The Elan Factory - Information Sheet

Lotus Esprit Turbo alternator problems

After many years of use and temperature cycling, there is a pattern emerging where the voltage regulators are failing in Valeo alternators (part number 2518035, 90 amp output) as fitted to the Lotus Esprit and Excel. However, there is a warning sign where the epoxy-resin runs out of the aluminium casing and drips on to the components below (usually the air-conditioning compressor). Once the resin melts and drips out of the casing, it leaves the solid-state circuit exposed to dirt and condensation. In a short space of time the unit fails completely and the alternator no longer charges the battery, leaving the owner stranded.

Fortunately the regulator is mounted externally and can be accessed from the rear of the Valeo alternator. However some Esprit owners may find this a little more difficult to access due to the close proximity of the turbo plenum chamber.

From experience gained on our workshop, we have noted that the regulator failure rate is more frequent in all Esprits fitted with this same Valeo alternator. It is suggested that the alternator and regulator in an Esprit are significantly heat-stressed as they are mounted in the rear of the vehicle. Consequently, the engine bay becomes very hot and the air that is recirculated around the alternator has a minimal cooling effect. This is in sharp contrast to a front engine vehicle such as an Excel where the alternator is cooled by a certain amount of air received from the front air intake.

It is worth noting that a similar problem is recognised on 911 and 914 Porsche vehicles. This problem has been solved by installing a shroud around the alternator that draws in cool air from outside the engine bay.

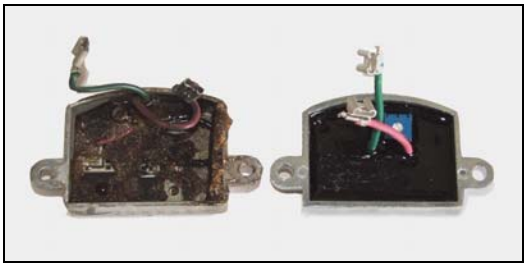
The new regulator is designed to replace the existing regulator supplied as original equipment in the charging system for the Lotus Excel and Esprit.

Features of replacement regulator

- All solid-state circuitry for improved performance and reliability
- Encapsulated construction for protection against dirt, vibration and reliability
- Easy, error-proof replacement by use of convenient wire push-on terminals

Removing the faulty regulator

Before attempting to carry out any electrical repair work, the battery must be disconnected as a safety precaution. A car battery stores large amounts of energy that can cause significant damage (even fire) if the cables or battery terminals are shorted together.



1. Remove the two regulator mounting screws (save the screws) at the rear of the alternator
2. Partially remove the regulator and disconnect leads at the alternator terminals
3. Finally remove and discard the faulty regulator

Installing the replacement regulator

4. Connect regulator red and green leads to the alternator colour coded terminals. Make sure regulator push-on terminals do not short to the alternator housing.
5. Install replacement regulator with two original mounting screws. Make sure the screws are tight to insure a good ground connection for the regulator.

Check out system

6. Reconnect the battery and then check all wiring in the charging circuit. All connections should be clean and tight. Inspect for any damaged or broken leads which would prevent the system from charging normally.

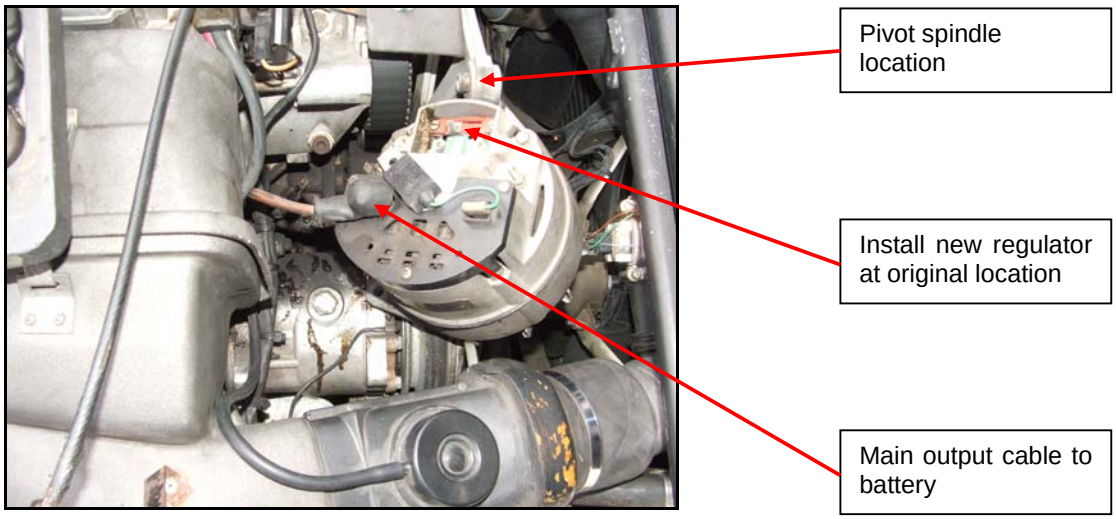
7. Turn the ignition on and check to see if that the alternator warning lamp is on. Start the engine and increase the revs. The lamp should go out and the alternator will begin to charge the battery.
8. Using a DVM, check the voltage at the battery terminals. The voltage should rise to a maximum of 14.3 volts depending on both temperature and battery condition.

   CAUTION: Remove negative (-) ground cable from battery before tightening alternator output terminal connection

9. If the indicator lamp does not operate correctly, then the charging system must be checked with the appropriate test equipment to determine the problem.

Whilst replacing the regulator it is recommended that a load test be carried out. This is ensures the alternator is charging correctly when delivering large currents and there is no volt-drop (high resistance joint) present. From experience, we have found a re-occurring problem where a high resistance joint has been discovered between the alternator body and auxiliary housing. This is caused by condensation/corrosion building up around the alternator 8.0mm diameter pivot spindle. This problem can be checked for by placing the probe tips of a high quality DVM between the alternator body and auxiliary housing. The DVM should be set on a sensitive DC voltage range eg. 2.5 volts. Typical voltage drop detected across these components has been between 0.65 volts to 1.75 volts. This is easily solved by removing the alternator, cleaning the spindle, coating it with anti-seize compound and then re-installing it. Coating the spindle in anti-seize compound has a two-fold effect where it prevents moisture ingress and also provides a conductive path. It is also recommended that a braided earth lead be installed between the alternator metal casing and auxiliary housing to eliminate future problems.

This problem can be very subtle as it is not immediately obvious. It is also not possible to see the corroded spindle as it is concealed by the alternator and auxiliary housing alloy castings. It is not until both the alternator and spindle are fully removed, that the corrosion can be examined. Symptoms of this, is when the car will not start the next day, where the battery is not charged properly as the result of night driving. If the battery is re-charged, the car will then operate perfectly during day time driving until the next night time outing.



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