





### CEN C633 Alternator/Regulator Description and Operation

**C633** 28 V 220 A alternator with optional 28 V/14 V (50 A maximum on 14 V) is internally rectified. All windings and current-transmitting components are non-moving, so there are no brushes or slip rings to wear out.

This alternator is externally energized when the battery master switch on the vehicle is turned on and provides power to the regulator through the IGN circuit. Regulator monitors alternator rotation and provides field current only when it detects alternator shaft rotating at suitable speed.

After regulator detects alternator rotation, it gradually applies field current (soft start), preventing an abrupt mechanical load on accessory drive system. The soft start may take up to 10 seconds at full electrical load. AC is rectified into DC output through diodes in drive end rectifier housing and supplied to the battery from the alternator B+ terminal. See schematic diagram on page 3. Alternator output current is self-limiting and will not exceed rated capacity of alternator.

The regulator maintains alternator output voltage at regulated settings (see below) as vehicle electrical loads are switched on and off.

Battery type selection and battery maintenance/function are the sole responsibilities of the customer.

**A2-355** regulators furnished with some units include:

- External IGN terminal for energize connection.
- AC terminal for optional AC voltage tap. AC terminal signal frequency (Hz) x 10 = alternator shaft rpm.
- Optional single or dual voltage operation.
  - Allows single-voltage (28 V only). 14 V is not available as a single-voltage application with this regulator.
  - Allows optional 28 V/14 V dual voltage operation only from this regulator when phase cable from alternator is connected to regulator and 14 V cabling from vehicle is attached to regulator 14 V terminal.
- Overvoltage cutout (OVCO) function. This regulator has OVCO (overvoltage cutout) that will trip at vehicle electrical system voltage above 32 volts in a 28 V system or 16 V in a 14 V system that exists longer than 2 seconds. OVCO feature detects high voltage and reacts by signaling relay in alternator field circuit to open. This turns off alternator. OVCO circuit is reset when engine is restarted.
- Regulator has negative temperature compensation. Setpoints are  $28.0 \pm 0.2$  V and  $14.0 \pm 0.2$  V at 75°F.

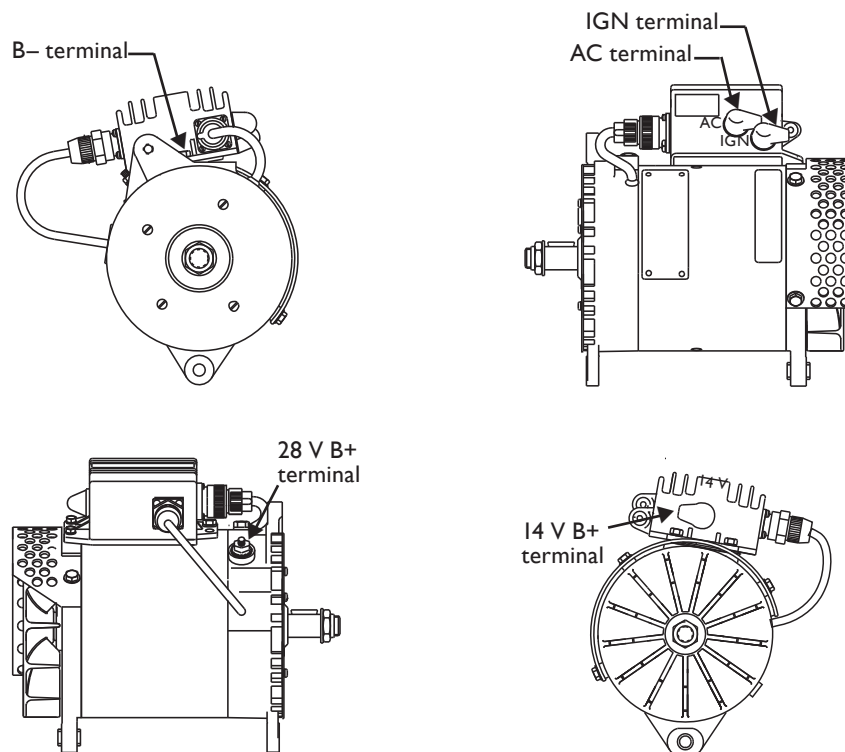


Figure 1 — C633 Alternator and A2-355 Regulator Terminals





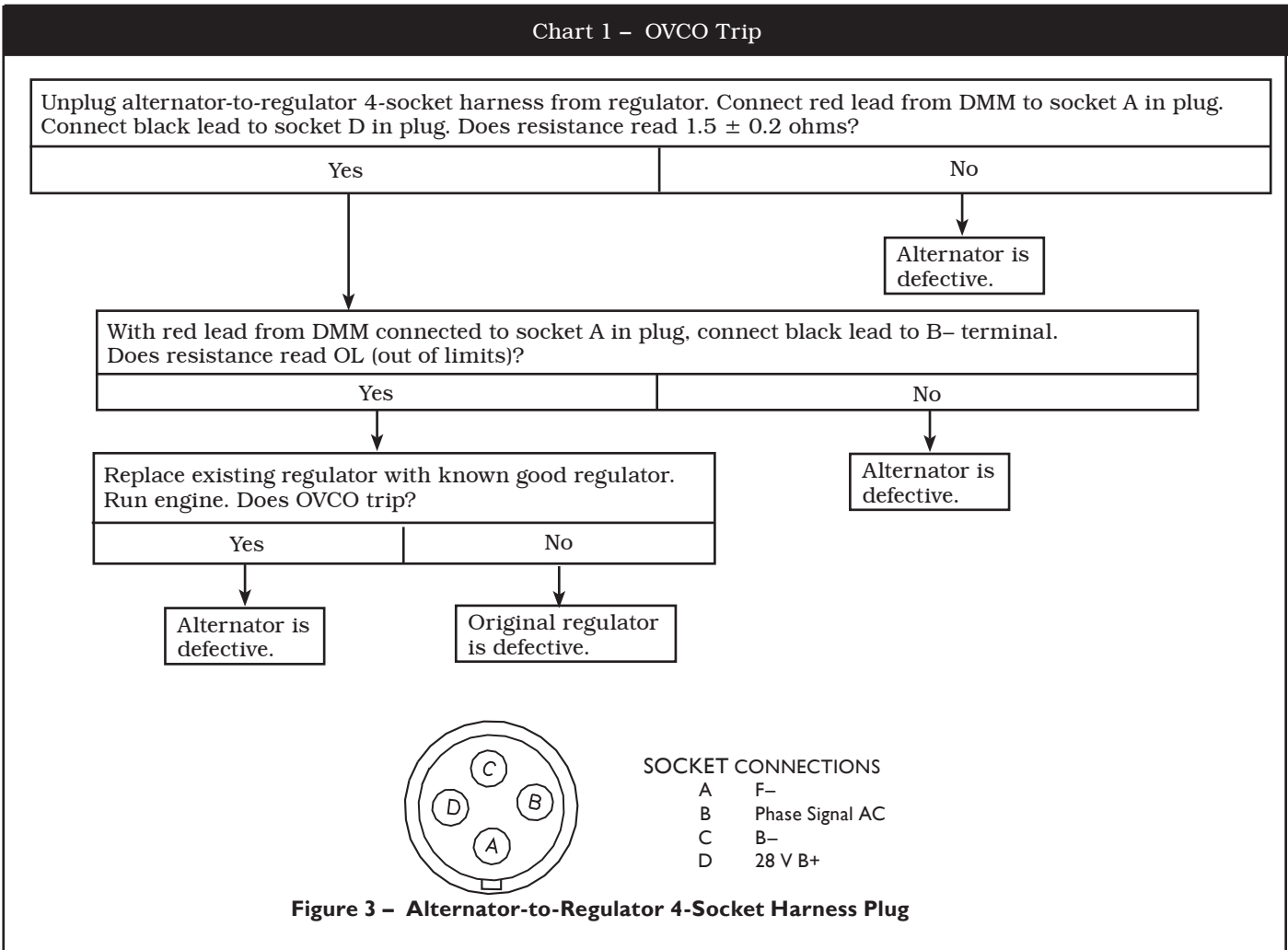
## OVCO Troubleshooting

Shut down vehicle and restart engine. If alternator functions normally after restart, a “no output condition” was normal response of voltage regulator to “high voltage” condition. Inspect condition of electrical system, including loose battery cables, both positive and negative. If battery disconnects from system, it could cause “high voltage” condition in electrical system, causing OVCO circuit to trip.

If you have reset alternator once, and electrical system returns to normal charge voltage condition, there may have been a one time, high voltage spike, causing OVCO circuit to trip.

If OVCO circuit repeats cutout a second time in short succession and shuts off alternator field circuit, try third restart. If OVCO circuit repeats cutout, go to Chart 1.

Chart 1 – OVCO Trip

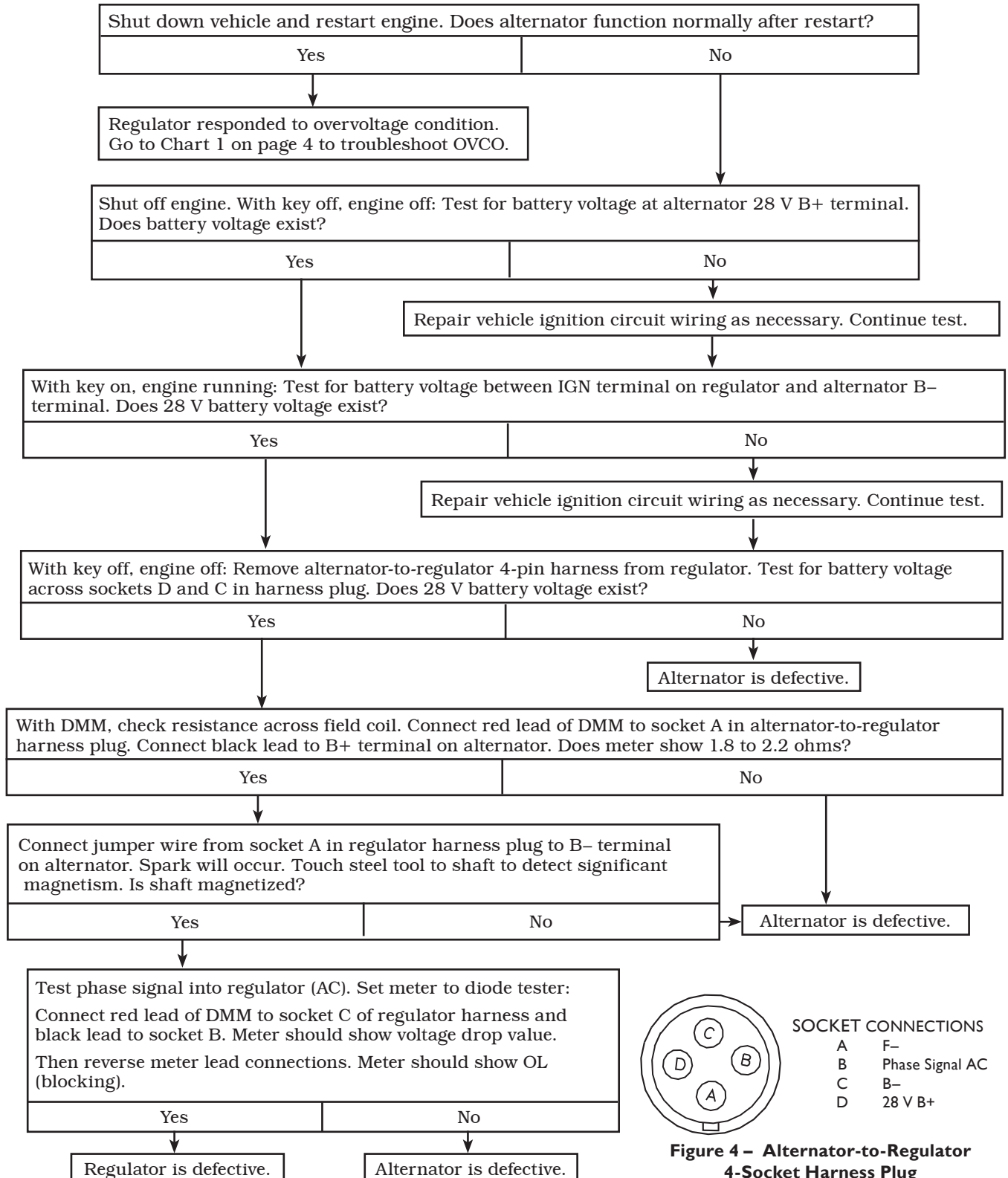




## Section D: On-Vehicle No 28 V Output Troubleshooting

Chart 2 – No 28V Alternator Output – Test Charging Circuit

### STATIC TEST – KEY ON, ENGINE OFF




SOCKET CONNECTIONS	
A	F-
B	Phase Signal AC
C	B-
D	28 V B+



Chart 3 – No 14 V Alternator Output – Test Circuit

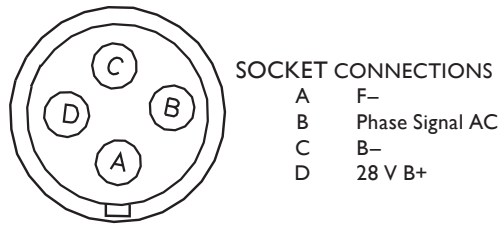
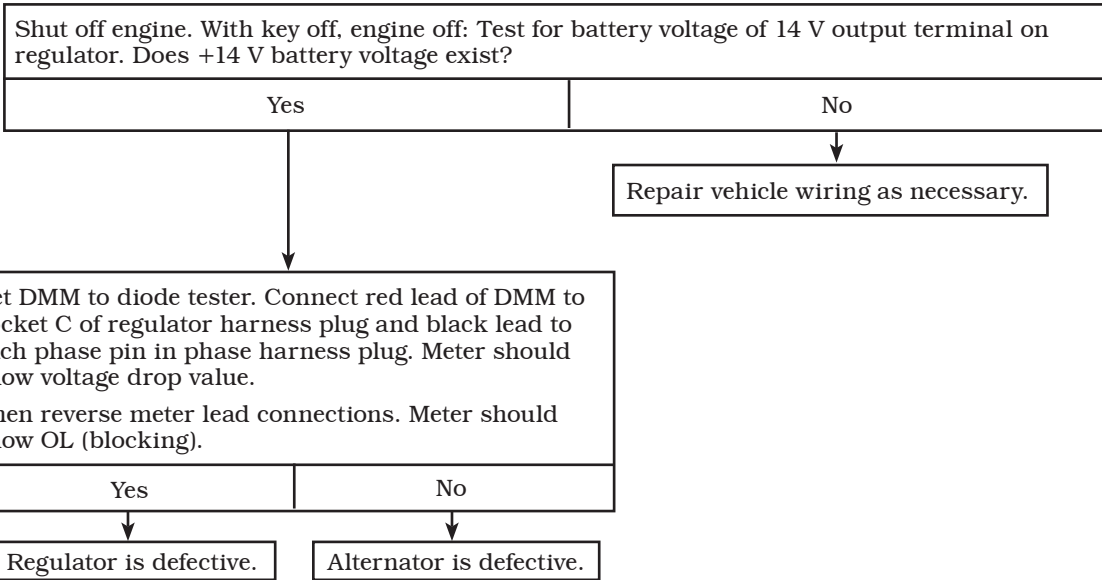


Figure 5 – Alternator-to-Regulator 4-Socket Harness Plug

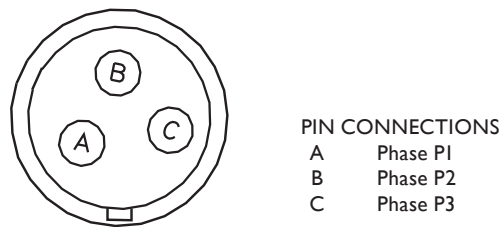


Figure 6 – Phase Connection 3-Pin Harness Plug

If you have questions about your alternator or any of these instructions, or if you need to locate a Factory Authorized Service Dealer, please contact us at:  
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