DG667

Shop Manual

685E

DUMP TRUCK

SERIAL SUFFIX

AFE43-AM - AN
AFE43-AQ - AT
AFE43-AX - BC
AFE43-BF & UP

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STATEX III ELECTRICAL SYSTEM CHECKOUT PROCEDURE

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Operating Principles

A typical wiring diagram is shown in Figure 2-3. The basic operating principles are explained as follows:

The base-emitter of transistors TR3 and TR1 is connected to the battery through resistor R5, thus turning these transistors on. Also, resistors R2 and R3 are connected to the battery, but the discharge current of the battery is very low because of the resistance values of R2, R3, R5, TR1 and TR3.

With the system operating, A.C. voltages initially are generated in the stator windings by residual magnetism in the rotor. The diodes in the rectifier bridge change the stator A.C. voltages to a D.C. voltage which appears between ground and the "BAT" terminal. As speed increases, current is provided for charging the battery and operating electrical accessories.

The stator also supplies D.C. field current through the diode trio, the field, TR1, and then through the diodes in the rectifier bridge back to the stator.

As the speed and voltage increase the voltage between R2 and R3 increases to the value where Zener diode D1 conducts. Transistor TR2 then turns "ON" and TR1 and TR3 turn "OFF". With TR1 "OFF", the field current and system voltage decrease and D1 then blocks current flow causing TR1 and TR3 to turn back "ON".

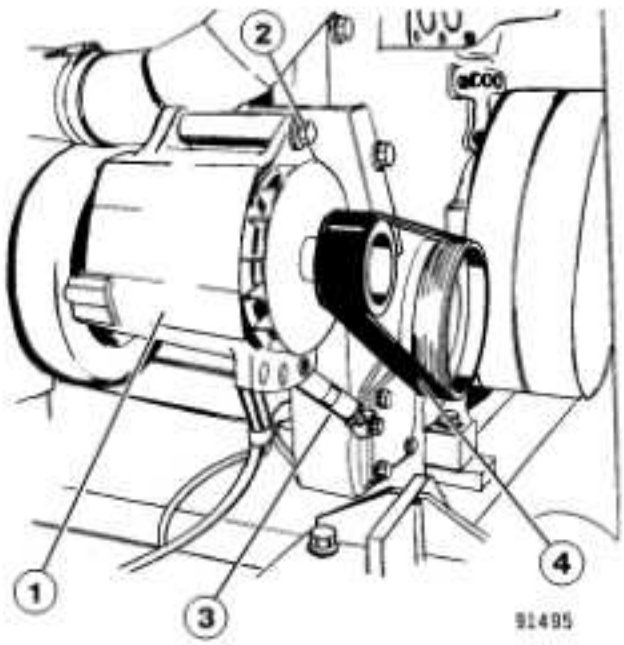


FIGURE 2-1. TYPICAL ALTERNATOR INSTALLATION

1. Alternator
2. Pivot Capscrew
3. Belt Tension Adjuster
4. Drive Belt

NOTE: Belt tension adjuster gauges are available from Detroit Diesel (Part No. J 23586-B) and Cummins (Part No. ST-1293).

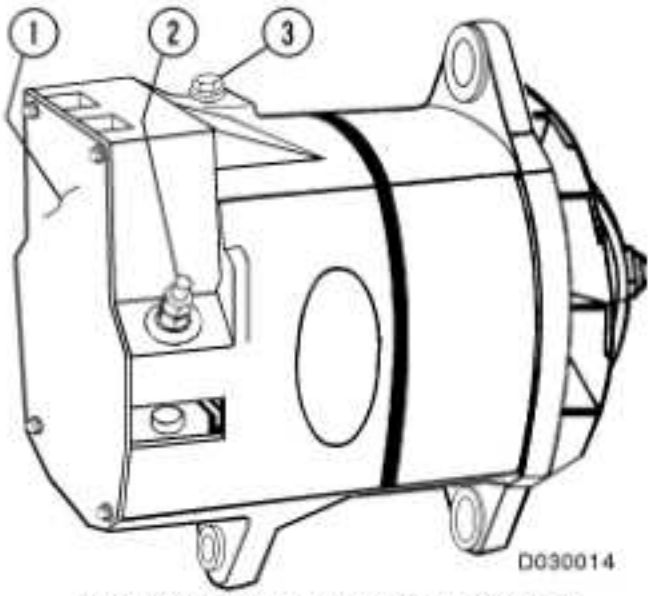


FIGURE 2-2. 30-SI SERIES ALTERNATOR

1. End Plate
2. Output Terminal
3. Ground Screw

The field current and system voltage increase and this cycle then repeats many times per second to limit the voltage.

Capacitor C1 smooths out the voltage across R3, resistor R4 prevents excessive current through TR1 at high temperatures, and diode D2 prevents high-induced voltages in the field windings when TR1 turns OFF.

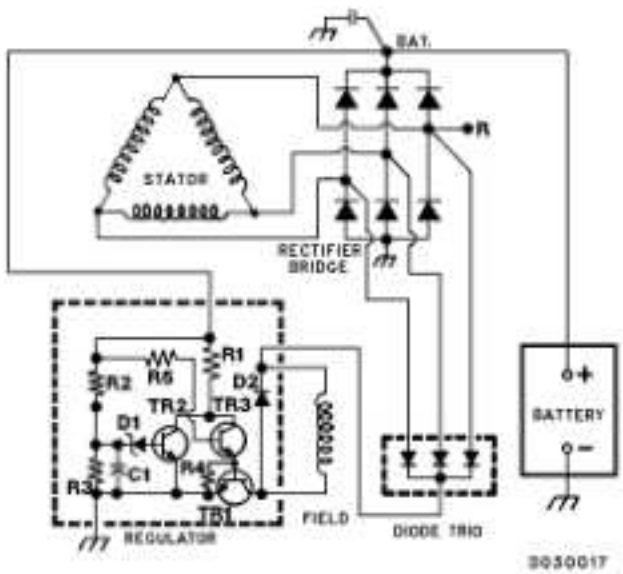


FIGURE 2-3. TYPICAL 30-SI CIRCUIT

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9. If clearance dimension is within the limits listed in Table 1, return truck to service.

10. If clearance dimension is not within limits, the brake requires adjustment. Remove or add shims to establish 0.020 – 0.050 in. (0.508 – 1.27 mm) clearance.

TABLE 1

TRUCK MODEL	CLEARANCE DIMENSION IN STEP 9
120C, 445E	Less than 0.200 in. (0.508 cm)
510E	Less than 0.150 in. (0.381 cm)
170C/D	Greater than 0.020 in. (0.051 cm), less than 0.065 in. (0.165 cm)
630E w/776 wheel motors	Less than 0.065 in. (0.165 cm)
630E w/788 wheel motors	Less than 0.120 in. (0.305 cm)
685E	Less than 0.065 in. (0.165 cm)
830E	Less than 0.065 in. (0.165 cm)

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TROUBLESHOOTING THE ELECTRIC DETECTION SYSTEM

TROUBLE: Green Indicator Light on Control Module Does Not Go On When Button is Depressed.

POSSIBLE CAUSES	SUGGESTED CORRECTIVE ACTION
Blown fuse in battery connector assembly	Look for possible short in external power wiring and change fuse
Battery connection loose	Clean and tighten
Connector between power wiring unsnapped or wire broken	Reconnect/install new length
Dead battery	Charge battery or install new one
Bulb burned out	Loosen green lens, install new bulb

TROUBLE: Test Module Light Will Not Illuminate.

POSSIBLE CAUSES	SUGGESTED CORRECTIVE ACTION
Jumper assembly not in place on end of detection zone wiring	Install jumper assembly
Connector apart on either power or detection zone wiring	Reconnect
Bulb burned out	Loosen green lens, install new bulb
Blown fuse in battery connector assembly	Look for possible short in external power wiring and change fuse
Wire broken	Install new length
Dead battery	Charge battery or install new one
Battery connection loose	Clean and tighten

TROUBLE: Test Module Light Will Not Go Out

POSSIBLE CAUSES	SUGGESTED CORRECTIVE ACTION
Jumper assembly left in place on end of detection wire	Remove jumper. Reinstall plugged blank connector
Damaged section at detection wire	Replace damaged length(s) of detection wire.

TROUBLE: Detonated Squib

POSSIBLE CAUSES	SUGGESTED CORRECTIVE ACTION
Check for previous fire condition	Replace length(s) of detection zone wire. Replace squib and recharge
Detection wire too close to heat source	Check for broken points of securement, move away from heat source and recharge
Test jumper assembly left in place after testing	Remove jumper, reinstall plugged end of line connector and recharge

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Optional components are shown in BOLD ITALIC type

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