1972 510 & PICKUP ENGINE MODIFICATION

Datsun 510 (1972)
Datsun 521 Pickup (1972)

NOTE – Air Injection is not used with this system.

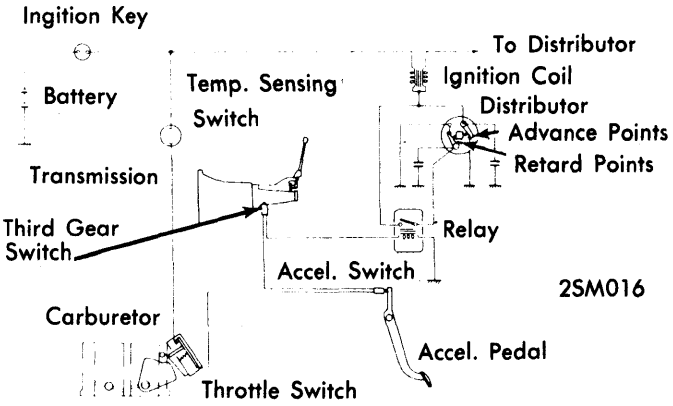
DESCRIPTION

The system consists of a temperature sensing switch, a throttle switch, a gear switch (Manual Trans.), a speed switch (Auto. Trans.), a relay, and a dual-point distributor. Timing is retarded when the following conditions are present:

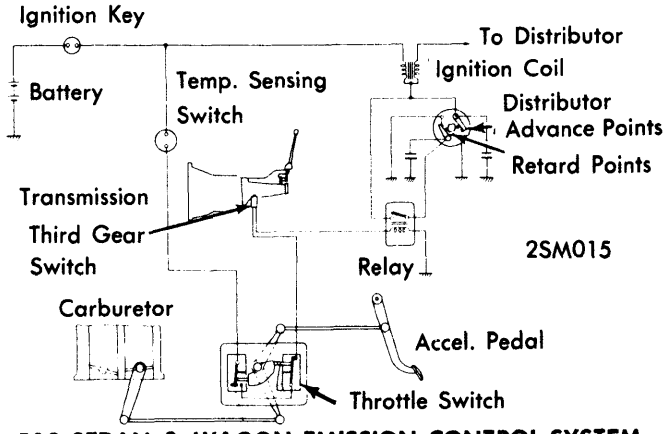
1) Temperature inside the passenger compartment is above 50°F.

2) The carburetor throttle valve is opened 3°-30° (510 with manual transmission), 3°-35° (510 with automatic transmission), or 3°-40° (521 with manual transmission).

3) Shift lever is in third gear position (manual trans.), or car speed is above 13 MPH (auto. trans.).



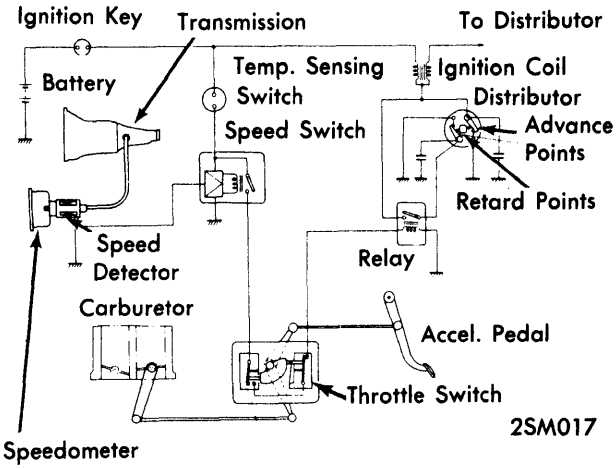
521 PICKUP EMISSION CONTROL SYSTEM (MANUAL TRANS.)



510 SEDAN & WAGON EMISSION CONTROL SYSTEM (MANUAL TRANS.)

NOTE – On the 521 the combination throttle switch is replaced with separate throttle switch on carburetor, and an accelerator switch by the accelerator pedal.

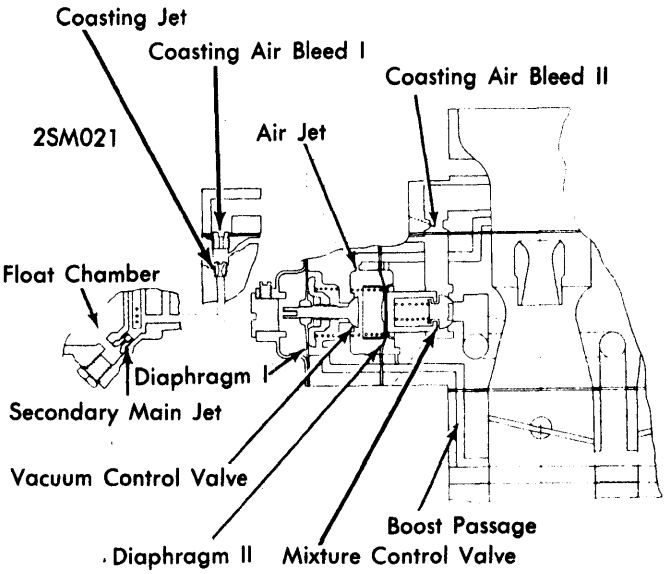
In conjunction with, but separate from, the dual point transmission controlled spark system, the 510 and 521 vehicles employ an automatic temperature control air cleaner, an electric automatic choke and a boost controlled deceleration device.



510 SEDAN & WAGON EMISSION CONTROL SYSTEM (AUTO. TRANS.)

OPERATION

Boost Controlled Deceleration Device – When manifold vacuum exceeds a pre-determined valve, (when throttle is suddenly closed) device provides an additional air/fuel mixture and delivers it below the carburetor throttle valve. This has the effect of delaying the drop of engine RPM. It should take 4 or 5 seconds for engine speed to decrease from 3000 to 1000 RPM. The amount of vacuum required to activate the device (and thus the time delay) can be varied by means of an adjusting screw in the end of the device.



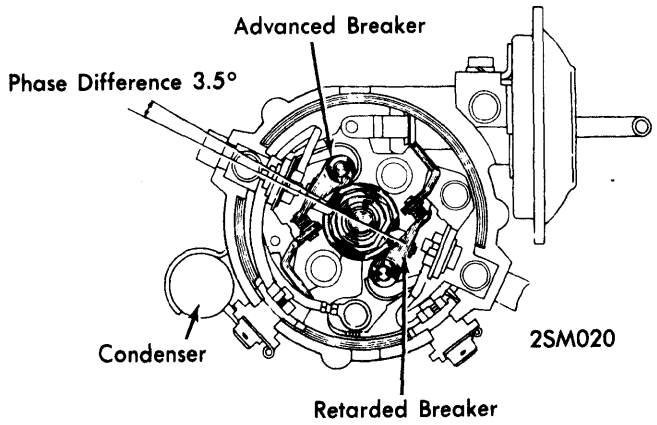
BOOST CONTROLLED DECELERATION DEVICE

Transmission (Third Gear) Switch – Switch is operated by the movement of the striking rod and the fork rod in the transmission. The switch is "ON" when gear lever is in third, and "OFF" in all other positions.

Speed Switch and Speed Detector – The speed detector is located to the rear of the speedometer. The unit transmits variations of car speed to the speed switch. The speed switch is "OFF" when vehicle speed is 0-13 MPH, and "ON" when vehicle speed exceeds 13 MPH.

1972 510 & PICKUP ENGINE MODIFICATION (Cont.)

Dual Point Distributor – Two spark timings, "Advance" and "Retard", are provided. They can be used independently and provide 7 crankshaft degrees phase difference. The "Retard" condition serves to prevent air pollution, while the "Advance" condition provides for better engine performance and fuel economy. The two breaker points are placed in parallel in the primary ignition circuit. The retarded breaker point works when relay is "ON", the advanced breaker point works when relay is "OFF".



DUAL POINT DISTRIBUTOR

Accelerator Switch (521 Pick-Up) – Switch is located at the dashboard and is operated by movement of the accelerator pedal. The switch is "OFF" when the pedal is depressed, and "ON" in all other positions.

Throttle switch (510 Sedan & Wagon) – Used on manual transmission vehicles, the switch is located on the bell crank of the accelerator linkage and operates in conjunction with the accelerator pedal. Its purpose is to relay information regarding the degree of throttle opening to the spark control system.

Automatic Temperature Control Air Cleaner – When air temperatures are above 100°F, the sensor acts to partially open valve. When air temperatures get higher, and exceed 118°F, the valve fully opens, stopping the supply of hot air from the exhaust manifold and allowing under hood air into the carburetor. In this way the heated and non-heated air is mixed so as to keep the carburetor air temperature at about 109°F. During heavy throttle operation, the valve opens the cooler air passage regardless of inlet temperature.

NOTE – The following tables show the operation of each control switch under vehicle operating conditions. Two charts are shown; one for manual transmissions with gear switches, and one for automatic transmissions with speed detector and speed switch.

OPERATING CONDITION	TEMPERATURE SENSING SW	THROTTLE SW		THIRD GEAR SW	SPARK TIMING	
		*Switch detecting close throttle position	Switch detecting wide open throttle position		"Advanced"	"Retarded"
Engine start and warming up (cold start)	OFF (below 34°F) ON (above 50°F)	ON	ON	OFF	X	—
Engine start (hot start)		OFF	ON	OFF	X	—
Idling		OFF	ON	OFF	X	—
Cruising or accelerating in 3rd gear with partially open throttle		ON	ON	ON	X (below 34°F) (above 50°F) X	
Cruising or accelerating in 1st, 2nd, and 4th gear with partially open throttle		ON	ON	OFF	X	—
Cruising or accelerating with wide open throttle		ON	OFF	ON (3rd) OFF (1st, 2nd, 4th)	X	—
Coasting		OFF	ON	ON (3rd) OFF (1st, 2nd, 4th)	X	—
Remarks	When the temperature of passenger compartment is below 34°F, this switch is "OFF." And when the temperature is above 50°F, the switch is "ON."	When the throttle valve is nealy closed, this switch is "ON." When the valve is slightly opened, the switch is "OFF."	When the throttle valve is opened more than 30 degrees for PL510 and WPL510, and 40 degrees for PL521, this switch is "OFF."	When the shift lever is in 3rd gear, this switch is "ON." And when the lever is in another gear position, the switch is "OFF."	When the "retarded" spark timing is provided, HC emission is reduced.	

* In case of Datsun PL521, this section should be replaced by accel. switch.

2SM018

SPARK CONTROL SYSTEM OPERATION (510 & 521 MANUAL TRANS.)

1972 510 & PICKUP ENGINE MODIFICATION (Cont.)

OPERATING CONDITION	TEMPERATURE SENSING SW	THROTTLE SW		SPEED SW	SPARK TIMING	
		Switch detecting close throttle position	Switch detecting wide open throttle position		"Advanced"	"Retarded"
Engine start and warming up (cold start)	OFF (below 34°F) ON (above 50°F)	ON	ON	OFF	X	—
Engine start (hot start)		OFF	ON	OFF	X	—
Idling		OFF	ON	OFF	X	—
Cruising or accelerating over 13 mph with partially open throttle		ON	ON	ON	X (below 34°F) (above 50°F) X	
Cruising or accelerating under 13 mph with partially open throttle		ON	ON	OFF	X	—
Cruising or accelerating with wide open throttle		ON	OFF	ON (above 13 mph) OFF (below 13 mph)	X	—
Coasting		OFF	ON	ON (above 13 mph) OFF (below 13 mph)	X	—
Remarks	When the temperature of passenger compartment is below 34°F, this switch is "OFF." And when the temperature is above 50°F, the switch is "ON."	When the throttle valve is nealy closed, this switch is "ON." And when the valve is slightly opened, the switch is "OFF."	When the throttle valve is open more than 35 degrees, this switch is "OFF."	When the car speed is under 13 mph, this switch is "OFF." And the speed is over 13 mph, the switch is "ON."	When the "retarded" spark timing is provided, HC emission is reduced	

2SM019

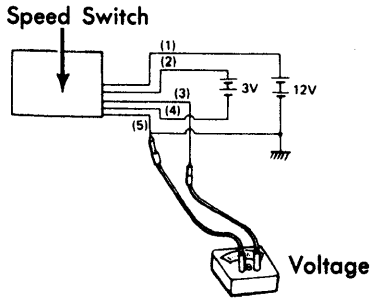
SPARK CONTROL SYSTEM OPERATION 510 AUTO. TRANS.

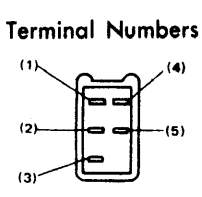
TESTING

ransmission (Third Gear) Switch – Disconnect lead wires t the switch and connect an ohmmeter to the terminals. The hmmeter should indicate zero when shift lever is in third ear position and infinity at other gear positions. If switch oes not function properly, replace.

peed Switch & Speed Detector – Disconnect lead wires at witch. Connect wires between terminals of speed switch nd voltage sources as shown in following illustration. onnect voltmeter as shown. Voltmeter should read 12 olts. Disconnect wire (from terminal two) from voltage ource. Voltmeter should indicate zero. Check for correct osition of armature inside the switch and repeat check. If witch does not perform as above, replace switch. *NOTE – 'hen speed switch is replaced, the speed detector must be eplaced also.*

Throttle Switch – Detach cover from throttle switch and make sure that there is a sound when accelerator pedal is depressed. Inspect clearance between cam body and micro switch body with a feeler gauge. The clearance should be .0315". If clearance needs adjustment, loosen adjustment screws and turn switch to achieve clearance, tighten adjusting screws. Disconnect coupling and connect ohmmeter between terminal "1" and terminal "2". Meter should indicate zero. When accelerator pedal is depressed even slightly meter should read infinity. If switch does not function properly it should be replaced. Connect meter between terminal "1" and terminal "3". When accelerator pedal is not depressed at all, or is fully depressed, meter should read infinity. It should read zero when pedal is partially depressed. If switch does not operate properly, replace switch.





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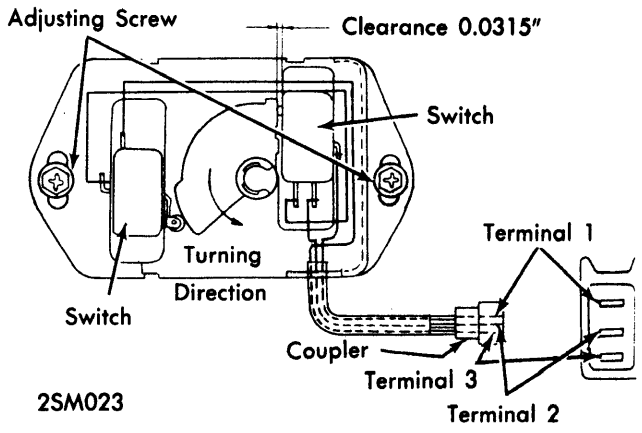
TESTING SPEED SWITCH



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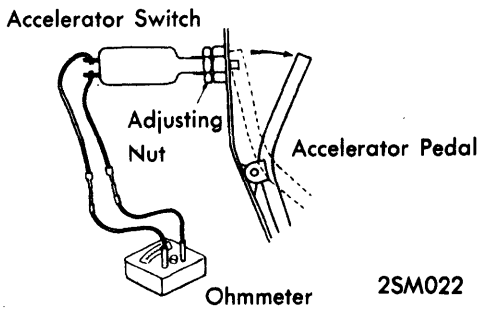
TESTING THROTTLE SWITCH

1972 510 & PICKUP ENGINE MODIFICATION (Cont.)

Accelerator Switch (521 Only) – Connect ohmmeter to terminals of switch. Meter should read zero when pedal is depressed and infinity when pedal is not depressed. If switch does not operate correctly, keep pedal down and push switch knob several times and repeat test. If switch then works, release accelerator switch adjusting nut and screw switch assembly towards the pedal. When ohmmeter indicates zero, screw switch in for one or two more turns and lock switch adjusting nut. If these procedures fail to obtain an operable switch, replace switch.



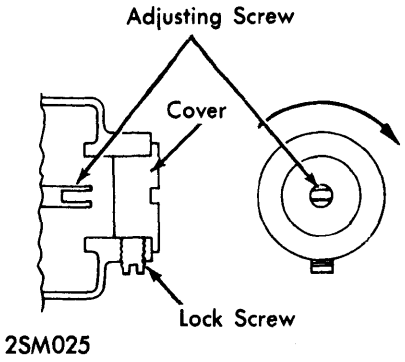
TESTING ACCELERATOR SWITCH

Boost Controlled Deceleration Device – 1) With engine at normal operating temperature, connect vacuum gauge to intake manifold and connect tachometer to measure engine speed. Increase engine speed to 3000-3500 RPM and then quickly release throttle. At this moment, manifold vacuum should read above 23.6 in. Hg and gradually fall to about 19.7 in. Hg at idle. This change in vacuum should take about 4 or 5 seconds and engine speed should drop to about 1000 RPM.

2) If device is set to actuate at vacuum which is higher than the desired level, the delay in returning to idle will be less than the specified 4 or 5 seconds. If device is set to actuate at vacuum which is lower than the desired level, the delay will be more than the specified 4 or 5 seconds.

3) To set the device to operate at the correct vacuum (21.85-22.44 in. Hg on manual trans., or 21.06-21.65 in. Hg on auto. trans.), turn adjusting screw so that the delay in returning to 1000 RPM from 3000-3500 RPM is about 4 or 5 seconds.

NOTE – Turning adjusting screw 1/8 turn in either direction will cause a change of .79 in. Hg of vacuum needed to operate device. Turn screw clockwise to decrease vacuum required (increasing delay) or counterclockwise to increase vacuum required (decreasing delay).



ADJUSTING OPERATING PRESSURE

ADJUSTMENT

With air cleaner installed, engine at normal operating temperature, connect a tachometer and a timing light.

1) Set idle speed at about 700 RPM and adjust ignition timing to 7° BTDC. Operate engine at 2,000 RPM for about 15 seconds and then let idle for one minute.

2) Set to best idle at 750 RPM (770 RPM on automatic transmission) by means of the throttle adjusting screw and idle adjusting screw.

3) Set engine speed at 700 RPM (720 on automatic transmission) by turning idle adjusting screw clockwise to lean out mixture.

4) Connect lead wire between advanced and retarded side of distributor. Engine speed should drop about 100-150 RPM. Check ignition timing with a timing light. It should be TDC. If not, stop engine and adjust position of retarded breaker points.

5) Start engine and check timing. Repeat adjustments until TDC is achieved.

6) Disconnect lead wire between advanced and retarded side terminals of distributor and check to make sure that ignition timing is now 7° BTDC.

7) Set idle speed to 700 RPM (720 RPM on automatic transmission) by turning throttle adjusting screw and adjust percentage of carbon monoxide to 2.0% at this idle speed. On automatic transmission vehicles, make sure that idle drops to 600 RPM in "Drive".