



STAG NEWS

Magazine of the Triumph Stag Club USA
Fall 2017 | Issue 97



Stags Conquer Lake Superior

1970s GTs • Throttle Body Fuel Injection • and More

Triumph Stag Club USA

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Submissions to Stag News

Submissions should preferably be non-formatted MS Word documents. Articles of 1,500-3,500 words are preferable but larger submissions can be accommodated. The Editor reserves the right to make changes to any submission for layout purposes. Photographs or diagrams should be sent separately as high-definition JPG files (>8000KB) with appropriate cut-line/caption descriptions. The author should provide a short biography. Send by e-mail to the Editor ahead of the deadline dates of March 1, June 1, September 1 and December 1 for inclusion in a future issue.

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Our website URL's are:

<http://www.triumphstagclubusa.org>

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On the Cover

Peter Weber's 1973
magenta Stag at
Cruisin' the
Coast, Mississippi

Photo: Peter Weber



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NEW MEMBERS Since Summer Issue #96

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Kevin Hayes, Sarasota FL

Terry Hunt, Wilmington DE (Rejoined from
8/2017)

Torin Little, Dorchester MA

Eric Mephram, Forest Hill MD

Glenn Nelson, Dallas TX (Rejoined from 1/2014)

Dan Petenaude, North Smithfield RI

Brad Reynolds, Burlington ON

Wade Santos, Manchester NH

Barbara Slocum, Chestertown MD

Richard Tarpinian, Shelter Island Heights
NY

Coming in a Future Issue

- 246 bhp Stag
- Bottom end rebuild
- Converting to ZF & AW70 transmission
- Flexible propshaft option
- 4-pot brake upgrade
- Engine Lubrication

DEADLINE

The deadline for the next issue of

STAG NEWS is:

Dec. 1, 2017

To submit material for publication
refer to details on inside front cover

PLEASE CONSIDER CONTRIBUTING

Producing a magazine dedicated to a single classic car model issue after issue, as we do at Stag News, can be challenging. In order to keep providing interesting articles and stories, we need to hear from more of our membership. Thanks to those who have already stepped up to the plate and prepared a once off submission or have become regular contributors.

Please consider sending us an illustrated article about your Triumph Stags; the hunt for a suitable model, the restoration projects completed or underway, the modifications you have made, the difficulties faced, why you still love them, the outings and trips you take, the shows and events that you attend, the friends and associates with whom you share this passion.

We would like to hear from members in as many different States and Provinces (and internationally) as possible in order to keep the content regionally balanced.

Renew your membership ON-LINE at
www.tscusa.org/join.asp

It was a very busy summer of classic car events here in southern Ontario, although the weather was often quite mixed. Sometimes it was just too hot to get out and about with the top down, while at other times we had torrential rain, more akin to the English weather for which our cars were originally constructed. The weatherman explained it away with reference to the jetstream staying further north this year which allowed moisture-laden air to migrate northwards. Fortunately, we didn't experience anything resembling the devastation of southeast Texas, Louisiana and Florida in the aftermath of Hurricanes Harvey and Irma. We hope all our members remained safe and dry.



I can personally vouch for the success of the Club's website Classified Section as a medium through which to buy or sell Triumph Stags. During the late spring, I put a local British car enthusiast in touch with a Stag owner in California who had his 1973 Stag for sale on the website and a mutually satisfactory transaction was completed, so we now have an additional Stag (and a new TSC member) on this side of the border.

In this issue, George Haar and David Baxa provide reports on the installation of throttle body fuel injection (Tbi) on their respective Stags using the Patton system which sits unnoticed inside the Stromberg carburetor chambers. I have taken a look at some Grand Touring cars of the 1970s that went head-to-head with the Stag, while Robin Searle recounts a 4,200 km (2,600 mile) odyssey he led for 20 Triumphs (including 3 Stags) around Lake Superior earlier this summer. We also have a short report on the gathering of 25 Stags at the Bronte Stag Weekend, organized annually by Tony Fox for the past 17 years, around the Toronto Triumph Club's British Car Day at which over 1,000 British cars participated.

We really do appreciate the written contributions and photographs received from our members describing travels, repairs, innovations and restorations of their Triumph Stags. Perhaps you will consider sharing your experiences with fellow members?

Enjoy the rest of the fall season's motoring in your Stags!

Terence McKillen



TSC member Tony Smith of Brookfield, CT with Pat & Mike Coffey at the VTR Nationals in Princeton NJ

Founder's Corner

TSC USA - Always Was & Is Your Club

With the majority of our members being in the USA and Canada, plus a small number from other countries, it is important that all of you reach out to the club Directors and Officers with input on how we can be of assistance to you with Stag ownership. Just about forty-six years ago, the first Stags were built and all our Stags on this "side of the pond" are now at least forty-four years old. Total production of Stags was small compared to other Triumph models. The enthusiasm of Stag owners around the world has been amazing for a model that was only built from 1971 to 1978 and only imported to the USA during 1971 to 1973. This enthusiasm has kept the demand for parts alive and availability is really very good for such a small production model. However, as the years pass the supply of original quality parts is decreasing and we see some very poor quality replacement parts in the market. The major suppliers in the UK are aware of this and are doing a decent job of supplying acceptable after-market replacements for all the former British Leyland items. As owner of Triumph Stag Parts USA, I am aware of the positive and negative aspects of this issue and am constantly discussing this ongoing scenario with our UK suppliers. I cannot say that there is a ready solution but I assure you of our best efforts to do the best for our members and clients.

Many British car clubs are experiencing a decline in membership and the number of cars attending shows has also dropped off. Obviously our members are ageing and in many instances health or finances are the cause for not attending as many shows as previously. It is with pleasure that I can tell you that our membership has been steady and experiencing growth over the years. Thank you all for your support.

The 2017 Vintage Triumph Register National Meet was held in Princeton, NJ during August 16 – 19 and was co-hosted by the New Jersey Triumph Association and the Delaware Valley Triumphs, Ltd. Overall the weather cooperated and the attendance was as expected. We had eleven Stags in Participants Choice Class and one in Preservation Class. TSCUSA members Pat Barber and Thomas Fansher were the winners in the Participants Choice Class and former member (deceased) Gerry Pagano's Brown Stag was shown in Preservation Class by his son. Unfortunately circumstances did not allow me to attend British Car Day in Bronte, Ontario. (Canada) this year, but I am sure that Tony Fox and Terence McKillen will give us details of the event and the TSCUSA members in attendance.

Thank you for your support of our club and preservation of the Stags. Call me with questions or parts needs and I will respond promptly to your inquiry. Stay well and enjoy driving your Stag(s).

Michael Coffey - Founder (1992)

1970s Grand Tourers

by Terence McKillen

The Triumph Stag was designed and engineered in the late 1960s as a grand-touring car to compete in the all-important U.S. market against the likes of the second-generation Mercedes 280SL, the air-cooled Porsche 911 Targa, or at a stretch of the imagination, another popular import of the period, Volkswagen's Karmann Ghia coupé. By the time the Stag reached U.S. shores in 1971, the Mercedes SL had been given its third generation facelift with larger engine options and the Stag's sibling marque, the Jaguar XJS coupé and convertible was on the drawing board for introduction in mid-1976. Two other contemporary European cabriolets would have been considered contenders of the Stag for garage space – the Peugeot 504 and the Saab 99, the latter still carrying a teeny bit of Triumph DNA.

Each of the models had their stylistic origins in the same time period and while the Stag may have bowed out after seven years of production, the others soldiered on well into the Eighties and early Nineties, achieving significant sales volumes, unlike the Stag. Although contending for roughly the same buyer demographic, the cars were quite a diverse lot, juxtaposing carburetion and fuel injection, front- versus rear-wheel drive, automatic transmission against manual gearboxes, turbo

or standard aspiration, and a mixture of power plants, from I-4s, I-6s or V-8s. Two of the cars only became convertibles later in their production lives; having started out as coupés (the Saab and the Jaguar), evidence of which is particularly noticeable in the side profile and the rear scuttle area, especially on the Saab.

Chances are that if you could design your ideal sports GT model, it would likely be along the lines of the Mercedes SL, widely considered the leader in this class. The offering from the Sindelfingen plant was considered the epitome of an easy-going Grand Tourer. Consequently, it is a huge tribute to the Canley designers (under Michelotti) and engineers (under Spen King) that the Stag has always been talked of in the same hallowed breath as the Mercedes SL.

It is interesting that contemporary car magazines as well as Triumph's own advertising department were making the comparison between the Stag and the SL, as well as the Porsche, and a 1974 advert (lower left) the Citroën SM coupé was also included as a contender. In yet another ad, Triumph added Alfa Romeo as a competitor.

By the time the Stag was introduced, Mercedes had replaced the earlier 'Pagoda' SL with the larger, square cut 107 generation, with a mix of straight six and V8 power plants, the car was good enough to stay in production for almost 20 years. Although the Stag was an astute sporting take on the Triumph 2000 saloon, its real inspiration was the new Triumph V8 engine (for sound, if not early reliability).

Like the Stag, the Mercedes was available in soft and hardtop formats, making them both 'cars for all seasons.' About 70 per cent of Stags were delivered as auto-

matics with the BW35 in the earlier cars and the BW65 in later models, in preference to the four-speed manual with overdrive option. Although available with a manual transmission option, the Mercedes was invariably supplied as an automatic. Trim levels were pretty even on both cars, with the Mercedes perhaps somewhat plainer but possibly more functional.



Porsche's Targa
\$21,345.

Porsche has long been recognised as one of the world's great cars.
And there has been no more distinctive Porsche than the Targa, with its integrated roll-bar and detachable roof.

Triumph's Targa
\$11,540.*

Now there's another Targa: Triumph Stag—as unique in its own way as the Porsche. A blending of style and safety, performance and practicality.

But as well as letting you enjoy the open air appeal of a sports car, Stag comes with a soft-top and a hard-top (the hard-top even has a heated rear window). So you can enjoy the feeling of open motoring, the protection of the soft-top, the snug luxury of the hard-top. Stag is truly a car for all seasons.

And Stag's padded Targa-type roll bar is an integral part of the body design. Its immense strength means that even with the top down, you're protected up top.

Inside, Stag offers reclining bucket seats (also adjustable for height). Complete instrumentation. A real wood dash. Adjustable steering, a padded alloy-spoke steering wheel and column mounted control stalks — all part of Stag's superb driving environment.

Under the bonnet, a beautifully compact 3 litre OHC V8, powerful enough to get you to 100mph (160km/h) in under 30 seconds. Small enough to be economical.

In fact, Stag's looks are matched only by its engineering. Drive the new Targa soon.

Triumph Stag V8

*Price shown is suggested retail price as of February 1995. Dealer price is subject to Scottsdale Motorcycles. Triumph price includes delivery for which price varies from State to State.

For a free brochure, and the name of your nearest Thrupoint dealer, contact: **Sydney:** Mr G Kendall, Thrupoint Cars, 2nd New Bay House, 2 Quilley Avenue, Double Bay, 2028 NSW, (02) 321 5014. **Adelaide:** Mr P Jones, Thrupoint Cars, 82 North Terrace, Kent Town, 5007, Phone (08) 424 3311. **Melbourne:** Mr S Bennett, Thrupoint Cars, 79 Kings Street, Balaclava, 3105, Phone (03) 850 6033. **Brisbane:** Mr D. Knechtel, Thrupoint Cars, 252 Pacific Road, Mooroolbath, 3608, Phone (07) 48 0322. **Forth:** Mr J. Allan, Paddy P's Ltd (Thrupoint), 500 H Street, Subiaco, 6008, Phone 81 3133. **Perth:** Mr D. Miles, Space Layland, 141 Murray Street, Hobart, 7001, Phone 0221 34 3221.

86 WHEELS, April 1976

Keeping up with the Triumph Stag is no problem if you've got the money.



"The Song's vibrant *Tempest* (read in character and performance) was a joy to watch. Her voice this is great. There has been a few changes to the Song since their debut, and from my head reviews are not hard to understand. In the past they have been a bit weaker. China media is not used to watch the Song, which they thought."

"The Song is very strong. It is a very strong voice for the future. Her's a real star."

Plus, a seemingly beautiful coachwork, how well a quality match-line, and the music is very good. China media is not used to watch the Song, which they thought."

"The Song is very strong. It is a very strong voice for the future. Her's a real star."

large help on all his systems. And the starting column editors have helped us much in our production run.

What's the best piece of hardware? It's a pit pit 486-16 meg, with a hard disk, a mouse, and a color display. It's a superbly efficient piece of gear, and everything starts to spin when you turn it on. It's a real performance and improved economy to an already outstanding system. The thing we've found is a computer of any size.

There's also a 3.5-inch floppy, with a special column display on the screen, and a printer, a 486-16 meg. A superbly efficient piece of gear, and everything starts to spin when you turn it on. It's a real performance and improved economy to an already outstanding system. The thing we've found is a computer of any size.

Triumph



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BL Stag advert from 1974



Road Test Magazine, April 1971

One of the major draw backs of the 911 was its handling characteristics when approaching its limits. Due to the position of the rear engine, most of the vehicle's weight was concentrated over the rear axle and early 911s were prone to oversteering and could easily be spun out by an inexperienced driver. By 1972, improvements

had been made to eliminate the handling quirks.

Although not as well known, the Peugeot 504 and the Saab 99 convertibles also made in-roads into the Stag's marketplace. The front-engine, rear wheel drive Gallic two-door convertible was produced from 1968 to 1983 while the Scandinavian entry was produced from 1968 to 1984, although in convertible format only from 1971.



European production, with another half-million in other countries. In contemporary car magazines, the 504 was often compared to the Jaguar XJ6, and surprisingly, to the Porsche 911. In 1974, the 504 coupé and cabriolet, were fitted with a 2,664 cc V6 unit developed in collaboration with Volvo and Renault. Maximum output was 136 bhp, supporting a top speed of 186 km/h (116 mph).

A little-known fact, especially for TSC readers, is that a number of Saab 99s were equipped with Stag V8 engines - actually 48 in number, at the time when Saab was looking for a more powerful engine. However, following the V8 evaluation, a 2-litre turbocharged unit was chosen for the 99 Turbo, introduced in 1978 as one of the first 'family cars' to be turbocharged.

Interestingly, Saab's marketing department compared the 99 with Peugeot, BMW, Audi, Volvo and Mercedes although with its early Triumph DNA, and the 'almost decision' to use the Stag V8 engine, the convertible might have been better compared with the Stag! **SN**

Lake Superior Conquered

by Robin Searle

Lake Superior or Gitchigumi (meaning Great Water or Great Lake in the Ojibwa language) is considered to be the largest fresh-water lake in the world by surface area although only the third-largest by water volume. The Lake Superior drainage basin is rich in natural resources and scenic beauty, is sparsely populated and economically dependent on its natural resources, which include metals, minerals, woodlands and recreation/tourism opportunities. It is particularly known for its clear, cold water and agate beaches. At its deepest point, it measures 1,333 feet (406m) with an average water surface area of 31,700 sq. miles (82,100 sq. km) and average water temperature of 39 deg. F (4 deg. C). Around two hundred rivers and a multitude of streams feed into it, but Lake Superior's waters only have one outlet, Saint Mary's River, which connects into Lake Huron. The lake extends 350 miles (560km) in length and up to 160 miles (256km) in width. Lake Superior is surrounded by ancient Precambrian rocks of the southern sector of the Canadian Shield. The Ojibwa knew the presence and majesty of this great lake - they believed that everything connected to it had a story, not only the rocks, but the deep water, the animals, and the people - Ed.

Three Stags ventured out on a 2,602 mile (4,160km) drive around Lake Superior in the company of 17 other Triumph LBCs from June 14th to June 25th, 2017.

Ten years ago, the Toronto Triumph Club decided on a four-day round the lake (RTL) drive of Lake Ontario which was a great success. Another year, we completed a tour around Georgian Bay (Lake Huron), then the Finger Lakes of Upstate New York and in 2015, it completed the circuit of Lake Erie.

The question at the end of each RTL was always, "Where to next?" How about Lake Superior, the biggest of the Great Lakes, came up several times. So, in the fall of 2015, I volunteered to take a look at how it could be organized. They say a Zebra is a horse designed by a committee - I wanted this to be a thoroughbred event, especially as we were celebrating Canada's 150th birthday a week after our return. All our other RTLs had been pre-driven to get all of the arrangements for meals and hotels in place beforehand but this time the distance was too great, plus I wanted to experience the same shock and

awe as all of the other participants.

Using Google and Google Maps, the Circling Lake Superior route magazine plus a video that a group of motorcyclists had put together in 2015, I was able to Google my way around Lake Superior. One of the conditions that everyone wanted was exploratory time, which resulted in keeping an average daily travel distance of about 150 miles (240km). Using this formula, it was possible to pick out towns for overnight lodging and to include tours, meals and a dinner cruise out on the lake.

Participants also voted that as far as was possible, we would not duplicate any of the roads, so the drive was extended on the home trip to include the northern shores of Lake Michigan and then the west side of Lake Huron, before crossing back into Canada through Sarnia, rather than at Sault Ste. Marie, used on the outgoing route.

After about 500 hours of preparation work, we had all hotels booked and all the meal stops arranged together with our traditional lake dinner cruise and a return ferry ride across to Madeline Island, WI as well as a bonus excursion of a moonlight cruise out of Munising, MI to see the "Painted Rocks" - an amazing natural phenomenon.

The Participants

June 14 was our start day. The three Stags, all belonging to TSC USA members Gord Linkletter, Chris Weekes and yours truly, assembled along with 4 TR6s, 4 Spitfires, 3 TR4s, 2 TR7/8s and 3 TR3As as well as a Jaguar XK8. My Stag had required a complete engine transplant the week before we started out as a result of the crankshaft not being properly hardened after its last rebuild which leading to all of the bearings being destroyed but, interestingly, with no accompanying evidentiary noise; the only symptom was an oil pressure drop to 3 psi. Thanks to the availability of a newly rebuilt engine purchased from Gord Linkletter and the



The three Stags - note the damage to Robin's left front fender

expertise of my mechanic at PD Engines, in Brechin, ON the transplant was completed in time and yes, we made it all the way around Lake Superior.

The Route

We set out from different locations around the Toronto area and as far away as Ottawa, to congregate for the first night at Parry Sound, ON. We spent five nights in Ontario at Parry Sound, Sault Ste. Marie, Wawa, Terrace Bay and Thunder Bay - all along the north shore of Lake Superior before crossing in to the USA at Grand Portage, MN on the way to Duluth, an other overnight stop and the destination for our Duluth Harbor dinner cruise. The border crossing was not busy with only a short queue. The driver of the TR6 immediately following the Jaguar XK was asked by the U.S. Customs and Border Protection agent, "Why did you let a Jaguar come on a Triumph trip?" To which the response was, "He's a friend, so we included him" and the CBP agent replied, "Have a nice trip, sir."

Following Duluth we stayed at Ashland, WI for a side trip to the Madeline Island and then on to Copper Harbor and Munising, MI where we left Lake Superior to traverse the Michigan Peninsula to Imlay City and back to the Toronto area.

Gourmet Dining

The whole drive was truly awe inspiring and almost immediately the trip gained a new name 'Gourmet eating around Lake Superior,' as all of the restaurants chosen had been well researched and were truly



and grille (centre car). Image: Gord Linkletter

welcoming with excellent food. The Edge View Restaurant in Nipigon, Ontario is normally closed on a Sunday but they opened especially for the 40 of us. The Harbor Haus Restaurant in Copper Harbor, MI went all out with a specially created menu choice just for our group, complete with a home brewed wine or beer choice. In Imlay City, MI the Mulefoot Gastro Pub, providing farm-to-table fare with microbrews and craft cocktails in a hip, rustic tavern setting, produced a truly great meal followed by a specially baked 'Canada 150' cake for dessert.

The Issues

All of the cars managed to complete the 2,600 mile odyssey over 12 days without major incident although several cars experienced one or two minor issues that were mostly able to be sorted out on the fly. The most reliable of all the Triumphs on the journey were the oldest machines, the TR3As from 1958, 1959 and 1960. Issues faced by the Stags included Chris Weeke's points slowly working loose resulting in harder and harder starts for a few days, until Gord put on his working smock, brought out his timing light, dwell meter and other diagnostic tools and discovered and rectified the problem. On my Stag, I had a misfiring on the RH side just at idle but it worked fine at speed, so we left that to be resolved after the trip.

Two days from the end of trip we were enjoying the scenery between Munising and Gould City, MI when out of the blue, I heard a loud bang and thought the front left tire had blown, followed by a piece of front trim fly-

ing up into the air. My wife informed me that a deer had come out of the long grass and ran onto the road. Unfortunately, or perhaps fortunately, the deer died instantly with damage limited to the Stag's left front and wing. Using a long screw driver and a wire wheel hammer, we managed to bend the lower lip on the wheel arch edge up and away from the tire, so we were able to continue but later on we passed several other dead deer along side of the road.

All three Stags performed well with only minor issues, easily rectified and the hard luck award went to Archie and Sandy in their yellow Spitfire which consumed two universal joints and a multitude of electrical issues but with all the Triumph expertise available and with the parts that each TR model had collectively brought with them, all returned home safely.

At the completion of each RTL drive, suggestions are received for 'Where to next?' How can we top this event of a lifetime? **SN**



Canada 150th birthday cake



On the Madeline Is. ferry



Chris, Robin & Gord



Sunset on Lake Superior near Munising, MI

Throttle Body Fuel Injection

text & images by George Haar & David Baxa

George Haar and David Baxa have been operating their Stags with throttle body fuel injection (TBI) for a number of years and both agree it makes a marked difference to the operation of their cars.

Rick Patton, a TR6 owner, and founder of Patton Machine LLC in Brunswick, Maine, has developed a throttle body fuel injection systems for classic British sports cars. The main reason for considering such an upgrade is for dependability and a more responsive and smooth operation with improved fuel economy as a bonus. Because the Patton system mostly utilizes GM components that have been proven over millions of miles of driving, it is very reliable and easily serviced.

The main advantage of the Patton conversion kit is its ease of installation and a fairly reasonable price. You don't have to build or alter the intake manifold or throttle linkage. You use the existing Stromberg carburetors, air cleaners and linkage. Depending on certain options you choose, the process can also be reversed if required.

If you install the Stromberg dash pots they must be machined to remove the damper tube inside which is non-reversible but if you use the Patton caps for the fuel injector plate instead of using the Stromberg dash pots you will need to spend a further \$89, or leave them uncovered.

As George and David indicate, the TBI setup provides great start ups, the car runs beautifully while warming up, and runs smoothly thereafter with a modest improvement in fuel economy. George installed the equipment himself while David chose to have it installed by his favorite mechanic and there is therefore some discrepancy in the total installation time estimate between the two authors - Ed.

George Haar

Seven years ago I installed the Patton Machine fuel injection kit on my Stag. Through the years I tried various carburettor combinations but was never happy with the cold starting, idle or warm up.

The kit is GM-based and consists of the following components:

- 1) ECU and wiring harness
- 2) Fuel pump and fuel regulator
- 3) O₂ coolant and map sensors

- 4) Throttle position sensor and bracket
- 5) CNC aluminum throttle body adapters with TBI injectors

What's Involved

It is mostly a plug and play system with only moderate skills needed for installation. The average amateur mechanic should be able to install everything within about 4-5 hours. Really, the hardest part was taking the passenger side (RHS) downpipe off and having a nut welded on to hold the O₂ sensor.

Fuel Supply

I found the best spot to mount the fuel pump is right next to the tank in the trunk above the spare tire. It really isn't necessary to place it below the tank. Since the fuel pressure in a TBI system is 12-13 psi, the original plastic fuel lines can still be safely used or you can install metal lines but the original fuel pump has to be replaced as it is rated at only 2.5-3.0 psi. I used one of the emissions fuel return openings on the tank for the return line and the normal fuel supply pipe that reaches to the bottom of the tank. It is best to pull it out of the tank first and cut off the most distal 1/8th of an inch that has a scalloped restriction, so there is no impediment to the flow.

Electronic Control Unit

The easiest place to mount the ECU is below the passenger seat. I raise the seat frame a half inch with some washers for clearance. The connectors all snap in place to the sensors. There is obviously a line going to positive and negative electrical power, the ignition switch and the fuel pump. It's very straightforward and properly labelled.

TBI Adapter

The Strombergs will have their rubber bellows and springs removed and the TBI



The throttle position sensor and pressure gauge

adapter installed between the cap and carburettor body. A throttle position sensor is installed at the carburettor linkage. Both injectors are connected to a FI hose that goes to the regulator which is mounted anywhere convenient, like on the fender.

The fuel lines to and from the tank connect to the regulator. Next, the idle control valve is connected to the vacuum fitting at the base of the carburettor body with the other hose going from the valve to the air cleaner. A manifold absolute pressure (MAP) sensor is connected to the manifold vacuum line that feeds the brake



The engine bay appears almost original



booster and wired back to the ECU. The MAP sensor should not be connected to the carburettor pedestal as it will throw off the readings.

Lastly, a water temperature sensor can be placed in a number of areas including the rear of the cylinder head. A quick adjustment of the throttle sensor and you are ready to go.

Once up and running, I strongly recommend balancing the two carb bodies with an old-style vacuum synchronizers so that each throttle plate opens at the same time. It makes a huge difference.

In Use

I don't think that having electronic ignition is mandatory but I use a Petronix unit with a stock distributor. Patton does offer a upgraded, mapped distributor but I didn't think it necessary. I believe that the power has increased but it has not been measured on a dyno. It's just feels far more usable and the fuel consumption is indeed much, much better.

Once the system is installed, you connect the ECU to your laptop and do a 30 minute trip, noting any issues at various speeds and revs. A data log is recorded which is sent to Patton who correct any issues and a new chip is returned for insertion in the ECU which will take into account any modifications, such as headers or high compression pistons. There is also a check engine light which will show any problems with sensors etc.

The car now starts without touching the gas pedal and runs without any hesitation during warm-up. Throttle response is excellent. It is the smoothness at all speeds that is most noticeable, along with a perfect idle at 600-700 rpm. It starts and drives like a modern car. It also looks totally stock with almost no indication under the hood that anything has been changed.

There were certainly some learning experiences along the way but nothing has failed and it has been 100% reliable.

David Baxa

After more than a decade of owning and enjoying a TR250, I reached the conclusion that the tight cockpit did not provide tolerable comfort for my long legs - especially on road trips. As I began to consider alternatives in 2012, my long-held desire of owning a Triumph Stag emerged at top of mind. It wasn't too much longer



TBi adapter installed between the cap and carburettor body

before I found a buyer for my TR250 and came across a reasonably good 1973 Stag for sale. It had a fairly fresh repaint in its original Mallard Blue, a rebuilt Triumph V8, and a 4-speed manual transmission. Upon arrival from Ohio to my home in Western Maryland, the Stag exhibited one characteristic that seemed to override most of its positive qualities - it consistently took *forever* to start with its stock Stromberg carburetors in need of some serious attention.

Upon consulting with my long-time Triumph mechanic, Chip Collingwood, of UK Motorsports in Richmond, VA, we discussed three alternative solutions to resolve the fuel delivery issues:

- 1) overhaul and tune the Strombergs;
- 2) purchase and install a custom intake manifold (or adaptor) along with a modern Weber carb; or
- 3) install a modern throttle body fuel injection (TBI) system in-lieu of any functional carburetors.

For any of these alternatives, I also wanted to convert my Stag to an electronic ignition system.

The Decision

The first alternative had the lowest initial cost and would preserve the entire originality of the fuel delivery system. However, it would require a fair amount of up-front labor and most likely some regular fiddling over time to keep the carburetors in top form. Further, given the age of the technology, retaining the original carbs might not entirely address engine starting issues, particularly under certain weather and/or temperature conditions.

The second alternative of replacing the original carbs with a new Weber carburettor, while having a higher initial cost, would offer greater reliability with a much more sophisticated modern carburetor-



Above & below: Some of the Patton kit parts





David Baxa's 1973 Mallard on Saddle tan Stag

based fuel delivery system. It would also likely require some ongoing maintenance to keep everything in top form. In addition, it would substantially change the look of the Stag engine since the Weber carb would look entirely different and the stock air cleaner set-up could not be used with this new carb.

The third alternative - installing throttle body fuel injection - would most likely be the highest in initial cost. On the other hand, it would allow the implementation of a modern, computerized fuel delivery system with proven reliability over millions of miles of driving. Not only did it promise to be the most maintenance-free of the alternatives, it came close to preserving the stock look of the Stag's engine bay since the existing Stromberg carbs, intake manifold, throttle linkage and air cleaner set-up would remain in use.

After doing some further research and careful consideration, I became convinced that the TBi approach would provide me with the most driving satisfaction over the long term. I also concluded that at least some of the initial cost would be amortized over the life of this modification, in the form of decreased maintenance cost, and overall piece-of-mind. My decision was also influenced by UK Motorsports and their successful prior experience in installing the TBi kit from Patton Machine and Affordable Fuel Injection (AFI) of Oxford, MI on other Triumphs.

Technology

With a TBi conversion, a Stag owner can expect all-around easy starting (in any weather) and smooth running - even while the engine warms up. The improvements generally manifest themselves in throttle

response, and perhaps fuel economy, rather than horsepower.

Once installed, it doesn't need any further tuning unless the engine is altered, such as with an upgraded cam. The TBi system is data log-capable, is programmable for fuel and ignition, and the GM Engine Control Unit (ECU) has the ability to learn and adapt to individual driving habits. Maintenance for the TBi system generally consists of changing filters, spark plugs, and an occasional gulp of fuel injection cleaner in the gas tank. Basic fuel injection components often go for 100k miles or more without adjustment or failure. As this conversion is based on popular GM components, parts can be found at one's local auto parts store. Further, test procedures, trouble codes, and service equipment are the same as for other GM implementations. There's even a port connection provided for an engine code reader.

The conversion kit is a joint offering from Patton and AFI.

Patton

Patton provides the aluminum TBi carburetor conversion adapters for the Stag's Stromberg carbs, carburetor bypass block offs, two GM injectors, filters and relays, fuel pump, pressure regulator, Throttle Position Sensor (TPS) with custom actuator and stainless mounting bracket, coolant temperature sensor, manifold air pressure sensor, O₂ (in exhaust) sensor, a GM ignition control module and the optional Lucas distributor conversion to electronic ignition.

An Idle Air Control (IAC) is also a recommended option for this kit. The IAC is a variable flow valve, controlled by the ECU,

that bleeds air into the intake manifold under various conditions. It provides extra air during startup, raises the idle speed during engine warm up, stabilizes idle speed, prevents stalling, acts as a damper during deceleration, and boosts available air during hard acceleration.

The carburetor adaptors are designed to use standard GM throttle body injectors from late 1980s and 1990s cars and trucks. Later style GM mini TBI injectors are specified since they are smaller and fit the Stromberg carbs better.

AFI

AFI assembles all the modules and electronics, and supplies the needed cables and wiring harness. They also provide the incredibly important, ECU programming and technical support. This includes up to four custom chips specifically tailored and optimized for an individual car's engine characteristics (including any modifications over the years), fuel grade used, and the owner's driving style. Included in the kit is a data cable which allows the monitoring and recording of the onboard ECU data with a laptop while the car is being driven.

Note that, while optional, Patton's conversion for the Stag's Lucas distributor will allow the onboard computer (ECU) to have complete control over ignition mapping. The conversion kit pretty much completely replaces all the mechanical components inside the distributor--points assembly, springs, counter weights, etc. In their stead, a reluctor assembly and companion electronic pickup coil are installed along with the stock rotor and distributor cap. The lead from the pickup coil is then plugged directly into the TBi ignition control module which is also connected to the ECU. While other electronic ignition conversions (Pertronics, Crane, etc.) can be used with this TBi implementation, the Patton Lucas conversion is the only one that



High-pressure fuel pump with new supply lines



TBI Position Regulator and Gauge.

allows the ECU to have complete control over engine mapping.

In TBI applications, fuel is squirted into the throat of the carburetor such that, after installation, the carbs house the two injectors and become simply "air doors" used to meter air into the engine. Once the TBI is installed, the domes on the Stag carbs become only ornamental and, with slight modification, can be refitted to hide the conversion and maintain the stock appearance of the carbs in the engine bay after installation.

Installation

My installation was performed by UK Motorsports. Necessary alterations included the installation of the electric fuel pump producing 15 psi (in lieu of the original Stag lower pressure fuel pump), a fuel return line back to the gas tank, the pressure regulator and gauge, and the four sensors - a coolant temperature sensor, a O₂ sensor (in the exhaust), a manifold air pressure sensor, and a throttle position sensor. Each of these sensors relay information to the ECU which controls ignition and fuel delivery.

In addition to the standard kit, we elected to add Patton's Lucas distributor conversion and the Idle Air Control (IAC). Once the TBI kit components were in hand, the first step was to look for reasonable locations for the fuel pump, outbound and return fuel lines, pressure regulator, each of the sensors, and the IAC.

The most logical place for the fuel pump turned out to be underneath the car, just forward of the trunk floor where it would be well protected.

Next to be located was the fuel pressure regulator and its companion pressure gage. For this, UK Motorsports chose to mount it in the engine bay fastened to the top of the driver-side suspension tower.

There it would be easily accessible and reasonably close to the carb-mounted fuel injectors.

With the pump and regulator positioned, it was time to install the new fuel line from the fuel tank/pump to the engine bay/pressure regulator and the new return line back to the tank. For this, stainless tubing lines were carefully bent and routed under the car between the engine compartment and the trunk. The next step was to get a billeted aluminum TBI carburetor adaptor and a by-pass block-off installed in each carb. These are the specialty items from Patton used to hold a fuel injector in its proper position for feeding precise amounts of fuel into the throttle body and to block off internal venturi orifices that formerly provided fuel into the throttle body. The photo (top right) shows both adapters mounted to the Stromberg bodies with an injector installed in each.

Once the modified carbs were reinstalled on the intake manifold, they were ready for the subsequent series of tasks including installing the four sensors, the ECU computer, the check engine warning light, the IAC, and converting the Lucas distributor. It was helpful to lay out the wiring harness to get a sense for the various lengths of the connecting wires which might influence the position of each connected component.

The Coolant Temperature Sensor was first as it required a bung to be TIG welded in the intake manifold near where the coolant hose from the top of the radiator is fastened (see photo below). Note the Throttle Position Sensor appears in the background. Both of these sensors are out of sight once the air cleaner assembly is reinstalled.

The Oxygen Sensor was installed next, since it also required the welding of another bung, this time into the exhaust



Coolant temp sensor on intake manifold



Aluminium adaptor plates for each carb downpipe.

Distributor Conversion

Having completed these two sensor fitments, it was a good time to apply the Patton Lucas distributor conversion for electronic ignition. This job, while not overly complicated, required very close attention to the detailed instructions that came with the TBI kit. It was also helpful to view the step-by-step photos and instructional video posted on www.pattonmachine.com. The conversion kit pretty much completely replaces all the mechanical components inside the distributor - points assembly, springs, mechanical advance counter weights, etc. In their stead, a custom reluctor assembly and companion electronic pickup coil are installed along with the stock rotor and distributor cap. The lead from the pickup coil is then plugged directly into the TBI ignition control module, which is also connected to the ECU. While other electronic ignition conversions (Pertronics, Crane, etc.) can be used with this TBI implementation, the Patton Lucas conversion is the only one that allows the ECU to have complete control over engine mapping.

ECU

Once the distributor conversion was complete, positioning the ECU on the firewall in the passenger compartment just below the Stag's component mounting plate was the next task. When the carpet was reinstalled after securing the ECU above the foot well, the computerized control unit is no longer visible from inside the cabin.



David positioned the ECU in the passenger footwall while George placed it under the passenger seat

Next, the Stag's choke cable and control knob were removed and the wiring for the TBI Check Engine warning light was routed to the center console so the light could be positioned in the hole left where the choke control had been.

Also installed at this time was the idle air control (IAC) and the ignition control module, both on a fabricated bracket on the front of the driver-side firewall. The IAC regulates fast idle during warm up and at other times whenever more air is needed to maintain idle speed or to support rapid acceleration. The ignition control module enables a spark to be produced at the correct time in each cylinder. It also gets it's signals directly from the ECU and does much the same job as contact breaker points did in the distributor prior to its conversion.

The throttle position sensor was installed on the front side of the carburetors under the air cleaner housing.

Wiring Harness

The final step was the wiring harness provided with the kit. As it is intended for multiple applications and not Stag-specific, UK Motorsports deemed it longer than they would like for use in the Stag. In order to make the installation a bit more tidy, they shortened some of the leads to better adapt it for my car. Completing this part of the



Check engine light in place of choke control

installation also required enlarging a hole through the firewall for all the wires going to the ECU in the passenger compartment.

Patton does not recommend shortening the wiring harness by simply cutting wires and splicing them back together with butt splices since some of the wires carry signals operating at low voltage and a poor or corroded connection will cause a malfunction. They suggest either finding a way to tuck a loop or two of wire under the dashboard or contacting Patton or AFI before attempting to shorten any wires in their harness.

Tuning

After all the parts and connections were double-checked and the system examined for possible fuel leaks, time was spent in the shop dialing in the Throttle Position Sensor with the laptop and included application. There was also some slight adjustments that had to be made on the throttle butterflies to make sure they were synchronized. The UK Motorsports team then drove some test loops to record data and send it to AFI so they could flash a refined chip for the ECU. The purchase price of the kit from Patton includes up to four iterations of this customization process, if needed. In the end, one more such iteration for a further refined chip was performed before UK Motorsports felt they had everything the way it should be.

Results & Operation

It took about 24 hours of labor by UK Motorsports to complete the installation of this TBI fuel system. Including the price of the kit, my total cost for this implementation was about \$3,500. Someone with more mechanical skills could certainly install this same system themselves and save the labor costs. The instructions that came from Patton were profuse and very detailed, and they are supplemented by many instructional notes, photos, and videos available on Patton's web site.

While it sounds expensive, I have never regretted doing this for my Stag. The car performs like a champ and is a true joy to drive. Over the four years since this conversion of my Stag to a modern throttle body fuel injection system, I have enjoyed over 7,500 miles of trouble-free driving while basking in the precision computerized fuel mixture control, adaptive ignition timing, and predictable engine response afforded by this exceptional automotive technology. In this time, I have made several trips of 1,000 miles or more and, while



Manifold idle air control (left) & ignition control module (right) mounted to firewall

I have continued to make other unrelated improvements and fixes to my Stag, I have never had to concern myself with any adjustments related to engine responsiveness or performance. I highly recommend this modification for the dedicated Stag driver. **SN**



George Haar at Bronte

The Patton kit sells for about \$2,000 while a similar kit, from Kee Auto in the UK, costs about £1,600 (\$2,100). Burlen Ltd., of Salisbury, UK, manufacturers of the original SU carburetors sells a fuelling system that includes a fuel injection device working inside an SU carburetor. The company says it may develop additional systems, perhaps also for

Strombergs? There are several other FI kit suppliers such as Holley-Sniper, Edelbrock, FI Tech and FAST that should be able to work off of Tony Fox's modified 4-barrell Holley-Edelbrock adaptor plate but would require further investigation to assess suitability for the Stag. These systems are significantly cheaper than the TBI systems.

in addition to the kit cost, there is also the cost of installing the O₂ sensor mount on the exhaust pipe, plus the additional return line plumbing, etc. For those who don't undertake the installation themselves, factor in a labor allowance of about \$1,500-2,000. As in all things, there are pluses and minuses to be considered and one has to ponder whether \$2,500 to \$4,000 is a reasonable expenditure for bringing the Stag's fuel delivery system up to modern standards - Ed.



Davies Craig temperature controller in George's Stag

Tony Fox

I believe that George was one of the first to pioneer the Patton FI system for the Triumph Stag. Finally, he has it working nicely and during my visit earlier this summer, the car started and ran like any modern day car. It starts instantly, either hot or cold and idles nicely (no choke required of course), and as it warms up there were no instabilities observed. It has the nicest idle I have come across in any Stag - idling very smoothly at around 700 rpm. I'd say there is no noticeable increase in power over a Holley or Edelbrock carburetor but the main point is the smooth and trouble-free operation.

The system is a good fit, hardly seen under the hood as it can use the bodies of the Stromberg carbs to mount the injectors (optional). To the casual observer it looks quite innocent. Alternatively, you can buy from Patton two smart covers for the fuel injector plates or simply leave them uncovered.

Bronte Stag Weekend

by Terence McKillen



The earliest Federal Stag - LD2 (pre-production model)

For the past seventeen years, our Canadian Director, Tony Fox, has organized events for TSC USA members, and other Stag owners, over the Friday and Saturday prior to the Toronto Triumph Club's annual British Car Day, held on the third Sunday in September.

There is usually a good turn out of Stags for the driving outings and dining experiences that Tony and his family put together, and this year was no exception. We had a total of 25 Stags participating in the Bronte Weekend activities, mainly from Ontario but with a number of TSC USA friends driving in from Western New York, Ohio, Michigan and Illinois.

The festivities started on Thursday evening as people began to arrive at the Admiral's Inn Hotel in Burlington but the real events began on Friday morning with a leisurely drive around the bucolic byways and back roads of Niagara Escarpment country north of Burlington to Campbellville with a lunch stop at Mount Nemo and later a visit to the Ireland House Museum.

In the early evening, Robin Searle gave an illustrated presentation on the circumnavigation of Lake Superior (see article on p. 6) and Joe Pawlak discussed his acquisition and restoration of Stag LD-2, the first pre-production Stag constructed

off-line to Federal Specification for the U.S. market. Saturday saw another drive along the Lake Ontario shoreline to Jordan Station for lunch and then to Grimsby to see the "Painted Ladies" gingerbread houses, followed by the familiar banquet and awards presentation in the evening.

On Sunday morning, Tony led a procession of 12 Stags from the hotel to Bronte Provincial Park to join 13 other Stags in the line up at British Car Day which took place in beautiful late summer weather and was attended by about 9,200 spectators and 1,050 British car entrants. Winners in the Triumph Stag category were Chris Tank (Waterloo, ON), John Kolton (Kildeer, IL), and Robin Searle (Brehin, ON). The Best in Show prize



Capturing 25 Stags in one shot is nigh-on impossible!

went to a 1954 Daimler Conquest drop head coupé while my personal pick was a 1937 Austin 7 with genuine vintage patina. **SN**



Yellows and reds of various hues were common colors at Bronte this year



Gord Linkletter & Fanny Gragor in one of Gord's four Stags



Chris & Griz Holbrook with Livvie travelled from the Michigan Peninsula



Susan & Bruce Krobusek brought their green Stag from Farmington, NY



Ted & Eden Allison travelled from Ohio

End Panel

Pre-Production Stags - the August-September issue of "Triumph World" has an interesting article on the restoration of two pre-production Stags by UK residents, Mike Nixon and Malcolm Bryan. The two cars are LD10 and LD12. Although numbered LD12, it was actually Pre-Production Car No. 9 (but the twelfth example built). The white on black Stag was used by BL as

[Back to Results](#)

Triumph Stag



Lot No	98
Make	Triumph
Model	Stag
Year	1970
Vehicle Registration	RVC4324
Chassis Number	LD12
Engine Number	U7394E
CC	2498
Body Colour	Triumph White
Tint Colour	Black
MOT Expiry	June 2018
Estimate	£45000 - £60000

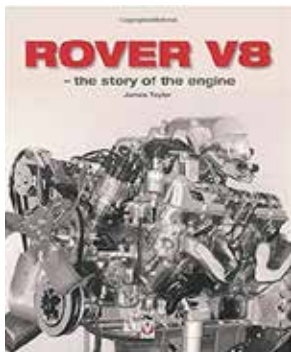


the Belgian press launch car. Subsequent to the publication of the article, LD12 went to auction on 26 July at H&H Auctions held at the Imperial War Museum in Duxford, Cambridge with an estimated catalogue price of £40-45,000 (\$52-60,000). However, the best bid was £33,000 (\$43,000) which did not satisfy the seller's reserve price.

Rover V8 - the story of the engine -

a new book by James Taylor tells the fascinating story of the engine that created a legend in its own lifetime. Starting life as a General Motors design in 1961, it was withdrawn three years later in favor of cheaper technology, and reached

Rover by chance in the mid-1960s and might possibly have powered the Triumph Stag, if history had taken another path. Veloce Press, ISBN: 9781787110267. Publisher's price is \$50 (but available for \$24.38 at amazon.com).



34th European Stag Meeting - the biennial European Stag Meeting was held this year in St. Gallen, Switzerland, May 25-28. Seventy-five Stags participated with 34 from Switzerland,

28 from UK, 6 from the Netherlands, 5 from Germany and one each from France and Austria. I wonder if TSC USA members could assemble 50 Stags somewhere, or better still in several places, in the USA and Canada in 2020 to celebrate the Stag's 50 anniversary?

Triumph Stag Reverse Light Upgrade - Gil Keane of Better Car Lighting in Broom, Warwickshire (www.bettercarlighting.co.uk), recently advised me that he has developed a compact, high power LED bulb kit to replace the standard 21w reversing light bulb in our Stags. It is a 2-pole bulb that requires the swap out of the standard bulb holder for a stop/tail bulb holder and running an extra power source from the front of the car.

Most Stags already have an unused heated rear window switch, complete with warning light, on the dash. If this is used for the rear foglight function, the wire just has to be extended into the boot (trunk). When you engage reverse, it will work as before, but much brighter, and using only 2 watts. When the switch is operated, the same bulb will change to powerful red, to ensure that you can be seen in poor conditions, and when you apply the brakes, the same bulb will light up red to give you twin brake lights, ensuring that following traffic will notice you. This new kit comes with two bulbs and two twin-pole bulb holders to replace the standard reversing light. The kit costs £49.99 (about US\$66) plus air mail to USA/Canada of about US\$7.20. I plan to install this update on my Stag and will provide a detailed report in



the next issue of Stag News.

Good Bye to the Internal Combustion Engine - if a proposal by the British government becomes law, no new gasoline or diesel cars will be sold in Britain starting in 2040. This proposal is the latest step in the battle against the damaging environmental and health impact of the internal combustion engine. What will this mean for collectors of classic cars? In the meantime, BMW has indicated that it will likely build the new, all-electric MINI at its Oxford factory.

Leather Covered Dash - Robin Searle reports that he had the vinyl parts of his Stag dash trimmed in leather by Paul Moore of Moore's Coach Trimmers & Upholsterers of Aylsham, Norfolk (www.mooresttrim.com).



com or mooresttrim@googlemail.com). The cost for both pieces to be covered was £624 (\$823) including shipping. He had previously had a quote for re-doing just the dash in vinyl at \$1,250.

Best British Car of All Time? - Britain has a strong history of making iconic vehicles, but which one should be named as the best British car of all time? Weekly car magazine, Auto Express (Apr 20, 2017), decided it was time to put an end to the debate. It engaged 10 industry bosses, including representatives from Aston Martin, BMW and Jaguar Land Rover, to create a definitive list of the most influential models made in the UK. So which car came out on top? The original Austin-Morris Mini (1959-2000).



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