

# Distributors & Ignition Systems

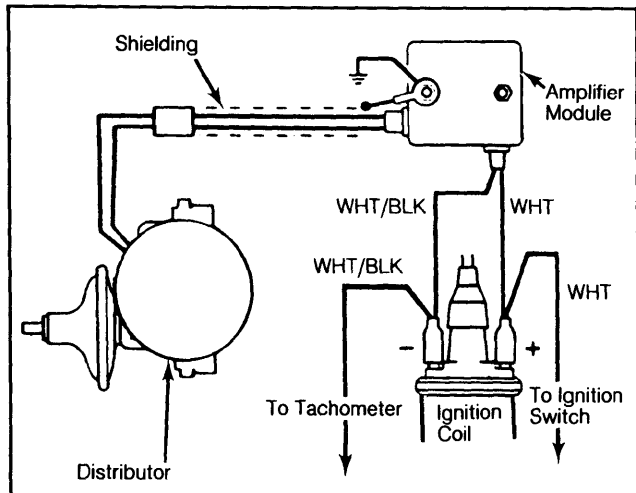
## LUCAS CONSTANT ENERGY IGNITION

Jaguar XJ6, XJS

### DESCRIPTION

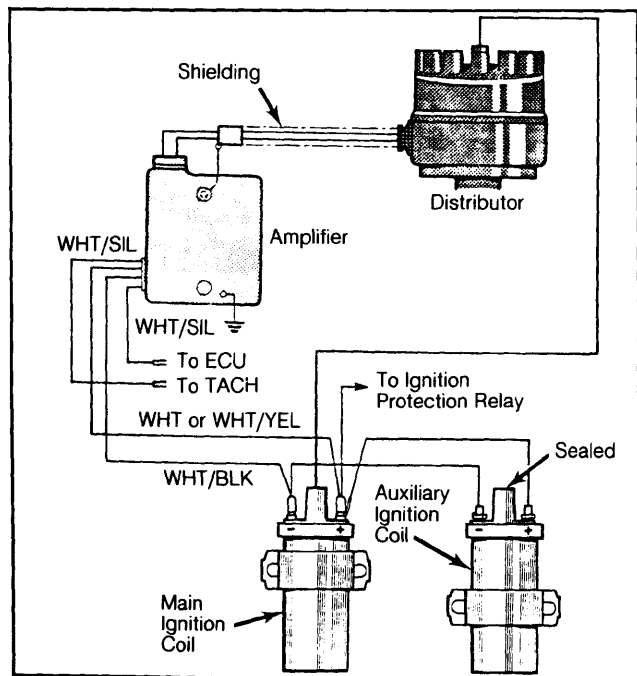
The Lucas Constant Energy Ignition System maintains energy stored in the ignition coil at a constant level, allowing the output voltage to remain constant over a wide range of engine speeds.

**Fig. 1: Wiring Schematic for Lucas Constant Energy Ignition System for XJ6 Models**



The system also provides for a variable dwell for more optimum performance. A long dwell is provided at high speeds for adequate energy storage in the coil. A dwell is provided at lower speeds for minimum power loss.

**Fig. 2: Wiring Schematic for Lucas Constant Energy Ignition System for XJS Models**



The power lost in both the coil and amplifier module is greatly reduced, compared to equivalent constant dwell systems. The system includes a breakerless distributor, amplifier module, an ignition coil, ignition switch, and battery. See Fig. 1. No ballast resistor is required.

The distributor has conventional centrifugal and vacuum advance systems, an anti-flash shield, rotor, reluctor, and pick-up coil. See Fig. 2. The reluctor is a gear-shaped component with 6 or 12 teeth, one for each cylinder of the engine. It is mounted on the distributor shaft.

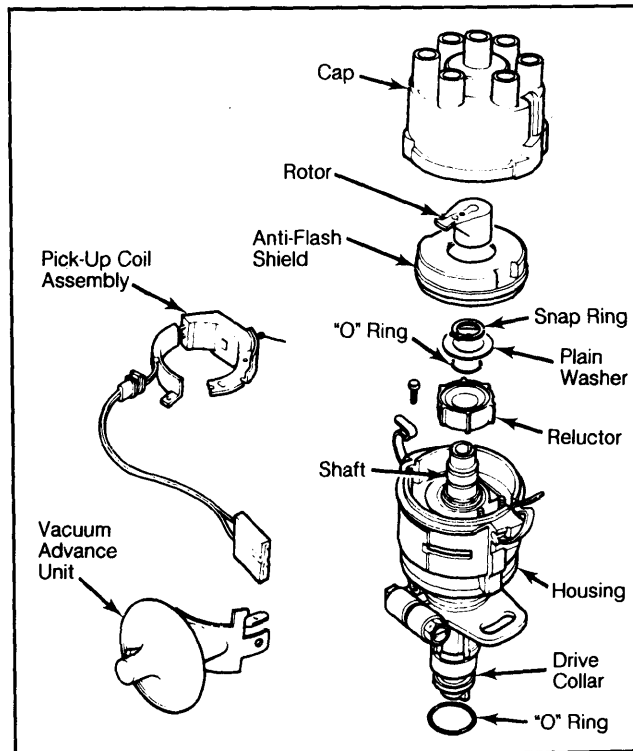
The pick-up coil includes a winding, pole piece and a permanent magnet. A 2-wire shielded harness connects it directly to the amplifier module. The amplifier module, housed in an aluminum case, is located near the distributor. It has a 2-wire harness, which connects to the coil primary terminals.

On XJS models, 2 ignition coils are used. See Fig. 2. The main coil is connected in parallel with the primary windings of the auxiliary coil. The secondary circuit of the auxiliary coil is not used and the coil tower is sealed. Amplifier modules are not interchangeable between models.

### OPERATION

As the distributor shaft turns, the reluctor turns with it. See Fig. 3. As each of the 6 or 12 teeth approach and pass the pick-up coil's pole piece, the strength of the magnetic field around it will vary. This creates a voltage in the winding of the pick-up coil.

**Fig. 3: Exploded View of Lucas XJ6 Distributor for Constant Energy Ignition System**



For exploded view of XJS distributor, see Fig. 8.

## LUCAS CONSTANT ENERGY IGNITION (Cont.)

The rise and fall of this voltage is sensed by the amplifier module, which then sends a signal, cutting off voltage to the primary circuit of the ignition coil. This causes a voltage surge in the secondary, firing the spark plugs at the proper time.

### SPECIFICATIONS

#### CENTRIFUGAL & VACUUM ADVANCE

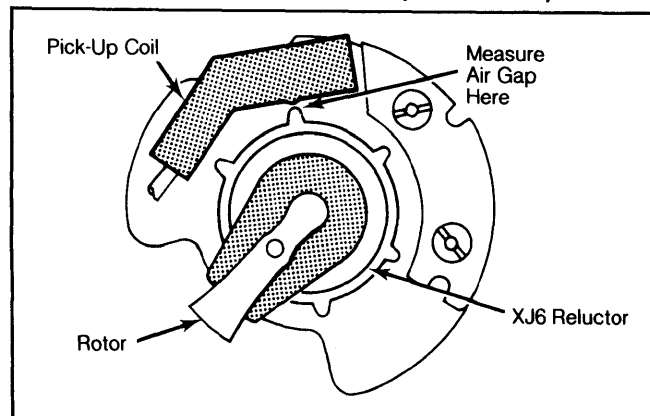
See the appropriate Distributor Specifications Table in this section.

### ADJUSTMENT

#### RELUCTOR-TO-PICK-UP COIL AIR GAP

1) Normally air gap will not need resetting unless it has been tampered with. Always use a plastic feeler gauge when checking or setting air gap. See Fig. 4. Gap must be checked at each reluctor tooth.

Fig. 4: Adjusting Reluctor-to-Pick-Up Coil Air Gap



Although XJ6 model is shown, procedure is same for XJS.

2) To check air gap, align reluctor tooth with pole piece of pick-up coil. Insert proper plastic feeler gauge. Original factory-set air gap is .006-.008" (.15-.20 mm). Set air gap during service at .008-.014" (.20-.35 mm). Check gap at each of the other reluctor teeth.

3) To adjust air gap, loosen pick-up coil mounting screws. Align reluctor tooth with pole piece of pick-up coil. Insert proper feeler gauge and move pick-up coil against gauge. Tighten mounting screws.

### TESTING

#### BATTERY VOLTAGE CHECK

1) Check battery condition and specific gravity. Connect voltmeter positive lead to battery positive post. Connect negative lead to battery negative post.

2) Reading should be at least 12 volts. If not, charge battery.

#### SYSTEM SPARKING CHECK

1) Disconnect high tension wire from center of distributor cap. Hold wire 1/4" from good engine ground.

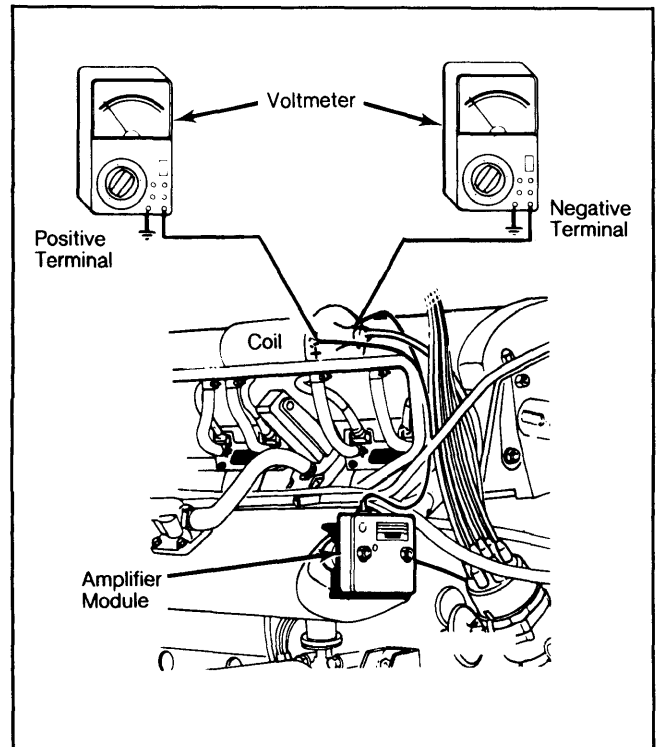
2) Crank engine. If a good spark is obtained, check spark plug wires, spark plugs, distributor cap and rotor. If no spark or poor spark is obtained, conduct the following component checks.

#### COIL VOLTAGE CHECKS

##### Positive Terminal

1) Turn ignition switch "ON". Connect voltmeter positive lead to ignition coil positive terminal. Connect negative lead to ground. See Fig. 5.

Fig. 5: Checking Ignition Coil Voltage



Check voltage at both positive and negative terminals.

2) Reading should be 12 volts. If voltage is less than 11 volts, check wiring back to ignition switch and battery.

##### Negative Terminal

1) With ignition switch still "ON" and negative voltmeter lead attached to ground, move the positive voltmeter lead to ignition coil negative terminal. See Fig. 5. Reading again should be 12 volts.

2) If a 0 (zero) reading is obtained, disconnect amplifier module lead from coil negative terminal. If voltage is still zero, a faulty ignition coil is indicated.

3) If a 0 (zero) reading was obtained in step 1), but a 12-volt reading was obtained after disconnecting amplifier module lead from coil negative terminal, suspect a faulty amplifier module.

#### PICK-UP COIL RESISTANCE CHECK

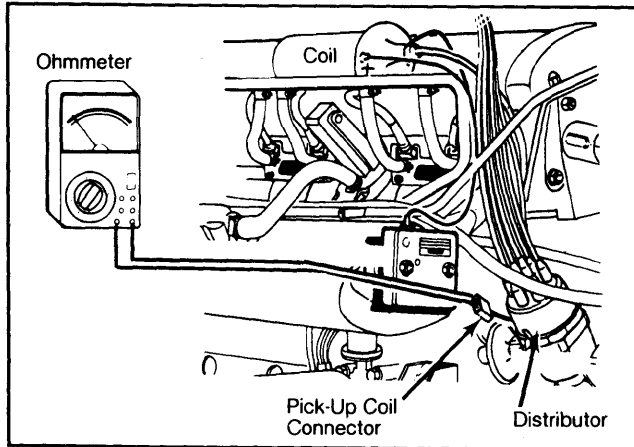
1) Disconnect pick-up coil connector from amplifier module. See Fig. 6. Be sure ignition is "OFF". Set ohmmeter in x100 scale. Insert ohmmeter leads into 2 pick-up coil harness terminals.

2) Resistance reading should be 2000-5000 ohms. If not, replace pick-up coil and harness assembly.

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**Fig. 6: Checking Pick-Up Coil Resistance**

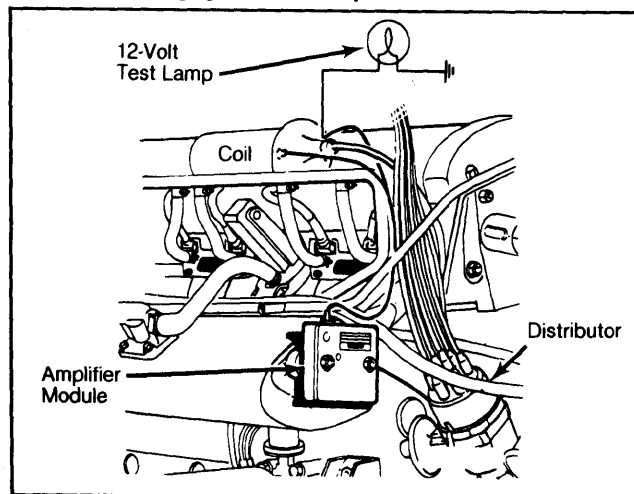


Use ohmmeter with ignition "OFF".

### COIL OPERATION CHECK

1) Connect a 12-volt test lamp to negative terminal of ignition coil. See Fig. 7. Ground test lamp.

**Fig. 7: Checking Ignition Coil Operation**



Use 12-volt lamp with ignition turned "ON".

2) Crank the engine, but do not start it. Test lamp should flicker slightly.

### AMPLIFIER LEAD TEST

#### Tachometer Lead

Connect ohmmeter leads to tachometer lead and to coil negative terminal. Reading should be 8,000-12,000 ohms. If not, replace amplifier.

#### ECU (Fuel-Injection) Lead

Connect ohmmeter leads to ECU connector and coil negative terminal. Reading should be 5,450-8,160 ohms. If not, replace amplifier.

## OVERHAUL

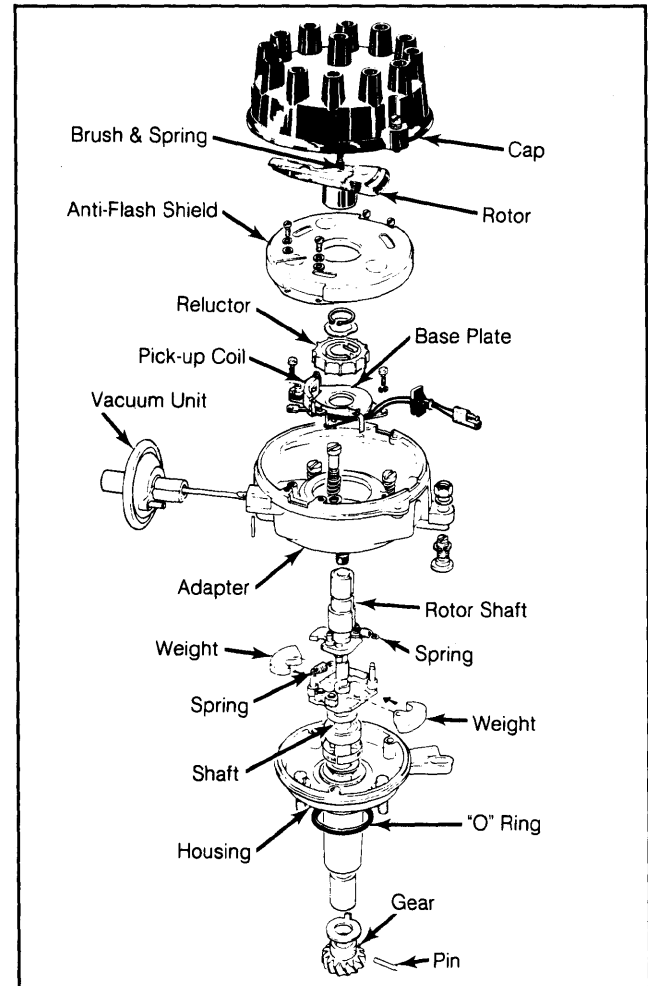
### DISTRIBUTOR

#### Disassembly

1) Disconnect negative battery cable, and remove distributor from vehicle. Remove distributor cap

by releasing spring clips. Pull off rotor from keyed shaft. Remove anti-flash shield. Remove snap ring holding reluctor to distributor shaft. Remove plain washer, "O" ring, and felt pad.

**Fig. 8: Exploded View of Lucas XJS Distributor**



See Fig. 3 for exploded view of XJ6 distributor.

2) Remove U-shaped key, and lift reluctor from distributor shaft. Remove attaching screws or roll pin, and lift vacuum advance unit from base plate peg. Do not loosen 2 barrel nuts, securing pick-up coil. However, loosen mounting screws to remove pick-up coil and base plate assembly.

3) Drive pin from drive gear collar. Check shaft for burrs, and remove distributor shaft from housing. Disassemble auto-advance mechanism as necessary.

#### Reassembly

1) To assemble distributor, reverse disassembly procedure. Check parts for wear, and lubricate weight assembly, felt pad, shaft and moving plate with Rocol "Moly Pad" or equivalent. Be sure all parts are properly assembled and that they move freely.

2) Install distributor in vehicle, and reconnect negative battery cable. Adjust air gap and ignition timing, if necessary.