CARTER YS SERVICE MANUAL

CM518

This manual covers the military Carter YS sealed carburetor, numbers 637S and 950S used on Willys-built 1949-56 134 CID F, L Engine 1/4 Ton 4x4 CJ-V35-U (US Navy) and MC, MCI M38 (Army) MD M38-A1 (US Army). It is compiled from military service manuals.

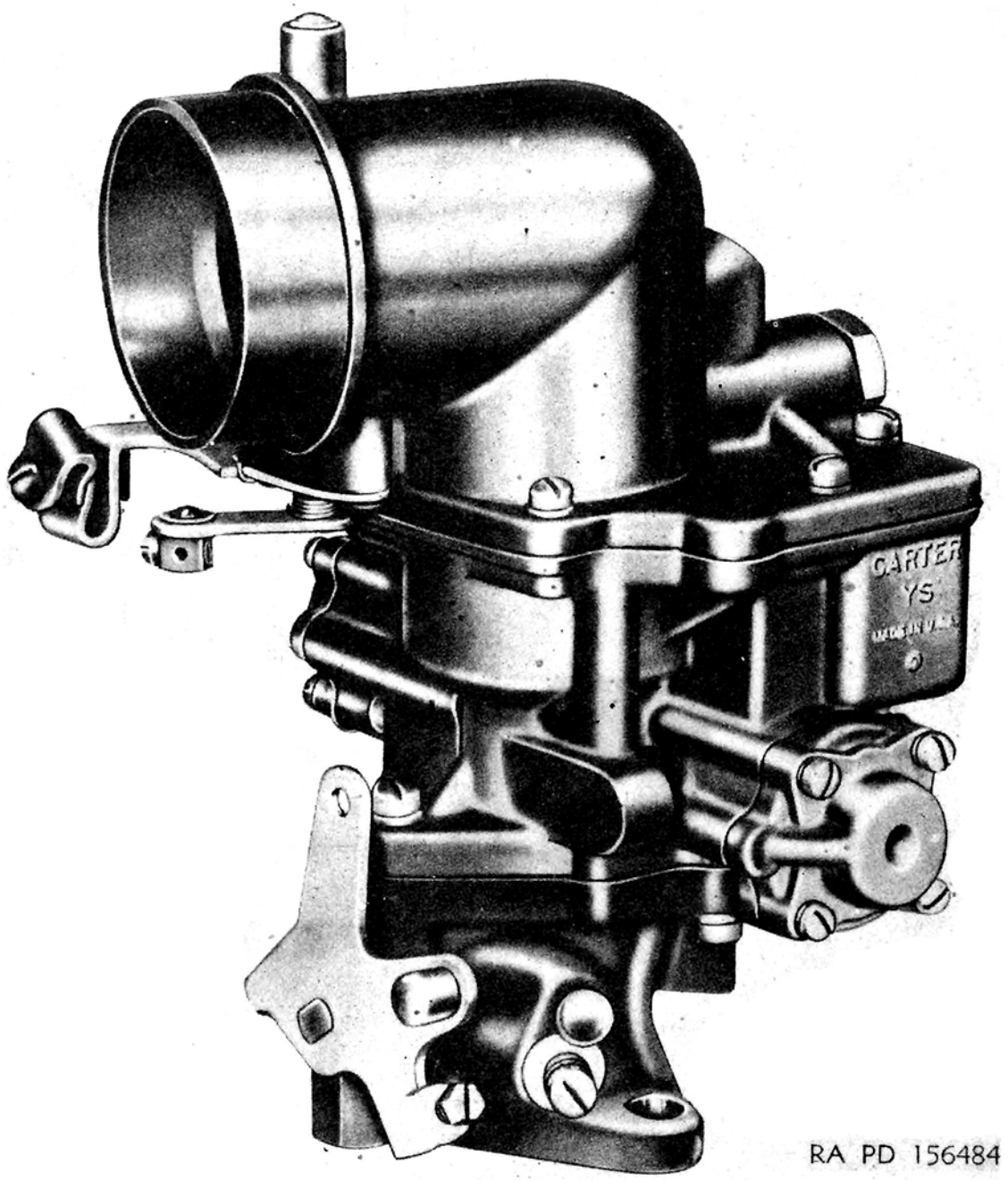

Figure 55. Type Y-S carburetor, model 637S.

89. DESCRIPTION

The type Y-S carburetor (fig. 55) is a single throat unit of waterproof design for use on deep fording vehicles.

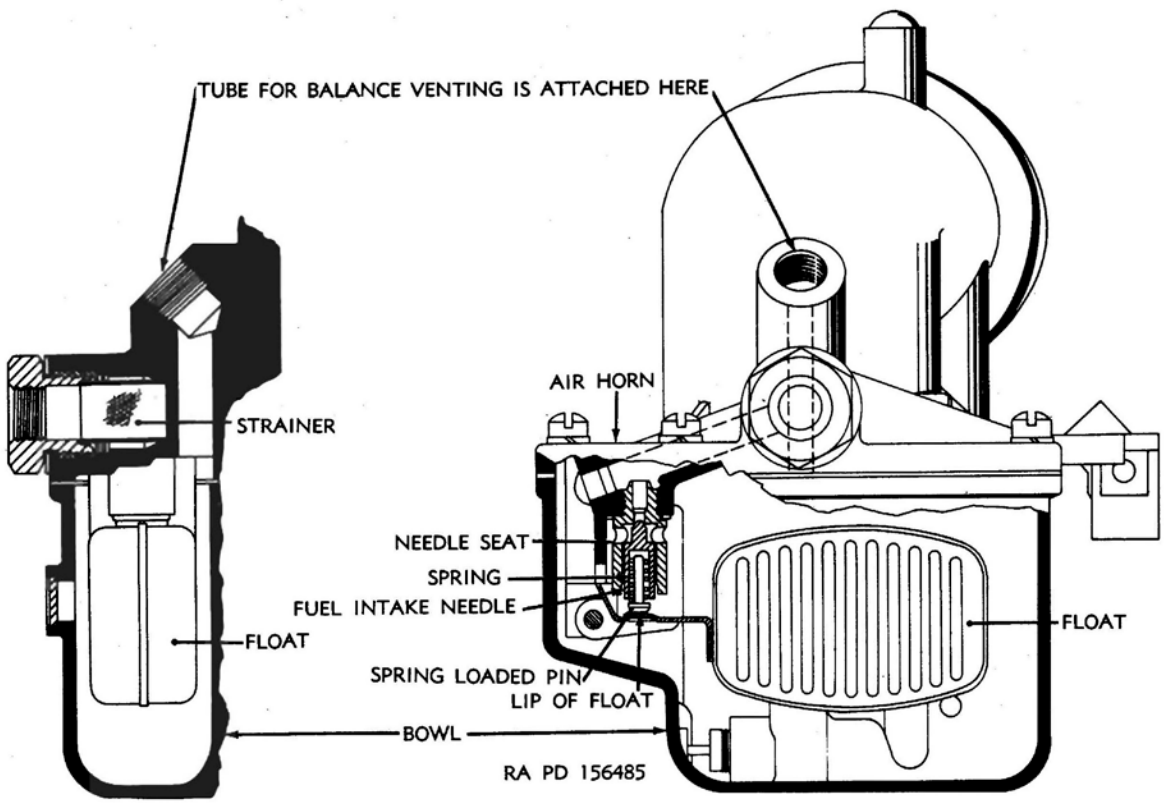

Figure 56. Type Y-8 carburetor, float circuit.

90. FLOAT CIRCUIT

(fig. 56)

The operation of the float circuit is conventional (par. 13). The fuel intake needle is hollow to permit the insertion of a spring and pin. The lip of the float bears on this spring loaded pin, which serves to prevent flooding due to needle chatter, caused by excessive vibration. The bowl is “balance” vented by means of an external tube which connects the air horn to the air cleaner.

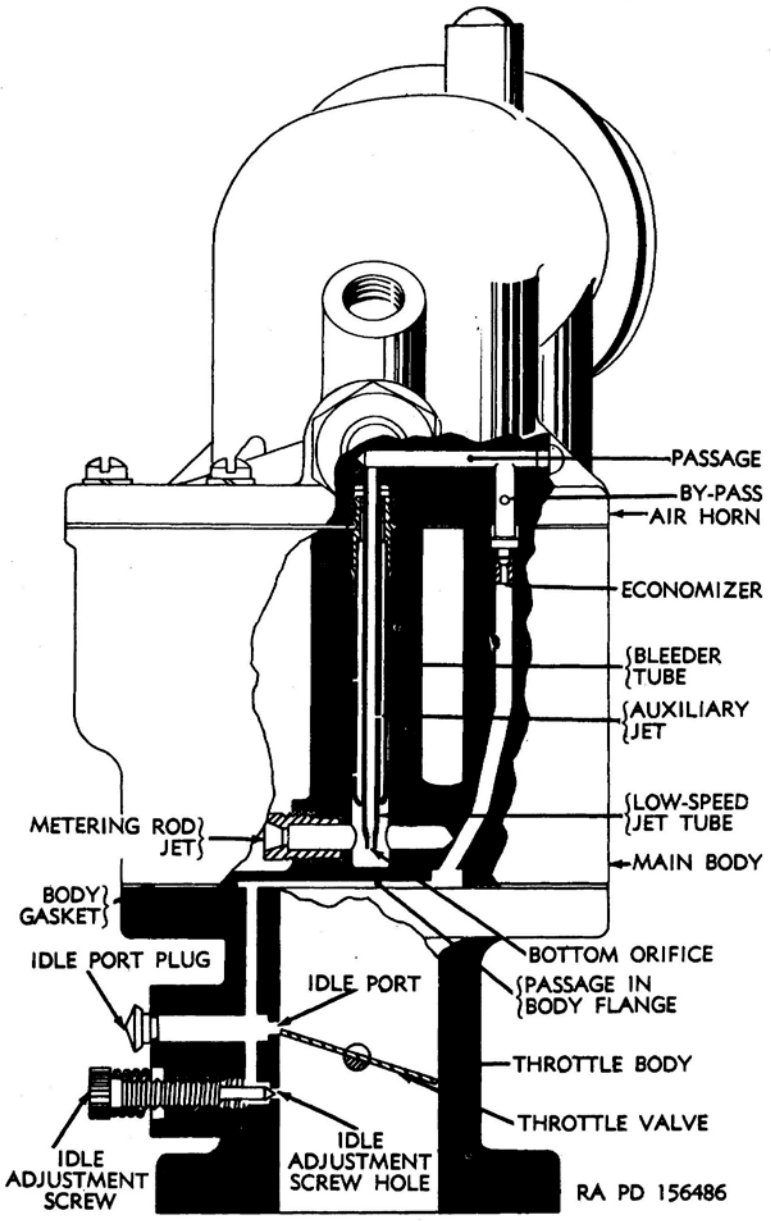

Figure 57. Type Y-8 carburetor, low-speed circuit.

91. LOW-SPEED CIRCUIT

(fig. 57)

Fuel, which passes through the metering rod jet, is metered to the low-speed circuit by the low-speed jet tube. The fuel passes through two orifices in the tube, one at the bottom and another in the side (auxiliary jet). The second orifice is at a point about three-quarters of an inch from the end of the low-speed jet tube, inside the bleeder tube. The fuel passes through the low-speed jet tube, the upper end of which is pressed into the air horn, across the passage in the air

horn, where it is mixed with air entering from the bypass through the economizer, and down through the passage cast into the main body flange, and then down through the passage in the throttle body. Fuel is discharged from the idle port and idle adjustment screw hole. Note that the main body gasket forms one side of the cross passage in the main body. It is important, that no air be allowed to leak in at this point.

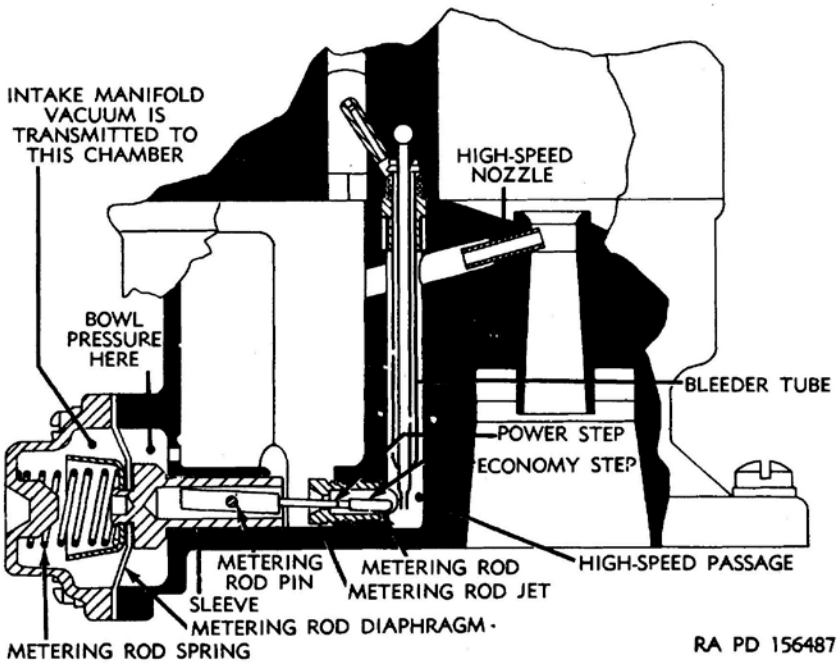

Figure 58. Type Y-S carburetor, high-speed circuit.

92. HIGH-SPEED CIRCUIT

(fig. 58)

a. General- Fuel is metered to the high-speed circuit by the orifice provided by the metering rod jet and metering rod. It flows through the high-speed passage, where it is mixed with air entering from the bowl by way of the bleeder tube. The mixture is then discharged from the high-speed nozzle at the throat of the primary (inner) venturi.

b. Vacuum Operated Metering Rod. The metering rod is vacuum operated by means of a neoprene metering rod diaphragm. The metering rod is loosely pinned to a brass sleeve which is riveted to the diaphragm. One side of the diaphragm is exposed to intake manifold vacuum by means of a passage leading to an opening in the carburetor bore, below the throttle valve. The other side of the diaphragm is acted upon by the pressure in the bowl. The manifold pressure side of the diaphragm is acted upon by a compression spring in addition to the manifold vacuum. Under low or intermediate load conditions, when intake manifold vacuum is high, the diaphragm is held back against the force of the spring. This results in the positioning of the larger (economy) step of the metering rod in the jet. When manifold vacuum drops, under

high load conditions, the spring forces the diaphragm forward, positions the smaller (power) step of the metering rod in the jet and permits the required additional fuel to flow.

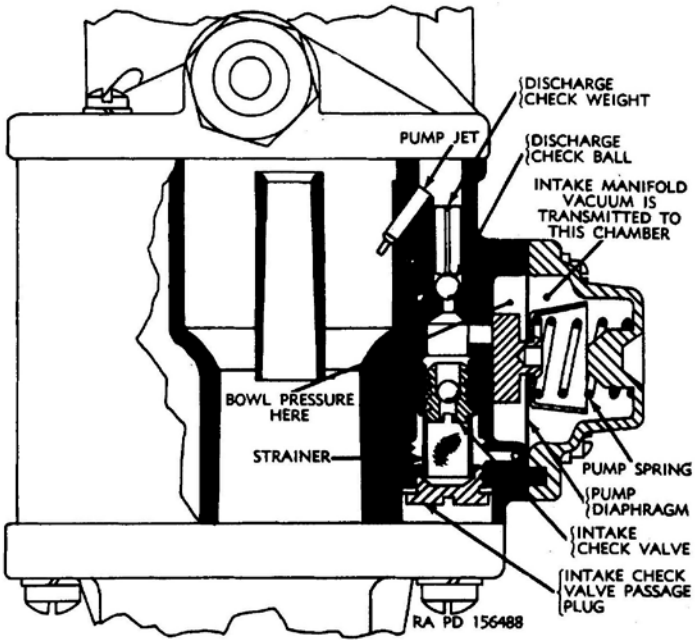

Figure 59. Type Y-8 carburetor, pump circuit.

93. PUMP CIRCUIT

(fig. 59)

The operation of the pump circuit is quite similar to that described for the vacuum operated metering rod; however, the movement of the diaphragm, instead of positioning the metering rod, is used to pump a small quantity of fuel from the bowl into the carburetor bore. When the throttle is opened, intake manifold vacuum drops, the spring forces the diaphragm forward, closing the intake check valve and forces a charge of fuel through the discharge check and out of the pump jet into the bore of the carburetor. When the throttle is closed, the intake manifold vacuum increases and the diaphragm is pulled back. This action closes the discharge check valve and draws a supply of fuel from the bowl into the pump via the open intake check valve.

94. CHOKE CIRCUIT

A manually operated choke is used. A poppet valve, built into the choke valve plate, gives inward relief to prevent flooding when the choke is closed.

95. DATA

Table VIII gives the following data for the Y-S carburetor: sizes of main venturi, bypass, and economizer; stock numbers of the metering rod, metering rod jet, low-speed jet, repair parts package, gasket assortment, float level setting, and gage number.

Main venturi (diam-in)	*1*
Bowl vent	*Balance vented by means of tube from air horn to air cleaner*
Bypass (drill size)	*No. 52*
Economizer (drill size)	*No. 58*
Metering rod	*7372526* *CAR-75-5958*
Metering rod jet	*7372519* *CAR-1509*
Gasket assortment	*737251L* *CAR-188*
Float level (in)	*¼*
Float level gage	*CAR-T109-81*
Set idle adjustment (turns open)	*1 to 1 1/4*

SECTION II. REBUILD OF TYPE Y-S CARBURETORS

96. GENERAL

Most carburetor troubles are caused by dirt which restricts jets and air bleeds or interferes with the free operation of moving parts. The instructions which follow cover the procedures for completely cleaning and adjusting the carburetor. If the carburetor is to be rebuilt, it is advised that a complete repair parts package be installed. Obviously, if this is done, those parts which are to be replaced need not be cleaned and inspected. Whenever the carburetor is serviced a new gasket assortment should be installed.

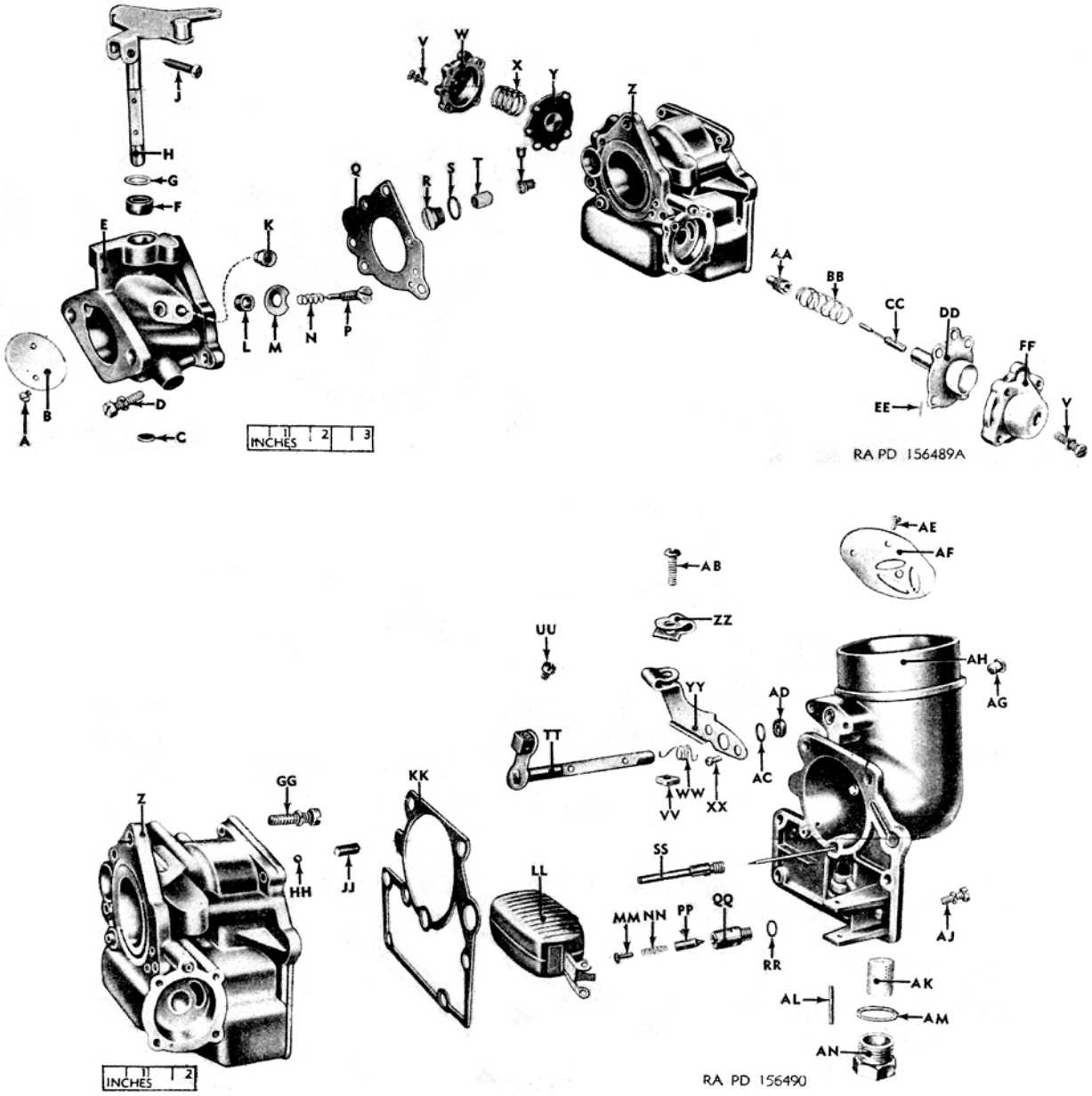

Figure 60. Type Y–S carburetor, model 6378—exploded view—Continued

(see note on placement of spring BB, below)

A—THROTTLE VALVE PLATE SCREW
B—THROTTLE VALVE PLATE
C—EXPANSION PLUG
D—MAIN BODY LOCK WASHER SCREW
E—THROTTLE BODY
F—THROTTLE SHAFT SEAL
G—THROTTLE SHAFT SEAL WASHER
H—THROTTLE SHAFT AND LEVER

J—THROTTLE ADJUSTMENT SCREW
K—IDLE PORT PLUG
L—IDLE ADJUSTMENT SCREW DUST SEAL
M—IDLE ADJUSTMENT SCREW DUST SEAL WASHER
N—IDLE ADJUSTMENT SCREW SPRING
P—IDLE ADJUSTMENT SCREW
Q—MAIN BODY GASKET
R—INTAKE PASSAGE PLUG
S—INTAKE PASSAGE PLUG GASKET
T—PUMP STRAINER
U—INTAKE CHECK VALVE
V—DIAPHRAGM HOUSING LOCK WASHER SCREW
W—PUMP DIAPHRAGM HOUSING
X—PUMP SPRING
Y—PUMP DIAPHRAGM
Z—MAIN BODY
AA—METERING ROD JET
BB—METERING ROD SPRING *(note that fig 60. shows the spring on the wrong side of the diaphragm DD)*
CC—METERING ROD
DD—METERING ROD DIAPHRAGM *(note that fig. 60 shows the spring BB on the wrong side of the diaphragm)*
EE—METERING ROD PIN
FF—METERING ROD DIAPHRAGM HOUSING
GG—MAIN BODY LOCK WASHER SCREW
HH—DISCHARGE CHECK BALL
JJ—DISCHARGE CHECK BALL WEIGHT
KK—AIR HORN GASKET
LL—FLOAT
MM—INTAKE NEEDLE PIN
NN—INTAKE NEEDLE SPRING
PP—FUEL INTAKE NEEDLE
QQ—NEEDLE SEAT
RR—NEEDLE SEAT GASKET
SS—BLEEDER TUBE
TT—CHOKE SHAFT AND LEVER
UU—CHOKE WIRE CLAMP SCREW
VV—TUBE CLAMP NUT
WW—CHOKE SPRING
XX—CHOKE TUBE BRACKET LOCK WASHER SCREW
YY—CHOKE TUBE BRACKET
ZZ—TUBE CLAMP
AB—TUBE CLAMP SCREW
AC—CHOKE SHAFT SEAL WASHER

AD—CHOKE SHAFT SEAL
AE—CHOKE VALVE PLATE SCREW
AF—CHOKE VALVE PLATE
AG—CHOKE SHAFT PLUG AH—AIR HORN
AJ—AIR HORN LOCK WASHER SCREW
AK—STRAINER
AL—FLOAT PIN
AM—STRAINER NUT GASKET
AN—STRAINER NUT

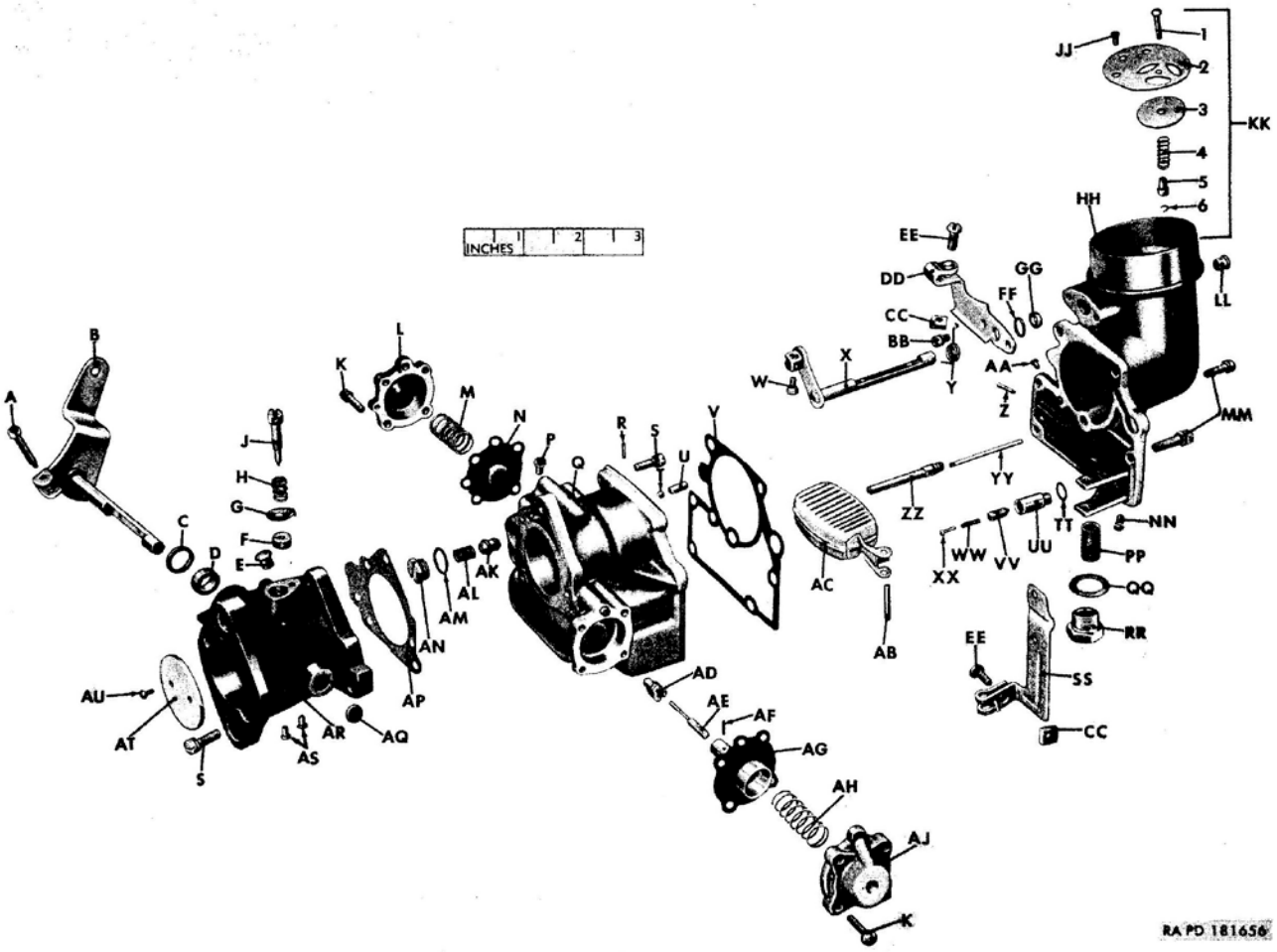

Figure 03-1. Carburetor, assy (8329774)—exploded view

(alternate exploded view with correct diaphragm spring placement)

Key	Item	Part No.
A	—SCREW	A293056
B	—SHAFT, ASSY	8329833
C	—WASHER	7372541
D	—SEAL	7372530
E	—PLUG	A312057
F	—SEAL	7372529
G	—WASHER	8329835
H	—SPRING	CAR-61-426
J	—SCREW	A346736
K	—SCREW	7372527
L	—HOUSING	7372517
M	—SPRING	8329834
N	—DIAPHRAGM, ASSY	7372512
P	—PLUG	7324058
Q	—BODY	7372502
R	—JET	CAR-48-144
S	—SCREW W/L WASHER	7372520
T	—BALL	A346738
U	—WEIGHT	7372542
V	—GASKET	7372514
W	—SCREW	131958
X	—SHAFT, ASSY	7372531
Y	—SPRING	7372533
Z	—JET	CAR-145-69
AA	—PLUG	7324060
BB	—SCREW	7343368
CC	—NUT	120619
DD	—BRACKET, ASSY	8329773
EE	—SCREW	120221
FF	—WASHER	7372539
GG	—SEAL	7372528
HH	—BODY	CAR-6-802
JJ	—SCREW	A281457

Note: All parts listed are in group 0301.

Key	Item	Part No.
KK	—PLATE, ASSY	8329830
	1—PLUG	CAR-136-17
	2—PLATE	CAR-7-177
	3—PLATE	CAR-148-12
	4—SPRING	CAR-51-21
	5—SLEEVE	CAR-112-12
	6—LOCK	CAR-61-79
LL	—PLUG	7372525
MM	—SCREW	A293063
NN	—PLUG	CAR-11B134
PP	—STRAINER	A293034
QQ	—GASKET	A293030
RR	—NUT	CAR-15-43
SS	—CLAMP	8329825
TT	—GASKET	A293029
UU	—SEAT	CAR-25-149
VV	—NEEDLE	CAR-17-49
WW	—SPRING	CAR-61-207
XX	—PIN	7378099
YY	—TUBE	7372536
ZZ	—TUBE, ASSY	7372537
AB	—AXLE	7372500
AC	—FLOAT, ASSY	7372513
AD	—JET	7372519
AE	—ROD, ASSY	8329832
AF	—PIN	7372522
AG	—DIAPHRAGM, ASSY	7372511
AH	—SPRING	7372534
AJ	—HOUSING	7372518
AK	—BALL, ASSY	7412959
AL	—STRAINER	A281437
AM	—GASKET	7378054
AN	—PLUG	CAR-11B124
AP	—GASKET	8329826
AQ	—PLUG	CAR-47-23
AR	—BODY	CAR-1-897
AS	—PLUG	A281413
AT	—PLATE	8329831
AU	—SCREW	A346734

Figure 03-1. Carburetor assy (8329774)—exploded view—legend

97. DISASSEMBLY

(fig. 60)

a. Disassemble Main Body.

(1) Remove air horn lock washer screws (AJ) and lift air horn

(AH) and gasket off.

(2) Remove discharge check ball (HH) and discharge check ball weight (JJ) by inverting carburetor.

(3) Remove pump diaphragm housing lock washer screw (V), pump diaphragm housing (W), pump spring (X), and pump diaphragm (Y).

(4) Remove metering rod diaphragm housing (FF), metering rod spring (BB), metering rod (CC), and metering rod diaphragm (DD). Detach metering rod pin (EE) and metering rod (CC) from diaphragm.

(5) Unscrew metering rod jet (AA).

(6) Remove main body lock washer screw (D) and gasket (Q) from main body (Z) and throttle body (E).

(7) Remove intake passage plug (R), intake passage plug gasket

(8) Remove pump strainer (T), and intake check valve (U).

b. Disassemble Air Horn.

(1) Remove float pin (AL) and float (LL).

(2) Remove fuel intake needle (PP), needle seat (QQ), needle seat gasket (RR), intake needle pin (MM), and intake needle spring (NN).

(3) Remove choke tube bracket lock washer screw (XX), choke tube bracket (YY), and choke spring (WW).

(4) Remove choke valve plate screw (AE), choke valve plate (AF), and choke shaft and lever (TT).

(5) Drive out choke shaft plug (AG).

(6) Remove choke shaft seal washer (AC) and choke shaft seal (AD).

(7) Remove strainer nut (AN), strainer nut gasket (AM), and strainer (AK).

(8) Remove bleeder tube (SS) (use 14-inch open end wrench).

c. Disassemble Throttle Body.

(1) Remove idle adjustment screw (P), idle adjustment screw spring (N), idle adjustment screw dust seal washer (M), and idle adjustment screw dust seal (L).

(2) Remove idle port plug (K).

(3) Remove throttle valve plate screw (A), throttle valve plate (B) and throttle shaft and lever (H).

(4) Drive out throttle shaft seal (F) and throttle shaft seal washer (G).

98. CLEANING

Soak all parts, except seals and diaphragms, in dry-cleaning solvent or volatile mineral spirits for at least 20 minutes. Blow out all castings with compressed air. Blow out all passages by applying tip of blow gun directly to the opening into the passage. Remove any carbon accumulation from the bore of the throttle body by scraping or with wet or dry sandpaper.

Caution: Do not use emery cloth.

Blow out all nozzles and jets, and bleeder tube with compressed air.

99. INSPECTION AND REPAIR

(fig. 60)

a. Air Horn, Main Body, and Throttle Body.

(1) Check air horn (AH) for warpage, out of roundness, and wear on the choke shaft bearings. Replace if necessary.

(2) Inspect throttle body (E) for wear on the throttle shaft bearings. Replace if worn.

(3) Be sure that all passages in air horn (AH), main body (Z), and throttle body (E) are clear.

b. Float Circuit.

(1) Check fuel intake needle (PP) and needle seat (QQ) for wear (par. 316 (1)). Replace if necessary.

(2) Inspect float (IX) for loading, damage, and wear. Replace if necessary. If lip of float is worn, it should be smoothed with fine emery cloth.

Note.—Do not file.

(3) Inspect float pin (AL) for wear. Replace if worn.

c. High-Speed Circuit.

Be sure that metering rod diaphragm housing (FF) is not warped. If it is, true the surface by draw filing. Carefully inspect the diaphragm for damage or wear. Replace if there is any doubt as to its serviceability.

d. Pump Circuit.

(1) Make certain that the intake check valve (U) is operating properly by blowing through jt.

(2) Be sure that pump diaphragm housing (W) is not warped. If it is, true the surface by draw filing. Carefully inspect the pump diaphragm (Y) for damage or wear. Replace if there is any doubt as to its serviceability.

100. ASSEMBLY

(fig. 60)

a. Group Parts.

Note.—Parts for the five circuits listed in (1) through (5) below when grouped as directed will greatly facilitate assembly of the carburetor.

(1) Group all float circuit parts including fuel intake needle (PP), needle seat (QQ), needle seat gasket (RR), float (LL), float pin (AL), strainer (AK), strainer nut (AN), and strainer nut gasket (AM).

(2) Group all low-speed circuit parts including throttle valve plate (B), throttle shaft and lever (H), throttle shaft seal (F), throttle shaft seal washer (G), idle adjustment screw (P), idle adjustment screw spring (N), idle adjustment screw dust seal (L), idle adjustment screw dust seal washer (M), and idle port plug (K).

(3) Group all high-speed circuit parts including metering rod (CC), metering rod pin (EE), metering rod diaphragm (DD), metering rod spring (BB), metering rod diaphragm housing (FF), metering rod jet (AA), and bleeder tube (SS).

(4) Group all pump circuit parts including pump diaphragm (Y), pump spring (X), pump diaphragm housing (W), intake check valve (U), pump strainer (T), intake passage plug (R), intake passage plug gasket (S), discharge check ball (HH), and discharge check ball weight (JJ).

(5) Group all choke circuit parts including choke valve plate (AF), choke shaft and lever (TT), choke shaft seal (AD), choke shaft seal washer (AC), choke tube bracket (YY), and choke shaft plug (AG).

b. install Float Circuit Parts.

(1) Install strainer (AK), strainer nut (AN), and strainer nut gasket (AM).

(2) Install needle seat gasket (RR), needle seat (QQ), fuel intake needle (PP), intake needle spring (NN), and intake needle pin (MM).

(3) Install float (LL) and float pin (AL).

(4) Set float level (par. 101).

c. Install Low-Speed Circuit Parts.

(1) Install new throttle shaft seal (F) .

(2) Install throttle shaft seal washer (G).

(3) Install throttle shaft and lever (H), throttle valve plate (B), and throttle valve plate screw (A). Before tightening screws, centralize valve by tapping against seat.

(4) Install idle port plug (K).

(5) Install idle adjustment screw dust seal (L), idle adjustment screw dust seal washer (M), idle adjustment screw (P), and idle adjustment screw spring (N).

d. Install Pump Circuit Parts.

(1) Install intake check valve (U), pump strainer (T), intake passage plug (R), and intake passage plug gasket (S).

(2) Install main body (Z) and main body gasket on throttle body (E) with main body lock washer screw (D).

(3) Install discharge check ball (HH) and discharge check ball weight (JJ).

(4) Install pump diaphragm (Y), pump spring (X), and pump diaphragm housing (W) with diaphragm housing lock washer screw (V).

e. Install High-Speed Circuit Parts.

(1) Install bleeder tube (SS) in air horn (AH).

(2) Assemble air horn (AH) and air horn gasket (KK) to main body (Z) with main body lock washer screw (GG).

(3) Install metering rod jet (AA).

(4) Assemble metering rod (CC) to sleeve with metering rod pin (EE).

(5) Install metering rod spring (BB), metering rod diaphragm (DD) (as assembled), and metering rod diaphragm housing (FF) using diaphragm housing lock washer screw (V).

f. Install Choke Circuit Parts.

(1) Install new choke shaft seal (AD).

(2) Install choke shaft seal washer (AC).

(3) Install choke tube bracket (YY) and choke spring (WW) with choke tube bracket lock washer screw (XX).

(4) Install-choke shaft and lever (TT).

(5) Install choke valve (with stem of poppet valve pointing out) and choke valve plate screw (AE). Centralize valve by tapping against bore before tightening screws.

(6) Install choke shaft plug (AG).

SECTION III. ADJUSTMENT OF TYPE Y-S CARBURETORS

101. GENERAL

The only adjustment which can be made on this carburetor is float level setting. It is important that this be done accurately since the proper functioning of the high-speed circuit depends to a large extent upon the maintaining of the correct fuel level.

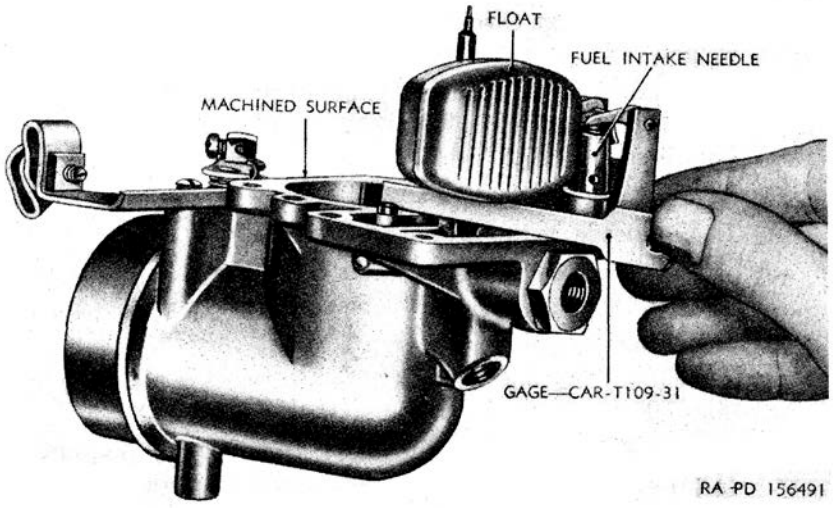

Figure 61. Adjusting float level with gage CAR–T109–31, type Y-S carburetor.

102. FLOAT LEVEL ADJUSTMENT

(fig. 61)

Invert the air horn and hold it level so that only the weight of the float is on the needle. The distance from the lowest point on the seam of the float to the machined surface of the bowl cover should be one- quarter inch as measured with float level gage CAR-T109-31. Adjust level by bending lip of float. Do not bend float.

SPECIFICATIONS (950S)

Dimensions	
Flange size	1 1/4 inch S. A. E.
Primary venturi	11/32 inch I. D.
Secondary venturi	19/32 inch I. D.
Main venturi	1 1/4 inch I. D.

Float Setting	
Distance from seam of float to float chamber cover, with weight of float on needle and spring	9/64 inch
Vents	
Balanced thru air horn to air cleaner via tubing external to carburetor	
Vent: Bowl chamber to carburetor bore, size	No. 68 (.031 inch) drill
Gasoline Intake	
Square vertical (spring loaded) needle	No.53 (.0595 inch) drill size in needle seat
Bleeder tube, assembled over idle tube, with 2 side holes	No. 65 (.035 inch) drill
Low Speed Jet Tube	
Jet size	No. 70 (.028 inch) drill (in end of tube)
Auxiliary jet (on side of tube) size	No. 75 (.021inch) drill
By-pass (in air horn) size	No. 52 (.0635 inch) drill
No. 52 (.0635 inch) drill	No. 54 (.055 inch) drill
Idle Port	
Upper port: slot type, length	.165 inch
Width	.030 inch
Idle Port Opening	
Top of port	.125 to .129 inch above top edge of valve with valve tightly closed
Lower Port (For Idle Adjustment Screw):	.053 to .057 inch diameter
Set Idle Adjustment Screw	1/2 to 1 1/2 turns open. For richer mixture, turn screw out.
Idle engine at	700 R.P.M. with deep fording vents open
Main Nozzle	
In primary venturi	angle 20°.
Discharge jet size	.0935 inch inside diameter
Main nozzle bleed (tube in air horn)	Size: No. 70 drill
Metering Rod (Diaphragm operated)	
Economy step	.070 inch
Power Step	.054 inch diameter

Vacuum passage restriction, size	No. 50 (.070 inch) drill
Vacuum passage bleed to bore, size	No. 65 (.035 inch) drill
Metering Rod Jet: Size	.096 inch diameter
Accelerating Pump: Diaphragm type, vacuum operated	
Discharge jet size	No. 72 drill
Intake ball check size	No. 40 drill
Discharge ball check under needle, size	No. 50 drill
Vacuum passage restriction, in flange size	No. 52 (.0635 inch) drill
Vacuum passage air bleed to bore, size	No. 62 (.038 inch) drill
Pump Stroke	No adjustment
Choke	Manual--Offset, butterfly type with poppet valve
Vacuum Spark Port	None