

Fuel System

CARBURETORS



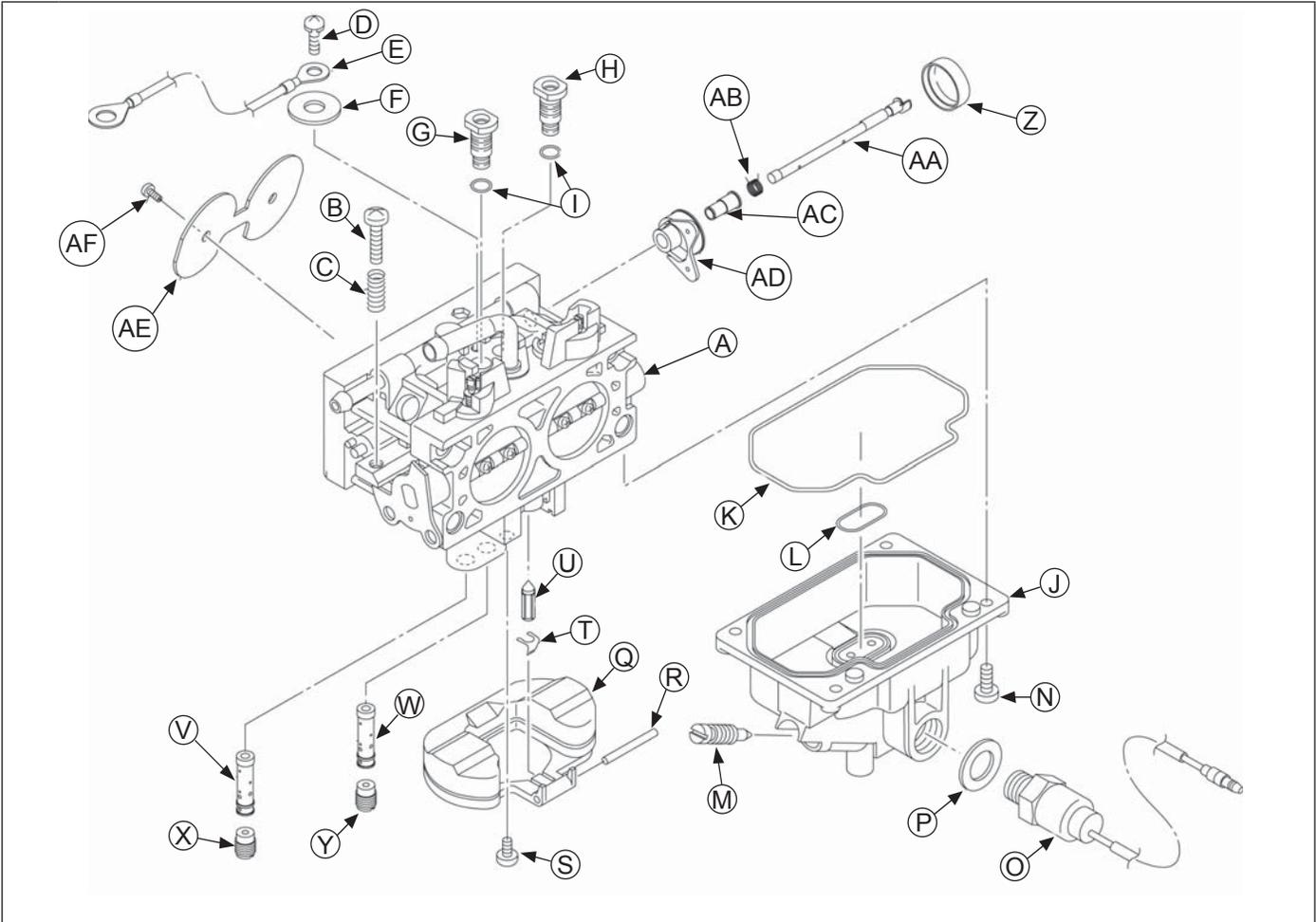
WARNING

Explosive Fuel can cause fires and severe burns.

Do not fill fuel tank while engine is hot or running.

Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well ventilated, unoccupied buildings, away from sparks or flames. Spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Never use gasoline as a cleaning agent.

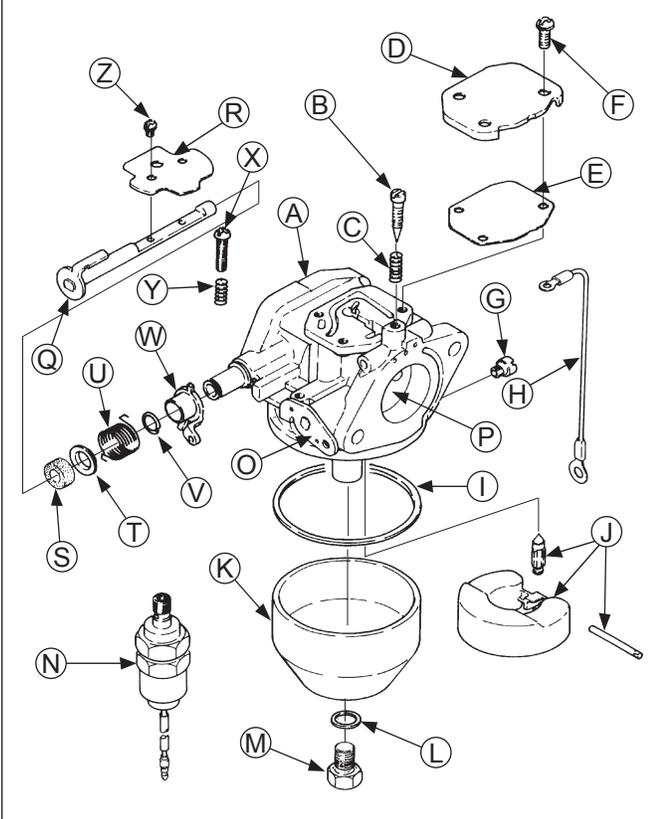
Keihin Two-Barrel Carburetor Components



| | | | | | | | | | |
|----|-----------------------------|----|--------------------------|----|-----------------------|----|---------------------|----|--------------------|
| A | Carburetor Body Subassembly | B | Idle Speed Screw | C | Idle Speed Spring | D | Screw | E | Ground Lead |
| F | Retaining Washer | G | Slow Jet-Right Side | H | Slow Jet-Left Side | I | O-ring (Slow Jet) | J | Fuel Bowl |
| K | O-ring (Fuel Bowl-Upper) | L | O-ring (Fuel Bowl-Lower) | M | Drain Screw | N | Bowl Screw | O | Fuel Solenoid |
| P | Sealing Washer | Q | Float | R | Pin | S | Screw | T | Float Clip |
| U | Float Valve/Inlet Needle | V | Main Nozzle-Right Side | W | Main Nozzle-Left Side | X | Main Jet-Right Side | Y | Main Jet-Left Side |
| Z | Choke Dust Cap | AA | Choke Shaft | AB | Spring | AC | Bushing | AD | Choke Lever |
| AE | Choke Plate | AF | Choke Plate Screw | | | | | | |

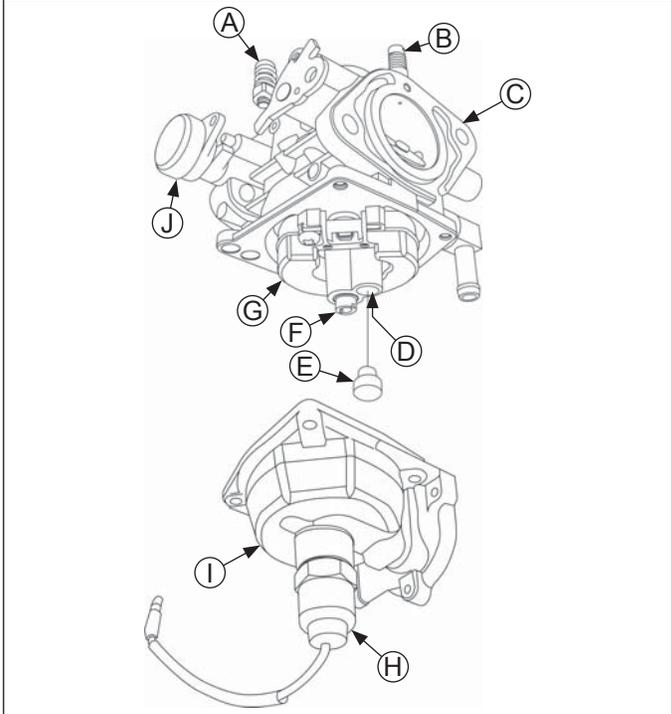
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Nikki One-Barrel Carburetor Components



| | | | |
|---|----------------------------|---|-----------------------------|
| A | Carburetor Body | B | Idle Fuel Adjusting Screw |
| C | Idle Fuel Adjusting Spring | D | Passage Cover |
| E | Cover Gasket | F | Cover Retaining Screw |
| G | Main Jet | H | Ground Lead (Solenoid Only) |
| I | Fuel Bowl Gasket | J | Float Kit |
| K | Fuel Bowl | L | Bowl Retaining Screw Gasket |
| M | Bowl Retaining Screw | N | Shut-off Solenoid Assembly |
| O | Throttle Shaft/Lever | P | Throttle Plate |
| Q | Choke Shaft | R | Choke Plate |
| S | Air Filter | T | Collar |
| U | Spring | V | Ring |
| W | Choke Lever | X | Idle Speed Screw |
| Y | Idle Speed Spring | Z | Setscrews |

Keihin One-Barrel Carburetor Components



| | | | |
|---|------------------|---|----------------------------|
| A | Idle Speed Screw | B | Idle Fuel Adjusting Screw |
| C | Carburetor Body | D | Idle Jet |
| E | Plug | F | Main Jet |
| G | Float | H | Shut-off Solenoid Assembly |
| I | Fuel Bowl | J | Choke Lever |

CV17-740 engines in this series are equipped with either a Nikki or Keihin one-barrel, fixed main jet carburetor. Some applications use a fuel shut-off solenoid installed in place of fuel bowl retaining screw, and also an accelerator pump. All carburetors feature a self-relieving choke.

CV750 engines in this series are equipped with a Keihin two-barrel side draft design with fixed main jets. A self-relieving choke similar to that used on single venturi carburetors is also contained in design.

Troubleshooting Checklist

When engine starts hard, runs roughly or stalls at low idle speed, check following areas before adjusting or disassembling carburetor.

1. Make sure fuel tank is filled with clean, fresh gasoline.
2. Make sure fuel tank cap vent is not blocked and that it is operating properly.
3. Make sure fuel is reaching carburetor. This includes checking fuel shut-off valve, fuel tank filter screen, in-line fuel filter, fuel lines and fuel pump for restrictions or faulty components as necessary.
4. Make sure air cleaner base and carburetor are securely fastened to engine using gaskets in good condition.

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5. Make sure air cleaner element (including precleaner if equipped) is clean and all air cleaner components are fastened securely.
6. Make sure ignition system, governor system, exhaust system, and throttle and choke controls are operating properly.

Troubleshooting-Carburetor Related Causes

| Condition | Possible Cause | Conclusion |
|--|---|--|
| Engine starts hard, runs rough, or stalls at idle speed. | Low idle fuel mixture/speed improperly adjusted. | Adjust low idle speed tab, then adjust low idle fuel needle. |
| Engine runs rich (indicated by black, sooty exhaust smoke, misfiring, loss of speed and power, governor hunting, or excessive throttle opening). | Clogged air cleaner. | Clean or replace air cleaner. |
| | Choke partially closed during operation. | Check choke lever/linkage to ensure choke is operating properly. |
| | Low idle fuel mixture is improperly adjusted. | Adjust low idle fuel needle. |
| | Float level is set too high. | Separate fuel bowl from carburetor body. Free (if stuck), or replace float. |
| | Dirt under fuel inlet needle. | Remove needle; clean needle and seat and blow with compressed air. |
| | Bowl vent or air bleeds plugged. | Remove low idle fuel adjusting needle. Clean vent, ports, and air bleeds. Blow out all passages with compressed air. |
| Engine runs lean (indicated by misfiring, loss of speed and power, governor hunting, or excessive throttle opening). | Leaky, cracked, or damaged float. | Submerge float to check for leaks. |
| | Low idle fuel mixture is improperly adjusted. | Adjust low idle fuel needle. |
| | Float level is set too low. | Separate fuel bowl from carburetor body. Free (if stuck), or replace float. |
| Fuel leaks from carburetor. | Idle holes plugged; dirt in fuel delivery channels. | Remove low idle fuel adjusting needle. Clean main fuel jet and all passages; blow out with compressed air. |
| | Float stuck. | Separate fuel bowl from carburetor body. Free (if stuck), or replace float. |
| | Dirt under fuel inlet needle. | Remove needle; clean needle and seat and blow with compressed air. |
| | Bowl vents plugged. | Blow out with compressed air. |
| | Carburetor bowl gasket leaks. | Replace gasket. |

Fuel Shut-Off Solenoid

Most carburetors are equipped with a fuel shut-off solenoid. Solenoid is attached to fuel bowl. Solenoid has a spring-loaded pin that retracts when 12 volts is applied to lead, allowing fuel flow to main jet. When current is removed, pin extends blocking fuel flow.

Below is a simple test, performed with engine off, that can determine if solenoid is functioning properly:

1. Shut off fuel and remove solenoid from carburetor. When solenoid is loosened and removed, gas will leak out of carburetor. Have a container ready to catch fuel.
2. Wipe tip of solenoid with a shop towel or blow with compressed air to remove any remaining fuel. Take solenoid to a location with good ventilation and no fuel vapors present. You will also need a 12 volt power source that can be switched on and off.
3. Be sure power source is switched OFF. Connect positive power source lead to red lead of solenoid. Connect negative power source lead to solenoid body.
4. Turn power source ON and observe pin in center of solenoid. Pin should retract with power ON and return to its original position with power OFF. Test several times to verify operation.

Carburetor Circuits

Float

Fuel level in bowl is maintained by float and fuel inlet needle. Buoyant force of float stops fuel flow when engine is at rest. When fuel is being consumed, float will drop and fuel pressure will push inlet needle away from seat, allowing more fuel to enter bowl. When demand ceases, buoyant force of float will again overcome fuel pressure, rising to predetermined setting and stop flow.

Slow and Mid-Range

At low speeds engine operates only on slow circuit. As a metered amount of air is drawn through slow air bleed jets, fuel is drawn through main jet and further metered through slow jet. Air and fuel are mixed in body of slow jet and exit to idle progression (transfer port) chamber. From idle progression chamber, air fuel mixture is metered through idle port passage. At low idle air/fuel mixture is controlled by setting of idle fuel adjusting screws. This mixture is then mixed with main body of air and delivered to engine. As throttle plate opening increases, greater amounts of air/fuel mixture are drawn in through fixed and metered idle progression holes. As throttle plate opens further, vacuum signal becomes great enough at venturi so main circuit begins to work.

Main (high-speed)

At high speeds/loads engine operates on main circuit. As a metered amount of air is drawn through air jet, fuel is drawn through main jet. Air and fuel are mixed in main nozzles then enters main body of airflow where further mixing of fuel and air occurs. This mixture is then delivered to combustion chamber. Carburetor has a fixed main circuit; no adjustment is possible.

Carburetor Adjustments

NOTE: Carburetor adjustments should be made only after engine has warmed up.

Carburetor is designed to deliver correct fuel-to-air mixture to engine under all operating conditions. Main fuel jet is calibrated at factory and is not adjustable. Idle fuel adjusting needles are also set at factory and normally do not need adjustment.

Low Idle Speed (RPM) Adjustment

NOTE: Actual low idle speed depends on application. Refer to equipment manufacturer's recommendations. Low idle speed for basic engines is 1200 RPM.

Place throttle control into idle or slow position. Turn low idle speed adjusting screw in or out to obtain allow idle speed of 1200 RPM (± 75 RPM).

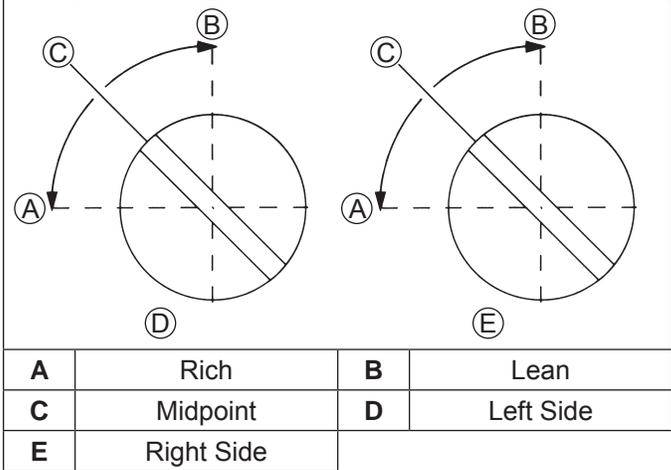
Governed Idle Speed Adjustment (If equipped)

1. Hold governor lever away from carburetor so throttle lever is against idle speed (RPM) adjustment screw of carburetor. Start engine and allow to warm up, then adjust screw to set approximately 1200 RPM. Check speed using a tachometer. Turn adjustment screw (inner) clockwise (in) to increase or counterclockwise (out) to decrease speed.

2. Release governor lever and check that throttle lever is in idle position. Turn governed idle adjustment screw to obtain equipment manufacturer's recommended idle speed (1500-1800 RPM). Some engines have a bendable tab that is used to set this speed. A pliers should be used to bend this tab to achieve recommended speed. Governed idle speed (RPM) is typically 300 RPM (approximate) higher than low idle speed.
3. Move throttle lever to wide-open/full throttle position and hold in this position. Turn high speed screw to obtain intended high speed no-load RPM. Governed idle speed must be set before making this adjustment.

Low Idle Fuel Adjustment

Optimum Low Idle Fuel Setting



NOTE: Engines will have fixed low idle or limiter caps on idle fuel adjusting needles. Step 2 can only be performed within limits allowed by cap. Do not attempt to remove limiter caps.

1. Place throttle control into idle or slow position. Adjust low idle speed to 1200 RPM. Follow Low Idle Speed (RPM) Adjustment.
2. Low idle fuel needle(s) setting: place throttle into idle or slow position.
 - a. Turn 1 low idle fuel adjusting needle out (counterclockwise) from preliminary setting until engine speed decreases (rich). Note position of needle. Now turn adjusting needle in (clockwise). Engine speed may increase, then it will decrease as needle is turned in (lean). Note position of needle. Set adjusting needle midway between rich and lean settings.
 - b. Repeat procedure on other low idle adjustment needle (two-barrel carburetor only).
3. Recheck/adjust Low Idle Speed (RPM) to specified setting.

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High Speed (RPM) Adjustment

1. With engine running, move throttle control to fast.
2. Turn inner adjustment screw outward to decrease, or inward to increase RPM speed. Courage singles require loosening screws on speed control bracket and sliding towards carburetor to lower and away from carburetor to increase speed.

Carburetor Servicing

| | |
|--|--|
|  | ⚠ WARNING |
|  | Accidental Starts can cause severe injury or death. |
|  | Disconnect and ground spark plug lead(s) before servicing. |
| Before working on engine or equipment, disable engine as follows: 1) Disconnect spark plug lead(s). 2) Disconnect negative (-) battery cable from battery. | |

NOTE: Main and slow jets are fixed and size specific and can be removed if required. Fixed jets for high altitudes are available.

- Inspect carburetor body for cracks, holes, and other wear or damage.
 - Inspect float for cracks, holes, and missing or damaged float tabs. Check float hinge and shaft for wear or damage.
 - Inspect fuel inlet needle and seat for wear or damage.
 - Inspect spring loaded choke plate to make sure it moves freely on shaft.
1. Perform removal procedures for appropriate air cleaner and carburetor outlined in Disassembly.
 2. Clean exterior surfaces of dirt or foreign material before disassembling carburetor. Remove bowl retaining screws, or solenoid assembly on most single cylinder engines, and carefully separate fuel bowl from carburetor. Do not damage fuel bowl O-rings. Transfer any remaining fuel into an approved container. Save all parts. Fuel can also be drained prior to bowl removal by loosening/removing bowl drain screw.
 3. Remove float pin (some carburetors may have a screw which requires removal), and inlet needle. Seat for inlet needle is not serviceable and should not be removed.
 4. Clean carburetor bowl and inlet seat areas as required.
 5. Carefully remove main jets from carburetor. For two-barrel carburetors, note and mark jets by location for proper reassembly. Main jets may be size/side specific. After main jets are removed, on some carburetors, main nozzles can be removed

through bottom of main towers. Note orientation/direction of nozzles. End with 2 raised shoulders should be out/down adjacent to main jets. Save parts for cleaning and reuse.

6. Position of slow jet varies and is removable only on some styles of carburetors. See correct illustration for corresponding style of carburetor showing location. (On two-barrel carburetors, slow jets may be sized to specific side. Mark or tag jets for proper reassembly. Note small O-ring on bottom of each jet.) Save parts for cleaning and reuse unless a jet kit is also being installed. Clean slow jets using compressed air. Do not use wire or carburetor cleaner.

Carburetor is now disassembled for appropriate cleaning and installation of parts in overhaul kit. See instructions provided with repair kits for more detailed information.

High Altitude Operation

Engines may require a high altitude carburetor kit to ensure correct engine operation at altitudes above 1219 meters (4000 ft.). To obtain high altitude kit information or to find a Kohler authorized dealer visit KohlerEngines.com or call 1-800-544-2444 (U.S. and Canada).

This engine should be operated in its original configuration below 1219 meters (4000 ft.) as damage may occur if high altitude carburetor kit is installed and operated below 1219 meters (4000 ft.).

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