

Overdrive Relay Replacement for Sunbeam Alpines Series III, IV, & V

Thomas Hayden
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The Problem

After 50 years or more, the original overdrive relay used in the Sunbeam Alpines Series III, IV, & V can fail and no longer send power to the overdrive's solenoid. There are multiple contacts inside the relay, and it can fail in a manner where one contact still works, e.g. lighting the overdrive lamp, but the second contact does not close and fails to power the OD solenoid.

The original overdrive relay was a Lucas 33199. It is a non-standard relay design used to support the overdrive self-cancelling feature. They can be a challenge to repair. They are rare and NOS units are very hard to come by.

Modified Overdrive Relay Circuit

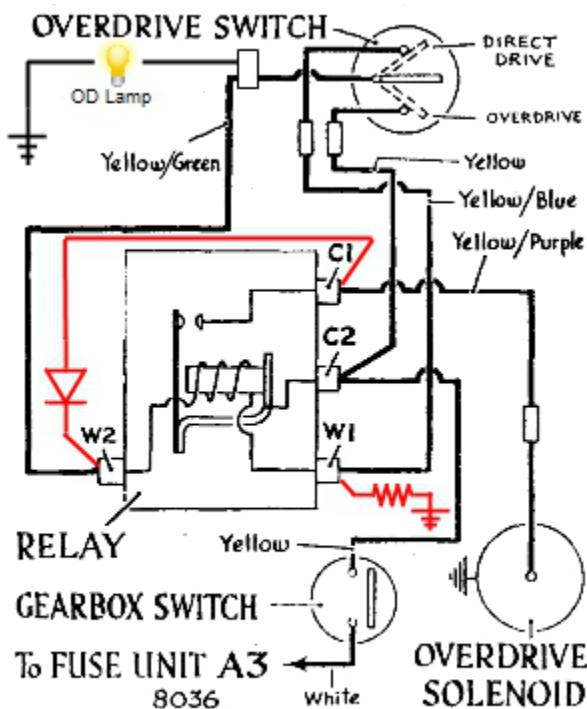
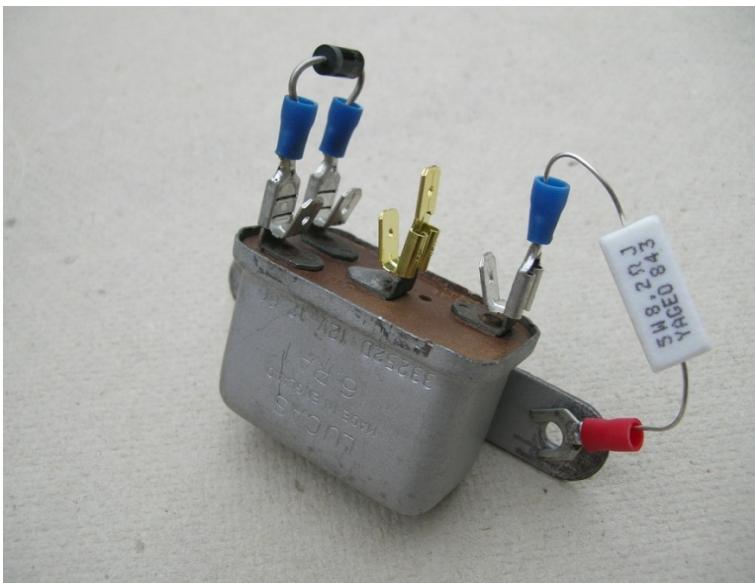


Fig. 4B. Overdrive circuit diagram
Self-cancelling switch

Illustration 1: Modified Circuit

Thanks to Rich Vose, his father, and some experimenting by me, I think I have the total solution to the OD relay on Series III through V. It uses a standard 6RA relay, like used in the Series V Alternator circuit and other applications. Using a standard relay like this maintains pretty much the original look and circuit of the special factory relay, and maintains the self-cancelling feature. Or you can use any 4 or 5 pin relays you can buy at NAPA and others, such as a Standard Brand RY115. It still works exactly the same as the original relay. I think this approach actually performs better. The modification to use a standard relay (6RA style or other) requires adding a diode and an 8.2 Ohm, 5 Watt resistor to duplicate the original operation. To make it convenient to install requires 3 relatively uncommon "piggyback" spade connectors and one common piggyback connector, because the original OD relay had dual connections on almost all terminals. The resistor and diode cost less than a dollar, and the connectors cost almost \$3 for the four needed. The use of these piggyback connectors means you can do the whole installation with no alterations to the original harness.



The photo shows the added parts connected to a standard 6RA relay. Be sure to ground the free end of the resistor and be sure the end of the diode with the band on it is connected to terminal W2.

NOTE: If used on a car with Positive Ground, the diode must be installed with terminals reversed from how they are shown in photo and schematic drawing.

Parts required w/Digikey P/N's:

Qty 1: 8.2 Ohm, 5 w resistor P/N 8.2W-5-ND

Qty 1: 3A, 100V, 1N5401 diode P/N 1N5401-TPCT-ND

Qty 1: Conn adapter 3-way P/N WM7273-ND

Qty 3: Conn Term Piggyback P/N 920084-04-ND

I have purchased extra sets of the parts from DigiKey. Anyone wanting a set, I'll send it out for \$10.00. Contact me via E-MAIL (NO PM's) on the SAOCA forum. Just click on my name (Tom H) and select "send an e-mail".

This is similar to the solution RootesRich posted on the SAOCA forum in Oct 2011, with 2 key changes. Using a diode to replace the white jumper means that only relay coil current goes through the Overdrive Switch (no heavy solenoid current goes thru the Overdrive Switch). And adding a resistor (similar to the internal resistor on the special OD relay) limits the current through the ignition switch, white wires, and Overdrive Switch when you use the OD switch to turn off the OD by shorting out the relay coil. Without this resistor, if the OD switch is in the Turn Off position for too long you could burn up wires, the OD switch, and the ignition switch.

I think every factory OD harness included the extra Yellow Green wire from the OD switch for the OD dash light. With this modified relay arrangement, this OD light is more useful than originally. In the original circuit, the OD light only told you that the relay was ON. In the original circuit the relay could be ON, but the solenoid contact not working and thus no OD, even though the indicator is lit. Now with this arrangement, since there is only one contact, it tells you that the relay is ON and also that there is 12 V going to the solenoid.

If you use a modern standard relay, the terminals will likely not be labeled W1, W2, C1, and C2. In that case note and carefully observe these Terminal translations: 30=C2, 87=C1, 85=W2, and 86=W1. If you use a 5 pin relay, simply leave term 87a or 87Q un-connected.

Final thought: It should be possible to disassemble the relay from its housing and install the diode and resistor inside and solder the free end of the resistor to the housing, thus maintaining an even closer-to-original look and eliminating the need for the 3 piggyback connector adapters.

Original Overdrive Relay Circuit

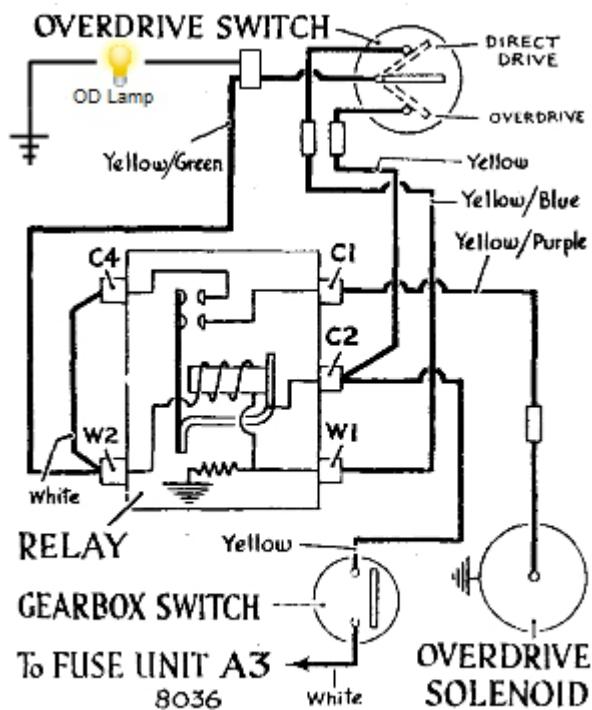


Fig. 4B. Overdrive circuit diagram
Self-cancelling switch

Illustration 2: Original Circuit



Illustration 3: Lucas 33199 Relay

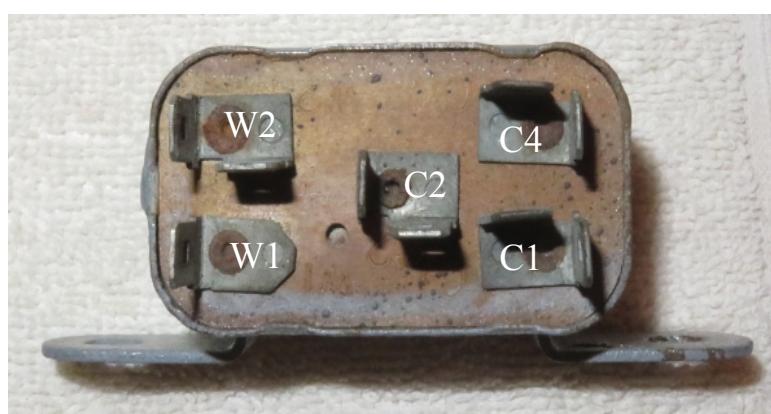


Illustration 4: Lucas 33199 Relay Connectors

All terminals have 2 connectors, except for the W1 terminal, which has only 1 connector.