

DATSUN AIR INJECTION PUMP

Datsun All Models

DESCRIPTION

Air injection pump is a positive displacement vane type which is permanently lubricated and requires no periodic maintenance. Sedan, station wagon and pick-up use a two vane pump, all other models use a three vane pump. A rotor shaft, drive hub, relief valve, inlet and outlet tubes are visible on pump exterior. A rotor, vanes, carbon shoes and shoe springs are incorporated in the rotating unit of the pump. Rotor is belt driven.

OPERATION

Vanes rotate freely around the off-center pivot pin and follow the circular shaped pump bore. In the three vane type, vanes produce three chambers in the housing. Each vane completes a pumping cycle in every revolution of the rotor. Air is drawn into inlet chamber through a tube connected to air cleaner. The air is sealed between the vanes and moved into a smaller chamber (compression area).

After compression, the vanes pass the outlet chamber. Vanes then pass the stripper, a section of the housing which separates inlet and outlet chambers. Continuing its cycle, vane again enters inlet chamber to repeat its pumping cycle. Relief valve, located in outlet chamber, incorporates a preloaded spring, a seat and a pressure setting plug. Its function is to relieve outlet air flow if pressure exceeds a pre-set value. Metering grooves (machined into housing wall) located in both inlet and outlet chambers, provide a quiet transition from intake to compression to exhaust.

MAINTENANCE

PUMP BEARINGS

Rotor is supported in the front by ball bearings, in the rear by needle bearings. Vane bearings are the needle bearing type. All bearings have been permanently greased and no periodic maintenance is required.

BELT TENSION

Air pump drive belt tension should be checked every 3,000 miles. Adjust the belt so that it has about 1/2" of slack under thumb pressure.

REMOVAL & INSTALLATION

AIR PUMP

Disconnect hoses from pump housing cover. Remove bolt securing air pump to belt adjusting bar (or adjusting bracket). Remove bolt securing air pump to mounting bracket, remove air pump drive belt. Remove air pump assembly from engine. To reinstall, reverse removal procedure.

AIR PUMP DRIVE PULLEY

Loosen air supply pump adjusting bar nut and bolt to relieve belt tension. Remove drive pulley attaching bolts, then remove pulley. To install, reverse removal procedure.

ANTI-BACKFIRE VALVE

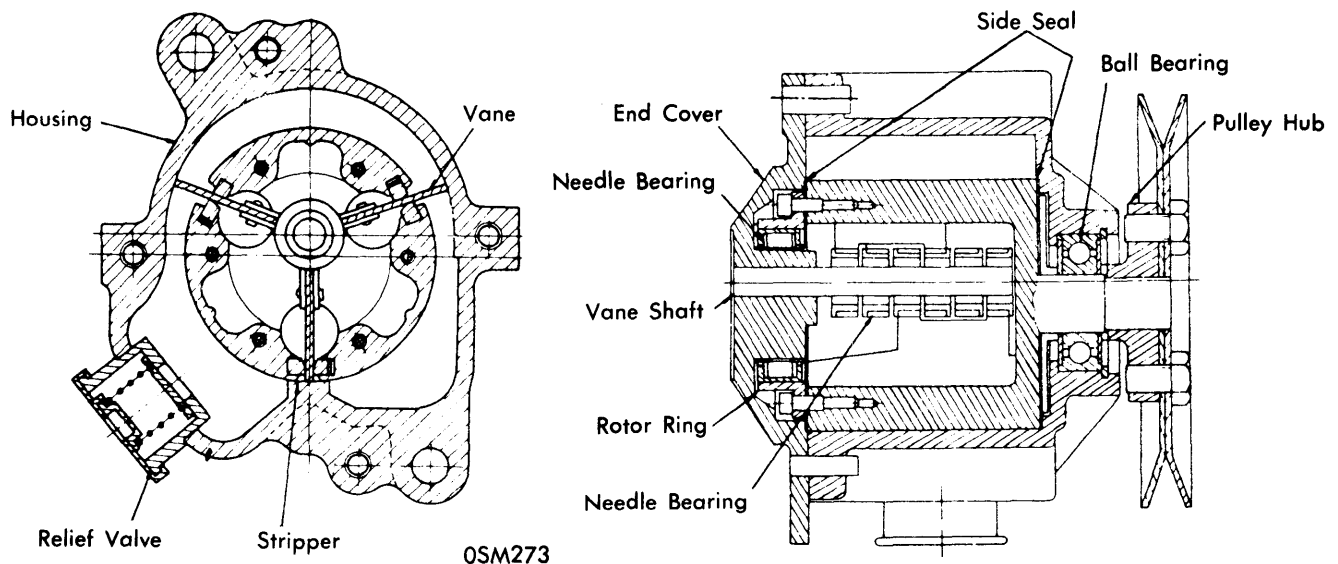
Disconnect hoses and remove anti-backfire valve. *NOTE—Valve should not be disassembled.* After reinstalling, check all hoses and connections for leaks.

TESTING

Bring engine to normal operating temperature and inspect all hoses and connectors for leaks. Make sure all leaks are corrected before testing of system components.

CHECK VALVE

- 1) Make sure that the valve plate inside valve body is lightly positioned against valve seat, away from the air distributor manifold.
- 2) Insert a probe into the valve connection on the check valve and depress valve plate. It should return freely to the original position, against valve seat, when released.
- 3) Leave hose disconnected and start engine. Slowly increase engine speed to 1500 RPM and look for exhaust gas leaks at



AIR PUMP SCHEMATIC

DATSUN AIR INJECTION PUMP (Cont.)

the check valve. The valve may flutter or vibrate at idle speed, but there should not be any exhaust leakage. If check valve does not operate properly, replace valve.

ANTI-BACKFIRE VALVE

- 1) Disconnect air hose to intake manifold at the anti-backfire valve and plug hose. Open and close throttle rapidly. If air flow is felt for one or two seconds at the valve outlet to the manifold, valve is operating correctly.
- 2) If air flow is not felt, or air flow continues for more than two seconds, valve should be replaced.
- 3) Connect air hose to intake manifold and disconnect air inlet hose from air pump at anti-backfire valve. If engine speed changes excessively, valve should be replaced.

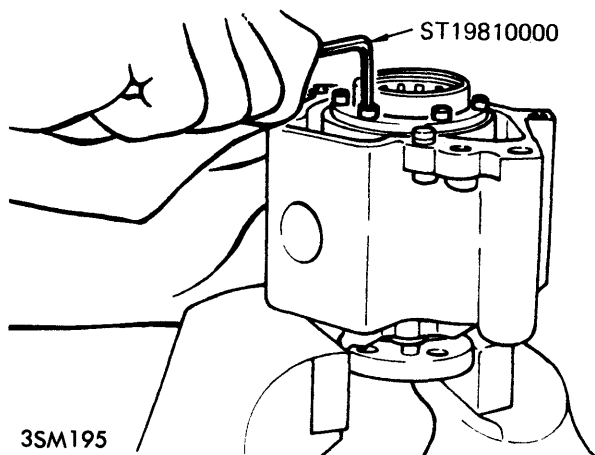
AIR PUMP

- 1) Make sure injection pump belt tension is correct (about $\frac{1}{2}$ " of slack under thumb pressure). Disconnect air supply hose at check valve and insert the open pipe end of air pump test gauge adapter (special tool ST19870000) into air supply hose.
- 2) Clamp hose to adapter to prevent it from blowing out and place adapter and gauge so that air blast through drilled pipe plug will be discharged harmlessly.
- 3) Install a tachometer on engine and check that air pressure is .63 psi or more at 1500 RPM.
- 4) If air pressure not to specification, disconnect air supply hose at anti-backfire valve and plug hose opening. Clamp securely, and repeat pressure test.
- 5) Check filter element. With engine speed at 1500 RPM, close hose of test gauge with a finger. If a leaking is heard or felt at relief valve, the relief valve should be replaced or repaired.
- 6) If the air injection pump still does not operate properly, it should be replaced.

OVERHAUL

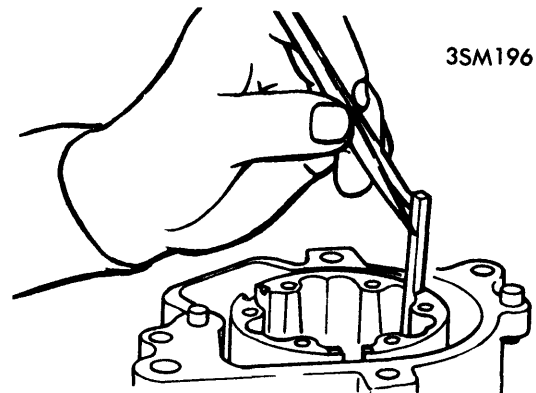
DISASSEMBLY

Remove pulley drive bolts and remove pulley from hub. Clamp hub in a suitable holding fixture and remove housing end cover bolts, remove housing end cover. Scribe rotor ring and side of rotor to ensure proper reassembly, then remove six screws



ROTOR RING REMOVAL

(four on two vane type) securing rotor ring to rotor. Remove rotor ring and side seal (three vane type) from rotor. Rear bearing (three vane type) may be pressed out of rotor ring using a suitable press. **NOTE** — Support rotor ring carefully to avoid distortion. Remove vanes from rotor. Remove three sets of carbon shoes and three shoe springs (two sets in two vane type). If relief valve (three vane type) is to be replaced, use a suitable puller.

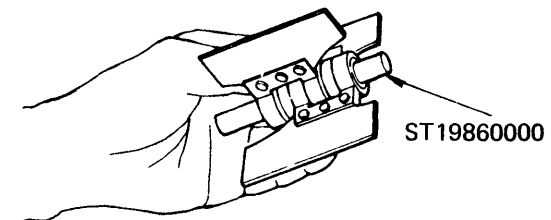


CARBON SHOE REMOVAL

INSPECTION

Clean rear and vane hub bearings in suitable solvent. Clean carbon dust from pump housing and rotor assembly with an air hose. **NOTE** — Do not use cleaning solvent on pump housing and rotor assembly. Inspect all parts for damage or wear, replace parts as necessary. If side carbon seal is scored (three vane type), replace it. Rear and vane hub bearings must be lubricated with a high melting point grease (Esso Andok 260).

3SM197



VANE ASSEMBLY

REASSEMBLY

Place pump housing in a vise, clamping pump drive hub between jaws. Correctly assemble vanes on a dummy shaft, place vanes into rotor. Do not remove dummy shaft at this time, in three vane type make sure one vane is against housing stripper. Insert one carbon shoe on each side of every vane. **NOTE** — Position carbon shoes so that chamfered end faces vane. Insert shoe spring into each shoe slot. **NOTE** — When springs are properly positioned, they will be flush or below rotor surface. Curved portion of spring will be against shoe and ends of springs will be against wall of shoe slot. Position new carbon seal on rotor ring so that holes line up. Position

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rotor ring, lining up scribe marks. Install retaining screws and torque to 2.2-3.6 ft. lbs. Remove dummy shaft from vanes, place housing end cover into position indexing vane shaft into vane bearings. *NOTE — Do not force cover on as this will distort vane bearings.* Seat end cover to housing and starting with bolt adjacent to large dowel torque bolts to 7.2-9.4 ft. lbs. Remove from vise, insert relief valve into housing mounting hole. Tap into position with plastic hammer.

TROUBLE SHOOTING

BACKFIRING

Anti-backfire valve line collapsed, plugged, disconnected or leaking. Defective anti-backfire valve. Incorrect idle mixture adjustment. Defective spark plug or high tension cables.

ROUGH IDLE

Incorrect idle adjustment or basic ignition timing. Vacuum leak at anti-backfire valve or air inlet hose. Defective or stuck anti-backfire valve.

ENGINE SURGES

Defective or stuck anti-backfire valve. Incorrect carburetor adjustment.

ENGINE STOPS

Incorrect carburetor adjustment or ignition timing. Vacuum tube of anti-backfire valve is disconnected.

EXCESSIVE AIR PUMP NOISE

Drive belt improperly adjusted. Air pump seized. Misaligned or defective pulley. Hoses or connectors leaking.

INSUFFICIENT DELIVERY OF AIR

Damaged vane hub bearing. Worn vane. Worn carbon shoe. Worn side seal.

BURNED OR BAKED AIR SUPPLY HOSE

Defective check valve on air distribution manifold.