

Exhaust Emission Systems

SUBARU 1300 & 1400 ENGINE MODIFICATION

Subaru 1300 (1972)
Subaru 1400 (1973)

NOTE - Some 1972 1300 models use same system as 1972 FF-1 1300G models.

DESCRIPTION

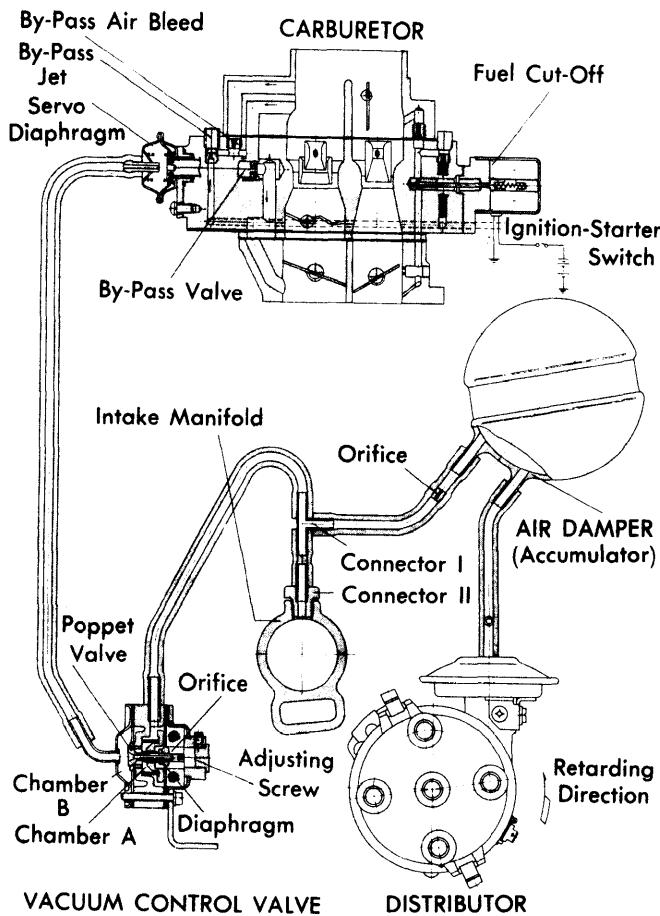
Exhaust emission control is accomplished by an engine modification system. System consists of a specially designed carburetor, a vacuum retarding distributor, a vacuum control valve, an air damper (accumulator) and hoses which connect components.

Carburetor - Equipped with a by-pass system which controls air/fuel ratio during periods of deceleration.

Vacuum Control Valve - Vacuum operated valve which operates from intake manifold vacuum. Valve controls operation of by-pass system of carburetor.

Distributor - Distributor has both centrifugal advance and vacuum retard mechanism, and its vacuum retard diaphragm is connected to intake manifold by way of air damper.

Air Damper (Accumulator) - Air damper is connected between intake manifold and distributor retard diaphragm. This device prevents rapid changes of manifold vacuum from affecting retard unit of distributor.



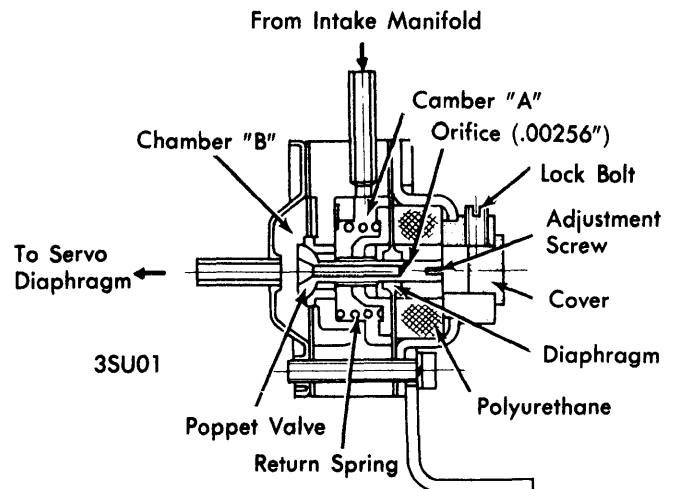
ENGINE MODIFICATION SYSTEM

OPERATION

The engine modification system controls ignition timing advance and retard, controls air/fuel ratio during deceleration, and promotes afterburning of exhaust gases to prevent emissions.

1) When primary throttle valve of carburetor closes during deceleration, vacuum is created in intake manifold. A hose connecting manifold to vacuum control valve conducts vacuum to valve chamber "A". This causes a diaphragm in valve to open a poppet valve.

2) Vacuum is then conducted to servo diaphragm on carburetor by-pass system. This causes by-pass valve to open, connecting air horn of carburetor to lower portion of secondary throttle valve.



VACUUM CONTROL VALVE

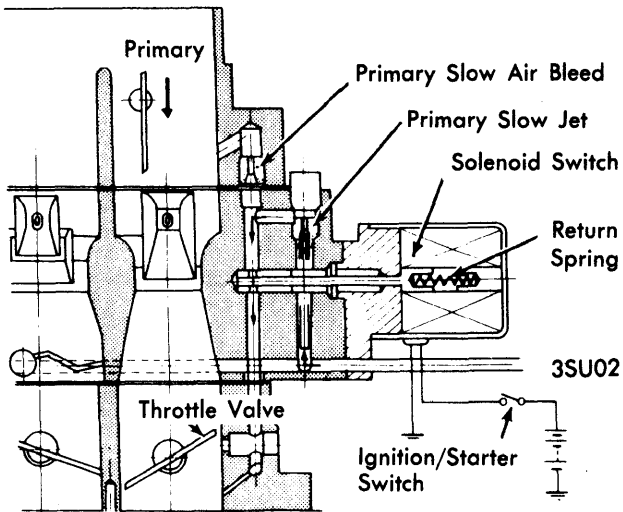
3) After by-pass valve is opened, air is conducted to by-pass valve from air horn. Air and fuel are metered at each by-pass jet and by-pass air bleed. Calibrations insure that proper air/fuel ratio is delivered to combustion chambers.

4) Ignition timing retard is brought about during deceleration by means of vacuum created in intake manifold. A vacuum line connecting manifold to air damper and then to distributor retard diaphragm conducts vacuum to distributor to promote afterburning.

5) During normal operation (acceleration, cruising and idling), a vacuum of 7.9 in. Hg is required to retard ignition timing, and 18.7 in. Hg is required to operate by-pass valve.

6) In addition to vacuum operated modification system, an electrically controlled fuel shut-off is provided. A solenoid switch is installed in primary slow passage of carburetor and operated through ignition/start switch. System controls dieseling by cutting off fuel of slow system when ignition is shut off.

SUBARU 1300 & 1400 ENGINE MODIFICATION (Cont.)



SOLENOID SWITCH (FUEL CUTOFF)

MAINTENANCE

Maintaining correct functioning of emission control system is dependent not only upon condition of components of emission system, but upon general engine condition and tune-up as well. Carburetor and distributor adjustments are particularly important to correct functioning of system.

Carburetor Adjustment (With CO Meter) – With idle speed set at 800 RPM and ignition timing at 6° ATDC with vacuum line connected, proceed as follows: Using CO meter, check that CO content is between 1-3%. If CO is beyond range, readjust engine idling speed to between 700 and 800 RPM, then adjust CO to 1-3% by means of cap of idle limiter screw. Acceptable adjustment ranges are as follows:

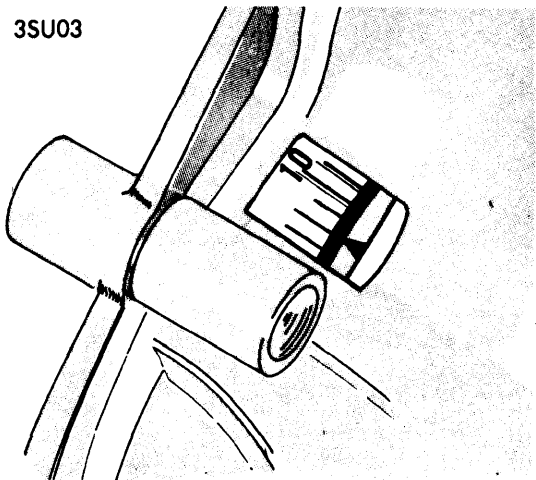
Idle Speed	700-800 RPM
Ignition Timing (Vacuum Hose Disconnected).....	4-8° BTDC
CO	1-3%

NOTE – If idle CO% cannot be set within limits above, remove idle limiter cap and adjust idle adjusting screw to obtain 1-3% CO. Install a new, red colored, idle limiter cap.

Carburetor Adjustment (Without CO Meter) – Adjust idle speed to the best idling at 850 RPM by turning throttle adjustment screw and idle mixture screw. Then turn idle mixture screw clockwise so that idling speed becomes 800 RPM. This should correspond to a CO level of 1-3%.

Distributor Adjustment & Ignition Timing – Make sure that distributor and its components are in good condition and that point gap is correctly set to .018-.022". Disconnect vacuum hose at distributor and plug distributor pipe. Using a timing light, adjust to 6° BTDC with engine idle set to 800 RPM.

Vacuum Control Valve Adjustment – With engine at normal operating temperature and using a stop watch or watch with sweep second hand, raise engine speed to 3000 RPM (without load) and then immediately release throttle. It should take 3-5 seconds for speed to drop from 3000 RPM to 800 RPM. If time required for drop is less than three seconds, turn adjustment screw on control valve clockwise. If time is more than five seconds, turn adjustment screw counterclockwise.



SUBARU 1300 & 1400 TIMING MARKS

Vacuum Control Valve Orifice – Inspect orifice of control valve every 12,000 miles. It is important that orifice remain clear and open. If it clogs, operation of control valve will be faulty.

Periodic Maintenance – Check engine tune-up every 6,000 miles and check all components of the emission system every 12,000 miles.