



WARNING

Before troubleshooting any CEN products, the service technician should:

- read, understand, and agree to follow all information contained in this troubleshooting guide.
- understand the operational characteristics of the electrical charging system components to be tested.
- be proficient at the use of tools and test equipment used in troubleshooting CEN products.

Hazard Definitions

These terms are used to bring attention to presence of hazards of various risk levels or to important information concerning product life.

WARNING

Indicates presence of hazard(s) that can cause severe personal injury, death, or substantial property damage if ignored.

CAUTION

Indicates presence of hazards that will or can cause minor personal injury or property damage.

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Tools and Equipment

- Digital Multimeter (DMM)
- Ammeter (digital, inductive)
- Jumper wires
- CEN 5-pin Metri-Pack Inline Harness Test Tool A10-115

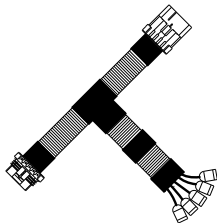


Figure 1—CEN 5-pin Metri-Pack Inline Harness Test Tool A10-115

Testing Guidelines

Professional service technicians rely on the following guidelines when testing electrical components.

Voltage testing:

- Set meter to proper scale and type (AC or DC).
- Be sure to zero the meter scale or identify the meter burden by touching meter leads together. Meter burden must be subtracted from final reading obtained.
- Be sure the meter leads touch source area only. Prevent short circuit damage to test leads or source by not allowing meter leads to touch other pins or exposed wires in test area.
- Be sure to use CEN tools designed especially for troubleshooting CEN alternators when available. See page 1 for more information.

Resistance (ohm) testing:

- Set meter to proper scale.
- Be sure to zero the meter scale or identify the meter burden by touching meter leads together. Meter burden must be subtracted from final reading obtained.
- Be sure the meter leads touch source area only. Prevent altering the reading by not allowing fingers or body parts to touch meter leads or source during reading.
- Be sure reading is taken when source is at 70°F. Readings taken at higher temperatures will increase the reading. Conversely, readings taken at lower temperatures will decrease the reading.
- Be sure to test directly at the source. Testing through extended harnesses or cable extensions may increase the reading.

Voltage drop testing:

- Measure voltage between B+ on alternator or source and B- (ground) on alternator or source. Record obtained reading. Move to batteries or other source and measure again between B+ and B- terminals on battery or other source. Difference between the two readings represents voltage lost within the circuit due to but not limited to inadequate cable gage or faulty connections.
- Voltage drop measurements must be taken with all electrical loads or source operating.

Dynamic/Live testing:

Definition: Connecting power and ground to a component to test operation/function out of circuit.

1. Be sure to connect jumper leads directly and securely to source contacts of the component being tested.
2. Be sure to make any connection to power and ground at the power supply or battery source terminals. Do not make connection at component source terminals as that may create an arc and damage component source terminals.



CEN C613, C615, C620, C623, and C634 Alternators with A2-128 Regulator

C613 (14 V, 290 A), **C615** (14 V, 340 A), **C620** (14 V, 340 A), **C623** (14 V, 290 A), and **C634** (14 V, 350 A) alternators are internally rectified. All windings and current-transmitting components are non-moving, so there are no brushes or slip rings to wear out.

These alternators are externally energized when the battery master switch on the vehicle is turned on and provides:

- power to the regulator at its IGN terminal.
- field coil power supply from the battery through the F+ terminal on the regulator. If a battery isolator is used in the system, the F+ terminal must be connected directly to the B+ terminal on the battery. If a battery isolator is not used in the system, the F+ terminal must be jumpered to the alternator B+ terminal so that the field circuit becomes activated.

AC is then rectified into DC output through diodes in drive end housing and supplied to the battery from the alternator B+ terminal. See Figure 4 on page 3. Regulator maintains alternator output voltage at pre-determined regulated setting (see below for setpoints) as vehicle electrical loads are switched on and off.

A2-128 regulator used with all units is designed to limit output current so output current will not exceed rated capacity of alternator. Regulator has a P terminal for optional AC voltage tap. P terminal signal frequency (Hz) x 10 = alternator shaft rpm.

Regulator fixed (flat temperature compensation) setpoints shown in Table 1 are selected based on battery type. Battery type selection and battery maintenance/function are the sole responsibilities of the customer.

Table 1— Voltage Setpoint Switch Position		
Voltage Setpoints (± 0.2 V)		Battery Type
Position 1	14.0 V	Maintenance (D Category)
Position 2	14.4 V	Maintenance-free (Group 31)*
Position 3	14.8 V	Maintenance-free (Group 31)*
Position 4	15.5 V	Battery Isolator Setpoint

* Group 31 batteries: If boiling or excessive gassing occurs with high voltage setpoint (position 3), change to medium voltage setpoint (position 2).

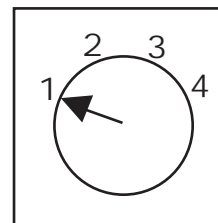


Figure 2—Voltage Setpoints

Electromagnetic interference (EMI) is suppressed with internal filters to acceptable levels defined by the Society of Automotive Engineers (SAE) specification J1113/41. C613, C615, C620, C623, and C634 alternators and A2-128 regulator have demonstrated electromagnetic compliance (or compatibility) by being tested in accordance to the limits defined by SAE J1113/41 standards for EMI suppression. However, these alternators and regulator will not reduce EMI from sources such as:

- vehicle digital systems
- wireless links
- digital devices
- antennas
- poor cable routing practice
- improper vehicle wiring
- battery imbalance

...and other sources that cause EMI.

If EMI continues after addressing the above conditions, consult an electromagnetic compliance (or compatibility) specialist to determine EMI source and potential resolutions.

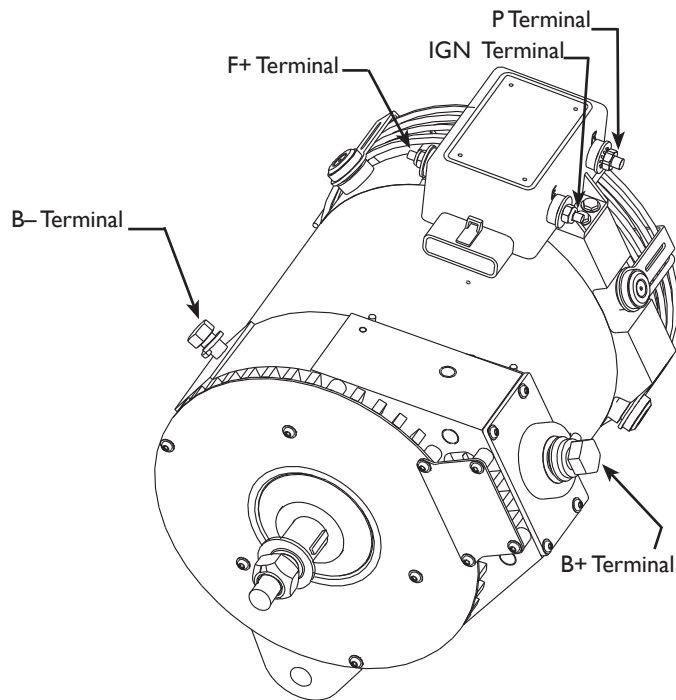


Figure 3—Alternator with A2-128 Regulator

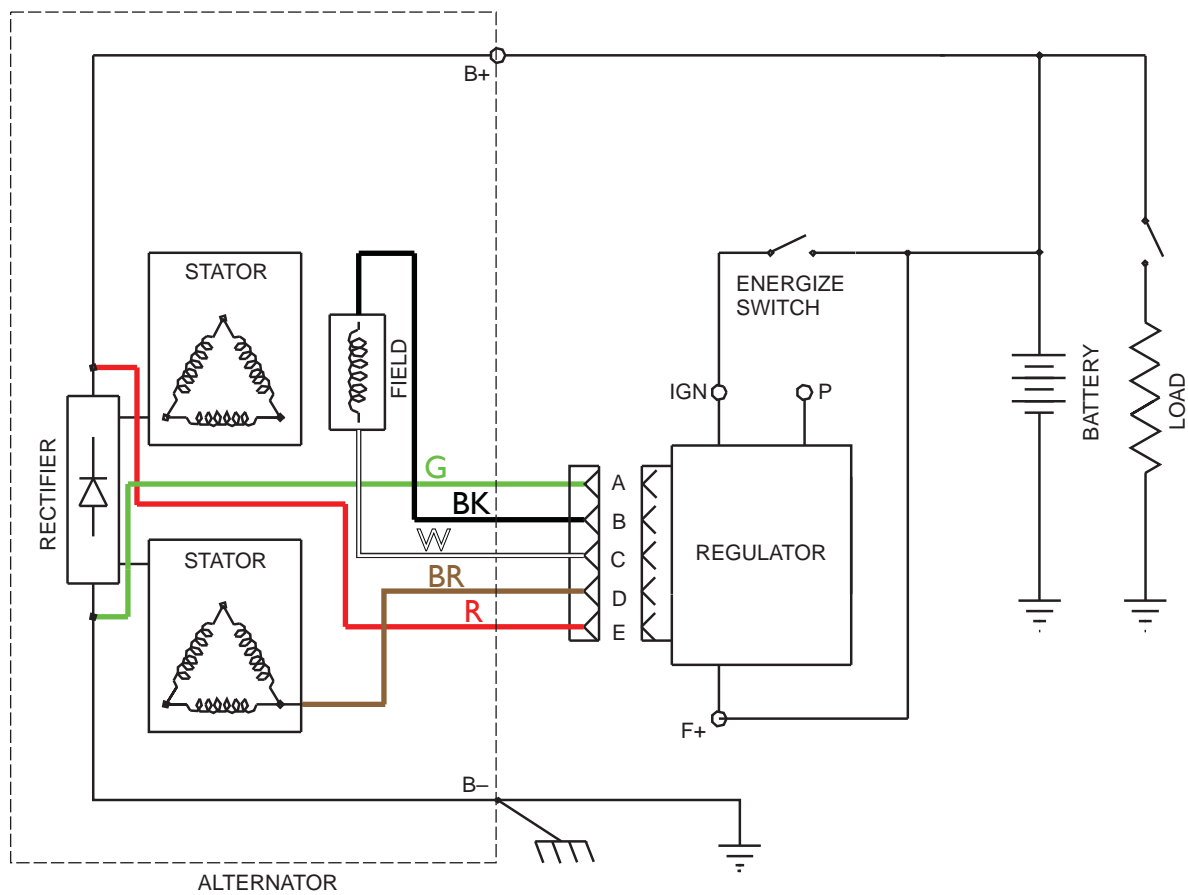


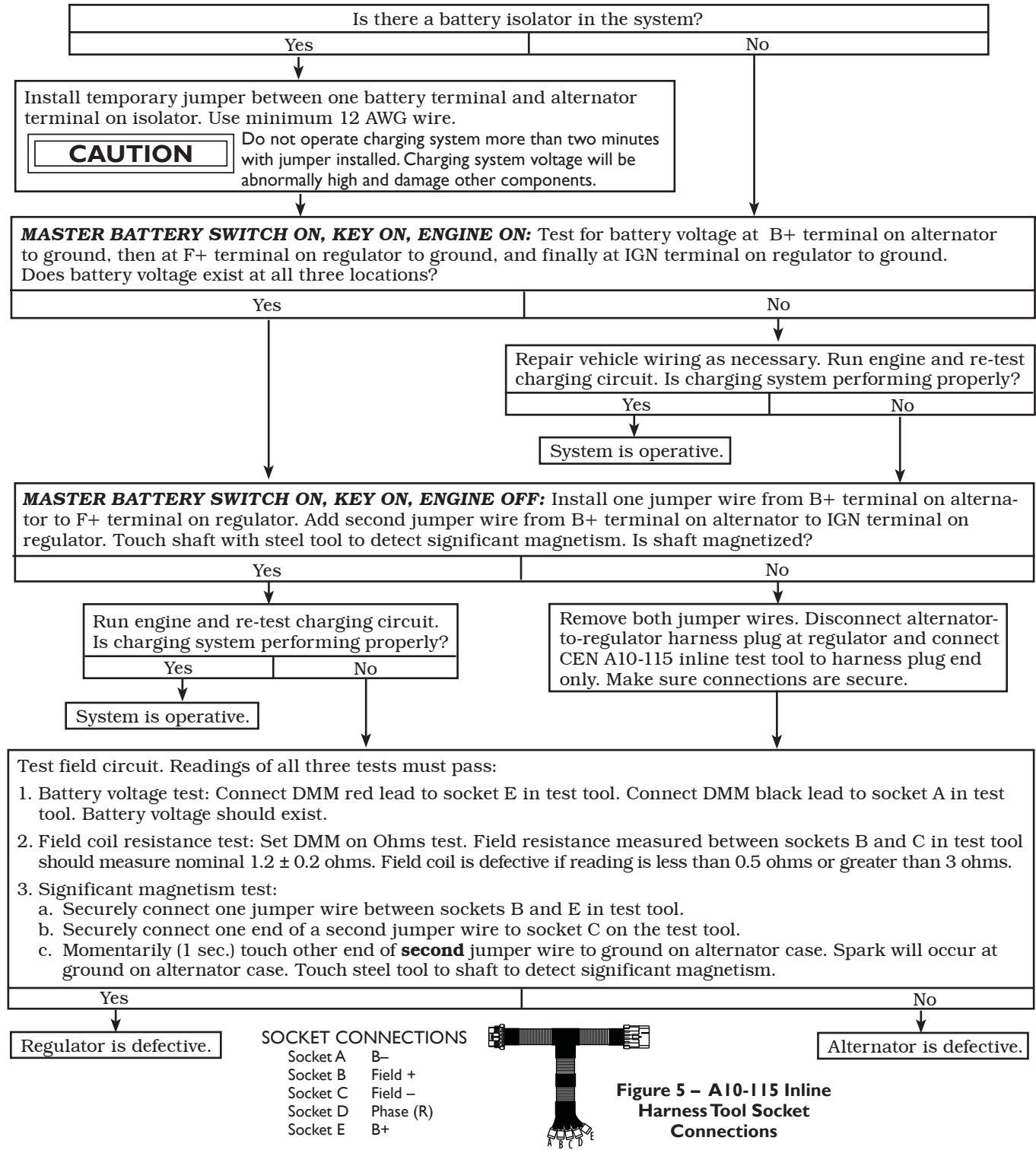
Figure 4—Alternator Schematic Diagram



No Alternator Output – Test Charging Circuit

Before starting diagnostic sequence, verify the following and repair/replace if not to spec:

- batteries for state-of-charge (12.3-12.6 V), condition, and secure connections
- master battery switch for function



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

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