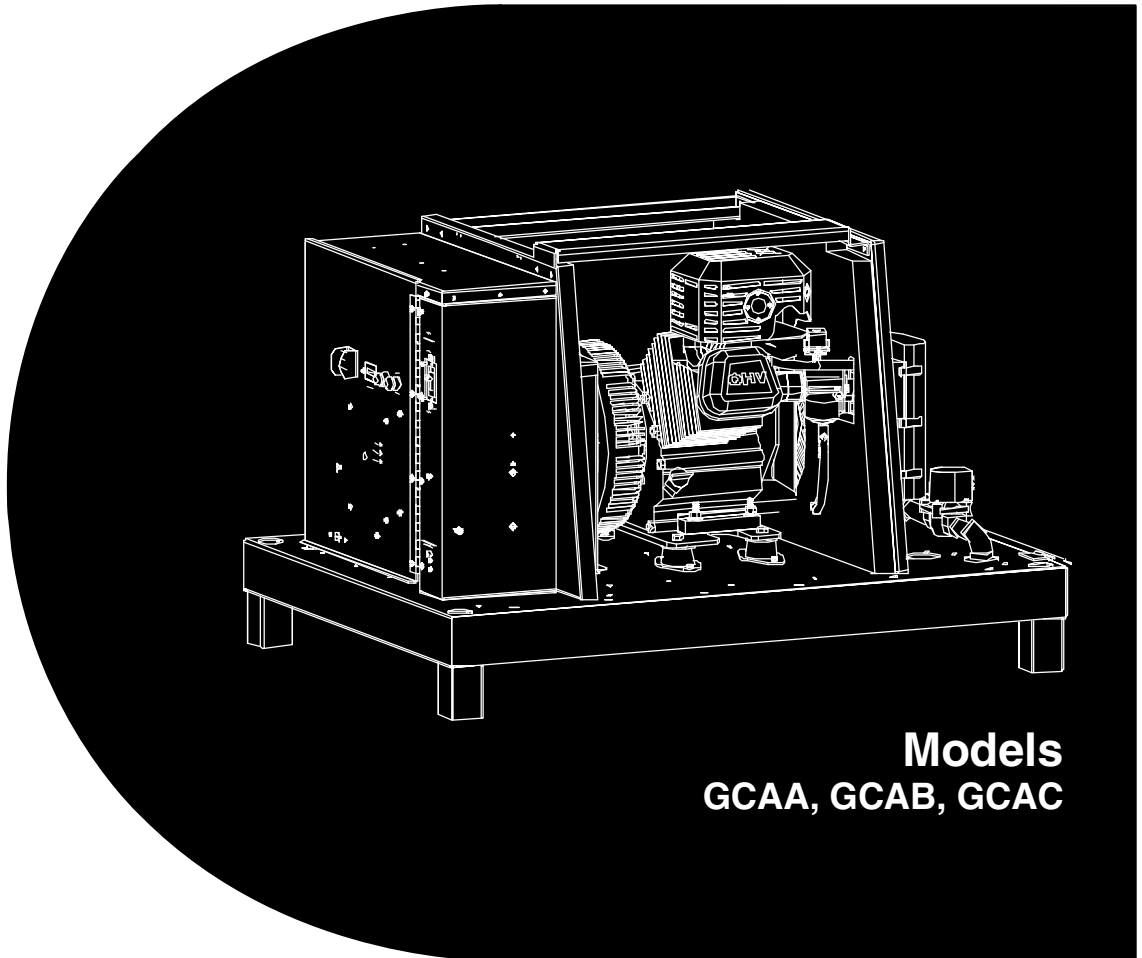


# Service Manual

## DCathlon® Generator Sets



# Stepper Motor

**⚠WARNING** *This equipment encloses multiple sources of electrical power that can cause severe personal injury or death. Always verify that all circuits are de-energized before connecting, disconnecting, or servicing.*

## STEPPER MOTOR B2

### Operation

The stepper motor (B2) varies engine speed by positioning the throttle in the gas-air mixer. By varying engine speed it maintains the setpoint voltage of 26 or 52 VDC as load varies.

**Models GCAB and GCAC:** The stepper motor lever and throttle lever are connected by a link and spring as shown in Figure 11.

**Model GCAA:** The stepper motor lever fork (Figure 12) directly engages the throttle lever.

### Testing

Observe stepper motor action on startup. It is probably okay if it drives to wide open throttle and then backs off slightly. If not, disconnect P10 from controller A1 and measure resistance across pin pairs 1-6, 1-5, 2-3 and 2-4 (Figure 13). Resistance should be 100 to 120 ohms across each set of pins. If not, replace the motor or connector, as necessary.

## SETTING THE IDLE STOP

The idle stop screw prevents the throttle from overshooting and stalling the engine while the stepper motor is in the process of reducing engine speed to match DC bus voltage. To adjust the idle stop screw:

1. Open the enclosure, push the circuit breaker to **OFF**, push the control switch to **MANUAL** and let the genset warm up.
2. Hook up a meter to monitor VDC across the terminals of output filter capacitor C1 (Page 17).
3. By hand push the throttle lever up against the idle stop screw and hold it there (overriding the stepper motor). While holding the throttle lever, adjust the idle stop screw to obtain **21 VDC** if a 24 VDC genset, or **42 VDC** if a 48 VDC genset.

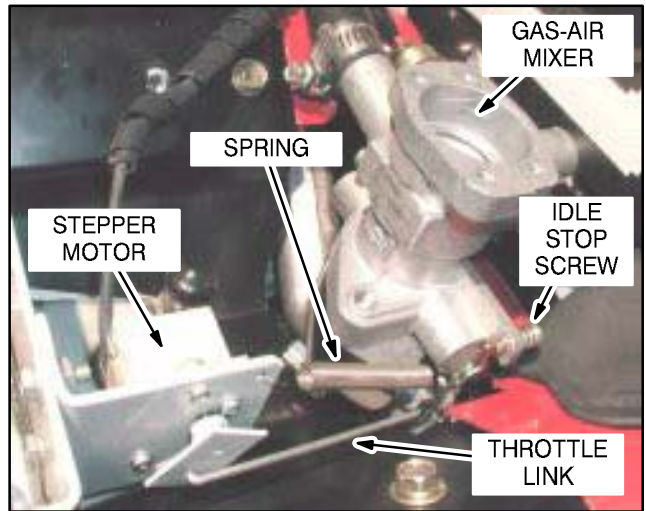


FIGURE 11. STEPPER MOTOR (GCAB, GCAC)

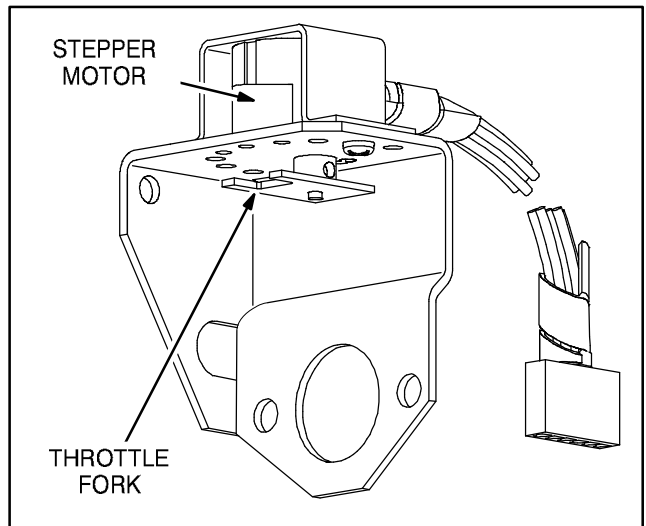


FIGURE 12. STEPPER MOTOR (GCAA)

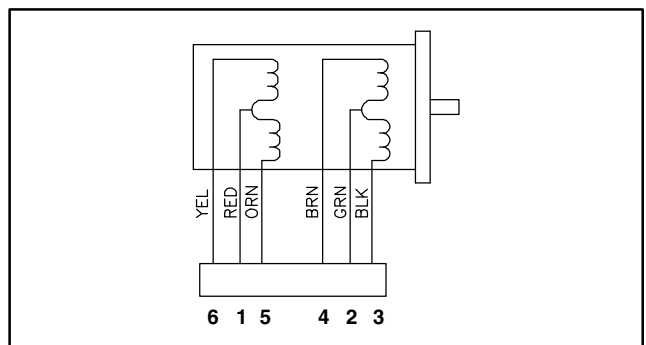


FIGURE 13. STEPPER MOTOR CONNECTOR PINS

# Alternator

**⚠WARNING** *This equipment encloses multiple sources of electrical power that can cause severe personal injury or death. Always verify that all circuits are de-energized before connecting, disconnecting, or servicing.*

This is a three-phase, twelve-lead alternator with a permanent magnet rotor. The stator is bolted directly to the engine block (Figures 14 and 15). The rotor is secured directly to the crankshaft by means of a tapered bushing that is keyed to the straight crankshaft (Figure 15).

## TESTING FOR GROUNDED STATOR WINDINGS

To test the stator windings:

1. Open the enclosure, push the control switch to OFF and disconnect the negative (-) battery cable from the battery to keep the genset from starting while working on it.

**⚠WARNING** *Automatic startup while performing maintenance or service can cause severe personal injury or death. Push the control switch to Off and disconnect the negative (-) battery cable from the battery to keep the genset from starting while working on it.*

2. Before opening the control cabinet door, disconnect the utility power sense circuit at its source (120 VAC) and the batteries being serviced (24 or 48 VDC) so that terminal blocks TB1 and TB3 inside the control cabinet are not live while working on the genset.
3. Disconnect all twelve (12) stator leads from TB4 (Figure 14) and check each for electrical continuity to ground. Replace the stator if any winding is grounded (Page 27).
4. If the windings are good, reconnect the leads to TB4. Torque the terminal screws to 20 lb-in (2.5 N-m).

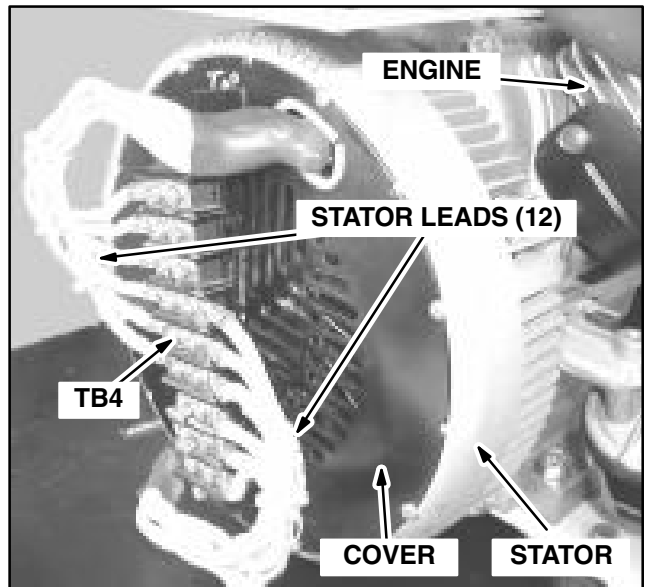


FIGURE 14. ALTERNATOR ASSEMBLED

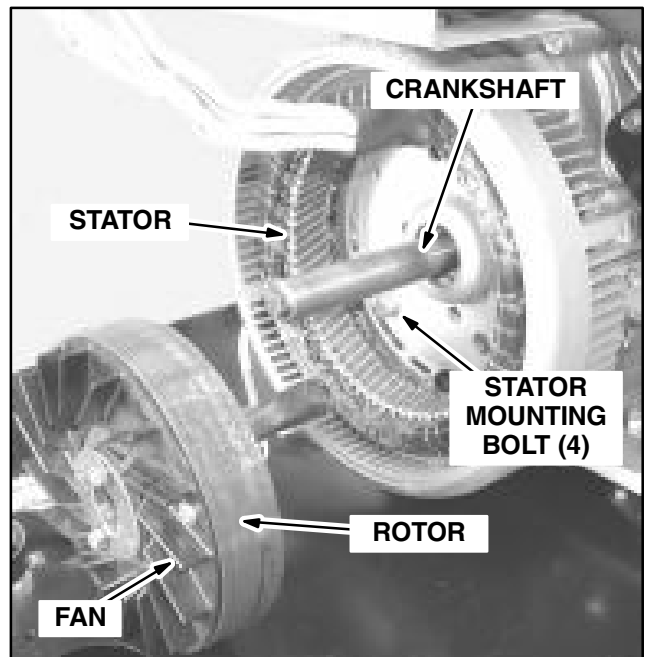


FIGURE 15. ALTERNATOR DISASSEMBLED

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