The Complete Tales of the FrankenStag

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Introduction

Thirteen years of articles, over 100 pages filled with the ultimate of good advice and abject misery. Yes, this is the first official compendium of the Tales of the FrankenStag(TOTF). I think the world is ready for this - we hope you enjoy!

From the very start the FrankenStag was seen as a car that I was unafraid of modifying. I traded a silver TR8 (which I got from Ron Fowler) to Doug Braden in late 2004 for it since we needed a "family car", a convertible Triumph with a back seat that wasn't a Herald. Doug found the car in a barn – it had a decent body but needed a lot of work. He gave it to a shop that did an excellent job on the body but decided to put a 4.3L out of a 1991 Safari van into it. Prior to that someone had a 3.8 Buick V6 (yes, the Grand National engine) in it. It was a FrankenStag before we ever got it. I had to do an extensive bit of work to make it roadworthy for long trips (and even that wasn't enough for the 2005 TRA trip to Branson – an interesting trip that was made at 55 mph or less and with the electric fan on…).

But the modifications were fun. I could use my creativity and the tools that were in our garage. I could use materials found at Lowes and machine shops in the local area. I could do about anything to it since it came in as a monster and remained that way. I tip my hats to original Stag owners since working on an original Stag is a pain. It must be a labor of love, or a mental condition.

Driving was fun. Either the 4.3L FrankenStag with an insane amount of power but abysmal handling qualities, or the 2.0L gutless wonder, but very drivable. This car has been to all TRA National Meetings since 2005 except for 2009 and 2010 (drove Freebie, the red 1981 TR7 instead) and 2012 (the passenger's half-shaft decided to self-destruct and I didn't have the time to replace) and many MVT tours and meetings. It' was our "go to" car when we needed room for 3 or 4 folks and/or the weather was terrible.

There are jumps in time, sometimes a month or two, other times years, between articles. You can roughly correlate those to when I was working on other cars: Inca, Freebie, Old Paint, and The Grey Ghost. I did not write an article every month since I did not work on the car every month, or I was being one of my alter-egos (Early TR Man, or Late TR Guy). There is very little wrote as TOTF when we first got the car, in fact the first full TOTF was written almost a year after we got the car, after the trip to TRA 2005. Prior to that the articles were either not named TOTF, or included in events articles I wrote separately.

Beyond the car itself, it is also the story of a family – we got the FrankenStag so the family could ride in the Triumph. Both Bridgett and Duncan grew up with the car, and experienced father making mods and driving it everywhere, more than our daily drivers, it was the "family car" we bought it to be. We took it to school events, sports events, music events as well as Triumph events. But now the era is over, another chapter is finished. With Bridgett now married and Duncan off to college the need for a "family car" was no more, so it was sold (minus the drive train) and headed off to a new owner, but the essence of it still lives on with that green TR7 engine is storage over in the corner of the garage!

So as I said above – enjoy and be glad you aren't married to me (smile) – yes, Alice is a saint for putting up with me for all these years (40 as of 2023), or she's doing an experiment!

Yes, there are three "Page 1"s – go ask Microsoft!

See you on the back roads!

Bruce

August 2005: Non-Cool Hand Luke

Original Engine – As I Got It With A Few Plumbing Fixes

Engine As Of Now. Holley Air Cleaner Is Really Boss!

As some of you might know, I traded the TR8 to Doug Braden for a Stag, one that had been slightly modified with a 4.3L GM V6 under the hood (bonnet). Above is a picture of the engine compartment after I had worked on the car for a week, but this was before I went cold-turkey with the carb & air cleaner. Yes, your vision is right, it was smashed down at the front to fit the hood bubble (hood bubble? Never mind, you don't want to know).

When I got it home I discovered that the beast had a lot not going for it. It was pretty, but it was a monster! What I mean by that is it has a lot of "integration" challenges, by-products of stuffing the 4.3 in there. This is the first in a series of articles that looks at what I'm trying to do to make it a bit more drivable. Original? Hell no, I head more to Summit Racing to get parts rather than Rimmer Bros or Moss. Gotta love it.

TRA Post Mortem

You know, I'm getting tired of writing these. Seems after every trip I'm writing one! We made it there and back with both cars. The TR7 going without a hitch, the Stag maybe should have been pulled with a hitch. The problem was overheating, I couldn't drive fast without puking coolant all over the place. The day after I got back I tore into the Stag to see what was the matter. Although there were a few cosmetic things bugging me, the worst thing was the overheating engine. Let me see…what might have caused that…

- Radiator from a 2 Liter Monza being used for a 4.3 Liter engine. What were they thinking? Fit the hole, but not the function.
- 14-inch, 1050 CFM cooling fan – same size as the TR7. Works for a 2 Litre engine, but not 4.3 Liter.
- No good dedicated expansion tank – no place for water to go. Plastic here is not the answer, and neither is the 1-gallon antifreeze bottle that's in there.
- No good way to get all the air out of the cooling system except to fill up using the plugged holes on to the thermostat.

To eliminate these called for a multi-front attack.

- First, I took the old radiator to Labe's. He's going to reuse one of the side tanks, grab another off the shelf so he can eliminate the auto-trannie cooler, and get a core that has 3-4 times the heat rejection capability. $370 (I tried to buy a stock racing radiator since that would be cheaper, but none would fit the Stag without major modifications to how the bumper mounts, sigh!)
- Second, I'm going from a 14" fan that can move about 1200 CFM to a high power 16" fan that is rated at 2200 CFM. $190
- Third, went with a high-flow thermostat. $20

- Fourth, moved the radiator fill to the top of the engine (Summit Racing is a wonderful place). $50
- Fifth, put in a higher flow water pump made of aluminum – more flow less weight. $190
- Sixth, replaced the old alternator with a brand-new 100 amp unit. $130
- Seventh, put in an aluminum expansion tank with a dedicated overflow line that goes under the car. $90
- Eighth, bought a trannie cooler to put in front of the radiator. $45
- Ninth, built a front spoiler to force more air into the radiator. Parts from Lowes - $20 (dang sheet aluminum is expensive!)
- Tenth, put in a water temp gauge that actually is calibrated. $41
- Eleventh, put on a bigger hood scoop to draw more air through the engine compartment. '69 Charger scoop that I'll turn around backwards. $140

Shot Looking Forward On Drivers Side – Aluminum Expansion Tank And Big Honking Electric Fan

Front Chin Spoiler, Relocated License Plate And Trannie Cooler

While I was at it I replaced the engine pulleys, alternator mounting brackets, alternator output wire, and experimented with using different air cleaners to lower required hood scoop height (none worked well). Another $200. I was lucky that the new alternator mounting position still fit under the hood. The final thing I want to do is drop the rpms at speed. Since this means changing the rear end ratio, or putting in a different read end, this is a winter project for sure!

Engine As Of Aug 05. Getting There – Now To Get Those Exhausts Coated One Of These Days…

I've also gone through and updated the instruments. I had to replace tach and speedo as they could not work with the engine/trannie combo the car had in it. I also went to an electric oil pressure gauge (someone had put a mechanical one in where the original clock used to be, at least they used a Smiths!), vacuum gauge, new voltmeter, big temperature gauge, new gas gauge (turns out the Triumph sender is in the right range to use the aftermarket one). I also put in a clock, that works! I moved the idiot light cluster to the side of the steering column where I might have a better chance in seeing them, chance I say… The clock will be moved to the non-functional passenger vent and another voltmeter installed that directly reads battery voltage, not the "green" wire system voltage. This has a secondary use of letting me know when I left the battery cut-off switch on.

I also discovered that the reverse lights were always on. That's because they were wired to a seat belt light buzzer switch (if you didn't have belts on, and the car could move, it buzzed) rasther than a reverse light. That they worked in reverse for a while was just serendipity. I put in a manual switch until I can update the shifter.

Updated Dash With Auto Meter Gauge Set. Moved Idiot Lights To Side Of Steering Column Where They Just Might Be Seen.

Big View – Non-Stock Dash Experiment. Need To Put More Stuff On IT!

I'm in the midst of thinking about a sound system. Plan is just to equip the car with speakers and amps, then drive them with an XM/Sirius radio or an IPod. This frees center console space up, and I think I'll need it since to properly use the TH-350 trannie in the car, or move to a 700R4 (to get a 4 speed) I have to put in a different shifter (one that has provisions for a reverse switch). This means I have to either heavily modify the console that's there, or make a new one. There are a lot of aftermarket shift consoles for the TH-350, but no four-speed ones I've seen yet.

Gosh, never made a street rod before – Mark, got any suggestions (besides not starting off with a Stag…) ? Oh, parcel Tray is shot. I can get NOS ones for $350 – worth it?

October 2005: Let There Be Light!

Something I've not talked about (up until now) is the headlamps. Originally the car came with four headlights, sealed high/low units on the outside and high beams only on the inside. The power to the lights is directly controlled by the light switch.

This is fine for 1973, but times have changed and I like to see at night. Back in April the proprietor of Import Auto Parts (IAP on Wilmington) sold me a pair of Autoroche headlamps with a set of H4 Blue Xenon bulbs which I put in the outside along with a set of high-only Sylvannia halogens on the inside. Well, you can tell the difference – the Xenon bulbs are white, the Halogens a bit yellow. One time driving it at night has convinced me that I had to get them all the same hue.

What To Do?

Returned them. They were not only totally made of plastic, but did not have any fluting on the lens and they could only handle the wimpiest of bulb wattages. Not good stuff. When I went to buy more bulbs the IAP owner had pity on me and sold me another pair of very nice used Autoroche lamps for $40. Deal!

Okay, let's take stock of what we have. I'm putting a set of four 100W/60W headlamps in place of two 60W/55W and two 60W lights. Simple math tells me that I've added 160W of high beam power and 130W of low beam power to the existing circuit. Since the existing wiring and switch was probably marginal with the original load, adding more without updating the rest of the circuit would be stupid.

At high beam I'll be having a maximum of 37 Amps running through the circuit. That's way too much to directly switch even if the wire in the wiring harness could handle it. The way you switch high current loads is you use your headlight switch to control a higher current relay.

So how do I do this? Figure 1 is the existing circuit. Pretty simple stuff. Now to add some complexity. Figure 2 is the modified circuit with the headlamp current being controlled by relays, the headlamp switch now just energizes the relays, which takes about .12 Amp each. Looks good, let's dig in!

Attack Of The Modifiers

First thing to do is to locate where the fuses and relays should be mounted. Since this is a fairly high

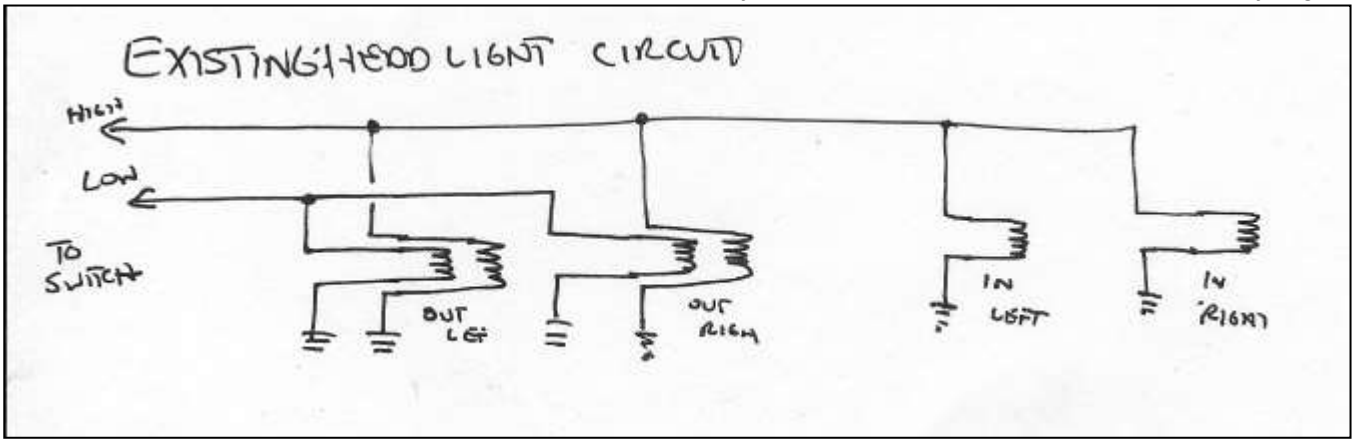


Figure1: Original Headlamp Circuit – Drawn By Me On A Piece Of Scrap Paper – So Sue Me!

Okay, there are a couple of ways I can go. I could go all halogens. Naw, the blue is cool, looks like HID but doesn't cost $700. Okay, so that means I have to replace the halogens with blue Xenons. Okay, I need a couple of lights that accept H4 bulbs. The H4 bulbs I'll get at IAP. Hey, J.C. Whitney has a set of 5 & some-odd inch headlamps in their catalog for $40. Ordered them.

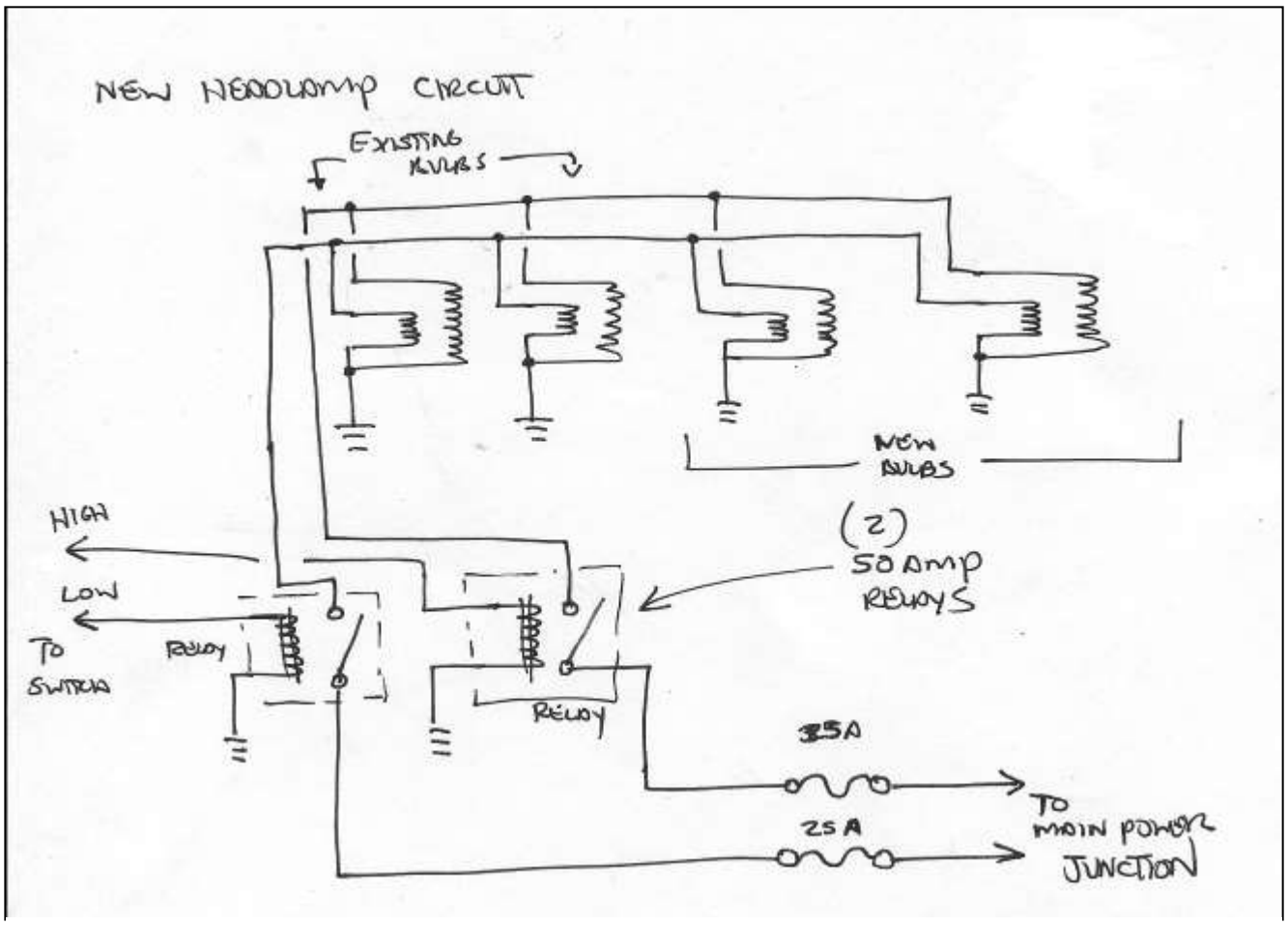


Figure 2: New Headlamp Wiring Harness. Headlight Switch Controls Relays That Control The Lights

current circuit, and one that is not switched by the ignition, one wants to keep the unprotected wire from the battery to fuse block as short as possible. To do this I located the fuse block next to the main power junction on the inner fender near the battery (don't look for this on your Stag, it won't have one) as shown in Figure 3. This is a four-fuse unit, but I'll only be using two fuses. I used #8 wire to connect to the power junction, and from there #10 wire to the relays.

Ah yes, the relays. Where to put them? I want to place them where they will be easy to install, and easy to access. I also don't want to drill gobs of new holes in already well-perforated fenders. In the end, I chose the driver's inner fender well, the front side near the expansion tank, mounting them using existing holes – see Figure 4. These are not your normal relays, these are 40 Amp relays I bought from MCM Electronics in Springboro. What they try to sell you at Pep Boys is a 30 Amp relay. Now for the wiring.

I need to digress and talk about wiring size. Don't judge by the size of the existing wire. I'm basically doubling the amperage in the high beam circuit as well as the low beam circuit, so to maintain the same loss level in the wiring I have to double the cross-sectional area. This is why I chose the wiring sizes I did, and in most cases went a bit larger.

I ran the #10 wires to the relays across the top of the radiator, encasing them in a black plastic wire loom and securing with nylon ties to existing holes that once held the radiator expansion hose in the ill-fated original cooling configuration. Knew they would be good for something. From each relay, each headlight pair was fed with a dedicated #12 wire, one for high beams, and another for low. Needless to say all connections were soldered and connectors covered with shrink-wrap tubing insulation. No crimping or electric tape here, current is too high and the connectors are exposed to the elements. It takes a bit longer to do it this way; however, I believe it to be justified, and the soldered connections have never let me down!

Now we've gone about as far as we can go without ripping into the existing wiring harness that runs across the front of the radiator. In the original '73 Stag configuration this carried wiring not just for the

lights up front, but also the air conditioning, fog lamps, and horns. To get to that harness I pulled the front grille pieces and headlamp buckets. Since the screws for these secure into plastic block that snap to the body the screws removed easy. Small victories! . That exposed the front harness that over the years had been modified, cut, corroded, overheated & melted, fixed, and fixed again (in fact one of the first things I did after getting it from Doug was to tape up some dead shorts waiting to happen). It had to come out. The plan was while I was at it to take the opportunity to fix iffy grounds and connections in the parking and turn signal wires also.

Figure 3: New Fuse Block To Handle The Much Higher Load

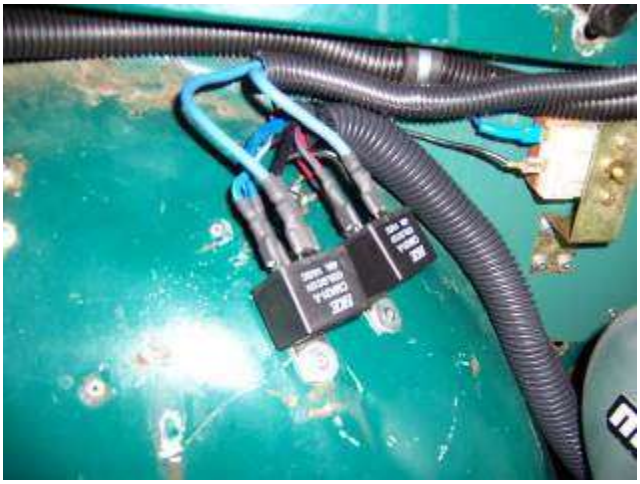


Figure 4: 40 Amp Relays On The Inner Fender, No Direct Switching Here

This ended up with me ripping out the entire harness- stripping the original wrapped plastic, and getting rid of all the multiple ground junctions, left-over air conditioning and fog lamp wires. What a dirty job – that friction tape originally used to secure the wires when they came in or exited the harness turned my fingers black and sticky (and of course the phone rang several times while I was doing this – oh, did I mention the garage temp was well into the 90's while I was having fun?)

Figure 5 shows the front end and the surrounding floor after an hour of wiring fun. What a pile of stuff! All told I ripped 25 ft of unused wire out of the harness, as well as 20 old nylon ties. Several of the wires showed signs of overheating, including the melted fog lamp wire. I stripped the harness back to just behind where the horn wires come out. Next I got my soldering iron out again. Rather than re-run the "starred" ground connections I put in local ground junctions using soldered connectors. I then cleaned the bullet connectors I was reusing, and for those I wasn't, cut the wire length cut to eliminate all the slop.

Figure 5: Grille Out, Headlamps Out, Wiring Harness Gutted

With the old harness out and existing wiring fixed, it was time to build a new harness. The #12 wires each went to a pair of headlights, one wire for high, the other for low beams. After routing the wires and cutting them to length, I encased them in plastic wire loom for protection, leaving enough wire to solder to coming out of the loom. I then soldered the leads from the headlamp buckets to those wires, then covered the junction with shrink-wrap tubing, then encased that in a plastic loom. A lot of work, but I want it to last.

After I got two lights installed (Figure 6). I did a smoke check. Once I remembered to install the fuses in the fuse block all worked like a champ. I replaced the 25 Amp fuses in the original fuse block headlamp circuit with 0.5 Amp ones since all the circuit did now was to energize relays. I then installed the last two lamps and "whala" - a blaze of light. I still have to re-aim the lights – the inner ones need to probably get depressed a bit more, but I can see clearly now, and I think I can even do it in the rain!

Figure 6: Two Lights In, Two To Go

Costs?

The resources required to do this were:

- Pair Autoroche Headlamps (used) $40
- Pair Blue Xenon 100/60 H4 bulbs $44
- Pair 40 Amp SPST Relays $10
- 20 ft 10 Gauge Wire $10
- 30 ft 12 Gauge Wire $10
- Fuse Block $5
- 40 Amp Fuses $5
- Assorted Shrink Wrap Tubing $10
- Assorted Connectors $10
- Wiring Loom $20

So about $165 in total. Not bad. What about labor? That's a bit more problematic. I figure this took me about 5 hours, so at today's shop rates that's in the neighborhood of $300 if you wanted a shop to do this. Since they wouldn't have to deal with two children, they might be able to go quicker, but then again, my familiarity with Triumph/Lucas wiring techniques and wiring colors might have saved a significant amount of time, so they might have charged a lot more. Don't know, I just know I have lights, white-blue ones at that.

November 2005: Shifty Tales!

Center Console, September 2005

Since getting this car I've been trying to fix the shifting. See, the folks who modified the car just used the stock shifter, set for a Borg-Warner 35 transmission, with a GM TH-350. It shifts, but where the pointer is pointing to might not be the actual gear it's in. One other thing, I got no reverse lights! If you remember last month I think I talked about the shifter having no reverse lamp switch fixture – that was built into the BW 65, but not in a TH-350. I had to put in a cheesy switch that I always forget about when going into reverse. Gotta fix that.

Fix, let's see, fix. Gee, could we modify the original. Okay, what do I have to do? I have to mount a reverse light switch, and figure out how to get it to point to "R" when in reverse. I might be able to do the first, but the second is a matter of geometry, and that wasn't my favorite math subject. Quick – grab the trusty Summit Racing Catalog and look up shifters. They have a bevy of them. The one that looks like it has a chance to work (comes with reverse light switch and isn't too high profile) also is the most expensive – the B&M "Hammer" shifter (Figure 1).

Figure 1: B&M Hammer Shifter (on the left). Wow, I might end up with a Chevelle after all after I get done with this thing!

$199.95 - before I ordered it I measured the existing console and determined that heavy duty modification to the existing console would be required. So, off I went to trusty ebay and bought another console that I could freely modify (Figure 2).

Figure 2: Center Console Victim

Examining the instructions, it soon became apparent that with the Frankenstag I would have to drop the dual exhausts to get at the shift linkage. Oh well, this would at least allow me to paint the headers as well as to change the trannie oil pan to one that holds more oil and has a better heat sinking ability

Plan modification #1. A quick measurement showed that I can't put in a deeper oil pan since it will interfere with the right side exhaust. Sigh. Back to Summit with you nave.

Now, before I could go any further I had to get the car in the air. Everything off the Backyard Buddy so I can get the Stag on it! Wow, how soon we collect stuff! We had camping gear and books stored on the lift – off there, you evil things! Finally got the Stag in the air, dropped the exhaust manifolds off, next came the front down pipes. I took the manifolds to Steve Miller at MG Automotive for sandblasting in prep for painting - anything to increase the looks. Next came the shift linkage. Ah, yes, the linkage. In order to make the trannie shift using a shifter made for a different transmission, the fine gentlemen that integrated this drive train in the Stag had to flip the gear selector lever 180 degrees, and then made the linkage out of a bent threaded rod. Ingenious, I suppose, but it made the shifting sloppy since the end could move a bit! The other problem is that you never knew which gear you were in until you hit the gas…

Once I had the linkage disconnected from the transmission it was time to pull the console, and this I did with reckless abandon. Results below.

Remains of a Center Console. RIP

Now came the decision time on what to do next…do I modify a center console to accept the Hammer shifter, or do I eliminate the console and do something else with the switches? A quick measurement of the shifter base showed that it would not be possible to modify a console to fit, so now I moved to Plan B.

Plan B was to make a small sub-panel that mounted to the underside of the dash to hold the power window and light switches, freeing up the trannie tunnel top for the shifter. This meant some rewiring.

Yet, some rewiring. I had to shorten wires for all the switches, as well as eliminate a whole bunch of wire that were in that loom that weren't used – such as the overdrive relay to trannie wires. This meant that I had to cut into two different loom sections, stripping off all the wrapping, which I countered by buying loom cover at Pep Boys. Bye-bye went the cigarette lighter wiring, as well as the fan wiring. I rewired the fans for only one speed, added a relay so a dash switch would turn them on. I also put a relay on the rear window heater and the radio circuits for good measure (hey, I had three relays…)

Wiring Mods About Half Way Through – Messy, Messy, Messy.

I made a switch panel out of some plywood I had sitting around, using the dark cherry stain to a so-so effect. I also had to find a home for the three heater controls that are cable actuated. Well, maybe later…

It's at this point that I wished I took more pictures of the installation progress, the mounting of the shifter, the cutting holes for cables, the filling of other holes with aluminum sheets, the wiring, cutting the base to fit. Oh well, the only picture I have is:

Hey, What's That Shifter Doing There?

Yep, I got it all the way in, including the cheap black carpeting Steve Miller gave me (thanks) to cover the

top of the tunnel. Positive action all the way through. Gear indicator actually shows what gear it's in, and the unit is actually like a "bang" stick with the sequence "1, 2, D" a simple push on the handle – I'm ready for the strip! Switch panel is functional (and needs one more switch …)

But wait, before you grab the champagne and celebrate with me. I found out that the left exhaust fouled with the shift linkage and lever at the trannie. Rats! Shucky Darns!

Drat! Shifter Linkage Hits Exhaust Pipe, More News At 11…

What to do, what to do? Well, I cut the flange off the header, and cut the pipe running back to the muffler, eliminating the junction. Now what?

Flexpipe-of course. This stuff is like a kid's bendable soda straw, except made of steel. If it works for 18 year olds and '74 Novas it can work for me also. A trip by the Autozone and I have in my possession a flex pipe that fits, first try, no returns. Strange, usually I have to return stuff a few times when working on exhausts before I find parts to fit. To attach to the header I slide it into the outlet and then pop-rivet in all around the circumference. Looks industrial, but holds better than a clamp and high-temp silicone glue. At the other end I wrapped header wrap around the pipe running back to the muffler, held it in place with silicone glue, and fit that inside the flex pipe. It actually fits – I'm astounded!

Now that I have the linkage clearing the exhaust, its back to the interior to work on the heating duct valve linkages – I decided to just fit ones for the front center vent control and the heat to windscreen or footwell control. The fresh air-recirculate flapper will have to wait since it's buried behind the dash.

Flexpipe Installed – We Now Have Clearance Houston!

First drive was to the Miami Valley Triumphs October meeting. Nothing fell off, oh yeah sure I forgot to tighten one exhaust clamp, but that's par for the course. It got the usual comment from Ted: "That don't look like no Stag I've seen!"

Costs?

The resources required to do this were:

- B&M Hammer Shifter $200
- Used Stag Console $18
- Wiring Loom Cover $20
- Exhaust Paint $7
- Exhaust Pipe $7

So about $252 in total. Not bad. I'm going to recoup some of that by selling the center console on ebay – at the moment it's up to $76. Bid early, bid often!

I Can See Clearly Now Part II

Last month I wrote about putting new headlights in the Stag, well, the 100W Blue Xenons were just toooo much for the 5.25" headlights – they were getting too hot. Besides, I had to damn near point them at the ground not to blind oncoming traffic. I replaced them with 60/55W Blue Xenon units. Still bright (but not aircraft landing light bright) and blue. As Ted said: "Don't look like no Stag I've seen!"

March 2006: The Big Stink!

Trusty Assistant!

(Writer's Note: I've been working on this article since last year – the forever article. I've made a vow to complete it this month come hell or high water…)

"Daddy, what's that smell?" The dreaded words came from Bridgett's mouth.

Sniff, sniff…

Gas!

Okay, so there are only about twenty things in this garage that use gas along with a gas can or two, or three. But I knew, *I knew*, to look under the Stag.

Wet spot, don't light that cigarette!

Out come the newspapers to sop up the puddle. Open went the doors to dilute the vapors. Out came the tube and gas pump to siphon off the gas in the tank (I actually pumped it out using the existing fuel line…). Lucky me, the tank was almost full, so the Blazer and Montero got their tanks topped off along with the mower, snowblower, and generator.

I knew this also meant that there are puddles of gas inside the Stag.

Stag Gas Tank Config 101

As with most Triumphs, the Stag's gas tank is totally contained in the body, being under the floor of the trunk and above a sloped underside rear body panel. That sloped panel has several rubber plugs in it, one of which was dripping, correct, two of which were dripping gas. The panel is also ribbed for strengthening, and those depressions could be filled with gas.

I had already disconnected the Stag's battery, so I didn't have to worry about that. Opening the trunk greeted me with something that smelled like explosion central, so I let that air out a few minutes before I went to work removing trunk stuff.

Yanking out the covering boards, spare tire and the other stuff I keep in the trunk greeted me with a thin puddle of gas across the trunk inside. A few shop rags got that sopped up and I started to yank out the gas tank

Fortunately, the Stag gas tank is easy to get out. Take off the hoses, loosen a few bolts, and presto – it's out. Not at all like a TR4 or TR3! Check for leaks - presto, it's dripping from the back corner!

Now, I had to jobs to do. Fix the gas tank and fix the trunk where gas had pulled up paint. First job was to dry out the gas tank. Kinda hard to fix the tank when gas is still sloshing around! I took out the fuel level sender and other fittings, positioned the tank where it would drain out the leak for about a week. After this I put in some degreasing solution and hot water, sloshed it around, and drained. Then I put in hot water, sloshed it around, and drained, then I rigged up this set-up:

Figure 1: This is the set-up I Rigged Up

A blow dryer my Grandma gave me was stuck in a 6' length of silicon rubber coated hose then attached to the filler neck tube. Hot air entering left via all the holes and took some gas with it. I did this outside away from house and humans, ensuring the tank was down wind of the blow dryer, and let it run most of the day. Ended up with a dry, fairly clean tank, and looking inside I could see the corrosion and some loose rust I was going to have to deal with. Later, I had a trunk floor to clean.

Figure 2: Trunk Floor Being Dealt With

Since this was the first time this tank had been out of the car in a little while there was a bit of surface rust (but no rust through!) to deal with. A little wire brushing, and a bit of Eastwood's anti-rust primer took care of that. Then a general coat of green paint and it was ready for the tank. But the tank wasn't ready!

Inspection of the tank showed it was leaking from a prior repair. What the last person did was to just fiberglass over the holes. Now, this will work for a while, but sooner or later it will start leaking. The trick to fixing a tank this was is to coat the inside after using fiberglass on the holes

Figure 3: Holes In The Gas Tank

Here were the steps I took to repair the tank:

1. Strip off old fiberglass and clean metal
2. Vacuum out inside of tank to get all that loose rust.
3. Duct-Tape over the holes and fill with gas tank etching stuff (I got it from Moss, but a lot of retailers sell this stuff).
4. Drain tank, wash out, and use the hair dryer rig I used before to dry out.
5. Repair holes with several layers of fiberglass mat & resin.
6. Coat inside of tank with gas tank coating compound – again I bought from Moss, but a lot of folks sell it (I think they all get it from Bill Hirsch). Slosh it around following directions
7. Let it sit for about a couple of days, then attach hair dryer to finish drying.
8. Paint tank.

That's about it – I re-assembled the tank and the trunk and it worked fine.

Cost? About $120 in the tank cleaning, etching, coating and painting materials, $5 in fiberglass repair, and about 6 hours of work all told. It was work I didn't want to do, but did it just the same!

Tale 2: I Got To Get That Frigging Top To Work Right!

Background

When I got this car from Doug the covetable top had not been raised for probably 15 years and had the usual stuff you'd find in a car stored in a barn. After I cleaned that out I had to install a new top. Since I'm not the greatest top installer I turned to our local Xenia car upholstery shop. Since the new top I got with the car had shrunk (probably 15 years old itself), we bought a top ($400) new seals from Britain ($120), and they installed it ($1000 – part of this was for trying to install, then uninstall, the top I got with the car).

After spending that $1500 I had a top on the car, but it didn't fit right. Not even close. No way, you're out'a there! Top would only go up if the air temp was above 90F, or air temp was above 80F and you had direct sunlight on the top. Cooler than that, forget it! Needless to say the car spent most of the time with the top up since I dare not take it down, lest I couldn't get it back up again. It also did not seal right across the front, so I had to add an extra weather-stripping piece. About a week after I got it back the parts that wrapped around the middle bows came unglued, pretty much along with me. I was not a happy camper – you'd think for $1500 you'd get a top that fit right, right? I was going to take it back, but since we had to get to Branson that week for TRA, I just drove it that way. I never did take it back to the shop, and I doubt if they'll get any more business from me. I wasn't happy (mild understatement) with the shop's work. They didn't spend the time to make sure it would operate under normal summer conditions, and, as it turns out, they didn't fix obvious flaws in the top frame which they had to see! I decided to wait until Spring 2006 and get it to a different shop.

Foreground

Well, Spring 2006 is here and I need to fix the top before driving season. First thing I did was to note the flaws in the top frame, let's see, wrong bolts, bent pieces, modified catches in the front, no side seals, missing rear catches, missing snaps, missing wrapping pieces – this is just to name a few. Rather than going on eBay for the parts, I bought an entire frame from Doug Braden. Since this was in decent shape the plan was to repaint the frame and put a new top, new rubber, and new upholstery on it. Then all I had to do is a hot-swap with the top/frame combo on the car

I said the "plan". Buying new rubber, new upholstered pieces, and a new top was going to run $1500 plus. Since that was a bit beyond the budget for the effort, I decided to fix the existing top/frame no matter how bad it looked, leaving the top on it rather than rebuild another top.

Figure 4: Parts Donor – I Have It's Organ Card, Honest!

The first this I did was take the top off the car. Now, this is simple in a TR3. Not so in a Stag. Bigger, heavier, more complex. You have to take the back seat out along with the side upholstery pieces then bribe your neighbor with a beer to help swing it off so you don't scratch the paint. I sat it next to the donor and compared. There were several reasons it didn't fit and I'd have to fix them all.

First off, there wasn't enough distance between the back top frame piece that goes next to the car and the last "bow". To fix this I had to loosen the top along the back, but then discovered that I needed almost two inches of additional length, but the top only had 1. This meant that it couldn't secure under the rear lip like it's suppose to. This meant I had to go to a snap fastener system like earlier TRs since glue would not hold, and I didn't feel like buying a new top. Besides, it's the FrankenStag!

The front frame piece was bent up at least 30 degrees from where it should be. To fix that I had to loosen the top and bend it back. This meant that I had to drill out about 20 pop rivets, but at least they were aluminum! Once bent back the profile of the top matched the profile of the top of the windshield frame, but I still had to shim the lever catches with some plastic pieces to get them to close. Had this been a concours car instead of the FrankenStag I might have tried to get it close, but it closed a lot easier than before, so I considered it a victory and pressed.

Figure 5: Plastic Shim On The Lever Catches

On the frame itself, I replaced 4 specialty bolts, three frame pieces, several pieces of Velcro securing strips, both front level catches, and two snaps. Buying that frame from Doug saved me about $250+ in parts! The bolt kit itself is nearly $150! This was above the $1500 I had estimated, so I was almost giddy with my frugality…almost…

Once I got the top back in and attached the frame to the body I aligned it so the catches in the front were easy (relatively) to close and the doors shut. Then I aligned the latch in the back so it would open easy (If you have a Stag, you know what I mean, if not, come over and I'll show you). Now came time to attach the back. Out came my snap kit. 22 snaps later the top was attached. Not perfect, but it's The FrankenStag (*name echo's*…)! I did three trials "erections" in the

garage at about 60-65F with the car in the shade. Top went up and down each time w/o problems. Yes, it will probably not be drum-tight when in hot sunlight, but at least it will open and close!

Figure 6: Sir Duncan Helps Me Fit The Top

Cost? Frame from Doug was probably $75 (was in a deal with a bunch of other stuff), $15 in snaps, and about $3 in contact cement. Heck of a lot cheaper than $1500…or was that $1750? Took a couple of days to finish (Started Friday, ended Sunday, did have some other fun in-between).

The Fixed Gas Tank In The Stag – yaaa!

July 2006: stuff is stuff!

No, Not The FrankenStag, But An Inspiration!

Crap, Working On The Car Again – And Fixing Things That Should Have Been Fixed Before

Ever since I got this car from Doug Braden I knew the front suspension was in need of a major rebuild. First hint was that the turning radius to one side was a lot more than the other. This was due to the tie rod ends being way out of whack to one side, but since the toe-in seemed great I was loath to play with it. Then there was those steel blocks used to lift the front end. Not quite stock. Decided to tear into it after TRA '06.

And tear into it I did. Everything including the front sub-frame cam off on to the floor. Doing that was not without problems due to age and corrosion. I didn't have to use dynamite, but I did have to use the air impact driver a few times. Inspection of the parts told me we have problems.

Hey, What's This – Something's Missing!

Problems, problems – We've got problems. Houston, we have problems!

- Every dog-gone thing is seized from old age and corrosion. I'm going to have to have darn-near everything pressed out be a shop – my 12 ton upright press cannot hack it. Several times parts flew off the press as I tried to pop them out. Fortunately, I have learned a few things over the years including putting padding around the press to catch things!
- Nuts at top of struts are rust covered with paint (when the car was repainted – can't anyone mask anything anymore?), doubt if I can get the struts apart without a struggle – that's okay since the strut rebuild kit from the UK is $390 – each. The car drove fine (no bouncing) so I'm optimistic.
- Steering rack mal-adjusted – knew it was bad, but not how much. On the driver's side absolutely no threads were showing neat the tie rod end – the other side almost all the way out! Who put this together? It's also leaking badly – and that's tough to do since there's no power steering pump connected…
- Rubber is shot, gone, history. All need replaced. Did I mention the ball joints or tie rod ends? Ditto! No work had been done to this front end since it rolled off the assembly line.
- The intermediate shaft between the steering column and the steering rack was held on by just a few mm of contact. Had I known this I never would have driven it. Whomever put this back together did not have a good conscience! That's dangerous!

And the best part, I really got a good look at the "lift kit" the folks did to fit that engine. Just to jog memories – the 69 Road Runner hood scoop is due to the engine sitting up so high. The engine is sitting up so high since the deep oil pan will not clear the front cross member and the power steering rack.

Rather than figure out how to move the engine down and back (which others have done when putting a small block Chevy in a Stag) it just sits on the front subframe. To do this the sway bar was lowered 2 inches and the front cross-member 1 inch by using a bunch of square tubes, U-bolts made by bending some threaded rods, and an odd assortment of bolts, some with washers, some not. Use of nyloc bolts, or bolts with lock washers, was not universal!

All That Suspension Stuff On The Workbench

Lift Kit Probably From Relatives Back In The Hills – Anyone want it?

Okay, now I took all that stuff and cleaned it up. Big tub of paint thinner followed by a pressure washing with Simple Green. That did it. Maybe not clean as a whistle, but good enough not to leave big globs of grease around.

Uh. Where to start? Good question.

First a web visit to Rimmer Brothers for about $400 of parts (no, no strut parts). This includes a LHD steering rack from a Triumph 200 sedan – ought to make a nice manual conversions. Next the pile of seized parts went off to the shop. Now to look at getting rid of the lift kit – maybe ebay?.

Oil Pan Modified To Clear Front Suspension w/o Lift Kit

Second, made cuts in the oil pan to see what I had to take off in order for the suspension to fit without the Bubba Lift Kit. I had to take off part of the front to clear the anti-roll (sway) bar and a good sized chunk to clear the front cross-member – this was what that looked like partway through the process:

Engine With Its Pants Down – Trial fit of a new oil pick-up

And this was without the cuts required to clear the steering rack and modify the oil pick-up - I might have to go to a ’95 Blazer pan and oil pick up – we’ll see.

I did head to NAPA and get a pickup that's a bit smaller and closer to the pump. It fit fine:

Third – we're going to take a chance that the struts are good enough for a couple of years. I had not noticed any problems, so why disturb sleeping gremlins? I'll just clean them up. Paint the parts that need painting, and hope they last a couple of more years.

So, armed with a Visa card and some knowledge I parceled out the pieces to get fixed and waited for boxes from England.

One Step Forward, Three Steps Back

Mid-July things started coming back. The oil pan went off to Performance Clinic to get welded up. It came back all patched up and painted. Cost? $150. Expensive, but if you figure into this new or used oil pans are unobtanium (I tried all the parts sources this side of the Mississippi and more - you'd think I'd be able to find a Blazer/S10 4WD oil pan somewhere – especially Dayton, but alas, no luck – what's up with that?) it's actually a deal.

As far as the suspension goes, well, I got all the parts cleaned up, sanded down, and painted. Thank you Mr,.Eastwood for the chassis painting kit. They thanked me for the $$$. Their paint is very expensive, but works very well. You get what you pay for. New ball joints pressed in and new rubber all around – but still no steering rack. Wonder where that is? Rimmers said it was on the way. I got the struts reinstalled and then came the good news. Rimmer Brothers informed me that the left-hand drive Triumph 2000 steering rack was unavailable, but they could rebuild my core. That does little good – rats! What to do?

Modified Pan Ready To Put Back On

Look Ma, A Manual Rack – Don't Try This At Home Kids!

I did the only thing I could do. Made a manual rack out of my power one, heck, it was there already…been driving the car since fall of 04 without a power steering pump connected (pump wasn't operating when I got it, I just removed the pump and lines to clean up the engine compartment) . Going into it, all I have to do is clean it up and get rid of the non-functioning plumbing on the rack. I have everything I need. I have new boots (gaiters), I have three or four sticks of JB Weld, I have raw guts, I have Vise Grips in all sizes. I got going.

Off came the lines, off came the control valves, off came the internal pistons and seals. Releasing the built-in threaded ring that holds one side of the rack together was a real hoot, but in the end it gave way to PB Blaster, heat, and a pipe wrench! In went the grease and JB Weld plugs. On went the new paint. Before long I had a manual rack – sure, a bit heavier than a stock manual rack, but one just the same. Only problem is that the modified oil pan would clear a manual rack, but won't clear the power rack – this means I'm going to have to get the aluminum stock out and make shims. Ah, but this is a temporary measure hoping to find a 2000 sedan steering rack some day!

Assembly Time

Well, it's come 20 July & all the parts are either back from the shop or delivered by the brown truck guys. Time to put this all back together.

First surprise: the new oil pick-up was too far to the side for the oil pan to fit. Hmmm, what would Tim Allen do? Power – that's it, apply power. Out came the hacksaw and files. I cut an inch off the end of the tube where it goes in the oil pump, cut a slot to allow the tube to shrink a little bit when Mr. Copper Hammer came a calling on the pick up – pounded it

in and applied my favorite – JB Weld to ensure the pickup wouldn't work its way out.

There is one good thing to having a GM engine in this car – you get to use a modern, stiffened, rubber oil pan gasket. It stays in place without and gasket compound and putting on the odd mix of metric and SAE bolts that hold the pan on was a snap. Just for kicks and grins I pulled the plugs and turned the engine over until I had oil pressure. Learn not to burn, or be burned…

Close fit under the oil pan, almost too close!

The subframe cross-member bolted right up. I was flabbergasted. No hammer needed. Surely this bodes ill. As I thought I had to shim the engine mounts for the rack to fit. Even without the fittings and power steering fluid lines I had to raise the engine 3/8 inch to clear the pan. I added shims on either side (top/bottom) of the engine mounts to make this distance up.

Suspension pieces went back together easy as well. Nothing was fighting me much? Had the car given in? Putting the pieces together was time consuming, but nothing tough. I soaked the old, surface rusty bolts in Dr. Pepper, and true to form the acid combo in the soda pop cleaned up the bolts after an 8-hour soak, wow, move over naval jelly!.

Wow, looks much nicer and no grease or grime. How can you call it a Triumph?

Ready for the wheels!

Oh, if you want that lift kit? Too late – I threw it way, Sorry about that…

September 2006: Ah, For Once, Working On Someone Else's Car!

Now that there is even another Stag in the club, I have more fodder to write about, and since the FrankenStag is in limbo this month, surrounded by TR8 parts on their way to ebay (but that's another story), it's time to focus on other Stag antics.

And that other Stag would be the Red Wonder, owned by the Dayes. Phil wanted to put a new top on it, so we identified Sunday, 27 Aug as a good day to try to put it on, I sent out an MVT APB and Mike McKitrick, Ellis Ball, and myself showed up at the Dayes. I got there a bit late, and by the time I got there the three MVT'ers had already taken off the old top and were fitting the new one.

The Old Top - Duct Tape and Rips - About Normal

In fact, they've already reached the opinion that they couldn't put the new top on since it was missing the side Velcro needed to attach it to the frame above the door windows. They were in the process of identifying other needs when I arrived. We figured out what was needed, then we went on to the engine.

About a week ago during a drive, Phil noticed a lot of white smoke coming from the back of the car – you guessed it, head gasket. We confirmed that by having Phil start the car – lot of bubbles in the coolant – yep – confirmed. Phil took it very stoically since he wanted to yank the drive train out anyway to put in the automatic transmission, might as well fix the engine while he's at it.

To help this along, Phil got us to help him get the automatic trannie into his car so he could take it to the trannie shop. While we were at it we found most of the missing top parts and a few other goodies he's going to need eventually.

Trial Fitting Of The New Top To The Red Wonder – Nope, Didn't Fit

So, after that we sat around and talked about the need for an end-of-summer picnic, ordering Phil

parts, what he would do next, etc. Since Phil's going to launch on getting the engine out there are sure to be more tech sessions soon!

As Usual, Ellis Supervises Mike's Work – Yes, He Gets Paid More As that…

February 2007: Return to bliss

Well, it's about time I headed back to the Stag. It has been way too long since I spent quality time with the Triumphs.

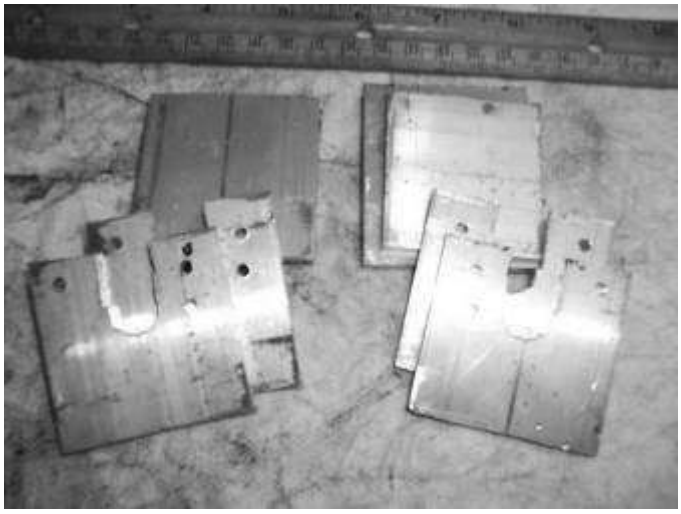
Narrator breaks in: "The last time we saw our intrepid hero working on the Stag he was redoing the front end trying to make a lot of wrong things less wrong. The only two things left to go were find a manual rack from a Triumph 2500 and fix the hard-to-rotate right strut."

The first thing: get that old power rack off

I had modified the power rack so it was a manual rack, taking off the valving, pistons, and blocking off the fluid ports. This was a stop-gap measure until I found a manual rack. Finding a manual rack for a Stag is an interesting journey. I needed a rack from a LHD Triumph 2500 sedan, which meant that looking in the UK was a no-go since all they had were RHD racks. I finally found a manual rack in Sweden and to get it I basically paid the TR8CCA dues of an overseas member for a few years into the future. The rack showed up on my workbench and I ripped the modified power rack off to compare:

Old Power Rack In Back, Manual Rack In Front

Wow - racks were quite a bit different! The first thing one notices is heft: the power rack weighs 3-4 times the manual rack. The next is the girth – again about three times less!. The weight, although important, was not as important as the girth reduction since that allowed me to get rid of the motor mount shims I had to put on to clear the oil pan. All the shims came off and the motor dropped about ¾ inch!



Shims, Shims, Shims – Gone, Gone, Gone!

Okay, one integration problem gone, probably about another hundred to go! The next thing was to re-route a front brake line. I've been going to do this since we've had this car, but I've not found the time or reason. Well, I don't know about the time, but I have the reason now…

Old Lines, Old Times, The Usual

As one might expect, re-routing one front brake line was not an option. This would imply that all is well in the Universe. In a prior life this car has a 3.8 L turbo engine from a Buick Grand National in it, and to do that quite a few things were modified, including the front brake line routes going to the brake master cylinder. The existing lines were all bent, kinked, and rubbed in spots as well as being too close to the exhaust header. The brake failure wizz-gizzy was way far away from its mounting hole. In other words, time to build new brake lines.

The old lines came off easy enough, once I got use to the fact the old fittings were rounded off and no normal open wrench would fit. Knowing that you were going to trash the old lines helped also. I saved a few of the fittings, or at least the ones that could be, since I at least had to put lines back into the master cylinder.

I love old cars. I looked at the rear brake line. I originally was going to just bend it a bit to get it past where I think the new steering shaft would go, but on closer inspection I found a spot where is was rubbed a bit too much for my liking. Great, this line needed replacement also! And the rear brake line is special

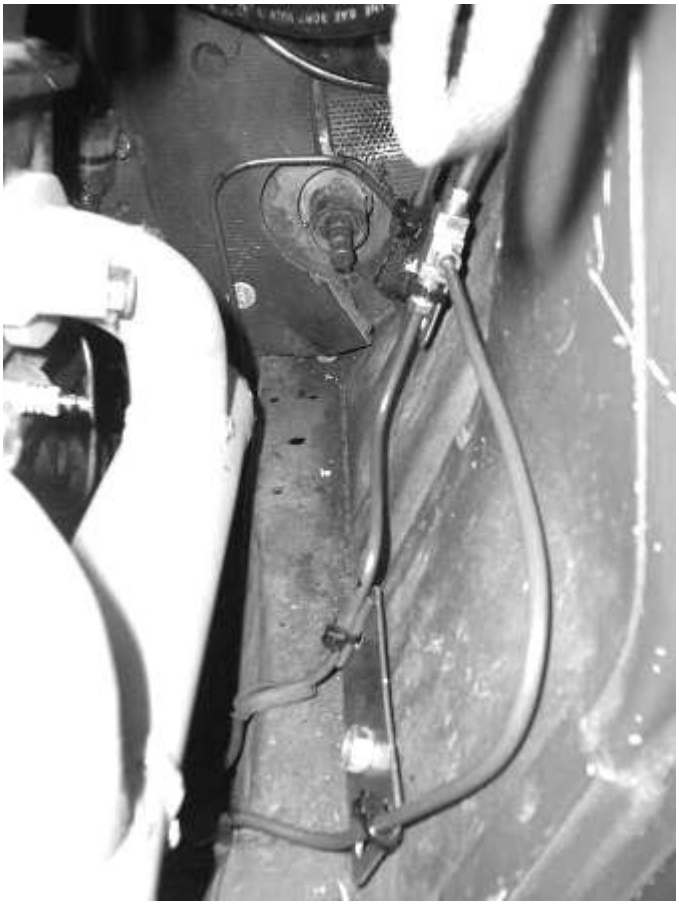
– it goes above the exhaust system and drive shaft. I was going to have to cut into this line and graft a new section on since dropping the drive shaft and exhaust was not in the plans…

Brake Failure Light? For Wimps Only

Triumphs of this period had a gizmo that if one part of your brake system failed a light would go on. Most of the time it didn't work, especially if you bled the system. Call me a sentimentalist – I wanted to get it working again, or at least try.

This switch relies on the fact that you have equal pressure between the front and back lines when you press on the pedal. If not, a shuttle moves via differential pressure inside and trips an electrical connection, thus lighting up that wonderful red light on the dash.

My trying only lasted until I had to drill out the shuttle inside – it was corroded hard in place. After destroying it getting it out, as well as making a hole in the brass body so I could get the drift in, maybe trying to rebuild it wasn't the best idea. The Stag original valve isn't available, but the TR6 version is at $230 a pop. I didn't need that light anyway…



It doesn't look like much, but this area is much neater now, and the lines will clear steering shaft and stay away from exhaust pipe!

New Lines, New Times

Okay, this gave me some freedom to run lines without that switch. Running the front lines close to the body and subframe was relatively easy, and gave me an excuse to use some scrap as brackets to hold the lines. The new plastic-coated lines are a bit easier to bend than the cad plated ones (probably won't last as long – a price paid to make a better environment), but you should still use a bender to make good curves. I use a wire (electric fence wire, if curious) to mock up a line w/bends before I bend a line. Doing this gets me close enough for government work, and reduces frustration. Worked well this time. I got all the lines bent up and installed spaced out over a couple of hours on a couple of nights. It now looks a lot neater in that area.

Back To The Rack

It would be too much to ask for the "new" 2500 rack to fit where the "old" Stag rack fit, and it doesn't. Fortunately I can reuse some of the parts, including the mounting brackets, for the new installation. I'd like to take a moment to thank Rimmer Brothers in England for parts. Stagaholics know that if you really need Stag specific parts you need to go to the UK. Rimmers is one of several suppliers that handles a wide range of parts for the Stag and several other Triumph models, including 2500 sedans. We I ordered rack mounting kits and new rack boots and just a few days later they showed up and I was not charges shipping. Wow, they must have screwed up! Late Merry Christmas Bruce. So, Rimmer Brothers set a new record getting me the mounting parts, now I need to set a new record designing a bracket for them to fit on and doing a few other modifications..

- First order of business is to make a mounting bracket. Custom brackets required
- Of course the tie rod ends on the 2500 are different, narrower shaft from the rack. Fortunately it looks like I can swap the link rods from the rack to tie ends from the Stag rack without changing anything else. Bonus.
- New steering shaft – as you might expect, the original lower steering shaft doesn't fit any more, but never worry Triumph fans, I'm getting a used set from a TR6 that can be modified.

Narrator cuts in: "Folks, we have to stop the story at this point. Our intrepid hero discovered that his bench vise would not stand the strain of bending a mounting bracket for the rack, nor would it hold the link rod mounting nuts so he could get those apart. In the process of making the bracket he ripped the

vise from the workbench in a brutal show of raw force! This lead to a trip to Lowe's to get a bigger, better vise. We could go on, but we want to hold you in suspense. Tune in next time, same Bat Time, same Bat Channel."

May 2007: More Fun With Steering

Let's see, where was I? Oh yeah, putting on a manual rack. The rack itself came from Sweden, on a three way deal – I paid for Odd in Sweden to be a TR8CCA member for about the rest of his life and he paid a friend to ship me the Triumph 2500 Sedan steering rack. You do remember the rack? You don't? Well here is the old rack (that now rests in Ted Allison's barn)

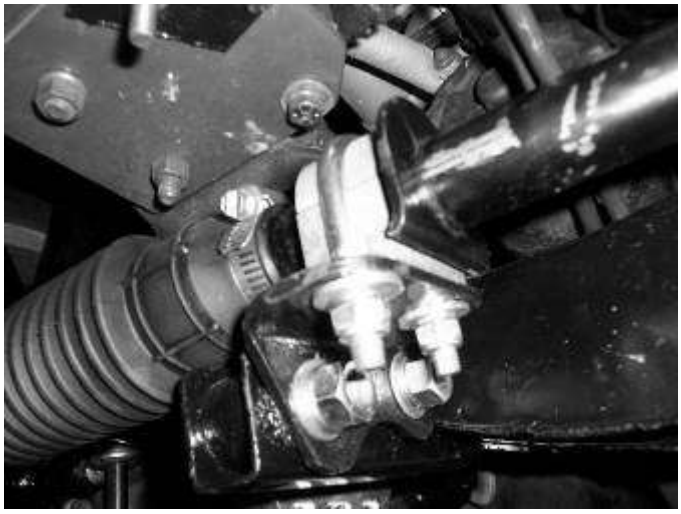
The original Stag Steering Rack modified to be a manual rack – no plumbing!

This already had been lightened a bit to make it function as a manual rack. Now imagine something that weighs a quarter of this and is a lot thinner – that's the 2500 rack. You get the picture!

I went through the 2500 rack, replacing some washers and reshimming the ends after using the Stag outer rods on it. On went new lock washers and rubber boots, and a lot of grease! Since the 2500 rack uses different brackets to mount to the 2500 frame I was in for a battle to mount the rack . But the battle turned out not to be that bad.

For one thing, I could re-use the passenger bracket for the power rack, I just had to relocate the holes, actually make them wide by about 1/16th on an inch! That was quality time with a drill bit!

I wasn't so lucky on the driver's side. Due to the rack design the place where the pinion gear and rack interact is a lot lower than the power rack, which meant that the bracket had to be a lot lower on this side.



Passenger Side – Re-used the existing rack bracket. One side down! One to go!

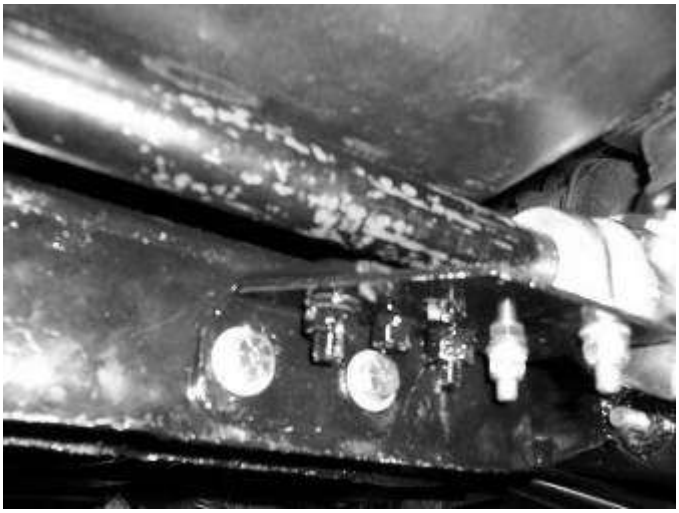
Rather than convoluting a mount on the existing bracket I decided to make a new bracket utilizing the old bracket and an additional piece of flat rolled steel. This I would attach to the sub-member under the engine. The bracket was easy enough to make. I bolted the new metal plate on to the old bracket with several Grade 8 bolts as well as using about a half-tube of JB weld. This isn't coming apart soon.

New Driver's Side Bracket Made From The Old Bracket And A Piece Of Thick Rolled Stock.

Attaching this puppy I had to be careful not to nick the brake line on the other side of the cross-member when I drilled the bold holes. Unlike past lives I did not knick the brake line and the bracket mounted up fine, and the rack mounted fine on it. Probably coincidence.

Okay, the rack was on., now to drop off the shims I had to put on the engine mounts last year when I was trying to elim the spacers the DPO put between the

sub-frame and body to lower the engine as much as possible – I had to shim it to get the engine to clear the power rack. I trust my measurements, I trust my measurements…yes! Uniform small gap between the rack and oil pan, no shims, engine down further! Sweet!



Rack Mount Driver's Side – note close clearance to the oil pan - I got the rack up about as High as I could and engine as low as possible

Okay, next challenge – the lower steering shaft. I didn't even try to see if the old lower shaft would work, by now I know better. I went ahead and ordered a new lower shaft and u-joint from Rimmers. They came in a few days and I was out to the garage to mod!

As usual the shaft was not the right length. I was hoping that I wouldn't have to modify anything, that it would somehow magically mate up – in other words, be lucky. Naw baby, naw. Sooo, I got a pipe with an inner diameter just slightly larger than the shaft, cut the shaft, then attached the shaft pieces with a combo of cross-drilled Grade 8 bolts and JB Weld putty epoxy. Not pretty, but it will hold! I coated it etching primer than chassis epoxy paint, using the famous Clough painting tree. It attached to the upper shaft and rack without a problem.

Struts Anyone?

Last year I didn't fix the struts as I should – the passenger side one was very sticky (it should rotate easy at the top), but I could still turn the car. Now that the front was apart it was time to fix that thing.

Assuming the struts were bad I bought a pair of struts from a Stag Email List buddy for $50 that seemed to be in good shape. One was good enough that I didn't have to replace the shock insert, just the gaiter, but of course that meant that I had to take the whole thing apart. It came apart easier than any other strut I've taken apart, including the AZ TR8…

But…it was from an early Stag and I had to fit a later Stag. Turns out to make this all fit right I had to take apart the original strut and use a few of its pieces. In the end the mix-&-match worked, the rebuild strut with the cleaned and greased bushings turned easily. So easily I went back and did the other side also. Now it's really easy to turn compared to before.

Homemade Lower Steering Shaft on my handy-dandy organic paint rack and solar drier. Etching primer. Don't Try This At Home…

New lower steering shaft in place, fits just right between brake lines and exhaust header.

I invited the club over to reset the toe-in, pictures you saw last month in the MVT Marque. Next to road test the puppy!

June 2007: The missing saga

This is the missing Tale of the FrankenStag that happened last Spring. The sad tale of the rebuilding of the steering column… I thought I had completed it, but in the frenzy to do something-or-another, I forgot it.

The story started in March this year. I had a wobbly steering column. Since I was replacing the lower steering column I had to take this out anyway, so why not rebuild while I'm at it?

I seem to remember that the upper part of the column comes out in one piece, but I did pull the steering wheel first.

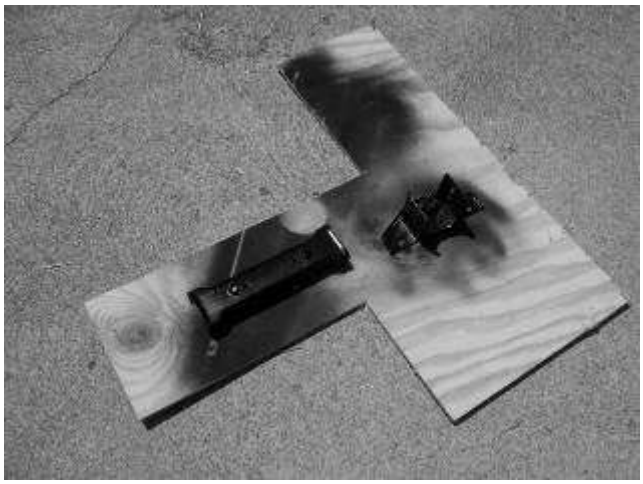
Whaaaa? Wait a minute here – Something Missing?

I then took everything apart and spread it on the floor.

As usual, once I got it apart I found things that were busted, broken, worn, beat-up, and just down-right abused. The rubber bushings in the inner column were shot – this was the source of the wobble. Since I didn't want to order new ones from Rimmer Brothers, I made my own from aluminum sheet, greased them up good, and shoved them in. I also took time to give fresh paint coats.

Putting things back together took a bit longer since I had to fix some wiring problems, but in the end it just took me 4 hours to rebuild and replace the entire steering column from wheel to rack (okay, I had made up the lower rack before) including interruptions from kids and phone. Another part of the car that has left stock configuration…

This Was A Steering Column. Remember, These Are Trained Professionals – Do Not Try This At Home!



My ¼" Pine Paint Booth

August 2007: More Cooling Bliss

Ughh, Popped An Eyeball Out – Ouch! "I'm back at the cooling again…."

As I reported in our TRA '07 report last month, the Stag cooling system I put together in response to the Branson Debacle wasn't quite up to the trip to TRA 07 and back again, I ended having to run the radiator fan while on the interstate, in addition I ran the heater and heater fan when I was going uphill on a hot day. Oh, the fan thermostat started not to work and I manually had to turn on and off the fan. Yes, better than Branson, but still not there, and uncomfortable for those riding with me. So, two years later I'm back into the system again.

From the symptoms – engine temp rising with speed, having to run the fan when ram air cooling should be good cooling, and having to run the heater - I'm coming to the conclusion I already know: the radiator frontal area and air flow through that, are not enough to do the job. After Branson I increased the depth of the radiator, but not the frontal area since the front structure of the Stag limits the size to about 21"x16". In comparison, the TR7 is 23"x17". Increasing the depth is only about 30% as good as increasing frontal area. In addition, the airflow into that radiator is blocked by the bumper/license plate/valence combo. I built a small spoiler, but that doesn't seem to be very effective at speed. So, I need to attack two problems - increased frontal area and better Air Flow. I decided to do this as part of a diabolical, radical plan.

Better Air Flow – To get a cleaner flow of air to the radiator.

One of the things I want to do is allow incoming ram air a straight access to the front of the radiator. That means I need to get stuff out of the way, and I have lots of stuff that can get moved.

- **Relocated the license plate** – I took the plate and put it under the front bumper originally after I got back from Branson, but for some reason put it back on its chrome bumper mount. Why? Dunno. Maybe I thought the home-made front spoiler was good enough? Maybe I liked the looks, because that central plate on the big chrome mount does look attractive, if not expensive. Back it went under the bumper, with the idea that it comes off for shows. I think this will considerably clean the air flow up at speed. Looks to me that the plate will deflect air from the intakes that are essentially behind it. I'm not an expert in computational fluid dynamics, but I played one on TV…
- **Remove Inner Lights, Replace With Grill** – What? Yep, the outer lights are 60/45 H4 halogens anyway, no need for the inners that are just replicas of that – I had them pointed down to not blind folks anyway. Took the inner lights out, cut off the back of the headlight bucket, glued in a metal screen, and glued a couple of aluminum strips inside the headlight retaining ring. The picture tells the story – more air getting in while maintaining the styling cues.

New Grill With Extra Air Holes Where Inner Lights Used To Be. Looking More Like A Rod Everyday! Great TR6, errr, Stag Front Spoiler

- **Removed the radiator-mounted transmission cooler** – the one I bought back in '05 went on the radiator in front. This blocks some airflow into the radiator and also adds heart to the air

before it gets to the radiator. But how do you cool the trannie fluid? Read on!

- **Put on an actual Stag Air Front Dam (Spoiler)** – I made the original one since I was too cheap to order one, but I think it's time to see if one designed for a Stag would fit…so…I pulled out my trusty Rimmer Brothers Catalog(ue) and ordered the "short" air dam (the full one was a racing style one that gives little ground clearance up front). About $180 as the exchange rate goes plus postage. I rationalized it by saying I stalled this purchase by my $12 home-made one for two years. When the spoiler arrived, surprise – it was one made for a TR6 in the USA!!!! That was an expensive lesson to learn, good thing I usually bring lunches to work. As you would expect, it was close, but no bananas, fit. The spoiler fit fine in the middle where the air holes are, but to the sides it has a gap at the end, and the hole for the end bolt is right where the fender/front under valence junction is at. This is hidden by the front bumper. But still I'd say it was a miserable fit. Sigh…..
- **More Frontal Area – get a larger radiator surface to have the air flow through.** The biggest issue here is working around the car structure. The top is on top, of course, and at the bottom a brace piece is right up against the lower valance, so there is very little room to expand up or down. Left and right expansion is limited by the bumper supports as well as running into the back of the headlight buckets. Either way you go you have some significant body work to increase the frontal area. I've decided that I probably can mount an trannie cooler where the battery is since I can cut out a front bulkhead section easier on that side (other side has horns & stuff in front), so to do that I had to:
- **Relocated the battery** – Back to the trunk with you. Back? Yep, back. When I got the car from Doug Braden the battery was duct-taped to the trunk floor – no kidding! It's back there again, but this time correctly, using a correct mount and correct wire. I've put in an Optima gel-battery that is much less prone to corrosion and a big-honking cut-off switch. Of course this meant mucking with the carpet and floorboard…. It also meant another $$$ out the door. If this works well I might do the same thing for the TR7.
- **Put a Trannie Cooler Where The Battery Was** – Now that I had all that room in front of the engine, I got out my sawsall, cut a big hole, and put in a B&M Fan-Driven Cooler. Expensive, but it fits the bill. It also allowed me the chance to leak trannie fluid all over the garage and driveway. I love cleaning messes. Oh, you would not believe the issues I had trying to find 5/16 line hardware – I actually ended up making my own with a little bit of filing and solder. I love propane torches!
-

Optima Gel-Cell Battery and Cut-Off Switch Mounted In Trunk Close TO The Location Of The Battery That Was In The Car When I Got It, Without The Duct Tape!

Trannie Cooler Where The Battery Used To Be

- **Designed & Built An Aux Cooler** – The idea is to put as much frontal area as possible for a radiator. The left side front bulkhead has about 64 sq-in of space that can be used for a radiator, so the goal is to design a radiator that will go in there. They don't really make little radiators, so I'm going to have to make my own. I started with a Ford F-150 heater core, 7.5" square and a 7 inch electric fan to cool it. I don't want to put in an oil cooler since I don't want to run oil lines across the engine bay – I'd rather try to take the heat out of the water first – paranoid about oil leaks! The goal is to use the heater

circuit, “T”-ing the heater flow to both the car’s interior heater and also this aux cooler. I’m using a set of manual valves to switch between interior heat and increased radiator cooling. I’ll probably stay with manual switches for now.

All the parts you need for an aux cooler, just add elbow grease!

Aux Cooler Together And In The Stag. The Front Bulkhead Is Now The “Wall Of Cooling”

I was going to have a separate sensor control the aux cooler, but for now I’ve just connected it to the same sensor that drives the radiator fan. I have a variable control that goes from 150F to 210F, but I don’t think I’ll have that in until this winter. The Aux Cooler, with a radiator size of 50 sq-in and a dedicated fan, should provide significant increase in cooling, if not add another quart or so of fluid to the system. It’s also more neat stuff loaded in the engine bay to talk about at car shows.

Other things-

While I was at it I decided to fix some things that needed it:

- **Put in an engine mounted fan switch** – Actually, this more correctly is put back in the switch. I replaced the variable unit, which in my opinion should not have failed after only two years, with a manifold mounted one. Fortunately, I saved the original switch, which checked out at 185F on, 170F off. Glad I don’t throw some things away. This meant that I had to modify the engine wiring harness, so that kept me busy for a while. The original reason I replaced it was that the switch isn’t variable and that the fan was on for long periods of time after the engine was turned off. The disconnect switch in the trunk solves that problem!

Mess Of Extra Plumbing I Had To Install For The Aux Cooler – Thank Goodness Lowes Is Open Until 10PM!

- **Replaced thermostat** – Since the engine was running hot, it’s always had a 160 thermostat in it. Since the cause of the engine running hot was insufficient radiator cooling capability, putting in a 160 thermostat won’t do squat except make you feel good. I put in an 180F unit that goes with the original heat range degree thermostat like the engine would have had in it. No, I don’t know what I was thinking, I’ve had several courses on thermodynamics and I should have known better.
- **Reworked Front Bulkhead Wiring Harness** – I had to add wires for the trannie and auxiliary cooling fans, so I went ahead and rebuilt the harness and added an extra relay for the aux cooler fan, I also fixed some wiring irregularities with the old wiring while I was at it.
- **Moved Overflow Container** – since this was right where the aux cooler is going I moved it to the driver’s inner fender. Now it’s easier to get at anyway!

- **Tightened up trannie pan bolts** – yep, it started to leak a bit, so I tightened them up.
-

In The Lab Of Evil Dr. Clough, Torturing Fan Switches - No, Alice Didn't See This One!

- **New Front Parking/Turn Signal Lights** – Since I had to pull these out anyway, it's time to get new ones. Although they looked good from the outside, the driver's side lights had frozen into their sockets and the passenger's side ones were actually in rear light mounts I modified to fit the old housing after the original sockets went bad (they cam bad when I traded for the car). The new ones were different from the originals, and actually from each other with different wiring plugs – I had to make some changes on the passenger side unit.

So, we'll see if this works. I think it will help a bit, but not enough. Biggest problem is that I'm dealing with a front end geometry designed for rejecting heat from a 3.0L engine producing 140hp and I have a 220hp 4.3L engine in it. I'm sure I'll be on to Phases II and III soon!

Phase II – This Fall

Several items I have ongoing right now. The plan was to do them after BCD, but I'm working them as time permits.

- **Install a finned trannie oil pan –** I got one, I just have to put it on. Difficulty is that I can't clear the right side exhaust pipe. Nothing that a few days effort with more pipe and a hammer won't fix – Just kidding, I'm going to have to redo the left side header. Anyway, this will drop the trannie oil temp a bit as well as look really cool, that is if you're being run over since that's the only way you'll see it.

Phase III – This Winter?

In the end I have to deal with getting the main radiator to reject more heat, this means…

- **Bigger, Aluminum radiator** – I think I can get another inch or two of width without having to bother the bumper mounts & I can rotate forward to get a bit more height. In other words, I can get a 15 – 20% increase in frontal area. Couple this with the increased efficiency of a modern aluminum radiator means that I can probably get that frontal area I need to drive at 70 mph all day long without running the heater. But, to do this I have to cut in the front bulkhead significantly. Not as much as parting out the TR8 last year, but still a lot of Sawsall time. I see Ellis smiling now… I'm also going to have to build a lot of custom shrouding – more aluminum sheets and pop rivets!
- **Bigger fan w/shroud** – I will go from the single 16" high CFM fan to either a dual 11" fan set-up or maybe a single 16" higher CFM fan with a shroud. What I do will be determined by the clearance I have between the fan back and the crank pulley, which I can't predict at this point. I think going with a thinner aluminum radiator I'll be able to use a shroud. We'll see.
- **Added air ports** – I might make a couple of more air ports behind the bumper to ease air access – other have had to do this also, we'll see what the current configuration gives – hat to modify the external sheet metal – I can always put back in blanking plates for what I've done so far.
- **Other** – since I'll have the front of the engine accessible I'll probably replace the timing cover, chain, and harmonic damper while I'm at it – maybe even make the timing marks more assessable? If I do this do I go for an electric water pump? Speaking of electrics, I'm going to re-do the dash wiring harnesses also – what a rat's nest, and I think I did that!

In Summary

I spent a lot of elbow grease and money to try to reject heat from an engine too big for the car it's in. I've also come to grips that this car is not a normal car. It's a rod – not a Stag, but a FrankenStag, and it won't be normal. But, then again, neither am I! It's ready for Dayton BCD and to sweep it's class – yeah, right!

The TR7 still runs at ¼ to ½ on the temp gauge even on very hot days – my hero….

September 2007: The need to modify...

Well, survived Dayton British Car Day. Won an award – not sure how that happened! Now that I got that out of the way – on with the modifications! Whaaa? You thought I was done? No way – still too many things not quite right. And it starts behind the dash!

The Need To Modify

I don't need a good reason to modify something, just ask Alice, Let's see:

1. FrankenStag has had at least three, if not more, owners that have made modifications
2. Behind the dash it looks like spaghetti – there are wires going everywhere, there are wires cut and going no-where
3. Some fuses in the original fuse box are not used while we have added fuses
4. There are added relays, connections, and switches put in odd locations
5. We have a A/C heater box that takes up a huge chunk of real estate behind the dash, but we don't have no stinkin' A/C

Five. Enough reasons to tear back into the car after a winning outing at Dayton BCD '07. What fun! Who needs sleep? Time to fix this stuff. Bob the Builder, move over!

Step One – Heater Box .

The heat exchanger in a Stag with A/C is quite a bit larger than one without A/C – added cold air matrix, two fans, big fat air hoses, and multiple cable controls. Since it's parked in the middle of the dash everything has to go around it and it's a hard thing to work around.

All I need is heat – the A/C is long gone and I don't plan on replacing it.

So for a heater I have several options:

1. Find a Stag heater-only box, which is somewhat smaller than the A/C heater box.
2. Buy an aftermarket "hot rod" heater
3. Use something else.

I went with Door #3. Stags shipped to the USA had A/C normally, so finding a heater box this side of the pond might be a chore. Aftermarket heater boxes that I'd use start at $179 and need modification anyway. Used TR6 heater boxes can be had for $40 in decent shape.

That's right – TR6. I was thinking of TR3, but they are expensive for decent ones and besides the TR6 units have decent blowers on them, and eyeballing them they seem to fit where I need them to. .

So, where do I get one? Ebay? Tried, got out bid on several. Hmmmm, what about local? Called Doug Braden – he's got a few, and he's coming to Dayton BCD as a vendor. Sweet. Doug brought two heater boxes and I got to pick the best for $40. Bonus.

I went with what I thought was the newest box (based on Smiths part number) , and rebuildamodified it. Didn't need the fresh-air take-offs at the top – blocked them off. Mount will be different from the TR6 top-mount – off came the top. In fact, since I'm not going to use the fresh air intake (I don't get fresh air anyway thanks to the hood scoop) I can mount this like a TR3 heater! Fresh coat of black paint and away we go!

No, it's not stock, but at least it Triumph – does that make it OEM?

I had to add a couple of mounting brackets, but I didn't want to fasten them until I could mock-up on the car how it would mount. That meant it was time to yank out the old hearer & A/C matrix box.

Easier said than done. The Stag manual read essentially like this:

1. Remove everything behind the dash including the dash.
2. Drain Coolant.
3. Remove Heater Box

See how easy that is. Since I had to go back in and rebuild the wiring harness and fuse system anyway all that stuff might as well come out. It turns out ripping it apart was easy; all the bolts came out, all the wires unplugged. Only thing that fought me was some of the things going through the bulkhead. some of the heater hoses. But, even with it being easy, there was so many things that one has to pull off that it took me a few solid hours of work to get everything off (in one piece, not ripped up or broken).

Dash Off – Look What A Mess I found!

Behind the dash was just a mess – spliced wires, unused tubes & wires, tape falling off, and the dash being taken up by that huge heater box. I found several cut and scraped wires, on a fat wire on the purple circuit, which would have made nice shorts! Shouldn't let the smoke out that way. Basically we had modification on modification on modification.

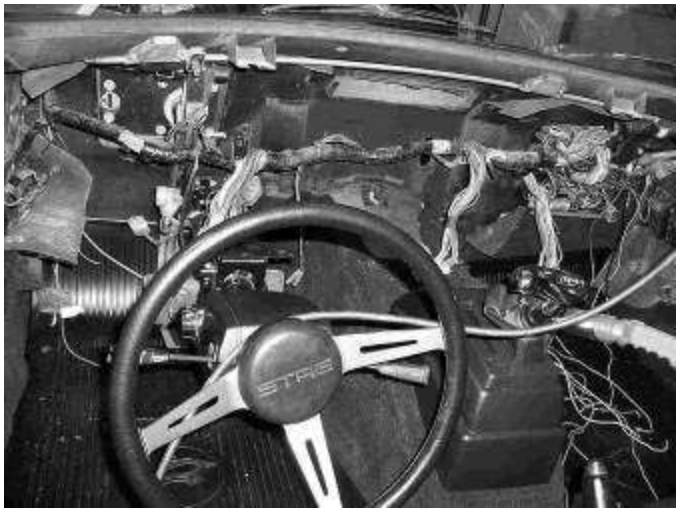
Time to simplify. First thing was to reduce the wires lying around. Since the is no A/C and half the other circuits aren't used, there is a lot of wires that can be eliminated. Eliminating those wires freed up 4 fuses with enough connectors for 8 protected wires in the circuits, so that meant I could get rid of one of those extra fuse blocks I put in the engine compartment. Of course that meant I had to rewire the engine compartment, or at least the firewall harnesses, and this time I wrote down what I did.

***Moral of the Story**: If you make modifications, write down what you did, not for the next guy, but yourself. Memories aren't all they are cracked up to be.*

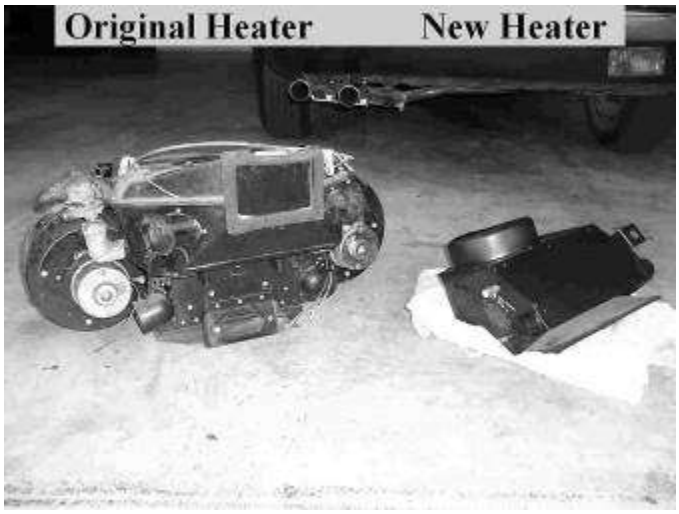
Time to drop the heater – it came out without a fight…weird.

A quick comparison of the original with the new heater box showed simplicity is nice. One third the size, a lot less controls to worry about, and it weighs about a quarter of what Big-Bertha does. I blocked off the fresh air vent since the new heater will recirculate inside air (how TR3ish of me). Oh, I found two old mice nests doing this. I was wondering what was making that noise in the blowers…

Heater box installation went easy. The only issue I had with installation of the TR6 heater box was the water inlets and outlets ended up on the other side of the heater from the holes. This meant that I had a lot more heater hose to run – I bought 10 feet at NAPA – you should have seen the look on the salesman's face! You'd think nobody came in and bought that much, I bet it happens all the time.



Heater Yanked – Actually It Was Easy – Making a Mess Is Fun! Oh, That Wiring Looks Like A Headache!



Old Heater, New Heater. New Heater Takes About A Third The Size. Any Questions?

Step 2: Electrical System

The electrical system was next. Time to right this mess since I helped create it!. I had already gotten rid of a bunch of wire, now to finish the job. The mods I made were:

- Turn Signal Flasher in relay box – remounted the flasher next to the relays under the

passenger's side of the dash. This was stuffed under the driver's side so you hear a "click". No click now, so folks are just going to have to yell at me to turn off the signals. Now to buy an electronic one for the hazard flashers.

- I had room for the flasher in the relay box since I took out the wiper delay (wasn't connected when I got the car), the ignition relay, the blower motor relay, and the seatbelt buzzer (anyone want it?). I eliminated several of the relays I stuffed under the dash and used the ignition relay as the new radiator fan ground relay (for manual operation).
- Removed about a mile more of wiring. I went through each circuit and figured out the wires I needed, and eliminated the ones not used. This left a pile of more wires on the floor. I also shortened quite a few wires since they didn't have to go around that behemoth of a heater box anymore. This meant I had a few splices to make – I use either the shrink-wrap crimp splices, or I solder and use shrink wrap. Either way this kept me busy for several hours, especially since I had to feel my way around prior owner mods, and this time I wrote down what I did!
- Reused fuses in original fuse block (circuits that were removed, like A/C) to eliminate one of the fuse blocks I put in the engine compartment as well as gobs of wires to feed them. Much simpler looking in the engine compartment and under the dash.

In the end I ended up with plenty of good left over electrical stuff for the Christmas Party Auction (MVT Tradition). I tied down the cables to keep rubbing down, and used some cable wrap in exposed places. It looked like progress, which is the opposite of Congress…..

New Heater In Dash Along With rebuilt Wiring Harness – That Was A Lot Of Work!

Step 3: Dash

Next thing to do was to start putting the dash together. I made a decision that I wanted to get a glove box again as well as move the cigarette lighter (aux power plug) to the dash. This meant I had to do something with the radio and switches I had there in place of the original glove box. I also wanted to get rid of the ugly panel I put under the dash for the power window and interior light switches. But where to put it? Hmmm, no Stag heater, no vent function, so out came the center console vent and in went a switch panel, covered with a vinyl that matched the car color.

New Switch Panel - Who Needs Stinking Vents? Notice I Kept The Original Window & Light Switches

The toggle switches are all lit so you know when something is on. Now to get a plaque made up that says what these switches are! I know, but others need to.

Staring at the instrument cluster, it was time to fix this. Duplication and ugliness. I mounted the idiot light cluster back in it and took out one of the voltmeters. I also got rid of the non-functional brake warning light and the non-functional rear window heater switch, the wires to run these having been corrupted by a prior owner. Off came the high temp light – another thing not working, and I got rid of the hazard flasher switch light (like I don't know where that switch is…). I then modified the instrument cluster wiring harness so it was using the right number of the right wires to do its job, writing down what I did. I probably got rid of another mile of wiring. I also switched the instrument lighting to LEDs rather

than bulbs – something I'm gradually doing all over the car. Prior to this I decided to cover the less than stellar dash wood with more of the green vinyl. Result looks very "roddish…"

New Instrument Cluster - Same Basic Configuration as the first, Just A Lot Less Wires!

Now to work on replacing the idiot light bulbs with LEDs – since they don't make LED lights in that miniature screw-in base I'm going to have to build my own, which is why I bought a spare cluster off ebay…

Where the glove box was a CD player is, or I should say was. I had yanked that to put in a home-made glove box – now to put some gloves in it. Next to it I put in two aux power plugs and arranged a stereo jack so the output of an MP3 player could be fed into the amplifier. I left in the clock, but I re-did the panel behind it in vinyl. I put back in a short control cable for the heat/defrost selection. As much as possible I used green, or green paint. I've got the theme going…

The entire Dash – Not Quite Stock…

When I attached the battery – okay, I cheated, I used the battery charger limited to 2 amps at first, then 10 amps. Learn not to burn if I managed to get wires crossed. Where was I – okay, when I hooked up power everything worked except for the oil and ignition idiot lights. A case of a mis-connected wire and burnt-out bulb. Besides, that all worked – more skill than luck, at least this time.

So, by the end of all this FrankenStag had strayed even further from "stock" and clearly into the "rod" category. I tried to reuse as much as I could, and even kept the new heater box in the Triumph family. However, I will be labeled a blasphemer for the dash if nothing else. I don't have to worry about concourse… I need to do something with the idiot light cluster to make it fit the theme better, and I still need to get some heater vent tubing…hey TR6 guys, have any around….

Side Journey

This was a "while-you-are-at-it" kinda thing. I've been going to replace the throttle and kickdown cables and their mounting brackets for a long time. They look very "just-ripped-off-the-Safari-van-and-modified" – which they are. Since I had to take the dash apart it was very easy to get to the gas pedal top, and rewiring of the left passenger bulkhead left more room to maneuver there.

So…got out my trusty Summit Racing catalog and ordered cables and bracket kit made by Lokar. Everything was easy to install except for the kickdown cable into the trannie. Everything is in the way of everything. Ended up dropping the exhaust header on that side. Neighbors heard me discuss what I wanted to do with the bubbas that did the engine install. I did not cuss (we have kids now), but I used more eloquent words for the same thing. I finally got it installed, but not before spilling a quart of ATF on the floor. It needed washing anyway…

Looks fine and works well, and is a lot easier to adjust than the stock cables.

(Note that several months after I wrote this I put the Stag heater box back in due to noise of the modified TR6 box and fan.)

October 2009: The smell I don't like!

I didn't want to write this column. I'm not supposed to be working on the Stag until I get the wedges done. And on my budget that will be about 2013. I think The FrankenStag had other ideas.

The smell of gas. I don't like it at all, so when I smelled gas in the garage somehow I looked at the Stag first, and there is was, a puddle on the ground coming from a trunk drain hole.

Okay, so it lasted four years. I originally fixed the gas tank in 2005 – used the expensive Moss Motors gas tank fixing kit (which they bought from Bill Hirsh…) and took my time and did it right. Or I thought I did.

Lifted paint on the FrankenStag trunk floor. Oh, the humanity of it all!

Oh well, you live and learn. The first thing I did was to get the tank out of the car – fortunately it only had a couple of gallons in it – and gander at the ruined floor plugs and paint. Okay, the paint wasn't much to begin with, just protection, but we're going to have to do it again! Rats.

I flipped the tank over and the exterior fiberglass patch fell off. The gas ate its way through the expensive rubber lining I put in it and then loosened the patch.

The remains of the gas tank patch. Great picture – kinda looks like jello – actually parts of the patch felt like it!

Looking at the tank you could see that the rubber had filled the holes under the patch, every one of them, but somehow the rubber gave way and let the gas by.

Damn reformulated gas.

"Fixed" gas tank holes – you can see the white rubber compound in them. The dark area is where the patch was.

Great, what now? I'm not going to try and fix this tank again. I either have to buy another tank or go with a street rod fuel cell. Decisions, decisions. Well, at least the garage doesn't stink as much…

~~December, January, February, March, April,~~ May 2011

Note – I started this back in November, but ran into a snag and never completed it – yes, I will blame it on the car…..

Hey, something's just not right here…

Honest, my kids made me do it!

I'm back working on the Stag. Yes, I wanted to get Freebie's seats recovered, but the kids are adamant that we drive the Stag next summer.

Sigh

Thinking about the Stag – yeah, it might look good, but it has a lot of issues:

- Engine to too heavy and too far forward which leads to significant oversteer
- All the rubber in the rear end is shot and the diff leaks
- Engine still runs warm and cooling system works hard
- Trannie shifts out of first too soon due to the light load on the engine
- Gas tank is rusted out
- That hood scoop has to go.

So where do I start? Well, probably with the rear subframe mounts and trailing arm bushes, since I know they are shot. How do I know they are shot? Easy, while cornering the back end has a mind of it's own – the rear feels, well, a bit sloppy.

It's been that way since we bought the car, BTW…

Now, if you don't have a Stag you might know that the rear end is on a subframe that bolts to the unibody in basically four places (hmm, I think that makes it a partial unibody, or would that be a semi-body???). It's a trailing arm configuration reminiscent of the TR6, and in fact, much of it is shared with the TR6, but also much is not.

This causes problems, more later.

The easiest way of getting the rear end apart is to drop the subframe and then take it apart. This went surprisingly easy. A couple of the caged nuts on the body will give me fits putting it back together, but that's down the road and not on the radar screen – yet.

Hey, isn't something missing?

As I expected all the rubber is shot. This won't stop me from putting it on ebay where somebody will give me $$ for it. Love ebay.

Once off the car I took the subframe apart. Since I might as well start in the middle, the first thing I did was to examine the spare differential I got with the car since the one that is in the car is pretty noisy. The gears looked good and the bearings all checked okay, but the seals were shot. I ordered the inner hub seals from TRF (TR6 parts), but the front seal and diff cover gasket are just for Stags so those came from Britain. While I was waiting for the parts I cleaned and repainted the differential.

Note: The Stag differential is very similar to the TR6 diff, but has beefier gears and a special extension on the front to connect to the subframe, in fact, it's part of the subframe.

The seals all went back in without too much of a fight. I had to offset the inner halfshaft hub seals since they had dug a grove – moved them in a smidge – hope they seal! Reused the nyloc nuts, but as always, I use Locktite on them so I'm not relying on the nylon to secure.

Now on to the biggest "problem", the half shafts. The biggest difference between the Stag and TR6 rear ends is that the halfshafts are longer, and they use staked U-joints. The halfshafts are designed to be replaced as a unit, not repaired piece-part. So the U-

joints are not designed to be easily replaceable. This is an issue since:

One used rear end kit, ready for fixing…

One pretty painted resealed Stag differential waiting for me to put back together the mess that is the rest of the subframe and rear axles. It's in the picture along with all the other Stag parts that take up where the Montero was parked, now it sits rusting on the cold outside…

- The U-joints on our halfshafts are bad.
- Rebuilt stock halfshafts start at $500, and that takes 4-6 months.
- New halfshafts using CV joints rather than U-joints are $750 each. Good thing is they can be here in a month.

Ouch.

My one saving grace is/might-be that Zabjel Machine Shop in Xenia can, and has, replaced staked U-joints. That will run about $300 total for the pair with parts extra. Hub kit is $50, U-joints are $30 each, plus other stuff. I just need to order some from the UK and pray it works. Hub kit is same as TR6, so at least TRF got that order.

Okay, so that's a bummer, and a budget buster. While I'm waiting on parts (actually waiting for an answer back from the UK on U-joint sizes) maybe I can clean up the training arms a bit and work on the other stuff…

It was at that point I made a startling discovery.

Hole in trailing arm

There was a hole in the trailing arm. Big whoop you say since all Stag and TR trailing arms have holes in them. They do, but the hole is supposed to have a rubber plug in it. On closer inspection I noted there were grass, seeds, and droppings inside. It was being used as a home at some point.

History – I traded Doug Braden a TR8 for this Stag back in 2004. Doug got it out of a barn where it had been a home for many an animal. I thought I had found and cleaned up all the nests he missed when he had the car restored the first time. Found one more!

I thought I'd never seen the end to the stuff that came out of that arm; it was like a clown car. It really was like a clown car – the stuff kept coming out. Nest, no, this was a high-rise apartment!

Okay, since I'm waiting a bit for parts, what else can I do? Oh I remember, the gas tank is shot.

Triumph Factoid: Once you use a gas tank coating "system" from Moss or Bill Hursch, and it rusts again, you have to take it to Cincinnati and spend a couple hundred bucks getting the coating out of it. That's before you spend a couple of hundred bucks getting the tank repaired.

The Stag Stud (you figure out what that means…) Ted Allison, of lovely Beavercreek, Ohio, gave me an earlier (MkI Stag) gas tank to work with, but it also had been coated at some time in its past. Yikes – that's as expensive as the original tank to fix.

The house I dumped out of the trailing arm. A lot of house. Gotta hand it to the mice, they picked a secluded location, and that cast aluminum makes a sturdy house.

What to do, what to do…???

Okay, is the car original? No????

Do you care if it's not original? NO!!!

Solution is easy then. Get out the Summit Racing catalog, turn to fuel cells, and find one that will fit! I need a top fill hole, built in gas tank sender, and a shape that will let me easily build a platform without too much effort.

The answer was $119 - 12 gallons, sender, and rectangular shape. Platform for it made from aluminum stock, semi-simple installation. Yes, I'll have to open the trunk to fill up, but at least that will give onlookers something to talk about.

After all, this is the FrankenStag.

Of course, now there is the issue of what to do with the fuel filler door and hose. Surely I can use it for something! Surely was right, I put the battery disconnect switch in it.

Street Rod Fuel Cell – cool…

Hey look Ma, found the perfect place to put the battery disconnect switch!

Of course now I have the issue of what to do with the spare tire. Well, silly boy, that's easy, you put it in the trunk next to the gas tank. Not so fast cowboy, to make space for the battery I had to move the tank over, and that made the space too small for the full-sized spare. I thought about getting a space-saver spare – 14" wheel, 4x4.5" bolt pattern – a few cars might fit, but if I did that I'd run into the same problem Russ Seto ran into when he had a flat on his TR3A – the flat wouldn't fit back where the spare came from, so it took a ride in the passenger seat…when it comes time to start and drive the car again I'm thinking larger rims with run-flat tires.

I'm planning on pulling that 4.3LV6 drive train and replace with half a Stag engine. Turns out I have two half-Stag engines sitting around.

Two (2) ½ Stag Engines…

Might as well use them. Ought to be interesting…

June 2011: Half-Shaft Hades

Dang, I got my eyeballs hanging out!

Note – Phil, you might not want to look at this one, it's getting ugly…

Still trying to get the half-shafts fixed. If you recount from last month, the Stag half-shafts are "staked" – the u-joints are held in by metal bits beat-out of the yokes rather than circlips for other Triumph's joints. This complicates things since it means you can't do u-joint replacement at home.

What really complicates things is that I found out nobody in the local area (here local is defined as east of the Mississippi River) can replace staked u-joints. I found a place called PowerTrain Industries in Garden Grove, CA that could do it, but I had to take the hubs off first so I took them to Zabel machining in Xenia.

This is where the plot thickens.

For those of you who have never taken a hub off before, they are on taper shafts and after 30-40 years can become quite attached. If you happen to have the proper Churchill tool you might be able to get them off, but I usually head toward a 50 ton press.

They got hub one off, but evidently the dreaded prior owner (DPO) had cross-threaded the nut the last time it was put together.

Galled threads on one rear tapered shaft…

At least that one came off, the other hub bent and the threaded end mushroomed as the labored in vain to get it off. Heat, shock, and cussing didn't work – it's still stuck hard!

…bent hub and smashed threads on the other…

Sigh

What to do?

Punt.

While I waited for inspiration I decided to put the rear suspension back together the best I could without the half-shafts.

I painted up the suspension bits using paint I had on hand, which meant that not all the stuff is black, but all black is boring anyway. I had already received new bushings and other suspension rubber bits from Paddocks in the UK (although I suppose I should have ordered TR6 ones from TRF), now I needed to put them in.

New Tool Time!

Yep, new tool time. Literally since the brushing insertion tool I had was now gone! Went to Lowes and bought one?

Lowes had one?

Yes, and only $2.

$2?

Yup. Two foot, 3/8" NC threaded rod. Best tool for the money. Multiple uses too! Everyone should have one. Who needs a press when you have a threaded rod?

Well, I should say you need also a large socket and some nuts and washers. Put the rod through the bushing holes, put a bushing on one side, a large socket (1.5", ¾ drive) on the other, put grease on some washers on each side, put a nut on each side, and tighten the nut on the socket side. Bush goes right in – oh, I also rub things down with a silicone grease to ease the installation.

Bush ready to be inserted.

Easy as pie, okay, actually easier than pie. Less than 30 minutes I had them all in, and I wasn't rushing at all. The best thing about this tool is that it has multiple uses. You read about it as a bushing insertion tool, but did you know it can also be used to spread brackets so the new bushes would fit? You don't? Well, it can – all you need to do is put the nuts and washers on the inside of the brackets so they push.

You can also use a 2' rod as a breaker bar, whacking stick, hood prop rod, and a gazillion other things, all for $2 at Lowes.

Gotta love it!

With that new tool I had a lot of the rear suspension back together in no time flat!

Oh, I managed to source a pair of supposedly good used halfshafts – on the way and hoping they are plug and play!

(almost, but that is a story for later…)

Bush inserted.

Two-foot rod as an expander tool

Rear suspension

Back on the Engine

The secret is out. I'm going to stick a TR7 engine, albeit a slightly higher HP one, in the Stag, but first I need to disassemble the monster I had created.

To help finance the project I put as much of the modified cooling system and the "bling" on eBay as possible. Carb, air cleaner, valve covers, pulleys, and a bunch of other stuff headed off for auction, and quite frankly, I recouped about 60-85% of the original purchase price on things, so I didn't lose too much money. My biggest headache is to get sold the 4L60 trannie I got from Brian Smith – nobody in the area seems to want to pay $$ for it. Wonder what I'll be able to get for the 4.3L block and Turbo 350 trannie? Maybe I'll sell the trannies as a package deal? Dunno. Anyway, buy the end of the first day this is what the engine compartment looked like:

"Bling-less"

And, after about a month later with a few business trips and a lot of other stuff I managed to get it this far:

Even less Bling

I managed to sell the Turbo 350 in the car, but nobody wants the 4L60 I got from the Smiths or the 4.3V6. Anyone want them? They make great boat anchors!

I did rewire the lights and horn so there is only one wiring harness going forward and installed a smaller fan on the radiator. Anyone want a monster 2300 CFM fan?

What is this? Find out next month!

Until next month – that's a wrap!

July 2011: More Fun With Engine Blocks

So, what is this Bruce, left over from last month's Marque – how dare you tease us!

More Fun With Engine Blocks

Simple – that's the savior of TR7/Stag owners – the Wayne Simpson Head Removal Tool (WSHRT). As any TR7 or Stag owners knows, the heads on the engine are aluminum, blocks iron, head studs are not parallel with block face, and head gaskets tend to weep, setting up the "dang this head is stuck on the engine" syndrome.

In the past I'd employ several different stud removal tools, working on one stud at a time. I always got the studs out and the head off, but it could take a while and be a bit frustrating.

Okay, a LOT frustrating, but no more.

The WSHRT is simple in concept – apply strong, even pulling on the head by pushing down on the head studs to lift the head. The tool has several main components - the first a top plate that carries the rods which push on the stud. This bolts to the head using the camshaft bearing stud holes. Next are three brackets that hold the other side of the top plate using the lower exhaust holes as mounting points. Then there are the threaded rods themselves, and the hollow joining nut and ball bearing that allow the pushing rods to rotate a lot free-er that if the rod was pushing against the stud.

The WSHRT as it came in the case

The WSHRT on a Stag head to show what it looks like ready to go

Okay, so it looks good in theory, but how well does it work? I have two TR7 engines to try it on, but a funny thing happened – all the studs of the first engine came out using the *double-nut technique* below:

That's not good, I mean it's not good if I want to write about the head tool – I'm a beta user for it after all! (I also have several other stud removal tools, one designed just for pulling TR7 studs that I didn't use…)

So, after I completed taking apart the first engine (which the Biglers gave to me and which they really didn't know the background of), I moved on to the second TR7 engine out of the car we parted out last fall. The second engine didn't disappoint me – 4 out of 5 of the studs were stuck. Yaah! On went the tool…

The WSHRT on a TR7 Engine with 4 Stuck Head Studs

...and off came the head! Check out the corrosion on them studs!

Fantastic – worked as advertised. Yes, it was a bit of work to get the tool on the head (you have to cut off the tops of the studs with a Dremel tool then start a small hole for the ball bearing to sit in), but man – it came right off! This will be a real boon to the TR7/Stag owners – Wayne plans to rent it out, but I'm also finding out how much $ they would want for one of these, wouldn't mind having one….

Okay, next step was to design the new motor mounts…

One small thing, you need a motor and transmission to do this. Hmmm, okay, I'll assemble a motor and trannie without any guts in it - light enough to move around easy, but absolutely realistic in the mounts.

I had two empty engine blocks already, and one head without a camshaft in it, but no empty TR7 R380 trannies. I do have three complete ones, so I grabbed what I thought was the worst of the lot (one I got from Ludwig's auction last year). I've never taken apart one of these, but after I bought a larger pair of snap ring pliers it came right apart. Also found out the 3-4 gear synchro had started to disintegrate! This explained all the residue on the magnetic drain plug and in the oil! Of course I was told this was a good trannie, okay, maybe a few gears were good…

So, with a block and trannie gutted I put them together along with the de-camshafted head and had a dummy drivetrain. But it looked so drab in the faded paint, corroded metal, and somewhat shiny aluminum – I wanted to make sure I could see it while designing mounts - what to do? Simple – paint it! Better yet, let the kids paint it!

Grabbed Duncan, Bridgett and 'Becca (neighbor), gave them four cans of pastel enamel, and let them have at it!

Three kids, four cans of spray paint, and giving them a free license to create – it's a beautiful thing.

About 30 minutes later the artist's guild had completed their work. Wow, Van Gogh, Raphael, and the Michelangelo guy would be proud of these young, aspiring artists!

The Masterpiece!

Now to get this colorful thing in the car. Fortunately, the Biglers came through with a nice hoist that made putting this back in a snap!

Back in the engine bay – wow, lots of room without all that external junk on it , eh?

Integration issue #1

It became painfully clear that this wasn't going to be just a straight "stick it in and go" installation. Although the TR7 engine block is the same length as the original Stag block, the 5-speed R380 trannie is different. Way different. I noticed immediately that the shifter extension was way too long and I'd have to seriously cut into a cross-support in the unibody to make it fit. I have to shorten it by 2.5 – 3 inches. Do-able, I think….

So, I headed to one of my old trannies, yanked off the extension, and cut it down to the sixe I thought I needed, lined up the shifting shaft bearings, and epoxied the two sides together. This is the jig for welding up the real thing. I hope I have enough distance between the sleeve bearings to take up side loads so the binding is minimized. We shall see.

Stock shifting extension (top), shortened one in front

One of the main reasons for getting rid of the V6 was the weight in the front making the car somewhat tricky to drive. I really want to move the engine back as far as practical, with the shifter extension being the limiting factor. The forward limiter is the oil pan hitting the front cross member. Somewhere in between is where the engine needs to sit. Once located I needed something to keep it in place so I could build a rear mount and then get the front mounts designed. As usual, I turned to nylon ties.

Front engine position located via nylon ties attached to sway bar.

Using the ties and the hoist to provide a bit of backwards pull, the engine was located where it gives me the room to run brake lines and shift. We shall see.

Now for the rear mount. The one the last transmission used was a simple bar attached to the body via some huge washers. Since that held the torque of a 4.3 and the weight of that engine plus the Th350 trannie I figured a similar arrangement would suffice for the R380.

To set the rear trannie height as well as engine angle I needed a driveshaft, but I don't have one, so I made an pseudo one from a pipe the right length. I cut an old piece of solid conduit to the right length and stuffed it up there

One fake driveshaft in place

Doing this I could set the rear height to ensure the final driveshaft can clear the brake cables, fuel and hydraulic lines and also play with engine angle. In the end I fixed a compromise height and cut a rear cross member from a piece of 2" square stock and set the height above the member for actual trannie mount point using big nuts. This will do for now.

Conan – the back trannie mount! Bring me your women! See how visible that engine/trannie is with the high-viz paint scheme?

Now I need to design the front motor mounts. The goal was to re-use the mounts the V6 used – that way I don't have to weld in new mounts, cut new holes, or do any other damage. Rather than just start cutting, drilling and welding 1/2:" stock (as if I could do that at home), I'm going to build mock-ups out of sheet metal and take them to a shop – easier and I'll know they fit – I've been burned before by assuming I'd get a end part made right the first time without drawings or mock-ups. Used sheet metal laying around the garage to make mount brackets, and attached them to the engine to check fit:

Front right motor mount mock-up. It's a beautiful thing!

Next month I'll discuss building the real front mounts as well as new pedals, and starting to rebuild wiring harnesses and electrical system.

August 2011: Remember kids, don't try this at home!

Whhaa? What's going on here? Who stole the dash? What's them wires????

Whew – that's better! Sure it was a Bad Dream.

Let's see, where were we last month? Oh yeah, I was cleaning up the engine compartment and looking at making motor mounts. That explains why I ripped the dash wiring harnesses all apart, sure.

Officer, I can explain. It's very simple. I wanted two wiring harnesses going forward from the dash. The left (driver) side one was going to be the engine harness, the right side was going to be the front lights' harness. To do that meant I needed to relocate the wires that run from the left side of the dash to the front (turn signal and parking light) to the right, and the engine wires in the right (basically the starter power wire) to the left. Oh, I also wanted to minimize the number of wires in the engine compartment so things look clean. To do this right meant I had to rip apart the dash wiring harnesses.

For those who have never redone wiring harnesses, re-running wires, cutting wires, making the connections with solder and shrink wrap, etc. takes time – let me rephrase – doing it right takes time. Plan on spending some quality time in the garage and going through a few nylon wire ties.

While I was at it I made a few modifications to the modified dash to eliminate superfluous stuff:

Eliminated oil pressure gauge – face it, you have the gauge there to tell you of a failure rather than to look for trends, but a light and a buzzer does that much better from a human factors point of view.

Eliminated Speedometer – If you are good, you can calibrate RPM to speed within gears. If you aren't good you can use the GPS as a speedometer. I can do both.

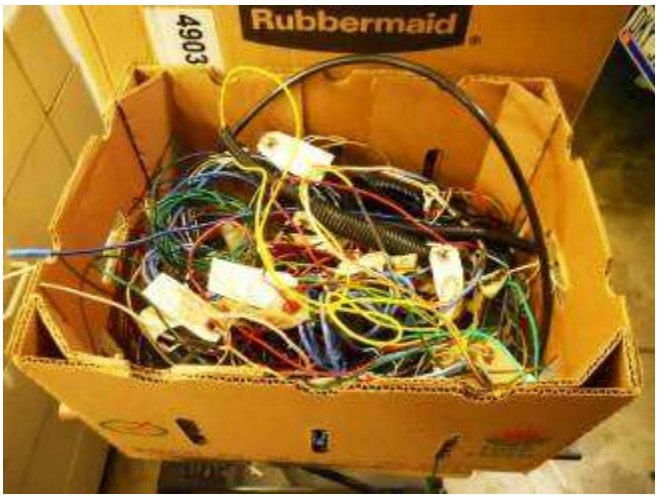
Eliminated vacuum gauge – I can hook one up in the garage if I need to for trouble-shooting rough running.

Eliminated clock – see the GPS argument, oh yeah, the iPod "sound system" has a clock also…then there's the cell phone…

Rewired instrument cluster – added a quick-disconnect for gauge wiring to match the hazard switch and idiot light cluster disconnects – now the whole thing comes off much easier

Eliminated cubby hole – all that was good for was dumping its contents on the passengers lap under acceleration, and all I ever put in there was the owner's manual and sunglasses.

I kept the 12V power outlets and everything in the center switch cluster. Doing these mods, as well as making the battery power connections under the right side of the dash and eliminating the separate headlamp relays (since I was both reducing the number of lights and replacing the illegal 100/80W H4 bulbs I had been using), meant I got rid of a lot of stuff from the car.



Box-chock-full-O'-stuff-eliminated

I'm hoping this makes the car a bit more reliable also with about 10 lbs of wiring gone, maybe quicker, we shall see…

Engine Bay Bliss

Okay, remember the engine bay from a little over a month ago:

Engine bay right before the 4.3LV6 was removed

Once the engine was out I was left with a big mess. Lots of holes from current and prior modifications, old, nasty engine bay sound deadener, multiple colors of paint, primer, and rust, etc.

I want it one color.

But I want it cheap one color.

Cheap?

Yeah, I wanted to keep my cost for redoing the engine compartment to under $50. Stretch goal for sure. Making new blanking plates for fixing holes had already set me back $25, so I didn't have much left to play with. Fortunately I had primer in the cabinet, so all I had to do was find the right color of can spray paint.

Can spray paint?

Sure.

This will never be a concourse car, nor am I shooting for a show-winner, I just want one color that is close to the car exterior since that has to be better than what I have. $20 worth of Rustoleum car enamel got me there:

Now it's green, for sure

It's green – yeah, it's not the absolute smoothest, but it's not bad and once the engine get's put back in along with the other stuff and allows me to save the $250 in paint and hours of elbow grease to get it show smooth for the TR3B…

Now, if you remember, the last edition of the FrankenStag was automatic, and I'm putting in a 5-speed, so I need to change pedal assemblies and add a clutch master cylinder. Fortunately, Phil had a manual pedal assembly which he gave me – thanks Phil! I cleaned up nicely and I put new pedal pads on it. Phil also gave me a clutch master cylinder which I cleaned up and mounted. I repainted the master brake cylinder and servo, I was going to rebuild it, but the master brake cylinder is another item (like the rear half-shafts) that is designed to be replaced all at once, so I put it back on and am hoping it's fine. I re-ran the brake lines, cutting them to a better length, and using the original routes and mounting points.

Okay, brakes and clutch master back in…

You can't see it in the picture above, but I rewired the engine electrical harness and added a connector. I'll build the rest of the harness on the engine itself. Okay. 8 July and we are now ready for an engine.

Ready for the engine folks!

Well almost – need to get back on the transmission as well as sort out what engine the bay needs to be ready for!

The Transmission

Last month I showed a picture of the shortened extension – cut about 2.5 inches out of it. This month I had to make that work. Needless to say cutting the shaft and getting it to shift right wasn't as easy as I thought it was going to be. The bright spot is I finally got to figure out what the spring-loaded thing bolted to the side of the extension was and how to adjust it (it adjusts the plate that keeps you from inadvertently shifting into reverse). I'm hoping that I have enough angle where it has to sit in the car in order to shift okay – we shall see.

Shortened shifter on the right. Yeah, I painted it.

This just left me the transmission itself. I have three – I'm hoping one is good enough just to clean up and drop in. One I took apart so I could mock-up the drive train in the car. Didn't matter anyway – it was shot. That leaves two. One from Ludwig's sale, the other out of the last parts TR7 I bought. I know the one in the parts car was working since I drove the car into the garage, so I decided to take a peek at it.

"Taking a peek" consists of draining the oil, then rinsing it out with mineral spirits. When I drain the transmission I'm filtering the fluid each time. If I see any large chunks of metal that means problems!

I decided to start with the trannie that came out of the running car. Added a bit of mineral spirits to the existing oil, shook it around and drained. Then I put a gallon on mineral spirits in it, shook it around quite a bit, then drained.

What metal?

That trannie looks good, very good, No chunks of metal, in fact, only saw one small flake. Oil looked very good and smelled okay. Hopefully that is a good sign, better be, cause I'm a betting man and going forward! Now to clean up this puppy.

I cleaned the trannie up (Gunk, then Simple Green, then rinse, then hand-dry) and refilled it with Pennzoil Synchromesh transmission fluid. Do not use anything but synchromesh lube in these Rover boxes if you want them to shift easy. The shortened extension fit okay, and I used new polyurethane bushes to mount it – rubber ones dies a long time ago. I had to rewire the reverse switch, but no big deal there. Setting the reverse switch is always fun. I suppose there is a process for this, but I usually go it by guesstimating then seeing if it worked with a multimeter. I looked through my assortment of TR7 throwout bearings already on sleeves, and found a real good one to use – lubed everything up, and put

the throwout system together on the trannie. It is now waiting for an engine to mount to.

Shortened extension on trannie…

Last month I had the mounts mocked-up and took them to Zajbel Machining in Xenia – they took the mock-ups and made mounts out of battleship armor. Laser cut, epoxy painted, and looking good.

Not your stock Stag motor mounts…

Expensive, but nice – can also probably be used as Allison V12 mounts. Most destroyers don't have steel this thick☺. Okay back to the engine discussion…

Tale Of Two Engines

Remember the picture below? I'm sure you do - I have two engines to choose from, but which is best? As you know, I broke them both down to inspect them. The one I pulled from the running car I found in Hamilton, the other the Bigler's gave to us. Inspection showed both had issues with bore corrosion from sitting with water in the bore, but the running one had real nice main and piston rod bearing wear – very uniform and light, so it doesn't need reground, so we worked with that one first. Turns out that block has issues, so right now we're working with the one Bigler's gave us. We're boring it out 0.02" over (had to re-sleeve one cylinder), putting in high compression European pistons, Redoing the head, new about everything. Carbs (TR4 Strombergs) have been sent to Apple Hydraulics for rebuild. I am losing space on my work bench!

Tweedle Dee and Tweedle Dumm – but which one is which?

Work bench with parts silently, patiently, waiting…

Besides the engine, I'm also thinking about custom exhaust headers – so if you know anyone in the local area that does this, let me know! I also have to rebuild and lengthen a Stag drive shaft – again, any good places to do this?

More next month!

September 2011: Still working engine

Well, the stuff besides the block is ready, and green – okay, so maybe the gnome isn't…

I found some neat "Racing Green" engine enamel at Summit Racing, so I bought a few cans and have been painting away while waiting for the block to be done. Matches the exterior somewhat well. The goal is to pretty much paint everything on the engine green except the carbs and a few other things. This is kinda an "anti-bling" thing, so we'll see how it comes out.

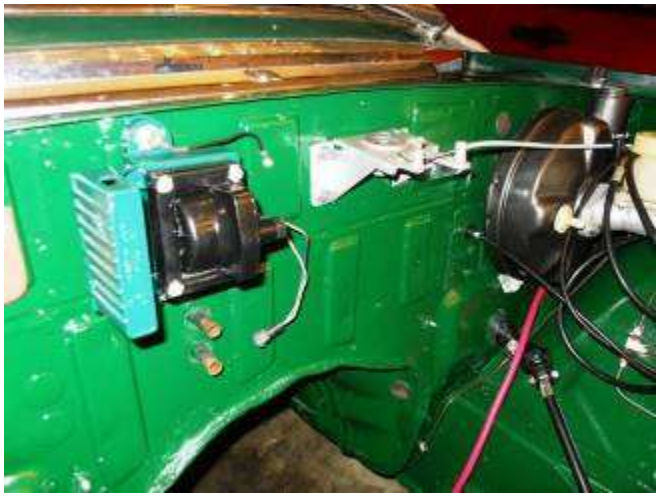
It's coming down to the wire here – the goal is to drive this car on the at least one of the fall tours, if not all. Question is, can I get it together on time? Will the Mastercard withstand the charge? *(evil laughter…)*

While I was waiting for the engine block to come back from the shop I tried to install all the gizmos in the engine compartment I could, like the ignition coil and the radiator expansion chamber and even the hood release mechanism.

This is known as treading water.

I even went and re-did the brake line routing, never did like what I had done originally, so now came the chance to fix it. Fortunately, all I had to do was to rebend the existing lines and figure out easier ways to tie down the lines.

Which reminds me – remind me to bleed the brakes before I take the car out for a drive.



Ignition coil mounted on the firewall close to where I think the distributor will end up.

About this time the engine shop called up and said your engine is done. Now, remember I was just going to freshen up a engine, not rebuild one.

Wrong.

I ended up having to line bore, re-sleeve, polish, yadda, yadda, yadda. Spending a little more than I thought – that's what you get when the engine ain't as good as your imagination is. Well, at least it's pretty.

Engine block just back from shop. Shiny. Like them new plugs. European compression pistons, 0.020 over.

Looks pretty, doesn't it? It better for what we have into it!! While they were at it, I had them modify things a bit. One of the things I'm going to try with this car is get away from the mechanical water pump and try an electric pump, so that meant…

For all you fraidy-cats out there, TR7 engines are not that hard to put back together. If you can follow

directions, you can do it. The trickiest part is setting the valve shims, and all you need there is a good selection of shims and a feeler gauge. Take your time, clean and measure as you go along. I was somewhat lucky since I could re-use timing chain guides and tensioner[1]. I did replace the sprockets as a matter of course, and new gaskets are a required thing.

Blocked-off water pump drive hole – there's another plug under this one that blocks the hole to the inside of the engine block, so one plug get's water, the other, oil.

Anyway, less than a week after the block came back from the shop I had it put together enough to load it in the car. Green of very green – still have the anti-bling going on. Mated up the clutch and the transmission.

One green engine. Note the motor mount and one of Ted Schumacher's starters. Beach towel is the protect paint as the trannie goes in tunnel

Loading in the engine is always tricky. I thought it would be easy since the GM block & Th350 came out easy, and this is much lighter than that. I originally used the stock engine lifting points, but I had to move back the mounting to a trannie attachment bolt…

Back lift attachment – used the rags to save block paint job

Worked well as you can see:

Engine going into the FrankenStag. These are trained professionals. Do not try this at home.

I had to take off the shifter extension – just didn't have enough room to maneuver and I wanted to get it welded-up anyway. With the shifter off I managed to get the engine in, but it wasn't easy – I had to constantly adjust engine position and angle. Easy

does it, a little at a time. To my surprise the motor mount brackets slipped over the studs on the mounts without a fight and the rear trannie mount bolted up. Strange. It worked. This bodes ill.

Engine sitting pretty in the car. Don't know if it works, but it looks green.

Next step is to start bolting on the externals, but that means work. I first built the engine wiring harness and attached the alternator (CS130 unit from a Saturn), then attached the carbs – yikes – now I have to build a throttle cable attachment and shaft w/attached lever – last time (Red TR7) I used a modified TR6 throttle shaft assembly, but I couldn't find one to use this time, so I pulled the H6 shaft lever from The Grey Ghost and modified it (finding another lever for the TR3B will be an easy task compared to much of the work needed on it). Fits like a charm.

Engine Bay – 24 August 2011

So now I'm working on the cooling system. I'm using an external Stewart electric pump in lieu of the block-mounted mechanical pump, and of course, the integration issues are non-trivial. More on that next month. I also need to paint and attach another hood since I couldn't fins a low-rise scoop to replace the 68 Roadrunner scoop on it now.

Funny, Ted A. didn't want my old hood? Wonder why?

Drive shaft is off at American Clutch to get about a foot added. A foot, needs to be 47.5 inches long. Long puppy, at least for a Triumph.

Besides the engine, I'm also thinking about custom exhaust headers – okay, so not thinking, I need to get a custom exhaust built. Like the left side of an original stag engine it has to go forward to clear the stuff on the left side of the block, but I need to go forward even more due to the motor mount. So, if you know anyone in the local area that does this, let me know!

Will Bruce get the Stag back together so the family can all ride in one Triumph? More next month!

Notes:

1. The new Rolon tensioners you get are not quite original – you have to do some modification to them, and they don't oil the chain as well as the original ones – therefore I keep my original used chain tensioners. You are right, they are hydraulic tensioners…

Whatdayathink? Looks good, don't it! Right?

October 2011: Even still more engine bliss – you cannot get too much

What's this? Read on…

Shifter is in, and it seems like it's working well

Labor Day weekend finds me getting the shifter installed as well as the driveshaft. As I wrote last month, I took the shifter extension to Performance Clinic to get it welded (one of the very few places in the Beavercreek-Xenia area that can weld aluminum I found out), so I took the chance to put it together and get it back in. Went in fairly easy - might have to adjust the reverse "guard", we shall see.

Cover that naked shifter boy…

Yeah, we got a big hole – having at least four different transmissions has not been nice to the trannie tunnel. Big holes, dented metal, what a mess. First step was to pop rivet in metal to cover the small holes, but I needed to use a larger sheet to cover the big one. Lucky that most hardware stores carry these sheets and I live near several. Unlucky that they charge what I think is a lot of money for metal sheets. Normally I'd use aluminum for this, but since I was having a hard time finding the right gage I went with steel.

If there isn't a structural need, or I have to worry about dissimilar metals and water, I like to use aluminum since it's easier to cut, bend and the cut edges are not as sharp. It is more expensive, and you have to use a special primer, but I think that's a small trade…

I cut the metal piece so it was ½" wider on each side than the hole, then marked the location where the shift lever comes through and made a hole similar size and shape to a TR7 shifter hole. I mounted the metal, mounted the shifter boot, and then mounted the choke cable bracket, and glued a bit of padding up top.

Hole covered, shifter boot installed, just need a bit of clothing for this…

Okay, now to cover. Finding an exact match for the super-cheap carpet that came in the Stag was impossible – it was some aftermarket carpet that I couldn't match, but I rummaged through the dumpster at a auto upholstery shop and found a piece of free carpet that is close enough, and the

price is right! As far as the shifter upholstery was concerned I just reused most of a TR7 shifter cover, reupholstering with the same green vinyl as the dash When I put the carpet down I used screws as much as possible, especially where I have to pull it up to access the shift lever mechanism. Not a perfect match, but good enough for the FrankenStag.

Almost good enough for Speed Racer…

Got Shafted Again

Another item I need to take care of is to get the drive shaft in. The original shaft is about a foot to short (the Stag trannie is very similar to a TR6 trannie and has a long extension on it), so I took it to American Driveline and Clutch on Troy Street in Dayton. They looked at it, guessed it was off something foreign, and said "we'll have it for you next week". They were true to their word, I picked it up, painted it green, and bolted it on.

4-Foot Driveshaft. Longest one I've ever seen in a Triumph! We'll see about vibrations…

Manifold Desires

The first picture of this installment of Bruce's latest soap-opera shows little "headerettes' on a spare TR7 head that I was using as a Jig for making headers. The idea was that I could run a 2"-2.5" exhaust pipe across this and figure out where to cut holes so I could weld up the headerettes to is (BTW – the headerettes came off that set of blue TR7 headers that had no chance of fitting a LHD TR7 even if they did manage to line up on the head bolt holes, which they didn't).

So, I had just figured out how I was going to do this when the idiot-stick hit me.

Use a left-hand Stag manifold, dummy.

The trade-off is that I'll probably have to cut into the motor mount a bit on the left hand side, but that's why I way-overdesigned them, so they could be "trimmed to fit".

Out came the phone (Ted Allison is on speed dial) and in a little bit Ted came over bearing a Stag manifold that needed a bit of TLC.

Okay, a lot of TLC.

First thing is that I had to get out the bolts holding on the LH Heat Riser. Out came the MAP torch, on went the heat, out came the bolts.

Two down, three to go.

Those last three were two bolts and a stud that held the remains of the down pipe on the manifold. Usually folks give up and drill out all three, but I'm an optimist.

Out came the MAP torch again, heated up those pesky hardware, quenched in water, heated them up again, quenched them again in water, headed them up again to evaporate the water, and cool. The two bolts came up, the stud sheered at the first thread. Oh well, I tried.

Tapping the drilled-out stud hole…

Okay, so now I have to clean up the manifold to make it presentable. Here are Bruce's "Manifold clean up steps":

How to clean a manifold on the cheap around the house:

1. Wire brush real good
2. Wipe with solvent, Air Dry
3. Wire brush real good
4. Wipe with solvent, air dry
5. Soak in de-rusting jelly for 2 hours
6. Rinse with cold water
7. Wash with Simple Green
8. Rinse with hot water
9. Put on BBQ to dry off (force dry)
10. Spray with Eastwood Satin Black Header paint while still warm from the BBQ
11. Let sit 3 hours
12. Put back in the BBQ with all burners on full for 30 minutes (400-500 degrees F in the BBQ)
13. Ready for installation (after it cools down, of course…)

Easy as cake!

Manifold-on-the-Barbie

Now came the time I dread – trial fit to find how much motor mount to cut away.

Big chunk actually.

But that's why I have a Sawzall.

Got the mount out, cut, repainted and back in, in about 90 minutes. Refit the manifold. Much better. A couple of the bolts I had to switch from the usual hex-head to Allen-head due to starter clearance issues, oh well. It fits.

I called up Mike Coffee at Stag parts USA and he has a VGC used LH downpipe – *sold* (and it's stainless to boot). I might have to shorten the "down" run of this pipe – we'll see when I get it in place.

Now to connect, errr, well actually, INVENT the rest of the system. Invent since there aren't stock exhaust systems for '73 stags running '80 TR7 engines with Rover gearboxes. Ah, but to dream…

Yeah, it fits…

Notched Motor Mount, but it clears!

We need an Exhaust Boys!

But since dreaming just gets you deeper in trouble when talking little British sports cars, we will stick to reality, and reality is that I need to develop a system from scratch.

Okay, let's start from the back, and that means start from the muffler.

Muffler?

Yeah, I want to mount the muffler on the back to continue to both shift a little weight back and also minimize heat under the floorpan.

But what type of muffler to get?

Usually mufflers in the back are those fat stainless types that sound like the car has a bad case of flatulence. Another drawback to those are the weigh a lot and also cost a lot ($300 for a decent American

made one). They also tend to be very fat and the FrankenStag will look like it has a big silver zit.

Not that it wouldn't improve the looks.

I want something smaller. Cherry-bomb types are too long, oval ones look, errr, silly. I finally settled on a universal 10" Super-Trapp muffler, you know, the type where you add and subtract discs to tune the sound and performance. It's price was a bit less than the US-made "rude-body-noise-making" fat stainless mufflers and it had a built-in mount. If it's not soft enough sound wise I can put a small, in-line muffler on the run back fro the front pipe. We'll see…

I also called up Ted Allison and got back the LH rear pipe for the stainless system that was on the FrankenStag when it has the 4.3LV6 in it. Turns out that is a stock pipe, and I need it since the Stag exhausts go through the back sub-frame and I needed a pipe with the right bends in it. Ted was happy to give it back with a cryptic "four squares Buddy!" Hmmm, did he say he was roofing?

Okay, I have a pipe to go through the frame. Progress[1], but now I have to figure out where to put the muffler exactly.

The exact placement was driven by wanting to get it back far enough so the exhaust wouldn't leave residue on the body and also get it at the right angle so the pipe coming to it could hug the bottom a little bit. I settled on a location just where the bottom meets the back.

Muffler and pipe in place on the FrankenStag – white arrow shows the end of the pipe that goes through the back sub-frame.

Now for a pipe to connect it.

I could take it (on a flat bed) to Muffler Brothers, Midas, or a shop like that and in the end spend $150-ish on a custom pipe.

Or I could let the car live up to its namesake and just assemble a bunch of exhaust parts from Advance Auto.

Advance Auto won.

Two adaptors for joining pipes, turn-down tip that I can use as an elbow, straight section, goop to seal the joints and a hanger & clamps. To be fair, I kinda knew what I needed before I bought the parts, and I did by a few extra parts, like clamps and the hanger. Better to have them and not need them.

Next, I laid on the floor with all my parts, a scribe, Sharpie marker, and a tape measure and sequentially figured out where to cut what, working from the pipe to the muffler. Rather than using a lot of clamps on the connections, I made sure I had tight connections and used many stainless pop rivets[2] and muffler sealer. In the end I had a nice pipe:

This is what $30 gets you at Advance Auto. One exhaust pipe kit.

Nice Pipe (on stand to be painted)

Only it needs to be black. Easy enough, I have plenty of header paint, several different kinds, in fact – I chose the Eastwood spray satin black paint. One funny thing about header paint, it only get's strong, and chemical resistant, if cured by heat, such as a running engine. But I didn't have an engine. I had something better, the Milwaukee heat gun. 1500 degrees of blown paint curing heat.

It took about 10 minutes to cure, but I let it go for 20. After letting it cool down for 30 minutes I fit it to the car. Fit without issue.

Okay, got the back done, now for the front. Quite frankly I thought this would be easy - Mike Coffee (at

Stag Parts USA) had an excellent used stainless front pipe for $50. That installed in about 10 minutes, and took me another hour to run to Ace Hardware and get a “U” clamp to secure the end of the front pipe to the trannie mount. I did wrap both the pipe and the mount with header wrap (braided fiberglass) to reduce the heat transfer before I clamped it.

These are trained professionals, do not try this at home.

…it fit right on the first time…

Now for the middle pipe. This turned out to be a bit tougher than I thought. My first plan was to use an adaptor going into the back pipe that would allow me to use the same type of turn-down I used on the back pipe. Then I would use several straight sections and some flex pipe to take up the misalignment. Only thing was I couldn’t find an adaptor that had the right OD to fit into the back pipe (1-5/8”). On to Plan B.

Plan B was to have Muffler Brothers make me a pipe that was close, and I would cut a flex-pipe to fit and misalignments. Well, Muffler Brothers informed me that you can’t get 1-5/8” pipe, not at least here in the States. 1.75” and 1.5”, sure, 1.625”, naw baby, naw. Time for Plan C.

Plan C was to find whatever I could at Advance Auto that would fit into the back pipe, buy some extra 1.75” flex pipe and straight pipe, and make something. I did manage to find a coupler that was the right OD to fit in the back pipe, but was too small to fit the flex pipe, so I had to cut several shim pieces made from other round pipes of different sizes, slather them with high-temp silicone sealer, push them on, then push on the flex pipe, then make sure they went nowhere with a double row of stainless pop rivets. .

Silicone and pop rivets – my kind of duo.

I then pop riveted the flex pipe pieces to the other straight parts, using silicone to seal the connections. Off again to the Barbie to heat-treat the silicone…

Exhaust pipe for dinner anyone?

Yes, the high-temp (copper) silicone you need to heat-treat so it sets up. In this case it was 30 minutes at about 250-300F, which was more than adequate. After I got them out of the grille I added the last straight pipe section and moved the whole thing to my paint shop (the concrete in front of our garage). There I painted them with more manifold paint and used my trusty Milwaukee heat gun to cure one while the other went back in the BBQ grille (too small diameter for the heat gun,) at 400F for 25-30 minutes.

The paint turned out well and I fit the pipe to the car…to my surprise, everything fit. Now for a few integration details.

Usual disclaimer about don't try this at home, these are highly trained professional, or daredevils…

Heat insulation

I already wrote about the insulation I used on the front pipe bracket to slow heat getting from the pipe to the trannie mount. Now I had to insulate for another reason – heat soak to the fuel line.

Header wrap on the exhaust pipe, silicone cover on the fuel line. Stainless clamps – got that?

Close to where the exhaust pipes go through the back sub-frame member the cross under the rear hydraulic and fuel lines, separation is about 4" vertically. Want to protect the fuel line there, especially from heat soak while stopped on a hot day, so I wrapped about a 6" section of the exhaust pipe with header wrap and then covered the fuel line 6" either side of the exhaust pipe with silicone fuel line insulation (silicone on the outside, soft fluffy fiberglass on the inside – got it at Performance Clinic in Beavercreek). I'm hoping that does the trick and I don't have any vapor-lock issues. Since I run silicone hydraulic fluid (DOT 5) in the brake lines I'm not expecting any issues from not insulating those separately – that fluid is supposedly good to 500F, and that's a lot hotter that is will get in that area.

Intermediate Bracing

Somehow I had to support the middle of the tube I just made since it was between two flex sections – and I need to keep away from the drive shaft and not dip down too low. Fortunately I have enough spare stuff around the garage to make up a middle brace. Took an 8" steel brace (un-used lawnmower part), drilled one side to accept a 1-7/8ths muffler clamp, drilled the other side to fit the floor pan under the driver's seat. Bolted it to the car using 5/16th SAE NF bolts, attached the pipe to the other side using the clamp, but wrapped a bit of header wrap around the brace so it would slow down heat transfer to the brace. Easy.

Middle brace. Note that you could take this across to the other side of the car so it could act as a drive shaft support in case of shaft failure. I'll note that for a future upgrade…

Wheels and Tires

Ah, yes, the shoes. Time to examine where the rubber meets the road. Not really good. The tires that came on the Stag were old, true, but they held air and cornered okay - as much as you would aggressively corner in a car that over-steered badly. The spare was even older and didn't hold air. The front rims had been restored a few years back, but the rear ones were corroded and had lots of chipped paint. I didn't want to take them to a wheel restoration shop since I wanted to spend money on the tires, hmmm, what to do…

Tires

The choice on original tires wasn't good (essentially a couple of inexpensive Chinese brands) so I decided to go with a wider tire. For the spare I needed something that would fit down in the remaining space. By trial I found that the spare from the red TR7 would fit in the trunk, and we matched the size to a 185/60-14, so we're using that for the spare with the "normal" tires being 205/70-14, which has a similar circumference as the originals, but just a bit wider. Went with B.F. Goodrich Radial T/A's since they are a good domestic tire. The white lettering is to the inside since this isn't a Camaro…☺ Spare is a cheap import since that was the only thing available in that size.

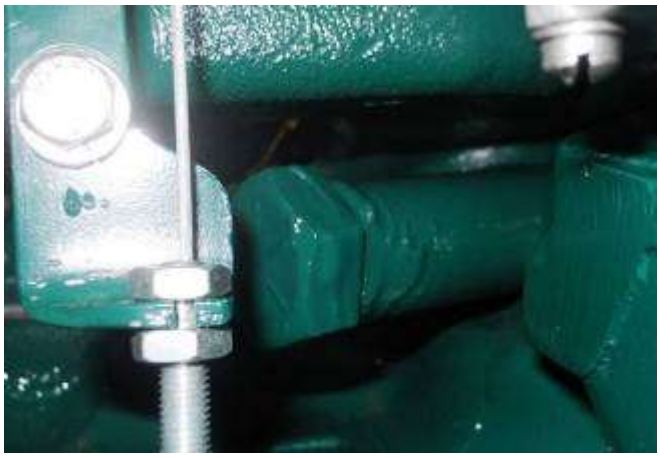
Restored wheel – can hardly see the elbow grease smeared across it…

Wheels

Taking stock, I had five wheels, three needing paint. The spare, being a spare, was just cleaned and reshot with clear wheel paint. For the wheels that would normally be on the car I had to spend a bit more quality time with them to make them acceptable 10/10 (looks great at ten feet and ten mph) wheels. For polishing the bare metal parts I did an experiment – on one I used sandpaper, the other steel wool, varying the coarseness as the metal became cleaner (180 – 1000 grit for the sandpaper, 3 to 0000 gage for the steel wool) and finished with metal polish and a buffing wheel on a drill while using black enamel on the painted parts. Originally I thought the sandpaper-cleaned wheel would turn out best, but I think the steel-wooled wheel look better, both took about the same amount of elbow grease, I keep that in a jar right next to my extra skinned knuckles…

Hey, what's that on the floor?

24 September was a red-letter day. That's the day I first filled up the coolant system and found out it leaked, in three places, quite a bit. All the spiders under the car are now being poisoned by ethylene glycol. It was leaking from the intake manifold gasket (not sealing a hole in the head like it should), manifold O-ring not seating well, and my heater hose water pump connection block off plug weeping (just a plug pushed into the hose with a clamp around it – it was supposed to be temporary, it was). Off came the offending parts, new gaskets and O-ring for the manifold, made a new plug for the heater hose port , and generally tightened clamps. Leaks stopped…



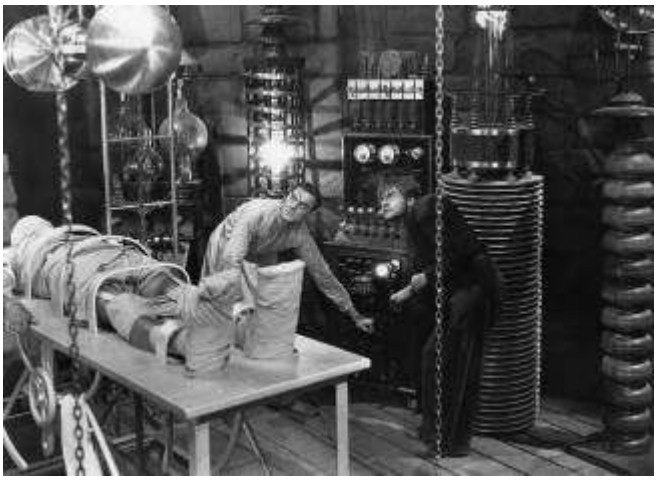
Large bolt, liberally coated with JB Weld epoxy screwed into heater hose port. That will stop the leak – Conan away!

So, it's the last week of October and no engine start yet. Maybe it will take me a year to fix this car…

Notes:

1. What is the opposite of "progress"? Congress! Okay, note to myself, comic life is not for me…
2. A technique I used to great success on several TRs, including both TR7's.

November 2011 – It Lives!!!



It Lives!

…but before we cover that part of the news, the rest of the story…

It's Integration Time

As some of you know, my background is aviation technology, and some of the more interesting times I've had is trying to get a bunch of new technology to play together.

FrankenStag is no exception, except it doesn't fly, in fact, it doesn't drive yet.

Need to fix that. First off the block, just trying to fil up the oil pan without a lot of leaky drips…no, not you guys…

Valve Cover Blues

The astute readers amongst us will notice the picture above is the TR7 valve cover upside down. What I'm doing is fixing an oil leak. An oil leak caused by me having to cut and trim the gasket to fit. You'd think that one could at least get the gasket right, but it was too big (long) in several parts where it goes around the camshaft sprocket. I had to cut lengths from it to fit, then glue back together using Permatex Aviation brush-on gasket stuff. Yes, I tried gaskets from other parts vendors, but they were the same gasket and didn't fit either.

What's this? Read on…

Why is this a problem? Humankind can accomplish all sorts of fantastic achievements, but can't cut cork gaskets to the right size. There must be something I don't know…

When I was putting the oil in the engine for the first time I had oil dripping from the places I had glued the gasket back together. Re-glued with black RTV. Hopefully this will hold. *(it did – Ed)*

Dip Stick Madness

I have another problem, I have no idea what the oil level is in the engine. I have no dipstick. In a "normal" TR7 the dipstick is in a long rubber hose that attached to the air filter housing, well, I have no air cleaner housing, and the dip stick that came with the engine is about a foot shorter than stock. I could do what I did on the red TR7 which is to cut it back and make a shorter tube out of metal.

Or I could just cut it back to the length to use the short tube that sticks out of the engine block that the stock rubber tube clamps to.

The easiest thing to do is shorten the dipstick and use the existing 3" tube.

Which I did, since I'm lazy and I can always get a longer dip stick should this not work out. I can always rationalize the easier path, that ability is not limited to Wally in "Dilbert". I do have to keep it from leaking around the top of the stick. I did this by layering on heat shrink tubing until I got an interference fit – be they never had anyone do this with it!

Dip Stick covered with shrink tubing – you are right, it's a lame subject for a photo, but it's my column…

Dip stick in situ – works fine!

Houston, we are go for engine start, aka, October Tech Session

I invited everyone over to the Clough Ranch (Château Rouge de Rocher) on the 8 Oct for a tech session. The goal was to work on any Triumph needing help before the Fall Tour, and if we ran out of things to do, work on the Stag.

Two Triumphs showed up, The McKitrick's wedge and this:

Hey, where are the other wheels?

Problem was, neither owner would let us touch their Triumph, sooo we had to work on the Stag.

Which wasn't a bad idea considering the august crew that showed up to work on the cars

The Crew

Now, we did actually have some work to do in the car – the night before I cleaned the garage, then put gas in the Stag to see if any lines leaked (they didn't), and then I tried to start the car just for kicks.

It started, but ran like fecal matter.

Since it was late and I wanted to get out to dinner with the family, I didn't troubleshoot too much, except for the thought it was due to either ignition or lean mixture – it was backfiring out of both carbs and seemingly only running in a few cylinders.

Back to the 8th – after the MVT members arrived, and after I made sure they had donuts and coffee, we attacked the Stag. The Reader's Digest (what's that?) condensed version of this is that I had set the carbs up right, I just assumed a clockwise rotor rotation. It's not, it's counter-clockwise. Reverse plug wires 2 and 3 and "whoopee" the engine roared

to life like it should have to begin with. Whew! I also managed to have a hose come off during all this (Looks as if I never tightened it during the "let's swap out hose parts to fit the pump" fun back in late August/early September), so the garage floor and driveway got a wash:

Yes, I do windows also

Anyway, due to the bad assumption on distributor rotation and loose hose clap I duly gave myself the rubber chicken.

The rubber chicken – given to the MVT member who breaks down during an MVT event. I carry one with me wherever I go, it comes in handy.

So, thanks to Miami Valley Triumph members Danny, Ted, Harry, Mike and Chuck for the physical and mental help. I know we made progress since I see two very visible outward signs:

The engine is back together and…

The workbench is bare…

But…I didn't make my goal of having the car running by the Fall Tour, so the adventure continues…

Until next month – Bruce

June 2012: I got those heavily depressing, low-down mind-messing, working with the gas tank blues…

Then

Now

Yowies – that's different. What gives? Simple – that great plastic fuel cell started to leak where the fuel pick-up fitting came through the side. Couldn't fix it at all. Nylon washers up against polypropylene plastic on the AN fittings – it was destined to leak at some time – who designs these things? Great – wanted to take the Stag to TRA this year and I have a trunk full of gas, and no, that's not the emergency tank.

Well, rats. Out came the Summit Racing catalog, out came the credit card, and off went an order for an aluminum tank (having any excess funds is way over-rated). The new tank was a different shape, and held more gas, which I guess is a good thing.

Another good thing about this is the shape of the new tank makes mounting the spare easy – that was going to be a challenge with the first tank. Now I just made a flange piece to connect to an existing body bracket on the front of the trunk. Of course, that meant I had to relocate the amplifier and fire extinguisher that were where the spare tire was going.

The fire extinguisher was easy – all I had to do was rotate and move to the left. The amp, well, that was a bit harder – I decided to mount it under the passenger's seat, which meant I also fixed several issues with the seat where the covers were coming unglued.

So now back to mounting the tank. For the plastic tank I had to literally build a shelf to hold it, but the new tank is a bit more rigid, so all I had to do is make three brackets for it to sit on, and re-bend the mounting straps I had. That was a lot easier than the shelf for the first tank. Of course, I had to make up some new hard lines for the gas line and vent, not too tough. Bingo – new tank and time to take it out for a drive.

Amp in place under the seat, right where Duncan can play with it with his feet.

Decent Length Drive #1

Now that I had it back running again, I decided to take it out for a decent drive, put a few miles on it. Made it back in one piece, but several things caught my attention.

- Hmm, didn't seem to have much power – running way lean, or did I foul a plug?
- Screeching alternator belt – too loose?
- Sticky throttle cable – have seen that before on Alice's TR7.

No, I didn't foul a plug, the plugs looked good in fact, maybe a bit lean. A quick check not only showed carbs were lean, but the front carb wasn't working at all and both float bowls were leaking gas from the float bowl gaskets. Off came the carbs, I put on new gaskets coated with Permatex #2 and reset the float height to raise the gas level about 1.5 mm.

Alternator belt was loose – tightened that.

Re-routed the throttle cable to eliminate the sharp bend just after it gets into the engine compartment – okay, got everything fixed – time to take it out for a drive again.

Decent Length Drive #2

Decided to do this on the hottest part of a hot day - 92 degrees F outside. Car ran pretty well, engine pulled good - less power than the 4.3 liter (of course), but enough to make the car very driveable. Coolant temp stayed at 190. Steering is light in the front, but not the oversteer with the V6 in it. Takes some time to get used to since it's pretty responsive.

Issues after drive two:

- Throttle cable still sticking, not as bad, also noted it's heat-soak sensitive.
- Transmission started making significant noise.

The first got me back on line to eBay and I bought three different throttle cables. From my experience with Alice's TR7 having the same issue, manufacturer does matter, so I bought three for very reasonable prices. All are on the way to me now.

The second was a bit more problematic. Pulled the fill/level plug and found a lot of metallic debris of decent size attached to the magnet on it. Rats. Trannie needs rebuilt. Okay, I thought I could get a year out of this trannie – hey, I paid a whole $250 for the car it came out of! The only good thing about this is the trannie on this FrankenStag is easier to drop than the same one in a TR7 would be. Ted Schumacher tells me he has a trannie solution for me…

Memorial Day View – will it make TRA???

Radio Announcer cuts in:"So, will Bruce get the FrankenStag on the road to TRA '12? Will he get all the bugs worked out in time? Stay tuned to this newsletter for the next installment of "Tales of the FrankenStag"!

July 2012 – One step forward, two steps back…

Here Rover!

Let's see, where did we leave off last month? Oh yes, I remember – I came back from a test drive and the trannie was trashed. Pulled the fill plug (that just happens to be magnetic) and it had large chunks of metal on it – not small shavings, but chunks of metal. Rats, and that oil drained sooo clear. Oh well, so much for that trannie. Emailed Ted Schumacher – he had a good used trannie and metallic oil pump with gasket for $350. Deal. Took a day off work to drive up to Pandora to retrieve this trannie:

Next Victim – Rover box out of an SD1 that will head into the Stag

The box looked good, I had to take some SD1-specific mount stuff off it at Ted's, but besides that it would bolt right up to my engine. He didn't have the metal oil pump, but said he's ship it off to me as soon as it came in. Okay, that could be an issue due to available time to work on this, but we'll see. I then tutored Ted on the copying and burning of DVDs, grabbed lunch as McDonalds, and headed home.

Post Mortem – I thought the failure of the trannie was due to either the oil pump failing or me forgetting to fill the box up with oil. In section showed the parts to be from synchronizers and the oil was full, but dirty. So, it had oil, and the failures were in the front of the box, not the back bearing that the oil pump services. The box was just bad and I didn't know about it – the oil I drained from it after I took it off the donor was clean and very little metal was in it. Oh well…

Since I'm trying to get some time on the car before TRA I decided to order new fiber oil pump parts rather than wait for the metal one to get here. I can always put it in later. Ordered new front and rear seals also as well as gaskets and a rear bearing (why not)…Moss expedited and the parts all arrived quickly, so it was time to take the back housing off the trannie.

Inside of the back end of the Rover box used in later TR7s and TR8s (and Rover SD's and a few other cars/trucks to boot…) - to the left is the selector shaft. Note the shop rags in the holes in the casting so parts of the gasket I was scraping would not fall in.

Back housing? Yep, I took the back off since the oil pump is located on the inside of the back housing, bolted to it under the output shaft. To replace the pump you have to take the back off, which means you will also have to get a new gasket and rear oil seal for the output shaft. While you are at it you might as well replace the front oil seal also – to replace that you need to take of the plate in front of the transmission. Oil dripping out the back can cause a mess, oil leaking out the front can ruin a clutch.

Now, if anyone is curious, the oil pump is a gear type, with two rotating gears forcing the oil out between them. The gears are made with fiber (phenolic-type material) and the small gear is driven by a short steel shaft that goes into the end of the bottom shaft of the transmission. The pump looks like this:

Rover Box Oil Pump – this supplies oil to the rear output shaft bearing. The pump gears are fiber rather than metal, so wear and damage can be a concern.

Note the long pick-up tube – this picks up oil from the main part of the gearbox. You can clearly see the fiber gears. You can also see the wear on the gears:

Old Transmission Oil Pump Gear on Left, New One on Right

Clearly there was a lot of wear here on the one in the trannie, but even then there was enough that it still pumped oil. I actually kept these as spares since the spare set I had was out of one of those old boxes I got from Rich Ludwig, and they had considerably more wear, if you can believe that.

Okay, now to start putting this back together. The first thing to do was to scrape off all the old gasket material, and since this was the first time this transmission had been opened since it was made the gaskets put up a valiant fight. I had to use my Craftsman Gasket Scraper for the whole removal, and that was for both sides since the gasket split in the middle rather than coming off clean. One thing I did note when I put on the new gasket (from Moss Motors) that at one point it did not cover the entire metal face, but enough that it could still seal.

The one place where the rear cover gasket didn't cover all the metal, but enough to work

I also took a few parts out that weren't needed, the speedo drive in specific – I don't have a speedo on the car, so the gear can go. I also replaced the clutch fork and a few other odds and ends.

Left-over/replaced parts after trannie was repaired.

Once buttoned all back up the trannie seemed to shift okay static, will have to get it out on the road to really see how good it is.

Starter Motor Mounting Blues

I don't know if Jim Croce ever sang about "Totally depressing, low down mind messing, working with Stag starter motor blues…", but I can identify. Any Stag owner can. With that Stag exhaust manifold and Stag inner fenders in place getting at the top mounting bolt is a real pain. I considered myself very lucky that in taking the motor off a stubby open box wrench just happened to fit. I can't take that to be a

given all the time, so I had to figure out how to capture the top nut (bottom is very easy to get to). Here, look for yourself…

Close fit for the top nut on the high-torque starter motor mounting/adaptor plate – bolt location shown - this is almost impossible to get to with the motor in the car – just like a Stag engine…

The solution was to notch the top slot to accept the nut, then JB Weld it into place.

Top nut JB-Welded into a notched bracket. Hopefully this will fix the nut access issue…

…and it did, the starter went in without much of a fight at all! Oh the transmission? Pretty much went in the first time we tried it. Scary…usually you have to fight a bit to get the input shaft to line up with the clutch.

Note – Hat's off to Chuck White, Scott Stout, and Mike McKitrick who helped me get this out and in again – Even when I bench-pressed 300lb for fun getting this in would have been a chore, so I appreciate them taking a little time to help me!

Dang-gone Engineers, they made me mad again…

What cost $190 and an afternoon? If you guess "replacing stripped-out trannie housing threaded bolt holes" you are correct indeed!

For some reason lost to modern man, the attachments on the TR7 trannie are either NF bolts with nuts on the other side, or NF bolts that attach into threaded steel...except, except the bolts that hold the clutch slave cylinder on. For some reason they go right into the aluminum bell housing using 8mm-1.25 threaded bolts and I want to give that designer a noogie. Sure they will hold, (sure!) for the first person who attaches the cylinder on the production line, the rest of us have a decent chance of stripping the dumb things.

Which I promptly did – I probably should add that I had noted thread damage before and knew if I had to take this back apart again I was in for trouble.

Okay – it's Saturday afternoon, how do I fix this?

Well, I could do something like my relatives and screw in a slightly larger SAE bolt that would self-thread and probably hold, or I had both a Locktite Thread-Repair kit and a Helicoil I could use. Nope, I'm going with the nuclear option - I drill the hole out thread both the trannie and the engine back plate with 3/8" NC thread. That will hold!

Not so easy though due to the engine oil pump and front cross member. No drill I have, nor any neighbors have, is able to get at that top hole, and the bottom one is iffy.

Easy solution, just go out and buy a right angle drill with a short-as-head-as-possible.

Not so easy – ever tried to find one? Another complications is that since I want to use it right away a battery-operated one isn't an option. I need 110V on a cord. I drove all over Dayton and finally found something that would work at Home Depot – a Rigid modular tool – a motor base that you can snap-on all sorts of tools. The motor unit and right angled drill set me back $190 bucks…

…and they worked like a charm. In 5 minutes after getting back I had the holes drilled. $190 for two holes, but I had to get the car back together… The holes tapped out easy – used a 21/64ths drill and 3/8ths NC tap, and the slave bolted right up without any issues. They should, the silly things…

This is what $190 looks like. Not very impressive, but it worked like a charm, and I suppose that's what's important. Eating regular meals is sooo under-rated.

This is a tap going into the holes that $190 made – note that we used a lot of packing material in the slave cylinder hole to keep drilling & tapping debris from falling inside. Due to clearance issues I had to use a ratchet on the tap rather than the more traditional metal bar – you have to be a bit more careful doing it this way.

This is the slave cylinder attached to the car using bolts in the holes $190 made

Back to the air cleaners again…

To steal the words of Earl Pitts (American!), "You know what makes me angry, so angry that I'd swipe the fish out of the mouth of a rabid Grizzly Bear?" Well, it's trying to put on K&N Air Filters with one hand. You have two sides, the element, the gasket, two internal spacer tubes, and the bolts you are all trying to hold in place while you try to attach the nuts on the back of the carb flange with no finger or wrench space. hand space. Solution to the frustration is use the filters on the TR3 and go with Velocity Stacks!

Besides, they look cool, I'll figure out the filtering later…

Wow, I bet this makes it go faster!

Wrong

Now that I had it back running yet again, I decided to take it out for another decent drive, put a few more miles on it. Decided to drive down to Bellbrook.

Made it two miles then I heard a loud “bang” and other interesting noises from the rear end. Got the car turned around, but that was about it – the drive was locking up.

Out came my AAA Card.

Out came Tony.

Tony getting the FrankenStag ready for the drive home

After AAA got the car back into the garage and on the lift I did an inspection. What I found caused me to use some words I’ve not used in a while.

Evidently the outer u-joint on the passenger half-shaft let go. The resulting force ripped one side of the yoke apart, pushed a u-joint bearing cap into the training arm, knocked two other big holes in the arm casting, and generally trashed any chance of driving this to TRA.

The worst thing was I took extra pain to examine those half-shafts when I replaced them over a year ago. They seemed in good shape- I was more worried about the outer wheel bearings. Moral of story – trust nothing, rebuild everything.

Real moral of the story is that I should have bought the Goodparts Axles I should have bought in the first place…but that would spoil the story.

So here it is 16 Jun, car is on blocks, and I have to drive a Subaru (now renamed the Stagaru) to TRA while Alice gets to drive her TR7. Rats…

I do have the Goodpart axles on order - being made up special for the Stag – if you are interested, Richard Good’s website is:

http://www.goodparts.com/

He specializes in TR6 racing parts, but also helps us Stag owners.

Holes in the trailing arm & busted yoke

The U-Joint bearing cap embedded in the other side of the trailing arm as seem though one of the holes. Wonderful!

August 2012 - Just fixing the rear, ma'am!

Well, June sucked, so let's see what July brings. As of the end of June the FrankenStag was on the lift with the left rear suspension yanked out and the left halfshaft removed. Looked kinda like this:

Passenger rear side minus the trailing arm

Not a pretty sight for those who actually like driving cars…

Bushing Travails

Since the right trailing arm was destroyed by the broken half-shaft I had to find a new one. As these things go I could use a TR250/5/6 part since they were the same, but I managed to find a good one on eBay that set us back about $40.

Inspection showed it to be in good shape – I have to replace the mount bushings, brake pipe clip, and one of the casting plugs, but the metal is in good shape and even comes with paint and undercover overspray (smile).

First thing is to replace the bushings – the ones that were in it actually looked in serviceable shape, but then again, that's what I said about the u-joints. Since I had a set of rubber bushes and the "tool" from prior replacements I thought I was already to go.

First of all to remove the old bushings Putting the arm in the bench vise I used a hacksaw to cut the protruding sides of the bushes off to make pressing them out a lot easier.

Cutting the protruding part of the bushings off – just use a hacksaw – pretty simple

Then I got out my "tool" – a threaded rod with the right washers, sockets, and double-nutted on one side, to press out the remaining part of the bush.

Trailing arm bushing removal tool – large socket is what the bushing presses into from the washer on the threaded rod forcing it up from below – Vise Grip is used to keep rod from spinning

I think this took well under 30 minutes to do including the clean up. Now to reverse this and get new ones in.

Not so fast…

The job now was to use the same tool to press the bushes back in, using a bit of silicone grease to make things easier. Worked like a charm two year ago when I rebuilt the back end (the first time). Didn't work this time. The rubber mushroomed sooo much I

couldn't force it in, and the steel tube in the middle pressed out of the rubber a bit. Funny, didn't have this issue before!

Steel tube pressed out of the new bushing about a third of an inch

I went back in and messed with washer and socket sizes as well as building a sleeve to keep the rubber part from mushrooming while being pressed, but still no go.

Anti-mushrooming sleeve made from Lowes parts

In the end I put a flat washer on the end to be pushed and then used the bench vise to press it in, rotating the arm a but while I was pressing – it went in finally, but the rubber and steel tube ends never really lined up, so I'm taking it out and getting a set of urethane ones…

Note – if other readers have good ways of doing this bushing inserting without taking it to a shop please let me know and I'll share!

Found out something else, Several studs that hold the outer bearing assembly to the trailing arm were missing. No big whoop I thought since I have the ones from the busted one. Wrong, the old one had 5/16" NF where they went into the trailing arm, the one I just got used 5/16" NC. Huh. What does the parts catalog say – it just lists TD518 for both the Stag and TR6, and the threads are not given. I love engineering changes that aren't noted. Fortunately I had several TR3 intake manifold studs that were the same as what the new arm needs. So there you have it – cross-reference that.

It's a thing of beauty…

The new half-shafts came in from Goodparts, they are beautiful:

Goodparts Stag Half-shaft – uses CV joints instead of U-joints

Hmm, the instructions state that you need to trial fit them to the trailing arms off the body in case you need to remove metal from the arm casting so the half-shaft can rotate freely. In case? There was no "in case", the shaft definitely was in interference with the casting. Inside, the tunnel that the shaft goes through it is not totally round, but has a small part of the circumference that is flat, and it was hanging up on that.

Turns out removing enough of the casting so the shaft could rotate freely was not a trial matter – not only was it inside the tunnel where access using a tool from outside was not easy, but also aluminum gums-up most metal grinding and filing gizmos. I ended up using a small shaping bit left over from my dad's lathe, followed up by a cylindrical stone with rounded tip, wire brush, and finally 60-grit sandpaper. It took me about an hour since I used a slow-speed on the drill so I wouldn't clog the tools with aluminum, an hour later (per side) but I hogged-out enough metal for the shaft to clear.

Removed enough metal at the bottom here to make the flat section round at the same circumference as the rest of the tunnel

Now to do the installation. The instructions that came with the shafts were pretty detailed and straight forward once you understood they were for TR6 shafts that used 3/8" studs that the Stag one did not. The installation is basically:

1. Install differential-to-shaft adaptors.
2. Install trailing arms.
3. Install brake plates and brakes.
4. Install half-shafts.
5. Install hub and brake drums.
6. Bolt wheels and tires on.

You're done (okay, there is paying off that hefty Mastercard bill, but hey, it's only money…). There was one thing that left me wondering - the hub nut installing directions told me to basically use red Locktite and torque to 250 ft-lb. Yikes, that essentially tells me that the nut would never come off again! 250? That's 100 ft-lb more than any torque wrench I have. I ended up using blue Locktite and torquing it first using the air impact wrench at 10% overpressure and then a socket wrench with a Thor hammer. I think I got close (smile)…

Besides having to take the aluminum out of the tunnels and replacing the trailing arm bushings it really didn't take much time or effort – the Goodparts shafts fit right on and they even included new hardware with the shafts. Hopefully the first test drive will confirm that these are a solution I've needed.

Adaptor plate holding shaft to differential

Inner CV Joint attached to adaptor

Done!

September 2012 – Car Shows!

Dayton British Car Day (BCD)

Made it. Made it. August 4th dawned grey and wet, but the car made it to Eastwood Park in one piece.

Of course, I only have to drive about 12 miles, but that's beside the point.

Hopefully others will remark on this great show. Hopefully folks enjoyed the announcing I did – somewhat awkward – I'm an extrovert, but I don't always find doing PA work fun. Hopefully all of you that came had a good time. As usual, I just have a few vignettes and will let others pontificate.

Eastwood Park Improvement Project – Stan never did get around to bringing the petunias…

Something that only a few folks know – Stan took it upon himself to fix the berm next to the sidewalk the pre-registered cars have to drive over. Last few years more than one car has scraped due to the low/non-existing berms next to the sidewalk. This year the park did put some dirt down, but not enough – Stan discussed bringing dirt and mulch, so I bought some too, and between us we built it up to where even aa Austin-Healey 3000 with bad springs could get over it.

Chris White Testing the latest Martha Stewart Accessory – Trashbag Hat

I'm not sure where she found the transbag hat, but it sets a new level of "glitz" for the club. My guess is that all females will be in bag envy over this, and will rush down to find their own. As Martha would say "It's a good thing"…

Cars into the distance as far as the eye could see – the view from registration…

We were down about 25% from where we normally are – a little over 250 cars versus 325. Several reasons – the economy was probably a factor, but the hot weather added to the morning showers and a decent chance of an afternoon storm was probably the major cause.

I suppose Rangers like to be fashionably late since the gate that was supposed to be open at 0700 didn't get opened until more like 0740. Oh well, it was a rainy morning – maybe they just slept in to the sound of the rain…

Le Mans Start

Proof positive it made it

No, I didn't win the Stag class. Ted paid off the judges, actually bribing them with old car parts. Expert he is.

Shirt booth crew – Carol, Duncan, Prez and Eden all master salemen, er, woman, er, whatever…

We had less folks registered, but somehow we managed to sell almost all the T-shirts. Must have been that high pressure sales staff combined with our loss-leader shirts from last year! Way to go profit center!

While I'm thinking about it, I'd like to thanks the MVT crew for the work they put out. Whether it was the registration (went off with little to whine about), t-shirt sale, or balloting, all went well due to the caliper of the folks behind the event. Now, as to the announcing…well, let's say I might head to IBS next time…

Rest Phil

Mild and Wild

We had two Anglicas show up. One was dead stock, the other anything but. Although the one with the blown big-block in it would probably get there faster, I think I'd like the original one better!

Roy Owens' Spitfire – Best Of Show

Roy won Best of Show for his RHD Spit. Very nice car – Roy is restoring a TR3 out of a few parts cars and ongoing restorations he bought over the last few years, so it should be interesting to see what he comes out with!

Rutledge Run – 18 August

We didn't go on this. Okay, we showed up at the Rutledge's campsite after the tour was over – and what a perfect day 18 Oct was – puffy fair-weather clouds, highs upper 70's, light winds – a great break from the heat wave.

Aww, nuthin' like cookin' and eatin' those vittles around the campfire! The end of the Rutledge Run at their Piqua campground.

That day Bridgett had a volleyball game and also we were supporting the Green County Splash & Dash (for dogs, but had we not been watching Duncan closely…), but we managed to get on the road in time to meet everyone for dinner at Café Rutledge, sitting on a pilfered table by the scenic banks of a dry stream bed (smile). Tube streaks for everyone, plenty of other vittles, and Ellis made TWO types of fudge! Thanks for hosting this and inviting us, even if we only showed up to empty your cupboard.

British Cruise-In at The Pub

August 19th was like any other day, except this day was a cruise-in at The Pub day. Okay, so maybe it was different, but not that much different. Bridgett and Duncan were still picking on each other, and we still needed rain.

Triumphs at The Greene

For those of you who do not know, The Pub is a restaurant at The Greene designed to look like an authentic English Pub if you gave it a lot of anabolic steroids, by that I mean you will never find a pub in Jolly ole' England that large, well lit, and with that menu. Never mind, the beer is good.

More Triumph at The Green with The Pub in The Background

Nathan, The Pub's manager, roped off part of the parking lot behind it and invited all the British Car Owners in this part of Ohio. We arrived early for lunch – the first two cars in the lot – parked and shopped a bit. About 3pm most folks started rolling in, and when all was done there were at least 10 MVT club cars lined up. As far as what we did, we parked cars and got the lawn chairs out, chatted with each other and passers-by for about two hours, then wandered into The Pub for the free food for car owners and the door prize drawings.

The White's sun shade that looks suspiciously like the MVT banner. Sneaky folks they are, using club assets to further their evil plans!

Dang, as usual, I didn't win a door. In fact, I won nothing. Alice won some stuff, but all I got was a Bud key-chain given to the "losers" in door prize drawings. Oh well, at least the car made it:

Two events in August that The FrankenStag made it to – a new record, at least over the last two years…

Looking forward to it next year and I'll win a door prize! I mean it!

February 2013 - Evan Coolant Integration

Yeah, I know its cold outside…great name for a song, BTW:

http://www.youtube.com/watch?v=AEErTyBgH9M

Sure, I'm from the Cleveland area and I do know where Mentor is – why do you ask?

I digress. Last fall I was driving around the Stag on the TR7 drive train as well as the rest of my mods. It could move under its own power, but I also had a slight leak from the front of the head – I re-torqued the head to eliminate that, but it got me thinking…is there any way I can reduce the chances of a leak further?

Turns out there is. Evans Cooling Systems makes a non-water coolant that is non-poisonous has a higher boiling and lower freezing point than water, and still has a significant percentage of water's specific heat – the thing that makes water the heat transfer medium of choice as long as you can keep it below its boiling point.

It's not cheap – about twice to three times as expensive as ethylene glycol (EG), but from what they say it will keep the car cool with no cavitation or hot spots as well as boil-over after shutting down. Okay, this sounds like something a TR7 engine should have.

The first step is to drain all the old coolant out of the system. To work right you need to get all the water out of the system (3% or less residual water). This meant I had to first drain what I could, and blow out the rest. I even crawled under the engine and took the engine drain bolt out.

Yes, TR7'ers, there is a bolt on the lower left hand side of the block you can remove to drain the system. In Stags they even had a petcock for the drain, but with all that power steering stuff up under there I'm not sure how easy it is to get to…

I ordered 3 gallons of the coolant plus a gallon of prep solution. As I said, not cheap - $160 after tax and shipping – about three times what four gallons of top-shelf premixed EG-based antifreeze would cost. But, get a load of this, you never have to change this stuff – lifetime guarantee – one fill and forget.. It's non-corrosive, won't boil over, and isn't toxic like EG coolants (highly toxic folks). I figure if it's good enough for Jay Leno, it's good enough for me, or at least that's my story…

The one flaw this stuff has is that its specific heat is about 70% that of water. That means its cooling efficiency is going to be reduced a bit from water, but since the electric pump can be used on big-blocks, since the radiator is large for the engine size, and since I put back on the high-flow 16" SPAL fan, I think I can handle it. In fact, this should make it run about the same. We shall see.

2200 CFM SPAL Fan back on – kept a 4.3V6 cool in the summer , ought to work for this…

Catch y'all at the meeting & Superbowl Party!

March 2013 - More stuff

Evans Coolant Integration – The complete story

Okay, so last month I left off talking about the Evans Coolant I was putting in the Stag. If this stuff works it's going in the TR7 and TR3B.

I ordered it from R/A Hoerr in Peoria, IL and it arrived the next evening. Wow! Almost as quick as running to Wal-Mart!

Since the idea of this stuff it to eliminate the need for high-pressure cooling systems by replacing water with a fluid that can run significantly hotter without boiling you have to remove all the water from the system. Considering the system has heater box and engine block you have to ensure they get drained also. That meant I had to:

a. Disconnect the heater hoses and blow out the heater. They show folks using high-pressure air lines or small blowers, but I just used my lungs. It takes a few times to blow it out, but I managed it (I just don't like to use high-pressure air on things that if they fail will be a pain to replace…).

b. Drain the block – the TR7 engine has a drain plug on the lower left-hand (as the driver would see it) of the block in front of the starter. There is a significant amount of fluid in the engine folks, so make sure you have a good-sized drip-pan when you do this.

So I did that, but that's not enough, you have to get all the water out, so I had to use Evan's Prep Fluid (essentially ethylene glycol with some special additives) to dilute the remaining coolant to reduce the water further. That meant another fill and drain sequence including heater core and block. But after that was done the system was ready for the new coolant, okay almost. I wanted to change something while I was at it,

Two years ago when I fitted this engine to the FrankenStag I pit a heater shut-off valve on the firewall near the wiper motor. That valve also had a built-in bleed valve so I could get the air out of the system. Since then I've been running with that valve open all the time (just like many modern cars which redirect air through hot and cold matrices (coils) depending on what you want rather than turning off coolant flow) and just turning on the fan if we needed hot air. Works fine, so I took that valve off, shortened the hose run, and took off several brackets used to hold the hose.

While I was at it I also eliminated the coolant expansion tank. This stuff doesn't expand and return to the system like water, so off that came. I also put a TR3 4-lb cap on the system since it doesn't need the 17-lb cap that was on it. Theoretically you don't need a cap at all to hold pressure since this stuff doesn't boil, but you need something to keep it from splashing out.

So how does it work?

Good!

More Lights!

I think I forgot to mention the lights I put back on the FrankenStag last summer. If you remember way back I removed the inner headlights (high beam only on a stock car) to provide more airflow area to cool auxiliary radiators I had developed.

Inner headlights replaced with air vents way back when…how about that hood riser???

Don't need those now that I've underpowered the car (wow, do I feel green…), so it would be nice to get lights back, The outer lights are the usual high/low beam combo of modern Xenon lights, so what can I do to make this unique?

Mercedes Benz.

Yep, Mercedes Benz – 300D to be more exact.

See, 300D

Turns out that body style used 5.75” fog lights that will fit where the original high-beam-only inner lights were. So, where do I find those lights?

Ebay.

Right – so I watched ebay for about a week and I found a pair for sale at a reasonable price, bought them for $30, but what to put in them?

For those of you who have been following the tale of Bruce and his “let’s try this technology” mule that he calls The FrankenStag” know that the only filament bulbs on the car are the headlamps, and that’s only because they do not make 5.75” LED headlamps. The logical thing is to find LED bulbs that fit the fog light socket. The fog’s take H3 Bulbs, so I headed off to ebay to look around.

Amber LED Bulbs

Found some from a guy in Hong Kong, and the price was pretty cheap. Took about 5 days to make it across half the globe. They are not the brightest I maybe could have found for the lights, but you can see them in the daytime and at night they do allow you to see better. Gives us room for growth…

Meanwhile I had to figure out how to wire these. I had the wiring harness and switching all ties and covered up, so I didn’t want to make huge mods, so I decided to dispense with a separate fog light switch and wire them into the running lights. What harm can a couple more running lights do? This kept the wiring changes to a minimum.

Fog on the FrankenStag

So far they are working well. I’m still on the look-out for brighter LED H3’s, but very drive-able as is!

Music, Music, Music

When I put the last sound system in the Stag, the thought was simple – really – just have the iPhone talk over a cable to a power amp. All music would be on the phone, no showing amp or electronics. Phone sits between seats, amp is under passenger seat – speakers are integrated where the passenger “cubby box” is on either side in the back - how hidden is that? No big displays at all. Very simple.

Well, in practice, too simple. That “240W” Pyle Power Amp I have coupled to the Pyle 6x9 tri-axials coupled to the iPhone just:

1. Can’t get it loud enough – not enough volume to listen at slow car speed – I have the iPhone all the way up to hear anything.
2. Can’t adjust the tone – you get what you get – I suppose I could play with the simple controls on the iPhone, or find an “app” for that (maybe), but I miss the flexibility of a multi-band equalizer, or even the simple bass and treble knobs.
3. Can’t adjust balance since there is no balance adjustment in the whole system.
4. Too many wires running around – I want something more stealth…

Okay, so I have some equipment to modify. I want to stay with the music storage on the phone (even though iTunes is a miserable music management environment) and I want to keep the visible minimalism going.

So maybe this will help you in your fight with LBC audio, maybe not, but at least it will give you some starting point. Let's talk about three parts of this – connection, pre-amp, and power amp.

I was thinking of getting a Bluetooth AM/FM Receiver. We have put Pioneer FH-X700BTs in both our Subarus with good luck, but it's a double-DIN receiver and I really don't want to hack up the dash to put it in. I does have cool lights and the functionality is good.

To give flexibility I decided to try a separate Bluetooth Receiver, pre-amp and power amp.

Connecting

Bluetooth. I got it, I'll use it. I've gotten used to getting in a car and the radio talks to the phone in the pocket to talk to the cell tower to bring me music over the web. Sure, it's compressed, but in a dynamic environment (like the Stag) you will not notice it. We ain't talking about a Lexus interior…

I looked around a little bit, and you can get cheap Bluetooth receivers from China for less than $10 including postage, so I ordered one. Aroud here you can buy the same receivers, but they cost you $30 plus tax. It's just a simple transceiver designed to be plugged in a USB for power and has a 3.5mm audio jack on it.

One Bluetooth Receiver from China via ebay – all of $9 including shipping, if it dies, it dies…

The most expensive thing about this was the $10 I paid for the USB power adaptor this takes, more on that later.

EQ and Boost

Just like high-end home audio systems that rely on a separate pre-amp and signal processing gear, I think the car would benefit from this – especially since I need more front-end gain for volume. Searching the Web I found a gazillion units for sale that combine pre-amp with equalizer. I went with an NVX XEQ7 unit for $60. There were others cheaper, but not with the specs and functions this has plus the "cool" name and blue glow..

NVX XEQ7 Pre-Amp and Equalizer

Ordered it from Sonic Electronics – no endorsement for that company, but web ordering was easy and it came the second day.

Boost Big Time

Next issue for volume is the power amp. What I have in there (bought for $29 from MCM electronics a few years back) is supposedly "240W" – well, finally looking at it really close (yeah, don't ask me like why I didn't do this earlier) I notice it has only a 5 amp fuse. Hmm, at 100% efficiency that's only 60 watts and it's not 100% efficient – that means that in reality this probably can do only 20 watts/channel if that, probably maybe 10-12 driving those 4 ohm speakers. No wonder it was whimpy, whimpy, whimpy.

Need more power.

Now loudness goes up by factors of 10 for power, which means that if I want it to play twice as loud without distortion I need ten times more power. So, I need at least 100 w/channel. Heading out to the Internet again, I found the Vibe Black Box unit with 110W/ch and a decent form factor – more about that later also.

The Power Amp – Looks Cool

The only good thing about power amps anymore is that the prices are cheap. Paid $60 for this including shipping and it also showed up two days after ordering.

Now Let's Talk About Installation

The old amp had been located in the trunk under a prior life of the car, but I moved it under the passenger front seat when I put the fuel cell in. Kinda nice since it hid everything, but you could get to it fairly easy (four bolts). My original goal for the updated equipment was to put the amp under the seat where the old one was and put the pre-amp in the dash. The Bluetooth receiver would be in the USB cigarette lighter adaptor and wires would connect them all.

But then I thought, "why not put it all under the seat? Maybe it will fit?"

Here is the old amp installed under the seat

Original amp under the seat

There actually is plenty of room under here which I took full advantage of:

New amp and EQ under seat

I had to cut back the carpet a bit (it's sad carpet anyway) and take the end pieces off the amp, but it fits – snugly. Power amp is to the left, pre-amp to right, and you maybe can just make out the USB power adaptor at the top right.

So how does it sound? Louder than before certainly. If you like bass there are several bass-boost switches in the system and I can torment those woofers (and folks in the back seat). If you have a discerning ear and are listening to music being played from a CD player using a line to connect to the system and then listen to the music from the iPhone through the Bluetooth you will notice the difference from reduced bandwidth and file format compression, but when the engine s running and you are on the road with the top down you won't hear that.

April 2013 – Batting clean-up…

This month I'm just closing the loops on a few stories. I've been driving it for a few weeks now and have learned/discovered a few things.

Evans Coolant Integration – The complete story (cont)

I think I left this story off after I had put in the new coolant – Evan's waterless coolant – based on an ethylene and propylene glycol mixture. Well, since then I've driven the car a few times and would like to report it's working well (so far). Car is cooling normally and the amount of coolant weeping from next to #1 cylinder is considerably less (and we hope it stays that way so I don't have to pull that head again!).

I did have to put back on the expansion tank. I went with a 4lb cap (a-la TR3) with a simple overflow, but this stuff has a decent expansion rate, so the car "wizzed" on the driveway the first time I let the engine warm up to operating temp. Besides that, it's been flawless – will continue to watch this and will report out anything unusual.

Music, Music, Music – continued also

Last time I discussed the new amp, equalizer, and Bluetooth network device. Well, it all works as advertised, but with a few quirks, the worst being a significant "turn-off" chirp followed closely by it deciding to turn off the connection when firing up Pandora on the iPhone. What's up with that? It's loud enough to hear it on the road at speed with the top down, and have Duncan complain "it's too loud dad!", and the equalizer has eliminated some of the nasal qualities of the cheap speakers. So far the under seat location isn't causing any issues.Only issue is on turn-off there is quite a "pop" – well, at least you know it is off.

Highway Cruiser!

Fifth gear, 65 mph, 1700 rpm. I think I built a real monster as far as gas mileage on the highway. On the back roads I'm never in 5th gear. Of course I pay for it in acceleration. As you might expect this won't win any drag races! Well, maybe, if I was racing my old '78 coupe with the automatic trannie – I'd beat that!

Recoat of Exhaust manifold

Those long time fans of Tales of the FrankenStag might remember two years ago when I put the TR7 engine in the FrankenStag I painted the manifold with some old manifold paint I had sitting around and then threw it in the BBQ grill to cure.

Fast-forward two years and that paint is pretty much gone. Time to try it again.

I noticed that POR-15 is now making manifold paint and is being sold by Eastwood.

http://www.eastwood.com/por-15-black-velvet-hi-temp-paint-16-oz-pint.html

What the heck, let's give it a try.

First, had to get the old paint off. I just happen to have a large collection of various wire brushes that just happened to shine that puppy up fairly well.

Rust off, ready for first coat

Okay, here's the instructions – get off the old paint and rust, put on a coat, and then wait 24 hours and put on a second coat…

…or…

Cure it in the oven at 400F for an hour. Oven gets it.

Coat #1 - Ready for the oven!

Coat #2 coming out of the oven!

Back on the car!

While I was at it I filed out part of the side of the lower front manifold flange mounting hole so you can slip a normal length bolt into it while it's on the car (why couldn't the factory think of that?) .

Glad we kept the old oven for the garage!

Now to drive this thing to TRA 2013 and back. Wish us luck…

April 2015 – Lights, camera action!

March 15th. Above freezing, in fact warm enough to start the Triumphs up and move them around.

And they all started first try.

Amazing. They must think I've come for Caesar…

Okay – no invalids, so time to start the shell game. FrankenStag came off the lift and over to the far bay for upgrade. The Grey Ghost went up on the lift (I'll get to that OD trannie later…), and Inca went back under the lift. Neighbors must get a real kick watching all this.

But back to The FrankenStag.

"I Can See Clearly Now": the continuing saga

I have played with the headlights on this car more than any other. What was a stock Stag system became a 4-headlight "blind them all due to the illegal H4 bulbs" system, which became a 2-light system when I put in extra cooling for that 4.3L V6, which became a 2-headlight, 2-Daytime Running Light system about 5 years ago that I upgraded to a Hella/Bosch lens system 2 years ago. But what I always wanted to do was go with higher tech/lower current draw than a Sylvania halogen bulb. What I wanted was an HID or LED system.

Okay, forget HIDs – that lens system needs to be designed for a different bulb orientation than the usual H4 – retofits into existing H4 housings do not work well – they blind oncoming drivers and don't let you see the road well.. LEDs were either too expensive (5.75" sealed units for $475 each) or not strong enough (about 150 lumens – an order of magnitude below what headlamps need), so I waited.

Last year I began to note that H4 LED bulbs with light output well above 1000 lumens started hitting the market. This was due to high output CREE LED technology as well as integral heat sinks. Last month I noted a system on line that had a light output greater than a Halogen (H4) (2200 lumens versus 1650 high beam) at about a third of the current draw (2 amps versus a bit over 5 on high beam). $89/pair including shipping from ebay seller. I bought a pair.

Conversion kit from ebay

The bulb system comes with a bulb and a power convertor. This unit uses a small integral fan to keep the LEDs cool. Here is a stock picture of the whole system for one side:

Expanded view of the LED bulb and power conditioning

I first trial fit this into the Hella headlight lens. As I expected the heat sink/fan assembly projected way out the back, enough that it wouldn't fit in the headlight bucket.

I fixed that with a hacksaw.

Headlight bucket backs are way over-rated. I cut it out. I then had to mount the power electronics near to the lights – passenger side went on the front bulkhead while the driver's side went on the front

valence next to the light. Finding a good mounting place was the hardest thing about this installation

LED headlamp bulb in Hella Stag Headlight Lens

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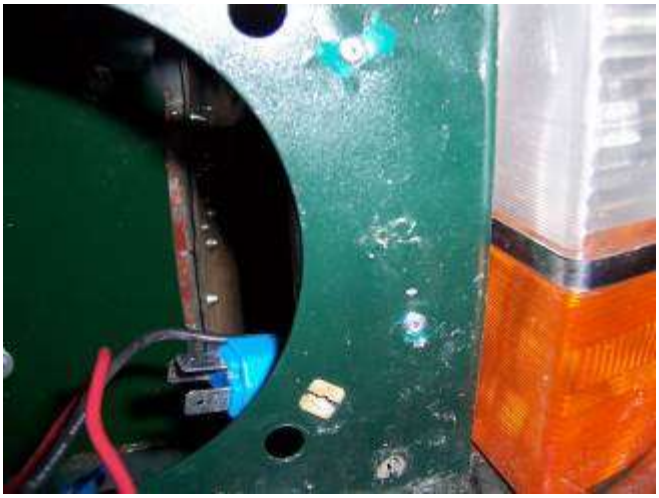


Driver's LED Power Convertor Pop-riveted to back side of the front valence, driver's side. Evidently the paint here wasn't prepped good for that last respray….

Once I got the lights installed I fired them up. These things are pretty bright, brighter than the Sylvania Silver Stars they replaced. They also illuminate the lenses a bit differently than the old bulbs so I am going to have to check aim once I get the car back on the road – if you look at the car only the top half of the lens is illuminated. Somebody already have the aim points laid out on their garage door?

So I was thinking, while I'm at it I might as well replace those anemic front parking lights with something more powerful. What was in there was a set of 4-LED lights that I put in 6 years back that I've always wondered if I could have put in more powerful ones. No time like the present! Headed to superbrightleds.com and bought a set that are about 8 times the output.

Not the worlds greatest shot, but the LED lights do work and they are bright!

New Front Parking Light LEDS (right) Versus Old (left)

What a difference!

Not to stop there, I pondered a question. What about Daytime Running Lights – those lights that make your car stand out in the daytime? Almost hit a guy last month in Xenia due to a black car againt a black building, car in a shadow, no DRLs and my windshield being in the sun. Not that DRLs would have cured that, but would have helped hime to be seen by these aging eyes.

The DRLs would replace the Bosch fog lights. I settled on putting back in clear lenses and H4 LED lights. More on that later.

Electrics: The idea with DRLs is that they are on when the car is on. The Subarus actually have it set so they are on when the car is in a motion gear. I'm not that fancy, so I installed a relay in the White (ignition circuit) that gives power when the ignition is on. Power will also come from the White circuit since I am using LEDs and the current draw will not be that

much (I hope). The concern here is more overloading wires and ignition switch since the White circuit is unfused in a Stag. This did mean I had to run another wire to the front of the car, which meant I had to run a wire within the passenger inner fender. This can be iffy some times since you are pushing a wire into a space you can not see or feel in. I was lucky – it went through without getting stuck! It also meant I had to undo some warnes covers and harnesses; however, I've done this sooo many times now it seems second hand. I retained the sockets and wires going to the buckets and found out that if I switched the buckets the wires were the right length for attaching to the new wire without splicing anything. Bonus!

Headlight lenses: The Bosch's would not work since they are amber and I want a white light. I found a set of new, clear H4 lenses in glass for $30. They are the same make as the lenses Little British Car Co. sells - made in India and of decent quality. Or so I thought…. Got them and I had to modify the metal ring they sit in so the chrome-plated ring that holds the headlight in would fit. Grrrrr.

H4 LED Bulb For DRLs

LED H4 Bulbs: This got a bit tricky. Go to ebay and type in "H4 LED Bulb". Since I had just done that or the headlights I knew what I was in for. There are a gazillion. What I am going for is not something as bright as the headlight bulbs I had just bought, but something a bit less bright. What I found was something bright, but supposedly less bright that a headlight bulb. Current measurements showed the each drew less than an amp, and they are about maybe half as bright as a headlamp. They had advertised that they worked high/low beam, but what this really was is that there was only one brightness setting for either input. Eh, what do you want for $20….

Putting this together: Pretty easy really – once I realized I had to modify the lens mouning ring. More neutral ebay feedback. Both lights came on when the ignition is on. Houston, we have DRLs. Now I need a warm night to head out to the road and aim all these lights!

Dang, four clear lights - looks almost normal for the first time since 2006…

Air Filters

So, for the few years I've been running velocity stacks on the FrankenStag without any filters. You are right, I am taking a chance, and so far, nothing has really gone in there and I've never been in dusty/dirty environments – the throats of the carbs are still clean. But, there is always a first time, so I decided I was going to get a pair of K&N Filters for them.

A quick search on the Web showed Summit Racing stocked filters for Stromberg TR4s, and per pair it was $30 less than Moss, so I ordered them…and found out that all TR4 Stromberg K&N Filters only fit the later, TR250 and TR6/7 carbs, not the TR4 ones. Back they went.

Okay, plan B – what other filters are out there? Not much for TR4 Strombergs – you can get the oval paper ones and that is about it. If you want something different you are out of luck.

Okay, so how's about a pair of filters that fit on over the ends of the stacks? Back out to the Web I found a pair from a VW parts store for $23 that fit 2.75" stacks. The guy on the other end of the phone didn't even flinch when I said they were for a pair of TR4 Strombergs on a TR7 engine in a Stag. Probably gets a lot of those…

They fitted right over the stacks perfectly, so know I have some measure of protection for the engine and still have the stacks!

New Air Filters

Brakes

I've never had a decent parking brake – the brake can barely hold the car from moving on our driveway while it's in gear. I've tried roughing up the shoes and the drums and that didn't work. I took the drums to be turned and they told me they were so far out of round that's not possible.

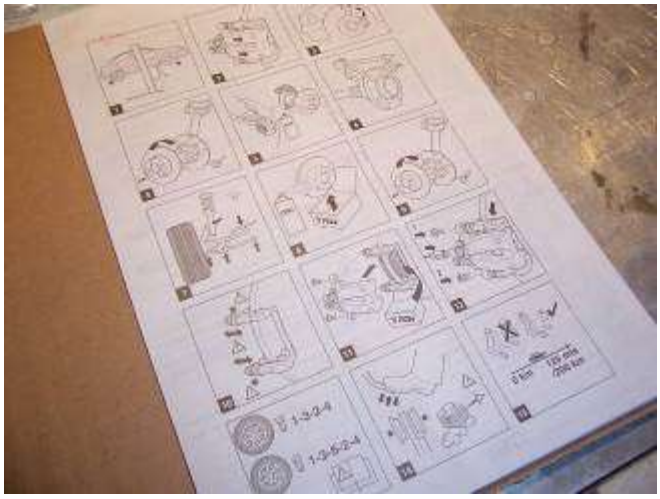
Okay – buy new ones. Not so fast Bruce – since the Stag was never really a popular car in the States all the Stag parts folks, sans one, are no longer in business, and the one never replied to my inquiries about new (or even decent used) drums. You can get used brake sets on ebay for $120-ish, but who knows how good they are. Rimmer Brothers (UK) carries them, but they were on backorder. Finally came to realize that I need new ones and I went ahead and back-ordered rear brake drums, shoes and cylinders from Rimmers in June of 2014.

Didn't hear anything until a box showed up in December, the brake parts all included. Virginia, there is a Santa! There thay sat while outside the cold winds blew. Once March arrived I decided to take an afternoon to put them on.

Now, I've done this several times. The first time it was a cussing contest since the Stag Workshop Manual isn't much help in the exact process of getting all the springs and self adjusters back together – it kinda says assembly is the reverse of dismantling. Okay, it technically is, but as with most things, there is an art to it. The second time it worked a bit better. This time it was actually easy.

Probably the hardest part of putting the rear brakes back together is installing the clip that holds on the new cylinders. This thing is damn-near impossible to assemble unless the backing plate is off the car due to angles and the hydraulic plumbing being in the way. Solved the issue. Filed down the dog ears on the outside clips so the clip is close to slipping over the cylinder without force. Bingo, that was it – managed to clip it into place without the neighbors wondering what all the commotion is about and why I am talking about male offsprings of female dogs <smile>.

Behind that leading shoe on the driver's side lies the self adjuster that can give you conniptions - patience is the key



Instruction sheet that came with the drums that shows how to install a disc brake rotor – huh???

Oh, we now have a real, working parking brake!

Spin-On Oil Filter Adaptor

Hold on to your seats – we still had a canister-style oil filter on The FrankenStag – yes, archaic, but functional. Moss has spin-on adaptors, so I bought one. Moss's are a bit different from the ones I have bought from Vicky British before with an inner and outer part. I had to laugh when I read these instructions without a corresponding diagram to point out what part of each piece they were talking about:

"To ensure the that the inner O ring is seated correctly slide the Spin On Outer over the Spin On Inner so that the outer face seal face is in line with the inner flange face. The Spin On Outer will then sit back from the Filter Head sealing face when locating the Spin On Outer…"

Fortunately it's somewhat intuitively obvious is you are looking at the part on how it goes together.

So, with any luck, The FrankenStag is ready for summer driving! I think I said this before…and bad things happened.

May 2015 - LEDs? The saga continues

You win some, you lose some when it comes to putting new tech on old tech. Last month I was waxing eloquently on the benefits of LED technology and the LED headlamp bulbs I was using.

Not so fast.

When I went out to adjust the headlights I noticed two things:

1. The LED Daytime Running Lights I put in were bright enough to be annoying and they shot light out in all directions.
2. The LED headlamps had a kinda blobby pattern to them with not as much light to the sides as I would have liked. Couldn't adjust them well.

I have back-up plans for the DRLs – I bought less powerful LED H4s as well as bought brighter LED lights for the Bosch Fog Lamps I had in there to begin with – gives me a choice on how I want to go. For the headlights, no easy fix, so they came out and normal H4 bulbs went back in.

The issue is not how bright the bulbs are, but where the light source is in relationship to the reflector and lens of the headlight unit. They are designed for the H4 bulb, which has one filament in front of the other, with the low-beam filament having a reflector inside the bulb below it.

The LED bulbs, in contrast, do not have the radiating elements in the same place, and/or radiating in the same directions as the original halogen bulbs. This is important since the far-field pattern (science & engineering term how the light illuminates the road in front of you) is critically dependent on how the light shines on the reflective back surface of the light as well as how it goes through the fluting on the glass lens. In retrospective nobody should expect that the light pattern they would get from a bulb not designed to fit a reflector-lens configuration will be the same as the original. That is the thing that one has to remember in retrofitting lights.

So, for now until they develop LED bulbs even closer in configuration to H4 halogen ones, I've gone back to halogen H4 bulbs in the head lights. The LED ones will be put aside until I can get back around to the Grey Ghost and see how they are in a 7" reflector assembly. I'm thinking the larger size might make the pattern better. I am also evaluating the Bosch fog lights with brighter LED bulbs in them as a replacement for the DRLs.

My advice – go carefully on buying LED headlight bulbs unless they are the type that replace the entire kens and bulb assemblies since you don't know the pattern you will end up with – be prepared to experiment!

June 2015 - LEDs? The saga continues, yet again

Well, based on some info I read on the Web (has to be true, right?) I decided to give the LED headlights another go. Put them all back in and drove the car three times, including the trip to the June meeting. When I got home I discovered one LED was not working. The bulb was okay, but the power supply was not. Then, while I was playing with it, it came back on, so I put it back on the car, and the next time I drove the car it failed again.

Sucker!

So I'm pulling these "Genssi" LED units out and replacing them with ones superbrightleds.com sells. The Superbright ones are a bit more expensive, but that company backs them with a two-year warrantee. I'll be using them on the drive to TRA 2015 and back, so we'll report back on them.

Report back – never drove it at night, so the jury is still out!

Muffler Blues

I really like the simplicity and the sound of the Supertrapp muffler I have on the FrankenStag, but it looks hokey. After over three years I have come to the conclusion that it needs a chrome-tipped resonator.

Issue is that if I go that way I'll need to put a muffler in line or I'll have essentially a straight pipe. Those might be nice for Harleys, but my neighborhood would come after me with sharp things that hurt!

So I went on line and found a 14" muffler from Summit racing for $17, and a NOS Pacesetter resonator tip for $50 (actually quite a deal, believe it or not).

The resonator tip mounts via a bracket between the tips (that is a bear to get a nut under BTW) that wouldn't line up with any hole, so I had to drill another and plug the prior ones.

Resonator Tip in place

This is the configuration all heard when we made the June meeting.

Too loud.

Never thought I'd say that, or write it, but I have. Too loud. So for TRA I'm trying out a 20" mid muffler – was easier to attach than the 14" I took off. Just two clamps needed.

20" $17 Jones Muffler from Summit Racing

Report back – a bit softer, but still loud – won't do anything until this fall…I need all the power I can get!

July 2015 – What's this?

Oh that? We're back from TRA after 1500 miles and I have to fix a few things. In general the drive worked well but did expose the fact that using a TR7 engine to drive this beastie around mountains leads to slow accelerations and a lot of shifting. Up to this point since I put that drive train in back in 2012 the roads have been a flatter. Also, the last day I picked up a bit of slop in the steering (what's up with that?) and I had a lot of wheel rubbing and a bit of vibration all throughout the drive, at least enough that it bugged me.

Aw, knuckles

The steering slop was due to a potentially serious issue – a steering knuckle was coming apart. One of the u-joint bearing cups was coming out on the upper knuckle. They are staked-in by several blows to the metal close to the cup and these were not enough for one cup.

Top steering knuckle minus a bearing cup

I immediately ordered two more from Rimmer Brothers so I have a spare and will put this on my "look at this every time you pop the hood" list. To be fair it is a Triumph 2000/2500 sedan part, so not original, but all the other bearing cups in the shaft assembly look good. As if the time of this writing I am still waiting on the knuckles to get here. Will report out on this further.

Aw, tires

I also replaced the 205 tires with 185's. Don't know when I bought these, but the date code said it's time to replace. The car originally came with 185s on it and I wanted a more modern tread pattern as well as less steering effort and eliminate the front wheel rubbing during hard cornering (mostly while parking). With the power of the mighty 7 engine laying down rubber is not much a problem even with decreased treadwidth. Wanted decent traction at an acceptable price point without having to resort to Chinese tires, so I found a set of Kenda Kinetics at Tire Discounters that had good reviews, made in Taiwan, decent price, and turns out match the spare I bought a couple of years back.

Aw leaks

We also experienced two leaks during the trip, both into storage spaces, and both due to nighttime gully-washer rainstorms. Some would say don't worry since they were not that bad considering the biblical proportions of the storms, but I'm still going to look into them. The cause was very easy to see, not only was the targa cover a bit off center, but the rubber seal looked every bit 43 years old. Hard, ripped, and worn, it's a wonder I didn't get more water inside.

Targa cover seal that has seen better decades

The seal was originally put on with contact cement and came right off with only a bit of coaxing using an awl. Under it was mostly good mental, but I did find rust on the passenger side of the car.

Rust in the targa top seal on the passenger side

Storage

You might not know it, but the top only takes up the top most portion of the space made for it behind the Stag's back seat. Under that is a lot of usable space, and we tend to use it on trips (which is the reason clothes got wet in there when it rained hard on the trip), but not anytime else.

Since it's not that hard to get to, even when the top is folded down, I thought maybe some of the road gear, such as spares kit and maybe some tools, could go there -

Space behind the back space under the top stowage area

Carpeted under hood stowage area

Think I solved the power problem…

August 2015 – Taking a break by talking car shows a little bit…

Cincinnati British Car Show

C'mon – it's not that wet outside!

Just because it's been raining all week and the forecaster is predicting an 80% chance for the day doesn't mean that you keep your car in the garage another day, right?

Wrong, or for at least a lot of folks in the SW Ohio area since the turn out at the show was small.

I had planned on taking the FrankenStag anyway so I wasn't worried too much about rain. Started the day out woken-up by rain and a nearby lightning strike, but by the time I was ready to leave the rain had stopped and you could see hints of blue sky. But…the threat of rain still hung over the tri-state, so I thought I might be the only one showing up at Bob Evan's for breakfast.

Wrong.

First Chris Yanity showed up, then Chuck (aka Church) White arrives, and the Ted Allison showed up. So much for eating alone and noticing that group of guys talking golf at the corner table are the same bunch of guys I see each year – I wonder if they think the same of us car nuts? Anyway, great breakfast conversation, walk outside, sun is out, tops come down, off we go for the side-roads drive to Harbin park.

If you've never been to Harbin Park, it's on the west side of US127 almost to I-275 in Fairfield. It's on top a ridge that overlooks the Great Miami River Valley and has great views of the valley – pretty place.

So, we get to Harbin Park, and there is nobody there – maybe 20 cars. I go and park where my class is, and there is nobody around me!

My car class with Harry holding down the fort!

Okay, so this bodes well on me getting a trophy for the drive, but Cinci car owners, the weather is not that bad!

I pull out the chair (thank you Chris Y for loaning me one) and head over to registration. I registered by mail so I knew I might have a low number, but not #9. Yikes, I hope these guys get more cars today!

Sidenote: if you are planning on going to a car show please register early. This helps the folks plan for the show as well as giving them seed money to use.

By the time I got back over to the FrankenStag the rest of the MVT members there had set their chairs up behind me. One lonely car with a bunch of old guys behind it! And the mud…

Just a little mud on the field due to the rain! You knew I would find it – not surprising given the amount of rain that we have been having the last week.

Lounging behind the FrankenStag – MVT Headquarters for this show. Yes, that TR7 was the closest car to us…and yes, that's Harry!

Harry arrived, and a bit later on the Moore's arrived, and a few more cars arrived – I think they had between 70-80 registrations, but nowhere near that many cars on the field. DeLoreans made a good showing – 3 total, but as far as Triumphs go, not so good - no TR2/3, only 4 was in the Premiere Class, a 250, several (mostly brown) TR6's, three wedges, two Spits, a GT6 and a Stag. I'm amazed – great location, good food, and tolerable weather – so what's up with this? Only a handful of MGs – more Jags than anything else, and a lot of those were new on display from the local dealer! So, what is the deal with these Indian cars at this show anyway? (smile – I know, I'm driving a BMW…)

Moore's TR250 with the owners hiding behind blast shields!

After a while the sun came out and it actually got warm! As I said, the food was good (okay, the skin on the brats was a bit thick) so we all ambled off to the food stand and afterwards handed out the Dayton BCD fliers we had with us. By the time I got back to the car I noticed I took Best of Class! I won the Stag Class! Okay, easy win, but I'll take my wins when I can get them!

Like Dayton, Cinci has gone to a winner's parade for the car show winners, so we headed to the top of the park for the awards ceremony. View was great, but no shade and the July sun was out in 80% humidity. I know, I complain too much.

In line to get an award – Stag took its class!

Nice award this year – I'll try to remember to bring it to the August meeting. After last year's splinter-inducing boards and fake oil cans this year's awards redeem them…

Oh, I won $100 off anything Cincinnati Jaguar-Rover sells including new cars and service in the door prize raffle – anybody want this? What will you trade?

We headed home after the awards ceremony and beat it around a rain shower, then stopped for ice cream in Bellbrook prior to heading home.

So, MVT did well – we fielded three cars and each one best of class. No rain to speak of, no breakdowns, and the food was good. Show was a bit small, okay, tiny, but the location is great. I'm hoping the Cincinnati folks go for this again next year since

we'll be looking forward to it…and all parking in the Premiere Class…except for harry, he goes back..I think…

Back working on the car again….

You know, nothing can't be improved, so between the Cinci show and the Dayton BCD I had to innovate, okay, I had to fix a few things.

First - the trunk leak was never fixed, I think this is due to the new seal I bought not fitting tight on the trunk metal lip at the top – when you get a lot of water at once, like we did several times during the TRA 2015 trip, water backs up under the seal and gets in the trunk. To fix this I could either glue it in with a bead of silicone along the lip, or try to make the fit tighter – I chose the latter and put a strip of vinyl material left over from the Grey Ghost - we'll see!

Second, music – as a flaming extravert I need music to keep up my energy level. I've always had a music player of some type in any car I had. For those who have been following our life with the FrankenStag about four years ago I installed an amp and equalizer/pre-amp under the passenger's seat. Well, this spring that pre-amp decided not to work? What's its issue? I mean I paid a whole $30 for it, could have lasted longer! This year I have been running without equalization, but I wanted more bass (you know it's all about the bass…), so I paid $35 for a new one, put it in, and now I will be looking for better speakers! <smile>.

Hi little equalizer, you look sooo lonely under that seat….

Third – Music Source - I also decided to update the music source. The original goal was to use an iPod or Smartphone with Pandora, but as I have found, even in the modern world there are places with bad cell coverage, like Waynesville, or most of the places we drove through for TRA in Eastern Ohio and West Virginia, so I am trying SiriusXM using the receiver I have in my office as a mobile source. They make a mobile kit for the car and I found one on deep discount at Best Buy. The mount just went where the old phone mount was – suctioned to a piece of Plexiglas I secured to the trannie tunnel. I attached the antenna to the top center dash grille where it just might see the satellite, and modified the power adaptor to work without being plugged into a "cigarette lighter" power adaptor, then hid that up under the dash…

SiriusXM Radio Mount – in easy reach of the driver.

Trial run in the garage and to/from the MVT Pool Party confirmed it was getting decent signal and good sound. Sweet!

Fourth – Interior lighting – In this last incarnation of The FrankenStag I used LED lights for interior lighting. In the top light I just used LED equivalents of the stock lighting, and under the dash I put in four red LED tail lights (they were a bit weak to use for actual tail lights) for footwell lighting. It worked, not real bright, but worked. Then I ran into a deal – I found a dozen 12 LED under-counter lights for RVs at Goodwill Outlet, so I paid 50 cents for them all. They each had a bright, multi-LED white light in them, much brighter than what is in the car…

…so I replaced all the interior lights with these. Year, getting these into the top light in the T-bar was a little work, but now it's like a modern car when you open up the door!

RV LED Fixture to the left, the LED bulb to the right

Bright LED interior lighting – and shaky human holding camera set to night mode…

August 2015 - “If women don’t find you handsome at least they find you handy” - Red Green

The Trials Of Being A Technology Mule

A technology mule is a platform where technologies are tried before releasing to the general public. That really is what I’m doing with the FrankenStag - I try stuff out on it and report out to you how well it went. Most things work good, others not so well.

So…about a year ago I found out that Moss (in concert with a few other folks across the world) had developed a carburettor conversion for MGBs using Mikuni carbs. Mikunis were originally SU-like carbs built for the Japanese motorcycle industry, but now have found broad application on other engines. They are side-draft and come in different sizes with multiple jets and accelerator pumps. Original reports from early adopters indicated they were better than SUs or Strombergs, and they have a neat, different look. Moss did not have a listing for TR engines, so I filed that info away in my brain…

...until I stumbled across a shop that races Volvos also using these carbs:

http://www.v-performance.com/products/air_fuel.html#mikuni_hsr_series_carbs

...and listing a conversion kit for and British car using 1.75” SU/Stromberg carbs. I thought “Cool, just what the Grey Ghost needs”, so I purchased a set - which have now sat next to the Grey Ghost on the lift for the last several months. I’ve been slow-rolling the conversion since I don’t want to add a lot more complexity to the sparce Grey Ghost engine bay, and also this would require an intake manifold mod to add accelerator cable brackets.

But the FrankenStag has none of these issues, and the Strombergs on the FrankenStag can replace the Strombergs on the Grey Ghost which are giving me some issues. So, for fun let’s try to fit these to the Stag. The engine displacements are similar so I should not have to fart around with jetting to get a running car.

The Kit

The kit from the shop comes with everything you need for a typical installation, including mounts, air filters, linkage, and the carbs themselves. The hardware was all Moss Motors which leads me to believe I was just buying a Moss kit that they have tuned for TR engines, we shall see.

The entire Mikuni Cab Kit laid out on the bench after we received it

The Mounts

The first chore was to take off the Strombergs, which, since they are new and the hardware new, came off without a fight. An inspection of the carb mounts to the manifold showed them to be cracking - rubber cracking is a chronic malaise of these TR7 mounts - so I headed on line and ordered new solid aluminum mounts from Classic Regulator:

http://www.classicregulator.com/carb-mounts/solid-carburetor-mount-kit

To keep pressing on the modification I then modified the existing mounts for the new carb adaptors. I am going to throw them away anyway, so I can have fun!

Mikuni carbs are press-fit - they install by a big clamp holding them to a semi-rigid mount. That means I have to have an adaptor to go from a 4-stud manifold mount to a clamp mount. That is provided in the kit, but it only uses 2 of the 4 studs - a diagonal pair. That meant I had to cut off the other two. I also had

to elongate one of the holes so the adaptor would slip over the remaining studs, but once modified it worked well.

Mikuni adaptor in place on an old carb mount. Note that it only uses two of the four studs so I cut the non-used ones off

On a trial fit of the carbs I noticed that the front carb came too close for my comfort to a casting boss on the old waterpump cover, so I had to grind that down a bit - you can see the ground area just below and a little left of center in the photo above. After that I fit the front carb again with a filter to make sure all cleared. It did. Wunderbar.

Air filter in place on the front Mikuni carb

About this time the new carb mounting adaptors arrived. Nice pieces of work, but I suppose someone would say that for that amount they should be good - but per pair they were only about $20 more than a stock pair, so I think that's a deal - here is what you get in the kit:

Solid carb mount kit - sweet.

Two milled plates, plastic separation/insulation pieces, gaskets, and plenty of hardware. Since this is for SU and Strombergs I had to get shorter bolts for the carb mounts, but hey, small price to pay for progress. For once everything fit together as it should.

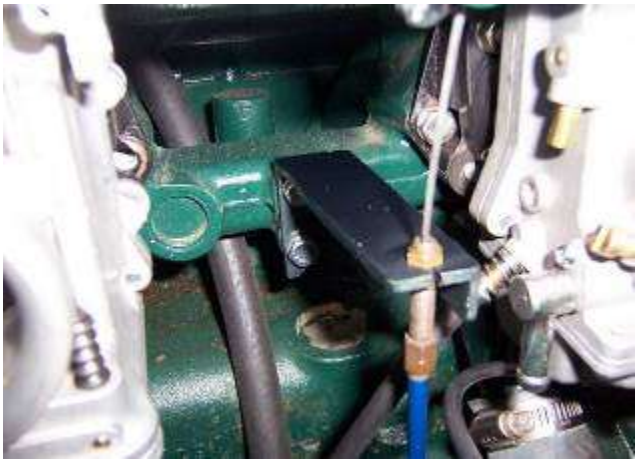
New Mikuni carbs in place on new carbs mounts

Attach Accelerator Cable

Next step was to attach the accelerator cable. The throttle shafts on these run through the top front of the units and rotate counter-clockwise from the car's front. so I had to move the cable mounting point to the left 4 inches (again, as you look at the car from the front) and up an inch or two. Fortunately I have a lot of aluminum bar stock left over from The Grey Ghost, so making a bracket was easy. The carb throttle shaft connector they give you in the kit is very long, you just cut it to fit between the carbs, put the shaft arm on, slide the throttle shaft clamps on, fit the shaft in place, tighten the clamps, put shaft lever in the correct lateral and rotational place (you will have to do a bit of geometry here to get it located, and bolt it all together. I reused the cable connector and

attached that to the new shaft lever and we had a working throttle cable.

Initial throttle linkage – bracket was made to move the adjuster mounting point farther away from the engine under the shaft



A closer view of the bracket made to hold the throttle cable adjustor

Connect Fuel Lines

Next step was to connect up the fuel lines. Easy peasy once you got over the fact that the carbs took 5/16" lines and the pump output is ¼" - that's what Lowe's is for. Found a T-connector and three barb'ed hose connectors that worked. Really heavy duty, almost something that Conan the Barbarian might identify with, but remembering Red Green I pressed them into service.

Lowe's special connector for the fuel lines under the rear carb - overkill

Throttle connected, fuel connected, time to work the choke and then I'll hook up overflows and block ports.

Choke Cable

On to what I knew might be the most difficult part - choke cables. The Stombergs used a single choke cable since the choke plates were attached by a rod between carbs, no such luck here - each carb's choke is individually actuated be a cable. For choke cables I decided to use bike cables to run individual cables to a TBD junction, then use an original TR7 choke cable to connect to them so I can have a cable that can pull, turn, and hold. The hardest part will be that junction since it has to carry a compression load across it as well as join the cables.

I decided to join the cables mid-ways on the cable run. In Triumphs that use dual choke cables (TR6 I'm thinking) the joining is at the choke pull, but I don't have that technology, so what I'll do is instead is build a small junction box and use barrel clamps and silver solder to join the cables. The box will hold the cable sheathes on both sides and provide the compression load path. I'll paint it black so it's not that obvious, and attach it to the underside of the brake master cylinder, maybe...

The cables attach inside the carb body to as brass valve held back by a spring. You unscrew a hollow plastic retainer and the valve body and spring come out. there is a slot and a hole in the valve body to hold the cable end. the bike cable I was using had end fittings too large to fit the holes so I had to file and hand fit. On went the plastic fitting, on went the spring, attach the valve, screw into the carb, repeat for the next carb.

Choke valve, spring, and cable

The above choke parts all together

Choke cables in place – note that they have to run forward a ways before you can reverse them due to the intake manifold

Next I figured out where the cables would run and the junction located so I could just the cables. Due to the carb construction the cables had to go forward then reverse back. I arranged it so they would run back together. The next step was to cut the cables the same length if for nothing else that to establish a common datum to work with. I lucked out - just had to cut one cable sheath since one cable was a lot longer than the other. “Cut” is an interesting word - you really peel back the plastic covering then use a small file to cut the sheathing (coiled flat wire) without harming the cable inside. Next you fit and crimp a cable sheath end to the cut cable. One final step I took (at this time) was to cut the cable about 6” longer than I thought using end cutting pliers - I found those make the cleanest cuts to stranded cable without distorting the cable, then you solder the end to keep it from fraying. Once the cable is ready to be joined you make the final cuts to length (and solder again).

Tip: I just used a good water-soluble flux on the cut cable end then used a good rosin-core solder and a 100W soldering iron to solder the cable tips. No silver solder needed - the trick is the flux and not just relying on the rosin core.

Next I had to fit the single choke cable that the carb cables will attach to, but I have a quandary - where to attach it? I decided to make a larger bracket and put it in place of the existing hood cable release bracket - having two holes for both the hood release and the choke cable. Not as aesthetic as I would want, but fits with what I have to work with and keeps the cable runs as short as possible.

New bracket to the left, old to the right

I painted the bracket with black epoxy paint for durability and mounted it to the car.

New bracket under the dash where the old bracket was, cables installed

Now to join the cables. This turned out to be a little art as well as technical skill, so I was in trouble. I decided to use a piece if ½" aluminum bar and ½" aluminum angle to make this. The choke cable moves about an inch during operation, so I needed a clear section at least twice that to join the cables and allow them to move. I ended up cutting the bar 3" long and then attaching an angle piece on each end and drilling holes for the cables to come through. Since I'm a "steam punk" kinda guy pop rivets work fine. Here it is in etching primer prior to going in the oven:

My first try at a cable junction "gizmo", the CJG, to hold the cables and transfer the compression load of choke operation

I painted the CJG with black epoxy paint also. Since I don't have a few days for the paint to cure (okay, to be honest I didn't want to wait a few days) I put it in the oven at 130F overnight to cure it.

Attaching the choke cables to the CJG – pretty crude, but hopefully workable

Close-up of the attachment – cables held in place by nylon wire ties and then epoxy put around them. Again, Red Green tips his hat….

Inside cables soldered, barrel-clamped and in place

Of course that didn't stop me from nicking the paint when it came out, but I tried.

To connect the cables I first epoxied and wire tied the cable sheaths to the bracket, then I used a barrel clamp to hold the cables together while I soldered them. Testing afterwards seemed to show all was well.

Block Ports

Vacuum port plug before assembly

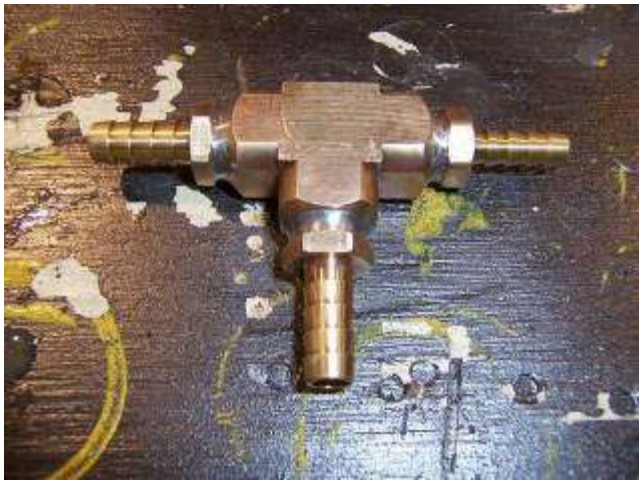
One of the last things I had to do before firing this puppy up, or at least attempting to fire it up, was to plug the vacuum advance ports - one port on each carb. The hose size was 3/16", and I had that size hose, but not a plug. To make a plug I took a short length of hose and plugged that with a piece of ¼" NF bolt that I cut off. I slotted the head so I could screw it in the hose and rubbed silicone around the threads before I screwed it in.

Overflow

Next I put on the float bowl overflow lines and ran them into the fender and by the wheel and away from the engine.

First Start

Non-Event. Pulled out choke, car started, shut down car and checked for leaks – okay, the T connector was weeping a bit, took it off and soldered it all together. Good excuse to get the propane torch out.

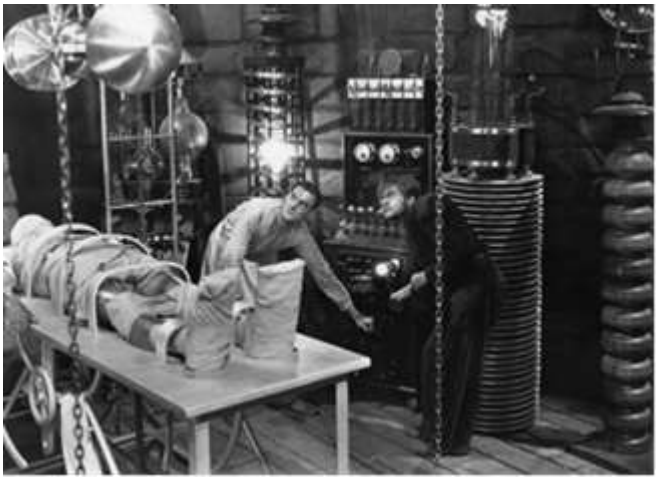


There, now it won't leak!

After the leak was fixed, and I figured out how the idle adjustor worked, I did a bit of tuning. The car is now set to idle at 800rpm warm, choke works fine, car accelerates faster and smoother and it seems more "drivable". The crankcase vent goes to the K&N air filter units and I think I actually have less stuff under the hood now.

Maybe I get a set for the TR7 next?

November 2016 - The Radicalization of a Dash



Last month I wrote about the dashes the Grey Ghost had gone through over the years. Then I realized, that was nothing compared to what the FrankenStag has gone through – almost tormented by me.

So let's head back to 2004. Later that year it dawned on us (okay, me) that we needed a convertible the family could ride in – I needed a back seat, but the Triumph choices were slim: pre-war roadster, 1800 or 2000 roadster, Herald, Vitesse, or Stag. I'm not really a fan of open fender roadsters, and Herald-based chassis cars back seats are too small, so maybe a Stag would work, but I hate working on that engine in that engine compartment.

Then Doug Braden offered to trade me his Stag (4.3L V6 with a Turbo 350 trannie) for our TR8. Alice, we have a family car! Well, it wasn't quite as easy as that – I had some engineering to do, and one of the things was trying to get all the gauges and other stuff in the dash working. First of all, let's look at a "stock" Stag dash:

Dead Stock Stag Dash, no not ours…

Nice fit and finish, plenty of wood, lots of gauges and controls. I was looking at something kinda similar:

FrankenStag Dash when we got the car

The only issue was that a lot of the lights, switches, and gauges didn't work. Some because they were not connected, some because they were broke or worn, and others simply because they couldn't (like connecting the Turbo 350 trannie to the Smith's speedo, or using the GM temp sending unit on the Smith's water temp gauge…). The parcel shelf was broke and the wiring behind it all was a real mess.

First thing I did was try to get the instrumentation working as well as a sound system, put the parcel shelf back in and clean up the wiring – I wrote about it at the time:

"I've also gone through and updated the instruments. I had to replace tach and speedo as they could not work with the engine/trannie combo the car had in it. I also went to an electric oil pressure gauge (someone had put a mechanical one in where the original clock used to be, at least they used a Smiths!), vacuum gauge, new voltmeter, big temperature gauge, new gas gauge (turns out the Triumph sender is in the right range to use the

aftermarket one). I also put in a clock that works! I moved the idiot light cluster to the side of the steering column where I might have a better chance in seeing them, chance I say… The clock will be moved to the non-functional passenger vent and another voltmeter installed that directly reads battery voltage, not the "green" wire system voltage. This has a secondary use of letting me know when I left the battery cut-off switch on."

First "fix" of the dash – this would only last for about a year

I also discovered that the reverse lights were always on. That's because they were wired to a seat belt light buzzer switch (if you didn't have belts on, and the car could move, it buzzed) rather than a reverse light. That they worked in reverse for a while was just serendipity. I put in a manual switch until I can update the shifter.

I also eliminated the driver and passenger face vents. The passenger side was broken and since the top was down 90% of the time a side vent was deemed superfluous. They made perfect clock and gauge locations. I also went with all AutoMeter gauges from Summit Racing – this would start a relationship with Summit that still gets me catalogs today…

You will note that I took out the busted glove box and mounted a cassette deck in the glove box front. I also added a CD player on a vibration mount. Ugly, but worked. I think I had it in this configuration for over a year until I decided to actually put in a shifter that would work with the Turbo 350 trannie and tell me what gear it actually was in. I also put in an AutoMeter speedo that allowed you to calibrate it and matched the GM trannie.

Close-up of dash – note where I put the radiator fan and fog light switches – under a smaller tach where the old tach went.

So, next summer came and I finally decided to solve the sloppy shifting (the Stag shifter was mated with the GM trannie – what would you suspect would happen…) by putting in another shifter.

Goodbye central shifter, console, and dash parts!

I chose a B&W Hammer Shifter which meant the center console had to disappear - the B&W has its own console. That meant I had to find a home for the stuff that was in the center console, about three switches, and the heater controls. To have a reliable shift into reverse and know what gear it was in was worth it. For the heater I eliminated the hot-cold valve and just left the choice of air movement to defrost and warm feet. I moved the window and interior light switches to a small wood panel mounted to the center bottom of the dash along with the heater fan switch. I replaced the small tach with a bigger one to match the speedo. I also replaced the Cassette deck with a CD one and moved the switches that used to be under the tach to left of the radio. The wood glove box front started to fall apart at this time (bad glue for that plywood??) so I made a new panel

from plywood and covered it with black vinyl and screwed it in place.

Next iteration of the dash showing the black vinyl radio/switch panel

This dash lasted about another year. I then was trying to update some cooling fan operation in the engine compartment as well as clean-up some engine wiring. Attempting to trace the wiring under the dash I ran into the rat's nest of wiring which was the result of three prior owners and myself. I decided it was time to make these wires neat, and to get to the wires I had to take the dash back apart (note that at time I was using a TR6 heater box rather than the Stag one). Here is where the narrative picks up:

"Next thing to do was to start putting the dash together. I made a decision that I wanted to get a glove box again as well as move the cigarette lighter (aux power plug) to the dash. This meant I had to do something with the radio and switches I had there in place of the original glove box. I also wanted to get rid of the ugly panel I put under the dash for the power window and interior light switches. But where to put it? Hmmm, no Stag heater, no vent function, so out came the center console vent and in went a switch panel, covered with a vinyl that matched the car color.

The toggle switches are all lit so you know when something is on. Now to get a plaque made up that says what these switches are! I know, but others need to.

Staring at the instrument cluster, it was time to fix this. Duplication and ugliness. I mounted the idiot light cluster back in it and took out one of the voltmeters. I also got rid of the non functional brake warning light and the non functional rear window heater switch, the wires to run these having been corrupted by a prior owner. Off came the high temp light – another thing not working, and I got rid of the hazard flasher switch light (like I don't know where that switch is…). I then modified the instrument cluster wiring harness so it was using the right number of the right wires to do its job, writing down what I did. I probably got rid of another mile of wiring. I also switched the instrument lighting to LEDs rather than bulbs – something I'm gradually doing all over the car. Prior to this I decided to cover the less than stellar dash wood with more of the green vinyl. Result looks very "roddish…"

The dash torn apart to get at the wiring harness

Now to work on replacing the idiot light bulbs with LEDs – since they don't make LED lights in that miniature screw-in base I'm going to have to build my own, which is why I bought a spare cluster off ebay…

Where the glove box was a CD player is, or I should say was. I had yanked that to put in a home-made glove box – now to put some gloves in it. Next to it I put in two aux power plugs and arranged a stereo jack so the output of an MP3 player could be fed into the amplifier. I left in the clock, but I re-did the panel behind it in vinyl. I put back in a short control cable for the heat/defrost selection. As much as possible I used green, or green paint. I've got the theme going…

New Center Dash Switch Panel

An interesting thing during this reincarnation of the dash was the elimination of the radio. This was when I started using MP3 players and phones that had music functions with a remote-mounted stereo amp. Where the radio was I put in another glove box – more a "cubby hole". And a great one it was since when I accelerated everything flew out of it. Hadn't seen that coming!

Okay – next reincarnation of the dash. Switches moved to the center of the dash, and all dash panels covered with green vinyl rather than wood and vinyl combo it had been

Another view of the dash at this stage. Note the air direction "T-handle" switch in the dash next to the glove box…

It stayed like this for quite a few years. In the summer of 2012 when we replaced the V6 with the TR7 drivetrain I had to completely rewire the engine compartment, so that meant the dash came out again and I had a chance to update. I went whole-hog. I noted that in the article I wrote at the time (below).

Dash back out again as part of the engine swap of 2012

"Officer, I can explain!" It's very simple. I wanted two wiring harnesses going forward from the dash. The left (driver) side one was going to be the engine harness, the right side was going to be the front lights' harness. To do that meant I needed to relocate the wires that run from the left side of the dash to the front (turn signal and parking light) to the right, and the engine wires in the right (basically the starter power wire) to the left. Oh, I also wanted to minimize the number of wires in the engine compartment so things look clean. To do this right meant I had to rip apart the dash wiring harnesses.

For those who have never redone wiring harnesses, re-running wires, cutting wires, making the connections with solder and shrink wrap, etc. takes time – let me rephrase – doing it right takes time. Plan on spending some quality time in the garage and going through a few nylon wire ties.

New dash instrument cluster being wired up – note I was still using the original wood one covered with vinyl.

While I was at it I made a few modifications to the modified dash to eliminate superfluous stuff:

Eliminated oil pressure gauge *– face it, you have the gauge there to tell you of a failure rather than to look for trends, but a light and a buzzer does that much better from a human factors point of view.*

Eliminated Speedometer *– If you are good, you can calibrate RPM to speed within gears. If you aren't good you can use the GPS as a speedometer. I can do both.*

Eliminated vacuum gauge *– I can hook one up in the garage if I need to for trouble-shooting rough running.*

Eliminated clock *– see the GPS argument, oh yeah, the iPod "sound system" has a clock also…then there's the cell phone…*

Eliminated cubby hole *– all that was good for was dumping its contents on the passengers lap under acceleration, and all I ever put in there was the owner's manual and sunglasses.*

Dash just before the TR7 engine was put in the car

Shot of the dash showing better the "cleaner green" look

I kept the 12V power outlets and everything in the center switch cluster. Doing these mods, as well as making the battery power connections under the right side of the dash and eliminating the separate headlamp relays (since I was both reducing the number of lights and replacing the illegal 100/80W H4 bulbs I had been using), meant I got rid of a lot of stuff from the car.

I updated this further in the Spring of 2013. I was tired of the chrome (or fake chrome) surround of the AutoMeter gauges, so I replaced them with a row of smaller black VDOs and the idiot light cluster. The air direction selector and fan speed was moved to the fan (and accessed by just reaching under the dash) and the emergency flasher moved to the switch panel. The original instrument cluster wood piece had to go and a vinyl-covered aluminum one was used instead. This is how the car looked from 2013 to about three weeks ago (although I put back in an FM radio/SD card player later in 2015).

Backside view of the updated instrument cluster using a aluminum sheet to mount them in. This actually was a shot when I went to replace it since the contact adhesive was letting go along the edges…

In September of 2016 I went back using a Stag gas tank (Thanks Ted & Eden!!!!) so I couldn't use the VDO gas gauge, using an early 70's Smiths gauge instead. To install this (and to eliminate a separate set of USB ports I put in the car in 2014) meant that the dash had to come out again. I also found out I was out of sheet aluminum, but I was not out of Plexiglas, I had a lot of that. Perfect!

See-through dash. Now I can see the smoke coming from the wires before it come out from under the dash!

What was better for The FrankenStag than a see-through dash? Nothing, that's it! So I made new dash inserts, including the top grille (where the GPS that I use as a speedo is mounted). Results were interesting, fitting the character of the car almost perfect.

Oh the nakedness of it all!

Of course the best part of this is now I can replace the white under dash courtesy lights with green LED strips at the top of the dash. Awesome!

Perrrrfect – green glow at night from under the dash…

Oh, almost forgot!

While I was at it in September I put back in a normal trunk floor and obviously re-arranged the spare tire mounting. Nice to have a flat-space again in the trunk.

Back to the normally cluttered Stag trunk with a flat floor…

Hat's off to Ted and Eden for finding the parts for me, thanks!

December 2016 - Bruce Clough

Now available – the (in)complete compendium of all knowledge: Stag Engine Rebuilding Rules

I found these while cleaning up files for my forthcoming book "*Life with the FrankenStag*" which should be published sometime in the next 140 years. Anyway, this guy named Stan, not OUR Stan, or at least I'm thinking not, wrote these at least prior to 2009. Caveat emptor since some of these I've not experienced. No, I have no idea where I got this – maybe Ted Allison? Anyway, here goes…

Well, the Stag engine rebuild is finally complete and is back in the car and running. Reflecting on this 2 year ordeal, I'll pass along some lessons learned when trying to accomplish this in the States.

- Be wary of machine shops. I went to what was touted as the best in Portland only to discover that they reversed the orientation of the connecting rods to 3 pistons, lost the oil passage grub screws, failed to install 2 freeze plugs and installed 2 others so poorly they leaked badly and had to be replaced.
- Replacement grub screws with an Allen head top can be found at ACE Hardware in the States in several lengths and with the proper fine threads. 3 cost less than a buck. Always use RTV sealer when installing the screws.
- Never use anything but brass freeze plugs, much easier to remove if they leak. And always apply RTV gasket sealer to both the hole and the plug. NAPA stocks the correct freeze plugs 1-1/8" stamped part number 1135 appears on the inside.
- Just because something's leaking at the rear of the engine doesn't mean that's where it's originating. With the slope of the engine, water and oil will flow to the back. Thanks to all you guys who pointed this out to me when I thought I was going to have to pull the engine.
- Be wary of using a water pump rebuild kit. The kit I got was supplied with a sleeve and pvc washer already installed that went to a Saab! Even after discovering this and taking the sleeve off, the seal would not press into the brass basket. If it doesn't leak, I'll leave it alone from here on.
- I'll swear by E-Zlok threaded inserts (www.EZLok.com). Worked like a charm on my head for the exhaust manifold bolts. These don't require any kind of special installation tool, only a properly sized drill bit and tap; provide a steel thread to bolt into; and held the torque without pulling out. I contacted E-ZLok about local sources and got mine from a local hardware store in Portland for about $2 apiece.
- Yes, you can cut an exhaust system apart! A prior owner had welded the exhaust pipes and mufflers into a single unit. I had to cut these apart to get the transmission and drive shaft installed. The dilemma was how to hold them together on reinstall. Home Depot carries a stainless steel band clamp around a rubber gasket for household plumbing lines 3" wide with two aircraft fittings in their plumbing supply section. Just loosen and remove the rubber internal gasket and this baby tightens right around both cut ends pulling them into alignment with little blow-by. The bands cost less than $5 - about 1/3 what they sell for in the racer catalog if you could get the right size (you can't).
- You don't need to buy all the water hoses as a set. I bought a replacement for the curved water hose at the rear of the engine for less than $10 by taking the old hose to NAPA and having the counterman match the curve against his stock hoses. Cut off what you don t need and clean up the ends on a grinding wheel if they're ragged.
- ACE Hardware carries a variety of T fittings and connectors with differing end sizes that I could buy as individual pieces (not a bubble pack) and return what I didn't use after I wrestled the vacuum and fuel line connections into submission.
- Saving the best for last. I will always take my business to Chinook O-rings and Seals (www.chinookor.com). While they have a $5 minimum, I was able to find O-rings to seal the cam cover nuts (and got extras) and one to replace the seal on the distributor base (and got extras) for the minimum since most o-rings are priced much less than a dollar. They took the time to mic the old o-ring, the depth of the land

and the o-ring expanded diameter after being trial installed on the distributor.

Cheers! Stan

Hmm, looks like Stan learned a little about a few things along the way. Let me add more:

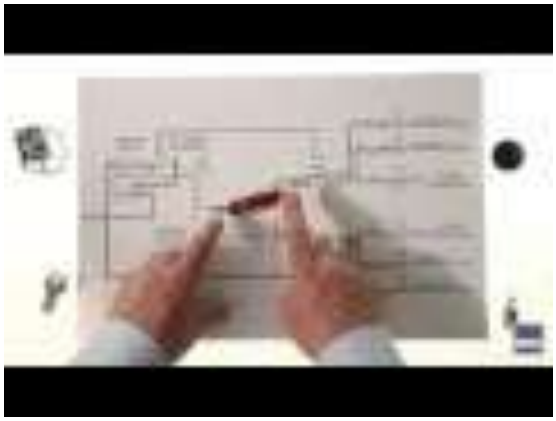
1. **Read the Repair Operations Manual** – understand how the engine works and what the parts are for. This allows you to have the inkling that "something ain't quite right!
2. **Learn geometry**. With an engine that has non-parallel head studs and bolts the geometry just becomes a bit more interesting when you deck things.
3. **Look at things before tearing into them**. Look at the goes-insas and the comes-outsas and the attachment points. What might interfere with the operation? What else has to come off, or where can't you get your hand into?

What's in a diode anyway?

If you were on the Little Miami Valley Tour when we were at The Workshops of David T. Smith you might have seen this scene:

This was Tim and Jeff discussing the need for ballast resistors for LED turn signals with John Coutant and myself. John and I were in disbelief that they needed to add ballast resistors to the turn signals to get the LEDs to work correctly, but Jeff and Tim said to go visit the Moss Hands.

So I did, I visited the Moss video explaining why ballast resistors are needed.



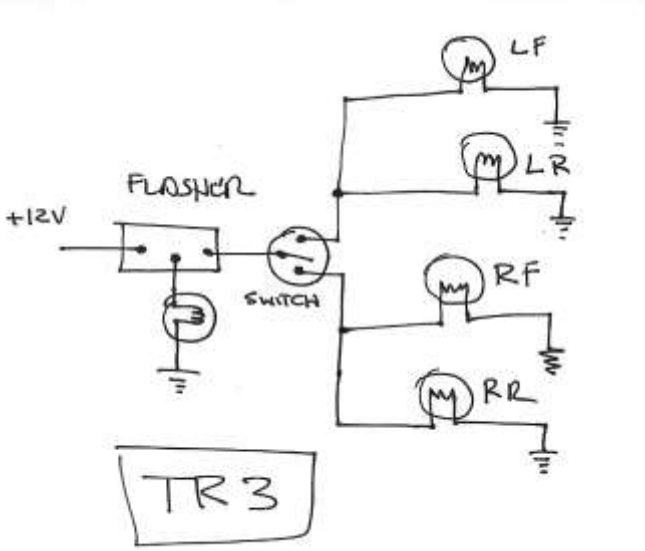
Moss Manos!
https://www.youtube.com/watch?v=auLY6lYeqcI

I learned something.

So let's go back to the beginning. If you have been reading my posts, as well as others, you know I am a big fan of LED lights (Light Emitting Diodes, relatives of transistors and integrated circuits) since they are bright, run cool, have lives measured in 10,000's of hours, and use much less power than normal bulbs.

However, there is a cost. A real cost – LEDs are much more expensive than incandescent bulbs, they have polarity (they have + and - sides that don't swap), and the turn signal LEDs required you to buy an electronic flasher since the old-style flashers don't work. But..but, once you have them installed you probably won't have to touch them for the rest of your life, or at least car ownership.

Okay, so what was going on with our argument? Simple, we were assuming a turn signal circuit such as our TR3's:

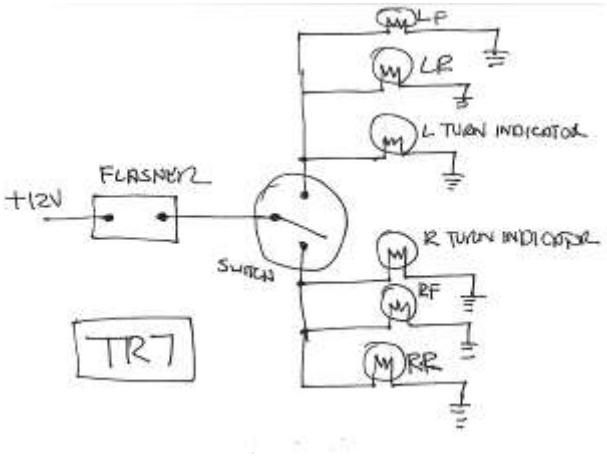


TR3 Turn Signal Circuit

When you make contact with the turn signal switch either the left or right set of lights come on and activate the flasher. The light below the flasher is the turn signal indicator – just one light – that comes on and flashes for either direction. Note that the turn signal indicator light has its own ground.

You can replace the flasher with an electronic one and replace all the turn signal lights with LEDs and the circuit will work the same way.

The later TR's and Stag are similar (or so we thought), just adding another turn signal indicator light so the driver knows which turn signal is on. That circuit looks like this:

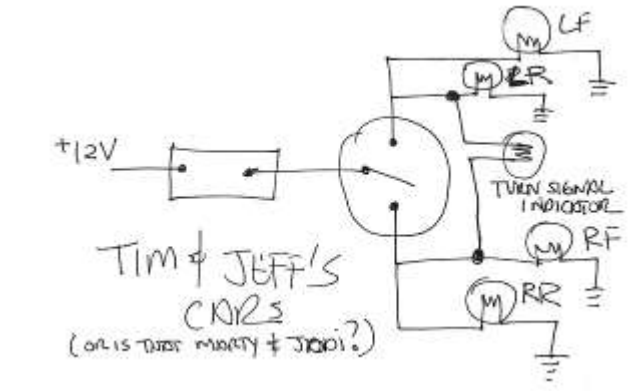


TR7 Turn Signal Circuit

The only differences between the TR7 and the TR3 (okay, so there is an emergency flasher that makes it a bit more interesting, but this simplification is good enough here) are the two indicator lights and the deletion of an indicator terminal on the flasher. So why won't TR6's and Spits work?

Simple, the circuit is different!

In some Triumphs this is the circuit for the turn signals:



T&J's Turn Signal Circuit

The turn signal indicator is across the outputs of the turn signal switch. When one side is selected the other side acts as a ground for the indicator light (the resistance of the turn signal bulbs used as ground is a lot lower than the turn signal indicator, so they do not light up). Why did Triumph use a different circuit in different cars? Probably cost – I can explain it to you if you buy me a beer.

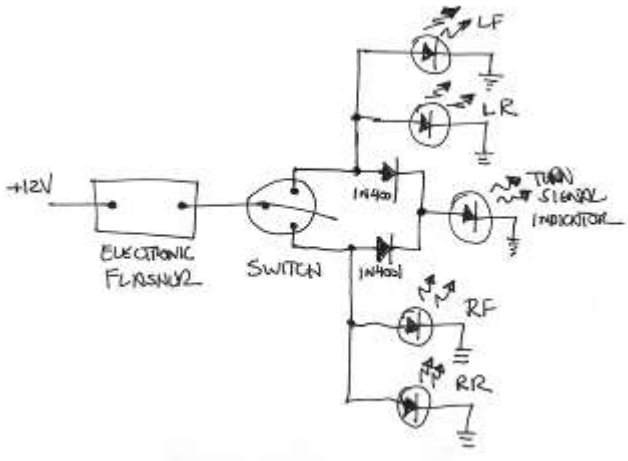
Anyway, this mucks up using LED turn signal lights since their resistance is much higher than the turn signal indicator, so the indicator looks like a straight wire to the LEDs, effectively a short, so when you use the signals all turn signal lights flash and the indicator does not. This isn't good!

The ballast resistor kit adds a resistor to the circuit in parallel to the turn signal bulbs on each side – two resistors are needed, each one runs to ground. This lowers the effective resistance to ground the turn signal indicator sees so it lights up as well as keeps the LED lights on the non-used side from lighting, but also allows the LED turn signals to work when that direction is selected.

The hands were right, which is a big thing for a left-handed guy to say.

So, due to cost considerations you TR6 and Spit owners have to add resistors while the rest of us bask in LED glory, or something like that.

But you can have it good also – a diagram to explain:



The diagram to Explain

Here I've shown the incandescent bulbs replaced by LEDs. I have added an LED turn signal indicator fed by an IN4001 diode connected to the output of each side of the turn signal switch to replace the light across the switch outputs. This will take a bit more

wiring but is the preferred Cloughian solution to the situation.

The Last Of The LEDhicans

Okay, bad title, my apologies go out to Mr Cooper, but I had to come up with some kind of catchy title for my segment on the replacement of the last incandescent bulbs on The FrankenStag..

Background

Over the last 5 years I have been replacing all the incandescent bulbs in the car with LEDs and had them all replaced except the headlamps as of two years ago. At that time there simply wasn't any decent 5.75" LED headlights available under $500 each.

Existing headlights – the one on the left is the "real" headlight using Halogen H4 bulb. The inner ones are daytime running lights now and come on with the ignition

Work

Times have changed, now everyone wants one for their motorcycles and the costs have dropped to $60 each (with shipping). There are about 4 styles out there and getting the specs is important. I went with a pair that indicated they had the same luminosity as the original H4 bulbs (okay, not original to Stags to begin with since they had sealed beam lights).

LED bulbs 5.75" Diameter – uses four individual LEDs to produce the light

These bulbs are a bit different that the halogen ones in several ways, not just the light source. Probably the most significant way is in the back-side dimensions due to heat sinks.

Although LED light produce much less heat, the light sources themselves do not like much heat at all. Halogens revel in heat – the hotter the better the halogen process works. Not so much LEDs – LEDs like it cold, the colder the better, so the designers need to build heat sinks into the lights, and those big aluminum fins are on the back of the light…

…and those fins are too deep to fit in the standard 5.75" headlight bucket.

Easy, just cut away the headlight bucket so the fins can stick through the back. Not so fast – The FrankenStag has Rimmer Brothers headlight buckets on it made of injection molded plastic. If you cut away the headlight bucker bowl the remaining plastic ring does not have enough residual strength to hold the light. Now, if I had original steel headlight buckets those would have enough strength, but where do I get original buckets? Parts suppliers? Nope – all plastic. Ebay? None available as far as I can see. Craigslist? Nationwide search found nothing except a few whole cars (I do not need a whole car…).

I called up Ted Allison. Ted had parts, too many parts. He will make you deals, but you have to take the parts. Anyway, Ted found a set of headlight buckets in one of his piles. (after he tried to get me to take a whole car – smile)

Ted's Treasures

A quick inspection showed that one bucket could be used right away with a bit of cleaning, the others would need work, in fact, it took the remaining three to make one good one (the inner and outer buckets were different in adjustor design and were not interchangeable (and the plastic adjustors of the inners were busted anyway), the single "hard mount" of the headlamp seating ring was also different between the outer headlight buckets and not interchangeable – GO FIGURE.

Okay – the first step here is to disassemble the headlight bucket. The light mounting ring is attached to the bucket itself by two threaded bolts (the adjustors) and a single fat split-pin that had a hard thick rubber washer on it (a pivot point for the adjustment). With a little light oil the adjustors came apart and the split pin was removed.

Condition of the adjustors – not too bad, just needed a bit of oil.

The last step is to push out the wiring which is held in the bucket by a big grommet-plug where the wiring comes through the bucket. I pushed it out with a small screwdriver. Now comes the fun.

Right at the point where the cupped part of the bucket meets the flat bucket mounting ring you need to make a cut all around the bucket. This separates the flat mounting part which you need, from the bucket part that was hitting the cooling fins on the LED light. Good luck holding this in a bench vise. I found out that if I was careful – and made a lot of adjustments to the vise and part I was cutting – I could make the cut with a hacksaw You have to be careful not to apply too much pressure or you will bend the metal, but not enough pressure and it pops out of the vise. After a few minutes I had the bowl cut off.

Next I compared the hole to the back of the LED headlight and used a pair of angle-cutting tin snips to make the opening a bit bigger in places, then into the vise for eliminating burrs due to cutting via filing.

Next I made sure the headlight adjustors on the mounting ring were lubricated and functional. Screwed the adjustors into their receivers and put the split-pin and rubber pivot point back on.

Trial fitting the LED lamps to the mounting ring I discovered that the little tab on the light to locate it on the ring, and the available notches for tabs, were different. I expected nothing else. Grabbing the tin snips again solved this problem. One good thing was once that tab was located the chrome headlight securing/trim ring fit perfectly.

Not so much mounting to the car. The existing hole in the front valence didn't fit the lamp heat sink fins. I scribed what needed to be removed and tried to enlarge the hole using tin snips, but getting to the hole has impossible around most of the circumference. On one side I ended up breaking the job into small radial cuts with the tin snips then fatiguing each tab off with pliers, but on the other side I simply bent the metal over using offset pliers. On both sides I touched up the paint to cover bare metal exposed by the operation.

Finished headlight mounting support mount ready for the headlight mounting ring to be attached.

After all this work was done mounting the lights was anti-climactic. I used the three-wire plugs from the old headlight buckets to attach to the plug connectors on the car. Mounted the lights, and made a guesstimate on aiming which I now have to hone in by driving at night.

The Result

LED headlight mounted and ready to dive – the DRLs are the inner lights, or the one to the left as you look at this

The lights have a decent flat, white, light pattern, but are not as bright as the Ultra-Star Sylvania H4s they replaced at low beam and the high beam adds just another LED and really not that much more light – just another bit of light straight ahead. However, the light is adequate for driving and eliminates the last energy-sucking incandescent set of bulbs in the car!

LED headlights mounted in car – thanks Ted for the headlight buckets!

Now for the DRLs

DRLs

See, I told you it was now time for the DRLs!

I'm a fan of daytime running lights, otherwise known as DRLs. I think I've waxed on that before, but they really do catch your eye and say that "something's there". After the last go-round on LED lights in the FrankenStag a few years back I settled on using 40-LED towers in the inside pair of lights as DRLs which are triggered by the ignition coming on. These are not as bright as I'd like, in fact, not bright at all, and I'd like to get rid of the "Bimmer Ring Light" around the outside of the lens. So I did what all good MVT'ers should do.

I went to ebay.

So for not a lot of $$ I got a set of smoked 5.75" headlights, as set of clear headlights with fluted glass, and three different LED bulbs – all inexpensive, all from China.

1 - "White H4 9003 HB2 60W SAMSUNG 2323 LED Fog Light Bulb High Low Beam Headlight" - H4 LEDs using 12 supposedly really bright Samsung LEDs using conical mirrors to deflect the light out into the headlight. Pair was $10 including shipping.

2 - "H4 9003 HB2 HID White 80W CREE LED Bulbs Car Fog DRL Driving Light Headlight" - 16 LEDs in another H4 bulb. "80W of power" – whatever that means – no way this takes 7 amps. Pair was $10 including shipping.

3 - "Aluminum 60W 6000LM H4 LED Headlight Kit Beam Light Bulb Hi/Lo 6000K Head Light" - the most powerful – high and low beam dual LEDs on an aluminum heat-sink pedestal with big aluminum heat sink behind it and separate power conditioning module. This was expensive - $20 a pair including shipping.

Pictures of LED Bulb 2 and 1

As I suspected **Number 1** wasn't even as bright as what was on the car already. **Number 2** was brighter, but both had the issue that there really wasn't a high/low setting for these – only the high beam connector spade was connected to the LEDs, so you get high beam or no beam. **Number 3** was much brighter and had real high-low beam capability (except the LEDs were upside down and had to be rotated 180 degrees to work right – what do you expect for $20 shipped from China…).

As far as lenses, the "smoked" lenses should be marketed as "black" lenses only. Almost all the light is attenuated. Maybe I can use them as planters or weird vases…The fluted clear lens headlights seem to be fine.

Number 3 LED in front of clear fluted headlight. This is before I rotated the LED stalk and bent the flange. $20 is about right…

Installation was not straightforward. As I already stated I had to rotate the LED stalk 180 degrees for the right LED to illuminate the right part of the reflector. The screws that held the LED stalk to the flange that fits into the headlights do not line up with the holes when rotated, so I have to rely on the wire securing lugs to hold it in – look like they can.

I next had to bend the bulb flange up around its circumference so the bulb would fit into the headlight.

Finally I had to cut the back off the headlight bucket bowl so the heat sink fins would fit. Good thing it's plastic – easy cut.

Finally had everything ready and put them in and tried it out – the low beans come on with the ignition, and the high beams are slaved to the high beams on the outside lights. Seems to work well - we shall see.

I have no idea if this is useful, but I use it

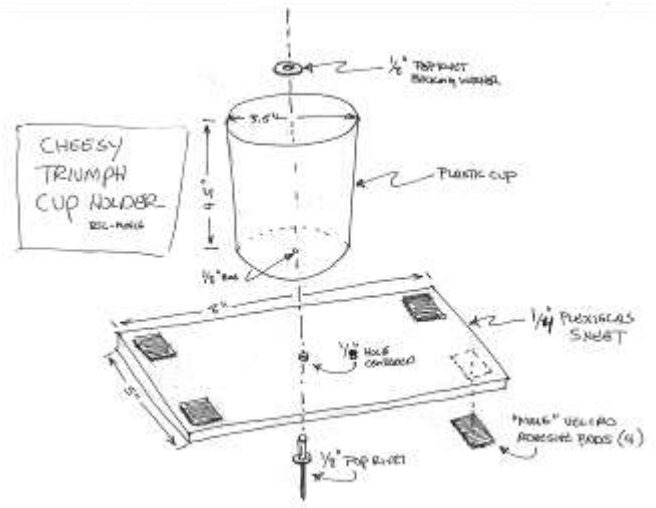
John Coutant and I were comparing cup holders on the Little Miami River Tour and he thought that what I was using the The FrankenStag was pretty simple and effective, so I thought I's share it.

Triumphs don't have any stinkin' cup holders. One hand is on the wheel, the other is on the shifter, period. Well, that doesn't jive with a modern coffee drinker – we need to have cup holders. But where do you put it. I believe many folks sell cup holders that either screw or stick into your door, or maybe stick to you center console, but those get in the way and leave some kind of attachment mark/hole if you pull it off. I needed something that didn't require a hole, or double-sided tape and could mount where I could get to it as well as put the cup into it while looking at the road.

Oh, also I needed to be cheap.

While I was cleaning the kitchen and wondering why we had soooo many plastic cups it hit me. Why didn't I think of that before? Pop rivet one of these cups to some kinda flat plate and then use Velcro to attach the whole thing to the floor carpet between my knees. I could reach it, it was simple, and it was cheap.

The cup I grabbed was able to hold my favorite thermos cups as well as soda cans, I found a piece of Plexiglas to mount it to (left over from all my dash fun), and we had plenty of Velcro in the quilting workshop. The below drawing shows how it goes together. The pop rivet is ½-inch long 1/8" aluminum.



Cheesy Triumph Cup holder

So far we've had the cup holder two summers and it's worked well. I'm thinking it's about time to get new

Velcro pads since the ones now have a lot of carpet stuck in them and do not stick well. I have compensated by making sure the footwell mat is over the top of the plastic pad which helps hold it in place.

Yep, cheesy, but functional.

"If the women don't find you handsome at least they'll find you handy" – Red Green

Replacing Quarter Vent Rubber

Stags have a neat thing that other Triumphs don't, the little triangular quarter windows that you can open. Great for days that you want some air, but don't want the top down.

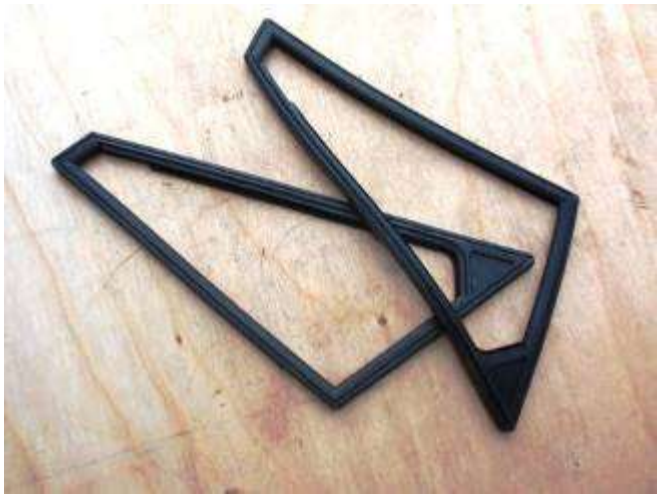
Stag Quarter Vent Windows

These are sealed with a molded rubber seal that fits into channels on the window frame. Needless to say after 43 years the rubber is kinda brittle, cracked, and looking ugly. They leaked, and pieces of runner broke off and hit occupants!

Cracked, broken and HARD quarter seal

Never fear, RobSports, Rimmers, and other Stag parts suppliers in the UK sell new rubber. I bought new rubber. Time to put new rubber in!

I shopped a little bit, and for these it looked like ebay was the best value, so I bought a set from Robsport International (https://robsport.co.uk/). They showed up on the doorstep a week later and are nice and soft and pliable.



Nice and soft and pliable

To replace is essentially a story of brute force and violence and then Vaseline and patience. The windows themselves are just held in by two screws – remove these on the top and then the window slips out of a slotted shaft (the shaft that rotates on opening) on bottom. Easy, peasy. Old seal, not so much…

Getting the old, hard, brittle rubber is a job for shot, smaller screwdrivers and needle-nose pliers. The screwdrivers allow you to lever-out the old rubber. It will not come out in one piece. Nor two or three. Try about twenty or so. You then need the pliers to get the residual pieces out of the channel.

Old Seal, passenger's side after removing

Now comes time to put the new seal in. Get some Vaseline and a small rod – I used a blunted, curved awl. Starting at the top side of the solid triangular section, Vaseline the part that sticks in the runner, stick the back side in, then push in the front with the side of the awl. Push the triangle piece down over the shaft and then work the seal back up to the top, then down the back side, and then finish the bottom. Use enough Vaseline to get the rubber slippery – you can wipe it off later. After a while you are ready to push the last rubber piece in.

Last piece of the last seal going in

Both seals are now in. They don't fit as well as I'd like – they are not exactly the correct size, but close enough I'm not going to complain!

Tools Explained

DRILL PRESS: A tall upright machine useful for suddenly snatching flat metal bar stock out of your hands so that it smacks you in the chest and flings your beer across the room, denting the freshly-painted project which you had carefully set in the corner where nothing could get to it.

WIRE WHEEL: Cleans paint off bolts and then throws them somewhere under the workbench with the speed of light . Also removes fingerprints and hard-earned calluses from fingers in about the time it takes you to say, 'Oh sh--!'

SKIL SAW: A portable cutting tool used to make studs too short.

PLIERS: Used to round off bolt heads. Sometimes used in the creation of blood-blisters.

BELT SANDER: An electric sanding tool commonly used to convert minor touch-up jobs into major refinishing jobs.

HACKSAW: One of a family of cutting tools built on the Ouija board principle... It transforms human energy into a crooked, unpredictable motion, and the more you attempt to influence its course, the more dismal your future becomes.

VISE-GRIPS: Generally used after pliers to completely round off bolt heads. If nothing else is available, they can also be used to transfer intense welding heat to the palm of your hand.

OXYACETYLENE TORCH: Used almost entirely for lighting various flammable objects in your shop on fire. Also handy for igniting the grease inside the wheel hub out of which you want to remove a bearing race.

TABLE SAW: A large stationary power tool commonly used to launch wood projectiles for testing wall integrity.

HYDRAULIC FLOOR JACK: Used for lowering an automobile to the ground after you have installed your new brake shoes , trapping the jack handle firmly under the bumper.

BAND SAW: A large stationary power saw primarily used by most shops to cut good aluminum sheet into smaller pieces that more easily fit into the trash can after you cut on the inside of the line instead of the outside edge.

TWO-TON ENGINE HOIST: A tool for testing the maximum tensile strength of everything you forgot to disconnect.

PHILLIPS SCREWDRIVER: Normally used to stab the vacuum seals under lids or for opening old-style

paper-and-tin oil cans and splashing oil on your shirt; but can also be used, as the name implies, to strip out Phillips screw heads.

STRAIGHT SCREWDRIVER: A tool for opening paint cans. Sometimes used to convert common slotted screws into non-removable screws and butchering your palms.

PRY BAR: A tool used to crumple the metal surrounding that clip or bracket you needed to remove in order to replace a 50 cent part.

HOSE CUTTER: A tool used to make hoses too short.

HAMMER: Originally employed as a weapon of war, the hammer nowadays is used as a kind of divining rod to locate the most expensive parts adjacent the object we are trying to hit.

UTILITY KNIFE: Used to open and slice through the contents of cardboard cartons delivered to your front door; works particularly well on contents such as seats, vinyl records, liquids in plastic bottles, collector magazines, refund checks, and rubber or plastic parts. Especially useful for slicing work clothes, but only while in use.

SON-OF-A-B*TCH TOOL: (A personal favorite!) Any handy tool that you grab and throw across the garage while yelling 'Son of a B*TCH!' at the top of your lungs. It is also, most often, the next tool that you will need.

Hope you found this informative.

June 2017 - Bruce Clough

Butt Holders & Brakes

Interviewer: *So, tell me Bruce, why are you changing out the seats, again, in The FrankenStag?*

Bruce: *We've had this car since Summer 2004 and it's time to thinks about seats, again.*

The first several years we had it the seats were original. Driver's side ripped, both sides side bolstering foam gone, bottom diaphragms rotted out, they looked okay from ten feet, but that was about it.

Phil Daye mentioned an upholstery shop in Middletown he used that he said did a good job inexpensively, so I spent $500 and had new seat covers made, installed, and foam replaced – black seat with green piping. They looked good…

..and rode bad – the "bucket" part was eliminated by piled foam so not only did you sit higher (my forehead is above the windscreen) but also you slide sideways in turns. An added bonus was the fact it changed the angle of my legs on the pedals that led to severe knee discomfort after a couple hours driving. Nice!

Interviewer: *But you replaced them, right?*

Bruce: *Well, no. Since I'm stubborn, I put up with this from about 2006 to this spring, putting 1000's of miles on the car and complaining the entire time. I finally got sick of it and decided to do something.*

I pulled up the Rimmer Bro's website and costed out new seat covers, foam, and all the strapping that goes inside the seat. Well north of $1200 for the pair, and that is without installation or shipping/duty charges.

Interviewer: *Gosh, that sounds like a chunk of change. Did you buy them?*

Bruce: *I needed to sort through my alternatives. I could buy the Rimmer kit and then have a good upholstery shop install them, but now we're looking at somewhere over $1700 for everything for the FrankenStag – putting new, shiny,stock seats into the FrankenStag. Didn't seem right.*

Interviewer: *Would kinda ruin the car, right?*

Bruce: *Yep, would shoot my creds all to Hades.*

I thought through some alternatives. I checked around for Miata seats. Needed vinyl seats, not leather or cloth. No dice. Also looked around for some TR6 seats, but all those I found were in the same shape as the Stag seats, or worse.

I also looked at aftermarket racing seats on ebay and elsewhere, but could not find black vinyl with black stitching.

Interviewer: *Did you give up?*

Bruce: *Nope, I did what all good red-blooded American males would do, I begged.*

Interviewer: *Did it work?*

Bruce: *You bet, it actually engineered a win-win.*

Interviewer: *How's that?*

Bruce: *I sent out an email to the club, MVT, asking folks if they had any old seats that they might have*

lying around that they would part with. Tim Moore let me know that he had a set of seats from who knows where that were originally in the TR250 sitting around in the garage that needed a new home, and the price was right – free. I did have to promise that I would never bring them back if I remember right. I got a pair of seats, and he had one less thing to move around.

Interviewer: *Well, that was easy.*

Bruce: *Well, not quite. The seats I got had decent covers on them, but the foam was shot.*

Interviewer: *But you should just look what they are up and find foam kits, right?*

Bruce: *I first had to figure out what they came from. Tim told me he was told they were from a GT6, so I looked up GT6 seats. These looked a bit different, so I kept poking around the Internet and determined they were from a 1970-71 Spitfire or GT6.*

Interviewer: *Great, you found it.*

Bruce: *I did, but it wasn't really great since those seats were a transitory type just used for a couple of years. Neither Moss, SpitBits, or Rimmers had any kits, or even just foam, for them. I had to contact Richard Newton's firm in the UK – they had seat foam kits for them. Took a bit of web-time to find those.*

Interviewer: *So did it take you long to get them?*

Bruce: *Nope – had them in a few days. I next contacted 2tall (Tim Krurso) and had him rebuild the seats. Took him a day or two to get them done. He had to cut the foam a bit as well as reuse some materials, but he got 'er done.*

Interviewer: *So what did you do to install them?*

Bruce: *Well, my preliminary measurements showed the track width on the Spit seats to be about 3 inches less than the Stag seats, so I would have to design brackets to hold the seats. After getting the driver's seat out I laid in the new track in the car. I wanted to design brackets that were as simple as possible and also that used the existing holes.*

Turns out that the Spit seat bottoms project lower than the tracks, so I couldn't just put a couple of metal bars across to bolt the seat to, I ended up making four brackets for each seat. Here's a picture of me sizing the inner driver's seat brackets.

Interviewer: *Pretty simple, eh?*

Bruce: *That was exactly the challenge, keep it simple and reuse holes and hardware where I could. No cutting the carpet, no new holes for bolts. Oh, you'll note in the picture the white power – that was foam crumbles from the Stag seats. - foam crumbles after one ride.*

The brackets were as simple, and inexpensive, as I could make them. This has to hold me, and I need to be able to work it using the tools in my garage, so I used wide aluminum stack straps from Lowes. They attach to the Stag seat holes, and then press into the floor inboard of the new seat rails. I pop-riveted an "L" section on the bottom to try and spare the crappy carpet as much as possible. Here's a picture of me making up a bracket – bent aluminum, bench vise, and pop rivets. Perfect:

Interviewer: *How did it work?*

Bruce: *Well. In fact, maybe too well. I am always scared when one of my fly-by-the-pants-seat designs works the first time. Here is a picture of the seat track mounted to the brackets.*

The seat attached to the bracket with two bolts, so I went ahead and put in the seat and it fit fine as shown in this picture:

Next came the acid test - I put my butt in it. It felt fine, I was inches lower, and I could extend my legs much farther.

Interviewer*: That's great, but does it really fit in the car?*

Bruce*: Well, that is also hard to judge since non-standard is the "C'est normal" for The FrankenStag. Comparing the seats, the Spit seat is narrower, back shorter, and it's about half the weight on the Stag seat. It actually was a joy to install compared to the original one. You can see that a bit better from this angle:*

It also matches the rest of the car better.

Interviewer: *Well, gosh, it does look better, but did the passenger's side give you any issues – how did it go?*

Bruce: *The only problem with the passenger side was fatigue. I was tired when I made the brackets so I made two of the same one. It actually bolted up better since I had done the driver's side first and knew what to do.*

Once I made all the brackets I took them back off and painted them satin black, it looked better that way.

Now they are back in the car and you sit lower, are more comfortable, and not covered in foam dust after a ride. When these die I can replace with more common Spitfire seats that Moss does sell covers for. Here's another shot of them in the car.

Interviewer: *So what happened to the old seats?*

Bruce*: The Internet is a great place – I posted on the VTR Facebook group page that I had free Stag seats and the world beat a path to my door – gone in less than a day. Here is the picture I posted – they look*

good, but I did tell folks of the travails they would face getting them

Interviewer: *Well, thanks for letting us into a little of your life, thanks for sharing!*

Bruce: *It was a pleasure. Hey, do you need any old Stag seats?*

Interviewer: *Let me think, NO! So, changing the subject a bit, what do you think of brakes?*

Bruce: Brakes?

Interviewer: Yeah, didn't you have a brake issue?

Bruce: Well, yes, I did have a little issue, nothing that cash couldn't solve. See, I was at the Market Car Show and Steve Miller of MG Automotive was looking at The FrankenStag and noticed that both sides of the brake fluid reservoir were almost empty.

Interviewer: Not good, eh?

Bruce: Not at all, Going is optional, stopping isn't. Fortunately I had a full bottle for DOT 5 in the trunk and topped off the reservoir. You know, it's always a good idea to carry extra brake fluid with you in these old cars.

Interviewer: So both brake circuits lost fluid?

Bruce: Yeah, which means I either had a simultaneous failure of brake lines or calipers and or cylinders, or the master cylinder failed.

Interviewer: But you had to get home first?

Bruce: Wasn't too bad – the parking brake on The FrankenStag works fine and I have 5 speeds to play with, so I only had to hit the brakes only a few times heading home. If you know you have an issue you can compensate for it. On the drive home I lost negligible fluid and pulled into the garage just fine.

Interviewer: So what was the issue?

Bruce: Master cylinder failure. After 44 years it decided it didn't wat to work anymore.

Interviewer: 44 years? You had an original non-rebuilt cylinder?

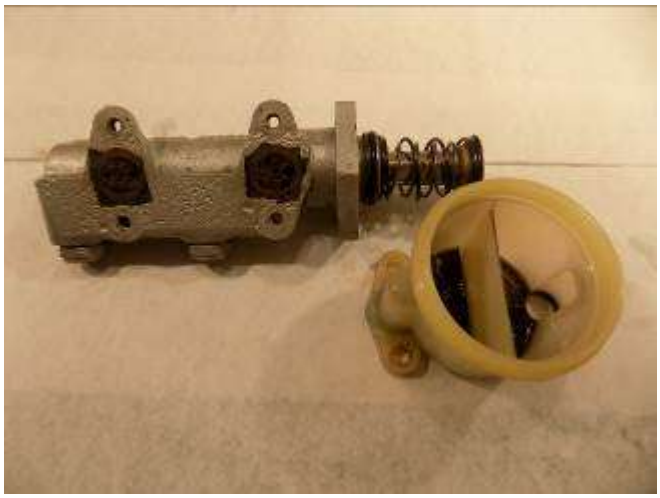
Bruce: Seems so. During the engine swap a few years back I didn't rebuild the master since the Stag factory manual does not have instructions in it for rebuilding them. That is sending a message, so all I did was clean the exterior, run a lot of clean fluid through it, and mount it back on the car. It was working fine then. Obviously, it has reached the end of its service life.

Interviewer: Are you going to rebuild it?

Bruce: After doing some research, no. Rimmer sells new Lockheed units at a reasonable price, so I'm just going to replace.

Interviewer: What was the failure?

Bruce: Not absolutely sure, but it seems like internal seal failure. I tried to do some forensic investigation, but could not get the master cylinder apart easily. The reservoir came off quick – here's a view of the cylinder out of the car.



The crud in the reservoir was amazing.

But beyond that I didn't get it much apart. The Teflon end washer was rusted into position and I decided it wasn't worth the time to dig it out. I'll save the heroics for getting the new master cylinder installed. However, I could tell by the feel that the seals were gone inside. This will go in my yard-art bin.

August 2017 - Bruce Clough

Let's Talk About Bearings

Bearings, those nice round things that let your wheel go round, and round, and round. Thousands of miles, without hiccup, without failure. Last month I wrote about bearing failure in the Marque tech article, and what it looked like when Ernie Parent's bearing failed at TRA.

Got me thinking, what do the bearings on the FrankenStag look like? I replaced all the bearings back in the fall of 2005 and checked them a few years later. It's been a while, so maybe it's time for a check.

Pulled the car into the center of the 2-car bay and chocked the rear wheels as well as had the parking brake on and the car in gear. It ain't going anywhere.

Well, first thing to do is to loosen the lug nuts before jacking the car. I only had front tires to take off. Lug nut size is 7/8". You do this before raising the car to make it easier to turn the nuts. You can try it once the tire is in the air, good luck with that – I suppose if you had another person to stand on the brakes it's doable. I do this one side at a time so I don't forget they are loosened.

Number two is jack the car. On Stag's the jacking points are denoted by a steel post on the underside of the rocker panel both front and rear. This post is for marking the jacking point as well as making sure the jack doesn't slip off during use. The one issue is if you are using a floor jack it doesn't have a hole in it.

Fixed that.

Years ago I made a couple of specialty wood blocks that fit over the post and allow a floor jack to be used. I actually found them the first place I looked for them. Stange.

Wood Spacer/locator block in place on the FrankenStag

As always once the car is in the air I have multiple support points – jack, jack stand, and I also push the tire taken off under the car. I do not want it to fall on me!

Jack, Jackstand, and Tire under the car. Think life.

Tire is off, now to remove the hub and check bearings. To remove the hub you must first remove the caliper. To my surprise the caliper bolts were not that tight – once out I checked the lock washers – they looked good, hmmmm. They were not loose, but they were not as tight as I would have expected. I'll fix that later…

Once nice thing about the Stag is that you do not need to tie up the caliper once removed – there is a little flat spot on the top of the front cross-member that you can sit it on.

Caliper with a good seat to watch the rest of the fun

Next you need to take the dust cap off the hub end. There is a little hole in the end that you can use a dent puller on to get out, or if you are like me you just carefully use a larger flat-bladed screwdriver and hammer to tap it out. One off the hub retaining nut and the cotter pin that holds it in place can be seen. Take the cotter pin off with a pair of needle-nose pliers. The hub nut should be loose enough to take off without a wrench. Take off the "D" washer (called that since it has a flat side on the hole which aligns to a flat side on the end of the stub axle, done so the washer will not rotate and wear the nut as well as put a load on the cotter pin.

Looking at the parts I took off they all look good, and the high performance grey moly-grease I used putting the bearings in years ago still is in great shape – has not liquefied any. Next I examined the stub axle. It also was in good shape – still covered by stiff grease without any scoring evident.

Next I felt the inside bearing. It looked good, it felt fine, and its grease was in good condition. I decided not to take the inner bearing out – most often the outside bearing fails first due to the greater relative loading on the small bearing size and the fact that I did not have extra inner bearing seals (seals against the stub axle) lying around.

Even though the outer bearing felt good, rolled good, and seemed not to have any excessive wear you really need to clean it off to see. This is a three-step process. First, use paper towels to wipe off grease, then dip it in some paint thinner while rotating it to force out grease inside, I then sprayed it with WD40 to force out the remaining grease. Finally, I went back and soaked it in acetone to get the remainder of the grease and WD 40 out. I also cleaned up the outer bearing outer race for inspection.

Bearing, D-washer, hub nut, cotter pin, and dust cap as they came off the car

Inspection showed the outer bearing still has a lot of life left on it. Bearing surfaces and race were in good shape.

Cleaned up outer bearing and race

Now to re-grease and get it back in the car. This means I need to find the special tool – the bearing packer!

The bearing packer I have is a simple device – two convex discs are held together by a threaded hollow tube with a Zirc fitting on one end, blocked off other end and holes in the side of the tube. Operation is simple – unscrew the top disc, put on the bearing wide side down, screw top disc back on, attach grease gun and pump until grease comes out the bottom outside of the bearing.

Bearing packer

Bearing in place in the bearing packer

Well, theoretically it was ready, but then began a bit of a fight. I got out my grease gun I had filled a year ago with good high-temp grease and a lot of red fluid dripped from it – the grease had separated. I then spent some time cleaning out the glue gun and putting in a tube of new Lucas X-TRA heavy-duty grease. Using the packer I then noticed grease coming out the top of the packer where the disc meets the threadings as well as on only one side of the bottom of the bearing. Look like something got bent and abused - wasn't me! Honest!

Well, rats, I'll have to pack it by hand. Not that its terrible doing it this way – just takes a bit more time. You work your fingers around pushing grease into the rollers from the ends.

Packed bearing

Next I reversed the taking apart sequence, but I made sure all the parts were arrayed next to me when putting the hub back on.

Parts ready to assemble next to the front axle

The reason you do this is that the hub can tend to slide off the stub axle while you're trying to fit the outer bearing and hardware. If everything is at your side it's easy to assemble.

Okay, where was I – oh yeah, I put the hub back on then used some of the grease still packed in the hub to pile up on the race. When the outer bearing was put in it will press against the grease and some of the grease will work back into the bearing.

Moly grease laid on to the outer bearing's outer race

Next the D-washer was put on, then the hub nut and hand tightened. Now to the factory manual to get the hub nut torque setting. "Tighten to 5 ft-lbs and then back off one flat." Time to get another tool out from my arsenal – the 3/8" digital torque wrench. I got this since it will torque down to a couple of foot-pounds and has a nice digital readout on the handle.

Digital torque wrench in position

Torqued to 5 ft-lbs and backed off one flat. Actually back of a bit over one flat to get the castellated hub nut to line up with a hole for the cotter pin. Installed a new cotter pin and then coated the nut with more moly grease and then put the hub dust cover back in place.

Finished!

Well, not quite, there still was the caliper to put back on.

Dust cover back in place

Getting the brake caliper back on was a bit of a fight. Whomever decided that the disc dust shield should attach to the same bolts as the brake calipers, and that the tabs for this form the dust cover would go between the caliper and the hub needs to be forced to watch old B-movies. Said a few words I hope the neighbors didn't hear, but eventually got it all back together without leaks. I also made sure the caliper

bolts were nice and tight! Put tire on, hand tightened nuts, lowered car, tightened nuts.

Other side was anti-climactic. Since all I was doing was examining the outer bearing I do not have to take the calipers off (unless I find something bad). I did not – passenger side was as good as the driver's side bearing. I cleaned up the bearing, regreased, and reinstalled. The caliper on passenger side was attached tightly.

Total time to check both sides was about three hours. A good bit of that time was used up by setting up and taking pictures (and cleaning my hands before I did) as well as repacking the grease gun and cleaning tools. Had I just knuckled down to inspect and regrease I could have done it well under an hour.

So, if you have not looked at your bearings in a while, it might be a good thing to do since it takes little time. Had I needed to replace the bearings it would have been significantly longer, especially since I do not have the proper tools to extract and install bearing races. You can do it with long drift punches and big socket wrenches, but a press and special tools are sooo much easier.

As far as spares, I will order some seals - hopefully they are the same ones used by the TR6 same vintage so I can order from domestic on-line companies. I do carry a set of bearings and probably should also carry a stub axle, although changing out a stub axle can be a pain since it's usually stuck in its socket when removing. BFG hammer time or some sort of pounding air tool…

Pile of cleaning paper towels after I was done. Those went to the burn pile since I don't put oily towels in the garbage, especially in the summer.

Sep 2017 - Bruce Clough

VTR 2017

About once every 10 years I head to the VTR National Convention. I'd like to go more, and take the rest of the family, but they either have it on the other side of the continent, or that have it during school year. This year it's in New Jersey and in middle August, so I decided I'd make an appearance – just myself since Alice is already back at school and Duncan and Bridgett are getting ready to head to school.

As I wrote, this year it is in NJ, Princeton, NJ to be exact. The Westin, which looks like a great place for a convention

Not exactly going solo – John Clifford coming along.

Shure looks purty…

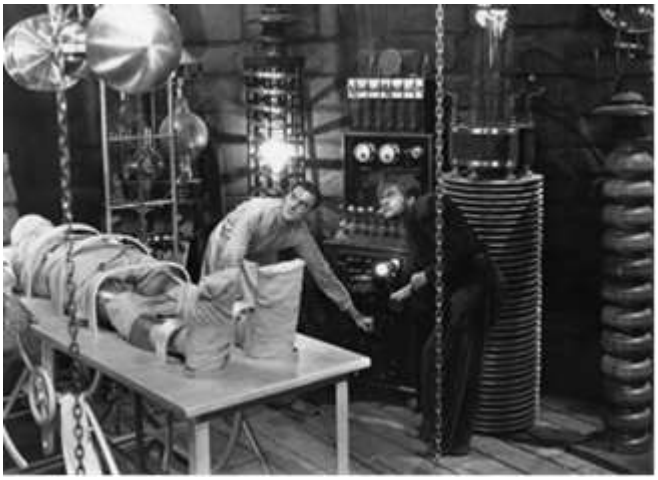
I am prepared!!!!!

Tales of

November 2018 - Bruce Clough

"If women don't find you handsome at least they find you handy" - Red Green

The Re-Radicalization of a Dash – Hack that Triumph!



The last time I wrote anything on The FrankenStag (TFS) was a chronological look at the dash – that was about two years ago. Well, guess what, for no other reason than "I can" I'm back at it again. Okay, actually it's more than that – the wiring is a mess – unruly, un-needed, unkept, just nasty looking, and you see all of it looking through the Plexiglas. I also don't think it's deviant enough to be worthy of The FrankenStag.

If you remember, and if you can't it's okay, the last pic of the dash posted was the below – that shows it in all its green glory – the (ply)wood panels have been replaced by Plexiglas, the glovebox long gone, and green backlighting installed – how cool….

Green Goblin approved.

Except you can see all that nasty wiring behind it – and I mean nasty wiring. You'd think that an electrical engineer could do better! So I decided that over this winter I would go about fixing the wiring and reinventing the dash one more time. As usual, no detailed plans, just a broad strategy and see where that leads me…

Plexiglas panels out, steering wheel dropped, time to pull the dash! Note the way we put the paint cans to good use.

It just so happens that nobody wanted to do anything for the Tech Session on 10 Nov, so Stagging we will go. In order to get at the wiring we have to pull the dash out. To do that we need to remove the existing panels then drop the steering wheel. That will enable us to get at the bolts holding the dash on.

Turns out that with three people getting the dash out is pretty quick once we decide on the size of sockets to use! Taking this out with one person is a bit tricky, but with three hyped up on donuts and coffee it's a cinch!

One we got the dash apart I handed out several line cutters and asked folks to cut the wireties holding those nasty wires which they did with glee – MVT'ers always like to destroy! So here it was at the end of the tech session:

Driver's side - dash out, wired released, steering column still on the paint can…

From the other side you can really see the mess of wires I have to deal with.

Passenger's side – wire loom hell

After we had the dash out we inspected the body around the windshield. Water had been coming in due to the ancient windshield rubber and it caused rust on the driver's side in two places:

Rust holes under the right side of the windshield

Rust holes a bit further down below where the dash attached due to water coming in the windscreen rubber

I think the windscreen rubber replacement will have to wait for warmer weather next year – I do not want to crack the windscreen I have since getting another would be problematic. So back to the wiring harness work.

My trash pile next to the passenger door – who needs this stuff!

Over the next few days I went through the harness and eliminated all the unused wires, shortened a lot of wires, remade grounds, sorted which systems used which fuse, and remade several power feeds to the fuses. In the process I got rid of a few wires, a few switches, and some coffee.

So here is was at that time – wiring partly sorted out and partly re-harnessed…

Still looks like a bird's nest!

I also made a discovery by accident – I connected the turn signals to the purple (fused, always hot) circuit rather than the green (fused, comes on with the ignition) circuit so the flashers can work when the car is off. Now I can leave the turn signal on even when the car is off, how's that for aging-friendly? Now here is where the "smart" part comes in - I recognized that with it misconnected all I needed to do was put a simple switch between the left and right turn signal lights and when you flip that switch and use the turn signals you get hazard flashers. Who needs the hazard flasher switch and separate flasher? Yank them puppies! I made the appropriate wiring changes…

At this point I had to stop wiring work since the steering column just sitting on the paint can was getting in the way – I needed to support the column. But how…

I actually was thinking about this. If you ask Alice, that's my problem, I'm thinking. Anyway, I want to be different with the dash, but support the steering column. Then the light bulb went off, the power saw came out…

…and the top of the dash came off!!

Then the remaining part of the dash had the vinyl and padding ripped off and a coat of green paint attached

This was installed back in the car to hold the steering column. A different look for sure, but nobody has ever accused me of being normal!

Column attached!

I also ordered some fuzzy press-on TR4 door seal from TRF to put along the top flange – dress it up and cover sharp edges.

Okay, so next I needed to kill a couple of birds. There needs to be some sort of footwell lighting as well as lights to help me complete the wiring harness clean-up. What do I have around the garage? Hey, I have some 12V LED strip lighting that will fit well on the front side of the steering column support – sweet! I now have plenty of light to see the wiring harness and footwell areas!

I can now see what I am working on, even while driving!

The astute reader will note that in the above picture I actually have some of the harness already covered with loom protector. With no dash to speak of this was easy to do. I started on the driver's side and went toward the fuse box wrapping the wires with take then covering the wires with the loom and securing the loom with nylon ties. About halfway across I ran into the wires for the gauges, idiot lights, and accessory switches. I decided to tackle the idiot lights first.

For the idiot lights I was going to build a layout in Plexiglas like on The Grey Ghost, but decided to just reuse the modified Stag one I had. I could reuse wires and connectors, but had to find a suitable mounting location. The mount I chose was the bracket on the driver's side for the top dash attachment – made a little bend in the metal so the cluster would point straighter back and secured with nylon ties – perfect!

Idiot Light Cluster in position and secured – to the right is the hot air duct, more on that later

For the gauge cluster I wanted to put it in a place that was seen, but not in the way. Turns out the front of the heater box was a good place to mount it that met those specs. Made a frame from aluminum I had lying around, painted it and attached the gauges. A few sheet metal screws and some connectors and it was on and ready for business.

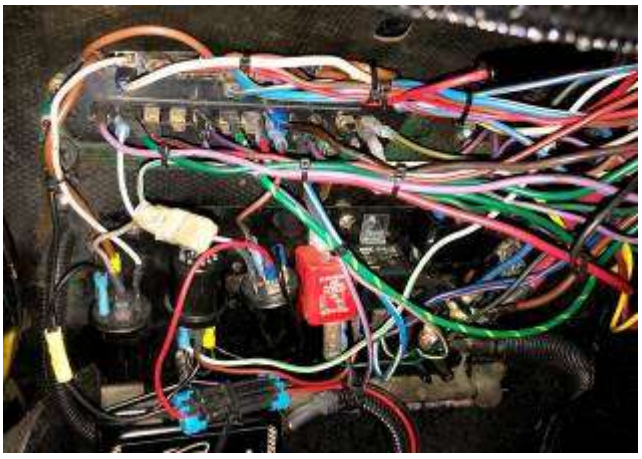
Instrument cluster all clustered

For the accessory switches, including the power window switches, I decided to go with a box on the top of the trannie tunnel. I also decided to dispense with the left/right interior lights – now when one comes on they all come on and you eliminate a lot of wires and the original light switch, replaced by a simple SPST toggle.

I bought a small black project box (small plastic box used for electronics projects) and some lighted switches and put in two more switches than I needed for growth. Looks okay.

Accessory Switch Box

Now for the fun of cleaning up the fuse box and relay mount area. This has been a mess since I got the car over 14 years ago, and my modifications since them have not helped. Everything works, but you can't easily trace anything and the relays are a haphazard collection piled on top one another. To start off I eliminated redundant, or unused wires, made two primary fuse feeds rather than five. I replaced all the relays with modern types and straightened up those wires/connections. I redid the grounds and detangled wires coming from the fusebox. The below is what it looks like – some would consider this still messy, but it's much better than what was there before.



You can now actually see the fuse box connections…

Now what to do with the accessory power? I still need the power outlet and USB power. I still have the panel, just need to attach it. Okay, I'll just attach it to the body above the fuse panel and be done with it.

I was done with it.

This still leaves me with what to do with the duct work – how do I spread out the air for defrosting, or do I? For the time being I have just flattened-out the exit to spread the air, but I might have to build a custom nozzle set – we'll see.

So that is it for this month. I still have custom nozzles and have to put in the nav system. I'm probably going to go with three displays for that since they are cool – that's it, just cool.

As we are now….

The end of the line…

I did not know it at the time, but November 2018 would be the last TOTF I wrote. Come 2019 the kids were almost grown, with engagement for one and college for the other in the works. With the handwriting on the wall for a 4-seater, we got another TR7 in fall of 2019 and Ball's Z4 in Spring of 2020. The FrankenStag was sold in summer of 2020 and went to VA to be restored back to a normal Stag.

It was fun while it lasted, providing transportation for a maturing family, artistic outlet for dad, and hopefully a guide of what not to do for other Stag owners!

Cheers!