ISUZU

Bellett

FUEL SYSTEM (GASOLINE ENGINE)

ENGINE SERIES

PART 8

INTRODUCTION

ISUZU MOTORS LIMITED

TOKYO, JAPAN

PART 8 FUEL SYSTEM (GASOLINE ENGINE)

CONTENTS

PART 8 FUEL SYSTEM (GASOLINE ENGINE)

8-1 FUEL SYSTEM

The fuel system of the Bellett gasoline engine comprises a fuel tank, fuel filter, fuel pump and a carburetor, and all the component parts are in common with the model G150 (1500cc) and model G130 (1300cc) except the carburetor.

A diagram illustrating the fuel system of the Bellett gasoline engine

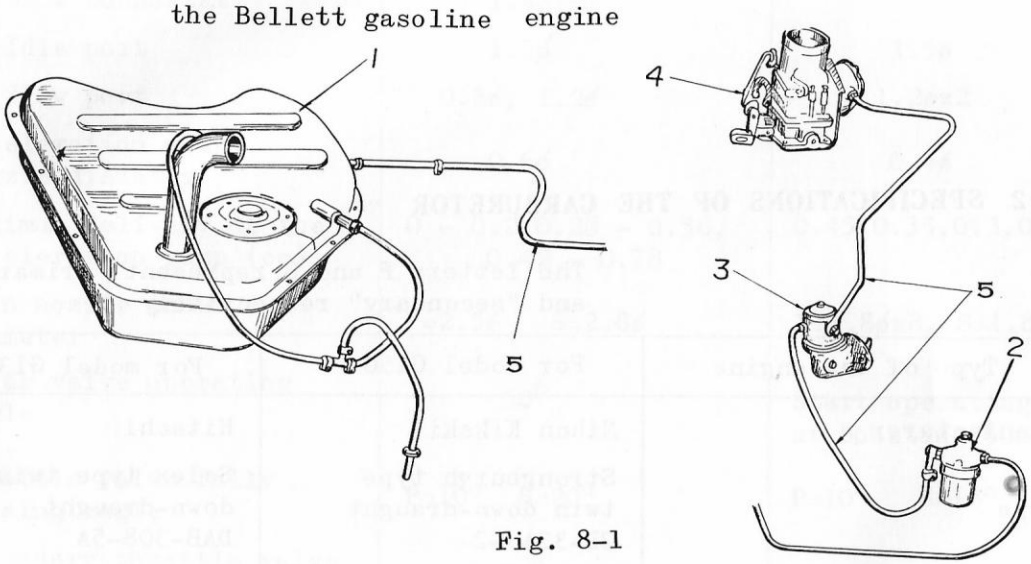


Fig. 8-1

(1) Fuel tank (2) Fuel strainer (3) Fuel pump
(4) Carburetor (5) Fuel pipe

(1) Carburetor

The difference of the carburetors between the model G150 and G130 is that the model G150 employs the strongburgh type carburetor manufactured by the NIHON KIKAKI whilst the model G130 is equipped with solex type carburetor manufactured by the HITACHI.

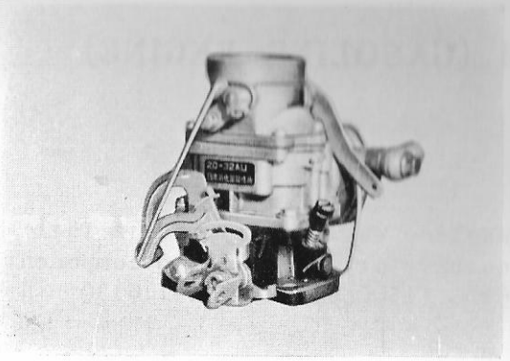


Fig. 8-2

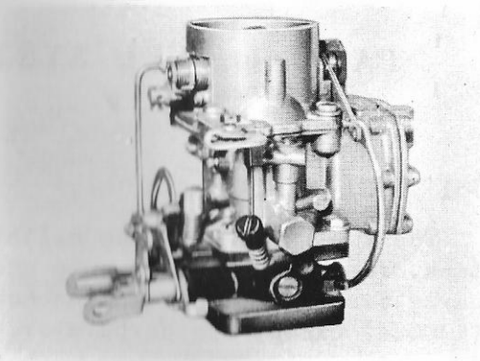


Fig. 8-3

8-2 SPECIFICATIONS OF THE CARBURETOR

The letters P and S represent "primary" and "secondary" respectively

Type of the engine	For model G150	For model G130
Manufacturer	Nihon Kikaki	Hitachi
Type	Strongburgh type twin down-draught 2D-32AU-2	Solex type twin down-draught DAB-308-5A
Parts number	8110-0071	8110-0080
Diameter of the bore (intake)	Inner diameter 57.5ø Outer diameter 63ø	Inner diameter58ø Outer diameter63ø
Diameter of the bore (outlet)	P=30ø S=32ø	P=28ø S=30ø
Venturi diameter	P=21ø, 8ø S=27ø, 14ø, 7ø	P=22ø S=28ø
Fuel level (from the top level of the body) (mm)	19	23
Fuel level (from the main nozzle)(mm)	13	10

Fuel feed pressure (kg/cm2)	0.22	0.13 - 0.16
Diameter of the main jet port: Main jet	P=0.96ø, S=1.4ø	P=0.95ø, S=1.6ø
Diameter of the main jet port: Slow jet	0.45ø	P=0.50ø, S=1.05ø
Diameter of the main jet port: Power jet	0.45ø	0.45ø
Diameter of the main jet port: Main air bleed	P=10.8ø, S=0.8ø (dynamic pressure)	P=2.0ø, S=20ø (dynamic pressure)
Diameter of the main jet port: Emulsion hole	P=0.6øx12, S=0.6o/x2	P=1.6øx16, S=1.0øx16
Diameter of the main jet port: First slow air bleed	0.8ø	P=1.9ø, S=0.7ø
Diameter of the main jet port: Second slow air bleed	1.5ø	
Diameter of the main jet port: Slow econostat	1.4ø	
Diameter of the main jet port: Idle port	1.5ø	1.5ø
Diameter of the main jet port: Slow port	0.8ø, 1.2ø	1.2øx2
Acceleration pump nozzle diameter	0.6ø	0.4ø
Maximum delivery of the acceleration pump (cc)	0 - 0.2, 0.28 - 0.56, 0.42 - 0.78	0.45, 0.35, 0.3, 0.25
Main nozzle inner diameter	P=2.5ø S=2.8ø	P=1.8øx8, S=1.8øx8
Power valve operating angle	50°	Start operating at boosting 60mmHg
Throttle valve fully closing angle	P=10° S=20°	P=10° S=18°
Secondary throttle valve operating angle	50°	49°
Choke valve fully closing angle	10°	15°
Opening angle of the throttle valve when the choke valve is fully closed	12.5° +2° -1°	14°

8-3 CARBURETOR FOR MODEL G150

(1) Construction of the carburetor

Construction of the carburetor for model G150

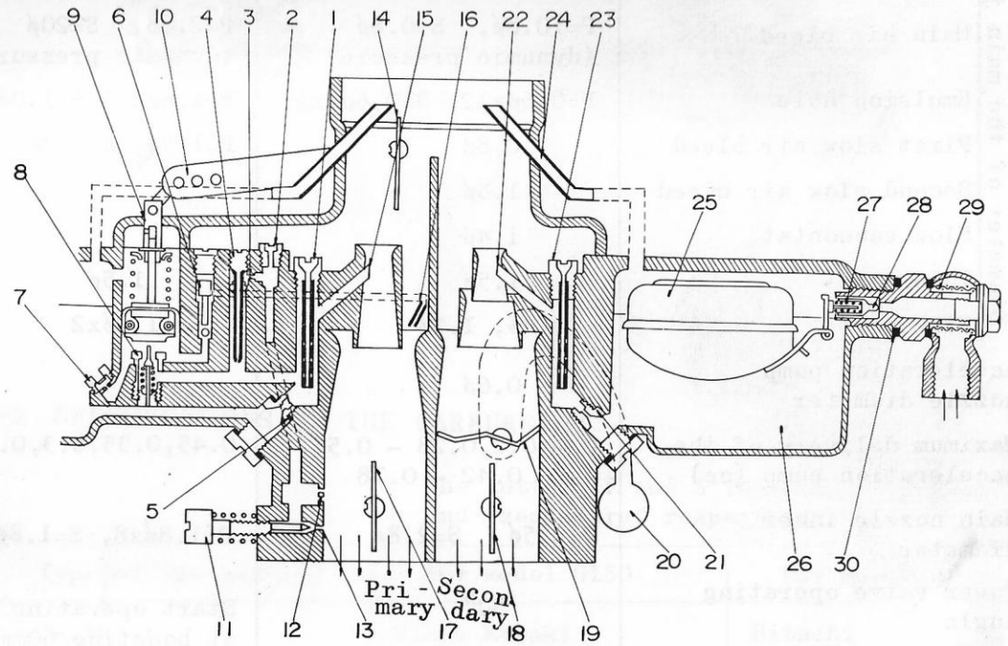


Fig. 8-5

1. Primary main air bleed
2. Slow air bleed
3. Slow econostat
4. Slow jet
5. Primary main jet
6. Outlet check valve
7. Inley check valve
8. Power jet valve
9. Acceleration pump piston
10. Acceleration pump arm
11. Idle adjusting screw
12. Slow port
13. Idle port
14. Choke valve
15. Primary main nozzle
16. Acceleration pump nozzle
17. Primary throttle valve
18. Secondary throttle valve
19. Auxiliary throttle valve
20. Auxiliary throttle valve weight
21. Secondary main jet
22. Secondary main nozzle
23. Secondary main air bleed
24. Air vent
25. Float
26. Float chamber
27. Valve spring
28. Float valve
29. Strainer
30. Gasket

Component parts of the carburetor for model G150

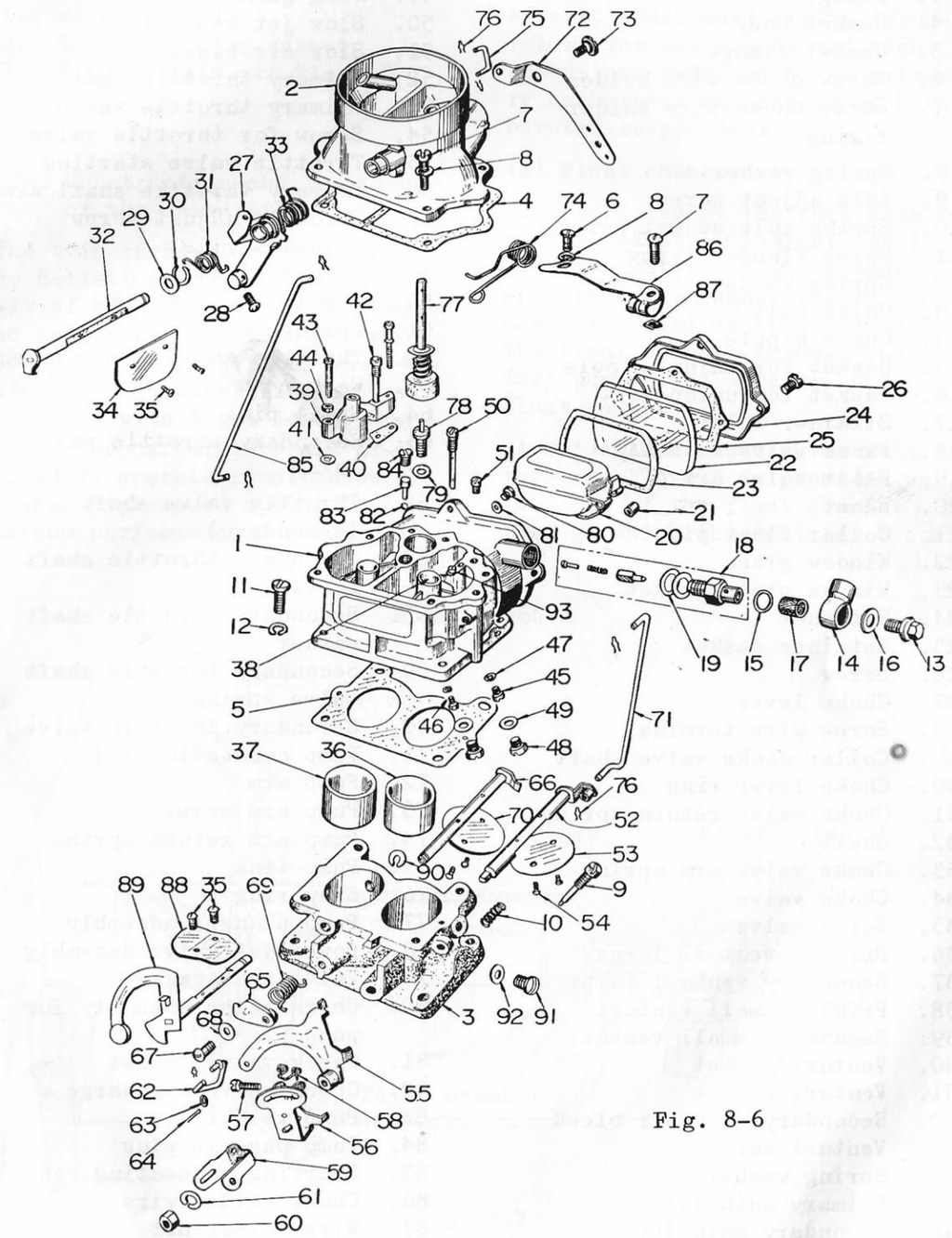


Fig. 8-6

1. Body assembly
2. Air horn assembly
3. Flange
4. Gasket body
5. Gasket flange
6. Screw choke wire holder
7. Screw choke wire holder fixing
8. Spring washer
9. Idle adjust screw
10. Spring idle adjust screw
11. Screw flange fixing
12. Spring washer
13. Union bolt
14. Union nipple
15. Gasket for union nipple
16. Gasket for union bolt
17. Strainer inlet
18. Float valve assembly
19. Float valve arm
20. Float
21. Collar float pin
22. Window glass
23. Window glass gasket
24. Retainer
25. Retainer gasket
26. Screw
27. Choke lever
28. Screw wire terminal
29. Collar choke valve shaft
30. Choke lever ring
31. Choke valve return spring
32. Shaft
33. Choke valve arm spring
34. Choke valve
35. Screw valve
36. Primary venturi large
37. Secondary venturi large
38. Primary small venturi
39. Secondary small venturi
40. Venturi gasket
41. Venturi gasket
42. Secondary main air bleed
43. Venturi screw
44. Spring washer
45. Primary main jet
46. Secondary main jet
47. Main jet gasket
48. Main passage plug
49. Plug gasket
50. Slow jet assembly
51. Slow air bleed
52. Primary throttle shaft
53. Primary throttle valve
54. Screw for throttle valve
55. Throttle valve starting
56. Primary throttle shaft arm
57. Throttle adjust screw
58. Adjust spring
59. Throttle lever
60. Throttle shaft nut
61. Spring washer
62. Throttle shaft link assembly
63. Washer
64. Split pin
65. Secondary throttle valve lever
66. Throttle valve shaft (secondary)
67. Secondary throttle shaft screw
68. Secondary throttle shaft washer
69. Secondary throttle shaft valve spring
70. Secondary throttle valve
71. Pump connecting rod
72. Pump arm
73. Pump arm screw
74. Pump arm return spring
75. Pump link
76. Snap ring
77. Pump plunger assembly
78. Power jet valve assembly
79. Valve seat gasket
80. Check valve assembly for pump
81. Check valve gasket
82. Check valve discharge
83. Pump weight
84. Pump passage plug
85. Starting connecting rod
86. Choke holder wire
87. Wire holder nut
88. Dumper valve
89. Dumper valve shaft
90. Clip
91. Slow port plug
92. Slow port plug gasket
93. Primary main air bleed

8-3-2 Construction and function of the carburetor

The twin carburetor employed in the Bellett engine comprises a pair of single barrel carburetors and so designed that only one of the carburetors operates when the automobile is travelling at low speeds or with light load. The two of the carburetors are arranged to operate simultaneously when high-speed operation or maximum performance is called for and the operation of two-carburetors will result in a marked increase in the mixture intake effect. Each unit of the carburetors for low speeds and high speeds are referred to as primary carburetor and secondary carburetor respectively.

(1) Float chamber

The fuel fed by the fuel pump is maintained at a constant level and transmitted to the primary and secondary carburetor in common. The fuel is transmitted to the float chamber through the fuel pump, fuel strainer and float valve.

A detachable glass cover with the mark "level" is provided on the side of the float chamber through which the fuel level can

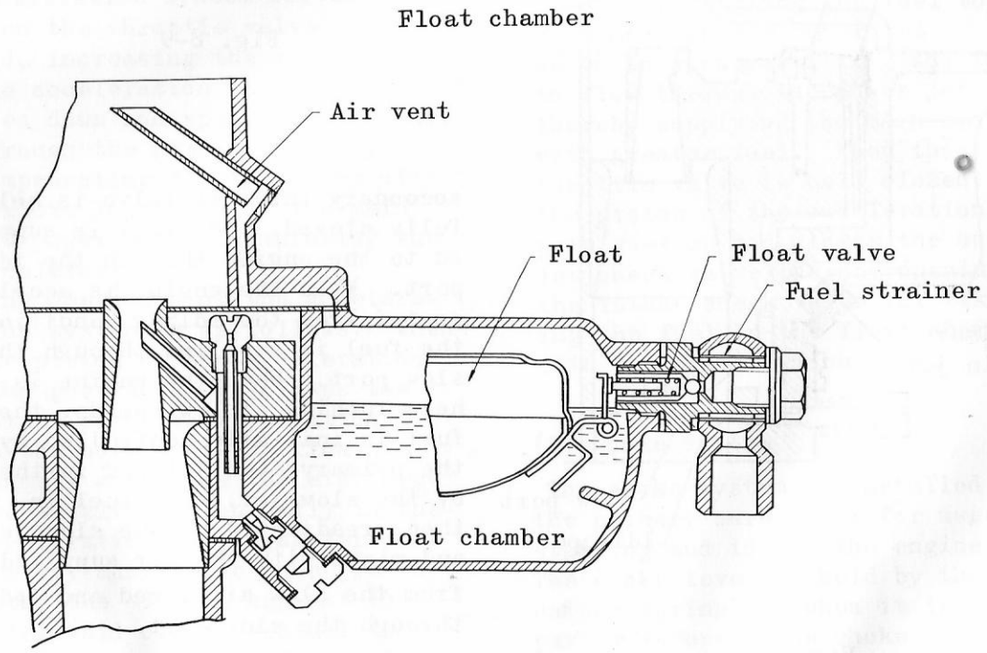


Fig. 8-7

be checked. The air ventilation pipe serves to communicate the dynamic pressure in the primary and secondary carburetors with the float chamber.

(2) Idling and slow running system

Both idling and slow running devices are provided in the primary carburetor, and when the engine is held running at idling speed, the primary throttle valve is held open about 2-3° while the secondary throttle valve is held fully closed. The fuel is supplied to the engine through the idle port. When the engine is accelerated from the idling condition, the fuel is supplied through the slow port. When the engine is hels running at low speeds, the fuel is initially controlled by the primary main jet and further by the slow jet. The fuel is then, readjusted by the slow jet and mixes with the air supplied from the slow air bleed and fed through the slow port.

Slow running system

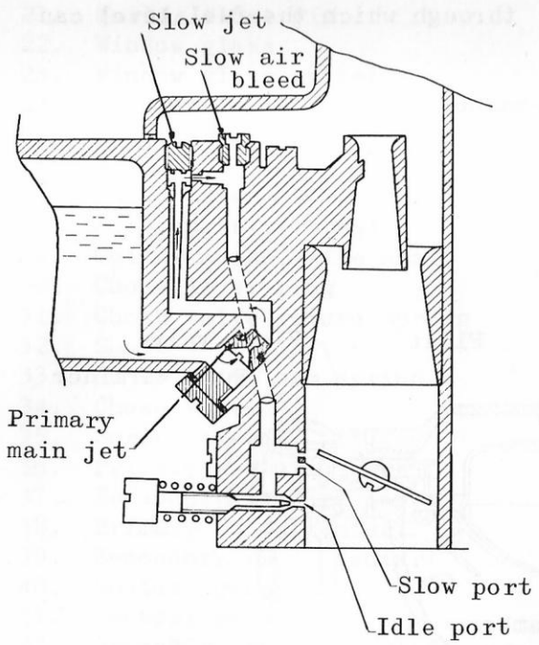


Fig. 8-8

Primary main supply system

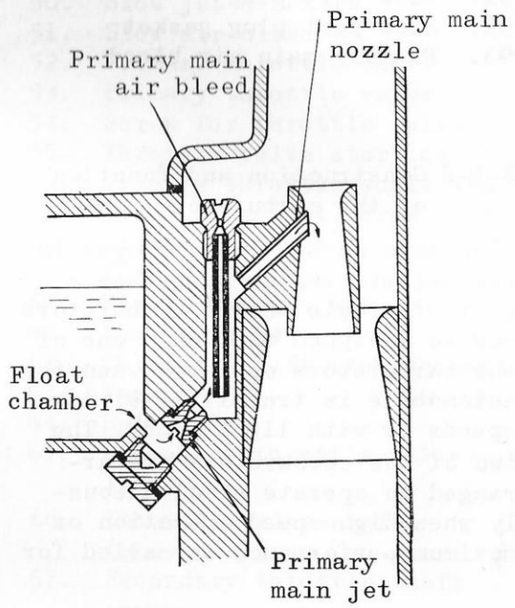


Fig. 8-9

(3) Primary main fuel supply system

When the engine is further accelerated and the throttle valve is held open at ablut 6-7°C, the fuel is supplied to the engine through the main fuel supply system. As illustrated in figure, the fuel in the main fuel supply system is primarily controlled by the main jet and mixes with the air supplied from the main air bleed and then fed to the engine through the main nozzle.

(4) Acceleration and power system

The acceleration system is provided in the primary carburetor and directly linked with the throttle valve. When the engine is suddenly accelerated, the acceleration system serves to open the throttle valve widely and, increasing the air intake, the acceleration pump plunger goes down and sprays the mixture through the pump jet therby compensating for the delay of mixture injection by the main and power nozzle, improving the acceleration.

The operation of the acceleration system is as follows: When the piston of the acceleration pump goes down, it closes the intake check valve positioned in the bottom of the float chamber and opens the discharge check valve (nylon ball) in the acceleration fuel transfer port thereby making the pump jet to spray the mixture against the inner wall of the venturi to give a vaporizing effect. When the throttle valve is further opened to 50°, the tip end of the piston in the acceleration pump causes the power jet valve to open permitting the fuel to flow through the power jet valve to open permitting the fuel to flow through the power jet thereby supplying the main system with greater fuel. When the throttle valve is held closed, the piston of the acceleration pump goes up and closes the outlet check valve thereby opening the intake check valve for taking the fuel in the float chamber into the acceleration pump.

Acceleration and power system

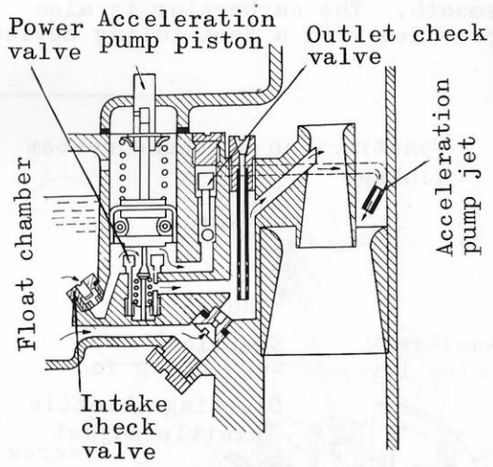


Fig. 8-10

(5) Choke system

The choke system is installed in the primary carburetor for use in starting and idling the engine. The choke lever is held by the damper spring and when it is held partially open, the choke valve automatically operates in re-

sponse to the engine speed and serves to keep the engine idling smooth. The carburetor is also provided with a fast idling device

Construction of choke system linkage

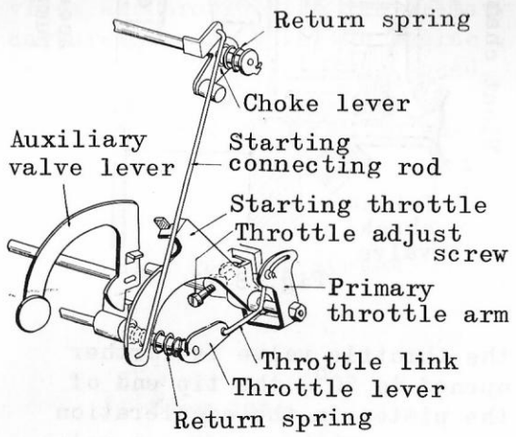


Fig. 8-11

which serves to open the throttle valve in the primary carburetor for easier starting and gives an ideal idling speed when the choke lever is held open. To prevent the air leaking from the secondary carburetor from going into the engine while the choke lever is operated, the carburetor is so arranged that the starting throttle lever serves to lock the auxiliary valve and hold it from being operated while the choke valve is fully closed.

(6) Secondary main supply system

As the primary throttle valve is opened to 50° or so, the secondary throttle valve which is directly linked with the primary throttle valve also started to open and both the primary and secondary throttle valves fully opens simultaneously. Both of the valves are forced to return to their close position by the return spring mounted on the secondary throttle valve shaft. To obtain the greater air-tightness, the secondary throttle valve is fabricated with material 2mm thicker than that of the primary throttle valve. The carburetor is so arranged that only the function of the primary carburetor will suffice the fuel delivery while the engine is operated at low speeds even when the accelerator pedal is pressed all the way down thereby causing the secondary throttle valve to open.

The secondary carburetor is so arranged that it is put into operation only when the operation of the primary carburetor is not sufficient to supply the fuel required for the engine performance. The auxiliary valve serves to control this operation automatically. The auxiliary valve is a butterfly valve having a corrugated section and arranged eccentrically on a shaft. A dumper valve lever integrally combined with a weight is fixedly mounted on the shaft.

On account of the weight, the auxiliary valve is always held closed and not brought into operation even if the throttle valve is fully opened as the low pressure side of the secondary carburetor is independently operable. And hence, the velocity of the

Choke system with the valve closed fully

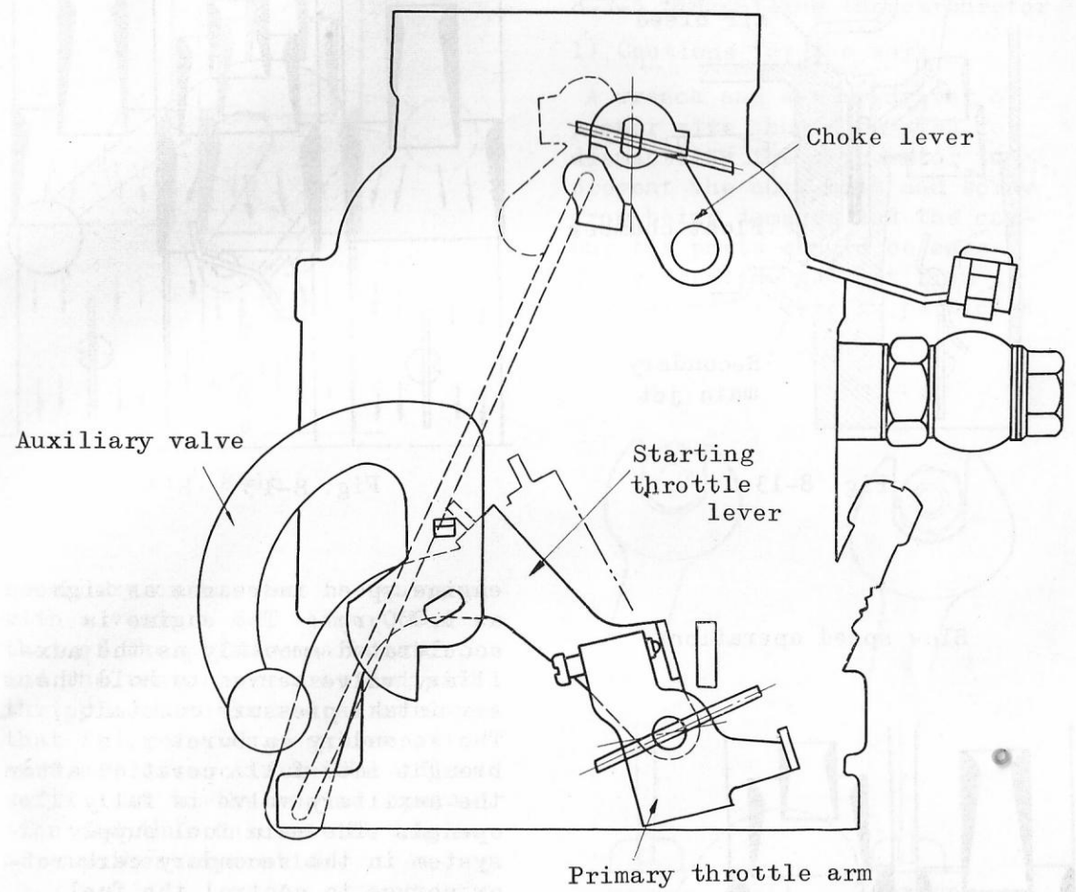


Fig. 8-12

air intake is held from being deaccelerated and provide the engine with optimum fuel mixture and thus ensures the engine of maximum performance particularly in slope-ascending and accelerating mode of operation. As the revolution of the engine increases with the throttle valve opening and the air intake pressure overcomes the weight of the auxiliary valve, the valve is forced to move toward opening side by the eccentrical force acting upon the weight and finally led to full open when the

Secondary main fuel supply system

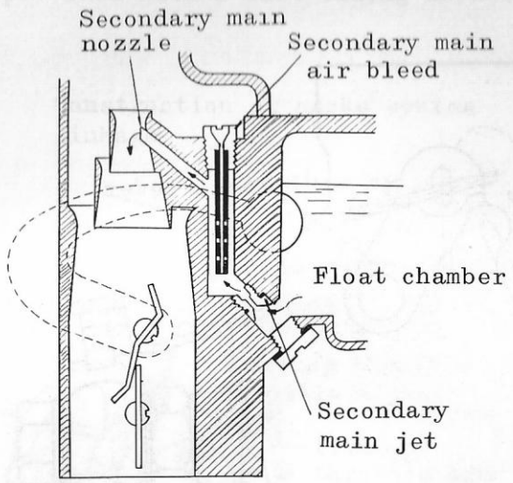


Fig. 8-13

Slow speed operation

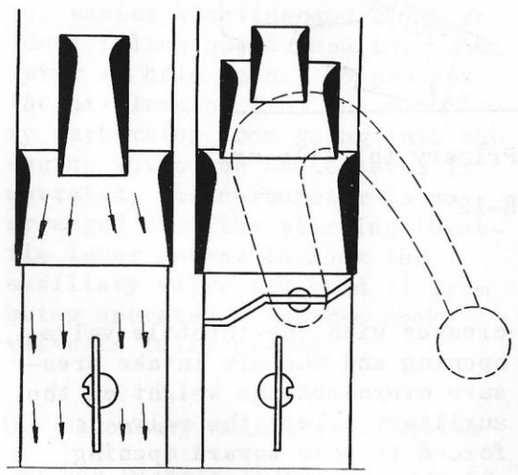


Fig. 8-14

Medium speed operation (200 - 3,000 rpm)

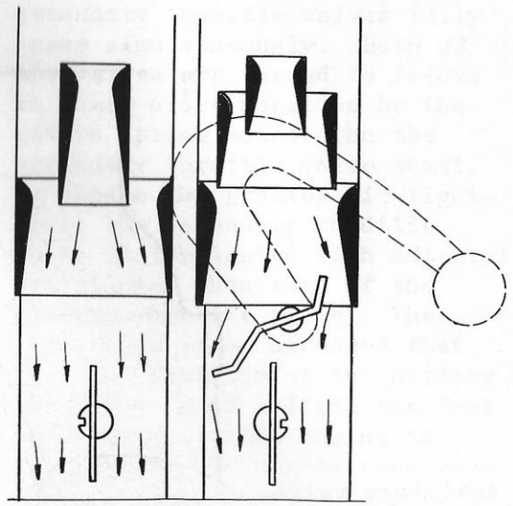


Fig. 8-15

engine speed increases as high as 3,000 rpm. The engine is accelerated smoothly as the auxiliary valve serves to hold the air intake pressure constant. The secondary carburetor is brought into full operation after the auxiliary valve is fully opened. The main fuel supply system in the secondary carburetor serves to control the fuel supplied from the float chamber with the secondary main jet and mixes the fuel with the air supplied by the secondary main air bleed and further lead the mixture to the narrowest portion in the tripple venturi through the main nozzle. As the secondary carburetor is designed to provide the engine with power, the fuel system is equipped only with the main fuel supply system. The

High speed operation

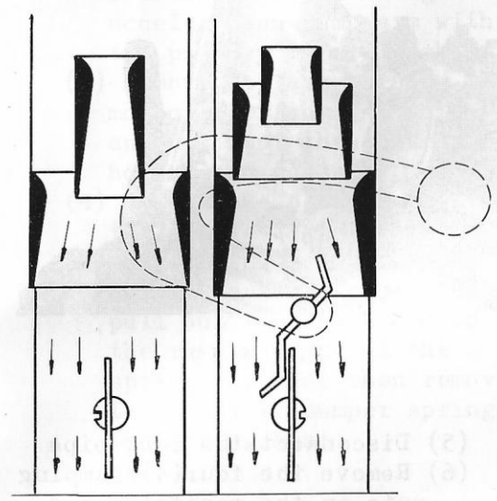


Fig. 8-16

secondary carburetor is equipped with a venturi far larger than that of the primary carburetor, and the venturi is provided with thripple channels and so arranged that it generates negative pressure and gives air intake effect sufficient to the engine operation and thus ensures the engine of smoothest operation.

7) Others

The carburetor is provided with a vacuum pressure ejector device on the upper portion of the throttle valve in the primary carburetor for operating a vacuum ignition timing control mounted on the distributor. The vacuum ignition timing starts operating when the throttle valve opens nearly 6° from its closed position and held from working when the engine is held idling.

8-3-3 Dismantling the carburetor

1) Cautions for the work

A wrench and a screwdriver of proper size should be used for dismantling the carburetor to prevent the nut, bolt and screw from being damaged and the carburetor parts should be carefully treated and kept from dust or other foreign particles.

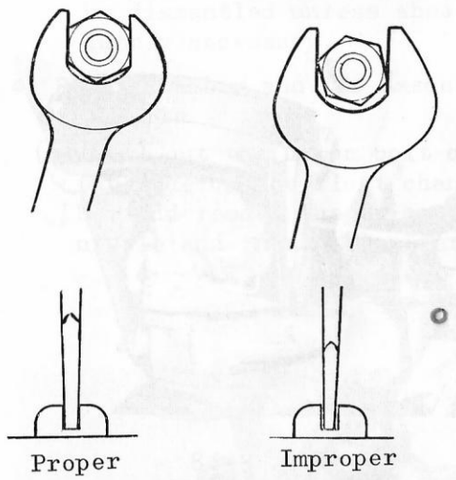


Fig. 8-17

The dismantled parts should be disposed separately by each system and protected from being interchanged. Careful attention each system and protected from being interchanged. Careful attention should be invited to the

parts in common with the primary and secondary carburetor. The parts should be thoroughly cleaned with gasoline and compressed air may be used for cleaning small hole on the parts. A wire and the like should not be used for cleaning the delicate parts as jets as the wire and the like may ruin nor enlarge the port of the jet and may often lead to engine trouble.

2) Removing the carburetor

(1) Remove the air cleaner

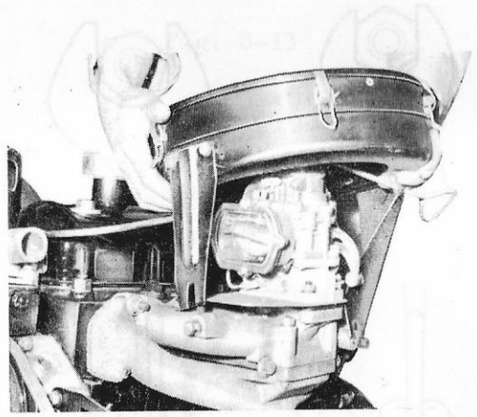


Fig. 8-18

(2) Disconnect the choke contol wire
(3) Disconnect the vacuum piping
(4) Remove the split pin on the operating shaft and then disconnect the linkage between the carburetor and the operating shaft.

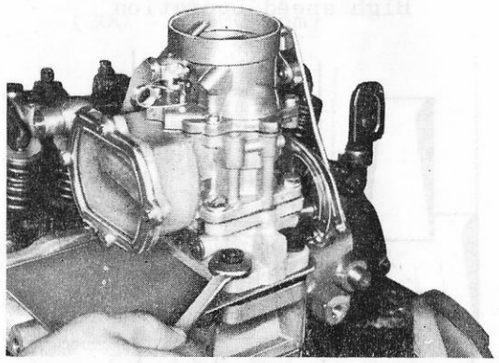


Fig. 8-19

(5) Disconnect the fuel pipe
(6) Remove the four(4)clamping nuts on the manifolds and dismount the carburetor from the manifold.

3) Dismantle the air horn and its associated parts

(1) First remove the spring clip and then remove the starting connecting rod serves to connect the choke lever with the starting throttle lever.

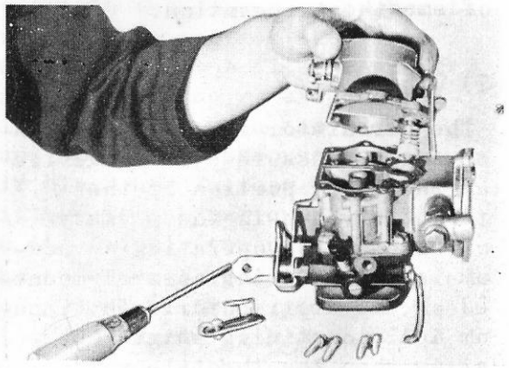


Fig. 8-20

(2) First remove the spring clip and then remove the connecting rod linking the acceleration pump arm with the primary throttle shaft.
(3) Remove the air horn by removing the four (4) screws and dismount the choke wire holder and gasket.
(4) Remove the plunger from the acceleration pump
First depress the dumper spring on the plunger and pull out the knock pin on the reverse side of the spring seat and then remove the plunger, dumper spring and spring seat.

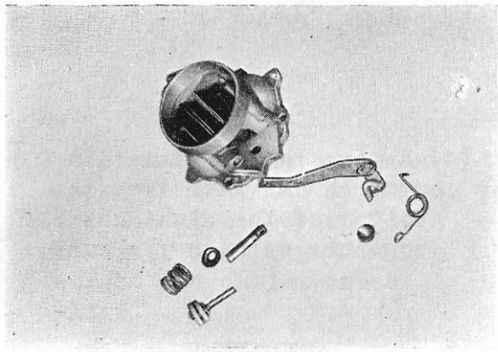


Fig. 8-21

(5) Check the operation of the choke valve and remove the choke valve and the shaft by removing the two (2) screws fixing the choke valve to the shaft as necessary. Carefully remove the valve to prevent the choke valve return spring from missing.

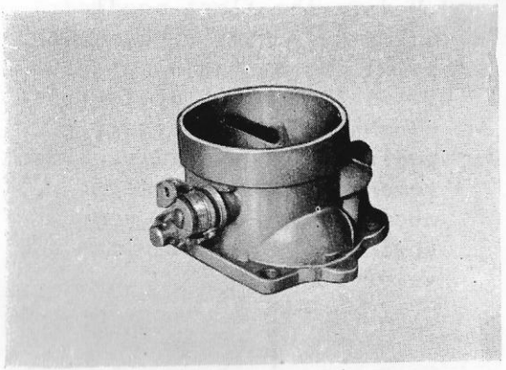


Fig. 8-22

(6) As the choke lever is secured to the air horn body with a ring, it should not be dismantled unless absolutely necessary.

4) Float chamber and its associated parts

(1) Pull out the union bolt on the side of the float chamber and remove the union nipple and intake strainer.

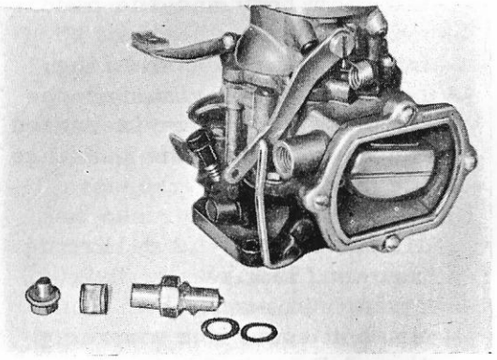


Fig. 8-23

Remove the float needle valve assembly. The needle valve can be taken out easily if the main body is tilted and the valve assembly is pulled out downwardly. Then remove the needle valve, needle valve spring and spring retainer from the valve seat.

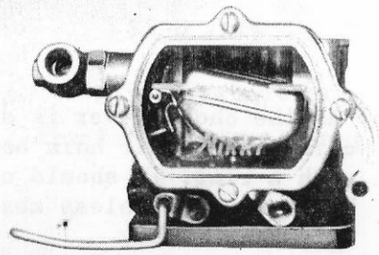


Fig. 8-24

(2) Note the number of copper packings provided between the main body and the needle valve seat as they may be required for reassembling. The fuel level rises as the number of packings increased and lowers with the packings increased.

(3) The float chamber can be dismantled in the following manner: Remove the four(4) fixing screws on the float chamber cover for removing the glass cover. The cover should be carefully removed to prevent the packing from being damaged. Then take out the float and check it carefully for damage. Shake the float with finger to see if it contains gasoline. Ruptured or leaky float should be replaced.

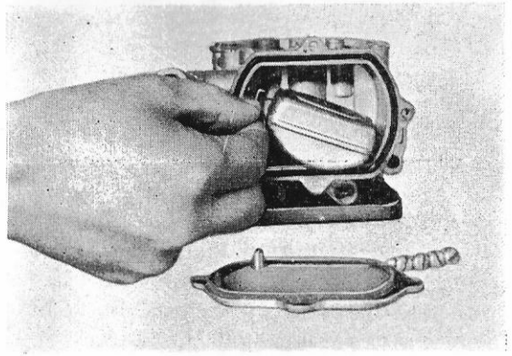


Fig. 8-25

(4) Remove the acceleration pump check valve from the bottom of the float chamber together with the packing.

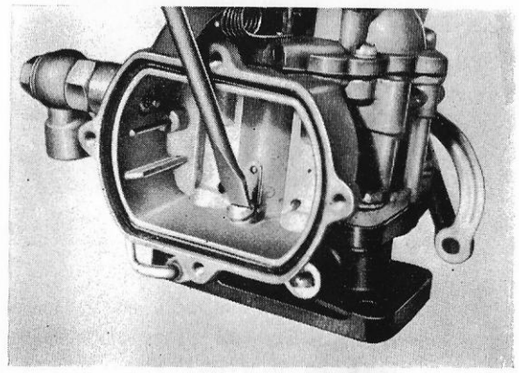


Fig. 8-26

5) Main body and its associated parts

(1) Remove the slow air bleed, slow jet and main air bleed on the upper part of the main body.

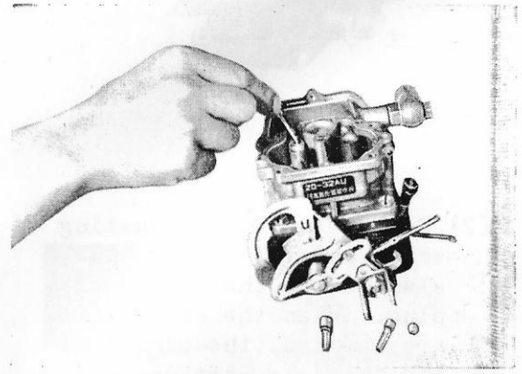


Fig. 8-27

(2) Remove the plug on the upper part of the main body and hold the body upside down for removing the pump weight and outlet check valve.

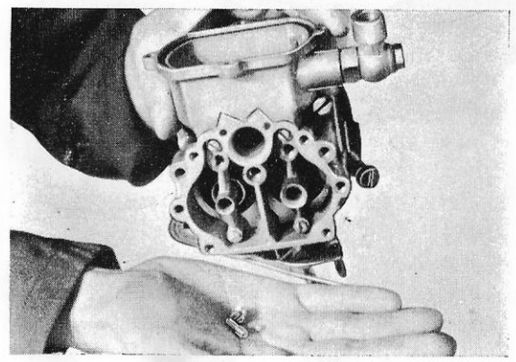


Fig. 8-28

(3) Remove the power jet valve from the bottom of the acceleration pump cylinder. Insert a screwdriver edge properly into the groove in the pump cylinder to prevent the valve rod from being damaged.

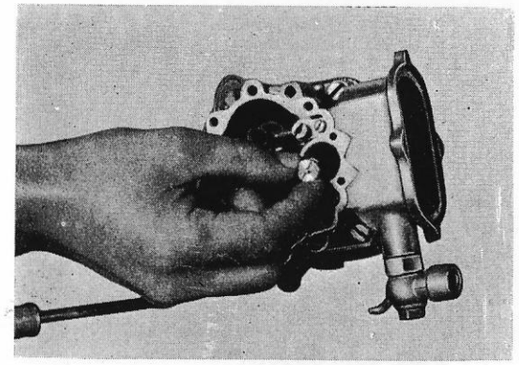


Fig. 8-29

(4) Hold the main body upside down and remove the plug from the primary and secondary main jet provided on the lower part of the body and then remove the main jet. Both the primary and secondry main jets are indistinguishable from their external appearance except the chamferred portion of the secondary main jet is smaller than that of the primary main jet.

(5) Remove the small venturi and their packings from the primary and secondary carburetor if absolutely necessary. The small venturi can be removed when the two (2) fixing screws are removed

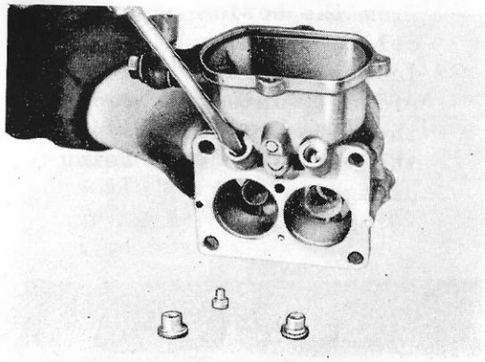


Fig. 8-30

but it is normally held in trouble-free condition and therefore, dismantling is not necessary and loosened screws may be re-tightened on detection.

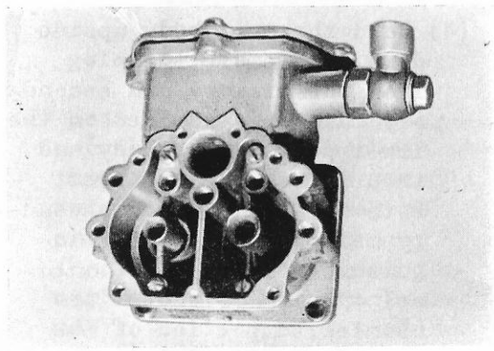


Fig. 8-31

6) Body flange and its associated parts

(1) Remove the four (4) fixing bolts from the main body and main body flange and then remove the main body.

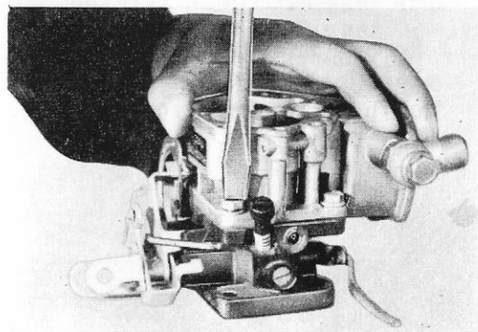


Fig. 8-32

(2) Remove the idle adjusting screw and its spring and also remove the slow port plug. When the above parts are removed, the slow port and the idle port can be easily cleaned.

(3) Remove the lock nut on the throttle lever and disconnect the throttle linkage by removing the split pin and then remove the primary throttle arm and starting

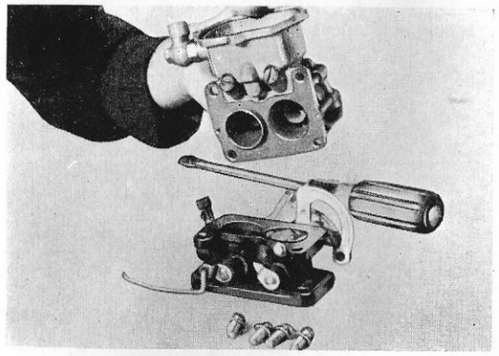


Fig. 8-33

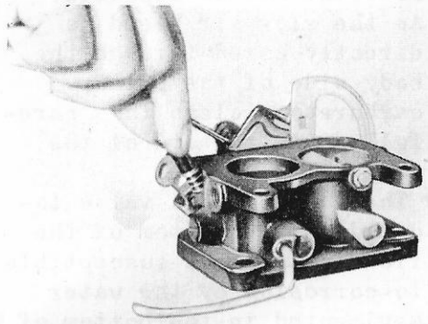


Fig. 8-34

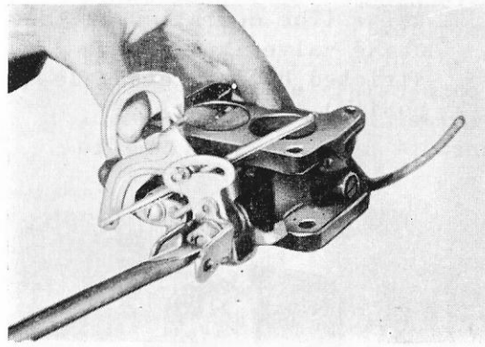


Fig. 8-36

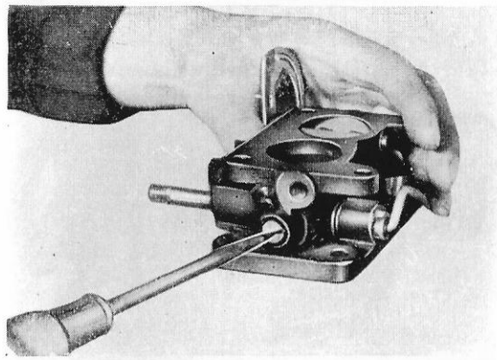


Fig. 8-35

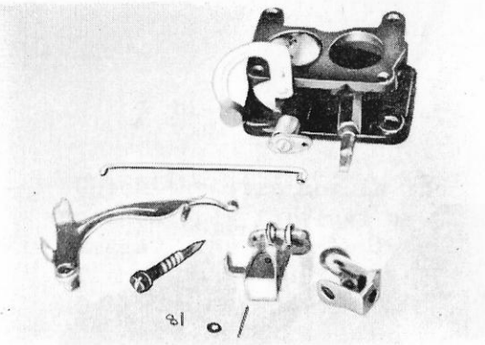


Fig. 8-37

throttle lever. Protect the return spring from being deformed.

(4) As the screws fastening the primary, secondary and auxiliary valves are carefully clamped and hermetically sealed to prevent the air leakage, they should be held from being turned loose but the carbon deposits may be carefully removed.

8-3-4 Inspecting the parts

When the carburetor is completely dismantled check the entire parts for trouble paying special attention to the following.

1) Air horn

(1) Crack or damage on the air horn particularly the damage on the contacting face.

(2) Wear on the joints on the shafts.

(3) Operation of the choke valve (The operation of the choke valve is often restricted by the carbon deposits).

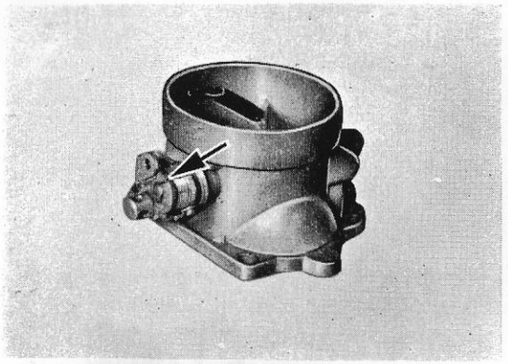


Fig. 8-38

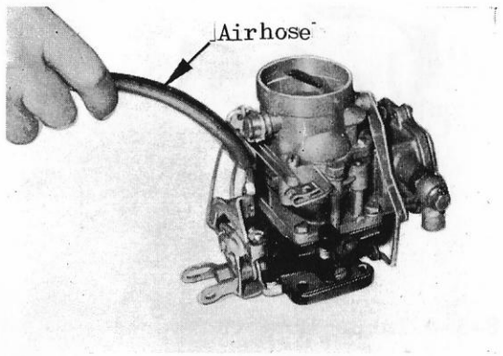


Fig. 8-39

2) Main body

(1) As the internal part of the body is normally subjected to carbon deposits, clean the parts carefully to remove the carbon deposits. As the slow air bleed is directly bored through the body side of the primary carburetor, clean this carefully with the aid of the compressed air.

(2) The outlet check valve located in the bottom of the float chamber is susceptible to corrosion by the water segimented in the bottom of the float chamber and also tends to lead to operating failure in contact with foreign particles and hence, the parts with any signs of trouble should be replaced.

Fig. 8-40

(3) The bottom of the acceleration pump cylinder should be carefully cleaned as the foreign particles tend to accumulate on this part and causes the jet clogging.

(4) If the needle valve, particularly the portion where comes in direct contact with the valve seat is worn and

Fig. 8-41

no longer provide desired sealing effect, it should be replaced as it often invite over-flowing and other troubles. The float valve spring should also be checked for weakened tensile force.

Fig. 8-42

(5) The float should be shaken to see if there is gasoline inventory inside. Leaking float should be immediately replaced. If the float pin inserting hole is worn the float should be replaced as loosely inserted pin would often result in over-flowing.

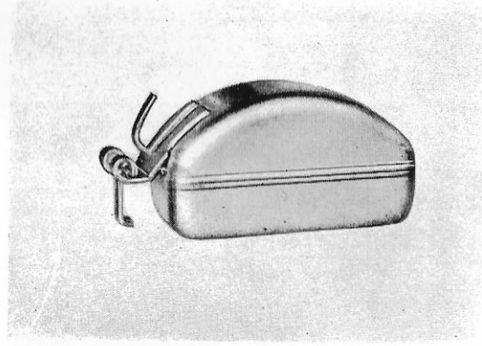


Fig. 8-43

Check the strainer in the union nipple for rust or damage. The tensile force of the dumper spring provided between the pump rod and the piston is acting on the acceleration pump plunger but the operation of the

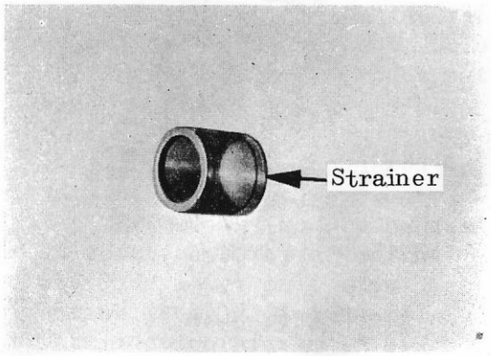


Fig. 8-44

pump plunger may be restricted if the piston rod fails to slide freely with the pump rod for rust. The leather boot should be checked for deformation. After the plunger is refitted into the cylinder, check to make sure that the plunger is allowed to slide freely.

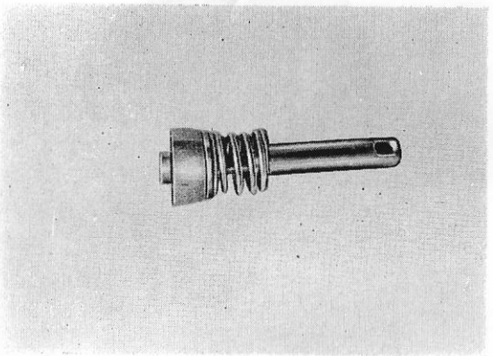


Fig. 8-45

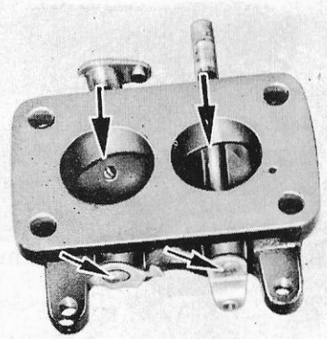


Fig. 8-46

3) Body flange

(1) Check the slow port and idle port for clogging.
(2) Check the throttle valve for carbon deposit and wear.
(3) Check the jointing portion of the throttle shaft for wear.
(4) Check the tip end of the idle adjusting screw where comes in contact with the seat for tapered wear, stepped wear or damage in the threaded portion.

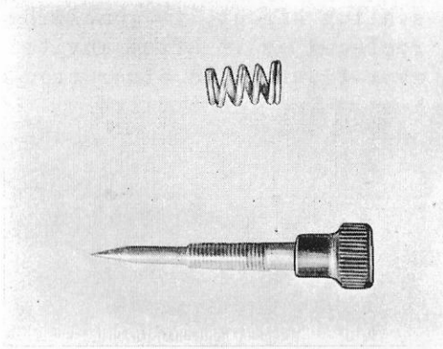


Fig. 8-47

(5) Reassembling and adjusting the carburetor
The carburetor should be reassembled in the sequence converse to dismantling and the following should be carefully noted.

1) After the darburetor is reassembled, move the primary throttle lever to see if the linking secondary throttle lever smoothly operate. Check

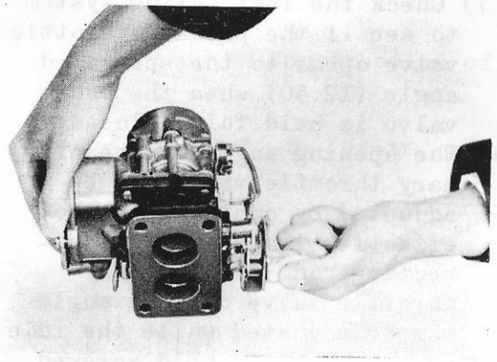


Fig. 8-48

to see if the primary and secondary throttle valve open fully at the same time. If the throttle valves fails to open fully simultaneously, readjust the valve operation by bending or stretching the linkage.

2) The main jet for the primary and the secondary carburetor should be kept from being interchanged. The packing should be replaced with that of good quality and the parts are firmly secured in position to prevent fuel leakage.

3) The power jet valve should be carefully mounted to prevent the valve rod from bending and carefully tightened to prevent fuel leakage. If the valve is not properly tightened, the fuel may be allowed to leak-off and increases the fuel consumption.

4) The small venturis may not have to be dismantled unless absolutely necessary but once they are removed, they should be provided with new gasket. Before fastening the small venturi to the body make sure to refit the new packings to the two (2) clamping bolts.

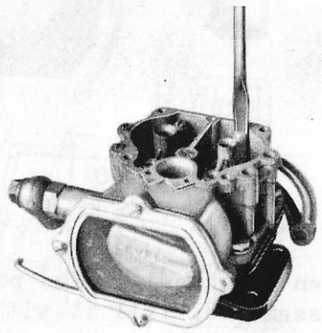


Fig. 8-49

5) The fuel level in the float chamber may be adjusted by reducing or increasing the number of copper gasket for the float valve seat. Increasing the number of gasket increases the fuel level and less gasket reduces the fuel level. The fuel level is standard at 19mm below the upper part of the body but since the glass cover is provided with level marks, the fuel level may be adjusted to retain within the markings. The level marks should be used as references for adjusting the fuel level only when the engine is held stationary. The float cover should be carefully checked for a sign of fuel leakage.

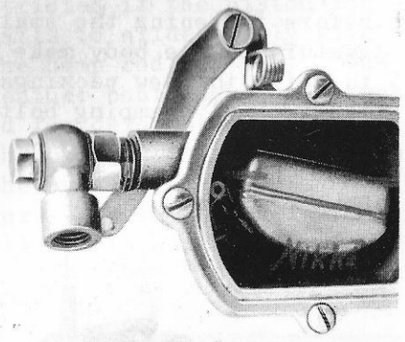


Fig. 8-50

6) When the acceleration pump is reassembled, fill it with gasoline and check to make sure that the fuel for acceleration is smoothly injected. As the pump piston also serves to operate the power jet valve, the connecting rod should be carefully treated to prevent it from being bent.

7) Check the fast idling system to see if the primary throttle valve opens to the specified angle (12.50) when the choke valve is held fully closed. The opening angle of the primary throttle valve may be adjusted by controlling the effective length of the connecting rod. The primary throttle valve opening angle may be adjusted while the idle adjust screw is held screwed all the may in so as to hold the primary throttle valve fully closed when the choke valve is opened fully.

8-4 CARBURETOR FOR MODEL G130

8-4-1 Construction of the carburetor

The carburetor for the model G130 engine has the construction substantially same to that for the model G150 except the carburetor for the model G130 is equipped with Solex type main fuel supply system. The acceleration pump similar to that on the model G150 equipped with the engine for the model G130 ensures the engine of maximum accelerating efficiency.

Construction of the carburetor

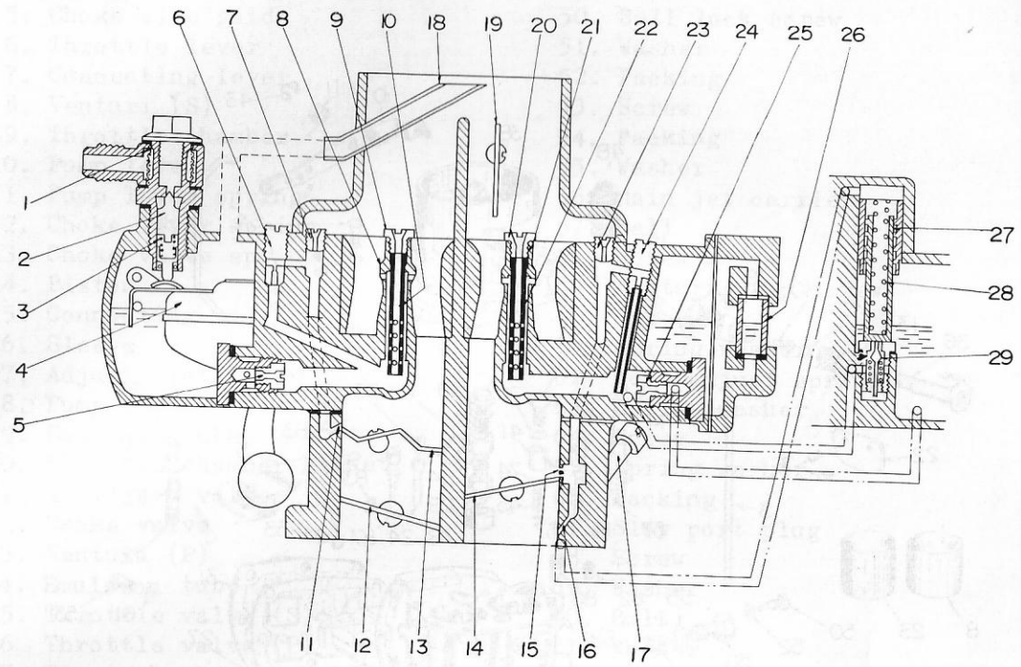


Fig. 8-51

1. Strainer
2. Needle valve
3. Valve spring
4. Float
5. Secondary main jet
6. Secondary slow jet
7. Secondary slow air bleed
8. Secondary main nozzle
9. Secondary main air bleed
10. Secondary emulsion tube
11. Step port
12. Secondary throttle valve
13. Auxiliary valve
14. Primary throttle valve
15. Slow port
16. Idle port
17. Idle adjusting screw
18. Air vent
19. Choke valve
20. Primary main air bleed
21. Primary main nozzle
22. Primary emulsion tube
23. Primary slow air bleed
24. Primary slow jet
25. Primary main jet
26. Fuel level gage
27. Vacuum piston
28. Vacuum piston spring
29. Power valve

Component parts of the carburetor for model G130

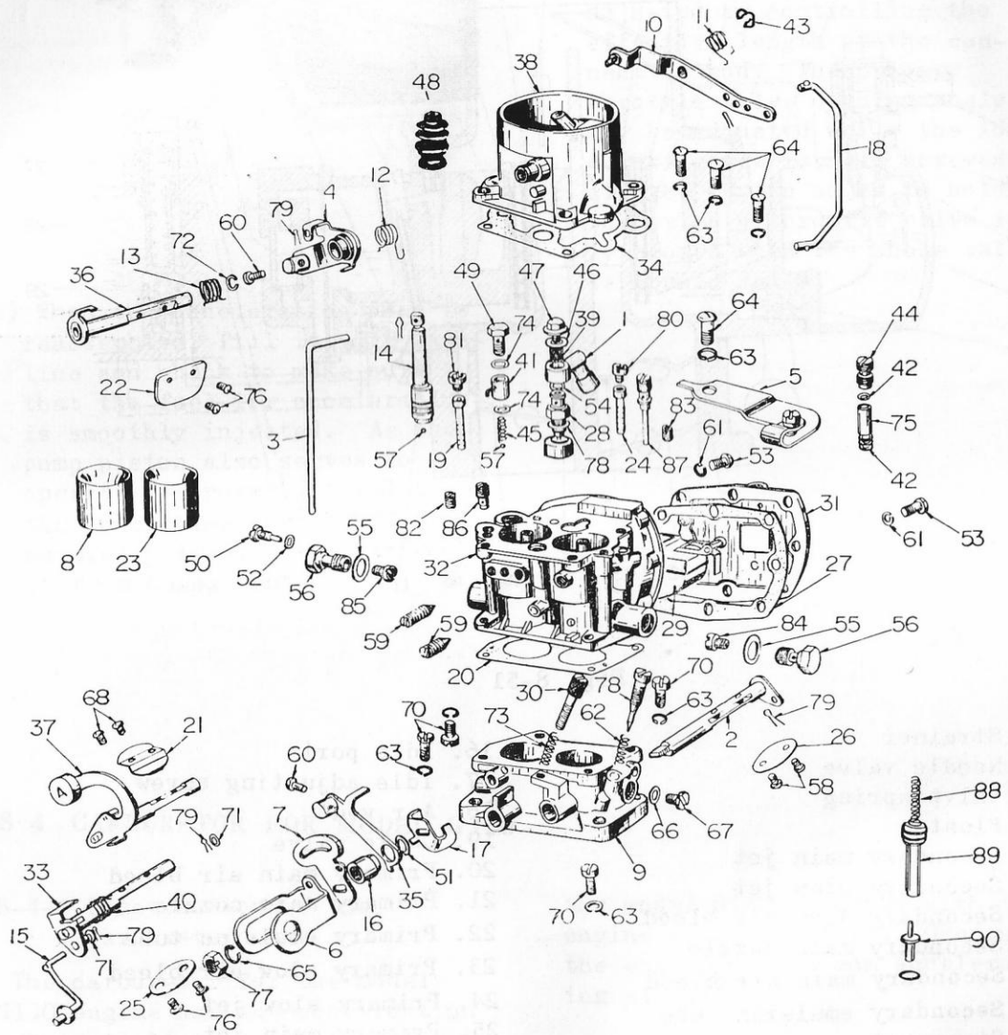


Fig. 8-52

1. Nipple
2. Throttle shaft
3. Connecting rod
4. Choke lever
5. Choke wire guide
6. Throttle lever
7. Connecting lever
8. Venturi (S)
9. Throttle chamber
10. Pump lever
11. Pump lever spring
12. Choke lever spring
13. Choke valve spring
14. Piston
15. Connecting rod
16. Sleeve
17. Adjust plate
18. Pump rod
19. Emulsion tube
20. Throttle chamber gasket
21. Auxiliary valve
22. Choke valve
23. Venturi (P)
24. Emulsion tube
25. Throttle valve (S)
26. Throttle valve (P)
27. Float chamber gasket
28. Needle valve
29. Float
30. Throttle adjust screw
31. Float chamber cover assembly
32. Float chamber
33. Throttle shaft (S)
34. Choke chamber gasket
35. Connecting lever
36. Choke valve shaft
37. Counter lever assembly
38. Choke chamber
39. Filter
40. Throttle spring
41. Pump injector
42. Packing
43. Shaft clip
44. Gage set screw
45. Pump injector spring
46. Washer
47. Filter setting screw
48. Pump cover
49. Injector set screw
50. Ball lock screw
51. Washer
52. Packing
53. Screw
54. Packing
55. Washer
56. Main jet carrier
57. Ball
58. Screw
59. Venturi stop screw
60. Screw
61. Spring washer
62. Idle adjust spring
63. Spring washer
64. Screw
65. Spring washer
66. Packing
67. Slow port plug
68. Screw
69. Washer
70. Bolt
71. Washer
72. Clip
73. Throttle adjust spring
74. Washer
75. Fuel level gage
76. Screw
77. Nut
78. Idle adjust screw
79. Cotter pin
80. Main air bleed (P) (#200)
81. Main air bleed (S) (#200)
82. Slow air bleed (P) (#190)
83. Slow air bleed (S) (# 70)
84. Main jet (P) (# 95)
85. Main jet (S) (#160)
86. Slow jet (S) (# 50)
87. Slow jet (P) (#105)
88. Power piston spring
89. Power piston
90. Power valve (# 45)

8-4-2 Construction and function of the carburetor

As the construction of the carburetor for model G130 is substantially same to that of the model G150 engine, the component parts of the carburetor in common with that of the model G150 are omitted from further description.

1) Main fuel supply system

The main fuel supply system has a construction similar to solex type and the fuel in the float chamber is fed to the venturi through the main jet and main nozzle through which the fuel is vaporized by the air supplied from the main air bleed through the emulsion tube. The main nozzle is provided with multi-hole and gives exellent fuel vaporizing effect.

2) Stop port fuel supply system

This system serves as the slow system in the primary carburetor and the secondary carburetor is also equipped with the step port fuel supply system. This system is provided for communicating the fuel between the primary and secondary carburetors and the delivery port of which is situated at the position close to the auxiliary valve when held closed.

3) Float chamber

The construction of the float chamber differs from that of the model G150. The cover of the float chamber is fabricated with aluminum and is provided with a fuel level gage. If the fuel level is such that the projected portion on the cover provided on both sides of the fuel level gage is filled with the fuel, the fuel level may be regarded as properly maintained.

4) Acceleration system

The acceleration pump is provided with the piston fabricated with metal and its arrangement facilitates the maintenance work.

5) Power fuel supply system

The power valve system of this carburetor relies upon the boost and is operated by the air intake pressure generated in the lower part of the throttle valve.

Acceleration system

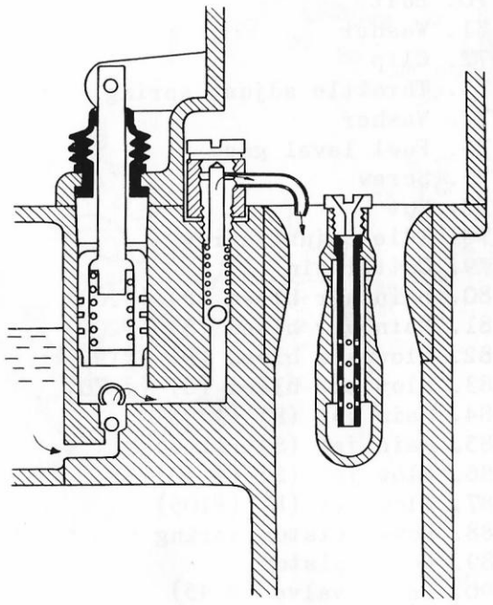
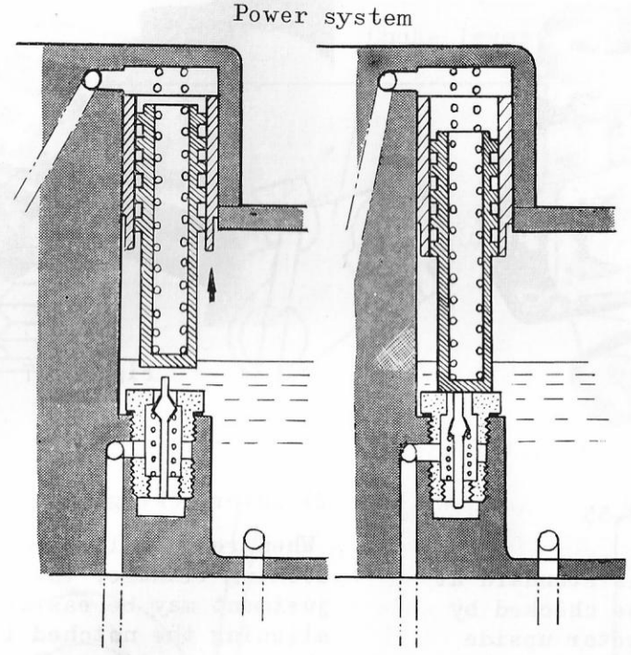


Fig. 8-53

Power system



When Light-load is applied

When heavy-load is applied

Fig. 8-54

When the engine is operated with light load, the throttle valve opening angle is considerably small and hence, strong negative pressure is generated in the lower part of the venturi and the vacuum piston is forced to move upward against the tensile force of the spring while the power valve is held closed.

However, when the engine is operated with heavy load or the engine is accelerated, the throttle valve is held open widely and the negative pressure in the lower part of the venturi is decreased and hence the vacuum piston is forced to move downwardly by the return spring and causes the power valve to open thereby supplying the fuel as necessary.

8-4-3 Dismantling, reassembling and adjusting

1) Float and its associated parts

For adjusting the fuel level, remove the float chamber cover by removing eight (8) fixing screws from the cover and then dismout the float. The fuel level may be controlled by adjusting the float seat. The effective stroke of

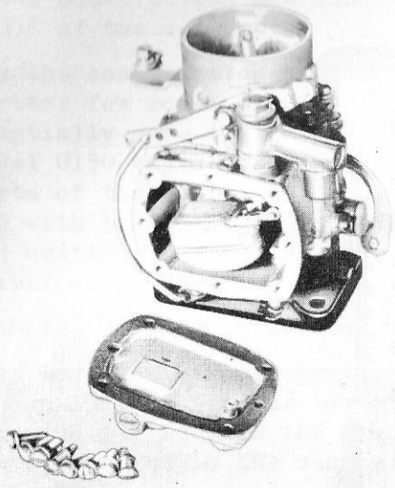


Fig. 8-55

the needle valve is standard at 1.5mm. This may be checked by holding the carbutetor upside down and lift the float all the way up and see if 1.5mm of clearance is provided between the tip end of the needle valve and the float seat. Adjust the clearance to 1.5mm by adjusting the float stopper as necessary.

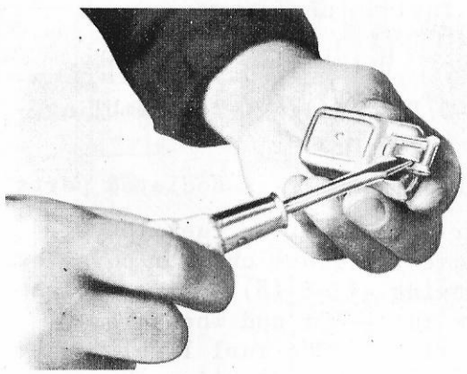


Fig. 8-56

Fig. 8-57

2) Interlocking system

When reassembling the interlocking linkage, the proper adjustment may be easily made by aligning the notched line on the choke connecting rod with the arrow marking on the post of the choke connecting lever.

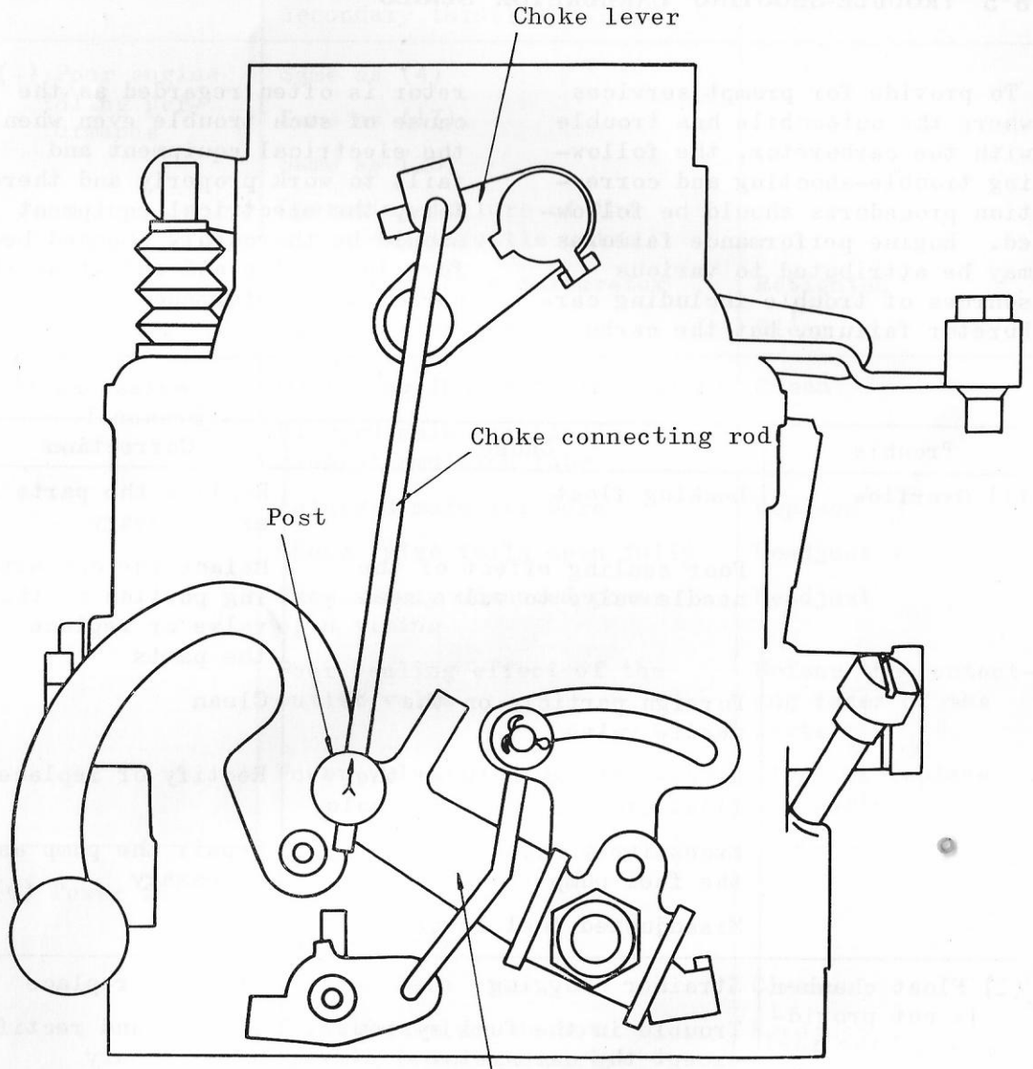


Fig. 8-58

8-5 TROUBLE-SHOOTING CARBURETOR SERIES

To provide for prompt services where the automobile has trouble with the carburetor, the following trouble-shooting and correction procedures should be followed. Engine performance failures may be attributed to various sources of trouble including carburetor failure, but the carburetor is often regarded as the cause of such trouble even when the electrical equipment and fails to work properly and therefore, the electrical equipment should be thoroughly checked before inspecting and adjusting the carburetor performance.

Trouble	Cause	Correction
(1) Overflow	Leaking float	Replace the parts as necessary
	Poor sealing effect of the needle valve to valve seat	Reface the contacting portion of the valve or replace the parts
	Foreign particle on the needle valve	Clean
	Excessive play between the float pin and inserting hole	Rectify or replace
	Excessively high pressure in the fuel pump	Repair the pump as necessary
	Misadjusted fuel level	Readjust
(2) Float chamber is not provided with the fuel	Strainer clogging	Clean or replace
	Trouble in the fuel system except the carburetor	Inspect and rectify as necessary
(3) Engine fails to start	Same as (4)	
	Same as (17)	
	Improper throttle valve opening angle when the choke valve	Adjust
	Excessive clearance between the throttle valve shaft and the boss	Replace

	Operating failure of the secondary throttle valve	Clean and rectify
(4) Poor engine idling performance	Same as (4)	
	Same as (17)	
	Same as (26)	
	Operating failure of the secondary throttle valve	
	Loosely mounted carburetor	Retighten
	Clogged slow jet	Clean
(5) Excessive fuel consumption	Over-flow (Check 1) through 6)	Clean
	Clogged main air bleeds or clogged emulsion tube	
	Enlarged main jet bore	Replace
	Choke valve fails open fully	Readjust
	Excessively advanced power open timing	Readjust
	Poor sealing effect of the outlet valve	Reface the contacting faces of the parts
	Power valve is held open	Clean or replace the parts
(6) Power failure	Same as (4)	
	Same as (44)	
	Clogged main jets	Clean
	Throttle valves do not operate (open) properly	Readjust
	Fuel pump operating failure	Rectify the pump as necessary
	Same as (18)	
	Auxiliary valve operating failure	Clean and adjust
	Clogged air cleaner	Clean or replace

(7) Engine fails to operate smoothly when accelerated	Auxiliary valve is held open	Clean and adjust
	Operating failure of the acceleration pump (Excessively retarted fuel injection timing, insufficient fuel injection, insuffi cient fuel injecting intervals)	Clean and adjust
	Excessive play in the acceleration pump linkage	Adjust or replace the parts as necessary
	Operating failure of the intake and outlet valves	Clean or replace
	Poorly adjusted idling	Adjust
	Same as (37)	
	Same as (57)	
(8) Engine fails to operate smoothly at high speed	Same as (57)	
	Plugged power valve	Clean

8-6 JET AND AIR BLEED

As the jet and the air bleed are the most important parts of the carburetor which have direct effects on the engine performance and hence, all the parts incorporated in the carburetor are manufactured in the most careful manner. The jet and the air bleed should be therefore, cleaned carefully with gasoline and dried with compressed air. As the number marking on the jet increases, the size of the bore increases and thus, with increased numbers on the main jet or slow jet, the mixture becomes heavier and with the mark number reduced, the mixture gets thinner. Conversely, the main or slow air bleed with larger numbers provide more air and hence, the mixture gets thinner with the main or slow air bleed with increased numbers. In such instance if the jet is replaced with that of different marks, the following should be carefully noted.

For the practical purpose of economizing the fuel consumption even sacrificing the power loss, the main jet or the slow jet with smaller bore or the main air bleed or the slow air bleed with larger bore may be put to use in place of the parts presently used.

For the purpose of improving the engine output regardless of the fuel consumption, the main jet or the slow jet with larger bore and the main air bleed or the slow air bleed with smaller bore may be used in place of the specified parts.

8-7 FUEL PUMP

The fuel pump for the Bellett engine is equipped with a diaphragm and operated on the principle of cam rotation. The rotation of the eccentric cam on the camshaft is shifted into reciprocative motion and transmitted to the diaphragm which serves to intake and deliver the fuel into the carburetor. The diaphragm is specially finished to prohibit the penetration of the fuel. The fuel pump is also equipped with a manually operable lever so that it may be readily operated for feeding the fuel to carburetor when necessary.

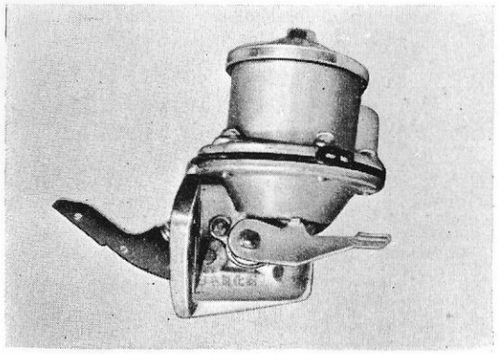


Fig. 8-59

8-7-1 Specifications of the fuel pump

Name of the manufacturer	NIHON KIKAKI
Type	Mechanically operated diaphragm PD-56Q
Parts number	15100-029
Valve closing pressure	0.2 - 0.25kg/cm^2
Maximum amount of delivery	Above 300cm^3/min
Number of cam rotation	1000r.p.m

Construction of the fuel pump

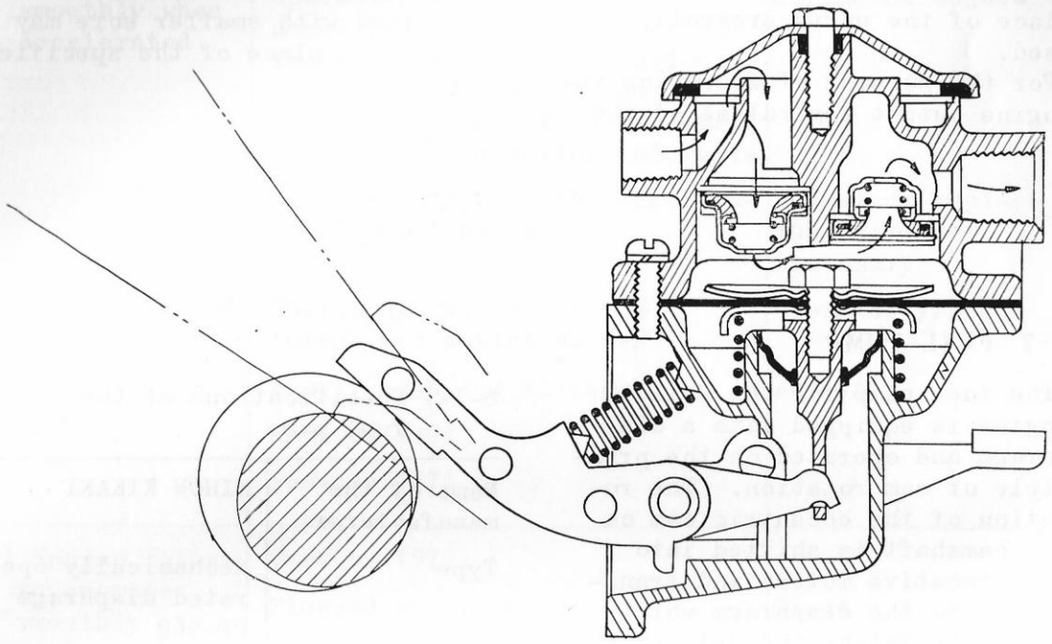


Fig. 8-60

Component parts of the fuel pump

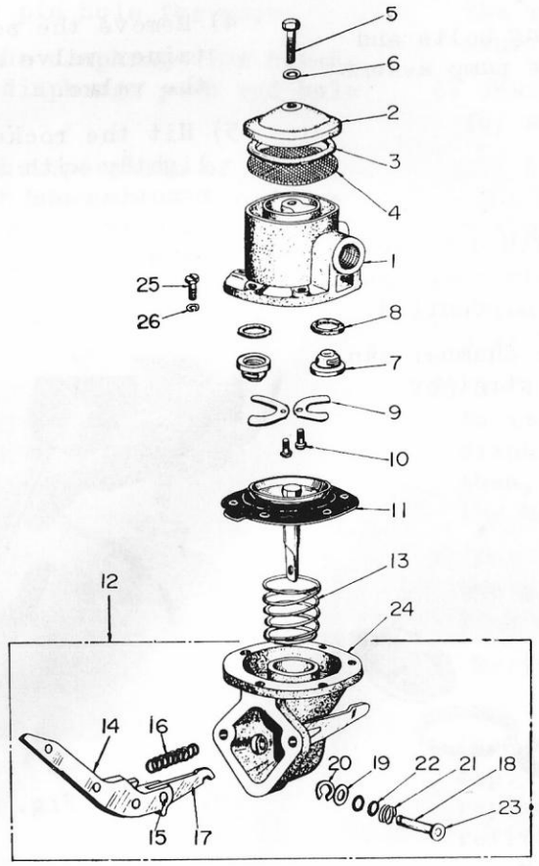


Fig. 8-61

1. Vlave chamber body
2. Valve chamber packing
3. Packing body
4. Strainer screen
5. Bolt and cap set
6. Packing bolt
7. Valve assembly
8. Valve packing
9. Valve retainer
10. Valve retainer screw
11. Diaphragm assembly
12. Rower body assembly
13. Diaphragm spring
14. Rocker arm
15. Rocker arm shaft
16. Return spring
17. Link arm
18. Rocker arm pin
19. Washer
20. Snap ring
21. Spring
22. "0" ring
23. Washer
24. Body
25. Body set screw
26. Spring washer

8-7-2 Removing

1) Remove the inlet and outlet pipe from the pump

2) Remove the fixing bolts and then dismount the pump assembly.

8-7-3 Dismantling

1) Wash the pump with detergent oil and dry it with compressed air before it is dismantled.

2) Remove the valve chamber cap and take out the strainer screen inside.

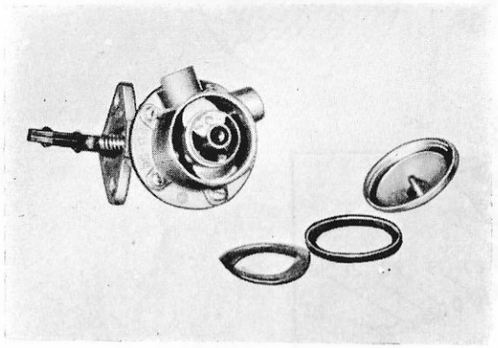


Fig. 8-62

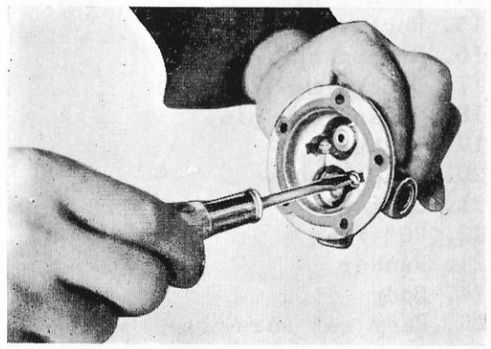


Fig. 8-63

3) Remove the upper body by removing the five (5) fixing screws.

4) Remove the screws from the retainer valve and then remove the valve.

5) Hit the rocker arm shaft lightly with a hide mallet for removing and then, remove the rocker arm, diaphragm, diaphragm spring and return spring.

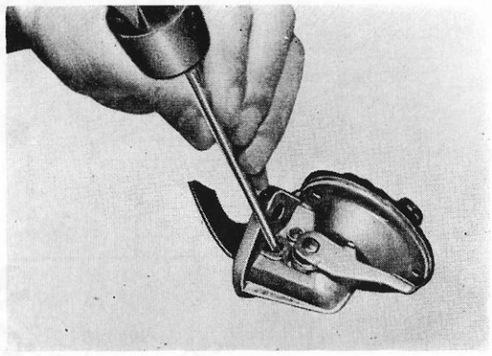


Fig. 8-64

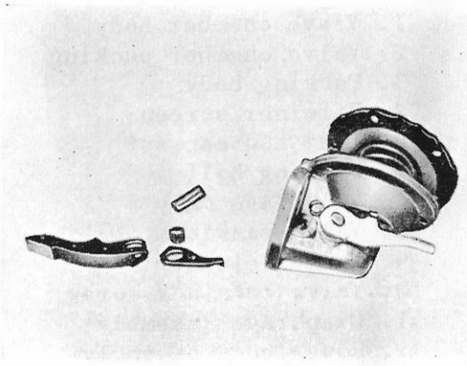


Fig. 8-65

8-7-4 Inspecting

1) Carefully check the cap and body for crack or deformation and body pin hole for wear.

2) Check the diaphragm for breakage and diaphragm push rod hole for wear.

3) Check the operation of the valve and also check the valve spring for weakening or rust accumulation.

Fig. 8-66

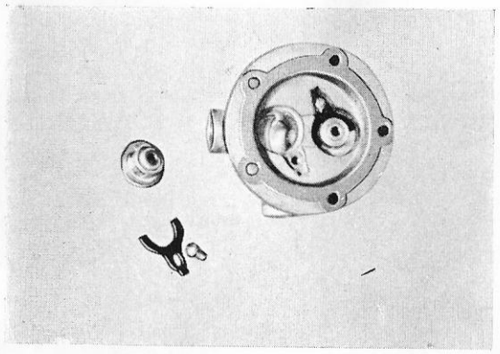


Fig. 8-67

4) Check the rocker arm pin for wear.

5) Check the contacting face of the rocker arm to the cam for wear.

6) Check the diaphragm spring for weakened tensile force.

8-7-5 Reassembling and refitting

1) Refit the intake and outlet valve to their respective positions with new gaskets.

2) Refit the diaphragm assembly to its position and press the diaphragm lightly upward and then, put the link arm through the hole on the push rod.

3) Put the rocker arms through the holes on the rocker arm, link arm and the body.

4) Refit the upper body.

5) Refit the strainer screen and then mount the valve chamber cap. The packing should be replaced before the parts are refitted to their positions.

6) All the parts should be fitted to their positions with new gasket attached. The pump should be carefully checked for fuel and oil leakage after it is reassembled.