

MIKUNI

**PHH CARBURETOR
SERVICE MANUAL**



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1. PURPOSE OF A CARBURETOR:

The purpose of the carburetor is to prepare and supply a mixture of fuel and air, in proper proportions to the engine cylinders. The functions of the carburetor can be summarized as follows:

- 1) To produce a combustible air-fuel mixture, by breaking fuel into tiny particles in the form of vapor.
- 2) To produce a proper mixture of fuel and air according to the operating conditions of the engine. The ratio of fuel to air required by the engine varies with the engine's operating conditions. While the air-fuel mixture in relation to the operating conditions depends more or less on the type and shape of the engine, a mixture ratio as shown in Fig. 1 is generally required.
- 3) To regulate the engine output power by adjusting the amount of air-fuel mixture that is supplied to the cylinders.

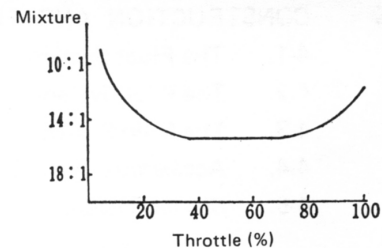


FIG. 1

2. FEATURES OF PHH-TYPE CARBURETORS:

PHH-type carburetors have been developed for vehicles such as sports and racing cars, with two air suction ports integrated into one (twin-choke). The features of this carburetor among others are:

- 1) **Maneuverability** — This carburetor maintains uniform performance even under conditions other than smooth, level riding. This carburetor allows sudden turning as well as excellent acceleration and deceleration because the twin-type float and the float hinge are located so as to minimize the changes in the fuel level in the float chamber.
- 2) **High Suction Efficiency** — Employment of a starter instead of a choke valve for improved air suction efficiency gives the outstanding maximum power of the engine.
- 3) **Easy Maintenance** — Jets can be replaced simply by removing jet chamber cover. Also removing and replacing of the venturi, pump nozzle, etc., can be done easily without removing the carburetor from the engine.
- 4) **Diaphragm-type Acceleration Pump** — Since the acceleration pump is of diaphragm type, there is no drop in effectiveness as in the piston-type pump. Pump nozzle is easy to remove and replace from the outside.
- 5) **Single Float Circuit** — Fuel is supplied to two choke tubes from the single float circuit. This serves to stabilize the float level and troubleshooting is made easy.

- 6) **Light Weight** – The main body is made of aluminum alloy and the overall weight of the carburetor has been greatly reduced.

3. SELECTION OF CARBURETOR MODEL:

3-1. PHH-Type Carburetor Model

PHH-type carburetors come in two different models, namely, 40PHH and 44PHH.

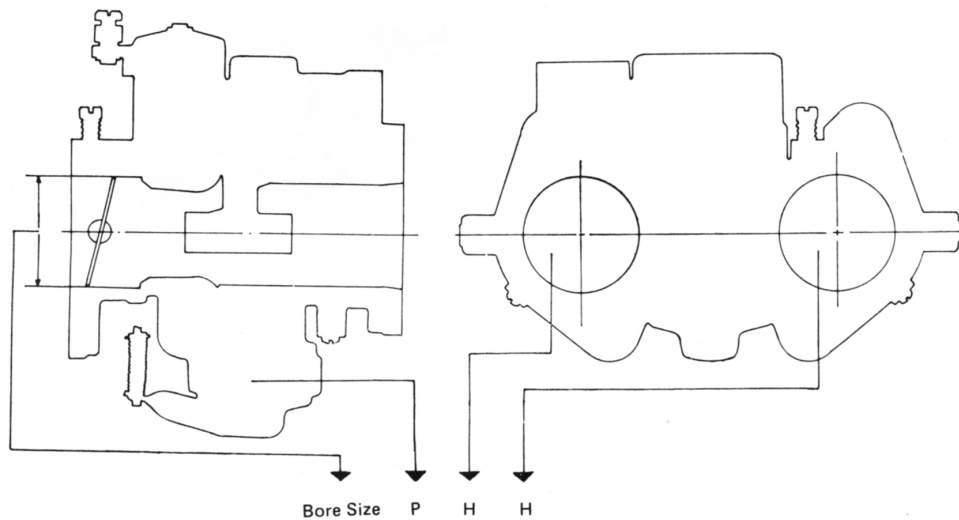


FIG. 2

The first two-digit numeral denotes the bore size in millimeters. The letter "P" means accelerator pump, while the letter "HH" means horizontal compound carburetor.

3-2. Selection of Carburetor Size

It is difficult to theoretically determine the size of carburetor, even if the capacity of given engines is the same, because there are various factors involved such as difference in air cleaner suction resistance, the shape of intake manifold, the shape of suction and exhaust cams. Therefore, make provisional selection based on the following formula and then determine the best size after running the test with sizes close to the tentatively-selected size.

$$D = 0.82 \sqrt{CN}$$

$$d = 0.65 \sqrt{CN}$$

Where: D is carburetor bore size (mm)
 C is capacity per cylinder (cm³)
 N is maximum rpm
 d is venturi size (mm)

4. CONSTRUCTION AND FUNCTIONS:

Since the carburetor is of twin-choke type, most of the components fitted to the carburetor are comprised of two pieces each. For the float system, the accelerator pump system and the starter system, however, one piece each of component is provided so that fuel can be distributed evenly to the left and right suction port.

The carburetor consists of the float system, the pilot system, the main system, the accelerator pump system, and the starter system.

4-1. The Float System

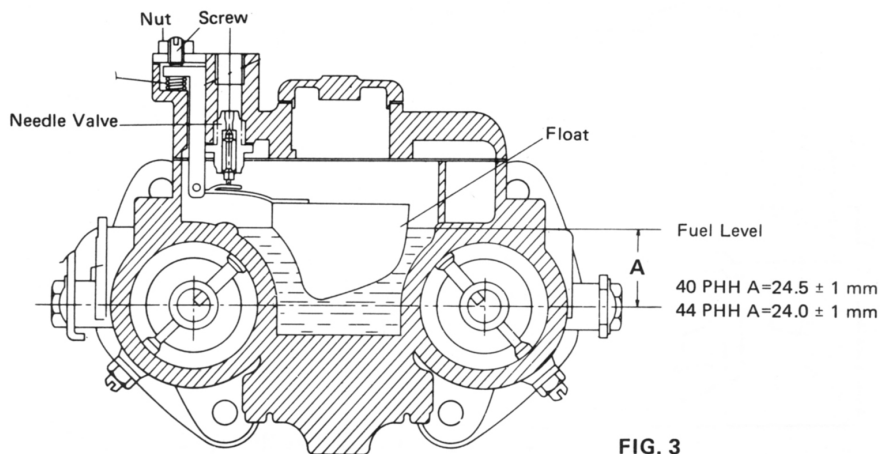


FIG. 3

In order to keep the operating characteristics of the carburetor and its atomization of fuel as nearly constant as possible, it is essential that the fuel level is always maintained at the same level. This is accomplished by means of the float system. The float system consists of a needle valve and a float. Fuel flows from the tank to the float chamber through the fuel pump and needle valve. When a fixed amount of fuel flows to the float chamber, the float rises and when it is in balance with fuel pressure in the fuel pump, the needle valve comes closely in contact and attains the specified height. Refer to Fig. 3.

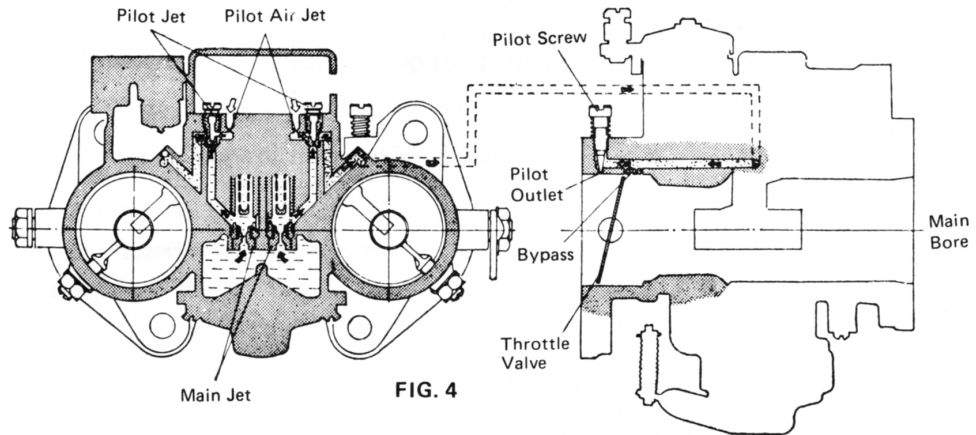
Fuel pressure of the fuel pump has a large bearing on the fuel level in the carburetor. The recommended fuel pressure is between $0.2 \text{ kg/cm}^2 - 0.35 \text{ kg/cm}^2$, or $2.84 \text{ lb/in}^2 - 4.98 \text{ lb/in}^2$.

4-2. The Pilot System

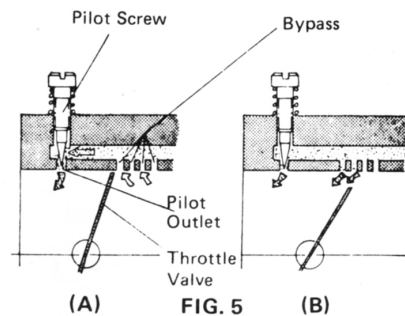
The pilot system is designed to supply the proper amount of mixture for the engine at idling and low and medium speeds. The pilot system comes in two different types, the homogeneous type and the independent type.

A) The Homogeneous Type

The homogeneous-type pilot system shown in Fig. 4, consists of such components as pilot jet, pilot air jet, pilot outlet, pilot screw, bypass, etc. At idling, the throttle valve is almost closed and the negative suction pressure of the engine acts on the manifold side from the throttle valve and the bypass area is nearly in a state of atmospheric pressure.



The fuel is metered with the pilot jets and is mixed with air metered with the pilot air jets. Then air is again drawn from the bypass and fine, atomized particles of rich mixture is supplied to the pilot outlet. The mixture fed into the pilot outlet jets out into the main bore through a clearance between the pilot outlet and the pilot screw and further mixes with a small amount of air flowing through the main bore. Then the air-fuel mixture, in the optimum proportion, is supplied to the engine.



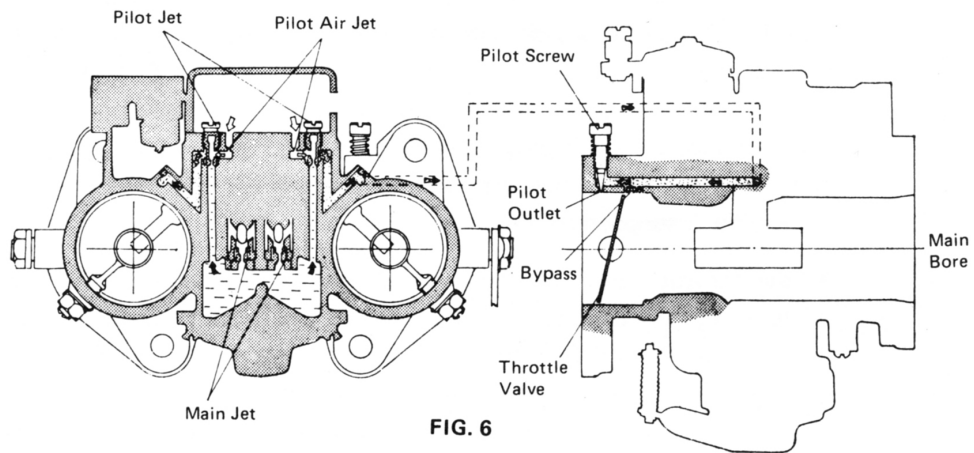
As the throttle valve opens wider and the engine revolutions increase, the air-fuel mixture from the pilot outlet alone becomes insufficient and the shortage is made up for it by the bypass. When the throttle valve is opened beyond the point as shown in Fig. 5(B), the negative pressure will act on the bypass area too, causing the mixture to jet out. To be more specific, the mixture jets out from the first bypass (the hole closest to the throttle valve), the second bypass and the third bypass in the order mentioned, depending on the opening of the throttle valve, with the amount of the air-fuel mixture increasing in proportion to the increase in the amount of air drawn in.

B) The Independent Type

The independent type pilot system shown in Fig. 6 is almost identical to the homogeneous type in terms of functions. As you will note from the comparison with Fig. 4, the former differs from the latter in that the fuel flows directly to the pilot jet from the float chamber.

C) Components

- 1) **Pilot Jet** — The fuel jetting out of the pilot outlet and the bypass is metered with the pilot jet.
- 2) **Pilot Air Jet** — The air that is mixed with the fuel metered with the pilot jet is metered with the pilot air jet.
- 3) **Pilot Outlet and Pilot Screw** — The pilot screw, screwed into the pilot outlet, serves to regulate the air-fuel mixture ratio at idling by increasing or decreasing the sectional area of the pilot outlet with its tapered area.
- 4) **Bypass** — The bypass consists of several holes. When the throttle valve is opened slightly, the bypass serves to facilitate atomization of the fuel as well as to produce a lean mixture by drawing in air. As the throttle valve opens wider, it discharges the mixture and performs as a stop-gap job until the fuel starts flowing from the main system.



4-3. The Main System

The main system supplies the fuel when high output power is required as in medium/high speeds, acceleration, climbing up a slope, etc. Like the pilot system, the main system comes in two different types – the homogeneous type and the independent type.

A) The Homogeneous Type

The homogeneous type main system, as shown in Fig. 7, consists of components such as main jet, main air jet, bleed pipe, jet block, etc. When the throttle valve is opened about 10%-15%, the velocity of air flowing through the venturi area increases and the negative pressure that acts on the main nozzle also increases, causing the air-fuel mixture to start flowing.

At the initial stage of the mixture flow, most of the bleed holes on the bleed pipe remain in the fuel and a small amount of air from the main jet mixes with the fuel. The amount of the mixture is controlled with the negative pressure that acts on the main jet and the main nozzle. As the engine revolutions further pick up and the throttle valve opens still wider, the negative pressure acting on the main nozzle will also increase, resulting in the increased flow of the mixture.

When the throttle valve opens more than 50%, the mixture flow from the main nozzle increases, causing the fuel level in the jet block to drop. This activates all the bleed holes on the bleed pipe for increased effectiveness of bleeding.

With a throttle valve opening of 50% or more, the fuel metered with the main jet and the air metered with the main air jet mix in the bleed pipe, sending the atomized rich mixture from the main nozzle. The mixture then mixes with the air flowing through the main bore in the optimum ratio and is supplied to the engine.

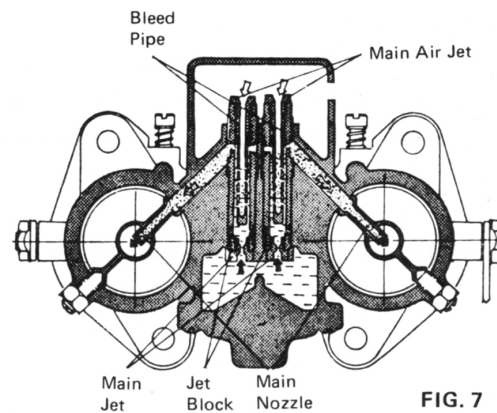


FIG. 7

B) The Independent Type

The independent type main system consists of such components as the main jet, the main air jet, the jet block, etc. The bleed pipe is not fitted to this type of the main system. In terms of function, it is almost the same as the homogeneous type unit, the only difference being that the timing of air-fuel mixture flow from the main nozzle in this system is slightly earlier as compared with the homogeneous type unit.

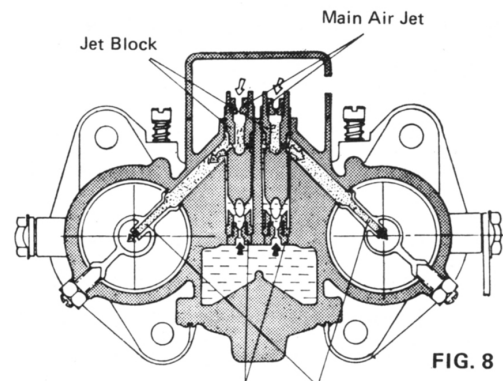


FIG. 8

C) Components

- 1) **Main Jet** – The main jet is for metering the amount of fuel required for medium- and high-speed driving, acceleration, as well as for climbing a slope.
- 2) **Main Air Jet** – The main air jet is used to meter the amount of air that is mixed with the fuel metered with the main jet.
- 3) **Bleed Pipe** – The bleed pipe serves to mix the fuel with air to facilitate atomization of the fuel.

4-4. Accelerator Pump System

When the throttle is opened suddenly to produce rapid acceleration of the engine, the fuel mixture tends to become too lean. This is because the fuel is of greater weight than air, and consequently when the accelerator pedal is depressed suddenly, the flow of fuel will lag behind the flow of the air, resulting in a lean mixture. The accelerator pump is designed to supply the additional fuel needed to overcome this condition. For the construction of the pump, refer to Fig. 9. When the accelerator is depressed quickly, diaphragm is raised through the throttle shaft, rod lever, pump rod, and pump lever. The movement of the diaphragm results in an increase of pressure in the pump chamber. The fuel flow at this point divides into two and flows into the pump nozzle by pushing up the outlet check ball and the weight. The fuel is then jetted evenly to each cylinder from the pump nozzle. The outlet check ball, weight and pump nozzle are provided in two pieces each. The working range of the accelerator pump is from zero to 30% of the throttle valve opening.

Note: Three-step holes are provided at the tip of the pump rod. The middle hole is the standard. To increase the amount of fuel flow, set the cotter pin at the hole on the throttle shaft side. Setting the pin at the bottom hole, on the other hand, will decrease the fuel flow.

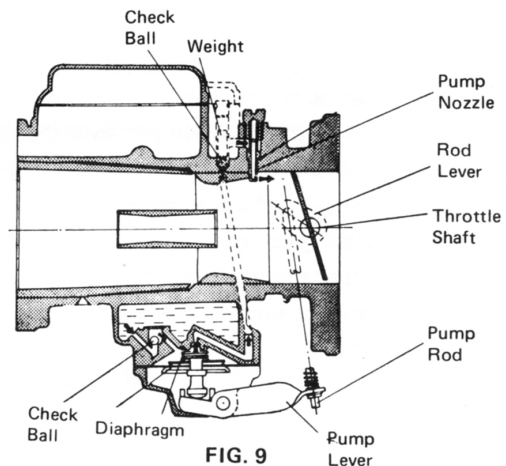


FIG. 9

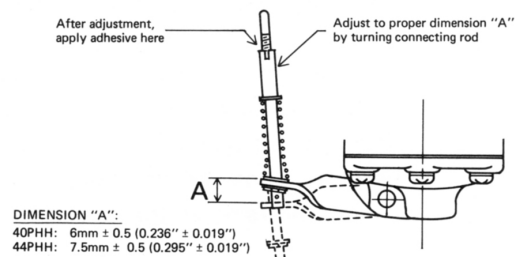


FIG. 10

4-5. Starter System

The PHH-type carburetor employs a starter instead of choke valve for improved suction efficiency. The starter system is composed of such components as starter jet, starter pipe, starter disk, starter cover, etc. Pull on the starter all the way turns the disk through the starter cover, thereby causing the fuel passage to fully open. If the starter is run in this way, the negative pressure will act on the fuel passage through the fuel outlet port. With the aid of this negative pressure, fuel is metered with the starter jet and flows to the starter disk, while it is mixed with the specified amount of air coming from the bleed hole of the starter pipe. The mixture flows into the starter disk further draws air in from a gap between the starter cover and the starter disk to produce the optimum ratio of mixture for starting and then is supplied to each cylinder evenly in two streams through the fuel outlet port. The starter disk comes in a shape as shown in Fig. 12. The pull on the starter knob halfway reduces the fuel flow by half, thereby producing a lean mixture. In the starter system, the throttle valve serves as a choke. Therefore it is important not to depress the accelerator pedal when using the starter. If the accelerator pedal is depressed, the negative pressure acting on the fuel outlet port decreases and causes insufficient suction.

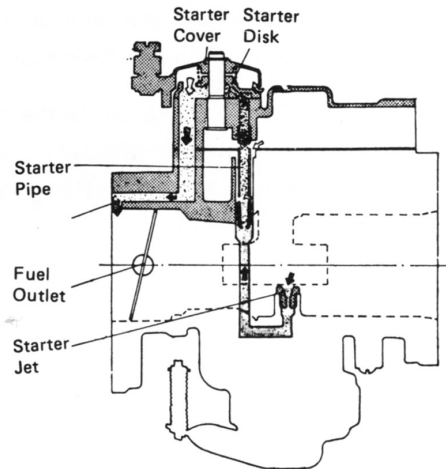
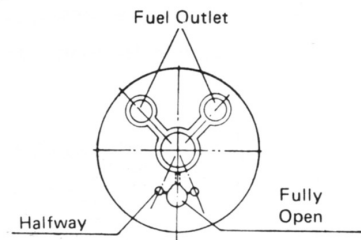


FIG. 11



Starter Disk

FIG. 12

5. MOUNTING ON THE ENGINE AND CARBURETOR ADJUSTMENT:

5-1. Mounting the Carburetor on the Engine

When mounting the PHH-type carburetor on the engine, pay attention to the following points:

- A) Fit the carburetor to the engine snugly so that there will be no air leak. Air leak can cause poor running at low speeds. Be careful of distortion of the carburetor flange surface, manifold flange surface, and deterioration and damage of the packing.
- B) When using more than one carburetor for the engine, carefully fit the starter wire so that the starter for each carburetor works properly. Remember that a pull on the starter knob all the way causes the starter on each carburetor to fully open, and that each starter fully closes when the starter knob returns to its original position.

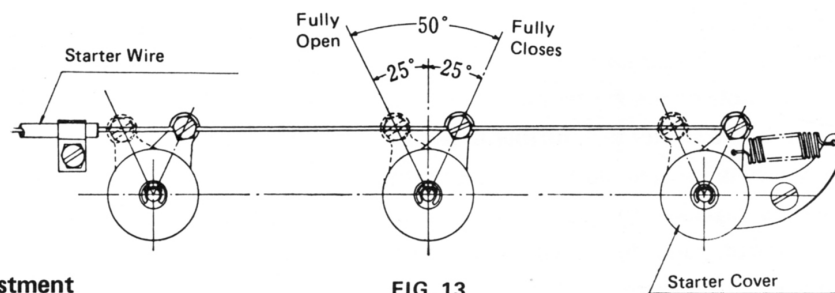


FIG. 13

5-2. Idle Adjustment

When more than one carburetor is used on the engine, synchronizing the carburetors is a prerequisite for the proper operation of the engine. Make it a rule to use a tachometer, a manometer or a flow meter in order to make accurate adjustments.

A) Adjustment Procedure

- 1) First set the pilot screws for each carburetor to the specified number of turns. This is done by carefully turning in the screw until it seats, then backing off the the correct number of turns. Next, set the throttle stop screw of each carburetor by screwing in the throttle stop screw about one turn past the point where the throttle screw comes in contact with the throttle lever.

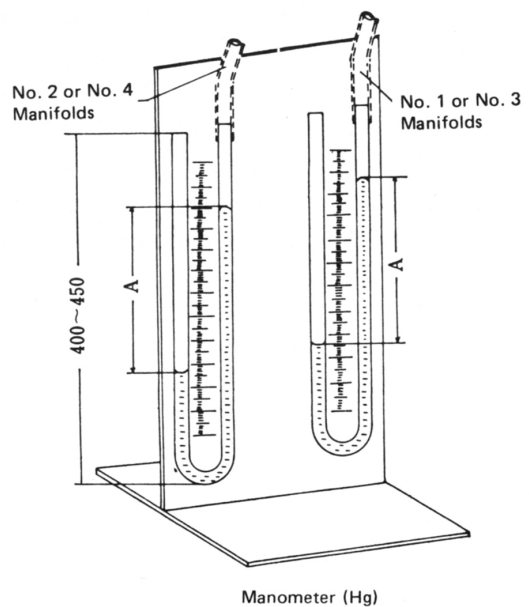


FIG. 14

- 2) Warm up the engine until normal operating temperature is reached, or it reaches the specified temperature.
- 3) In the case of four-cylinder engines, connect a manometer to No. 1 and No. 3 or No. 2 and No. 4 manifolds. If the negative pressure of each manifold measured is not right, set the negative pressure with the adjusting screw. When using a flow meter, take care to keep balance by placing it on the air horn side of No. 1 and No. 3 or No. 2 and No. 4 manifolds.

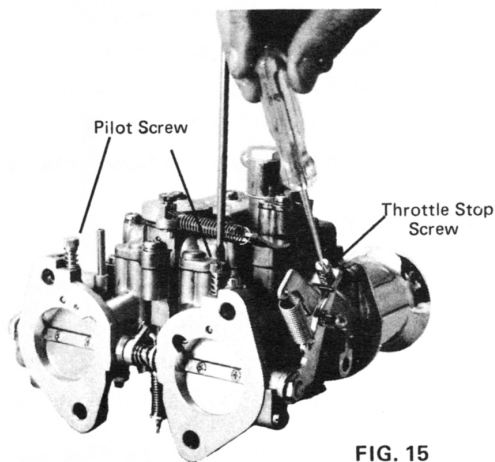


FIG. 15

- 4) Find the position of the highest engine RPM by screwing each pilot screw in and out about 1/8 turn and set the position.
- 5) Decrease the engine RPM to the normal idling speed with the throttle stop screw, and again find the position of the highest engine RPM by screwing each pilot screw in and out about 1/16 turn and then set the position.
- 6) Set the engine at the proper idling RPM with the throttle stop screw.

- Note:
1. When using a flow meter for synchronization of functioning of each carburetor, measure the fuel flow as quickly as possible. (Applying a flow meter to the air duct too long can cause a rich mixture).
 2. The pilot screw and the throttle stop screw have fine threads (0.5mm pitch). Be sure to use a proper tool so as not to damage the threads of the main body.

5-3. Starting

A) To start a cold engine, pull the starter rod as far as you can and turn the starter motor without stepping on the accelerator pedal. After the engine has started, return the starter rod about halfway to warm up the engine. When the engine temperature has reached the operating temperature, return the starter rod to the original position.

B) When the engine is warm (in summertime, for example), start the engine by depressing the accelerator pedal lightly. (Do not use the starter).

Note: If the engine will not start, it is possible that the air-fuel mixture is either rich or lean or that the electrical system is out of order. If a lean or rich mixture is suspected, make adjustment by referring to the troubleshooting section, as per text, page 21.

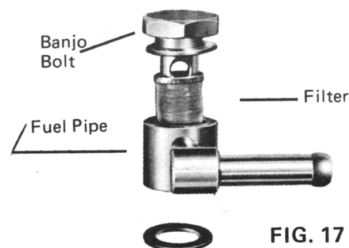
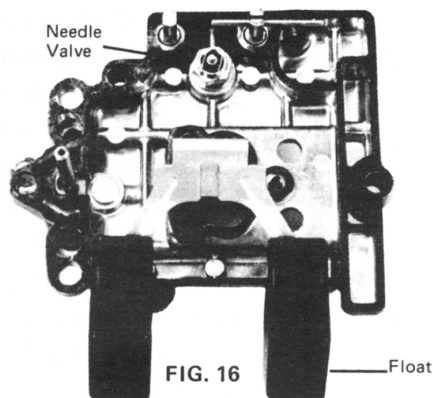
6. OVERHAUL AND MAINTENANCE

Most carburetor malfunctions can be ascribed, with the exception of mechanical breakdowns, to improper air-fuel mixture ratio, which is generally caused by clogged jets, air passages or fuel passages, and to a change in the fuel level. It is therefore important to keep the components clean at all times so that air and fuel will flow properly.

6-1. Float Chamber

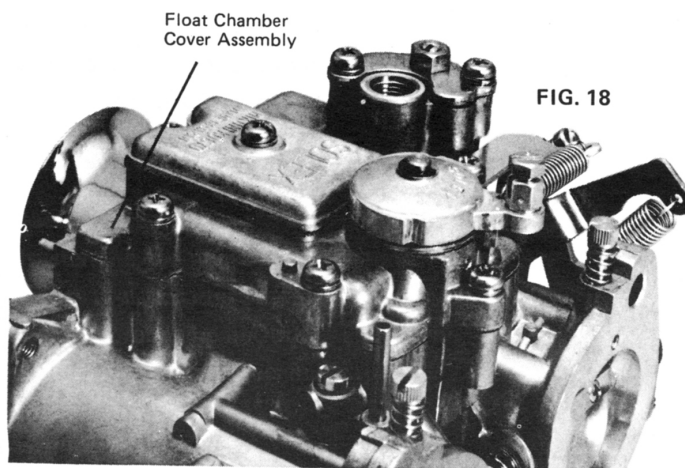
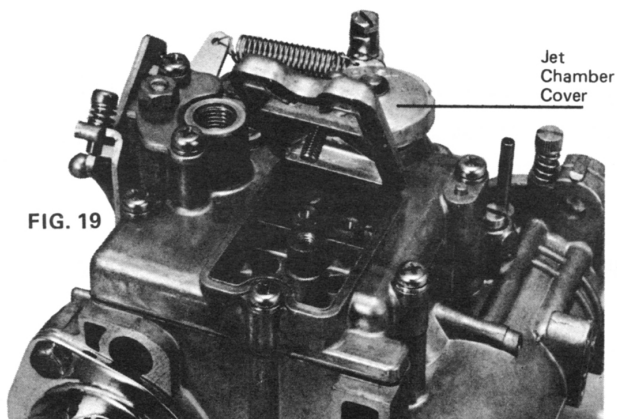
- A) The float chamber cover can be removed by first removing the five screws which retain the float chamber cover. The float chamber cover embodies the needle valve and float.
- B) The fuel pipe and the filter can be separated by removing the banjo bolt. For easier disassembly, remove the banjo bolt from the float chamber cover before you remove the float chamber cover from the carburetor body.

Clogging of the filter causes an insufficient supply of fuel, hindering smooth engine operation. Make it a rule to clean the filter at regular intervals.



6-2. Jets

- A) For access to jets, unscrew the jet chamber cover screw and remove the jet chamber cover.



B) Jets in the homogeneous main system consist of main air jet, bleed pipe, jet block, main jet and pilot jet as shown, Fig. 20-A.

C) Jets in the independent main system consist of main air jet, jet block and main jet as shown, Fig. 20-B.

- Notes:
1. When jets are removed, clean the mounting holes without fail.
 2. When cleaning jets, use a cleaning material and dry with an air compressor. Never use a wire or a drill for cleaning.
 3. When removing and replacing jets, be careful not to damage them with tools. Use proper screwdrivers.

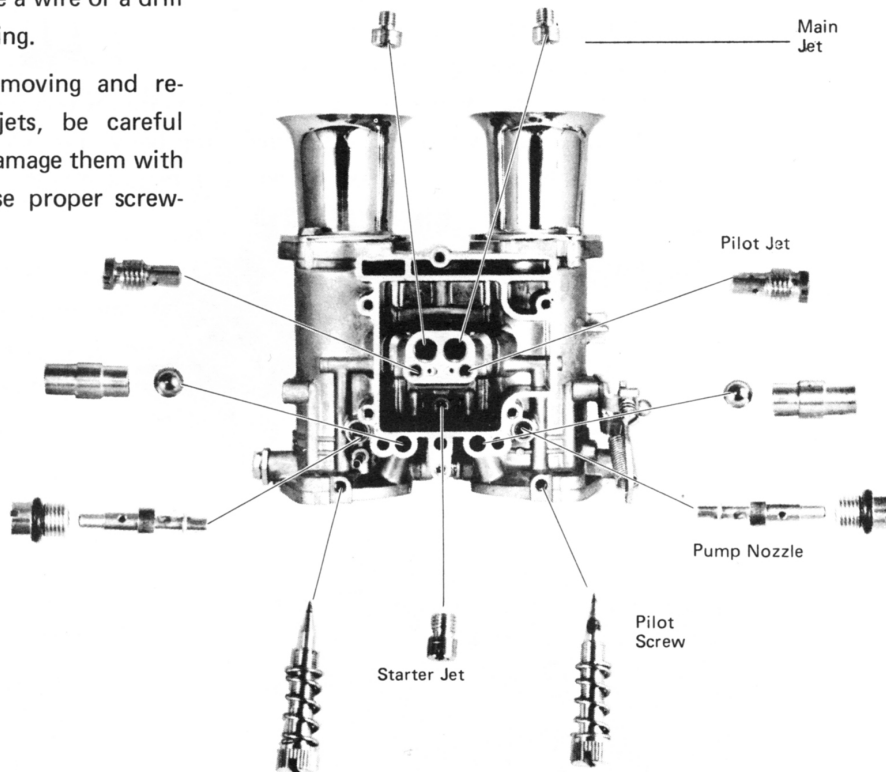
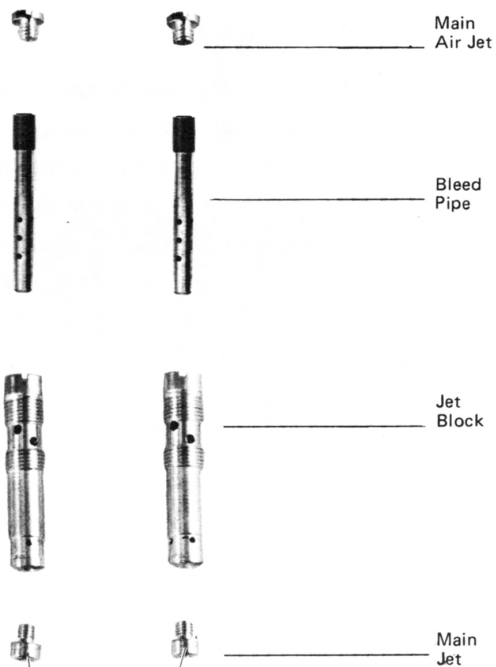


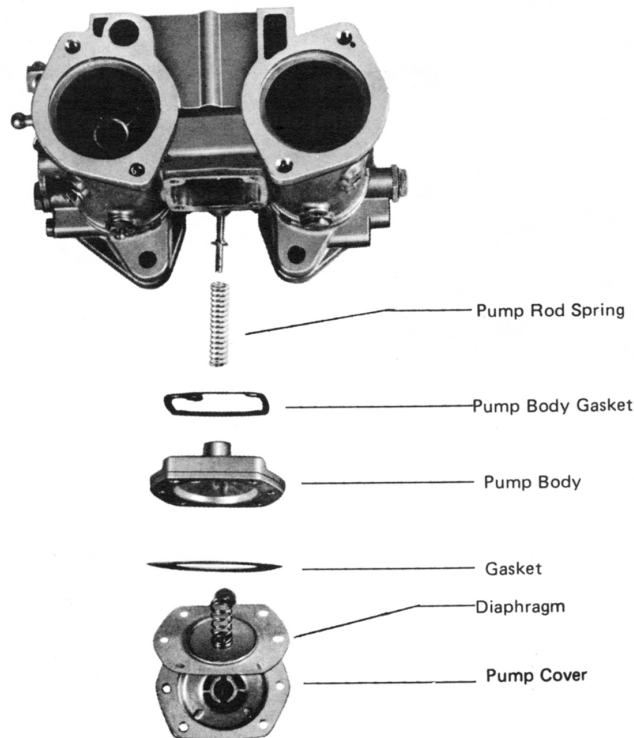
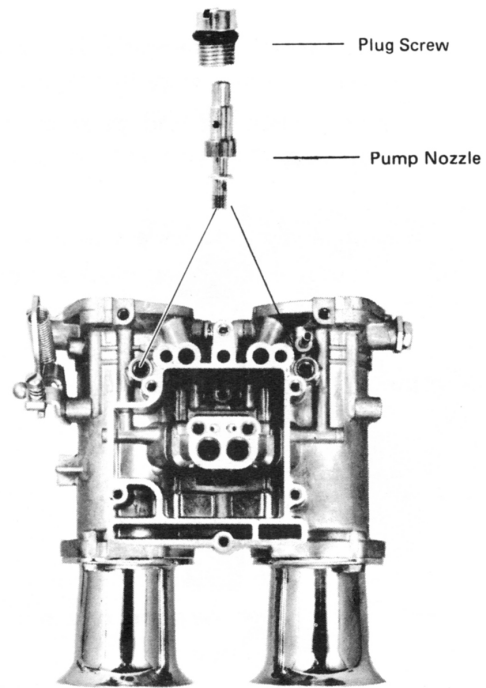
FIG. 20-A

FIG. 20-B

6.3 Accelerator Pump

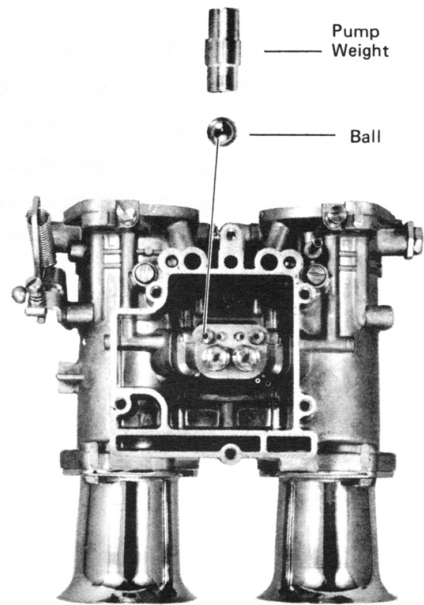
A) The pump nozzle can be pulled out easily by removing the plug screw. Clean the pump nozzle with a cleaning material and dry with compressed air. When fitting the pump nozzle, be sure to insert the packing and to fit the nozzle in the proper position. If the O-ring is found to be damaged or worn out, replace it with a new one.

B) The accelerator pump can be disassembled into the pump cover, diaphragm, pump spring, packing, pump body, washer and spring by removing six pieces of screws. The inlet check ball is incorporated into the pump body. If a sound generated by the ball is heard when you shake the pump body, it is okay. If any abnormality is found (flaws, pinholes, abnormal expansion, etc.), replace it with a new one.



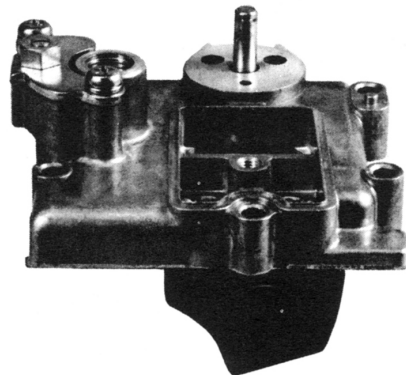
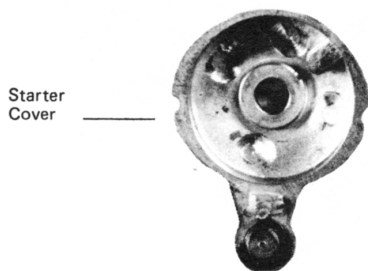
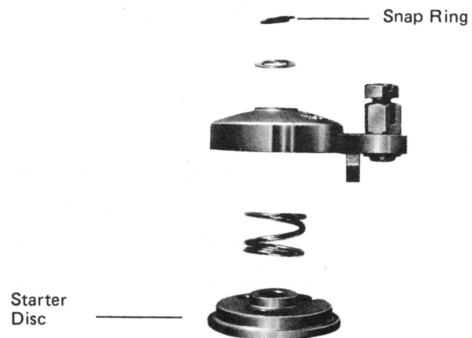
- C) Packing for the pump body should be replaced with new ones, whenever the body is disassembled.

- D) The pump plug, ring, weight and outlet check ball can be separated by removing the float chamber cover. When reassembling the pump, check the outlet check ball and the seat surface on the main body for signs of wear. If the O-ring (the same one as that for the plug screw) is found damaged or worn out, replace it with a new one without fail.



6-4. Starter

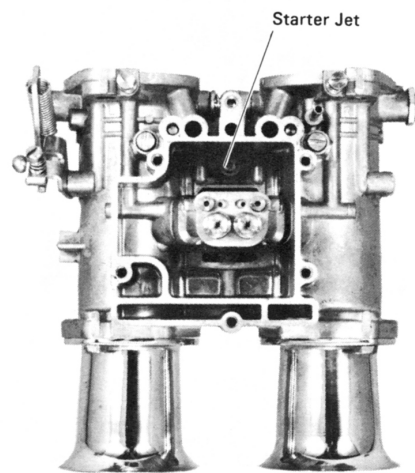
- A) The starter can be disassembled into the washer, starter cover, starter spring and starter disc by removing the snap ring. The starter cover comes in two different types as shown in photo. Type "A" moves clockwise and is identified with P/N N101/083. Type "B" moves counterclockwise and is identified with P/N N101/007.



- B) The starter disc comes in two different types. One is designed to function only when the knob is pulled all the way, while the other starts functioning when the knob is pulled halfway or all the way.

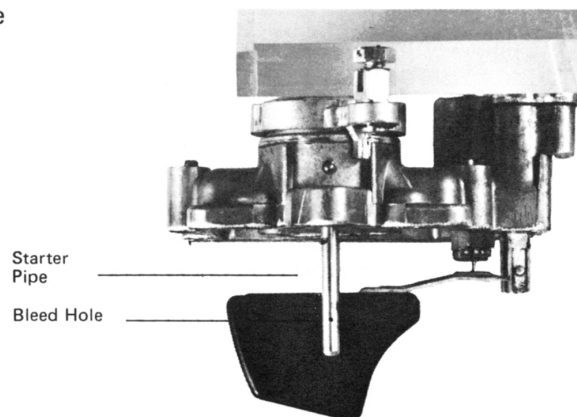


- C) The starter disc comes closely in contact with the body surface. Take care not to damage the starter disc surface.



- D) When removing and replacing the starter jet fitted to the main body, use a proper screwdriver to avoid damage. For cleaning, use a cleaning solvent and dry with compressed air.

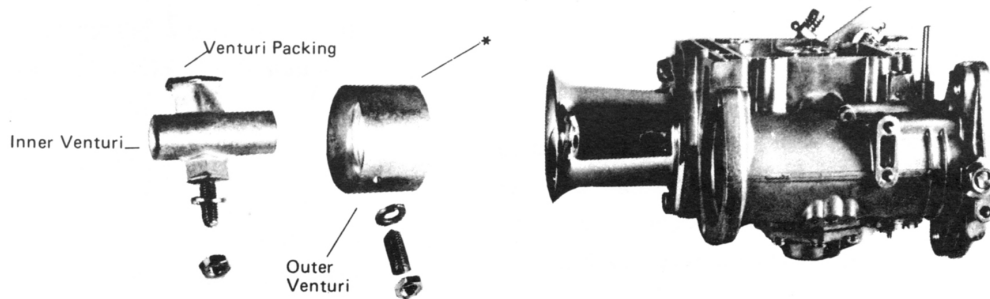
- E) The starter pipe is press-fitted into the float chamber cover and cannot be removed. Clogging of the bleed hole on the starter pipe causes a rich mixture.



6-5. Venturi

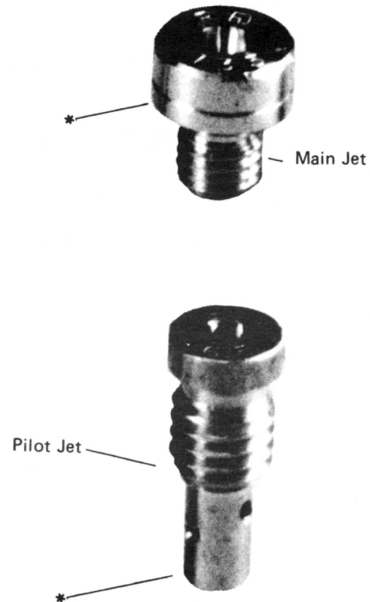
The venturi can be disassembled. To disassemble the inner venturi, venturi packing and outer venturi, loosen the lock nut and lock screw.

- A) Replace the venturi packing with a new one each time the venturi is disassembled.
- B) The outer venturi has a groove in the area marked with an asterisk. When assembling the venturi, fit the pump nozzle into the groove.
- C) Two lock screws differ in length. The shorter screw is for the outer venturi and the longer one is for the inner venturi.
- D) After tightening each lock screw, be sure to use the lock washer to prevent the lock nut from becoming loose.

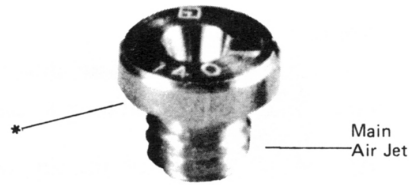


6-6. Jets

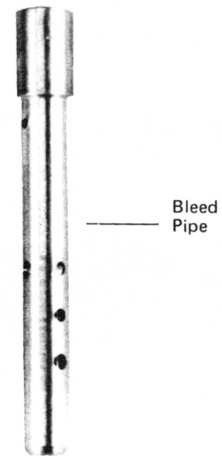
- A) The main jet is for metering the fuel in the main system. The higher the jet number, the larger the bore of the jet, thereby producing a richer mixture. The size numbers of main jets come in increments of 2.5 from No. 50 to No. 210.
- B) The pilot jet is used to meter the fuel in the pilot system. As the jet becomes larger, it produces a richer mixture. The size numbers come in increments of 5, from No. 25 to No. 110.



C) The main air jet is designed to meter the amount of air. The larger the jet number, the larger the bore of the jet, producing a leaner mixture. The size numbers come in increments of 10, from No. 60 to No. 300.



D) The bleed pipe is designed to mix the fuel with air as well as to facilitate atomization of the fuel. The inscription shown on the bleed pipe denotes the position of the bleed holes and the hole size.

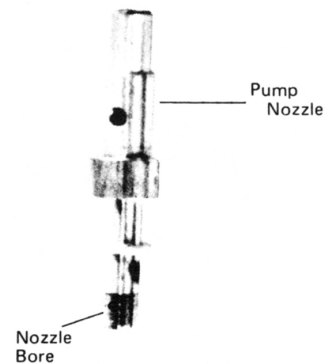
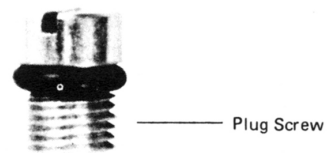


E) The pump nozzle is designed to regulate the duration of fuel injection at acceleration. The inscribed numerals denote the nozzle bore size.

The larger the nozzle bore, the shorter the duration of the fuel injection.

The size numbers range from 30 to 60 in increments of 5 (for example, 30, 35, 40, etc.)

Note: Be careful not to damage the area marked with an asterisk.



7. INSPECTION AND ADJUSTMENT OF FUEL LEVEL:

40PHH and 44PHH CARBURETORS

In general, remove the float chamber cover and follow the procedures as described below.

A) Hold the float chamber cover as shown in Fig. 21 so that the float arm just rests on the needle valve without compressing the needle valve spring. In this position, the height from the surface of the float chamber cover to the top surface of the float (dimension "A") should be 12.0 – 12.5 mm.

B) If the above mentioned height is not right, make adjustment by removing the nut and screwing the screw in or out. Screwing-in will decrease the length and screwing out will increase the length. After the length has been adjusted, be sure to tighten the nut.

Notes: 1. Since the float is of twin-type, the float level should be the same for the two.

2. Turning of the screw one turn will change the float level about 2mm.

3. The old-type PHH carburetor (Model III) is not provided with the adjusting screw. Therefore, make adjustment by changing the packing for the needle valve. The standard packing is 1mm thick, but two other packings, 0.5mm and 1.5mm in thickness, are available and can be used for making adjustment. The use of 0.5mm- or 1.5mm-thick packing lowers or raises the fuel level by 2mm, respectively.

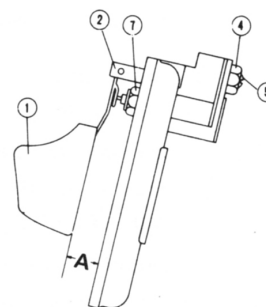
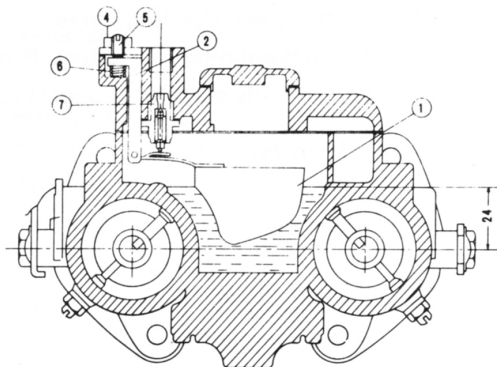


FIG. 21

A = 12 ~ 12.5 mm

8. SETTING AND TUNE-UP OF CARBURETOR:

8-1. Throttle Valve Opening Curve

When determining the setting, it is important to fully understand the throttle valve opening curve in relation to the main jet and main air jet as shown in Fig. 22.

A) Main Jet

The main jet serves to regulate the flow of fuel. A change of the main jet will increase or decrease the fuel consumption from low speed to high speed driving at full throttle valve opening, resulting in the change of output power.

B) Main Air Jet

The main air jet serves to regulate the supply of air. A change of the main air jet will affect the flow of fuel mainly at medium- and high-speed driving, resulting in change of output power.

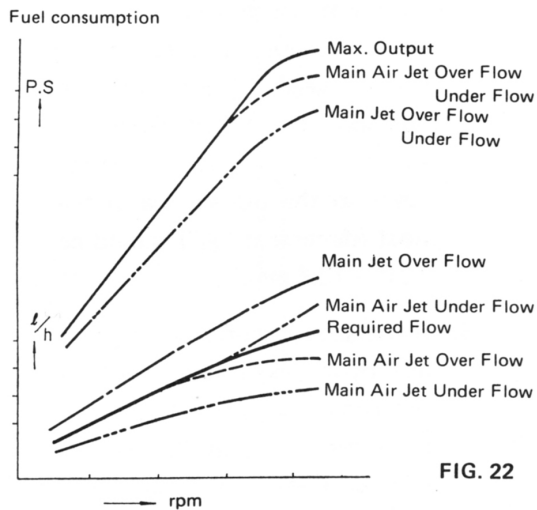


FIG. 22

8-2. Setting Carburetor Pilot System

The pilot jet is used to regulate the fuel from "fully-closed" to 20% throttle opening. The pilot air jet is machined in the body and cannot be changed or adjusted. To find the most suitable pilot jetting by running tests alone may take a few tries; the steps for jetting are as follows:

- A) Warm engine to operating temperature. On a flat road, drive in top gear and with a gradual application of the accelerator pedal (up to 20% throttle valve opening) increase speed from 20mph to 50mph.
- B) If engine runs smooth: Try a smaller pilot jet until a slight engine knock is apparent. Then try larger jets, one size at a time, to find the smoothest engine operation (for best economy and best setting).
- C) If engine knocks, carburetor spits back or backfires: Indication of a lean mixture. Change pilot jet, using one size larger at a time, until best engine operation is obtained.

- D) If engine runs rough, or hesitates, or if there is exhaust afterburn or dark exhaust smoke: Indication of a rich fuel mixture. Change to a smaller pilot jet, one size at a time, until knocking is just apparent; then try one or two sizes larger to obtain best jetting.

8-3. Setting of Carburetor Main System with Running Tests Alone

After warming up the engine, bring the engine revolutions up to the maximum rpm through rapid acceleration from around 1,000rpm. Make adjustment as described below, depending on the condition observed at that time.

- A) If there is lack of power at high speeds:
- 1) Enrich the air-fuel mixture by changing the main air jet to the size one or two steps smaller.
 - 2) When the desired output has been obtained, try out a few different sizes close to the above mentioned size and determine the most suitable size.
 - 3) If the engine still lacks power, change the main air jet to the size one or two steps larger to produce a lean mixture.
- B) If the power is okay at high speeds, but if it drops at low and medium speeds:
- 1) Enrich the mixture by using the main jet one or two steps larger in size.
 - 2) If the desired power has been obtained, try out a few different sizes of the main jet close to the above mentioned size and determine the most suitable size.
 - 3) If the engine still lacks the power, use a smaller size of main jet to produce a lean mixture.
- C) If the condition at high speeds is getting worse, while the engine runs well at low and medium speeds:
- 1) If the main jet was changed to a larger size, change the main air jet to a larger size as well.
 - 2) If the main jet was changed to a smaller size, change the main air jet to a smaller size as well.
- D) If the response at acceleration is poor:

Try out pump nozzles with different jet sizes and determine the most suitable nozzle size.

- Notes:
1. Sizes for the pump nozzle range from 0.3mm to 0.6mm in increments of 0.05mm.
 2. Nozzle hole is very small and can be clogged by dust. When cleaning the nozzle, use compressed air at all times. Never use a wire for cleaning.

TROUBLESHOOTING THE MIKUNI PHH CARBURETOR

SYMPTOMS	PROBABLE CAUSE	CORRECTIVE MEASURE
Hard starting	Pilot screw maladjusted.	Readjust as per text, page 9.
	Carbon build-up on throttle valves and pilot screws.	Remove carb; clean pilot screws, bore of carb, and throttle valves.
	Throttle valves out of synchronization	Synchronize as per text, page 9.
	Clogged pilot jet	Clean or replace.
	No fuel, or fuel level too low in float bowl.	Check fuel pump for proper operation; check fuel line for obstruction; check for proper float level and set as per text, page 18.
Instability at idle and at off idle, or engine stalling	Carburetor flooded.	Fuel pump discharge pressure too great. Adjust or replace to obtain 2.84 lb/per sq. inch to 4.98 lbs/per sq. inch (0.2 kg/sq. cm to 0.35 kg/sq. cm).
		Needle valve dirty or worn; clean or replace.
		Floats out of adjustment. Adjust as per text, page 18.
	Fuel percolation	Hold at wide open throttle while turning ignition.
	Pilot screw maladjusted.	Readjust as per text, page 9.
Instability at idle and at off idle, or engine stalling	Carbon build-up on throttle valves and pilot screws.	Remove carb; clean pilot screws, bore of carb, and throttle valves.
	Throttle valves out of synchronization.	Synchronize as per text, page 9.
	Clogged pilot jet.	Clean or replace.
	Fuel level too low in float bowl.	Check fuel pump for proper operation; check fuel line for obstruction; check for proper float level and set as per text, page 18.
	Air or fuel leak from starter system.	Check and clean starter disc.
	Air leak between inlet manifold and carb or inlet manifold and cylinder head.	Check carb flanges for distortion or cracks. <i>A/ways</i> replace gaskets.
	Pilot screw damaged.	Replace.

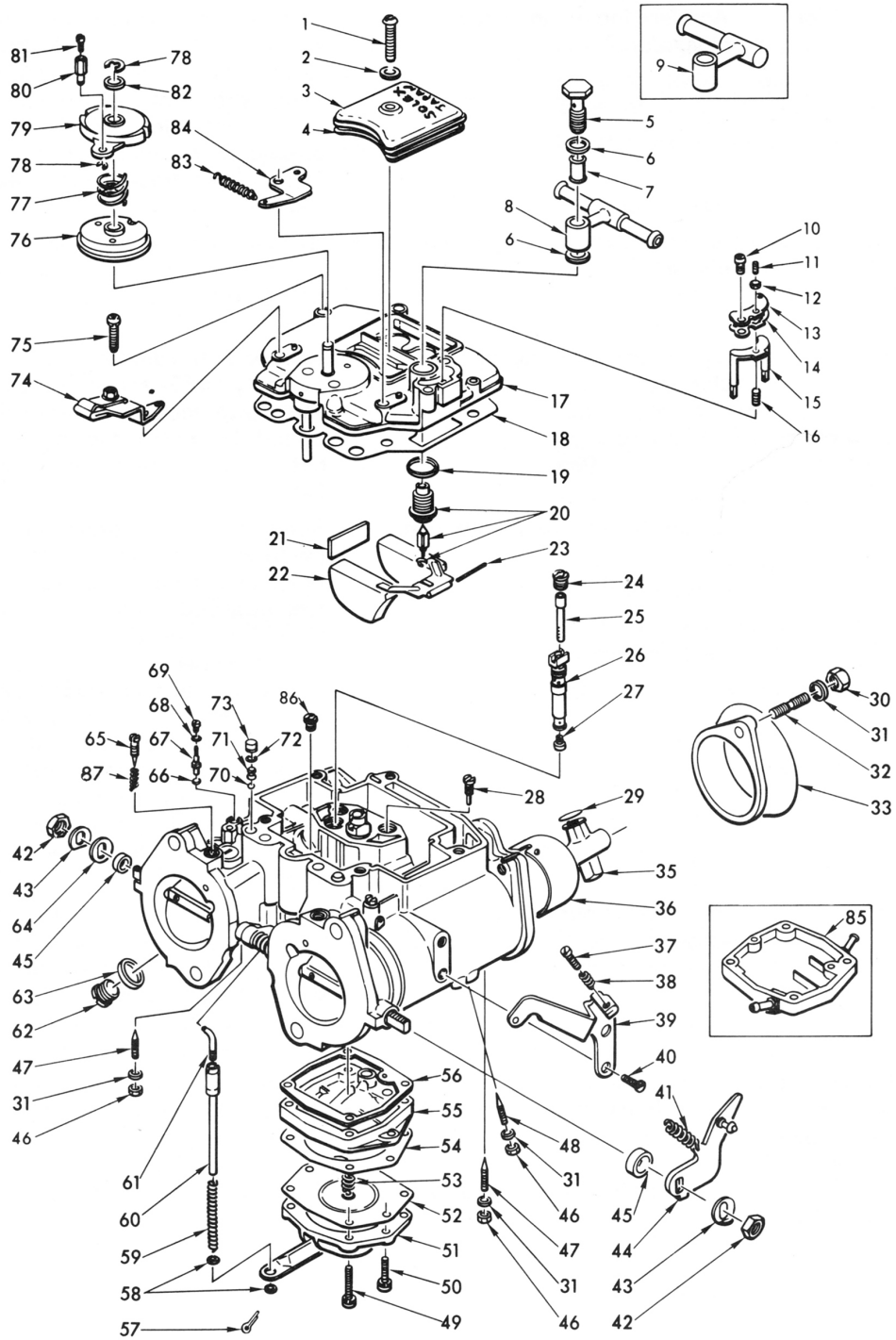
TROUBLESHOOTING THE MIKUNI PHH CARBURETOR

SYMPTOMS	PROBABLE CAUSE	CORRECTIVE MEASURE
Poor acceleration	Acceleration pump nozzle clogged.	Using a small mirror to look into bore of carb, pump carb throttle lever several times. You should observe a strong stream of fuel from pump nozzle. If not, clean nozzle with compressed air or replace. If still unsatisfactory, continue with next step below.
	Leakage from diaphragm assembly (#52)	If fuel is leaking from bottom center of accelerator pump cover assembly replace diaphragm (#52) and gaskets (#54 and #56).
	Inlet check-valve leaking or clogged.	Remove accelerator pump body assembly (#55) and shake it in an up and down motion. Check-valve ball should be heard moving freely. If not, replace pump body assembly (#55).
	Outlet check-valve malfunction.	Remove pump nozzle plug screw (#69) and pump throttle lever several times. You should observe a positive fuel flow without bubbles in the well around the nozzle. If not, remove float chamber cover (#17), then remove pump plug (#73). Pump carb several times — there should be a positive fuel flow without bubbles. If not, remove pump weight (#71) and ball (#70). Examine for foreign particles, sticking, or corrosion of weight, ball and seat. Clean or replace as necessary.
	Improper amount of fuel from accelerator pump due to change in pump stroke.	Remove carb and check for looseness between pump rod (#60) and connecting rod (#61). Rod height is preset at factory and then glued. For proper adjustment, refer to Fig. 10 in text, page 7.
Loss of Power: poor progression from pilot system (slow to main system (high speed); at half open throttle, and at wide open throttle.	Loose or dirty pilot jet, pilot air jet, main jet, main air jet.	Remove and clean, or replace (except pilot air jet which is machined in body).
	Improper fuel level in float bowl.	Re-set as per text, page 18.

NOTE: REFER TO NUMBERS ON EXPLODED OVERVIEW, PAGE 23.

EXPLODED OVERVIEW

40PHH 44 PHH



PARTS LIST**40 PHH 44 PHH**

ITEM NO	PART NUMBER	DESCRIPTION	40PHH-97, 98	44PHH-41, 42
1	N115,050	SCREW, JET CHAMBER COVER		2
	N115,106	SCREW, JET CHAMBER COVER	2	
2	BVZ23/40	WASHER	2	2
3	N115,014	COVER, JET CHAMBER		2
	N115,102	COVER, JET CHAMBER	2	
4	N107,018	GASKET, JET CHAMBER COVER		2
	N115,103	GASKET, JET CHAMBER COVER	2	
5	N101,023	BANJO BOLT	2	2
6	N101,080	WASHER	4	4
7	N101,092	FILTER ASSEMBLY	2	2
8	N115,028	FUEL PIPE ASSEMBLY		1
	N121,016	FUEL PIPE ASSEMBLY	1	
9	N115,033	FUEL PIPE ASSEMBLY		1
	N121,017	FUEL PIPE ASSEMBLY	1	
10	CW2-0512	SCREW	4	4
11	N115,005	FLOAT ADJUSTING SCREW	2	2
12	N101,260	NUT	2	2
13	N115,009	PLATE	2	2
14	N115,010	GASKET	2	2
15	N115,016	ARM ASSEMBLY	2	2
16	N115,015	SPRING	2	2
17	N115,402	FLOAT CHAMBER COVER ASSEMBLY		2
	N115,100	FLOAT CHAMBER COVER ASSEMBLY	2	
18	N115,013	GASKET, FLOAT CHAMBER COVER		2
	N121,019	GASKET, FLOAT CHAMBER COVER	2	
19	N114,011	WASHER, NEEDLE VALVE	2	2
20	N115,037	NEEDLE VALVE ASSMEBLY	2	2
21	N115,018	PLATE		2
22	N115,011	FLOAT ASSEMBLY	2	2
23	BD28/44	PIN, FLOAT	2	2
24	B42/56	JET, MAIN AIR	4	
	B42/55	JET, MAIN AIR		4
25	N101,190	MAIN BLEED PIPE	4	
26	N101,188	JET BLOCK ASSEMBLY	4	
	N101,253	JET BLOCK ASSEMBLY		4
27	N100,604	MAIN JET	4	4
28	N101,043	PILOT JET	4	4
29	N101,019	GASKET, SMALL VENTURI		4
	N121,118	GASKET, SMALL VENTURI	4	
30	N1-06	NUT	8	8
31	W4-06	WASHER	16	16
32	N101,147	STUD BOLT	8	
	T3-0616	STUD BOLT		8
33	N101,193	AIR FUNNEL (L = 25)	4	
	N101,240	AIR FUNNEL (L = 50)		4
35	N121,106	VENTURI, SMALL	4	
	N101,205	VENTURI, SMALL		4
36	N121,015	VENTURI, LARGE (I.D. = 32)	4	
	N107,203	VENTURI, LARGE (I.D. = 34)		4
37	N101,176	SCREW, THROTTLE ADJUSTING	2	
	N115,053	SCREW, THROTTLE ADJUSTING		2
38	4/148	SPRING	2	
	N115,057	SPRING		2
39	N107,073	BRACKET, THROTTLE STOP	2	2
40	N107,026	SCREW	4	4
41	N107,112	SPRING, THROTTLE RETURN	2	2
42	BDC36/35	NUT	4	4
43	B42/75	WASHER	4	4

PARTS LIST**40 PHH 44 PHH**

ITEM NO.	PART NUMBER	DESCRIPTION	40PHH-97, 98	44PHH-41, 42
44	N107,071	THROTTLE LEVER ASSEMBLY		2
	N115,104	THROTTLE LEVER ASSEMBLY	2	
45	BDC36/325	SEAL	8	8
46	N3-06	NET	8	8
47	N107,173	SCREW, VENTURI SET	4	
48	N107,174	SCREW, VENTURI SET	4	4
	N107,784	SCREW, VENTURI SET		4
49	CW2=0422	SCREW	8	
	CW2=0435	SCREW		8
50	CW2=0416	SCREW	4	4
51	N101,067	PUMP COVER ASSEMBLY	2	2
52	N107,030	DIAPHRAGM ASSEMBLY	2	2
53	N101,056	PUMP SPRING	2	2
54	N107,048	GASKET, PUMP COVER	2	2
55	N102,219	PUMP BODY ASSEMBLY		2
	N121,067	PUMP BODY ASSEMBLY	2	
56	N107,012	GASKET, PUMP BODY	2	4
57	Y-1006	SPLIT PIN	2	2
58	VM15/252	WASHER	4	
	BV26/32	WASHER		2
	RFT/40	WASHER		4
59	N101,030	SPRING, PUMP ROD	2	2
60	N102,220	ROD, PUMP	2	
	N107,044	ROD, PUMP		2
61	N107,831	ROD, CONNECTING		2
	N121,140	ROD, CONNECTING	2	
62	N101,097	PLUG SCREW		4
	N121,024	PLUG SCREW	4	
63	BD34/44	WASHER		4
64	N107,106	COLLAR	2	2
65	N101,181	PILOT SCREW		4
	N110,266	PILOT SCREW	4	
66	N102,065	GASKET, PUMP NOZZLE	4	4
67	N102,202	PUMP NOZZLE		4
	N121,033	PUMP NOZZLE	4	
68	BVZ23/18	O-RING	4	4
69	N102,026	PLUG SCREW	4	4
70	N110,081	BALL	4	4
71	N115,060	WEIGHT, PUMP		4
	N121,035	WEIGHT, PUMP	4	
72	B21/156	O-RING		4
73	N102,064	PUMP PLUG		4
74	N107,134	BRACKET ASSEMBLY	1	1
75	CW2=0525	SCREW	10	10
76	N107,118	STARTER DISC	2	
	N107,247	STARTER DISC		2
77	N101,063	SPRING, STARTER DISC	2	2
78	BSW28/69	SNAP RING	4	4
79	N101,083	STARTER COVER	2	2
80	N107,019	TERMINAL	2	2
81	B2=0508	BOLT	2	2
82	M10/59	WASHER	2	2
83	B30/61	SPRING, STARTER RETURN	2	2
84	N115,067	BRACKET, STARTER	2	2
85	N107,176	COOLING BODY ASSEMBLY		2
86	B42/55	STARTER JET	2	2
87	N110,209	SPRING	2	
	4/148	SPRING		4

JETTING TABLE

(1) 40PHH - 97, 98		
DESCRIPTION	PART NO.	SIZE
MAIN JET	N100.604	140
MAIN AIR JET	B42/56	180
PILOT JET	N101.043	57.5
PILOT AIR JET	—	1.4
VENTURI, LARGE	N121.015	32
VENTURI, SMALL	N121.106	12 – 16
THROTTLE VALVE	N101.038	165
JET BLOCK ASSY	N101.188	5.8 – ^(6×2.5 & 4×1.5)
BLEED PIPE	N101.190	T
NEEDLE VALVE	N115.037	1.5
PUMP NOZZLE	N121.033	40
PILOT SCREW	—	1.0 TURN

(2) 44PHH - 41, 42		
DESCRIPTION	PART NO.	SIZE
MAIN JET	N100.604	150
MAIN AIR JET	B42/55	200
PILOT JET	N101.043	57.5
PILOT AIR JET	—	1.2
VENTURI, LARGE	N107.203	34
VENTURI, SMALL	N101.205	10.5 – 14
THROTTLE VALVE	N101.203	175
JET BLOCK ASSY	N101.253	OA
NEEDLE VALVE	N115.037	1.8
PUMP NOZZLE	N102.202	40
PILOT SCREW	—	1-1/8 TURN

GASKET KIT

(1) 40PHH - 97, 98		
KIT PART NUMBER: Z70-1040		
KIT COMPONENTS		
PART NO.	DESCRIPTION	QTY.
N115.103	GASKET, Jet Chamber Cover	1
N121.118	GASKET, Small Venturi	2
N115.010	GASKET	1
N114.011	WASHER, Needle Valve	1
N101.080	WASHER	2
N107.012	GASKET, Pump Body	1
N107.048	PACKING, Pump Cover	1
Y-1006	SPLIT PIN	1
N102.065	GASKET, Pump Nozzle	2
BVZ23/18	O-RING	2
N121.019	GASKET, Float Chamber	1
BDC36/325	SEAL	4

(2) 44PHH - 41, 42		
KIT PART NUMBER: Z70-1044		
KIT COMPONENTS		
PART NO.	DESCRIPTION	QTY.
N115.010	GASKET	1
N115.013	GASKET, Float Chamber	1
BVZ23/18	O-RING	2
N114.011	WASHER, Needle Valve	1
N101.080	WASHER	2
N107.018	GASKET, Jet Chamber Cover	1
Y-1006	SPLIT PIN	1
N107.012	GASKET, Pump Body	2
N102.065	GASKET, Pump Nozzle	2
N101.019	GASKET, Small Venturi	2
N107.048	GASKET, Pump Cover	1
B21/156	O-RING	2
BDC36/325	SEAL	4

JETTING PARTS LIST

DESCRIPTION	PART NUMBER	AVAILABLE SIZES	40PHH - 97, 98	44PHH - 41, 42
MAIN JET	N100.604	50 – 210 (increments of 2.5)	X	X
PILOT JET	N101.043	25 – 110 (increments of 5)	X	X
AIR JET	B42/56	60 – 300 (increments of 10)	X	
	B42/55	60 – 300 (increments of 10)		X
PUMP NOZZLE	N121.033	30 – 60 (increments of 5)	X	
	N102.202	30 – 60 (increments of 5)		X
VENTURI, LARGE	N107.013	30, 32, 34	X	
	N121.015	31, 32	X	
	N107.014	36	X	
	N107.203	33, 34, 35, 37		X
	N107.233	39, 40, 41		X
VENTURI, SMALL	N101.186	(I.D.) (O.D.)		
		8.5 14	X	
	N101.119	10.5 14	X	
	N107.032	10.5 16	X	
	N121.106	12 16	X	
N101.205	10.5 14		X	
NEEDLE VALVE	N115.037	1.2, 1.5, 1.8, 2.0	X	X
JET BLOCK (EMULSION TUBE)	N101.188	(Well Dia.) (Outlet Hole)		
		5.8 6 x 2.5 & 4 x 1.5	X	
	N107.240	5.8 6 x 2.5 & 4 x 1.5 (22mm longer than N101.188)	X	
	N101.051	6.0 6 x 2.5 & 4 x 1.5	X	
	N101.253	(Well Dia.) (Bleed Hole) (Marking)		
		9.0 8 x 1.0 (OB)		X
	N101.253	9.0 8 x 1.2 (OA)		X
	N107.242	9.0 8 x 1.0 (OB) (22mm longer than N101.253 OB)		X
	N107.242	9.0 8 x 1.2 (OA) (22mm longer than N101.253 OA)		X
	N101.174	9.4 8 x 1.0 (OB)		X
N101.174	9.4 8 x 1.2 (OA)		X	
BLEED PIPE (MAIN)	N101.190	No. 1 No. 2 No. 3 No. 4 No. 5 No. 6		
		M 1.2φ x2 1.2φ x2 1.2φ x2 1.2φ x2 1.2φ x2	X	
		N 1.2φ x2 1.2φ x2 1.3φ x2 1.3φ x2 1.3φ x2 1.3φ x2	X	
		P 1.2φ x2 1.3φ x2 1.3φ x2 1.3φ x2 1.3φ x2	X	
		Q 1.2φ x4 1.2φ x4 1.2φ x2 1.2φ x2 1.2φ x2	X	
R 1.2φ x4 1.2φ x2 1.2φ x2	X			
AIR FUNNEL	N101.193	L = 25	X	
	N101.157	L = 50, L = 75, L = 100, L = 125, L = 150, (L = 25)	X	
	N101.240	L = 50		X
	N101.207	L = 75		X
	N101.271	L = 120		X

GENERAL:

The performance parts listed in this catalog were designed for the modification of vehicles used in sanctioned "off-highway" competitive events. No other applications are intended or implied. In fact, federal law as administered by the "Environmental Protection Agency" restricts the removal or modification of any part of emission control systems required for motor vehicles designed for transporting persons or property on a street or highway. The Clean Air Act (42 U.S.C. 1957 et seq.) states that the following acts and the causing thereof are prohibited "... for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle engine in compliance with regulations under this title prior to its sale and delivery to the ultimate purchaser, or for any manufacturer or dealer knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser." Also many state laws prohibit disconnecting, modifying or removing emission control devices. Check the applicable state laws on this point.

WARRANTY:

Because of the purpose and intended usage of these parts, THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF FITNESS OR MERCHANTABILITY, WITH RESPECT TO THESE PERFORMANCE PARTS. Installation of these performance parts or carburetor kits in your vehicle may void the vehicle warranty.

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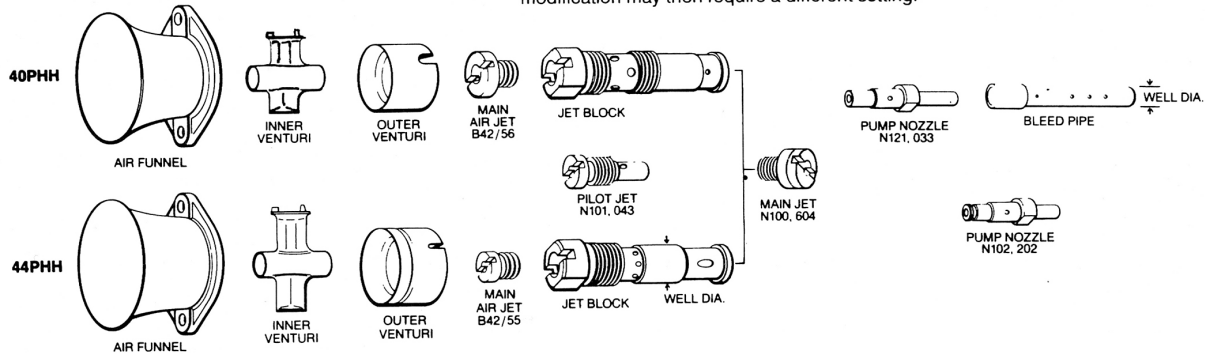
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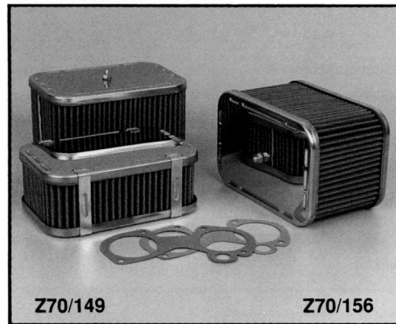
Jetting Recommendations

The following list of recommended settings applies only to PHH kits installed on otherwise stock engines. Should the PHH kit be used in combination with any other engine modification, such as a different cam or the installation of headers, each modification may then require a different setting.



	APPLICATION	KIT NO.	CARBS	VENTURI LARGE	MAIN JET	MAIN AIR JET	PILOT JET	PUMP NOZZLE	
TOYOTA	Corolla 2TC, 3TC (1600, 1800)	Z40-510	40PHHx2	32	140	180	57.5	0.40	
		Z44-510	44PHHx2	34	150	200	52.5	0.40	
	Corona 20R (2200)	Z40-540	40PHHx2	32	150	180	57.5	0.40	
		Z44-540	44PHHx2	34	150	200	52.5	0.40	
	Celica 20R (2200)	Z40-541	N40PHHx2	32	150	180	57.5	0.40	
		Z44-541	N44PHHx2	34	150	200	52.5	0.40	
	Pick-up 20R (2200)	Z40-542	N40PHHx2	32	150	180	57.5	0.40	
		Z44-542	N44PHHx2	34	150	200	52.5	0.40	
	Celica 22R (2400)	Z40-546	N40PHHx2	32	145	200	57.5	0.40	
		Z44-546	N44PHHx2	34	165	250	52.5	0.40	
	Pick-up 22R (2400)	Z40-547	N40PHHx2	32	145	200	57.5	0.40	
		Z44-547	N44PHHx2	34	165	250	52.5	0.40	
	Corolla, Tercel 3AC, 4AC (1500, 1600)	Z40-548	N40PHHx2	32	140	180	57.5	0.40	
		Z44-548	N44PHHx2	34	150	200	57.5	0.40	
NISSAN	280Z, 280ZX (L28)	Z40-550	N40PHHx3	32	140	200	57.5	0.45	
		Z44-550	N44PHHx3	34	145	200	50	0.45	
		Z44-550	N44PHHx3	37	155	200	50	0.45	
	260Z (L26)	Z40-550	N40PHHx3	32	140	180	57.5	0.45	
		Z44-550	N44PHHx3	34	150	200	52.5	0.45	
	240Z (L24)	Z40-550	N40PHHx3	32	140	180	57.5	0.40	
		Z44-550	N44PHHx3	34	150	200	52.5	0.40	
	510, 610, 710, 200SX, Pick-up (L16, L18, L20B)	Z40-570	N40PHHx2	32	135	160	57.5	0.45	
		Z44-570	N44PHHx2	34	150	250	52.5	0.45	
	200SX, Pick-up (Z20, Z22, Z24)	Z40-580	N40PHHx2	32	150	180	55	0.40	
		Z44-580	N44PHHx2	34	150	190	55	0.40	
	MITSUBISHI	(78-80) D-50 Pick-up G52B, G54B, (2000, 2600)	Z40-530	N40PHHx2	32	155	180	55	*0.50
			Z44-531	N44PHHx2	34	160	250	52.5	*0.50
		(78-80) Arrow, Sapporo, Chal- lenger G52B,G54B (2000,2600)	Z40-531	N40PHHx2	32	155	180	55	*0.50
Z44-531			N44PHHx2	34	160	250	52.5	*0.50	
(81-86) D-50 Pick-up, Montero G52B, G54B (2000, 2600)		Z40-535	N40PHHx2	32	155	180	55	*0.50	
		Z44-535	N44PHHx2	34	160	250	52.5	*0.50	
(81-84) Arrow, Sapporo, Chal- lenger G52B,G54B (2000,2600)		Z40-536	N40PHHx2	32	155	180	55	*0.50	
		Z44-536	N44PHHx2	34	160	250	52.5	*0.50	
MAZDA	GLC (81-84) E3, E5 (1300, 1500)	Z40-590	N40PHHx2	32	140	180	57.5	0.40	
		Z44-590	N44PHHx2	34	155	200	57.5	0.40	
	RX7, 12A (1146)	Z44-595	N44PHHx1	39	200	240	62.5	0.90	
VW	Rabbit, Scirocco, Pick-up, GTI (1500, 1600, 1700, 1800)	Z40-560	N40PHHx2	32	140	180	57.5	0.45	
		Z44-560	N44PHHx2	34	150	200	50	0.45	
BMW	2002 (1990) 320i (1766, 1990)	Z44-630	N44PHHx2	34	150	200	55	0.40	
		Z44-635	N44PHHx2	34	140	250	55	0.35	
HONDA	CRX/CIVIC S	Z40-620	40PHHx2	32	145	180	55	40	
		Z44-620	44PHHx2	34	155	200	52.5	40	
MGB		Z44-640	44PHHx1	34	145	220	52.5	55	
SUZUKI	SAMURAI	Z40-660	40PHHx2	34	140	180	57.5	40	
		Z44-660	44PHHx2	34	140	220	52.5	40	
SUZUKI	SIDEKICK	Z40-662	40PHHx2	32	140	180	57.5	40	
		Z44-662	44PHHx2	34	150	200	57.5	40	

ACCESSORIES



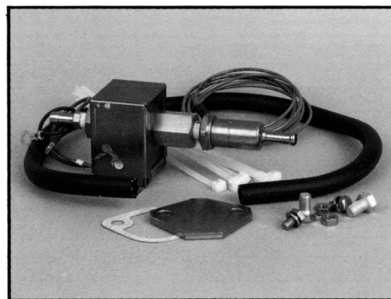
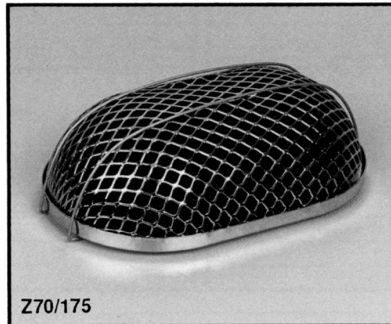
Air Filters

Mikuni air filters are designed to solve your air filtration needs in an efficient, attractive manner. Our chrome mesh filter features a flame-resistant, washable, polyurethane foam element. Our box filters feature K&N pre-oiled, washable cotton gauze element. Necessary mounting hardware and gaskets are included.

Z70/149 Air Filter, 2 1/4" element

Z70/156 Air Filter, 4" element

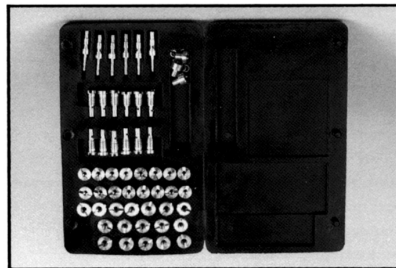
Z70/175 Air Filter-Chrome Mesh



Electric Fuel Pump Kit

These kits feature a low pressure, high volume, solid state electric fuel pump which is completely compatible and recommended for all Mikuni PHH kit installations. Kit comes complete with all necessary hardware and fittings.

Z60-54400 Electric Fuel Pump Kit



Jetting Kits

Although all of our carburetor kits are pre-jetted at the factory, many of our customers have made engine modifications and now require jet changes. Each of these kits contains a range of jets to allow fine tuning of our carburetors in the field.

Z70/161 Jetting Kit, 40PHH, 4 cyl.

Contains: 4 ea. #135, 145, 155 Main Jets
4 ea. #160, 200, 230 Main Air Jets
4 ea. #55 and #60 Pilot Jets
4 ea. #45 Pump Nozzles
4 ea. #Y-1006 Cotter Pins
4 ea. #N102.065 Pump Nozzle Gaskets

Z70/162 Jetting Kit, 40PHH, 6 cyl.

Contains: 6 ea. (same parts as Z70/161)

Z70/163 Jetting Kit, 44PHH, 4 cyl.

Contains: 4 ea. #135, 140, 145 Main Jets
4 ea. #180 and #220 Main Air Jets
4 ea. #50, 52.5, 55 Pilot Jets
4 ea. #45, 50 Pump Nozzles
4 ea. #N102.065 Pump Nozzle Gaskets
4 ea. #Y-1006 Cotter Pins

Z70/164 Jetting kit, 44PHH, 6 cyl.

Contains: 6 ea. (same parts as Z70/163)

Z70/220 Jet Board

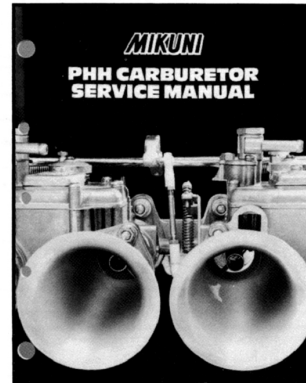
(Handy Jet Carry Case)-Sold separately.



Fuel Pressure Regulator

This patented regulator raises the fuel pressure for power and lowers fuel pressure to 1.5 psi for idle, cruising and stopping. The result is increase in performance, increase in fuel economy and helps cure flooding in off road situations. Used by professional racers in off road, tracks, and on the street in motorhomes and pickups.

Z60-1002 Fuel Pressure Regulator- Model #1140 with pressure range from 1.5 psi to 4 psi.



PHH Carburetor Service Manual

A complete service guide to Mikuni PHH carburetors. Included are chapters on carburetor types and features, the carburetors' various tuning features and how they function, carburetor mounting and adjustment, overhaul and maintenance, as well as tuning. Also included are exploded drawings and complete parts and jetting listing. The PHH manual is a must for anyone working with Mikuni PHH carburetors.

Mikuni PHH Carburetor Manual



Gasket and Rebuild Kits

Everything to perform maintenance or rebuild sidedraft Mikuni automotive carburetors.

Z70-1040 Gasket Kit 40PHH

Z70-1044 Gasket Kit 44PHH

Z70-1144 Rebuild Kit for O.E.M. Mikuni on Datsun. All Engines.

Z70-1002 Rebuild Kit for O.E.M. Mikuni on Toyota 2TG or 18 RG Engine.