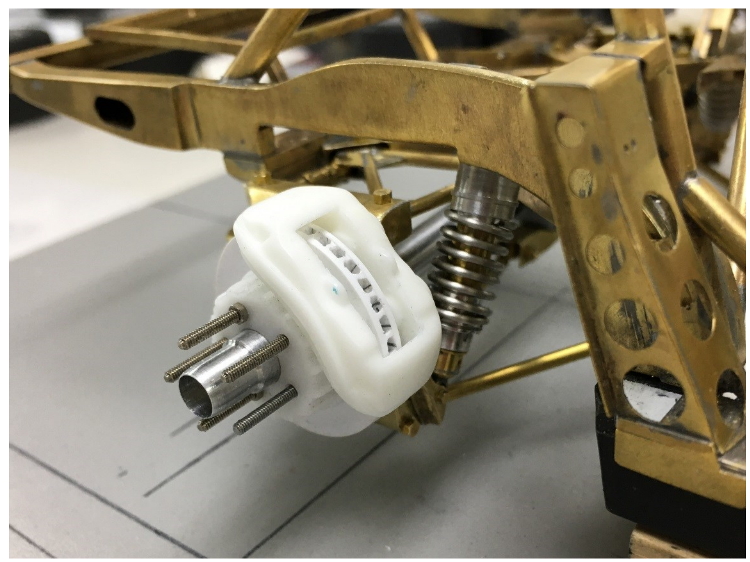


Brake rotors and calipers were constructed next, with the ventilated rotors assembled from multiple pieces of styrene plastic strips and sheet. Once these were built, the friction surface was laminated with 0.001" thick stainless steel sheet to represent the full-size rotor surface. Rotor hats were resin castings made from a master built from acrylic rod. A master of the four-piston Hurst-Airheart brake caliper was constructed from plastic and aluminum, then multiples cast in resin. These were later detailed with laser engraved logos, RB Motion bleeder screws and fittings. Brake pads were constructed by adhering sheet plastic "linings" to aluminum backing plates. These were inserted into the calipers and held in place with wire cotter pins.

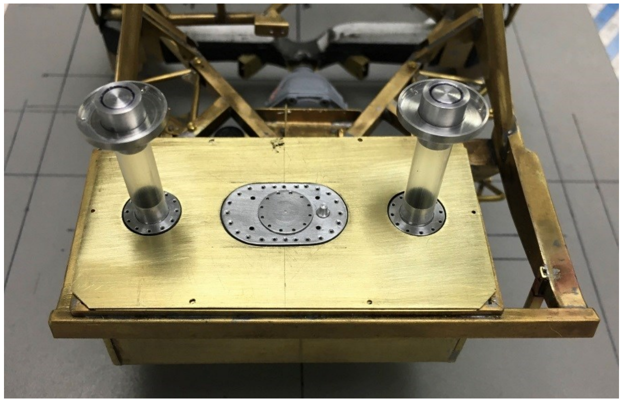


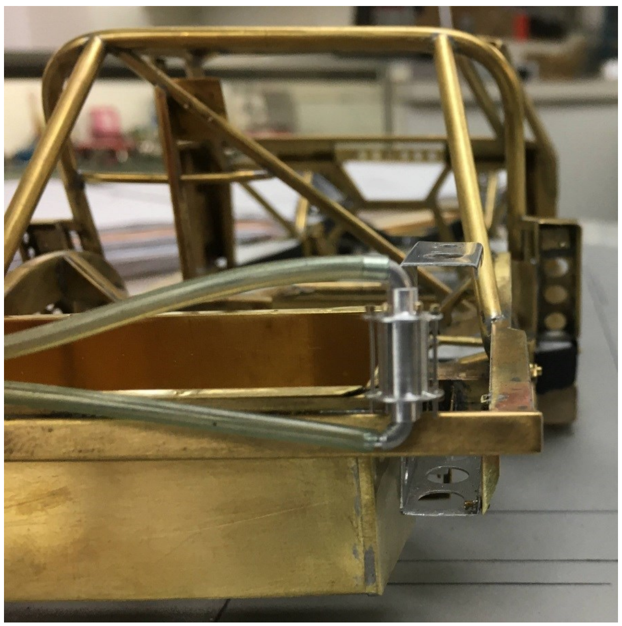


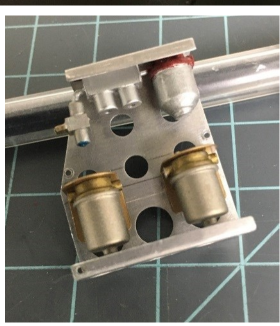




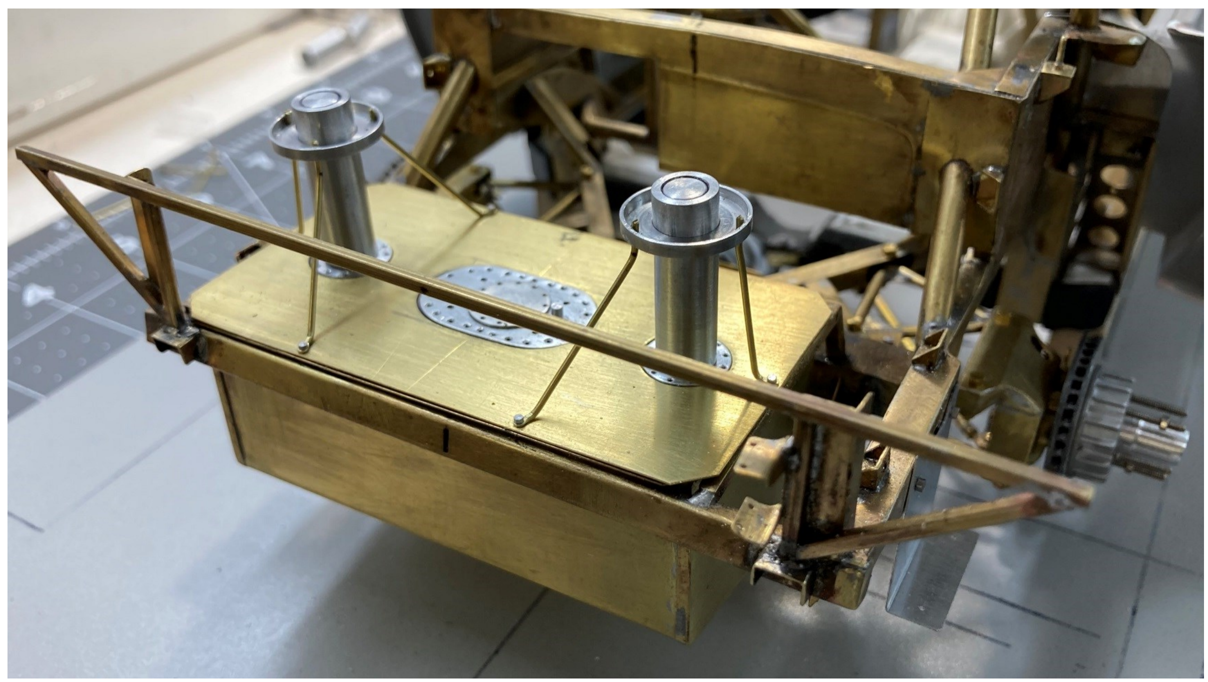
4) Chassis/Suspension (continued)





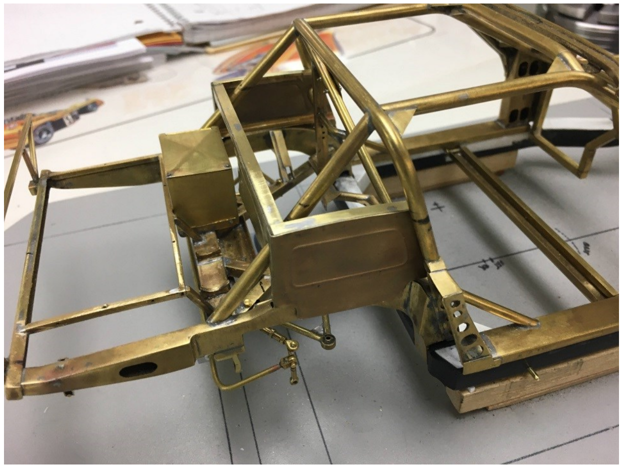
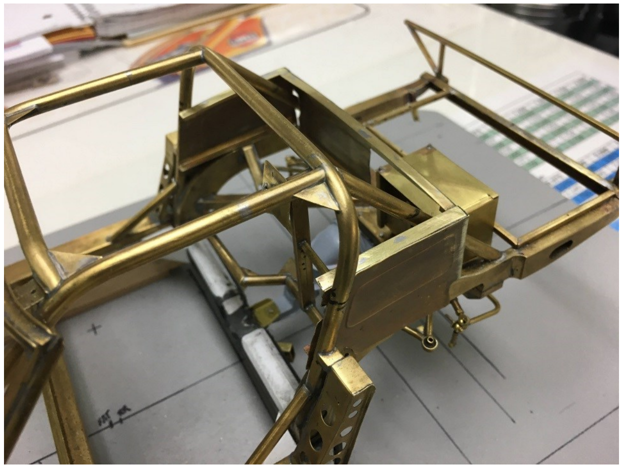
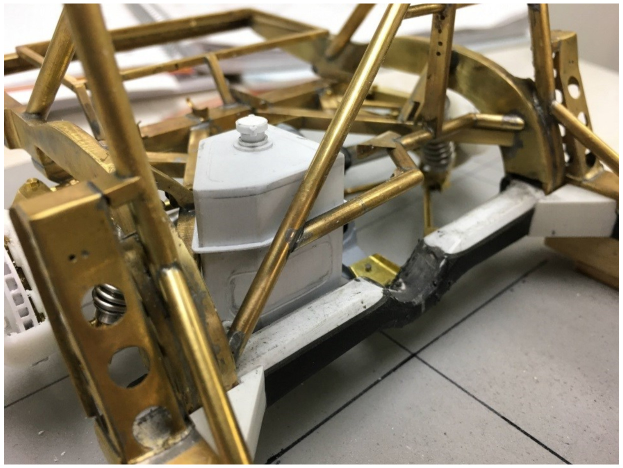
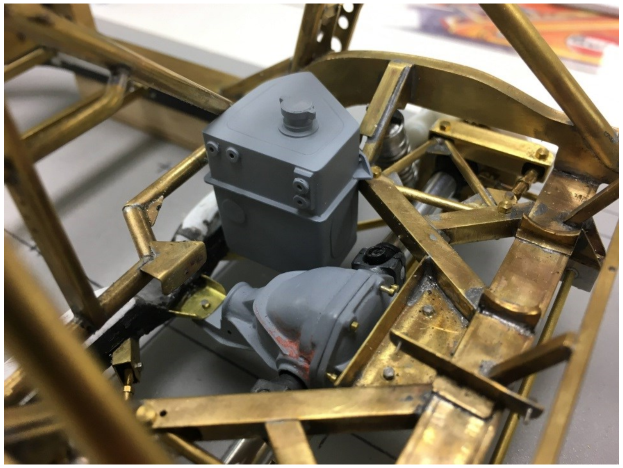
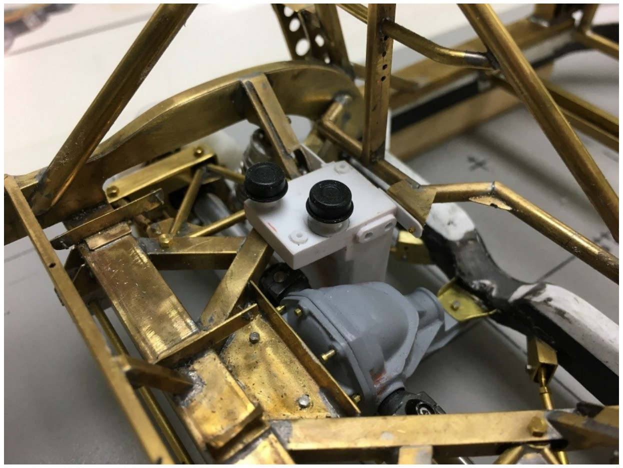
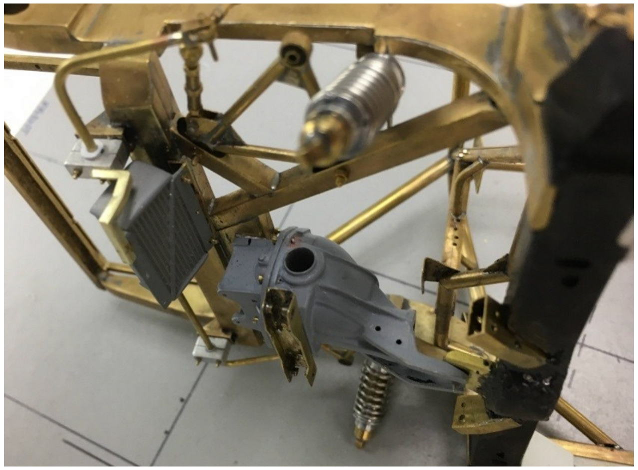


Attention now turned to the remaining chassis components, starting in the rear of the vehicle with the fuel tank and fuel pump/filter system. The tank was formed from brass sheet, with aluminum plate used for the access port, which was later detailed with RB Motion fittings and bolt heads. The dry-break fillers and overflow trays were machined from aluminum and then mounted on brass support legs. The overflow check valve was machined from aluminum and brass and mounted on a brass frame bracket. Fuel pumps and filters were machined from acrylic rod, with brass brackets added. These were then mounted to an aluminum bracket for mounting to the vehicle. Braided lines and fittings were added at final assembly.



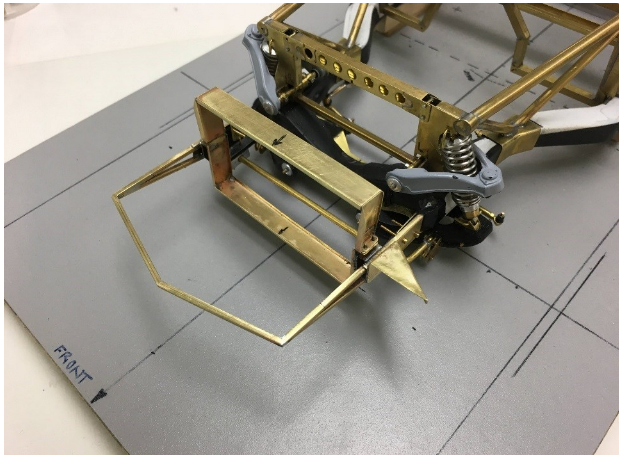
4) Chassis/Suspension (continued)

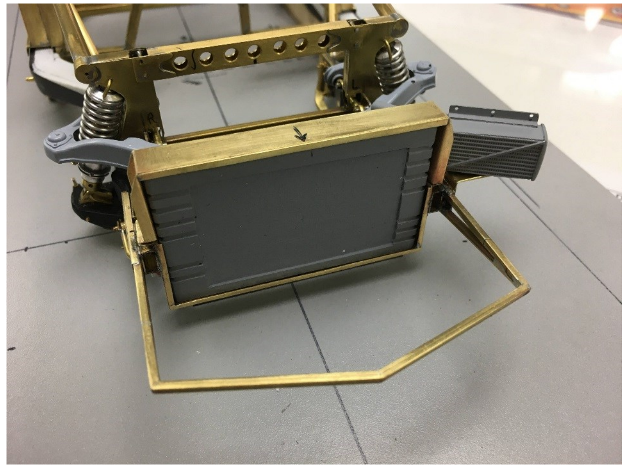
Continuing to work at the rear of the chassis, rear bulkheads were made from brass sheet, with bead rolling added and then installed in place to separate the fuel cell area from the interior of the vehicle. The oil tank and the overflow tank were fabricated from sheet plastic and mounted in the rear area of the chassis on brass brackets. Breather caps for the overflow tank were machined from aluminum. The rear differential oil cooler was made from plastic and brass and mounted on brass brackets.

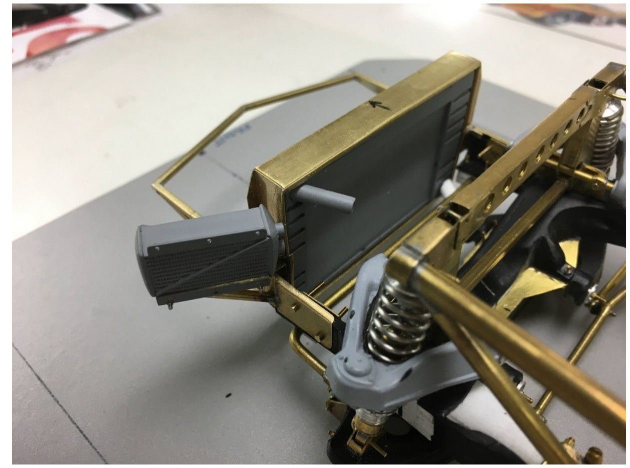







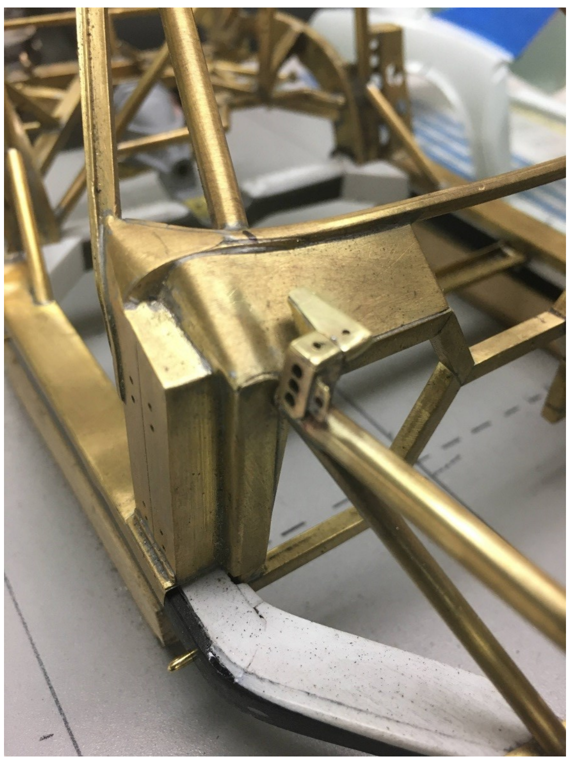
4) Chassis/Suspension (continued)

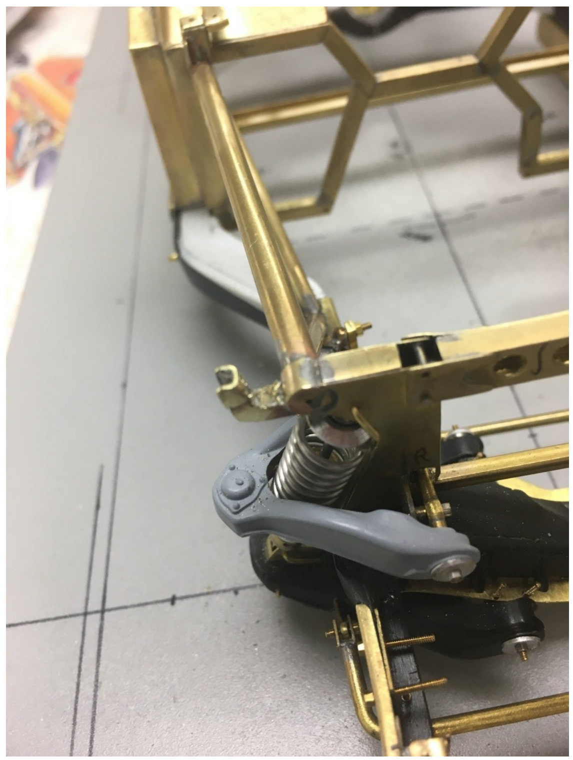
Work now moved to the front of the chassis with the fabrication of the radiator, the radiator mounting bracket, front bodywork support, oil cooler, and its mounting bracket.



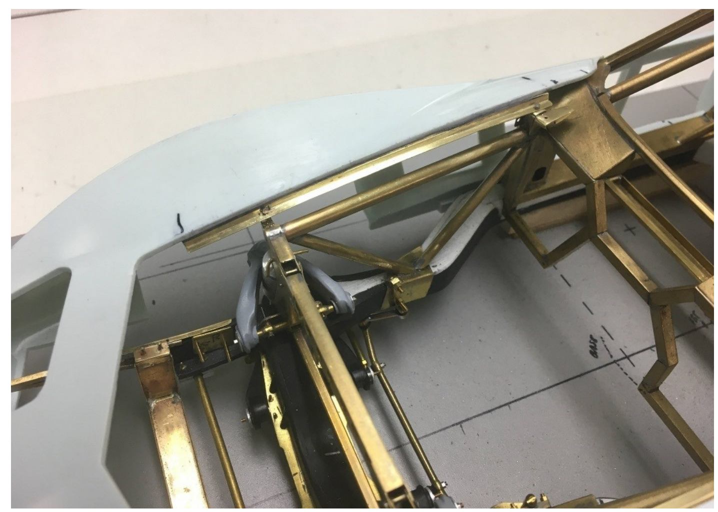




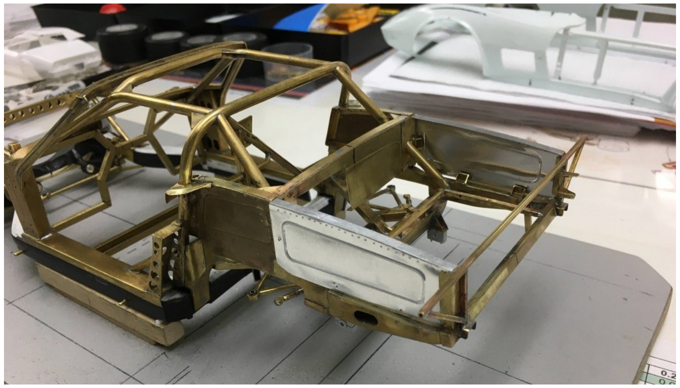




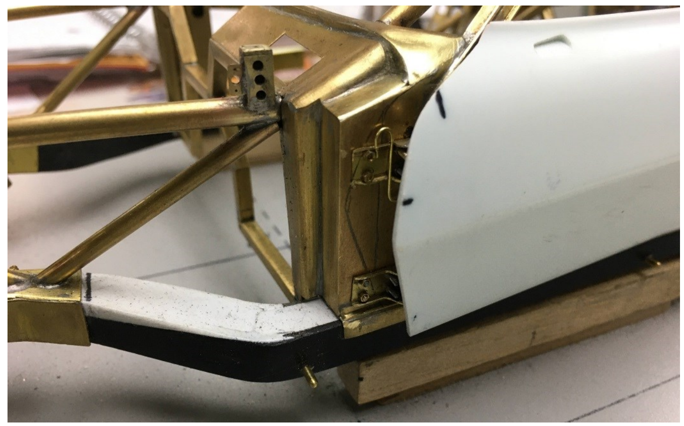
Work also began relative to mounting the bodywork on the chassis, with brass support brackets made and attached to the upper frame tubes.



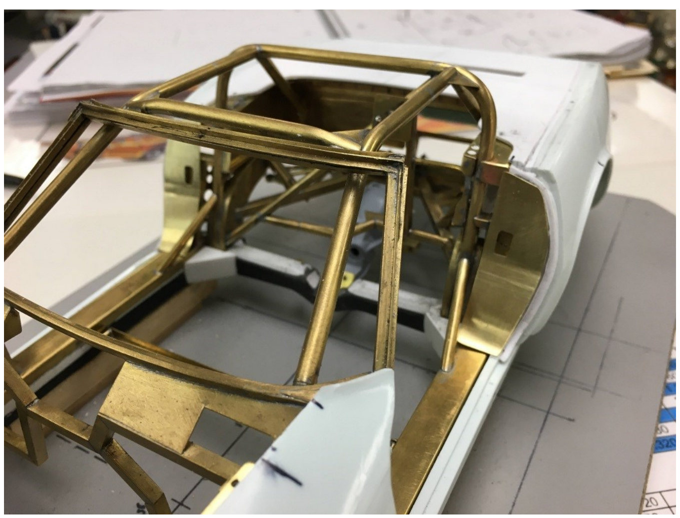
4) Chassis/Suspension (continued)



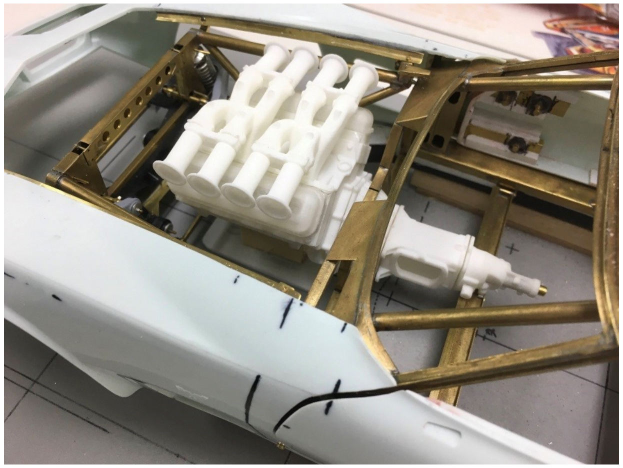
The next step was to mount the body into position. Square brass tubing was used to construct the supports for the rear of the bodywork, and aluminum panels with bead rolling were made to close off the fuel cell area from the wheel wells. Brass mounting pins temporarily inserted into the rocker panels were used to locate the bodywork to the chassis, thus insuring it was always in the exact same location relative to the chassis and suspension.

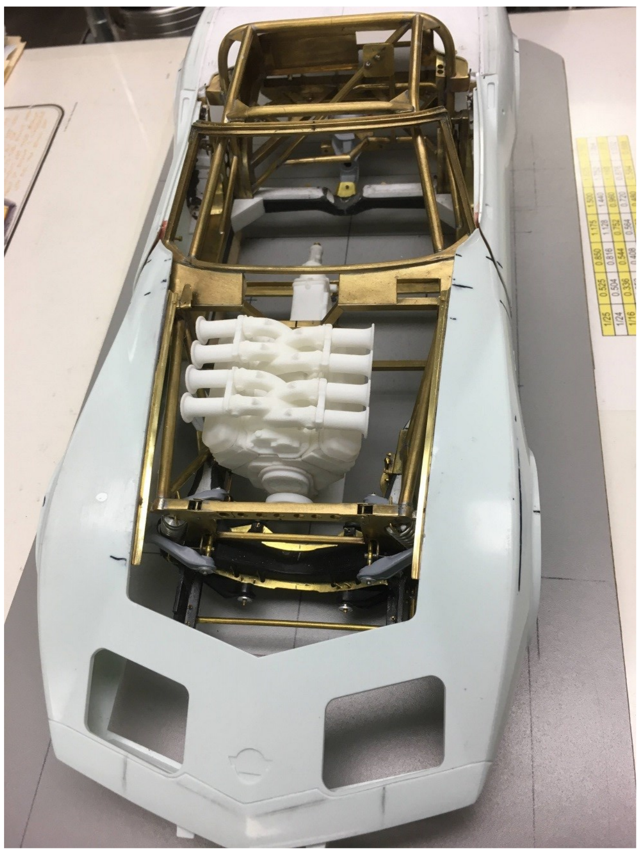


The modifications to the kit body are underway as well, with the roof removed and the rear deck filled in. The door hinges were fabricated and mounted to the doors and door pillars to locate the doors relative to both the bodywork and the chassis. Door jamb details were added using sheet brass and plastic.

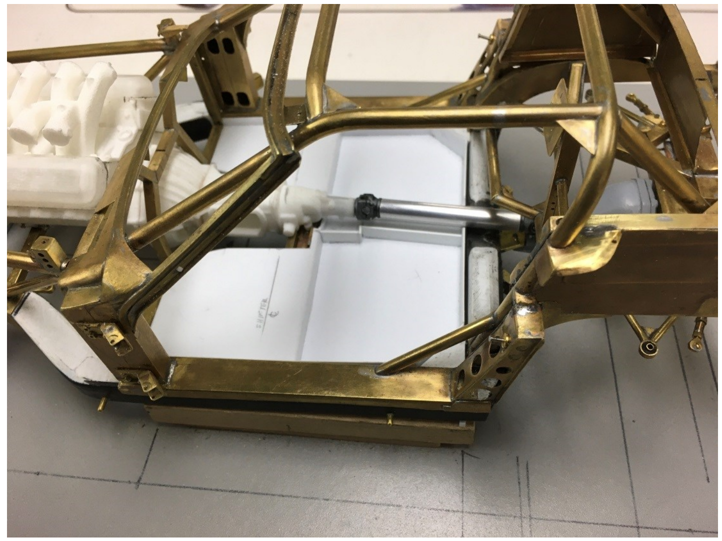


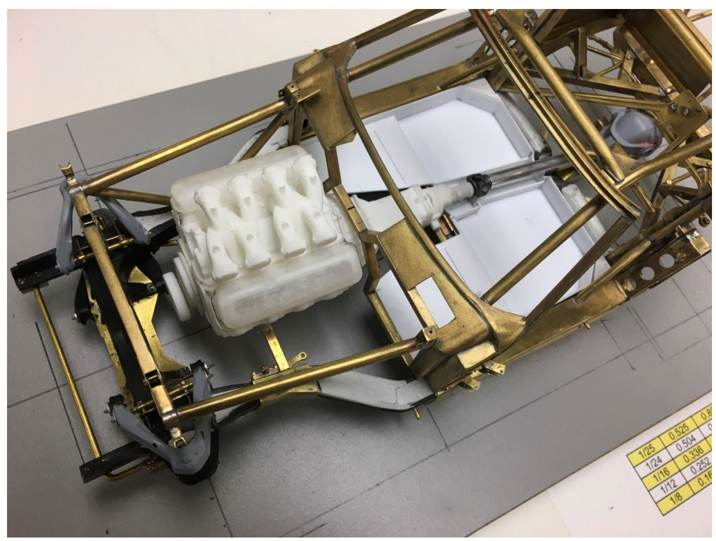
4) Chassis/Suspension (continued)



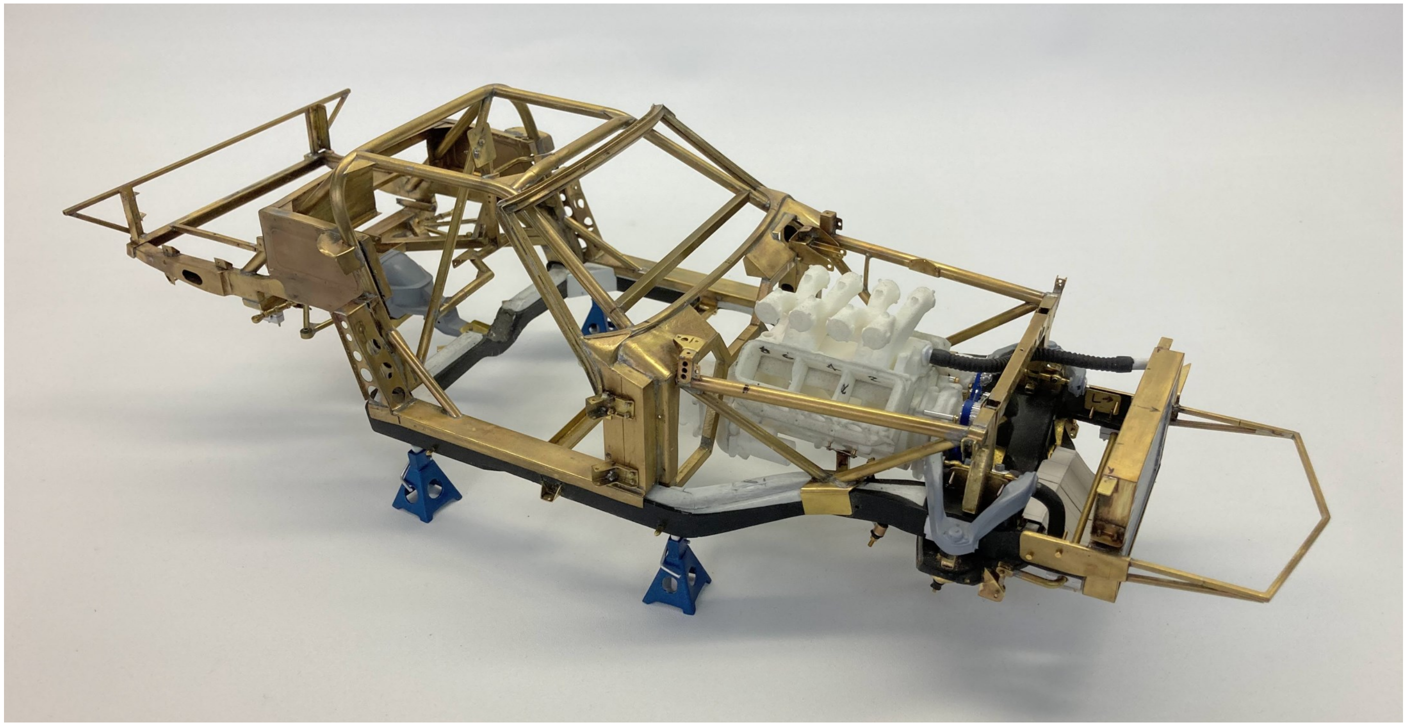


The engine, intake manifold, bellhousing, and transmission were 3D printed parts sourced from TDR/Shapeways. While they were well engineered, the type of plastic used for the printing resulted in a rough texture on all of the parts. While this worked out okay for the engine and transmission castings, it was too rough for the intake manifold to be realistic, thus requiring a great deal of filling and smoothing to make them usable. Here the drivetrain is being fit into the chassis, followed by the interior floor pan, fabricated from sheet plastic. This floor pan was later covered with textured paper to give the appearance of raw fiberglass.

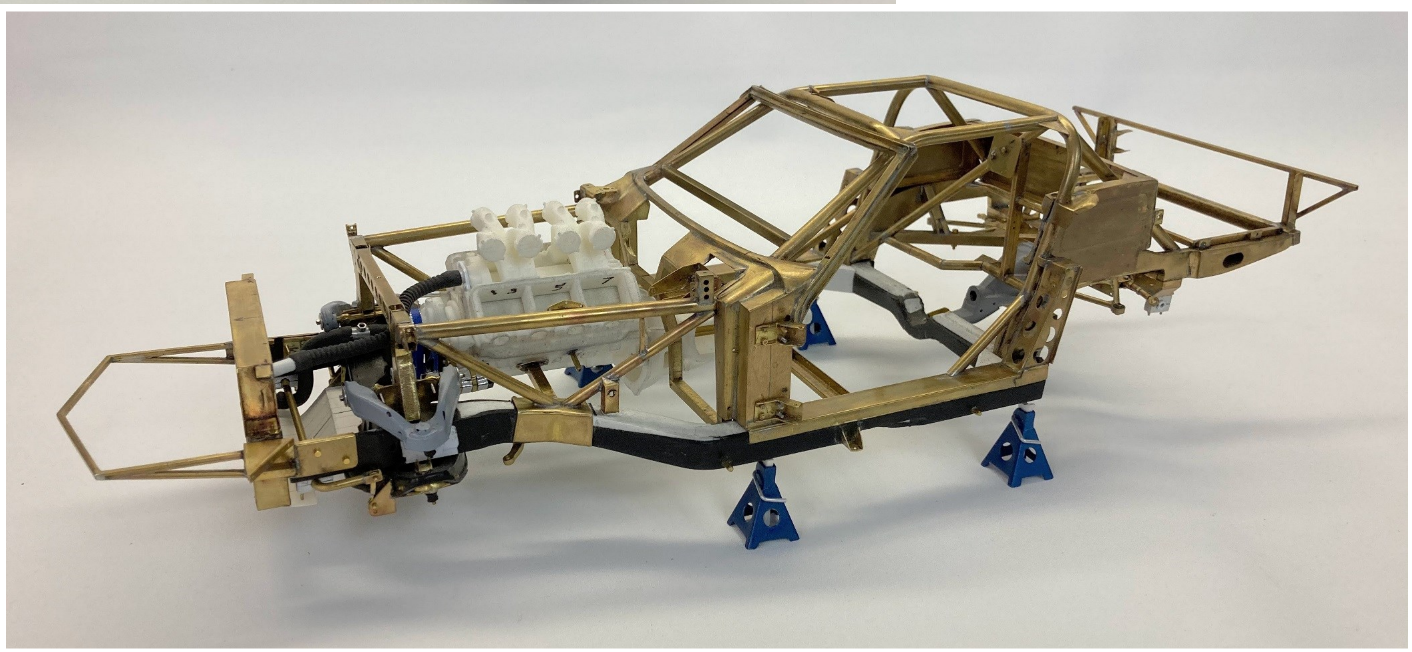




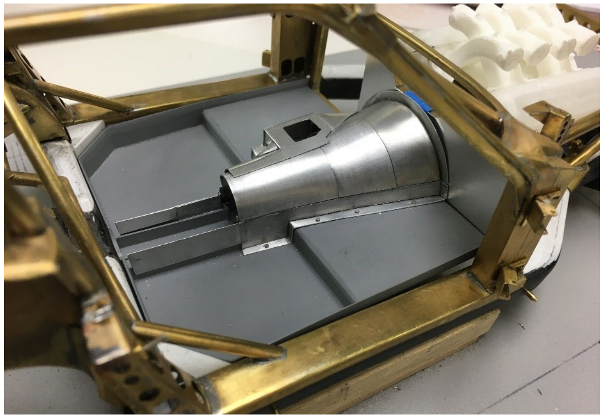
4) Chassis/Suspension (continued)



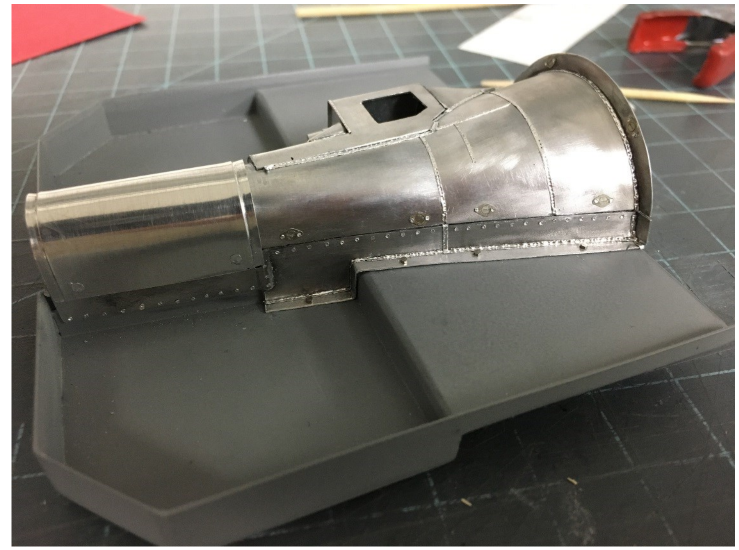
With a large portion of the chassis and its related components now completed, it was a good time for some overall progress photos of the basic frame structure.

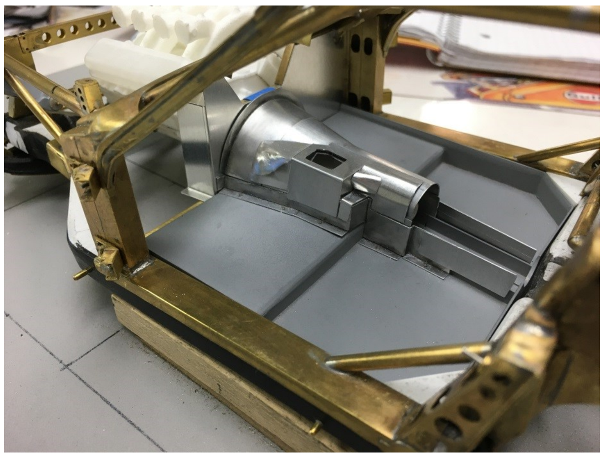


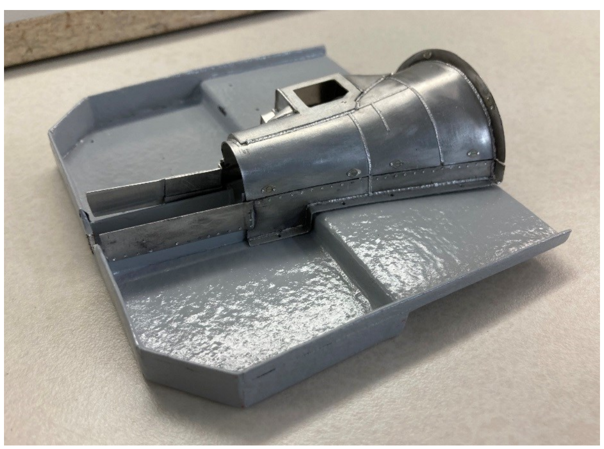
5) Interior

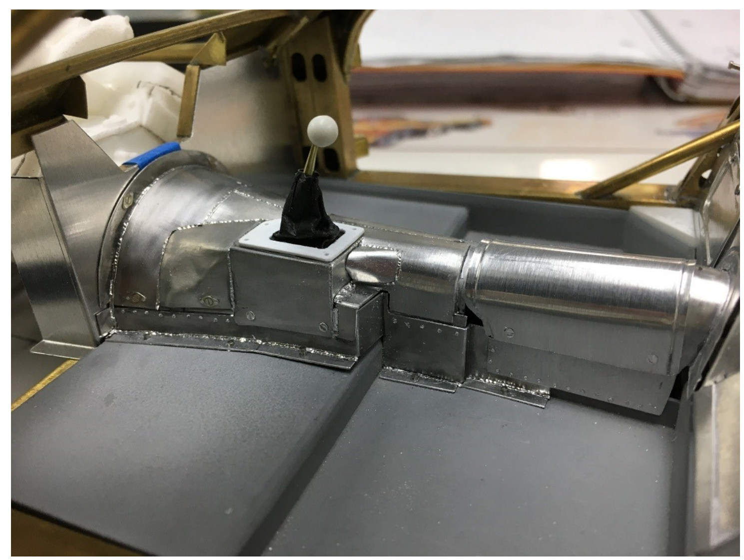


The transmission/driveshaft tunnel was made from aluminum sheet, with extra details added using photoetched Dzus fasteners and simulated pop-rivets made from aluminum furnace tape. To replicate the weld beads on the tunnel, very thin strips of furnace tape were applied and then embossed using a pick to give the appearance of heliarc welds. The shifter lever was made from brass, with a tissue paper boot, and the knob from a roundhead sewing pin.

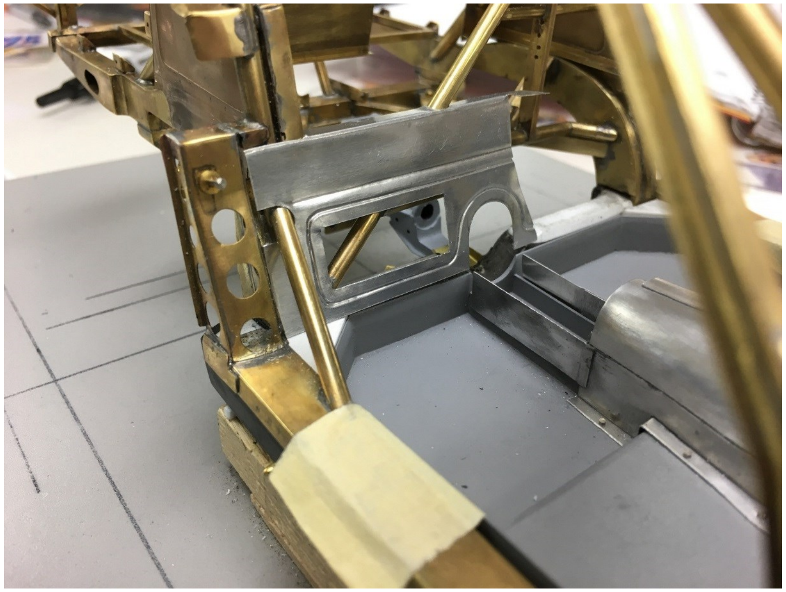




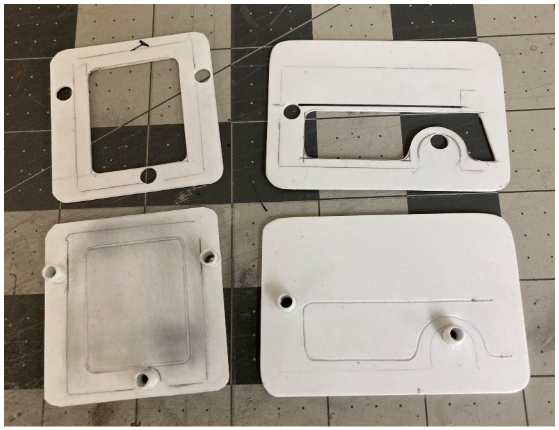


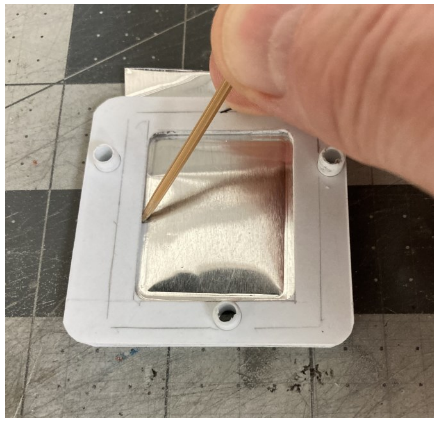


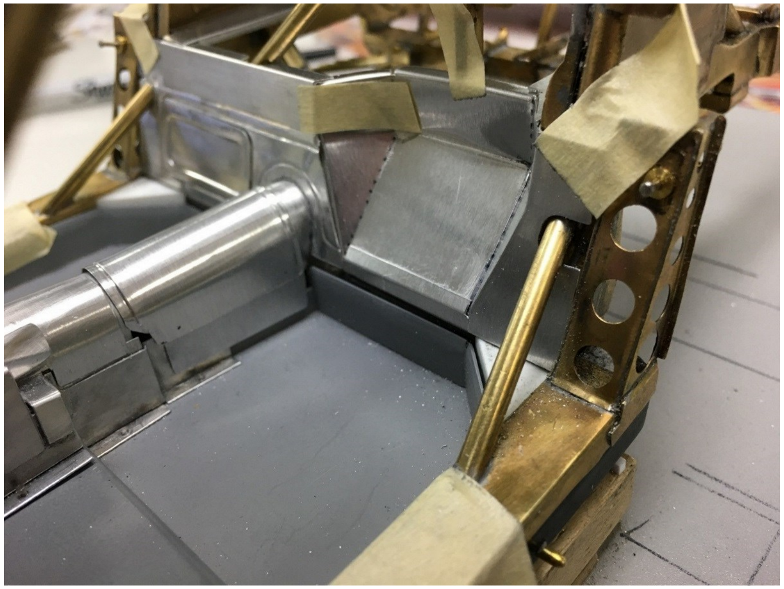
5) Interior (continued)

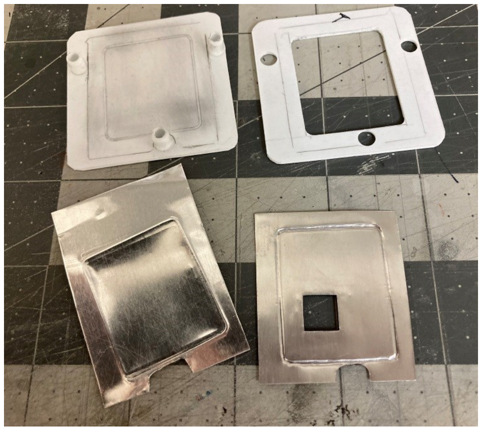


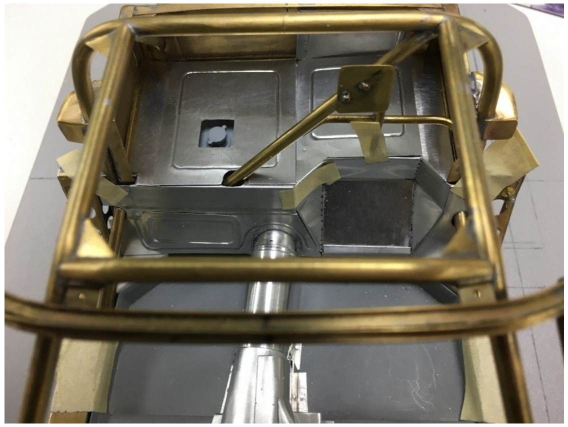
The rest of the interior aluminum panels were next to be built and installed. Bead rolling was used extensively on these pieces to replicate the original panels on the actual vehicle. This was accomplished by making a sheet plastic template of the bead pattern, and scribing a groove into another sheet of plastic using that template. A piece of aluminum sheet was then placed between those two pieces of plastic and the aluminum burnished down into the groove to form the bead.



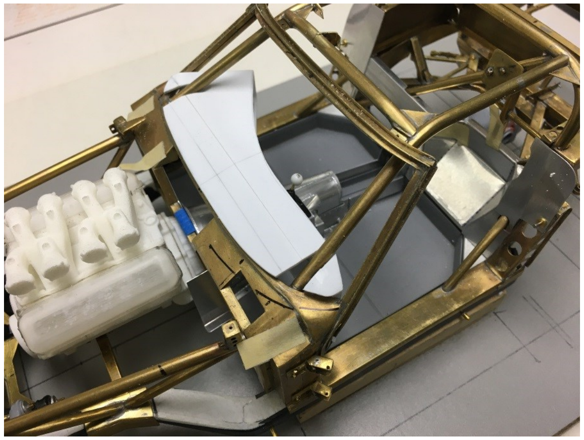


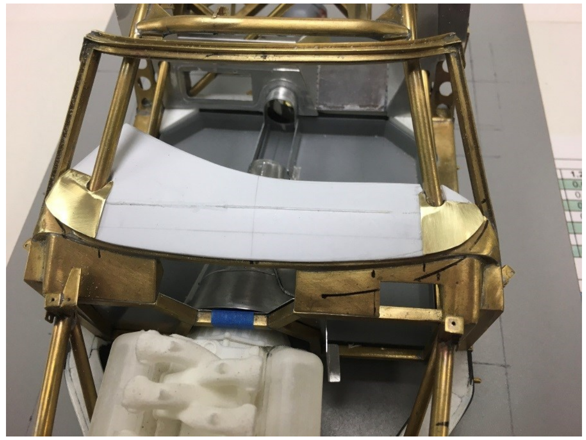




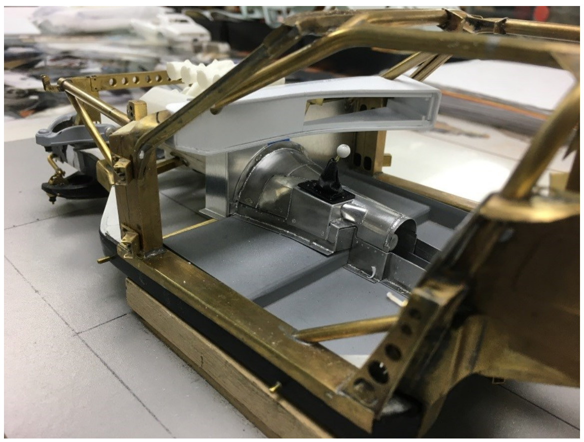


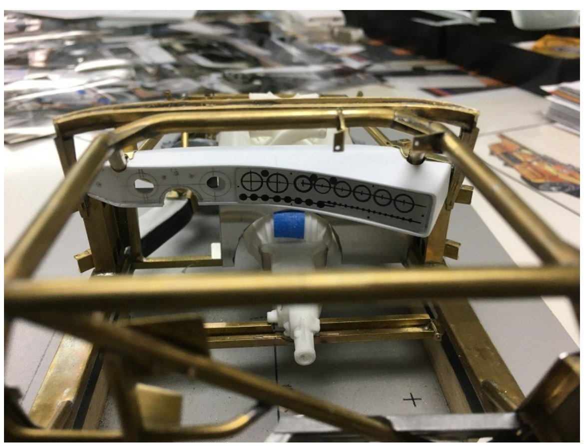
5) Interior (continued)

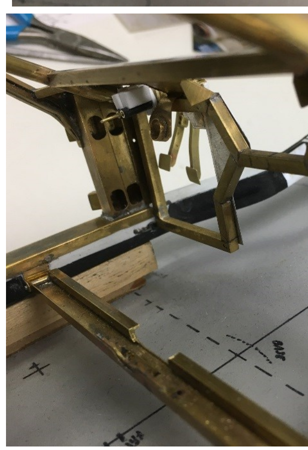


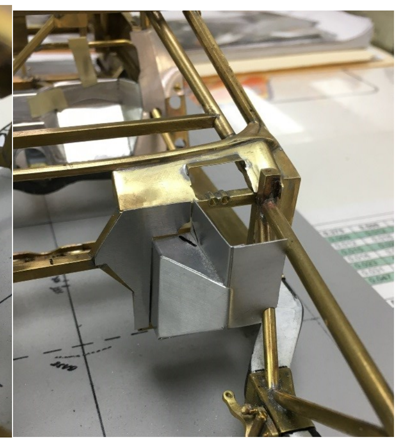


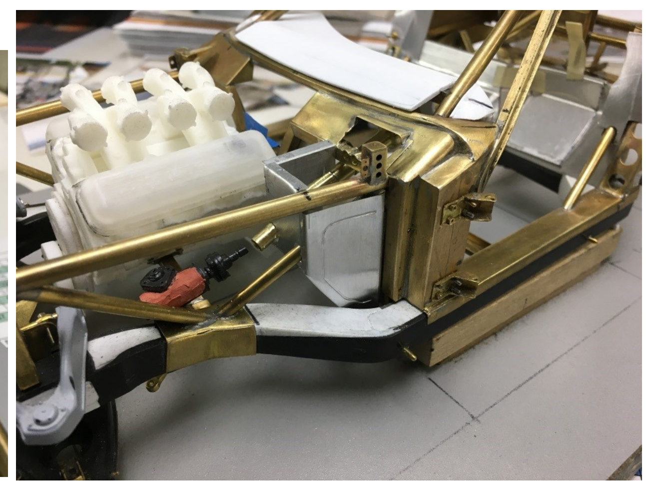
The distinctive curved dashboard was made from sheet plastic, brass, and aluminum, and was fitted to the chassis in a manner that allowed for precise location, but easy removal to aid in the rest of the construction of the car. Clutch and brake pedals with master cylinders were also fabricated from brass and installed. The driver footbox was made from sheet aluminum and proved to be one of the more difficult components of the model, as a precise fit was needed around many other chassis components and frame tubes, but it too had to be removable during the remainder of the model's construction.



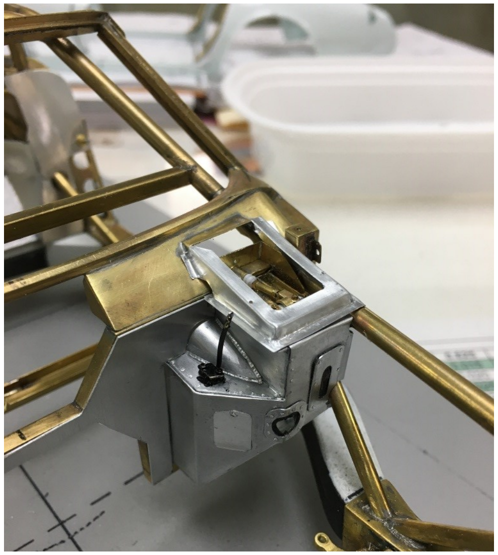


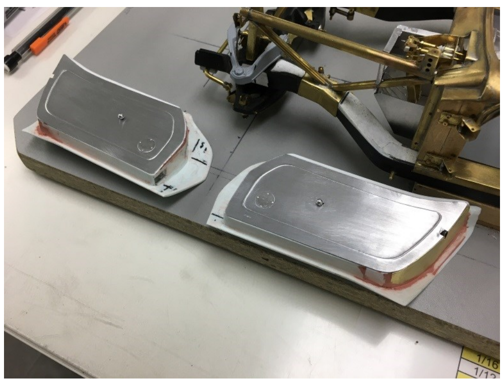


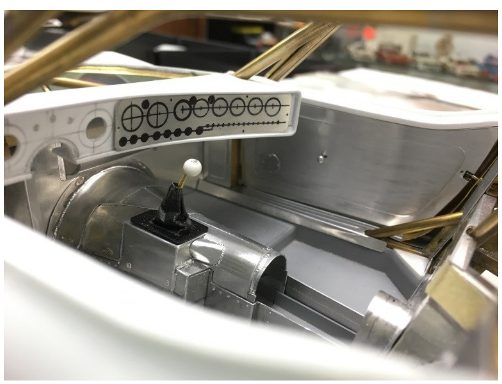


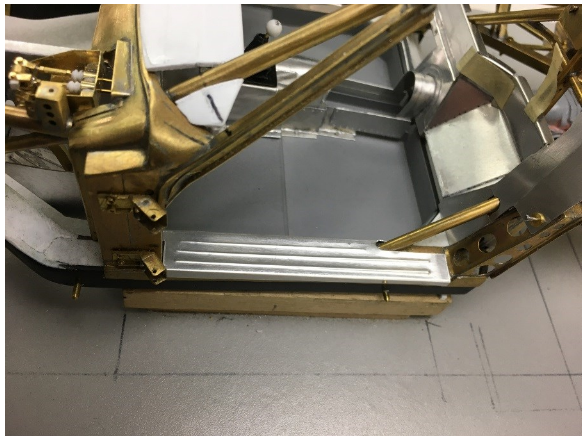


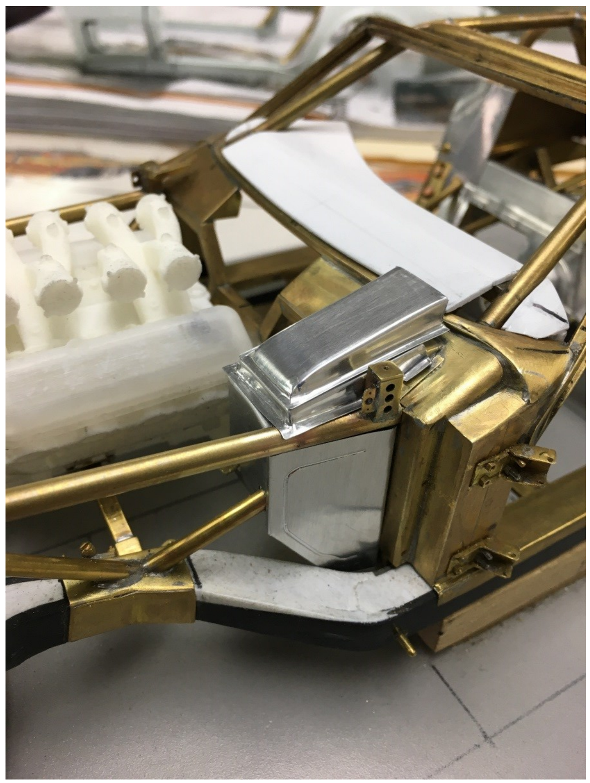
5) Interior (continued)



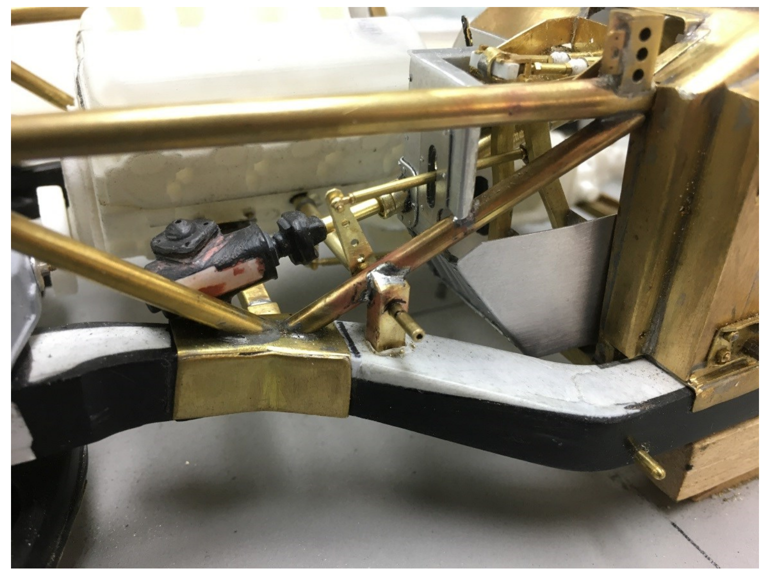






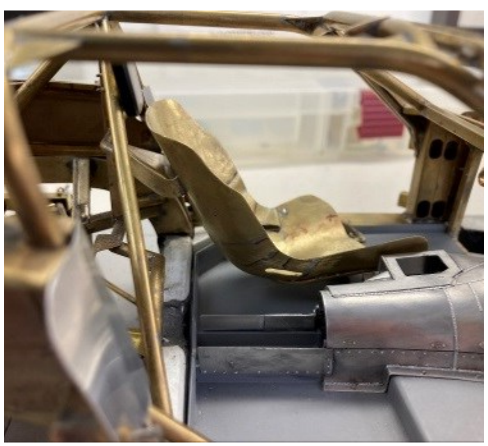


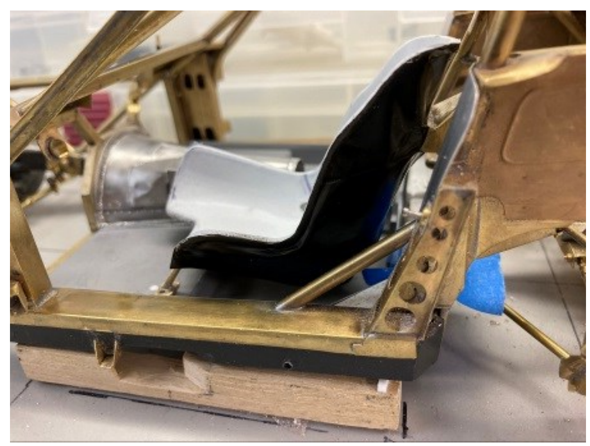
The driver's footbox was completed, along with door sills, kick panels and inner door skins, all from aluminum with bead rolling added as needed. The aluminum cover for the master cylinders was formed from sheet aluminum using a wooden buck. The clutch linkage and throttle linkage were made from brass tube/rod and installed, along with the steering column and steering gear.



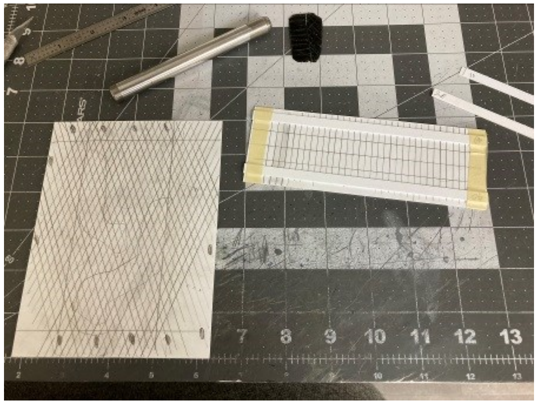
5) Interior (continued)

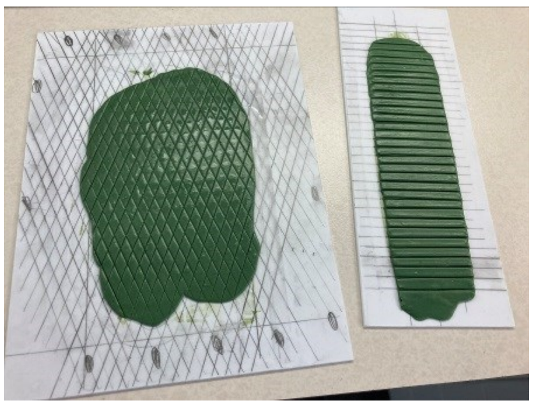
The driver's seat was the next component to fabricate. Sheet brass was cut, annealed and formed around a wooden buck to make the basic seat structure. Mounting brackets were soldered to this bucket and it was fitted to the interior. A seat liner was vacuumed formed from sheet plastic to fit inside the brass bucket. This would serve as the base foundation for the upholstery. Thin polypropylene plastic from an Amazon shipping bag was painted with black shoe dye and glued to the outside perimeter of the plastic seat liner to replicate the vinyl seat cover on the full-size vehicle.

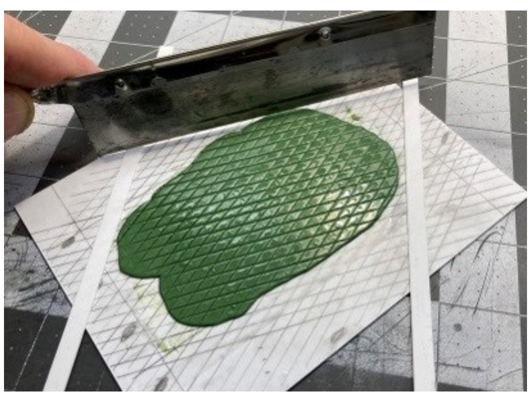




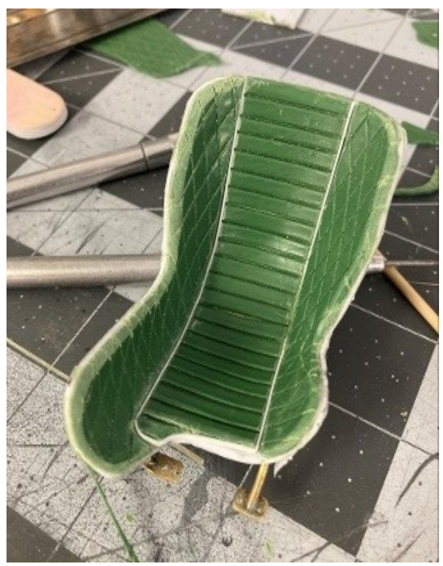
5) Interior (continued)



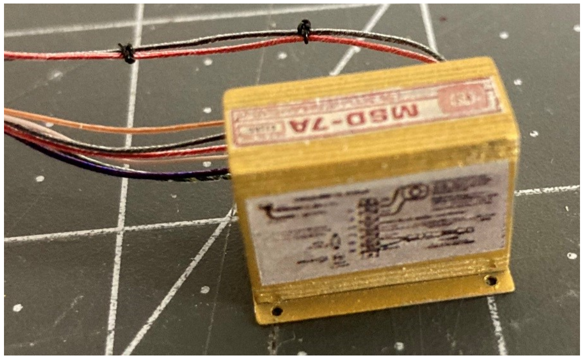




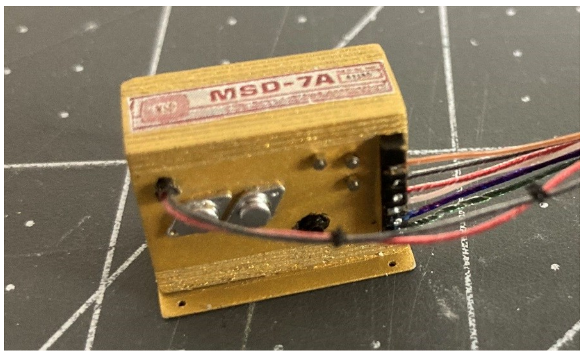
The next step was to replicate the diamond pleat and the tuck and roll upholstery of the seat. This was accomplished by drawing the two patterns to scale on large pieces of sheet plastic. Two-part epoxy putty was mixed and rolled out onto these pieces using side rails to achieve a consistent thickness. Once the putty was rolled out, a very fine-toothed razor saw was used to imprint the putty to replicate the stitching on the upholstery, following the pattern lines drawn on the plastic. Side rails were again used to control the depth of the imprint, so it would look like stitching with the correct contour, but not cut through the putty. Once the putty had cured, but was still flexible, it was peeled off the plastic base, cut to size and glued to the seat liner. Styrene strips were added to replicate the piping around the edges and between the sections of the seat. Once this was complete, the entire seat upholstery was sprayed with black shoe dye to replicate the vinyl seat cover.

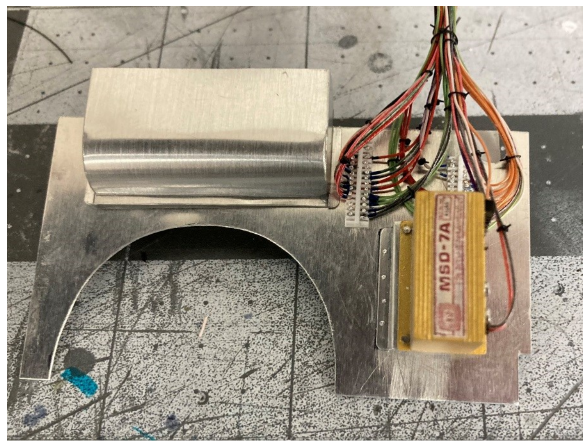


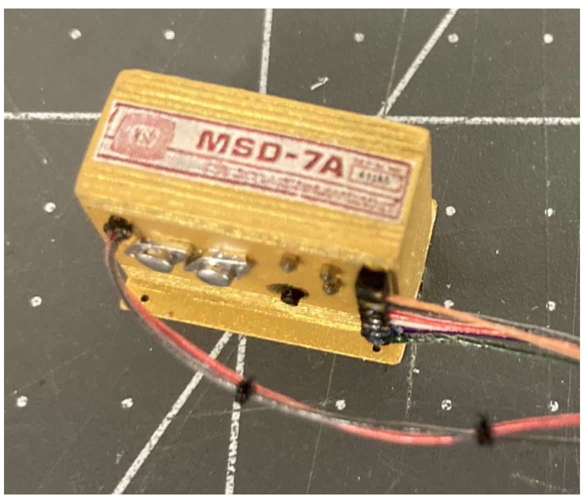
5) Interior (continued)

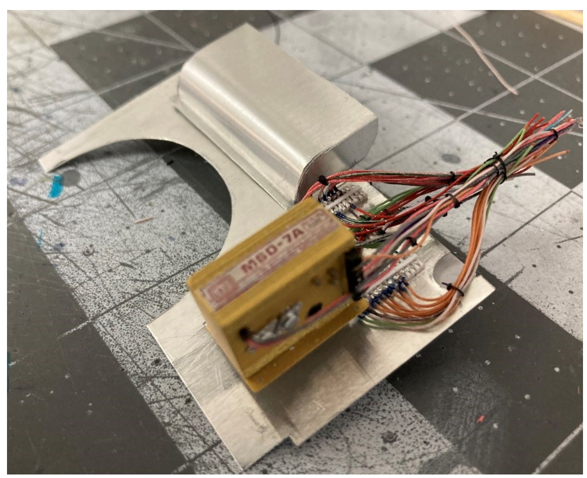


Continuing to work in the interior of the vehicle, the electronic ignition box and wiring harness was the next component to be made. It was built from a block of styrene plastic with a brass mounting plate. The terminal block was made from styrene square stock and the electronic components were made from aluminum. The labels were laser jet printed on blank decal paper. The wiring harness was made from wires scavenged from an old set of ear buds. The completed ignition box and wiring was all mounted to the interior firewall, made from 0.010" aluminum flashing sheet. Cable ties were made by heating up the end of a piece of 0.006" diameter nylon fishing line to bulge the end, which was then flattened and a hole pierced through it with a straight pin. The free end of the line was then run around the wires, through this hole, and the cable tie was cinched up and clipped to length. A drop of CA glue holds the tie tight.



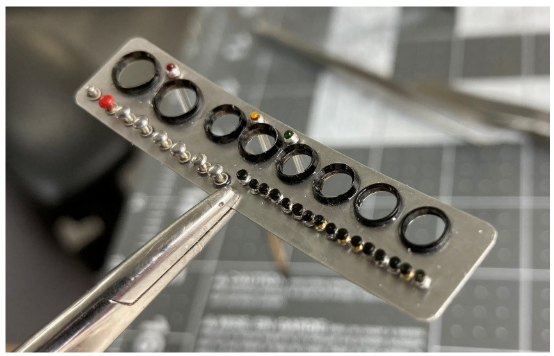




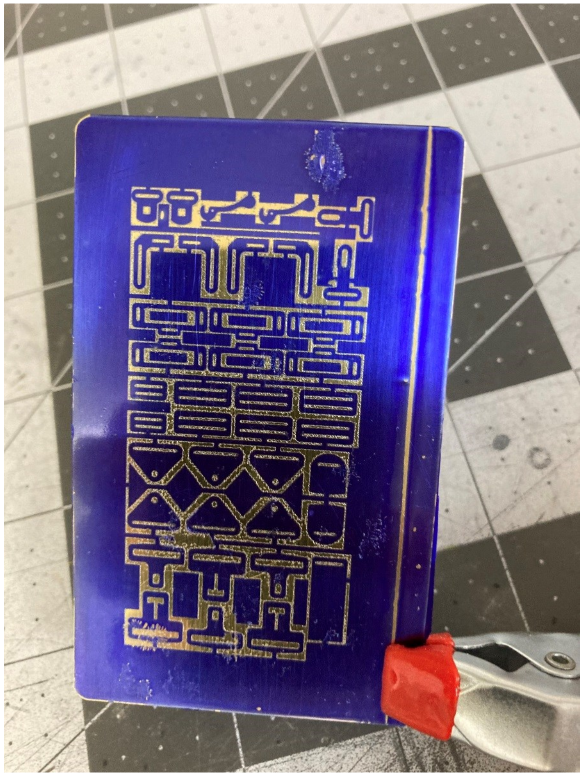


5) Interior (continued)

Completing the gages and dash panel came next. The gage faces were photo-reduced from photos taken of the actual gages, enhanced in Photoshop, then printed on blank decal paper. Gage bezels were turned from aluminum. The gages were finished with needles cut from mylar sheet and "glass" made from clear sheet styrene. The various knobs were made from straight pin heads, and the fuse holders were machined from brass. Decals were laser printed to represent the labels for the switches and fuses. Warning lights were machined from clear acrylic rod, then colored with Tamiya clear paints and mounted with machined aluminum trim rings.



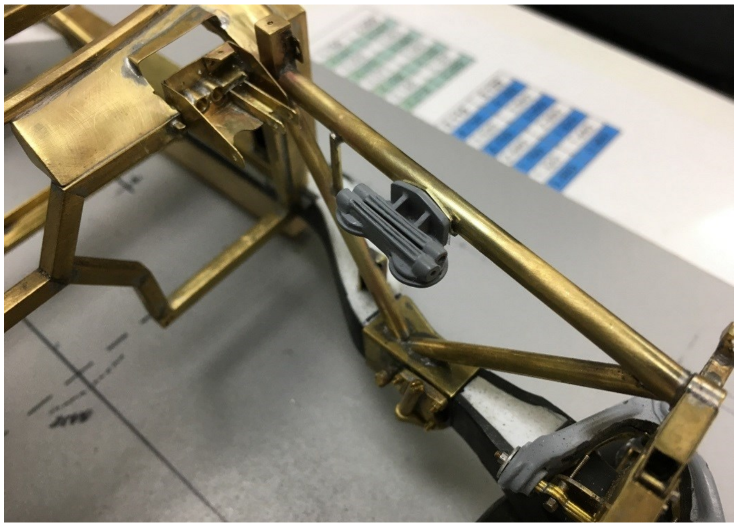
5) Interior (continued)

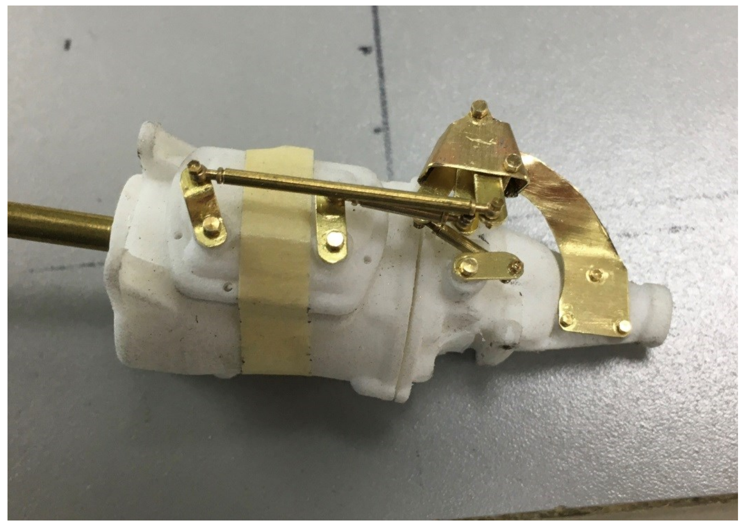


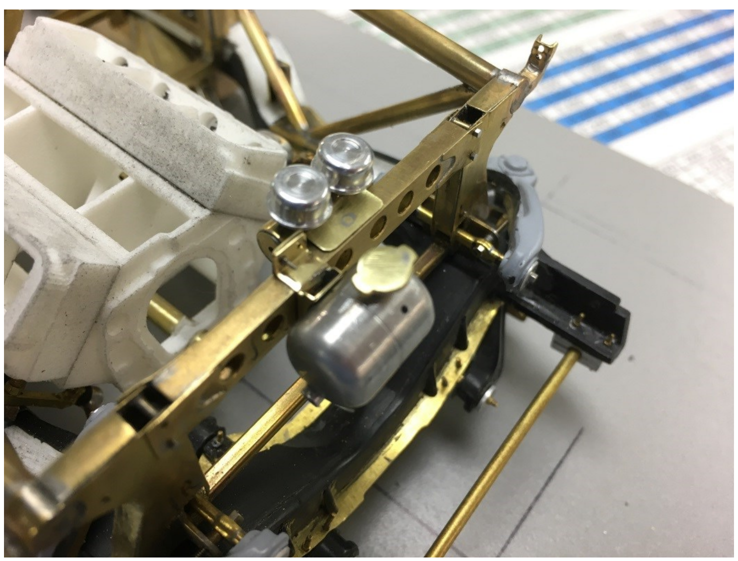
Artwork for the seat belt harness buckles was drawn up and used to photo-etch the buckles themselves out of brass. These were cobalt-nickel plated using the Caswell Plating system, and installed on belts cut from Bondex pressure sensitive nylon patch material found at a fabric store. The belts were then detailed with laser-printed manufacturer's labels and assembled to the buckles.

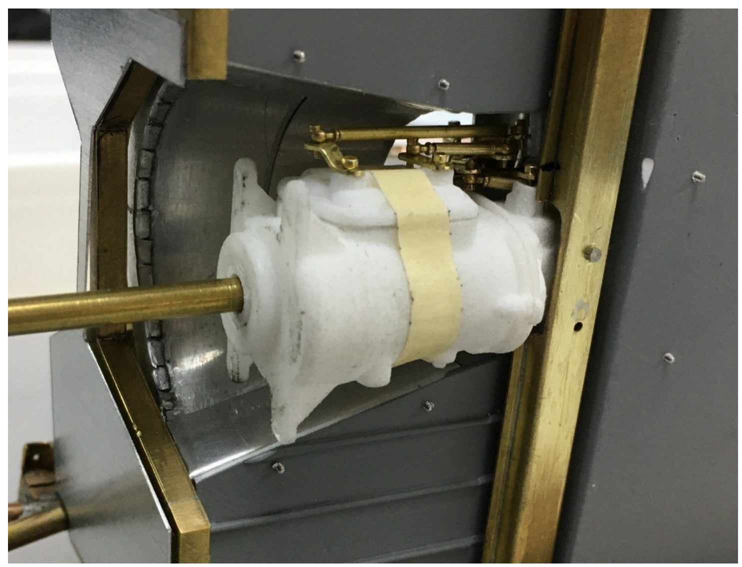
6) Engine/Drivetrain

The focus now turned back to finishing up some of the small components under the hood, such as the dual oil filter adapter, which was scratch-built from styrene rod and sheet, then resin-cast. This was mounted to the frame tube using a brass bracket and threaded fasteners. The oil breathers were machined from aluminum, as was the coolant expansion tank, which was topped with a brass cap. The transmission linkage was fabricated from brass tubing, brass rod ends, and threaded bolts, with sheet brass used to make the mounting brackets and shifter housing.

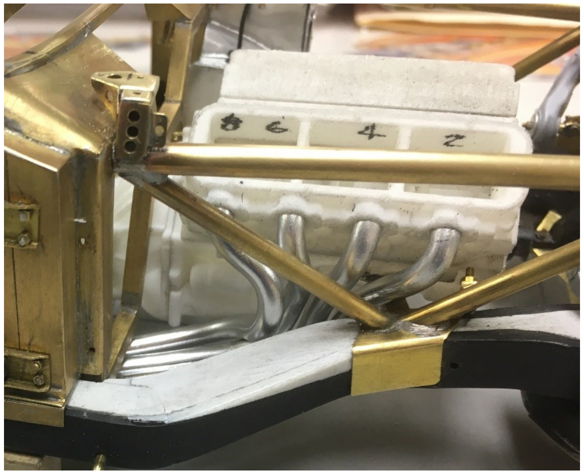




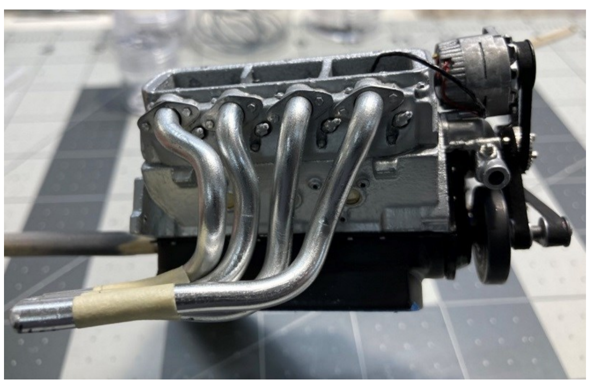


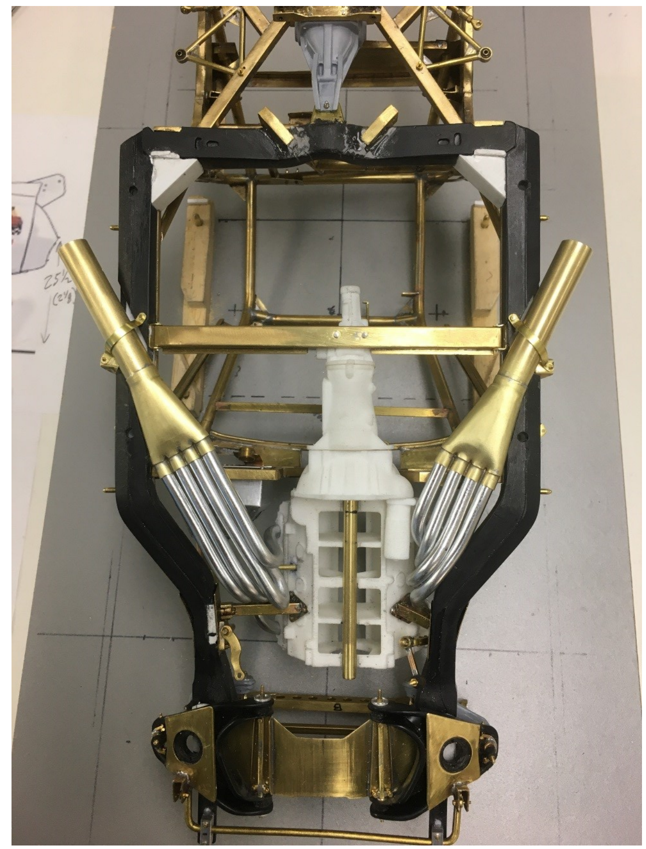


6) Engine/Drivetrain (continued)

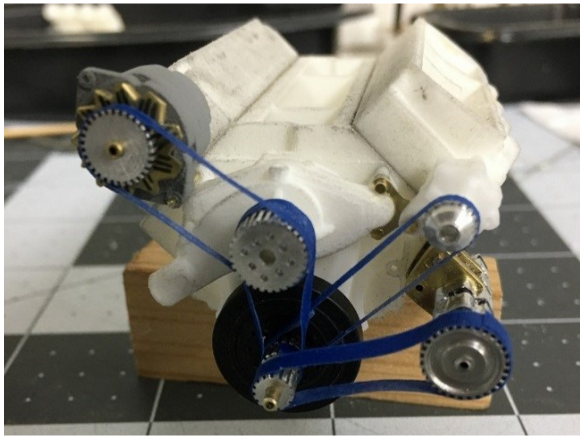


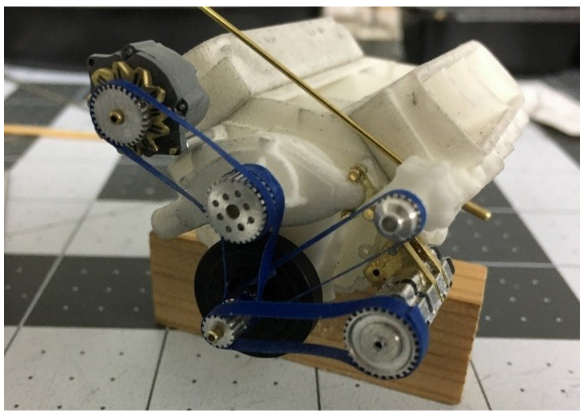
The next step was to fabricate the unique headers and exhaust collectors used on this car. The individual header pipes were formed from 4mm diameter aluminum wire. Prior to forming, the wire was annealed with a torch to soften it a bit, thus making it easier to bend into the complex shapes. Each header pipe was fitted with a flange made from sheet aluminum and mounted to the engine with RB Motion hex bolts. The collectors were fabricated from brass tube and brass sheet. These collectors were later electroless cobalt-nickel plated.

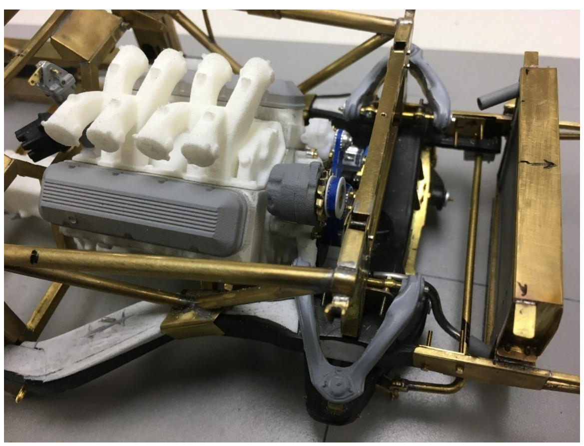




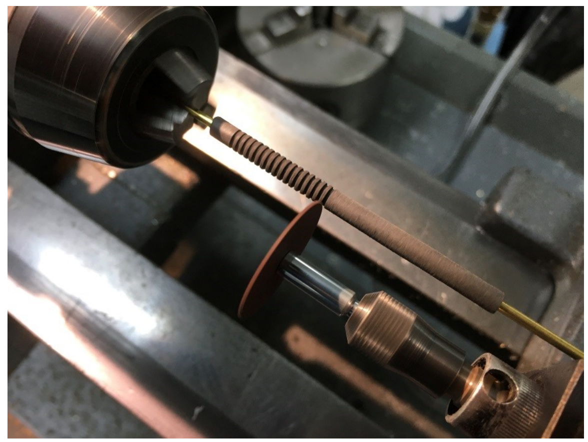
6) Engine/Drivetrain (continued)

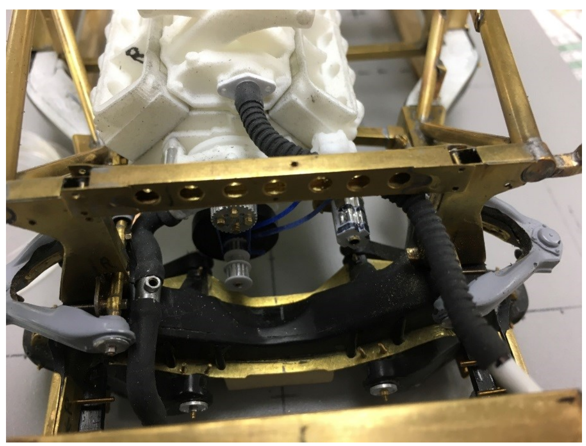


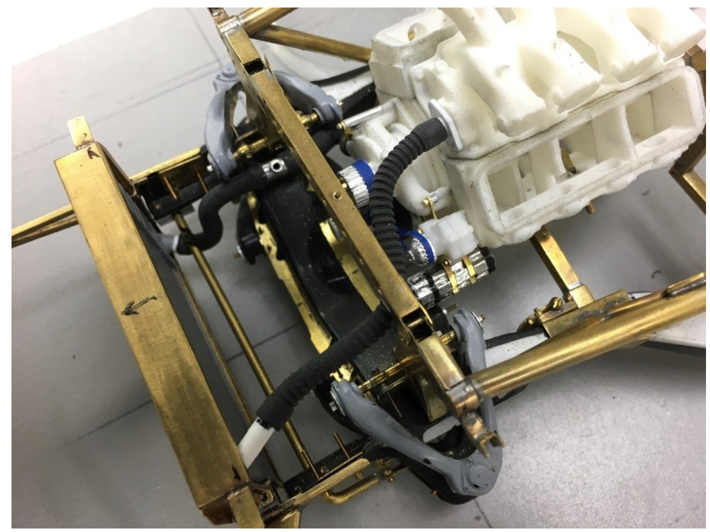




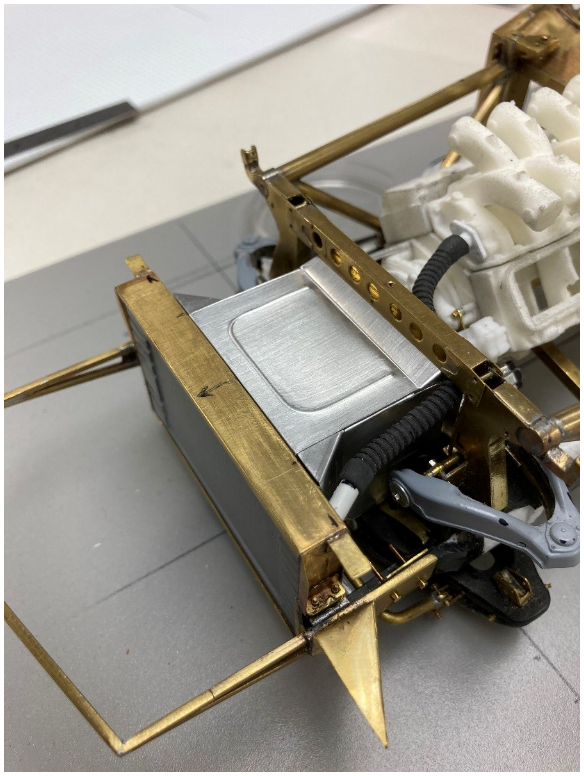
Attaching all of the components to the front of the engine was accomplished using brass and aluminum bracketry with threaded brass fasteners. The radiator hose was made from a length of very soft electrical cord salvaged from a clothes iron. The rubber insulation was stripped off of the copper conductor wire, then a brass rod was inserted into the center as a temporary holder. This allowed the insulation to be rotated on the lathe while a carbide cutting disc was used to "machine" the convolutions into it, thus duplicating the flexible radiator hose.

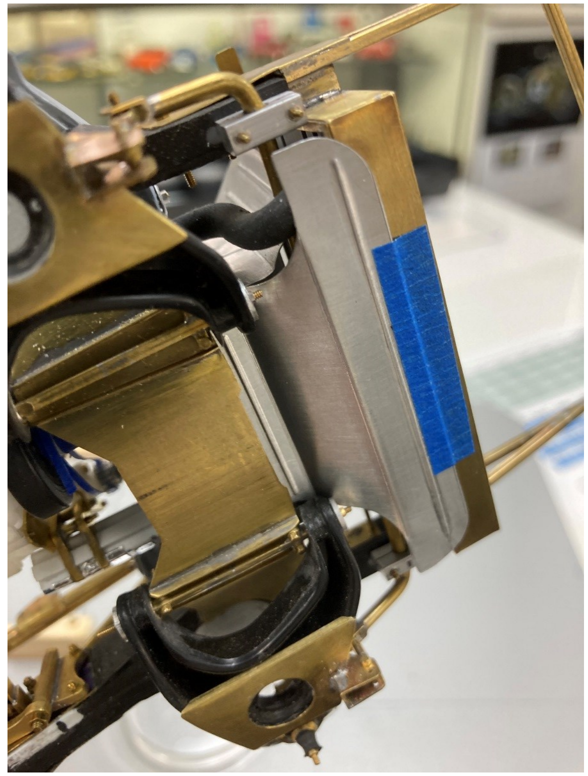




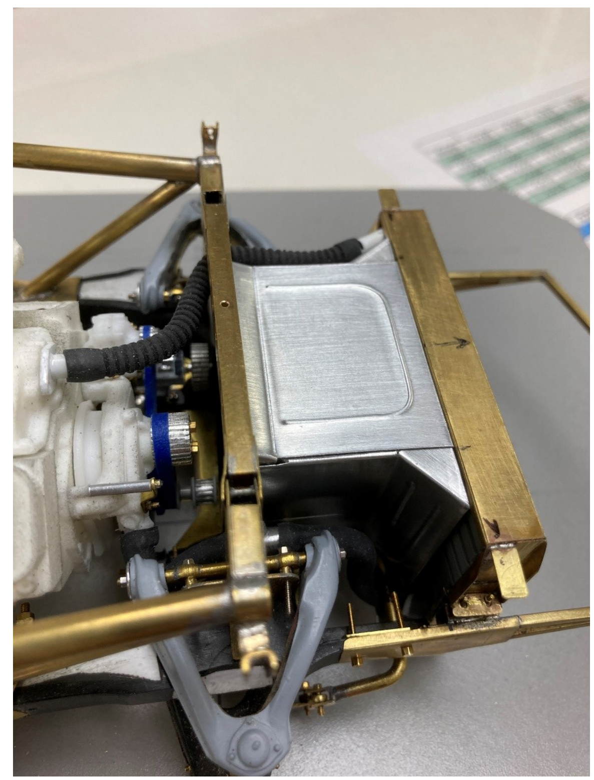


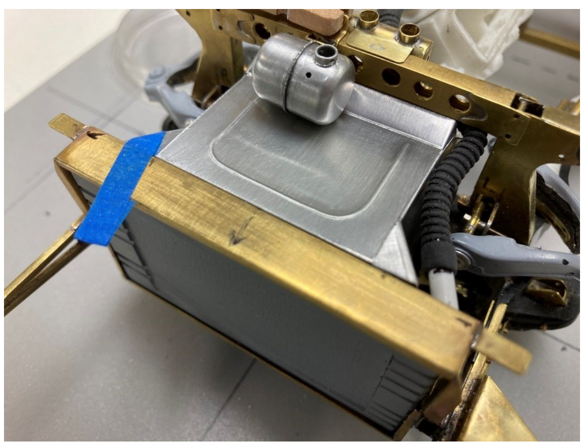
6) Engine/Drivetrain (continued)

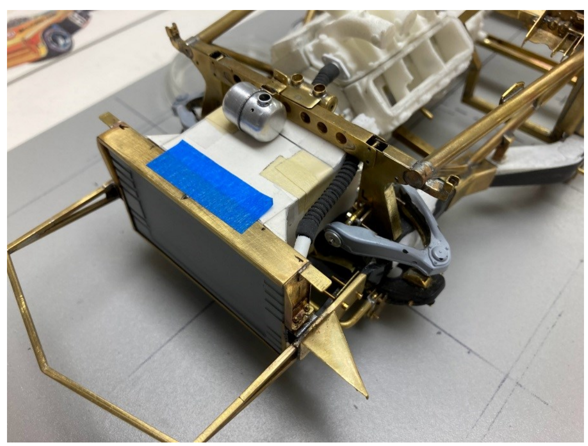




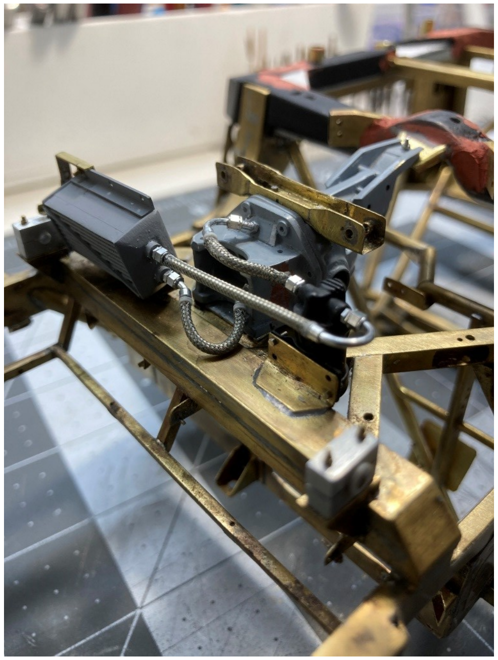
The radiator ducting was then fabricated from sheet aluminum, with the added bead rolling, using the same technique as used on the interior panels.



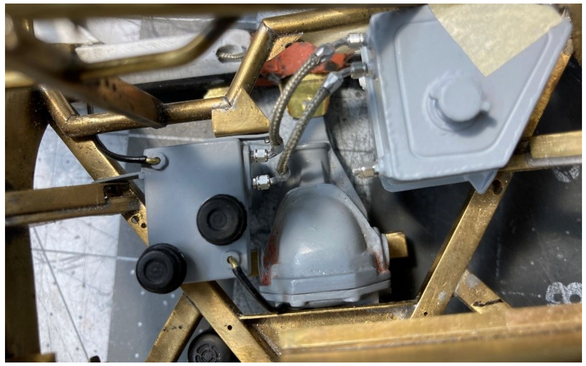


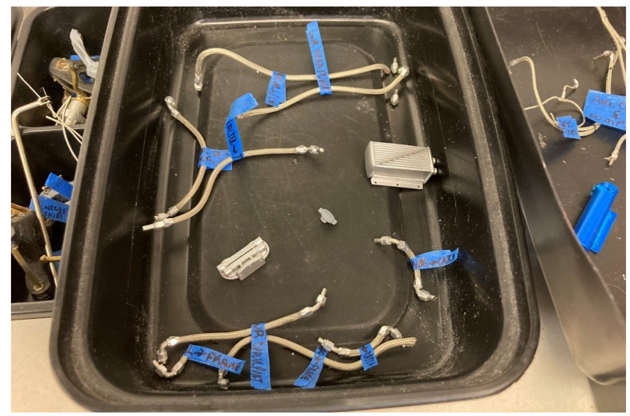


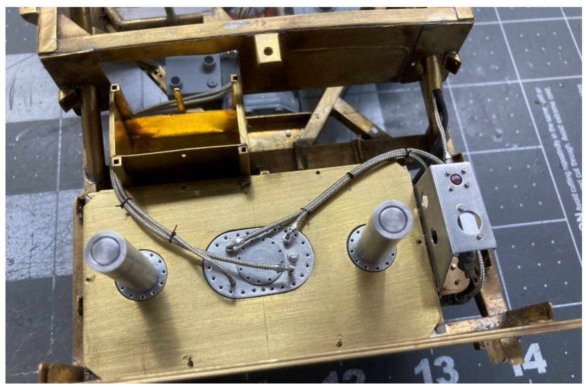
6) Engine/Drivetrain (continued)

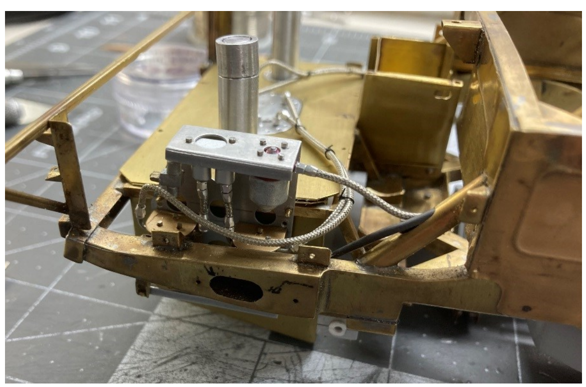


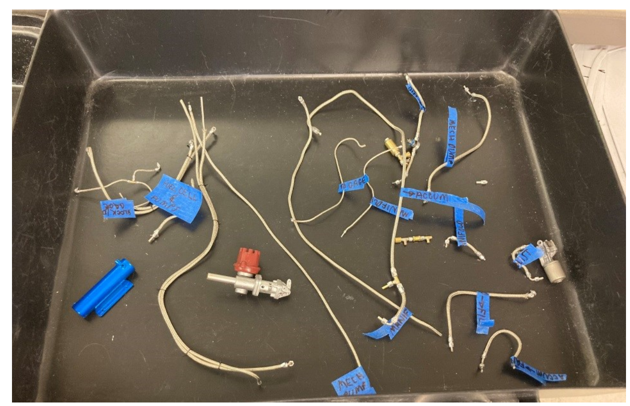
With most of the chassis and interior components now completed, it was time to complete the engine/drivetrain. All of the oil and fuel lines were fabricated using Pro Tech braided line with RB Motion fittings added. These lines were all roughed-in at this point in the construction process, so the fit would be correct. Each was then labeled and set aside for detail painting the fittings and installation at final assembly.



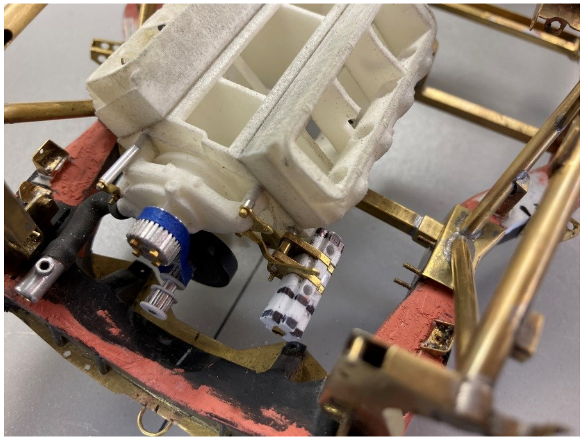




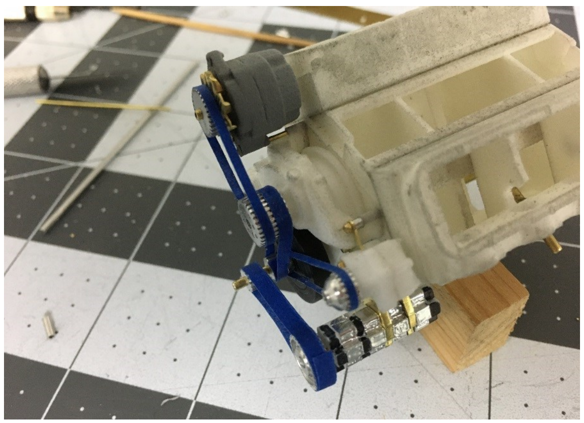


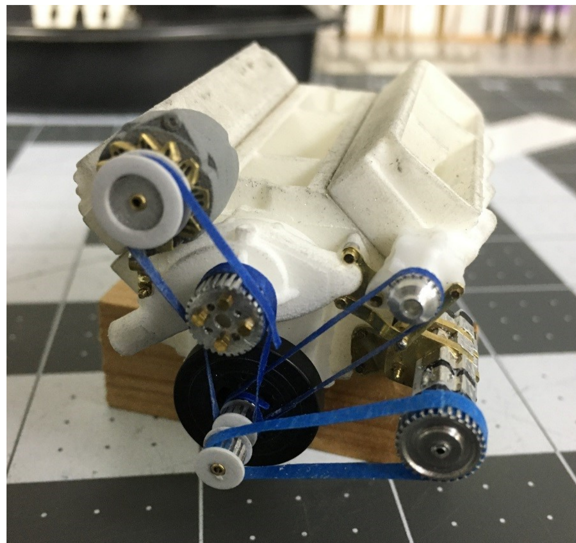


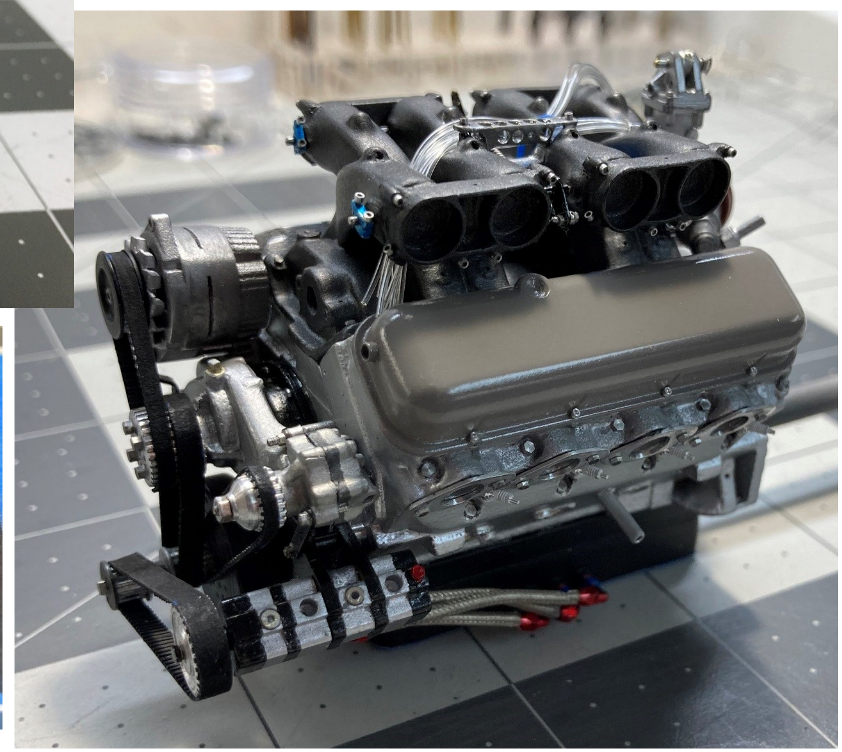
6) Engine/Drivetrain (continued)

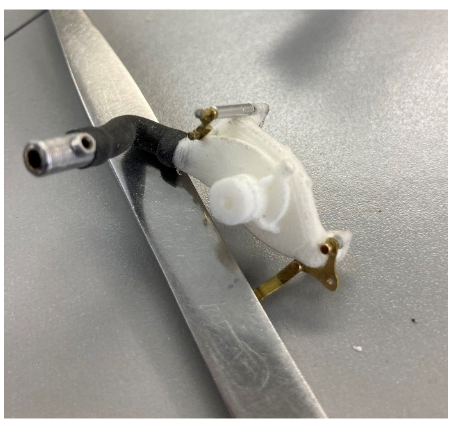


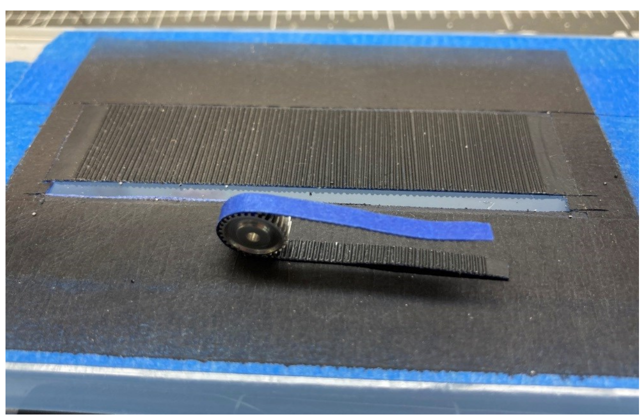
With all the front of engine accessories now mounted on brass bracketry to the engine, cog pulleys were machined from aluminum. The cog belts were made by gluing lengths of plastic strips to the sticky side of blue painter's tape, then cutting strips to the right width to make each belt. These were then painted flat black and installed at engine final assembly.



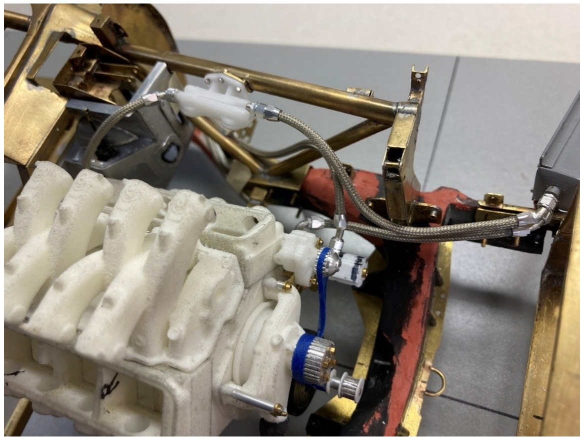




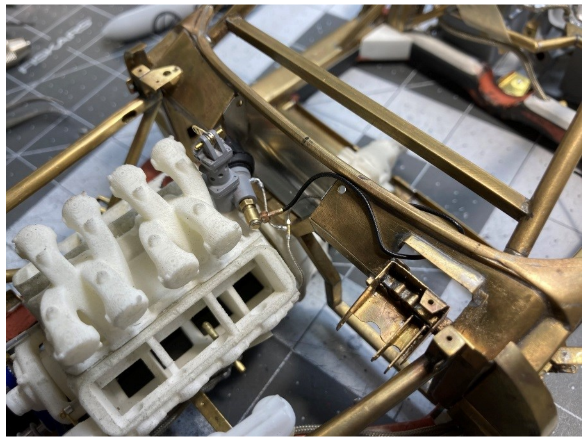


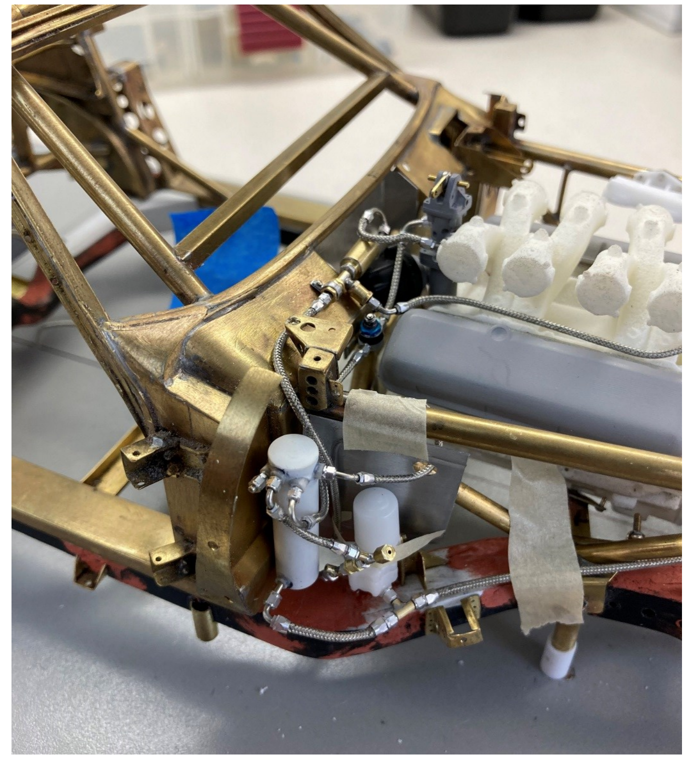


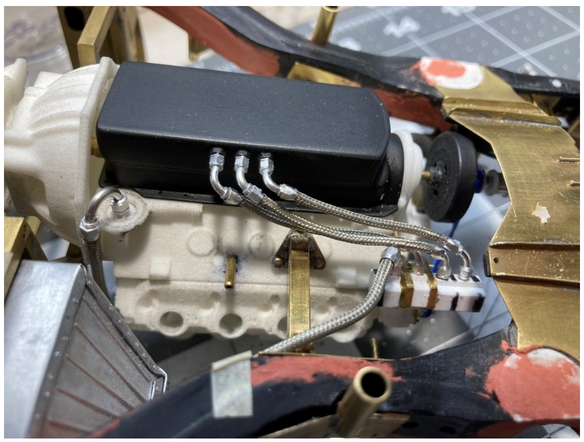
6) Engine/Drivetrain (continued)

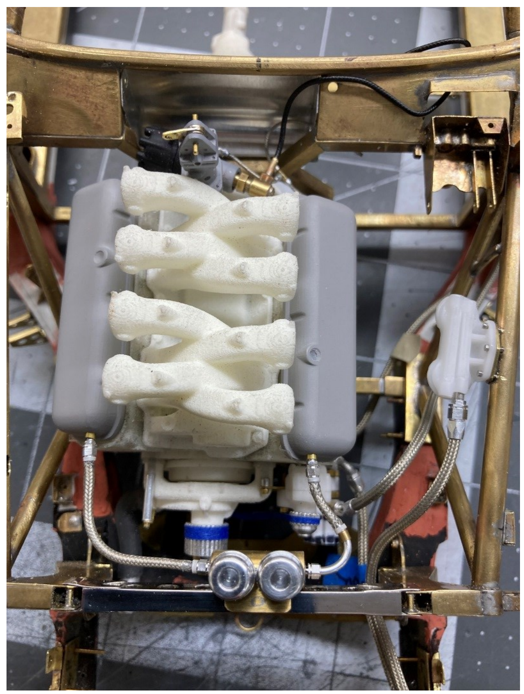


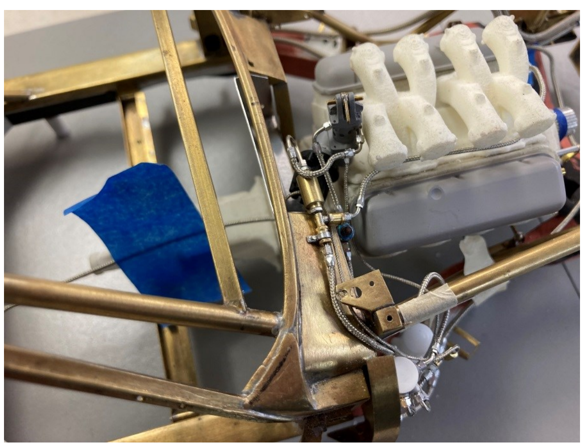
The oil lines for the engine and the rest of the complex fuel system were also fabricated at this point in the project. Other engine details such as the starter motor and the battery cables were also completed.

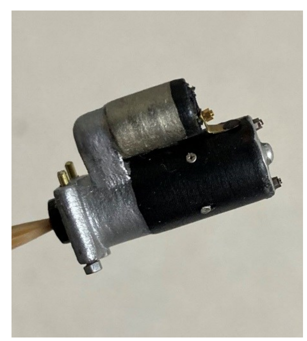


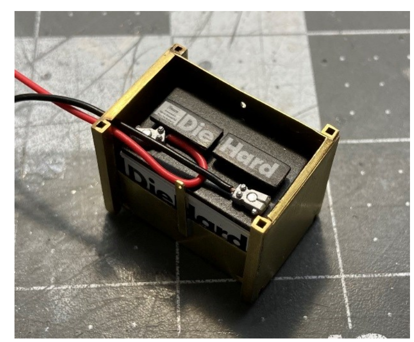




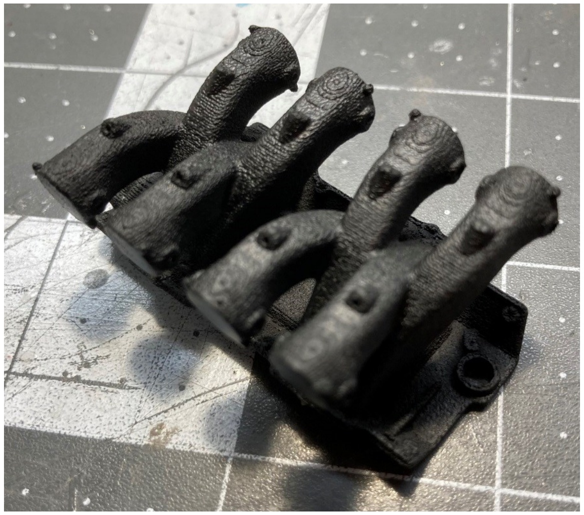




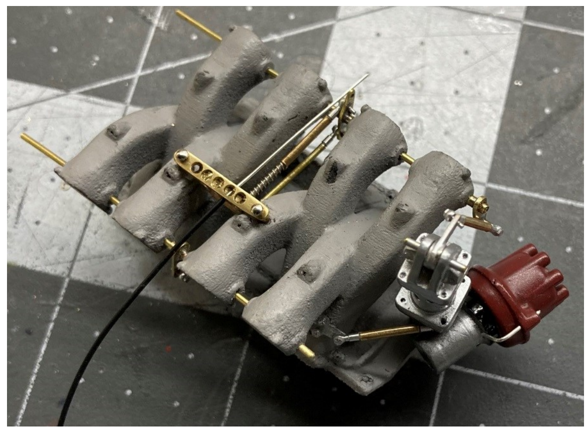


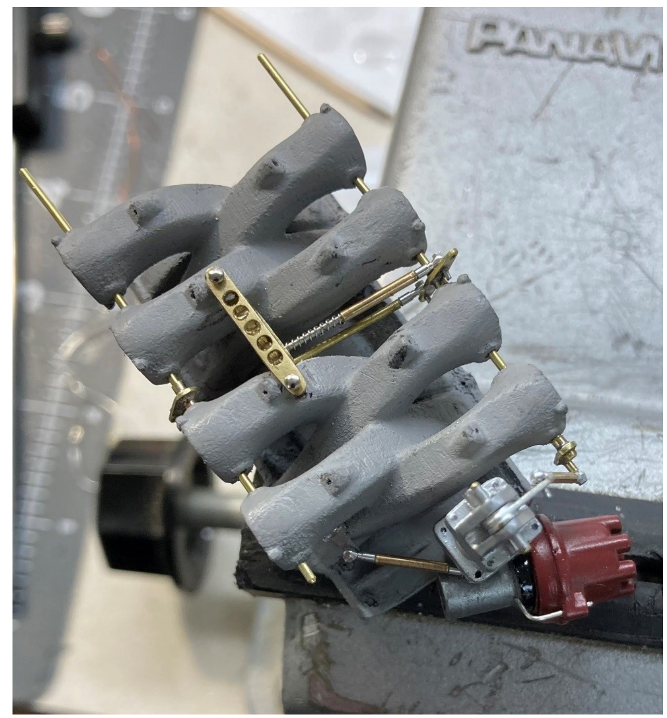


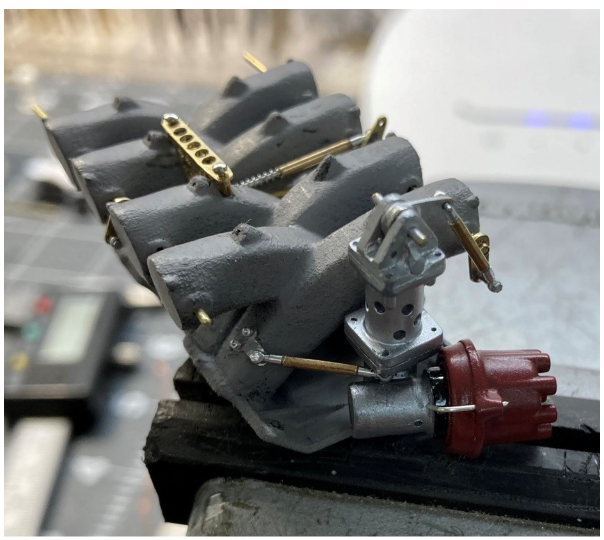
6) Engine/Drivetrain (continued)

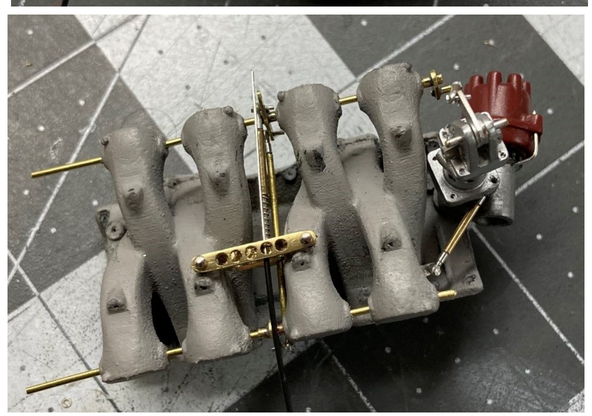


It was now time to tackle that complicated intake manifold and fuel delivery system. The as-printed condition of the manifold was not as smooth as it needed to be, so it took a great deal of filling and smoothing to get to an acceptable state. Intake stacks were formed from aluminum tubing on the lathe using a custom-made flaring tool. The intake screens were formed from stainless steel mesh. All of the linkages were made from brass tubing and RB Motion components. The fuel distributor was scratch-built from brass and plastic, and the distributor cap was a modified kit part.

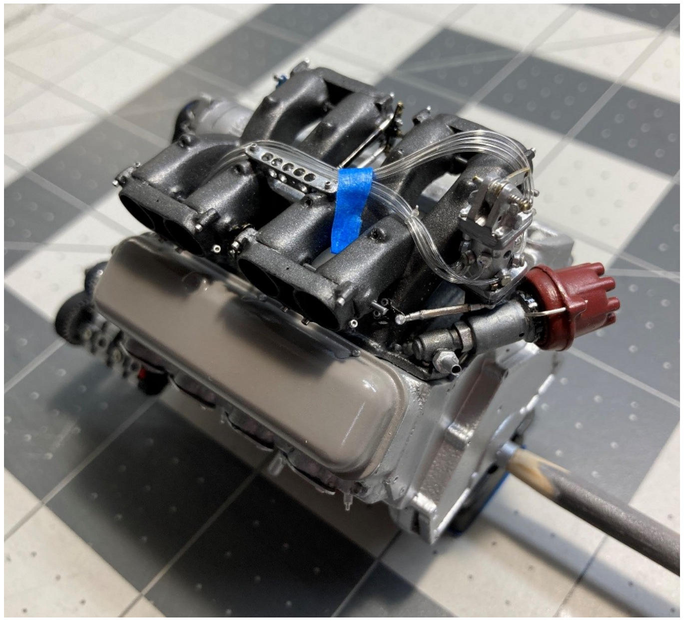




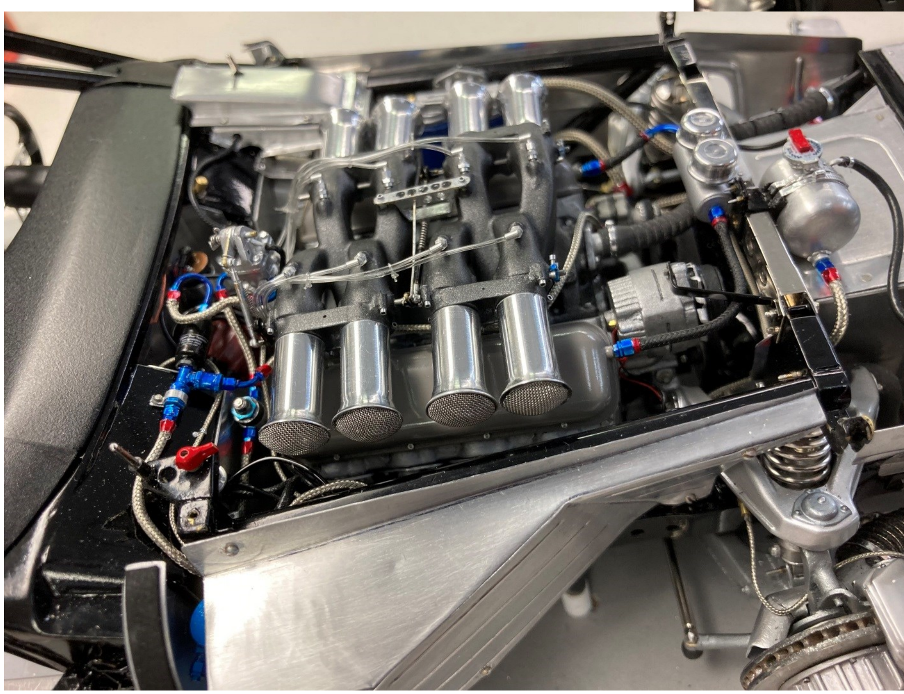




6) Engine/Drivetrain (continued)

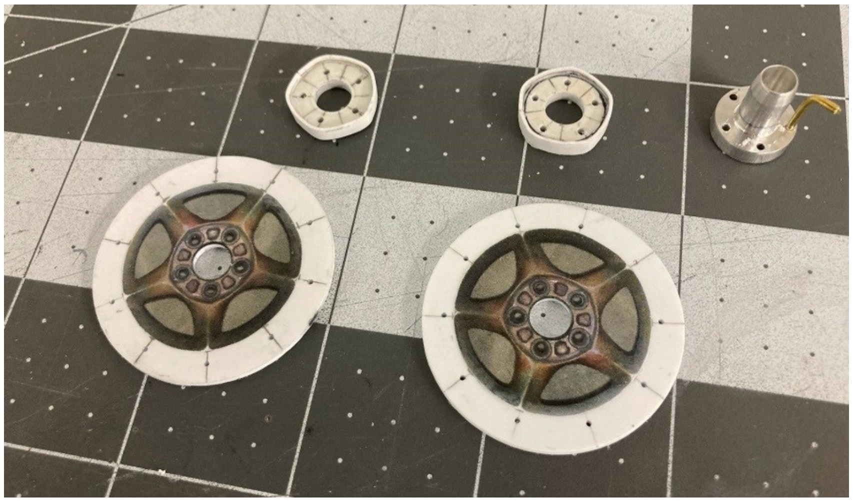


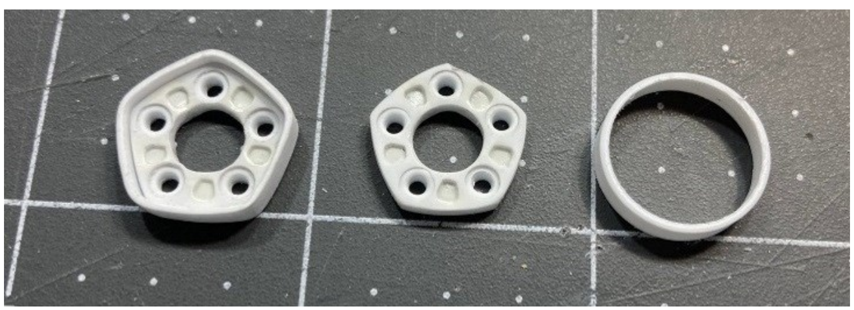
The fuel lines were made from Orvis stretchable tubing. This is a product made for tying fishing flies/lures and is a small diameter (0.020” or 0.030”) stretch tubing that comes in various colors. The clear 0.020” tubing was perfect to replicate those fuel lines running from the fuel distributor to the injectors and the black 0.030” tubing served as ignition wires. RB Motion plug boots/ spark plugs and countless numbers of their hex bolts were used to detail the engine, along with Testors Metalizer paints

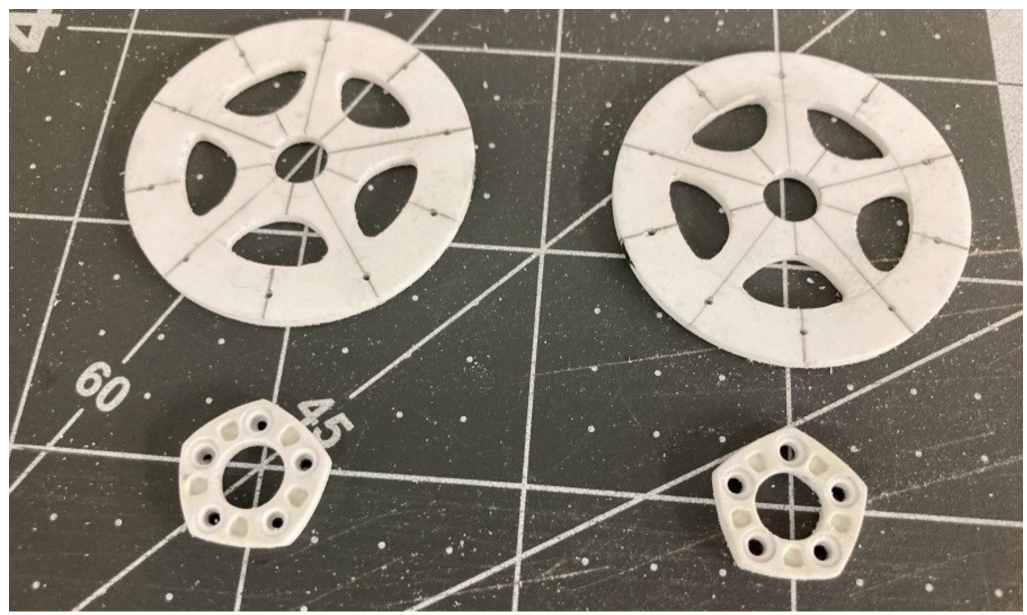


7) Wheels/Tires

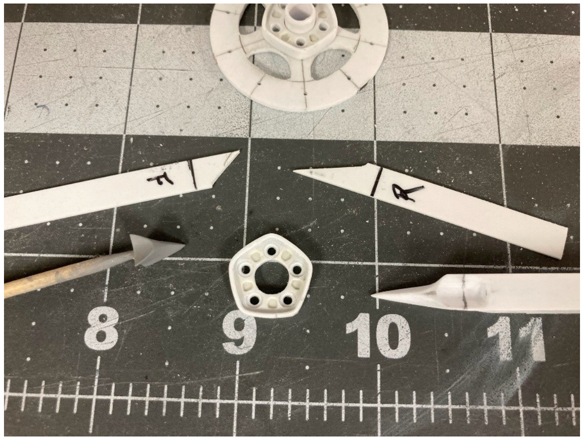
With the majority of the under-hood components now complete, attention was turned to another challenging aspect of the project: the wheels. To duplicate the rare Sterling mags used on the original car, a three-piece design was utilized using a center section, an inner rim, and an outer rim. The center section was ultimately going to be a resin casting, with the two rims machined from aluminum. Two different center sections and two different inner rims were needed, as the front and rear wheels were of different widths and offsets. To make the center section masters, discs were cut from sheet plastic and a photo-reduced image of each wheel were attached to these discs. This provided the template to open the area between the spokes and locate the spokes. The wheel centers were fabricated from sheet plastic and plastic rings, then duplicates resin-cast for consistency.

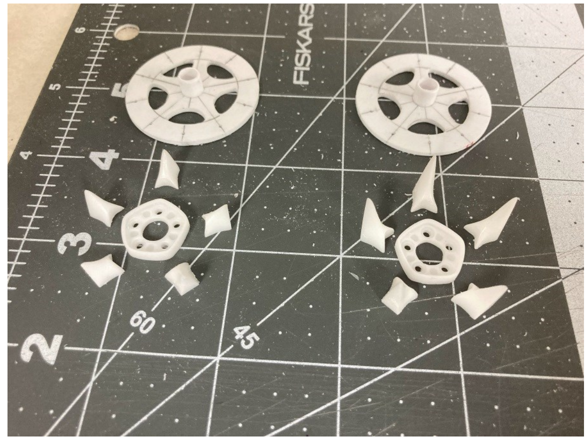


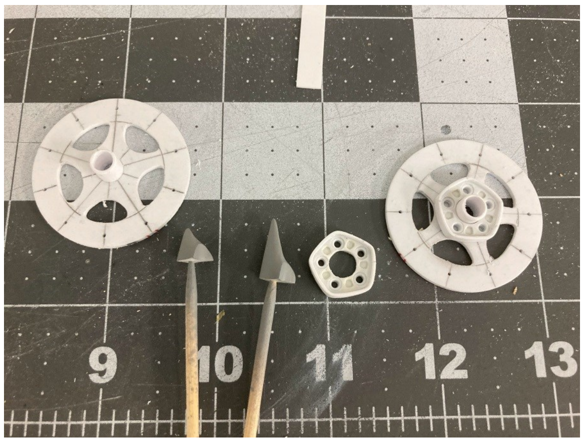


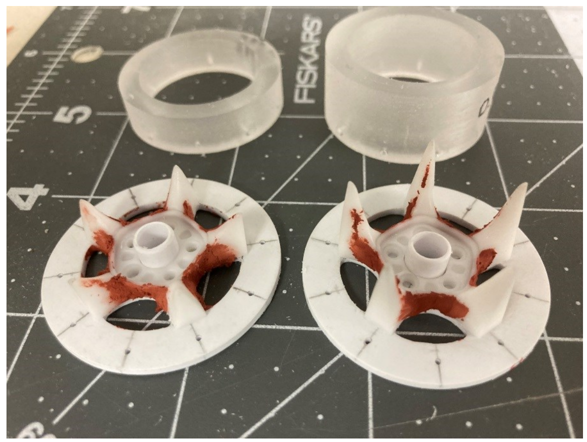


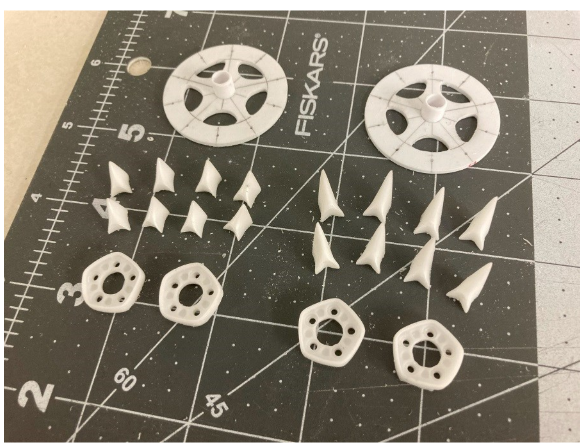
7) Wheels/Tires (continued)

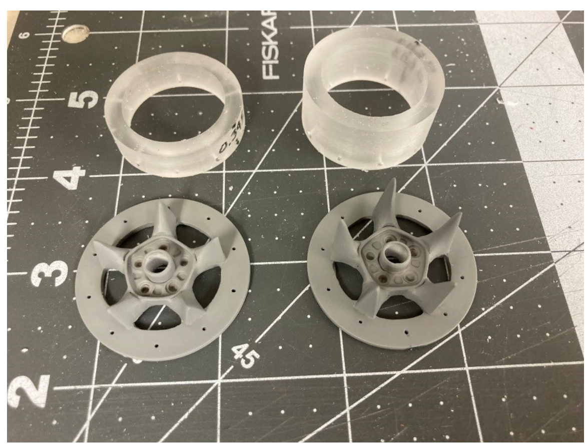




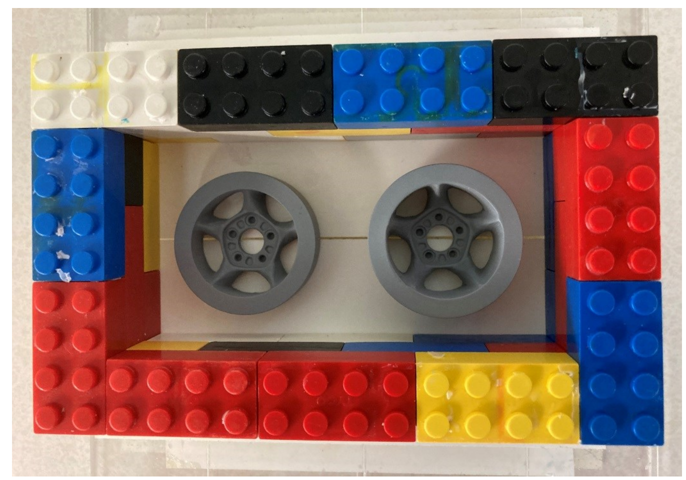




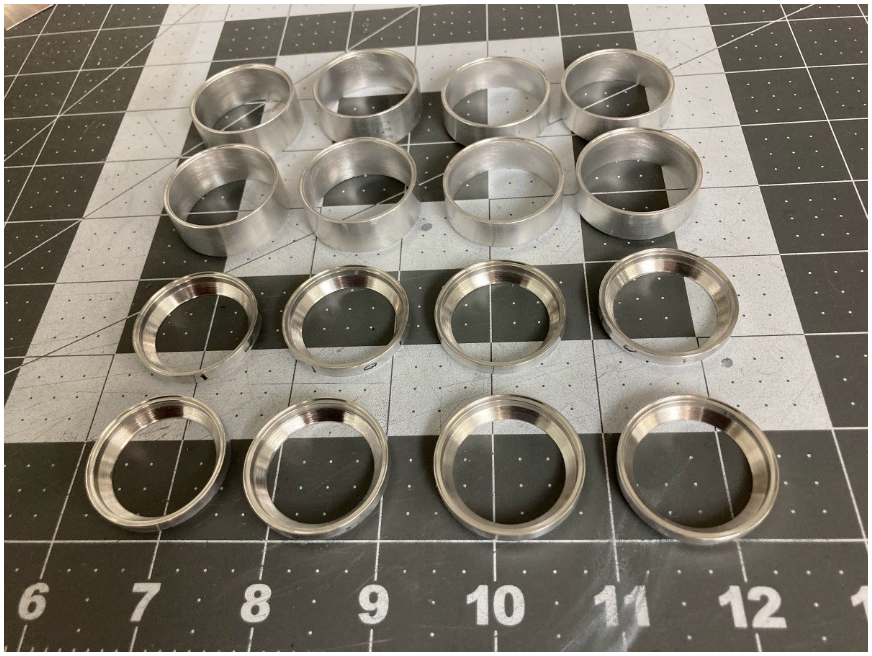




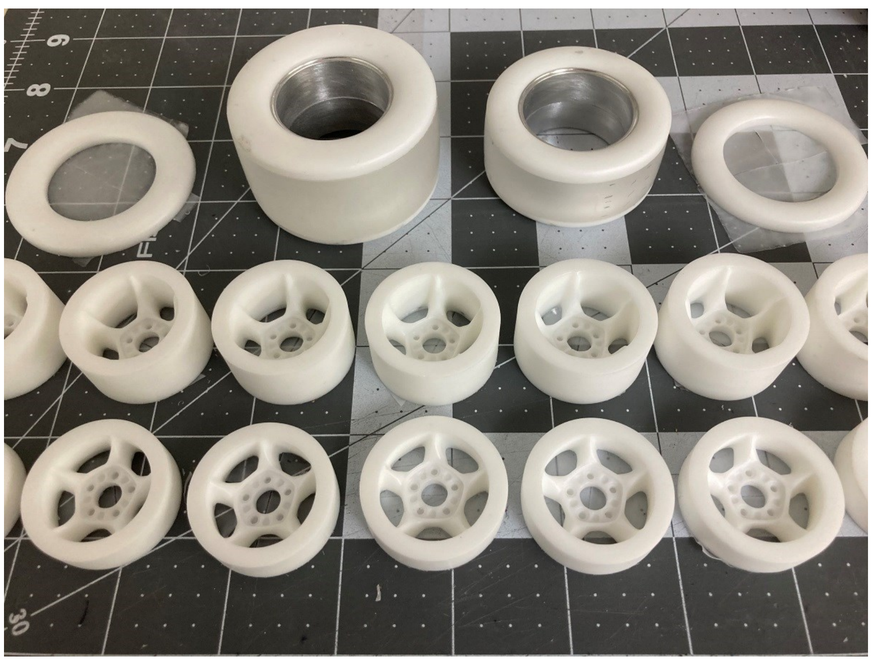
A single front and rear spoke was each carved from styrene, and multiples of these were resin-cast. Once all of these pieces were ready, they were assembled onto the discs, blended together, and machined on the outside diameter to allow the installation of an acrylic ring to complete the wheel spoke centers. These were then resin cast to provide the necessary duplicates.



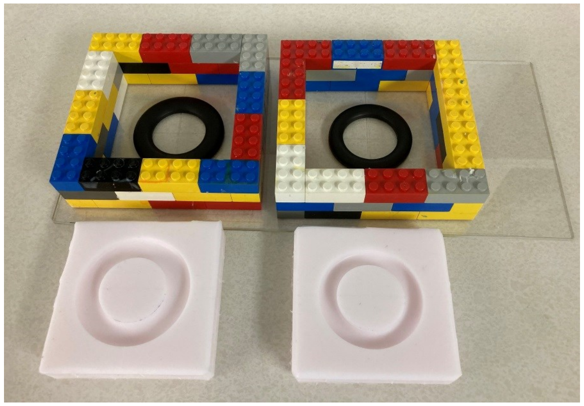
7) Wheels/Tires (continued)

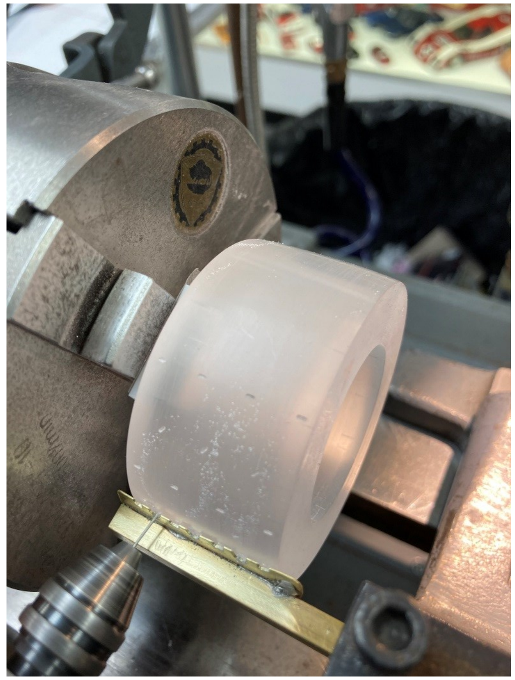


The resin-cast center sections were mated with machined aluminum inner and outer rings to complete the wheels.

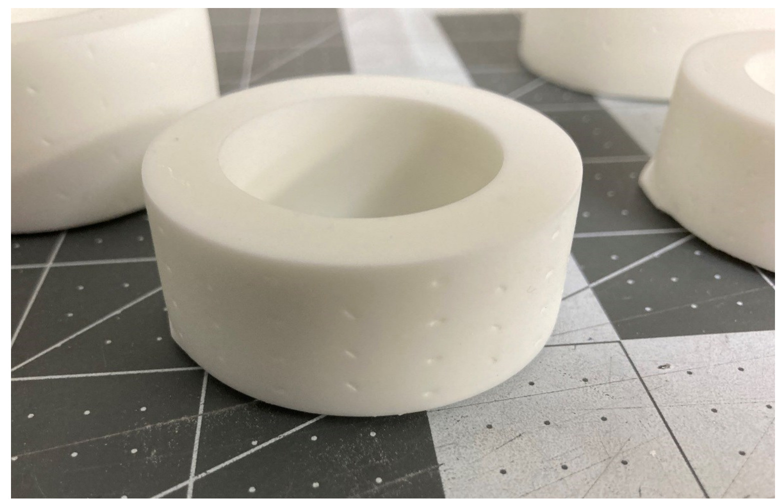


7) Wheels/Tires (continued)

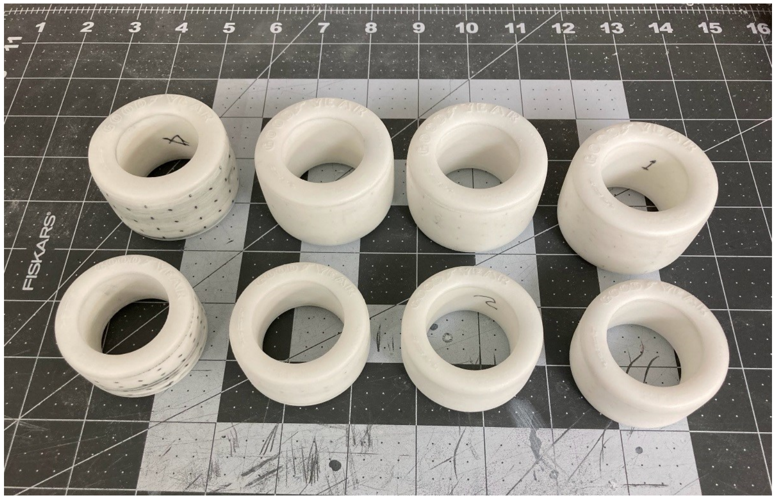




The tires were mastered as a three-piece assembly as well, using two sidewall resin castings, joined to a resin cast center tread ring. The sidewall molds were laser engraved in mirror-image with the lettering and other tire information to create raised letter tires. The tread rings were engraved on the lathe using a simple brass template to add the tread wear indicators. Multiples of the sidewalls and tread rings were cast in resin.

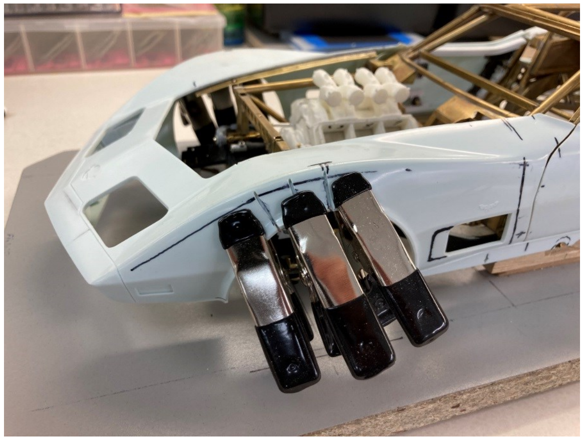


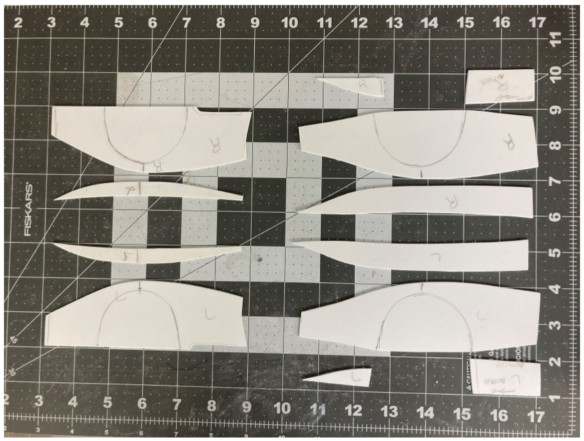
7) Wheels/Tires (continued)

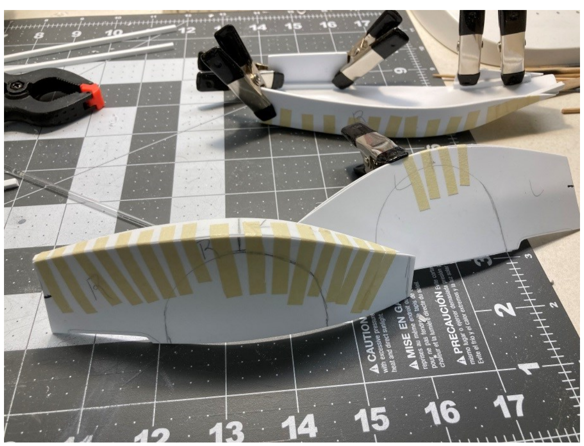


After assembling the sidewalls to the tread-rings, the joint was puttied and smoothed, then the tread surface was painted with Rust-oleum textured paint to replicate the tread surface after picking up rubber marbles from the track surface. The three-piece wheels were also assembled after polishing the outer rims and painting the center section with Testors Model Master Metalizer paint to replicate the magnesium casting of the actual wheel.

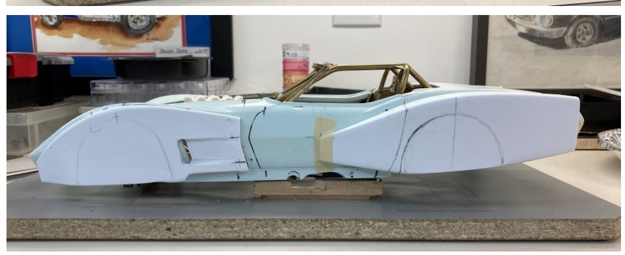
8) Bodywork

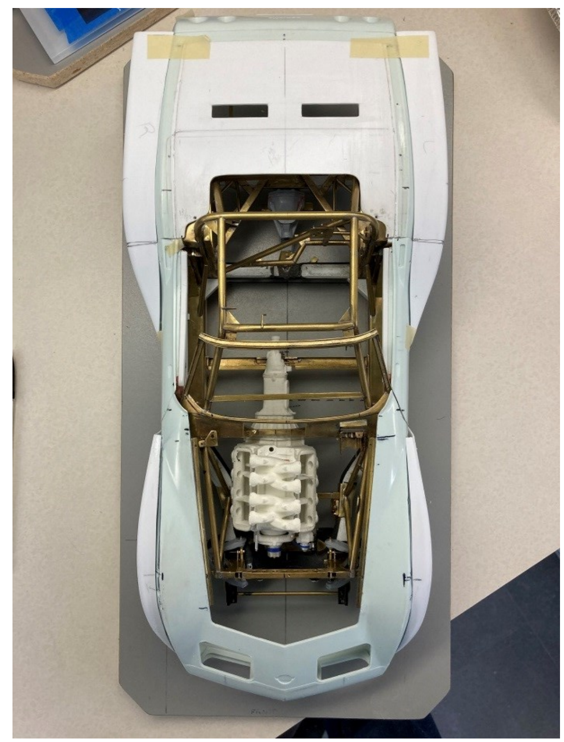




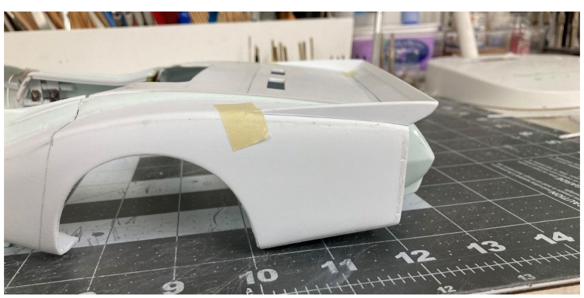


Now that the chassis, suspension and wheels/tires were completed, it was time to turn the attention to the bodywork. The first step was to make some pie-cuts in the front fenders of the stock bodywork and bend the nose of the car downward about 3 scale inches in order to add additional “droop” to the front of the car. The race car was based on stock Corvette body panels, but these were heavily modified with the wide flares and other subtle changes to improve aerodynamics. Dropping the front of the car was one such improvement. The signature Greenwood fender flares were fabricated from 0.060” sheet styrene, then attached to the body for further blending and shaping. The previously modified roof is also shown in these photos.

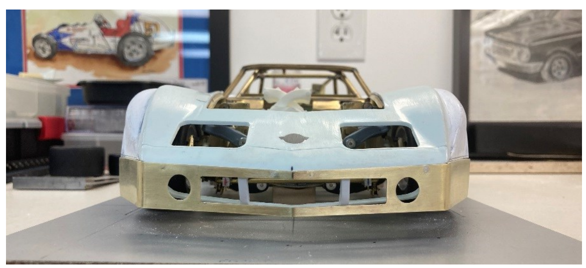




8) Bodywork (continued)

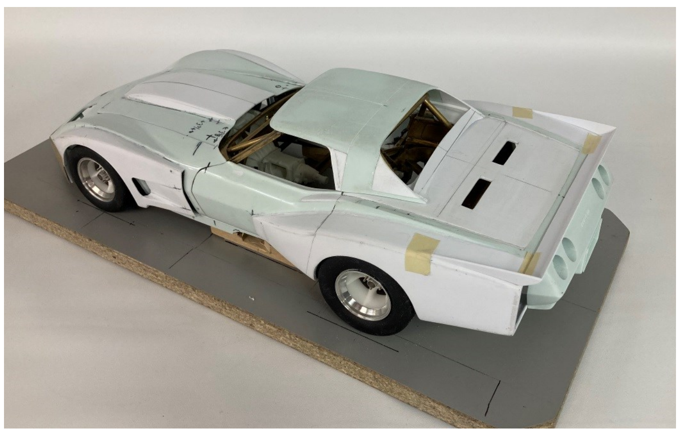


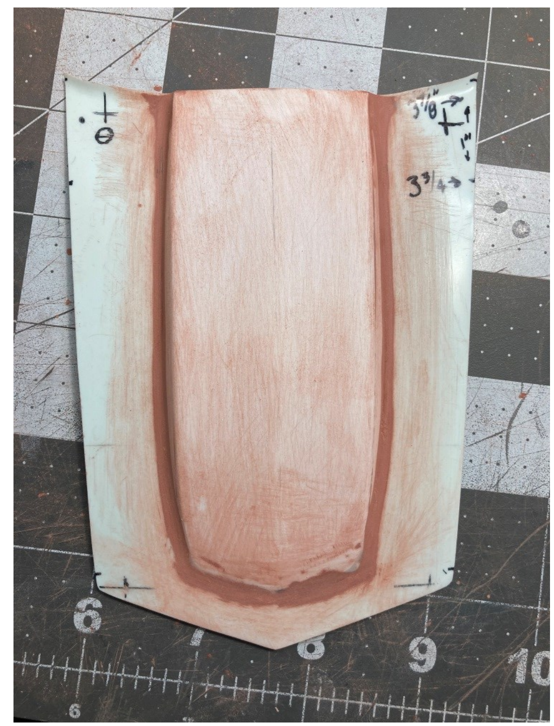
After installing and beginning some initial shaping of the fender flares, it was clear the rear flares were too flat on the sides, without enough contour to represent the prototype car, or to cover the rear tires properly. To remedy this, additional pieces of 0.080” sheet styrene were added to the flares, and then blended in to give the proper shape to these iconic fenders. The rear spoiler was also added at this time and the front fender air vents were roughed in. The front air dam was made from 0.015” brass sheet, as it needed to be thin, yet hold its shape well. The radiator opening was cut into this air dam, and brake cooling ducts also were added. This air dam was integrated into the front fender flares to match the full-size car, and it was still removable at this point in the construction to aid later work.



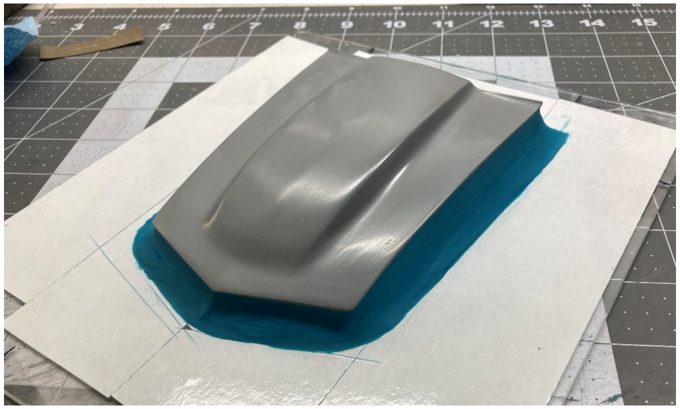
8) Bodywork (continued)

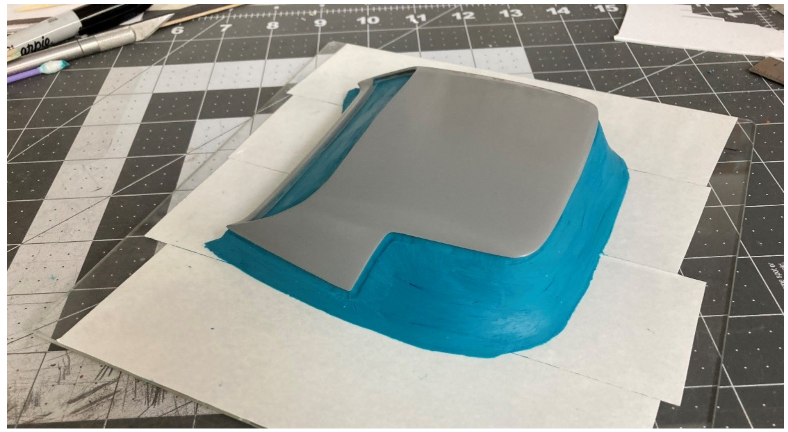
The power bulge on the stock Corvette hood needed to be raised 2 scale inches to clear the unique Kinsler intake system on this car. This was accomplished by blending pieces of 0.060” styrene plastic onto the stock hood, then later removing the stock material from underneath. The wheel openings were also cut out and shaped at this time to correctly frame the wheels and tires. The rear window opening in the roof was also finished to give the proper shape to this piece. CA glue mixed with styrene plastic dust, along with very small amounts of filler putty were used to smooth the seams in the bodywork, to avoid problems with shrinkage in the future.





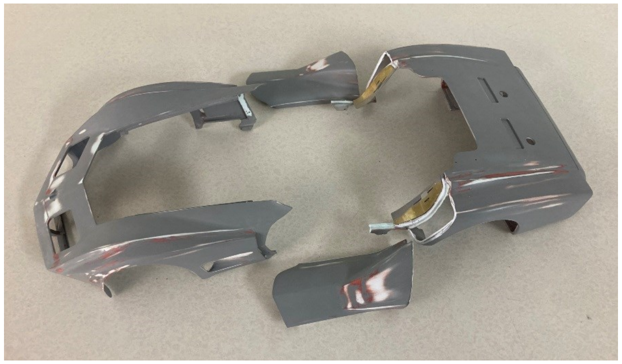
8) Bodywork (continued)



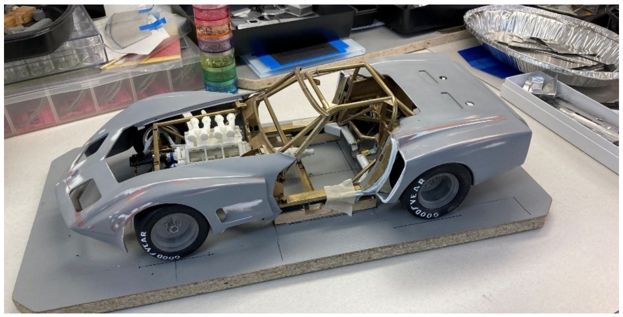


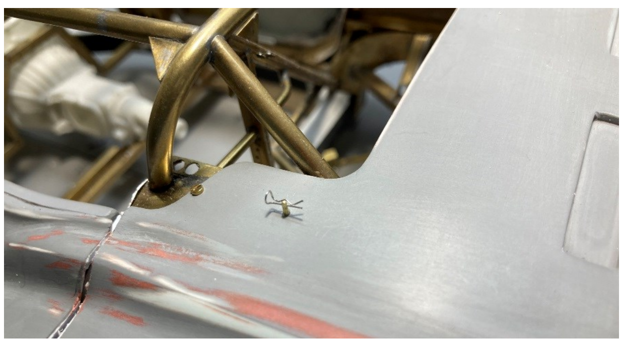
Since the roof and hood each consisted of many pieces of styrene joined together, and they were of a reasonable size, it made sense to resin cast those two pieces to provide solid, homogeneous components for the model. These resin pieces would be stronger and more stable after final finishing, and would avoid any potential cracking at the seams. Two-part RTV molds were made of each component and multiple castings were then made. These "extras" allowed for test parts to be used later for painting and decal development.

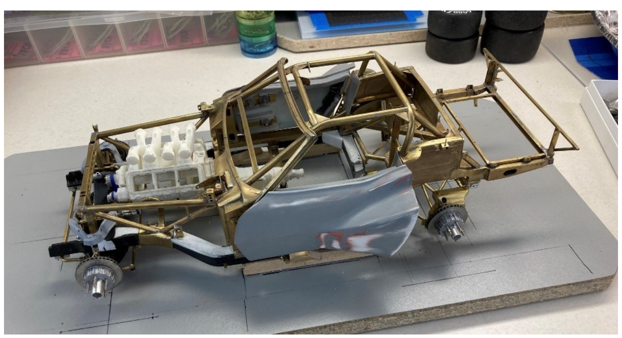
8) Bodywork (continued)

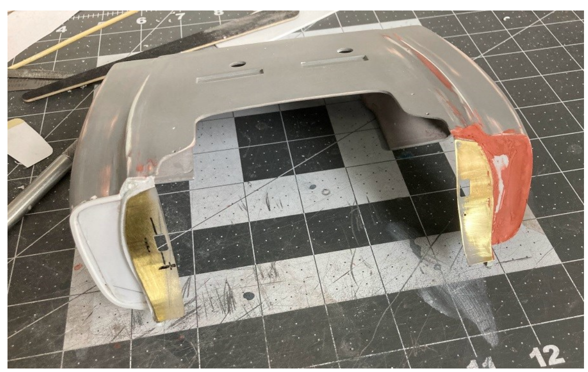


With the fender flares blended into the body, it was time to cut open the doors and make the door jambs and finalize the door hinges and location. Much of the stock bodywork residing under the new flares was removed at this time too. The roof and body attachment points were also completed to "lock in" the location of the various body components. This provided consistent, positive location of the bodywork, so when the panels were removed and replaced, they always were in the same location relative to each other and to the chassis. This prevented any surprises with panel lines and panel fits during subsequent assembly steps.



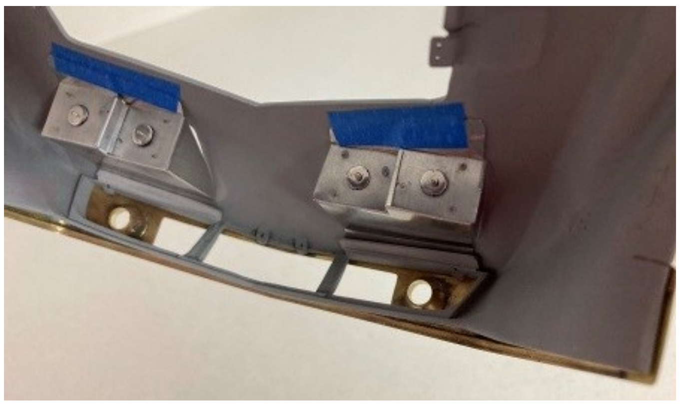


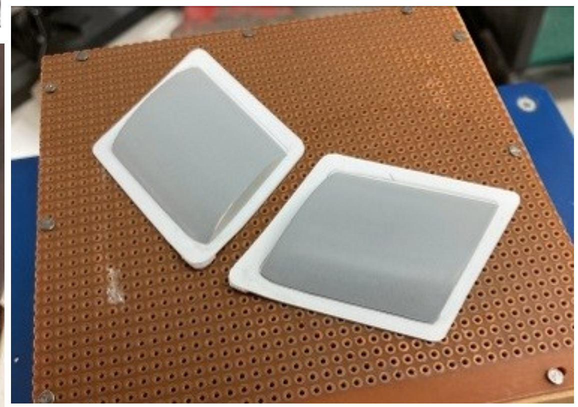




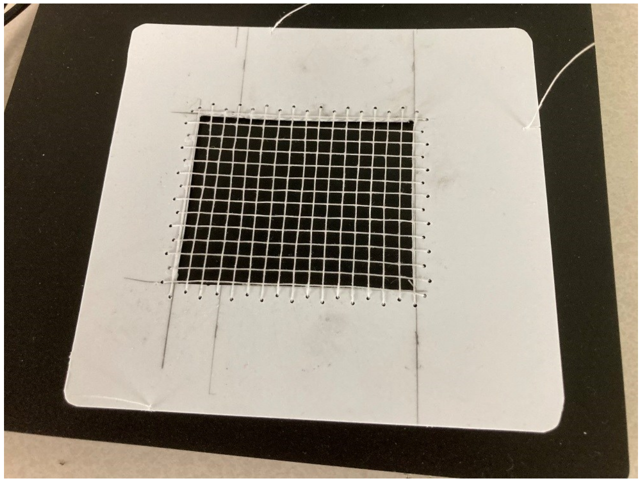
8) Bodywork (continued)

The headlight bucket assemblies were fabricated from aluminum sheet and fitted with headlights including adjuster screws and springs. Wood and plastic bucks were made for the headlight covers and then styrene was vacuum-formed to make the headlight cover surrounds. Clear plastic was then fitted to these surrounds to complete the covers.

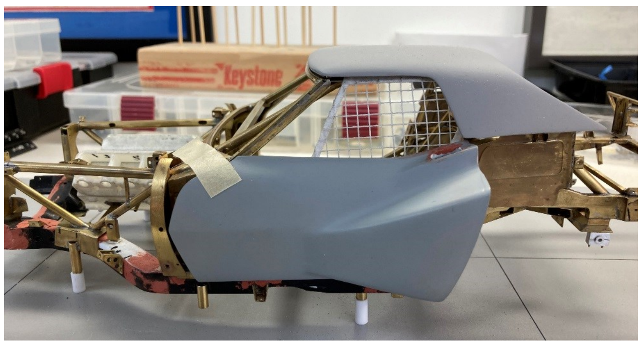


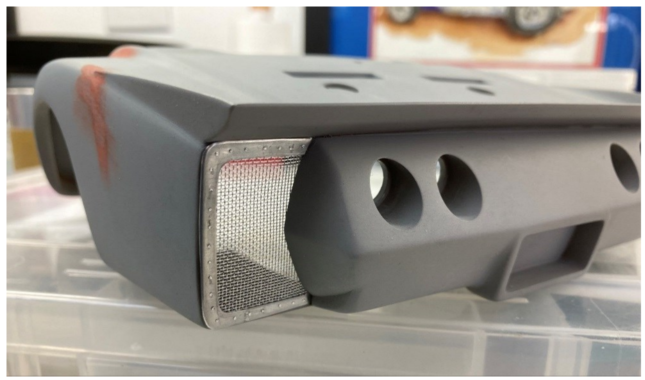


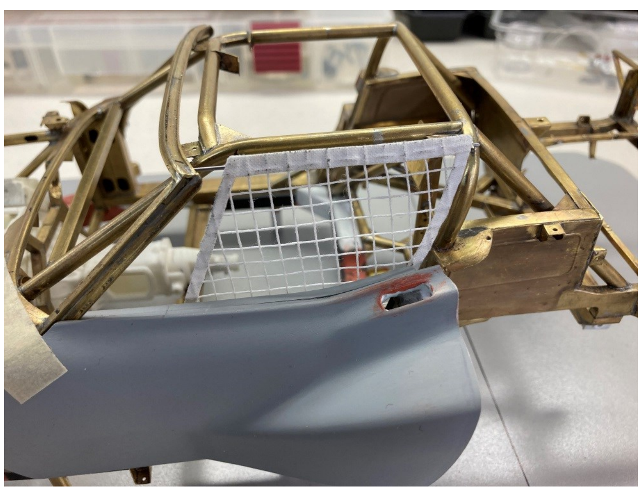
8) Bodywork (continued)

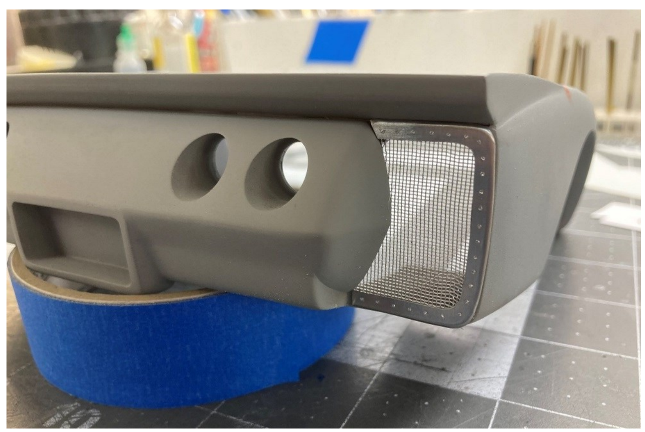


The driver's window net was woven from lengths of button/carpet thread, using a custom-made loom to achieve the correct spacing, and the crossovers were held in place using a drop of CA glue at each one. It was then cut to size and the edges trimmed with white athletic tape. New taillights and trim rings were machined from red acrylic rod and heavy wall aluminum tubing respectively, as the kit parts were inaccurate and lacked the necessary detail. The rear fender flare openings were finished with screens made from an open-mesh ribbon found at a craft store. These were trimmed out using thin aluminum sheet with furnace tape/Pentel pencil rivet heads.

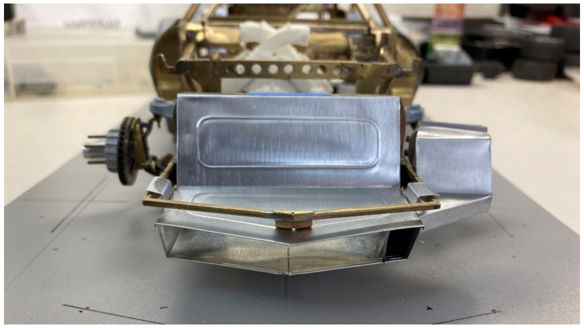




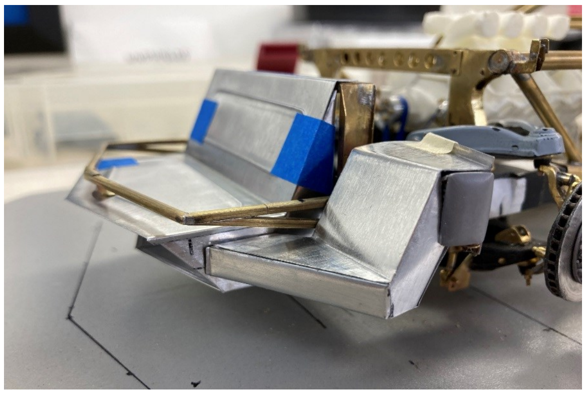


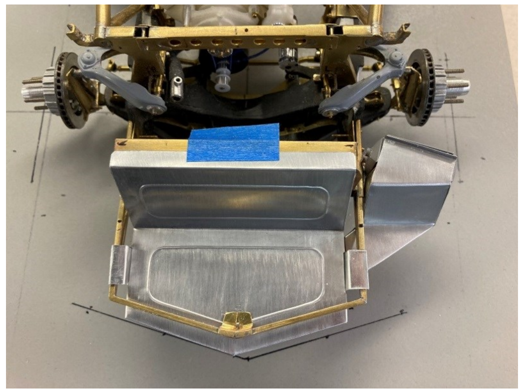


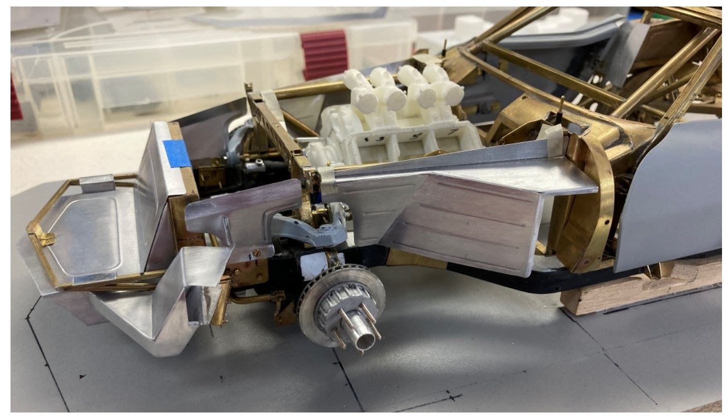
8) Bodywork (continued)

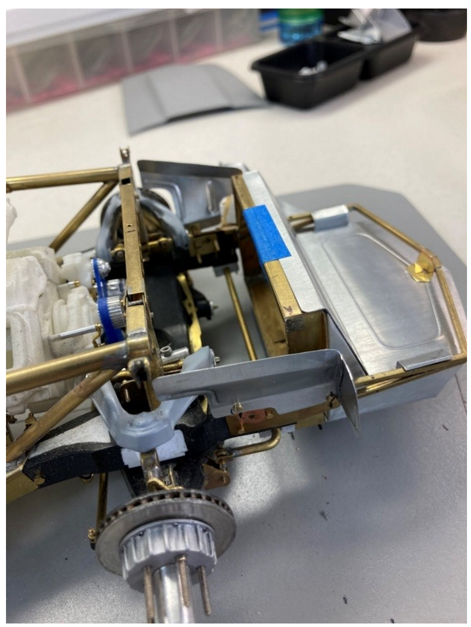


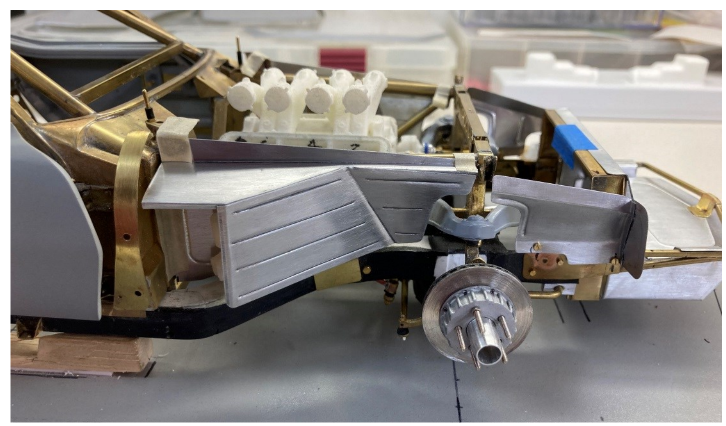
With the headlight buckets now complete and fitted in place, the radiator ducting was next, as it had to fit around those headlight buckets and still connect the opening in the front air dam to the radiator. This ducting, and the attendant oil cooler ducting was fabricated from thin sheet aluminum, with bead rolling added to replicate the original. The wheelhouse enclosures were also made from this sheet aluminum and bead rolled as well.



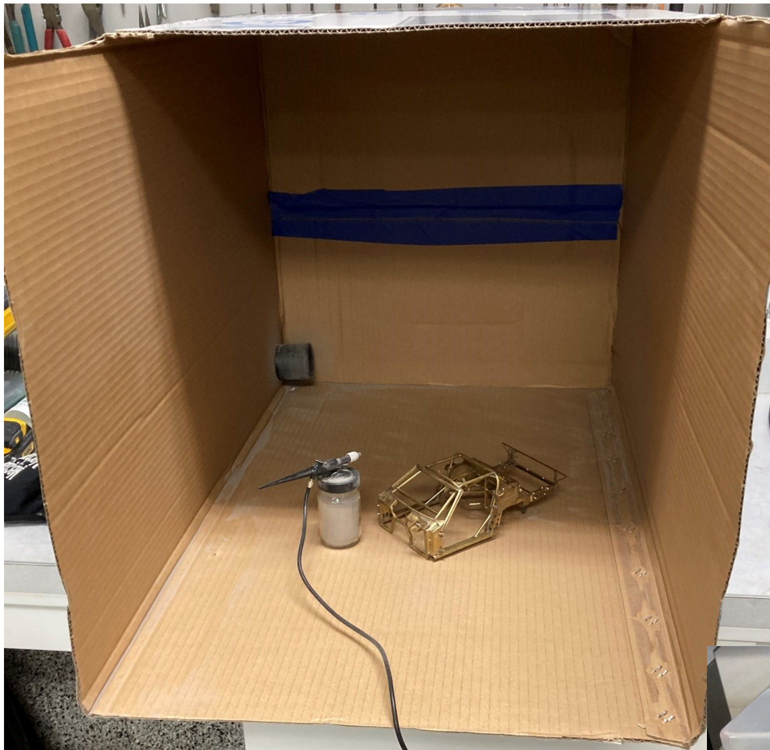






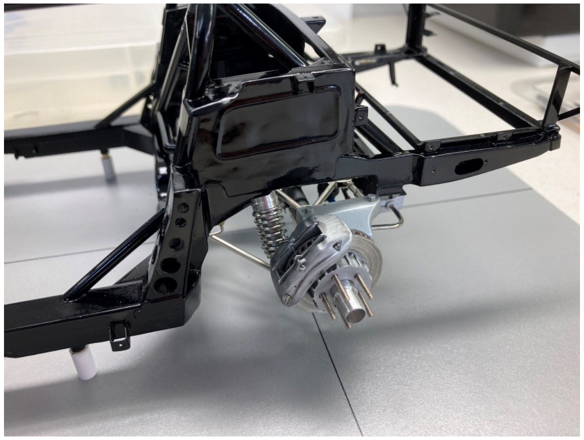


9) Final assembly

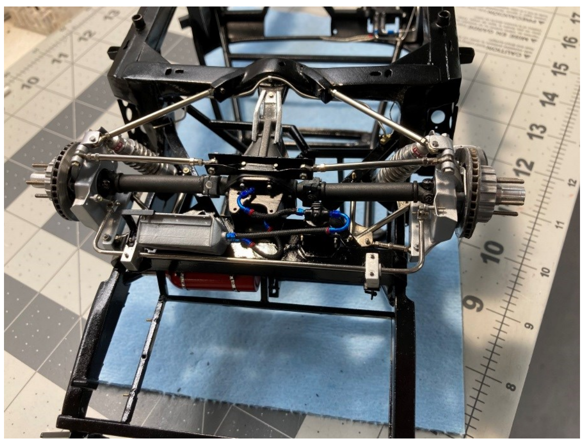


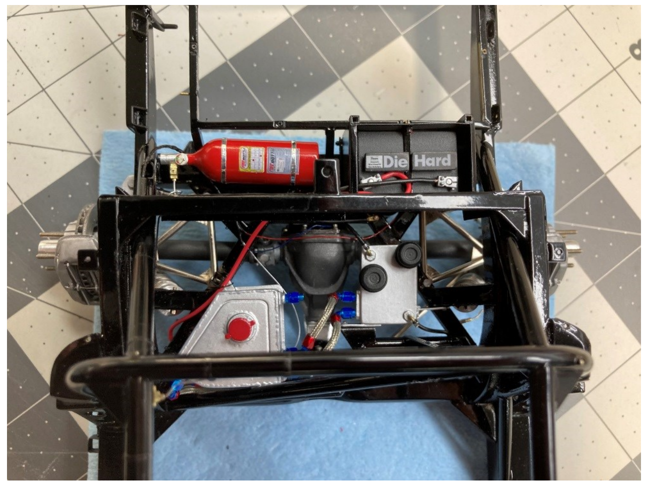
With the majority of the components and details finished, it was time to paint everything and then begin final assembly. The brass frame assembly was bead blasted and cleaned with lacquer thinner prior to applying a coat of metal-etching primer followed by several coats of Brite Touch flat black primer. After applying primer to the various frame components and sub-assemblies, the brass cage was joined to the plastic frame rails with two-part JB Weld epoxy. The entire frame assembly was then painted with Tamiya TS-14 Black lacquer.

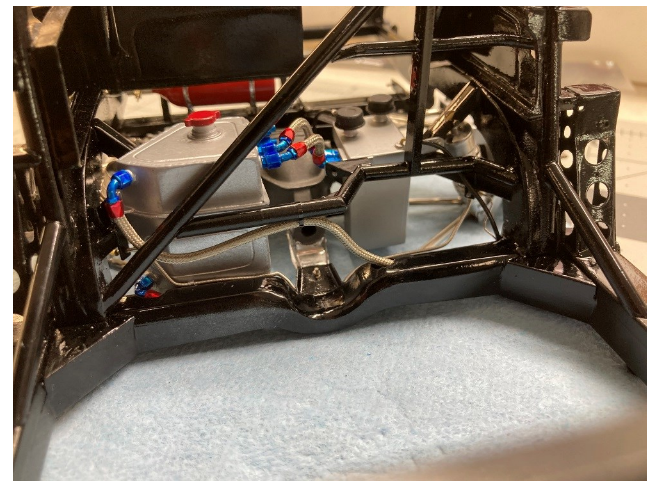
9) Final assembly (continued)

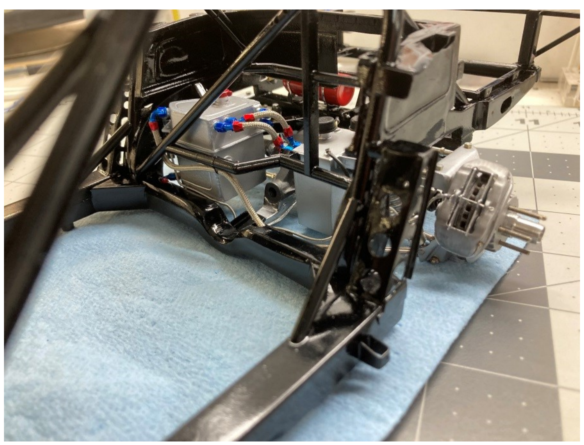


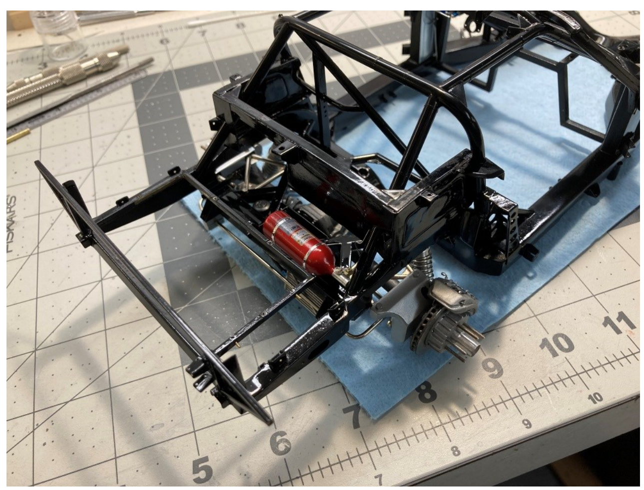
After painting the various chassis components, final assembly began at the rear of the vehicle with brake lines, rear suspension, oil tank, catch tank, fire extinguisher, fire extinguisher lines, battery and the assorted braided lines and wiring. Given that all components were already made and had been pre-fitted to the chassis, this part of final assembly happened quite quickly.

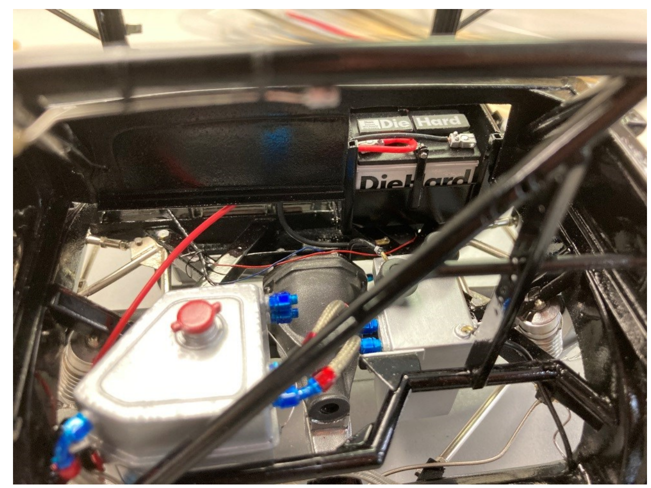






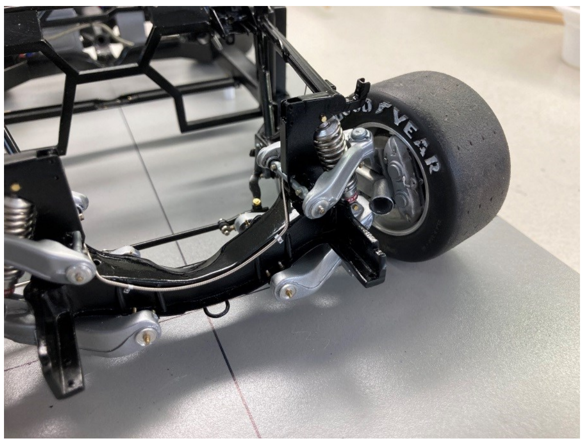


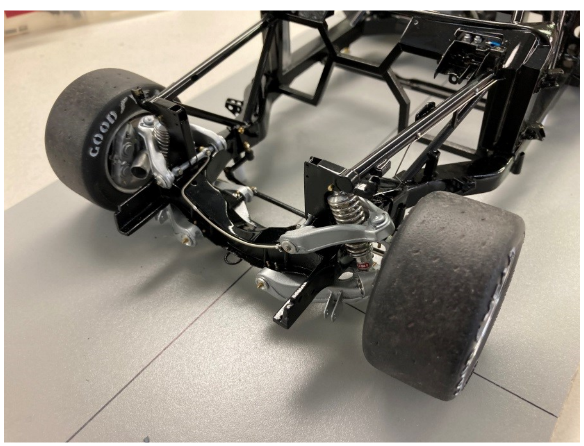


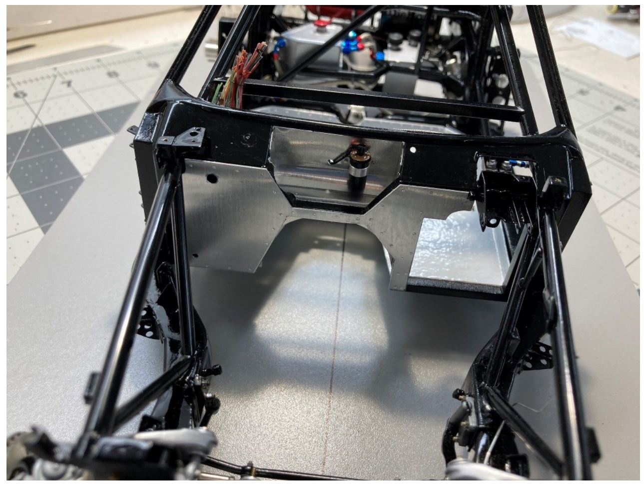


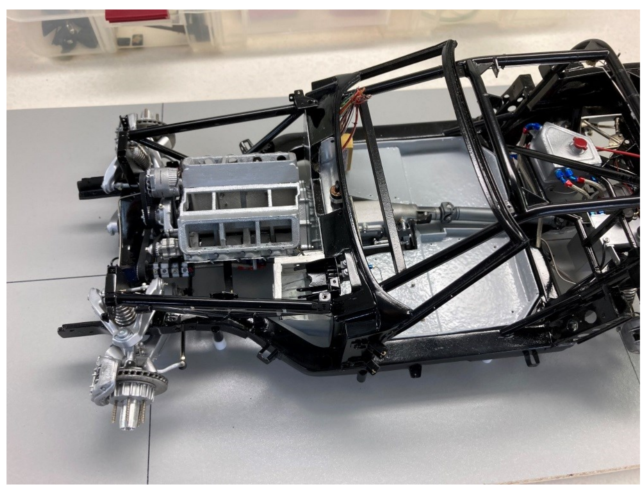
9) Final assembly (continued)

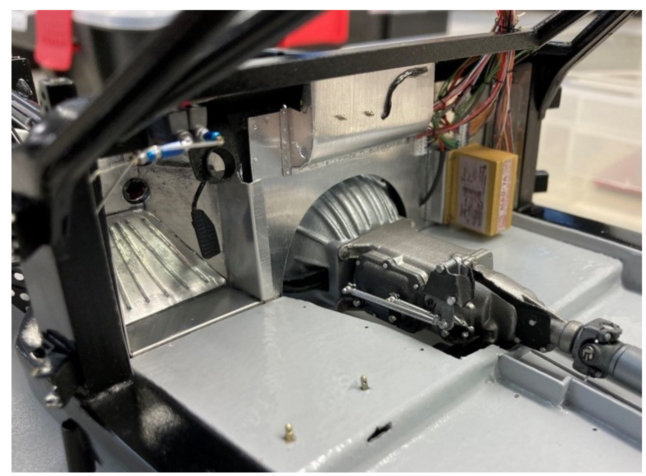
The front suspension was installed next, followed by the interior floor-pan, front bulkhead, and then the engine and transmission. The driver's footbox was installed, along with the pedal assemblies, clutch linkage, throttle linkage and the master cylinders.



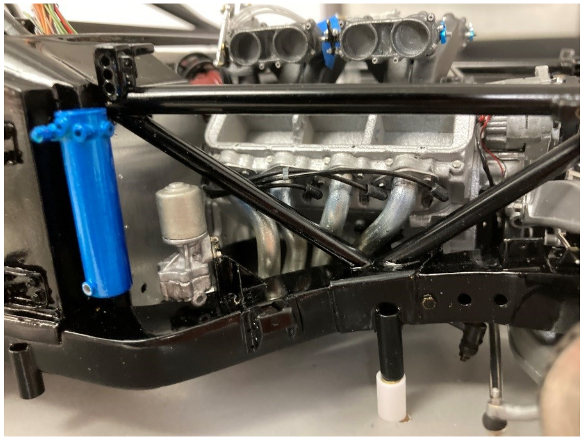




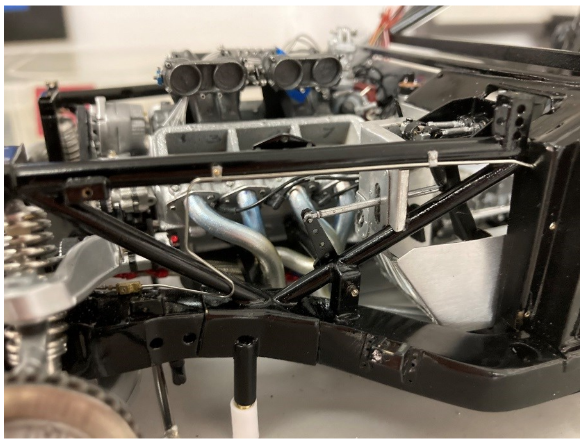


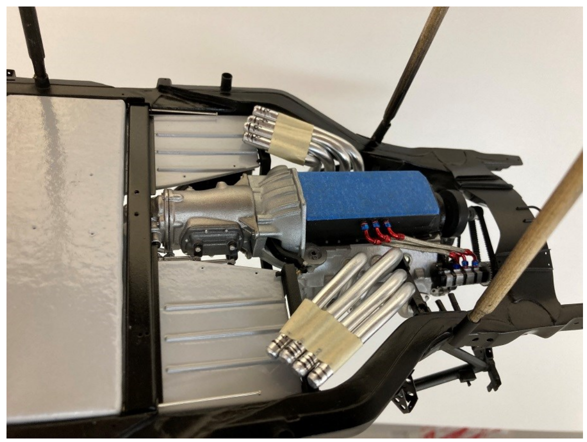


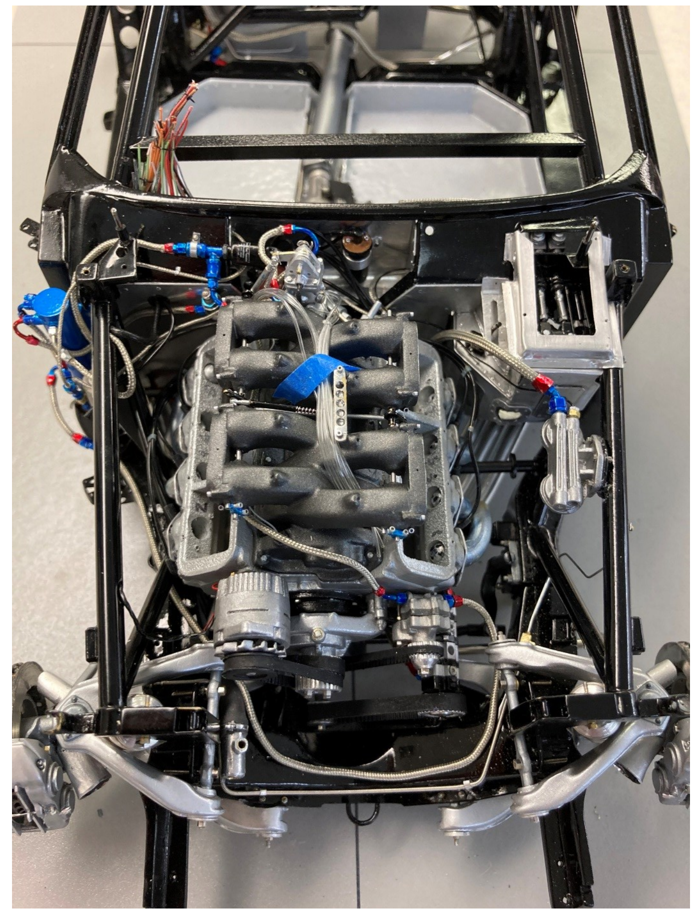
9) Final assembly (continued)

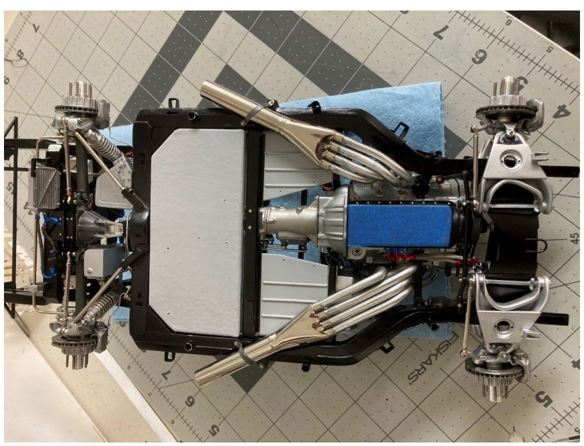


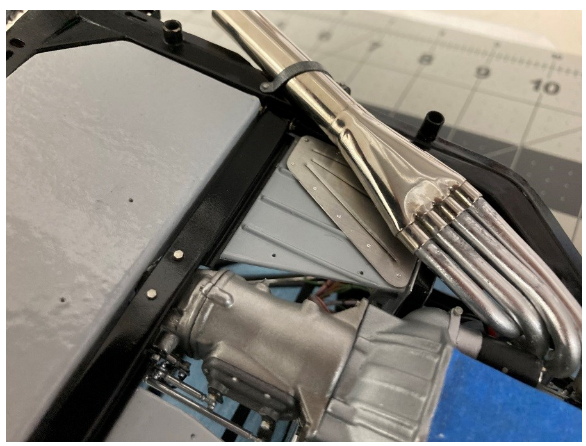
The exhaust headers and collectors were next to be installed, and these were especially tricky due to the tight spaces surrounding the engine at this point. Each header pipe had to be installed individually, and then the collectors slipped onto the head pipes. The headers were subtly detailed with pastel chalks to give the appearance of heat discoloration.



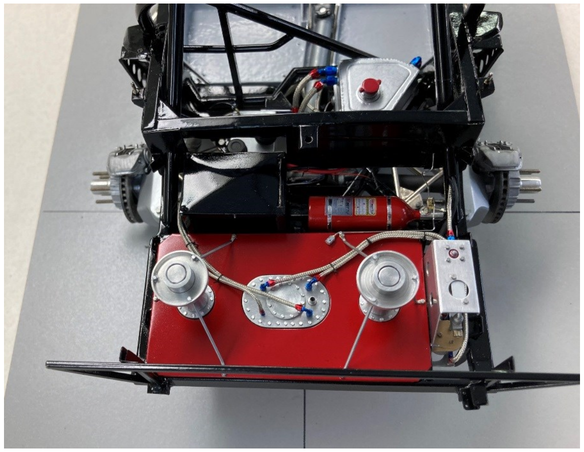




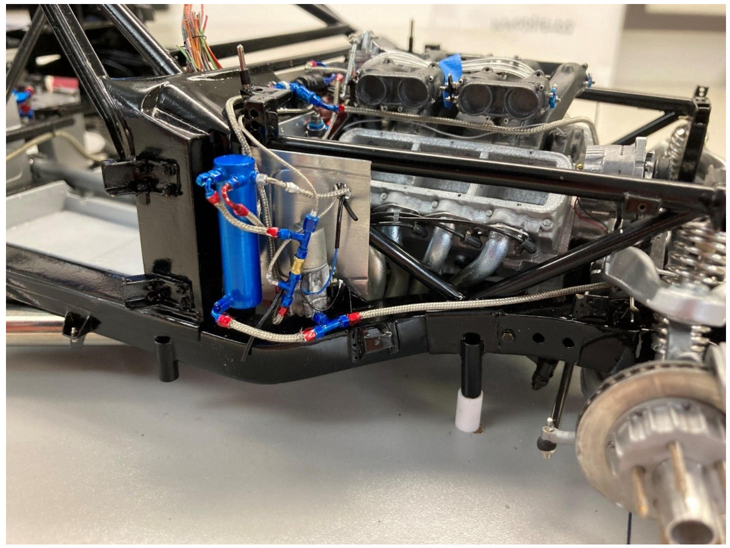


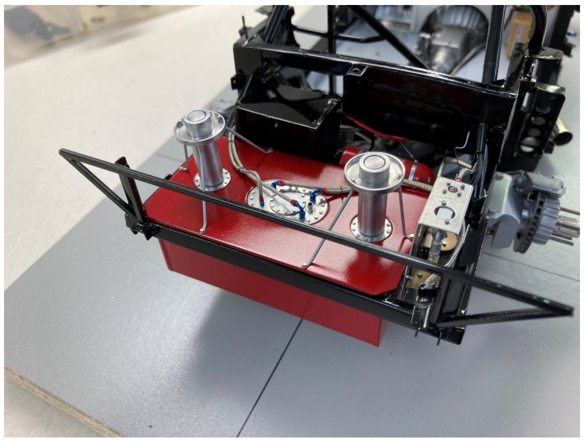


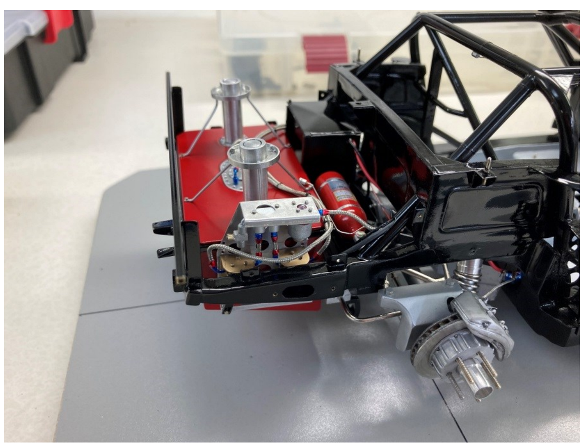
9) Final assembly (continued)

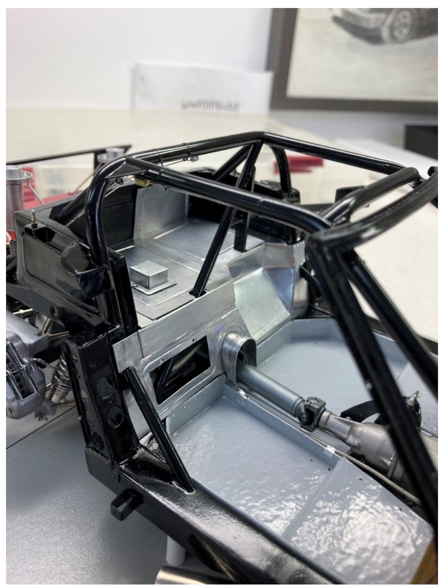


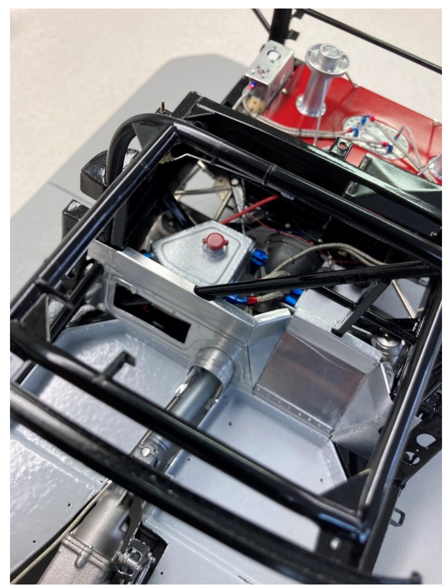
The fuel cell, fuel fillers, pumps and filters were installed at the rear of the chassis, along with all of the braided lines for the fuel system. The fuel pump and accumulator tank were also installed in the front of the vehicle, and the fuel lines installed.

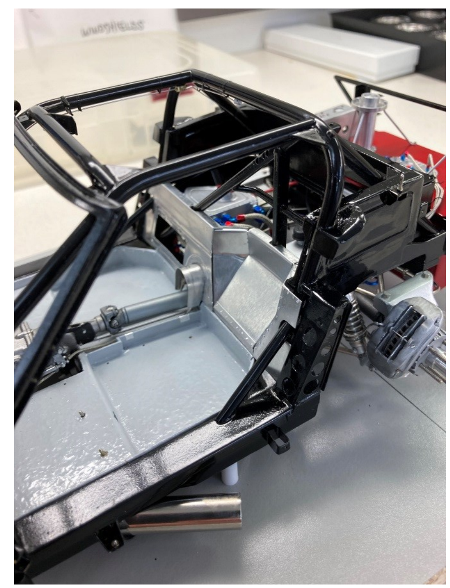




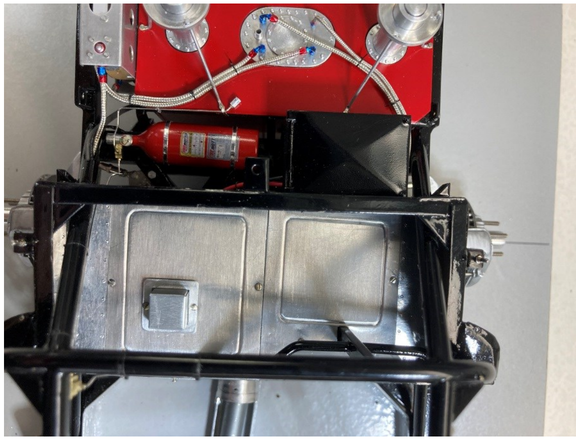




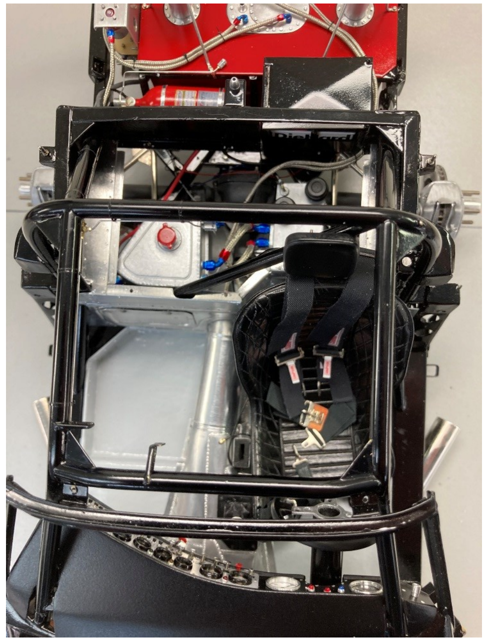


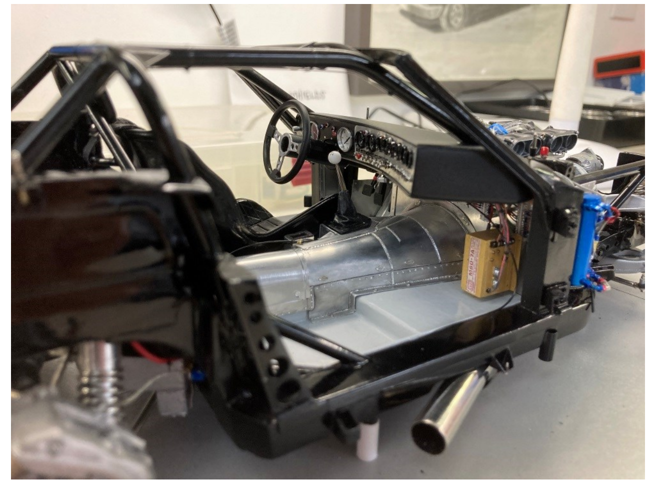


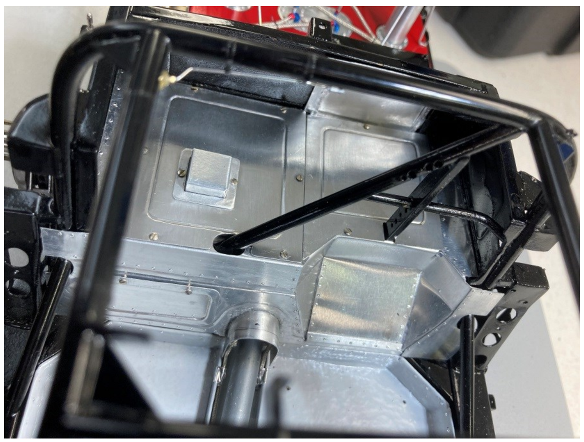
9) Final assembly (continued)

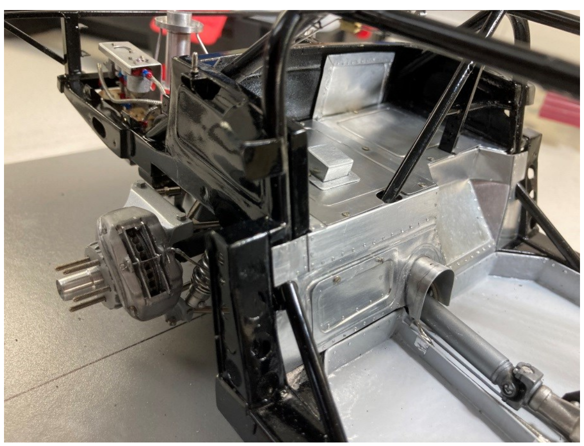


The remainder of the interior panels were installed, along with the dashboard, steering column, steering wheel, seat and harness assemblies. Things are coming together very quickly at this point.

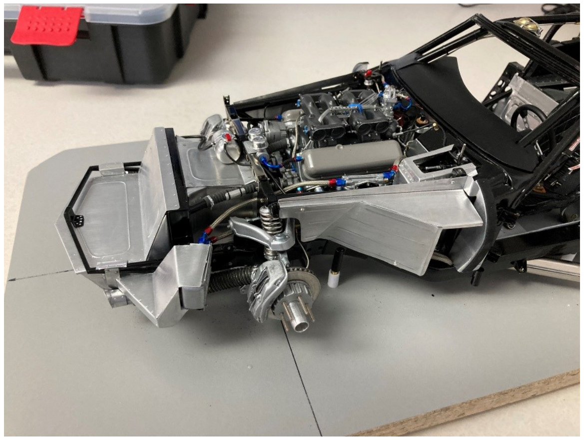




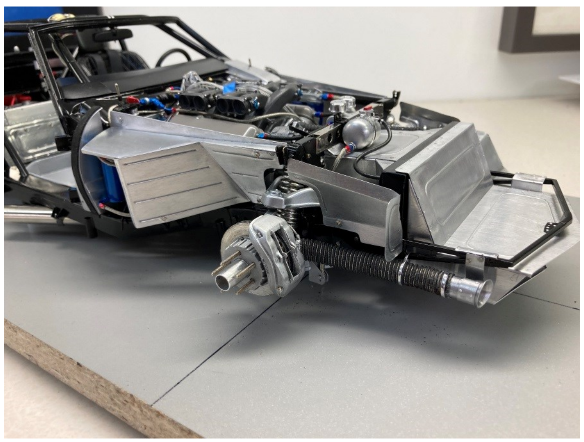


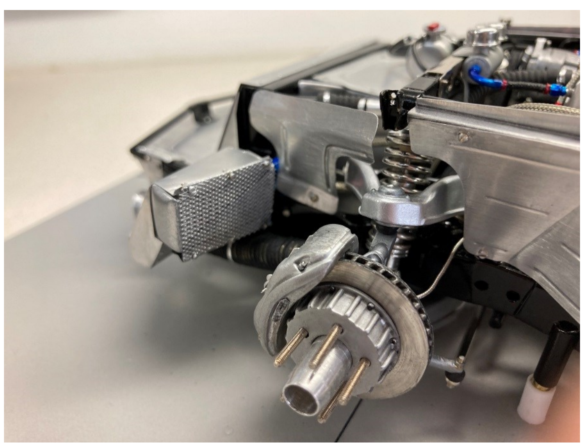


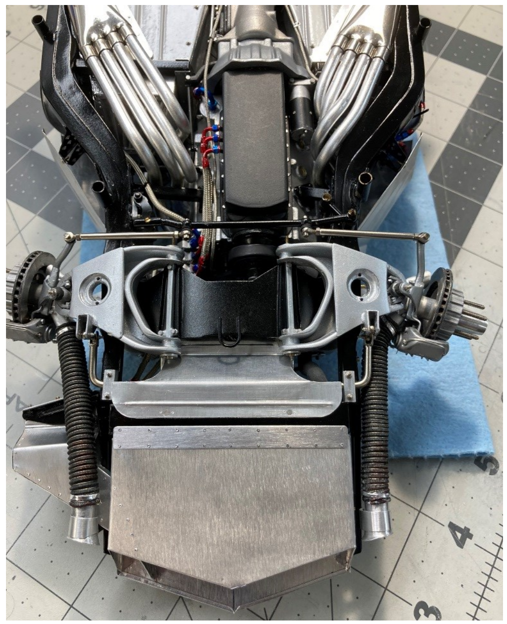
9) Final assembly (continued)

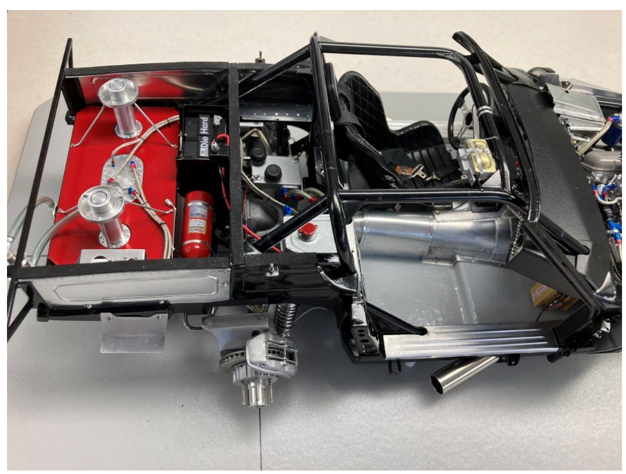


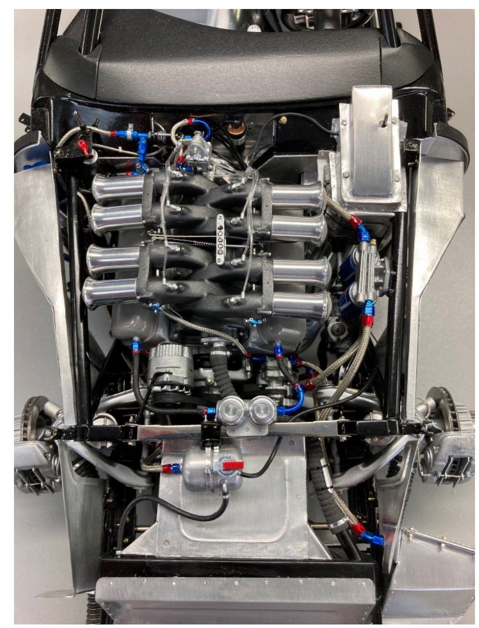
All of the aluminum panels were then fitted to the front and rear of the chassis, including radiator ducting, wheelhouse enclosures, and brake cooling ducts. The remaining braided lines were also connected in the engine compartment.



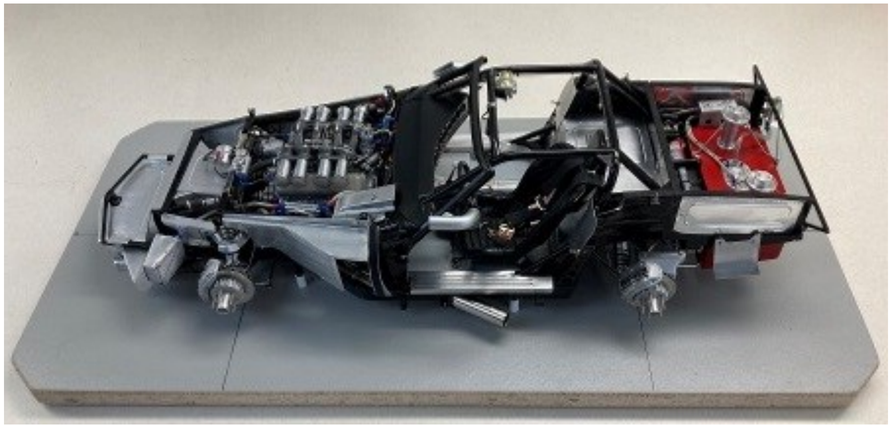




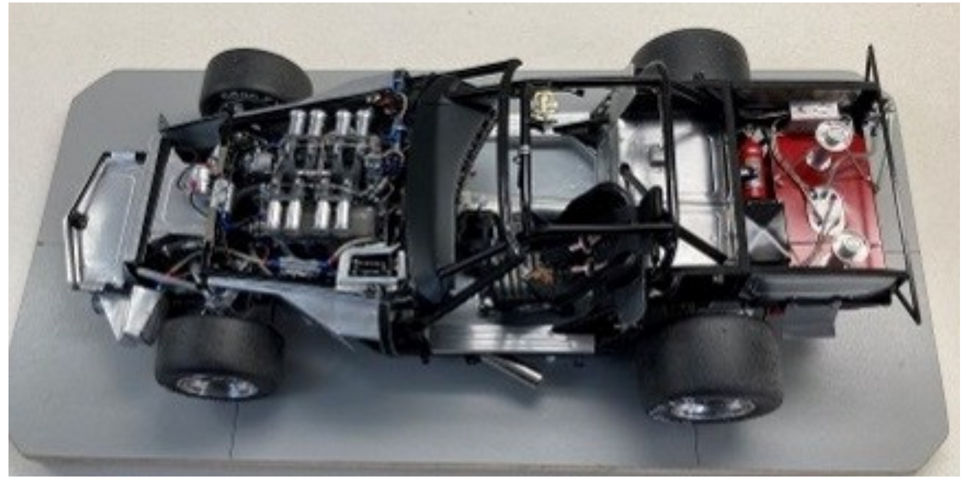


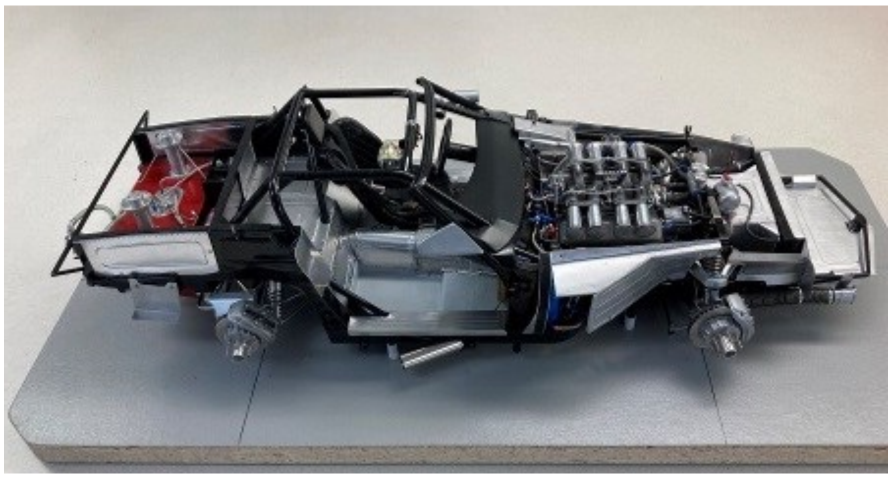


9) Final assembly (continued)

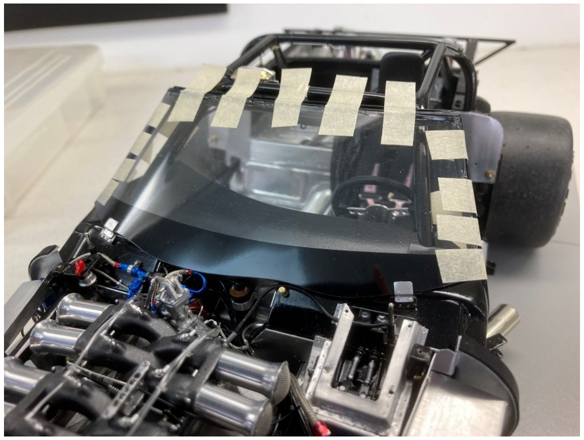


After a few more details were added, the chassis was complete.

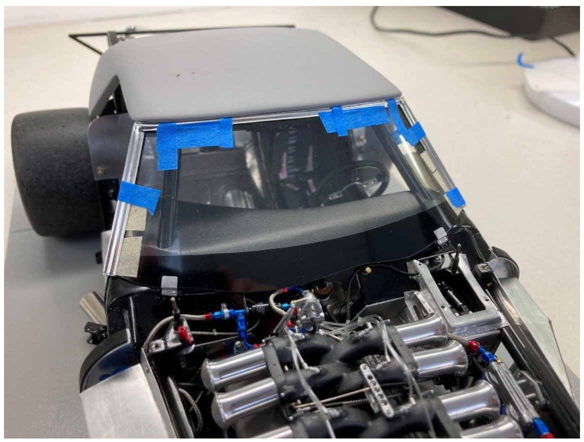


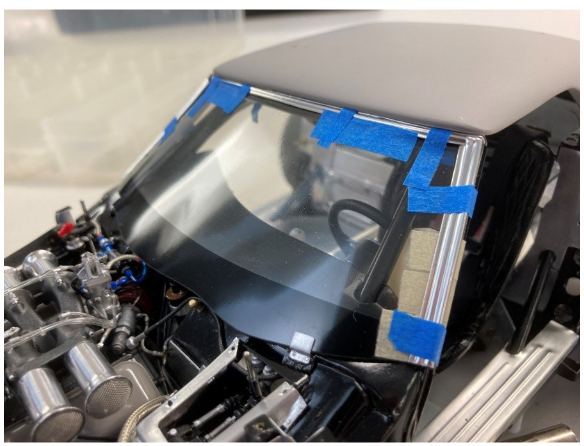


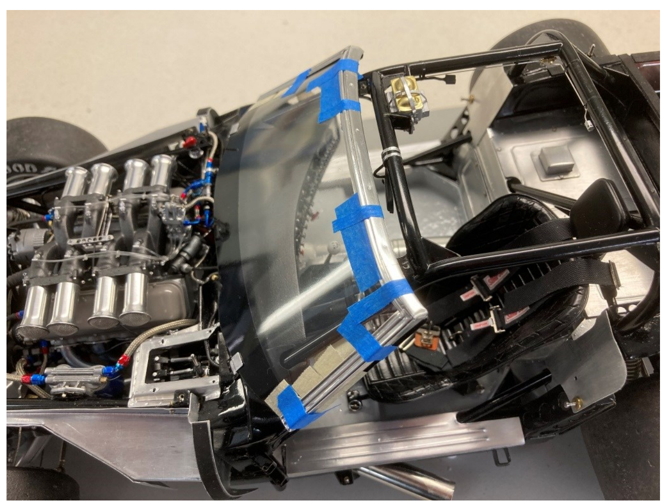
9) Final assembly (continued)

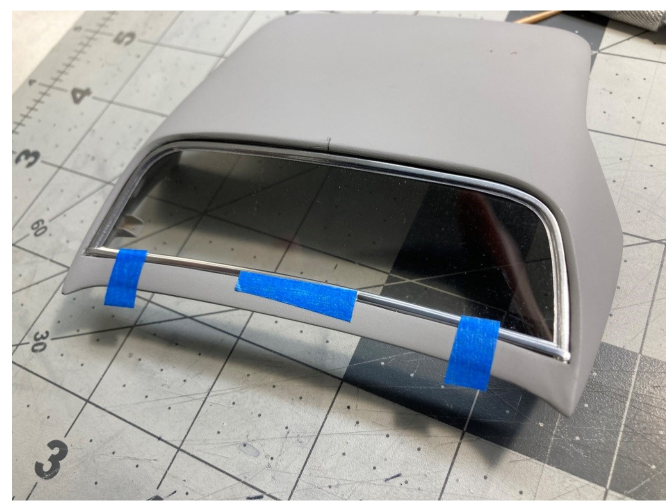


The windshield was made from clear sheet plastic and installed, along with window trim formed from thin aluminum sheet over specially-made bucks to give the trim the correct profile. The rear window and trim was made using the same method, but was only trial-fitted at this point, with final assembly planned after painting the bodywork.

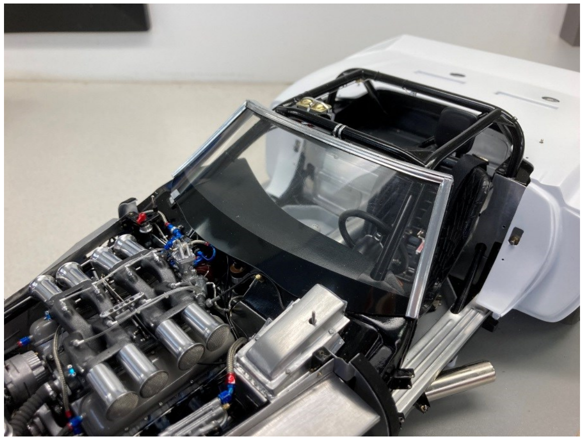


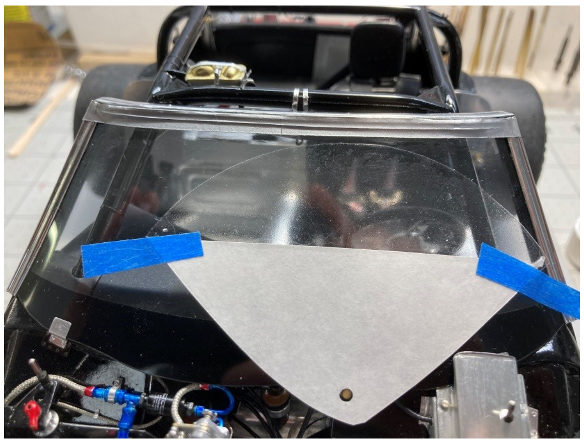


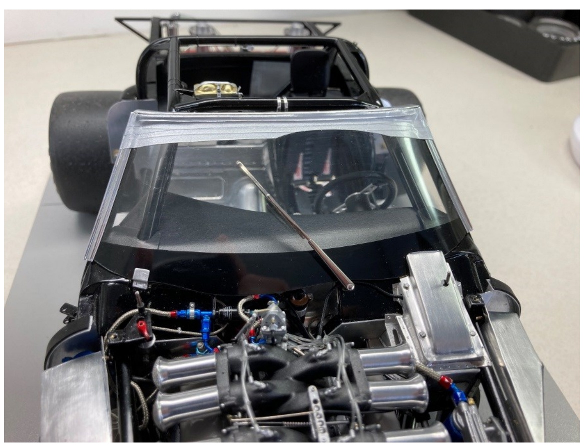




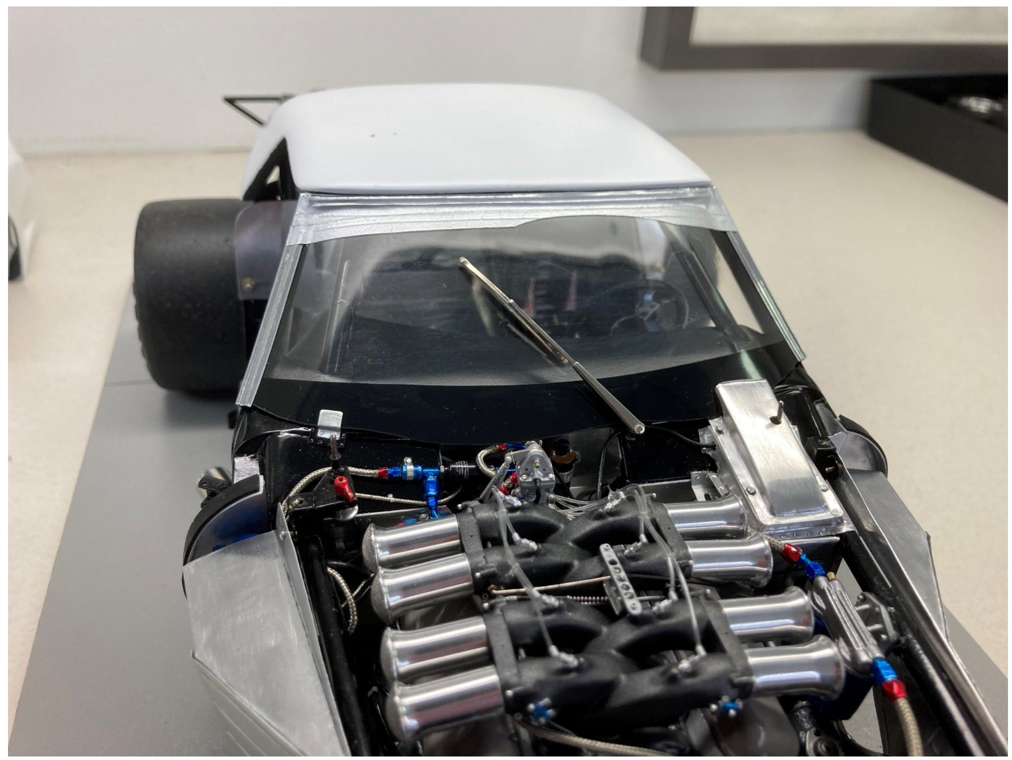
9) Final assembly (continued)





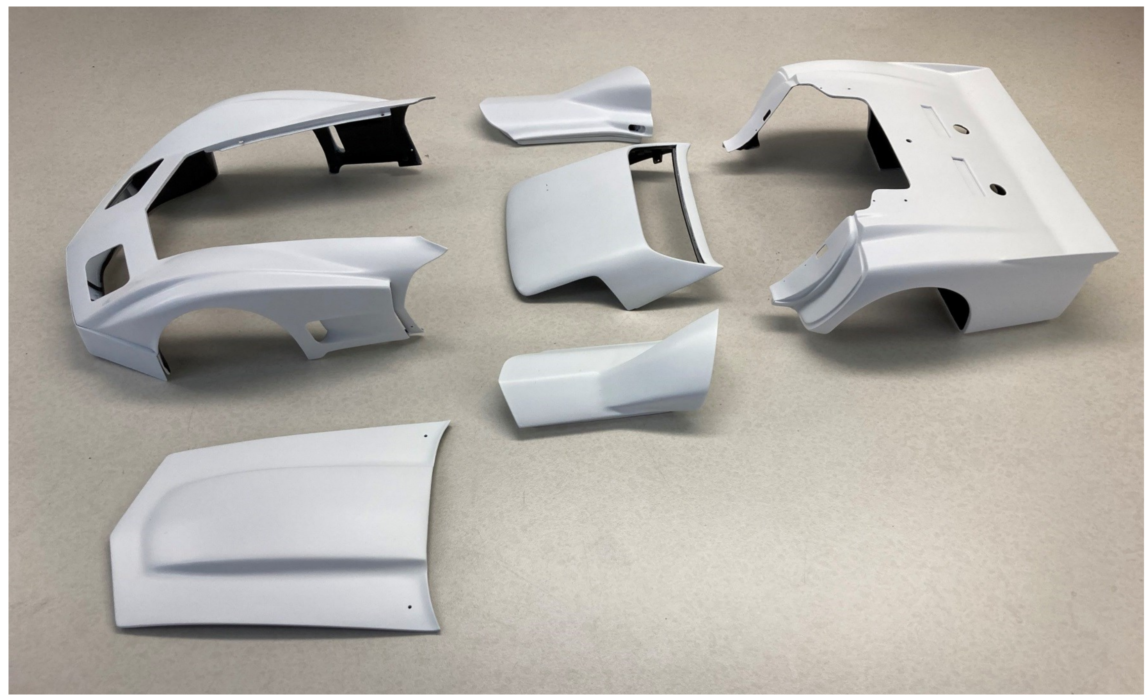


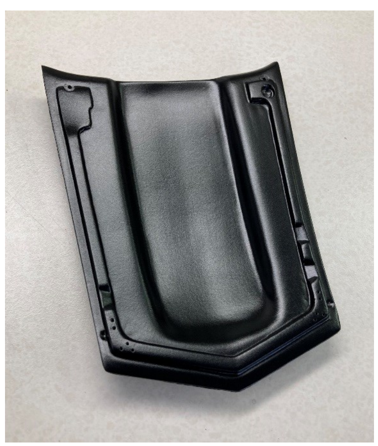
With the windshield installed and the trim in place, the duct tape sunscreen needed to be created. The duct tape itself was replicated using blank decal film painted silver. Strips of this decal were cut and applied to the top edge of the windshield, overlapping the trim, just like on the full-size vehicle. To cut out the arc for the wiper to clear, a template was made from frisket film and located on the windshield using the wiper pivot as the datum. The decal film/duct tape was cut along the edge of this template providing the radiused cut-out for the wiper to traverse. The windshield wiper was made from brass and cobalt-nickel plated.



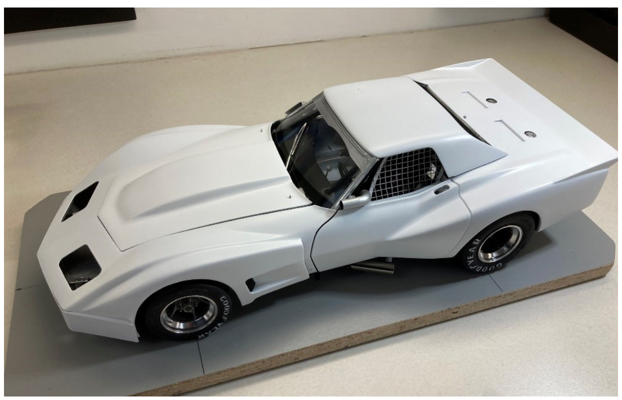
9) Final assembly (continued)

Now it was time to finish the bodywork. To simulate the raw fiberglass surface on the inside of the body panels, surfacing putty was applied, textured with a piece of open-cell foam, then painted semi-gloss black. The undersides of the hood and roof panel did not have this rough texture, so they were simply smoothed and painted semi-gloss black to represent a finished fiberglass surface. Once the undersides of the panels were finished and masked off, the outer surfaces all received a few coats of Tamiya Fine White Primer.

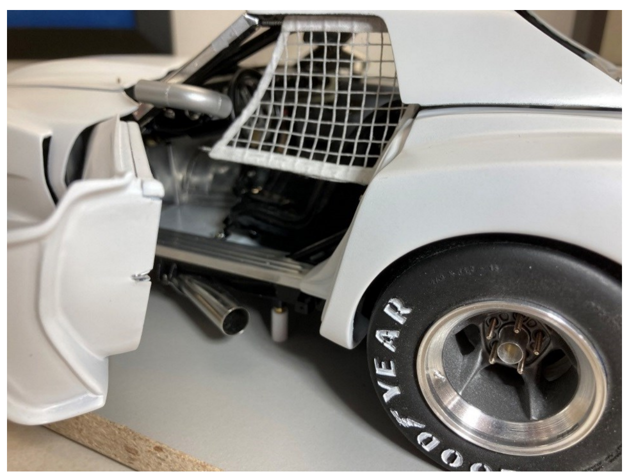




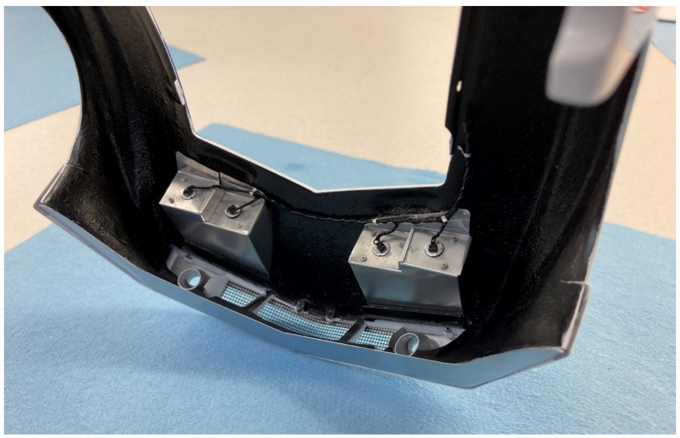
9) Final assembly (continued)



After the primer dried sufficiently, the body panels were reinstalled onto the chassis to confirm the correct fit prior to final paint. Also visible in these photos are the two air ducts used to divert cool air into the interior. These were made from brass sheet, brass tubing and plastic tubing, then painted with Testors Metalizer aluminum. The installed window net was also checked for final fitment to the roof panel and roll cage.



9) Final assembly (continued)



Some minor details were still needed to complete the model, such as the front and rear clip wiring harnesses. The brake master cylinder reservoir and the roof indicator light harness were also completed and installed. The roof indicator lights were made from vacuumed-formed lenses, sheet plastic and brass, and installed on the roof panel. The outside door handles from the kit were inadequate, and were replaced with brass versions, plated with the cobalt -nickel plating.

10) Paint/Graphics

With the primered bodywork installed on the chassis, it was a good time to dial in the graphics, so their sizes/shapes could be confirmed prior to printing and applying them. All the graphics were generated using Paint 3D and Powerpoint, and were first printed on plain paper and held on the car with double sided tape during this "checking" session. They were adjusted and reprinted multiple times before the fit was perfect. The "Sebring '75" graphic across the nose of the car was the most challenging to get to fit correctly. Each individual letter in this graphic had to be "tuned" for the correct height and width to fit the contours properly and hit the hood opening just right. The American flag graphic on the hood was test of my artistic capabilities, as I worked to replicate the original airbrushed artwork from the race car in 1975. Paint 3D had tools that were particularly useful to mimic the airbrushing in scale.

10) Paint/Graphics (continued)

Once the artwork was finalized, it was printed as both water slide decals and dry transfers. The waterslide decals were laser printed on Sunnyscopa paper and the dry transfers were made using the "Decal Pro" system/materials available from Pulsar. The dry transfers worked the best for graphics that needed to look like painted graphics such as the driver's name on the roof, while the waterslide decals worked well for graphics that needed to conform to compound curves, such as the "Sebring '75" on the nose and the numbers on the doors. One key piece of learning was that I could apply the clear mylar Decal Pro film to any laser printed image on the waterslide paper instead of spraying it with clear and it made those much stronger and easier to apply to the car. Another thing learned was that the white Sunnyscopa paper "disappeared" better on this white car than the clear paper did.

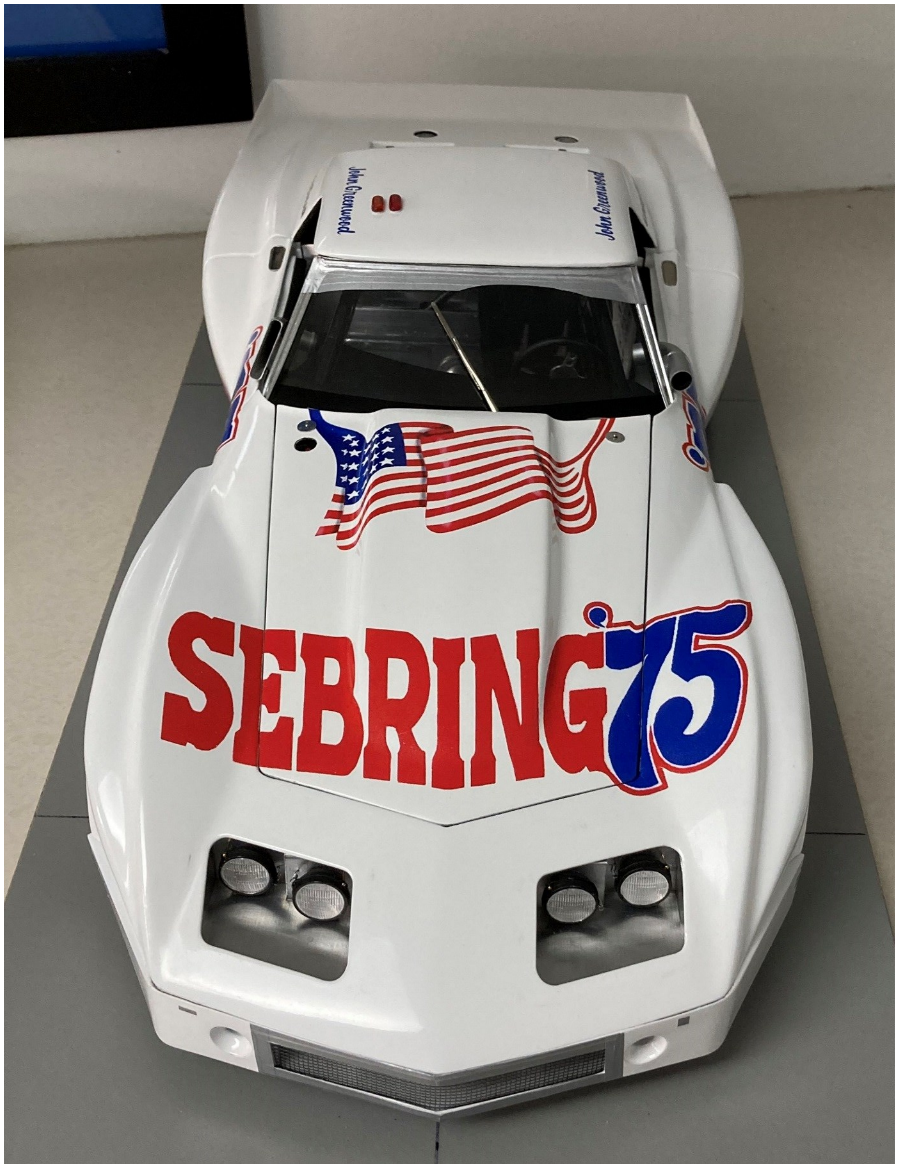
10) Paint/Graphics (continued)

Final paint on the bodywork consisted of five coats of Tamiya TS-26 Pure White. This clean, bright white matched the original car very well. The original car was painted white because in that era, white was the international racing color for cars from the United States. Given the relatively large size of the bodywork pieces, and the lack of any superfine detail on these parts, the color coats were sprayed straight from the can, without any issues. Each coat was allowed to dry, then smoothed with a 3200 grit polishing cloth prior to applying the next coat. This is when all those extra hoods and roofs were painted first, as test pieces prior to painting the actual bodywork. Some of these also served as test parts for applying the graphics to experiment with different decal films and coatings.

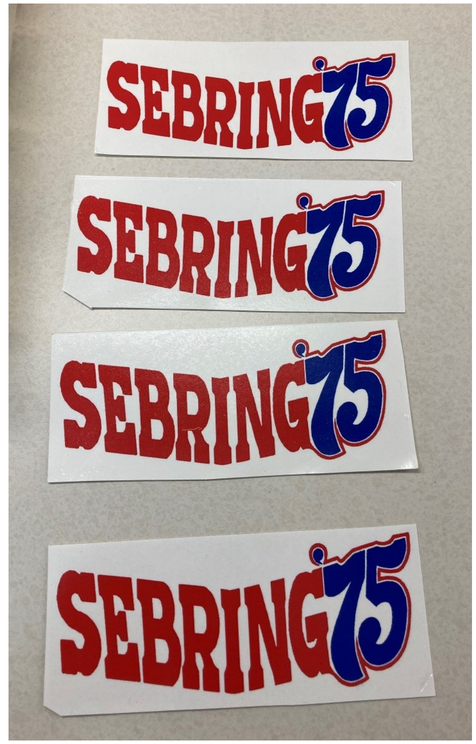
10) Paint/Graphics (continued)

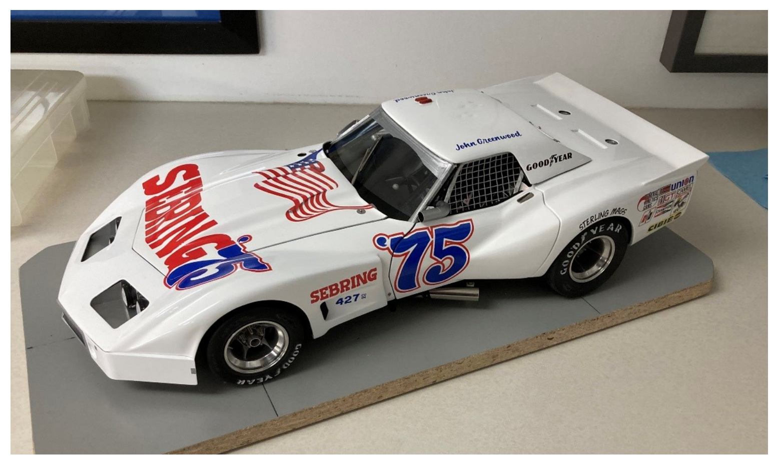
After allowing the paint to cure for about one week, it was polished and buffed, then the final graphics were applied beginning with the roof and tail sections of the car. The doors were then installed and the numbers applied. The spacing of the contingency markings on the rear fenders took some time to get right, but the previous test-fitting process paid off and garnered good results.

10) Paint/Graphics (continued)



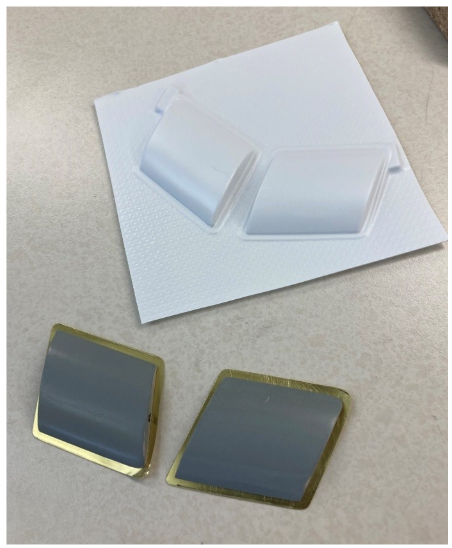
The "Sebring '75" graphics on the nose of the car were the last to go into place. These proved to be the most difficult to get to cover the many contours of the nose, and each letter was applied individually to achieve the best results. Some required multiple attempts, but that is the advantage of making your own decals; you can always print more if needed!





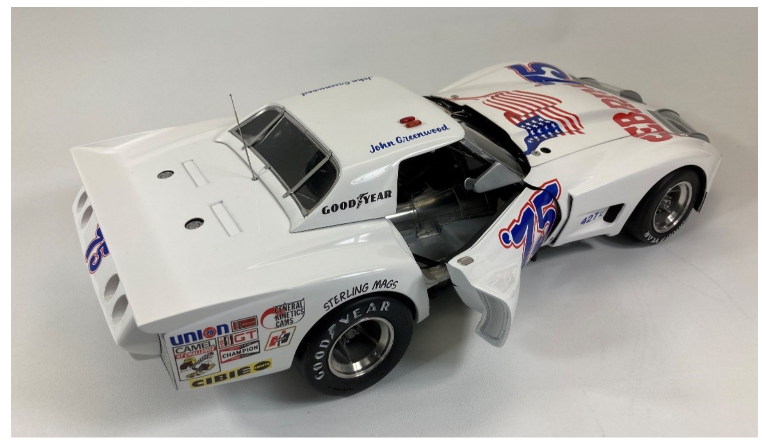
10) Paint/Graphics (continued)

With the graphics now in place, it was time to install the clear headlight covers. Even though these had been made and test-fitted many months earlier, newly discovered reference photos showed (at this eleventh hour) they were incorrect and did not match the prototype! So it became necessary to generate new molds and vacuum-form new covers to be installed. Blue painter's tape provided protection to the new paint while fitting and installing these covers. The "lenses" for these covers were made from clear plastic drinking glasses, as they already had the correct curvature to fit the surround. The same silver decal "duct tape" was applied around the covers and the grill opening to replicate those details from the prototype car.

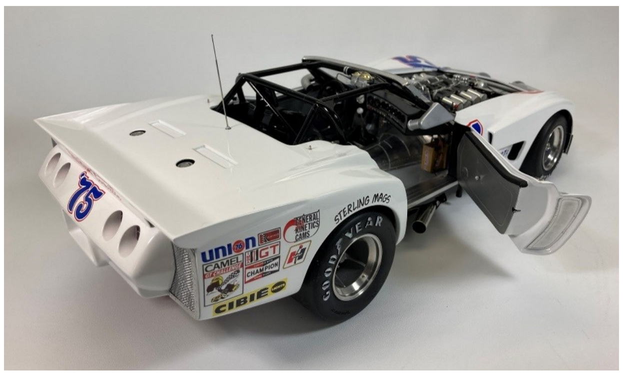


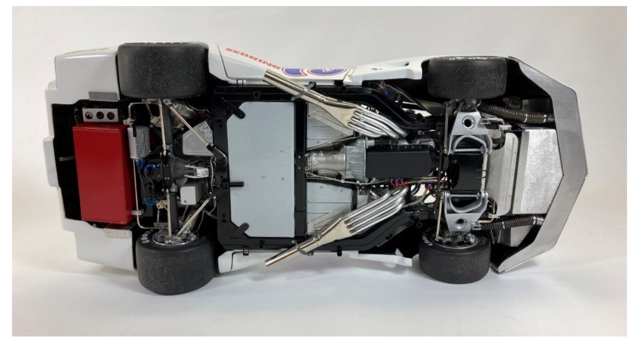
11) Completed Model

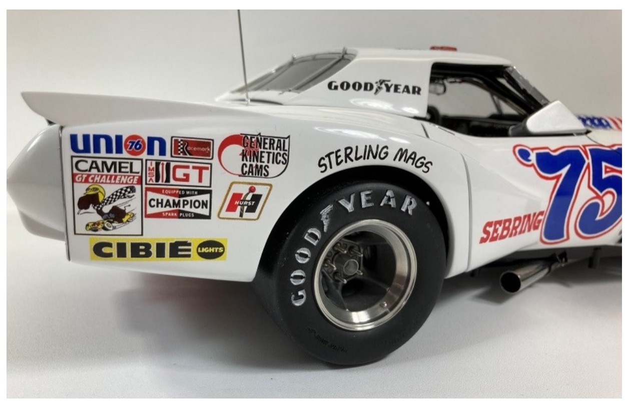
A bit of clean-up/touch-up and after nearly 3 1/2 years in the works, this tribute to the efforts of John and Burt Greenwood and the entire Greenwood Racing team was finished!

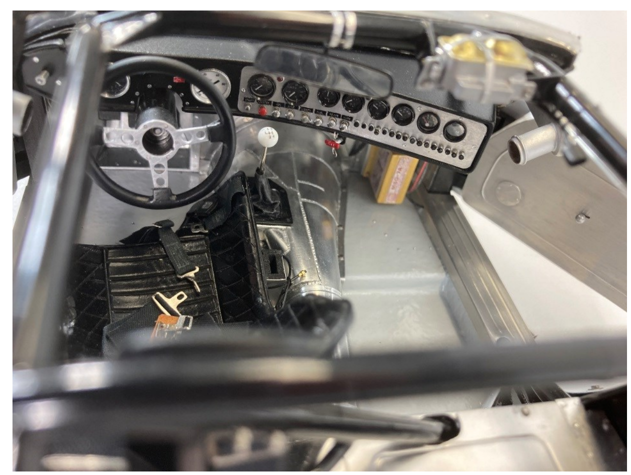


11) Completed Model (continued)

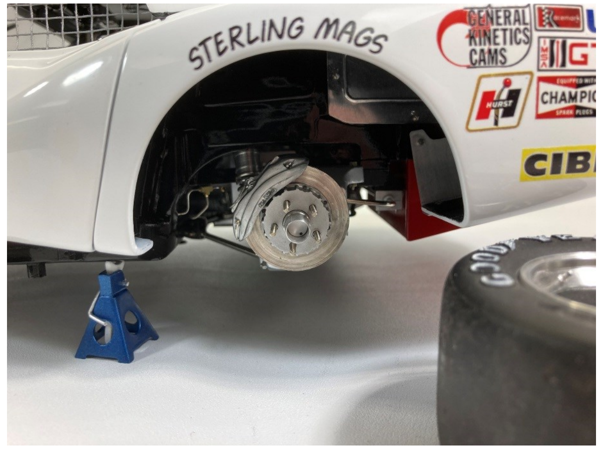


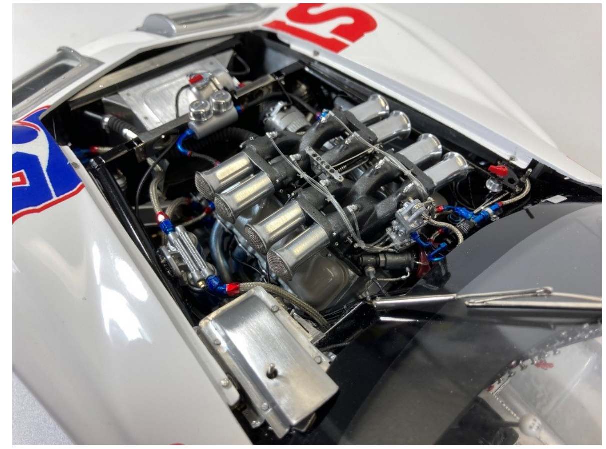


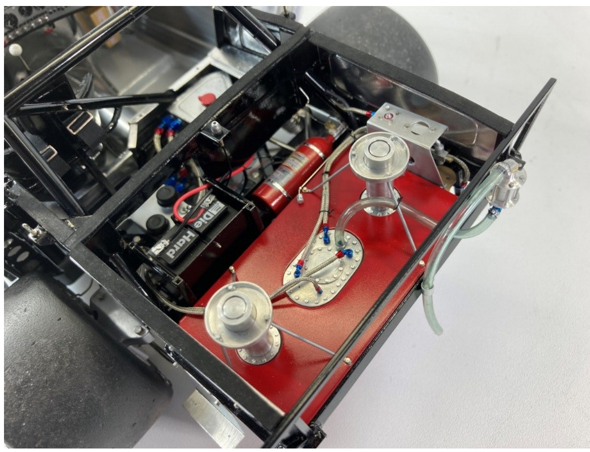


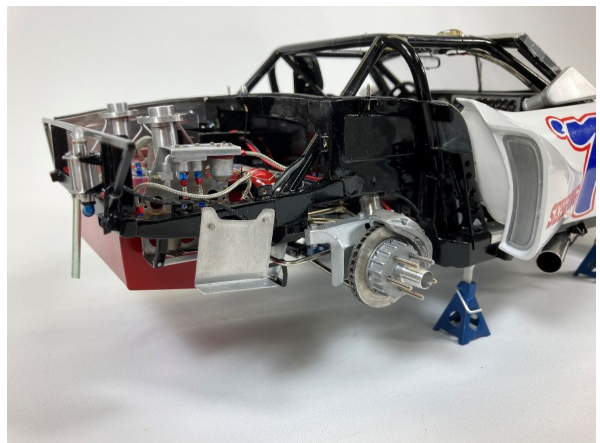


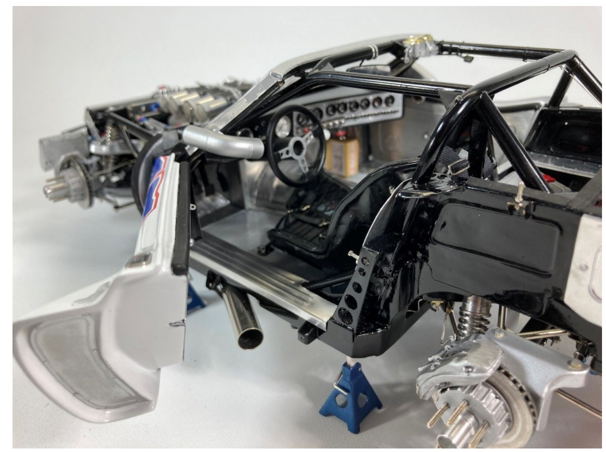
11) Completed Model (continued)

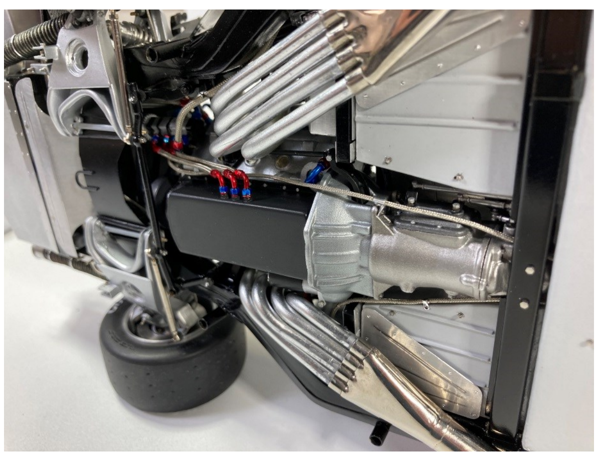


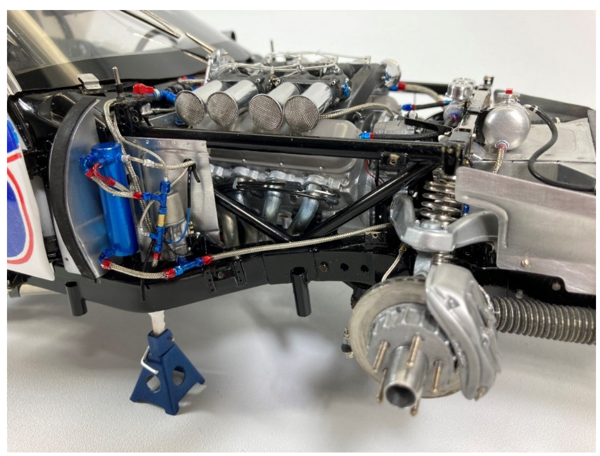


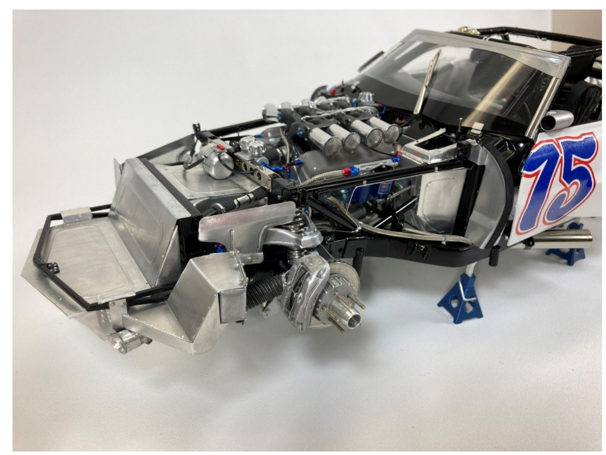




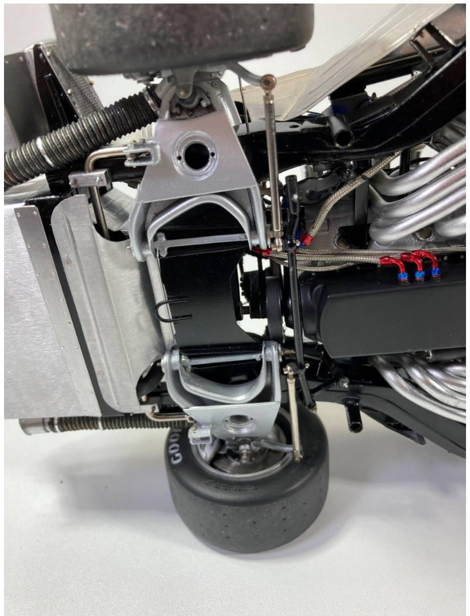


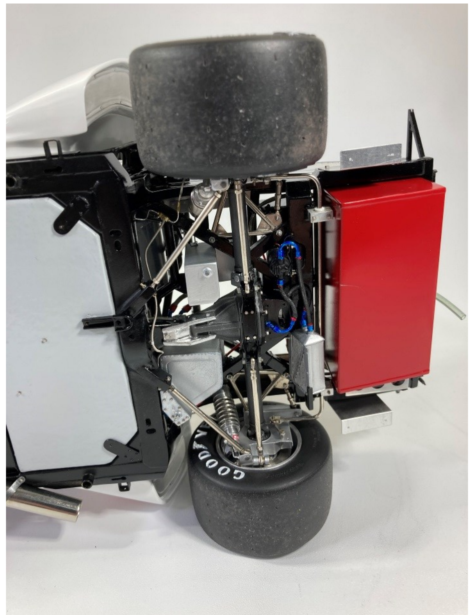


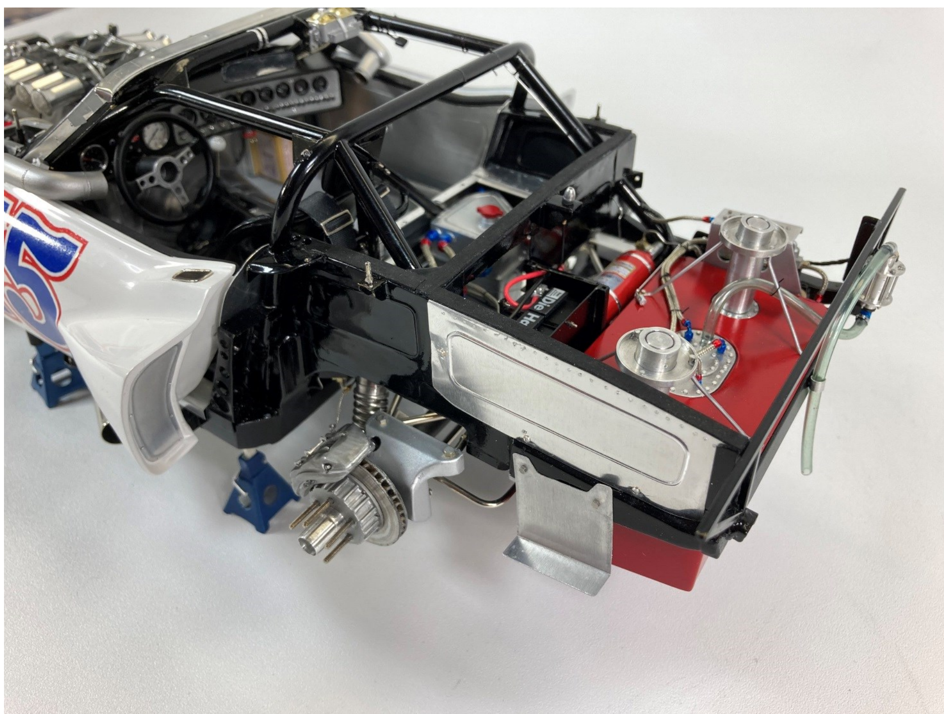


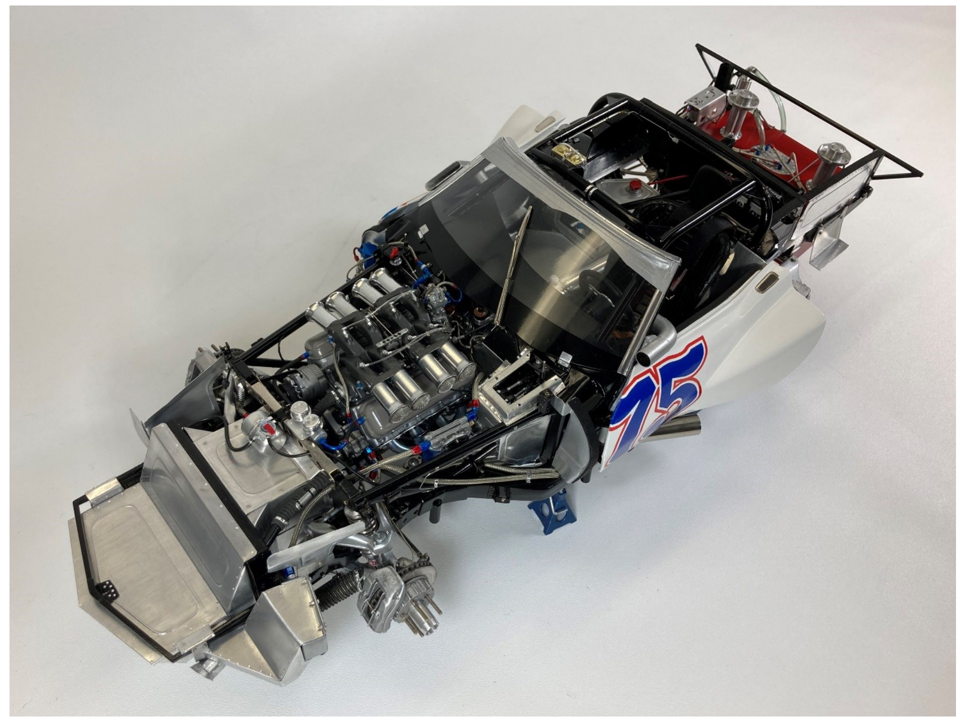


11) Completed Model (continued)









Greenwood "Sebring 75" IMSA Corvette

1/12th scale replica

By: Randy Derr