

SECTION 6B FUEL SYSTEMS

Disassembly

Refer to Figures 6B-2 and 6B-5.

1. Remove the bowl retaining screw, retaining screw gasket, and fuel bowl.
2. Remove the bowl gasket, float pin, float, and fuel inlet needle.

NOTE: To prevent damage to the carburetor, do not attempt to remove the fuel inlet seat as it is not serviceable. Replace the carburetor if the fuel inlet seat is damaged.

3. Remove the idle fuel adjusting needle and spring. Remove the idle speed adjusting screw and spring.
4. Remove the main fuel jet.
5. In order to clean the "off-idle" ports and the bowl vent channel thoroughly, the welch plugs covering these areas must be removed. Use tool No. KO1018 and the following procedure to remove the welch plugs. Refer to Figure 6B-6.

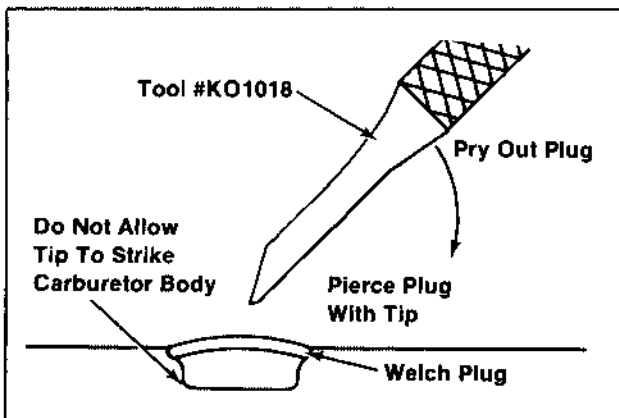


Figure 6B-6. Removing Welch Plugs.

- a. Pierce the welch plug with the tip of the tool.

NOTE: To prevent damage to the carburetor, do not allow the tool to strike the carburetor body.

- b. Pry out the welch plug using the tool.

Throttle and Choke Shaft Removal

Further disassembly to remove the throttle shaft and choke shaft is recommended only if these parts are to be cleaned or replaced.

Throttle Shaft Removal

1. Because the edges of throttle plate are beveled, mark the throttle plate and carburetor body with a marking pen to ensure correct reassembly (refer to Figure 6B-7). Also take note of the throttle plate position in bore, and the position of the throttle lever.

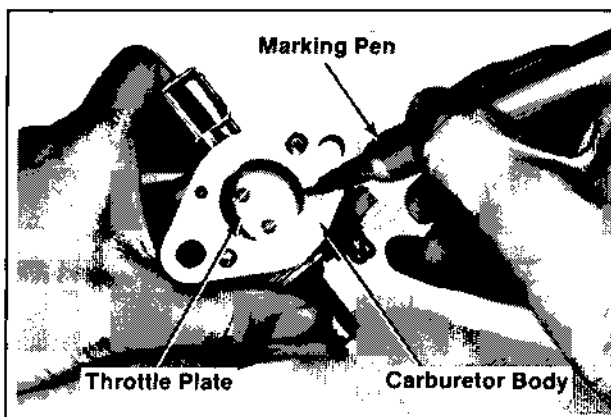


Figure 6B-7. Marking Throttle Plate and Carburetor Body.

2. Carefully and slowly remove the screws securing the throttle plate to throttle shaft. Remove the throttle plate.
3. File off any burrs which may have been left on the throttle shaft when the screws were removed. Do this **before** removing the throttle shaft from carburetor body.
4. Remove the throttle lever/shaft assembly with foam dust seal from carburetor body.

Choke Shaft Removal

1. Because the edges of choke plate are beveled, mark the choke plate and carburetor body with a marking pen to ensure correct reassembly (refer to Figure 6B-8). Also take note of the choke plate position in bore, and the position of the choke lever.

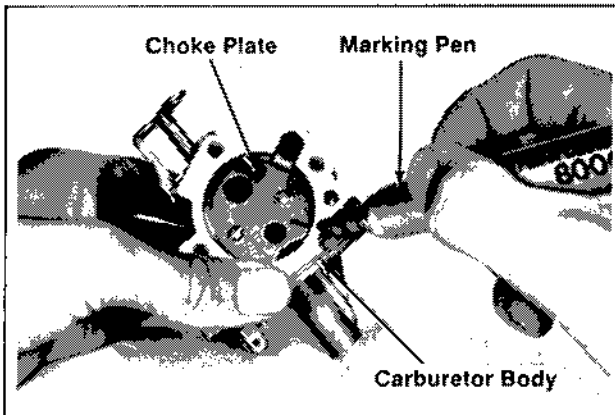


Figure 6B-8. Marking Choke Plate and Carburetor Body.

2. Carefully and slowly remove the screws securing the choke plate to choke shaft. Remove the choke plate.
3. File off any burrs which may have been left on the choke shaft when the screws were removed. Do this **before** removing the choke shaft from carburetor body.
4. Rotate the choke shaft until the cutout portion of shaft is facing the air cleaner mounting surface (refer to Figure 6B-9). Place the carburetor body on workbench with choke side down. Remove the choke lever/shaft assembly from carburetor body; the detent ball and spring will drop out.

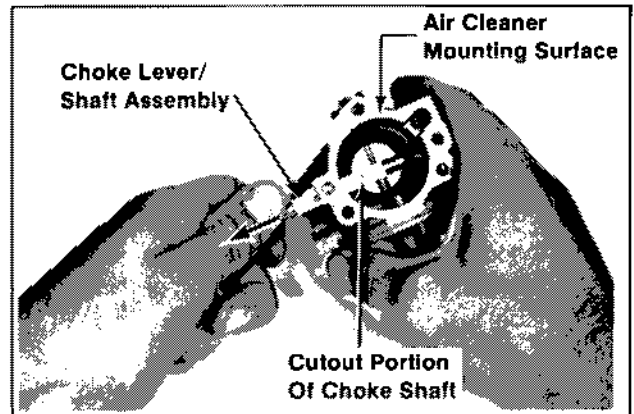


Figure 6B-9. Removing Choke Lever/Shaft.

Cleaning



WARNING: Flammable Solvents!

Carburetor cleaners and solvents are extremely flammable. Keep sparks, flames, and other sources of ignition away from the area. Follow the cleaner manufacturer's warnings and instructions on its proper and safe use. Never use gasoline as a cleaning agent.

All parts should be carefully cleaned using a carburetor cleaner (such as acetone). Be sure all gum deposits are removed from the following areas:

- **Carburetor body and bore;** especially the areas where the throttle plate, choke plate, and shafts are seated.
- **Idle fuel and "off-idle" ports in carburetor bore, main jet, bowl vent, and fuel inlet seat.**

NOTE: These areas can be cleaned using a piece of fine wire in addition to cleaners. Be careful not to enlarge the ports, or break the cleaning wire within ports. Blow out all passages with compressed air.

- **Float and float hinge.**
- **Fuel Bowl.**
- **Throttle plate, choke plate, throttle shaft, and choke shaft.**

NOTE: Do not submerge the carburetor in cleaner or solvents when fiber, rubber, or foam seals or gaskets, or the fuel inlet needle are installed. The cleaner may damage these parts.

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Inspection

Carefully inspect all components and replace those that are worn or damaged.

- Inspect the carburetor body for cracks, holes, and other wear or damage.
- Inspect the float for cracks or holes. Check the float hinge for wear, and missing or damaged float tabs.
- Inspect the fuel inlet needle for wear or grooves.
- Inspect the tip of the idle fuel adjusting needle for wear or grooves.
- Inspect the throttle and choke shaft and plate assemblies for wear or excessive play.

Repair

Always use new gaskets when servicing and reinstalling carburetors. Repair kits are available which include new gaskets and other components. These kits are described below.

Components such as the throttle and choke shaft assemblies, throttle plate, choke plate, idle fuel needle, main jet, and others, are available separately.

Refer to the appropriate Parts Manual to ensure the correct carburetor repair kits and replacement parts are ordered.

Carburetor Repair Kit No. 25 757 11
(For WHG-Series 1") Contains:

Qty.	Description
3	Gasket, carburetor (3 different styles)
4	Gasket, air cleaner (4 different styles)
1	Gasket, fuel bowl
1	Gasket, bowl retaining screw
1	Plug, 3/8" dia. welch
1	Plug, 5/16" dia. welch
1	Needle, fuel inlet
1	Valve, fuel inlet assembly

Float Assembly Kit No. 25 757 09
(For WHG-Series Carbs.) Contains:

Qty.	Description
1	Float Assembly
1	Float Pin

Reassembly

Throttle Shaft Installation

1. Install the foam dust seal on throttle shaft. Insert the throttle lever/shaft assembly into carburetor body with the cutout portion of shaft facing the carburetor mounting flange.
2. Install the throttle plate to throttle shaft. Make sure the plate is positioned properly in bore as marked and noted during disassembly (the numbers stamped on plate should face the carburetor mounting flange). Apply Loctite® #609 to threads of 2 plate retaining screws. Install screws so they are slightly loose.
3. Apply finger pressure to the throttle lever/shaft to keep it firmly seated against pivot in carburetor body. Rotate the throttle shaft until the throttle plate fully closes the bore around its entire perimeter; then tighten screws. Refer to Figure 6B-10.

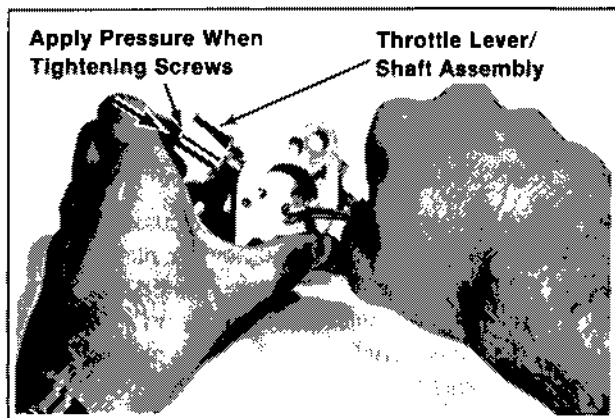


Figure 6B-10. Installing Throttle Lever/Shaft.

4. Operate the throttle lever; check for binding between the throttle plate and carburetor bore. Loosen screws and adjust throttle plate as necessary; then torque screws to 8/12 in. lb.

Choke Shaft Installation

1. Install the detent spring and ball into the carburetor body.

NOTE: If the detent ball does not drop through the tapped air cleaner base screw hole by its own weight, do not force it. Forcing the ball could permanently lodge it in the hole.

Install the ball through the choke shaft bore instead.

2. Compress the detent ball and spring. Insert the choke lever/shaft assembly into carburetor body with the cutout portion of shaft facing the air cleaner mounting surface (refer to Figure 6B-11). Make sure the choke lever is on the correct side of carburetor body.

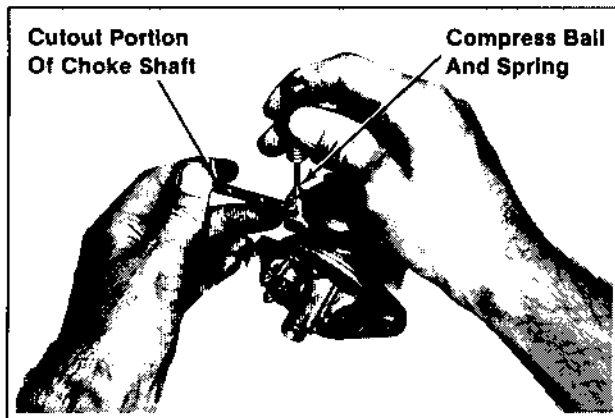


Figure 6B-11. Installing Choke Lever/Shaft.

3. Install the choke plate to choke shaft. Make sure the plate is positioned properly in bore as marked and noted during disassembly. (The numbers stamped on plate should face the air cleaner mounting surface and be upright.) Apply Loctite® #609 to threads of 2 plate retaining screws. Install the screws so they are slightly loose.
4. Operate the choke lever; check for binding between the choke plate and carburetor bore. Adjust plate as necessary; then torque screws to **8/12 in. lb.**

Carburetor Reassembly

1. If the welch plugs have been removed for cleaning, new welch plugs must be installed. Use tool No. KO1017 and the following procedure to install the welch plugs.
 - a. Position the carburetor body securely with the welch plug cavities to the top.
 - b. Place a new welch plug into the cavity with the raised portion up. Use the end of the tool that is about the same size as plug and **flatten** the plug. Do not force the plug below the top surface. Refer to Figure 6B-12.

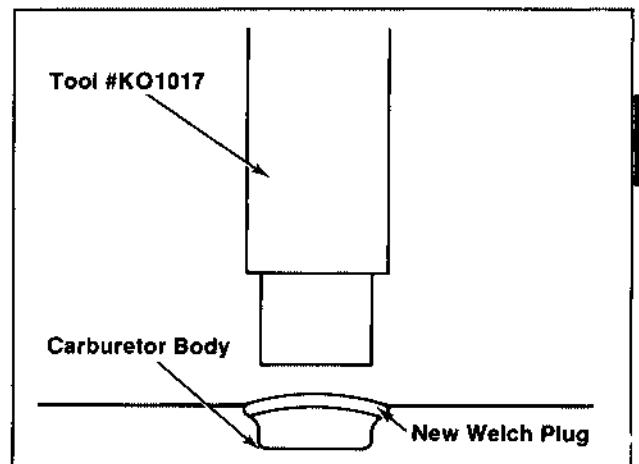


Figure 6B-12. Installing Welch Plugs.

- c. After welch plugs are installed, seal the exposed surface with Glyptal™ (or an equivalent sealant). Allow the sealant to dry.

NOTE: If a commercial sealant is not available, fingernail polish can be used.

2. Install the main fuel jet and torque to **12/16 in. lb.**
3. Install fuel inlet needle/clip assembly, attach clip to the adjusting tab on float as shown in Figure 6B-13, slowly lower float into position in seat.
4. **Set Float Level:** Invert the carburetor so the float tab rests on the fuel inlet needle. The exposed surface of float should be **parallel** with the bowl gasket surface of the carburetor body (exposed, free end of float .690"/.720" from bowl gasket surface). Refer to Figure 6B-14.

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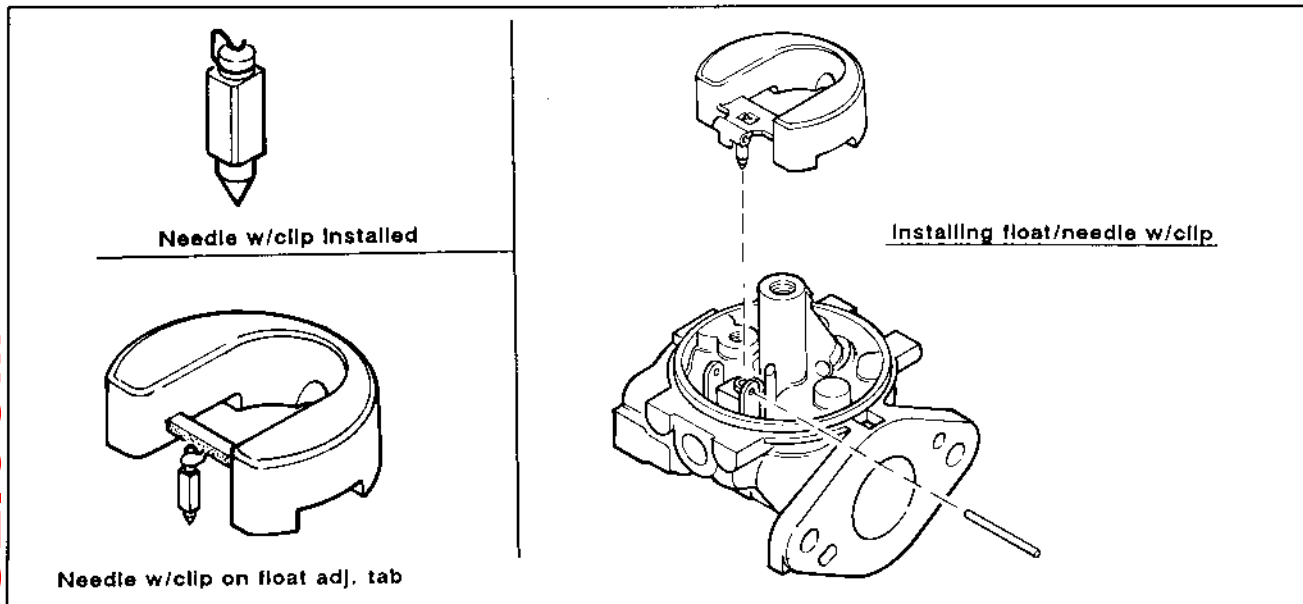


Figure 6B-13. Fuel Needle Clip.

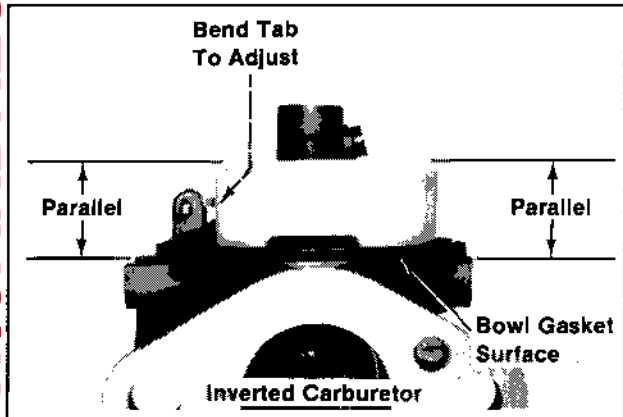


Figure 6B-14. Setting Float Level.

Bend the float tab with a small screwdriver to adjust.

5. Install a new bowl gasket and the fuel bowl. Make sure the bowl gasket and bowl are centered and positioned properly to ensure a good seal.
6. Install a new bowl retaining screw gasket and the bowl retaining screw. Torque screw to **45/55 In. lb.**
7. Install the idle speed adjusting screw and spring.

8. Install the idle fuel adjusting needle and spring. Turn the adjusting needle **In** (clockwise) until it bottoms **lightly**.

NOTE: The tip of the idle fuel adjusting needle is tapered to critical dimensions. Damage to the needle and the seat in carburetor body will result if the needle is forced.

9. Turn the idle fuel needle **out** (counterclockwise) from lightly bottomed according to the instructions in the "Adjustment" portion of this Section.

**High Altitude Operation
(Fixed Main Carburetors)**

When operating the engine at high altitudes, the main fuel mixture tends to get over rich. An over rich mixture can cause conditions such as black, sooty exhaust smoke, misfiring, loss of speed and power, poor fuel economy, and poor or slow governor response.

To compensate for this, a special high altitude main fuel jet is available for each carburetor. The high altitude main fuel jet is sold in a kit which includes the jet and necessary gaskets.

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The following table lists the kits and the altitudes above which the kits should be used.

Engine Model	Kit No.	Altitude
M18	52 755 74	6000 ft.
M20	52 755 68	6000 ft.

High Altitude Jet Installation

1. Remove the fuel bowl retaining screw, retaining screw gasket, fuel bowl, and bowl gasket.

NOTE: If necessary, remove the air cleaner and carburetor from engine to make fuel bowl removal easier.

2. Remove the float pin, float, and fuel inlet needle.
3. Remove the existing main fuel jet.
4. Install the new high altitude main fuel jet and torque to **12/16 in. lb.**
5. Reinstall the fuel inlet needle, float, and float pin.
6. Install the new bowl gasket from kit and the fuel bowl. Make sure the bowl gasket and bowl are centered and positioned properly to ensure a good seal.
7. Install the new bowl retaining screw gasket from kit and the bowl retaining screw. Torque screw to **45/55 in. lb.**
8. Reinstall the carburetor and air cleaner to engine as necessary using the new gaskets from kit.

M20 Linkage and Dampening Spring Installation

M20 engines built between Serial No. 1619504216 and 1631600816 inclusive were built with a dampening spring connected to the governor arm and the bushing in carburetor throttle lever. The dampening spring can be eliminated by installing a new governor linkage and new bushings as shown in Figure 6B-15. These parts are available in Kit No. 52 755 64.

To reinstall the existing dampening spring, bushings, and governor linkage, use the following procedure:

1. Install the bushings and governor linkage as shown in Figure 6B-15.
2. Install the dampening spring to governor arm and bushing on carburetor throttle lever as shown in Figure 6B-16. Make sure the end of spring with larger hook is installed around the bushing in carburetor throttle lever.

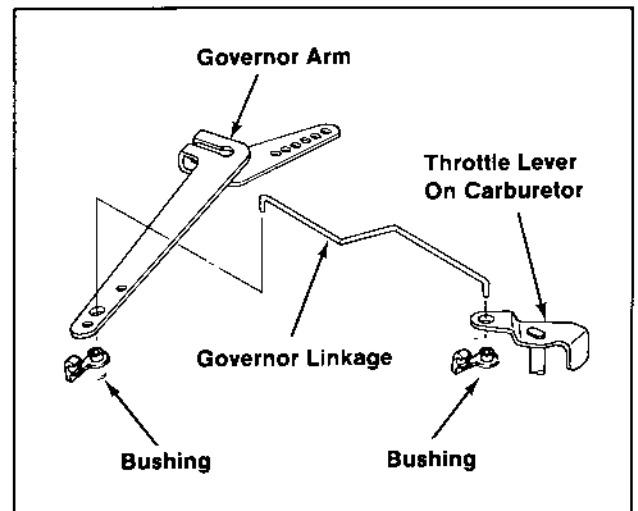


Figure 6B-15. Installing Bushings And Governor Linkage -- M20 Engines.

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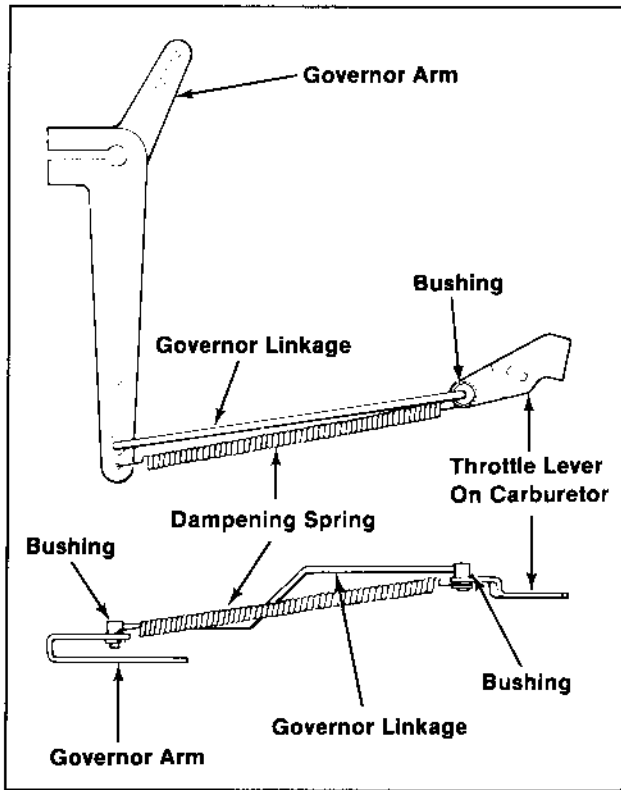


Figure 6B-16. Installing Dampening Spring --
M20 Engines.

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