

REOPUS Fitting Instructions

Notes:

The REOPUS replacement board is purchased as a kit for the owner/home mechanic to install. **Please read the instructions thoroughly before you start.**

If you are not comfortable fitting it yourself, we strongly recommend you take the REOPUS and these instruction sheets, to an auto electrician. He should be able to fit it to your car inside an hour. If you don't want to, you don't even have to take your car... just unbolt and disconnect your original amplifier, then take it with your new REOPUS kit for the board to be soldered into place.

Ensure that all other ignition and fuel delivery components are in good condition and set up as specified by the manufacturer. A faulty amplifier may be only one of the conditions contributing to problems with the vehicle.

Introduction:

The REOPUS circuit board is installed into the original Lucas OPUS amplifier case and utilises the original Lucas magnetic pickup, ferrite rod timing disc, and existing wiring. It also utilises the original OPUS coil or later compatible coils.

Three decades later, advanced high-grade electronics have allowed us to dramatically improve on the original's capabilities. Now you have more precise timing and considerably more spark energy.

In redesigning the electronics we have followed the original approach of the OPUS designers to ensure compatibility with the rest of the vehicle electrical system.

We have included 2 diagnostic LED's on the circuit board to check the power supply and pickup operation.

The REOPUS Kit includes:

- Easy to follow, installation instructions.
- The replacement REOPUS amplifier circuit board.
- An installation kit comprising 2 x 50mm ¼ NC bolts, 2 x ¼ spring washers, 2 x 35mm aluminium spacers and 2 x ¼ flat washers. It is recommended that spacers are used to assist airflow if the amplifier is installed in the engine valley in front of the distributor.

Fitting the "REOPUS" circuit board into your amplifier casing.

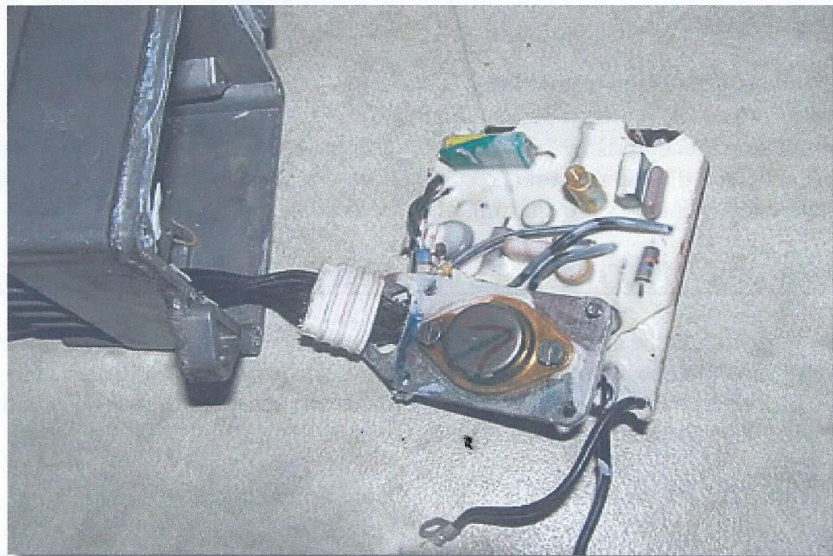
- 1) The board can be fitted into the amplifier case without removing it from the vehicle. However, it must be unbolted from its mounting position to enable the bottom plate to be removed. Alternately for easier access, disconnect the pickup connector, the ballast resistor connector, and the positive and negative wires from the coil and after unbolting the amplifier remove it from the vehicle.
- 2) Remove the 4 base plate screws from the bottom of the amplifier unit.
- 3) Carefully lever off the base plate, taking care not to damage the paper gasket, which should be reused when fastening the plate after installation.

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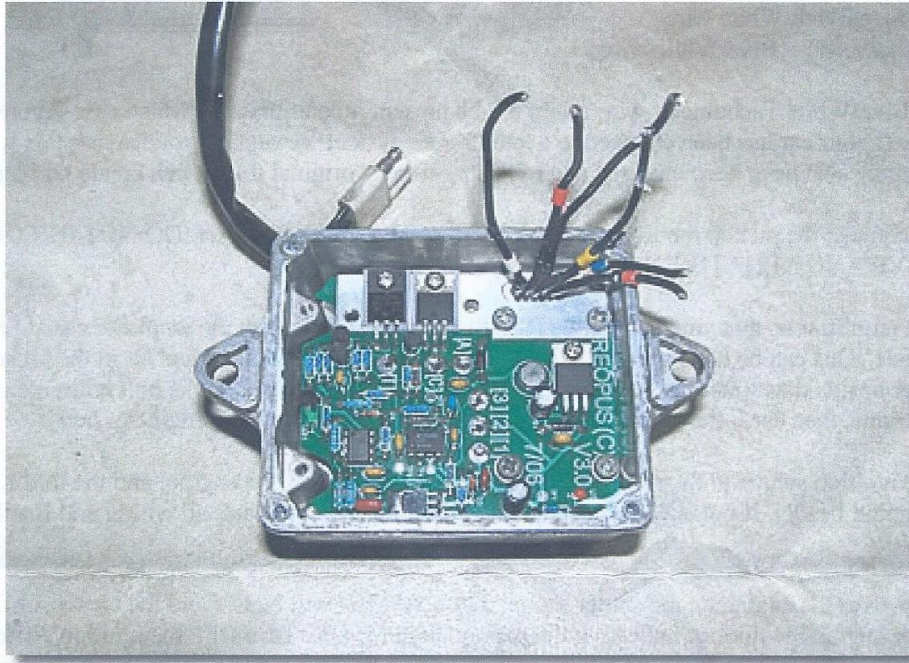
4) Remove the 6 Posidrive screws holding down the OPUS circuit board and carefully remove the board from the amplifier case. You will need to push the wires and rubber grommet from the top of the case to provide enough wire length to do this.



6) Depending on the model of the amplifier, the board will have a flat 5 or 6 wire cable attached to it. The 6th wire is a Blue/White Tachometer (also known as a Rev-counter) wire and if not present, the Tachometer will be driven off the coil wire. Therefore there is no connection to Pad T on the REOPUS board with 5 wire systems.



- 7) Carefully cut the wires as close to the circuit board as possible, to ensure they will be long enough to solder to the pads on the REOPUS board. Some early boards are covered in a creamy white rubberized material, so scrape that off to reveal where the wires attach to the board. Keep any colour code sleeves or bands on the respective wires. (See step 10).
- 8) Cut the wire between the components on the base plate and the OPUS board and discard. The REOPUS board makes these components redundant.

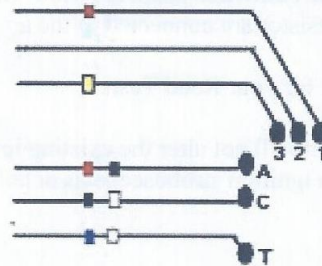


- 9) Fit the wires through the aluminium cable slot of the REOPUS circuit board making sure that the components are facing towards you as in the picture above. Position the wires and rubber grommet in the top of the case and seal with a silicone sealant to prevent water ingress then position the circuit board into the amplifier case. Using 4 of the original screws fasten the circuit board into the case.
- 10) Carefully strip the ends of the wires and tin them. Carefully solder the wires, as detailed below, onto the solder pads 1, 2, 3 and A, B, T on the component side of the REOPUS circuit board. .

Early Type (Black Wires with colored bands)

- Pad 1 = Red Band
- Pad 2 = Black Wire (No band)
- Pad 3 = Yellow Band

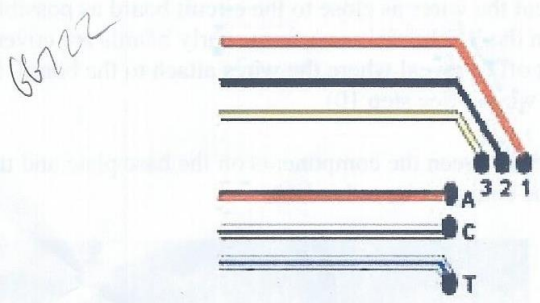
- Pad A (Batt +) =Red and Black Band
- Pad C (Coil -) = Black and White Band
- Pad T (Tachometer) = Blue and White Bands



Later Type Coloured wires

- Pad 1 = Red wire
- Pad 2 = Black wire
- Pad 3 = Yellow wire

- Pad A (Batt +) = Red/Black wire
- Pad C (Coil -) = Black/White wire
- Pad T* (Tachometer) = Blue/White wire



*Note. The Blue/White Tachometer wire might not be present in later units, in which case ignore the instructions for this wire. If your car has been changed to a later 5-wire system we suggest you leave it this way as other components may also have been changed and to restore it to its original format can create problems. .

- 11) Next, reconnect the pickup module and the Ballast resistor to the amplifier. **DO NOT RECONNECT THE POSITIVE AND NEGATIVE COIL WIRES AT THIS STAGE.**
- 12) Turn the amplifier so that you can see the REOPUS board and connect the amplifier case to a good earth on the vehicle. This can be done by using one of the long bolts and spacers supplied in the kit and bolting the amplifier upside down into the engine valley in front of the distributor. If the bolt holes are not visible on top of the engine, then earth the amplifier case to an appropriate earth on the engine or body.
- 13) Turn the ignition switch to the run position (do not attempt to start the engine) and the Red LED on the circuit board should be ON. If not check the soldered connections on the board, all wiring and finally the earth connection.
- 14) Now turn over the engine on the starter motor. The **Red** LED will be ON and the **Green** LED will flash (6 times per engine revolution) indicating the pickup circuit is OK. Turn OFF the ignition switch. If the LED does not flash then check the connections, wiring and earth. This could indicate a problem with the pickup, particularly if the vehicle would not start previously.
- 15) Remove the amplifier case if bolted down and refit the base plate using the original screws and paper gasket. Apply a small amount of sealant to each side of the gasket to prevent water ingress.
- 16) Refit the amplifier in its original position. If refitting into the engine valley we recommend that you use the 2 x 50mm long bolts, a spring washers, through the amplifier case lug, the original steel spacer, the 35mm aluminum spacer and the flat washers provided and then refit the amplifier unit to the engine. The amplifier is now fitted 35mm above the original position to increase airflow and cooling.
- 17) Reconnect the coil wires positive (white Green) and negative (white/Black) wires and ensure the pickup and the ballast resistor are connected to the amplifier.
- 18) Now its time for your Road Test.

The REOPUS unit will not alter the existing ignition timing, however we recommend the ignition timing be checked using an ignition stroboscope as detailed in the service manual for ultimate performance and economy.

REOPUS Warranty.

The manufacturer warrants, for a period of five years from the date of purchase, that the REOPUS circuit board is free from defects in material and workmanship.

The manufacturer's obligations under this warranty are limited to the REOPUS circuit board only when it is used as a replacement for the Lucas Opus Type AB3 ignition trigger amplifier together with the original car manufacturer's pickup sensor and an appropriate coil.

All warranty claims will require examination at our manufacturing facility, transportation charges pre-paid, and if after examination, the unit is found to be defective we will either repair or replace it at our discretion.

The warranty shall not apply to any units which been repaired or altered except by the manufacturer, or which have been subjected to misuse.

Additional tips and checks

This advice stems from our experience with Jaguar V12 engines and relates primarily to that application.

Make sure original wire connectors and terminals are clean and protected from corrosion. HT leads and spark plugs should also be in good condition.

Where applicable, make sure the carburetor dashpots are filled to the correct level with the manufacturers recommended oil. Failure to do this can cause misfiring on light throttle due to the fuel mixture being too lean on acceleration.

Whether your engine has carburetors, or fuel injection, the fuel delivery system and the ignition system are interdependent. Many faults can be "Either/Or" scenarios, so ensure the fuelling system is also functioning correctly.

A known problem can be internal fracture of the amplifier connection leads just after entering the distributor. This is due to constant movement of the vacuum retard or advance unit. Hardening of the cable insulation from heat aggravates the situation.

A very common V12 problem is the centripetal advance weights in the base of the distributor being "stuck" with dried up grease. This will drastically affect the advance of the ignition timing and they need to be cleaned, freed, and lubricated with a high temperature lubricant.

The vacuum advance or retard module (early Jaguar V12 carb engines have retard, fuel injection V12's have advance) is another weak point. The internal rubber diaphragm hardens with age and heat then splits or cracks. This adversely affects engine performance, temperature, and fuel economy.

If you still have a problem after fitting the REOPUS unit, Please don't hesitate to contact us for technical support.

email; dcurry@xtra.co.nz

REOPUS Engineering, 1/26 Sudeley St, Orakei, Auckland New Zealand.

Ignition Fault finding for the REOPUS customer.

Your car is now 30 yrs old and your cars wiring has possibly had little maintenance over the years or has possibly been altered by a previous owner.

If you do have problems we suggest you carry out the following tests with the REOPUS circuit board mounted in the Amplifier case with the connectors to the coil and the ballast resistor in place. The Amplifier case connected to the engine (negative) with the circuit board and LED's visible.

On the REOPUS circuit board are 2 LED's for diagnostic purposes their application is covered in the installation instructions. These LED's are also referred to in the following instructions in the test procedures.

Note: The ignition should not be switched ON for long periods during the following tests as the coil may over heat.

If the engine will not start and the RED LED is on and the GREEN LED flashes when the engine is cranked over.

The following procedure tests the Ballast resistor and the coil circuit.

1. Turn OFF the ignition.

Before you continue with the following test we suggest that you remove the coil HT lead from the distributor cap and push a spark plug into the lead, then place the spark plug on the engine to complete the ignition "spark plug" circuit.

2. Remove the negative connector from the coil.

3. Connect an amp meter (10 amps DC minimum) between the coil negative terminal and the engine.

4. With the ignition switched ON, you should have between 4 and 6 amps showing on the meter.

5. If you have low or no amps, then proceed to 1 below.

Note: If the coil circuit is correct when the amp meter is disconnected or the ignition is turned OFF you should see a spark across the spark plug connected to the HT lead.

If RED LED on the REOPUS circuit board is not ON when ignition is ON, proceed with the following tests.

1. Disconnect the amp meter from the coil negative terminal.

2. Carefully connect a voltmeter positive (20VDC range) on either of the center terminals of the Ballast resistor (battery positive from ignition switch) and the negative on the engine. (Caution the Ballast resistor Aluminum body is negative)

3. With the ignition switch ON the voltage should be 12 volts.

4. Now connect the coil negative terminal to the engine (i.e. coil is in circuit). You should now have a minimum of 8 to 10 volts on the center terminal of the ballast resistor with the ignition coil in circuit. If the voltage is less than 8V then.

A. Check Battery voltage (minimum 12 Volts under running load)

B. Check for broken wires. Check resistance from Pad A of the amplifier circuit board to center terminal of ballast resistor (Black/red wire)should be less than 1 ohm. Suggest the crimped terminals are carefully soldered we have found old crimp connections often are faulty.

C. Check connector terminals are clean.

D. Check fuses behind the instrument panel.

E. Clean fuse terminals and the fuse holder terminals. Note: bad connections are often a source of poor starting, especially if the starter relay is faulty.

F. Reconnect Coil negative wiring.

If the GREEN LED on the REOPUS circuit board does not flash when the engine is cranked with both the ignition and the RED LED being ON.

Switch the ignition OFF.

This test is for the pickup circuit resistance, using a meter on a low ohms range.

With the Pickup connected to the REOPUS circuit board test the pickup circuit resistance between Pads 1 and 2, 2 and 3 on the REOPUS circuit board

Don't forget to add the test meter lead resistance to the following values.

Between Pads 1 and 2 the resistance should be about 1 ohm

Between Pads 2 and 3 the resistance should be about 2.5 ohms.

If a low resistance approximately as above is not indicated, then follow A, B, C below.

A. Clean and re tension the 3 pin connector terminals on the pick up lead.

B. Check pickup wiring for damage.

C. Check the pickup for damage.

D. Also check 4B above

Misfiring under acceleration.

Misfiring under light acceleration (when engine is up to operating temperature) this is often due to a lean mixture, check carburetor dash pots have oil.

Check carburetor's are correctly balanced.

If car starts to accelerate then dies the problem is possibly fuel starvation due to

A. Low fuel pressure.

B. Blocked fuel pipes.

Test fuel flow.

Remove the fuel pipe at the carburetor, fit a suitable hose to this pipe, ensure there are no leaks by using the correct size hose clip. Put the end of the hose into a suitable container

turn on the ignition switch you should have minimum of 1 pint (0.5 liter)/ minute flowing.

If the fuel flow is less then

Check both ends of the SU pumps are operating.

Check flexible fuel hoses, these will deteriorate over time, it is advisable to replace the flexible suction pipe from the pump to the fuel tank.

Check fuel filter.

Check Pump pressure, you should have between 2.5 and 3.5 PSI fuel pressure.

If the misfiring happens after a short while, remove the petrol filler cap does it suck air? If it does the fuel tank breather is possibly blocked.

Misfiring is often caused by Faulty ignition leads. Open the car bonnet after dark with the engine running you may observe sparks from the ignition leads if so replace the leads.

REOPUS gives approximatly 4 times the spark energy compared with the old OPUS amplifier.

I recommend NGKBP6ES for carburettor V12 engines.

For Technical support.

Email Dave at REOPUS Engineering.

Email: dcurry@xtra.co.nz