

DATSUN AIR INJECTION

Datsun

1600 Sports (1968-70)
 2000 Sports (1968-70)
 510 (1968-71)
 Pickup (1970-71)
 240Z (1970-73)

DESCRIPTION

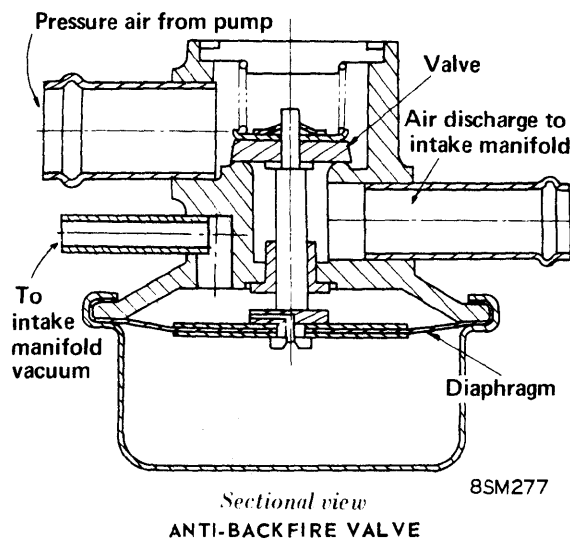
The Datsun Air Injection System is basically an air injection system combined with engine modification to increase its effectiveness. The basic elements of the system are the air pump, distribution manifold and air injection nozzles, anti-backfire valve, and check valve.

OPERATION

The air injection pump receives clean air by means of a hose, connected to a fitting on the carburetor air cleaner. *NOTE - Sports Car has separate air cleaner for injection pump.* This rotary vane type pump has been designed to draw air in and compress it to produce maximum air flow with quiet operation. Fresh air line from air injection pump is routed through a check valve, which prevents exhaust gas from entering air pump in the event exhaust manifold pressure is greater than air injection pressure, or in the case of an inoperative pump. The compressed fresh air is injected through an injection nozzle at the exhaust ports. A relief valve on air pump controls exhaust air flow to a preset pressure.

ANTI-BACKFIRE VALVE

This valve is controlled by intake manifold vacuum and is required to prevent exhaust system backfires during deceleration. During deceleration, mixture in intake manifold is too rich to burn and ignites when combined with injected air in exhaust manifold. The anti-backfire valve is used to provide a gulp of air into intake manifold thereby making air/fuel mixture leaner to prevent backfire.



CHECK VALVE

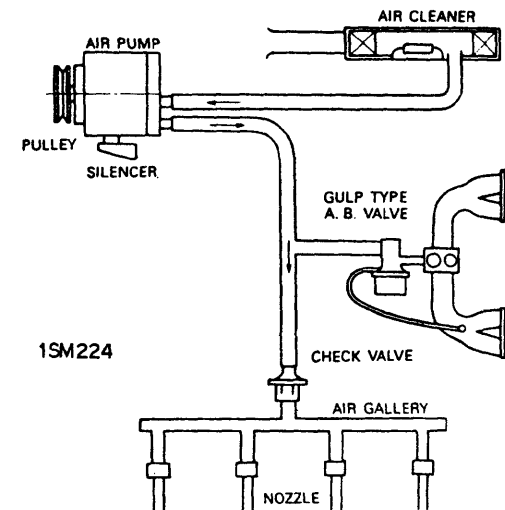
Check valve is set between air pump and air injection nozzle. It prevents a back flow of exhaust gas. Normally, it passes air into air distribution manifold. When exhaust manifold pressure exceeds air injection pressure, as it will at high speed, or when air pump drive belt fails, check valve prevents exhaust gas from entering system.

THERMOSTATIC FAN CLUTCH (SPORTS CAR 1970)

Cooling system fan is equipped with a thermostatic clutch. During normal operation, clutch slips reducing fan noise and fuel consumption. When temperature rises to a predetermined setting, thermostatic fan clutch is activated causing speed of fan to increase.

THERMAL MODULATOR (2000 ENGINE 1967-70)

Thermal modulator provides full vacuum advance at idle when the cooling system temperature becomes too high (approximately 220°F). The advanced timing reduces cooling requirements and increases engine speed at idle, and so extremely high temperatures in cooling system can be avoided.



DATSUN AIR INJECTION SYSTEM (4 CYLINDER)
 (6 CYLINDER SIMILAR)

SERVICE PROCEDURE

The following procedures are recommended for setting ignition timing and adjusting idle speed and mixture.

DATSUN SEDAN & STATION WAGON (1968-69)

Air cleaner must be installed, engine at normal operating temperature with transmission in neutral and all lights and accessories off.

- 1) Connect tachometer and timing light. Set idle speed at 700 RPM (650 RPM for automatic transmission) by adjusting throttle adjusting screw.
- 2) Adjust ignition timing to 5° ATDC. Adjust idle adjusting screw and throttle adjusting screw until correct idle speed is obtained, then turn idle adjusting screw clockwise for leaner mixture until engine idle speed begins to drop approximately 30 RPM.
- 3) Turn idle adjusting screw counterclockwise for richer mixture one turn (one and a half for automatic transmission). Reset engine speed and ignition timing to correct specifications.

DATSUN SEDAN, STATION WAGON & PICKUP (1970-71)

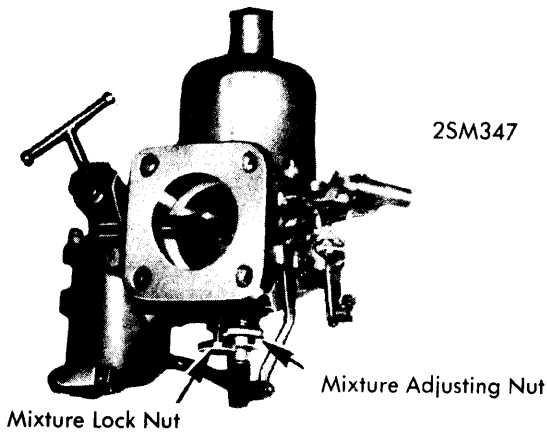
Air cleaner must be installed, engine at normal operating temperature with transmission in Neutral and all lights and accessories off.

Exhaust Emission Systems

DATSUN AIR INJECTION (Cont.)

1) Connect tachometer and timing light. Set idle speed to 700 RPM. Adjust ignition timing to 10° BTDC. Set engine to best idle at 750 RPM (770 RPM for automatic transmission) by turning throttle and mixture adjusting screw.

2) Turn mixture adjusting screw clockwise to obtain an engine speed of 700 RPM (720 RPM for automatic transmission). On 1971 models only, place automatic transmission in drive and set engine speed to 575 RPM by using throttle adjusting screw. On both year models, connect a jumper wire between advance and retard terminals of distributor engine speed should drop approximately 100-150 RPM. Check ignition timing, it should be at TDC.

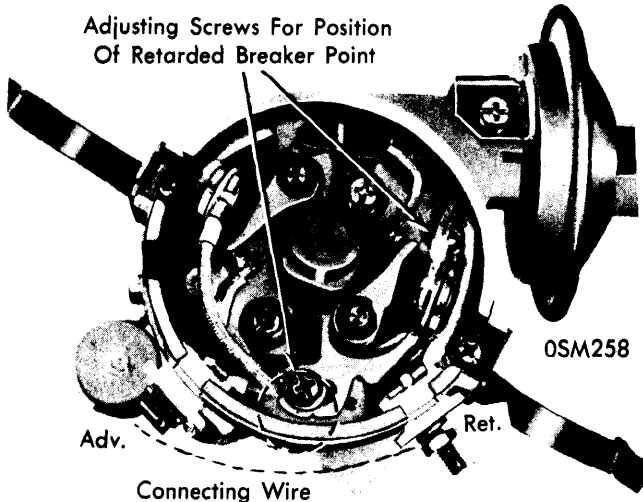


Mixture Lock Nut

Mixture Adjusting Nut

MIXTURE ADJUSTING NUT

3) If timing is not correct, stop engine and adjust position of retarded breaker points until timing is at TDC. Disconnect jumper wire, timing should now be at 10° BTDC. If not, repeat entire procedure.

Adjusting Screws For Position
Of Retarded Breaker Point

Adv.

Ret.

Connecting Wire

ADJUSTING DISTRIBUTOR BREAKER POINTS

NOTE — If idle speed and mixture are to be set using a CO meter, the following procedure should be followed:

DATSUN SEDAN, STATION WAGON & PICKUP (1970)

1) Connect tachometer and timing light. Set idle speed at 700 RPM. Set ignition timing at 10° BTDC. Run engine at 2000 RPM for about 15 seconds, then run engine at idle for one minute. Disconnect air supply hose at check valve and plug check valve inlet.

2) Turn throttle adjusting screw to obtain 700 RPM (720 RPM automatic transmission). Turn mixture and throttle adjusting screws to obtain a CO reading of 3.0±1% at 700 RPM (720 RPM automatic transmission).

3) Check ignition timing, should remain 10° BTDC. Connect air supply hose at check valve. If engine speed rises slightly, turn throttle adjusting screw to obtain 700 RPM (720 RPM automatic transmission).

DATSUN SEDAN, STATION WAGON & PICKUP (1971-73)

1) Connect tachometer and timing light. Set idle speed at 700 RPM. Set ignition timing at 10° BTDC. Disconnect air supply hose at check valve and plug check valve inlet.

2) Turn throttle adjusting screw to obtain 700 RPM (575 RPM in drive with automatic transmission). Turn mixture and throttle adjusting screws to obtain a CO reading of 2% at idle speed.

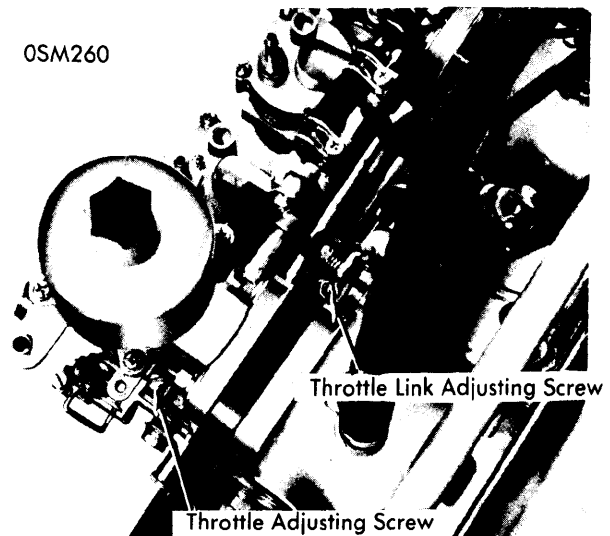
3) Check ignition timing, should remain at 10° BTDC. Connect air supply hose at check valve. If engine speed rises slightly, turn throttle adjusting screw to obtain 700 RPM (575 RPM in drive with automatic transmission).

SPORTS CAR (1600 ENGINE)

Care must be taken when adjusting throttle valves, make sure carburetors are synchronized.

1) Inspect damper oil in carburetors. Remove air cleaner and make sure pistons are free in their chambers. Connect tachometer and timing light. Start engine, bring to normal operating temperature.

2) Turn throttle adjusting screws to left until they no longer touch their stops. Screw in mixture adjusting nuts on both carburetors until they touch idle lock nuts, then turn mixture adjusting nuts back out ½ turn. **NOTE** — Do not adjust idle lock nuts.



0SM260

Throttle Link Adjusting Screw

Throttle Adjusting Screw

LOCATION OF ADJUSTING SCREWS

DATSUN AIR INJECTION (Cont.)

3) Adjust front throttle connecting rod length to 2.76". Turn in throttle adjusting screw (located on auxiliary shaft) to obtain an engine speed of 800-1000 RPM (1968-69 models) and 1000-1500 RPM (1970 models). Using a suitable carburetor synchronizer, adjust rear throttle connecting rod length until volume of both carburetors is equal.

4) Unscrew throttle adjusting screw (on auxiliary shaft) to lower engine speed to 700 RPM (1968-69 models) and 750 RPM (1970 models). Then screw in throttle adjusting screws on both carburetors until they contact their stops. Make sure carburetors are still synchronized then loosen throttle adjusting screw (on auxiliary shaft).

5) Set ignition timing at TDC. If engine speed changes, adjust by turning both throttle adjusting screws equal amounts. Timing should remain at TDC at 700 RPM (1968-69 models) and 750 RPM (1970 models). If using a CO meter proceed as follows:

6) Turn mixture adjusting nuts on both carburetors to obtain a CO reading of $2.0 \pm 0.2\%$. If engine speed changes, adjust by turning both throttle adjusting screws equal amounts to obtain 700 RPM (1968-69 models) and 750 RPM (1970 models).

SPORTS CAR (2000 ENGINE)

Engine must be at normal operating temperature before adjusting carburetors.

1) Inspect damper oil in carburetors. Remove air cleaners, make sure pistons are free in their chambers. Connect tachometer and timing light. Start engine and adjust engine speed to 800-1000 RPM (1968-69 models) and 1000-1500 RPM (1970 models). Using a suitable carburetor synchronizer, balance air intake on both carburetors.

2) Push throttle control knob (located on dashboard) all the way in. Turn throttle adjusting screws on both carburetors to obtain an engine speed of 700 RPM, making sure carburetor

air intake is synchronized. Screw in mixture adjusting nuts on both carburetors until they touch idle lock nuts, then turn mixture adjusting nuts back out $\frac{1}{2}$ turn. **NOTE** - Do not adjust idle lock nuts.

3) Set ignition timing at TDC. If engine speed changes, adjust by turning both throttle adjusting screws equal amounts. Timing should remain at TDC at 700 RPM. If using a CO meter, turn mixture adjusting nuts on both carburetors (equal amounts) to obtain a CO reading of $2.0 \pm 0.2\%$. If engine speed changes, adjust by turning both throttle adjusting screws equal amounts to obtain 700 RPM at TDC.

DATSUN 240Z

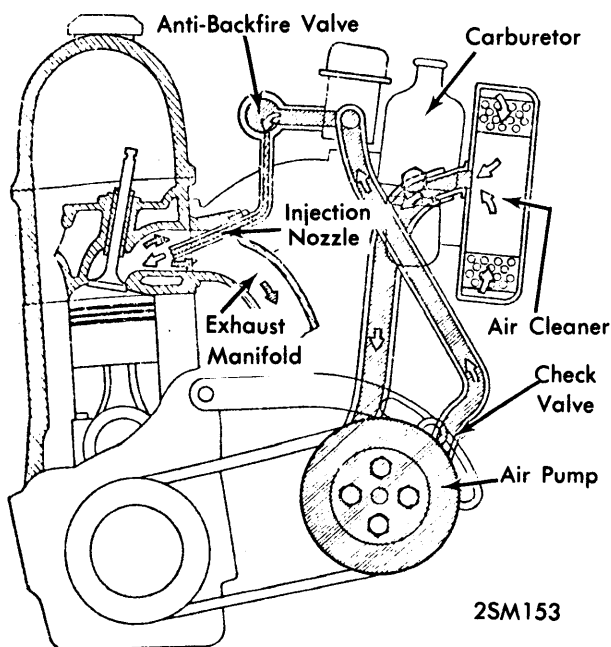
Remove air cleaner, check oil in carburetor damper. Make sure piston moves freely in chamber. Engine should be at normal operating temperature and all lights and accessories off.

1) Connect tachometer and timing light. Using a suitable carburetor synchronizer, balance air intake on both carburetors while maintaining an engine speed of 750 RPM (manual transmission in Neutral) or 600 RPM (automatic transmission in Drive). Set ignition timing to 5° BTDC (TDC with automatic transmission).

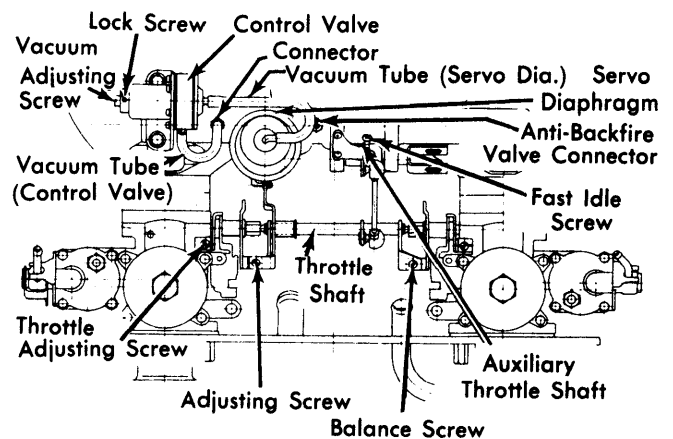
► **IGNITION TIMING NOTE (240Z AUTOMATIC ONLY)** - On models equipped with dual point distributor, ambient temperature must be above 40° (1971 models) and 52° (1972 models) to set timing. Dual point distributor is temperature controlled, and advanced reading will result if temperature is not to specifications.

2) Disconnect control valve vacuum tube from control valve connector, connect servo diaphragm vacuum tube to control valve connector. Apply manifold booster to servo diaphragm. Turn rear carburetor balance adjusting screw (located on connecting shaft) to obtain an engine speed of 1200 RPM. Using carburetor synchronizer and maintaining 1200 RPM, turn front carburetor balance adjusting screw until air intake of both carburetors is balanced.

3) Disconnect servo diaphragm vacuum tube from connector and then reconnect and make sure engine speed is 1200 RPM. If not, repeat above procedure. Reconnect control valve vacuum tube to original position. Adjust each idle adjusting nut until best idle is obtained, or until a CO reading of 6% (5% with automatic transmission) is obtained with air injection pump disconnected.



DATSUN AIR INJECTION SYSTEM (240Z)



240Z CARBURETOR LINKAGE

DATSUN AIR INJECTION (Cont.)

TROUBLE SHOOTING & TESTING

EXCESSIVE BACKFIRE IN EXHAUST SYSTEM

Anti-Backfire valve vacuum line collapsed, plugged, disconnected or leaking, defective or malfunctioning anti-backfire valve, improper carburetor fuel mixture adjustment.

AIR SUPPLY HOSE BAKED OR BURNED

Defective check valve on air distribution manifold.

ROUGH ENGINE IDLE

Improper carburetor adjustments, improper ignition timing, intake vacuum leak at anti-backfire valve vacuum line or air inlet, hose anti-backfire valve defective or stuck open.

ENGINE SURGES AT ALL SPEEDS

Anti-backfire valve defective or stuck open, improper carburetor adjustments.

NOISY AIR PUMP DRIVE BELT

Drive belt improperly adjusted, seized or failing air pump, misaligned or defective pulleys.

CHECK VALVE TEST

Operate engine until it reaches normal operating temperature. Inspect all hoses and connectors for obvious leaks and correct as necessary before checking valve operation. Disconnect air supply hose at check valve and visually inspect position of valve plate inside valve body. It should be lightly positioned against valve seat away from air distribution manifold. Insert a probe into valve connection and depress valve plate. It should freely return to original position against valve seat, when released. Leave hose disconnected and start engine. Slowly increase engine speed to 1500 RPM and watch for exhaust gas leakage at check valve. There should be no leakage. The valve may flutter or vibrate at idle speeds, but this is normal due to exhaust pulsations in manifold. If check valve does not meet the above recommended conditions, replace it.

ANTI-BACKFIRE VALVE TEST

Operate engine until it reaches normal operating temperature. Inspect all hoses and hose connections for obvious leaks and correct as necessary before checking anti-backfire valve operation. Accelerate engine, in neutral. Allow throttle to close rapidly. Valve is operating satisfactorily when no, or few, exhaust system backfire occurs. If a further check is necessary, disconnect air hose to intake manifold at anti-backfire valve. Insert a suitable plug in hose and fasten it securely. Open and close throttle rapidly, if air flow is felt for 1-2 seconds (240Z) or 2-3 seconds (all others) by a finger at valve outlet to intake manifold, valve is functioning properly. If air flows continuously for a longer period, valve should be replaced. Connect air hose to intake manifold and disconnect air inlet hose from air pump at anti-backfire valve. If engine idle speed changes excessively, valve function is improper and should be replaced.

THERMAL MODULATOR TEST

Remove the vacuum tube at the distributor, and connect a vacuum gauge to the distributor vacuum tube open end. Operate engine until it reaches normal operating temperature. Observe pressure produced at vacuum gauge. If vacuum is less than 3.937" Hg. at idle, thermal modulator is functioning properly. If not, check vacuum leakage from the plunger in the thermal modulator. Replace if necessary.

AIR PUMP TEST

With engine at normal operating temperature and all hose connections tight, check air injection pump belt tension and adjust if necessary. Disconnect air supply hose at check valve and connect suitable air pump test gauge (ST19870000). Position gauge outlet so air will be discharged harmlessly. With engine running at 1500 RPM, air pump output should exceed .63 in (16 mm) Hg. If pressure is not to specifications, recheck all hoses and belt tension, check air cleaner element and recheck output. If still not to specifications, close hole of test gauge with finger. If a leaking sound is heard at relief valve, valve is bad and should be repaired or replaced. If pump still fails test, pump is defective and should be repaired or replaced.