From the Driver’s Seat
by President Wayne Simpson

If you stay in the old car hobby long enough, you’ll collect a few things. Parts you think you might need someday, leftovers from a car you no longer own, or hand-me-downs from others. Over time, the acquisitions build up into a collection; a box or two here, a shelf of parts there, and eventually, if you’re like me, you find yourself living an episode of “Hoarders”! I’ve been at this for some 36 years now and recent circumstances, the death of my father-in-law and the sale of the house in whose basement I’ve been storing things for a few years has made me confront my parts hoarding affliction. I present this here as a cautionary tale to those only mildly afflicted, or as reassurance to those like me that “you are not alone”.

As you all know, the first rule of the British car hobby is never throw anything out. I took this to heart. I still have the catalysts I took out of my TR8 about 15 years ago. Or maybe it’s 20 years by now, I forget. The car, by the way, was wrecked in 2007, but you never know when I might need those catalysts again. Or the grass shields I took off the old exhaust system, or the original, dead Delco R-4 A/C compressor, or any of the other bits and pieces of that car I might still have. After all, I do intend to own another TR8 someday, I just don’t know when that might be.

And then there’s the new and new old stock (NOS) parts cache. Sometimes, I buy things because they’re on sale, or I buy them for a current project, not remembering that I already have them somewhere in the cache. Or maybe I do remember and just can’t find them. Somewhere in the stash, I have about 10 low fuel level delay units. I’ve never actually had to replace one of these, but hey, they were cheap, and you never know.

TWOA on the web:
http://www.triumphwedgeowners.org
http://www.facebook.com/groups/TWOAGroup

Editorial contributions to the TWOA Newsletter are welcome and encouraged. Submissions should be emailed to editor@triumphwedgeowners.org. Materials are subject to revision as needed for publication. Unless otherwise specified, all correspondence will be considered for publication.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without prior permission of the Triumph Wedge Owners Association.

© 2019 Triumph Wedge Owners Association
Cover: Spring in Michigan, Dave TenCate
So there I was in mid February, needing to move an entire basement full of brake disks, transmissions, engine blocks, heads, cranks, heater and A/C matrixes, wheels, and the rest of the stuff I’ve collected over the past 30 years which, for some reason, I can’t bring myself to sell, throw out or otherwise dispose of. It took I don’t know how many loads to move it all in my old Land Rover, plus one rental trailer load for the things that were too big to fit or too heavy to want to lift into the Disco. For the time being, everything is now housed, along with my TR7, in a 10x30 storage unit, a Triumph owner’s Cave of Wonders, located “somewhere in southern New Jersey”.

If there is some solace in this for me, it’s the knowledge that I’m not the only one afflicted with this condition, and that there are others among us far worse than me. Are you a parts hoarder? Share your story on our Facebook page at https://www.facebook.com/groups/TWOAGroup/

Accepting that you have an issue and talking about it is the first step to healing.

Mark your calendars!
(The host hotels are taking reservations)

- Triumphest 2019 will be held in Santa Maria, CA, 12-14 September 2019. There’s already a website up and running: https://triumphest2019.com
- This year’s VTR Nationals will be a month later in Dripping Springs (outside of Austin TX), 6-11 October 2019. http://www.vtr2019.com

I’ve heard from a few members with questions on their cars and have been able to give out a little hopefully useful information gleaned from the archives. Unfortunately several emails got stuck in my spam folder, so replies may have been slow and I likely have missed some completely—do try again if that happened to you.
**One of a Kind**  
*by Richard Truett*

I get in trouble when my wife is away on business trips. Not long after she returns, I have to find some gentle way to explain why yet another forlorn, wayward Triumph is headed into our garage. And so it was in May of 2017 when she was away for a business trip for a few days that late one night just before bed, I took one last look at the Triumphs for sale on eBay Motors. and that’s when I spotted a blurry photo of a red 1981 TR8 and this ad:

“Very nicely kept last-year Triumph. Almost entirely original paint and interior. New exhaust system. New soft top last year. Original 3.5 liter Rover V8, with Holly carb and Edelbrock manifold installed last year to add 50% more horsepower. Has power steering and an AC system which worked but underhood pieces were removed to save weight [comes with car]. Oil light started going on at idle, so parked it, although there are no motor noises and it can be driven. I have too many projects already. Fix the issue yourself or it’s a great candidate for Buick V6 conversion; there are kits for this and those motors are common. I have driven such a conversion, and it makes a fine & fast car. Nice almost new stereo and speakers, front shocks, fuel pump, distributor and coil. Has accessory top cover; headlights work fine, as well as gauges, horn, wipers etc. Carpets so-so. I know of no rust of consequence on the car. The power steering is fine. The A/C is disconnected but I have all parts. Vehicle is sold without warranty of any kind. Clear title and current license in my name. No reserve.”

Nothing special about that really. But a closer look at the technical specifications showed the car to be one of the 13 TR8s built for the 1981 model year with an automatic transmission. I’ve only ever seen three 1981 TR8s and TR8s. As always, we urge TWOA members to participate in these great events. There will be TWOA officers in attendance at both shows, so get your cars ready for a road trip and come on out!

---

**TWOA Sponsors 2 Major Triumph Events**

Have you made your plans to attend any of the big shows this Fall? As we have in the past, the TWOA will be sponsoring the two major shows on the Triumph calendar: Triumphhest, September 12-14 in Santa Maria, CA presented by the Triumph Club of Southern CA; and the VTR National, Oct 6-11 in Dripping Springs, TX, hosted by the Hill Country Triumph Club of Austin. Host hotel information is listed on page 3 of this issue of *The Bulletin*.

The TWOA will be sponsoring the Welcome Party at VTR and will also be presenting a Tech Session on brake systems and maintenance, notably a big deal on TR7s and TR8s. As always, we urge TWOA members to participate in these great events. There will be TWOA officers in attendance at both shows, so get your cars ready for a road trip and come on out!

---

**TWOA Website News – Events Calendar**

*by Secretary Brent Roth*

One of the great things about Wedge ownership (or ownership of virtually any car for that matter) is the opportunity to meet with others who share the same appreciation for your choice of ride. Luckily, there are many car clubs and groups that sponsor a variety of British car events throughout the year where Wedge enthusiasts can gather to trade stories, participate in fun and challenging competitions, or just enjoy the comradery of like-minded folks.

To help keep our members aware of such events, the TWOA website has been updated with a ‘Calendar of Upcoming Events’ page with a rolling 12 months of events. Upcoming British car events can be submitted for posting to the calendar by both members and non-members. Please note: Local events such as club meetings, rallies, fun runs, evening drives, etc., will not be posted to the calendar.

The calendar can be viewed by TWOA members as well as the public. It is located under the *Events* menu at [https://www.triumphwedgeowners.org](https://www.triumphwedgeowners.org) with link at the top of the calendar to enable the submission of events. Please contact me if you have any questions about the calendar.

– Secretary@triumphwedgeowners.org
was 36 years old and had seen 89,000 miles. That any orphan car could survive and still able to move under its own power was to me a minor miracle.

The engine idled quietly, but any kind of load on it elicited a knocking sound from the crankshaft. That new top? You might think it was put on by Stevie Wonder. It was so sloppily fitted that the previous owner cut parts of the old top and sewed them on to the new top so that the side snaps could hold the top to the car. The transmission and rear end were OK, but the suspension was shot. An accident kinked the left chassis leg and knocked the front bumper out of alignment. The car’s wiring harness had more nips and tucks and splices than a Kardashian booty.

On the plus side, however, the entire fuel injection system including a pristine plastic cover for the ECU was in the trunk along with the entire air conditioning system.

In between the time I paid for the car and it arrived, I asked my friend Richard Connew in England if he knew offhand how many 1981 automatics were made. With my car having a September 1981 build date, it had to be one of the last. But what I didn’t know—or even think to ask about—was about the color, Oporto Red Metallic. Triumph made two one-off 1981 TR8s with different colors. There was one Triton green TR8 built (a 1980 color) and one Oporto Red TR8. There are a few Oporto Red TR7s, but just the one TR8.

The seller told me he bought the car from a lady who had used it in the Los Angeles area for many years. He removed the EFi system when some of the cylinders stopped firing. He also attempted an engine rebuild. When that went wrong, he decided to cut his losses and sell the car.

The TR8 wasn’t in my garage for a week before I decided to do a complete restoration, and I started right away by ditching the aftermarket wheels and installing a restored set of TR8 alloys and new tires. Next came the suspension system rebuild and then some electrical system work to fix the turn signals and horn.

Then I rented a garage and started taking the TR8 apart. All the way apart. By the time it was ready for the body shop, all the interior trim and electrical components were out of the car. It was just a roller. Two rust spots were found, one on the right front lower firewall and the other in the spare tire wheel well. Both were easily repaired with new metal.

I tracked down a new Triplex XXX windshield from Pilking- ton Classics and I found a NOS Triumph dealer replacement convertible top on eBay. All the car’s external trim parts, such the black trim on the windshield, the rear quarter panels where the top snaps to the car and the strips below the door went to the powdercoater, as did the door handles.

My goal was to make the engine bay look new again, and so the subframe, all the brackets on the engine, the steering linkage, brake booster and other parts were either replaced, replated, refurbished or restored to look new. The Borg-Warner Type 65 transmission went to a specialist here in Detroit and got many new internal parts to replace the originals. But it was the engine that caused me the biggest worry and dictated the direction of the restoration.

I took the car’s original engine to Mark LaGrue at D&D Fabrications for a rebuild. But when he took it apart, he found a disaster. The crank had been machined improperly, causing the knock. The rods were worn out, the cam was no good. Someone didn’t bother to hone the bores or replace the rings, and piston clearance was far out of spec. The crank would need to be turned again, the block needed to be bored, necessitating new pistons, the rods needed to be rebuilt or replaced, etc. It would cost at least $10,000 to put the original engine back in the car in good shape.

That’s when 408171 started losing some of its original parts. I sold the engine to LaGrue and replaced it with a 3.9-liter from a 1995 Land Rover Discovery that I bought from Ted...
Schumacher. D&D charged me $5,500 for the rebuild. With the 3.9-liter, you start with 188-horsepower and go up from there. A camshaft and headers, which is what I added pushed horsepower up over 200. That extra power helps negate the performance that is lost with the automatic.

As we all know, there is no way to faithfully replace the tan velour upholstery used in the 1981/82 TRs. I found some cloth from a mid ’70s Mercury that is close, but I would never be able to use that cloth on the door panels and have it look professional. That’s when 408171 lost more original parts. I decided to do an interior color change from tan to black and to use MG TF seats from a 2001 car. I bought the seats in England had them shipped here. Rimmers and Victoria British provided the black interior panels.

The TR8 went to the body shop in late October 2017 and returned in late December. I had a real blast getting a gallon of Oporto Red Metallic made. The color does not show up in any paint manufacturer’s U.S. catalog. You can’t import paint because it is nearly impossible to ship. Oporto was not used on any other car other than a few TR7s and my TR8. Jaguar didn’t use it and it was out of production by the time the Range Rover showed up in 1987. I ended up taking a headlight bucket to the paint store and had the color matched.

I spent nearly all of 2018 building the car. The steering rack went to Jorgen Automotive (https://www.jorgenauto.com/) for a complete rebuild. Several internal parts were worn and the left inner tie rod was bent from the accident.

One thing that made the job go so slow is that I replaced all the fasteners with NOS original or better than new replacements. I found some impossible to find trim parts and underbody clips in the Netherlands so that I could build the car just like the factory. The Magnetti Marrelli cooling fans were replaced with the Bosch fan upgrade from the Porsche Boxster. I bought a new oil cooler and lines for the transmission, sent the radiator out for a new, high capacity core and did a thousand other things.

One area that I was determined to restore was the fuel injection system. I took it completely apart and had the upper plenum powdercoated. I harvested a set of higher flow fuel injectors from Jaguar XJ6s in local junkyards and had them rebuilt. All EFi sensors were replaced. I taught myself to solder and replaced all the broken Bosch connectors. By September she was ready to run. Or so I thought.

It took at least a month of rework to get the engine running well enough to start putting on some test miles. I had a few leaks to fix, some additional electrical repairs and other things to attend to. Jim TenCate was instrumental in helping me isolate and repair the remaining issues with the injection system.

Just before winter storage, I got about 50 test miles under the wheels before the weather turned. Now that spring is here, the remaining bugs have been worked out of the car and she’s a real joy to drive. The the 3.9-liter is the right choice for the Borg-Warner automatic. The added horsepower and torque from the bigger engine puts plenty of pep in the TR8s step. The gearing of the three-speed automatic is such that the car does OK in the city and on the highway.

The original Federal fuel injection system seems a great match for the bigger (241 cubic inch) Rover V8 engine with its 9.35:1 compression pistons. It does not run out of breath and the performance is generally excellent. The black interior works well with the red metallic paint. The seats, designed for a sports car, fit well, are far more comfortable and supportive than the TR8’s seats, and they look great. They also take the TR8s seat belts buckles which bolt right on.

Some would say it is a crime to modify a one-of-one car. If the engine could have been saved for a reasonable cost, I might not taken this road with 408171. But nothing I did can’t be easily reversed in the event TR8s ever do become extremely valuable collectible cars. Right now, I just want a great-looking, comfortable, reliable, and fun-to-drive TR that is different from the rest. I think I’ve got it!
Diagnosing and Repairing the TR7 Delco Ignition
by Vance Navarrette

Introduction:
The TR7 had two different ignition systems in North America during its production run; The much-maligned OPUS system, an electronic ignition system with dreadful reliability, and the French-made Delco system (see Figure 1) during 1980 and 1981. The latter was a state-of-the-art electronic high-energy ignition, incorporating variable dwell for improved performance at high RPMs. The Delco system has proven to be very reliable but is no longer in production, with difficult to source spares and a paucity of diagnostic information on the web.
The North American Delco system is physically much different, but has decent spares availability, and excellent trouble shooting guides are available. This article attempts to summarize diagnosis and repair of the TR7 Delco unit, as exemplified by the author’s recent experience.

Troubleshooting:
While the author was unable to find any troubleshooting guides for the French-made TR7 system, it turns out that the U.S. built system used many of the same components and is electrically identical. The U.S. built system incorporates the coil and amplifier into the physical structure of the distributor for V8 installations, but used a separate coil for 6-cylinder installations. The TR7 system consists of three main components; the pickup coil, the amplifier, and the coil. The pickup coil is inside the distributor, and the amplifier and coil are mounted on the inner left fender well.

Some symptoms of an ignition problem are as follows:
1. No start. Verify an ignition problem by pulling the coil lead from the distributor and holding the tip next to the chassis while cranking the engine. If there is no spark the ignition system is suspect.
2. Intermittent miss at idle, cruise, or during acceleration.
3. Engine “breaks up” at high RPMs. The engine may start and idle fine, and can even run smoothly at low RPMs, but will lose power and begin to sputter or miss as RPMs increase.

This article assumes you have rounded up the usual suspects prior to diving into the ignition system itself; the ignition timing has been set (if possible), the spark plugs have been cleaned and gapped, and plug wires have been verified as correctly routed. Additionally, the distributor cap and rotor have been inspected and replaced if necessary, as well as inspecting the ignition system wiring for damage and insuring that ground points are tight and free of corrosion.

Begin the diagnosis by inspecting the coil assembly on the inner fender (Figure 1). Confirm that a black ground wire is present and connected between the coil assembly and the top of the adjacent shock tower. Set your ohm meter to its lowest range, and measure the resistance between the metal frame on the ignition coil and chassis ground. If it is not zero ohms, clean and tighten the connections at each end of the ground wire and try again.

After verifying the ground, unplug the lead from the distributor pickup coil to the amplifier at the amplifier end. This cable plugs into the side of the coil assembly near the top of the fender. Set your ohm meter to the 1 kOhm scale, and measure the resistance between the two spade connectors at the end of the pickup cable. Any value between 650 and 850 ohms is acceptable (Figure 2). The author’s pickup measured roughly 780 ohms. While measuring the pickup coil, apply and remove a vacuum to the vacuum capsule on the distributor several times. The resistance of the pickup should not change while this is being done. If it does change appreciably, the pickup coil is intermittent and must be replaced. If this test is good, measure the resistance between one terminal of the pickup coil cable and chassis ground. Any value less than an open circuit means the pickup coil and/or cable must be replaced.

Next, put your meter on the lowest resistance range, and measure the primary resistance of
the ignition coil (Figure 3). You may find it difficult to access the primary connections as they are underneath the coil, so removing the coil assembly and testing it on a workbench will ease the work. There are two pairs of lugs on the primary side, and a single high voltage connection to the secondary. Each pair of lugs is connected to one end of the primary coil. All connections to the coil must be removed to prior to making this measurement, and you should measure less than one ohm, but not zero. The author’s primary measured approximately 0.6 ohms. Any reading outside of the zero to one-ohm range indicates a defective coil.

Incidentally, a resistance of less than one ohm indicates a very high-performance coil, since it draws a high current that creates a powerful magnetic field, which in turn dumps substantial energy into the spark plug. Thus, installing a “high performance” ignition system in a Delco equipped TR7 is pointless – the original ignition system is already high performance. The earlier Lucas OPUS system used a 1.2 to 1.5-ohm coil, and while it eliminated the wear and RPM limitations of breaker points, it offered little or no improvement in spark energy over a conventional points-based system.

If the primary side of the coil passes, measure the secondary resistance. Do this by placing your meter on the 100,000-ohm scale and connecting the test leads between the high-voltage tower and either terminal pair on the primary (Figure 4). Any value between 6,500 and 30,000 ohms is acceptable. Repeat the test using the remaining primary terminal pair and the high-voltage tower – the reading for the second test should be identical to the first. Once again, a reading outside the specified range indicates a defective coil.

The author found the secondary resistance of the original coil to be out of range (over 30 MOhms), indicating a failed coil, despite the fact that the car started easily and idled smoothly. A virtually identical replacement coil is still available from suppliers such as Amazon, but is expensive and often on back order. A Delco six-cylinder HEI coil was substituted, the secondary resistance of which was measured at 8,500 ohms.

The ignition amplifier is mounted inside the coil assembly housing and is removed by accessing two hex head screws through openings in the casting. The amplifier is a black, crescent shaped module approximately four inches long, with two terminals on each end (Figure 5). There is no definitive test for the amplifier short of a diagnostic oscilloscope, and is normally deemed to be defective only when all other components are found to be good. If it is replaced, you must smear heat sink compound (white grease) on the back of the amplifier prior to installation, as it dissipates appreciable heat during operation.
plug in pursuit of low emissions and consistent high RPM operation.

**Spares Availability:**
The Delco HEI system was in use through the mid to late 1970s in General Motors pickup trucks, V8s and some six-cylinder cars. While the physical configuration of the components varies from the Triumph HEI system, U.S. spec parts can be substituted for the Triumph components with a minimum of effort. Some spares cross reference information in this matter can be found on the Team.net website at http://www.team.net/TR8/tr8cca/crossref/index.htm.

**Ignition Coil:** The Delco six-cylinder HEI coil (part number D525) can be substituted for the original coil. This coil is electrically compatible, and fits on the original TR7 casting. The coil requires changing the gender of the high-voltage lead to the coil. The author found that the original high-voltage insulating boot could be trimmed away, and the existing ferrule could be crimped to fit the high-voltage tower. Several layers of heat shrink tubing were applied to insulate the connection (Figure 6). Alternately, a short length of suitably sized fuel line could be slipped over the ferrule, and glued in place with RTV to form a boot over the high voltage tower. The leads from the amplifier to the primary side of the coil also must be extended by about three inches to accommodate the slightly different orientation of the primary connectors. When extending the leads, be certain to observe the polarity of the connections. The author used color coded heat shrink tubing to indicate the positive and negative connections to the primary.

The original TR7 ignition coil is still available new from Amazon and others under part number UF-88, and was also used on the Renault L4 in Europe. It is more expensive than the D525, and may be on out of stock as production is intermittent due to low demand. It requires replacing the connectors to the primary side of the coil, but no modification to the high-voltage lead is required. As of this writing, Amazon shows the coil is in stock.

**Pickup Coil:** The original pickup coil with its long cable to the fender mounted coil assembly is no longer available. However, the pickup coil for the original U.S. HEI system is available under part number D1925A, and can be used after splicing the coil leads to the original cable, or a new cable can be fabricated.

**Ignition Amplifier:** Available under Delco part number D1906, new old stock is still out there so these units are readily available. Delco stopped production of these many years ago, but they are still sourced new by other suppliers. As mentioned earlier, some of the alternate suppliers do not offer the variable dwell feature of the original Delco unit, but in any case are acceptable despite the potential lack of variable dwell.

**Results:**
The author’s car had severe breakup issues and would not operate above 3,500 to 4,000 RPM when originally acquired. After replacing the defective OEM coil with an eBay sourced Delco D525 unit (Figure 6), the engine will smoothly operate up to its 6,500 RPM limit. Of course, operation that high is pointless, as the base TR7 engine is at its best below 5,000 RPM. Plans to address this shortcoming include a conversion to the European 135HP 16 valve engine, which will be detailed at a future date.
**3D Printing: A brief tutorial**

*by Brian Tilton (British Cars of New Hampshire)*

Here is a short (long) explanation how 3D printed parts are created and produced. This process goes by a couple of names. Fused Filament Fabrication (FFF) or Fused Deposition Modeling (FDM), both referred to as 3D Printing. I won’t go into the complete process but it’s basically a process where a CNC controlled machine lays down hundreds to thousands of precise layers of plastic that builds up to a completed part. Depending on the part, this can take a few minutes to dozens of hours. The finished parts are not smooth like a plastic molded part. You can see and feel the layers—very similar to the lines you have in the old record players we all used to have. So there is a texture to these parts. There are a number of plastic filament materials available and more being developed on a frequent basis. Choosing the material used to create a part is very important depending on the use of the end part. If it’s a cosmetic part or a structural functioning part greatly influences the material decision. All the above is the simple part in regards to making parts for our LBC vehicles. All this isn’t possible unless the particular part has been modeled using CAD software that creates the part as a 3 dimensional model. So this also requires the technical ability of the designer to reverse engineer any part to a very precise level. This can take 30 minutes per model or many hours depending on the complexity of the part. Once the model is completed, it is converted into an STL file format and then that is loaded into a special program called a SLICER. This program, with input from the design engineer is used to create what is known as a g-code. This is the program the 3D printer uses to interpret all its movements to make the part.

So this whole process is more than just printing a part for our cars (or whatever you want to create). It all starts with the need for a certain part for our cars. Then from that part it has to be reverse engineered. The easy part is letting the printer do its thing. Then after the part(s) are done, there is always functional testing to do to make sure the part functions as it should, will it last and be durable and does it look appropriate. In my case, I’m a retired senior designer with over 20 years of engineering structural and mechanical part experience. I started my career as a tool room machinist and have 30 years of experience in the machine tool industry. I currently have a 68 TR250 and a 70 GT+ which I’ve owned since it was new and I purchased it in England. As I’ve restored both these cars, I’ve occasionally come across parts that are no longer available or I felt were very expensive so I would develop tooling to make the parts I needed in my home machine shop, 3D printing opened up a new realm of possibilities for the various plastic and rubber parts that I needed. Sometimes I produce the part as it was originally designed or if necessary I design in improvements to make the part better.

What I’m doing is not a business, but a hobby and a means to provide parts to the LBC community. It does cost money to produce these parts. There was of course the investment in the 3D printer itself but there are maintenance items, running costs and the variety of filaments needed to produce parts. I’m trying to make a few parts for our cars and make enough money to sustain the effort. I can’t begin to charge my engineering time because for such small quantity runs the economics just aren’t there. Just recently there was a program on TV and the Velocity channel (Wheeler Dealers) where there was a part for a classic car sun roof and the part was no longer available anywhere. They took the part to an outfit that reverse engineered the part and then 3D printed it. The cost for that part that fit in the palm of your hand was $125. So there are outfits that will make these parts for you but the costs are pretty high. I wrote this to hopefully make the LBC community aware of the possibilities and the potential this technology may provide us in the future as more parts become scarce and may be not cost effective for our regular suppliers to invest in. The 3D process doesn’t lend itself to high quantity production work but it does work for parts that are not available anywhere else on the market and where the quantities needed are relatively low.

I hope this explains my motivation for making a few parts for our British car hobby.

- Brian
This is a project I decided to take on as a result of a comment made on the Triumph Experience forum. These straps have not been commercially reproduced since the 1990's according to statements made. I felt that the 3D (FDM) printing process might be of help on this project. With some encouragement and help (OEM sample straps) from a couple of forum members (Pat Ledford and Laverne Downey) I experimented with several designs. After producing approximately 30 prototypes I have settled on a process that achieves the goal I was after—a strong strap with ends that are very close in appearance to the OEM straps. I did deviate from the originals a slight amount, instead of the push pins to secure each end, I facilitated that purpose using button head screws. This allows easy attachment, very strong connections, and also provides easy removal, should that ever be necessary.

Information gained from an article written by Jim TenCate (Issue 35, Summer 2016 of The Bulletin) was very helpful in determining the correct lengths of the straps. As Jim mentions, the straps from the factory were 6 inches, center to center. However, having two identical straps duplicated the original problem of just one strap being stressed and eventually breaking. Jim determined that the straps have to be made in different lengths in order for each strap to equally share the load. He also noted that new straps should be fitted in pairs as the original straps will have stretched somewhat. The two correct lengths, center to center should be 6 inches and 6 3/8 inches. So this is how I have made these straps.

**Construction:** I created the two ends using a 3D printing process. I designed each end using CAD software to create the 3D model, experimenting with various design enhancements over the many prototypes I produced. The two ends are different designs. Each strap consists of three parts: two individual ends and a flexible connecting cord. The ends are polyurethane and the straps from engineering-grade black nylon. I tested a finished strap for strength in tension too. My digital tension meter tops out at 50 lbs, and I have had no strap failures. That tension is the weight of the suitecase we can all take on commercial flights these days (to give some idea of the strength of one strap). I do believe it will comfortably support the weight of a TR7 or 8 glovebox lid and a cup of coffee or two as well. I have also 3D printed a special jig so I can accurately control the lengths of each strap consistently.

For assembly to the glove box, it will require 3/32” and 1/8” Allen wrenches. The small end of the strap attaches to the glovebox door (1/4”) hole and the opposite end attaches inside the glovebox (5/16”) hole. Just press the strap end into the respective holes fully home and then turn the retaining screw in until it contacts the end surface. No need to over tighten the screw.

As a side note: I don’t own a TR7 or TR8, the cars I do own are a TR250 and GT6 and most all the parts I’ve recreated are for those models—but also usually NLA parts using the 3D printing process. Up to this latest endeavor, the only TR7 and 8 parts I have recreated are the exhaust muffler bumpers, a version of the shift boot insert, and another version of the front sill drain plugs Jim had 3D printed a while ago—this time in nylon and/or TPU for more durability. Watch this space for more projects.

To start, I’ll be taking orders for pairs of glove box straps first. **Price is $25.00 per pair which includes US shipping.** Email me for more details: bptilt@myfairpoint.net
The other day I got an Email from The Vintage Triumph Register (TWOA’s “parent organization”) telling me that as a member I could now order some of the NOS emissions labels we wrote about in the last issue. These are not reproductions, they’re original labels, on 3M decal paper, and including the semicircular anti-tamper circle pattern punched on the decal as you can see in the photos. I’ve seen suppliers (like Abingdon Spares) reproduce these sorts of labels with “faux anti-tamper circles” printed on the label. These shown here are not reproductions, these are the real deal.

There are a wide variety of these, and the numbers of each type of label vary. At the moment, they’re selling like hotcakes. The intent is to sell these all off but they’ll only initially be available to VTR members and initially only ONE of each kind per member. You can’t buy up the entire supply of 1981 TR7 P.I. labels for example. So, if you’re not a VTR member and are interested in getting one of these, make sure your VTR membership is current. Pricing is around $12 each. Joining VTR is easy. Simply go to vtr.org and click on the Join menu. Cost is $35 per year for US, $45 per year Canada or Mexico and $50 per year Rest of World. If you use the online form, remember that TWOA is an official VTR Affiliate “Chapter” so please select that when filling out the online form. For those of you who don’t like using the web for stuff like this, Email me at this address and we’ll work something out:
editor@triumphwedgeowners.org

Most of you have probably seen the label shown above. It’s the quality control sticker from the folks who made your seat trim etc. Many of you have written to me, excitedly thinking you’d found a cool thing. Quite so! What’s really interesting though is how many of you (me included) first though the company name was Gallow & Maddox. No, it’s Callow & Maddox. The company still exists, I think I read that it was bought out by some ex-employees and is still alive and well. Now you know!
I have been asked by several people over the years to write down the history of "fuel injecting the Rover V8 engine." As I think all documentation has been lost, I will have to rely on my memory. Without factual evidence I will not mention names except in tribute—or because I have forgotten them.

Me? I was the project engineer designated by Lucas Electrical to be responsible for fueling the Rover V8 engine. This engine was to be fitted to the Rover SD1 and Triumph TR8. [Editor: Note that the Rover SD1 was sold as the Rover 3500 in North America in 1980 and 81]

In 1976 BL Management approached Lucas, enquiring whether they would be interested in fueling the V8 engine. After initial negotiations had taken place, George Whitehurst and myself from Lucas were instructed to discuss the engineering side of this project with Jack Swain of Rover. It transpired that early in 1975 Bosch and Rover had got together and Rover had, to Bosch's specification, designed and built a V8 engine modified to accept Petrol Injection (P.I.). A prototype engine had been fitted to a Rover P6 vehicle. Bosch had then completed the vehicle installation and carried out emission testing. This engine had previously been used by Bosch for initial assessment on a test bed. Lack of resources forced Bosch to re-evaluate their EFI commitments due to the following:

- Relatively small production numbers envisaged, and
- Difficulty of 'L' Jetronic to fuel and achieve acceptable drivability when cold.

They had thus elected to forego this project, but did agree to minimise the effect of their withdrawal by handing over all their data and train four Lucas engineers, free of charge, in the workings of the 'L' Jetronic system.

It was jointly agreed by Rover and Lucas that Lucas should present a programme to meet the following requirements:

1. All Bosch EFI components should be used except for a [newly designed] Lucas E.C.U.;
2. A single E.C.U. was to be interchangeable between SD1 and TR8 and auto versions;
3. Both vehicles were to meet 1975 California Emissions Regulations;
4. Both vehicles to meet B.L. 'Rest of World' specifications, -30 to +40°C;
5. Similar, if not the same, ignition distributor characteristics should be used;
6. Three-way catalysts to be employed; Lucas to specify;
7. The BL charcoal canister system was to be used which ‘must meet Federal regulations’;
8. The same ‘engine build specification’, except exhaust manifolds and water pump, was to be used.

It was impossible to meet the original Bosch programme timing so production would have to slip twelve months. (Our E.C.U. was still in the design stage!!) This was reluctantly agreed. It was still a very tight programme with no allowance for further slippage.

Lucas E.C.U.

Having obtained the Rover V8 contract plus a tentative agreement with Jaguar, Lucas worked very hard to produce the E.C.U. Basically the engine fuel requirements were mapped using 16 speed sites and 8 load sites, with 16 interpolation steps between each site. The 'L' Jetronic air flow meter was programmed to overcome discrepancies between the two vehicles. The fuel map was given to Ferranti to make a hard chip. Some other engine requirements were also included but warm-up laws, feedback and other peripherals were obtained from discreet components. This gave Ferranti more time to make the chip. Ferranti, with their aerospace technology, was the only company that had the expertise to produce the chip at the time. One requirement was that it had to have a 'life of
at least ten years’ yet Ferranti could not give us this assurance. Lucas were forced to accept this and had the chips failed, Lucas would have had to replace the E.C.U. free of charge. (Twenty-seven years later I personally have never had one fail! Is this tempting fate?) Even today both vehicles will run quite satisfactorily with any E.C.U./air flow meter combination. [Editor: The same cannot be said for the two different Bosch systems fitted to the TR7!] The later U.K. SD1 E.C.U. will also drive both vehicles. As it is a U.K. specification it will not recognise Lambda sensors, so it is best to remove the catalyst from the exhaust system if this E.C.U. is used. I do however believe that on the later SD1 E.C.U.s, all feedback components are fitted. It requires a link or resistor to be inserted to make the feedback loops operational.

I also believe the TR8/SD1 vehicles were the first U.K. cars to be fitted with diagnostics, sensed through the Lambda sensors. Interrogating these outputs can be very informative when fault finding. Editor’s note: Indeed it is this diagnostic port that we make use of for our “Gizmo” which you can rent as a club member: https://www.triumphwedgeowners.org/tr8-fuel-injection-gizmo.html

https://preview.tinyurl.com/y385kyeu

The only other difference was the Bosch throttle potentiometer was replaced with a Lucas one.

**Development Programme**

Initial test bed results at Lucas and Rover showed that as both vehicles had completely different intake/exhaust systems it would be impossible to fuel or use the same ignition distributor characteristics for the Rover 3500 and Triumph TR8. This caused huge consternation between Rover, Lucas, and Triumph.

Yet, the first TR8 vehicle arrived on time, RAC 196R, maroon, hard top, completed to manufacturer’s specifications. Initial tests showed that the injectors beneath the plenum chamber were too hot and also the internal volume of the plenum was too large. This caused an unacceptable lag on accelerations. I redesigned the plenum chamber as it is today. This is the only change to that originally designed by Rover/Triumph in component or layout in 1975, a tribute to both design houses. The catalyst specification was decided during emission testing. It had previously been envisaged that ‘throttle icing’ would be a problem. As no one had a cast iron solution, it was decided to leave this problem until the vehicles were tested in the environment. Both SD1 and TR8 suffered badly. Driving along at 30–40 mph, with ambient temperatures less than 10°C, icing occurred after approximately 15 miles. At 30 mph it was found that the plenum chamber was about 3°C higher than the ambient temperature! I modified a plenum chamber using liquid aluminium putty which resulted in the present design (which is shown in the photo of the underside of a TR8 plenum chamber and was discussed in a previous issue of *The Bulletin*.)

Other problems had to be solved too. Bosch had experienced problems starting and accelerating this engine when cold. When cold the V8 required nearly twice the amount of fuel to start than other engines and also, needed higher amounts of fuel when accelerating. Both these problems were overcome but not completely solved with the Lucas E.C.U. In addition, as the firing order on each bank is not even, the exhaust gas presented to the Lambda sensors was not homogeneous. This caused the sensors to operate erratically. Swirls were introduced into the down pipe to reduce this effect. Obtaining a smooth idle was another problem, accentuated by the Lambda sensors. (Many years later, a new crankshaft giving an even firing order, i.e., each bank firing alternatively, gave a much smoother idle.) The TR8 did not have a problem passing its emission test, the SD1 did cause a few headaches. In addition, an acceptable re-instatement of fuel after deceleration could not be achieved on the TR8 owing to:

- Slack in the transmission,
- A very light car,
- No control over the throttle, and
- Limited control of fuelling.

This lack of control caused the TR8 to shuffle on fuel re-instatement to an unacceptable level. This problem was solved on the SD1 (also reducing emissions). Alas, as the same E.C.U. fuelling chip had to be used for both vehicles, fuel cut-off could not be employed.

The TR8 engine also had to have its water pump modified to overcome cavitation problems. Rover engineers solved this. The power output was a constant problem too. I wanted to change the exhaust manifolds on the TR8 but Triumph management would not entertain the idea. What was designed was what we had to use.

Due to insufficient time, or seasons occurring at the wrong moment reference to the development programme, very little
environmental testing was undertaken. Hot and cold testing in test chambers was carried out to B.L. specifications, and these were all passed. The fact cold chamber testing was totally unrealistic to that which occurred in real environmental conditions was disregarded or not acknowledged. My pleas fell on deaf ears. Thus, over-fuelling when cold became a major problem with the later Range Rover, due to the same reasons. Had the SD1 and TR8 continued in production, the same problems would have been encountered.

The test cars. Parallel development was carried out on a brown fixed-head automatic TR8, now believed to be YRW606S, the car shown in the photographs below left—owned by a member of the TRDC. (Photos courtesy Rex Holford.) For the SD1 programme, we had one auto and one manual. Both of these vehicles were camouflaged.

Politics and Sales

It must be appreciated that the TR8/SD1 programmes were carried out when the British motor industry was in great turmoil. British Leyland (BL) had just been formed by amalgamating several hitherto independent companies. Of these, Jaguar was determined to remain independent and indeed Lofty England and Harry Mundy saw to that. Rover had wanted a more powerful engine and had gone to Buick—hence the thought of having to use this American V8 came to the newly formed BL. However, the V8 caused great consternation throughout the group: everyone was trying to upgrade existing engines to find ways of meeting the new emission regulations with existing power plants/carburettors. P.I. was frowned upon. No one seemed to understand that tail pipe emissions had to be reduced by at least 95%, CO, hydrocarbons, and NOx. I knew that Jack Swain, whom I regard as the ‘father’ of the V8 engine, had many a tussle promoting the V8 and without great perseverance and dexterity on his part, the Buick engine would possibly have been scuppered. Even after production had begun, there were still elements within the company trying to install different power units and do away with the V8 entirely. I do believe though that the V8 engine cost less to produce than many other engine derivatives.

Another concern for management at BL at the time was the Trade Unions who were very powerful. With everyone trying to make their particular department important, thereby ensuring employment, ‘empire building’ did take place, encouraged by the unions. Within this background, the Rover and Triumph TR8/SD1 teams require some acknowledgement in producing these vehicles.

When these vehicles were introduced into the U.S.A., you could buy four compact cars for the same price as an SD1, and three for the TR8. It was very noticeable that when the TR8 price was reduced by approximately $4000, they were all sold immediately.

I hope you have found this both interesting and informative. If there are any questions arising from this, I will be happy to answer them. Just write to editor@triumphwedgeowners.org and they’ll be forwarded to me.

Albert Tingey

Editors note: For further reading on the history of the Buick/Olds/Rover V8, there’s an excellent article in Hagerty with link below. The engine photographed for that article is the engine in Richard Truett’s Oporto Red TR8 which you’ve read about earlier!

https://preview.tinyurl.com/yy2daymw
Mail Checks payable to: Triumph Wedge Owners Association

Mail to: Gary Klein, 8153 Quarterfield Farms Dr, Severn, MD 21144-2746, USA

ONE YEAR MEMBERSHIP: US & Canadian $20.00 US FUNDS, Overseas $25.00 US FUNDS
(I encourage 2 years—makes less work for me! THANKS!) Electronic only? $20 worldwide!

RENEWAL_______ NEW MEMBER_______

NAME _____________________________________
ADDRESS ______________________________
_________________________________________
_________________________________________
PHONE____________________EMAIL : ____________________________

SOME INFO ON YOUR CAR (if not already provided):
Vehicle1 ID # ________________________________(windshield, driver’s side door)
Build Date: ______________ Color Code __________ Trim Code __________
Vehicle2 ID # ________________________________(windshield, driver’s side door)
Build Date: ______________ Color Code __________ Trim Code __________

ARE YOU OPEN TO RECEIVING NEWSLETTER BY EMAIL?    YES _____ NO _____
MAY WE ADD YOUR EMAIL TO OUR COMMUNICATIONS LIST?   YES _____ NO _____