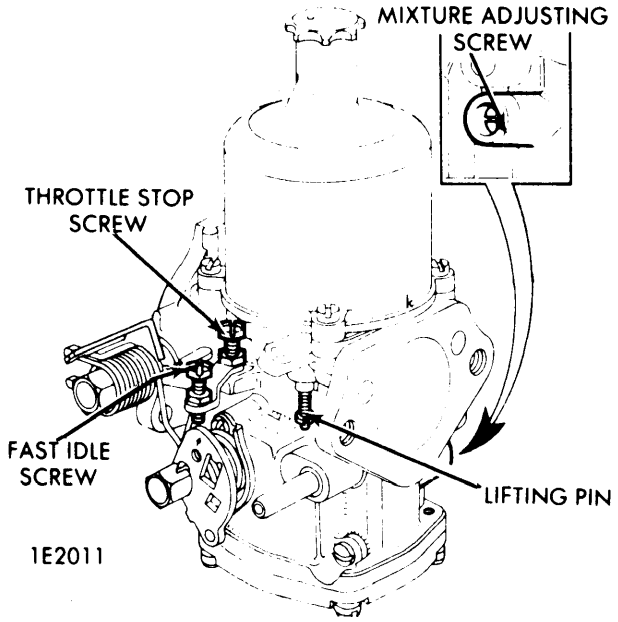
HIF 1-BARREL

Austin Marina (1973)
MGB (1973)
Volvo 140 Series (1973)

NOTE – 1972 and later B20B engine has been sold in Canada only.

DESCRIPTION

Carburetor is a sidedraft emission control type. A vacuum chamber carries a piston which moves up or down, dependent upon manifold vacuum acting on vacuum chamber. Piston is damped by an oil filled chamber. This prevents piston from rising too rapidly at acceleration, allowing mixture to increase in richness for demands of sudden increase in engine speed. A cold start valve is fitted to front carburetor and provides an extra amount of air/fuel mixture during cold starts. Coupled with this device, the throttle is opened to allow increased RPM during engine warm-up. Carburetor is also equipped with a temperature controlled fuel jet, overrun valve (poppet valve) in throttle butterfly valve and a hot start valve. Temperature controlled fuel jet thermostatically controls air/fuel mixture to maintain a constant air/fuel ratio over wide ranges of operating temperatures. Overrun valve is to prevent over rich mixtures when throttle is suddenly closed, and when decelerating. Hot start valve vents hot fuel vapor from floatchamber to prevent hard starts when engine is hot. Floatchamber is integral in this carburetor.



S.U. HIF TYPE 1-BARREL CARBURETOR

OPERATION

Cold Starting – When choke is pulled, a cold start valve and a fast idle cam are actuated on front carburetor. Cold start valve spindle is hollow and has a V-slot linked to a transverse hole. As spindle is rotated, fuel flows from floatchamber through spindle to venturi. The V-slot in spindle regulates the amount of fuel passing through spindle, until spindle reaches a limit of rotation, at which time transverse hole aligns with passage to venturi allowing maximum flow of system. Also as spindle is rotated, a fast idle cam increases engine RPM.

Hot Start Valve – The purpose of hot start valve is to regulate an outlet from a passage in floatchamber. When engine is hot or during high ambient temperatures, fuel vapors form in floatchamber. With throttle set at idle, hot start valve is opened to allow fuel vapors to be vented from floatchamber. When throttle is opened, hot start valve is closed to external venting and a passage is opened running to air cleaner. Fuel vapors are drawn into air cleaner and mixed with incoming air. By venting floatchamber, hard starts are avoided when engine is hot.

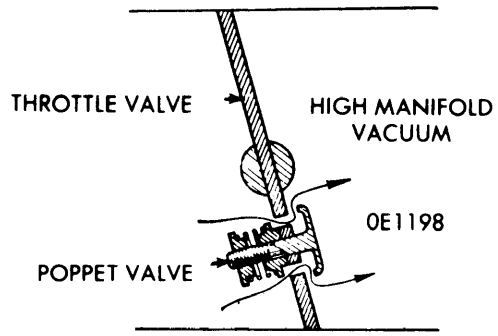
Normal Operation – Air entering carburetor intake increases in speed when it crosses a constrictive area called the bridge. Fuel from jet is supplied at this point. Movement of piston is determined by amount of vacuum in intake system. As vacuum increases, piston rises, allowing greater fuel from jet, and air from intake to be admitted to engine.

Acceleration – Movement of the piston in suction chamber is damped by a plunger in an oil filled cylinder at top of carburetor. This damper prevents piston from rising too rapidly. This delay or dampening allows fuel from jet to be mixed with a smaller amount of air than usual, and enrichens mixture. This enriched state is necessary for sudden throttle increase.

Idling – There is no separate idling system as this is accomplished through normal running of carburetor. Due to up and down movement of piston in suction chamber, air volume is varied continuously. When engine is at idle, only a small amount of air/fuel mixture passes through carburetors. Throttle valves are held in a slightly open position by the idle stop screws. Idling of multiple carburetor systems is adjusted independently. Air/fuel mixture is adjusted by adjusting screws. These are located on front, right-hand side of carburetor. The air/fuel mixture screws are preset at factory to maintain a CO level of 2-3%. Screws are covered by plastic plugs and should not need adjustment.

Automatic Mixture Control – A bimetal spring located in float chamber controls height of fuel jet. As fuel temperature varies in float chamber, bimetal spring bends automatically, varying fuel mixture ratio to compensate for different fuel temperature and pressure.

Overrun Valve (Poppet Valve) – This small air-operated spring-loaded valve is set in throttle valve (see illustration). At high intake manifold vacuum (such as engine overrun or coasting with throttle closed), vacuum overcomes valve spring to open valve. With valve open normal volume of air/fuel mixture is supplemented, and with a retarded ignition timing setting, correct combustion is obtained.



OVERRUN VALVE (POPPET VALVE)

S.U. HIF TYPE 1- BARREL (Cont.)

ADJUSTMENTS

IDLE ADJUSTMENT (VOLVO)

NOTE — Since carburetors are equipped with temperature controlled jets, floatchambers should be about the same temperature before starting adjustment. Prolong idling will cause loss of temperature regulation.

1) Remove air cleaner.

2) Lift air valve and screw in mixture adjusting screw until fuel jet is level with bridge in venturi. Then lower jet by turning mixture adjusting screw 2 1/2 turns clockwise. *NOTE — This is basic setting for a carburetor at 68°F (20°C). If temperature is above 68°F (20°) turn screw less than 2 1/2 turns and if lower turn more than 2 1/2 turns.*

3) Connect a tachometer and a CO meter. Run engine until water thermostat opens.

4) Adjust idle speed to 800 RPM (Man. Trans.) or 700 RPM (Auto. Trans.) by turning throttle stop screws. Use a suitable carburetor syncronizer to ensure that air flow through both carburetors is equal.

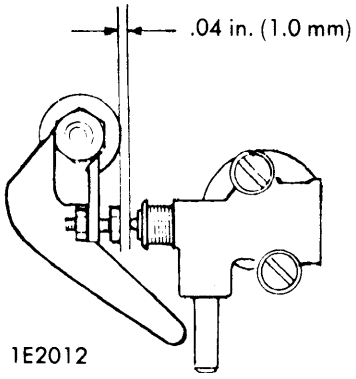
5) With CO meter, screw mixture adjusting screws in equally, until a CO value of 2-3% is reached. Before each adjustment briefly accelerate engine so that air valves are in their proper position.

6) Without CO meter, screw mixture adjusting screws in equally until maximum idling speed is obtained. Then unscrew until engine speed just begins to drop. Replace plastic plugs over mixture adjusting screws.

7) If necessary, reset idle speed using a suitable carburetor syncronizer.

8) Adjust throttle link rods so that with throttle control against stop on manifold there is .004" (.1 mm) clearance between lever and flange on throttle spindle.

Hot Start Valve — With control rods pressed down to their bottom position, distance measured between rod and adjusting screw should be a maximum of .04 in. (1.0 mm) (see illustration).



HOT START VALVE ADJUSTMENT

IDLE ADJUSTMENT (AUSTIN & MG)

NOTE — On Austin Marina models with single carburetor, ignore procedures concerned with carburetor balancing.

1) Remove air cleaner and check throttle for signs of sticking. Unscrew throttle adjusting screw(s) until just clear of throttle lever, then turn clockwise two full turns.

2) Turn jet adjusting screw counterclockwise until jet is flush with bridge or as high as possible. Observe by lifting piston, or if necessary, remove suction piston chamber. Check that needle guide is flush with bottom of piston groove. Turn jet adjusting screw two turns clockwise. Repeat procedure for second carburetor (if equipped).

3) Turn fast idle adjusting screw(s) counterclockwise until well clear of cam. If suction piston chamber(s) were removed, reinstall and make sure that piston falls freely. Check that oil in piston damper(s) is 1/2" (13 mm) above top of piston rod.

4) Run engine at a fast idle speed until normal operating temperature is obtained, then continue to run for five more minutes. Run engine at 2500 RPM for 30 seconds.

5) On Twin carburetor models, loosen both clamping bolts on throttle spindle interconnections and cold start interconnections. Using a suitable carburetor balancing tool, set idle speed to specifications with flow through both carburetors equal. On Single carburetor models, set idle speed to specification.

6) Turn jet adjusting screw(s) clockwise to richen mixture or counterclockwise to lean mixture until maximum speed is achieved. Turn screw(s) counterclockwise until engine speed begins to drop, then adjust screw(s) very slowly clockwise until maximum speed is regained. On models with twin carburetors make adjustment equally on both carburetors.

7) Tap neck of each suction chamber with screwdriver and using a suitable exhaust gas analyser, check that CO level is within specifications. If reading is outside of specifications, readjust jet adjusting screw(s) minimum amount necessary to bring CO into specification range. *NOTE — If more than 1/2 turn is necessary to achieve specification setting, carburetors must be overhauled.*

8) Adjust throttle interconnection levers so that clearance exists between link pin and lower edge of fork. Run engine at 1500 RPM and check for carburetor balance.

Fast Idle (Volvo) — Pull choke knob out .8" (20 mm) from dash and adjust fast idle screws equally to obtain specified fast idle speed.

Fast Idle (Austin & MG) — With fast idle cam(s) against their stop(s), set fast idle interconnection so both cams move together. Check for 1/16" (1.5 mm) free play in control cable. Pull out choke control knob until arrow on cam is positioned under fast idle adjusting screw of each carburetor. Turn fast idle screws to obtain specified fast idle speed. Use a suitable carburetor balancing tool to adjust both carburetor equally on models with twin carburetors.

Float Level — Invert carburetor and remove floatchamber screws. Distance between float and flange is 1/64-1/16 in. (.5-1.5 mm) (see illustration).

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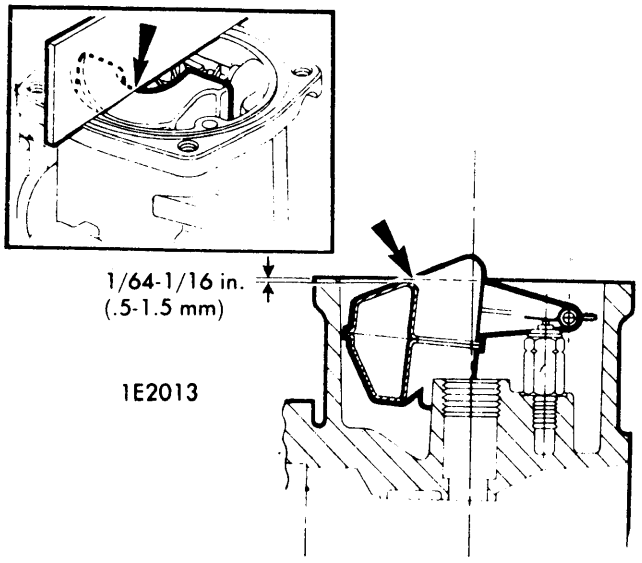
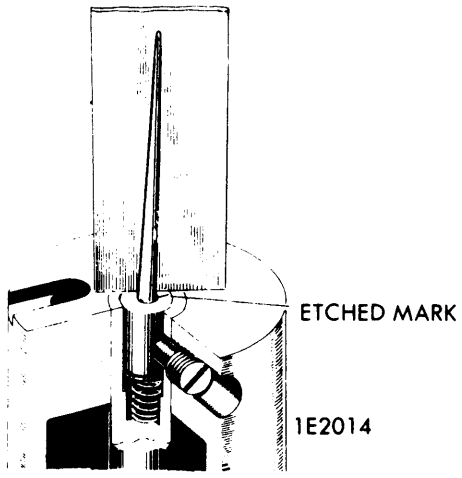


FLOAT LEVEL ADJUSTMENT

Metering Needle – Place needle in air valve with etched mark point away from holes in air valve on Volvo models (see illustration). On Austin and MG models, etched mark should be reverse 180° from illustration. Place guide bushing over needle and set shoulder of needle flush with full face of piston. Take care not to overtighten setscrew.



METERING NEEDLE ADJUSTMENT

OVERHAUL

DISASSEMBLY

1) Remove air cleaner and rod ball joints from carburetors. Remove all hoses and choke cable. Remove nuts and washers from mounting studs and take off carburetors.

2) Remove piston damper and its washer.

3) Unscrew piston suction chamber retaining screws and remove identification tag.

4) Lift chamber vertically from body without tilting it. Remove piston spring and piston assembly.

5) Unscrew needle guide locking screw. Withdraw needle guide and spring.

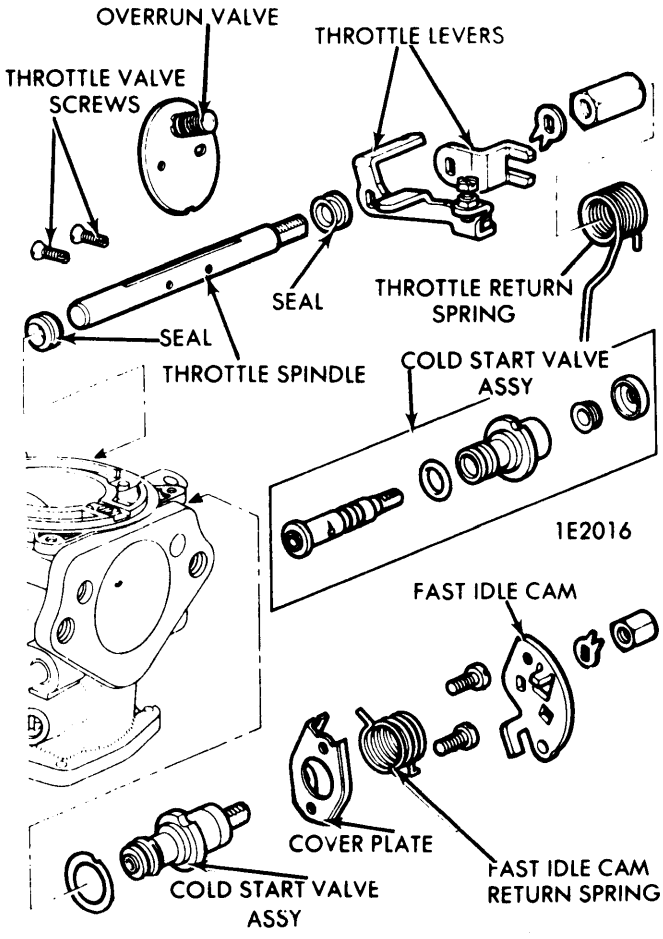
6) Mark bottom cover-plate and body to ensure correct reassembly. Remove screws and cover-plate complete with sealing ring.

7) Remove mixture adjusting screw and "O" ring.

8) Remove jet adjusting lever retaining screw and spring.

9) Withdraw jet complete with adjusting lever. Disengage lever and disengage bi-metal temperature control spring (Volvo 140) using care not to bend spring.

10) Remove float spindle and fiber washer. Then remove float and unscrew float needle and valve.



S.U. HIF CARBURETOR DISASSEMBLY

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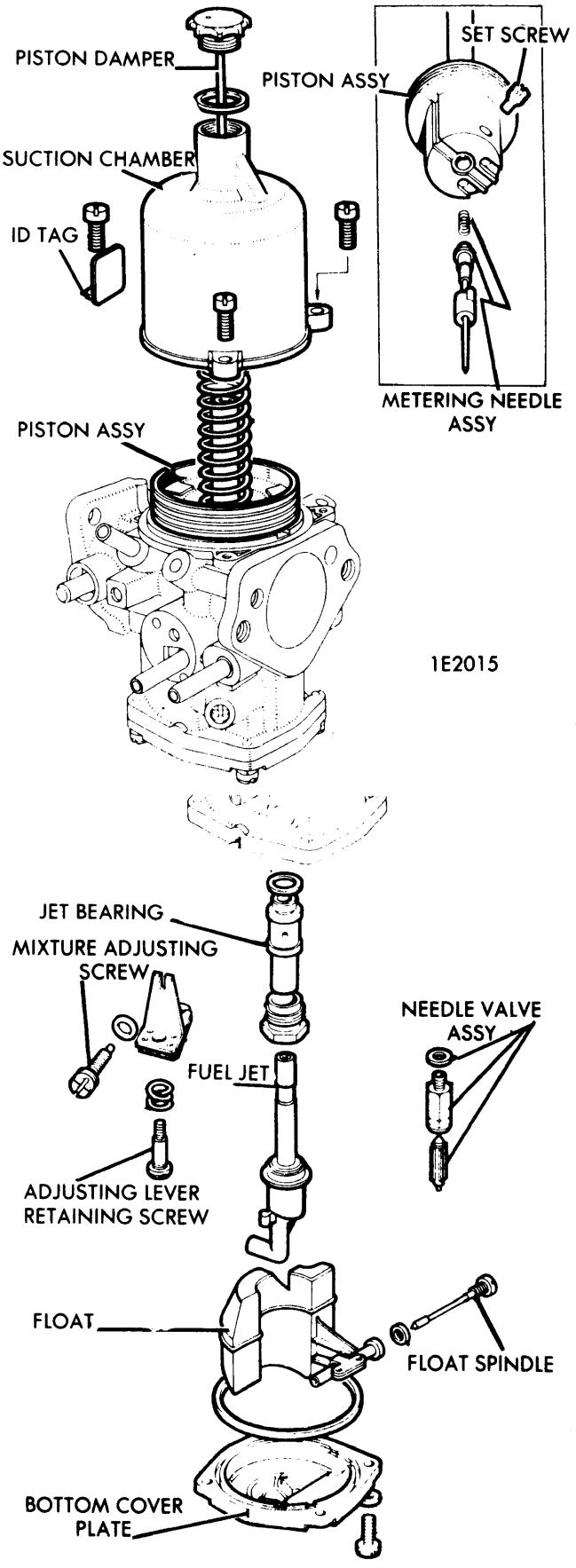


S.U. HIF CARBURETOR DISASSEMBLY

11) Unscrew jet bearing lock nut and withdraw bearing complete with fiber washer.

12) Remove fast idle cam retaining nut and washer. Note position of cam and lever.

13) With return spring held towards carburetor body, pry off cam lever and remove return spring.

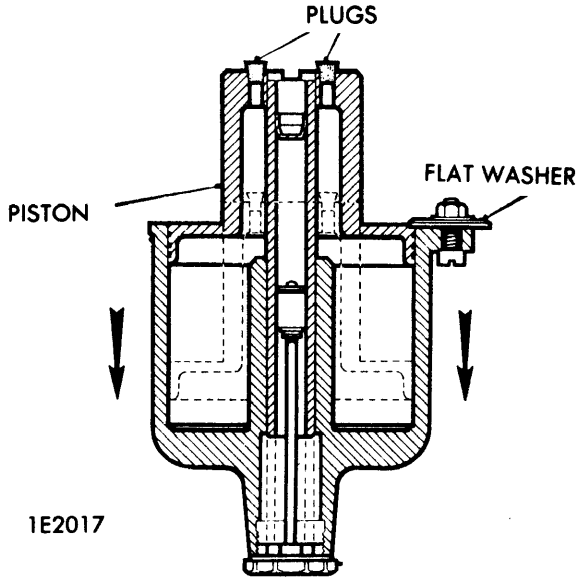
14) Remove screws from cover of cold start valve and withdraw cold start valve assembly. Pull out valve spindle, "O" ring, seals and dust cap.

15) Note location and loading of ends of throttle lever return spring and remove spring. Remove nut and tab washer retaining throttle levers.

16) Remove throttle lever and throttle actuating lever.

17) Remove throttle valve retaining screws. Withdraw throttle valve taking care not to damage throttle overrun poppet valve. *NOTE – New throttle valve retaining screws must be used on reassembly.*

18) Withdraw throttle spindle and seals.



AIR VALVE TIMING CHECK

TROUBLE SHOOTING & TESTING

Piston Sticking – The suction disc, piston, and needle all have suitable clearances to prevent sticking. If sticking does occur, the whole assembly should be carefully cleaned and the piston rod should be lubricated with a spot of thin oil. *NOTE – Do not apply oil to any part except the piston rod.* To test for a sticking piston, remove piston damper and lift piston with a pencil or similar instrument. The piston should come up freely and fall freely back on bridge when released. Piston return spring should not be stretched or increased in tension to improve the rate of piston return. To check for proper function of air valve, remove suction chamber and air valve Remove air valve spring and plug holes in bottom of air valve. Return air valve to chamber. Using a nut, screw and flat washer (see

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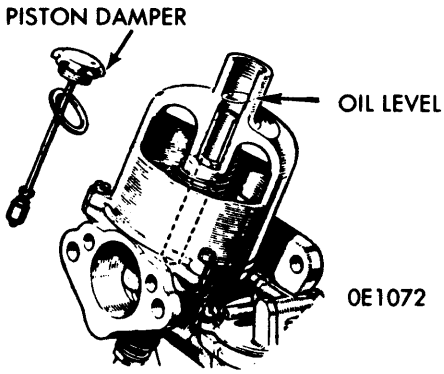
illustration), place flat washer so that it goes over edge of suction chamber to prevent air valve from being dropped. Raise air valve up against flat washer and then release. It should take 5-7 seconds for air valve to fall the full extent of its travel. If after thorough cleaning and checking for damage, timing doesn't fall within 5-7 seconds replace air valve and suction chamber.

Carburetor Flooding – If flooding occurs check float needle and float needle seat. Clean thoroughly and inspect for any signs of wear. If wear is found replace needle and needle seat. Recheck float level setting when replacing float needle assembly.

MAINTENANCE

Carburetor Lubrication – The reservoir on each carburetor must be topped up periodically with light engine oil. Under no circumstances should a heavy oil be used. SAE 30 is the heaviest oil that should be used. Unscrew reservoir cap, withdraw damper, add oil until oil level is 1/2 in. (13 mm) above top of hollow piston rod.



CARBURETOR LUBRICATION

Multiple Carburetor Linkage Lubrication – Periodically lubricate the moving parts of the linkage with a light visocosity oil (engine oil of the same weight as used to lubricate the carburetor damper reservoir).

Air Cleaners – Follow vehicle manufacturers recommendations for proper mileage intervals for either cleaning or replacing the air cleaner.