Robison on Rovers

Installing the Superchips™ performance chip in your Land Rover, and some technical questions answered.

Welcome to the third installment of Robison on Rovers *in the Rovers North News.*

Many of you have read my posts on the Rovers North and DiscoWeb bulletin boards, and some have corresponded with me on various topics. For those who don't know me – I manage J E Robison Service – on the web at www.robisonservice.com – an independent Land Rover specialist shop in Springfield, Massachusetts. I've worked continuously with Land Rovers since their re-introduction to North America some fifteen years ago. In my column, I can answer your questions at greater length than is possible on the bulletin boards. Each issue, I will take on a few of the interesting questions I receive or will address a topic of interest to Land Rover owners.

I am a longtime Land Rover owner. I've had many Land Rovers over the years, and currently have a 2000 Range Rover P38A, a 1996 Discovery I, and a 1966 Series. My father has a 1995 Range Rover Classic, and my brother has a 2003 Discovery II. So we're a Land Rover family.

If you have questions or issues you'd like discussed email: robison@robisonservice.com

Last winter I purchased one of the Superchips™ performance kits from Rovers North *[exclusive North American suppliers for Superchips™; prices vary by vehicle type – at time of installation a Superchip for a 4.0 liter P38A was approximately $500.]* and installed it for evaluation purposes in my personal 1997 Range Rover 4.0SE. It's an otherwise stock truck with 140,000 miles on the odometer. I drove it 7,500 miles on the Superchip for this article.

RSC1340 installed 1996 Discovery I 4.0 ltr

The Superchip upgrade discussed here is available from Rovers North for 1995-1999 Range Rover P38As with GEMS engine management, 1996-1999 Discovery I models, and 1997 Defenders. A chip upgrade for newer Land Rovers is in final testing and will be available soon – look for updates in my columns later this season. Robison Service installs the full range of Superchips products.

I was always looking for a little more zip from the 4.0 liter engine, and this chip provided it. Installation was easy, and I saw immediate benefits. There is a noticeable improvement in takeoff response and midrange power. The 4.0 now drives much like a 4.6. The truck is generally quite a bit more responsive. I've had several other 4.0 drivers try my Range Rover, and they have all had the same reaction. I would recommend this upgrade for anyone looking for a little more power from their Range Rover.

How does the Superchip get more power from the motor? I talked for quite a while with the folks at Superchips about this very thing. North American Land Rover engine controls are programmed to tolerate poor fuel, poor upkeep, and poor driving habits. They do this with very conservative programming of the engine management. The Superchip programming takes out a lot of that slop. You get more power, but it becomes much more important not to neglect your Land Rover's care and feeding. They use more timing advance, which gets more power, but you have to be sure you only run premium fuel. They deliver more fuel on initial takeoff, but it's vital that you stay on top of oil services, because engine loads are higher. Superchips have made many small adjustments to fuel delivery and ignition that add up to (according to them) nearly a 10% improvement in power at most speeds.

I expected gas mileage to decline if power went up, but that did not happen. Over two long tests (5,000 miles) my fuel economy remained within ± 0.4 MPG, sometimes being better, other times worse. I conclude that the power gains are from increased efficiency, not from increased fuel consumption.

In cold weather I noticed a different idle behavior. I noticed a faster idle when cold. Otherwise, there was no difference in how the truck started or ran.

The Superchip system is slightly less forgiving of wear on other system components. For example, the Superchip ECU gave faults on my truck for slow O2 sensors. The standard ECU showed no O2 faults. However, on a manual test, I found the sensors were near the end of their service life, so I replaced them. After that, the Superchip ECU was fine. My point here is that when you install a performance chip, it may show up other weaknesses in your system, and you should be prepared to deal with that. Don't just assume there is a chip problem if you get a check engine fault right after you put the Superchip in.

To install the chip, remove the GEMS ECU and take off the cover. You should do this work on a (conductive) metal table and wear an anti-static lead to avoid damage. On the circuit board you will see the EPROM covered by a plastic cap. Remove the cap and the EPROM, and then fit the new EPROM. Be very careful fitting the chip – it's easy to bend the pins, and if you install it backwards you could damage both the chip and the ECU.

Once the chip is fitted and the ECU is assembled and fitted into the P38A, you will need to use a ROVACOM, Testbook or similar diagnostic system to reset the security interface between the engine ECU and the security system. The truck will not run until this is done – so if you don't have the ability to perform this step – don't start!! Call Rovers North for the name of the nearest shop equipped to do the installation for you.

In the remainder of this month's column I have answered some questions at greater length than I was able to on the bulletin board

Where can I get service information for my Land Rover online?

Many enthusiasts, including myself, discuss Land Rover issues on the Rovers North Bulletin Board. Here's a link to the Range Rover/Defender/ Discovery board: http://catalog.roversnorth.com/wwwboard/w3bbrrframe.html
If you need specific repair information you should be aware that Land Rover has established an official site, www.landrovertechinfo.com, where you can obtain all the factory service documentation for your vehicle at moderate cost. They offer daily, monthly, and annual subscriptions starting just over $25. It's a real bargain for full access to the factory archives. This site is limited to North American market Land Rovers from 1987 to the present day. Here are some of the things you can access:

- All workshop manuals
- Electrical troubleshooting manuals
- Component overhaul manuals (for example – transfer cases)
- Service bulletins
- Parts information
- Descriptions of recalls
- Training materials on most systems – fuel injection, ABS, etc.

The Land Rover site was established in conformance with new Federal laws requiring them to provide everyone (not just dealers) full access to all service materials. You can find similar sites for other car makes at the directory of the National Auto Service Task Force: http://www.nastf.org/

> ***"Land Rover has established an official site, www.landrovertechinfo.com, where you can obtain all the factory service documentation for your vehicle at moderate cost."***

What do I have to do to install one of the inexpensive new short blocks in my older Range Rover? I am speaking here about a 1995 or older Range Rover Classic with the 14CUX fuel injection.

Installation of a newer block in your Range Rover is pretty straightforward with these points kept in mind:

The new block does not come with a timing chain, timing gears, or a camshaft. I suggest you install a new cam, chain, and lifters when fitting a new short block. You will need a cam for a 1990-1995 engine as the newer cams do not have provision to drive the distributor. The 1994-'95 engines use a serpentine fan belt and an oil pump embedded in the front cover. 1993 and older motors use individual fan belts and an external oil pump. Get a cam that's correct for the year of your vehicle, and swap the front cover from the old engine.
The cylinder heads should have a valve job whenever they are off, in my opinion. I suggest you surface the heads .020 and use the later model head gaskets (they are thicker.) When you install the heads you will note that the lowest row of head bolts is no longer used. Land Rover found that those bolts caused uneven stress and they deleted them from the block.

You should use the newer intake and valve cover gaskets from Land Rover. The newer rubber parts are less likely to leak. Also, don't forget to use new cylinder head bolts. The bolts stretch on installation; they are not meant to be re-used. They sometimes break when used twice, necessitating a time-consuming tear down.

Be sure you use the timing cover gasket that matches the cover actually fitted to your engine. The covers have oil passage holes in different places – fit the wrong gasket and your oil pump may never prime. The oil pans are sealed to these newer blocks with sealant, not a gasket. Land Rover and we recommend a product called The Right Stuff from Permatex. It's expensive, at nearly $26 a tube, but very effective, and is available from Rovers North. The less expensive RTV sealants sold in consumer auto parts stores are much less effective and in some cases don't work at all on oil pans. I highly recommend the Right Stuff.

You will need a spacer at the end of the crank pulley because the end of the crankshaft on the newer motors is longer. Rovers North or Robison Service can supply the spacers, or you can make one locally.

Is there a vibration problem with the newer engines used in Land Rovers?

In 1999 Land Rover began using a new Bosch engine management system. One virtue of this system is that it allows trimming of individual cylinders to ensure that each cylinder makes an equal contribution to the running of the engine. This might be thought of as "precision electronic balancing." Because of this new technology the balancing of the new shorts blocks is no longer done to the tighter tolerances required by the former engine management systems. In addition, the newer Bosch short blocks were designed to be used with different harmonic balancers and flywheels, so their internal balancing is a bit different.

Consequently, if you fit a new short block to an older truck you may notice a different vibration or a different "feel" to the engine. The differences I have observed have been most noticeable from 1,200 to 1,800 RPM.

Most owners of automatic transmission Land Rovers will not notice this difference. It is more noticeable in standard shift trucks. It's not a terrible problem – it's simply a difference someone attuned to their car may pick up on.

I've been told my Land Rover's engine has a dropped liner. What does that mean?

Land Rover V8 engines use aluminum blocks with pressed-in steel liners. At the factory the liners were pressed in and machined off even with the top cylinder head sealing surface. In some engines the liners were not pressed in far enough, or they were not retained at the bottom. In either case, the liners begin to move up and down. When this happens there is often a hard-to-identify rap from within the motor.

With time the movement allows coolant to begin leaking from the passages that surround the liner over the top of the liner and into the cylinder. When that happens you get coolant coming out the exhaust, and exhaust gases may pressurize the cooling system excessively and cause overheating.

I have seen some trucks with knocking and loose liners run 20-30,000 miles without coolant failure, while others fail right away. The most common liners to drop are those for the two driver-side rear cylinders. The only cure for this problem is a new short block. Land Rover has dropped the price of replacement short blocks (see my winter column) in response to increased dropped liner complaints.

Dropped liner failures are often associated with overheating incidents – either because they caused the incident or because the overheating caused the liner to come loose. As a result, you should take any overheat or near-overheat situation very seriously. Never drive for long periods with a clogged cooling system and the needle near the red. Never drive at all when the gauge is in the red. Not even for a mile to get off a highway. The price of neglecting this rule could be a your motor.

Is it true that a coil sprung Range Rover rides more gently than an air sprung Range Rover? And if so, why?

Speaking of road-going Range Rovers, it's true – normal coil spring installations give a softer ride. Why? Because they have a taller ride height and a softer spring rate. What does that mean? Here is a simple explanation.

An air spring is, as the name implies, filled with air. The more you compress it, the harder it gets to push because the air is more and more compressed. If you have an air spring that's six inches tall, and you compress it to three inches, you will have doubled the pressure within and doubled the force needed to compress it farther. So if it takes 200 pounds to compress it one inch, it might take 600 lb. to compress two inches, and 1000 lb. to compress three inches. A steel coil, in comparison, would usually be more linear, taking 200 pounds to compress one inch, 400 lb. two inches, and 600 lb. three inches.

You can see from the above example how a jolt is felt more sharply with the air springs.

The steel coil springs fitted to Range Rovers are fairly soft and fairly tall. Therefore, they can soak up a good-sized bump. In highway mode, the air springs have much less ability to soak up a big bump, and the difference is really noticeable.

Should I be using Dex-Cool antifreeze in my new Land Rover in view of the problems I've heard about?

Land Rover specifies Havoline Extended Life Coolant (the orange coolant) for all Bosch-engine Land Rovers. According to Texaco/Havoline, this is a DexCool formulation as stated in this quote from their web site: "Havoline Extended Life Anti-Freeze/ Coolant is recommended by General Motors Corporation, which has been factory filling with DEX-COOL antifreeze since 1995." There have been many reports of problems when Dex-Cool is left in cooling systems for long periods of time (more than 3 years or 36,000 miles.) At this time there are several class action suits alleging problems stemming from use of Dex-Cool in GM cars. Land Rover recommends changing your Dex-Cool coolant every three years or at every 30,000 mile major service. If you follow that service interval there is no reason to expect cooling system trouble.

We believe in using the manufacturer specified fluids in most cases. DexCool and traditional green coolant are both ethylene glycol based, but the additive packages are different. Test results are inconclusive – you may have cooling system trouble if you switch. Therefore, if you have a Land Rover that was factory filled with DexCool we suggest you stick with it. But to be safe, we suggest changing the coolant every two years regardless of mileage, or every 30,000 miles, whichever comes first.

Coolant manufacturers have told us you are much less likely to have cooling system trouble if your system is kept full. That means making sure your expansion tank is always kept topped off to the full mark. The coolant needs some space to expand, so the tank can't be filled to the brim. There is risk of coolant deterioration if the tank goes empty and the level in the radiator drops. Another thing that can cause trouble is low pressure. You get low pressure when your system has a leak or when the cap fails. When your truck is running make sure the hoses feel hard with pressure. If they feel soft, you may have a pressure problem.

Readers with questions can contact me at robison@robisonservice.com. I try and answer emails individually but I can't always answer them all. I put the most interesting in my columns. Beginning in the summer of 2004 an archive of *Robison on Rovers* columns will be available for review on our web site, www.robisonservice.com > service department > Land Rover > articles.

See you next issue
John Robison

RSC1340 installed 1996 Discovery I 4.0 ltr

RNP8522

Superchips

RSC1240	Defender 90, 1997	$ 499.00
RSC1340	Discovery I, 4.0 ltr, 1996-'99	$ 499.00
RSC1640	Range Rover P38A, 4.0 ltr, 1995-'97	$ 499.00
RSC1646	Range Rover P38A, 4.6 ltr, 1995-'97	$ 499.00

The Right Stuff Gasket Sealant

RNP8522	The Right Stuff, 7.5 oz	$ 25.75

Green Oval

The Solihull home page

News from the heart of the company, brought to you courtesy of LAND ROVER enthusiast

24-hour Stoppage in January

Members of the Amicus trade union at Land Rover held a 24-hour strike from 6 am on Monday, January 26 in rejection of the company's pay offer.

In October, 2003, car workers at both Solihull and Gaydon Land Rover plants voted overwhelmingly to reject the offer of six and a half percent, to be phased in over two years. In December they voted by ballot for strike action in protest. Amicus members claim that the current Land Rover offer will not give them pay parity with colleagues working at Jaguar plants, which belong to the PAG along with Land Rover.

January's strike represented an escalation of union action, following the introduction of an overtime ban in December and withdrawal from the operating time flexibility agreement effective from January 5, 2004.

Duncan Simpson, Amicus National Officer for the Motor Vehicle Industry, said "It's with reluctance that we've moved to strike action but we hope the company will rethink their position and agree to negotiations. We've said we are prepared to meet the company at any time without preconditions. The ball is in their court."

Amicus has 2500 members in the two Land Rover plants. TGWU and GMB trade union members at the plants took strike action at the same time.

Last Discovery panels from Swindon

In mid-January, an announcement was made that the BMW pressings plant in Swindon would be looking to shed 330 jobs over the next few months through natural wastage. The reason was that its contracts with Rover and Land Rover to produce body panels had come to an end.

The Swindon plant has been manufacturing body panels for the current Discovery, and it is this element of the Land Rover operation which is affected. The plant has been making and will continue to make some panels for the Range Rover.

News from Bluewater Adventure Zone

The Land Rover Adventure Zone at Bluewater was closed temporarily during January for repairs. Two areas were suffering from the constant pounding meted out by vehicles taking visitors around the course. The see-saw had been taken out of commission, and the concrete at the base of a steep descent had started to break up.

However, the Adventure Zone is now back in commission and promises business as usual.

In fact, business is slightly different from usual. In the beginning, the rides around the zone were provided by Discoverys. Shortly before Christmas 2003, Range Rovers were introduced on the 45-minute demonstration ride which tackles a challenging course covering seven acres of Kent cliff-side and boasting four different themed zones.

Since its opening in June 2002, the Adventure Zone has given over 11,000 visitors an off-road experience they will never forget. The retail complex is also home to a Land Rover Gear store, where visitors can complement their driving experience with branded clothing, outdoor equipment and tailored off-roading adventure holidays.

In December, the Adventure Zone at Bluewater scored yet another success when it received the Best Leisure Marketing Campaign of 2003 award presented by Property Week.

Bill Welch, marketing programmes manager at Land Rover, said: "We are delighted with the award and look forward to welcoming more new visitors to the Adventure Zone in 2004. It gives visitors a chance to experience the adventure side of Land Rover, while also seeing our vehicles' unrivalled off-road ability."

Team Saluki sign with Land Rover

UAE- based Team Saluki has been officially sponsored by Land Rover for the 2004 rally season, through Al Tayer Motors, the marque's sole importer in the region.

Team Saluki, named after the legendary Arabian hunting dog that is bred for both speed and endurance in the harsh desert conditions, is led and driven by a team of dedicated rallying enthusiasts.

Commenting on the sponsorship, Marwan Halabi, Marketing Manager for Land Rover in the middle East and Africa, said, " In our constant striving to bring adventure and lifetime experiences to our consumers, we are

proud to announce Land Rover's association with Team Saluki. It is a dynamic and energetic team of adventure enthusiasts who have a mission to succeed."

He added, "Over the years, rally racing has grown steadily in size and stature, and now enjoys a reputation as one of the major sporting events of the region, attracting world-wide audiences. Moving another step for-

ward in our constant endeavour to deliver adventure for everyone, this initiative furthure reiterates our commitment. I am sure this year's rally events will leave us with many enduring memories to cherish, an I wish Team Saluki good luck in their mission."

Team Saluki is well equipped to match the endurance of some of the world's best drivers, with a modified Defender 110 that features a 275 bhp 4.5-litre V8 engine.

Speaking on behalf of the team, Mark Powell said: "We are very pleased to secure Land Rover's support for this challenging event. What makes rally racing a true adventure is its unpredictable nature. Apart from the skill, endurance, stamina and dedication required for any rally racing, we have to rely a lot on the performance of our vehicles, and with the supreme capability and endurance of Land Rover by our side, we have nothing to fear and are ready to face the challenge."

Co-sponsors of Team Saluki for 2004 are GAC, UPS, QBB Ghee, Serck Services, Wild Horse Energy Drink, Al Thika Packaging and Mobil.

More information is available at: www.teamsaluki.com or lrclubuae.com.

V8s in demand

Land Rover was all set to bring production of its much-loved V8 engine to an end later this year, but a sudden upsurge in demand for V8-engined Discoverys has caused a rethink.

"We had a date all set, " said a Land Rover spokesman, "but this has changed things and we don't currently know when the last V8s will be made."

100,000th Range Rover sold in the USA

On February 7, Land Rover sold its 100,00th Range Rover in the USA. Sales of the company's flagship model began in 1987 with a special version of the classic Range Rover, moved on to the second-generation or P38A Range Rover at the start of 1995, and are now exclusively of the third-generation or L322 type.