

Tuning and Overhaul — Holley Type R8360A

HOLLEY CARBURETTOR R8360A**RG 225 Engine****TUNING AND OVERHAUL****To Remove**

Disconnect the battery.

Remove the rear engine cover.

Disconnect the air cleaner pipe at the air feed intake box.

Disconnect the two temperature sensor connections at the air feed intake box.

Unscrew the securing bolt and washer, remove the air feed intake box and rubber seating washer from the carburettor.

Disconnect the vacuum pipe carburettor connection from the solenoid tee piece connection.

Disconnect the vacuum pipe from the solenoid valve at the throttle positioner.

Disconnect the vacuum pipe from the PCV valve at the carburettor.

Disconnect the vacuum pipe from the OSAC valve at the carburettor.

Disconnect the choke heater operating rod at the carburettor.

Disconnect the throttle linkage at the carburettor.

Disconnect the fuel pipe at the carburettor.

Remove the two nuts and spring washers securing the carburettor to the inlet manifold. Carefully withdraw carburettor to avoid spilling fuel from fuel bowl.

Remove the two gaskets and spacer.

To Refit

Inspect the mating surfaces of carburettor and inlet manifold.

Ensure both surfaces are clean and free of damage.

Fit a new gasket to each side of spacer and fit to inlet manifold.

Position carburettor on inlet manifold and secure with two nuts and spring washers. Tighten nuts evenly to ensure no leakage at gasket.

Connect the fuel pipe to the carburettor.

Connect the throttle linkage to the carburettor.

Connect the choke heater operating rod to the carburettor.

Connect the vacuum pipe from the OSAC valve to the carburettor.

Connect the vacuum pipe from the PCV valve to the carburettor.

Connect the vacuum pipe from the solenoid to the throttle positioner.

Connect the vacuum pipe from the solenoid tee piece connection to the carburettor.

Fit the air feed intake box and rubber seating washer to the carburettor. Secure with the bolt and washer.

Connect the air cleaner pipe to the air feed intake box.

Refit the two temperature sensor connections at the air feed intake box.

Reconnect the battery.

Start the engine, check for fuel and air leaks at the carburettor.

Check the operation of the controls.

Stop the engine and fit the rear engine cover.

Engine Tuning

Many performance complaints are wrongly attributed to the carburettor, which cannot compensate for any of the following:

Vacuum leaks at manifold, throttle positioner, OSAC or hoses.

Blockages in induction or crankcase ventilation systems.

Low or high fuel pressure.

Low or unbalanced cylinder compressions.

Faulty ignition or ignition timing.

Electric assist choke system inoperative.

In all cases of suspected carburettor malfunction carry out the following checks, rectifying any faults, before condemning, removing and dismantling the carburettor.

Check the air cleaner filter element. Clean or renew it as necessary. Check the operation of the Automatic air control system (Sub-section B 702).

Check the crankcase ventilation system. Clean the crankcase inlet filter or renew the PCV valve as necessary.

Check that the Electric assist choke system is operating.

Check that the Orifice spark advance control (OSAC) is operating.

Check the tightness of the inlet and exhaust manifold and carburettor securing nuts.

Remove and clean the spark plugs, reset the gaps.

Check the cylinder compressions. Check and if necessary adjust the valve clearances.

Check and if necessary reset the ignition timing at idling speed with vacuum advance pipe disconnected.

Check the centrifugal advance. Check that the vacuum advance capsule is working and the connecting pipe is not leaking.

Check the ignition secondary voltage. Check the H.T. cables and coil for satisfactory insulation.

Test the fuel pump pressure. Check the filter in the fuel pump.

Check that the exhaust system is not blocked or restricted by damage.

Check manifold heat control valve in exhaust manifold for correct operation.

Adjust the carburettor idling speed.

Road test the vehicle to confirm a fault and if the carburettor is suspect, identify which of the carburettor circuits is at fault.

ADJUSTMENTS

Idle Speed — To Adjust

Connect a tachometer and run the engine until normal working temperature is achieved.

Set the idling speed to the recommended figure (Sub-section B 401) by moving the idling speed adjusting screw (Fig. 1) in or out as necessary.

Disconnect the tachometer.

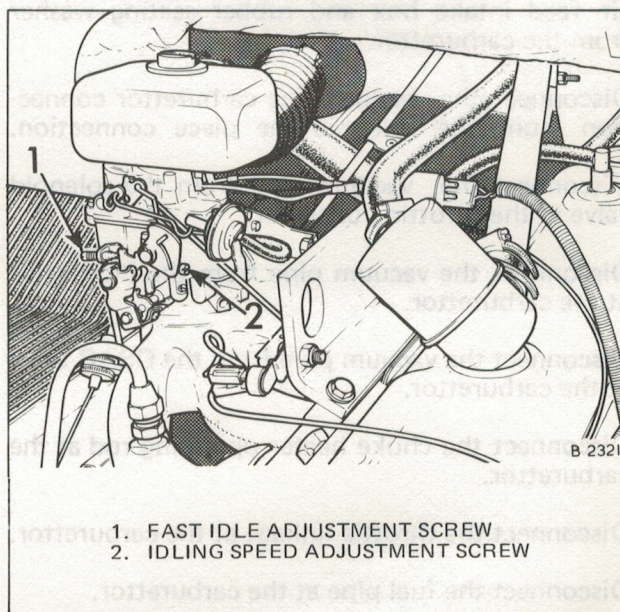


Fig. 1 Idling speed and fast idle speed adjustment screws

Fast Idle Speed — To Adjust

Disconnect the vacuum pipe carburettor connection from the solenoid tee piece connection.

Disconnect the vacuum pipe from the OSAC valve at the carburettor.

Blank off the two carburettor vacuum connections.

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Remove the air cleaner element.

Withdraw the fast idle screw away from the fast idle cam, rotate the cam to allow the screw to rest on the highest speed step.

Move the fast idle cam until fast idle screw drops to second highest speed step (Fig. 1).

Connect a tachometer, start the engine and determine stabilized speed.

Set the fast idle speed to the recommended figure (Sub-section B 401) by moving the fast idle speed adjusting screw (Fig. 1) in or out as necessary.

Disconnect the tachometer and refit the vacuum pipes and air cleaner element.

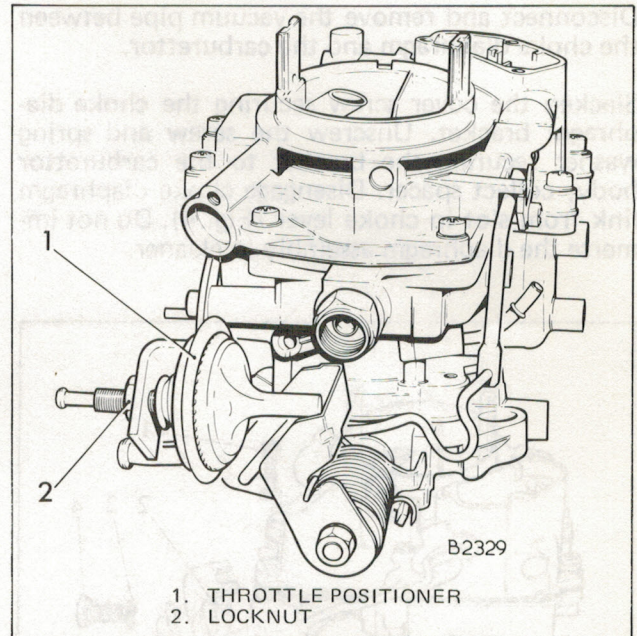


Fig. 2 Throttle positioner adjustment

Throttle Positioner — To Adjust

Connect a tachometer and start the engine.

To check throttle positioner is operating correctly, accelerate engine to 2000 r.p.m. plus, and verify that the unit can withstand a hand applied load along its axis, in its extended position.

If the unit is operating correctly, accelerate engine manually to a speed of approximately 2,500 r.p.m.

Loosen locknut and rotate complete unit until extension just contacts throttle lever (Fig. 2).

Release throttle, slowly adjust unit to decrease engine speed until a sudden drop in r.p.m. occurs (approximately 1,000 r.p.m.). At this point continue adjusting unit in the same direction for a further quarter turn.

Tighten locknut.

Accelerate engine manually to approximately 2,500 r.p.m. and release throttle. Engine should return to normal idle. Stop engine.

Remove any twists in vacuum pipe.

Disconnect the tachometer.

Idle Mixture

The idle mixture screw is adjusted and sealed with a steel plug by the carburettor manufacturer, after the initial setting no adjustment is permitted in service.

To Dismantle

Remove the two setscrews securing the throttle positioner to the carburettor, remove throttle positioner.

Remove the fast idle cam retaining clip, remove fast idle cam and disconnect cam from link.

Disengage fast idle link from choke lever (Fig. 3).

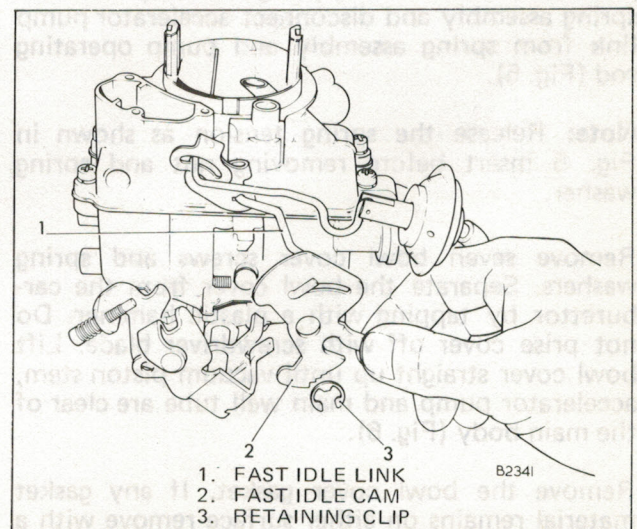
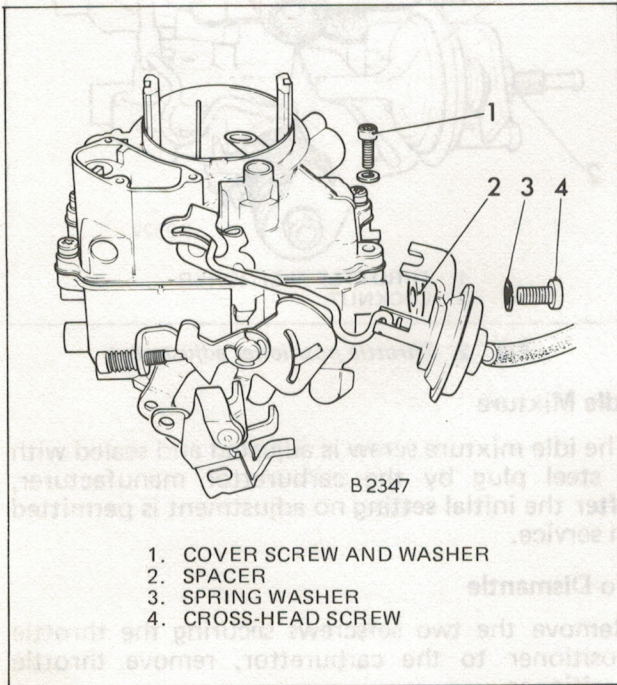


Fig. 3 Removing or installing fast idle cam and link

Disconnect and remove the vacuum pipe between the choke diaphragm and the carburettor.

Slacken the cover screw securing the choke diaphragm bracket. Unscrew the screw and spring washer securing the bracket to the carburettor body, collect spacer. Disengage choke diaphragm link from slot in choke lever (Fig. 4). Do not immerse the diaphragm assembly in cleaner.



1. COVER SCREW AND WASHER
2. SPACER
3. SPRING WASHER
4. CROSS-HEAD SCREW

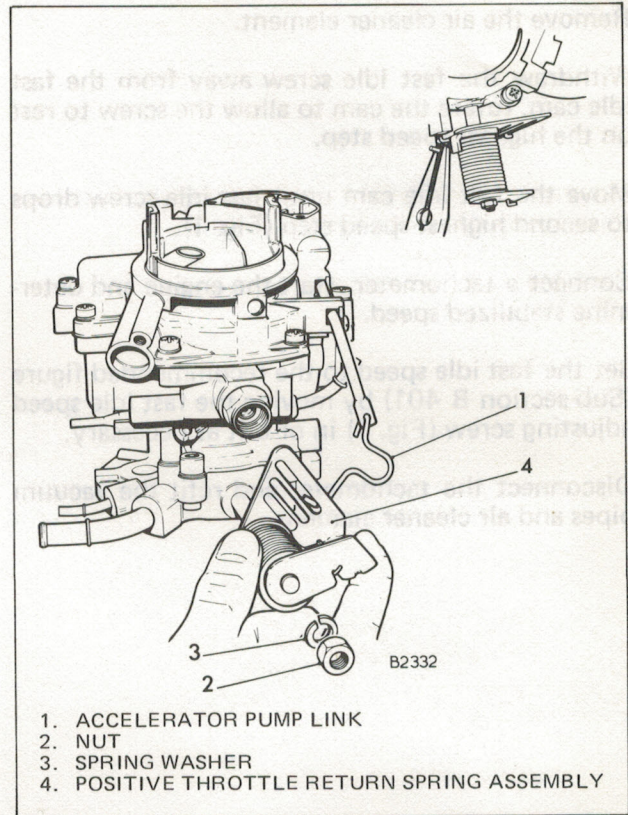
Fig. 4 Removing or installing choke diaphragm

Remove the nut and spring washer securing the positive throttle return spring assembly. Remove spring assembly and disconnect accelerator pump link from spring assembly and pump operating rod (Fig. 5).

Note: Release the spring tension as shown in Fig. 5 insert before removing nut and spring washer.

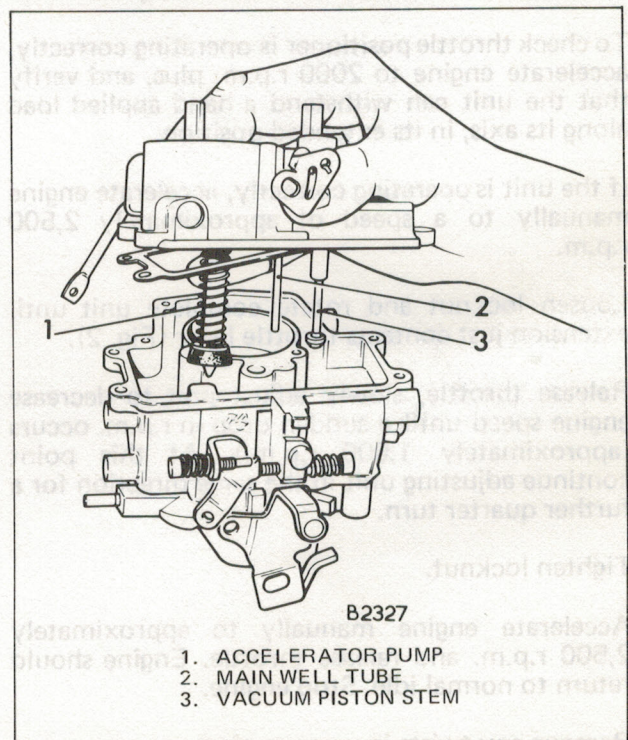
Remove seven bowl cover screws and spring washers. Separate the bowl cover from the carburettor by tapping with a plastic hammer. Do not prise cover off with screwdriver blade. Lift bowl cover straight up until vacuum piston stem, accelerator pump and main well tube are clear of the main body (Fig. 6).

Remove the bowl cover gasket. If any gasket material remains on either surface remove with a plastic scraper, do not use a metal scraper.



1. ACCELERATOR PUMP LINK
2. NUT
3. SPRING WASHER
4. POSITIVE THROTTLE RETURN SPRING ASSEMBLY

Fig. 5 Removing or installing positive throttle return spring assembly



1. ACCELERATOR PUMP
2. MAIN WELL TUBE
3. VACUUM PISTON STEM

Fig. 6 Removing or installing bowl cover

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Remove the accelerating pump operating rod retainer screw and retainer.

Rotate the pump operating rod and disconnect the pump drive spring and accelerator pump assembly (Fig. 7). Set the pump stem and cup aside. Do not immerse in cleaner.

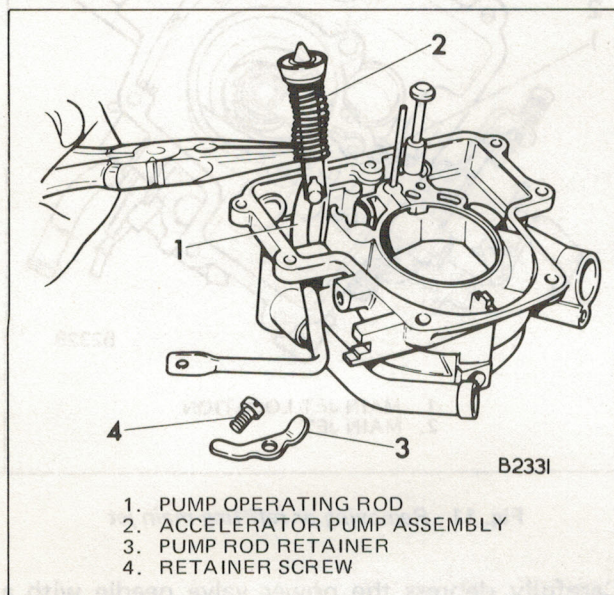


Fig. 7 Removing or installing accelerator pump

Rotate the pump operating rod and remove from bowl cover (Fig. 8).

Remove the pump operating rod grommet.

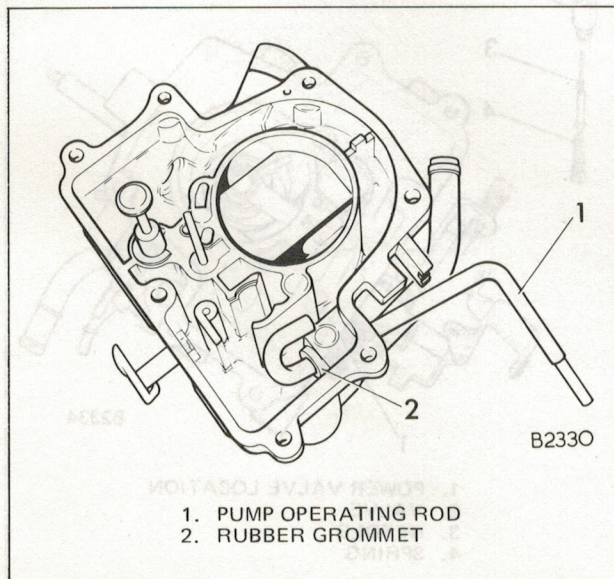


Fig. 8 Removing accelerator pump operating rod

The vacuum piston stem retaining ring is staked in position and care must be taken at removal. Remove staking with a suitable sharp tool then remove the vacuum piston from the bowl cover by depressing the piston and allowing it to snap up against the retaining ring (Fig. 9).

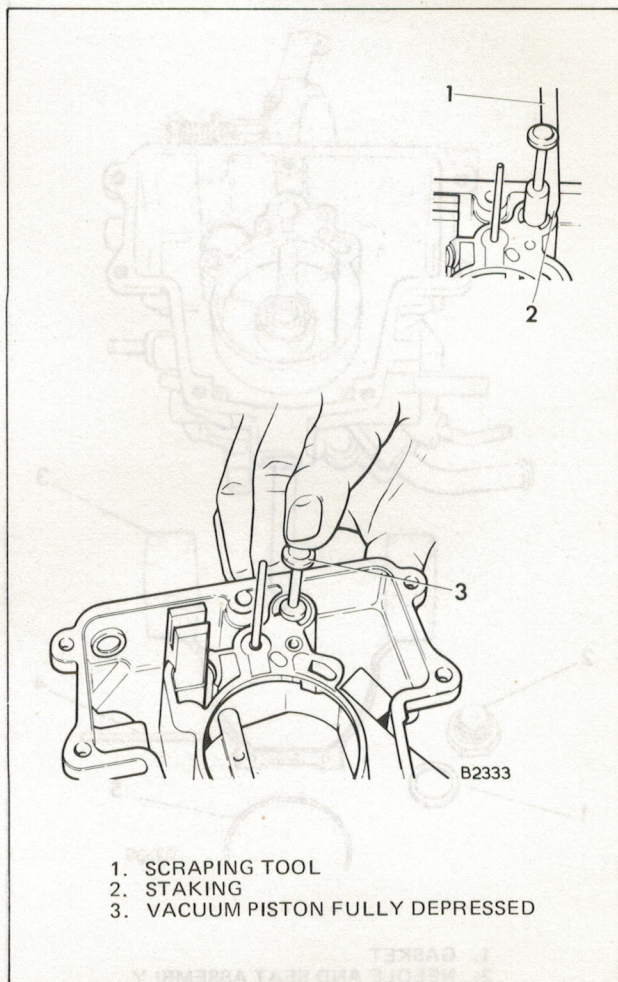


Fig. 9 Removing vacuum piston

This completes dismantling of the bowl cover. The main well tube cannot be removed and must be blown out carefully from both inside and outside the cover.

Remove the fuel inlet valve and gasket from the main body (Fig. 10).

Remove the spring float shaft retainer, fulcrum pin and float assembly (Fig. 10).

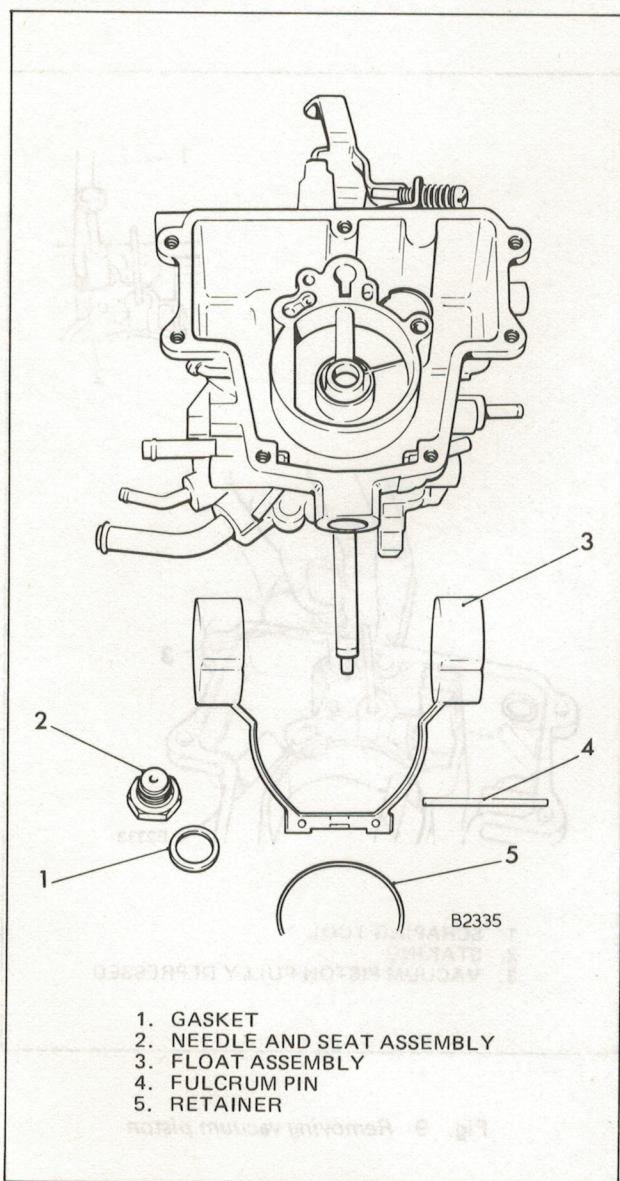


Fig. 10 Removing float assembly

Turn the main body upsidedown and remove the pump discharge check ball and weight.

Remove the main jet using a suitable screwdriver (Fig. 11).

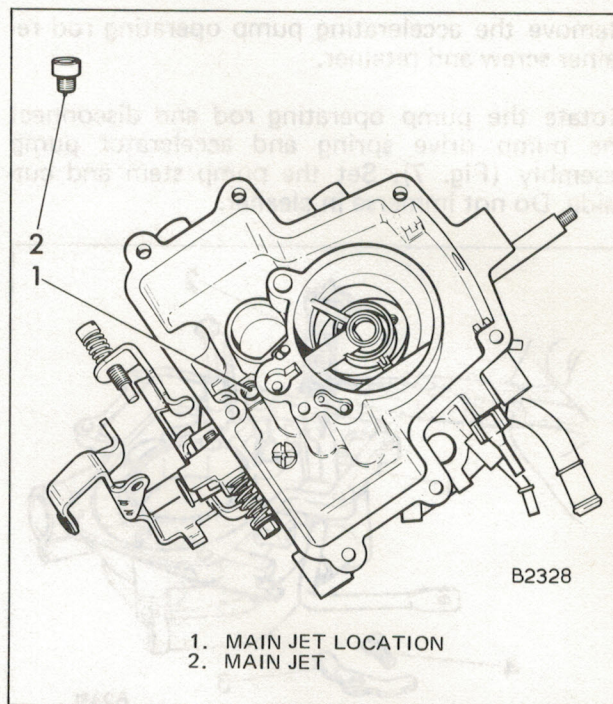


Fig. 11 Removing or refitting main jet

Carefully depress the power valve needle with a 3/8 in. wide screwdriver until screwdriver blade is squarely seated in slot on top of valve. Remove valve. The assembly consists of valve, needle and spring, if any part requires renewal the complete assembly must be renewed (Fig. 12).

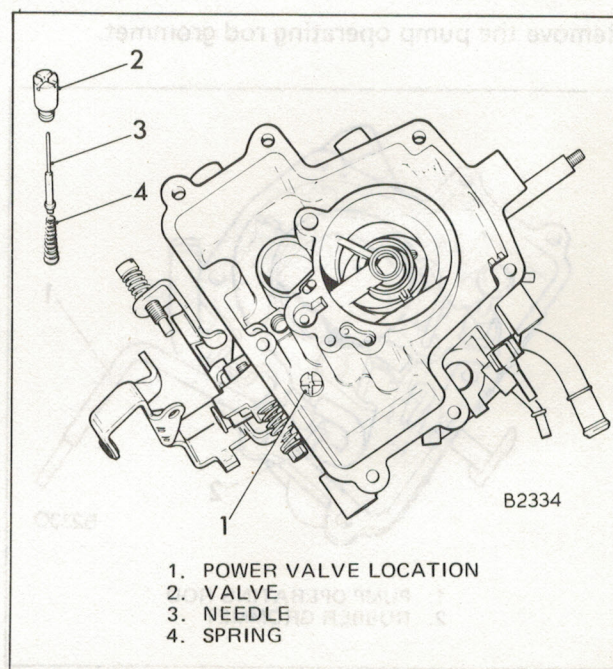


Fig. 12 Removing or installing power valve

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Remove the three screws and spring washers securing the throttle body to the main body. Separate the throttle body from the main body and remove the gasket (Fig. 13).

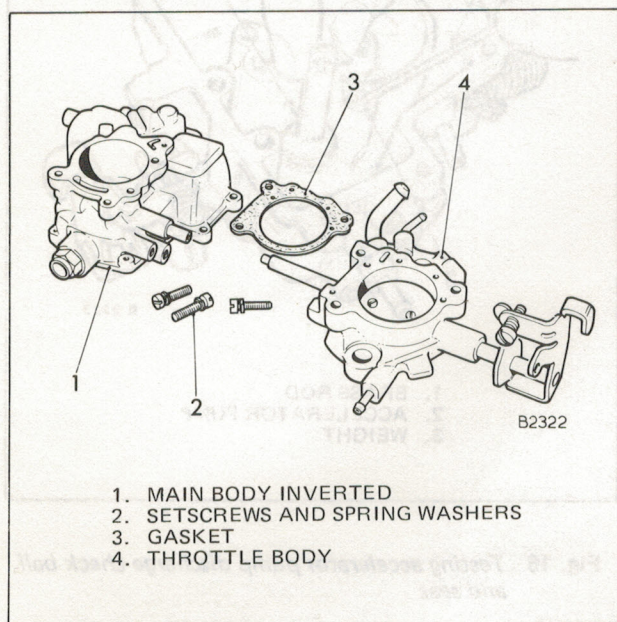


Fig. 13 Separation of main body from throttle body

Cleaning

Thoroughly clean all metal parts with a suitable cleaning solvent, blow dry with compressed air. The choke diaphragm, accelerator pump assembly and throttle positioner must not be immersed in cleaning solvent.

Inspection and Overhaul

Check throttle shaft for excessive wear in body. If wear is extreme, it is recommended that carburettor be renewed rather than installing a new shaft in old body.

Check the vacuum piston assembly for wear, if wear is present renew assembly.

Check fuel floats for fuel absorption by lightly squeezing between fingers. If wetness appears on surface or float feels heavy, renew float assembly.

Check that the mounting flange on the throttle body is not distorted.

To Re-assemble

Using a new gasket, install throttle body to main body, secure with three screws and spring washers.

Before installing the vacuum piston assembly in bowl cover ensure all staking is removed from the retainer cavity. Install the spring and piston in the vacuum cylinder, seat the retainer and stake lightly with a suitable tool (Fig. 14).

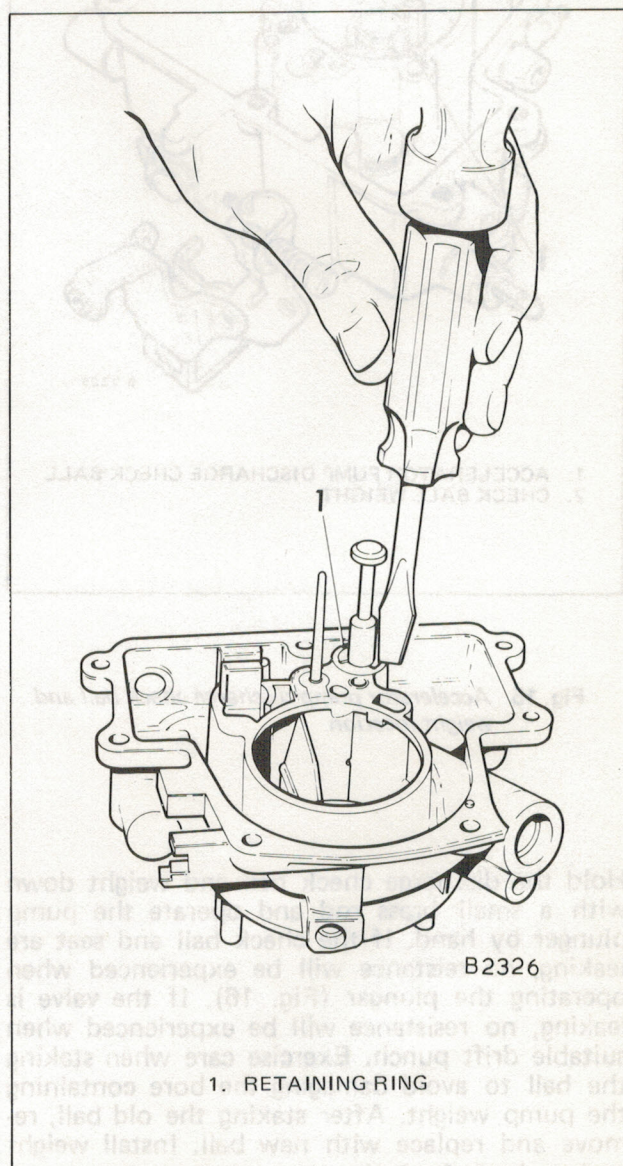


Fig. 14 Staking vacuum piston retaining washer

Test the accelerator pump discharge check ball and seat prior to assembly by coating the pump with oil, or filling the fuel bowl with clean fuel. Install accelerating pump discharge check ball and weight (Fig. 15).

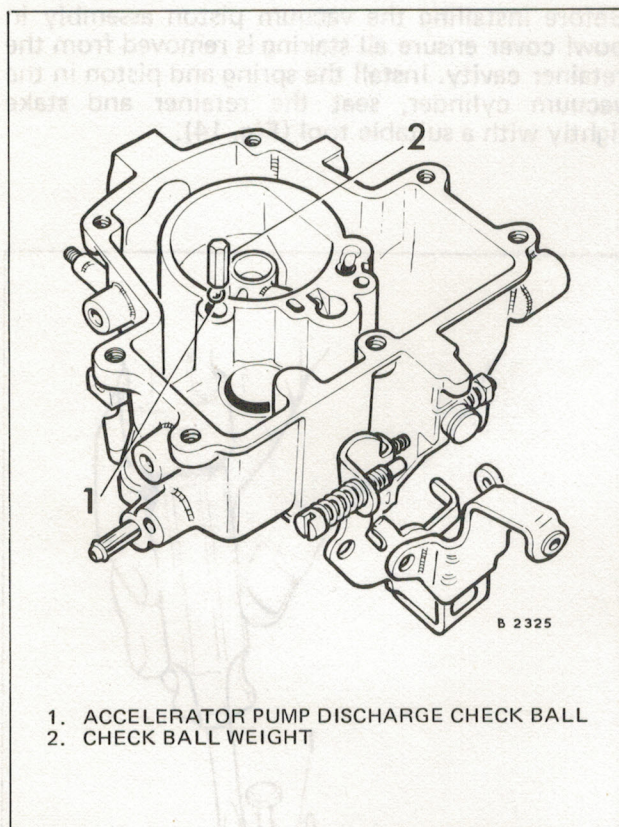


Fig. 15 Accelerator pump discharge check ball and weight location

Hold the discharge check ball and weight down with a small brass rod and operate the pump plunger by hand. If the check ball and seat are leaking, no resistance will be experienced when operating the plunger (Fig. 16). If the valve is leaking, no resistance will be experienced when suitable drift punch. Exercise care when staking the ball to avoid damaging the bore containing the pump weight. After staking the old ball, remove and replace with new ball. Install weight and re-check for leaks. If no leaks, remove check ball and weight from main body and install accelerator pump, pump operating rod, grommet and rod retainer in bowl cover (Fig. 7).

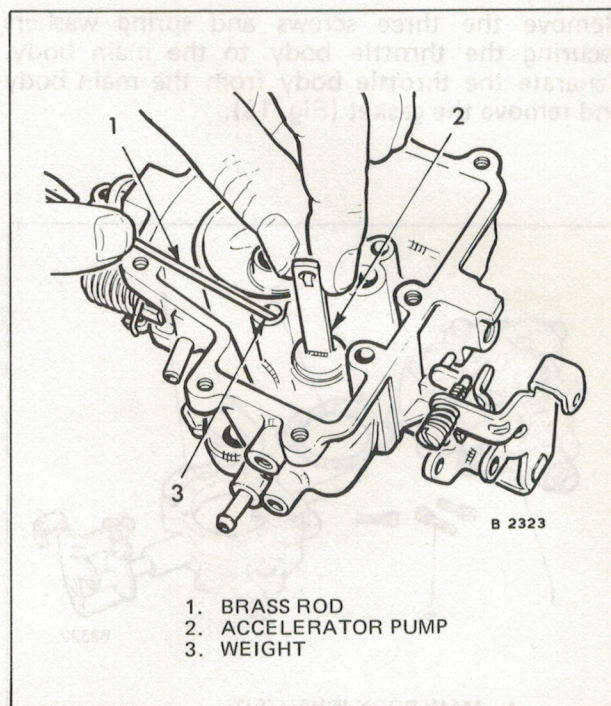


Fig. 16 Testing accelerator pump discharge check ball and seat

Carefully install power valve assembly in bottom of fuel bowl and tighten securely. Ensure needle valve operates freely (Fig. 12).

Refit main metering jet (Fig. 11).

Fit a new gasket on fuel inlet assembly and screw into main body, tighten securely.

Install float assembly and fulcrum pin in the float cradle. Insert retaining spring. Check float alignment to prevent binding against bowl casting.

Check the float level as follows:

Place bowl cover gasket on top of fuel bowl.

Hold gasket in place and invert bowl.

Place a straight edge across the gasket surface.

The portion of the float, farthest from the fuel inlet should just touch the straight edge (Fig. 17).

If adjustment is necessary, bend the float tang.

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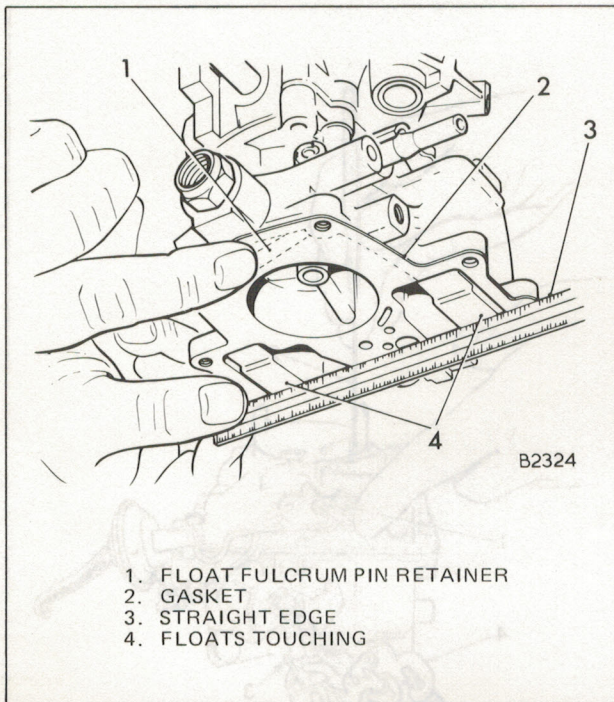


Fig. 17 Checking float level

Remove bowl cover gasket.

Refit check ball and weight into accelerator pump discharge well (Fig. 15).

Position bowl cover gasket on top of fuel bowl.

Carefully position bowl cover on top of gasket. Ensure the leading edges of the accelerator pump cup are not damaged as it enters the pump bore. Be careful not to damage the main well tube (Fig. 6).

Install seven bowl cover screws and spring washers, the longest screw secures choke diaphragm bracket. Tighten screws alternately, to compress the gasket evenly. Slacken off choke diaphragm bracket screw.

Refit positive throttle return spring. Ensure the accelerator pump link is located in the longest slot in the throttle lever (Fig. 5).

Locate the choke vacuum diaphragm and secure with the screw, spring washer, spacer and cover screw (Fig. 4).

Refit the fast idle cam and link, secure with the retaining clip (Fig. 3).

ADJUSTMENTS

The following checks or adjustments should be carried out after carburettor dismantling and overhaul.

Accelerator Pump Piston Stroke Adjustment

Position the throttle in the curb idle position with the accelerator pump operating link in the longest slot in the throttle lever.

Measure the pump operating link as shown in Fig. 18. This measurement should be 59mm (2-21/64 in), if necessary bend the operating link to achieve required dimension.

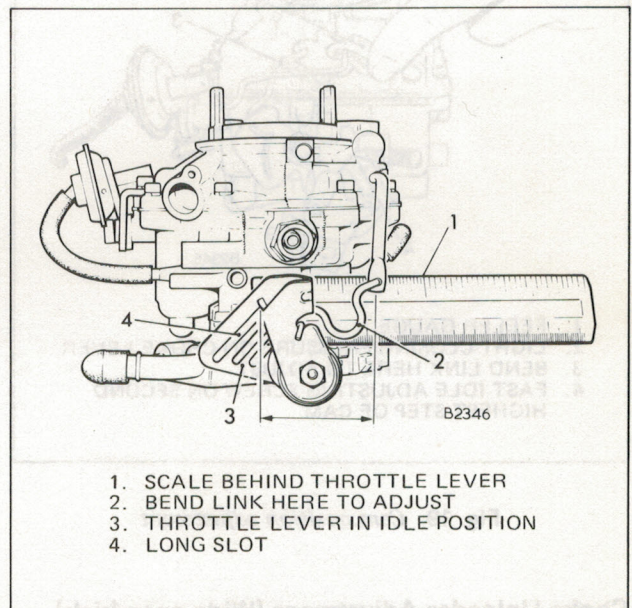


Fig. 18 Adjusting operating link

Fast Idle Cam Position Adjustment

This adjustment is important to assure that the speeds of each cam step occur at the proper time during engine warm-up.

Position the fast idle speed adjusting screw on the second highest step on fast idle cam, move choke valve toward closed position with light pressure on choke control lever.

Insert a 2mm (.08 in) feeler gauge between top of choke valve and carburettor intake (Fig. 19).

If an adjustment is necessary, bend fast idle link at upper angle, until correct valve opening has been obtained.

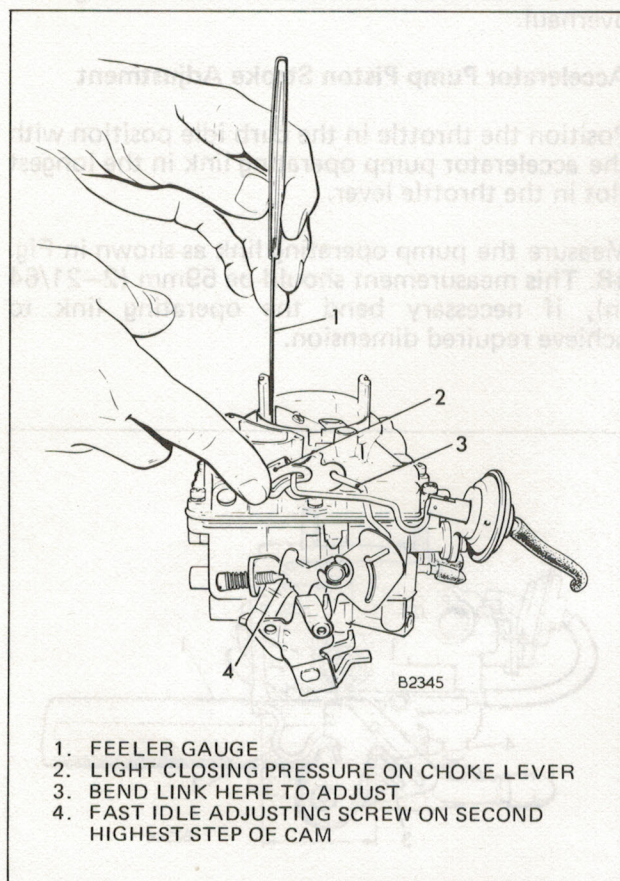


Fig. 19 Cam position adjustment

Choke Unloader Adjustment (Wide open kick)

The choke unloader is a mechanical device designed to partially open the choke valve at wide open throttle. It is used to eliminate choke enrichment during cranking of an engine. Engines which have flooded or stalled by excessive choke enrichment can be cleared by use of the unloader.

Hold throttle lever in wide open position.

Insert a 6.35mm (.25 in) feeler gauge between top of choke and carburettor intake.

With light pressure on the choke lever, a slight drag should be felt as feeler gauge is being withdrawn (Fig. 20).

If an adjustment is necessary, bend unloader tang on throttle lever until correct opening is achieved.

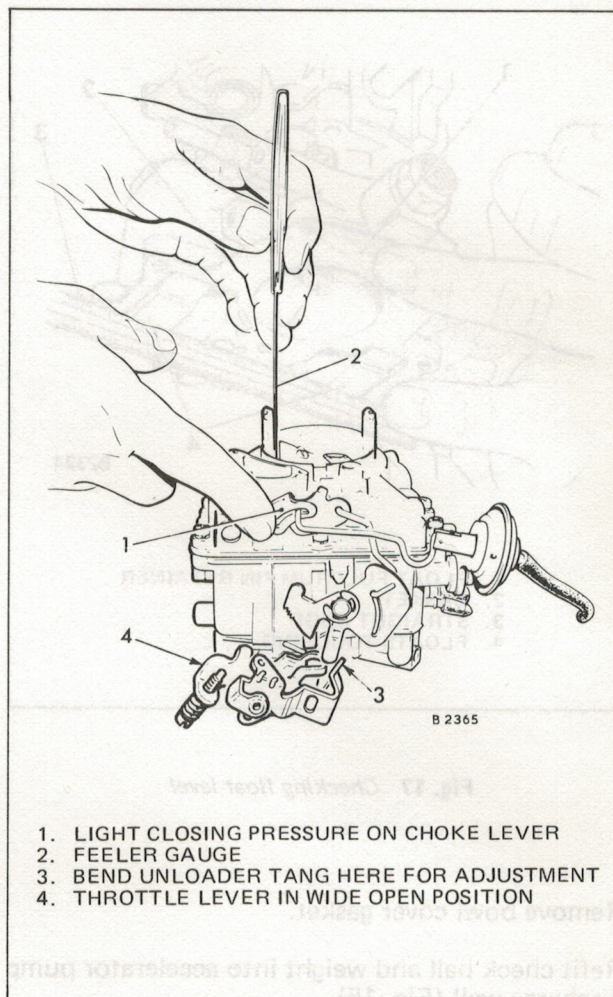


Fig. 20 Choke unloader adjustment

Choke Vacuum Kick Adjustment

The choke diaphragm adjustment controls the fuel delivery while the engine is running. It positions the choke valve within the carburettor intake by action of the linkage between the choke shaft and the diaphragm. The diaphragm must be energised to measure the vacuum kick adjustment.

Disconnect the vacuum hose from carburettor to choke vacuum diaphragm

Connect an auxiliary vacuum source to the choke vacuum diaphragm. Apply a vacuum of fifteen or more inches of mercury.

Insert a 2.8mm (.11 in) feeler gauge between top of choke and carburettor intake (Fig. 21).

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Apply sufficient closing pressure on lever to which choke rod attaches to provide a minimum choke valve opening without distortion of diaphragm link. Note that the cylindrical stem of diaphragm will extend as internal spring is compressed. This spring must be fully compressed for proper measurement of vacuum kick adjustment.

Adjustment is necessary if slight drag is not obtained when withdrawing feeler gauge. Shorten or lengthen diaphragm link to obtain correct choke valve opening. Length changes should be made by carefully opening or closing the U-bend provided in the link. Do not apply twisting or bending force to diaphragm.

With vacuum applied to diaphragm the choke valve must move freely between open and adjusted positions. If movement is not free, examine linkage for misalignment or interference caused by bending operation. Repeat adjustment if necessary to provide proper link operation.

Disconnect auxiliary vacuum source and re-connect vacuum hose to carburettor and choke diaphragm.

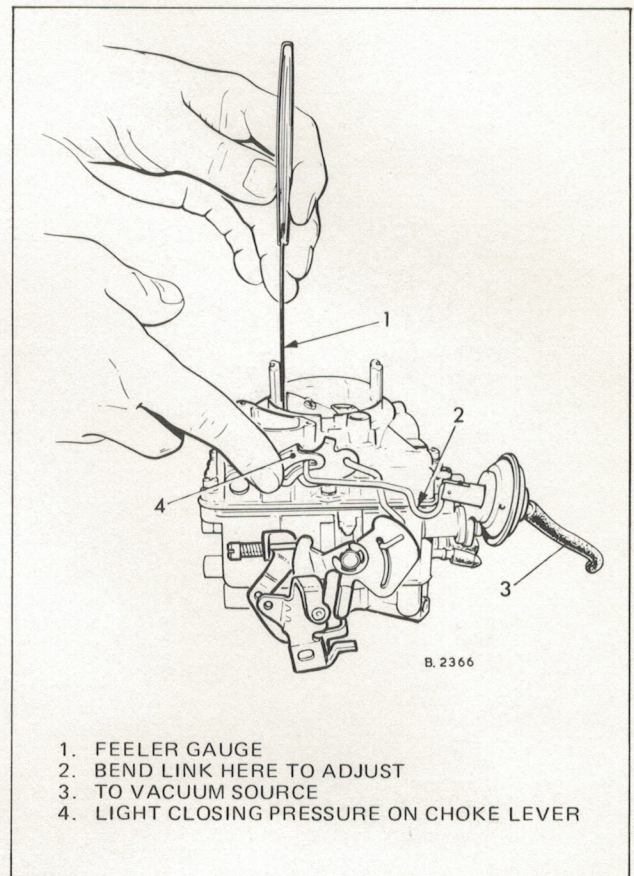


Fig. 21 Choke vacuum kick adjustment