

CAV Fuel Injection

CAV FUEL INJECTION

Land Rover Series III 2.25 Liter
88 (1971-73)
88 Station Wagon (1971-73)
109 (1971-73)
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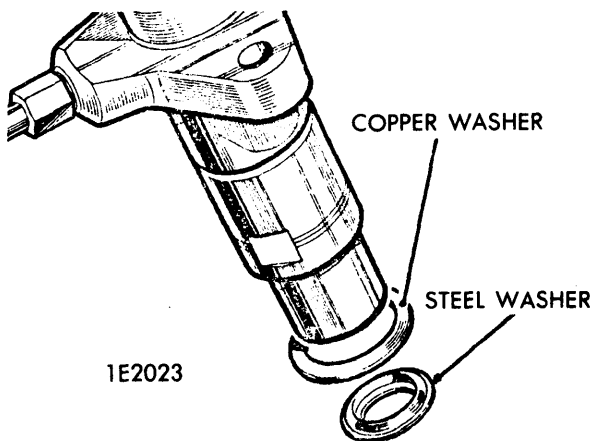
DESCRIPTION

CAV fuel injection system uses a mechanically governed distributor pump and CAV Pintaux injectors. Fuel is supplied to distributor pump by a conventional mechanical fuel pump at a pressure of 5-8 psi (.35-.56 kg/sq. cm). Distributor pump is preceded by two fuel filters. The first filter is used to remove most of the water and foreign matter from diesel fuel and second filter is a paper element type, which removes any remaining water or particles from fuel, before entering distributor pump. Distributor pump supplies fuel at a pressure of 1985 psi to individual injectors located in cylinder head. Glow plugs located in cylinder head are used for cold starts to aid in raising air/fuel temperature in combustion chambers. Glow plugs are controlled by a switch on instrument panel.

ADJUSTMENTS

NOTE — Absolute cleanliness must be maintained when handling any part of fuel injection system.

NOTE — An engine stop control is used to cut off fuel when stopping engine. This control must be returned to running position before attempting to start engine.



FUEL INJECTOR

INJECTORS

NOTE — Nozzle holders and nozzles should not be dismantled. If a nozzle is found to be faulty, replace complete unit.

- 1) To test nozzle with engine running, loosen fuel feed pipe union on each nozzle in turn.
- 2) If injector being tested has been operating properly, there will be a distinct reduction in engine speed accompanied by obvious roughness, but a faulty injector will make less reduction to engine speed.
- 3) If a faulty injector is found, replace it by disconnecting spill pipe at "T" connector and loosen banjo bolts at nozzles. Feed pipes must be removed from injector and pump. **CAUTION** — Pipes must not be bent to clear unions on injectors.

- 4) Remove flange securing nuts.
- 5) Lift out injectors complete with spill pipe and copper washers.
- 6) Remove steel washers from inside injector holes.
- 7) To reinstall, attach spill pipe to new injectors, make sure connections are absolutely clean and free of foreign matter. Do not fully tighten banjo bolts at this stage.
- 8) Reassemble injectors and spill pipe to cylinder head, making sure new copper and steel washers are used. **NOTE** — Steel washer must be fitted with "u" of corrugation facing downwards.
- 9) Replace flange securing nuts.
- 10) Tighten each nut alternately an equal amount to ensure that injector goes into position evenly. Tighten nuts to 6-8 ft. lbs. (.8-1.0 mkg), do not over tighten as nozzle distortion may result, causing rough and uneven running. Finally tighten spill pipe banjo bolts.

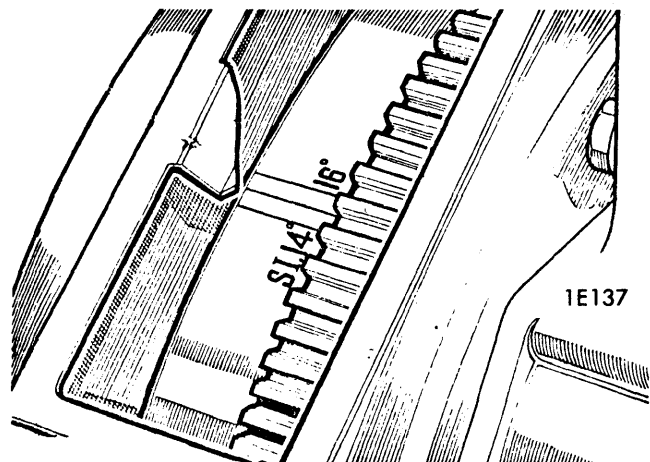
Injector Specifications

Injector	CAV Pintaux
Nozzle Size	BDNO/SPC6209
Operating Pressure of Nozzle Valve	1985 psi
Back Leakage Rate at 1470-2205 psi	
Original Nozzle	5 sec.
New Nozzle	7 sec.

CAUTION — If a test stand is used to check injectors, hands must be prevented from coming into contact with fuel spray because working pressure is sufficient to cause fuel to penetrate the skin with ease.

GLOW PLUGS

Glow plugs do not require any maintenance or adjustment. When glow plug switch is turned "ON" and indicator light glows brightly this indicates a short, if no light is seen there is an open circuit. **NOTE** — Care should be taken when replacing glow plugs not to twist center connector. When using glow plugs for starting a cold engine, turn on glow plugs for 10 seconds before starting engine.



FLYWHEEL TIMING MARKS

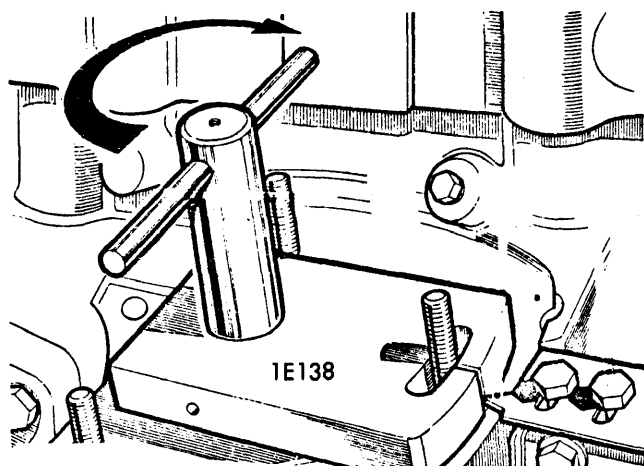
CAV FUEL INJECTION (Cont.)

DISTRIBUTOR PUMP

NOTE — No adjustment or repair is permitted to distributor pump. If trouble is experienced, return pump to nearest CAV agent or dealer.

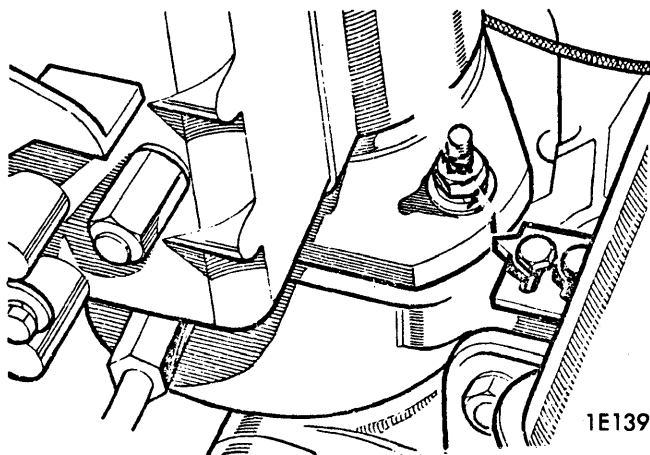
To time distributor pump use the following procedure:

- 1) Turn crankshaft in direction of rotation until flywheel timing marks are at 15° mark. Remove distributor pump.
- 2) Master spline on pump driving gear will be approximately 20° (4 o'clock position) from center line of engine viewed from front.
- 3) Insert timing gauge (No. 605863) into pump driving gear. Twist gauge in a clockwise direction to take up backlash and wear.



TIMING GAUGE

- 4) While maintaining this position, loosen timing pointer and align with notch on timing gauge. Tighten timing pointer bolts and remove gauge.



DISTRIBUTOR PUMP ADJUSTMENT

- 5) Match up master splines on pump driving gear and distributor pump gear. Install pump and align pump mark with timing pointer and tighten pump bolts.

NOTE — Should there be any fall-off of power during engine life, re-time distributor pump to compensate for drive gear wear.

Distributor Pump Specifications

CAV	DPA Type
Direction of Rotation	Ⓢ Clockwise
Pump Timing	15° BTDC
Maximum Speed Setting (Sealed).....	4200 eng. RPM

Ⓢ — Viewed from drive end.

MAINTENANCE

NOTE — Diesel fuel systems must be maintained free from air leaks at all times. If air is allowed to enter system, do not try to start engine before proper priming procedures have been carried out. Do not run low on fuel as air may enter system.

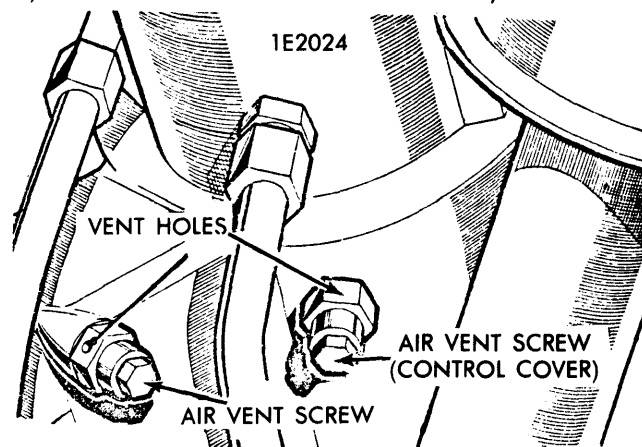
PRIMING FUEL SYSTEM

A — When paper element filter is changed:

- 1) Loosen bleed pipe on top of filter.
- 2) Operate hand priming lever on mechanical pump until fuel, free from bubbles, emerges.
- 3) Tighten bleed pipe.
- 4) Operate hand priming lever once or twice to clear last bubbles of air into filter bleed pipe.
- 5) Start engine in normal way and check for leaks.

B — When fuel system has been completely emptied proceed as follows:

- 6) Carry out previous steps one to four inclusive.
- 7) Loosen air vent screw on distributor body.



DISTRIBUTOR PUMP PRIMING

- 8) Operate fuel pump hand priming lever until fuel, free of air bubbles, emerges.
- 9) Retighten air vent screw.
- 10) To ensure that all air is exhausted from pump, it may be necessary to loosen air vent screw in distributor control cover and repeat steps eight and nine.
- 11) Start engine in normal manner and check for leaks.

C — When distributor pump only has been drained it is only necessary to carry out steps seven to eleven inclusive.

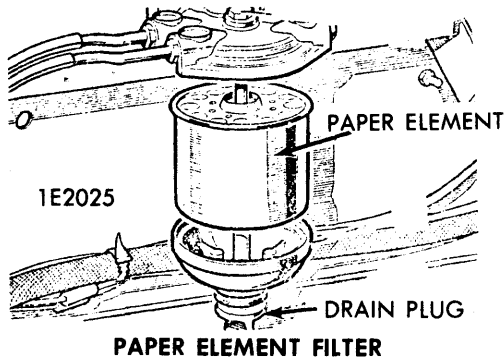
CAV Fuel Injection

CAV FUEL INJECTION (Cont.)

FUEL FILTERS

NOTE — It is important to maintain filters at proper intervals to reduce wear on distributor pump and injector nozzles.

Paper Element Filter — Change element every 12,000 miles or 12 months. Drain off water every month. Drain off water by loosening drain plug and allow water to run out. When pure diesel fuel is emitted, tighten drain plug.



Fuel Sediment — Clean every 12,000 miles or 12 months. Drain off water every month. Drain off water by loosening drain plug and allow water to run out. When pure diesel fuel is emitted, tighten drain plug.

Cleaning — 1) Disconnect fuel inlet pipe at sediment bowl and raise pipe above level of fuel in tank to prevent draining.

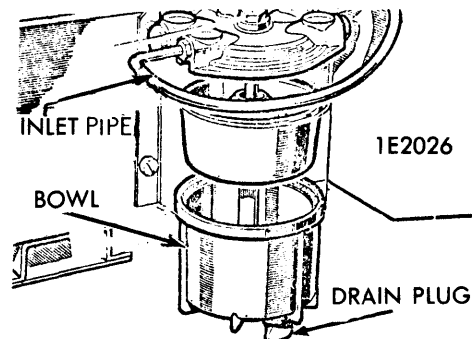
2) Support sediment bowl and remove bolt on top of unit.

3) Remove bowl and element.

4) Clean all parts in suitable cleaning fluid.

5) Install new oil seals and reverse removal procedure.

6) Loosen drain plug, when pure diesel fuel runs out tighten plug. Start engine and check for air leaks.



FUEL SEDIMENT BOWL