

Exhaust Emission Systems

LAND ROVER SERIES III ENGINE MODIFICATION

Land Rover Series III (1972-73)

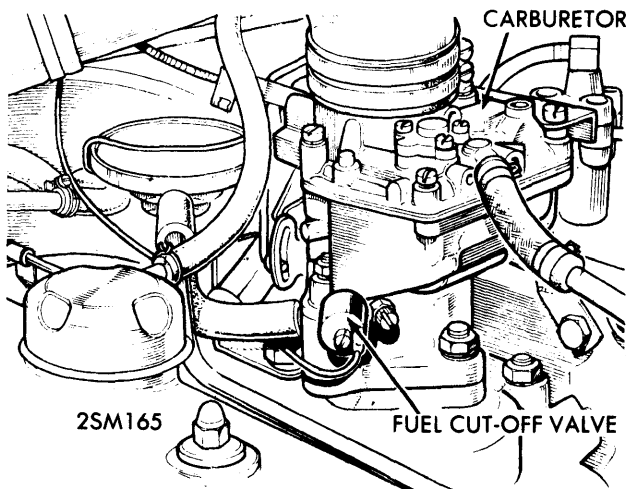
DESCRIPTION

Exhaust emission control is achieved by alterations to carburetion and combustion characteristics and modifications to the distributor vacuum ignition advance. System consists of a carburetor throttle prop system, a solenoid operated fuel cut-off valve, and a distributor which is controlled by a throttle controlled vacuum switch.

Throttle Prop System — System is designed to open throttle valve slightly to admit extra air to intake during periods of deceleration.

Fuel Cut-Off System — To prevent dieseling of engine when ignition is shut off, cut-off valve is provided to cut off idle by-pass drilling and progression chambers when the ignition is shut off.

Ignition System — Provides retarded ignition setting at lower speed range while allowing normal advance at higher engine speed. During high speed deceleration, throttle controlled vacuum switch provides for ignition retard.



FUEL CUT-OFF VALVE

OPERATION

Throttle Prop System — During deceleration (high manifold vacuum) wet fuel is drawn off the intake manifold walls and gives a rich air/fuel ratio and poor combustion. To compensate for this condition, the throttle prop system opens the throttle valve to reduce manifold vacuum and admit additional volumes of air. This provides a more correct air/fuel mixture for better combustion. System operates as follows:

1) A trigger valve is connected to the intake manifold by a pipe. Under high manifold vacuum a diaphragm in the trigger valve is pre-set to lift at 22.5-23" Hg.

2) This vacuum is relayed to a vacuum servo unit equipped with a spring push/pull link. The vacuum moves the diaphragm and causes the spring link to open the throttle prop lever.

3) The throttle prop lever holds the throttle valve open a slight amount until vacuum in the intake manifold drops to about 18" Hg. Trigger valve then closes and movement of the vacuum unit closes the throttle valve. An air bleed pipe from the air cleaner elbow to the trigger valve allows atmospheric air to replace the vacuum after the valve diaphragm closes.

Fuel Cut-Off Valve — To prevent dieseling, a solenoid operated needle valve operates to cut off the idle by-pass drilling and progression chambers when ignition is switched off. The solenoid is located externally on the carburetor body and is electrically connected to the (+) side of the ignition coil. The fuel cut-off valve is pre-set and must not be adjusted.

Ignition System — Throttle controlled switch is located in vacuum line between intake manifold banjo connection and distributor vacuum retard unit. A throttle operated cam governs switch position progressively from open to closed. In the open position (switch plunger out), vacuum line is closed and distributor capsule is open to atmosphere. This allows ignition to advance. In the closed position (switch plunger in), vacuum line is open to distributor unit, retarding ignition.

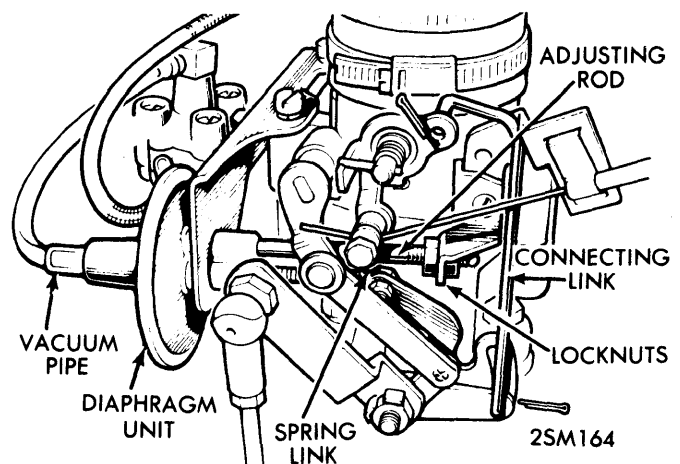
ADJUSTMENTS

Carburetor Throttle Prop Lever — With engine at normal operating temperature and an accurate tachometer attached to the engine, proceed as follows:

1) Loosen locknuts at vacuum unit adjusting rod. Operate throttle linkage to increase engine speed to about 2500 RPM.

2) At same time, disconnect atmospheric bleed pipe from air cleaner elbow and block off end of pipe with thumb or finger. Release throttle linkage to allow throttle valve to fall to propped position.

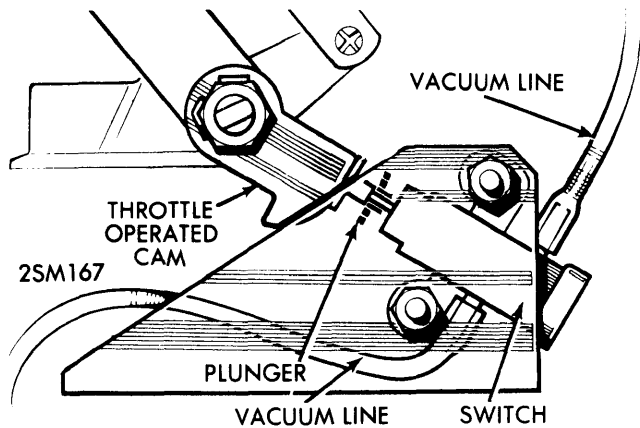
3) Turn adjusting rod locknuts by equal amounts to increase or decrease engine speed until 1300-1400 RPM is obtained. Tighten locknuts against bracket and reinstall vacuum pipe on air cleaner elbow. Engine should return to normal idle speed of 750-800 RPM. Throttle prop is now set.



THROTTLE PROP SYSTEM

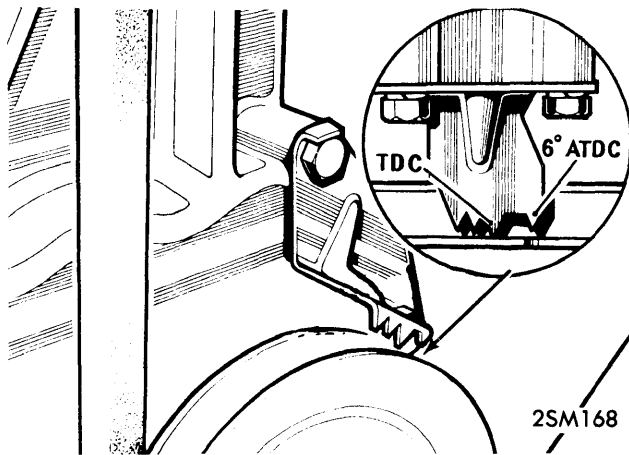
LAND ROVER SERIES III ENGINE MODIFICATION (Cont.)

Throttle Controlled Vacuum Switch — Make sure that throttle linkage is in idle position and then push plunger fully into switch and hold in this position. Measure the clearance between plunger and cam on throttle linkage. Clearance must be .030". Adjust by loosening mounting bolts and moving switch and bracket in the required direction.

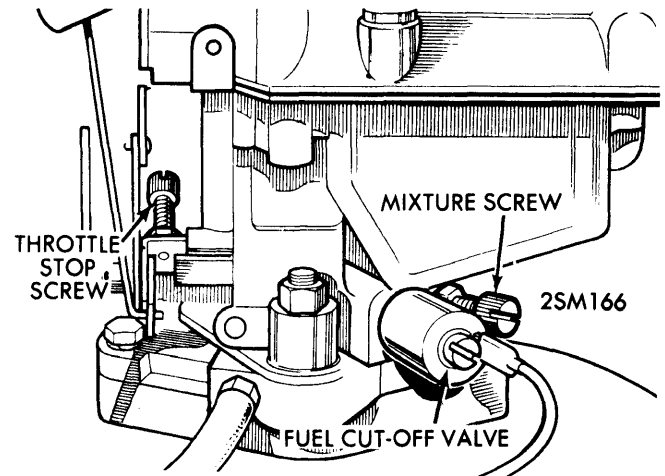


THROTTLE CONTROLLED VACUUM SWITCH

Ignition Timing — Make sure that throttle controlled vacuum switch is correctly set. Connect a timing light and tachometer to engine. With engine idle set to 750-800 RPM, set vernier advance and retard adjustment on distributor to extreme advance position. Loosen distributor clamp bolt and rotate distributor to set timing at 6° ATDC. Tighten distributor clamp bolt and recheck timing.



IGNITION TIMING MARKS



IDLE ADJUSTMENT SCREWS

Carburetor Idle Adjustment — With ignition timing correctly set and engine at normal operating temperature, connect an accurate tachometer and proceed as follows:

- 1) Unlock mixture screw and turn gently clockwise by hand until it is fully in. Then screw out ¼ turn. Adjust throttle stop screw to obtain speed of 800 RPM.
- 2) Reset mixture screw to obtain highest idling speed at this throttle setting. Readjust throttle stop screw to give an idle speed of 800 RPM. Tighten locknut to secure throttle stop screw.
- 3) Lean out the mixture by turning mixture screw clockwise until an idling speed of 750 RPM is obtained. Then richen mixture by turning screw ¼ turn counterclockwise. Tighten locknut to secure mixture screw.
- 4) Adjust throttle stop screw to increase engine idling speed to as close as possible to 800 RPM without exceeding this speed. Tighten locknut to secure throttle stop screw.

MAINTENANCE

Idle Adjustment — Adjust idle speed every 10,000 miles.

Throttle Prop System — Check every 10,000 miles and adjust as necessary.

Ignition Timing — Check ignition timing every 10,000 miles and adjust as necessary.

Spark Plugs — Check every 10,000 miles and replace every 20,000 miles.

Throttle Controlled Vacuum Switch — Check clearance between plunger and cam on throttle linkage every 10,000 miles.