

LOTUS LINES



OFFICIAL NEWSLETTER OF THE EVERGREEN LOTUS CAR CLUB

Winter 2018

From The Chairman's Desktop

By Doug Jackson

As the weather cools off and your thoughts might lean toward putting your Lotus car away for the winter, I hope you have made some good memories by using it (or them in the case of a few of you) during the warmer and drier months of the year.

The past ten months or so of 2018 have offered you a bunch of opportunities to get into your unique cars and "stretch their legs" a little on some fun "Drives In The Country" (including the really enjoyable, two-Lotus Car Club "Olympic Peninsula Loop Tour" drive in June) and attend a few interesting car shows and events like: the All British Car Show in the Redmond Town Center; the various Vintage Races at Pacific Raceways; the All British Car Show at the Triple X in Issaquah; possibly the Greenwood Car Show; the Vancouver BC All British Field Meet (ABFM); maybe the Portland ABFM, and of course; the Western Washington ABFM, plus others.

I don't know if any of you attended the Maryhill Art Museum Car Show and Maryhill Loops Hill Climb event just a while ago, which is held near Goldendale in Eastern Washington, but if you didn't this year, you might like to consider putting this SOVREN event on your calendar for 2019.

I hope you took the opportunity to visit the LeMay-America's Car Museum and the LeMay Family Foundation complex at least once during the year, simply because their display of cars (and other things) changes all the time and they are always worth a visit.

Keep in mind that, your Lotus car(s) are really just cars (even if a lot of you don't look at them that way) and don't need to hide from the cooler and rainier weather during the late fall and winter time. Our cars are mostly made of some sort of plastic and, at least their bodies don't rust like every other vehicle that is assembled of different types of metal. That's not to say that they don't need to be protected from the elements (and probably like you, I try to keep mine in the garage as much as possible!), but it does, more-or-less remove one of the things that can deteriorate other types of vehicles.

A couple of you might get a kick out of the picture that I chose to accompany this "article". It's a picture I took of my 1976 Lotus Elite parked next to Tim Barker's Lotus Elite at Toby Peterson's DeLorean NW facility when it was on Bel-Red Road in Bellevue, before he moved to Woodinville... who knew there were two white '70s Lotus Elites in the Pacific NW!?!?

Enjoy your cars and I'll see you "on the road" sometime.



Doug's and Tim's Elites at DMC

The Esprit, by Alan Perry

In April, 2016, I bought Corky Russell's 1983 Turbo Esprit project. It was a fire-damaged, insurance write-off that he had bought some years earlier and had been trying to repair himself. The damage was limited and Corky had already replaced enough parts that it was hard to tell what the fire had burned. As he described it, the engine was almost back together, it just needed the intake and accessories reinstalled.

I estimated it as a 6-month project. I never finished it and got it as far as I was going to get it 28 months later.

Corky was kind enough to deliver the car to my home. However, since I live on a narrow, gravel road and near the top of a steep hill, I usually have cars dropped off at the bottom of the hill. Then I figure out some way to push or pull them up the hill. Since the Turbo Esprit is from the days of 5 mph bumpers, I figured it would be safe to push the car up the hill with the family-mobile (Mazda CX-9). Through the sounds of plastic cracking, I discovered that,

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unlike the Federal-spec Esprit S2s, which have solid, energy-absorbing bumpers, the Turbo Esprit has plastic shells for bumpers.

Later, when I had the rear bumper off to repair it, I discovered that I was not the first person to make this mistake. There were existing repairs to damage more severe than what I had caused.

The First Repair

The first repair that I made to the car was not finishing assembly of the engine or fiberglass, epoxy, and paint repair to the rear bumper. It was replacing the driver door glass. Before Corky sold me the car, a rake had fallen on the car and shattered the door glass. The replacement glass came with the car.

Replacing the door glass in an Esprit basically involves disassembling most of the door to get remove the window frame. Since the car was 35 years old, there were other things to take care of while in the door, like the window felt and the paint on the window frame (which is much easier to paint outside of the door with no window felt in it). And, of course, the plastic sheet of vapor barrier was missing.

When I got the door reassembled and started testing components to make sure that I got everything put back right, I discovered that the window did not go up and down. Later, I traced the problem to a wiring mistake that I made, but for a while I thought it was the window's electric motor.

That vintage Esprit uses a Delco electric motor here, a part used in Corvettes and Camaros from the 60s to the 80s, varying only the connector on the motor and the Esprit's wiring used a two spade connectors and could be adapted to most any of them. The only trick is that the sides of the car that the different motors are used is swapped.

Since it is a Delco part, these window motors are easy to get at the local auto parts stores like O'Reilly's. However, what one usually gets is rebuilds of old units with the most fragile-looking brush assembly. Happily, I found the wiring mistake that I made and didn't have to use the rebuilt unit to make the window work.

The Engine, Attempt 1



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As mentioned, I was given the impression that the Esprit's engine had been gone through and just needed the intake and accessories reinstalled.

The prospect of working on the engine in a longitudinal, mid-engined car can be daunting, but I had owned a S2 Esprit for 10 years and did most of the work on it myself, including the "World's Slowest Top-End Rebuild" (TM). The turbo plumbing and some differences in the chassis make things a little different working on a Turbo, but much of it is the same. You just have to be comfortable climbing into the engine compartment.

I started reassembly at the front of the engine with the alternator, the alternator belt and the A/C belt. I would then work back to the intake manifold, the carbs, fuel lines, vacuum lines, etc.

There isn't much room between the front of the engine and the firewall. Since it is at the front, you have to almost lie on top of the engine and then reach around the sides of the exhaust cam carrier on one side and a coolant pipe on the other to reach the water pump pulley bolts and the nuts/bolts holding on the alternator and the belt adjusters for the alternator and A/C compressor belts. It is a little awkward, but not that uncomfortable. Except for the one time that I managed to do something completely wrong and gave myself Tennis Elbow and couldn't work on the car for two weeks while my elbows were restrained by straps to heal.

On the early Turbo engines, the alternator is partly located by a triangular bracket. One corner of this bracket attaches to the water pump. When I tried to thread the bolt into the water pump, it wouldn't bite. I discovered that it was stripped. Off came the water pump. And, since it was off, I sent it down to Barry Spencer to get it rebuilt. He also repaired the stripped thread.

While the water pump was off, I was looking at the engine, the belts and the accessories that they attach to. Turbo Esprits have an engine-driven vacuum pump for the brake boosters, the HVAC system and some emissions components.

However, this Esprit had an electric vacuum pump located in the front compartment. The stock vacuum pump was not connected to anything. So, I removed it.

The vacuum pump is driven by the same belt off of the crankshaft pulley that drives the water pump, so, to remove the vacuum pump, I needed a different belt. Since normally-aspirated Esprits don't have vacuum pumps, I was able to use the same belt as on those cars. When I eventually sold the car, I included the mechanical vacuum pump and belt, in case the buyer should ever decide to go back.

In the time that I was messing with the vacuum pump, Barry was able to complete the work on the water pump and return it. After that, it didn't take long to get the accessories, intake and

carbs back on. It took a little fiddling with the timing, but it didn't take long to get the engine running.

However, it did not run well. It was missing and the timing wouldn't advance, so it didn't run much above idle. I checked the compression and it was low across the board. In the to-be-solved-later category, it was leaking a lot of oil at the base of the cam carriers, filling up a couple spark plug wells with oil.

After consulting with some people, I figured that the rings were not sealing because the engine had not run in years. I got some Marvel Mystery Oil, poured some into each cylinder and let it do its thing. And eventually it did, the compression came up and the running of the engine improved. I quickly got it to the point that it would fire right up with a little choke. But, it would occasionally misfire and, after it warmed up, it would sometimes light up unburned fuel in the exhaust.

I did another compression check and one cylinder was still low. I also checked the valve clearances were really off and it was the same cylinder that the compression was low on. Time to redo the valve clearances.

The Engine, Attempt 2

I really didn't want to do the valve clearances. The Lotus 907/910 does valve adjustment with inverted buckets and shims. Each cam spins in its own housing (its cam carrier) and these are not part of the head, but bolted on. To change the valve shim, the cam carrier needs to come off. To take the cam carrier off, the timing belt needs to come off. To take the timing belt off, the accessory belts need to come off. The accessory belts that I had just installed.

After much delay, I eventually bit the bullet and started pulling things apart. When I got to the timing belt, I noticed something odd. It is a toothed rubber belt that goes between a crank pulley, the exhaust cam pulley, the intake cam pulley, and the distributor drive pulley. Then the smooth backside of the belt goes around a tensioner and back to the crankshaft. The tensioner had a bunch of rubber from the timing belt deposited on it.

I removed the tensioner and found that its bearing was bad. Ordered a new bearing. Rebuilt the tensioner. Cleaned off the tensioner pulley. Ordered a new timing belt since the old one was suspect since it had left so much of itself on the tensioner pulley.

I took the opportunity to try one of the new Gates Racing blue timing belts. It is actually from a '93 Nissan, but it has the same tooth pitch, tooth count, width and length as the original Lotus part. And it can go longer between timing belt changes. I later found out, on the minus side, some claim that it does not stretch when hot like the original Lotus part and may cause additional wear on other parts.

To adjust the valve clearance on a shim and bucket set-up, you

measure each valve clearance and figure out how out of spec it is, measure the thickness of the shim, and calculate the thickness of shim needed to get the desired clearance. If you want to increase the clearance, you use a thinner shim and vice versa. Also, in the early days of the Lotus 907 engine, there was a paper gasket between the cam carrier. Later on, Lotus replaced the paper gasket with a gasket eliminator, like Loctite 518. You needed to account for any difference between the cam carrier and head gasket material that had been used and what will be used.

Remember how I earlier mentioned that a couple spark plug wells were full of oil. In the previous installation of the cam carriers, the gasket eliminator was not properly applied or the head or cam carrier surfaces not properly prepared, so it leaked oil at the cam carrier/head interface.

I went through all 16 valves. Three or four were within spec. Eight could be made within spec by swapping shims around. Four or five needed replacement shims. At the time, I thought that correcting the valve clearances would solve the problem with how the engine was running and I was trying to finish adjusting the valve clearances in time to take the Esprit to the 2017 ABFM.

However, I could not obtain the missing valve shims in time.

When I finally got the correct valve shims, I completed the valve adjustment, got the rebuilt timing belt tensioner and new timing belt on, and reinstalled the accessory belts. It was during this work that I gave myself Tennis Elbow, but the symptoms did not start until the next day. With a little choke, the engine started right up. And the compression problem and the misfiring had not been solved.

The Pause

At this point, I took a step back to evaluate where things were and how to proceed. I took care of some more non-engine things like changing the front wheel bearings, brake rotors and pads. I changed the rear pads as well as replace the pins for the sliding calipers. I thought that I had taken care of the clutch hydraulics, but I later found out that I was wrong.

I also decided that I would not be keeping the Turbo Esprit after I finished it. When I got it, the plan was to sell it once I got it working, but I was also open to keeping it if I liked it. I referred to the car as the "cute little puppy" and wondered if I would fall in love with the puppy and want to keep it. But, at this point, the "puppy" was pooping all over the house and I was ready for it to go.

Not only was I ready for the car to go, but I was confident enough of when I would be done that I set myself a deadline for when it would go. No matter the state of the Esprit, I was going to sell it at the end of the following July. It was around Septem-

ber and I thought that there was no way that I would still be working on the car in July.

Getting back to the engine, I thought about what I had observed so far. I discussed what I had observed with others more knowledgeable than me. The compression check was showing low compression on one cylinder. Putting oil in the cylinder and doing a compression check again raised the compression a little, but not to an acceptable level. The leakdown test was not showing any problem. The engine would idle, but occasionally misfire and spit out through the carb barrel on that cylinder. That did not seem conclusive on what action to take next.

Several people suggested that I rebuild the bottom end or pull the engine and send it out. I decided to just get the head rebuilt. The model that I had in my head was that there was something compressible on the valve seat so that the valve wouldn't reliably seat in the repeated opening and closing when the engine is spinning, but it would settle in and seat when the engine was running.

Recall that this had been a fire damaged car. The electric motor that drive a circulation fan on the engine cover seized and caught fire. It burned components directly under the fan and dripped melted plastic on the carb below. Some of the smoke went into the intake and, based on what I saw when I rebuilt the carbs, into the carb barrel for the cylinder with low compression. Perhaps that had deposited something on the intake valve seats.

The Engine, Attempt 3

Over last Christmas break, I started pulling the head off of the engine. I finally got it off in mid-January. I had to remove everything that I had installed onto the engine and then some. At the end of the month, I dropped the head off at the machine shop that would rebuild it.

I was expecting the work on the head to take some time, so started looking at other things that should be done since I was getting the head done. I took the turbo in to get rebuilt and rebuilt the turbo's wastegate myself.

The shop rebuilding the turbo reported that the center section

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of the Esprit's turbo was cracked (which explained a bunch of oil that I found around there) and the cold side intake vanes had been eroded dangerously thin over time. With some effort, they found the parts and were able to rebuild it.

When the turbo and the wastegate were removed from the exhaust manifold, half of the fasteners broke. My attempt to drill out and tap (or repair) the thread failed and I sought Corky's assistance. What we did only partly worked, but not completely, so I took the manifold to a local fabricator to make it all right.

The machine shop rebuilding the head reported that the exhaust guides needed to be replaced, so I ordered a set and had them shipped to the shop. Also, the valve buckets on the early Turbo Esprits were made out of steel that have been found to crack over time, so I ordered a new set of buckets and had them shipped to the machine shop as well.

I started getting busy with the big stage rally that I help organize as well as another rally that I steward, so I didn't notice how long the machine shop was taking. But, after the rallies had run and the shop still wasn't done with the head, I started calling. And calling. And calling. And after a bunch of calling, the head was ready. Or was it?

As I was getting the head ready to go back on the engine, I noticed a burr across a couple of teeth on one of the timing belt pulleys. I don't know if the machine shop put it there, but it was in the middle of where the timing belt ran. It didn't seem like a good idea to use that pulley anymore and I bought a replacement. But there weren't any in the US, so I had to wait for it to come from the UK.

While I was waiting, I started preparing pieces to go back on. In this vintage Turbo Esprit, the part of the exhaust manifold that the turbocharger and wastegate attaches to is a separate part from the exhaust manifold itself.

It is called the 'wastegate adapter' and literally half of the bolt threaded into it were seized and broken in place. I tried to get them out and failed. I sought the assistance of someone who got them all out, but one still needed work. That last bit of work was done by a local fabrication shop (Jantz Engineering in Poulsbo, for those of you on this side of Puget Sound).

All of the parts came together and I started assembly. Got everything back together and proceeded to try it out. And the compression was up, but not to where it should have been.

The Beginning Of The End

At this point, it was the middle of July and my end of July deadline was coming up. It was time to take stock of what state the Esprit was in and get ready to sell it.

Most of the electrics worked. The brakes were in good shape. The engine started easily and idled. The cooling fans would cycle

on and off as the temperature rose and fell.

I decided that, before I sold the car, I wanted to drive it, if only out and then back into the garage. The first problem stopping this from happening was that the engine would not rev. Despite having a new distributor, the mechanic advance was not working and the engine would not rev much above idle. The second problem was that the clutch hydraulics had failed again. Taking care of the second problem first, I investigated the clutch.

After playing with the adjustment at the slave cylinder, I discovered that the clutch master cylinder had failed. I bought a rebuilt unit rather than taking the time to rebuild it. However, the hydraulic fitting on the replacement master cylinder was not the same as the banjo bolt for the braided steel clutch line in the car. Luckily, I found the correct size banjo bolt in some parts from another car.

Hoping that I could get the car to rev high enough to move under its own power, I gave it a shot. No go. I pulled the distributor, which isn't easy, given that it is underneath the carbs. The vacuum advance was working fine. I didn't see any obvious problem with the mechanism advance. At this point, I could have taken the distributor to be tested, but I was pretty much done with the Turbo at this point. I reinstalled the distributor.

The End Of The End

Since just before I found that the clutch master cylinder had failed, I had listed the car on Craigslist as well as the Facebook Obscure Cars For Sale group. I based the price on what a similar car had sold on Bring-A-Trailer.

I received a few nibbles and a couple people who seemed very interested.

During this time, I bought another car. The seller dropped the price on that car, so I dropped the price that I was asking for the Turbo Esprit by the same amount. This didn't get either of the people who had been interested to pull the trigger, so, after a week, I put the car up on eBay Classified.

I got a response within an hour.

There was some negotiation of price. The guy seemed like an enthusiast and I wanted the car gone, so I came down a little more on price (but not much). And the car was sold. A deposit was made immediately and the remainder wire transferred the next day. A week later, it was loaded onto a flat bed and driven away.

But that wasn't really the end.

A club member contacted me about a Turbo Esprit from Bainbridge Island (where I live) that Copart had received and was preparing to auction. He wanted to know if I was familiar with the car. I was sent some photos and I discovered that I had not in fact sold the car to an enthusiast.

I contacted someone associated with Copart and described exactly what was wrong with the car. I also described what needed to be done to start the car. Of course, none of the problems that I described managed to find their way into the auction listing.

I don't know if the car ever sold through Copart. I saw it listed four times, but it didn't hit the reserves, which, though lowered with each run of the auction, was still much too high for a Turbo Esprit with an engine in an "unknown" state as far as the auction description was concerned. Each time the auction got much higher than I had been asking for the car; where was that bidder then? So, I ended up owning the car a couple years longer than intended. I learned a lot about early Turbo Esprits. As long as the labor that I put into the car (and the frustration) is considered to have no value, I made money on the car. But I have still never driven a Guigiaro Turbo Esprit.

Westfield Lotus Eleven, built in 1983/4.

Running gear from 1967 MG Midget, 1275cc BMC A Series motor, 45 DCOE Weber, Mild Isky cam, lightened flywheel. Currently licensed in OR by owner since 1988, 18,000 miles during that time, total of 73,257 miles includes donor car. "People's Choice" at 2007 PDX ABFM. \$30,000, for more details call Don 503-866-5941.



For Sale: 1971 Lotus Elan SE S4 Coupe, \$25,000 obo. Numbers matching. Twin cam w/Stromberg carbs. Carbs and front trunnions rebuilt. New upper ball joints and tie rod ends. All four calipers rebuilt with new hoses. 41,000 original miles. Rust free car and no signs of accident damage. All electrics working, Interior good condition with one small hole in the driver's seat and the dash pad is cracked. The car starts right up and drives well. Dan Morrison danmo@yahoo.com or 425-444-1628



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