John Woody Builder Notes
Factory Five Spyder GT
December 2003

Started December 2003

This car kit is only a collection of parts designed for use primarily as a race car. Applying the license plate bracket does not mean that this vehicle is street legal. Factory Five Racing does not build completed or partially completed street vehicles. If you choose to title, register, and operate your kit on public roads, you are responsible for ensuring that the vehicle you build complies with all Federal, State, and local laws regarding its use. The inclusion of the license plate bracket does not indicate that this kit complies in any way with Federal, State, or local laws.

As Built Specification for John Woody FFR GT Spyder
Completed February 2009

Communication & Notes

26 November 2003

1. Factory Communication

6/13/03

Call about the Spyder kit. Sent deposit check (AGE # 2009) $1,000.00.

6/23/03

Received preliminary order. Customer # 00688041 Invoice # 25587
Received $2,500.00 discount as one of first 50 buyers.

8/21/03

Spyder GT Kit **Order Number: 0688041**	$14,990.00
Discount	$ (2,500.00)

Additions

1.	Independent Rear Suspension	*12301	$ 1,950.00
2.	Tubular Lower Control Arm	*12066	$ 480.00
3.	Battery Cut Off Switch	*12453	$ 29.00
4.	Mirror Passenger Side View	*10614	$ 35.00
5.	Coupe A/C System	*13287	$ 1,200.00
6.	Body Cutouts, 427	*12070	$ 120.00
7.	Coupe Wiper Assembly	*13026	$ 395.00
8.	Ceramic Coating to Exhaust	*12190	$ 375.00
9.	Competition IFS Bracket	*12245	$ 0.00

Total	$17,074.00
Deposit	$ (1,000.00)

Stewart Transport Co. Shipping Cost $ 1,100.00

8/11/03

2. Navy Federal Credit Union Loan

NFCU Loan # 430002641040-02	@9.25%	$17,174.00
48 months	$432.59 / mo.	

Paid to Factory Five Racing.

NFCU loan paid off in full early on 7/2/2005 at seventeen (17) months.

3. Phone notes to FFR/AMP:

7/1/03

Convertible top not designed as yet. It will not require any body modifications/cuts/additions and will use top snaps on body to hold top. Top designed to be removed and stored in trunk.

There is heat from headers on aluminum foot wells. Heat shields and carpeting are required to keep the heat down in the cockpit. Ceramic coating on exhaust will help.

(12/28/07)

Note from Dennis Dietz about ceramic coating on exhaust: The inside of header and side exhaust can be coated as is done on the outside to help control heat.

11/20/03

Kit shipment by Stewart Transport arrived. Inventory of back-ordered parts and delivered parts with shipment.

12/2/03

Colin Stewart provided name of parts house from AZ. Tom @ All Mustang. Phone numbers are (602) 437 0720 & (602) 437 2727. Also has 1(800) number, (800) 454 8387. Tom Thompson, owner All Mustang Performance Inc (AMP) is my contact.

12/2/03

FFR Tech bulletin on Adjustable Upper Control Arm bolt replacement parts as safety item. Present bolts may be too short and will come loose. Bolts must be dry, no grease, and tightened to 60 lbs torque.

Upper control arm bolt location for the FFR tech bulletin.

12/3/03

Call to establish contact with All Mustang Performance Inc., AZ., Tom Thompson, for donor parts & Ford Racing parts-(602) 437 0720, (602) 437 2727, & (800) 454 8387. Tom knew what I needed and will follow-up with price quote for donor and Ford parts. He will space the order so that I will not run out of room for storage.

12/4/03

Received two invoices from AMP, #15240 for $6,405.14 and #15241 for $10,543.60. Substrate review of both found duplicate parts and parts from other companies. #15240 ended as total $5,556.14 after FFR front lower control arms, FFR half shafts for IRS, and CV joint boots removed. Also, T-bird IRS unit billed twice. Invoice #15241 had Ron Davis radiator, $389.00, and 302 headers, $345.00, removed as FFR parts.

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12/9/03

Call to FFR about Back Order box UPS #74B-7351. Wrong color faceplate in Water Temp Gauge. Send back under RGA 003559. Carrie took call. I asked to stop back order shipments that may arrive after 19 December.

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This was the first of several back-order shipments that were not complete. I have continued to find missing parts nearly three year's later.

12/10/03

Letter mailed to AMP Performance with check down payment of $1,500.00, Ref AMP invoices # 15240 & 15241 for donor parts. Check # is USAA 837. AMP quotes #15240 & #15241 received 1/3/2004.

12/18/03

FFR back order via UPS. TX782-9-31, 74B-7238, four boxes, A/C kit plus other parts. Called FFR about some of the brackets. The parts were unpainted exhaust brackets (2), door frames (2), and windshield bracket frames (2). In July 2007, when planning for A/C started, it was determined that the compressor engine mounts were not shipped with the A/C from FFR. FFR was contacted by e-mail. It took an e-mail summary of all the delivery problems I have had to get FFR to make the AC compressor mount delivery.

1/18/04

Letter mailed to AMP Performance with check payment of $500.00. Check # is USAA 3003.

1/21/04

Call to AMP, Tom Thompson, about delay in donor parts shipment due to leg operation.

2/17/04

AMP called to get some of the parts while David is here. AMP could not ship parts until March.

2/18/04

FFR called, Mark Dougherty, Tech help, about part numbers that do not match. I told him about the shipment history to date, including not receiving FFR # 13067, adjustable upper control A-arm and water temp gauge. We also discussed the parts list number scheme mismatch. I asked him to restart shipment of back orders. I asked Dougherty about a pair of parts that I could not identify. Parts are part of the door hinge assembly. He said to take photo and send by e-mail.

E-mail address: mark.dougherty@factoryfive.com .

Dougherty no longer works at FFR.

Dougherty identified these parts as part of the door support assemblies. This part bolts to the door steel frame and becomes the door hinge. It is adjustable as can be seen. The P/N is actually #13566 & #13567.

2/20/04

AMP called to find out about shipments while David is here. AMP could not make shipments due to other orders. I talked to Tom Thompson.

2/24/04

Check to AMP for $400.00. Check # USAA 3035.

4/3/04

Check to AMP for $250.00. Check # USAA 3063.

4/6/04

I called both FFR and AMP to hold the shipments until after 15 April. Delay due to knee injury during soccer refereeing match.

4/16/04

Call both Tom Thompson and Mark Dougherty to let them know that I am able to receive parts.

4/26/04

Tom Thompson sent e-mail about first parts shipment. He has recovered the shipment to make good inventory.

4/27/04

Check to AMP for $300.00. Check USAA # 3067.

5/9/04

Welded plug in the 2 x 3 square frame-member opening at the bottom of the frame behind both seats to seal that area from mud and water.

This was my first use of the MIG welder.

5/18/04

Call to FFR, Mark Dougherty, about the shipment. He did not have its status on hand. I asked for the front upper control arms, FFR# 13067, as I will need them very soon. The remainder of the shipment can be made when FFR sees fit.

5/18/04

Call to Tom Thompson about the shipping dates and inventory. He indicated that the Thunderbird IRS was ready to ship.

5/24/04

Check to AMP for $300.00. Check #USAA 3079.

5/25/04

I received IRS assembly. Thunderbird Super Coupe 92-94 complete sub-assembly on pallet by FedEx. Bear Brake assemblies attached to spindle. Differential completely reworked, is a posit-traction 3.73 ratio, ready.

Called AMP to let them know that following were missing;

(1) 10.9 hard spindle to extension arm bolt 18 mm x 4 5/8 " x 13/16/nut, 1 each
(2) 13/16/" locking nuts for above bolts (2) each
(3) Shaft to rotor end nuts, 2 each

I mailed a FFR Manual Donor parts list to AMP. Tom and John are looking at it to plan shipping.
All three items have now been obtained.

IRS assembly as shipped. AMP shipped the whole T-bird IRS sub-assembly. Be sure to save all the bolts and nuts from the assembly for use in the re-installation.

6/4/04

Call to Mark Dougherty about the front upper A-arm assemblies. He indicated that they were in the manufacture process to be shipped. I asked him to confirm by e-mail. I never received an e-mail from FFR.

6/7/04

E-mail to FFR (Redline & Mark D.) about the return of the IRS lower control arms. It seems that FFR shipped me two driver side (left) control arms, P/N 12428. I returned both at Mark D. suggestion. I will need a new set, driver P/N 12428 and passenger P/N 12429 to replace them. FFR will supply the RGA #.

This was the second call of several for back-ordered parts from FFR.

redline@factoryfive.com

The e-mail also covered a request for the status of other RGA and backordered FFR parts. These are:

1.	Water Temp gauge (light face)	P/N 13119	RGA # 003559	rcvd
2.	Body Nose	P/N 12648		rcvd
3.	Panels,	P/N 13506 & 13507		rcvd
4.	Overflow tank	P/N 13338		rcvd
5.	Radiator panels, floor and side	P/N 12793		rcvd
6.	Radiator duct center panels	P/N 12800		rcvd
7.	Adjustable front upper control arm assembly	P/N 13067 Driver & Passenger		rcvd
8.	Exhaust support tab frame mount assembly	2 each		rcvd
9.	302 Headers	2 each		rcvd
10.	Battery Tray assembly	P/N 13095		
11.	Radiator duct panel mount, driver	P/N 12844		rcvd
12.	Radiator duct panel mount, passenger	P/N 12845		rcvd
13.	Radiator duct panel driver	P/N 12991		rcvd
14.	Radiator duct panel passenger	P/N 12992		rcvd
15.	Transmission top aluminum Cover	P/N 12792		rcvd
16.	Roll Bar	P/N 13509		rcvd
17.	A/C engine mount	P/N		rcvd
18.	Door adjuster hinge (2)	P/N 13565		rcvd
19.	“U-bolts for hood latch (2)	P/N 13016		rcvd
20.	Windshield Assembly	P/N 12811	hold	
21.	Trunk Hatch hinges			rcvd
22.	California Car Cover			rcvd

6/10/04

Call to Chris (Shipping) to find status of backorders and missing parts. Chris promised to answer in an e-mail. He did not know of the history of the shipments. The e-mail did not get here.

This was the third of several requests to FFR for back-ordered parts. FFR did not answer my redline e-mail request.

6/11/04

Another call to Chris Sigman (Shipping), who wanted to know the priorities. I related that I needed the upper front and IRS lower control arms to get the chassis rolling. Hopefully he will get these parts to me. I will send a letter with the shipping cost to him for reimbursement for the IRS control arms.

6/11/04

I received e-mail conformation of UPS shipment of the 302 headers, UPS #1ZX013040346757899. Two packages total, wt 38.5 lbs. Content of packages was headers and front upper control arms for IFS.

UPS shipment to arrival in SA on or about June 18, 2004.

6/16/04

Call to Tom Thompson about FFR 302 headers. Question, whether they are interchangeable with Shorty headers, ceramic, quoted by AMP. They are interchangeable and Tom will trade them out for the quoted set.

Note: The FFR 302 headers are from Hooker. They are ceramic coated. This is a new feature from FFR. AMP credited the AMP quote to reflect removing the AMP headers version from their bill.

I talked to John (AMP) about the half shaft end nuts that were missing from the IRS shipment. He will send new nuts. I am to send e-mail to Tom about schedule to get together to start parts shipments. AMP does not need a drive shaft drawing to complete the donor parts. This turned out to be a problem as the Spyder drive shaft is longer than the Cobra drive shaft they had been making. The FFR drawing was later sent to AMP. A new drive shaft was ordered and shipped.

6/18/04

Check to AMP for $2,000.00. AGE check #2042.

6/18/04

UPS delivery of headers and front upper control arm assemblies.

The headers are from Hooker, P/N 507R18, metallic ceramic coated. FFR ships the headers ceramic coated.

6/21/04

I called Chris Sigman at FFR about the delivery of the Left side IRS control arms at FFR. He stated that they had been received. I told him that I had delivery of the headers and front upper control arms. I told him that I needed the IRS lower control arms next.

His e-mail is: chris.sigman@factoryfive.com

6/25//04

I sent an e-mail to Chris Sigman, summarizing my parts back-order to date that I know about. I received no e-mail reply from Sigman about the status of the back-order.

7/12/04

Call to FFR, Mark D. handled it. Requested IRS Lower control arms.

This was the fourth call to FFR about parts.

7/16/04

Call to FFR, Linny, and set priority on the IRS lower control arms.

This was the fifth call to FFR about parts.

7/20/04

E-mail from AMP, Tom Thompson, about the Front brakes and steering components. UPS 1Z7R706W0342350310, 1Z7R706W0342601129, 1Z7R706W0340483734. The rack kit is coming from Flaming River directly.

7/23/04

AMP shipment arrived. It included the front Baer brake calipers, rotors, fittings, Mustang spindles and brake lines.

7/25/04

I have not heard from FFR yet about the IRS lower control arms.

7/26/04

Sent e-mail about outstanding parts to FFR.

7/27/04

Check to AMP Performance for $500.00. USAA check #3094.

Have not heard from FFR concerning my e-mail of 7/26/04 yet.

7/29/04

Tom T., at AMP, rack and pinion at his location, he will ship it and bushings, and will look for the brake line mounts, front and rear. I also still need the emergency brake handle. We are just about finished with invoice # 15240. AMP needs only to ship the wheels and tires.

7/29/04

Chris S., FFR, to ask about shipping of the lower IRS control arms. He will do all he can to get them in the mail. Back ordered due to manufacture back-log. He had not looked at his e-mail.

This was the sixth call to FFR about parts.

7/29/04

I received an e-mail from Tom T., AMP, and a phone call from John D. about the rack and Pinion assembly and a request for pictures of the Mustang brake line mounts. I copied and faxed them to AMP.

John told me that I can pry the CV joints and half shafts off of the 8.8 differential housing to get the housing installed in the chassis.

I tested this method of removing the CV joint / half shaft from the differential case and it worked.

7/30/04

I sent an e-mail summarizing AMP invoice # 15240 to Tom for review to determine its completion. The e-mail contains a list of the components shipped and their cost with my dates of receipt. I also sent an e-mail of the list of my payments toward invoice # 15240. It shows my payments from January 04 to January 05 as being $7,850.00 and the invoice # 15240 as being $6,605.14.

8/6/04

I received the wheels and tires, fuel filter, two each front steel to flexible brake line mounts, one each rear steel to flexible brake line mount.

Tom sent an e-mail stating that they had mounted two sets of 245 45 ZR 17 Nitto tires instead of the needed rear 275 45 ZR 17 tires. I am to have one set dismounted and install the new tires when they arrive.

8/9/04

I called AMP, got Tom, who directed me to a tech. They will send the fuel filter mount and the other steel to flexible rear brake line mount bracket to meet my IRS installation. I provided a photo copy of the mounts from the FFR manual.

8/11/04

I received one package from FFR containing overflow tank FFR # 13338, backordered water temp gauge FFR # 13119, and aluminum radiator panel FFR # 12793.

8/13/04

UPS notification 1ZX013040346792850 of FFR shipment of the Driver & Passenger IRS lower control arms and rear splash guards. Delivery date is August 20. received.

8/17/04

UPS notification 1ZX01304034435894 of FFR shipment of the radiator duct panels. Delivery date is August 24. received. (Note) The back panel for the duct was bent in shipping and I had to straighten it out.

9/1/04

Check to AMP Performance for $500.00. Check # 3103.

9/9/04

I shipped extra front tires to AMP via UPS. Tracking number 1Z 6R3 V69 03 4177 8422. This cost was $65.22. Sent e-mail to Tom about the tires.

9/21/04

Check to AMP Performance for $500.00. Check #3110.

9/30/04

AMP fuel tank, straps, emergency brake handle, and rear steel to flex brake line mounts arrived.

10/13/04

I called AMP to talk to Tom Thompson about invoice #15240 and its completion. He is in the process of completing it now. I gave him the Ford p/n for the fuel tank to determine what year it came from. He is sending chrome lug nuts and lock nuts. (16 plus 4). He stated that the fuel tank is new with a new fuel pump.

10/30/04

Check to AMP for $500.00.

11/17/04

AMP mailed last of Invoice # 15240 parts: Lug nut and locks received.

12/1/04

Check to AMP for $300.00. Ck # 3129

1/6/05

Check to AMP for $300.00. Ck # 3135

1/26/05

Check to AMP for $300.00. Ck # 3141

2/25/05

Check to AMP for $300.00. Ck # 3154

3/23/05

Check to AMP for $300.00. Ck # 3166

4/28/05

Check to AMP for $200.00. Ck # 809

5/30/05

Check to AMP for $100.00. Ck# 3189

6/14/05

Call to FFR about shipping the nose shell. Chris Sigman stated that FFR would ship ASAP.

This was the seventh call to FFR about back-ordered parts.

6/22/05

Call to FFR about the front lower chassis control arm brackets:

1. Driver bracket closest to chassis upright X member is 1 7/32 “from upright.
2. Passenger bracket closest to chassis upright X member is 1 “from upright.

Question for FFR was why the difference and how to make the Ford bolts clear the upright member.

Answer from FFR is that the welding can pull the brackets that far. Use washers to clear the bolt from the upright. In my case, the FFR lower control arms fit on each side. I added washers to the bolt head to decrease the thread showing in order to get the nut to fit. See the photos below to see the clearance problem on the passenger side. The FFR information indicated that alignment would not be affected.

Driver side bracket at 1 7/32”.

Passenger side bracket at 1”.

6/23/05

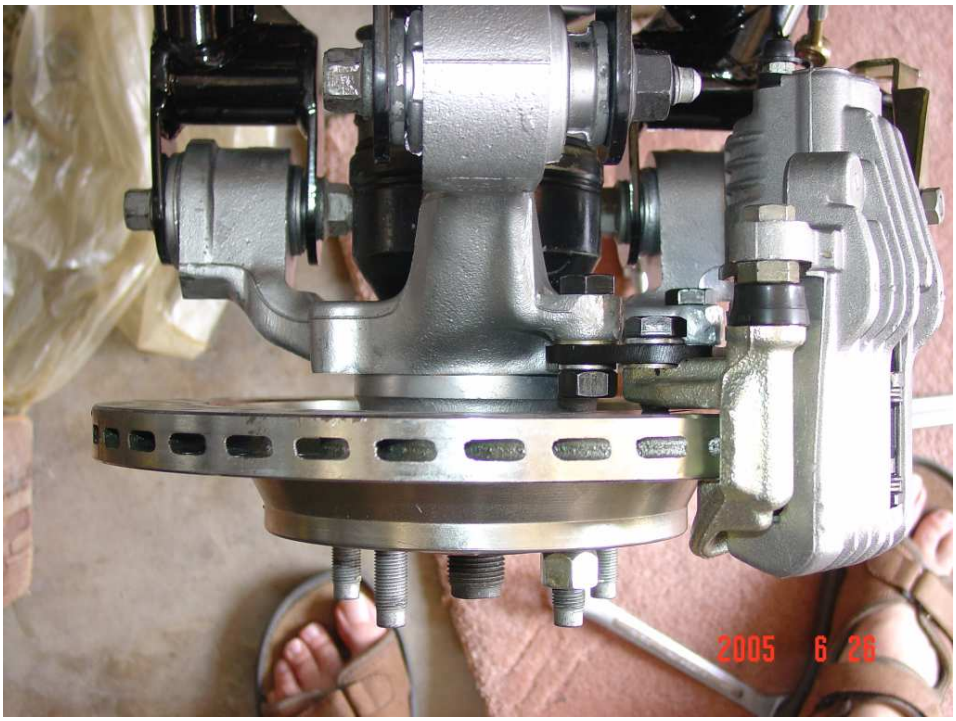
Check to AMP for $100.00. Check # 3194.

6/24/05

Call to Tom T at AMP about tie rod ends and the taper in the Mustang spindle arm. I had attempted to fit the Baer bump steer tie rod end to the spindle and had found that the taper in the Mustang tie rod spindle was from the bottom. John at AMP, told me that that was indeed the right way. The bump steer or tie rod attaches from the bottom.

6/26/05

Rear Baer calipers were bolted to the Thunderbird rear hubs. The AMP plate that fits the caliper to the hub will require a thicker washer fitted between the caliper and plate. The bolt that screws into the caliper is too long and rubs the rotor.



Driver side looking down on the Baer caliper and plate fitted between the hub and caliper. Note the bolt that fits into the caliper is rubbing the rotor.

A thicker washer needs to be placed at the bolt head and lock washer.

This is needed on both sides. The driver side is the worst. Second spacer washer installed on each of the bolts 6/27/05, which removed the extra bolt sticking out on rotor side of caliper. The extra spacer washer was installed one bolt at a time, using a screwdriver to hold that end of the caliper in place. This held the existing spacer washer in place for easy reinstall of the bolt at each corner. All bolts were torqued to spec.

6/28/05

Lug nut mix up. Ten (10) of the lug nuts use a ¾ " socket for installation and six (6) use 13/16 " socket. Two (2) lock nuts use 13/16 "socket. The lock nut socket sent to me is a ¾ "socket.

Called Tom Thompson, who told me to sent the 13/16 " nuts back to be exchanged for ¾ " nuts and lock nuts.

7/12/05

Received ¾" lug nut set from AMP, complete with locking nuts and lock nut tool.

7/24/05

David helped to install the front wheels and tires during his visit. We then installed the Baer bump steer tie rod ends and rolled the chassis out.

First chassis roll-out photo.

7/29/05

Check to AMP for $300.00. Check # 3203

8/16/05

I moved the chassis to Alamo Body and Paint for preliminary front and rear wheel alignment. The chassis was trucked by Alamo to their Bandera location. Richard Maspero, the alignment mechanic, was recommended by Alamo as the best alignment mechanic to do the job. The IFS was out of alignment specification. An Alamo alignment tool print out holds the record for the IFS. The Baer bump steer tie rod ends were adjusted, and, next the upper control arms were adjusted to bring the IFS into specification.

The IRS passenger side was in alignment. The driver side lower control arm was adjusted to bring it into alignment by changing the location of three spacer washers.

The Flaming River rack was not level. The driver side mounting hole was reamed about ¼" to level the rack.

A review of mechanical work done to date was volunteered by various mechanics with the following items to be redone:

1. The Mustang spindles are of different year. The passenger side has a raised (about) 1 ½" rise in the tie rod knuckle from the '92 – '94 Mustang. The driver side tie rod knuckle is flat. Due to the offset of the steering rack, the angle of the steering rod is much greater than the passenger side.

Driver side spindle with straight tie rod arm.

Passenger spindle with raised tie rod arm.

Tom Thompson was contacted and has agreed to send a raised knuckle spindle to replace the flat driver side unit. The passenger side spindle is a '94-'95 spindle and the driver side is '96 or later. The raised spindle arm will allow the angle of the tie rod end to lessen and will help the bump steer in the car.

2. The front brake calipers are mounted up side down. They need to be removed and installed on the opposite side so that the bleed valve is at the highest point.

3. The Flaming River steering rack is not level. The driver side is about ¼" higher, making the steering rod angle greater than the passenger side. The Driver side mounting hole was reamed to lower the rack to a level position by Alamo.

4. The upper control arm bolts are not strong enough. Harder steel bolts are needed.

The FFR supplied hard steel lug bolts were installed on 8/17/05. Each was torqued to 40 ft-lb. Specification calls for 60 ft-lb.

The driver side suspension assembly was disassembled and the spindle removed. The Baer calipers were removed and the right side unit was installed on the passenger side.

The driver side '94-'95 spindle was installed. The upper and lower spindle bolts were re-installed and torqued to the specified torques.

The spindle lug bolts were replaced on both sides with FFR supplied bolts. I used a heavy hammer to remove each lug bolt from the spindle. I replaced each bolt one at a time. Do this removal and re-install by placing each spindle bolt in place and placing a washer. Then use a regular lug nut and impact wrench to set the bolt in the spindle hub.

Time to disassemble driver side suspension.	180 minutes
Time to install the FFR lug bolts.	120 minutes.

The chassis located in the Alamo alignment tool and on the Alamo truck for return delivery on 8/17/05.

The tow and alignment charge was $320.00, $140.00 towing and $120.00 for alignment. The chassis was preliminarily aligned at Alamo Paint and Body with no problems.

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9/30/05

Check to AMP for $300.00. # 3221.

10/25/05

Check to AMP for $500.00. #3226.

11/1/05

I called FFR with questions about how the Flaming River steering shaft assembly connects and which firewall hole it passes through, and do I need a Mustang upper steering shaft assembly? Are there any better photos of the firewall and holes for assembly?

The answer is that the shaft passes through the second hole from the top. The Master brake assembly goes in the upper hole.

I do need a Mustang upper shaft assembly and they are furnished by FFR now. One unit was placed on order for $60.00.

I asked about shipping the nose assembly and was told that it would be shipped by FedEx next week.

I asked about the drive shaft. The Coupe/Spyder drive shaft is longer than the Cobra due to the lengthened chassis. I am to use the manual Coupe drive shaft diagram for its cut-down and assembly.

11/2/05

I made a call to AMP and Tom Thompson about the drive shaft diagram and the shaft construction by AMP. Tom asked for a letter with the diagram and will also send the pedal box assembly for me to install before I complete the driver foot well sheet install. I asked for the Mustang Quad Shocks also.

11/1/05

I called FFR about the upper steering shaft. Joe, a tech rep, told me that I needed either a Mustang upper shaft or one from FFR. I chose to buy from FFR. The FFR unit was shipped on 11/8/05. The FFR shaft is $50.00 plus $10.00 FedEx.

I also asked about the length of the drive shaft. This chassis is longer than a Cobra chassis. I need to send the Manual drive shaft drawing to AMP. I did this after talking to Tom Thompson.

I also called Tom Thompson about the drive shaft and asked him to ship the Mustang pedal box assembly and Quad Shocks.

11/15/05

I installed the steering shaft. I have a question about the two Flaming River black flange collars that came with the steering assembly. Where do they fit in the shaft? The answer about the flanges is that they fit the steering collar at the firewall bushing and at the hollow to solid column intersection.

11/21/05

I made a visit to AMP in Phoenix to meet Tom Thompson and pick up the Mustang brake/clutch pedal box assembly, accelerator pedal, and clutch release cable.

11/30/05

Check to AMP for $500.00. Ck#3234.

12/2/05

Call to FFR about steering boss flange on firewall. Flange is in two pieces. How must it be mounted? Flange mounts completely on the engine side of the firewall footbox.

12/16/05

Contracted with Bruni Welding Company for the pedal box, brake pedal, and accelerator pedal mods. Also had Bruni Welding make an aluminum battery box for the rear trunk deck. The cost was $70.00.

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The modified brake pedal installed in the pedal box assembly.

The accelerator pedal as modified.

The emergency brake handle assembly as modified.

1/2/06

Check to AMP for $500.00. #3239

1/11/06

Call to AMP, Tom T. to discuss the new Ford engine and ask for shipment of filler neck and master cylinder proportioning valve. Also, a reminder about the Mustang Quad Shocks.

Check to AMP for $500.00. ck# 3241.

1/17/06

Received AMP shipment of Mustang gas filler neck and Baer adjustable brake proportioning valve.

1/26/06

Check to AMP for $500.00. ck # 3245

2/15/06

I am going to change out the brake lines due to discussions with experts at Alamo Hot Rod Parts. My insert mounted connections on the brake lines will not hold the brake pressure. I need to replace each connection with a 45 degree double flanged flare fitting. Alamo HR put me in contact with Kris Castillo, who knows the details of brake installations.

3/3/06

Check to AMP for $2,923.00 as final payment for Invoice 15241. ck #914

3/21/06

I re-plumbed the steel brake lines by using new steel lines and double flare fittings. I had used the wrong fittings in the original plumbing. Kris Castillo, local hot rod builder, did the work and I assisted. Cost was $150.00

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3/22/06

Call to FFR. Subject not listed in phone log.

3/22/06

Made contact with Roger Stine about the Mustang wiring harness. I have contracted with Stine to furnish a '93 wiring harness and '92 computer to match my engine. Cost was

$900.00 plus $40.00 shipping. Stine will do the diet on the harness to provide me with exactly what FFR requires. Delivery will be in approximately three weeks. I am awaiting and address to make the payment to. Stine will make the harness with A/C connections left in the harness. He will make the front electrical cables long enough for me to place disconnect fittings in the light connections to be able to easily remove the nose piece if I have to. I received Stine's name from the FFR Spyder Internet forum.

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3/26/06

I made contact with the company who manufactures FFR self canceling turn signal assemblies.

3/22/06

Richard Oben of North Race Cars to provide the turn signal assembly. It fits over the existing FFR / Flaming River steering assembly. Cost of the turn assembly is $235.00 plus $10.00 for shipping. The basic turn signal assembly is from VW.

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3/27/06

FFR A/C assembly requires serpentine pulley belts.

3/28/06

Check sent to Roger Stine at CAPO BAY Charters for $940.00 to cover the wiring harness.

5/30/06

Stine Mustang dieted wiring harness arrived.

6/29/06

I made a new call to FFR about shipping back-orders. C Sigman no longer works there. Lady (Meredith Kay) in shipping is to send an e-mail to me on 6/30/06 about back-orders. We will use the e-mail to determine what is required.

I do need the nose body piece and roll bar.

Tech rep stated that I should get the aluminum in before laying the wiring harness in place. The engine computer goes behind the dash aluminum in the passenger foot-box. There is a pre-cut hole for it to pass through in the top of the passenger foot-box.

7/7/06

Mark Daugherty stated that my nose piece and roll bar are on the shipping dock. If I do not hear from shipping by next week, call again. Send photos of unmarked aluminum panels to them at tech@factoryfive.com to get idea of where the pieces belong.

The original request for the nose piece was never shipped or answered about from FFR.

7/10/06

E-mail arrived from Meredith Kay listing what FFR thinks has been shipped. List is consistent with my list above with these exceptions I have received, not documented by FFR:

13338	Overflow tank

507R18	302 Hooker headers
12428	IRS lower control arm
12429	IRS lower control arm
13067	Driver / passenger upper control arm
12793	Floor / side panel
12800	Duct center panel
12844	Driver duct mount panel
12845	Passenger duct mount panel
12991	Driver duct panel
12992	Passenger duct panel

Parts not in my inventory:

13509	Roll bar
12648	Body nose piece
12792	Transmission top panel
13565	Hinge adjuster bracket (2)
Xxxxx	“u” bolts for hood lock down (2)

8/16/06

I made a call to FFR. I talked to Kevin and Mark Webber. I asked them about the square footage of the cockpit aluminum. They did not have the exact footage. There is 200 sq ft of aluminum in the car. I need this information to determine how much Lizard Skin material to purchase.

8/16/06

I made a call to LizardSkin about their ceramic insulation and Sound Control spray on products. I talked to Bob Call, owner, who helped me to determine how much product to buy. We determined that I would need two ceramic pales (two gallons each) and one pale Sound Control (two gallons). I also would need the spray gun kit.

8/17/06

I placed the order for the LizardSkin products. The total plus shipping is $731.84.

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9/4/06

I moved the chassis to Alamo Paint and Body for the cockpit painting. Augie Santaga did the paint work. We covered the interior of the cockpit with the LizardSkin Sound Control on Saturday. The time to prep the chassis and paint it was two hours.

On Sunday, we painted the outside and interior of the cockpit aluminum with LizardSkin Ceramic insulation material. The time to complete the job was two hours.

The basic LizardSkin application took four hours. I paid Augie $200.00 for the task.

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LizardSkin Sound material on passenger side.

LizardSkin ceramic coating inside cockpit.

9/16/06

The FFR parts arrived consisting of the nose piece, roll bar and console aluminum top piece.

10/12/06

I purchased a wiring diagram book from Northside Ford. It is entitled "Electrical & Vacuum Trouble-shooting Manual" for 1989 Mustang. It will be needed to help read the wiring color code from the Stine harness. The cost was $43.25.

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The Counter man helped me track down an analog speedometer cable source for the car. His name is Mike Goodman. He is the Mustang Parts man for Northside.

He recommended S X Callaghan Speedometer Division as the best source for a speedometer cable. This would be to mate the cable to the Auto Meter P/N 4495 speedometer and the T-5 transmission.

A call to FFR confirmed that a Mustang speedometer cable was required for the car.

10/20/06

I received the Ford Racing M-6007-XB3 GT40 engine assembly as a drop shipment from a Houston location per request to AMP. Tom told me that this was one of the three last engines available at the current price. I will assemble the engine and other drive train components.

10/20/06

I ordered a FFR Name Plate for $17.00 including shipping. Order placed on MC xxxx 1246. The MC cleared on 10/23/06. I was told to request a "Certificate of Origin" from FFR to prove the transfer of the FFR components to me.

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10/30/06

I received the next shipment from AMP consisting of the BW T-5 transmission, Ford injectors, 75 mm Mass Air unit, Ford Cobra upper and lower EFI manifold unit with gaskets, Ford Motorsport spark wires, Luk clutch assembly, Ford transmission mount, and Mustang clutch cable. An e-mail from Tom indicated that the remainder of the shipment would be forthcoming.

11/6/06

I made a call to FFR about the Name plate. It had not been shipped. It was shipped on 11/6/06.

I also sent my letter requesting a FFR Certificate of Origin for the car. My certificate of origin number is FFR 4526CP.

11/13/06

AMP shipped the drive shaft. It was the wrong type. It did not meet the FFR drawing spec. It measured 11.5 inches from flange to flange. The FFR drawing calls for 12.5 inches flange to flange. I shipped the drive shaft back to AMP via UPS. I sent an e-mail as well.

11/14/06

I received the BBK 65 mm throttle body from JEGs.

11/14/06

I received an e-mail from Patrick Eaton, Patrick.eaton@comcast.net about his recent purchase of a Spyder. I sent some of my experience.

11/14/06

I received information from FFR about Breeze Automotive, 508 533 6455. They specialize in FFR cars. They have the emergency brake cable extension that I may need. They also have coupe/spyder drive shaft. It is a special order and takes about four weeks for delivery. They guarantee balancing.

AMP sent three large boxes of engine components. I e-mailed AMP about the contents.

12/8/06

The FFR Certificate of Origin arrived. The name plate still has not arrived.

12/8/06

The new drive shaft arrived. It measured 12 inches flange to flange per the drawing.

2/26/07

The FFR Name Plate arrived with chassis S/N engraved.

4/2/07

I purchased a Mustang throw-out bearing lever and clutch lever dust plate from Northside Ford. The clutch lever assembly cost $43.03 and the dust cover cost $40.42 with $6.78 tax. Clutch dust cover bolt size is ¼ x ½ x 20.

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4/13/07

I purchased clutch to flywheel bolt kit from Northside Ford for $12.98

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4/16/07

I purchased bell housing to block bolds from Alamo Bolt and Screw. Sizes are 7/16 x 1.5 x 14 (4 each), and 7/16 x 1 x 14 (two each).

4/19/07

I purchased BBK cold air induction kit for EFI from JEGs for $151.98

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4/20/07

I purchased one MSD Blaster Two coil, Ford chrome coil bracket and chrome Distributor hold-down clamp from Jegs for $71.96. The MSD coil and coil bracket will not be used. I will use a new Mustang coil assembly with the used bracket.

4/23/07

I purchased 5/16 x 1 ½ course thread bolts (4 each) and 5/16 x 1 course thread bolts (6 each) Grade 8 for BBK throttle body to TFI manifold from Home Depot.

5/10/07

I had the Ford distributor shaft assembly rebuilt at Alamo Performance with new Motorcraft electronics. Cost was $166.35.

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5/16/07

I purchased a distributor O ring seal from Northside Ford. Cost was $2.09

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6/5/07

Kris Castillo and I started the engine build and installation.

Drive train attached to engine.

Clutch install

6/6/07

I purchased four 7/16" x 2" HVA grade 8 bolts from Alamo Bolt. The cost was $2.00

6/7/07

Kris and I installed the engine and drive train in the chassis. We had to remove the T-5 shift knob to get the transmission in place. The AMP drive shaft was a perfect fit. The bolts for the drive shaft to rear end were not a good fit.

The engine contained a tag with the following:

s/n:	300573403
mfg:	5/12/06
p/n:	M-6007-XGB3M

Engine and drive train being lifted into the chassis

Drive train, including drive shaft installed in chassis

6/8/07

I purchased four SCM bolts, 12-1.75 x 25 12.9 from Alamo Bolt. The cost was $1.51.

6/8/07

We installed the Hooker headers.

Both exhaust headers and the lower intake manifold

6/10/07

I purchased four ¼ x ½" bolts for the fuel rail injector lines for $2.15 from AutoZone.

6/12/07

I purchased one Ford engine overhaul manual, high temp silicone and intake gasket kit for $34.57 from AutoZone.

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6/12/07

I paid Kris Castillo $550.00 for eight hours service in the engine installation.

6/13/07

I purchased intake connectors, sensor assembly, EGR element filter, EGR valve assy retainer, EGR gasket, speedometer sensor, and sleeve from Northside Ford for $187.90.

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6/14/07

I will not be installing the Ford EGR sensor assemblies in this car. I made an EGR upper intake blocking plate and installed it for the BBK throttle body.

I also made a rear brake pressure valve rack to relocate the Baer valve on the chassis close to the Master Brake assembly.

6/15/07

I answered a FFR forum e-mail about the description of my Spyder. I will send a full description and photos of it to date.

6/16/07

I purchased 3/8 brass plug and 3/8 nipple for the upper intake manifold for $4.15 from Home Depot.

6/18/07

I purchased four 3/8 brass plugs from Home Depot for $7.53.

6/19/07

I purchased Russell Mustang fuel line fittings from Alamo Performance for the fuel rack to fuel lines. 3/8 intake and 3/8 return with flare nuts for $35.68. I may not use these fittings as we modify the entire fuel line.

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7/14/07

Castillo and I installed the upper EFI manifold, fuel rail, injectors, BBK throttle body, and Air Mass sensor with BBK cold air induction tubing. I connected the EFI throttle sensor and manufactured a plate over the EGR throttle body outlet. I will not be using the EGR in the wiring harness.

We redid the fuel intake and return lines. We used high pressure flexible ¼ inch fuel line from Alamo Hot Rod Parts for $59.94.

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7/16/07

I purchased a Mustang coil assembly from Northside Ford for $70.29. It will fit in the used Mustang coil bracket.

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I also determined that I need Mercon Dexron in the T-5 transmission at 2 ½ quarts.

I also determined that I need to break the engine in with 30 w HD oil.

7/17/07

Castillo and I installed the battery to starter cable, reversed the EFI injector wiring harness to make it fit properly, installed the distributor to TDC, installed more of the engine wiring harness, installed the clutch cable, and determined that we need a fitting for the accelerator cable. We also determined that we need the brackets for the A/C compressor.

We installed the alternator bracket and the alternator. The bracket will need modification for the high output alternator to fit properly. Tom Thompson stated that it would need to be ground out a bit for the alternator to fit.
The clutch cable and throttle cable were installed and terminated.

I paid Castillo for services at $420.00.

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7/18/07

FFR will send the A/C compressor mounting kit.

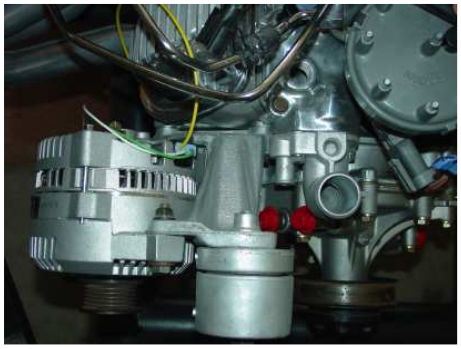
7/18/07

Tom Thompson, from AMP will send a crank pulley and terminal fitting for the accelerator cable at the throttle body.

7/26/07

I made a modification to the alternator mount so that the high output alternator would fit the Mustang mount. It required grinding a section of the mount so that the larger alternator would pivot into the upper mount hole.

Bracket modification by grinding metal away



Top view of ground bracket notch

7/26/07

I delayed the AMP shipment until I return from Seattle.

I also determined in a call to FFR that the A/C compressor mount had not been shipped. There may be a problem getting it from FFR. I sent an e-mail outlining my parts problems with FFR and received an e-mail that they would mfg the compressor bracket.

8/11/07

Kris Castillo and I installed the throttle cable bracket after Kris had modified it to fit. The Throttle cable is installed and working.

We also started the steering turn signal assembly installation. Kris will have to get the shaft cover re-welded as the bracket came loose in our assembly fit out process.

8/13/07

I purchased two M8x1.25 mm bolts for the throttle body cable bracket at $2.15.

Throttle bracket to be shortened and temporally fitted.

Throttle bracket finally fitted and installed.

8/23/07

FFR sent e-mail confirming that the A/C compressor engine bracket assembly had been shipped.

9/1/07

FFR A/C compressor engine bracket assembly arrived.

9/4/07

Kris Castillo and I fitted the A/C compressor and bracket assembly to the engine. It was removed for painting (black)

9/5/07

I purchased one HH 5/16 x 4 ½ inch bolt for the A/C mounting assembly from Alamo Bolt.

Kris Castillo mounted the A/C compressor bracket and removed it for painting. We started instillation of the steering column turn signal assembly. The FFR upper steering shaft was

drilled for the turn assembly signal correcting pins in the assembly. Painted A/C bracket and compressor were installed.

I paid Kris Castillo $270.00 for labor.

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9/12/07

I purchased a high output battery from NTB. It is warranted for 84 months with 36 months free replacement at $223.83. It has 970 starting power amps.

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I purchased a fan belt from Advanced Auto. It needed to be longer and was replaced for $21.50.

I also purchased JB Weld for the steering column wheel ring at $8.47.

10/2/07

Kris Castillo and I completed the engine wiring harness, starter and alternator wiring, and readied the car for hot wiring testing. I purchased wiring fasteners from Home Depot for $8.47

10/3/07
Engine wiring 95% is complete. We conducted a hot wiring electrical test by turning the starter over from the key start. It worked without problem. The clutch must be engaged to get the excite wire to fire the starter.

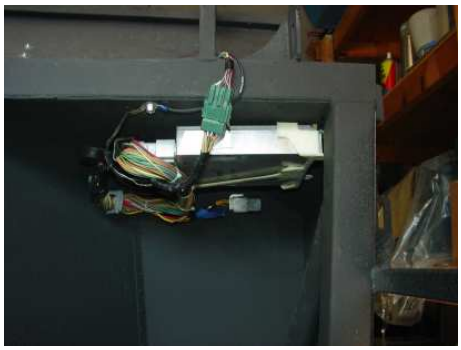
The EFI computer was installed in the passenger foot box.

Passenger side engine wiring

Driver side engine wiring

The battery box was completed for installation in the battery well in the trunk deck.

Battery in battery well box in trunk deck



'92 computer installed in passenger foot box

10/4/07

I riveted the trunk deck in place and mounted the battery well and battery box finally.

10/5/07

I filled the engine with 5 qts of Havoline SAE 30 wt oil. We installed the oil pressure and oil temperature sensors on the engine. Kris had a special sensor fitting made at Alamo Hot Rod. The oil temperature sensor is not in the oil sump, but should give close to real temperature.

10/8/07

I fitted the trunk side aluminum plates and riveted the driver side plate in place. Roberto and I filled the transmission with 2 ½ qts of oil.

Special oil and temperature sensor fitting

Mercon transmission oil purchased from Auto zone for $20.48. Five quarts of oil.

10/9/07

Driver side trunk side and passenger side trunk wall riveted to chassis.

10/17/07

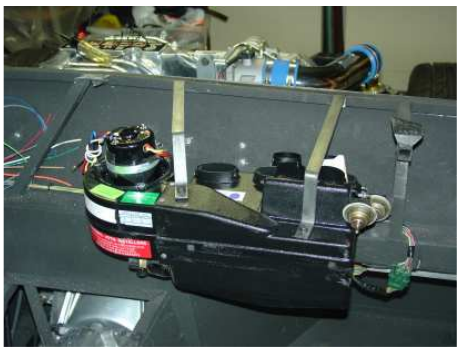
Kris continued on the dash wiring. We fitted the dash board and started fitting it to the chassis. We stopped this effort and fitted the body to the chassis for the first time. Roberto Guerrero assisted me in fitting the dash. I cut the holes for the dash gauges. The oil pressure, oil temp, water temp, volts, and gas gauges went in well. I cut the holes for the tacho and speed o to large and the plugs had to be fiber glassed back in place to start the cut again.

I purchased a fiberglass kit from Home Depot for $63.57. I purchased a 4 ½ in Rigid Tools hole saw with mandrel for $48.50.

First fitting of the body on the chassis.

Front view of the body on the chassis.

There are areas under the body that need filling to keep the weather out, especially behind the cockpit in the trunk area. This would be a good place to apply fiberglass.



AC mounted in dash

AC mounted in cockpit

10/23/07

Kris Castillo started the wiring to the AC. We got AC blower electrical power via the key to the AC. Kris started the wiring to the dash instruments through two six conductor plugs. All dash instrument wiring will go through these two plugs for ease of removal if needed. Roberto finished the fiber glassing of the dash panel. We cut and fitted the tach and speedo instruments. I fitted the radiator for the first time.

10/24/07

I fitted the dash instruments for the wiring behind the dash. Kris Castillo finished the dash wiring harness and applied power to show the instrument lights and sensor functions. All worked. Roberto and I fitted the radiator fan and AC evaporator core to the Griffin radiator. We then started assembly of the air shroud to the radiator.

10/24/07

I ordered a replacement Auto Meter Ultra Lite Oil Temp 100 – 250 degree gauge from JEGS for $59.98. This unit replaces one that I dropped in the installation fitting process.

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10/29/07

Roberto and I installed the radiator to engine cooling lines from the kit and purchased parts.

10/30/07

Kris Castillo finished the turn signal light installation and provided power to the light locations. We now have working electrical power to nearly everything.

Roberto installed the cooling system over flow tank.

11/3/07

I paid Kris Castillo $360.00 for previous work.

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11/4/07

I completed the radiator install. It is mounted with the top bracket to the chassis. I used bicycle tube as a cushion for the top bracket. The passenger lower U bracket rests on the lower AC evaporator outlet.

I got bolts and nuts for the bracket from Home Depot at $3.31.

11/6/07

I started the gas tank filler install. I cut the Mustang filler pipe per the Manual. I have now fitted the FFR steel flexible hose to the tank filler pipe.

11/7/07

Kris Castillo and I started the install of the fan temperature sensor on the engine. Kris finished the AC hose clamping to finish the AC install. We need to install the gaskets in the hose fittings.

The heater hoses will take some routing and new hoses due to the close quarters in the water pump and Alternator.

I purchased heater hose and clamps from Advanced Auto at $22.21.

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I ordered four each Pontiac Style tail lights from Parr Automotive at $169.75. They are round and flat backed like the Lucas lights but larger.

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Kit vs. Parr tail light comparison

11/8/07

I called FFR after reading the manual again about the door hinge support assemblies. I suspect that I did not receive all the door hinge support parts. After talking to Brandon Wright of FFR, I sent an e-mail describing the parts that I hold.

The e-mail, dtd November 8, 2007 states that I hold "door support brackets, driver & passenger" and hinge brackets. I am trying to identify the part numbers. I also stated in the e-mail that I do not hold the hood latch down "U-bolts" from P/N #13016. I attached three JPGs showing what I hold.

Further reading of the assembly manual and cross-checking the Parts List has determined that I hold:

1. Door support brackets, P/N #12982 & #12983
2. Hinge brackets, P/N #13566 & #13567

The "U-bolts are part of the P/N #13016 assembly.

11/9/07

In a second phone call to Brandon Wright, I determined that they are shipping the above parts.

11/11/07

I started the door assembly by cutting the openings for the door brackets to fit into. I also sorted through the door hinge assembly packet to find all the fittings.

Driver door panel cut-out

11/12/07

I made a call to FFR and talked to Brandon Wright about help with identifying all the brackets that are needed in the doors. It turns out that Brandon Wright had never worked with the GT Spyder. He had to look the parts up. I hold the Door support brackets (2) P/N 12982 & 12983 and Hinge Brackets P/N 13566 & 13567. I also asked Wright about the template package that is supposed to be in the manual. As I paid for factory cut out work, the templates were not included in my manual. I need the door and tail light templates to complete those installations.

I do not hold the door Hinge Adjuster brackets P/N 13565 (2).

I also do not hold the hood lock-down "U" bolts from Assembly P/N 13016.

All of these parts are still in the FFR inventory as they are also Coupe parts.
I sent an e-mail covering all of these issues to Brandon Wright. He finally got the e-mail on 11/13/07. He had to be refreshed about my problem on 11/13/07 and stated that the parts had been shipped. I have not received conformation about the shipment yet.

11/13/07

Castillo and I finished the heater installation. The engine is physically closed up at this point.
Auto Zone had heater fittings and additional 5/8" heater hose for $25.37

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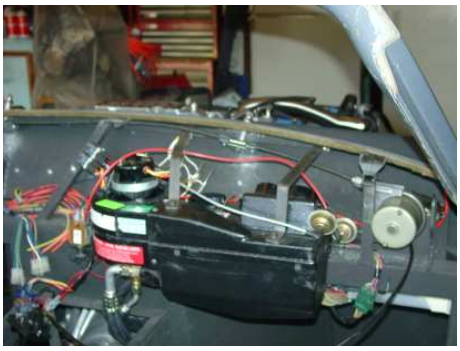
Castillo had 3 hours work.

Heater hose by-pass at water pump

11/14/07

Castillo, Roberto, and I started the windshield wiper installation. Castillo made the physical wiper motor and cable install and ran the wiper with battery electrical power from the key switch.



Wiper motor on passenger side dash

We also laid the windshield in place for the first time. It fits with little fiberglass work to be done.

Windshield in place for first time

This placement confirms that our work on the dash will take some time and redesign. We will not be able to lift the dash out of the car with the windshield in place and the steering wheel on.

11/16/07

I made calls to FFR about the ordered parts. They are on the shipping dock to be shipped Friday by FedEx.

I sent a second e-mail covering another possible parts problem about the windshield Assembly Pack, P/N 12811.

I received an e-mail answer from xxx that I had the windshield post brackets. I will furnish the bolts and nuts.

I still do not have an answer about the windshield plastic disks to hold it in place.

I also do not have a template answer.

11/17/07

I paid Castillo $400.00 for services for the past week.

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He returned parts that he had cleaned and painted, hood hinge fittings and door brace brackets that included the hood hinges fittings and door hinge brackets.

11/27/07

I received the FFR hinge adjuster brackets (2) and nose latch sticker U-bolts (2).

11/28/07

I purchased 8 each 5/16" nuts and washers from Alamo Bolt at $2.00.
I installed the nose latch sticker U-bolts and 5/16" nuts.
I painted the hinge adjuster brackets and door windshield support brackets black.

12/5/07

Castillo installed the windshield wiper tubes and completed the wiper install. The unit worked with car electrical power. Castillo had 3 ½ hours.

12/6/07

Castillo cut the body for tail lights, license lights,
Roberto and I started the nose piece rough fiberglass sanding.
I purchased a Ryobi Orbit Sander and discs for $44.57 from Home Depot.
Castillo had 3 ½ hours.
I purchased a floor dimmer switch and two speed wiper switches from Parr Automotive for $42.74

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12/7/07

Castillo finished the tail light, rear turn signal, and license plate light install and electrical power test. During the light electrical testing, we discovered that one of the four Pontiac tail light lens had an orange glow and the other three had ruby red glow. The orange tent lens was returned for replacement after a call to Parr Automotive.
I purchased a respirator for sanding of the fiberglass body.
Castillo worked 3 ½ hours.

Tail and License lights during installation

Tail and License lights in working order

12/8/07

I paid Castillo $400.00 for the week's work.
We fitted the driver door and hinge hardware. We had extensive cutting on the door to make it fit the body correctly.
We installed the emergency brake handle and started that install. We will need to shorten the cable.

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12/9/07

Castillo and I fitted the driver door brackets and hinges after cutting the door to allow the door bracket to fit in the door. We cut the latch opening in the door and fitted the door to the chassis.

12/10/07

Castillo and I finished the driver door.

12/11/07

Castillo finished the wiper electrical install and electrical power to the wiper motor including the two speed wiper switch. He fastened the wiper motor to the chassis dash. He finished the electrical to the dimmer switch.

Final Windshield wiper assembly & motor install

Roberto and I installed the passenger door brackets and hinges. We cut the door to accept the door bracket and fastened it to the door. Roberto fitted the door to the body and completed the fiberglass work on it. Roberto and Kris fitted the door to the chassis. Castillo worked from 10 am – 2 pm.

12/13/07

I paid Kris Castillo $285.00

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12/14/07

Kris and I started the trunk lid fit. We installed the trunk hinges the wrong way. There is a left and right part in the hinge kit parts.

I ordered a new hinge kit set from FFR for $42.00

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Passenger door hinged and being fitted

12/20/07

I purchased stainless 5/16 x ¾ button bolts, nuts, washers from Alamo Bolt for $5.00. These will go into the nose hinges in place of the current bolts.

2008

1/7/08

Kris and I fitted the side body to chassis 1" x 5/16 bolts and nuts.

Kris replaced the nose body hinge bolts with 34" x 5/16 bolts.

We fitted the driver side exhaust. It took some cutting and fitting in both the body and the exhaust.

Photo of the exhaust as we cut it to length fit

Photo of the driver side exhaust as fitted

Driver side exhaust mounted

1/9/08

Kris and I fitted the passenger side exhaust.

Passenger side exhaust as mounted.

We did extensive shortening on the driver side exhaust and did not have to on the passenger side. This is because of the V-8 block cylinder offset.

We changed the nose body hinge bolts.

I paid Kris $150.00 for work done.

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1/21/08

Kris and I fitted the trunk lid, aligned the hinges and installed the trunk lock. We started the dash final fit.

Trunk lid with hinges and trunk lock

1/22/08

I called Tom Thompson, AMP, about a Mustang horn wire male end with four inches wire to use to install the Mustang horn.

AMP called back to state the wire and plug were on the way.

1/28/08

We started the fiberglass dash extension to cover the AC unit and provide a console for controls, key, lights, and dimmer switch, plus radio and AC outlet.

1/29/08

We finished the fiberglass dash mold with Roberto's help.

Fiberglass mold at start

finished fiberglass mold ready with dash corners

We found a 90 degree air passage joint for the throttle body/air mass assembly.

1/31/08

We removed the dash mold backing and laid the dash fiberglass.

Laying the dash fiberglass in the mold we mfg

2/1/08

We removed the mold from the fiberglass and refitted the dash to the body. We used a fiberglass based Bondo to build the new dash to the proper thickness. The AC unit is now completely covered by the dash panel. The center console panel will contain the AC controls, key, lights, and dimmer switches. There is also room for a center AC outlet.

The panel will be sanded and filled to make it smooth. Then we will prime it for final painting.

Fiberglass Bondo for thickness buildup

I paid Castillo $677.09 for parts and service.

2/11/08

Kris and I installed the hood latches.

Driver hood latch from inside

Passenger hood latch in place

As a result of fitting the hood latches, we do not have to do as much hood body fitting as we thought.

Kris has taken the dash mod home to work on. He will sand and use Bondo to fill the dash out for painting.

2/12/08

I ordered the door inside latches from Parr today. This is a kit complete with latch cable. They are $154.95 plus shipping.

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2/14/08

I received the inside door latches from Parr.

2/18/08

Castillo and I fitted the hood latches, and cut the bottom hood panel just below the latch opening to shorten the hood side to pull it onto the body. We installed the acorn bolts and the guide fitting to the hood.

Driver hood latch from inside

Driver hood latch from outside

The shorting panel process looks like this.

Bottom edge of hood panel being fiber glassed

Look closely to see the cut and re glass

About ¼ inch was taken out of the bottom edge of the panel to make the hood conform to the body. We fiber glassed the bottom edge back to the side panel to complete the fit.

We then installed the acorn nut and the guide to the chassis body and hood.

I purchased new paint thinner at Home Depot for $10.77.

2/20/08

We made the final fitting of the hood to the body by sanding the hood edge.

We rough sanded the seams in the total body to get the body and hood rough sanded.

2/21/08

We did the final rough sanding of the body and hood.

Body and hood after rough sanding of seams

Rear of driver side after rough seam sanding

We fitted the lower front wheel well splash panels on both sides. We also fitted and attached the radiator air duct to the chassis and hood.

Air guide fastened to chassis

Radiator air duct attached to chassis

These photos show the passenger side of the radiator air duct.

I paid Castillo $510.00 for two weeks services.

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2/25/08

I finished adding the rubber gasket material to the lower splash guards. Kris finished fitting, sanding and adjusting the passenger door. We installed the passenger striker to the chassis and body. Kris fitted and installed the Parr inside door handle and fitted and installed the door wiring to the handle and door locking latch.

Passenger door striker in place

Cut-out for inside door handle

Passenger door handle installed and working

3/4/08

Kris, Roberto and I started strengthening of the hood ribs to hold the hood lift pistons. We decided to strengthen the ribs because they seemed too weak to hold the piston attachments.

Hood rib panel with fiberglass and wood strengthening applied

We applied 1/8th thickness plywood to the rib sides and fiber glassed each side.

3/6/08

We had to purchase and install 40 lb pistons to hold the hood in the up position. The kit supplied 28 lb pistons would not hold the hood in the up position.

Driver 40# piston in place

Passenger 40# piston in place

I paid Kris Castillo $450.00 for services and parts for this period.

4/7/08

Kris manufactured driver and passenger wheel well inserts using the FFR kit aluminum wheel well splash guard as cutouts. These new splash guards have been fiber glassed onto the hood behind the wheel opening.

Fiber glassed wheel wells in place

These wheel well inserts will be covered with Lizard Skin when the hood underside is painted.

4/15/08

Kris finished the dash shape modifications and we completed the basic dash install. We trimmed the excess dash modification to fit in the cockpit area. The dash will be mounted by bolts at the doors and at the center console in front of the shift lever.

I paid Kris Castillo $510.00 for services for the period.

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4/17/08

I ordered a Pioneer radio receiver kit from Crutchfield to include:
Pioneer Receiver
Pioneer IPod interface
Pioneer XM radio
Kenwood 5 x 7" 3 way speakers (pair) (Returned for 4" 3 way speakers)
Kenwood 4" 3 way speakers (pair)
Waterproof speaker backing units (4 each)

System total cost is $423.93 delivered.

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4/28/08

Kris made the final fit to the dash. We cut the radio and AC control holes in the dash.

5/1/08

Kris cut the AC outlet holes in the center console of the dash. We also cut the wiper control hole.

Center console holes cut into the dash

The starter key will go in the center console to the left of the AC outlets. The light switch will go on the driver side next to the door. An AC outlet will go on the passenger side next to the door. An under dash AC outlet will go next to the driver door under the light switch.

I paid Kris Castillo $420.00 for services.

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5/7/08

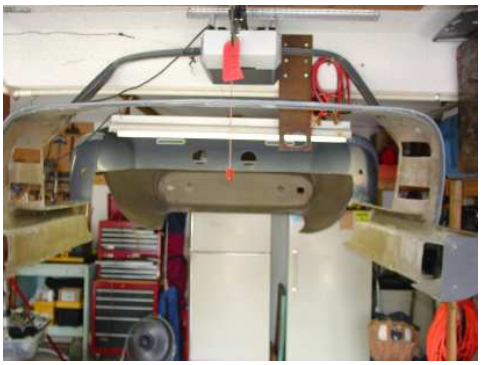
We visited a Pick N Pull to find seat tracks for the seats. I obtained a pair of Ford tracks. On placing them on the seat and checking for seat height, it turns out that any track will make the seats to high to fit in the cockpit. We will place the FFR seats on the floor pan to gain the height needed to be below the windshield and use a top later.

5/8/08

Kris cut 4 inch holes in the body back between the seats for speakers. The 5 x 7 inch speakers will not fit. They were returned for two more 4 inch speakers.

5/13/08

Cut seat belt shoulder holes in the body back of the seats to fit the shoulder straps for the seat belts. We modified a fitting to run the shoulder straps through the body behind the seats.



Speaker holes and seat belt holes in body

We removed the body and attached it to the ceiling above the chassis.

5/15/08

We added the front sections to the trunk sides for the trunk space. I attached the gasket edging material.

We attached the quad shocks to the upper IRS control arm and the body.

Quad shock on driver and passenger IRS assembly

We also moved the steel to flex brake fitting from the under side of the chassis to the side and welded each side to the side of the chassis to gain room for the quad shocks. We placed the chassis on jack stands and removed the wheels for safety inspections.

I paid Kris Castillo $630.00 for services.

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5/21/08

We inspected each brake and spindle assembly for correct fit and checked all brake lines for tightness. I called AMP about the front spindle bearings. They are sealed and are good for 75,000 miles.

We bled the brakes. We have brakes.

5/27/08

We finished installing the parking/emergency brake cables and handle. We have parking brakes.

We installed the main battery cut-off switch in the trunk on the + battery cable. Now all electrical power can be shut off on the car from the trunk for safety and security purposes when it is necessary.

Passenger rear brake assembly

Passenger front brake assembly

This is the final assembly and brake bleed position of the brake assembly at the wheels. The repositioned steel to flex brake line fittings at the rear brakes are in this set of photos.

6/2/08

We installed all vacuum hoses and AC vacuum connections and lines on the engine. The engine is now buttoned up completely. We installed the Ford Racing 9 mm distributor and plug wires.

The firing order for this engine is: 1-3-7-2-6-5-4-8. It is a 302 HO engine.

The number one cylinder is on the front right of the engine.

AMP 9 mm Ford Racing ignition wiring

I paid Cris Castillo $705.85 for parts and services.

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6/3/08

We did a trouble shoot on the Stine wiring harness to determine the fuel pump connection. The Stine harness fuel pump wire goes into the '92 Ford Mustang computer. We found that we had not connected the Ford computer harness to the computer. Once that was connected and our ungrounded wire from the harness was done, the Stine harness worked without problems.

We filled the gas tank with 5 gallons regular gas and during a test of the fuel pump from the key, got a backfire. The wiring harness works to the engine.

6/5/08

We connected the cooling fan. The fan is connected through a heat sensor on the engine to start sensing at 180 degrees. We also connected the AC electrical. It will not be plugged in until the AC is charged with Freon.

6/9/08

We were not able to make the engine run. It would fire and miss. With Roberto's help we discovered we had the plug wiring to the distributor going to the wrong plugs because we assumed the distributor turned the opposite from its right way, counter-clock-wise. Once the distributor wires were correct, the engine started with no problem. We ran it for about 20 minutes.

6/10/08

I changed the radiator cap from 16 # unit to 7 # unit.

6/16/08

Kris and I did a trouble-shoot on the instrument wiring panel electronic instruments. The power wire to the Amp gauge was not connected right. It requires both power wires in and out to be on the same post. All of the gauges worked properly when this correction was made.
The gauge readings:

1. Oil pressure 50 lbs
2. Radiator fan goes on at 180 degrees.
3. Fuel gauge shows proper fuel level.
4. Water temperature 190 to 210 degrees

I paid Kris Castillo $450.00 for services.

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6/30/08

We started the driver seat install. We will use four 3/8 grade 8 bolts, washers, and nuts on each seat. The seats will be in one place.

I purchased the seat bolts from Alamo Bolt for $5.00.

We pulled the side pipes and headers. Both header gaskets were burned out on the bottom of the gasket. This was with 25 minutes of run time. The header bolts are 5/16 x ¾ and do not have much thread in the head.

I ordered a new copper gasket set and locking 5/16 x 1 in bolts for the header install from JEGs at $96.97 ($29.99 gasket set; $54.99 bolt set, $11.99 shipping.)

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7/3/08

The Hooker header bolt face plate is too large to fit the GT-40 Ford aluminum head exhaust face. The headers were not bolting flush to the heads thus causing the gasket to burn out. A bolt in the head extends into the bottom of the matching bolt faces. Kris will grind a small section of the Hooker header at each port on both headers to clear this bolt extrusion.

Note the burned bottom edge of each port on both gaskets.

Portion of each gasket face on Hooker header to be removed

7/9/08

We finished re-installing the headers, new copper gaskets, and locking header bolts. We started the engine again for about five minutes at various RPM - 500 to 3,000.

Header face with ground area

7/14/08

We ran the engine again for about 5 minutes to check the clutch and gears. We had to adjust the clutch to completely disengage. I then drove the car on the street for the first time to the end of the block in 1st gear and then back in 1st and 2nd gears. We still have header gasket leaks that Kris will grind this week.

We pulled the headers off again to grind more of the header face to make them fit the heads.

7/21/08

Kris finished the header face regrind and re-installed the headers and exhaust pipes. We started and ran the engine for 10 minutes at various RPMs. I then learned the T-5 shift pattern and backed the chassis for the first time into the street and ran the chassis down the block and back using the first three gears.

First reverse

First run

The engine ran with no problems. Our previous smoke problem with the engine was my problem. I filled the engine with 5 qts 30 SAE 30 wt oil. The engine had 5 qts oil in it. It was over full which caused the smoke during running.

Mike Goodman, Northside Ford, visited and gave us some tips on the engine. He suggested that we re-align the fan belt tensioner and run a shorter fan belt. This will take removing the tensioner arm and drilling a new spring holder hold in the housing.

8/1/08

I ordered a fuel pressure gauge from JEGs at $44.98. This unit is mounted in the engine compartment at the fuel line rail pressure fitting.
I paid Kris Castillo $516.85 for services.

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8/11/08

I purchased a new fan belt from AutoZone at $15.13 to make the fan belt run be within tension tolerance.

Fuel pressure measured at 37# on first run.

8/19/08

The roll bar was short at the fitted location by ½ of its diameter. Kris cut and fitted in the amount (1 5/8 inches) from that we removed for height to make the roll bar fit on the chassis fittings.

We cleaned all the driver foot well wiring by attaching, cutting to fit, and routing the cable to make a neater appearance.

Driver wiring in cleaned mode

8/20/08

Kris and I made molds for the front nose piece splash guards that fit behind the head lights. We used cloth and mat fiberglass.

Front splash guard behind the head lights.

Rear and front splash guards during installation

I purchased Home Depot fiberglass material at $20.20.

8/22/08

We traveled to Seguin to find John's Junk Yard to see about a '65 Mustang name tag. It is not possible to use one.

John helped us talk to the auto license and tax person in Seguin who was very helpful in understanding Texas special car registrations.

I ordered a Parr hidden FM radio antenna for $48.63 shipped.

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8/26/08

We finished the nose/front wheel splash shields and cut the head light and access panels. We cleaned the driver foot well and dash wiring up.

Driver front splash shield with head light and access panel

I received the Parr antenna.

8/27/08

Kris completed the radio wiring including running the speaker wiring. The XM unit is mounted in the trunk. The speakers will be in the doors and behind the seats. Kris also completed the antenna install under the dash.

8/28/08 thru 9/11/08

We sprayed the Lizard Skin heat shield ceramic coating on the inside of the nose body and under side of body. The body now has heat shield inside and outside of the area by the exhaust panels.

We cut and finished aluminum panels to fit over the nose splash shields under the lights.

We also sprayed Lizard Skin in the trunk deck and sides.

Nose body with Lizard Skin heat shield

Driver body under side showing Lizard Skin shield

Driver splash shield with access port covered

We re-installed the body, doors and nose body to ready the body for final fiberglass finish.

We re-installed the tail, turn signals, and license lights and completed the electrical check. We also installed the head lights and turn signals as noted above.

The electrical system checks out completely.

9/16/08 – 9/20/08

We started the body work with body filler Bondo. Only the nose body and light areas remain to be prepared for primer paint.

Body readied for primer

9/17/08

I paid Kris Castillo $510.00 for services.

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9/18/08

We completed the body work sanding and filler on every side except the area around the lights front and rear, cockpit body, windshield frame, and inside doors.

I paid Kris Castillo $254.00 for service and parts.

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10/9/08

I visited Alamo Body and talked to Shane Blocker. I am to call Shane when we are ready to bring car to Alamo Body for Augie to prime and paint.

Body rough sanded and ready for primer

10/11/08

We completed the lights front and rear, cockpit body and wind shield frame plus the door insides.

10/14/08

We completed the body work on the windshield frame.

Windshield frame body work

We completed the install mount of the windshield wind shields.

Driver head light wind shield

We also welded the seat bolts to the driver seat bracket while the seat was placed in the car. We can now re-mount the seat bottoms. We also placed the passenger seat and completed its install bracket weld.

10/15/08

We found that the supplied rear view mirrors would not work with the driver seat location. We will not install them.

The car is ready for painting.

10/16/08

We installed the driver and passenger door jam panels. The passenger panel fits very well with no binds. The driver panel will need some work to make a good clear fit.

10/17/08

I rented a U-Haul auto transport at a cost of $54.95 for one day to move the car from the house to Alamo Body.

10/21/08

I cashed a check for paint at USAA for $1,500.00 and paid Augie Santiago $1,000.00 of the $4,000.00 owed.

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I got photos of the first primer cover.

Driver side initial primer cover at Alamo Body

Passenger side initial primer cover at Alamo Body

The primer and finishing body work by Augie Santiago has turned out to be the best I have seen. He has removed all blemishes that we had not covered over the entire body. Augie has arranged for the windshield installation. I am to take the windshield to him the next time I go to Alamo Body.

11/3/08

Kris and I went to J. F. Hagan Distributor, Inc for new gasket material. We purchased high quality rubber gasket with attaching grooves to replace the material that comes apart from the kit. We now have dash gasket to fit at the windshield edge of the dash. We also got trunk lid gasket material. We finally got thick flat gasket material for the hood / body fit.
The cost of the Hagan gasket material is $69.31.

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We saw the red paint job for the first time. Kris commented that this is a really good paint job.

First view of red paint

Red paint job

I got the final payment in cash from USAA today. It is $3,000.00.

11/6/08

I paid Augie $1,000.00 for paint services. I delivered the windshield. He will call Saturday about the finish schedule.

11/10/08

Augie called to give me a status of the car. The paint job is complete. They fine sanded and buffed the car paint. They have had some problem re-installing the doors. We may need to install washers on the body to door hinge bracket to move the doors forward. Augie painted the underside of the hood and in the cockpit with flat black paint.

I am taking the windshield install instructions to Augie this afternoon.

I ordered a glue-on inside rear view mirror from Parr Automotive for $67.95 with $8.26 shipping. The total is $76.21.

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We will not use this mirror.

11/12/08

I talked to Augie. They have finished final fitting the doors by placing washers ahead of the door hinge bracket at the frame connection. There was some question about screws in the body under the windshield. I told Augie that we were not going to install these screws. We arranged to pick the car up on Saturday morning.

Augie reported that the hood came down on him during some of the work. It seems that the paint added over three lbs of weight to the hood and the 40# pistons will not hold it up. We may have to reposition the frame ends of the pistons or get 60 # lb units to hold the hood up.

The Parr rear view mirror arrived.

11/15/08

I picked the U-Haul Auto Transport up in the morning to pick the car up from Alamo Body and Augie. Augie provided 1 pint paint for touch up work. He had finished the dash and made one minor paint adjustment to it. I paid Augie the final payment of $2,000.00 for the paint job. Kris thinks it is one of the best paint jobs he has seen in a while.

I returned the U-Haul trailer to U-Haul. It was $54.95.

The Spyder in the sun

Second photo in sun

The windshield was done at Alamo Body.

Final windshield fit

We will need to take the Spyder back to Alamo Body windshield installer to fit a bead of silicone around the edge of the windshield to fill the gap between the windshield and the windshield frame.

Final dash paint before instrument install

11/19/08

I have made contact with San Antonio Police Dept Theft Division to get the car inspected for serial numbers, and chassis numbers. The Inspector is Ray Dustin, who made the inspection and sighted the chassis number, 022, and the engine number. He looked at my paperwork and did not make any comment about the fact that I did not have a car serial number or other identifying mark on the car. I did not show him the FFR name plate with the FFR serial number on it. Dustin signed the VIN application papers. He did not tell me that I needed the FFR serial number attached to the car.

I rented a U-Haul Auto Transport trailer again for $54.95 to make the inspection.

11/21/08

I visited the TXDOT office about the VIN number today. I was told by the supervisor that they could not issue a VIN number if the number on my certificate of origin was not on the car. I am now waiting for the supervisor to call Dustin to make a determination about the serial number. I showed the supervisor the FFR Name Plate with the FFR S/N on it.

I have made contact with the Robert C. Dietrich Agency about insurance. Rosie, 210 690 6061, has arranged with Grande insurance to cover the car. It will be insured for $55,000.00 per year. The cost is $764.00 per year. She is e-mailing the application to me.

11/23/08

I returned the dash to Augie for touchup after my cat, Truck, or another cat knocked one of the seats over on it. A bolt in the seat cut a gouge in the top of the dash. Augie will fix it during the holiday.

12/02/08

Trip back to the TXDOT office about my VIN number found that I can attach my name plate to the car and go to the license and title office. My VIN number is **FFR4526GT.** I can now go to the title and license office and obtain my title and license.

I obtained a new set of hood struts that are 120# each. I obtained a pair of them from O'reillys for $41.06. These units were returned for 80# units.

12/4/08

We completed the final assembly of the rear lights, license holder, and license lights.

Rear lights

We also completed the final assembly of the front turn signal lights and head light shields.


Front turn signal lights and head light shields in place

We placed the weather striping on the body for the hood and adjusted the hood latches for final fit.

We installed new 80# hood struts in place of the 120# units we returned to O'reillys.

We installed a glue-on rear view mirror from O'reillys.

12/5/08

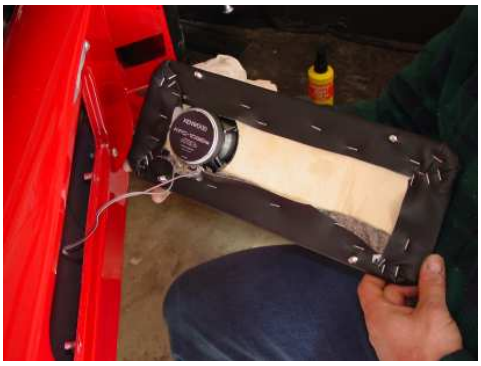
We started the radio speaker installation by installing the trunk speakers and the driver door speaker.

We also installed the hood vent screens. We purchased additional weather stripping from Hagan for $29.73. We used Locktite Power Grip Construction Adhesive to secure the screens.

Hood screens in place

Rear and rear view mirror in place

Trunk view of speakers and XM radio unit over battery



Driver radio speaker installation

Final driver door speaker position

We used marine vinyl material to cover the door panel wood insert.

12/8/08

We completed the passenger door speaker unit. We installed both side exhaust pipe units. We installed the FFR Name Plate with the car's VIN number on the passenger foot well. We picked up the repaired dash panel.

12/9/08

We installed the dash and tested the electrical circuits.

Final dash installation with everything in place

The A/C blower works through all the vents.

12/12/08

We completed this phase of the car. It is ready to drive on the street. We had to trouble shoot the blinker system and found that the blinker had shorted the fuse out. We replaced the blinker and fuse. We also had to trouble shoot the passenger door latch. The latch cable bolt had come off and we had to replace it. The hazard blinker is not used. It is a blinker spare.

We installed the windshield wipers.

The only items left to do are to connect the speedometer and install the roll bar.

I paid Kris Castillo $260.00 for services.

12/15/08

I completed the title, registration and licensing for the car. The VIN number is **FFR4526GT**. I have applied for a special license number which is Texas **GT SPDR**. The title, license and sales tax fee was $2,047.42.

12/19/08

Kris connected the speedometer cable to the speedometer.

I received the California Car cover. It is a Weather Shield HP cover. I received a cable/lock for it as well. It is red. The cover and lock assembly was $329.99.

2009

1/4/09

I received the license plates.

1/5/09

I made a test run and discovered that the speedometer was not working.

1/6/09

Kris Castillo repaired the speedometer. It was not connected at the speedometer.

1/7/09

Kris re-wired the radiator fan to turn on/off at the key switch. It was running too long as wired to the heat switch on the engine.

We also discovered that the IRS spindle axle hubs had movement and required adjustment. We called AMP and discovered that each spindle nut needed to be torqued to 300 ft lbs. We tightened each spindle nut to 300 ft lbs.

1/8/09

I received the Texas Safety Inspection Sticker from Northside Ford. It was $14.50. We also determined that the computer would not provide codes.

THE CAR IS COMPLETELY READY TO DRIVE.

1/9/09

Final safety inspection photo

This is the first photo of the finished car taken to show it.

1/10/09

We discovered during the safety inspection that the car was running rich. It is pumping to much fuel and is bleeding unburned fuel through the exhaust. We will need O2 sensors in the exhaust to be able to control the fuel and to be able to read the computer codes properly.

The Spyder headers are split into two pipes on both sides. The O2 sensors need to be at a point where all four pipes come together. We can get particle control of the fuel with O2 sensors installed in ½ of each side, i.e., making the computer read ½ of each side. We also found that this engine runs lean at cylinders #1 and #8. it was recommended by others that we install the O2 sensors on cylinders not related to #1 and #8.

We selected to install buns on cylinders #3 and #4 on the left side and #5 and #7 on the right side.

1/17/09

We confirmed the above information at Alamo Performance (Roy) and purchased two buns for $20.00. I also purchased a Ford Racing Relay Package with O2 sensors from Northside Ford for $117.95.

1/19/09

We installed the buns as noted above on each side of the exhaust system. Kris welded the buns into the header pipes where each cylinder is connected to the other in the pipe. He also extended the O2 sensor cable on the driver side to reach the new port.

Bun welded into the driver side

Final sensor installed on the driver side.

This made a noticeable change in start up, idle, and low speed driving.

2/2/09

Kris made a change to the dimmer switch location. It had been mounted in the driver foot-well next to the 2 x 2 frame support. Due to the close quarters for feet in the driver foot-well, I separated one of the electric cables. We moved a new push switch to the 2 x 2 cross member frame under the dash. It will be activated by hand.

2/3/09

I arranged to take the car to Alamo Speed Shop for a final tune-up. They found that we had #5, #6, and #7 plug wires crossed. They installed a new coolant sensor and replaced all 8 plugs. They set the IAC, Taps, and adjusted timing to 10 degrees. 210-967-8900

They checked the computer and got it regulated.

Cost was $407.08.

They also recommended General Brake and Alignment as the place to get the final alignment.

2/10/09

General Brake and Alignment worked on both front and rear to bring everything to final alignment. They changed the IRS to 0 camber and 3 ¼ caster and 1/16 toe-in.

The rear was set at 0 camber, 1/16/ toe-in.

Cost was $130.00.

2/12/09

I made my first night run and discovered that the head-lights are intermittent. They come on when the switch is pulled and after a time, go out. Then later, they come on. At first, I thought that a wire was loose. Then, when the car was standing still, engine running and lights on, they again went off. There may be a heat problem in the head-light switch.

Kris and I are going to trouble-shoot this problem.

2/16/08

I have entered the car in the FFR forum and rally.

3/28/09

My Spyder among a bunch of Snakes!

Step-by-Step Chassis Build-up

4. Assembly Notes:

Back ordered parts:

a.	Front half body	rcvd 10/5/06
b.	Roll Bar	rcvd 10/5/06
c.	Weather strip, rubber seal, adhesive-back, 15 ft	rcvd 12/8/03
d.	Radiator hose filler	rcvd 12/8/03
e.	Overflow tank tubing, 4 ft	rcvd 12/8/03
f.	Leather check strap, (2)	rcvd 12/8/03
g.	Hinge bushing, (8)	rcvd 12/8/03
h.	Adjustable hinge arm assembly – driver	rcvd 12/18/03
i.	Adjustable hinge arm assembly – passenger	rcvd 12/18/03
j.	Hinge adjuster bracket, (2)	rcvd 12/18/03
k.	Door frame assembly – driver	rcvd 1218/03
l.	Door frame assembly – passenger	rcvd 12/18/03
m.	Boot, emergency brake, black vinyl	rcvd 12/8/03
n.	Seat harness, black, (2)	rcvd 12/8/03
o.	Exhaust frame mount assembly, (2)	rcvd 12/18/03
p.	Windshield, tented	rcvd 1st ship.
q.	Windshield support, driver	rcvd 12/18/03
r.	Windshield support, passenger	rcvd 12/18/03
s.	Windshield support fastener assembly	rcvd 12/18/03
t.	Water temp gauge	rcvd 8/11/04
u.	Aluminum panel, trunk wall, driver	rcvd 2/18/04
v.	Aluminum panel, trunk wall, passenger	rcvd 2/18/04
w.	Aluminum panel, rear splash guard, driver, #13506	rcvd 8/24/04
x.	Aluminum panel, rear splash guard, passenger, #13507	rcvd 8/24/04
y.	Ceramic coated side exhaust, L/R, (2)	rcvd 1/14/04
z.	Engine exhaust tube assemblies, headers, L/R (2)	rcvd 6/18/04
aa.	Wiper arm, (2)	rcvd 1/12/04
bb.	Coupe A/C assembly, complete	rcvd 12/18/03
cc.	Front tubular lower control arm, L/R, (2),	rcvd 12/5/03
dd.	Front Upper A-Arms (2)	rcvd 6/18/04
ee.	IRS Lower control arm, L/R, (2), #12428 & #12429	rcvd 8/20/04
ff.	Radiator air duct aluminum assembly, FFR # 12793	rcvd 8/11/04
gg.	Radiator air duct aluminum panel, FFR # 12844	rcvd 8/20/04
hh.	Radiator air duct aluminum panel, FFR # 12845	rcvd 8/20/04
ii.	Radiator air duct aluminum panel, FFR # 12991	rcvd 8/20/04
jj.	Radiator air duct aluminum panel, FFR # 12992	rcvd 8/20/04
kk.	Radiator air duct aluminum panel, FFR #12800	rcvd 8/20/04
ll.	Battery tray assembly	
mm.	Radiator overflow tank	rcvd 8/11/04
nn.	Transmission top panel	rcvd 10/5/06
oo.	A/C engine mount	rcvd 9/1/07
pp.	Hinge adjuster brackets (2)	rcvd 11/28/07
qq.	Hood latch down “U-bolts” (2)	rcvd 11/28/07
rr.	Cut-out templates for manual	
ss.	Trunk hinges	rcvd 12/21/07
tt.	Door latches (Parr Automotive)	rcvd 2/14/08

uu.	Crutchfield Pioneer Radio kit	rcvd 4/17/08
vv.	JEGs SB Ford copper gasket set	rcvd 7/2/08
ww.	JEGs locking header bolt set	rcvd 7/2/08
xx.	JEGs fuel pressure gauge	rcvd 8/11/08
yy.	Parr FM hidden antenna	rcvd 8/26/08
zz.	Parr internal glue-on rear view mirror	rcvd 11/12/08
aaa.	O'Reilly internal glue-on mirror	rcvd 12/5/08
bbb.	California Car Cover	rcvd 12/19/08

5. Engine Assembly and Mustang donor parts:
From AMP Performance

a. Crate Engine, Ford M-6007-XB3M GT40 rcvd 10/20/06
- Ford M-6670 A50 Fox Conversion kit on engine
- Ford 24 lb injectors rcvd 10/30/06
- Ford 75 mm 24# conical Mass air EFI rcvd 10/30/06
- Ford GT 40 5.0 EFI Manifold kit, M-9424-251 rcvd 10/30/06
- EFI bolts for lower Manifold rcvd 11/16/06
- EFI Air Flow tubing BBK from JEGS
- Water outlet connector
- Adjustable fuel regulator
- Ford Intake gasket kit rcvd 10/30/06
- Ford 65 mm TB & EGR spacer
- Ford Mass Air Unit bracket BBK from JEGS
- Ford TPS sensor on TB
- Ford IAC motor red box
- Ford Adjustable fuel pressure regulator
- Ford distributor, cap & rotor rcvd 11/16/06
- Ford Distributor clamp, bolt from AMP rcvd 11/16/06
- Ford spark plugs, Motorsport wires 5.0 rcvd 10/30/06
- Ford Hi-AMP Alternator & kit rcvd 11/16/06
- Ford Alternator brackets, bolts rcvd 10/30/06
- Ford tensioner pulley, bracket, bolts part of bracket
- Ford alternator pulley, bolts rcvd 10/30/06
- Ford crank pulley, bolts
- Ford Hi-torque starter, cable rcvd 11/17/06
- Ford starter plate on engine
- Ford starter bolts Northside Ford
- Mustang engine harness kit (engine, dash, 02, fuel) recd 5/30/06
- Ford O2 sensors rcvd 11/16/06
- Luk Clutch kit rcvd 10/30/06
- Ford throw-out bearing, fork lever from Ford
- Clutch to flywheel bolts from Ford
- Mustang Bellhousing , cable rcvd 10/30/06
- Pivot ball, bolts, Northside Ford
- Throw-out fork lever plate, bolts Northside Ford

b. Crate Transmission, BW T5 rcvd 10/30/06
- 2.95 first, 1.94, 1.34, 1.00, .63 OD
- Roller tapper bearings, bolts

c. Ford, engine rubber mounts & bolts rcvd 11/16/06
d. Ford, transmission rubber mounts & bolts rcvd 10/30/06
e. FFR Drive shaft, shortened & balanced rcvd 12/8/06
f. EEC-IV Computer & cradle rcvd Stine / 11/16/06

g.	Power Booster Push Rod	rcvd
h.	Pedal Box, Accelerator Pedal & Clutch Cable	rcvd 11/21/05
i.	Mustang brake master	rcvd
j.	Baer adjustable proportional valve	rcvd 1/17/06
k.	Shifter & Shifter Handle	rcvd FFR
l.	Wiring Harness, front	rcvd Stine / 11/16/06
m.	Wiring Harness, dash	rcvd Stine / 11/16/06
n.	Fuel Inertia Cut-Off Switch	
o.	Wiring Harness, rear	rcvd 5/30/06
p.	Rack & Pinion assembly	rcvd 8/2/04
q.	Rack & Pinion bushings	rcvd 7/23/04
r.	SN 95 front spindles/hubs, bolts	rcvd 7/23/04
s.	Baer Bump Steer kit	rcvd 7/23/04
t.	Baer 13" slotted/cross rotors, pair	rcvd 7/23/04
u.	Baer two piston calipers, brake lines, pair	rcvd 7/23/04
v.	21 tooth speedo gear	rcvd 7/23/04
w.	97 T-bird IRS posi-traction 8.8 rear end	rcvd 5/25/04
x.	Rear end o/h, 3.73 rack & pinion, Auburn 28 spline, seals	rcvd 5/25/04
y.	Baer 12" slotted, cross rotors, pair	rcvd 5/25/04
z.	Baer two piston calipers, brake lines, pair	rcvd 5/25/04
aa.	Emergency brake cables, Baer	rcvd 5/25/04
bb.	Emergency brake handle, Mustang	rcvd 9/26/04
cc.	New Mustang fuel tank	rcvd 9/26/04
dd.	Mustang filler neck	rcvd 1/17/06
ee.	New 190 LPH Fuel Pump, sending unit,	rcvd 9/26/04
ff.	Mustang fuel filter	rcvd 8/6/04
gg.	Mustang fuel filter bracket	rcvd 9/26/04
hh.	Mustang Vapor Canister	
ii.	Ford 17 x 9 Cobra R silver wheels, front, pair	rcvd 8/6/04
jj.	245 45 ZR17 NITTO 555 tires, front, pair	rcvd 8/6/04
kk.	Ford 17 x 9 Cobra R silver wheels, rear, pair	rcvd 8/6/04
ll.	275 45 ZR17 NITTO 555 tires, rear, pair	rcvd 8/20/04
mm.	Chrome lugs and lock kit	rcvd 11/17/04
nn.	Mustang front brake line mount, pair	rcvd 8/6/04
oo.	Mustang rear brake line mount, pair	rcvd 9/26/04
pp.	Mustang horns, pair	rcvd 11/16/06
qq.	Mustang throttle cable	provided by FFR, new Ford cable
rr.	Mustang Quad shocks	rcvd 11/16/06
ss.	Mustang Fog Lights, pair	rcvd 11/17/06
tt.	Mustang speedometer cable	rcvd 11/17/06
uu.	Crutchfield Pioneer radio system	rcvd 4/30/08
vv.	Hood struts, pair, #120 each, returned	rcvd 12/2/08
ww.	Hood struts, pair, #80 each	rcvd 12/5/08
xx.	Ford Racing O2 sensor assembly	rcvd 1/17/09

6. Chassis Build-up:

a. Chassis Delivery

Chassis delivered by Stewart Transport on 11/20/03. Partial delivery with several parts on back order as noted above. Ray Stever, driver, went through the delivery package of manual addendum directions and Parts Lists. Stever stated that Stewart could provide donor parts vendor. Colin Stewart did call with AMP Performance, Phoenix, AZ, 1 (800) 454 8387. Ask for Tom (Thompson).

Do a through parts inventory as soon as possible after the kit arrives as things get left out. This is really important as some of my FFR parts were not shipped until nearly three years later. I am still attempting to get the full bill of goods.

Chassis sat on jack stands after body removed. Work area may be limited in this garage. Storage will be problem in the work space. I will need to time deliver donor and FFR backorder parts.

Take some time to plan out the work space for a project of this magititude. The garage space should have at least 15' x 15' foot print space to work on. It should electrical have power and storage space for parts until they are required. I will repeat this often in the course of finishing this project.

b. **Body Removal**

Rear body removed on delivery with help from the Stewart driver, Ray Stever. Rear body panel, doors and dash stored in back yard and tool shed. Front body panels on back order. Remember these steps in the re-installation of the body sections during the final assembly stages later.

One very important point to remember at this time is to have plenty of space to lay the chassis, parts, and work space out. At least 15' x 15' space is needed, with 20' x 30' preferred. I do not have that kind of space in my garage. I also do not have enough storage space to hold the complete parts inventory at one time.

Rear half of body is being stored in back yard. FFR representative told me that the weather would not hurt the fiberglass components as the body is stored in the open. It may help in that the sun will help cure the fiberglass to bring out all the air bubbles.

Note: A body buck is needed to keep the body from spreading out when sitting on the ground. I did not do this and may have body to chassis fitting problems.

Received the front body shell and stored it in the back yard during 2006.

1. **Body is shipped setting on frame**.

Rear section body arrived on Spyder frame. # Six screws hold the body section to frame. Use ¼ socket to remove screws and save them.

The time to remove the screws and the rear body: 20 minutes

2. Using two people, one person on each side of the body to hold the body in the wheel area for removal.

This keeps door side panels from bending. Rear body section stored in back yard. Stever assisted in removing the rear body section from the frame. Mark each piece at it is attached to the frame with some method so that it will be identifiable later when you need it.

3. The Nose section removes easily from the front. Slide it forward before lifting off.

My nose section was shipped separately in 2006.

4. Carefully pull the front sides of the body out and up around the door hinge mounts while at the same time lifting the rear of the body.
5. Rotate the back of the body down and the front up once the back is clear of the frame.
6. Remove the body by walking towards the rear of the frame.
7. Store the body on the ground using two 43" 2" x 4" wedged over the doors to keep the sides from having a lot of weight on them.

Time to Complete: 45 minutes

c. Aluminum Panel Removal & Preparation

First photo taken from the rear of the passenger side showing aluminum panels temporarily in place. Second photo taken after the chassis was turned on its passenger side for work underneath.

1. Mark each panel and take pictures of how the panels fit together (e.g., which panel lies on top of which).

The alignment of the foot-well panels will provide some problems in getting them back in place without bending. The panels were marked and stored for re-installation.

Additional photos of the cockpit aluminum panels before being removed for work.

2. Mark the floors, trunk walls and floor, and cockpit rear walls for the rivets before removal. To get straight and evenly spaced rivets, draw on the underside of the aluminum panel around the frame members with a black permanent marker.

Mark each side of the panel on all frame members to show where to drill the rivet holes later.

Panels were stored in shelf area adjacent to work space. The frame members are marked on the bottom side of each panel. I intend to drill the 1/8" holes two and three inches apart. Be very careful in replacing the panels. Try to get them back in place in the order they were removed. Each sheet metal aluminum part needs to be identified with a marker in some fashion.

Drill the 1/8" rivet holes in the panels as they are taken out. I did not drill them at the time and now much time is needed to drill each panel.

Take some care in marking the chassis rails on each panel. Then take care in drilling the center line each marked location.

3. Remove any screws holding the panel to the frame and remove the aluminum panels. Using a ruler and marker, mark every 3 inches along the centerline of the pen outline on the aluminum.

I will use 3" rivet spacing in all parts of the cockpit except in the driver and passenger floor and firewall, where I will use 2" spacing.

4. Drill the marks with a 1/8" drill bit.
5. Position the frame in the workspace with plenty of room to move things around. Use jack-stands to place the frame on.

I do not have extra room for chassis and parts layout. This is a problem. To drill the panels, I am using a 2" x 4" frame that I have used in the past as a ply wood cutting table. This gives plenty of work room.

6. Frames are shipped painted black or powder-coated semi-gloss black. After the freight ride there may be places that need a quick touch-up. Use fingernail polish or enamel model paint for powder-coated touch-ups and flat black spray paint for black paint touch-up. **Frame paint is DP-90 Flat Black.**

NOTE: The spacing of the rivets is a personal preference. The kit includes enough rivets to space them every 3 inches except in the foot-boxes where spacing is every 2 inches.

Time to Complete:	20 minutes
Panel marking & drilling time to Complete:	165 minutes

d. Brake Lines, Front and Rear

1. Rear Brakes

Start at the master cylinder area leaving a little extra line. Run the brake line straight down the front of the foot-box and back under the driver's side on the outside of the 4 inch round tube fastening it to the 2 in x 2 in cockpit outriggers using the small size insulated line clips (FFR # 10970) and screws provided with the kit.

It is hard to get under the chassis and press a drill up to drill holes of the insulated clips that hold the brake lines in place as they are run to back of the chassis. This is another reason to have really adequate space around the chassis build-up. A lift is needed to hold the chassis and to install some of the components such as the IRS differential.

The 3/16-inch steel brake line (FFR # 10785) is provided with the kit. Bottom driver side rear looking forward, brake line placement.

At this point, it may be a good thing to rotate the chassis to its side for easy working on all the things needed to be done on the bottom of it. The steel brake line and fuel lines are the first parts that benefit from having the chassis on its side.

Time to complete: 45 minutes

Installing the gas tank, fuel filter, and battery assembly in the back part of the chassis is another installation process that benefits from having the chassis on its side.

2. Run up along the backside of the 2 in x 3 in frame members and across the ¾ in tubing that runs down forward to the transmission rear mount.
3. Attach the line to the frame with the small size insulated line clips (FFR # 10970) and screws provide with the kit.

Drilling the outriggers was easy enough. It is best to have a titaumim bit for this drilling. The main round frame and some of the 3"x4" frame members are very hard to drill. The front frame upright and cross-member is too hard to drill. I welded three small bolts at this area to hold the passenger brake line assembly. It turns out that I was attempting to drill in the weld. I should have drilled at the edge of the frame member.

4. Connect the lines to the Mustang brake line connectors using a double flare tool.

I am using brass connectors with brass flares that tighten and seal the line into the connector when placed on the line.

This is a mistake. Double flared fittings are required on the steel brake lines. I had to replace the original steel brake lines with new 45 degree double flared fitted lines. I had help in getting this replacement task redone. Kris Castillo led this task showing me how to make the double-flared lines.

5. Drill two holes for the Mustang brake line bracket on the underside of the 2 in x 3 in frame member and mount the Mustang brake line bracket.
6. Attach the brake line to the Mustang mount.

Having the front and rear Mustang brake line brackets in hand for this work is a must. I did not have them on hand, and have had to delay working on the bottom areas under the chassis for a considerable time.

Mustang steel to flexible brake line mounts for rear. mount.

Front Mustang steel to flexible brake line

Rear brake line to flexible mount showing steel line and flexible connection assembly.

Time to complete:	180 minutes
Time to remove inserted fittings and line:	45 minutes

We relocated the rear steel to flex brake line brackets from under the chassis to a weld on the chassis 2 x 4 steel frames to gain flex brake line clearance with the quad shock installation.

Time to complete	45 minutes
Time to complete re-location	60 minutes

7. Front Brake Lines

8. Attach the flexible brake line to the frame mount behind the upper A-arm attaching points on the ¾ inch square tubing.
9. Use the Mustang Circlip to attach the stock flexible rubber line.
10. From the driver foot-box area, run the right front brake line forward along the ¾ inch tubing to the front side of the "X" member for a clean engine appearance. Go down along the "X and up again, then along the ¾ inch tube to the brake bracket.

I welded three ¼ "x ½" bolts to the "X" frame member and attached the cross-over brake line to it using the small line clips.

11. Run the brake line back towards the driver's foot-box.
12. Attaching the brake lines to the master cylinder will be done later.

2/14/04	11	each brass male connectors 3/16 inch flare	@ $1.69	$18.59
	1	each brass street tee 3/16/inch x	@ $3.99	$ 3.99
	1	each brass coupling	@ $1.39	$ 1.39
	3	each brass ¼" x 3/16" m/f	@ $1.79	$ 5.37
	3	each compress brass	@ $ .59	$ 1.57
	4	each male to male 3/16 inch connectors	@	$ 6.25

Passenger flexible brake line assembled.

Driver flexible brake line assembled.

The Mustang front steel to flexible brake brackets were drilled and attached to the driver and passenger upper 1" x 1" chassis brace using the supplied Mustang ¼" self-tapping screws. The Mustang retaining brackets were used to secure the Baer flexible brake line to the Mustang bracket. The Baer flexible brake line was attached to the front calipers using the Baer attaching bolts and copper washers.

Make sure that flanged fittings with double flared steel brake line ends are used. I had to redo my brake lines at my cost because I did not use flared fittings.

Time to complete:	186 minutes
Time to redo brake lines:	360 minutes

e. Fuel Filter

1. Mount the bracket and filter on the inside of the passenger 2" x 3" rear trunk frame extension as shown in the photo.

2. Make sure the fuel line will not get in the way of the tire or rear lower control arms. Fasten the lines securely to make sure there is sufficient clearance.

Attention: Make sure to install the fuel filter in the correct flow direction. Determine whether or not a new filter is needed. It is a good general rule to replace the filter no matter what. Some of the fuel filter bracket may have to be cut off to fit the space under the frame and above the IRS cage.

Fuel filter bracket and fuel filter lay out before installation. Fuel Filter bracket after modification.

Fuel filter and bracket mounted on passenger side of the frame at the end of the 3" x 2" frame tube.

The Mustang fuel filter bracket had to be cut on the top and end of the frame mounting positions to fit on the chassis. Mounting and routing the fuel and return lines required drilling two holes in the chassis for self tapping screws.

Time to complete: 128 minutes.

f. Fuel Lines

1. The ¼ inch return (FFR# 10784) and 5/16 inch (FFR# 10783) fuel lines are provided with kit. The vapor line is used from the Mustang donor.
2. Temporarily install the passenger floor on the frame.
3. Measure four feet of both lines with a marker pen. Use a tube bender of appropriate size to make a 90 degree bend at the point marked as seen in the photo. This bend goes in the front middle of the passenger foot-box so that the lines stick straight up in the air. Leave sufficient length for engine type/placement.

I measured both steel lines and bent them at the same time. I used tie raps to hold them together. There may be a clearance problem with the lower IRS control arm on the passenger side between it and the fuel line bundle.

Note: The '93-'95 Mustang fuel rack connectors are no longer available. We had to remove the FFR steel fuel line and install after market flexible slip on fuel intake and return line from the fuel rack to the tank. The steel fuel lines were removed and after market fuel intake and return fuel lines were installed. This setup connects with the Mustang fuel rail. These fuel lines are after market high pressure racing flexible lines.

4. From the passenger foot-box, go towards the first 2" x 2" frame outrigger alongside the 4" round tube.
5. Fasten the lines to the 2" x 2" square cockpit outriggers with the insulating line clips.
6. In a similar fashion to the rear brake line, run the fuel lines up the outside of the 2" x 3" frame member. It may be easier to turn the frame on its side to do this.

I turned the frame on its side to complete both the brake line and fuel line installation. I plan on doing as much as I can to the underside of the frame while I have it on its side.

7. Run the fuel lines to the inside of the frame after the lines pass the angled ¾ "tube. See previous photo.
8. Run the 5/16" line to the fuel filter. Cut the 5/16" line three to four inches from the fuel filter.

9. Continue the ¼" line to the end of the 2" x 3" frame member.
10. Bend the ¼" line so that it will cross the fuel return connector (the smaller tube) on the gas tank.
11. Cut the line four inches from the connector.
12. Double flare the ends of the fuel lines. Use the ¼" flexible line (FFR#10997), 5/16" flexible line (FFR#11051), and fuel injection hose clamps (FFR#10855) to connect the Mustang connectors to the hard line.
13. Attach the connectors onto the fuel filter and fuel pump.
14. Run the vapor line to the plastic connector on the fuel tank along with the hard line to the fuel canister, which will be mounted later to about where the fuel lines end up in the engine bay.

There may be a clearance problem with the rubber fuel line that runs from the steel line to the exit side of the fuel filter. This rubber line passes over the passenger frame shock mount. Longer rubber fuel line may be required so that a grommet can be attached to the frame tubing above the shock mount to clear the rubber fuel line.

Both the fuel lines and the rear brake line may require re-routing to clear the lower IRS control arms on both sides.

This was confirmed by the mechanics at Alamo Body. The fuel lines need to be re-routed away from the passenger side lower IRS control arm. The reroute was completed when we installed the after market fuel lines.

I re-routed the fuel and return lines to add clearance by the passenger IRS lower control arm.

Time to complete.	65 minutes
Time to re-complete	60 minutes

Attention: Some carbureted fuel pumps do not require a return line. Read the instructions from your pump and carburetor.

I am using the Ford GT-40 Mustang 5.0L EFI manifold kit throttle-body injection assembly, 65 mm unit. I will need the return fuel line.

Fuel line routed to the fuel filter installed on the passenger side frame. View of fuel filter mounted before gas tank installed. Fuel return line mounted close by the fuel line.

Fuel Vapor Canister

1. The emissions canister can b e mounted to the right side of the engine bay on the outside of the ¾" horizontal tubing just behind the mass air meter.
2. Drill two 3/16" holes through the canister bracket OEM holes. Mount w/two #14 screws. See the photo below.

3. Attach the vent hose from the gas tank to the canister and the hose leading to the engine.

g. Front Suspension Installation

Attention: Use extreme caution when working with coil springs. If you are using 1994 or newer spindles, make sure you have the correct IFS brackets. The 1993 and earlier measure 4.75" tall and the 1994 and later brackets measure 5.75" tall.

Parts: Front suspension Ball joint bracket assembly (FFR # 10918), independent front suspension assembly (FFR # 12741), optional tubular front control arm assembly (FFR # 12066), OEM spindle bolts, Mustang spindles, brakes, and rotors.

Front Upper A-Arm

Attention: There is no specific left or right control arm, they are interchangeable.

Upper FFR front control arms.

Upper FFR front control arms with ball joints.

1. Install the ball joints into the control arms making sure to orient the arm according to the drawing below.

Note the ball joint insert fitting angle and orientation.

2. Install the arms using the outer mounting holes on the mount plate.
3. Torque the two bolts that hold the arm to the frame to 100 lb-ft of torque.

The Ford bolts were torqued to 100 lb-ft.

4. Slightly loosen the three pivot bolts using a 5/8" and 11/16" wrench.
5. Loosen the jam nuts on both ends of each adjusting tubes using a 1-1/8" wrench. Turn the adjusting tubes to lengthen or shorten the arm.

The jam nuts were tightened down on the adjusting tubes after the preliminary alignment was completed by Alamo.

6. After you have adjusted the arm to the desired length, tighten down the jam Nuts, against the adjusting tubes, and then tighten each of the three pivot bolts to 40-lb-ft of torque. There should never be more than 1" of thread showing past the tightened down jam nuts on either end of both adjusting tubes. The cross shaft comes pre-greased from the factory. Re-grease both ends frequently to insure smooth trouble free operation.

The jam bolts were changed to the FFR supplied replacements and torqued to 40 ft-lb. The new specification calls for 60 ft-lb.

7. Insert the ball joint into the IFS bracket (FFR#10918). This bracket replaces the Mustang strut. Be sure to use the cotter pins included with the ball joint. If the top of the crown nut goes past the hole in the ball joint, use the spacer that comes in the ball joint box.

IFS bracket attached to upper control arm.

Major front suspension components, upper and lower control arm, Mustang spindle, IFS bracket, and Baer five lug spindle hub.

8. Attach the IFS bracket/upper A-arm assembly to the spindle using the factory OEM strut bolts and nuts.

8/1/04 FFR IFS brackets bolted to both spindles using OEM bolts and nuts and set at 100 Lbs torque. The Mustang spindles are of different years makes and will require replacement on the driver side. This will require that the driver side front end be disassembled and re-installed with the new parts. See the steering rack section for particulars.

Install of the FFR IFS spindle to Upper A-arm brackets: 48 minutes.

Mustang spindle with FFR IFS bracket installed.

Pair Mustang spindles with FFR IFS strut brackets installed and torqued to 100 ft-lbs.

The IFS bracket is manufactured by FFR and will take some forcing to fit on the Mustang spindle. Use light hammer tap to make it fit.

Take care in placing the IFS assembly on both sides. Use a floor jack to hold the control arms in place when torquing the Ford spindle nuts.

Time to complete front driver suspension: 215 minutes.

Driver side IFS assembly supported by jack.

Driver side IFS assembly in place.

The passenger side IFS assembly was done next. The lower control arm was attached using the Ford IFS bolts to hold the arm. Next the upper control arm was attached to the chassis outside plate fitting using the Ford bolts. The shock/spring assembly was attached to the lower control arm. Remember to attach the shock with body at the upper end. Also, remember to place the pipe spacers in the right order at both brackets. Now, the Mustang front spindle assembly was installed. The lower spindle was torqued to specification. Next the upper control arm was adjusted so that the shock/spring assembly will clear the upper arm and attached to the upper shock/spring chassis bracket. The passenger spindle assembly was bolted to the lower control arm and then to the upper control arm. I had to remove the grease fitting and use a hammer and two by two would block to make the upper spindle bolt go into the FFR extension spindle fitting. The upper spindle bolt was torqued to specification.

The Flaming River steering rack assembly was installed in the proper location according to directions. The Baer bump steering tie rod ends were installed next. The chassis will have to be aligned to make sure that the wheels, front and rear, are aligned or close to alignment before the chassis is buttoned up and so that there is room to reach the control arms. Final alignment can be made after the engine and other heavy components are installed.

The steering rack as mounted in the chassis was not level. The driver side was ¼" higher than the passenger side. This work was done by Alamo Body and paint during the preliminary front and rear alignment.

Passenger side IFS assembly in place looking aft.

Passenger side IFS assembly forward.

Time to complete: 120 minutes.

Time to align: 120 minutes.

Attention: The upper ball joint boot will look crushed and out of shape when the car is in the air, this is OK. The boot will seat when the car is on the ground. It is a dust boot and will not leak grease.

Attention: Technical alert from FFR dtd October 16, 2003.
See Appendix A.

This technical alert was accomplished on 8/17/05.

Time to complete: 32 minutes.

Lower Control Arm (Mustang) Not used in this installation

1. Mount the lower control arm to the frame with the Mustang lower control arm bolts. It may help to use a rubber mallet to get the control arm in between the frame brackets. Tighten by hand for now.
2. Attach the spindle assembly to the lower control arm on the frame. Removal of the brake caliper and disc along with the brake shield may be necessary. Use the Mustang crown nut and torque specs 106-163Nm (80-120 lb-ft).
3. Put wheel on the rotor and with the frame at ride height, 4.5" off the ground, torque the lower control arm bolts to Ford specs 194-203Nm (110-150 lb-ft).

Front Tubular Lower Control Arm

NOTE: An alignment will be needed after the installation of the Tubular Lower Control Arm because the new arms add Caster. The shock mounts upside down, with the body on the top. Do not lose the ball joint cotter pin. Screw the ball joint grease fitting into its port in the bottom of the ball joint.

Front lower control arm with fittings and ball joint.

'96 Mustang spindle assembly with Baer five bolt hub end.

Driver upper and lower control arm

Passenger upper and lower control arm.

1. Attach the coil-over shock to the frame using the spacers from the kit so that it is upside down so that the screw on rod end will attach to the new control arm.
2. Grease all of the bushings and the balljoints with chassis grease until the grease starts to come out of the arm.
3. Install the control arm on the frame. The shock mounts are on the underside of the arm. Use the 5/8" washers as needed on the inside of the rear arm mount. Insert both bolts at the same time then push them through and place the nuts on the bolts. This will allow you to install them even if there is a slight angle on the bushing sleeves.
4. While holding the arm so that it is parallel to the ground, torque to 149-203NM (110-150 lb-ft).

The lower control arms were torqued to 140 lb-ft. Washers may be needed to space the Ford control arm bolts properly in their respective brackets. There may be clearance problem between the chassis X frame and the nearest bracket ear. This was discussed with FFR, who stated that welding the brackets ears may not be precise on each side. I had clearance problems on the passenger side for the Ford control arm bolt. This did not affect the fit of the IFS Lower Control Arm.

5. Attach the coil-over shock to the lower control arms reusing the spacers that were supplied in the kit. The shock mounts upside down, with the body on the top.
6. Attach the spindle to the control arm using the supplied crown nut and cotter pin. Torque the crown nut to 106 NM (80 lb-ft).

The crown nut on the lower ball joint was torqued to 100 lb-ft.

The upper crown nut on the upper control arm was torqued to 100 lb-ft.

The shock/spring bracket bolts were torqued to 60 lb-ft.

Passenger IFS looking aft.

Passenger IFS looking forward.

Passenger side IFS control arms and spring/shock assembly in place before installing the Mustang spindle assembly.

Time to complete:	180 minutes.
Time to install Baer tie rods	130 minutes.

Baer two piston front caliper.

Baer thirteen inch slotted, drilled rotor.

The driver and passenger Baer rotors and calipers were installed and torqued to 60 lb-ft. Note that there is a left and right side for Baer calipers as the bleed port must be the highest point during the fluid bleeding process.

Driver side Baer rotor and caliper in place.

Driver side Bear assembly from back.

The Baer calipers are installed on the wrong side. They need to be changed to place the bleed valve on the top. This was noted during the preliminary alignment procedure. I changed the calipers to place the bleed valve at the top when I changed the driver spindle to a Year '94/'95. I also changed the spindle lug bolts to the very hard FFR bolts.

Use an air torque wrench to pull the FFR lug bolts into place. Use the old lug nuts and a large washer to get the new lug bolts seated. The old bolts can be removed by hitting them with a hammer.

Passenger side Baer brake assembly from front.

Baer assembly from back on passenger side.

7. Install the wheels and tires.

Cobra R Silver 17 x 9 five lug wheel with 245 45 ZR 17 Nitto tires for front.

Rear Passenger wheel and tire installed.

Rear Driver wheel and tire installed.

Time to complete: 40 minutes.

The final chassis suspension mechanical assemblies are shown next.

Three quarter front view of the chassis.

Three quarter rear view of the chassis.

Alignment Specification:

Camber:	-0.5 to – 1 degree
Caster:	3 degrees
Toe In:	1/16” total

Preliminary alignment was done by Alamo Body and Paint for both front and rear on 8/16/05. See basic notes.

Front Coil-Over Shock Assembly

ATTN: The front aluminum bodied shock is pre-valved at the factory. FFR supplies 450 lb springs with the kit. Other springs are available for harder ride characteristics.


Spring/shock assembly.

1. Push the small rubber donut onto the shaft. Its purpose is to indicate the shock travel.
2. Put the spring collar and safety pin onto the shaft.
3. Tighten the jam nut all the way onto the shaft followed by the rod-end and tighten the jam nut to the rod end.
4. 2" of thread between the threaded collar and the rod end.
5. Using a ½" drill bit, enlarge the hole on the Ford bracket (FFR# 10810).
6. Attach the lower shock eye to the Ford bracket using the spacers provided in the kit.
7. Pass the front coil-over shocks through the upper A-arm and fasten the upper shock mount using the supplied fasteners and shock spacers as shown below.
8. The area towards the center of the spring mount needs to be bent or cut away to prevent damage to the coil-over unit. Check clearance with the new shock and the mount.
9. Pass the front coil-over shocks through the upper A-arm.
10. Attach the shock to the lower control arm as shown using the fasteners and spacers provided.
11. Fasten the coil-over to the top mount with the fasteners and spacers provided. The longer spacer should go towards the front of the frame on the top.
12. The upper ball joint boot will look crushed and out of shape when the car is in the air, this is OK. The boot will seat when the car is on the ground.


Final IFS suspension assembly installed and torqued with front and back views.

Rear-end Installation (Independent Rear Suspension)

The IRS cage assembly is part of the Spyder frame assembly in this kit. The cage assembly is welded into the frame rear and contains attachment points for the T-bird differential, upper and lower control arms, coil-over shock assemblies, and Mustang Quad-shocks.

IRS cage assembly in frame from driver side.

Driver side attachment points for control arms, quad-shocks and coil-over shocks.

- **NOTE**:
- These instructions are designed to supplement the Assembly manual where the assembly process is different from the build-up using a live axle. Sections of the manual that deal with the assembly of the rear instructions before beginning assembly as some of the changes occur early in the build-up.
- Using the FFR Independent Rear Suspension (IRS) will require a conversion to 5 lugs which, if you are not currently using 5 lugs will require new wheels.
- If you need 11" 5 Lug rotors for the front then use '82-'83 Lincoln Continental or '91 Lincoln Mark VII LSC or Ford Motorsports #M-1102-C.

ATTN: Independent Rear Suspension Technical Bulletin dtd 6/29/03

See Appendix B.

1. Parts included in the Kit

a. Aluminum Shocks and fasteners
b. Lower Arms and Cage (built-in this chassis)
c. Upper Arms and Cage (built-in this chassis)
d. Battery relocation Kit
e. FFR T-Bird 1.2" half shafts (2 each).

2. Thunderbird Parts needed

a. 8.8" Center section and front mounting bushings
b. CV joints
c. Spindles and attaching hardware
d. Brakes with flexible lines and mounting brackets.
e. A-arm to spindle bolts (6) each

f. Rear mount bolts, bolts and frame
g. Center section front mounts and bolts, (2) each
h. Ford Quad shocks (2) each

Two views of the 8.8 Thunderbird Supercoupe Traction-Lok differential with the FFR half-shafts and Boots installed.

3. Non-Thunderbird parts needed

a. Mustang Quad shocks – Do not use aftermarket KYB shocks
b. ½ " lug nuts

4. Tools needed

Drill	3/16" drill bit
3/8 ", ¾ ", 15/16" sockets	3/8", ¾", 15/16" wrenches
3/8-7/16" brake line wrench	Brake line cutter
Brake line bender	Tape measure
Snap ring pliers	Pliers
Flat head screwdriver	Tin snips/razor
Marker	

5. Supplies needed

3.25 pints gear oil	4 oz Friction modifier
Brake fluid	Rear brake pads

6. Torque specification chart

Metric threads	**Ft-lbs**
M12	60
US threads	
¼"-20	6-9
½"-13	70
5/8"-11	85

7. Alignment Specification

Front:	Caster	3
	Camber	-1
	Toe-in	1/16" total
Rear:	Camber	-1
	Toe-in	1/16" total

8. Selection and Disassembly of the Thunderbird Donor

The donor Thunderbird IRS assembly has several areas to look at to keep the problems to a minimum. Ford used the same IRS set-up in different cars, Thunderbirds between 1989 and

1997, Lincoln Mark VIII's between 1992 and 1999, and Mercury Cougar XR7's between 1989 and 1992. Only some of the cars have the correct parts that are needed. Points to check are:

1. The first and most important item to check is the diameter of the CV shafts. The V6 and some V8 cars came equipped with smaller diameter CV shafts. These CV shafts will not work with the new shorter shafts provided or with the Torque/Horsepower from a 5.0L HO. Check for the proper shaft size; check the diameter of either side. **The proper diameter is 1.2 inches.**

2. Check the center section. An 8.8 inch unit is required. It will have 8.8 cast into the top of the differential and is noticeably larger than the 7.5 inch center section that was also used. Lincoln Mark VIII came with aluminum center sections that are 15 lbs lighter than the iron core.

3. Thunderbirds were available with and without rear disc brakes. We recommend one with the discs (free upgrade from a drum brake solid axle).

4. Obtain the whole rear end sub-frame as it unbolts with four bolts. Remove the drive-train if possible as the salvage yards just cut the drive shaft with a torch. The sub-frame will contain all the donor parts (bolts, etc.) that are needed.

5. FFR recommends that the best units come from Thunderbird Supercoupe. They are available for around $300 - $500. The Lincoln Mark VIII's go for around $600.

I purchased my IRS differential assembly from AMP. AMP obtained a '97 Supercoupe sub-assembly with limited slip differential, 3.73 gear ratio, and completely overhauled it before shipping. I supplied the 1.2 inch diameter half shafts from FFR along with the CV joint boots. The assembly arrived via FedEx with the complete sub-frame assembly. I disassembled the sub-frame saving the Ford control arm to spindle bolts and nuts (6) each, front differential tie-down bolts and nuts (2) each, and the center section rear mount bolts (2) in frame. Save the rubber front differential mounts also.

One spindle bolt and two nuts and the two half shaft lock nuts were lost in shipment.

Ford bolts and nuts to save along with the front differential mounts. Note that one spindle bolt and two nuts were lost in shipment.

Missing Ford spindle bolts and nuts placed on order through Northside Ford. Package of four nuts and package of two bolts were purchased at $26.80. Parts received from Ford 6/15/04.

Limited slip (Posi-traction/Traction-Lok) and Open Differentials

6. Early Mark VIII center sections do not have a limited slip differential.

7. The Thunderbird Supercoupe does have a limited slip differential.

8. The IRS is an 8.8 center section and it can use the same gears that the solid axle 8.8 from the Mustang uses, but, it can not use the same differential. The IRS differential has a step cut in the side gears to hold the CV joints in the center section. Without this step, there is nothing holding the axles from coming out.

9. There are three differentials that will work in the Mark VIII or Thunderbird center section, the stock Supercoupe traction-Lok, an Auburn Gear differential and a Torsen differential. Auburn offers two units, the high performance unit (P/N 542079) for standard OE replacement ($250) and the pro series (P/N 542080) for better traction and faster engagement ($350). The Torsen, sold by Ford Motorsport is the best differential around and is used by many performance car companies (Porsche) as standard equipment. It is not designed for drag racing, but for roadracing. The Ford Motorsport part number is M-4204-T28 ($500).

I selected an IRS donor package from AMP and provided the FFR half shafts and new CV joint boots from the kit. This AMP package included BAER 12inch slotted brake rotor and one cylinder brake caliper assemblies as well. The differential has posi-traction and 3.73 gears installed.

10. Parts can be brought new if desired:

Aluminum 8.8" Center section with 3.73 gears	$675	Ford Motorsport
CV joints	$120 each	Autozone
Spindles	$600 each	Ford Dealer
Brake caliper	$100 each	Napa
Spindle bolts & center section mounts		Ford Dealer

Master Cylinder Selection Chart

Front Calipers Number	MC Bore Diameter	MC Source Vehicle		Part Source	Part
Lincoln	1"	93 Mustang Cobra	Ford	Bendix #12669	
Mustang Cobra	15/16 "	94 Mustang Cobra	Ford		
Mustang stock 11764	7/8 "	82 4 cyl Mustang	Parts store	Bendix #	
Baer Racing					
Rear Calipers					
Mark VIII or Supercoupe					
Baer Racing					

Modification of IRS parts

Do not throw any parts away from the IRS donor until the IRS is installed and the axles have been changed.

11. Spindles

a. The Thunderbird uses a 5 lug x 4.25" Lug pattern. This is not very helpful since the Mustang uses either a 4 lug x 4.25 "pattern or a 5 lug x 4.5 "pattern. Drill to the 5 x 4.5" pattern to maintain the same pattern on front and back. Use a machine shop to maintain the precise pattern to fit the wheels. New ½ "studs are included.

My spindle assembly came with the Baer 5 lug x 4.5" hub caps, the studs were included.

b. Be sure to check the hubs for slop in the bearings. There should be none. Have the shop change the bearings if there is slop. Check the new bolt pattern in a wheel to make sure that it will go on.

Spindle front view, '97 T-Bird.

And spindle side view.

Baer Racing 5 lug x 4.5"pattern bolt rotating assemblies are pressed onto the T-bird spindles. Re-drilling of the assembly was not necessary. The FFR lug bolts are not used on this installation.

Note: The spindle nut must be torqued to 300 ft lbs to tighten the spindle to the axle.

12. Rotors

Once the spindles have been redrilled, the rotors must be made to fit the new lug pattern. The easiest way to do this is using a Dremel tool or grinder to oval out the existing holes. Mustang 5 lug rotors can not be used as they have a different wheel mount surface to rotor surface distance.

I have chosen Baer Racing 12 " drilled, slotted discs with 5 lug x 4.5 " pattern ½ " studs.

13. CV Joints

Do not cut the CV Boots, they may have to be reused. Some joints have one side that is bigger than the boots we supply. If you need a replacement for the larger boot, they are available from the Ford Dealer.

a. Cut the clamps that hold the boots to the CV joints and pull back the boots toward the center of the axle shaft. **Do not cut the CV Boots**, they may have to be reused.
b. Slide the larger joint off the shaft and set to the side.
c. The two remaining pieces, the fixed joint and the inner plunge joint, need to be tapped off with a hammer. Be very careful not to damage any of the moving parts, work from all sides to be sure each piece comes off straight.
d. Once the joints have been removed, the "C" clips can be slid off the old axles using a pair of snap ring pliers.
e. Inspect the CV joints for any damage or obvious wear and re-grease.
f. Test fit the new CV boots on the joints to see if they fit. If they do not, then re-use the old boots.
g. Slide the boots onto the new axle shafts with the narrow openings toward the center.
h. Replace the "C" clips in the same grooves on the new axle shaft and tap the joints back onto the shaft. (The shaft is symmetrical so either joint can go on either end).
i. Slide the larger CV joint back into position and pull the boots up over both ends.
j. Install the boot clamps tight to prevent grease from creeping out, make sure on the larger CV joint that there is room for the joint to plunge without crushing or stretching the boot.

The T-bird IRS rear differential came to me from AMP assembled. I determined from AMP that the half shafts slip out of the differential housing using a pry bar. The half shafts will have to be taken off the differential housing to fit the housing in the chassis IRS cage. The room for assembly and bolting the differential housing is very limited.

FFR half shaft with CV joints and FFR boots installed.

Note: This is the spindle shaft nut that must be torqued to 300 ft lbs in the spindle.

14. Brake Calipers / Lines

a. Unpack the included parking brake cables and find the smooth end of the cable (the end without the built in retaining barbs) and try to fit it into the

bracket on the caliper. Use a screwdriver and bend the bracket until the cable fits.

I am using the parking brake cables supplied with the Baer Braking system. The Baer parking brake assembly is part of the calipers. The brake cable slips through a bracket on the caliper and is held on the caliper emergency brake lever with a cable socket. The cable is held in the bracket with a lock clip.

Baer emergency brake cable assembly.

b. Using the Thunderbird flexible brake line with the "T" connection on it, hold it up to the ¾ "tubing on the driver's side that connects the two 2" x 3" frame rails. Mark the location of the mount hole and the locating pin hole on the tube as shown in the picture.

I have installed the brake lines IAW the Brake Lines Rear section of this manual. The 3/16 "steel line runs from the driver side firewall under the frame 4 "tubular member and is attached to the 2" x 3"outrigger member. The main line tees into a driver/passenger connection to cover both sides. Mustang rear line connectors are used to terminate both sides. The Baer flexible brake line attaches to the Mustang rear line connector and the brake caliper on each side.

Main rear steel brake line, tee for driver and passenger side fittings.

c. Drill two 3/16" holes, one for the mount screw and one for the locating pin.
d. Mount the "T" junction to the tubing.
e. Mount the other flexible line to the passenger side of the frame in the same location.
f. Insert two of the brake fitting adapters into the "T" and tighten with a ½ o lines "wrench.
g. Attach the brake line going from the Master Cylinder to the rear brakes to the "T".

h. Using some of the brake line provided in the kit, make a line to run between the two flexible line mounts. Run the line along the 2" x 3" tube. Use the insulated line clips and screws provided to mount the line to the frame.

i. Check the routing of the fuel and brake lines. No lines can run up the back side of the 2" x 3" tube. Bend the lines forward and out of the way. The IRS lower arms run approximately ¾ "away from the back side of the 4" frame rail.

15. Bolt-On Parts

The 8.8 '97 Thunderbird differential was the first item to bolt on in this process. It takes some maneuvering to get the differential through the chassis bottom IRS supports. It must be lifted from under the chassis, twisted sideways, front first, up through the supports, and then, turned into place for bolting down. Use the Ford rear bolt assembly and the bushing/bolt assembly to attach the differential to the chassis.

Differential in place on the chassis, front view.

Differential in place on chassis, rear view.

Driver Side IRS Setup

Make sure that the front Differential bolts are installed with the nuts on the bottom. Remember to use large diameter washer on top next to bolt head.

Driver side lower IRS control arm was installed with shims in the lower chassis brackets. The front bolt started with four (4) shims on the front and three (3) shims on the rear inside the bracket. The rear bolt started with zero (0) shims in front and eight (8) shims on the rear inside the bracket.

The driver side upper IRS control arm was installed with shims as supplied in the upper chassis bracket.

The driver side Thunderbird IRS hub was installed by inserting the driver side half shaft into the differential and tightening the end hub nut to pull the half shaft into the hub. Then, insert the two bottom connector bearings into the two brackets on the lower IRS control arm. Insert the Ford bolts. Do not tighten at this time.

All of the hub to control arm fits are very tight. I needed to hammer all of them into the control arm brackets to get them in place.

Next, insert the upper IRS control arm in the top hub connector bearing. Hold it in place with the Ford bolt. Do not tighten yet.

Next, insert the shock/spring in the upper chassis bracket and shim per the instruction. Then, place the shock/spring in the lower control arm bracket using the supplied shims.

Passenger Side IRS Setup

The passenger lower IRS control arm was installed with shims as supplied in the lower cassis brackets. The front lower bolt started with five (5) shims on the front and two (2) shims on the back of the bolt. The after lower bolt started with one (1) shim in front and five (5) on the back of the bolt.

The passenger upper IRS control arm was installed with shims as supplied in the upper chassis bracket.

The passenger side thunderbird IRS hub was installed as above by inserting the passenger side half shaft into the differential and inserting the two Ford bolts in the bottom connectors. I used a high lift floor jack to hold the hub in place to insert the upper hub to upper control arm bracket.

Next, I installed the shock/spring assembly per the instructions.

The rear driver and passenger wheels and tires were installed. See the photos in the front suspension section.

IRS assembly in place looking through the cockpit aft.

Time to complete, total: 420 minutes.

Note: The 5/8" pipe shims will need to be fitted by hand. I had to grind one of the shims on each of the control arm or shock fittings to remove some metal so that the shim would fit.

16. Differential Installation

- **a.** Drain the Differential and make sure the rear cover seal does not leak. Replace if necessary. Do not fill the Differential with oil yet!
- **b.** If not installed, install the Center Section rubber front mounts from the donor onto the Center Section.
- **c.** Slide the Center Section under the lower cage. With the help of a friend from the top and you under the Cage, raise the Differential up through the middle of the Cage, sideways and Pinion first. Rotate the Differential and rest the front on the front frame member and insert the rear mount bolts.
- **d.** Install the front mount bolts from the top down with a washer next to the head. A deep ¾ "socket must be used to tighten the nut from the underside.
- **e.** Tighten the rear Differential bolts.
- **f.** Fill the differential with 3.25 pints Gear oil and 4 oz. Friction modifier.

The 8.8 differential requires that it be installed by lifting up through the chassis and then twisted to fit per c. above. Take care, as it took two helpers to make the fit. The bolts were tightened to 100 ft lbs. A lift tool is really required to get the differential in place.

Differential from top driver side.

Differential ¾ view from passenger side.

The differential was filled with three (3) pints Valvoline 80 – 90 SAE weight Gear oil and seven (7) ozs of Trans-X posit-trac oil per Ford specification M2C118A.

17. Lower Control Arm Installation

NOTE: There is a driver (left) and passenger (right) IRS lower control arm. They are not interchangeable.

a. Screw the Jam nuts all the way onto the Rod ends.
b. Screw the Rod ends into the lower arms so that there is only ½ "total of the thread (including the Jam nut) sticking out of the arms.
c. Attach the lower arm to the cage using the supplied 5/8" fasteners. Attach the front lower mount first using an equal number of shims on either side of the rod end.
d. Attach the rear mount using only as many shims as will fit without being forced into place on either side of the Rod end. As the alignment changes, the number of shims per side will change as well.
e. The shock mount should be toward the back of the car and under the arm.
f. Tighten the control arm bolts per spec. Tighten the jam nuts on the rod ends making sure that the rod ends are vertical and have room to articulate as the control arm moves.

Lower IRS Control Arm with rod ends.

Driver Lower IRS Control Arm set in chassis brackets.

The lower IRS control arm fits very snuggly in the chassis brackets. Log the shims on the front and back of each bolt in each bracket.

Time to complete: 120 minutes.

18. Shock and Spring Installation

The shocks are pre-valved at the factory. FFR supplies 450 lb. springs that allow for a comfortable street ride with good handling. Other springs are available for different handling characteristics or track duty.

a. Push the small rubber donut onto the shaft. Its purpose is a shock travel indicator/bump stop
b. Put the collar and safety pin onto the shaft.

Donut, washers, and spacer installed.

Rear shock assembly ready to install.

c. Put one of the spacer bushings on the shaft so it will rest on the collar.
d. Place one of the 0.62"spacers on the shaft followed by another spacer bushing.
e. Screw the jam nut all the way onto the shaft followed by the rod end and tightens the jam nut.
f. Slide the spring onto the shock and screw on the threaded collar so that there is 2" of threads between the threaded collar and the rod end.
g. Position the shock so that the shock body is up and the collar/spacer end is in the triangle of the lower control arm that the shock is to mount in.
h. Fasten the shock to the top mount with the fasteners, washers, and spacers provided.
i. Fasten the shock to the bottom mount with the fasteners and spacers provided. The longer spacer goes towards the front of the car.

The shock/spring in place on the driver side IRS assembly.

The passenger side IRS assembly.

19. Upper Control Arm Installation

a. Screw the jam nuts all the way onto the rod ends.
b. Screw the rod ends into the upper arms so that there is only ½" of thread sticking out of the arms.
c. Attach the upper arms to the cage using the supplied 5/8" fasteners, washers, and spacers. The Quad shock mount should be under the arm.

Upper IRS control arm assembly and parts.

Rod end assembled with bolt parts.

The upper IRS control arm located in the chassis bracket as it awaits installation in the hub assembly.

20. Quad Shock Installation

a. Attach the body end of the Quad shock to the upper arm of the IRS with the supplied metric bolt.
b. Attach the shaft end of the Quad shock to the rear quad shock bracket hole on the frame using the washer on the outside of the Quad shock as shown in the picture.

Quad shock installation on both sides IRS

Note: There is a little bit of angle between the upper control arm and the chassis bolt hole for the quad shocks fit.

Note: The steel to flex brake line bracket is welded to the side of the chassis.

Time to complete 45 minutes

21. Spindle Installation

a. Push the inner joint into the center section until it clicks.
b. Push the outer CV joint through the spindle.
c. Using the OEM T-bird nuts and bolts, fasten the spindle to the control arms.
d. Attach the large nut using an impact wrench.
e. Put a jack under the lower shock mount and raise the jack until just before the frame lifts off the jack stands in order to simulate ride height.
f. Torque the spindle attachment bolts to 100 Ft-lbs.

Driver side spindle attached to lower control arm brackets.

Time to complete: 120 minutes.

22. Rear Calipers and Rotors

a. Push the slotted rotor onto the spindle.
b. Attach the caliper to the spindle using the OEM T-bird bolts.

The Baer Racing calipers and rotors are installed in the same manner, except that the caliper is attached to the spindle using a specially built ½" steel plate, bolts, and washers to go between the spindle and caliper. AMP constructed these plates.

Baer assembly attached to T-bird spindle.

AMP spindle to caliper plate with spindle bolts.

Driver side Baer brake assembly installed.

Top view of the driver side Baer brake assembly.

The Baer brake assembly was installed using the AMP plates between the calipers and Thunderbird hub. There are two sets of bolts to hold the plate in place. One set of two (2) ¾" bolts attaches to the hub and consist of bolt spacer washer, lock washer, and nut. These are installed first. Then, the second set of two (2) bolts consisting of ¾" bolts, spacer washer, and lock washer that screw into the caliper. This set of bolts may be too long for my setup and will require a second spacer on each bolt to take up the length. A second spacer washer was placed on the bolt head side on each of the four (4) bolts to take up the extra length.

Note: Make sure the caliper bleed valve is on top in the installation of each caliper. This will allow bleeding to be done properly.

This assembly is required on both sides.

The passenger side Baer brake assembly in place.

A top view of the passenger Baer Brake assembly.

Time to complete: 160 minutes.

Attention: The special AMP spindle to caliper plate fits only the side it was made for and the direction. Be sure to mark each for top and side.

23. Emergency Brake Cable Installation

a. Release the emergency brake handle using the button and make sure it is all the way in the down position.

b.

c. Push the cable sleeves into the caliper brackets and attach the cables to the caliper.

Emergency brake cable connection point.

Emergency brake cable in the attachment point and connected to the caliper lever.

d. Bend and route the cables through the upper cage triangles and to the cable bracket in the transmission tunnel.
e. Pull on the T connector attached to the emergency brake handle and slide on the cables one at a time.
f. Pull up on the emergency brake handle, so that the automatic tensioning cog can adjust the free play in the lines.

The emergency/parking brake assembly is installed. We had to make a mod to the cables to make a good connection.

We had to make custom terminations on the emergency brake cables to shorten and get the proper connection.

Time to complete 160 minutes

24. Battery Cable/Box Installation

a. Place the battery in the battery box and mark the height of the flat top of the battery on the box.
b. Remove the battery and use a ruler and marker to mark a line 3/16" below the point marked previously. Mark this all the way around the box.
c. Using a razor blade or tin snips or scissors, cut the top of the battery box down to the line marked.
d. Replace the battery and place the crossbar hold down over the battery. The crossbar should be able to go over the sides of the battery box.
e. Position the box with battery on the passenger side lower part of car trunk. Push it forward against the aluminum step and just far enough over so that the crossbar does not touch the side.
f. Use a marker and mark around the base of box on the aluminum.
g. Hold one of the "J" bolts vertically through the crossbar hold-down and locate the ¾" tubes below the aluminum that will be used to fasten the "J" bolts. FFR has provided four bolts for the battery. Three of these will be able to go into ¾" tubes, while the fourth can only go into the aluminum. If you wish to run all four bolts, use a fender washer or weld an additional tube in for the fourth bolt to go into.

Note: in SCCA, as long as the battery does not move, it is OK. NHRA rules specify two 3/8" bolts as required. Mark the locations of the bolts on the aluminum so that holes can be drilled.

h. Decide which way around the box you would like to run the battery cables and make sure there is enough room for them. There should be

enough room in the current location to run them on out of the box on the wall side.

i. There is more than one way to route the battery cable to the front of the car. One way is drill a ¾" hole through the aluminum step next to the wall in order to pass the positive battery cable through. Pass the eye end through the aluminum, then push on some of the plastic grommeting around the aluminum edge before pushing through the remaining cable. Another way is to pass the cable through the aluminum next to the shock tower, again using grommeting on the aluminum.
j. Follow the manual instructions on the routing up to the front of the car once the cable is through the trunk.
k. Locate a point on the frame for the ground cable. You may drill another hole like the positive cable or attach it inside the trunk.
l. Without moving the crossbar or battery, move the battery box to the middle of the trunk.
m. Take the battery box top and press it down onto the box over the crossbar.
n. Lift the top of the box off along with the crossbar that should be wedged inside.
o. Mark the location of the holes used for the crossbar bolts with a marker.
p. Drill ¼" holes through the top of the ¾" tubes only, at the bolt locations marked.
q. Insert the "J" bolts into the tubes so that the threaded part sticks straight up.
r. Position the battery box with battery between the bolts and place the crossover over the bolts.
s. Attach the battery cables to the battery so that they exit the box in the desire location.
t. Place the cover over and onto the "J" bolts.
u. Put washers and locknuts on the bolts and tighten them evenly until the box does not move.

I have had an aluminum box manufactured that fits in the middle of the trunk the trunk deck plate. I cut a hole in the deck plate to hold the aluminum box. The fiber battery box will fit in this arrangement to hold the battery. The aluminum box will be pop riveted to the deck plate. The battery leads is fitted through holes in the battery box and aluminum box. The battery is secured by provided "J" bolts. The trunk deck frame is modified to fit the box.

Aluminum box fitted into the trunk deck frame.

Battery box inserted into the aluminum box.

Time to modify 165 minutes

25. Battery Cable Installation to Front (from basic manual)

a. Run the battery cable (FFR# 10579) from the **positive terminal** of the battery straight forward, down the driver's side of the transmission tunnel. Zip tie as you go.

Note: My cable runs down the passenger side of the chassis in the transmission tunnel. The cable was shortened to fit the battery location.

b. If the starter solenoid was mounted behind the engine, run the cable up the transmission tunnel front wall behind where the engine will sit and to the solenoid. If the starter solenoid was mounted to the 1" tube near the master cylinder, run the cable to the front of the floor/tunnel bend and along the edge to the front of the driver's foot box. Run the cable under the floor to the outside of the car and up to the starter solenoid.

Note: The starter solenoid is located on my starter. I had to modify the cables from the coil as well as the exciter cable from the key to the starter.

c. Use the grommeting on the edge of the aluminum where needed to prevent damage.
d. Leave the battery cable fastened for now with zip ties everywhere so that the rear harness can be run with the cable later. Use the insulated line clips and screws for final assembly.
e. Drill a 5/16" hole in the side of the passenger frame engine mount in order to attach the engine ground cable.
f. Sand the contact area down to bare metal.
g. Attach the engine ground cable using a 5/16" bolt and nut on the frame and an engine mount bolt or other bolt on the engine.
h. Attach the OEM braided engine ground strap on the back of the driver's side cylinder head to the 2" x 2" tube pm the frame using a ¼" x ½" screw from the engine/harness assembly. Make sure to sand the contact area down to bare metal before attaching.

We installed a cut-out switch in the main electric cable just in front of the battery. It is located in the trunk area and can be turned on and off. The switch key is removable and can be taken out of the car when it is parked.

Time to complete 45 minutes

26. Fuel Line Installation

a. Use the included 5/16" flexible line and fuel injection hose clamps (FFR # 10855) to connect the fuel filter to the hard line using the Mustang connector. Route the hose through the triangles in the upper cage.
b. Slit the old 6" piece of fuel line and wrap it around the new fuel line where it goes through the triangles. Zip tie the line and the slit hose in place so that the hose will not wear on the edge of the steel frame.

Note: A completely new fuel hose assembly was installed from the fuel tank to the EFI fuel rail, along with a return line. This assembly is after market flexible fuel line with clamps at the filter, fuel rail and tank.

As noted before, we used after market fuel lines as the Mustang connectors are not available.

27. Final Assembly of the Rear IRS Assembly

a. Double check that all the bolts are tight.
b. Mount the wheels and tires.
c. Lower the car off the jack stands.
d. Set the ride height in the car as specified in the manual.
e. Zip tie through the slot in the shocks or tape the threaded collar so that the settings do not change.
f. Align the car to the specifications at the front of these instructions. Do not change the ride height after this is done as this will change the alignment and it will need to be done again.
g. Installing the IRS changes the roll centers of the car compared to the solid axle so the car will roll slightly more than the solid axle. If you are racing the car, call for alignment and spring suggestions.
h. The IRS was designed so that the 5.95" Backspace; Cobra R wheels will bolt on. These are fairly inexpensive as far as wheels go and look good on the car.
i. Check the rod end jam nuts to make sure they are tight on a regular basis.

c. Fuel Tank Installation

Attention: Use caution when handling and storing a fuel tank that contains fuel. See the manual for additional precautions.

Parts: Donor fuel tank, mounting straps, fuel line from tank to filter, and fuel neck. Fuel tank assembly (FFR # 10896), fuel line assembly (FFR # 11078).

Fuel tank and straps as received from AMP.

Close-up of the fuel 5/16 inch outlet and ¼ inch return.

1. Put the four square plastic plugs (FFR # 10966) into the ¾" vertical frame extensions under the trunk area (these are the open ended tubes that stick straight down from the floor of the trunk steel framework). The plastic caps prevent the metal tube from touching the fuel tank edge flange.
2. Place the plastic cover on the fuel tank bottom (if not already in position) and position the tank behind the trunk so that the fuel filler neck is on the passenger's side.
3. Put a floor jack underneath the center of the gas tank with a friend holding one end of the gas tank for balance.
4. Raise the tank and hold it up to the ¾" vertical tubes while you get the straps positioned.
5. The straps install first at the rear of the frame with the 2" bolts provided. Swing the straps under the tank and bolt them to the front posts. Use the kit fasteners provided.

6. Do not tighten the rear strap fasteners (ends closest to cockpit). The tank will have to be lowered slightly later in order to mount the body and the bumpers.
7. Attach the Mustang high-pressure line from the fuel pump to the fuel filter.
8. Attach the ¼" return line to the fuel pump return inlet using the ¼" fuel line and fuel injection hose clamps.

Fuel tank and fuel filter installation time: 210 minutes.

Fuel tank in place with straps as installed with frame on side.

The fuel tank was installed with the chassis on its side as shown above. Additionally, during the aluminum cockpit LizardSkin application, I removed the gas tank and painted it with the Lizard Skin ceramic material.

I will use a rubber gasket under the tank straps to keep the metal from rubbing a hole in the gas tank. I used bicycle tire tube material as the gasket.

d. Pedal Box & Accelerator Pedal

Parts: Mustang pedal box, pedal box fastener assembly (FFR # 11023), aluminum cockpit assembly (FFR # 12838), 1/8" rivets.

Mustang pedal box assembly.

Mustang accelerator pedal assembly.

Note: The brake and accelerator pedals will need to be cut and fitted for better direct leverage in the case of the brake pedal, and, fit for the accelerator pedal.

The brake pedal should be cut and shortened by 1 ½" between the attachment bolt and the master cylinder push rod attachment point. MIG weld the shortened pedal assembly.

The accelerator pedal must be shortened at a point just above the original plastic pedal piece. Remount the plastic pedal piece on the shortened pedal rod. Squeeze the pedal rod and drill a hole for the plastic piece pin.

1. Temporarily install the driver's side foot-box front vertical wall (FFR # 10904) using the factory screws to position it.
2. Position the Mustang pedal-box on the two angled ¾" tubes over the driver's feet, and attach using two short upper mount bolts and two washers (fasteners in kit) to the front wall at the front of the foot-box.
3. There are four holes on the Mustang pedal-box assembly on top of the ¾" tubing. Mark these holes. The right hole for the master cylinder must also be marked on the pedal-box. Use the laser cut hole in the foot-box steel as a guide to mark the Mustang pedal-box. Mark the corner of the pedal box that sticks out past the front foot-box plate. This will have to be trimmed. See photo below.
4. Remove the pedal-box assembly.
5. Drill ¼" holes completely through the ¾" tubing for the pedal-box.
6. Drill a hole in the pedal-box using a 7/16" drill bit for the master cylinder bolt.
7. Trim the corner off the pedal-box using a hacksaw.
8. The front foot-box aluminum panel can now be bonded (silicon) and riveted in place with the 1/8" long rivets.
9. Install the pedal-box with the two 3/8" bolts and washers at the top as before. They go through existing holes in the front of the foot-box. The four ¼" socket head bolts hold the foot-box to the ¾" tubes. Use the large washers (FFR # 12337) on the underside of the tubing.
10. Attach the trimmed accelerator pedal using the kit fasteners [(2) ¼" x ¾" long bolts (FFR # 12335) washers and nuts (FFR # 10802)] to the bracket on the vertical ¾" tubing at the front of the foot-box.

The Mustang pedal box was modified per FFR instructions. I had the work done at Bruni Welding. The accelerator pedal arm was shortened and the brake pedal arm was shorted per the FFR instructions. The master cylinder push rod was removed from the Mustang power assist canister and re-installed on the brake pedal arm.

The pedal box and accelerator were removed to apply the LizardSkin applications on the inside of the cockpit driver foot box...

The pedal box assembly as installed:

e. Accelerator & Clutch Cable Installation

Attention: Inspect donor cables for signs of wear and crimping. Replace if needed with factory Ford parts. If you are installing an aftermarket/heavier pressure clutch, an aftermarket aluminum adjustable Clutch Quadrant is recommended instead of the stock plastic part.

Parts: Mustang pedal-box fastener assembly (FFR # 11023), clutch cable.

1. The throttle cable provided with the kit has an up-turned sheath as the pedal-box end of the cable that needs to be trimmed off in order to have a straight shot at the accelerator pedal. Carefully use a hacksaw or cut-off wheel to cut the sheath of the cable off. Do not fray the inner cable as this could cause the cable to get stuck at the worst possible time.
2. Push the two-hole head of the cable holder into its mount on the foot-box front side.
3. Use the ¼" x ¾" screws and nuts provided to bolt the throttle cable to the foot-box.
4. Attach the cable to the throttle pedal as shown in the photo.
5. Push the clutch cable into the front of the foot-box and attach the cable to the clutch quadrant. See photo.

Final throttle cable assembly at Throttle Body

Clutch cable routed around headers

Time to install 120 minutes
Time to install 45 minutes

f. Master Cylinder & Push Rod

1. Use the 3/8" x 2" bolts provided to mount the master cylinder and spacers to the foot-box front wall. The number of spacers used dictates the height of the brake pedal. Start with one spacer unless you are 6' or taller, then use more.
2. One of these bolts doubles as a foot-box lower mounting bolt.
3. Tighten all of the mounting bolts for the pedal-box and master cylinder.
4. Install the push rod from the power booster into the master cylinder and insert the white plastic bushing in the ring end.
5. Hold the rod between the two ears of the brake light switch and slide it over the brake pedal post.
6. Push the retainer clip through the hole in the pedal so that the push rod will not come off.
7. If you plan to race frequently, find some small springs and attach them to the brake pedal and the pedal-box to prevent the pedal from moving during severe acceleration.
8. Connect the brake lines to the Master cylinder. The front two connections go to the distribution block. The bottom rear connection goes to the front left brake caliper. The distribution block connections are shown below.

Note: The Power Booster Push Rod for the master cylinder must be removed from the Power Booster canister and installed to operate the brake system as a manual braking

system. The process of removing the push rod is done by breaking the plastic housing around it. Pull the push rod out. Remove the aluminum fitting by heating it with a torch. It will pop off.

The master cylinder as installed with brake plumbing:

Master brake cylinder installed

g. Cockpit Aluminum

Attention: Do one panel at a time. Be careful of the aluminum edges as they are sharp.

Parts: Drill, 1/8" drill bits, rivet tool, silicone, #6 self tapping screws, #6 hex nut driver, ruler, marker, acetone, or carburetor cleaner, rags.

Tools: Aluminum cockpit assembly (FFR # 12838), secondary body fasteners assembly (FFR # 12749).

h. Aluminum Floor Panels

Attention: If you have not spaced and drilled the aluminum for the rivets, return to the aluminum removal and preparation section earlier in the manual.

1. Position the pieces before doing any work to make sure you are familiar with placing them in the frame accurately and to see where the silicone needs to be applied.
2. Apply silicone to the frame on the main contact points of the 4" round tube, 2" x 2" floor supports, and the ¾" x ¾" tubes as shown.
3. Lay each floor piece into position and attach the panel with self-tapping #6 screws. Press firmly on all surfaces to squeeze the silicone out and along the panel.
4. Drill through all the holes previously made in the aluminum and into the frame.
5. Wipe and clean the aluminum panel using either acetone or carburetor cleaner.
6. Use the 1/8" short rivets wherever possible and the 1/8" long rivets elsewhere.

One half of the driver foot box has been set and riveted in place. The foot panel and the inside wall panel are in place. The remainder is waiting on the installation of the brake/clutch box. The reminder of the driver foot box will be installed after the wiring has been completed.

Driver cockpit metal looking to back.

Driver cockpit floor looking forward.

Time to complete: 65 minutes

I purchased and installed an Oben turn signal assembly on the FFR upper steering shaft.

i. Transmission Tunnel front Vertical Wall

1. Position the panel on the frame as shown.
2. Mark where the rivets will go.
3. Remove the panel and apply silicone to the frame.
4. Attach the panel with #6 self-tapping screws.
5. Rivet the panel in place.

Driver center front tunnel panel attached to footbox.

Center front panel attached to driver floor / foot box.

Time to complete: 65 minutes

j. Driver's Foot-Box

1. Position the foot-box floor. The front edge sits on top of the front wall bottom tab and the back gets attached to the 2" x 2" tube.
2. Mark where the rivets will go.
3. Remove the panel and apply silicone to the frame.
4. Attach the floor panel with #6 self-tapping screws.
5. Rivet the panel in place.
6. Position the outside wall on the foot-box. The tab on the front wall goes on the inside of the outside foot-box wall.
7. Mark where the rivets will go.

8. Remove the panel and apply silicone to the frame.
9. Attach the outside panel with #6 self-tapping screws.
10. Leave the top edge of the panel that rests along the 1" tubing unattached so that the foot-box top panel can fit underneath it later.
11. Rivet the panels in place.
12. Position the inside wall panel on the foot-box from the engine compartment side. The bent tabs go behind the front wall.
13. Mark where the rivets will go.
14. Remove the panel and apply silicone to the frame.
15. Attach the inside wall panel with #6 self-tapping screws.
16. Rivet the inside wall panel in place.
17. Position the top/inside panel.
18. Remove the top/side panel and apply silicone to the inside wall, front wall, and along the top ¾" frame tube.
19. Rivet the panel to the inside and front walls only.
20. Take a look at the completed foot-box and floor for gaps between the panels and around the seat harness mounts. Use silicone to fill these gaps.

Attention: Leave the top/outside of the driver's foot-box open in order to do the wiring.

The floor foot well panel was riveted to the frame. The inside wall panel was attached to the front panel and the foot panel.

Time to Complete: 85 minutes

k. Passenger Foot-Box

1. Attach the foot-box top panel to the frame using the factory mounting hole and #6 self-tapping screws. Note where the panel touches the frame.
2. Remove the top panel.
3. Apply silicone to the underside of the 2" x 2" frame tube where the panel will
4. Install the top panel again with a #6 self-tapping screw.
5. Drill and rivet the panel to the underside only of the 2" x 2" tube.
6. Position the foot-box inside wall panel with #6 self-tapping screws in the factory holes. Note that the panel tabs go under the floor and top panel and to the inside of the transmission front wall.
7. Mark where the rivets will go.
8. Remove the panel.
9. Apply silicone to the inside wall tabs.
10. Install the inside wall with #6 self-tapping screws.
11. Rivet the panel in place.
12. Position the outside wall with #6 self-tapping screws.
13. Apply silicone to the panels.
14. Install the outer wall and drill and rivet the panel in place. The entire passenger foot-box should now be complete.
15. Take a look at the completed foot-box and floor for gaps between the panels and around the seat harness mounts. Use silicone to fill these gaps.

The passenger floor panel was installed using the pre-drilled rivet holes as the guide to pop rivet it in place. Silicone was used on each frame member and each panel section to maintain a seal in the assembly. The footbox wall panels were installed next, starting with the outside panel, then the end panel and next the top panel. The inside wall panel was installed next. All the panels were pop riveted using the two inch hole spacing. 139 rivets were used.

Time to complete: 60 minutes

l. Transmission Tunnel U-Joint Cover

1. Position the panel on the frame.
2. Mark where the rivets will go.
3. Remove the panel and apply silicone to the frame.
4. Attach the panels with #6 self-tapping screws.
5. Rivet the panel in place.

The transmission tunnel side covers and U-joint cover were installed when the cockpit back panel was installed.

Time to complete 45 minutes

m. Cockpit Rear Wall

1. Position the rear wall panel on the frame. The panel sits on top of the floors and in front of the U-Joint tabs.
2. Mark where the rivets will go.
3. Remove the panel and apply silicone to the frame and aluminum tabs.
4. Attach the panels with #6 self-tapping screws.
5. Rivet the panel in place.

The driver and passenger cockpit panels as installed:

Driver foot box and cockpit aluminum panels installed.

Passenger foot box and cockpit panels installed.

Time to complete 120 minutes

n. Trunk Walls

1. Position each trunk wall panel on the frame.
2. Mark where the rivets will go by tracing around the tubes the same way done with the floor panels.
3. Remove the panels and apply silicone to the frame and the side walls.
4. Attach the panels with #6 self-tapping screws.
5. Rivet the panels to the sides and back, do not rivet the bottom edge.

Time to complete: 40 minutes

o. Trunk Rear Wall

1. Position the panel on the frame overlapping the side wall tabs.
2. Mark where the rivets will go by tracing around the tubes the same was done with the floor panels.
3. Remove the panel and apply silicone to the frame and side wall tabs.
4. Attach the panel with #6 self-tapping screws.
5. Rivet the panel in place.

p. Firewall

1. Position the firewall panel on the frame, moving it as far to the driver side as possible.
2. Mark where the rivets will go.
3. Remove the panel and apply silicone to the 2" x 2" and ¾" tubes.
4. Attach the panel with #6 self-tapping screws.
5. Rivet the panel in place.
6. Silicone between the firewall and the top/inside panel.

Time to complete 90 minutes

q. Passenger Side Firewall Extension

1. Apply a section of the press-on weather stripping along the bottom of the panel.
2. Position the passenger side firewall panel on the frame. The tab goes behind the main firewall and the weather stripping should seal against the top of foot-box.
3. Mark where the rivets will go.
4. Remove the panel and apply silicone to the aluminum tab and the ¾" tube.
5. Attach the panel with #6 self-tapping screws.
6. Rivet the panel in place.
7. Apply silicone to fill any air gap.

The entire aluminum panel assemblies were covered with LizardSkin Sound Proofing and Ceramic heat shield.

Firewall after LizardSkin application.

Firewall after assembly with pop rivets.

Note: The LizardSkin is a water based ceramic application applied via a spray gun. It is heat and fire proof.

r. Engine / Transmission

Attention: Use extreme caution when lifting and positioning the engine assembly. Never get underneath an engine hoist. A couple of extra people come in handy at this point in the build-up. The Engine and Transmission should be attached and lowered into the frame as one unit.

Parts: Engine/transmission, drive shaft, transmission mount, engine mounts and bolts.

1. Lift the engine using two factory brackets that are on the 5.0 engine (make sure that the brackets are turned the correct way).

We used a two ton engine hoist and installed the engine and drive train as one unit. We had to take the T-5 shift lever off to clear the chassis transmission tunnel steel and cross member. We had to install the transmission mount after we had inserted the drive train in the chassis.

2. The engine/transmission assembly should be drained of oil to ease installation and so that the transmission does not leak during installation. Apply tape over the rear of the transmission to help reduce drips even if already drained of fluid.
3. Make sure the Ford rubber engine mounts are installed on the engine.

Use the Ford engine mount to engine bolts.

4. Slowly lower the engine and transmission assembly into the engine bay.
5. Lower the transmission mount bolts into the rear transmission mount plate on the cross-member and then lower the engine onto the frame engine mounts. Make sure the passenger side engine mount is inserted into the engine mount hole first, followed by the driver's side mount into the slot.

This caused us some problem in getting the engine level in the mounts.

6. Level the engine in the frame using the top two bell-housing bolts and a bubble level, not the intake manifold. The other way is to look at the engine mounts and note where the bolts are in the slots.
7. Tighten the large engine mount bolt on each side and secure the two smaller transmission bolts.

Make sure these bolts are really tight.

8. From above, slide the drive shaft into the end of the transmission then line up the four holes in the rear flange with the holes in the rear axle and install the pinion flange bolts.

I am using Allen head bolts as the area for the wrench is very tight.

Ford Racing M-6007-XB3 GT40 engine

BW T-5 Transmission

Ford Bellhousing

Luk clutch assembly

Ford transmission mount

Ford Racing EFI upper assembly

Drive train assembly on engine before install

Engine and drive train on hoist

Engine and drive train installed

Drive train including drive shaft installed

Clutch install on fly wheel

Transmission install on bell housing

Exhaust header installation was completed in one evening.

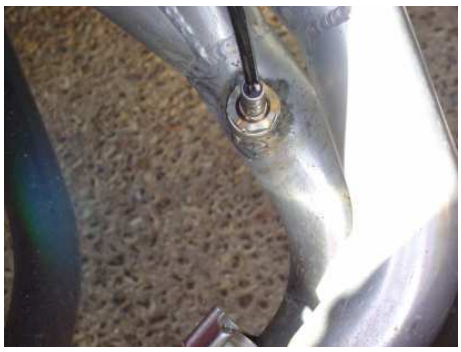
Engine with exhaust headers installed and lower intake manifold sitting in place

Time to assemble and install the major engine and drive train: 320 minutes

Note: The Hooker Headers head face plate was too wide for the Ford Racing aluminum GT-40 headers. We had to grind a portion of the bottom face plate to make the headers fit the heads properly. A bolt casting under each exhaust port caused the header to be open on the bottom side of the flange face.

Time to complete rework 320 minutes

Note: O2 sensors are needed to make the complete connection in the '93 Mustang computer.



Passenger side O2 sensor and location

s. Accelerator, Clutch & Speedometer Cables

1. On a fuel injected engine, attach the cable to the throttle body on the engine and run the cable from the throttle body mount plate behind the EGR sensor, tightly against the intake manifold down tubes.
2. On a carbureted engine, we have found that Holley carburetors come with a variety of throttle cable connectors, one of which works with the cable provided. Use a Universal Throttle Cable Bracket to attach the cable to the carburetor.

Note: I used a Mustang throttle cable bracket and modified it to fit. Check the front notes for photos.

Throttle cable bracket attached to Throttle Body

3. Check the idle screw underneath the throttle body to see if the throttle arm is hitting it. If it is not, the small tab behind the accelerator pedal may be stopping the plate from closing. Bend it up until the idle screw hits the throttle arm. You will notice a fairly high idle later when the car starts if this has not been done.
4. Anchor the clutch cable to the clutch release arm, which is located under the small cover on the bell housing. A 5/16" bolt anchors the cover and a circle anchors the cable shielding to the bell housing. Be careful anchoring the cover as the aluminum threads can strip easily.
5. Push the clutch cable into the mounting hole on the foot-box front. The clutch cable is routed in front of and under the exhaust header. It can be fastened to the frame using the bracket on the cable.
6. Mount the cable so that is clear of the hot exhaust header or the cable may fail prematurely. Make sure clutch and throttle cables line up with the pedals.
7. Run the speedometer cable through the hole in the foot-box top. The rubber grommet on the cable pushes into the laser cut hole.
8. Route the cable along the transmission tunnel to the transmission and push it into the sending unit.
9. When positioning the foot-box top, take care to keep the speedometer cable out of the way of the pedals and steering shaft.

Time to complete 30 minutes

Note: There is an allen nut on the throttle assembly that will adjust the idle.

t. Steering Rack

Parts: Steering rack/shaft assembly (FFR# 12753), Mustang steering rack.

1. Place the steering rack between the rack mounts on the frame (above the front lower control arm bolts as shown in the photo) making sure the rubber bushings and spacer sleeves are inside the rack mount.
2. From the front, pass the bolt through the front plate.
3. Place as many washers as possible between the mount bracket and the rack.
4. Push the bolt through the washers, rack and the rear mount.
5. Attach the locknuts to the bolts.
6. Attach the tie rods to the spindles and secure with nuts and cotter pins.

The Flaming River steering rack was added to the chassis by securing it with the two ¾" x 6 " bolts and lock nuts. The washers, 12 of 14, were used as spacers inside the chassis mounting bracket. The bolts and nuts were torqued to 100 ft-lb.

Time to assemble: 35 minutes.

Flaming River steering rack assembly with bushings and frame installation bolts.

Flaming River rack assembly in the mount.

Top of rack assembly before bolt torque.

The front end rack assembly with the Baer bump steer tie rods installed was the one of the last components installed. The chassis needs alignment at this point to make sure that it rolls true. Room is needed to get to the alignment components.

Driver Baer tie rod installed.

Passenger Baer tie rod installed.

The chassis needs front and rear end alignment before much is installed on the chassis because of the room required to reach the alignment areas.

u. Steering Shaft

Basic steering shaft assembly components less the pillow block bearings.

Attention: Mount the bearings so that the ring collar is on the front side (towards the front of the frame) of the bearings.

Parts: Steering rack/shaft assembly (FFR# 12753), Mustang upper steering shaft w/OEM clips, pillow block assembly (FFR# 12752).

1. Remove the set screws from the U-joints.

2. One at a time, slide each U-joint onto the shaft until the shaft is flush on the inside of the joint. Use a marker to mark the center of each set screw hole. Remove the U-joint after marking. The 1" DD tube must also be marked at one end.
3. Use a 3/16" drill bit and drill to put a small indentation in the shaft at the set screw locations previously marked. This is done to ensure that the shaft is locked in place in the U-joints.
4. Mount the 1" flange bearing on the front of the foot-box (collar on the engine side of the foot-box) using a 5/16" hex key and 9/16" wrench along with the kit fasteners. Do not tighten the bolts all the way; allow the bearing to swivel in the bracket.
5. Mount the ¾" upper pillow block to the bracket on the front of the 2" x 2" tube. Again, use a 5/16" hex key, 9/16" wrench and the kit fasteners. Do not tighten the bolts all the way; allow the bearing to swivel in the bracket.
6. Remove and save the two small OEM clips that are on the end of the Mustang upper shaft, as we are only checking the positioning of the column.
7. Slide the lower splined U-joint onto the steering rack shaft with the set-screw on the flat side.
8. Slide the upper U-joint onto one end of the ¾" DD shaft. Do not tighten the set-screws.
9. Slide the 1" DD tube through the flange bearing on the foot-box making sure that the set screw indentations made are in the engine bay side and not in the fo9ot-box.
10. Slide the collar for the 1" flange bearing onto the bearing from the front, but do not tighten the set screw.
11. Slide the ¾" DD shaft into the lower U-joint and then slide the upper U-joint over the 1" DD tube.
12. Slide the Mustang upper steering shaft through the upper pillow block, into the collapsible shaft tube.
13. Adjust the U-joints and shafts until the shaft is flush on the inside of each U-joint. The upper U-joint will be tight against the locking collar.

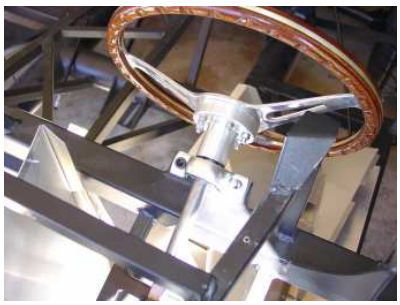
14. Tighten the set screws and the jam nuts on both U-joints and the 1" locking collar.
15. Tighten the bolts holding the ¾" pillow block and the 1" flange bearing to the frame.
16. Attach the steering wheel boss to the Mustang upper steering shaft using a 15mm deep socket. Be careful not to force fit the aluminum steering wheel boss. Match the flat sides on the shaft to the flat sides on the boss.
17. Attach the aluminum steering wheel boss to the steering wheel. Use a 10mm wrench and a Phillips-head screwdriver. The steering wheel will only line up with the holes one way. Rotate the wheel until all the holes line up.
18. Turn the steering wheel to make sure there is no bind in the U-joints. The steering should be smooth. Readjust the U-joints if necessary to prevent any binding.

I used an FFR upper steering shaft. I have questions about the two Flaming River collar flanges. Where do they fit in the assembly? In a reply from FFR, both flanges are on the outside of the firewall. The collar locations on the upper steering shaft need some guidance from FFR.

The Oben North Race Cars turn signal assembly is installed on the upper steering shaft.

Steering shaft & boss flange at the firewall.

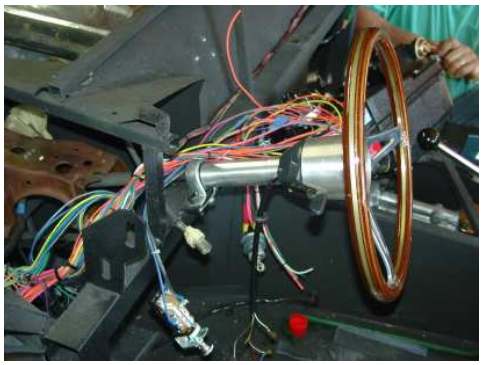
Overall photo of the steering assembly.



Steering wheel and boss flange in cockpit.

Steering shaft assembly looking forward.

Time to complete. 130 minutes



North Racers turn signal assembly

The North American (Oben) turn signal assembly is basically a Volkswagen unit.

The wiring schematic is:

Time to complete	120 minutes
Time to complete electrical	60 minutes

v. Engine Wiring Harness & EEC-IV

Attention: The aluminum is laser cut for the EFI ("Electronic Fuel Injection) rubber grommets. The kit comes with block-off covers if a carbureted engine is used. If you are running a carbureted engine, you do not this section. There are after-market harnesses available for fuel injection applications. There are two ways to wire an EFI engine. One is to use the entire Mustang harness and transplant it. Another way is to use an engine harness from the Mustang and splice the power leads into an aftermarket car harness such as the Painless harness using Chilton's or Ford wiring diagrams. Make sure that the battery is not connected any time you are working with the computer.

Parts: Mustang engine harness, engine harness assembly (FFR # 12874).

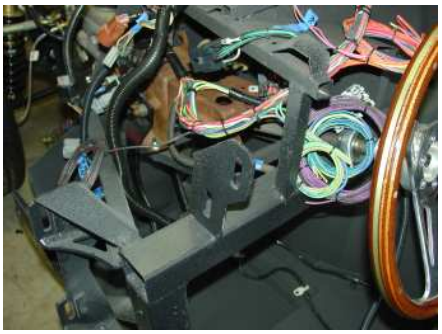
Note: I am using a '92 Mustang harness with a '93 computer that has been modified (dieted) by Roger Stine.

1. Attach the computer to top of the footbox or behind the dash using the plastic bracket from the Mustang and the screws provided.
2. Cable ties can be used to secure the extra harness to the top panel by drilling two 3/16" holes a ¼" apart and passing a zip tie through them.
3. The harness splits into two on top of the foot-box. The short, smaller one of the two goes forward and connects to the Mass Air sensor and the harness on the engine for the O2 sensors and oil level sender. The long bundle goes along the firewall and contains the vacuum control lines for the EGR valve and engine, the connection to the distributor, the two plugs for the fuel injector harness, and the power connectors to the dash harness by the master cylinder.
4. The engine harness begins in the passenger foot-box. The Computer hookup is pushed through the oval shaped hole in the passenger's foot-box from the engine bay side. See the photo.
5. Use the screws provided with the kit to mount the vacuum controls, BAP (Barometric Air Pressure) sensor, and starter solenoid. Mount the solenoid either to the 1" tube near the master cylinder or behind the engine for a cleaner engine bay.

6. Attach the computer connectors to the starter solenoid and the ground to the backside of the solenoid against the 1" tube as shown. The ground looks like a female stereo jack (sort of). Cut the connector off and use the ring connector provided.

Attention: If you are running EFI without emissions equipment, the vacuum/electrical solenoids located on top of the foot-box along with the vacuum reservoir are not necessary. Plug the vacuum outlets on the intake and remove the unused parts.

Wiring harness start.

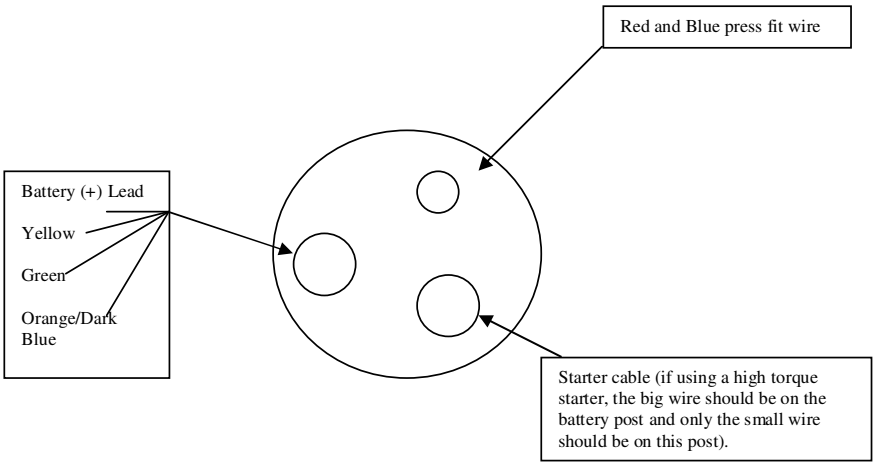


Wiring harness under the driver foot-box

Time to complete **120 minutes**

The Stine wiring harness has installed without problems in all cases. Every time we test the electrical system for new parts additions, it functions without problem.

Starter Solenoid Wiring



w. Mass Air Meter

Attention: If you've chosen to run a non-fuel injected engine, this step is not needed.

Parts: Mass Air meter, air filter.

1. Turn the Mass Air Meter on its side and attach the bracket to the 1" tube leading to the front suspension.

Note: I am using a 75 mm Mass Air meter and filter.

BBK throttle body, Mass Air sensor installed

The mass air tube from BBK has a 45 degree bend and is 11 inches long. We found that with the mass air sensor and air filter in the installation as noted above, there was not hood and wheel well clearance.

We found a 90 degree elbow and installed it as noted next.

The 90 degree elbow installed in the mass air inlet

x. Wiring Harness

Wiring harness assembly supplied by Roger Stine of CAPO Bay Charters. It has been completely dieted. It is a '93 wiring harness with a '92 computer and has turn signal, light high and low beam connections to plug into my existing Mustang components. The Stine wiring harness has been stripped of unnecessary Mustang wiring and has added wiring with the name of the electrical connection on every wire. We did not have any problems with this wiring set, except when we forgot to ground a connection and connect the computer in the harness for the fuel gauge.

Attention:

1. If you are running a carbureted engine in your car, you do not need this section. Call us and let us know at time of purchase and we will delete the EFI gear and include a non-EFI wiring harness. After-market gauges will have to be used.
2. There are after-market harnesses available for both carbureted and fuel injection applications.
3. Make sure that the battery is not connected any time you are working with the computer unit.
4. If during this section, you decide to cut your harness, wait until after the car has been started, then remove sections of the harness one at a time, starting the car after each cut to make sure it runs. Use the Chliton's or Ford wiring diagrams!
5. If you did not take the harness out of the donor car yourself, when connecting the plugs together, check the wire colors going into and out of the plugs to make sure that they line up and are the same color. The only plug that may not be the same color is the fuel tank harness. All other plugs that go together should be matching in color and shape or they will not connect. Different color plugs mean you may have a different year harness than the rest of the harness that you have and could cause complications later when trying to start the car.
6. There is more than one way to route the harness on the frame. These instructions only illustrate one way to accomplish this. We ran them to give the cleanest looking engine bay.
7. Block off plates is included in the kit for the holes where the fuel injection harness passes through the foot-box and transmission tunnel. The Block off plate for the driver's side foot-box hole can be drilled to pass the wires through for the lights. The grommet that comes with the harness can be used here to keep the firewall sealed around the wires.
8. The starter solenoid, coil, and ignition system can be mounted to the firewall for an uncluttered look in the engine bay. There is a hole in the rear corner of the drivers inside foot-box wall for these wires, as well as the rear taillight wires to pass through.
9. Do not connect the Battery!

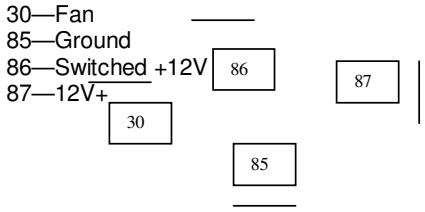
Parts: Misc electrical assembly (FFR # 10975), misc electrical assembly (FFR # 12873), insulated line clip assembly (FFR # 11029).

Note: Be sure to connect the Ford wiring harness to the computer before completing any test, especially from the fuel pump to the engine. The fuel pump wire goes through the computer.

y. Headlight Harness

1. The headlight harness is started at the alternator and runs forward to the passenger headlight area, then goes under the fan shroud to the driver's side headlight area and then rearward to the coil and starter relay area.
2. The Mustang is wider than the Spyder GT in front, so there is extra wiring between the headlights. Removing the tape from the harness, overlap the wires, re-tape and use the loom material provided in order to have a cleaner looking harness.
3. Run the harness along the front side of the "X" with the brake lines.
4. Run the harness down along the top of the 1" tube to the front "X". Use the insulated line clips, and the wire loom to hold the wires.
5. At the front "X" split the harness into two sections: Driver side lights and horns; Passenger side lights.

6. Run the driver side wires along the outside of the 1" tube running to the nose hinge forward to the headlight area.
7. Run the passenger side light wires forward to the headlight area along the outside of the 1" tube running to the nose hinge.
8. The electric radiator fan ground should be grounded to the frame. Make sure to scrape down to bare metal before attaching the ground wire.
9. It is recommended that the relay included be used for the electric fan. Connect the relay as shown below. Use the electric fan wire in the harness as the switching wire. Run a separate wire to the hot side of the starter solenoid for constant power. Connect the harness electric fan wire to one of the dash toggle switches. The fan is not needed all the time. The 2-position toggle will serve as your on-off switch. If a thermostat switch is desired instead, you can pick one up
At the local auto parts store.



Note: Leave extra head light cable so that a connector can be installed to ease nose piece removal if needed.

The Stine harness wired directly to the head light assemblies with connections for removal.

Driver head light wiring to Stine wiring

Time to complete 45 minutes

z. Dash Harness

1. The dash harness begins at the coil area and goes rearward to the large hole in the front of the driver's side foot-box.
2. The key to routing the dash harness is to start on the inside of the foot-box and push the smaller items through the large hole from the inside of the foot-box.
3. The connections for the coil, starter relay, and the connectors for the rest of the harness easily fit through this hole and the big rubber grommet on the harness press fits into the laser cut hole.

4. Remove 4” of the tape covering the harness wires on the outside of the dash harness grommet.
5. Pull enough of the harness through the grommet so that the coil can still mount on the outside of the ¾” tube next to the master cylinder. By doing this, the amount of visible wiring in the engine bay is reduced.
6. Run the harness over the pedal box.
7. The dash harness can then be run on top of the 2” x 2” tube, using the insulated line clips.
8. Connect the relays and snap connectors to their original spots along with all sensors and relays.
9. When the wire harness is installed, mount the fuse panel to the 2” x 2” dash hoop support and between the two ¾” x ¾” frame tubes in the drivers side foot-box using the Mustang metal brackets and a couple of the #6 self-tapping screws.
10. Mount the headlight and hazard switches using the aluminum pieces (FFR # 10566 & 10638) toward the center of the car just to the left of the transmission front cover.
11. Attach the harness across the 2” x 2” tube, using the insulated line clips.
12. Run the dash area wires along the top of the 2” x 2” tube to the inside driver wall location.
13. Use the insulated line clips, and the wire loom to hold the wires.

Note: I have placed all the Stine dash wiring into two plugs for ease of dash removal.

First dash fitting to determine AC space behind it

Dash wiring in place

Time to complete	240 minutes
Time to assemble	240 minutes

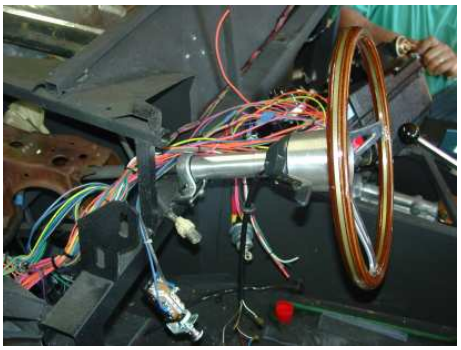
z. Ignition & Turn Signal Stalk

Parts: Gauge/dash assembly (FFR # 10893), donor ignition switch and turn signal stalk.

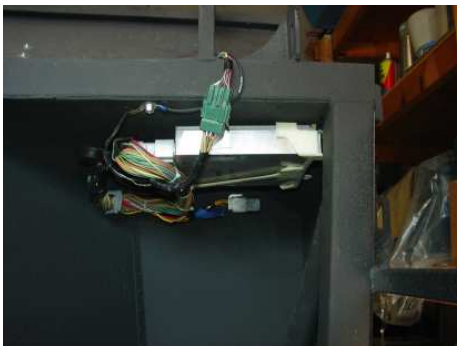
1. Mount the turn signal stalk with the stalk pointed towards the seat as high as possible between the plate steel that also holds the windshield and the vertical ¾" tube next to it. The switch spans the gap. Use two 1" screws and a 5/16" socket and 9/64" drill bit.
2. The ignition switch mounts under the turn signal stalk on the 2" x 2" frame hoop that has the door hinge mounted to it. With the door closed, mount the switch as close to the hinge as possible without hitting it. Use two 1" screws and a 5/16" socket and 9/64" drill bit.
3. The turn signal stalk can be cut shorter so that when it's mounted, it will not protrude past the dash lip. If you want to cut the stalk length, do it after the dash is installed and you have sat in the car to see if it is needed. Cut half of the length first. Do not worry about the pieces that fall out, as they are for the Mustang wipers and are not used. Re-use the end cap and epoxy it to the newly cut stalk to give it a nice finished look.

I purchased my turn signal assembly from North Racecars Inc, who specializes in FFR steering turn signal assemblies.

We had to modify the FFR upper steering assembly to fit the turn signal assembly by drilling a ¼ x ¼ inch hole in the shaft to fit the turn return signal mechanism.



Turn signal assembly in place



Computer in place in passenger foot box

Time to complete 240 minutes

aa. Engine Bay Area

1. Place grommeting around the hole in the upper corner of the inside driver foot-box wall.
2. Run the engine bay wires through the hole in the driver foot-box inside wall.
3. Run the wires to the starter solenoid.
4. Bundle the wires for the alternator as they can be run on the engine.

bb. Rear Harness

1. Run the rear harness from the hole in the driver foot-box inside wall, along inside frame. Use zip ties, insulated line clips, and the wire loom to hold the wires and battery cable.
2. At the rear of the frame, run the wires low on the frame so that they are accessible after the body is mounted on the frame. Run the brake light wires

to the far corners of the frame. The lights will mount to the 1/16" plates on the rear of the frame.

3. Use the Mustang inertia cut-off switch in-line with the fuel pump power.
4. Locate the switch out of the way but still accessible in case it is tripped.
5. Use the inertia cut-off switch as a template and drill two holes in the trunk aluminum on the far corner of the driver's side. Mount the inertia fuel cut-off switch on the inside.
6. The remaining section of the rear harness runs to the battery where it joins the battery cable and runs along the transmission tunnel down tubes.
7. From the battery forward, use some of the ¾" black plastic wire loom (included with the kit) to cover and protect the rear harness and the battery cable.
8. Replace the cable tie wraps that were used earlier during the battery cable install with the large insulated line clips where possible.
9. Run the harness forward with the battery cable (zip tie them together to prevent movement) to the beginning of the driver foot-box, passing over the transmission harness section on the way.
10. Place insulation grommeting around the ¾" hole in the upper corner of the inside driver foot-box.
11. Slide the harness down the edge of the foot-box into the hole.
12. Cable ties can be used to secure the harness up to the hole by drilling two 3/16" holes about a ¼" apart and passing a zip tie through it.
13. At the front of the tunnel, the rear harness goes up into the top foot-box area where it meets the dash/engine main harness.
14. Wrap the extra harness around the ¾" tube in the foot-box and zip tie it in place.

cc. Transmission Harness

1. Push the harness plugs through the hole in the driver's side floor aluminum.
2. Push the rubber plug into the laser cut hole.
3. Run the harness forward into the corner of the ¾" tube at the foot-box front. The go up and along the angled ¾" tube to its connector. Make sure that it does not get in the way of the accelerator pedal. Use the drilled holes and the zip tie trick to keep the harness in the corner along the floor.

dd. Battery Tray Installation

1. Place the battery tray, on top of the trunk floor, with half of the plate on each side of the cross brace located on the driver side of the trunk.
2. Mark where the holes line up on the rear facing side of the ¾" tube.
3. Drill the holes for the hooks on the rear face of the ¾" tube.
4. With the bends on the battery tray pointed up, put the hook ends through the tray holes and thread the washer and nut onto the ends.
5. Hold the tray up to the drilled holes on the frame and insert the hooks into the holes as shown in the photo.
6. Duct tape the hooks into the holes to help in the assembly process.
7. Place the battery onto the tray with the positive terminal on the driver's side.
8. One by one, wipe clean any grease/oil on the hook bolt. Using *JB Weld* or silicone cover each hook from coming out if is not tight.
9. As you tighten the battery plate upward, make sure that the battery brace is lined up with the depression on the battery and make sure the battery is straight.

10. Tighten the battery down until is snug against the frame and does not move. **Do not** over tighten and bow the sides of the battery causing damage to the battery. The bolts should be tightened evenly and none should be loose.

ee. Battery Cable

Attention: Do not connect the battery yet. Leave the cable zip tied. The cable will need to be run through the trunk floor later.

Parts: Battery ground cable assembly (FFR# 13005), engine ground cable assembly (FFR# 12717), OEM braided ground strap, engine/harness assembly (FFR# 12674), insulated line clip assembly (FFR# 11029), misc. electrical assembly (FFR# 12873).

1. Run the battery cable (FFR# 10579) from the positive terminal of the battery straight forward, down the driver's side of the transmission tunnel as shown. Zip tie as you go.
2. If the starter solenoid was mounted behind the engine, run the cable up the transmission tunnel front wall behind where the engine will sit and to the solenoid. If the starter solenoid was mounted to the 1" tube near the master cylinder, run the cable to the front of the of the driver's foot box. Run the cable under the floor to the outside of the car and up to the starter solenoid.
3. Use the grommeting on the edge of the aluminum where needed to prevent cable damage.
4. Leave the battery cable fastened for now with Zip ties everywhere so that the rear harness can be run with the cable later. Use the insulated line clips and screws in order to attach the engine ground cable.
5. Drill a 5/16" hole in the side of the passenger frame engine mount in order to attach the engine ground cable.
6. Sand the contact area down to bare metal.
7. Attach the engine mount bolt or other bolt on the engine.
8. Attach the OEM braided engine ground strap on the back of the driver's side cylinder head to the 2" x 2" tube on the frame using a ¼" x ½" screw from the engine/harness assembly. Make sure to sand the contact area down to bare metal before attaching.

ff. Radiator, Fan & Hoses

Attention: Avoid damage to the delicate radiator fins during handling. Do not warp/distort the fan shroud as it will make the blades break.

Parts: Fan mounting assembly (FFR# 12875), Radiator hose assembly (FFR# 2876), radiator mounting assembly (FFR# 12878), OEM radiator cap, secondary body fasteners assembly (FFR# 12749), aluminum engine bay assembly (FFR# 12841).

gg. Fan Mounting

1. Attach the two plastic mount tabs to the top of the electric fan (FFR# 10668).
2. Attach the two metal strip mount tabs to the bottom of the electric fan.
3. Lay the radiator down with the front side down.
4. Center the fan left to right on the back of the radiator.
5. Raise the fan as high as possible so that the fan mount nut can go on the bolt on while sitting in the top radiator flange.
6. Angle the lower mounting tabs at a 45 degree angle outward then adjust them so that the mounting bolts will again go through the flange and the nut will go on the bolt.
7. Mark the upper and lower mount tab holes on the radiator flanges.

8. Mark where the lower mount tabs can be trimmed.
9. Remove the fan from the radiator.
10. Drill the mount tab holes in the radiator using a 7/32" drill bit.
11. Trim the excess off the lower fan mount tabs.
12. Attach the fan to the radiator using the black #10 x 1" screws on the top and the #10 x 5/6" screws on the bottom.

FFR fan installed on back of radiator

AC evaporator installed on front of radiator

1. Use a razor knife and slit the 8.5" long sections of fuel line lengthwise.
2. Push the slit sections of fuel line onto the lower radiator frame mounts at the front of the frame and trim off any extra.
3. Install the radiator from above the frame.
4. Attach some stick on weather stripping to the underside of the radiator top mount bracket.
5. Position the top mount bracket so that the small tab sticking up is on the rearward side of the bracket.
6. While holding the bracket on top of the radiator, mark the location of the mount bracket holes on the 1" x 1" tubes. Do not let the end of the bracket overhang the tube, another piece of aluminum will be attached to the outside of the tube later (see the picture).
7. Remove the top mount bracket and drill through the 1" x 1" tubes at the marked locations using a 5/16" drill bit.
8. Attach the top radiator mount bracket using the 5/16" x 1.5" screws, washers and locknuts.

hh. Radiator Aluminum

1. Rivet and silicone the radiator side aluminum to the center air duct panel. The side with the semicircle cut-out goes on the driver side.
2. From the secondary body fastener assembly, use some press-on weather stripping on the three top sides, the sides that will contact the radiator, and along the lower front edge of the large radiator duct (see the photo).
3. Insert the radiator duct aluminum from behind the radiator.
4. Attach the driver and passenger side duct brackets to the top of the 1" x 1" tubes and the sides of the main duct using 1/8" rivets and silicone.

Note: Fit the nose body to the hinge fittings and mount to chassis before final rivet assembly of the radiator duct aluminum to the chassis. This allows a snug fit of the aluminum

to the upper inside of the nose body. Remember to place all the gasket edge material to the aluminum.

First fitting of air duct to radiator from front

First fitting of air duct to radiator from back

Radiator duct air guide and air duct chassis placement was done after the hood body was in place. The side air duct was attached to the chassis so that the upper edge touched the hood when fastened. The side air ducts were marked and fastened to the air duct and then to the chassis.

Air duct side sheet medal attached to chassis

Air duct chassis brace attached to air duct and chassis.

Time to complete 180 minutes

ii. Radiator Hoses

Attention: Follow the instructions included with the corrugated radiator hoses to attach the hoses to the radiator and engine. Do not discard any of the hose remnants as they are used for the fuel filler neck.

1. Starting at the radiator, route the lower radiator hose over the top of the steering rack tie rod and under the steering shaft to the water pump.
2. The upper radiator hose should be routed on top of the passenger side duct bracket. The kit includes a remote fill adapter that should be installed at the highest point in the cooling system which is the return hose back to the radiator.
3. Install the remote fill adapter in-line with the upper radiator hose. Use either a section of the stock radiator hose or a section of the corrugated hose between the engine and the adapter.
4. Attach the overflow container to the front 'X' frame using the supplied screws.

5. Attach the overflow tube and nipple to the overflow tank.
6. Zip-tie the hose to the corrugated upper hose and run it to the radiator fill adapter.

Lower radiator hose from engine to radiator

Upper radiator hose from engine to radiator

Note: Save all extra hoses and adapters as they will be needed for the fuel neck.

Time to complete 120 minutes

jj. Aluminum Trunk Floor

Parts: Secondary body fastener assembly (FFR# 12749), aluminum rear trunk assembly (FFR# 13014).

1. Trial fit the trunk floor so that you know where to drill the holes. This can be tricky, but take your time and it will fit without damage. This is one of those steps where you need to take your time and proceed slowly. Another person would also help with this install. If not marked and drilled for rivets, do this at this time.
2. Remove the trunk floor panel.
3. Apply silicone to the flat surfaces of the frame where the aluminum will contact.
4. Re-install the aluminum panel.
5. Use #6 screws to hold the panel in place.
6. Drill through the aluminum rivet holes and into the frame.
7. Wipe and clean the aluminum.
8. Rivet the panel in place with the 1/8" short rivets.
9. Adjust the trunk floor panel and mark it for the battery cut-out. Fit the aluminum battery box to match the frame cut-outs.
10. I had to cut and re-weld the chassis trunk floor X braces to allow the new battery box to fit in the center of the truck space.

Chassis trunk frame cut-outs.

Battery box fitted into frame.

Trunk deck with battery well and box

Battery installed in battery well and box

kk. Emergency Brake Handle

Parts: Interior trim assembly (FFR# 12884), brake fastener assembly (FFR# 11076).

1. Mount the emergency brake handle to the floor mounts with the fasteners provided.
2. Attach the cable 2 into 1 'T' connector to the handle if it is not already there.
3. Release the emergency brake handle using the button and make sure it is in the all way down position.
4. Run the emergency brake cables under the 4" round tube transmission cross-member and up to the handle area.
5. Pull on the cables one at a time and slide them into the slots on the 'T' connector.
6. Pull up on the emergency brake handle, so that the automatic tensioning cog can adjust the free play in the lines.
7. Check to make sure the cable does not rub on the aluminum.
8. Push the leather cover onto the handle.

As noted before: we had to modify the emergency brake cables by shortening them and adding custom brake handle cable hooks.

Time to complete 45 minutes

ll. Wheels, Tires, & Ride Height

1. Mount the wheels onto the car.
2. The ride height in the front is 4.25". This is measured from the bottom of the 4" round tube to the ground using 235/60R 15 tires.
3. Ride height in the rear is 4.50". This is using 275/50R 15 tires.
4. Adjust the ride height with the driver in the car for proper weight loading on the suspension.

Note: The tire and wheel sizes on this car are:

Front	17x8 Cobra R with 245 45 ZR17 Nitto 555 tires
Rear	17x9 Cobra R with 275 45 ZR17 Nitto 555 tires

Note: I am keeping the ride height front and rear the same as above.

mm. Checking the Running Gear

1. Secure loose and unused wires with cable ties.
2. Never cut a seemingly unimportant wire or bundle.
3. Starting problems are commonly due to a wire or relay not being hooked up or grounded properly.
4. Before starting the engine, check the following electrical connections:

    a. Battery ground strap
    b. Engine to frame ground
    c. Fuel pump/rear harness ground
    d. Fuel pump relay ground
    e. Computer ground near the computer
    f. Computer ground near the starter solenoid
    g. Lighting grounds at each corner where lights are
    h. Dash area grounds
    i. Any other black wires with circular toothed clips

5. When the ignition is turned to the 'on' position, the fuel pump should be heard whirring for about three seconds and then shut off. This sound is the fuel pump pressurizing the system. If you do not hear the sound, check the emergency inertia cut-off switch. The red button should be pressed in. Double-check that the computer is hooked-up and re-check all the ground connections. The computer ground near the starter solenoid has a black plastic one wire quick disconnect that many people forget to ground because the other half of the connector is missing. If it is found to be missing, cut the connector off and attach a circular ground connector.
6. Various clicking and whirring sounds are a great indication that things are working well.
7. **Check the oil level. Double check the oil level as we added to much oil.**
8. **Check the coolant level.**
9. Crank the engine for ten seconds with the coil connector removed so that the oil pressure can build up before starting the engine.
10. Reconnect the coil lead and start the car.
11. After running the car for two minutes at idle, turn off the engine and recheck everything for leaks and problems.
12. Several warm-up and cool down cycles are necessary before air in the coolant system is bled out. You will ruin your engine if you start it and drive without checking to see if the radiator is getting hot water pumped to it from the water pump. The best way to tell if the water pump is working is to feel

the radiator after the engine has warmed up and see if the radiator is warm. Usually, it will be very cool if water is not being pumped through and you will have to add coolant and allow the purge tank to replace some of the coolant as the motor cools down. The overflow tank should be half full during all the test sessions so that it can bleed water into the system as the engine cools.

13. Turn the steering wheel stop to stop to check for wheel rubbing. There should not be any contact. If there is contact, you can put an extra spacer ring in the steering rack. This effectively changes (reducing) your steering travel and turning radius. It is a good trick to remember if you use oversize tires or have bought custom wheels (not from us!) and the wheels rub slightly.
14. If you are using the Ford alternator and not a GM one wire alternator, remember that the car does not charge the battery without the voltmeter hooked up and the battery will run down over time.

nn. Foot Box Top Section

Attention: Make sure there are no electrical problems; it is easier to access and fix the problems now than later.

Parts: Aluminum cockpit assembly (FFR# 12838), secondary body fasteners assembly (FFR# 12749).

1. All wires should be inspected in the foot-box area before the foot-box top is installed. Double check the clutch pedal movement. As the clutch pedal moves you do not want contact with any wires.
2. Position the driver foot-box top/outside panel so that is inside the outer wall and on top of the top/inside panel and behind the foot-box front panel as shown in the photo.
3. Use #6 screws to position the panel.
4. Mark the panel for rivets.
5. Remove the panel and silicone where the panel will contact other panels and the frame.
6. Use the #6 screws to hold the panel while drilling and riveting the panel in place.

Chapter Three; Body & Interior:

oo. Body Mounting

At this time you should be finished with the rolling chassis. This is an exciting time because the bulk of the real difficult work is behind you. From here on out, the time is really in the details.

Attention: The body will be trial fit and adjusted along with the doors to ensure everything fits before the body and parts are painted. All of the trim accessories will also be trial fit/adjusted. Since the rear clip is one piece, get two people to help when you are ready to position the body onto the frame.

If body cut outs were ordered, the side exhaust, side louver, headlights, taillight, turn signal, wiper, gas cap, and side mount holes are done at the factory.

It is smart to have some help when doing this step. Much of this positioning is push and pull until all holes line up. The fiberglass edges can be very sharp. Wear gloves when lifting or holding the body.

First fitting of the after body to the frame

Body with nose body installed in first roll-out

first body roll-out

Parts: Body assembly (FFR# 13505), windshield support brackets (FFR# 13510, 13511).

1. Insert the windshield bracket supports into the slots on either side of the windshield opening and use duct tape to hold them in place temporarily while lowering the body onto the frame. The flat face of the bracket should face toward the inside of the car.
2. Using two people, one on each side holding the wheel well and side exhaust recess move toward the frame from the rear with the back slightly lower than the front.
3. Pull the sides of the body out to clear the frame.
4. Watching the rear of the frame, move the body forward slowly lowering the front.
5. Pull the body out to get around the door hinge brackets.
6. Move forward until the rear of the body meets the rear mount and put the body down in place. Watch the door hinge mounts and striker post mounts on the frame.
7. Once the body is in position, it will be snug against the taillight plates in the rear, the lower rear corners of the door opening should be at the corner of the tubes for the door latch.

Note: I had my windshield installed by a professional windshield person.

pp. Tail Lights

Attention: Photocopy the template from the manual in case it gets ruined. Be careful with the lenses, they are glass and can break if dropped from a fairly low height.

Parts: Taillight assembly (FFR# 12885).

1. The rear taillights double as the rear body mount.
2. There is a plate mounted on the frame to receive the light mount screws.
3. Use the template in Appendix A to mark the body as shown. Use a level to align the template.
4. Use a 1 ¼" hole saw to make the center holes and a 7/32" drill bit for the screw holes.
5. Take the lights apart and cut the protruding rubber part fro the light off as in the manual picture.
6. The lights mount from the outside of the body with out the lenses and trim rings in place.
7. Test fit the lights. You may have to bend the ground tab slightly or file away a bit at the hole to make it fit perfectly.
8. Mount the lights using the supplied hardware.
9. This is a test fit so do not wire the lights yet.

Pontiac tail lights during install

I replaced the kit tail lights with after market '56 Pontiac lights. I realigned the lights to be on a center with the license plate fixture.
The Stine wiring assembly would not work through the turn signal assembly for brake lights. We used the Stine third brake wiring to the inner back lights and the turn signal wiring to the outer back lights. All back lights work with the lights on switch.

Final assembly of the tail light system

Time to complete	120 minutes
Time to re-assemble	60 minutes

qq. Side Body Mounts

Parts: Secondary body fasteners assembly (FFR# 12749).

1. The body sides are mounted using four stainless 5/16" x 1" bolts with a washer next to the head.
2. The rear most side body mount needs 7/16" worth of washers between the body and the frame so that the body is spaced correctly and there is enough thread left so the locking part of the nut is used. See the photo.
3. When the doors are fitted, the number of washers may have to be changed to ensure a flush door fit.
4. The edge of the body doorsill should be flush with the inside side of the doorsill 1" x 1" tube. Use a #6 self-tapping screw to hold it in place if necessary.
5. Work from the rear of the car towards the front.

Passenger side body mounting bolts in place

Time to compete both sides 35 minutes

rr. Body Cut Outs

Attention: Use caution when cutting. Go slowly, measure twice, and cut once. Make two photocopies of the templates (one for each side of the car) from Appendix A.

Note: The best way to handle these cutouts is to have them done at the FFR factory. I ordered my cutouts done at the factory. A problem with this is that the templates were not included in the manual and some of the needed cut-outs are not done at the factory.

Note: The door hinge cutouts are not done at the factory as are the door latch cut-outs.

Parts: Templates in Appendix A. (Not in my manual.)

ss. Side Exhaust Cut-Outs

1. Cut out the side exhaust template.
2. The template goes to the top edge of the body.
3. Tape or hold the template and mark around it with a pen.
4. Use a jigsaw to cut out the marked area.
5. The template is slightly tight. Enlarge the holes after fitting the side pipes later if desired.

tt. Turn Signal Cut-Outs

1. Only cut the outer lines of the shapes out.
2. Position templates on the body in their correct locations and tape in place.
3. Use a 1" hole saw to make the center holes and a 3/16" bit for the small holes.
4. Test fit the lights. The tab may have to be bent slightly or file away bit at the hole to make it fit perfectly.

uu. Side Louver Cut-Outs

1. At the corners of the louver indentation, use a ½' drill bit to make a starter hole.
2. Use a jigsaw or hacksaw for the straight edges.

vv. Headlight cut-Outs

1. Tape the template to the headlight bucket.
2. Using a 7/16" drill bit, drill the outer holes and make sure that they do not hit the circle.
3. Drill a 7/16" hole on the inside of the circle so that the edge of the hole is just touching the circle. Use a jigsaw to cut the circle out.

ww. Front Nose Mount

Attention: It is smart to have help when doing this step. The fiberglass edges can be very sharp. Wear gloves when lifting or holding the body.

Parts: Nose/trunk fastener assembly (FFR# 13016), (FFR# 12645), Mustang fog lights.

1. The nose mounts double as the hinges for the nose, they attach to the underside of the fog light openings and the bottom of the nose.
2. The frame mounts for the nose hinges are 30 5/8" apart center to center. This is how far apart on center the hinge mounts on the nose will need to be.
3. Using the lower radiator opening for reference, find the centerline of the nose and mark it on bottom on the inside.
4. Measure from this centerline 15 5/16" to determine the center mounting location for the hinge brackets.
5. The hinge brackets mount with the flat round fact up against the fog light recess and the "T" shaped surface along the bottom of the nose. Bend the flats of the bracket so that they conform to the body.
6. Angle the fog light so that the stud mount points straight back.
7. Put a dab of silicone on the end of the fog light bolt.
8. Hold the fog light in the opening so that it is centered and the lines in the glass are vertical.
9. Push the light in so that the mount bolt touches the back of the light bracket and leaves a mark.
10. Drill the mark in the fog light bucket and one other hole in the nose for an additional mount bolt.
11. Line the hinge plates up against the openings with the angled supports as vertical as possible. These need to be as vertical as possible to prevent binding in the hinge.
12. Mark the brackets through the mount holes.
13. Remove and drill the hinge brackets.
14. Bolt the hinge brackets in position.
15. Use a coupe of #6 screws in the legs of the "T" to hold the bottom of the nose for positioning. Do not rivet these until after the nose has been painted.

I used (8) 5/16 x ¾ stainless button bolts, nuts, and washers to hold the nose body hinge mount to the nose body. Four bolts were used in each hinge mount.

16. Trim the stud on the fog lights to allow full adjustment of the hinges.

Driver nose body hinge mount

xx. Hood Latches

Parts: Nose/trunk fastener assembly (FFR# 13016).

1. Open the latches and apply a little bit of chassis grease to the sides of the latches.
2. Work the latches a few times to help loosen them.
3. Attach the latch mount plate to the front side of the latch as shown in the photo.
4. Cut the area for the latch on the nose leaving the lower finger recess for the bottom of the latch.
5. Position the latch from the backside of the body. Make sure the latch looks straight in the cutout and compared to the rear edge of the nose.
6. Drill 7/32" holes for the mounting screws as shown. Use tape on the outside of the body if the body has been already painted.
7. Mount the latches to the nose. Use the washers on the backside of the body.
8. Attach the "U" bolts to the nose latch striker mounts on the frame. Do not tighten them yet.

Driver inside hood latch

Passenger hood latch in place

Time to complete 120 minutes

zz. Nose Hinge Alignment

Attention: It is smart to have some help when doing this step. The fiberglass edges can be very sharp. Wear gloves when lifting or holding the body.

Parts: Nose/trunk fastener assembly (FFR# 13016), secondary body fastener assembly (FFR# 12749).

1. Screw the jam nuts onto the rod ends all the way.
2. Screw the rod ends into the vertical frame mounts so that there is 1 ¼" of threads total sticking out of the frame including the jam nut. This is a rough setting.
3. Back the jam nuts against the frame but do not tighten as they may need adjusting. With the latches unlatched, position the nose on the frame so that the rod ends are in between the nose hinge mount brackets on the nose. See the photo.
4. Move the nose around so there is a small gap (i.e., 1/8") along the backside of the nose against the rear body clip and along the bottom edge of the nose. Use wood or washers in the gap to keep it consistent. Use jack stands in the front and duct tape on the back to keep the nose in place.
5. Either through the nose or from under the car, look at the alignment of the rod ends and the location of the rod ends (left to right) in the brackets.
6. Screw the rod ends in/out as necessary to align the hole with the slots. The nose gaps may also have to be adjusted.
7. Once the alignment has been made, use the included spacers and shims on either side of the rod ends.
8. Insert the bolts through the bracket, spacers and rod end.
9. Tighten the bolts and jam nuts.
10. At the back of the nose engage the latches around the "U" bolts and tighten the bolts so that the hood stays in position.
11. Remove the duct tape and jack stands looking for movement in the nose. Some adjustment may be necessary.
12. With someone on the other side of the nose, unlatch the nose and slowly raise it. You may have to pull out slightly on the latches so the bottom edge of the nose clears the "U" bolts. You can trim the nose if like so that is not necessary.

Passenger nose hinge in place

My hood did not fit the chassis properly and we had to cut the lower side panel below the air vent and hood latch to bring the hood in proper fit with the body. The panel was cut above the flat curve and below the hood latch and a section was removed from the panel and re-fiber glassed to the hood on both sides. This allowed the hood to join the body at the fire wall.

Hood shorting process to make the hood fit the body.

Inside photo of the seam from the fiber glass process.

Time to complete 180 minutes

yy. Hood Struts

Time to complete 65 minutes

Parts: Nose/trunk fastener assembly (FFR# 13016).

1. With the frame at 4" ride height in the front and the help of a friend, open the nose until the Fog light area of the nose is parallel with the ground. Use a ratchet strap or some rope to hold the nose in this position until the struts are in place.
2. The taller strut bracket for the nose should be positioned with the bracket 7 1/8" from the top of the nose support rib. The bracket should be on the outside of the rib with the strut ball pointing in. The stud should be 7/16" from the side of the rib to allow clearance for the strut. Mark the locations of the mounting holes.
3. Use a 7/32" drill bit for the mounting screws.
4. Attach the strut brackets to the nose support. Tighten the locknuts but do not crush the support.

5. Attach the rod end of the strut to the nose-mounted bracket.
6. From the front suspension "X" member, measure down the 1" tube towards the nose 4 ½". This is the starting location for the frame mounted strut bracket. The bracket should be mounted with the ball facing out. Mark the mounting holes.
7. Position the strut bracket by hand and hold the strut up to the bracket stud. If necessary, move and remark the bracket holes.
8. Tighten the locknuts.

We opted to strengthen the hood struts on both sides by fiber glassing a 1/8 in wood ply to the strut with layers of glass. We also discovered the 20# pistons supplied with the kit would not hold the hood up in the position we installed the pistons. We changed the pistons to 40# units.

Passenger hood strut with ply and fiberglass

Passenger 40# piston in place

zz. Trunk License Plate Light & Bracket

Attention: This kit is only a collection of parts designed for use primarily as a race car. Applying the license plate bracket does not mean that this vehicle is street legal. If the builder chooses to title, register, and operate this kit on public roads, the builder is responsible for ensuring that the vehicle complies with all Federal, State, and local laws.

Parts: License light/bracket assembly (FFR# 12835).

1. The license plate bracket and lights can be positioned anywhere on the rear of the body as long as it does not block the taillights.

2. Use the license plate bracket as a template for the mounting screws. Use a level to make sure the bracket is level since there are not straight lines on the rear of the car.
3. Use a ¼" drill bit for the mount screws.
4. Attach the bracket to the body using the two flat head screws and nuts.
5. Attach the license plate with the self-tapping screws.
6. Take the front cover off the license light and use as a template.
7. Mount the license plate lights on either side of the license plate.
8. Use a 1/8" drill bit for the side mount holes.
9. Assemble the light and attach it to the body using the two supplied screws as shown.

License plate lights installed

Trunk lid and trunk lock

The trunk lid hinges and lock are fitted after the trunk lid as been rough fitted to the body. There is a right and left part for the hinges.

Note: There is a right and left hinge in the set for the trunk lid.

Time to complete 60 minutes

aaa. Fuel Neck & Gas Cap

Attention: When you are finished, double checks the hose clamps that connect the rubber fuel neck to tank cap. Previously the fuel neck hole was cut out of the body using the template.

Parts: Fuel filler assembly (FFR# 13580), fuel tank assembly (FFR# 10896).

1. Remove the filler neck from the gas tank.
2. Cut the Mustang steel fuel neck in the mid-section after the 90 degree bend. Leave enough straight tube, to attach a hose clamp to each side.

Mustang gas tank filler pipe cut

3. Insert the neck back into the tank to prevent gas fume leakage.
4. Drill a 2" hole in the body 5 ¼" up from the bottom edge of the trunk opening and a 2 ¼" hole to the right edge of the trunk opening.
5. Push the filler cap through the body hole.
6. Mark the six 3/16" holes for the mounting bolts.
7. Drill six 3/16" holes for the mounting bolts.

Gas tank filler body cut and parts

8. Connect the ring connectors to the grounding wire provided.
9. Place one end of the ground wire to one of the filler neck mounting bolts and attach the other end to the frame.

Note: This wire prevents any static charge build-up at the gas tank and must be used.

10. Fasten the cap to the body using the kit mounting bolts.
11. Cut two 4 ½" long sections of the 2" rubber hose supplied with the kit. One section slips over the end of the gas cap and connects to a leftover section of the corrugated radiator hose. The other section connects the bottom of the corrugated radiator hose to the Mustang filler neck.

Note: To seal the 2" rubber hose to the corrugated hose, the extra adapters supplied with the radiator hose must be used.

12. Slip a section of the left over adapter hose from the radiator hose over the end of the corrugated hose as shown.
13. Slip the filler hose over the adapter hose until the ends of both hoses are flush. Fasten the filler hose to the adapter hose with a clamp.
14. Repeat for the other end of the corrugated hose.

Note: I needed to take time to get the length of the final filler pipe right in the car. Make sure that there are no places in the pipe for gasoline to be trapped.

Time to complete 65 minutes

Note: The corrugated hose as part of the fuel filler pipe makes it very hard to fill the tank without spilling fuel on the car due to air escaping. Much time must be taken to fill the tank to control the air venting.

bbb. Doors & Hinges

Attention: Take your time to align the doors properly. There is plenty of built-in adjustability.

Parts: Door frame assembly (FFR# 12886), door latch/hinges assembly (FFR# 12894), body assembly (FFR# 12645).

1. Make copies of the door cutting templates found in the appendix.
2. Place the templates on the front of the doors they are labeled for and trace the outside of the template onto the front of the doors with a marker.
3. Using a jig saw or other reciprocating saw, cut the area traced.
4. Draw a line 5/8" from the edge of the recessed area on the inside of each door.
5. Drill a 3/8" hole in one corner and use this starting point to begin cutting the recess out.
6. Cut and remove the inside face of the recessed area. Do not worry if the cuts are not perfectly straight as this area will be covered later.

Passenger door cut-out

7. Cut the latch area from the door using a template.
8. Attach the latch to the door using three Phillips head screws.
9. Install the driver side door frame into the driver door through the hole in the front. To get it in you will have to start inserting it at an angle and once it is part way in straighten it out and push it the rest of the way in.
10. Push the frame all the way in until it touches the back of the door. Clamp the frame to the door with two or three small clamps.

Note: Make sure the inside surface of the frame is resting on the top edge of the recessed area of the door.

11. Using a straight edge draw a line along the top and bottom edges of the recessed area. Draw a line parallel to the line 5/8" above the top line and ¾" below the bottom line.
12. Mark the door for drilling using the diagram for locations.
13. Drill through the door and frame with a 5/16" drill bit.
14. Bolt the frame to the door using the stainless steel button head bolts and nuts. Then remove the clamps.
15. Using the door hinge cut out template; mark the cutout locations on the body as shown.
16. Drill a 3/8" hole in each of the cut out locations and cut out with a jig saw.
17. Install the adjuster plates to the frame using the 3/8" square head bolts with nuts and a washer, but do not tighten yet.
18. Press the bronze bushings into the ½" holes in the hinge arms.
19. Attach the hinge arm assembly to the4 adjuster plate using the 2" shoulder bolts, washers, and 5/16" nuts. Tighten the nuts down until the arm is hard to move and then loosen slightly.

Note: If you tighten the nut tight and you can still rotate the hinge easily, then the washer is caught on the shoulder. Loosen slightly, adjust the washer and retighten.

20. Attach the doors to the hinge arms using 3/8" lock nuts and washers.
21. Align the door in the opening with 3/16" spacers under it. Tighten the nuts in the door, check the alignment, then tighten the nuts holding the adjuster plate.
22. Check door gaps and movement, adjust if necessary.

Note: My door hinge cutouts are not photo covered.

Time to complete 75 minutes

ccc. Striker Mounting

1. From inside the rear wheel well, use a 1/8' drill bit through the center of the door latch striker mount to drill through the body.
2. Use the 1 ¼" hole saw to drill from the front side of the body through hole just drilled.
3. Hold the door in the door opening.
4. Remove material from the doors if necessary to allow a good fit in the door opening. Allow a 1/8" – 3/16" gap around the door.
5. Use a marker through the door latch striker hole to mark the location of the striker on the door.
6. Remove the door.
7. Using the aluminum rear cover as a template, center the door latch striker mark on the door in the rounded end of the latch mount. Mark the door with the shape on the template.
8. Use a jig saw to cut out the area marked on the door.
9. Cut the front of the door with a jig saw on the line ½" in from the aluminum lines.
10. Attach the latch striker to the mount plate on the frame using two 3/8" washers next to the striker flange to space it out and one washer next to the locknut.

Passenger door striker installed

Passenger inside door handle installed and working

Time to complete 75 minutes

Note: I finally used the door cutouts to house my radio speakers. I built a panel that can be removed with bolts and nut serts.

ddd. Side View Mirror

Parts: Mirror assembly (FFR# 12837)

1. The side view mirror location must be determined from sitting inside the car, so place one of your seats in the driver's side.
2. Sit in the driver's seat and determine a comfortable position for the mirror.
3. Once the position is determined with ample clearance, mark around the base of the mirror with a pen.
4. Disassemble the mirror by removing the screw from the back and the screw that holds on the base.
5. Positions the base plate in the center of the marks made for the mirror and mark the screw holes.
6. Mount the mirror to the base and adjust using the screw in the back. Drill the holes with a 1/8" drill bit and install the base with the two screws and gasket provided with the mirror.

Note: We have decided not to mount the mirror assemblies because one can not see to the back because of the seat location and window frame.

eee. Windshield Area Body Mounts

Attention: There are three windshield area body mounts along the bottom.

Parts: Secondary body fastener assembly (FFR# 12749), windshield assembly (FFR# 12811).

1. Drill two holes through the windshield flange and the body mount tabs.
2. Use the supplied screws and plastic spacers to hold the windshield area in place.
3. For fitting purposes only, position some of the small rubber posts from the secondary Body Fasteners Assembly in the windshield area using tape to hold them in place.
4. Position the windshield in the opening. There should be a gap all the way around the windshield.
5. If there is no gap, remove the windshield and add another spacer to the closest mount area. If there is too much gap, remove a spacer from the closest mount area.
6. Reposition the windshield. Check for fit and spacing.
7. Remove the windshield.

These parts were installed per the manual on final fit of the body to the chassis.

Windshield final install

fff. Body Removal

Attention: If you will be painting stripes on your car, it is a good idea to mark or scribe the start points of the lines on the body. When the body is off the car it is flexible and difficult to get stripes on the front half of the body to line up perfectly with those on the back half.

1. Remove all of the accessories (mirror, gas cap, lights, etc…) from the body.
2. Remove the nose.
3. Remove all of the parts (latches, fog, main and tail lights, hinge brackets) attached to the nose.
4. Unbolt the sides of the body.
5. With the help of a friend, remove the body from the frame in reverse order it was put on.

ggg. Body Prep & Paint

Attention: Take your time with the bodywork. During the bodywork, take care to look for any small flaws. Time spend here will pay off down the road. If you have never done body work before, talk to an auto-body person who is familiar with working on fiberglass first. Before painting your body and panels, we recommend mounting the body, doors, and nose along with all lights and accessories so if there is a problem with the panel, it is easier to take care of it. After working with more than 1,500 customers we have found the best results are found by painting the body at the very end of the build, after everything is tight and aligned properly. We suggest removing the body and painting it off the car. This eliminates overspray and keeps your nice work intact.

First rough sanding process on the body.

Driver view of the rear panel during rough sanding

Parts: 100, 200, 400 grit sand paper, sanding blocks.

1. Remove all trim, doors, windshield, lights and other accessories before beginning body work.
2. Take extra care to sand away the fibers and strands. Finished flange around the door should not exceed ½" to make sure the press-on door trim fits.
3. The primer gel coat sands easily, and is a forgiving material to work with. Remember that the body comes out of the mold with a wax release compound and a thorough cleaning with a wax remover is the best way to begin this job. After the body is cleaned, you can begin the sanding steps.
4. The parting lines are easiest to remove with a file or scraper. For a car that will be painted a dark color such as black or dark blue, it is very important to understand the nature of fiberglass as a material. The vinyl-ester resins used for these bodies will shrink with a final stage of curing with the elevated temperatures that are present in the sun on a dark car. The seams and any area of body filler repair should be given at **LEAST** several days to cure. If you want to heat cure the body, do not exceed 140 degree F. When the final paint is applied it is very smart to add several coats of clear to those areas where work was done so that years later you or the next owner can simply sand out and buff any imperfections that may develop.
5. Much time and energy was spent on the mold so that the parts line up evenly and do not have a different height when you begin sanding. Take your time at this final fitting stage and you will be rewarded with a fine finish, and a perfectly straight body. Of all the areas to be a perfectionist, this is the one.

6. Block sand the entire body surface with 100 grit sandpaper. For flat sections, you can use a harder rubber sanding block. For curved sections, us a firm sponge at an angle to the curve that you are sanding.
7. Make sure the body is clean and grease/wax free before priming.
8. Allow the bodywork or repairs performed to sit for several days outside in the sun or at an elevated temperature to allow the repair materials to cure.
9. Paint the inside of the body 4" around the windshield opening with a flat black. A spray can works great. This will make any visible parts of the windshield flange "disappear".
10. Prime the body surface with a polyester primer/surfacer such as Feather-fill. Make sure to prime with a polyester primer over all areas of repair. This polyester primer is the same chemical base as gel coat and acts as a barrier between the raw fiberglass and the top coat you will be applying.
11. Block sand the primer with 220 grit paper.
12. The last coat of primer should be a different color so that you can see scratches or flaws that were missed the first time around. Pay particular attention to the areas on the top of the car since these are the most visible to the person looking at the car.
13. After the primer is dry, use 400 grit wet sanding paper with wet sponge soaked frequently to finish the surface preparation. You will see the heavier 220 grit scratches in the surface you are sanding with 400 grit and you want to sand until these heavier scratches are gone.
14. While wet sanding, you know you are finished with an area when it appears foggy and water does not bead up on the surface. Wipe the area with a flat squeegee while sanding to inspect the surface for defects.
15. Spray a sealer coat over the primer and follow this with your first paint coats. The modern two stage basecoat/clear-coat urethanes are the best choice since they offer the workability of the lacquer paints with the flexibility and resistance to cracking of the enamels. The clear coat should be fairly thick since you can repair this layer in the future if something happens to the car's finish. We have seen bad looking scratches repaired if the scratch did not pass through the clear.
16. Go slow. It is amazing how many people (including us) who rush the last steps in order to get the paint on the body when only a few more hours would give you a show car. Keep in mind that paint is impossible to keep looking perfect if you are going to put miles on the car. If the car will sit in a protected garage all its life then yes, spend the $8,000.00 on the show car paint. If you are like the rest of the world, try to control the expense of the project. An average cost for painting a Spyder GT is roughly $4,000.00.

Body prep with Bondo filler for smoothing before primer:

Body rear panels readied for primer

It takes two quart cans of fiber Bondo and two quart cans of Bondo filler to cover the car.

Time to complete 300 minutes

I have arranged to have the car painted at Alamo Body by the same painter who applied the Lizard Skin.

The cost of this paint job is $4,000.00.

Red paint that has not been cut and buffed

Red paint in the sun light

hhh. Remount Body

1. Using two people, one on each side holding the wheel well and side exhaust recess move towards the frame from the rear with the back slightly lower than the front.
2. Pull the sides of the body out to clear the frame.
3. Watching the rear of the frame, move the body forward slowly lowering the front. Watch the door latch posts.
4. Once the body is in position, it will be snug against the taillight plates in the rear, the lower rear corners of the door opening should be at the corner of the tubes for the door latch and the windshield mounts should be close.
5. The body sides are mounted using four stainless 5/16” x 1” bolts with a washer next to the head.
6. The rear most side body mounts needs 7/16” worth of washers between the body and the frame so that the body is spaced correctly and there is enough thread left so the locking part of the nut is used.
7. When you are fitting the doors, the number of washers may have to be changed to ensure a flush door fit.

8. The edge of the body door sill should be flush with the inside of the doorsill 1" x 1" tube. Use a #6 self-tapping screw to hold it in place if necessary.
9. Work from the rear of the car towards the front.

I painted the body on the car. It was so hard to adjust the hood hinges and door hinges that I opted to have the body shop paint with the body on the car.

iii. Reinstall Tail Lights

1. The lights mount from the outside of the body without the lenses and trim rings in place.
2. Wire the turn signals up to wiring harness.
3. Mount the lights using the supplied hardware.
4. Attach the lenses and trim rings to the rubber seals.

jjj. Side Louvers

Parts: Louvers assembly (FFR# 12836).

1. Position the mesh screen behind the louver cut-out area.
2. Remove the mesh and lay a bead of silicone around the cut-out so that it will contact the mesh.
3. Reposition the mesh, pushing it into the silicone.
4. Use duct tape to hold the mesh in place until the silicone dries (usually overnight).

Side screen installed

I used Locktite Power Grip Construction Adhesive to secure the screens.

Time to complete 20 minutes side

kkk. Windshield

First fitting of the windshield

Attention: Handle the windshield with care and store it in a safe place. We highly recommend having a professional windshield installation shop do this installation. Once the windshield is installed, the screws around the windshield are not accessible making removal of the rear part of the body impossible without the removal of the windshield. Most glass shops prefer to use their own weather strip and materials to install the glass since they warranty the installation. Our local installer used a ¼" x 3/8" tall foam dam tape and 409 T 102 weather stripping on our race car.

Parts: Windshield assembly (FFR# 12811).

1. Stick the foam dam tape around the windshield flange on the body.
2. Prime the windshield flange for the urethane.
3. Apply urethane around the windshield flange.
4. Attach the weather stripping to the windshield.
5. Push the windshield in place.
6. Do not move/touch the windshield for 24 hours.

Windshield frame body work completed

As noted before: the windshield was installed professionally.

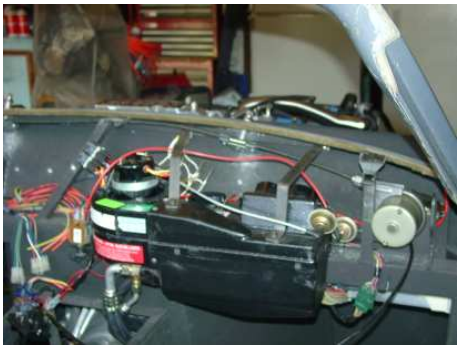
Windshield final fit

Windshield in place

III. Windshield Wiper (Coupe Instructions)

Attention: The wiper system is installed inside the car, not in the engine bay.

Parts: Windshield wiper assembly (FFR# 13026)



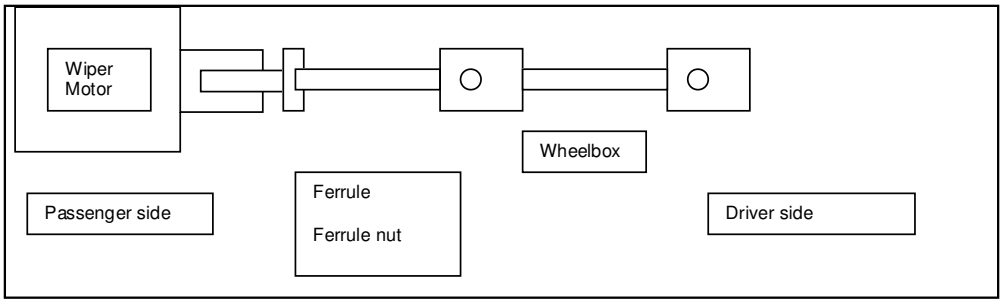
Wiper motor on passenger side of dash

Wiper drive cable to windshield rotors.

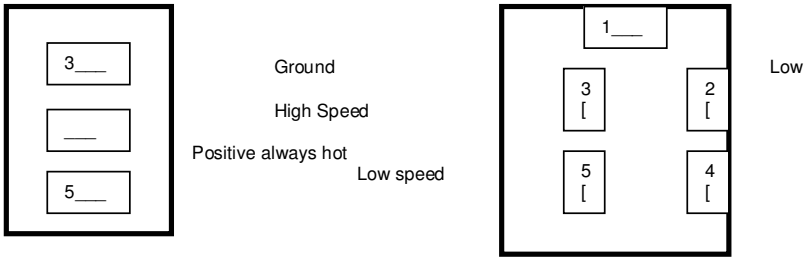
1. Slide the angle cut sleeve and chrome sleeve over a wheelbox.
2. Use a razor knife to trim the angle on the sleeve so that the wheelboxes at the locations show in the diagram.
3. If not already done, drill 3/8" pilot holes for the wheelboxes at the locations shown in the diagram.
4. Using the angle cut sleeves as a guide for the angle necessary; open the holes up to 5/8".
5. Trial fit the wheelboxes to the body using the angled spacer on the underside and the gasket, chrome bezel and nut on the outside.
6. Trim the flat side of the angled spacer so that the nut will fully engage. The smooth part of the wheelbox should just stick out of the body.
7. File the front part of the chrome bezel in order to side properly against the body.
8. Drill a 5/8" hole in the center dash mount for the cable tubing to pass through. Do not allow it to touch the sides of the hole as this will transmit vibrations and amplify the noises made by the wheelboxes and motor.
9. Bend the tubing slightly to match the curve of the cowl.
10. Using the wiper cable as a guide, locate the motor location on the passenger side of the firewall and mount it using the 3" wiper motor clamp. To prevent

any excess noise mount both the motor and the bracket with a piece of rubber.

11. Cut the tubing to the lengths required to connect the motor and the wheelboxes together.
12. Drill the Ferrule nut out with a 25/64" drill bit.
13. Place the Ferrule nut on the tubing for the wiper motor. Flare the ends of the tubing going into the wiper wheelboxes and the wiper motor.
14. Install the tubing as shown in the diagram below.



15. Adjust the length of the wiper arms so that measuring from the center of the arm mount to the center of the blade mount, the driver arm is 12" long and the passenger arm is 11" long.
16. Attach the wiper blades to the arms.
17. Loosen the wiper arm saddle nut so the angle of the blade can be adjusted.
18. Push the arms onto the wheelboxes making sure the driver side is the 12" arm and the passenger side is the 11" arm.
19. The wiper motor included in the kit is a two speed motor. Connect the power leads to the corresponding terminals marked using the female wiring connectors provided. At 12 volts, the low speed uses 1.5 amps and the high speed uses 2.0 amps. Pin #2 is for the "Park" mode and is not used.



20. Connect the "Positive – Always Hot" to the wiper switch wire in the wiring harness.
21. Connect the wiper switch to the same wiper switch wire.

Note: I found that the springs in the kit supplied wiper arm are too strong to allow free movement of the arms during wiper operations.

Time to complete 65 minutes

mmm. A/C Installation (Coupe Instructions)

Note: This A/C system is designed for a serpentine belt accessory set-up. Not recommended for use with under drive pulleys.

Parts: Coupe A/C system (FFR# 13265).

AC installation under the dash

1. Follow the manufacturer's directions on hooking up the various parts of the A/C system.
2. Use the Coupe specific installation pictures from the Supplemental Instatallation Instructions.
3. The bracket holes may have to be chased due to powdercoating.
4. Assemble the compressor bracket using the spacers and bolts provided. Do not tighten the locknuts completely until the assembly is attached to the engine.
   a. Use the 5/16" bolts and the narrow 2" spacers to attaché the brackets together. The larger bracket is the front bracket.
   b. Attach the compressor to the brackets with the inlet/outlet on top. The long bolts go from back to front. The compressor mounts to the front side of both brackets.
   c. The 1.08" spacer goes between the brackets and the 0.9" spacer goes between the front side of the front bracket and the front compressor ear.
   d. Put one of the smaller washers on each of the water pump mount bolts and slide the assembly on followed by the remaining small washer and locknut. Do not tighten down all the way.
   e. Pass the 7/16" bolt through the appropriate slotted hole (upper for 351, lower for 302) with the 2" spacer between the brackets and the other spacer between the bracket and head.
   f. Tighten all of the bolts down, compressor first, then the two brackets, then the head bolt, and then the water pump mount.
   g. Check the alignment of the pulleys. If necessary, move the small washers either all behind or all in front of the water pump and add a washer next to the head in order to align the pulleys.
5. The pressure hoses can either be run along the top of the footbox and out the front as shown here or through eh switch panel and through the firewall next to the Bellhousing.
6. Mount the condenser on the front side of the Radiator. Be careful not to crush the radiator fins.
7. Run the lower hose through the lower radiator mount bracket and up to the Drier.
8. Make sure that the hose connectors to the compressor are bolted down square to prevent leaks.

9. Run the hoses for the compressor across the top of the engine and over to the 1" square tube.
10. Run the duct hose through the holes in the windshield center mount for the driver side dash and footbox hoses.

The FFR dash has major modifications to cover the AC unit under it. We designed a complete passenger and center console to extend the dash to cover the AC unit.

A/C ducts in place under the dash

Note: This is the first AC installation in a GT Spyder. The dash requires extensive modification to get the room for the installation in the car.

Time to complete	75 minutes
Time to complete	120 minutes

nnn. Remount Doors

Attention: Take your time to align the doors properly. Follow the previous mounting instructions.

1. Attach the door frame to the door hinge rod ends using the 1 ¾" long bolts. Insert the bolts through the hinge arms, washers, and rod ends. The upper hinge bolt is easier to install from the bottom up. Tighten the locknuts.
2. Slowly close and engage the door latch on each side.
3. Open the latch and swing the door frame open.
4. Bolt the door skin to the door frame using the 1 ½" long x 5/16" stainless screws. If washers were used to space the skin away from the steel, do not forget to put them on the screws.
5. Reach in the door and release the latch.
6. Slowly open the door and try closing it.

ooo. Door Weather-Stripping

Parts: Secondary body fastener assembly (FFR# 12749)

1. The weather stripping that is provided looks like a double D with adhesive on the back. This should be pulled apart into the two D's. This is used around the bottom of the door and the front.

Note: A phone call to FFR determined that FFR does not furnish the double D weather stripping any longer.

ppp. Check Straps

Attention: The check straps can either be mounted using screws or 3/16" rivets.

Parts; Door latches/hinge assembly (FFR# 12894), check straps (FFR# 10820).

1. Sitting inside with the door closed, hold the check straps up to the door and the 2" x 2" tube and position the strap so that it will hit the framework in the door.
2. Use a marker and one of the check straps (FFR# 10820) to mark the two mounting holes on the middle of the inside face of the 2" x 2" vertical tube that the hinge is mounted on.
3. Use a 1/8" drill bit to start holes for the screws to attach the straps.
4. The door check straps simply stop the door from opening all the way up and scratching your paint. Test the placement of the strap for door travel before final assembly.
5. Open the door wide but not enough so that the door hits the body. The straps will stretch slightly over time so allow enough room for this.
6. Hold the loose end of the check strap up to the hinge.
7. Mark the locations of the drill holes.
8. Fasten the other end of the check strap to the door.

qqq. Cockpit Aluminum

Parts: Secondary body fastener assembly (FFR# 12749), Aluminum cockpit assembly (FFR# 12838).

rrr. Transmission Cover

1. Slide the top cover under the rear U-joint cover, then forward and down as much as possible on top of the front cover flap.
2. Use a marker and ruler to mark rivet positions.
3. Remove the panel and silicone where the panel will touch the already mounted panels.
4. Reassemble the Transmission cover using a couple of #6 self-tapping screws to hold the top and sides in position.
5. Drill the rivet holes.
6. Rivet the panel in place.
7. The transmission/clutch is removed through this panel for service if necessary.
8. The T-5 shifter goes through the forward laser cut hole. The Tremec transmission can have a "mid-shift" shifter installed to relocate the shifter. This is how the original looked with the shifter relocated, riveted cover plate and all.

sss. Door Sills

1. Using the #6 self-tapping screws, position the Door Sill aluminum on top of the body and even with the edge of the 2" x 2" vertical tube. The side going down to the floor will be angled slightly.
2. Use a marker and a ruler to mark the location of the rivets to hold the panel in place.
3. Remove the panel and spread silicone between the body and the door sill 1" x 1" tube and where the aluminum will contact the frame and body.

4. Reattach the aluminum panel using the screws and drill and rivet the panel in place.
5. Repeat for the opposite side of the frame for the other door.

ttt. Front and Rear Splash Guards

1. Position the splash panels so that they are flat against the rear cockpit wall and the corner is against the aluminum panels.
2. Hold the panels in place with #6 self-tapping screws.
3. Use a marker and ruler to mark the rivet holes on the aluminum panel.
4. Note where the panels touch each other and where they touch the frame. Remove the panels.
5. Apply silicone to the upper splash panels.
6. Install the upper splash panels with #6 self-tapping screws.
7. Apply silicone to where the lower splash panels touch.
8. Install the lower splash panels with 36 self-tapping screws.
9. Use 1/8" drill bit and drill the rivet holes.
10. Rivet the panels in place with 1/8" short or long rivets.

We used the aluminum front splash guards as molds to manufacture fiber glass upper wheel splash guards. We also used the same technique on the rear upper splash guards.

Front upper wheel splash guards

Time to complete 300 minutes

uuu. Headers & Side Exhaust

Attention: Try not to drop the side exhaust assembly as it will probably land on the outer curved surface and dent (if it sound likes this has happened to us, it has). The side-pipes are positioned with the rear mount on the bottom of the pipe facing the body.

Parts: header assembly (FFR# 12899), side exhaust assembly (FFR# 12829), Mustang exhaust hanger.

1. Mount the headers to the engine and fully tighten. The driver side is easiest to install from above the body, but underneath the 1" x 1" tube. It will also fit from the bottom if the car is raised.
2. Slide the band clamps for the side pipes onto the headers. The small diameter goes on first.
3. Slide the side pipes into position over the header tubes. Align the pipes with the body.

4. Tighten the clamps. It helps to hold the rear of the tubes slightly upward. **Torque the clamps to 75 ft/lbs.**
5. Bolt through the top hole of the rubber and the frame bracket.
6. Line the bottom hole up with the slot on the side exhaust and tighten the bolt.

vvv. Shifter Installation

Attention: the kit includes a shifter for a T-5 or rear mount Tremac transmission. The photos in this manual show a Tremac TKO with a mid-shift kit installed and a 289 style handle welded on.

Parts: Shifter assembly (FFR# 10888).

1. Install the shifter handle onto the transmission neck using the shifter bolts provided.
2. Slide the boot over the shifter to determine where the holes need to be for the screws to hold it in place.
3. Drill the four holes with a 1/8" drill bit and screw the boot down using the four screws provided.
4. Screw the shifter knob onto the rod and hand-tighten.

www. Gauges & Dash

The dash molding had to be modified for the Vantage AC in dash unit. We built an AC cover and center console extension in the modified dash to cover the AC and hold the AC controls, key, lights, and light dimmer switches. Space was also made for a radio and the AC air outlets in the dash and center console.


The mold for the AC cover and center console

The final dash assembly will be removable. It will be fastened at the window mounts to the body and at the transmission console at the center console.

Modified dash with most of the holes cut into it

The dash will contain all of the engine and electrical information gauges, tach and speedo, radio, AC control, AC outlets, wiper switch, starter key, and light switch.

Passenger dash mounting bolt location

Dash console mounting bolts location

The dash mounting bolts are fixed with nut inserts or wood bolt inserts to allow easy removal and install.

The final dash with paint

Dash in red

Gauges

All of the gauges are installed in the dash and center console. The units are wired so that two plugs disconnect the gauges from the dash. The radio and Air Conditioner cables are also unplugable.

xxx. Gauge Wiring Harness

All the gauge wiring is terminated into two plugs for ease of dash removable.

yyy. Instrument Lighting
zzz. Water Temperature Gauge
aaaa. Oil Pressure Gauge
bbbb. Oil Temperature Gauge
cccc. Tachometer
dddd. Volt Gauge
eeee. Speedometer
ffff. Fuel Gauge
gggg. Battery Charging

All of the light wiring to the gauges is collected into one bundle into two plugs.

Dash wiring in place

hhhh. High Beam Indicator

This switch is located on the driver floor by the clutch. The light is on the dash.

iiii. Turn Signal Indicator

The turn signal indicator and switch assembly is part of the North Racers unit on the steering column. The indicator lights are on the dash.

jjjj. Splash Guards

My front and rear splash guards are formed in fiberglass and are part of the hood and rear body.

Hood Lizard Skin under side and splash guards

Time to complete 120 minutes

kkkk. Nose Side Locator Brackets

The nose side locator brackets are mounted per the assembly manual.

llll. Headlights

The head lights are mounted per the manual. I added a full front splash guard behind the lights with an opening to connect and install the turn signals.

mmmm. Turn Signals

The turn signals were mounted and wired per the manual.

nnnn. Headlight Covers

Head light covers installed

Time to complete 55 minutes

oooo. Seat Installation

Kit supplied seats are installed. The carpeting will be installed at a future date.

pppp. Seat Cover Installation

qqqq. Seat Harness Installation

The Simpson seat harness assemblies are installed at the frame connections with bolts as supplied in the kit. I have made openings in the back of the cockpit body to allow the shoulder harness to properly fit over the seats.

9. Independent Rear Suspension

a. Thunderbird Parts
b. Spindles
c. Rotors
d. CV Joints
e. Brake Calipers / Lines
f. Bold-On Parts
g. Differential Installation
h. Lower Control Arm installation
i. Shock & Spring Installation
j. Upper Control Arm Installation
k. Quad Shock Installation
l. Spindle Installation
m. Rear Calipers & Rotors
n. Emergency Brake Cable Installation
o. Battery Cable / Box Installation
p. Fuel Line Installation

10. Donor Parts

a. Clutch Cable
b. Transmission mount w/ mount bolts
c. Drive shaft & 4 original bolts
d. Speedometer cable
e. Circlip, Clutch cable retainer
f. Engine mounts w/ OEM nuts (2)
g. Oxygen sensors (2)
h. Rubber bushing. Rear exhaust hanger (2)
i. Fuel tank w/ filler neck, cap and mount straps
j. Fuel filter w/ bracket and hose
k. High pressure fuel line w/ fitting, engine bay, cut 4 inches into steel line
l. Low pressure fuel line w/ fitting, engine bay, cut 4 inches into steel line
m. Emergency inertia cut-off switch
n. Mount, front, flexible hose to steel line, mounted to body (2)
o. Mount, rear, flexible hose to steel line, mounted to body (2)
p. Emergency brake handle w/ “T” cable
q. Upper Steering shaft, non tilt
r. Steering rack w/ tie rods, ends, boots, nuts, mount bushings
s. Wiring harness, engine

t. Horns (2)
u. Ignition switch w/ key
v. Vacuum reservoir, cylinder shaped black plastic
w. Ground strap, battery cable w/ terminal
x. Wiring harness, rear
y. Wiring harness, front
z. Coil, starter solenoid
aa. Wiring harness, dash
bb. EEC IV computer w/ plastic holder
cc. Wiring harness, transmission
dd. Pedal box, brake clip, and (2) plastic washers
ee. Radiator cap
ff. Fog lights (2)
gg. Interior rear view mirror and mount
hh. Accelerator pedal
ii. IRS 95-97 Thunderbird Supercoupe 8.8 Carrier, posi-traction
jj. Thunderbird Inner & Outer CV Joints
kk. Spindles & attaching hardware
ll. Disc brake flexible brake lines & mounting brackets
mm. Mustang Quad Shocks
nn. ½ inch Lug nuts
oo. Axle shafts, 1.2 inch splined end(2) rcvd FFR

11. Back Ordered Parts

a. FFR Parts Delivery

1. FFR Tech bulletin about bolts/nuts for fastening Upper Control Arms.
2. FFR delivery of front Lower Control Arms.
3. FFR UPS box #74B-7351, needs to return Water Temp Gauge because of black face.
4. FFR UPS boxes # TX782-9-03 (2), 74B-7238 (2), A/C, door hinge frame (2), windshield brackets (2), exhaust brackets (2).
5. FFR UPS box with windshield wiper arms
6. FFR outside exhaust pipes (2)

b. Donor Parts Delivery
c. Ford Racing Parts Delivery

12. Ford Racing

a.	Ford 5.0L/302 engine assembly	M-6007-XB3	$3,195.00
b.	EFI System	M-6001-A50	$ 695.00
c.	EFI throttle body	M-9926-A302	$ 175.00
d.	EFI Valve covers (pr)	M-6000-K302R	$ 175.00
e.	T-56 Transmission	M-7003-H	
f.	T-5 Transmission	M-7003-Z	$1,395.00
g.	Bellhousing	M-6392-E	$ 195.00
h.	Fly wheel	M-6375-D302	$ 259.95
i.	Clutch kit	M-7560-A302	$ 259.95
j.	Small block starter	M-11000-A50	$ 200.00
k.	Alternator	M-10300-A351	$ 159.00
l.	EFI Wiring harness	M-12071-C302	$ 225.00
m.	Brake kit	M-2300-K	$2,100.00
n.	Spark plug wire set	M-12259-Y301	$ 59.95
o.	Distributor cap kit	M-12106-A302	$ 32.95
p.	Ignition coil	M-12029-A204	$ 80.00

q.	Engine & transmission rubber mounts		
r.	Mass Air injection Kit	M-9000-C52	$ 595.00
s.	EFI Bolt Kit	M-6002-A50	$ 6.95
Total			$9,805.75

13. Wheels & Tires

a.	Front wheels	17x8 Cobra R silver
b.	Rear wheels	17x9 Cobra R silver
c.	Front tires	245 45 ZR17 Nitto 555
d.	Rear tires	275 45 ZR17 Nitto 555

14. Final Check

a. Registration & Title

Texas Title 11 09; VIN: FFR4560GT; personalized plate {GT SPDR}

b. Tire, Rim, & Alignment

See Above.

Deleted:

c. Alignment Specifications
d. Rear end Gear Ratio @ 2.73
e. Throttle body @ 65 mm
f. Mass Air Meter @ 70 mm
g. Injectors @ 24 lbs/hr
h. O2 sensor installed in header pipes for #3 & #4 cylinders left side
i. O2 sensor installed in header pipes for #5 & #7 cylinders right side

15. Parts Location

a. Stewart location
b. Local junk yards
c. FFR location
d. Ford Racing, Northside Ford, San Antonio, TX
e. Alamo Performance, San Antonio, TX