If an extended wiring harness is supplied with alternator and regulator, see separate instructions packed with harness.

1. Turn off battery switch or disconnect battery ground cable.
2. Remove alternator drive belt.
3. Remove all oil lines between alternator and engine. Plug oil line outlets with properly-sized pipe or tubing plugs. Remove oil drain hose at existing alternator and plug opening.
4. Label wires for identification, then disconnect electrical connections from existing alternator.
5. Remove alternator mounting bolts and existing alternator from mounting bracket.
6. A2-330/A2-336 regulators are flat-temperature compensated and are factory-set at lowest setting to accommodate 8D batteries. For other batteries:
   a. Remove regulator from housing and change position on voltage selector switch. See Table 1.
   b. Re-install regulator on drive end housing, and torque mounting screws to 8.5 Nm/75 lb in.

Regulator is factory-set to Position 1. To change, remove regulator, turn regulator over, and select appropriate switch position (see NOTICE above and Table 2). Re-install regulator on alternator. Torque screws to 8.5 Nm/75 lb in.

### Table 1 — A2-330/A2-336 Regulator Voltage Selector Switch Position

<table>
<thead>
<tr>
<th>Switch Position</th>
<th>Battery Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27.5 V Maintenance</td>
</tr>
<tr>
<td>2</td>
<td>28.0 V Maintenance*</td>
</tr>
<tr>
<td>3</td>
<td>28.5 V Maintenance-Free</td>
</tr>
<tr>
<td>4</td>
<td>29.0 V Maintenance-Free*</td>
</tr>
</tbody>
</table>

* Use this setpoint to maintain proper battery charge level during shorter operating cycles.

### Table 2 — A2-346 Regulator Voltage/Battery Switch Position

<table>
<thead>
<tr>
<th>Switch Position</th>
<th>A9-4036 Harness Connected (Battery Select)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27.5 V Maintenance (D Category)</td>
</tr>
<tr>
<td>2</td>
<td>28.0 V Maintenance-free (Group 31)</td>
</tr>
<tr>
<td>3</td>
<td>28.5 V AGM</td>
</tr>
<tr>
<td>4</td>
<td>29.0 V DO NOT USE POSITION # 4</td>
</tr>
</tbody>
</table>

7. Units are shipped with shaft collar, Belleville washer and nut. Remove and discard shaft collar. Install pulley and furnished Belleville washer. Torque nut to 162.7 Nm/120 lb ft.
8. Install alternator:
   a. Carefully place alternator on alternator mounting bracket.
   Use caution when lifting alternator to prevent possible minor personal injury.
   Use hoist along with alternator lifting ring located on top of alternator.

   b. Secure alternator to alternator mounting bracket.
   Mounting bolts should extend 17.8/22.7 mm (0.7/0.88 in.) into alternator mounting rail. Use four 1/2-13, grade 5 or higher mounting bolts with lock washers (existing hardware may be suitable). Torque mounting bolts to 88 Nm/65 lb. ft.

   c. Some alternator installations may require a vibration dampening bracket (CEN part no. A4-104). Attach one end of bracket to drive end housing and other end to engine. See Figure 1. See engine manufacturer’s torque specification for engine gear case bolt torque.

9. Replace alternator drive belt if damaged or worn. Install alternator drive belt and secure belt tension bracket assembly. Loop alternator drive belt over pulleys and align belt with polyvee grooves.

10. Belt tension guidelines shown below are a starting point for manual and automatic belt tensioners.
    - K-section pulley: 10 grooves minimum, 12 grooves preferred.
    - Belt wrap: 180 degree nominal. Less wrap requires a pulley with more grooves and more belt tension.
    - Belt tension: 80 lbs to 120 lbs nominal. More pulley grooves permit lower belt tension. For further questions, please contact drive belt manufacturer.

   Both too low and too high belt tension causes premature bearing failure. Too low belt tension causes belt slip, pulley heating, bearing heating, and ultimately bearing failure. Too high belt tension increases bearing fatigue, resulting in bearing failure.

11. Modify electrical connections to disable existing regulator:
    - 50-VR regulator without Deutsch connector – see Figure 3. Disconnect IGN lead at IGN terminal on regulator and reconnect to FLD terminal on regulator. Torque #10-32 screw to 2.3 Nm/20 lb. in.
    - 50-RD regulator – see Figure 2. Disconnect POS lead at POS terminal on regulator and reconnect to FLD terminal on regulator. Torque #10-32 screw to 2.3 Nm/20 lb. in.

   NOTE: For 50-VR regulators with Deutsch connector, unplug the Deutsch wiring harness from the 50-VR regulator and plug it into a CEN A9-040 wiring adaptor. No other wiring modification to 50-VR regulator is required. Support wiring harness as needed.

12. Regulator electrical connections (see Figure 2):
   a. Make sure alternator-to-regulator harness plug is secure in regulator receptacle.
   b. A2-330/A2-336: Connect FLD lead from existing regulator to IGN terminal on new regulator, using proper ring terminal. Torque terminal nut to 4.5 Nm/40 lb. in.
   c. P terminal can tap AC voltage, typically half the charge voltage. When required, connect P terminal to tachometer or relay. Use proper ring terminal. Torque terminal nut to 4.5 Nm/40 lb. in.
   d. D+ terminal can provide 28 VDC sense voltage to multiplex controller. Maximum current from D+ can be no more than 5 amps. When required, connect D+ terminal to controller through a relay. The relay coil must be diode protected and rated for proper voltage. Use proper ring terminal. Torque terminal nut to 4.5 Nm/40 lb. in.
   e. A2-346 only: If not using A9-4036 temperature-voltage sense/J1939 harness, keep cap on regulator. If using A9-4036 temperature-voltage sense/J1939 harness:
      1) Remove cap from regulator and plug harness connector into 10-pin connector.
      2) Harness length is 182 inches, enough to reach battery compartment in most vehicles. Unused harness length should be coiled up. Use cable ties every 12-14 inches to securely support harness between regulator and battery compartment. If harness length must be shortened:
         a) Black wire:
            — Cut black wire off 6” above terminal, save terminal.
            — Cut remaining black wire to length.
            — Crimp and solder terminal and 6” wire or connect with insulated butt splice and seal with heat.
         b) Red wire—cut to desired length and use terminal post.
         c) Attach terminal from black wire in A9-4036 harness to 28 V battery negative post. Attach terminal from red wire to 28 V battery positive post.
         d) If using J1939 connector on harness, connect as indicated by vehicle manufacturer.

13. Alternator electrical connections:
    a. Replace battery positive cable if damaged or worn.
    b. B+ cable must be supported by cable clamp within 12 in. of B+ output terminal to avoid premature failure of B+ output terminal. CEN recommends using cable clamp attached to alternator anti-drive end housing for support.
    c. Replace ground cable if damaged or worn. Connect ground cable from vehicle to alternator B– terminal. Torque B– terminal on alternator to 15 Nm/11 lb. ft.
    d. B+ cable must be supported by cable clamp within 12 in. of B+ output terminal to avoid premature failure of B+ output terminal. CEN recommends using cable clamp attached to alternator anti-drive end housing for support.

14. Attach fresh air duct to duct opening on anti-drive end housing. Duct specifications include:
    • 100mm/4 in. diameter duct no more than 2.5 m/8 ft. long must be used.
    • A maximum of two 90º bends is allowed.
    • Installation must not obstruct airflow.
    • Do not allow moisture, such as rain, road spray, water used during vehicle cleaning, to be ingested by duct.