

General description

The alternator is driven from the crankshaft pulley by single or double belt(s).

The CAV AC5RA or AC5RS and the Lucas A127 alternators have solid state regulators fitted at the rear. The regulator of the Lucas A127 alternator includes the brush box as a part of the unit. The regulators of both alternators are sealed and repair is not possible.

Precautions

To prevent damage to the diodes and to the resistors, the precautions given below must be followed.

- Do not disconnect the battery while the engine is in operation. This will cause a voltage surge in the alternator charge system which will immediately cause damage to the diodes or to the transistors.
- Do not disconnect an electrical wire before the engine is stopped and all electrical switches are in the "off" position.
- Do not cause a short circuit by the connection of electrical wires to the wrong terminals. The correct identification of the electrical wire to the correct terminal must be made. A short circuit or wrong connection which gives reverse polarity will immediately cause permanent damage to the diodes and to the transistors.
- Do not connect a battery into the system until it has been checked for correct polarity and voltage.
- Do not check for current flow with a spark contact as damage can be caused to the transistors.

Drive belts

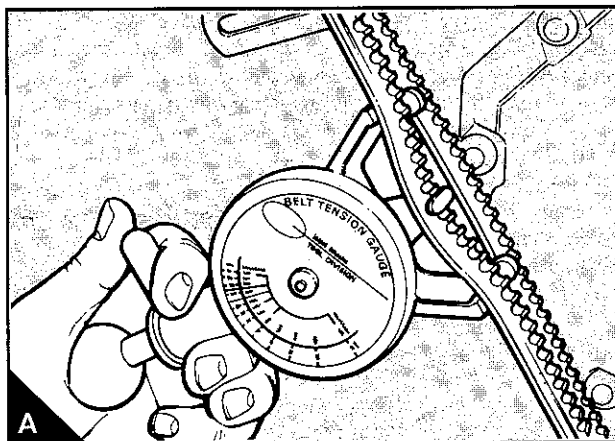
To check

23A-01

1 Check the belt(s) for wear and damage and renew the belt(s), if necessary. If twin belts are fitted, they should both be renewed.

2 Check the belt tension. If twin belts are fitted, check/adjust the tension on the tighter belt. To ensure maximum belt life, it is recommended that a belt tensioner gauge is used. Fit the gauge (A) at the centre of the longest free length and check the tension. If a "Burroughs" gauge is used, the correct tension is 355N (80 lbf) 36 kgf. If the tension is as low as 220N (50 lbf) 22 kgf, adjust it to 355N (80 lbf) 36 kgf, operation 23A-02.

If no gauge is available, press down the belt with the thumb at the centre of the longest free length and check the deflection (B). With moderate thumb pressure, 45N (10 lbf) 4,5 kgf, the correct belt deflection is 10 mm (3/8 in).



To adjust tension

23A-02

1 Loosen the pivot fasteners (B1) of the alternator and the fasteners of the adjustment link (B2).

2 Change the position of the alternator to give the correct tension. Tighten the pivot fasteners of the alternator and the fasteners of the adjustment link.

3 Check the belt tension again to ensure that it is still correct.

To remove and to fit

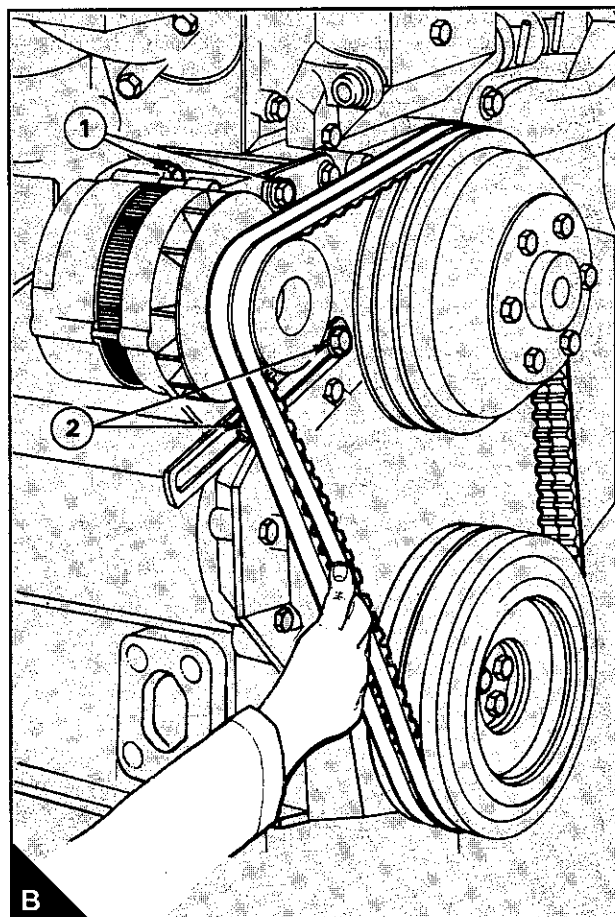
23A-03

Where twin belts are fitted, they are supplied as a set and must be renewed as a set.

1 Loosen the pivot fasteners (B1) of the alternator and the adjustment link fasteners (B2).

2 Release all of the tension from the belt(s) and remove the belt(s).

3 Fit the new belt(s) and adjust the tension, operation 23A-02. The belt tension must be checked again after the first 1000 km (600 miles) or 20 hours of operation.



23A

Alternator

To remove and to fit

23A-04

To remove

- 1 Disconnect the electrical connection.
- 2 Loosen the pivot fasteners of the alternator and the fasteners of the adjustment link.
- 3 Release all the belt tension and remove the belt(s).
- 4 Remove the adjustment link from the alternator and remove the pivot bolt(s). Make a note of the position of the washers and distance pieces to ensure that they are fitted correctly. Remove the alternator.

To fit

- 1 Put the alternator in position and assemble loosely the pivot fasteners and the adjustment link and its fasteners. Ensure that the washers and the distance pieces are fitted in their correct positions and that the alternator pulley is aligned to the crankshaft pulley within $\pm 2,4$ mm (3/32 in).
- 2 Fit the drive belt(s) and adjust the drive belt tension, operation, 23A-02. Tighten the fasteners and check the tension again.
- 3 Connect the electrical connection.

To maintain

- 1 Ensure that the drive belts are not worn and that the belt tension is correct.
- 2 Keep the alternator clean. To clean the alternator, use a material which is damp with kerosene or a special fluid used for this purpose. Ensure that the fluid does not enter the cover of the alternator.
- 3 Ensure that air can pass easily over the casing to keep it cool.

Fault diagnosis

The alternator is so designed that a flow of current indicated by no light at the warning light or a reading shown on an ammeter is enough indication that the system is in correct operation. If the system is in correct operation, no open circuit, voltage or current output checks need to be done on the installation unless:

- The warning light does not show when the alternator is stationary and the switch is in the "on" position or it shows a light when the alternator is in operation.
- No charge current is shown on the ammeter.
- The battery is discharged.
- The battery is hotter than normal which is an indication of loss of voltage control.

If one or more of the above symptoms occur, the procedure indicated below should be applied.

- 1 Ensure that the battery is in a fully charged condition.
- 2 Connect a moving-coil voltmeter of good quality, with a range of 0-50 volts, across the positive and negative terminals of the alternator. If an ammeter is not fitted in the electrical circuit, fit a moving-coil ammeter of good quality, with a range of 0-100 ampere, in the wire between the alternator and the positive terminal of the battery.
- 3 Turn the warning light switch to the "on" position (main switch on instrument panel) when the warning light should be illuminated.
- 4 Switch on a 10-15 ampere load, for example, lights, fans, etc..
- 5 Start the engine and operate it at a fast idle speed when either the warning light should be extinguished or the ammeter indicates a small change in the current in relationship to the engine speed.
- 6 Increase the engine speed for a moment to near maximum speed, when the charge current should be approximately 60 amperes (AC5RA or RS) or 55 amperes (A127) for a 12 volt system or 40 amperes (AC5RA or RS) for a 24 volt system.
- 7 Operate the alternator at approximately half speed (engine speed approximately 1500 rev/min) and remove the electrical load. The voltage should go up to 14 volts for a 12 volt system or 28 volts for a 24 volt system and then remain constant. At the same time the current reading should show a reduction.

Any change in the above data can indicate a fault and the procedure that follows should be used before any components are disconnected. This procedure is not suitable for A127 alternators and, if a fault is found, the alternator should be removed for test by a specialist.

The regulator is a sealed unit and a repair is not possible. If there is a regulator fault, the regulator must be renewed.

If the warning light is not illuminated when the switch is in the "on" position:

Check the bulb.

If no fault:

Check all the connections at the regulator, at the alternator and at the battery.

If no fault:

Turn the switch to the "off" position. Disconnect the wire from the "F" terminal on the alternator and connect a wire between the "F" terminal and the negative terminal on the alternator. Turn the switch to the "on" position.

If the warning light shows, the fault is in the regulator.

If the warning light does not show, the fault is in the alternator.

If the warning light continues to show and the ammeter shows no output when the alternator is in operation:

Check all the connections at the regulator, alternator and battery.

If no fault:

Turn the switch to the "off" position. Disconnect the wire from the "F" terminal on the alternator and connect a wire between the "F" terminal and the negative terminal on the alternator. Turn the switch to the "on" position and operate the engine at fast idle.

If there is no output, there is a fault in the alternator.

If there is an output, there is a fault in the regulator.

If the warning light continues to show when the alternator is in operation and the ammeter shows a reduced output with maximum output only at maximum engine speed or, if the warning light does not show, but there is a reduced output from the alternator with maximum output only at maximum engine speed:

There is a fault in the alternator.

If there is an intermittent light from the warning light and the ammeter needle is not stationary when the battery is charged fully and no load is applied:

Check for a higher than normal resistance in the negative control wire of the regulator.

If the resistance is normal, there is a fault in the regulator.

If the battery charge is too high and the ammeter indicates high or maximum output at all times:

Check the positive control wire and its connection at the regulator.

If the wire and its connection are correct, there is a fault in the regulator.