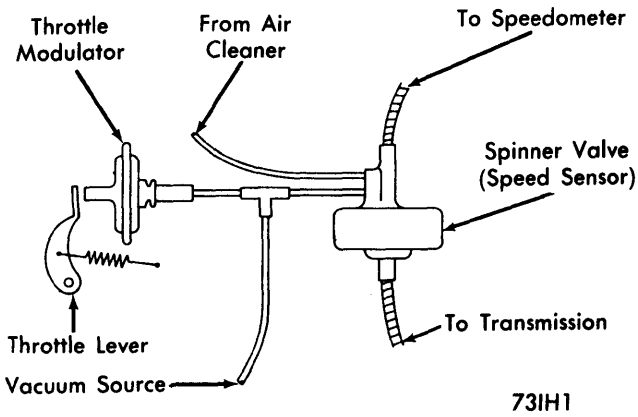
INTERNATIONAL HARVESTER CO. THROTTLE MODULATOR

DESCRIPTION

Throttle Modulator System is used to reduce emissions during vehicle deceleration. System consists of vacuum operated throttle modulator unit on carburetor, solenoid vacuum valve and electronic engine speed sensor used on heavy duty vehicles or a spinner valve which senses vehicle speed and controls vacuum to throttle modulator on light duty vehicles. Normally an engine will emit relatively high levels of unburned hydrocarbons during (closed throttle) deceleration. Throttle modulator system overcomes this condition by maintaining a slightly greater throttle opening (high idle) during initial deceleration, which permits intake of just enough additional air/fuel mixture to promote combustion and eliminate misfire.



THROTTLE MODULATOR SYSTEM (LIGHT DUTY)

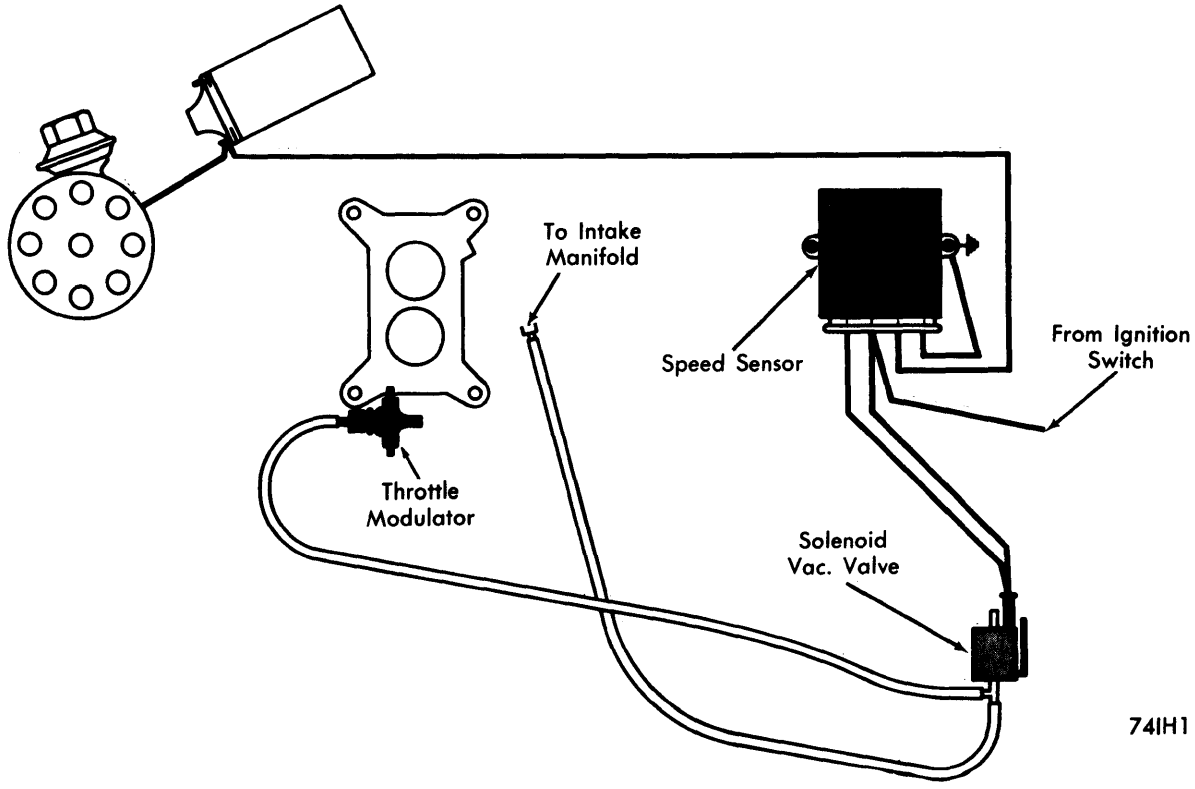
OPERATION

Two types of speed sensing units are used; on heavy duty vehicles an electronic speed sensor unit controls solenoid vacuum valve, on light duty vehicles a speedometer driven speed sensor controls vacuum to throttle modulator (see illustrations). Engine speed sensors are calibrated to activate or deactivate throttle modulator at approximately 1850 RPM (heavy duty) or 24 MPH (light duty). When engine speed exceeds cut-in speed, vacuum is applied to throttle modulator. Throttle modulator then holds throttle lever in high idle position. When engine speed drops below cut-in speed, vacuum to throttle modulator vacuum diaphragm is allowed to bleed off. Throttle modulator shaft retracts and engine returns to curb idle.

TESTING

1) With engine stopped, inspect visually to see if throttle modulator is fully retracted. There should be a slight clearance between end of modulator unit and throttle lever. If no clearance exists, modulator is either stuck or improperly adjusted. Modulator plastic housing should have about ¼" of bind free movement. Adjust position of modulator or replace if necessary to obtain smooth movement of unit.

NOTE — It will be necessary to determine engine RPM which is equal to 24 MPH on light duty vehicles. This will be cut-in RPM used in following tests. On light duty vehicles, place rear axles on floor stands so wheels may be free to spin. Place transmission in high gear.



THROTTLE MODULATOR SYSTEM (HEAVY DUTY)

INTERNATIONAL HARVESTER CO. THROTTLE MODULATOR (Cont.)

2) With engine at normal operating temperature, install a tachometer and operate engine at idle speed. Observe throttle modulator, it should remain in retracted position when engine is at curb idle. If modulator extends when engine is idling (causing excessive idle speed), either solenoid vacuum valve (heavy duty) or engine speed sensor is faulty.

3) Accelerate engine slowly and observe throttle modulator and tachometer. Throttle modulator should extend when engine reaches cut-in speed and remain extended at engine speeds over cut-in speed. Decelerate engine slowly while observing throttle modulator and tachometer. Throttle modulator should retract when engine speed drops below cut-in speed. If throttle modulator does not respond to engine speed changes, either throttle modulator, solenoid vacuum valve (heavy duty) or speed sensor unit is faulty.

4) Check high idle speed with throttle lever resting against extended throttle modulator as follows; disconnect vacuum hoses from carburetor or intake manifold vacuum port and throttle modulator. Connect a vacuum hose directly between throttle modulator and vacuum port. Start engine and accelerate to 1500-2000 RPM. Throttle modulator should be extended. Release throttle allowing engine to decelerate. Extended modulator should hold engine speed at specified high idle speed. If high idle speed is not within specified limits, loosen lock nut and adjust position of throttle modulator to obtain correct high idle speed. Disconnect temporary vacuum hose from throttle modulator and hold finger over end of hose. Throttle modulator should retract and engine speed return to normal curb idle. Stop engine and reconnect hoses to their proper connections.

MAINTENANCE

Throttle Modulator System should be inspected and tested every 12,000 miles. Replace any component found faulty.