LP Gas Burning Engines, Carburetor Parts Lists, Service And Parts For LPG Equipment By Engine Model

MODEL	DESCRIPTION	PART NO.
ACNDG, BKNDG	LPG vapor withdrawal system	SK1330C
HACNDG, HBKNDG	Using Zenith two stage regulator (obsolete)	SK1323A
ACNDG, BKNDG	Carburetor service parts list	L68S1
ACNDG, HACNDG, BKNDG, HBKNDG, AENLDG, HAENLDG	Regulator service parts list (replaced by L109S1)	L82
AENLDG, AENL	LPG liquid and vapor withdrawal (obsolete)	SK1249, SK1249B
AENLDG, AENL	Liquid SK1249 conversion kit (replaced by LPG130S1)	L65S1
AENLDG, AENL	Vapor SK1249B conversion kit (replaced by LPG130S1)	L65S1
AENL	LPG fuel vapor withdrawal	LPG101
AENLDG, AENL	Carburetor service parts list	L65S1, L65D
AENLDG, AENL	Carburetor service parts list (obsolete)	L65A
AENLDG, AENL	LPG trouble shooting	
AENLDG, AENL	LPG fuel filters	LP50A, LP51
AGNDG	Operating instructions	
	Liquid withdrawal (obsolete)	L65D, L67
	Vapor withdrawal (obsolete)	L65D, L69B
S7DG, S8DG	Vapor withdrawal	SK1427
	Conversion kit	L88S1 (Beam)
	Conversion kit (replaced by L109S1)	L121
	Fuel filter and trouble shooting	
	Carburetor parts list	
S10DG, S12DG, S14DG	Vapor withdrawal system	LPG111
	Vapor withdrawal system (obsolete)	SK1484
	SK1484 conversion kit	L89S1
S12DG, S14DG	LPG fuel vapor withdrawal	LPG111, LFA101
S10DG, S12DG	Carburetor parts list	L89S1
	Carburetor parts list Garretson	L110 (Not serviced)
	Trouble shooting and fuel filter	
THDG, TJDG	Liquid and vapor withdrawal	SK1254F1, SK1254G1
THDG, TJDG	Liquid withdrawal conversion kit	L79AS1, L114

LP Gas Burning Engines, Carburetor Parts Lists, Service And Parts For LPG Equipment By Engine Model (Cont.)

MODEL	DESCRIPTION	PART NO.
THDG, TJDG	Vapor withdrawal conversion kit	L79AS1, L69B2
THDG, TJDG	Conversion instruction	
THDG, TJDG	LPG trouble shooting	
THDG, TJDG	LPG fuel filters	
THDG, TJDG	Pressure carburetor parts list	L79A, L79B, L79C, L79D
THDG, TJDG	Carburetor servicing	
THDG	Algas LPG fuel system	SK1254K1
THDG	Algas LPG fuel system (obsolete)	SK1254L, SK1254L1, SK1254L2, SK1254K
THDG	Liquid withdrawal kit	L92S1
THDG	Vapor withdrawal kit	L92AS1
THDG	Trouble Shooting	
VF4DG	Operating and installation instructions	SK1275
VF4DG	Open engine	
VF4DG	Liquid and vapor parts list (obsolete)	L65A
VF4DG	Special parts for LPG power unit	
VF4DG	Algas fuel system LPG	SK1275D, SK1275D1, SK1275E, SK1275E1
VF4DG	Liquid withdrawal kit	L92S1
VF4DG	Vapor withdrawal kit	L92AS1
VF4DG	Trouble shooting, fuel filter	
VG4DG	Operating instructions LPG fuel system	SK1262A, SK1262B
VG4DG	Installation, liquid and vapor open engine	
VG4DG	Parts list	
VG4DG	Installation power unit	
VG4DG	Special parts list	
VG4DG	Carburetor parts list	L70
VG4DG	Algas liquid withdrawal kit	SK1262E, SK1262E1, L94, L94A
VG4DG	Algas vapor withdrawal	SK1262H, SK1262H1, LPG119
VG4DG	Trouble shooting, fuel filter	LZ94 , LZ94A
VH4DG	LPG liquid and vapor withdrawal	SK1260D, SK1260E
VH4DG	Liquid withdrawal kit	L79BS1, L114
VH4DG	Vapor withdrawal kit	L79BS1, L69B2
VH4DG	Conversion instructions	

LP Gas Burning Engines, Carburetor Parts Lists, Service And Parts For LPG Equipment By Engine Model (Cont.)

MODEL	DESCRIPTION	PART NO
VH4DG	Trouble shooting	
VH4DG	Fuel filters	
VH4DG	Algas liquid withdrawal	SK1260F, SK1260F1
VH4DG	Algas vapor withdrawal	SK1260G, SK1260G1 (LPG110)
VH4DG	Trouble shooting, fuel filter	
VR4DG	LPG carburetor parts list (obsolete)	LZ72
V461DG	Conversion instructions	
V461D	LPG vaporizer – primary regulator	L67D
V461D	Trouble shooting	
V461D	LPG filters	
V461DG, V465DG	Algas liquid withdrawal	SK1394B, L91
V461DG, V465DG	Operation Zenith pressure carburetor	L83
V461DG, V465DG	Carburetor parts list	L83
Various	Vaporizer – primary regulator	L67
Various	Second stage regulator	L66B
Various	Parts list	L66B
For vapor only	LPG primary regulator	L69B
VF4DG, VH4DG, VG4DG, THDG, V461DG, V465DG	LPG converter Algas	L90, L90A, L90B
V461DG	LPG carburetor Algas	L91
VF4DG, VH4DG, VG4DG, THDG	Primary regulator Algas	L93
VF4DG, VH4DG, VG4DG, THDG	LPG natural gas carburetor Algas	L92, L94

LP Gas Burning Engines, Carburetor Parts Lists, Service And Parts For LPG Equipment By Part Number

PART NO.	DESCRIPTION	MODEL
L65, L65A, L65D	Carburetor service parts list	AENLDG, AENL
	LPG trouble shooting	AENLDG, AENL
L65A	Liquid and vapor parts list	VF4DG
	Special parts for LPG power unit	VF4DG
L65D, L67	Liquid withdrawal	
L65D, L69B	Vapor withdrawal	
L65S1	Liquid SK1249 conversion kit	AENLDG, AENL
L65S1	Vapor SK1249B conversion kit	AENLDG, AENL
L66B	Second stage regulator	Various
L66B	Parts list	Various
L67	Vaporizer – primary regulator	Various
L67D	LPG vaporizer – primary regulator	V461D
	Trouble shooting	V461D
	LPG filters	V461D
L68S1	Carburetor service parts list	ACNDG, BKNDG
L69B	LPG primary regulator	For vapor only
L70	Carburetor parts list	VG4DG
L79A, L79B, L79C, L79D	Pressure carburetor parts list	THDG, TJDG
	Carburetor servicing	THDG, TJDG
L79AS1, L114	Liquid withdrawal conversion kit	THDG, TJDG
L79AS1, L69B2	Vapor withdrawal conversion kit	THDG, TJDG
	Conversion instruction	THDG, TJDG
	LPG trouble shooting	THDG, TJDG
	LPG fuel filters	THDG, TJDG
L79BS1, L114	Liquid withdrawal kit	VH4DG
L79BS1, L69B2	Vapor withdrawal kit	VH4DG
	Conversion instructions	VH4DG
	Trouble shooting	VH4DG
	Fuel filters	VH4DG
L82	Regulator service parts list	ACNDG, HACNDG, BKNDG, HBKNDG, AENLDG, HAENLDG
L83	Carburetor parts list	V461DG, V465DG
L83	Operation Zenith pressure carburetor	V461DG, V465DG

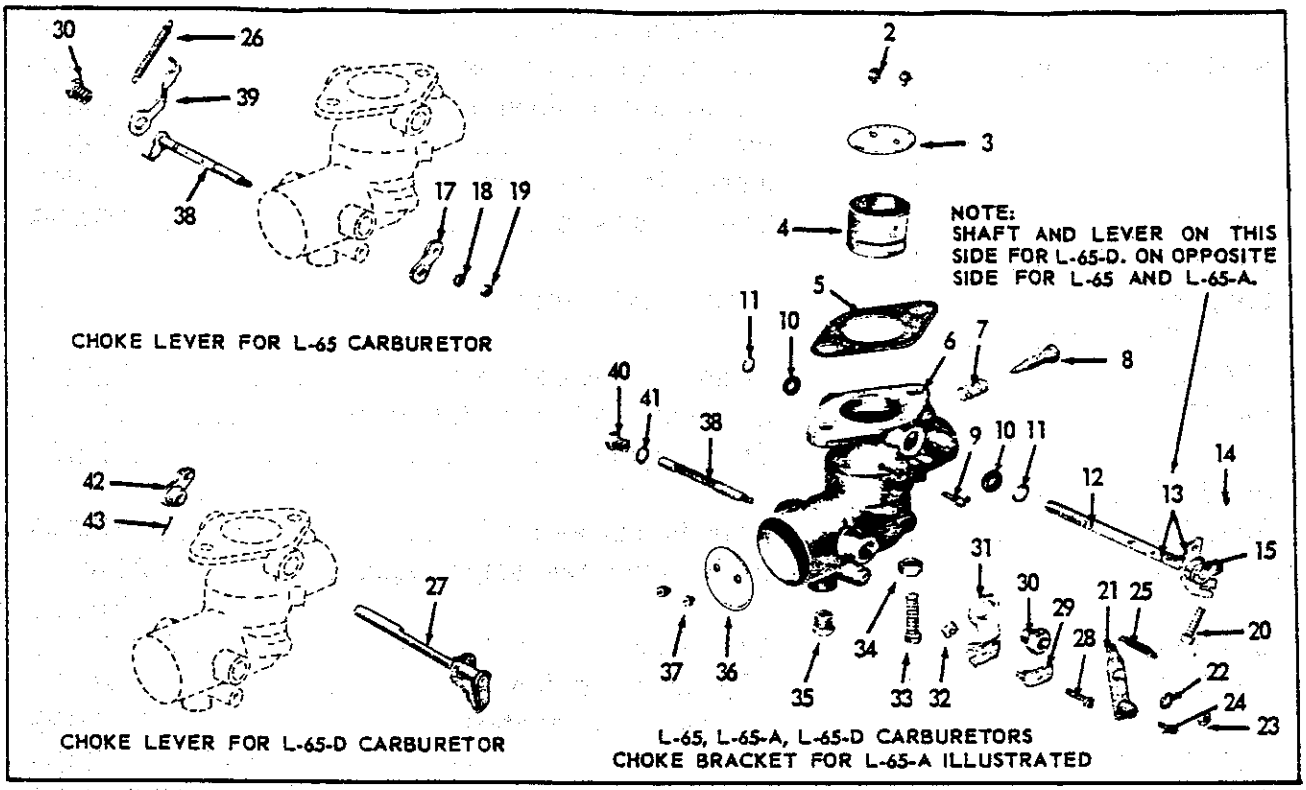
LP Gas Burning Engines, Carburetor Parts Lists, Service And Parts For LPG Equipment By Part Number (Cont.)

PART NO.	DESCRIPTION	MODEL
L88S1, L121	Conversion kit	
	Fuel filter and trouble shooting	
	Carburetor parts list	
L89S1	SK1484 conversion kit	
L89S1	Carburetor parts list	S10DG, S12DG
L90, L90A, L90B	LPG converter Algas	VF4DG, VH4DG, VG4DG, THDG, V461DG, V465DG
L91	LPG carburetor Algas	V461DG
L92	Liquid withdrawal kit	THDG
L92, L94	LPG natural gas carburetor Algas	THDG
L92A	Vapor withdrawal kit	THDG
	Trouble shooting	THDG
L92	Liquid withdrawal kit	VF4DG
L92A	Vapor withdrawal kit	VF4DG
	Trouble shooting, fuel filter	VF4DG
L93	Primary regulator Algas	VF4DG, VH4DG, VG4DG, THDG
L110 (Not serviced)	Carburetor parts list Garretson	
	Trouble shooting and fuel filter	
LP50A, LP51	LPG fuel filters	AENLDG, AENL
	Operating instructions	AGNDG
LPG101	LPG fuel vapor withdrawal	AENL
LPG111, SK1484	Vapor withdrawal system	S10DG, S12DG, S14DG
LPG111, LFA101	LPG fuel vapor withdrawal	S12DG, S14DG
LZ72	LPG carburetor parts list	VR4DG
LZ94, LZ94A	Trouble shooting, fuel filter	VG4DG
SK1249, SK1249B	LPG liquid and vapor withdrawal	AENLDG, AENL
SK1254F1, SK1254G1	Liquid and vapor withdrawal	THDG, TJDG
SK1254L, SK1254L1, SK1254L2, SK1254K, SK1254K1	Algas LPG fuel system	THDG
SK1260D, SK1260E	LPG liquid and vapor withdrawal	VH4DG
SK1260F, SK1260F1	Algas liquid withdrawal	VH4DG
SK1260G, SK1260G1 (LPG110)	Algas vapor withdrawal	VH4DG

LP Gas Burning Engines, Carburetor Parts Lists, Service And Parts For LPG Equipment By Part Number (Cont.)

PART NO.	DESCRIPTION	MODEL
	Trouble shooting, fuel filter	VH4DG
SK1262A, SK1262B	Operating instructions LPG fuel system	VG4DG
	Installation, liquid and vapor open engine	VG4DG
	Parts list	VG4DG
	Installation power unit	VG4DG
	Special parts list	VG4DG
SK1262E, SK1262E1, L94, L94A	Algas liquid withdrawal kit	VG4DG
SK1262H, SK1262H1, LPG119	Algas vapor withdrawal	VG4DG
SK1275	Operating and installation instructions	VF4DG
	Open engine	VF4DG
SK1275D, SK1275D1, SK1275E, SK1275E1	Algas fuel system LPG	VF4DG
SK1323A	Using Zenith two stage regulator	HACNDG, HBKNDG
SK1330C	LPG vapor withdrawal system	ACNDG, BKNDG
SK1394A, L83S1	LPG liquid withdrawal	V461DG
	Conversion instructions	V461DG
SK1394B, L91	Algas liquid withdrawal	V461DG, V465DG
SK1427	Vapor withdrawal	S7DG, S8DG

L65 (Zenith Model LPEU71, No. GO12161), L65A (Zenith Model LPE71, No. GO12192), L65D (Zenith Model LPE71, No. GO12249A) LPG Carburetors Service Parts Lists



L65, L65A, L65D LPG Carburetors Service Parts Lists

USE WITH MODEL AENL (see pg. 1)

ITEM	PART NO.	DESCRIPTION	QTY
2	T315B5-3	Screw	2
3	C21-176	Plate	1
4	B838-2-18	Venturi (L65)	1
—	B838-2-19	Venturi (L65A, L65D)	1
5	C141-4-5	Gasket	1
6	A802-17B2	Body (L65, L65A) (includes 10, 11)	1
—	A802-17B3	Body (L65D) (includes 10, 11)	1
7	C111-17	Spring	1
8	C46-53	Needle	1
9	T311S6-9	Screw	1
10	CT48-9	Seal	2
11	CT52-57	Retainer	2
12	C823-12	Shaft	1
13	C229-12161	Shaft and lever (L65) (includes 12, 14, 15, 20)	1
—	C229-12192	Shaft and lever (L65A) (includes 12, 14, 15, 20)	1
—	C229-12249	Shaft and lever (L65D) (includes 12, 14, 15, 20)	1
14	CT63-9	Taper pin	1
15	CR27-219	Lever and stop (L65)	1
—	CR27-163	Lever and stop (L65A)	1
—	CR27-201	Lever and stop (L65D)	1
17	CR106-157	Lever (L65)	1
18	T41-10	Lock washer (L65)	1
19	T22S10	Nut (L65)	1
20	T8S8-12	Screw	1
21	C106-17	Lever and swivel (L65A) (includes item 24)	1
22	T45-8	Lock washer (L65A)	1
23	T22S8	Nut (L65A)	1
24	T8S8-6	Screw (L65A)	1
25	C112-6	Spring (L65A)	1
26	C112-11	Spring (L65)	1
27	C908-7	Shaft and lever (L65D)	1
28	T8S8-10	Screw (L65A)	1
29	C110-1	Clamp (L65A)	1
30	C140-2	Screw (L65, L65A)	1
31	C109-46-1	Bracket and clamp (L65A) (includes 28, 29, 32)	1
32	T21S8	Nut (L65A)	1
33	C873-10	Needle	1
34	T23S31	Nut	1
35	T91-1	Plug	1
36	C902-2	Plate	1
37	T315B5-3	Screw	2
38	C908-5	Shaft and lever (L65)	1
—	C905-8	Shaft (L65A)	1
39	C109-63	Bracket (L65)	1
40	C138-24	Plug (L65A)	1
41	PH499	Washer (L65A)	1
42	C106-180	Lever (L65D)	1
43	CT63-9	Taper pin (L65D)	1
—	C8-27	Adapter (L65D)	1

L.P.G. TROUBLE SHOOTING

FOR ENGINE MODEL AENLDG

I. ENGINE WILL NOT START

Before starting work on any LP gas equipment, be sure that engine's malfunction does not exist in the ignition system. Reference should be made to the engine instruction manual for **TROUBLES, CAUSES and REMEDIES.**

(A) Check for fuel flow to carburetor.
1. Fuel tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after tank is filled). Close tank valve and open slowly.
4. Fuel lines plugged up.
5. Damaged or stopped-up fuel filter.

(B) Check for too much fuel to carburetor.
1. Regulator valve seat leaking.
2. Carburetor main adjustment too rich.

(C) Regulator adjustment.
If primary regulator pressure becomes low or falls off when engine is cranked, selected fuel mixture may be incorrect for climate conditions. Straight propane should be used in cold climates.

NOTE: Refer to Wisconsin Motor Form No. ML-14-2 for primary regulator adjustment as used with ***liquid withdrawal*** system. Refer to Form ML-18 for two stage regulator adjustments as used with ***vapor withdrawal*** system.

Repairs and adjustments of regulators should be done by an authorized service dealer, as special tools and gauges are required.

II. FROST – DURING OPERATION

(A) Frost on fuel filter, shut-off valve, or inlet line caused by opening outlet valve on tank too rapidly. Caution must be taken in opening fuel supply valve ***slowly.***

(B) If carburetor, vapor lines, and regulator are frosted over, close tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.
1. Frost on vapor lines between vaporizer and secondary regulator is caused by inadequate vaporizing; engine taking load too rapidly.
2. Frost on connection fittings; Check for fuel leaking, kinked lines, or restriction at frosted area.

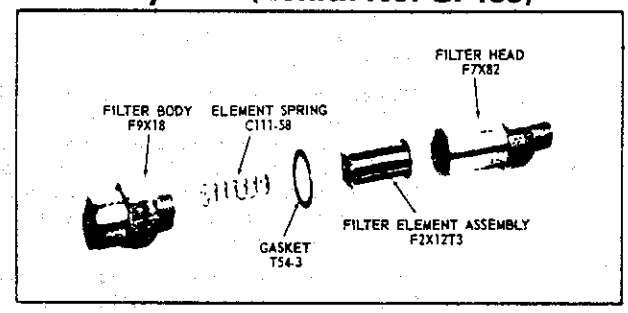
(C) Frost on tank can be caused:
1. In liquid system by a dip tube fracture in tank.
2. In vapor system by too rapid fuel withdrawal for tank size. Larger tank may be necessary.

NOTE: On a vapor system, caution should be taken that connection is made to the vapor outlet valve.

III. FLOODED SYSTEM

If system is flooded, crank engine with throttle wide open. Engine will not start until rich mixture dissipates. It may be necessary to shut off fuel supply at fuel tank to clear carburetion system.

LP51 LPG Vapor Withdrawal Fuel System (Zenith No. GF483)



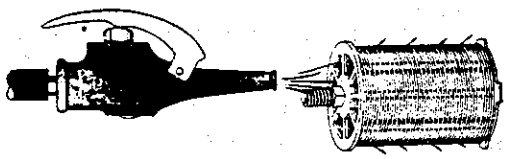
ZENITH PART NUMBERS SHOWN

MAINTENANCE

This filter is designed to be installed in the fuel line. It is made to operate under working pressures up to 250 p.s.i. and is approved by UL for such use.

The filter is made to protect the equipment on which it is used, by removing all foreign particles of .003" or larger. Consequently, from time to time it will be necessary to clean the filter element.

To clean the filter it is necessary to detach the fuel line from the filter head. The head may then be unscrewed from the filter body. Remove the element assembly from the head. Wash the element in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, we suggest a short soaking period in solvent cleaner. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW — FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT. The element may then be reassembled in the filter head with the assurance that none of the dirt that has been separated can possibly enter the system. None of the dirt is forced through the discs.

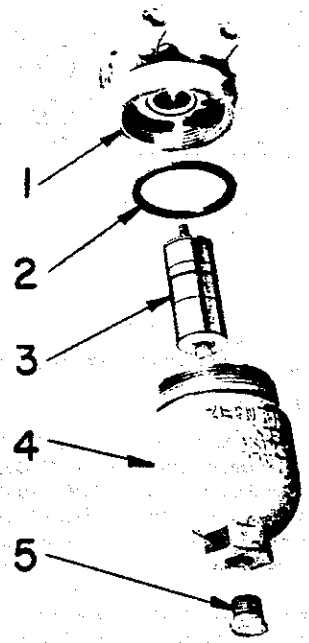


NEVER DIP ELEMENT IN 'BRIGHT DIP' OR OTHER ACID SOLUTION

In reassembling the filter, it is important that the element be inserted into the filter head with the round washer entering first into the opening. The gasket is put on the filter body and the spring is located into the filter body so that when the filter is put together the spring holds the element against the head.

LP50A LPG Liquid Withdrawal Fuel System (Zenith No. GF462-1-2)

The two principle parts should be assembled with 75 foot pounds torque. After the unit has been reinstalled, the joint at the gasket should be checked with a soap bubble solution to be sure there is no leak. The fuel line connections should also be checked.



PARTS LIST

Ref No	ZENITH Part Number	Description	No Req
1	F7X169A	FILTER HEAD	1
2	F1X127	GASKET for bowl	1
3	F3X9T2	FILTER ELEMENT	1
4	F8X765	FILTER BOWL	1
5	CT91-3	PLUG for bowl drain 1/8" hexagon head pipe.	1

MAINTENANCE

Fuel filter can be drained by removing plug (5) at bottom of the filter body (4).

To clean filter, it is necessary to unscrew body (4) from its head (1). Remove the element assembly (3) from the head. Element can be washed in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, a short soaking period is suggested. The element should then be rinsed and dried. Check "O" ring (2). Replace if necessary.

OPERATING INSTRUCTIONS

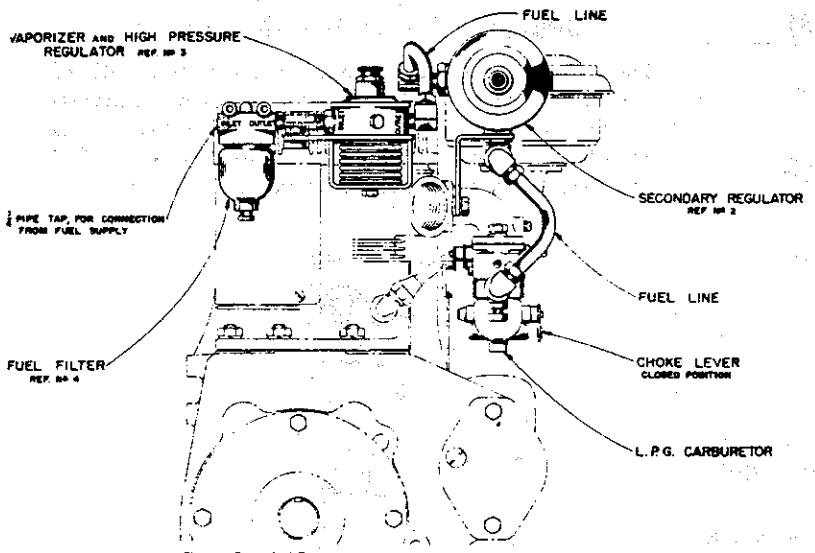


Fig. 1. LIQUID WITHDRAWAL SYSTEM

GENERAL INFORMATION

Liquefied petroleum gas (L.P.G.) consists of petroleum fractions or derivatives known and identified commercially as BUTANE, PROPANE, or a mixture of the two gases. When these gases are pressurized, they assume a liquid state which is more suitable and economical for handling. At normal atmospheric temperature and pressure, L.P. fuel is in a vapor state. As one receives this fuel in a container, it is compressed so that the storage tank is approximately 80% full of liquid fuel. The pressure in this container at 70°F will be in the vicinity of 100 pounds per square inch (p.s.i.). Depending on the mixture of the fuel and the effect of ambient temperature, it can be noted that as the temperature decreases, the pressure decreases. For example, at 0°F, the pressure will be approximately 20 p.s.i. in the cylinder. **Selection of fuel cylinder size and withdrawal system are very important for satisfactory operation.** The fuel may be taken from the top of the tank as a vapor, or from the bottom of the tank as a liquid. In either case, the heat of vaporization is about 790 BTU per gallon.

Due to local climatic differential, information for proper cylinder selection should be received from your local L.P.G. distributor.

FUEL SYSTEM

When the fuel is removed from the bottom of cylinder (LIQUID WITHDRAWAL SYSTEM) fuel expansion and vaporization takes place in the **high pressure regulator.** To prevent this regulator from freezing, which occurs due to a refrigeration effect, it is necessary to add heat. A heat exchanger is therefore added around this regulator to prevent such freezing. The Wisconsin heat exchanger (VAPORIZER, Ref. 3, Fig. 1 and 2) has been located and calibrated to supply this need.

Fuel removed from the top of cylinder (VAPOR WITHDRAWAL SYSTEM) enters the **primary regulator,** (Ref. 3, Fig. 3), in the vapor state and needs no heat exchanger. However, if fuel is required at an excessive rate, freezing may occur in the tank. This problem can be eliminated by selecting a larger fuel container or by locating tank in a warmer place.

Under the influence of tank pressure, the fuel passes through a **fuel filter,** and in some cases, through a solenoid lock-off valve, actuated by the ignition switch, before reaching the **primary regulator.** This regulator reduces the 100 psi tank pressure to a pressure of 6 to 8 psi. As the liquid fuel is converted from 100 psi line pressure to the lower pressure, it tends to vaporize. The resulting drop in temperature must be offset by a transfer of heat from the engine. This is accomplished by passing warm air over the heat exchanger restoring heat normally lost in vaporization of the fuel.

The dry gas then passes to the **secondary, or low pressure regulator,** (Ref. 2), which has a discharge pressure slightly below atmospheric pressure. The fuel is then delivered to the **carburetor** from the **secondary regulator** as required by speed and load of the engine.

On engines requiring limited amounts of fuel for operation, connections are made for a VAPOR WITHDRAWAL installation at the tank. On such installations, the addition of external heat for vaporization is not required, as noted above. Pressure regulation is required to reduce tank pressure to required values in the same manner as for liquid withdrawal system.

STARTING PROCEDURE

Connect fuel inlet line from storage cylinder to **fuel filter** inlet on a liquid withdrawal system. On a vapor system, mount **primary regulator** to storage cylinder and connect fuel line from **primary** to **secondary regulator.** Inlet line must be approved L.P. fuel hose and should be flexible. **(Fuel inlet line and storage cylinder furnished by customer.)**

Open fuel tank shut-off valve, injecting fuel into regulation system. **Check for gas leaks with soap suds solution. There must be no leak.**

With the magneto switch or ignition switch in running position, prime engine by having choke fully closed. (Choke closed when lever is in downward position.) Turn engine through two or three suction strokes, resulting in fuel entering the carburetion system.

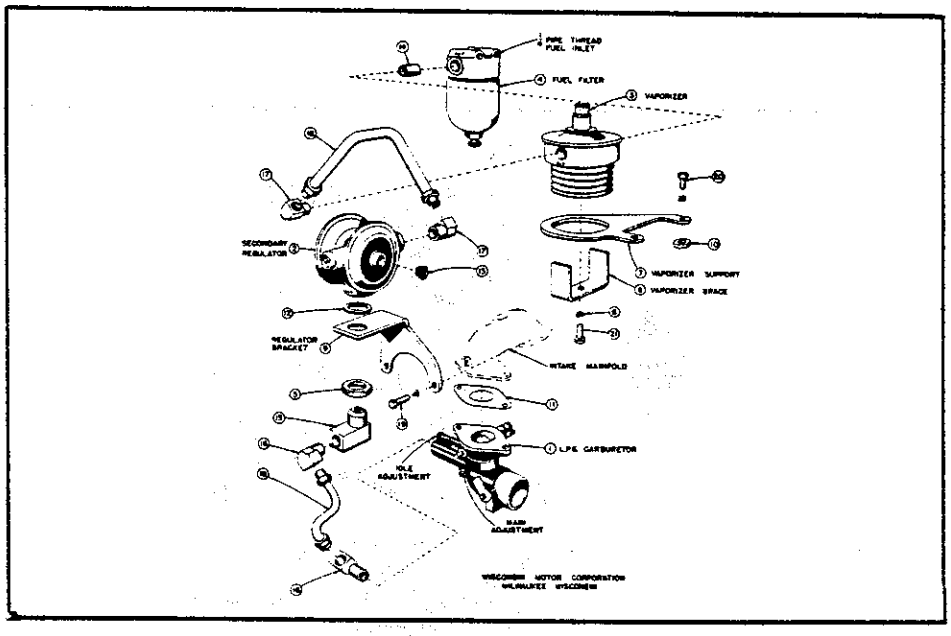
Open choke from full closed position. Crank engine briskly – engine should fire after a few turns. If necessary, repeat cranking engine.

When engine fires, choke should be opened gradually as engine warms up.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

L65, L65A, L65D LPG Carburetors Service Parts Lists
(Liquid Withdrawal System)

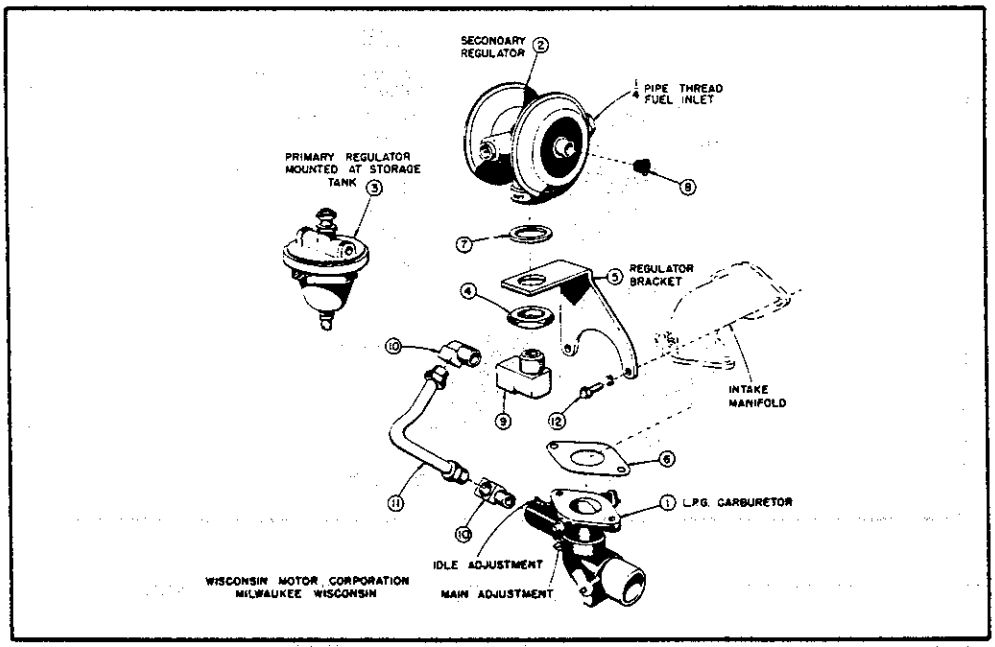
USE WITH MODEL AGNDG



ITEM	PART NO.	DESCRIPTION	QTY
—	AB102A2	Cylinder head	1
—	AE87D	Stellite exhaust valve	1
—	AF55	Valve spring exhaust	1
—	AG31	Roto caps	1
—	HG272D	Valve seat insert	1
1	L65D	LPG carburetor	1
—	PG343C	Air cleaner support plate	1
—	SD53H	Name and instruction plate (NLA)	1
—	YD35	Spark plug	1
2	L66B	Secondary stage regulator, Zenith model B806B	1
3	L67	Vaporizer and primary regulator, Zenith model A965A (NLA)	1
4	LP50A	Fuel filter, Zenith no. GF462	1
5	PD209A	Lock nut, 3/4"-16 thread	1
6	PE5	Lock washer, 3/8" I.D.	1
7	PG824A	Vaporizer bracket (NLA)	1
8	PG825	Vaporizer support brace (NLA)	1
9	PG834A	Regulator bracket	1
10	PH456A	Spacer (NLA)	1
11	QC71	Gasket	1
12	QD740	Regulator gasket	1
13	RD135	Regulator vent screen	2
14	RF503	Pipe nipple, 1/4"-7/8" long	1
15	RF1300A	Male elbow, 3/4"-16 thread	1
16	RF1331	Inverted flare male elbow, 3/8" (NLA)	2
17	RF1333	Inverted flare male elbow, 1/4" (NLA)	2
18	RM641A	Fuel line (NLA)	2
19	XD17	Cap screw, 5/16"-18 thread x 1" long	2
20	XD31	Cap screw, 3/8"-16 thread x 1-3/4" long	2
21	XD114	Cap screw, 3/8"-16 thread x 1/2" long	1

L65, L65A, L65D LPG Carburetors Service Parts Lists
(Vapor Withdrawal System)

USE WITH MODEL AGNDG



ITEM	PART NO.	DESCRIPTION	QTY
—	AB102A2	Cylinder head	1
—	AE87D	Stellite exhaust valve	1
—	AF55	Valve spring exhaust	1
—	AG31	Roto caps	1
—	HG272D	Valve seat insert	1
1	L65D	LPG carburetor	1
—	PG343C	Air cleaner support plate	1
—	SD53H	Name and instruction plate (NLA)	1
—	YD35	Spark plug	1
2	L66B	Secondary stage regulator, Zenith model B806B	1
4	PD209A	Lock nut, 3/4"-16 thread	1
3	L69B	Primary regulator, Zenith no. B806-26	1
5	PG834A	Regulator bracket	1
6	QC71	Gasket	1
7	QD740	Regulator gasket	1
8	RD135	Regulator vent screen	2
9	RF1300A	Male elbow, 3/4"-16 thread	1
10	RF1331	Inverted flare male elbow, 3/8" (NLA)	2
11	RM641A	Fuel line (NLA)	1
12	XD17	Cap screw, 5/16"-18 thread x 1" long	2

L66B Secondary Stage Regulator

The vaporizer assembly is a dual purpose unit. It is, first, a primary pressure regulator reducing variable tank and line pressure to lower and constant valves. Second, it is a heat exchanger designed to transfer necessary heat from the engine air passage to permit continuous vaporization of the liquid fuel. A vaporizer unit is furnished ONLY with a liquid withdrawal system.

DISASSEMBLY (Refer to Fig. 1)

1. Remove vaporizer assembly from its engine mounting.
2. Remove heat exchanger (25 or 25a) from vaporizer body by loosening and removing the retainer screw (27) and fibre washer (26) with a 1¼" thin wall socket wrench.
3. Remove inlet orifice retainer (19) and washer (20) from the vaporizer.
4. Remove inlet orifice (21) and inlet orifice washer (22) as follows:
   (a) Loosen adjustment locknut (2) and screw pressure adjustment (1) down as far as it will go by hand.
   (b) Turn a long screw having a 1/4-20 standard thread into the threaded end of the inlet orifice (21) for about 1/4". This is to be used as an extractor.
   (c) Grasp the body of the screw with a pair of pliers and tap the inlet orifice out of the housing.
   NOTE: This part is prevented from turning in the housing by a dowel pin. **Do not attempt to turn.**
   (d) Remove the inlet orifice fibre washer (22) from the bottom of the opening with a scribe or wire hook.
5. Release the tension on the regulator pressure adjustment (1) and unscrew it out of the diaphragm cover (5). Remove the regulator spring (3).
6. Remove the six diaphragm cover screws (4) and cover (5) from the vaporizer body.
7. Separate the edge of the diaphragm (9) from the body. By grasping the diaphragm and the diaphragm plate (8) with the fingers and twisting back and forth, they may be removed from the body with the piston (10) and "O" ring (11) to which they are attached. Do not loosen diaphragm assembly screw (6) unless diaphragm is defective.
8. With the piston (10) removed from the body, the valve seat (13) and retainer (12) and valve spring (15) may now be removed. If the retainer (12) sticks in the channel, a small wire hook may be used to pull it out. Do not lose the spring button (14) attached to the upper end of the valve spring (15).

With all "O" rings and gaskets removed, the metal parts of the vaporizer assembly may be cleaned by a solvent rinse or, if heavily contaminated, by a dip in carburetor cleaner. Dry off with an air hose before assembly. Make sure that all drilled passages in vaporizer body are open and clean.

It is recommended that new "O" rings and gaskets be used for re-assembly.

Satisfactory operation of the fuel system depends, to a great degree, on proper control of liquid fuel and the condition and operation of the movable fuel inlet seat (13), also the fuel inlet orifice (21). The mating surfaces of these parts must be carefully inspected and replaced, if necessary, before reassembly

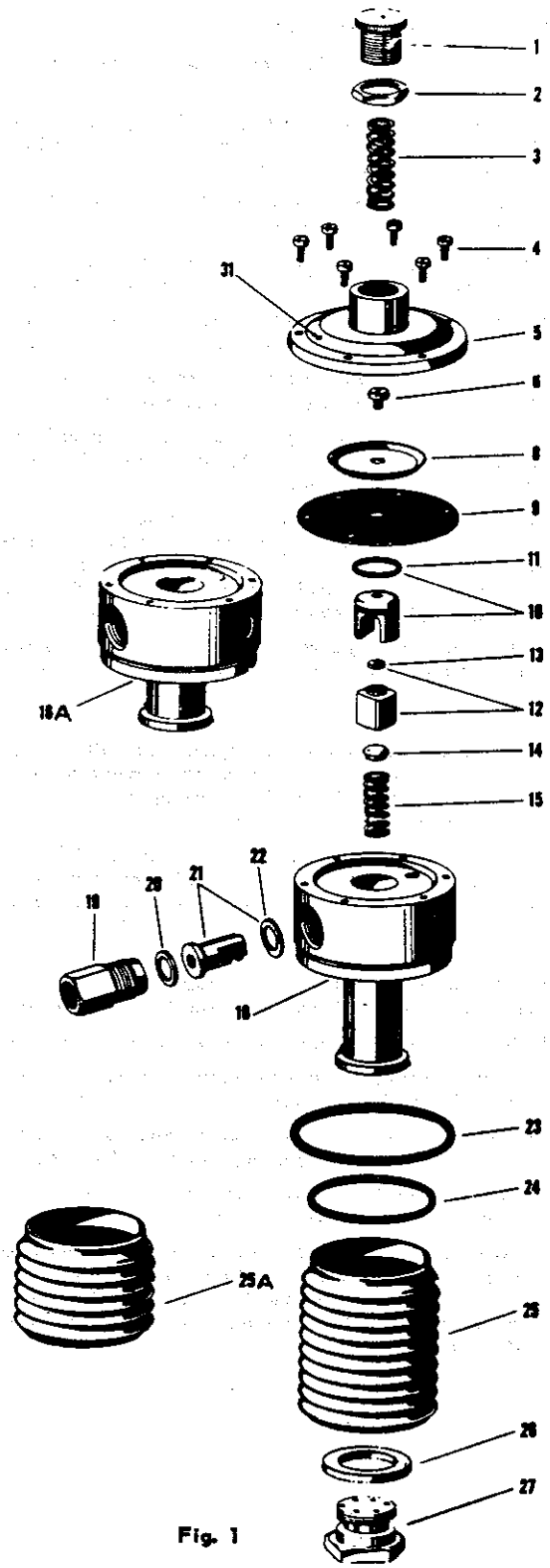


Fig. 1

INSPECTION OF PARTS (Refer to Fig. 2)

1. Inspect fuel inlet orifice tip (21) for nicks or scratches. Tip must be smooth.
2. Inspect fuel valve seat and retainer (12). The synthetic seat disc (13) carried in the retainer must be free from swelling, grooves, or scratches. Replace if defective.
3. See that interior and exterior surfaces of the piston (10) are smooth and free from nicks or burrs.
4. Inspect the diaphragm (9) carefully for any evidence of deterioration or cracking. Replace, if defective, as follows:
   (a) Loosen and remove diaphragm assembly screw (6) and diaphragm plate (8), remove diaphragm from piston (10).
   (b) Install new diaphragm in same manner but leave assembly screw loose enough for diaphragm to turn on piston.
   (c) Push the piston (10) into its position in the cylinder with the opening through the skirt of the piston exactly parallel with the inlet orifice channel.
   (d) With a small straight edge inserted through the orifice channel and piston, hold this position and rotate the diaphragm with the assembly screw as an axle, until the holes at the edge of the diaphragm registers with those in the housing. Tighten diaphragm assembly screw (6).
5. Inspect the small diaphragm vent orifice (31) on the upper face of the vaporizer body to make certain that it is open.

RE-ASSEMBLY

1. Assemble the seat retainer (12) and spring (15) with spring button (14) at the retainer end. Slide the three parts into the vaporizer cylinder with the base of the spring resting on the spring base spool (not a removable part).
2. Align the seat retainer (12) in the cylinder with one flat surface facing the inlet orifice channel. In this position, pressure from the spring will be distributed across all four corners of the seat retainer by the mating surfaces of the piston (10).
3. Install the assembled piston and diaphragm in proper position in the cylinder as outlined in 4c and 4d of Inspection.
4. Mount diaphragm cover (5) in place with six cover screws (4).
5. Place regulator spring (3) in position with the base of spring centered by the head of diaphragm assembly screw (6).
6. Install the pressure adjustment (1) and locknut (2) by compressing the regulator spring (3) enough to start the threads.
7. Screw adjustment down 6 to 8 turns until inlet valve seat (12) has moved down below the level of inlet orifice channel.
8. Install the fuel inlet orifice (21) with a new orifice washer (22) into place. This is easily positioned and installed by using the ¼" threaded screw used in disassembly as a handle. The dowel pin in the body and the slot of the inlet orifice must be in alignment.
9. Install the metal orifice retainer screw washer (20) and retainer screw (19) to hold the orifice in place.
10. Slip new heat exchanger "O" ring (24) over the open end of the heat exchanger (25) and place in position over the vaporizer chamber.
11. Install heat exchanger retaining screw (27) with washer (26) and tighten securely.

REGULATOR TEST

Test of primary regulator before re-assembly to engine.

(A) Plug fuel outlet with a suitable pipe fitting to which a shut-off valve is attached.

(B) Connect a 25# pressure gauge into 1/8" pipe tap connection in the vaporizer body.

(C) Connect the fuel inlet to a compressed air line having approximately 100 lbs. of pressure.

(D) Back regulator adjustment screw out, close to end of threads.

(E) Turn on air pressure.

(F) Screw in pressure adjustment gradually and see that regulator holds each increase steadily without rising.

(G) At several points in the check, release air by opening the valve in the fuel outlet fitting and note pressure recovery to original 8 p.s.i.g. setting.
CAUTION: Make certain that air for test is dry. Do not permit water or water vapor to enter vaporizer assembly.

ADJUSTMENT

The vaporizer pressure can be measured by attaching a 25# pressure gauge to the vaporizer outlet or to 1/8" pipe tap opening in body.

Pressure of the system is raised by screwing adjustment (1) in a clockwise direction and increasing tension of regulator spring.

Pressure should be set at 8 p.s.i.g. to assure an adequate fuel supply for maximum power and good acceleration of engine.

Adjustment procedure, when unit is mounted to engine:

(1) Connect a 25# gauge in the 1/8" pipe tap outlet.

(2) Back off vaporizer adjustment screw until only one or two threads are holding screw in cover. Apply inlet gas pressure.

(3) Turn pressure adjusting screw in slowly until a reading of 8 p.s.i.g. shows on gauge. After proper adjustment has been made, tighten locknut on pressure adjusting screw.

(4) With vaporizer connected and adjusted as above for pressure check, smear soap film over vent hole (31). Bubbles will appear if diaphragm is leaking.

L66B Secondary Stage Regulator (Zenith Type "C" No. B806D36)

USE WITH VARIOUS MODELS

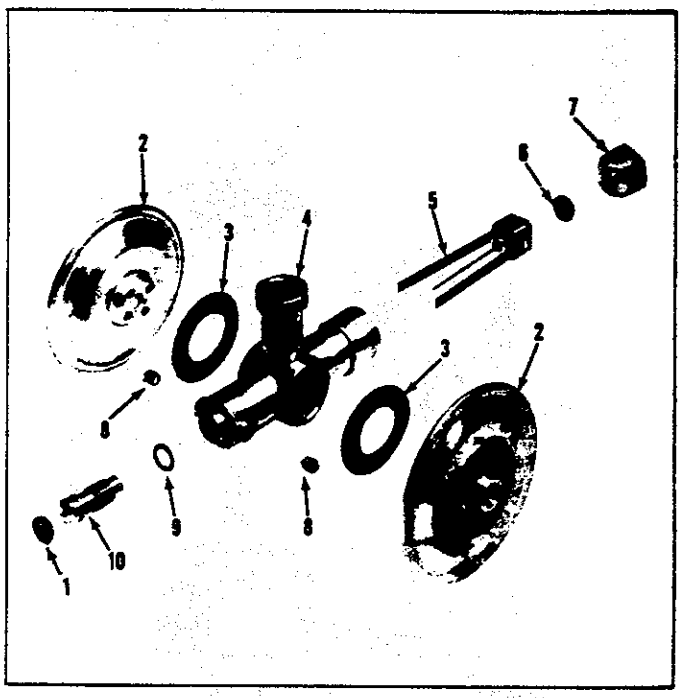


Fig. 3

ITEM	ZENITH PART NO.	DESCRIPTION	QTY
1	CT93B51	Plug	1
2	C987-14	Diaphragm and cover	2
3	C946-13	Gasket	2
4	A805-4	Regulator body	1
5	C885-4	Control valve, block and spring	1
6	C844-7	Valve seat	1
7	C949-9	Fuel inlet and seat	1
8	C938-9	Lock screw	2
9	CT75-2	"O" ring seal	1
10	C873-9	Adjusting screw	1

L67 (Zenith Part No. A965A25A), L67A (Zenith Part No. A965B23A), L67B (Zenith Part No. A963B1), L67C (Zenith Part No. A963B2) LPG Vaporizers – Primary Pressure Regulators

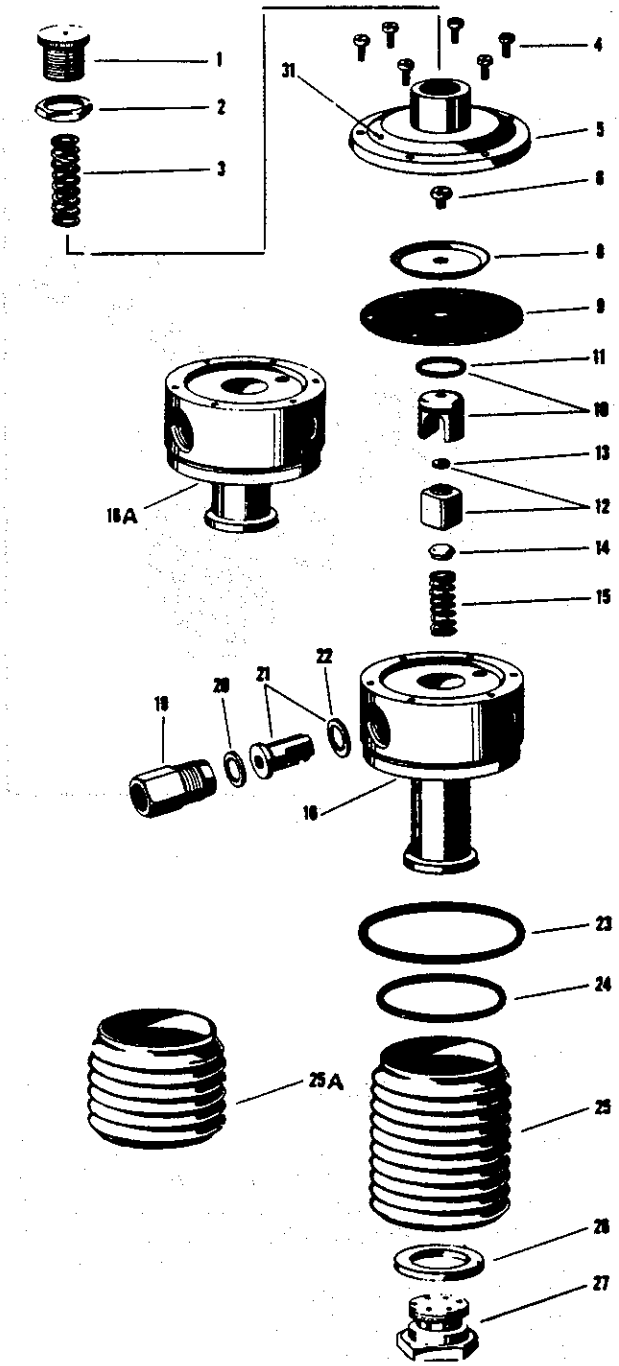


Fig. 2

L67, L67A, L67B, L67C LPG Vaporizers – Primary Pressure Regulators

USE WITH VARIOUS MODELS (see pg. 11)

ITEM		ZENITH PART NO.	DESCRIPTION	QTY
1		C873-1	Pressure adjustment	1
2		C958-1	Locknut	1
3		C911-4	Spring	1
4		T11S8-5	Cover screw	6
5		C987-2	Diaphragm cover	1
6		T1S10-4	Diaphragm screw	1
8		C935-2	Retainer plate	1
9	†	C988-3	Diaphragm	1
10		C984-2	Piston (includes item 11)	1
11	†	CT75-5	"O" ring seal	1
12		C883-2	Valve seat retainer (includes item 13)	1
13	†	C844-2	Valve seat	1
14		C924-1	Button	1
15		C911-3	Valve spring	1
16		BR965-23	Vaporizer body (L67A)	1
—		BR965-22	Vaporizer body (L67B)	1
—		BR965-28	Vaporizer body (L67C)	1
16A		BR965-25	Vaporizer body (L67)	1
19		C938-3	Retainer	1
20		C935-8	Inlet washer	1
21		C882-3	Inlet orifice (includes item 22)	1
22	†	T56-76	Washer	1
23	†	CT75-6	"O" ring (L67, L67A)	1
24	†	CT75-4	"O" ring	1
25		B990-1	Heat exchanger (L67A)	1
25		B990-3	Heat exchanger (L67B, L67C)	1
25A		B990-2	Heat exchanger (L67)	1
26		T56-75	Washer	1
27		C938-4	Retainer screw	1

† Items included in the 93C993-2 repair kit.

DISASSEMBLY (Refer to Fig. 3)

1. Remove diaphragm and cover assemblies (2). Zenith service tool C-161-190 will facilitate removal.
2. Remove inlet orifice (7).
3. Remove main adjustment (10).
4. Remove both leaf spring retainer screws (8).
5. Remove spring and valve block assembly (5). **Handle with care.**

INSPECTION OF PARTS

1. Inspect diaphragm covers (2) for damage. Replace if necessary.
2. Remove inlet valve seat (6) and replace if damaged.
3. If either leaf spring of control valve block assembly (5) is damaged, replace assembly.
4. Inspect other parts and replace if necessary.

RE-ASSEMBLY (Refer to Fig. 3 and Fig. 4)

1. Insert spring and valve block assembly (5) in regulator body making sure that ends of leaf spring enter their respective slots in regulator body (4), and are visible through leaf spring retainer screw holes.
2. Install and tighten inlet orifice (7).
3. With "O" ring seal (9) lightly lubricated, use finger pressure only to screw main adjustment (10) into regulator body (4).
   NOTE: If resistance is felt, it indicates that round valve rod has not entered hole in center of main adjustment. In this event, remove main adjustment screw and try again until screw can be turned in by hand until slotted head is almost flush with body.
4. Using screw driver, lightly seat main adjustment (10) by continuing clockwise. Then back out (counter-clockwise) approximately 2-1/2 turns.
5. Insert Zenith part C-161-189 leaf spring gauge set, holding in position while installing and tightening leaf spring retainer screws (8).
6. Install and thoroughly tighten by hand both diaphragm and cover assemblies (2). Use cover to body gaskets (3) when assembling.

ADJUSTMENT PROCEDURE

1. Connect air or gas at 13 p.s.i.g. to regulator inlet.
2. Lightly seat main adjustment (10) with screw driver.
3. Cover regulator outlet with soap film or submerge slightly a dip tube mounted to regulator outlet under a film of water.
4. Slowly back main adjustment (10) out by turning counter-clockwise until regulator valve begins to leak gas or air. This will be indicated by a slowly expanding soap or water bubble at regulator outlet.
5. Now turn main adjustment (10) approximately 3/4 to one full turn clockwise from this position. Set air or gas inlet at 11 to 12 p.s.i.g. No leak-off should occur.
   NOTE: A leaking regulator valve will be indicated by an expanding soap or water bubble at regulator outlet.

If regulator leaks, dismantle the regulator and clean valve seat or replace valve parts if needed. Re-check for leaks.

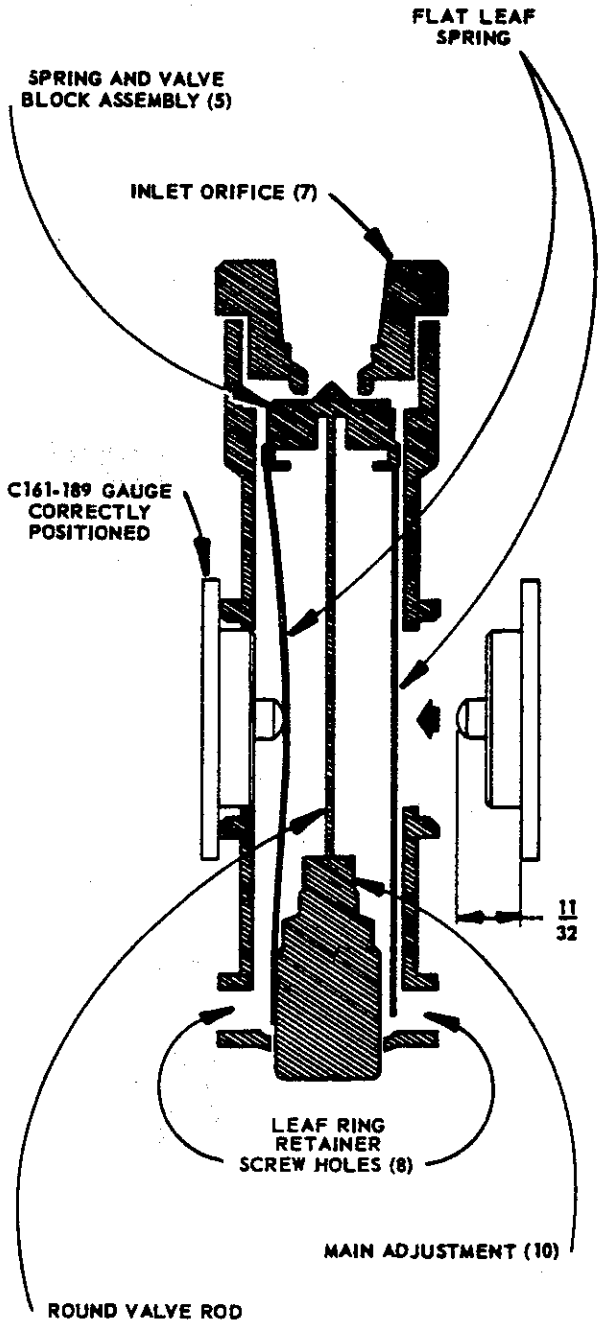


Fig. 4

L67D Vaporizer – Primary Pressure Regulator

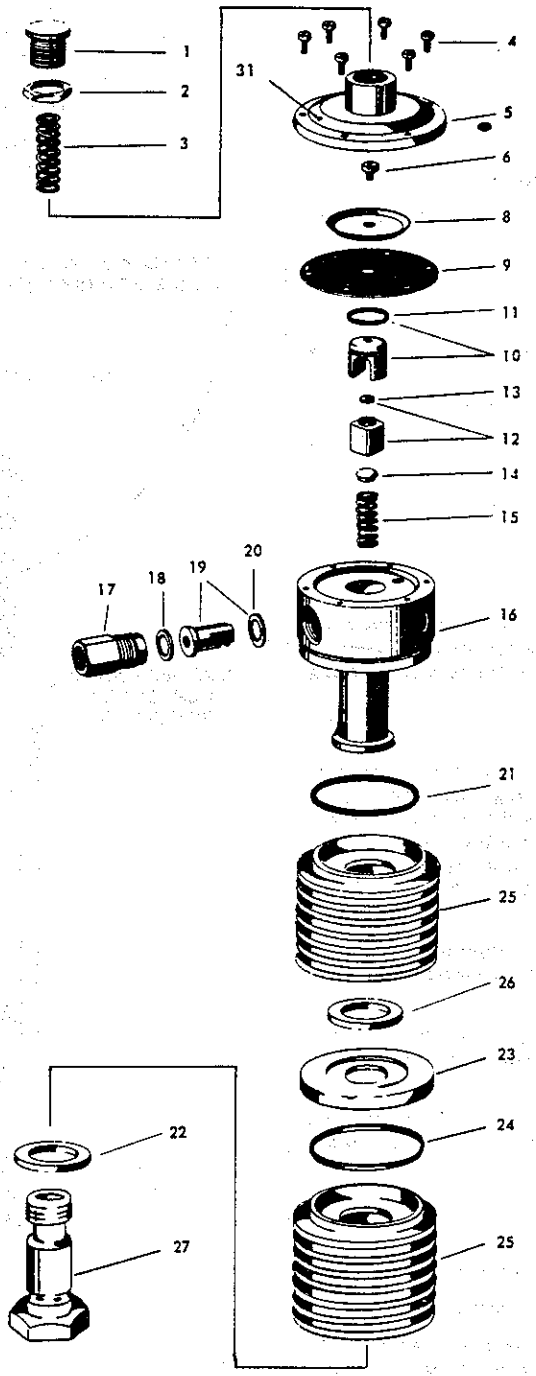


Fig. 3

L67D LPG Vaporizer – Primary Pressure Regulator

USE WITH MODEL V461DG (see pg. 14)

ITEM		ZENITH PART NO.	DESCRIPTION	QTY
1		C873-1	Pressure adjustment	1
2		C958-1	Lock nut	1
3		C911-4	Spring	1
4		T11S8-5	Cover screw	6
5		C987-2	Diaphragm cover	1
6		T1S10-4	Diaphragm screw	1
8		C935-2	Retainer plate	1
9	†	C988-3	Diaphragm	1
10		C984-2	Piston (includes CT75-5)	1
11	†	CT75-5	"O" ring seal	1
12		C883-2	Valve seat retainer (includes C844-2)	1
13	†	C844-2	Valve seat	1
14		C924-1	Button	1
15		C911-3	Valve spring	1
16		BR965-28	Vaporizer body	1
17		C938-3	Retainer	1
18		C935-8	Inlet washer	1
19		C882-3	Inlet orifice (includes T56-76)	1
20	†	T56-76	Washer	1
21	†	CT75-4	"O" ring	1
22	†	T56-75	Washer	1
23		HF584	Spacer (NLA)	1
24		JK66	"O" ring (NLA)	1
25		JO18	Heat exchanger, Zenith model A990-3 (NLA)	2
26		PH544	Washer, Zenith no. T56-76 (NLA)	1
27		PI211	Lock screw (NLA)	1

† Items included in the C993-1 repair kit.

L67D LPG Vaporizer – Primary Pressure Regulator

The vaporizer assembly is a dual purpose unit. It is first, a primary pressure regulator, reducing variable tank and line pressure to lower and constant valves. Second, it is a heat exchanger, designed to transfer necessary heat from the engine air passage to permit continuous vaporization of the liquid fuel. A vaporizer unit is furnished ONLY with a liquid withdrawal system.

DISASSEMBLY (Refer to Fig. 3)

1. Remove vaporizer assembly from its engine mounting.
2. Remove the two heat exchangers (25) from vaporizer body by loosening and removing the lockscrew (27) and fibre washer (22).
3. Remove inlet orifice retainer (17) and washer (18) from the vaporizer body.
4. Remove inlet orifice (19) and inlet orifice washer (20) as follows:
   (a) Loosen adjustment locknut (2) and screw pressure adjustment (1) down as far as it will go by hand.
   (b) Turn a long screw, having a 1/4-20 standard thread, into the threaded end of the inlet orifice (21) for about 1/4". This is to be used as an extractor.
   (c) Grasp the body of the screw with a pair of pliers and tap the inlet orifice out of the housing.
   NOTE: This part is prevented from turning in the housing by a dowel pin. **Do not attempt to turn.**
   (d) Remove the inlet orifice fibre washer (20) from the bottom of the opening with a scribe or wire hook.
5. Release the tension on the regulator pressure adjustment (1) and unscrew it out of the diaphragm cover (5). Remove the regulator spring (3).
6. Remove the six diaphragm cover screws (4) and cover (5) from the vaporizer body.
7. Separate the edge of the diaphragm (9) from the body. By grasping the diaphragm and the diaphragm plate (8) with the fingers and twisting back and forth, they may be removed from the body with the piston (10) and "O" ring (11) to which they are attached. Do not loosen diaphragm assembly screw (6) unless diaphragm is defective.
8. With the piston (10) removed from the body, the valve seat (13), retainer (12) and valve spring (15) may now be removed. If the retainer (12) sticks in the channel, a small wire hook may be used to pull it out. Do not lose the spring button (14) attached to the upper end of the valve spring (15).

With all "O" rings and gaskets removed, the metal parts of the vaporizer assembly may be cleaned by a solvent rinse or, if heavily contaminated, by a dip in carburetor cleaner. Dry off with an air hose before assembly. Make sure that all drilled passages in vaporizer body are open and clean.

It is recommended that new "O" rings and gaskets be used for re-assembly.

Satisfactory operation of the fuel system depends, to a great degree, on proper control of liquid fuel and the condition and operation of the movable fuel inlet seat (13), also the fuel inlet orifice (19). The mating surfaces of these parts must be carefully inspected and replaced, if necessary, before re-assembly.

INSPECTION OF PARTS (Refer to Fig. 3 or 4)

1. Inspect fuel inlet orifice tip (19) for nicks or scratches. Tip must be smooth.
2. Inspect fuel valve seat and retainer (12). The synthetic seat disc (13) carried in the retainer must be free from swelling, grooves, or scratches. Replace if defective.

3. See that interior and exterior surfaces of the piston (10) are smooth and free from nicks or burrs.
4. Inspect the diaphragm (9) carefully for any evidence of deterioration or cracking. Replace, if defective, as follows:
   (a) Loosen and remove diaphragm assembly screw (6) and diaphragm plate (8), remove diaphragm from piston (10).
   (b) Install new diaphragm in same manner but leave assembly screw loose enough for diaphragm to turn on piston.
   (c) Push the piston (10) into its position in the cylinder with the opening through the skirt of the piston exactly parallel with the inlet orifice channel.
   (d) With a small straight edge inserted through the orifice channel and piston, hold this position and rotate the diaphragm with the assembly screw as an axle, until the holes at the edge of the diaphragm register with those in the housing. Tighten diaphragm assembly screw (6).
5. Inspect the small diaphragm vent orifice (31) on the upper face of the vaporizer body to make certain that it is open.

RE-ASSEMBLY

1. Assemble the seat retainer (12) and spring (15) with spring button (14) at the retainer end. Slide the three parts into the vaporizer cylinder with the base of the spring resting on the spring base spool (not a removable part).
2. Align seat retainer (12) in cylinder with one flat surface facing the inlet orifice channel. In this position, pressure from the spring will be distributed across all four corners of seat retainer by the mating surfaces of piston (10).
3. Install the assembled piston and diaphragm in proper position in the cylinder as outlined in 4c and 4d of Inspection.
4. Mount diaphragm cover (5) in place with six cover screws (4).
5. Place regulator spring (3) in position with the base of spring centered by the head of diaphragm assembly screw (6).
6. Install the pressure adjustment (1) and locknut (2) by compressing the regulator spring (3) enough to start the threads.
7. Screw adjustment down 6 to 8 turns until inlet valve seat (12) has moved down below the level of inlet orifice channel.
8. Install the fuel inlet orifice (19) with a new orifice washer (20) into place. This is easily positioned and installed by using the ¼" threaded screw used in disassembly as a handle. The dowel pin in the body and the slot of the inlet orifice must be in alignment.
9. Install the metal orifice retainer screw washer (18) and retainer screw (17) to hold the orifice in place.
10. Slip new heat exchanger "O" ring (21) over the open end of the first heat exchanger (25) and place in position over the vaporizer chamber.
11. Place washer (22) and second heat exchanger (25) onto lockscrew (27). Mount new "O" ring (24) and spacer (23) over open end of heat exchanger. Put washer (26) into recess on top of spacer and mount complete heat exchanger unit to vaporizer body. Tighten lockscrew (27) securely in place.

REGULATOR TEST

Test of primary regulator before re-assembly to engine.

(A) Plug fuel outlet with a suitable pipe fitting to which a shut-off valve is attached.

(B) Connect a 25# pressure gauge into 1/8" pipe tap connection in the vaporizer body.

(C) Connect the fuel inlet to a compressed air line having approximately 100 lbs. of pressure.

(D) Back regulator adjustment screw out, close to end of threads.

(E) Turn on air pressure.

(F) Screw in pressure adjustment gradually and see that regulator holds each increase steadily without rising.

(G) At several points in the check, release air by opening the valve in the fuel outlet fitting and note pressure recovery to original 9 to 10 P.S.I.G. setting.

CAUTION: Make certain that air for test is dry. Do not permit water or water vapor to enter vaporizer assembly.

ADJUSTMENT

The vaporizer pressure can be measured by attaching a 25# pressure gauge to the vaporizer outlet or to 1/8" pipe tap opening in body.

Pressure of the system is raised by screwing adjustment (1) in a clockwise direction and increasing tension of regulator spring.

Pressure should be set at 9 to 10 P.S.I.G. to assure an adequate fuel supply for maximum power and good acceleration of engine.

Adjustment procedure, when unit is mounted to engine:

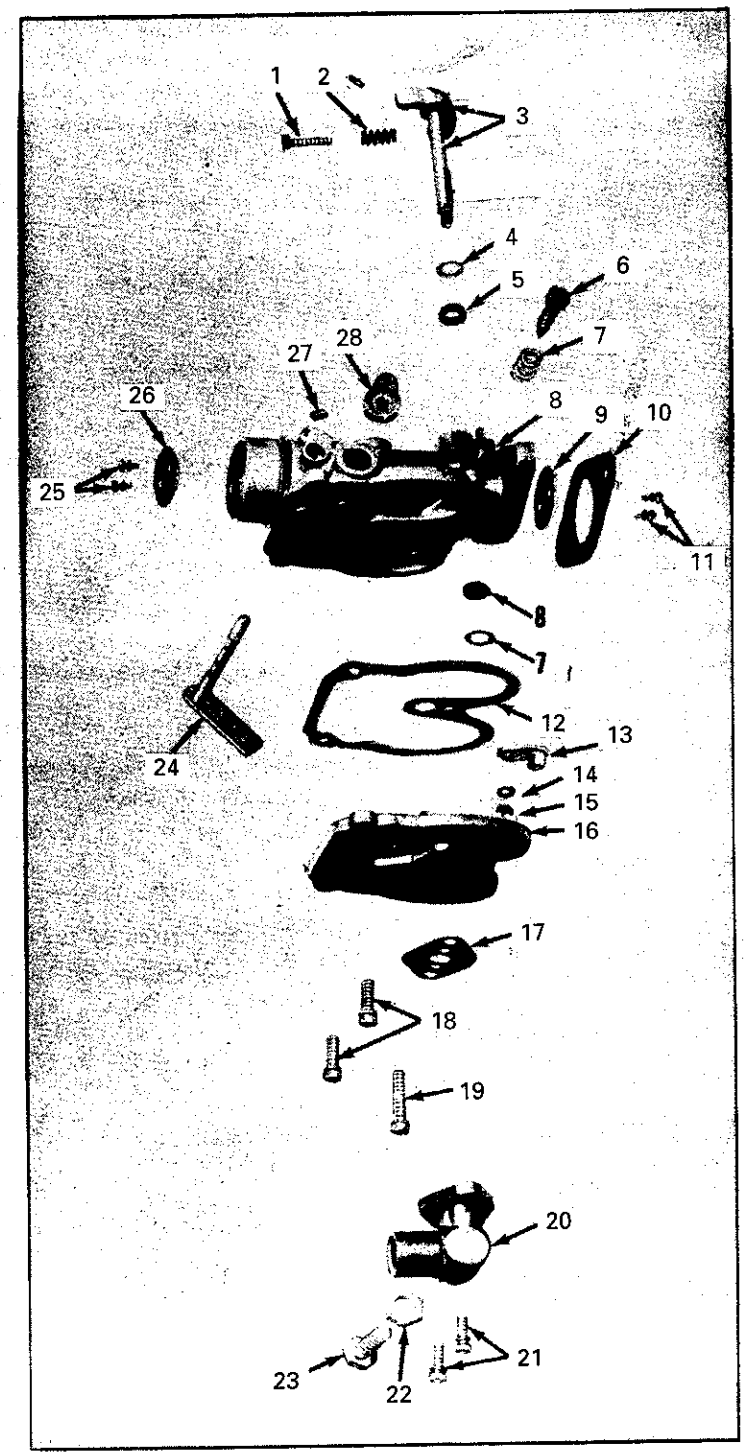
(1) Connect a 25# gauge in the 1/8" pipe tap outlet.

(2) Back off vaporizer adjustment screw until only one or two threads are holding screw in cover. Apply inlet gas pressure.

(3) Turn pressure adjusting screw in slowly until a reading of 9 to 10 P.S.I.G. shows on gauge. After proper adjustment has been made, tighten locknut on pressure adjusting screw.

(4) With vaporizer connected and adjusted as above for pressure check, smear soap film over vent hole (31). Bubbles will appear if diaphragm is leaking.

L68 LPG Carburetor Service Parts List
(Zenith Model LP87BY6, No. G12213)

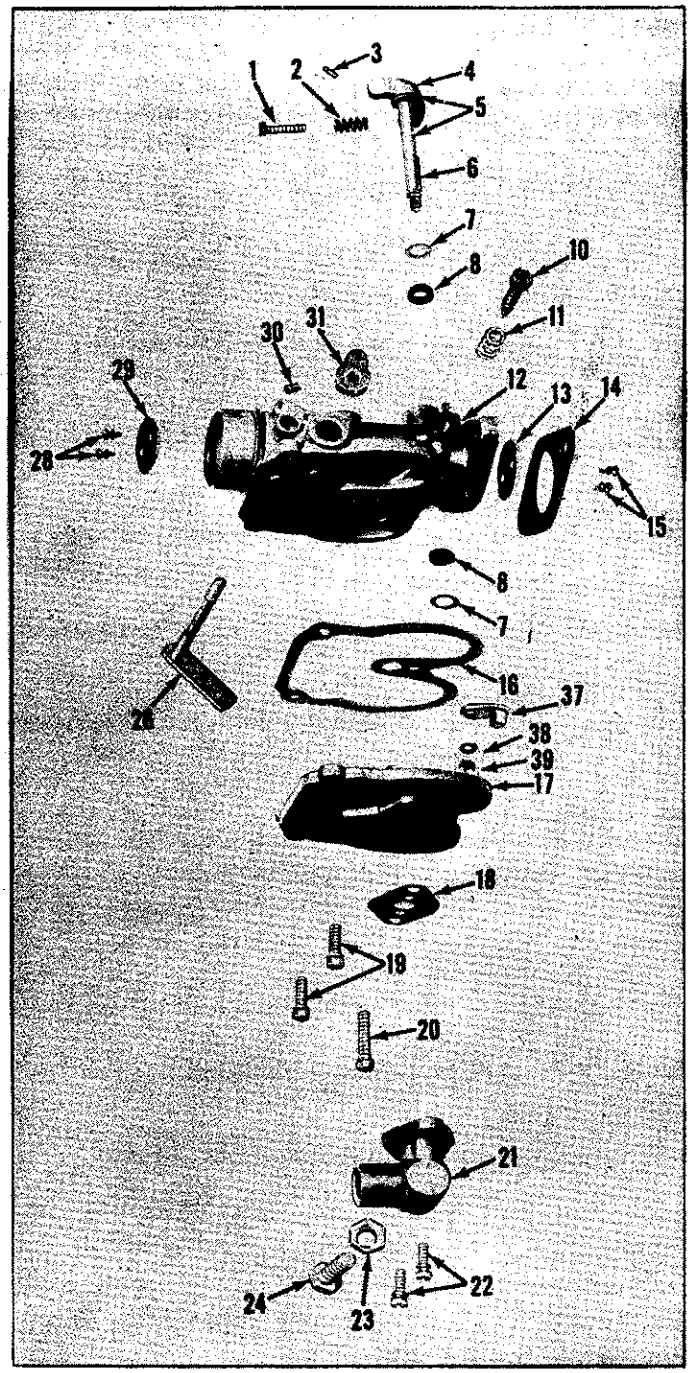


L68 LPG Carburetor Service Parts List

USE WITH MODELS ACNDG, BKNDG (see pg. 18)

ITEM	PART NO.	DESCRIPTION	QTY
1	T18S8-10	Screw	1
2	C111-10	Spring	1
5	C29-1312	Shaft and stop lever (includes 1-4, 6)	1
7	T52-13	Retainer	2
8	T48-7	Seal	2
10	C46-49	Needle	1
11	C111-155	Spring	1
12	A802-13-2	Body (includes 7, 8)	1
13	C21-157	Plate	1
14	C141-4-17	Gasket	1
15	T315S5-3	Screw	2
16	C142-55	Gasket	1
17	C929-5-2	Plate	1
18	C946-10	Gasket	1
19	T301S8-9	Screw	2
20	T301S8-14	Screw	1
21	B872-5A	Block	1
22	T301S8-7	Screw	1
23	T23S31	Lock nut	1
24	T8S31-16	Screw	1
26	C108-127	Shaft and lever	1
28	C140-47	Screw	2
29	C902-3	Plate	1
30	T10-11	Set screw	1
31	C106-182	Lever and ratchet (includes item 30)	1
37	C25-148	Lever and swivel	1
38	T41-10	Lock washer	1
39	T25S1	Nut	1

L68 LPG Carburetor Service Parts List
(Zenith Model LP87BY6, No. G12213B)

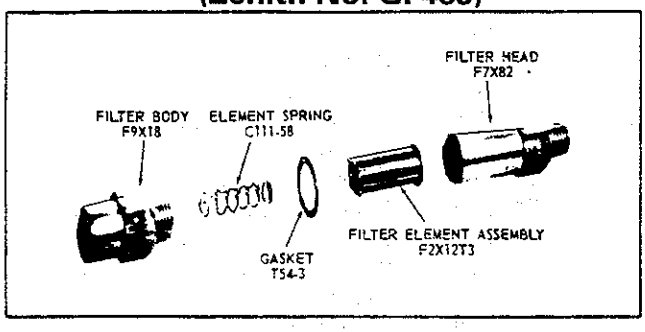


L68 LPG Carburetor Service Parts List

USE WITH MODELS ACNDG, BKNDG (see pg. 20)

ITEM	PART NO.	DESCRIPTION	QTY
1	T18S6-10	Screw	1
2	C111-12	Spring	1
3	T63-9	Taper pin	1
4	C28-102	Lever	1
5	C29-1312	Shaft and stop lever (includes 1-4, 6)	1
6	C23-638	Shaft	1
7	T52-13	Retainer	2
8	T48-7	Seal	2
10	C46-60	Needle	1
11	C111-191	Spring	1
12	A802-13A1	Body (includes 7, 8)	1
13	C21-157	Plate	1
14	C141-4-17	Gasket	1
15	T315B5-13	Screw	2
16	C142-55	Gasket	1
17	C929-5-2	Plate	1
18	C946-10	Gasket	1
19	T301S8-9	Screw	2
20	T301S8-14	Screw	1
21	B872-5A	Block	1
22	T301S8-7	Screw	1
23	T22S31	Lock nut	1
24	T8S31-16	Screw	1
26	C108-127	Shaft and lever	1
28	C140-47	Screw	2
29	C902-3	Plate	1
30	T10-11	Set screw	1
31	C106-182	Lever and ratchet (includes item 30)	1
37	C25-148	Lever and swivel	1
38	T41-10	Lock washer	1
39	C158-4	Nut	1

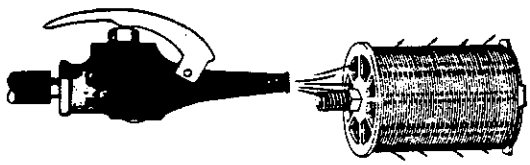
LP51 LPG Vapor Withdrawal System (Zenith No. GF483)



This filter is designed to be installed in the fuel line. It is designed to operate under working pressures up to 250 p.s.i. and is approved by UL for such use.

The filter is made to protect the equipment on which it is used, by removing all foreign particles of .003" or larger. Consequently, from time to time it will be necessary to clean the filter element.

To clean the filter it is necessary to detach the fuel line from the filter head. The head may then be unscrewed from the filter body. Remove the element assembly from the head. Wash the element in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, we suggest a short soaking period in solvent cleaner. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW--FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT. The element may then be reassembled in the filter head with the assurance that none of the dirt that has been separated can possibly enter the system. None of the dirt is forced through the discs.



NEVER DIP ELEMENT IN 'BRIGHT DIP' OR OTHER ACID SOLUTION

In reassembling the filter, it is important that the element be inserted into the filter head with the round washer entering first into the opening. The gasket is put on the filter body and the spring is located into the filter body so that when the filter is put together the spring holds the element against the head.

The two principle parts should be assembled with 75 foot pounds torque. \fter the unit has been reinstalled, the joint at the gasket should be checked with a soap bubble solution to be sure there is no leak. The fuel line connections should also be checked in the same manner.

I. ENGINE WILL NOT START

Before starting work on any LP gas equipment, be sure that engine's malfunction does not exist in the ignition system. Reference can be made to the engine instruction manual for **TROUBLES, CAUSES and REMEDIES** section.

(A) Check for fuel flow to carburetor.
1. Fuel tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after tank is filled). Close tank valve and open slowly.
4. Fuel lines plugged up.
5. Damaged or stopped-up fuel filter.

(B) Check for too much fuel to carburetor.
1. Regulator valve seat leaking.
2. Carburetor main adjustment too rich.

II. FROST – DURING OPERATION

(A) Frost on fuel filter, shut-off valve, or inlet line; Opening outlet valve on tank too rapidly will cause excess flow valve to close when inlet line and filter are empty. Caution must be taken in opening fuel supply valve **slowly.**

(B) Frost on carburetor, vapor lines, and regulator; Close tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

(C) Frost on connection fittings; Check for fuel leaking, kinked lines, or restriction at frosted area.

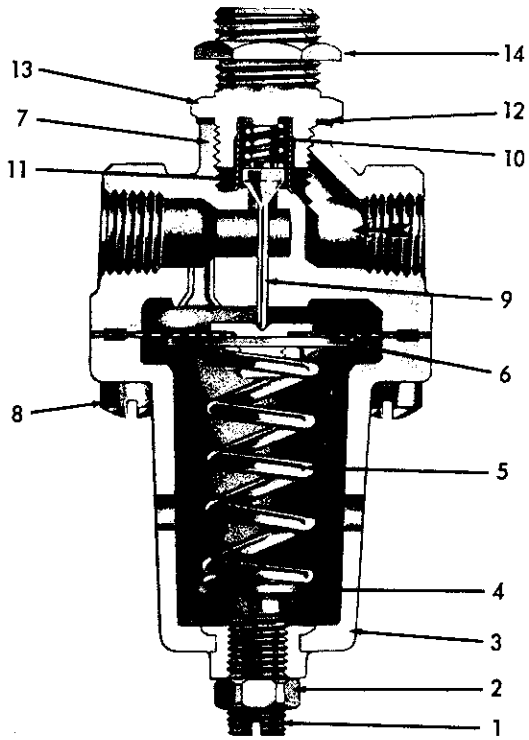
(D) Frost on tank; Can be caused by too rapid a fuel withdrawal for tank size. Larger tank may be necessary.

III. FLOODED SYSTEM

If system is flooded, crank engine with throttle wide open. Engine will not start until rich mixture dissipates. It may be necessary to shut off fuel supply at fuel tank to clear carburetion system.

L69A LPG Vapor Withdrawal Primary Regulator (Zenith No. B806-26) (Replaced By L69B, Watts Regulator Co. Model MZ5)

USE WITH VAPOR WITHDRAWAL SYSTEM ONLY



NOT SERVICED BY TTP

ITEM		WATTS PART NO.	DESCRIPTION	QTY
1		40A55D	Adjusting screw	1
2		16Y51	Check nut	1
3		SA112Z3	Spring cage assembly	1
4		112Y61	Spring washer	1
5		259	Adjusting spring	1
6	†	SA6Y20	Diaphragm assembly	1
7		N26Y1	Body	1
8		— — —	Cage screw, 1/4"-20 thread x 5/8" long	4
9	†	SA15Y37-1	Inner valve assembly	1
10	†	94	Poppet spring	1
11		112Y77	Strainer	1
12	†	— — —	Bottom plug gasket, 5/8" x 13/16" x 1/32" thick	1
13		26Y2S	Bottom plug	1
14		15X56	Mounting nut	1
—		4005	Repair kit	1

† Items included in the Watts Regulator Co. repair kit.

L69A LPG Vapor Withdrawal Primary Regulator (Replaced By L69B, Watts Regulator Co. Model MZ5)

DISASSEMBLY

1. Release spring tension on diaphragm by loosening nut (2) and turning adjusting screw (1) counter-clockwise.
2. Remove bottom plug (13) from regulator body (7), releasing plug gasket (12), poppet spring (10), and inner valve assembly (9).
3. Remove spring cage (3) from body, releasing diaphragm assembly (6), adjusting spring (5) and washer (4).

All metal parts of the regulator assembly may be cleaned by a solvent rinse, or if heavily contaminated, by a dip in carburetor cleaner. Dry off with air hose before assembly. Make sure that all drilled passages in regulator body are open and clean.

INSPECTION OF PARTS

1. Inspect inner valve (9) for nicks or scratches. Replace if defective.
2. Check diaphragm (6) carefully for any evidence of deterioration or cracking. Replace if defective.
   NOTE: Diaphragm assembly and bottom plug gaskets should be replaced when re-assembling.

RE-ASSEMBLY

1. Insert adjusting screw (1) with check nut (2) to spring cage (3). Install spring washer (4) and spring (5) into spring cage. Insert diaphragm assembly (6) to spring cage (3).
2. Install and tighten regulator body (7) to spring cage (3).
3. Insert inner valve assembly (9) into body. Install poppet spring (14), strainer (11) and secure by mounting gasket (12) and tightening bottom plug (13).

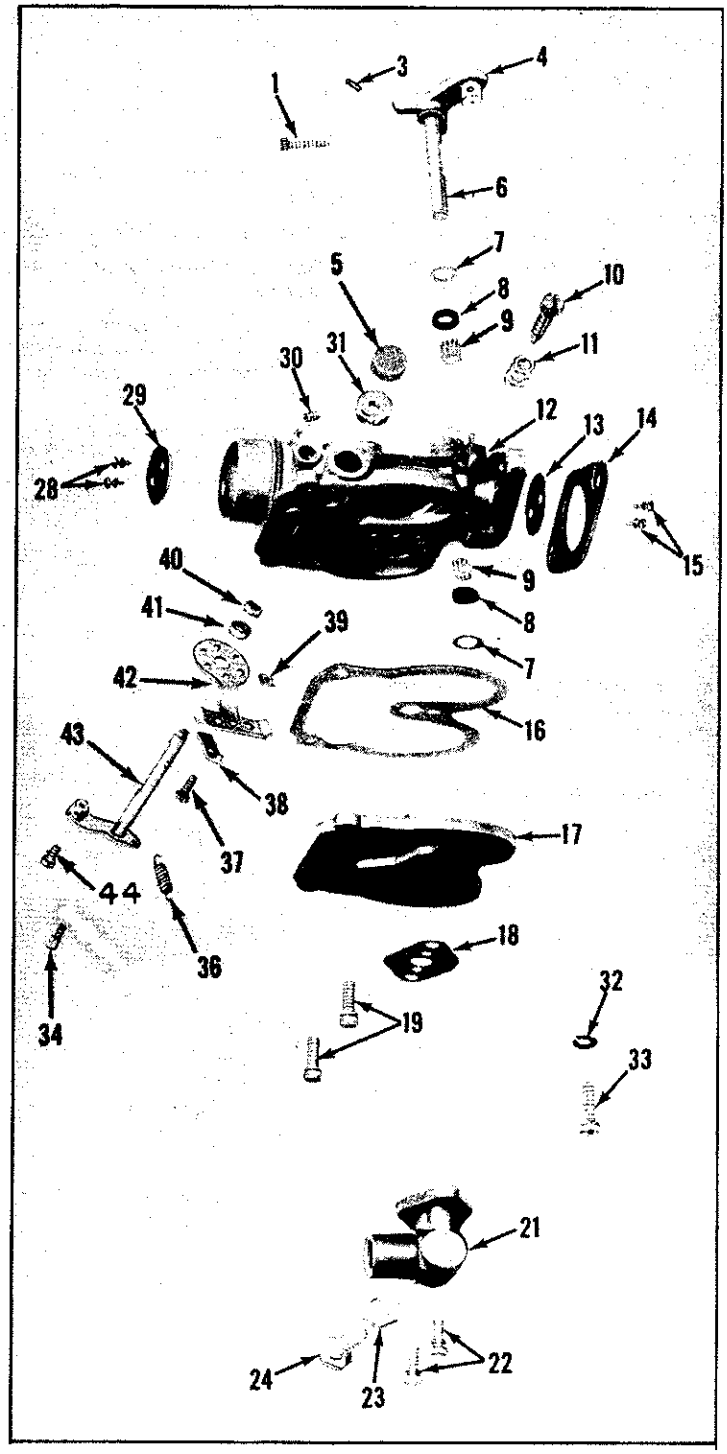
ADJUSTMENT

The regulator pressure can be measured by attaching a 25 lb. pressure gauge to the regulator outlet side. The pressure setting of the regulator is raised by turning adjustment screw (1) in a clockwise direction. Pressure should be set at 7 p.s.i.g., ± ½ p.s.i., to assure an adequate fuel supply for maximum power and good acceleration from the engine.

Adjustment procedure when unit is mounted to engine fuel system:

1. Connect a 25 lb. gauge to the outlet side of regulator.
2. Back off adjustment screw approximately 3/4 travel. Apply inlet gas pressure.
3. Turn pressure adjusting screw in slowly until a reading of 7 p.s.i.g. shows on the gauge. After proper adjustment has been made, tighten the locknut on the pressure adjusting screw.
4. With regulator adjusted and connected as above for pressure check, smear soap film over vent hole in spring cage. Bubbles will appear if diaphragm is leaking.

L70 LPG Carburetor Service Parts List
(Zenith Model LP87A8, No. G12226B)



L70 LPG Carburetor Service Parts List

USE WITH MODEL VG4DG (see pg. 25)

ITEM	PART NO.	DESCRIPTION	QTY
1	T8S8-10	Screw	1
3	CT63-9	Taper pin	1
4	CR27-241-1	Lever (includes item 1)	1
5	CR37-1X1	Plug	1
6	C23-533	Shaft	1
7	T52-53	Retainer	2
8	T48-9	Seal	2
9	C9-72	Bushing	2
10	C46-60	Needle	1
11	C111-191	Spring	1
12	A802-14A1	Body (includes 5, 7-9, 40, 41)	1
13	C21-42	Plate	1
14	C141-4-6	Gasket	1
15	T315B5-3	Screw	2
16	C142-55	Gasket	1
17	C929-5A	Plate	1
18	C946-10	Gasket	1
19	T301S8-9	Screw	2
21	B872-5B	Block	1
22	T301S8-7	Screw	2
23	T22S31	Lock nut	1
24	C873-10	Screw	1
28	T315B5-3	Screw	2
29	C102-113A	Plate	1
30	T63-9	Taper pin	1
31	C130-4	Collar	1
32	T41-8	Lock washer	1
33	T1S8-10	Screw	1
34	C140-58	Screw	2
36	C112-6	Spring	1
37	T8S8-8	Screw	1
38	C110-7	Clamp	1
39	T21S8	Nut	1
40	T57-4	Packing	1
41	C131-4X2	Retainer	1
42	C109-60	Bracket (includes 37-39)	1
43	C105-3	Lever and shaft (includes item 44)	1
44	T8S8-7	Screw	1
—	C106-2	Lever and swivel	1
—	T22S8	Nut	1
—	T45-8	Lock washer	1

L79A (Zenith No. 12723), L79B (Zenith No. 12720), L79C (Zenith No. 12724), L79D (Zenith No. 13232), LZ79-1 (Zenith No. 12713) LPG Pressure Carburetors

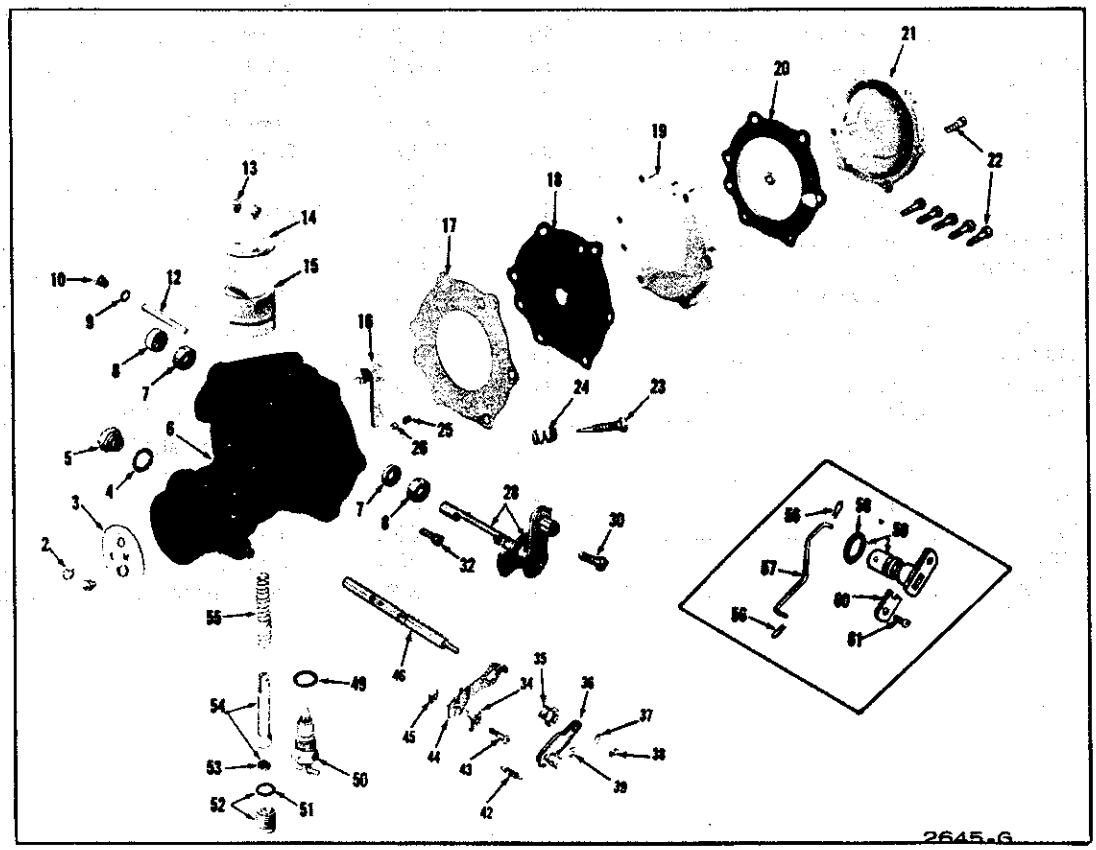


FIG. 1

L79A, L79B, L79C, L79D, LZ79-1 LPG Pressure Carburetors

USE WITH MODELS THDG, VG4DG, THDG, TJDG (see pg. 27)

ITEM	PART NO.	DESCRIPTION	QTY
2	T315S5-4	Screw	2
3	C102-125	Air shutter (L79A, L79C)	1
—	C102-124	Air shutter (L79B)	1
—	C901-3	Air shutter (L79D, LZ79-1)	1
4	PH499	Fiber washer	1
5	C138-24	Plug	1
6	A802-25-1	Throttle body assembly (L79A, L79B)	1
—	A802-25-2	Throttle body assembly (L79C)	1
—	A802-23A2	Throttle body assembly (LZ79-1)	1
—	A802-23A3	Throttle body assembly (L79D)	1
7	† T48-9	Seal	2
8	† C116-2X2	Retainer	2
9	† T56-24	Fibre washer (NLA)	1
10	C138-93	Screw	1
12	† C120-70	Axle	1
13	† T315S5-4	Screw	2
14	C21-185	Throttle plate	1
15	B838-8-19	Venturi	1
16	C824-7	Lever assembly	1
17	† B946-20	Gasket	1
18	† C989-7	Inner diaphragm assembly	1
19	B930-4	Diaphragm spacer	1
20	† C989-8	Outer diaphragm assembly	1
21	B987-15	Diaphragm cover	1
22	T321S10-16	Screw	6
23	† C846-1	Screw	1
24	† C111-9	Spring	1
25	T40S8-3	Set screw	1
26	† C137-60	Nylon plug	1
28	C29-1387	Throttle shaft and lever assembly (L79A, L79B)	1
—	C29-1301	Throttle shaft and lever assembly (L79C)	1
—	C29-1383	Throttle shaft and lever assembly (LZ79-1)	1
—	C29-1609	Throttle shaft and lever assembly (L79D)	1
30	T8S8-12	Screw	1
32	T311S6-9	Screw, Venturi	1
34	C110-1	Clamp	1
35	C140-7	Bracket screw assembly (L79A, L79B, L79C, LZ79-1)	1
—	CR140-7	Bracket screw assembly (L79D)	1
36	C906-2	Choke lever assembly (L79A, L79B, L79C)	1
—	C106-17	Choke lever assembly (L79D, LZ79-1)	1
37	T41-10	Lock washer	1
38	T22S8	Nut	1
39	T8S8-6	Swivel screw	1
42	C112-12	Spring	1
43	T8S8-10	Clamp screw	1
44	C109-46-1	Choke bracket assembly	1
45	T21S8	Nut	1
46	C905-8	Choke shaft	1
48	† T75-7	"O" ring (not illustrated)	1
49	† T56-51	Fibre washer	1
50	C870-7	Main jet adjustment assembly (L79A, L79B, L79C)	1
—	C870-6	Main jet adjustment assembly (L79D, LZ79-1)	1
51	† T75-2	"O" ring	1
52	C949-14	Inlet orifice assembly	1
53	† C844-11	Valve disc	1
54	C881-6	Fuel valve and seat assembly	1
55	C911-17	Spring	1
56	† T62-1	Hair pin cotter (L79A, L79B, L79C)	2
57	C900-1	Control rod (L79A, L79B, L79C)	1
58	† T75-9	"O" ring (L79A, L79B, L79C)	1
59	C883-16	Starting piston assembly (L79A, L79B, L79C)	1
60	C960-3	Retainer (L79A, L79B, L79C)	1
61	T301S10-6	Screw (L79A, L79B, L79C)	1
—	TC131-2	Cup plug (L79D)	1
—	T48-9	Seal (L79D)	1
—	C852-2-94	Main jet (LZ79-1, L79D)	1
—	93K2944	Repair kit (L79A, L79B, L79C, L79D, LZ79-1)	1

† Items included in the 93K2944 repair kit.

DISASSEMBLY

1. Turn throttle stop screw to left until throttle plate is fully closed. Fig. 2.
2. Remove throttle plate screws and throttle plate. (Exploded view).

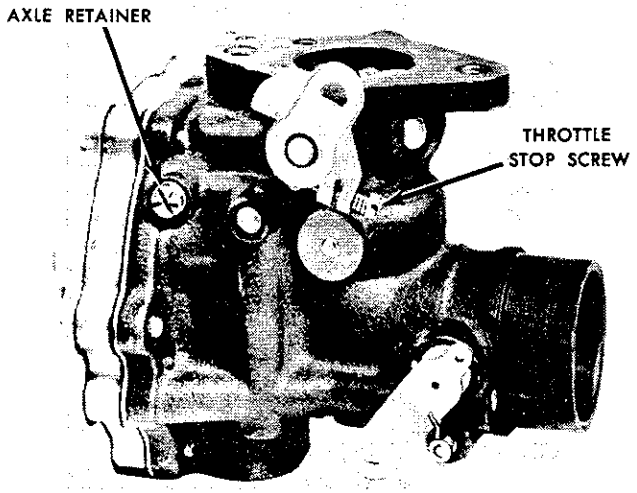


FIG. 2

WITH REFERENCE TO EXPLODED VIEW, FIG. 1 ON PAGE 1:

3. Remove piston retainer (Ref. 60) and retainer screw (Ref. 61).

   Remove starting piston (Ref. 59) and "O" ring (Ref. 58), after disconnecting control rod (Ref. 57).

   When reassembling, use a new "O" ring (Ref. 58) and mount to piston (Ref. 59).

4. Remove throttle shaft seal retainers and seal, as illustrated in Fig. 4.
5. Take out venturi retainer screw and remove venturi. Fig. 5.
6. Remove choke plate screws, choke plate and choke shaft. (Exploded view.)
7. Remove idle adjusting needle and spring. Fig. 5.

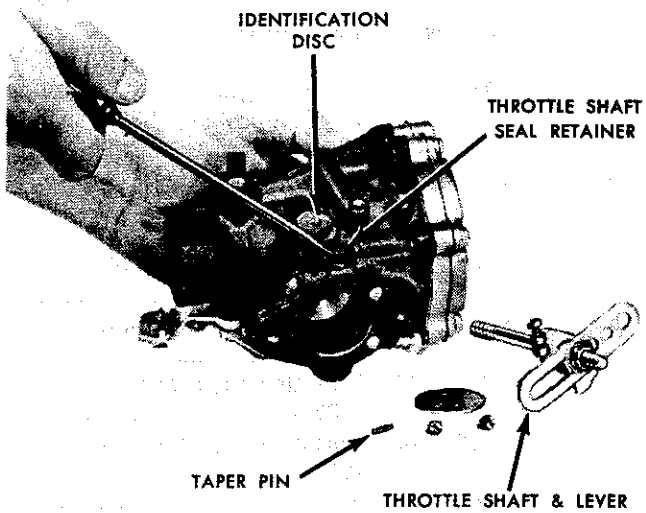


FIG. 4

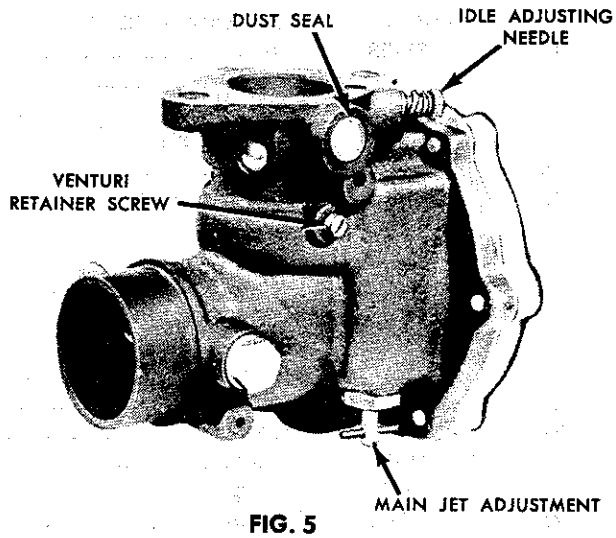


FIG. 5

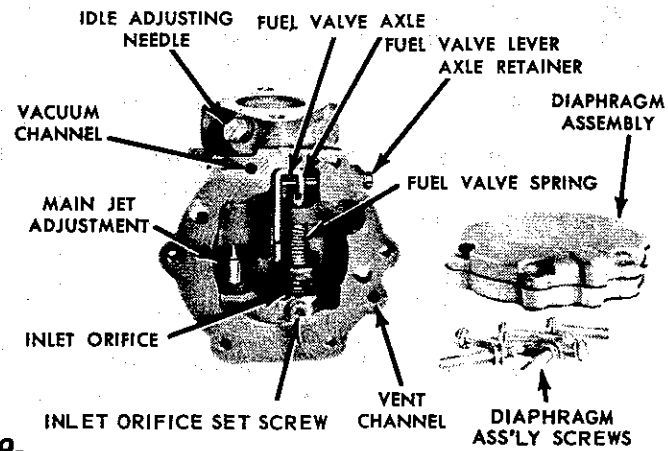


FIG. 6

8. Remove diaphragm cover assembly screws and complete diaphragm assembly. Fig. 6.
9. Separate diaphragm assembly components. (Exploded view.)
10. Remove axle retainer, fuel valve axle and fuel valve lever. Fig. 6.

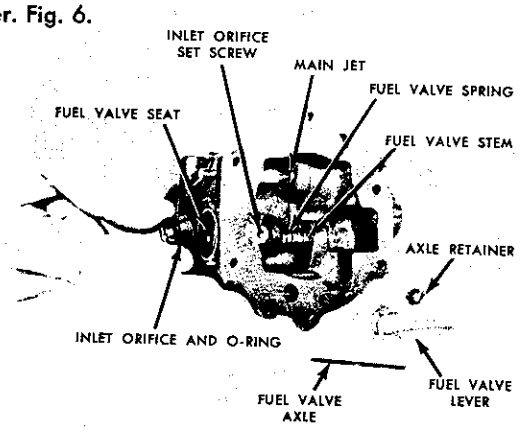


FIG. 7

11. Remove inlet orifice. Orifice is secured in position with 8-32 Allen Set Screw. Loosen this set screw before attempting to remove inlet orifice. Fig. 7.

NOTE: Early production did not have set screw.

12. Remove inlet valve stem and spring. Fig. 7.
13. Remove adjusting needle from main jet adjustment. Fig. 5.
14. Use a ⅝" socket wrench to remove main jet adjustment body. Fig. 5.

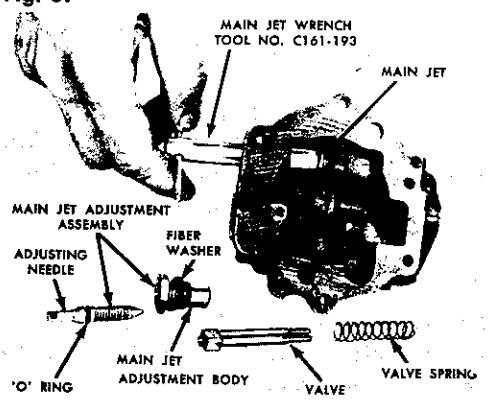


FIG. 8

15. Use main jet wrench C161-193 to remove main jet. Fig. 8.

NOTE: Many PC-1 Carburetors are equipped with a compensator jet, see Fig. 8-A. Compensator Jets and main jets are identical except for size of metering orifice. In general, when a compensator jet is used, it will have a smaller calibration than the main jet. If in doubt, check specifications. THIS COMPLETES DISASSEMBLY.

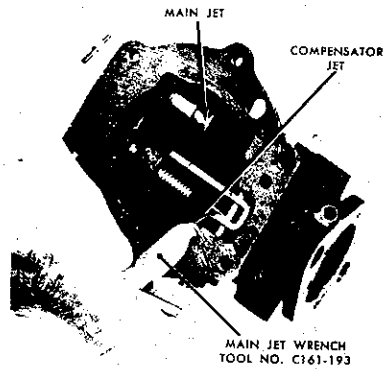


FIG. 8A

INSPECTION

1. Discard old diaphragms, gaskets, o-rings and throttle shaft seals.
2. Clean remaining parts in a grease solvent and examine for evidence of wear or damage. Replace all imperfect and discarded parts with new parts.
3. C994-9 Repair Kit contains all common items to be replaced.

REASSEMBLY

1. Install main jet and compensator jet (when used) with Tool C161-193. Fig. 8 and 8-A.
2. Place a new fiber washer on main jet adjustment body. Install and tighten with a ⅝" socket wrench. Fig. 8.
3. Place a new o-ring on main jet adjusting needle. Seat adjusting needle, then back it out 2 to 3 turns. Fig. 8.
4. Place a new rubber seat on fuel valve stem. Fig. 9.

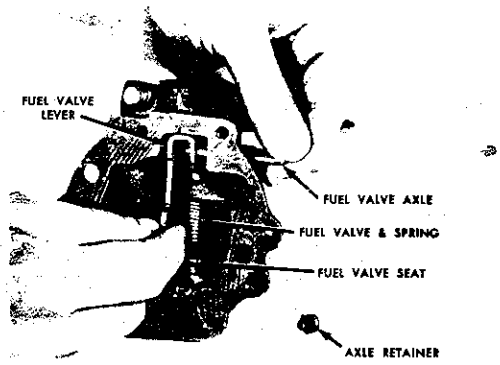


FIG. 9

5. Place fuel valve spring on fuel valve and inset valve, spring end first into casting. (Exploded view.)

EARLY PRODUCTION CARBURETORS DO NOT REQUIRE ADJUSTMENT OF FUEL VALVE LEVER.

6. Place new o-ring on inlet orifice and turn part way into casting.

   NOTE: On early production orifice should be seated. Early production does not have set screw to secure orifice.

7. Insert tip of fuel valve lever into slot in valve stem. Install axle and axle retainer. Fig. 9.

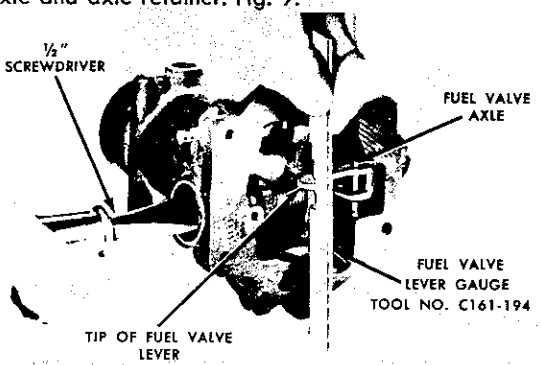


FIG. 10

8. Place gauge, C161-194, on machined surface of casting. Adjust fuel valve lever to specified (Carburetor Specification Section) step on gauge by turning inlet orifice in or out Fig. 10. Secure position by tightening 8-32 Allen set screw Fig. 11.

FUEL VALVE LEVER SETTING ABOVE CASTING FACE:
.110 to .120" for L-79-A, L-79-C, .045 to .055" for L-79-B

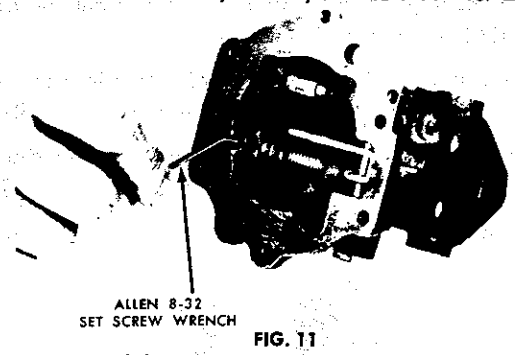


FIG. 11

9. Install three (3) aligning studs, Tool C166-52, in casting. Fig. 12.

10. Refer to Fig. 12. Install diaphragm assembly components as follows:

    NOTE LOCATION OF VACUUM PORT AND VENT CHANNEL PORT AND INSTALL COMPONENTS SO THAT CORRESPONDING OPENINGS ARE IN RIGHT POSITION.

    (1) Gasket
    (2) Inner diaphragm, spacer cup out.
    (3) Diaphragm spacer, recessed side out.
    (4) Outer diaphragm, diaphragm plate in.
    (5) Diaphragm cover.

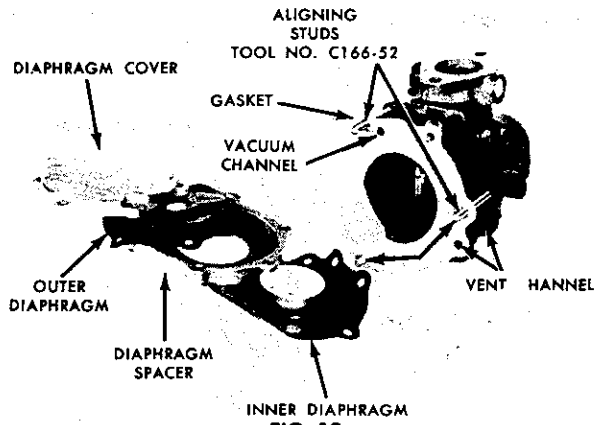


FIG 12

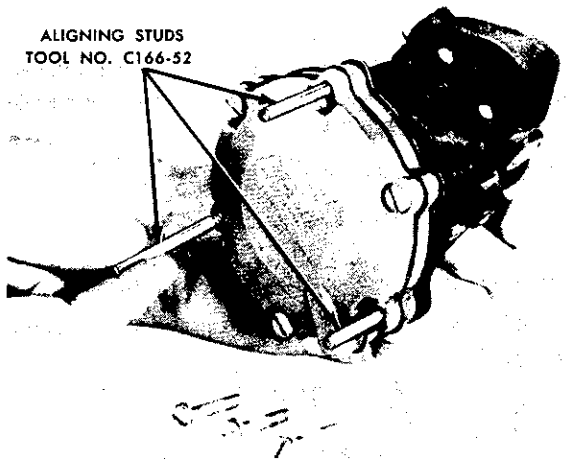


FIG. 13

11. Install three diaphragm assembly screws, then remove aligning studs and install remaining screws. Fig. 13.
12. Install venturi and secure with venturi screw. Fig. 5.
13. Install throttle shaft seals and seal retainers. Secure retainers by staking.
14. Install throttle plate. (Exploded view.)
16. Install idle adjusting screw and spring, seat, then adjust needle to 1½ to 2 turns open.
17. Install choke shaft and choke plate.
18. Replace choke spring.
19. Turn throttle stop screw to right to open throttle far enough for a fast idle. Fig. 2.

8. Remove diaphragm cover assembly screws and complete diaphragm assembly. Fig. 6.
9. Separate diaphragm assembly components. (Exploded view.)
10. Remove axle retainer, fuel valve axle and fuel valve lever. Fig. 6.

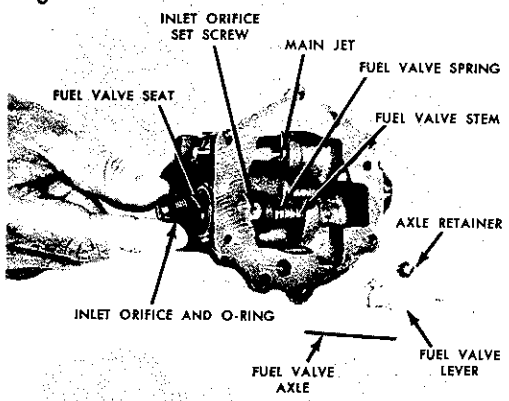


FIG. 7

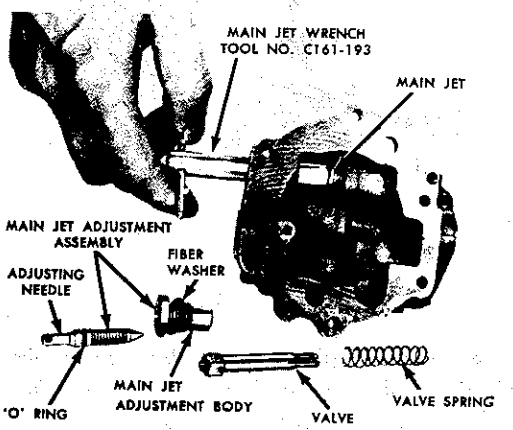


FIG. 8

11. Remove inlet orifice. Orifice is secured in position with 8-32 Allen Set Screw. Loosen this set screw before attempting to remove inlet orifice. Fig. 7.

NOTE: Early production did not have set screw.

12. Remove inlet valve stem and spring. Fig. 7.
13. Remove adjusting needle from main jet adjustment. Fig. 5.
14. Use a ⅝" socket wrench to remove main jet adjustment body. Fig. 5.
15. Use main jet wrench C161-193 to remove main jet. Fig. 8.

NOTE: Many PC-1 Carburetors are equipped with a compensator jet, see Fig. 8-A. Compensator Jets and main jets are identical except for size of metering orifice. In general, when a compensator jet is used, it will have a smaller calibration than the main jet. If in doubt, check specifications. THIS COMPLETES DISASSEMBLY.

INSPECTION

1. Discard old diaphragms, gaskets, o-rings and throttle shaft seals.
2. Clean remaining parts in a grease solvent and examine for evidence of wear or damage. Replace all imperfect and discarded parts with new parts.
3. Repair Kit contains all common items to be replaced.

REASSEMBLY

1. Install main jet and compensator jet (when used) with Tool C161-193. Fig. 8 and 8-A.
2. Place a new fiber washer on main jet adjustment body. Install and tighten with a ⅝" socket wrench. Fig. 8.
3. Place a new o-ring on main jet adjusting needle. Seat adjusting needle, then back it out 2 to 3 turns. Fig. 8.
4. Place a new rubber seat on fuel valve stem. Fig. 9.

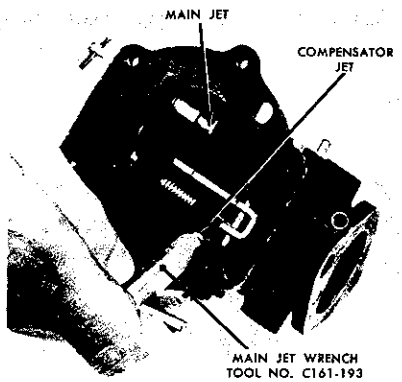


FIG. 8A

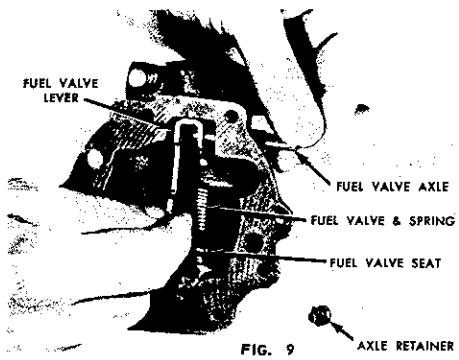


FIG. 9

5. Place fuel valve spring on fuel valve and inset valve, spring end first into casting. (Exploded view.)

EARLY PRODUCTION CARBURETORS DO NOT REQUIRE ADJUSTMENT OF FUEL VALVE LEVER.

6. Place new o-ring on inlet orifice and turn part way into casting.

   NOTE: On early production orifice should be seated. Early production does not have set screw to secure orifice.

7. Insert tip of fuel valve lever into slot in valve stem. Install axle and axle retainer. Fig. 9.
8. Place gauge, C161-194, on machined surface of casting. Adjust fuel valve lever to specified (Carburetor Specification Section) step on gauge by turning inlet orifice in or out Fig. 10. Secure position by tightening 8-32 Allen set screw Fig. 11.

   FUEL VALVE LEVER SETTING ABOVE CASTING FACE:
   .080 to .090" (Notch No. 3 on C161-194 gauge).

9. Install three (3) aligning studs, Tool C166-52, in casting. Fig. 12.
10. Refer to Fig. 12. Install diaphragm assembly components as follows:

    NOTE LOCATION OF VACUUM PORT AND VENT CHANNEL PORT AND INSTALL COMPONENTS SO THAT CORRESPONDING OPENINGS ARE IN RIGHT POSITION.

    (1) Gasket

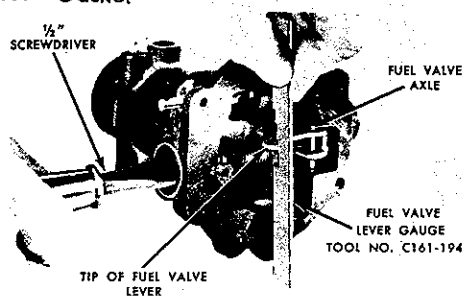


FIG. 10

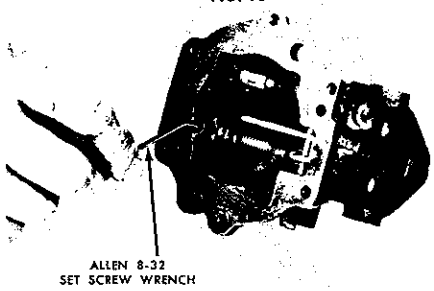


FIG. 11

    (2) Inner diaphragm, spacer cup out.

    (3) Diaphragm spacer, recessed side out.

    (4) Outer diaphragm, diaphragm plate in.

    (5) Diaphragm cover.

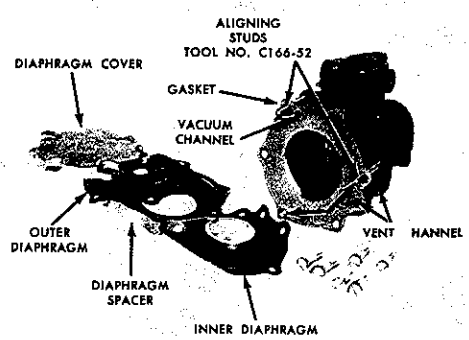


FIG. 12

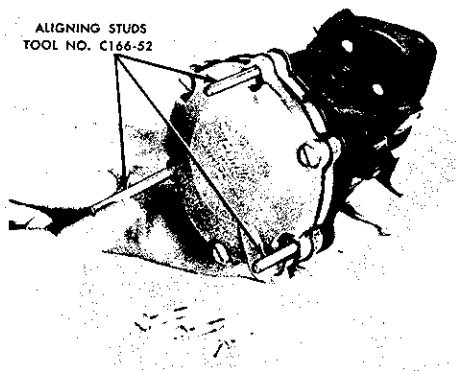
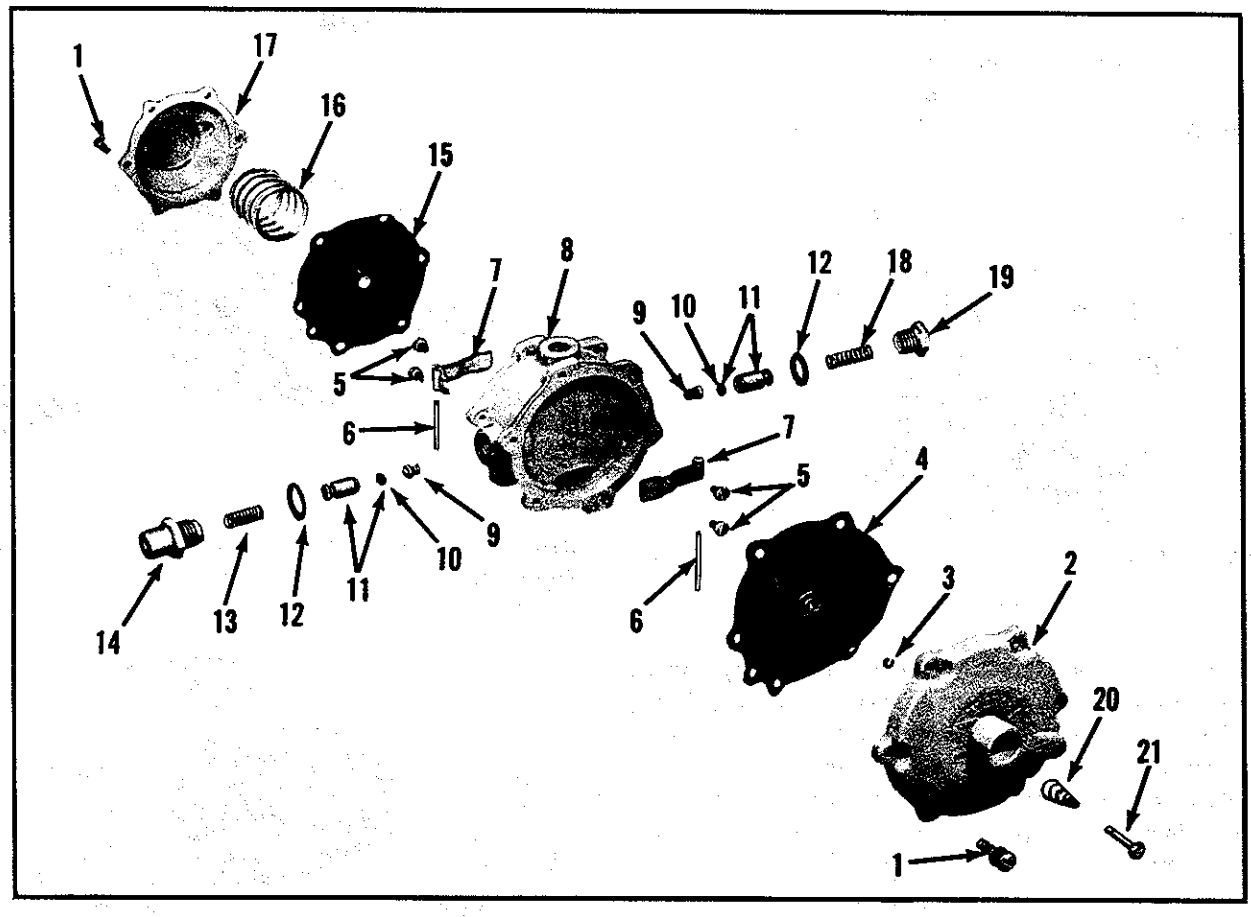


FIG. 13

11. Install three diaphragm assembly screws, then remove aligning studs and install remaining screws. Fig. 13.
12. Install venturi and secure with venturi screw. Fig. 5.
13. Install throttle shaft seals and seal retainers. Secure retainers by staking.
14. Install throttle plate. (Exploded view.)
15. Install idle adjusting screw and spring, seat, then adjust needle to 3½ turns open.
16. Install choke shaft and choke plate.
17. Replace choke spring.
18. Turn throttle stop screw to right to open throttle far enough for a fast idle. Fig. 2.
19. With reference to exploded view, Fig. 1; install idle diaphragm housing gasket (Ref. 45) and housing (Ref. 46). Assemble new idle valve disc (Ref. 53), diaphragm lever (Ref. 52) and axle (Ref. 51). Install lever spring (Ref. 56), channel screw (Ref. 54) and gasket (Ref. 55). Mount idle diaphragm (Ref. 48) and cover (Ref. 49).

L82 Regulator Service Procedure
(Zenith No. A806-43)

USE WITH MODELS ACNDG, HACNDG, BKNDG, HBKNDG, AENLDG, HAENLDG



ITEM		PART NO.	DESCRIPTION	QTY
1	†	T311S10-9	Screw	12
2		B987-20	Cover	1
3	†	CT64-3	Truarc lock	1
4	†	C989-8	Secondary diaphragm assembly	1
5	†	C140-52	Screw	2
6		C120-71	Axle	2
7		C824-5	Diaphragm lever assembly	2
8		ER805-6A	Regulator body	1
9	†	C809-5	Valve seat	2
10	†	C844-14	Valve disc	2
11		C883-14	Fuel valve piston	2
12	†	T56-6	Fiber washer	2
13		C911-20	Spring	1
14		C870-5	Secondary adjustment assembly	1
15	†	C989-10	Primary diaphragm assembly	1
16		C911-19	Spring	1
17		A987-19A	Cover	1
18		C911-18	Spring	1
19		C938-16	Primary valve plug	1
20		C911-21	Primer spring	1
21		C104-25	Primer stem	1

† Repair kit C994-7.

DISASSEMBLY

1. Place regulator on bench with primary side up and fuel outlet boss toward operator. Figure 2.
2. Scribe a match mark from primary diaphragm cover to regulator body casting so that upon reassembly these parts can be replaced in their original position. Figure 2.

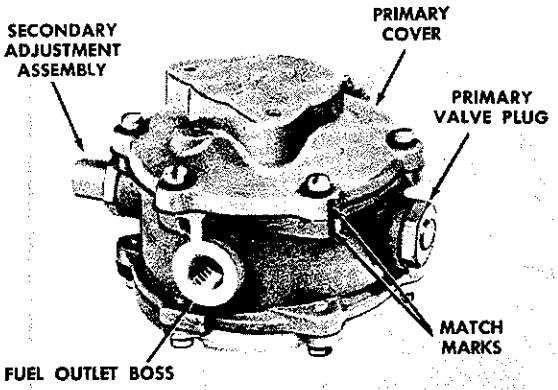


FIGURE 2

3. Use a 13/16" wrench and remove the primary valve plug, secondary adjustment assembly, valve springs and fiber washers, Figure 3. Notice that secondary adjustment assembly is toward operator's left and contains a spring loaded adjusting screw. Also note that primary valve plug is not adjustable and contains a much heavier spring. Figure 3.

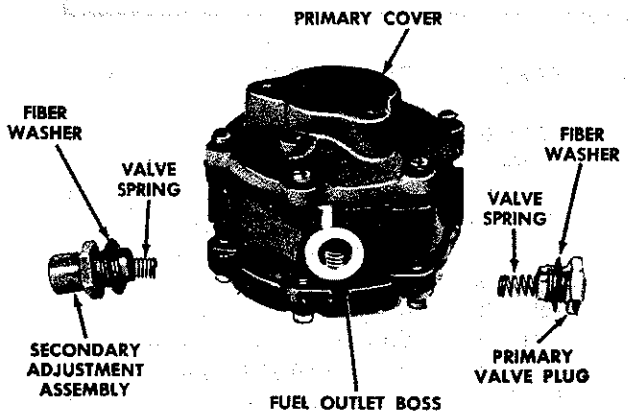


FIGURE 3

4. Remove the six assembly screws that secure the primary cover and diaphragm assembly to regulator body. Figure 4.

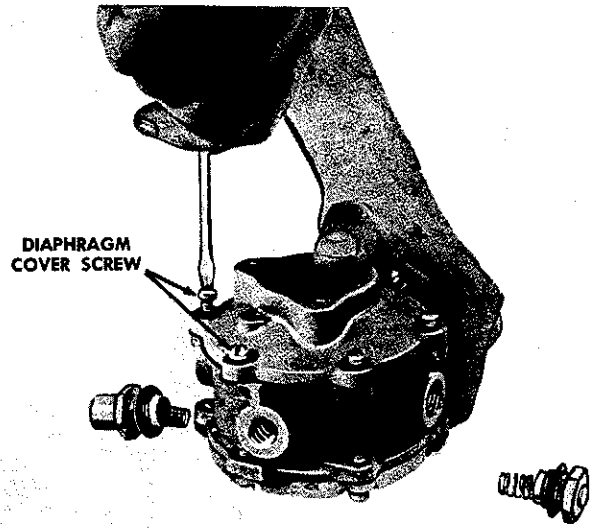


FIGURE 4

5. Remove the primary cover, spring and diaphragm. Figure 5.

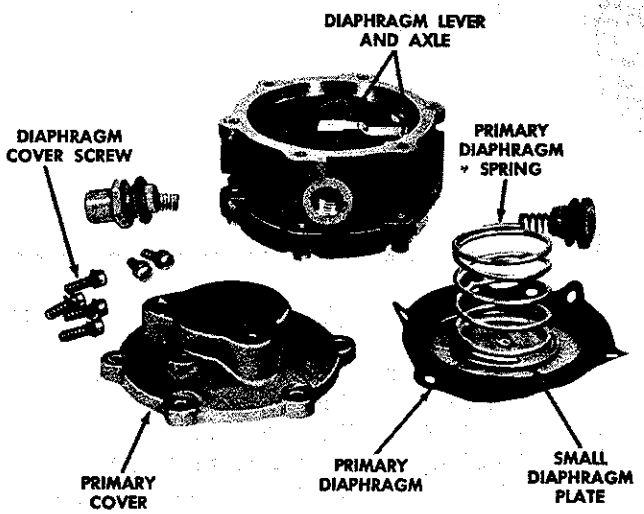


FIGURE 5

6. Remove the primary diaphragm lever, Figure 6, by taking out the two axle retaining screws and lifting out the lever and axle. Tilt the casting and primary fuel valve piston will fall out, Figure 7. Use a paper clip or similar tool and remove the rubber valve disc. Figure 8.

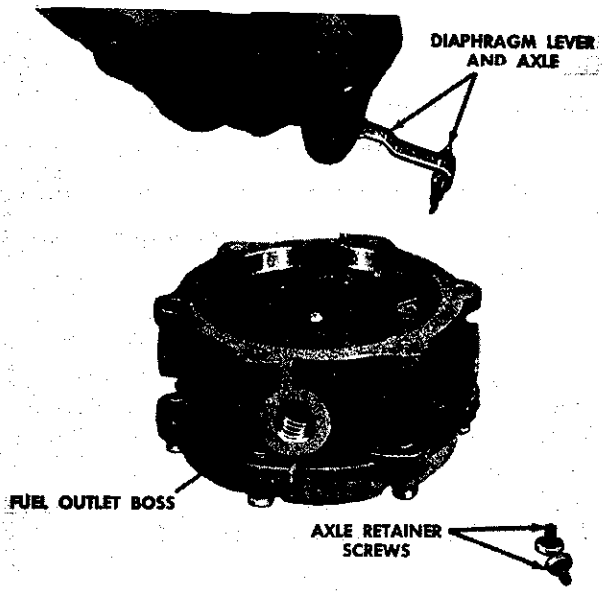


FIGURE 6

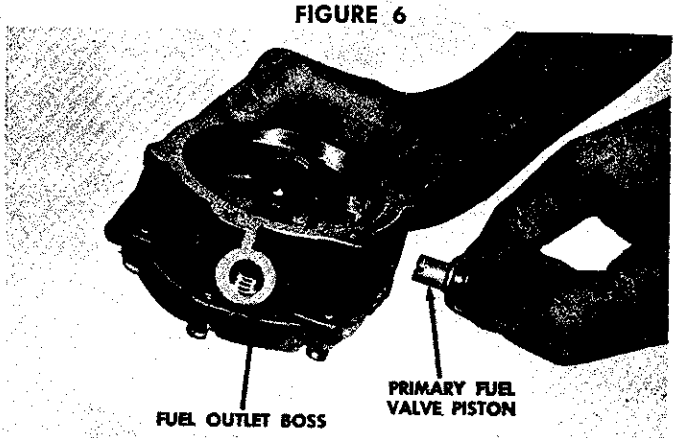


FIGURE 7

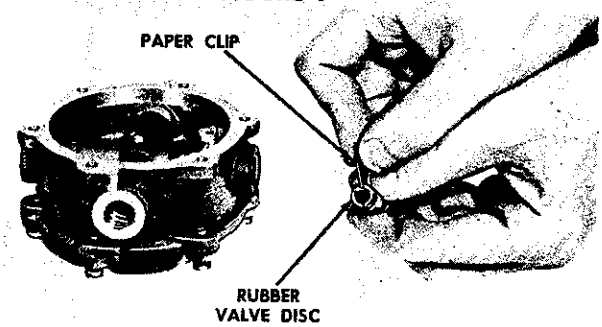


FIGURE 8

7. Turn regulator over and remove the six secondary cover assembly screws. Figure 9.
8. Remove secondary cover and diaphragm. Figure 10.

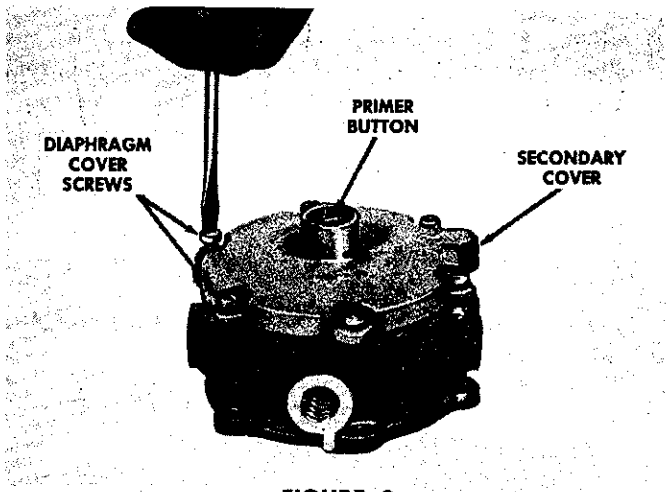


FIGURE 9

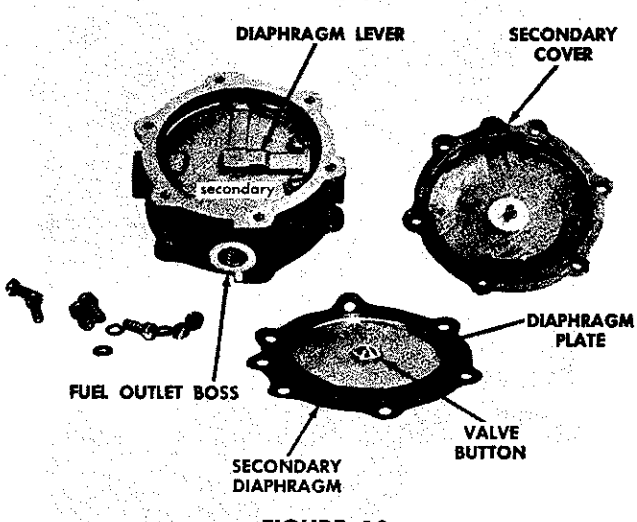


FIGURE 10

9. Remove the diaphragm lever and valve piston assembly by following procedure outlined in step No. 6, Figure 6 and 7.
10. Carefully examine the orifices of the primary and secondary valve seats, Figure 11. These seats are located in the valve channels of the regulator body. If either seat is scratched or imperfect in any way, it must be replaced, see next step.

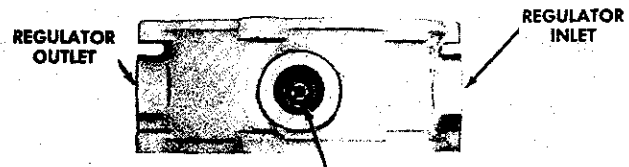


FIGURE 11

11. Clamp casting in vise. Place old fiber washer on shoulder of puller nut, part of tool C161-199. Insert tapered end of tool C161-199 in orifice of valve seat. Align easy-out with valve seat orifice by adjusting puller nut until half of its shoulder has entered fuel valve channel. Figure 12. Turn easy-out to left (counterclockwise) until tapered threads are firmly engaged in valve seat orifice. Figure 12. Hold easy-out handle, Figure 13, to prevent its turning while screwing puller nut to right (clockwise) to extract valve seat. Discard old valve seat.

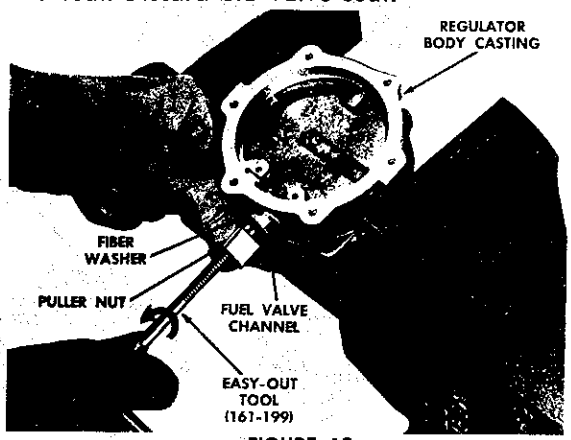


FIGURE 12

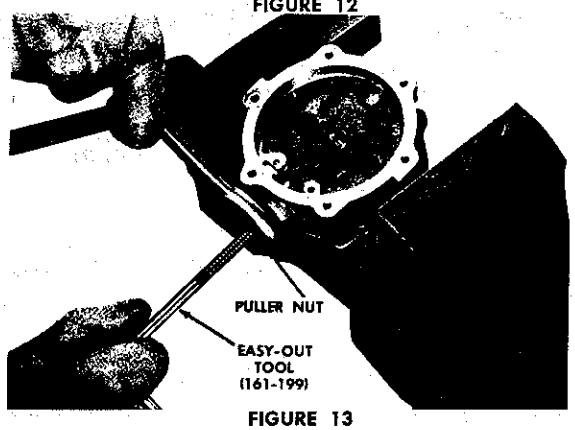


FIGURE 13

12. Examine primer button located in the center of the secondary diaphragm cover as shown in Figure 9. Depress the button and then release it. The button should return to its original position. If primer is operating normally, no further service is required. Should a part be rusted or corroded, remove the truarc lock, as shown in Figure 16, and replace parts as needed, then secure by replacing truarc lock.

THIS COMPLETES DISASSEMBLY.

REASSEMBLY

NOTE: The following parts are interchangeable:

Primary and secondary valve seats.

Primary and secondary valve pistons and discs.

Primary and secondary diaphragm levers and axles.

1. If valve seats have been removed, replace them with new seats as follows: Hold body casting with valve channel in a vertical position. Figure 14. Place a new valve seat, orifice down, on inserting tool (C161-198). Insert tool and valve seat in valve channel. Use a small hammer and seat the valve by driving it in with a series of light taps. Figure 15.

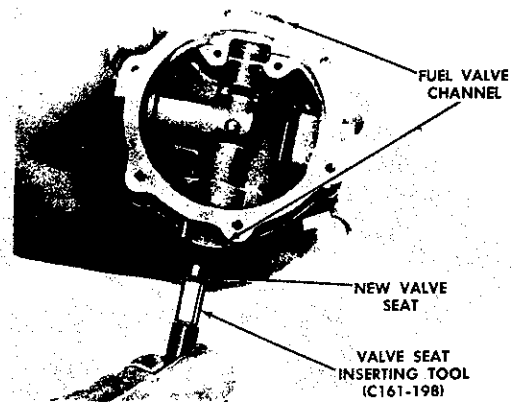


FIGURE 14

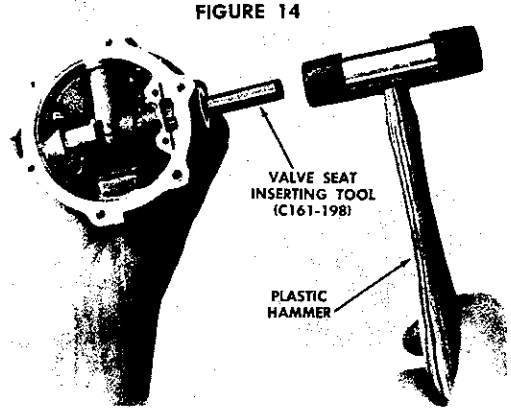


FIGURE 15

2. Install primer button assembly in secondary diaphragm cover by inserting plunger through small end of spring and depressing plunger far enough to secure with truarc lock. Figure 16.

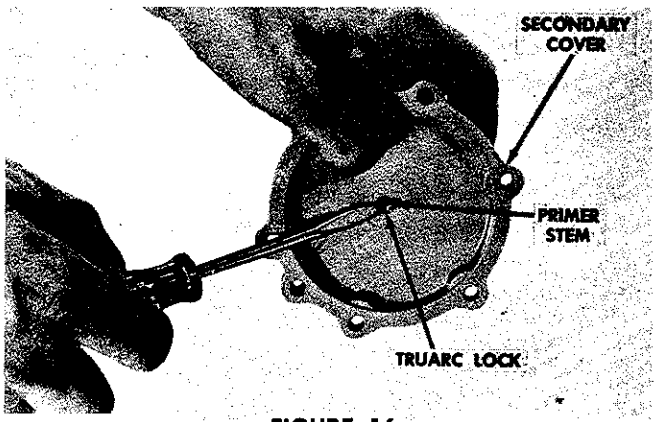


FIGURE 16

3. Install new rubber valve discs in valve pistons, no tools required.
4. Place regulator body on bench with side marked "secondary" up and fuel outlet boss toward operator. Figure 10.
5. Insert a valve piston, the end with rubber disc first, in valve channel on operator's right. Figure 17.

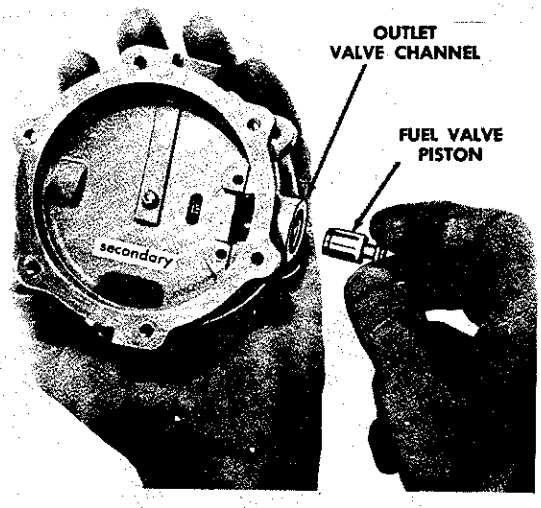


FIGURE 17

6. Examine both diaphragm levers. Surfaces should be parallel. Figure 18.
7. Install diaphragm lever and axle assembly and secure with two axle retainer screws. Figure 6.
8. Insert five aligning studs (C166-53) in five assembly screw holes in body casting. Figure 19.
9. Install secondary diaphragm, plate and valve button down. Figure 19. *Note: Disregard 7th hole in diaphragm.*
10. Install secondary cover.

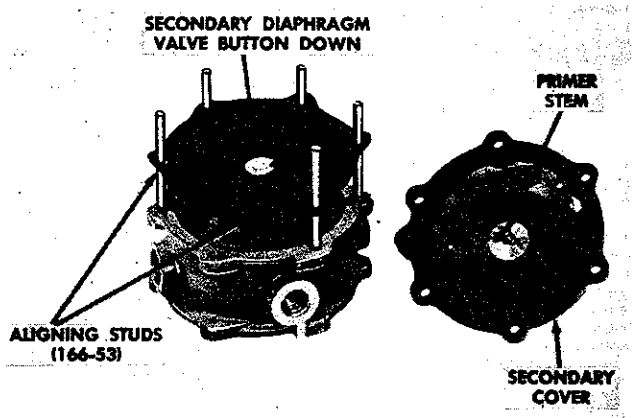


FIGURE 19

11. Install one assembly screw finger tight and then remove one aligning stud and replace it with another screw. Figure 20. Continue in this manner until all six assembly screws have been installed, then tighten all assembly screws evenly.

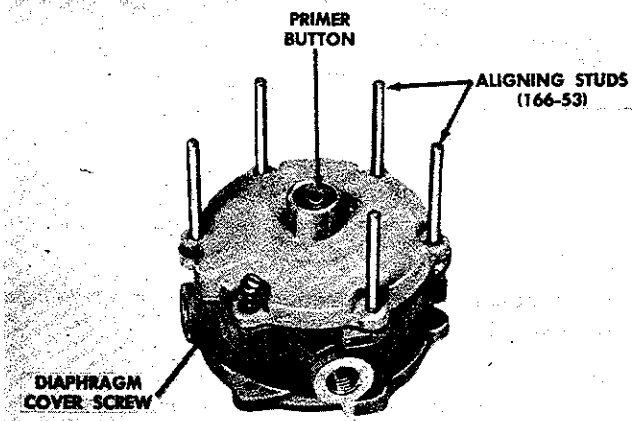


FIGURE 20

12. Turn regulator over and position it on bench so that the word "primary" is up and fuel outlet boss is toward operator. Figure 21.

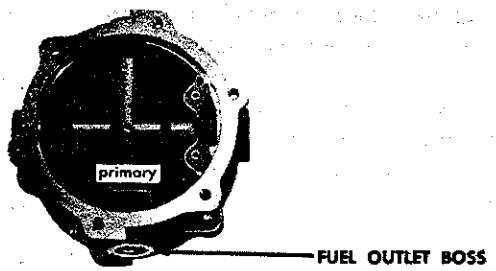


FIGURE 21

13. Insert a valve piston, the end with rubber disc first, in valve channel on operator's right. Figure 7.
14. Install diaphragm lever and axle assembly and secure axle with two retainer screws.
15. Insert six aligning studs (C166-53) in the six assembly screw holes in body casting finger tight, then install primary diaphragm, plates up. Figure 22. *Note: Disregard 7th hole in diaphragm.*

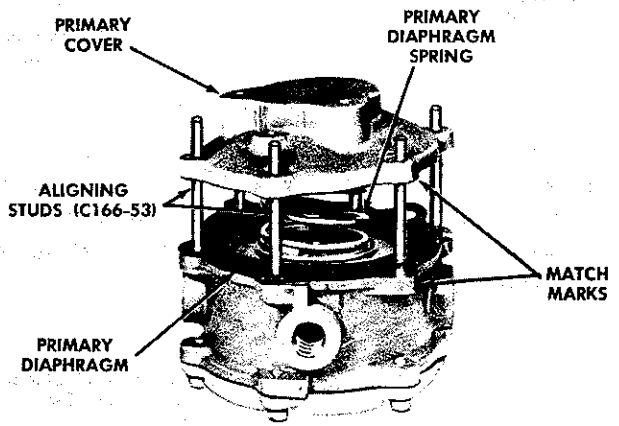


FIGURE 22

16. Place primary diaphragm spring on small diaphragm plate. Figure 22.
17. Align match marks on primary diaphragm cover and regulator body. Figure 22.
18. Depress diaphragm cover all the way, remove one aligning stud, and replace it with an assembly screw, tighten screw moderately tight. Figure 23.
19. **Remove remaining aligning studs one at a time and replace them with assembly screws while maintaining pressure on the cover. Tighten all screws evenly.**
20. **Place regulator on bench, primary side up and fuel outlet boss toward operator. Figure 3.**
21. Place a new fiber washer on the primary valve plug, (the one without the spring loaded adjusting screw and the one having the heavier of the two springs). Figure 3.

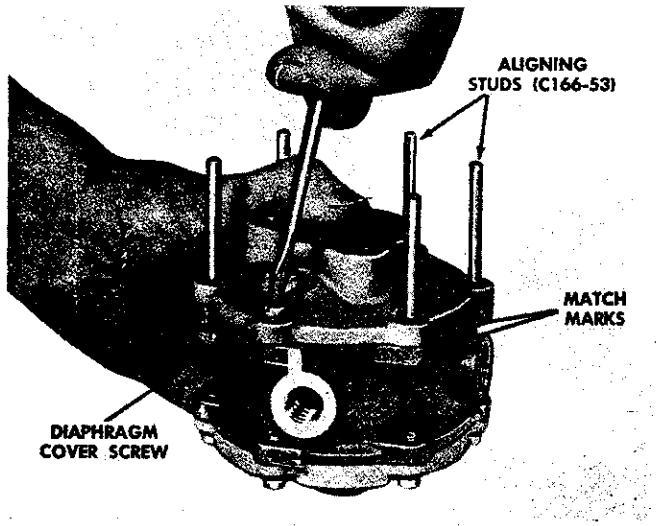


FIGURE 23

22. Install primary valve plug, fiber washer and spring assembly in the right hand piston channel. Tighten securely with a 13/16" wrench.
23. Use a new fiber washer and install secondary adjustment assembly in left hand channel. Figure 2.

TESTING AND ADJUSTING

1. Seat secondary adjusting screw by turning it to the right (clockwise) until it bottoms. Figure 24.

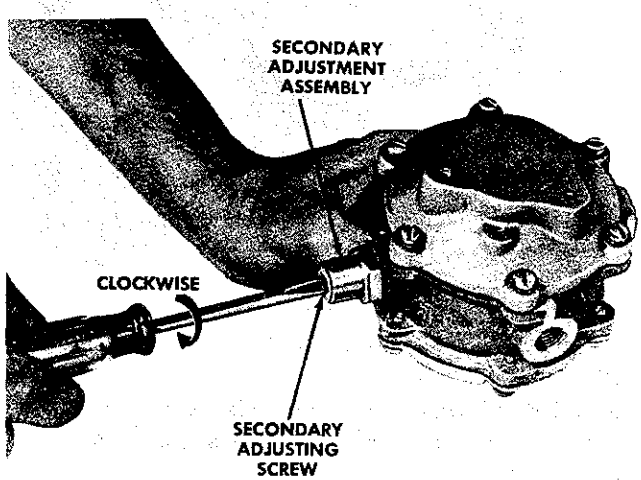


FIGURE 24

2. Connect regulator inlet to a scource of compressed air or gas in excess of 25 PSI, depress primer button two or three times, connect a 0-15 lb. pressure gauge to fuel outlet and hold primer button in a depressed position. Pressure gauge should read approximately 2 PSI and remain steady. If pressure creeps up primary valve is leaking, clean or replace parts as necessary. Figure 25.

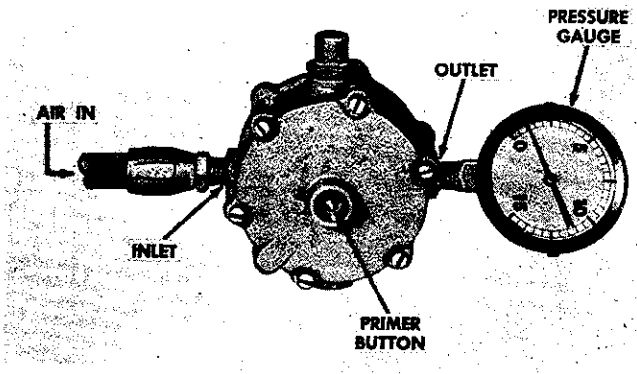


FIGURE 25

3. Keep regulator inlet connected to a source of compressed air or gas in excess of 25 PSI. Remove pressure gauge from fuel outlet channel and cover opening with a film of bubble solution. If secondary regulator valve is leaking a bubble will begin to expand. Clean or replace valve parts as needed and re-check for leak. Figure 26.

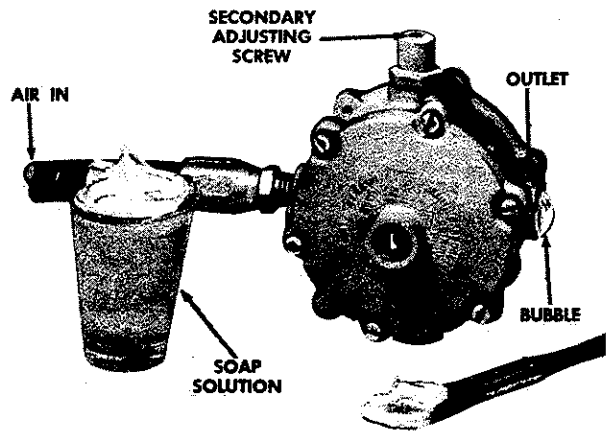


FIGURE 26

4. Keep regulator fuel outlet covered with a bubble film and slowly turn secondary adjusting screw to left (counterclockwise) until a bubble begins to form at outlet, then turn adjusting screw one turn to the right (clockwise). Figure 27.

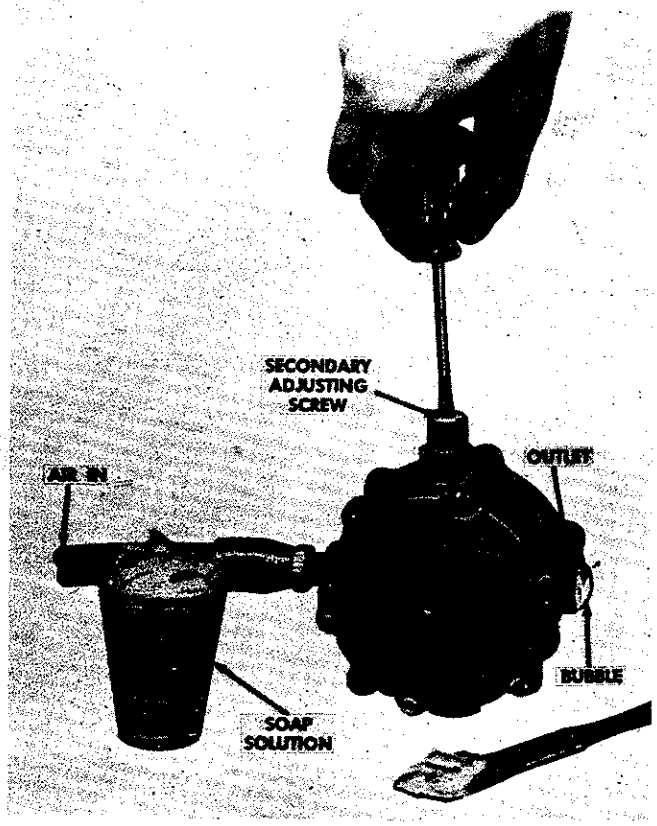
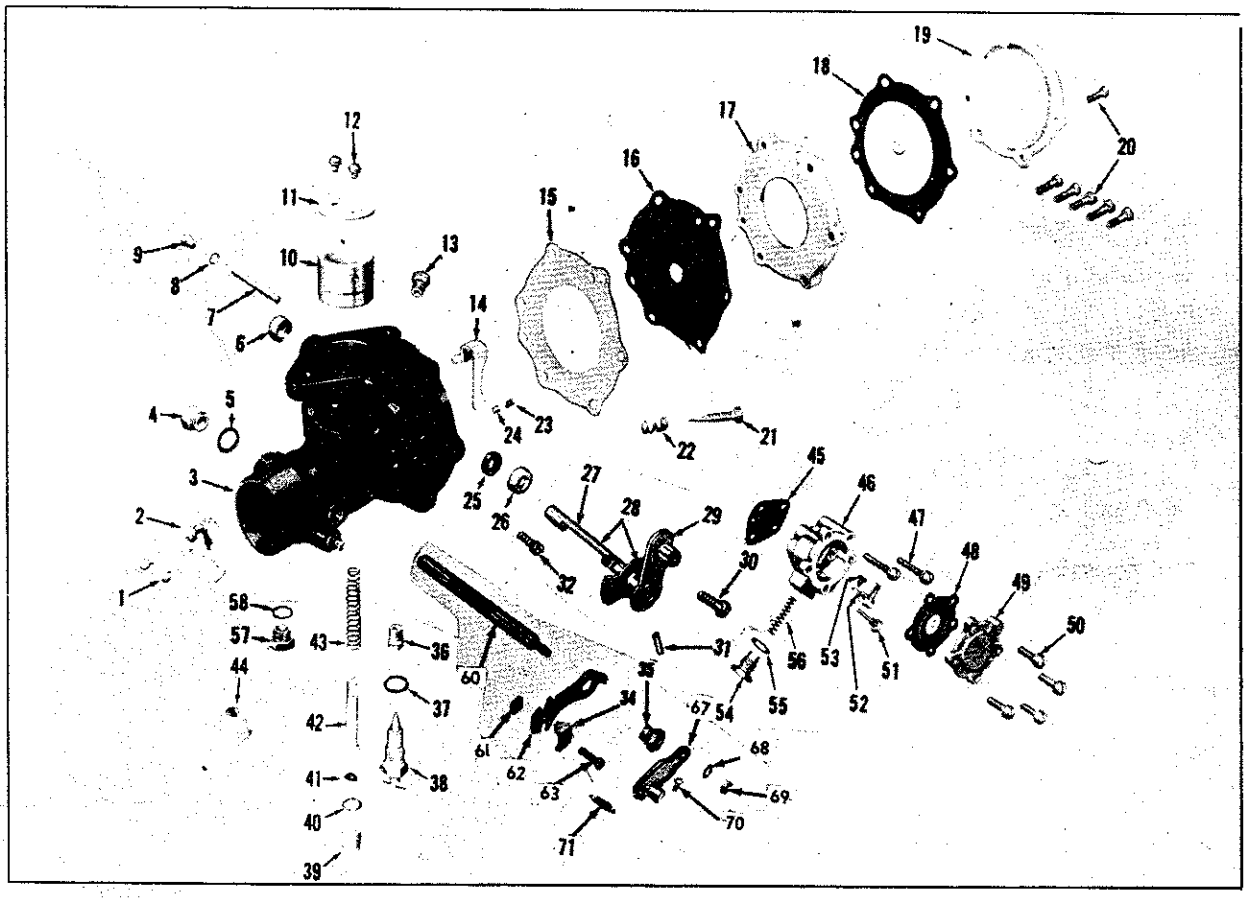


FIGURE 27

5. Regulator is now ready to be placed in service. Further adjustments should be made at the carburetor ONLY.

L83 Carburetor Parts List (Zenith No. GO12836)



L83 Carburetor Parts List

USE WITH MODELS V460DG, V461DG (see pg. 41)

ITEM		PART NO.	DESCRIPTION	QTY
1		T315S6-4	Screw	2
2		C901-4	Air shutter assembly	1
3		E802-24-11	Throttle body assembly (includes 6, 25, 26)	1
4		C138-24	Plug	1
5	†	PH499	Fiber washer	1
6	†	C131-2	Plug	1
7	†	C120-70	Axle	1
8	†	T56-24	Fibre washer (NLA)	1
9		C138-93	Screw	1
10		B838-10-28	Venturi	1
11		C21-207	Throttle plate	1
12	†	T315S5-4	Screw and lock washer	2
13		C852-2-40	Compensator jet	1
14		C824-7	Lever assembly	1
15	†	B946-20	Gasket	1
16	†	C989-7	Inner diaphragm assembly	1
17		B930-4A	Diaphragm spacer	1
18	†	C989-8	Outer diaphragm assembly	1
19		B987-15A	Diaphragm cover	1
20	†	T321S10-16	Screw	6
21	†	C846-1	Screw	1
22		C111-9	Spring	1
23		T40S8-3	Set screw	1
24	†	C137-60	Nylon plug	1
25		T48-9	Seal	1
26	†	C116-2X2	Retainer	1
27		C23-561	Throttle shaft	1
28		C29-1588	Throttle shaft and lever assembly	1
29		CR27-358	Throttle and stop lever assembly	1
30		T8S8-10	Screw	1
31		T63-9	Taper pin	1
32		T311S8-10	Screw, Venturi	1
34		C110-1	Clamp	1
35		C140-7	Bracket screw assembly	1
36		C852-2-94	Main jet	1
37	†	T56-51	Fibre washer	1
38		C870-6	Main jet adjustment assembly (includes 38A)	1
38A	†	T75-7	"O" ring (not illustrated)	1
39		C949-14	Inlet orifice assembly (includes item 40)	1
40	†	T75-2	"O" ring	1
41	†	C844-11	Valve disc	1
42		C881-6	Fuel valve and seat assembly (includes item 41)	1
43		C911-17	Spring	1
45	†	C946-27	Gasket	1
46		AR805-7A	Idle diaphragm housing	1
47		T301S8-12	Screw	2
48	†	C989-12	Idle diaphragm housing	1
49		C987-23A	Cover	1
50		T301S8-8	Screw	4
51	†	C140-76	Lever axle	1
52		C824-8	Diaphragm lever assembly	1
53	†	C844-15	Valve disc	1
54		C938-17	Plug	1
55	†	T56-58	Fibre washer	1
56		C911-22	Spring	1
57		C138-47	Screw	1
58	†	T56-51	Fibre washer	1
60		C105-18	Choke shaft	1
61		T21S8	Nut	1
62		C109-46-1	Choke bracket assembly (includes 34, 61, 63)	1
63		T8S8-10	Clamp screw	1
67		C106-17	Choke lever assembly (includes item 70)	1
68		T41-10	Lock washer	1
69		T22S8	Nut	1
70		T8S8-6	Swivel screw	1
71		C112-12	Spring	1

† Items included in the C994-8 repair kit (NLA).

DISASSEMBLY

1. Turn throttle stop screw to left until throttle plate is fully closed. Fig. 2.
2. Remove throttle plate screws and throttle plate. (Exploded view).

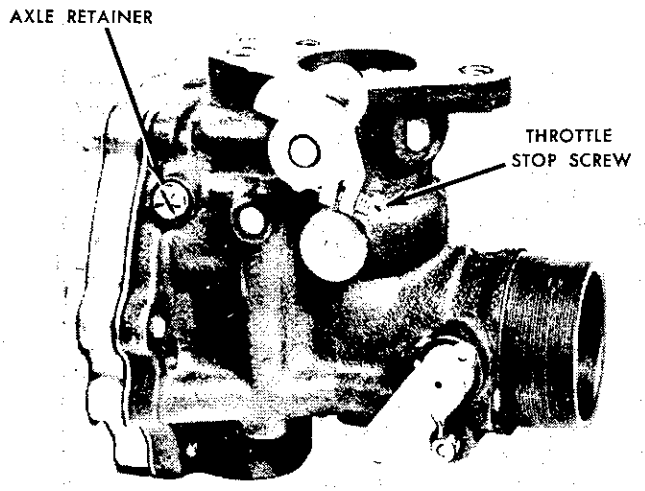


FIG. 2

WITH REFERENCE TO EXPLODED VIEW, FIG. 1 ON PAGE 3.

3. Remove throttle shaft seal retainer and seal, as illustrated in Fig. 4.
4. Remove idle diaphragm cover (Ref. 49) and diaphragm (Ref. 48).

   Take out lever spring channel screw (Ref. 54) and spring (Ref. 56).

   Remove idle diaphragm lever axle (Ref. 51), lever (Ref. 52) and valve disc (Ref. 53).

   Take off diaphragm housing (Ref. 46) and gasket (Ref. 45).
5. Take out venturi retainer screw and remove venturi. Fig. 5.
6. Remove choke plate screws, choke plate and choke shaft. (Exploded view.)
7. Remove idle adjusting needle and spring. Fig. 5.

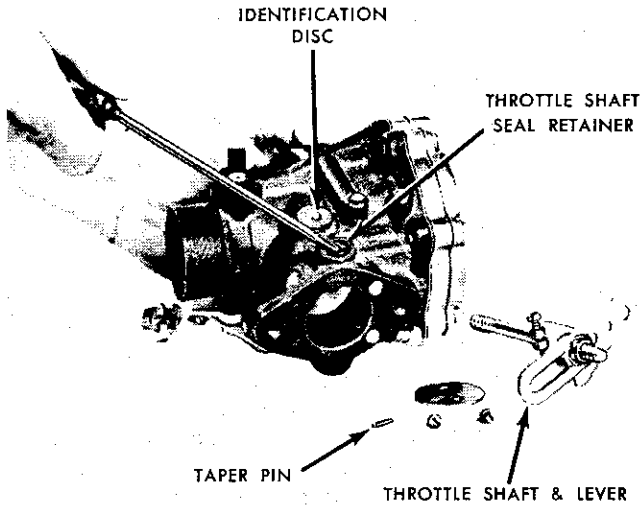


FIG. 4

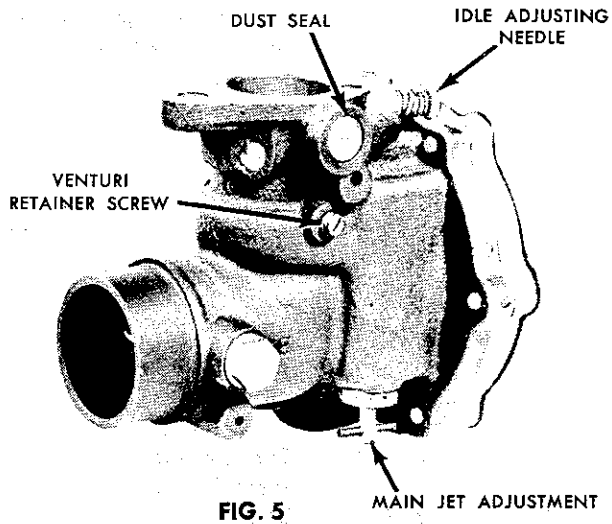


FIG. 5

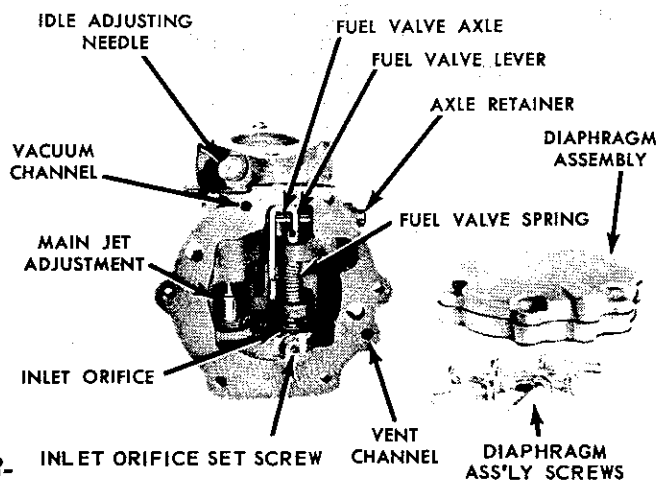


FIG. 6

L83 Carburetor Parts List (Cont.)

DESCRIPTION

The Zenith PC2 type of LP pressure carburetor is bascically the same the the PC1 type of carburetor except for the addition of an Idle Fuel Regulator and an Economizer Check Valve.
The function of the Idle Fuel Regulator is to control the flow of fuel to the engine during the idle and light load range of operation; to assure more consistent idling speeds over extended periods of service without the need for frequent adjustment. The function of the Economizer Check Valve is to provide economy over the light and medium load range of operation without affecting the full power output of the carburetor.

OPERATION

The fuel pressure at the Fuel Inlet (Fig. A) is controlled by the primary regulator in the fuel system and should be set at 10 pounds per square inch pressure (PSI). The pressure should never be set above 12 pounds per square inch, which has been approved by Underwriter's Laboratories, Inc. The Fuel Valve Seat (2) is adjustable so that the relationship of the lever (9 Fig. B) to the mounting flange of the diaphragm (10 Fig. B) may be varied to meet the specifications for the particular engine application. The Fuel Seat is locked in position by means of a Lock-screw (3) which tightens the Lockplug (4) against the side of the fuel valve seat. An 'O' ring (5) prevents leakage of fuel around the seat so that the synthetic rubber disc (6) assembled to the Fuel Valve (7) shuts off all incoming fuel when the fuel valve closes on the seat.

The force exerted by the Fuel Valve Spring (8) on the Fuel Valve Assembly (7) is such that fuel inlet pressure of 20 p.s.i. would be necessary to push the valve off its seat.

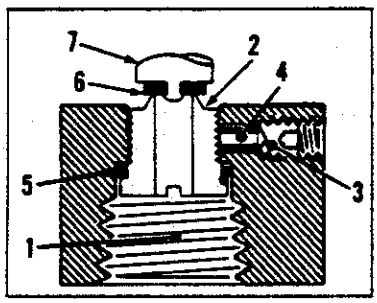


FIGURE A

The travel of the Fuel Valve Assembly (7) is actuated by the Lever (9) which is controlled by the movement of Diaphragms (10) and (11), both of which are responsive to pressure variations at key points in the carburetor structure. It is essential to have a specific starting position for the diaphragm lever for a particular engine. An adjustable fuel valve seat is provided for setting this position. This avoids the necessity for a variety of diaphragm levers. This adjustable fuel valve seat, when once set, is locked in position and after the carburetor is assembled it is not accessible to tinkerers.
The diaphragm chamber (12) receives its ventilation through the Orifice (13) and Channel (14) from the Air Intake (15) of the carburetor. The Diaphragm Chamber (16) communicates directly to two pressure areas in the throttle body of the carburetor. Through Channel (17), Orifice (18) and the Annulus (19) it reaches the throat of the Venturi (20). Through Channel (17) and the Adjustable Idling Orifice (21) it connects into the area beyond the Throttle Plate (22). The pressures transmitted to the Diaphragm Chamber (16) will vary with the position of the throttle plate. Thus, whichever of the two areas (above the throttle plate or at the throat of the venturi) produces the lower pressure will be most influential in the movement of the Diaphragms (10) and (11). The position of these diaphragms controls the pressure in Fuel Chamber (23).

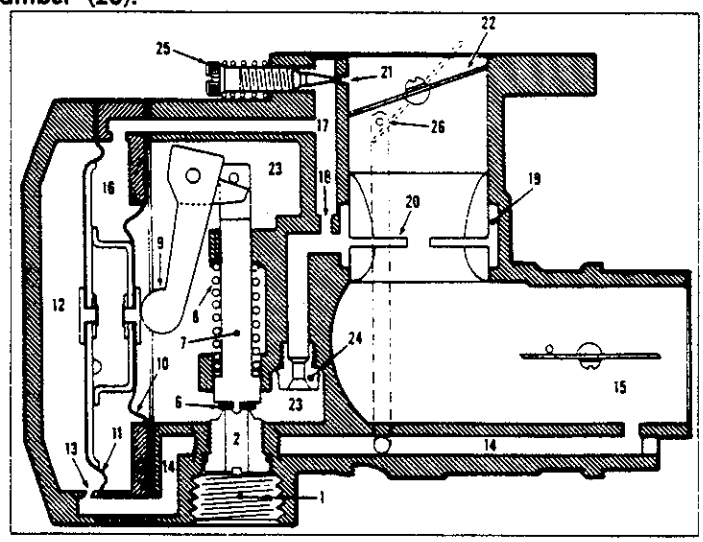


FIGURE B

As fuel from the vaporizer enters the Idle Fuel Regulator, (Fig. C), through the channels in the throttle body, spring (27) holds the orifice seat (28) against the idle inlet orifice (29) to prevent fuel leakage when the engine is not operating. The low pressure, which prevails above the throttle during idle, is communicated to the low pressure side (34) of diaphragm (30) through the idle discharge holes and channels in the throttle body. The high pressure side (35) of the Idle Regulator Diaphragm is subjected to the fuel chamber pressure through a channel connecting the fuel chamber with the diaphragm chamber.

L83 Carburetor Parts List (Cont.)

The differences in pressure acting upon the Idle Regulator Diaphragm (30) causes the diaphragm button (31) to move the idle regulator lever (32) and orifice seat (28) and permit fuel to enter the Idle Regulator housing and pass through the channels and idle discharge holes to the engine. The amount of fuel which enters the engine for idle and light load operation is controlled by the amount the idle needle valve (33) is open. The size of the Main Jet (24) regulates the maximum flow of fuel.

To assist in obtaining good fuel economy at part throttle operation without upsetting full power when needed or without affecting a good idling mixture, a back suction type of economizer check valve is used. Reduced flow of fuel is accomplished in the part throttle range of operation by letting the low pressure beyond the throttle plate communicate, through the back suction orifice (26), with one side of the economizer check valve (36). The opposite side of the economizer check valve communicates with the air intake (37) of the carburetor. The differences in the areas of the back suction orifice (26) and the area of the air intake channel (37), determines the extent of the pressure change. The relationship between the back suction and the economizer check valve spring (as governed by the position of the throttle) determines the operating range in which the fuel flow is reduced.

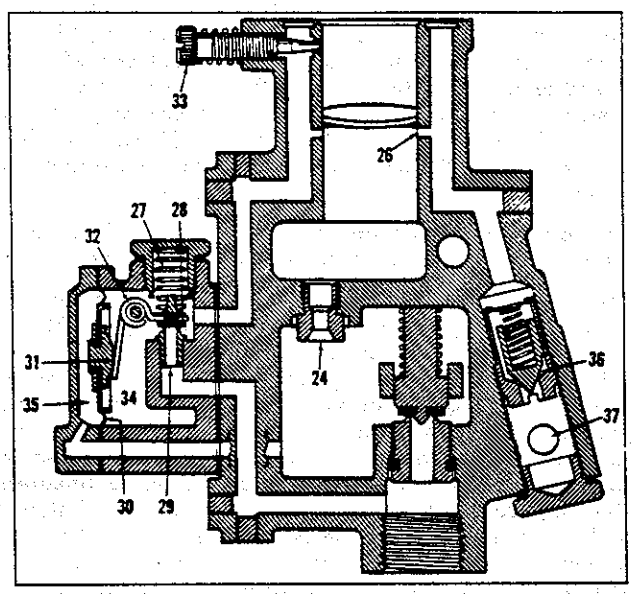
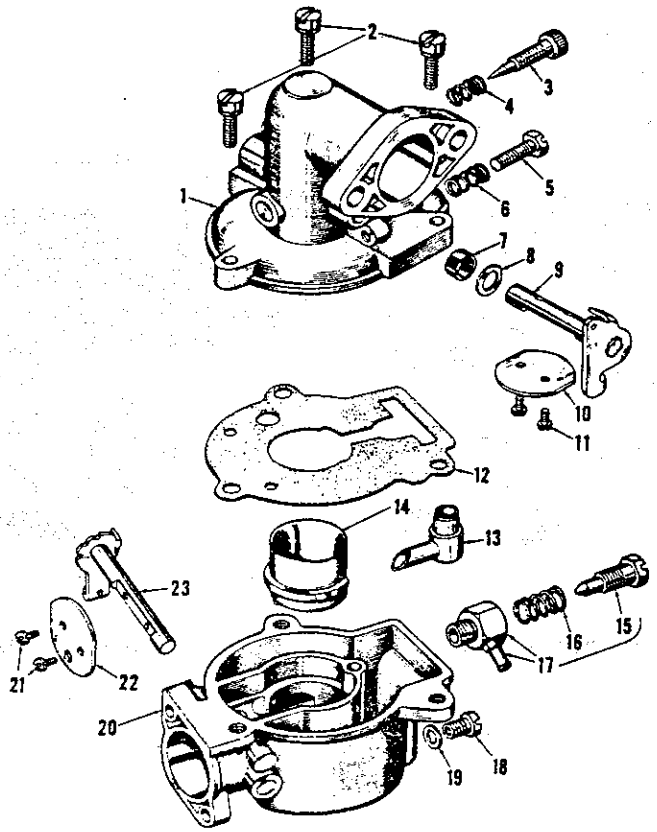


FIGURE C

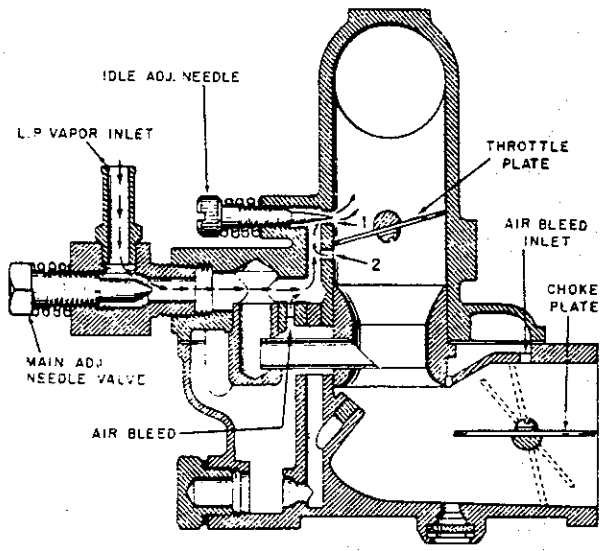
L88 LPG Carburetor Service Parts List (Zenith Model LP72Y6, No. 12976)

USE WITH MODELS S7DG, S8DG

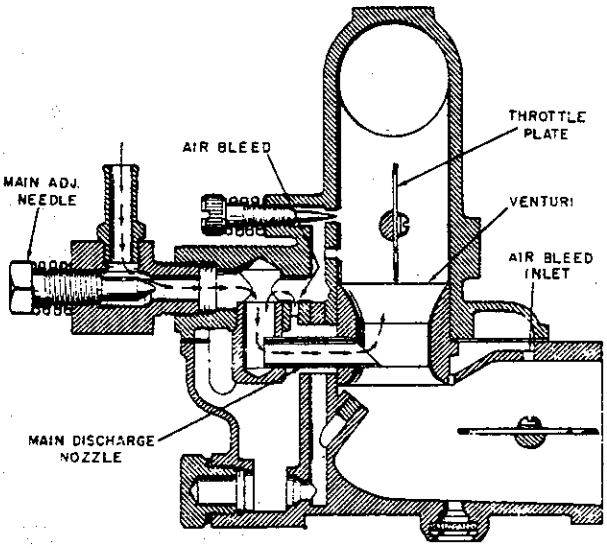


ITEM	PART NO.	DESCRIPTION	QTY
1	B802-26A1	Throttle body assembly (includes 7, 8, 12-14)	1
2	T301S10-10	Screw	3
3	C46-65	Needle	1
4	C111-155	Spring	1
5	T8S8-12	Screw	1
6	C111-10	Spring	1
7	T48-7	Seal	1
8	T52-13	Retainer	1
9	C29-1388	Throttle shaft and lever assembly	1
10	C21-214	Plate	1
11	T315S5-4	Screw, 1/8"-40 thread	2
12	C142-76	Gasket	1
13	C866-30-110	Jet	1
14	C838-11-18	Venturi	1
15	C873-20	Needle	1
16	C111-214	Spring	1
17	C871-24	Block (includes 15, 16)	1
18	C138-24	Plug	1
19	PH499	Washer	1
20	B803-7A	Bowl assembly	1
21	T315S5-4	Screw, 1/8"-40 thread	2
22	C102-127A	Plate	1
23	C108-273	Choke shaft and lever assembly	1

L88 LPG Carburetor Service Parts List



FUEL SUPPLY-IDLE AND CHOKE SYSTEMS



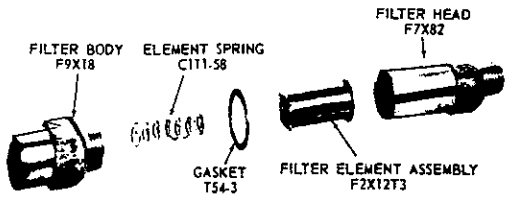
HIGH SPEED SYSTEM

LP51 LPG Vapor Withdrawal Fuel System (Zenith No. GF483)

MAINTENANCE

This filter is designed to be installed in the fuel line. It is made to operate under working pressures up to 250 p.s.i. and is approved by UL for such use.

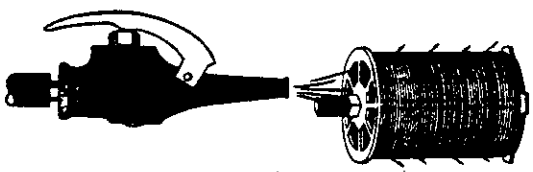
The filter is made to protect the equipment on which it is used, by removing all foreign particles of .003" or larger. Consequently, from time to time it will be necessary to clean the filter element.



To clean the filter it is necessary to detach the fuel line from the filter head. The head may then be unscrewed from the filter body. Remove the element assembly from the head. Wash the element in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, we suggest a short soaking period in solvent cleaner. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW—FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT. The element may then be reassembled in the filter head with the assurance that none of the dirt that has been separated can possibly enter the system. None of the dirt is forced through the discs.

In reassembling the filter, it is important that the element be inserted into the filter head with the round washer entering first into the opening. The gasket is put on the filter body and the spring is located into the filter body so that when the filter is put together the spring holds the element against the head.

The two principle parts should be assembled with 75 foot pounds torque. After the unit has been reinstalled, the joint at the gasket should be checked with a soap bubble solution to be sure there is no leak. The fuel line connections should also be checked in the same manner.



NEVER DIP ELEMENT IN 'BRIGHT DIP' OR OTHER ACID SOLUTION

L.P.G. TROUBLE SHOOTING

I. ENGINE WILL NOT START

Before starting work on any LP gas equipment, be sure that engine's malfunction does not exist in the ignition system. Reference can be made to the engine instruction manual for **TROUBLES, CAUSES and REMEDIES** section.

(A) Check for fuel flow to carburetor.
1. Fuel tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after tank is filled). Close tank valve and open slowly.
4. Fuel lines plugged up.
5. Damaged or stopped-up fuel filter.

(B) Check for too much fuel to carburetor.
1. Regulator valve seat leaking.
2. Carburetor main adjustment too rich.

II. FROST – DURING OPERATION

(A) Frost on fuel filter, shut-off valve, or inlet line; Opening outlet valve on tank too rapidly will cause excess flow valve to close when inlet line and filter are empty. Caution must be taken in opening fuel supply valve **slowly.**

(B) Frost on carburetor, vapor lines, and regulator; Close tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

(C) Frost on connection fittings; Check for fuel leaking, kinked lines, or restriction at frosted area.

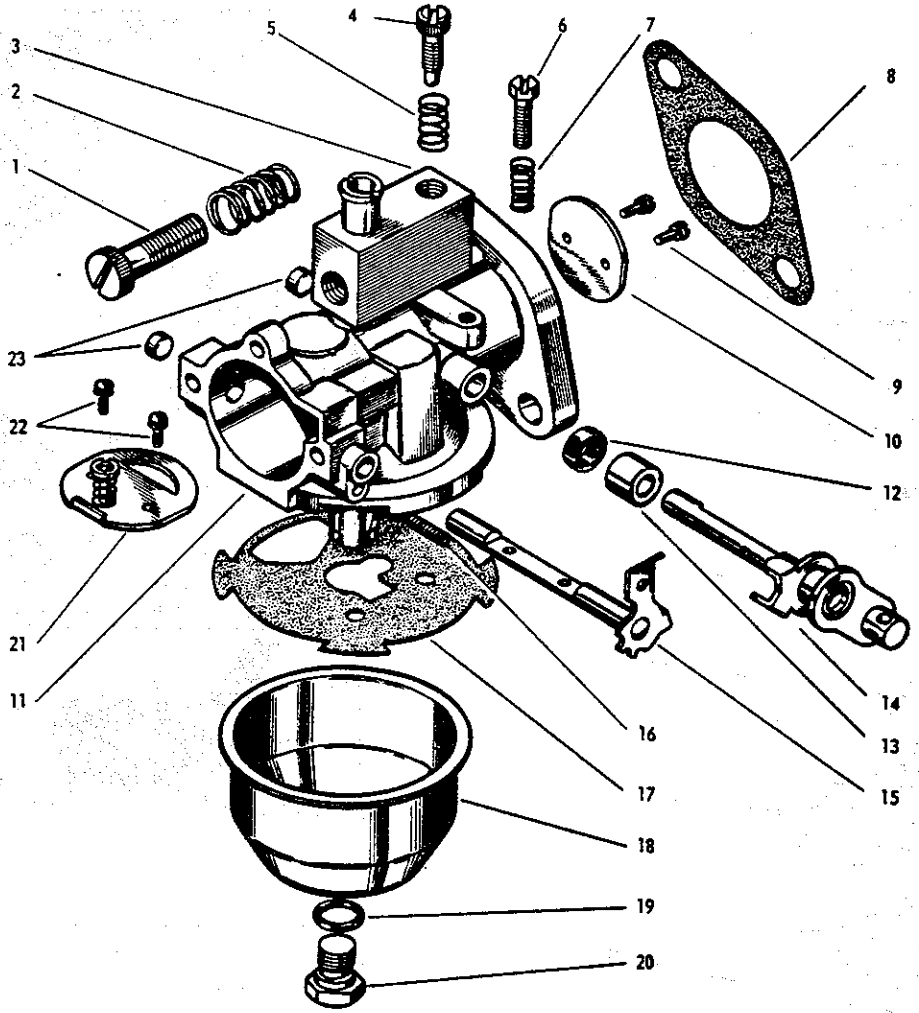
(D) Frost on tank; Can be caused by too rapid a fuel withdrawal for tank size. Larger tank may be necessary.

III. FLOODED SYSTEM

If system is flooded, crank engine with throttle wide open. Engine will not start until rich mixture dissipates. It may be necessary to shut off fuel supply at fuel tank to clear carburetion system.

L89 LPG Carburetor Service Parts List (Zenith Model LP1408, No. GO13158)

USE WITH MODELS S10DG, S12DG AND NATURAL GAS



ITEM	PART NO.	DESCRIPTION	QTY
1	C873-4	Screw	1
2	C911-3	Spring	1
3	C871-26	Metering block assembly	1
4	C846-5	Screw	1
5	C111-17	Spring	1
6	T18S8-10	Screw, no. 8-32 thread	1
7	C111-10	Spring	1
8	C141-4-6	Flange gasket, Wisconsin no. QC12A	1
9	T315S5-4	Screw-lock washer, no. 1/8-40 thread	2
10	C21-9	Plate	1
11	B12-13158	Throttle body assembly	1
12	T48-9	Seal	1

ITEM	PART NO.	DESCRIPTION	QTY
13	C116-33	Retainer	1
14	C29-1463	Throttle shaft and lever assembly	1
15	C108-278	Choke shaft and lever assembly	1
16	C111-208	Spring	1
17	C142-80	Gasket	1
18	C3-132	Fuel bowl	1
19	PH499	Washer	1
20	C938-24	Screw	1
21	C101-89	Plate	1
22	T315S5-4	Screw-lock washer, no. 1/8-40 thread	2
23	CR137-19	Cup plug, 1/4"	2

L90 (Algas No. C250AH4), L90A (Algas No. C250AH5), L90B (Algas No. C250AH) LPG Converter

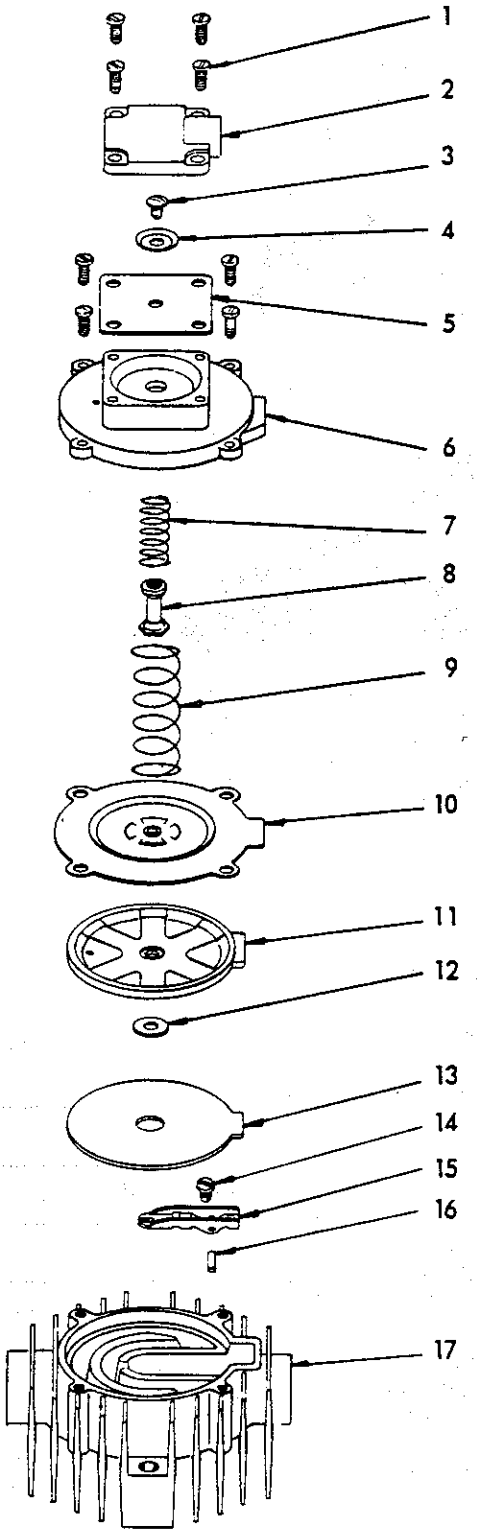


Fig. 1

Remove regulator cover assembly with power ram cover attached. Be careful not to lose main spring. Check for power ram operation by sucking on vacuum connection and observe movement of power ram pin. (Continue with Fig. 2).

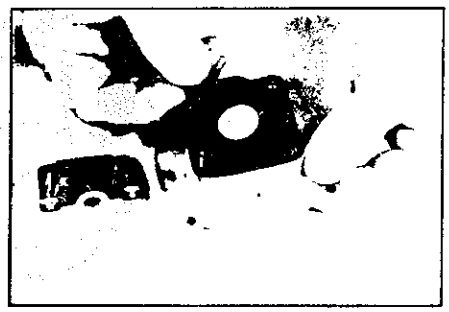


Fig. 2

If pin does not move when suction is applied, remove power ram cover and replace power ram diaphragm.

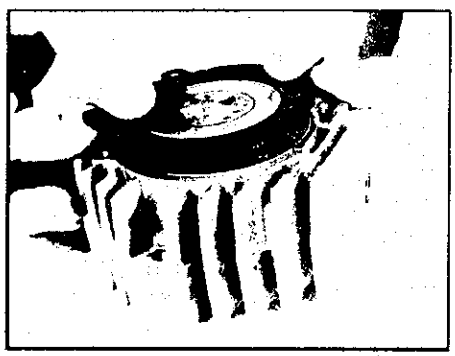


Fig. 3

Loosen main diaphragm and rotate it 1/4 turn (90°), in either direction. This will disengage the diaphragm pin from the lever.

L90, L90A, L90B LPG Converter

USE WITH MODELS VF4DG, VH4DG, VG4DG, THDG, V461DG, V465DG (see pg. 50)

NOT SERVICED BY TTP

ITEM		ALGAS PART NO.	DESCRIPTION	QTY
1		8307	Screw, 10-24 thread x 5/8" long	8
2		2261	Cover (L90, L90B)	1
—		2216	Cover (L90A)	1
3	†	8171	Screw, 8-32 thread x 1/4" long (L90, L90B)	1
4	†	2259	Plate (L90, L90B)	1
5	†	2257	Diaphragm (L90, L90B)	1
6		2250	Cover	1
7		2260-1	Spring (L90)	1
—		2233	Spring (L90B)	1
8	†	2258	Pin (L90, L90B)	1
9		2254	Spring (L90B)	1
—		2254-1	Spring (L90, L90A)	1
10	††	A2246	Diaphragm assembly	1
11		A2249	Liquid seal cover assembly	1
12	††	2272	Liquid seal	1
13	††	2247	Sponge seal	1
14		8203	Screw, 8-32 thread x 1/4" long	1
15	††	A2241	Lever assembly	1
16	††	2242	Fulcrum pin	1
17		A2297	Body assembly	1
—		2210	Repair kit (L90, L90B)	1
—		1-7010	Repair kit	1

† Parts included in power ram kit.

†† Parts included in regulator kit.

Fig. 4

Lift out liquid seal cover assembly and remove seal washer with pencil or small pointed tool. Be careful not to loosen brass retainer ring.

Remove seal sponge and lever assembly. When necessary, the body may be cleaned with any common solvent or carburetor cleaner. Install new lever assembly and new seal sponge (No. 2295 Repair Kit).

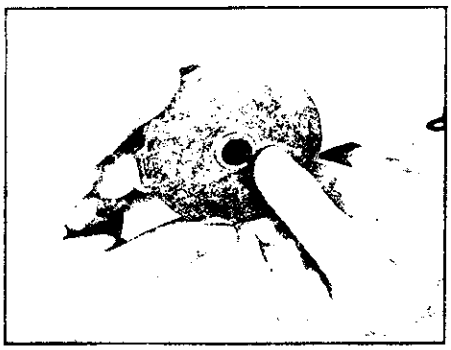


Fig. 5

Insert new seal washer into liquid seal cover. Place seal cover assembly into body and firmly squeeze so as to compress the sponge somewhat.

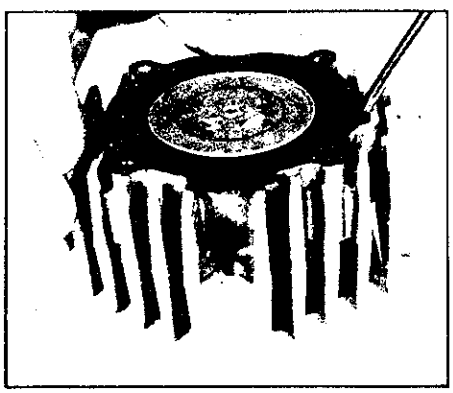


Fig. 6

Add a drop of oil to the seal washer or on the diaphragm stem, and install diaphragm assembly with tab 90° from recess in body.

Engage diaphragm pin to lever by placing screw driver on seat end of lever and holding lever in closed position.

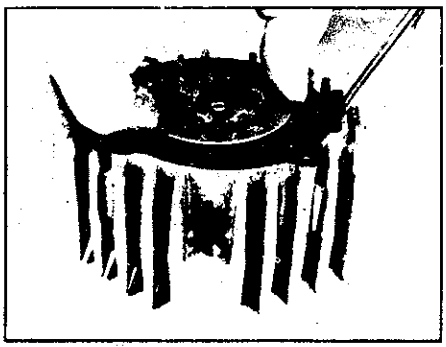


Fig. 7

Rotate diaphragm assembly 1/4 turn (90°), so that the tab on diaphragm aligns with recess in body. Lift diaphragm and make sure pin is engaged in lever.

Fig. 8

Snap regulator spring onto guides in diaphragm backup plate.

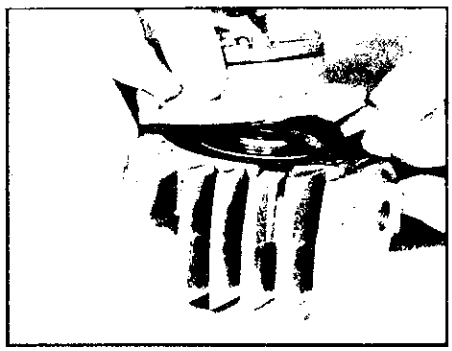


Fig. 9

Install cover assembly, taking note of tab and recess alignment.

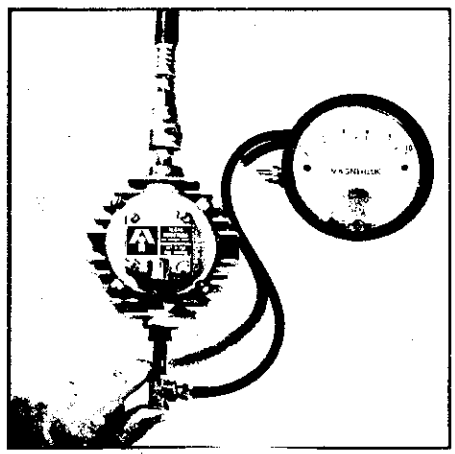


Fig. 10

Test, by applying 100 P.S.I. air pressure to fuel inlet marked **'LPG'.** Connect pressure gauge to tee installed, at fuel outlet marked **'GAS'.** Turn on air supply. Slowly cover open leg of tee through which air is discharging and observe pressure gauge. Outlet pressure should read as follows:

MINIMUM LOCKUP PRESSURE

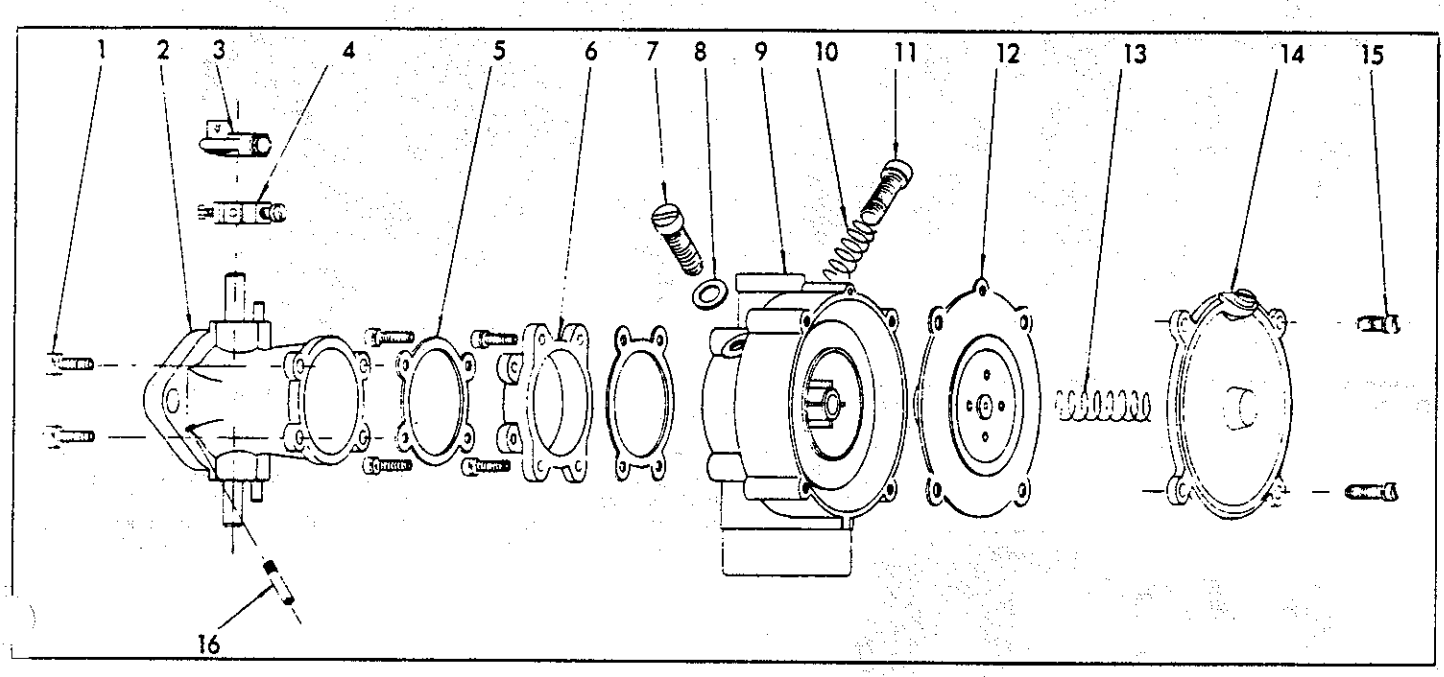
2.2" HG or 1.08 P.S.I. or 17.3 oz. (L-90, L-90
2.5" HG or 1.25 P.S.I. or 20.0 oz. (L-90-B)

MAXIMUM LOCKUP PRESSURE

2.9" HG or 1.42 P.S.I. or 22.7 oz. (L-90, L-90A)
3.5" HG or 1.75 P.S.I. or 27.2 oz. (L-90-B)

L91 LPG Carburetor Service Parts List

USE WITH MODEL V461DG



ALGAS PART NUMBERS NOT SERVICED BY TTP
SERVICED BY ALGAS, DALLAS, TX

ITEM	ALGAS PART NO.	DESCRIPTION	QTY
1	8256	Screw, 12"-24 thread x 5/8" long	8
2	A2411-1	Throttle box assembly	1
3	144-1	Throttle lever assembly	1
4	2402-2	Stop lever assembly	1
5	2529	Gasket	2
6	2510	Body adapter, 90°	1
7	7014	Idle screw plug	1
8	1938	Washer	1
9	A2550-2	Mixer body assembly	1
10	2509	Spring	1
11	7013	Idle adjusting screw	1
12	A2553-4	Diaphragm and air valve assembly	1
13	2560	Diaphragm spring	1
14	A2551	Cover assembly	1
15	8220	Screw, 10"-24 thread x 1/2" long	4
16	739	Fitting	1

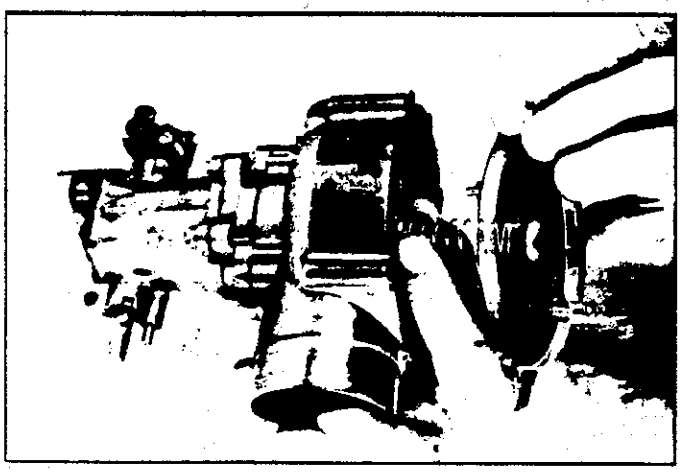


Fig. 1

Remove cover assembly, being careful not to lose diaphragm spring, which will come loose when cover is disassembled.

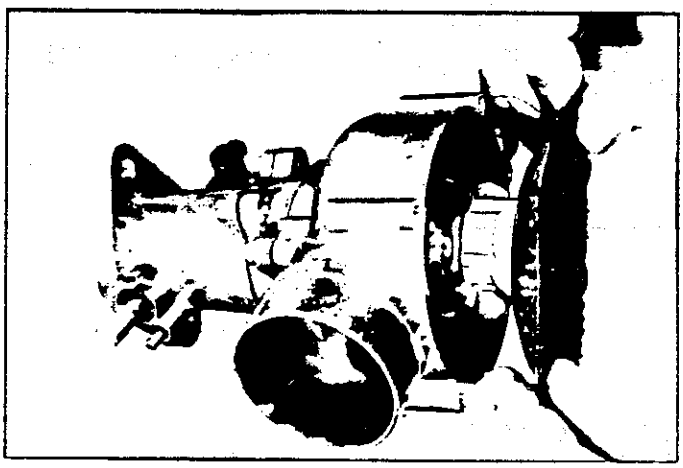


Fig. 2

Take out diaphragm and air valve assembly. Clean thoroughly with solvent, blow dry and inspect for damage or wear.

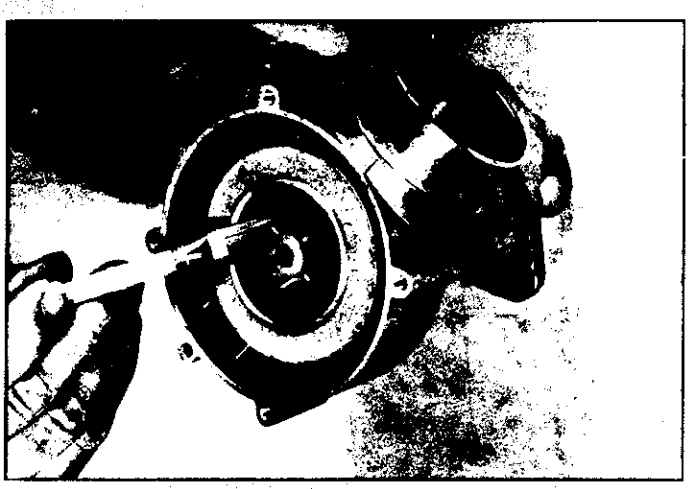


Fig. 3

Brush inside of carburetor with solvent. Thoroughly clean fuel orfice and guide fins.

To service **Throttle Box** (Ref. 2 in exploded view), clean thoroughly with solent and check for binding or play in throttle shaft bearings and disc closure. If bearings bind, or if there is too much play in shaft, or if throttle disc will not close properly; the entire throttle box assembly should be replaced.

Fig. 4

Reassemble clean, or new diaphragm and valve assembly, into clean carburetor bowl. Rotate air valve assembly to make sure it is free and does not bind in any one position.

Snap spring on to diaphragm backup plate washer.

Install cover assembly. Carefully match casting bosses and screw holes with diaphragm tabs.

After mounting carburetor to engine, make power and idle adjustments per Wisconsin Motor Instructions, Form MF-41 for Model V-461DG.

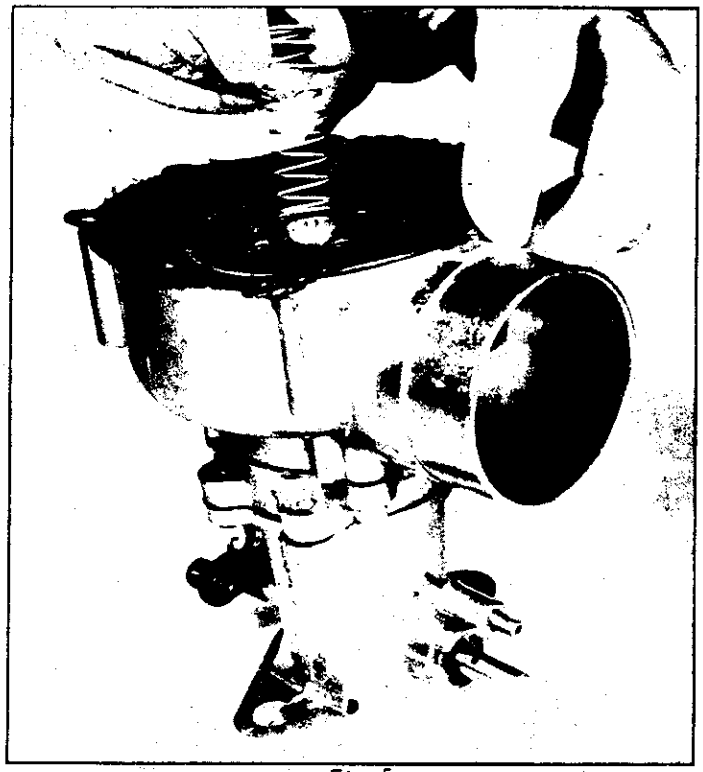
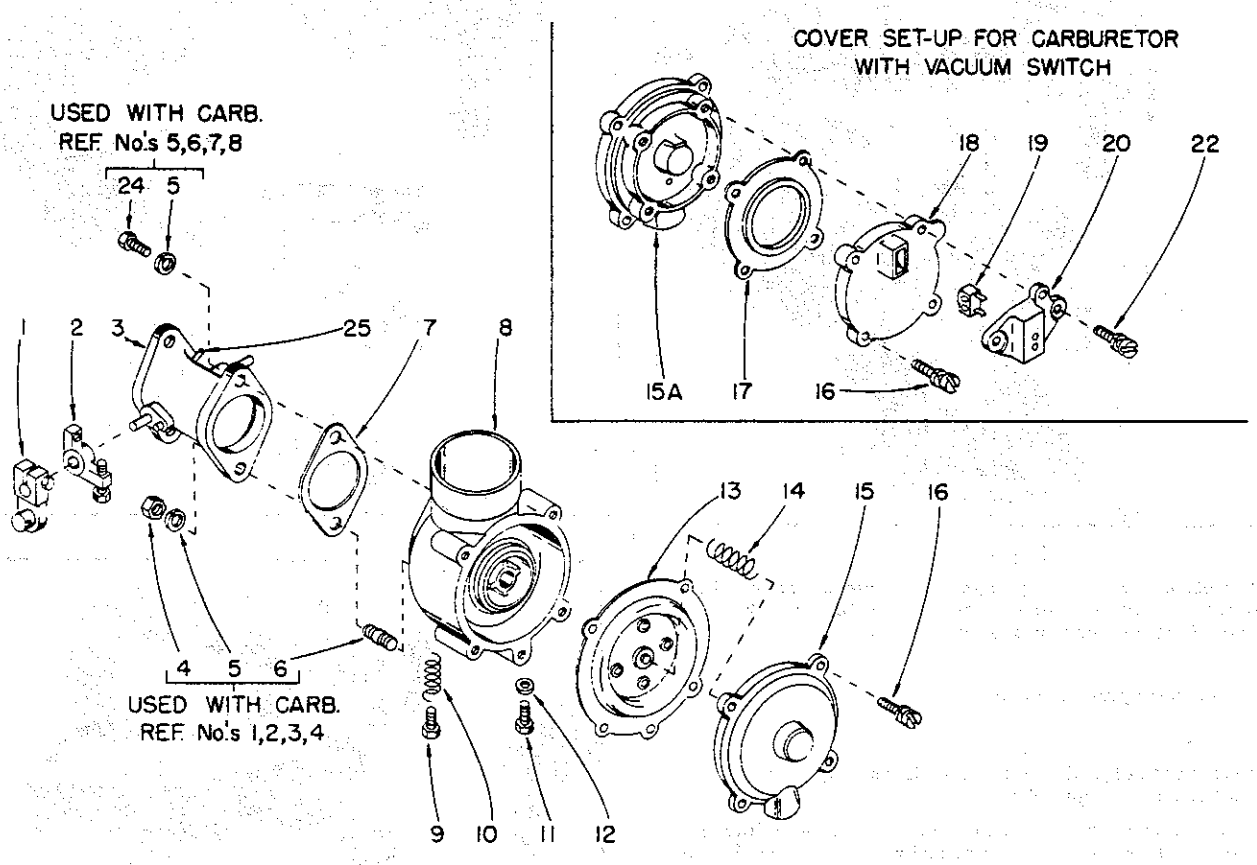


Fig. 5

Fig. 6

L92 (Algas Carburetor No. 01-0012), L92A (Algas Carburetor No. 01-0013), L92B (Algas Carburetor No. 01-0015), L92C (Algas Carburetor No. 01-0014), L94 (Algas Carburetor No. 0-0010), L94A (Algas Carburetor No. 01-0017), L94B (Algas Carburetor No. 01-0019), L94C (Algas Carburetor No. 01-0020) Algas LPG And Natural Gas Carburetors



SERVICED BY ALGAS CO., DALLAS, TX.

L92, L92A, L92B, L92C, L94, L94A, L94B, L94C
Algas LPG And Natural Gas Carburetors

USE WITH MODELS THDG, VF4DG, VH4DG, VG4DG (see pg. 56)

FOR MODELS THDG, VF4DG, VH4DG

CARB. REF. NO.	ALGAS CARB. NO.	WISCONSIN CARB. NO.	DESCRIPTION
1	01-0012	L92	LPG Std. 1-1/2" air horn
2	01-0013	L92A	With vacuum switch
3	01-0015	L92B	For natural gas
4	01-0014	L92C	Nat. gas, with vacuum sw.

FOR MODELS VG4DG

CARB. REF. NO.	ALGAS CARB. NO.	WISCONSIN CARB. NO.	DESCRIPTION
5	0-0010	L94	LPG Std. 2-1/16" air horn
6	01-0017	L94A	with vacuum switch
7	01-0019	L94B	For natural gas
8	01-0020	L94C	Nat. gas, with vacuum sw.

Not serviced by TTP

ITEM	PART NO.	DESCRIPTION	QTY
1	144	Throttle lever assembly	1
2	A123-3	Stop lever assembly	1
3	75SB	Throttle box assembly (for 1-4)	1
	100LB	Throttle box assembly (for 5-8) (includes item 2)	1
4	7119-1	Jam nut (for 1-4)	2
5	7960	Lock washer	2
6	1853-1	Stud (for 1-4)	2
7	416	Gasket	1
8	A2220-21	Mixer body assembly (for 1, 2)	1
—	A2220-31	Mixer body assembly (for 5, 6)	1
—	01-4144	Mixer body assembly (for 3, 4)	1
—	01-4146	Mixer body assembly (for 7, 8)	1
9	7886	Idle adjusting screw	1
10	2223	Spring	1
11	7885	Idle screw plug	1
12	2283	Gasket	1
13	A2330-4	Diaphragm and air valve (for 1, 2, 5, 6)	1
—	01-4195	Diaphragm and air valve (for 3, 4, 7, 8)	1
14	2233-1	Diaphragm spring	1
15	2225-1	Cover assembly (for 1, 3, 5, 7)	1
15A	2267-1	Cover assembly (for 2, 4, 6, 8)	1
16	8220	Screw with lock washer, 10-24 thread x 1/2 long	4 or 6
17	A2228	Diaphragm assembly (for 2, 4, 6, 8)	1
18	2229	Cover (for 2, 4, 6, 8)	1
19	2231-2	Switch (for 2, 4, 6, 8)	1
20	2180	Switch cover	1
22	8222	Screw (for 2, 4, 6, 8)	2
23	739	Fitting	1
24	7897	Bolt (for 5-8)	2
—	8096	Switch terminal (for 2, 4, 6, 8) (not illustrated)	2
—	8102	Switch terminal (for 2, 4, 6, 8) (not illustrated)	2
25	739	Nipple (for 5-8)	1

L92, L92A, L92B, L92C, L94, L94A, L94B, L94C Algas LPG And Natural Gas Carburetors

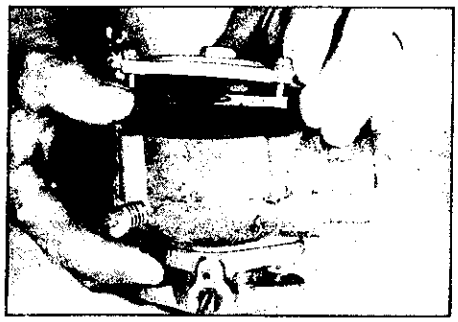


Fig. 1

Remove cover assembly being careful not to lose diahpragm spring, which will come loose when cover is disassembled.

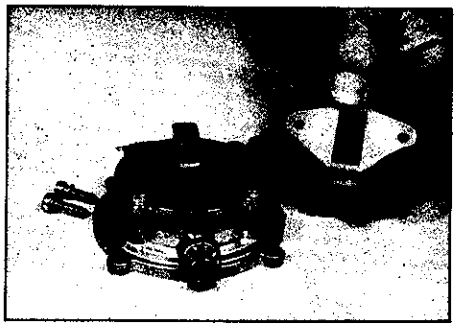


Fig. 2

Remove Micro-Switch Assembly, (if applicable), from main cover assembly. To check Micro-Switch; depress small operating button and if clicking is heard, switch is okay.

Fig. 3

Remove vacuum switch diaphragm cover and check diaphragm for leaks, and plates for warping or bending.

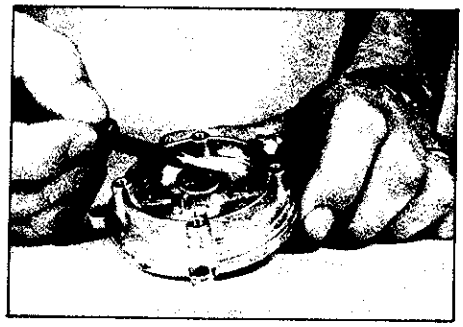


Fig. 4

Clean diaphragm chamber and check to see that vacuum transfer hole is open.

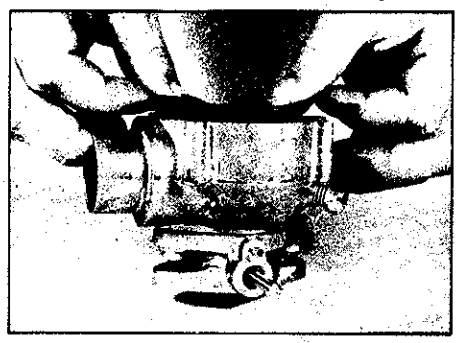


Fig. 5

Remove diaphragm and air valve assembly. Clean thoroughly with solvent, blow dry and inspect for damage or wear.

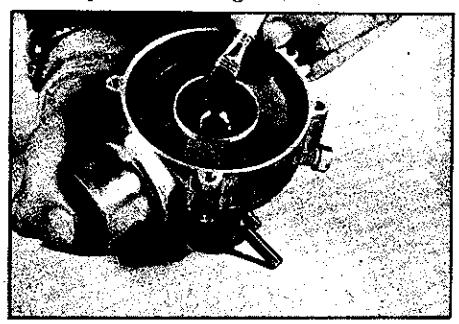


Fig. 6

Brush inside of carburetor with solvent. Thoroughly clean fuel orfice and guide fins.

To service Throttle Box (Ref. 3 in exploded view), clean thoroughly with solent and check for binding or play in throttle shaft bearings and disc closure. If bearings bind, or if there is too much play in shaft, or if throttle disc will not close properly; the entire throttle box assembly should be replaced.

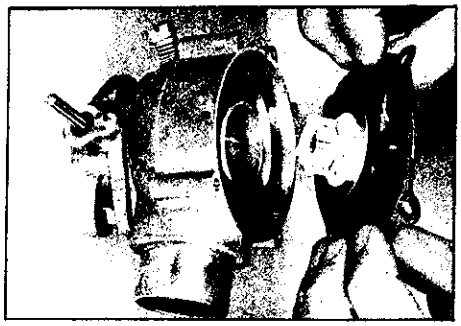


Fig. 7

Reassemble clean or new diaphragm air valve assembly into clean carburetor bowl. Rotate air valve assembly to be sure it is free and does not bind in any position.

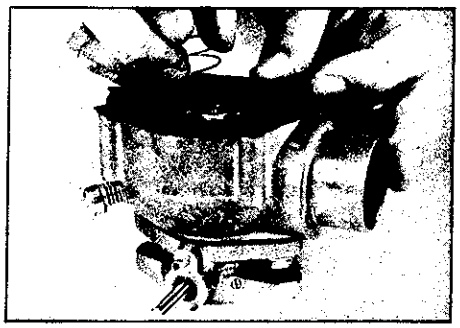


Fig. 8

Snap spring onto diaphragm backup plate washer.

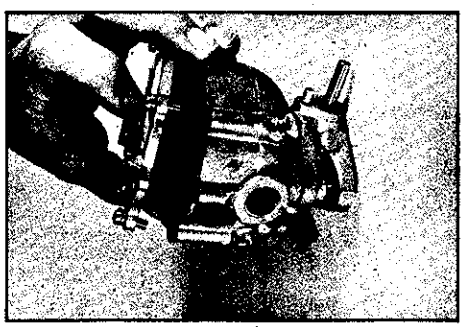


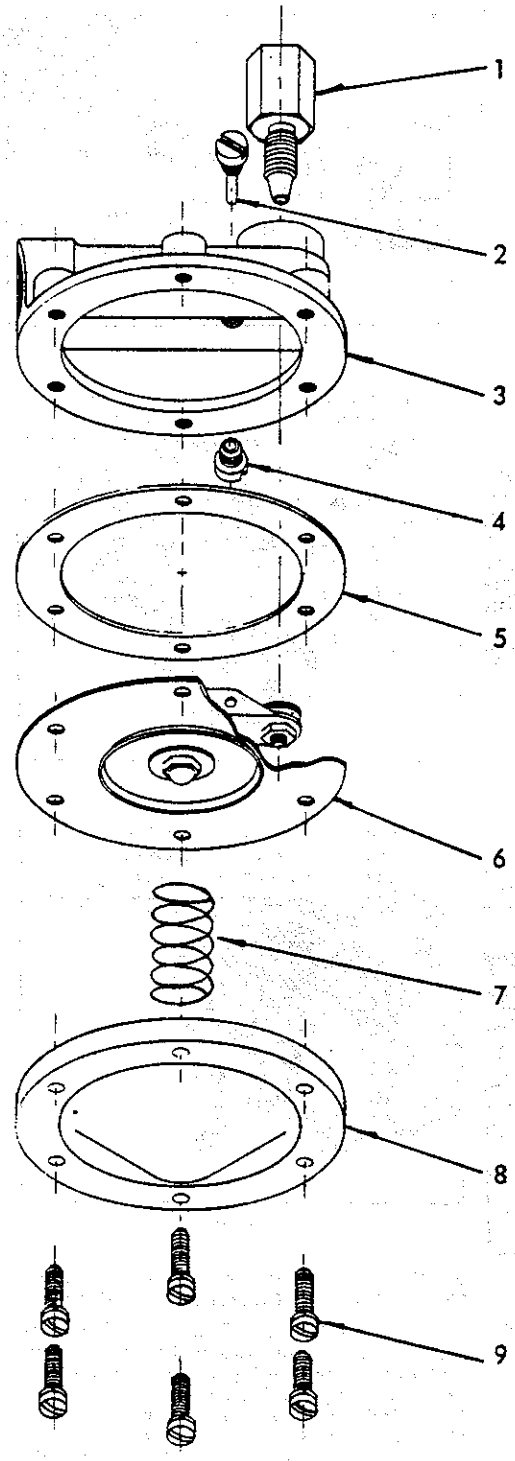
Fig. 9

Install cover assembly. Carefully match casting bosses and screw holes with diaphragm tabs.

After mounting carburetor to engine, make power and idle adjustments per Wisconsin Motor Instructions, Form MF-42 (VG4DG), MF-43 (VH4DG), MF-44 (VF4DG) or MF-45 (THDG).

L93 LPG Primary Regulator

NOT SERVICED BY TTP



L93 LPG Primary Regulator

USE WITH MODELS THDG, VF4DG, VH4DG, VG4DG (see pg. 59)

ITEM	ALGAS PART NO.	DESCRIPTION	QTY
1	1013-1	Primary orifice	1
2	655	Pivot assembly	1
3	1015	Body	1
4	1019	Pivot screw	1
5	1026	Gasket	1
6	A1021	Diaphragm and lever assembly	1
7	1024-17	Spring	1
8	942	Cover	1
9	8222	Screw	6

Not serviced by TTP

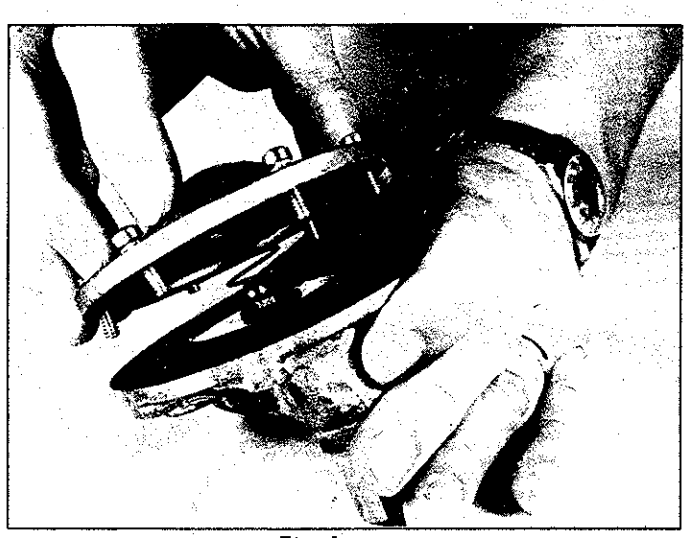


Fig. 1

Remove cover being careful not to lose regulator spring.

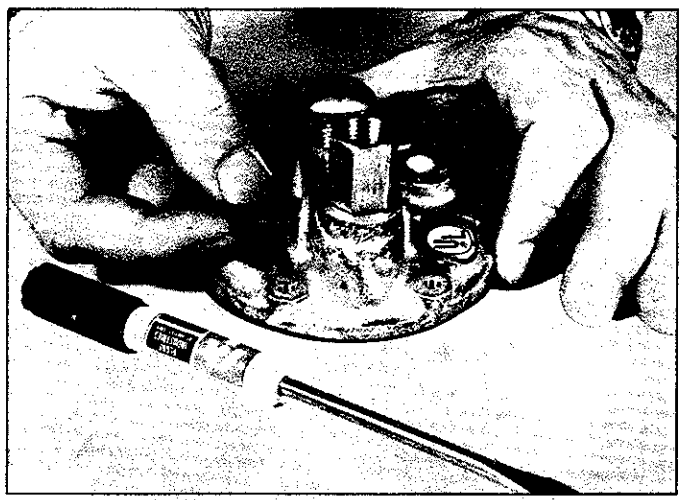


Fig. 2

Take out pivot pin screw for removal of diaphragm and lever assembly.

Fig. 3

Remove diaphragm and lever assembly. Clean the body and inspect the orifice for knicks or wear. If the orifice shows signs of leaking, replace.

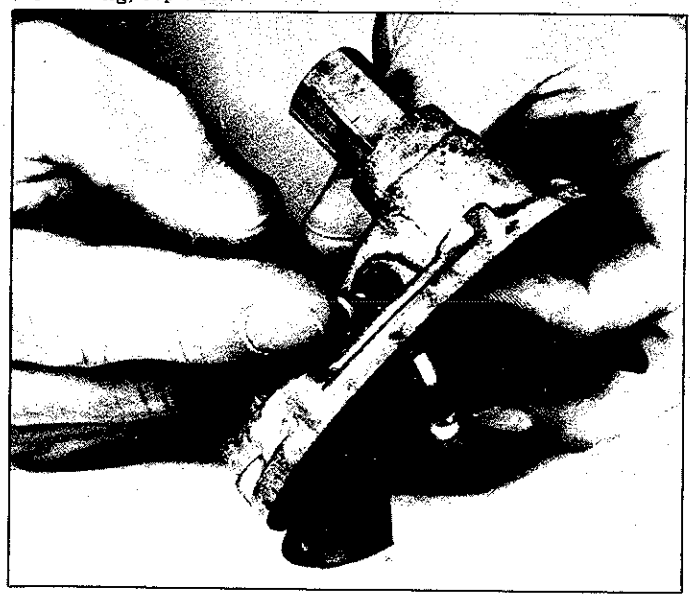


Fig. 4

Mount gasket between the body and diaphragm. Install diaphragm and lever assembly taking note that rubber seat lies on primary orifice. Insert pivot pin screw through the holes in primary lever so that lever is free to operate.

Place spring on diaphragm plate and install regulator cover. Note that spring is placed into spring well in cover. When installing screws, be careful not to engage diaphragm with the screw threads. Drawing diaphragm into the screwholes will damage it.

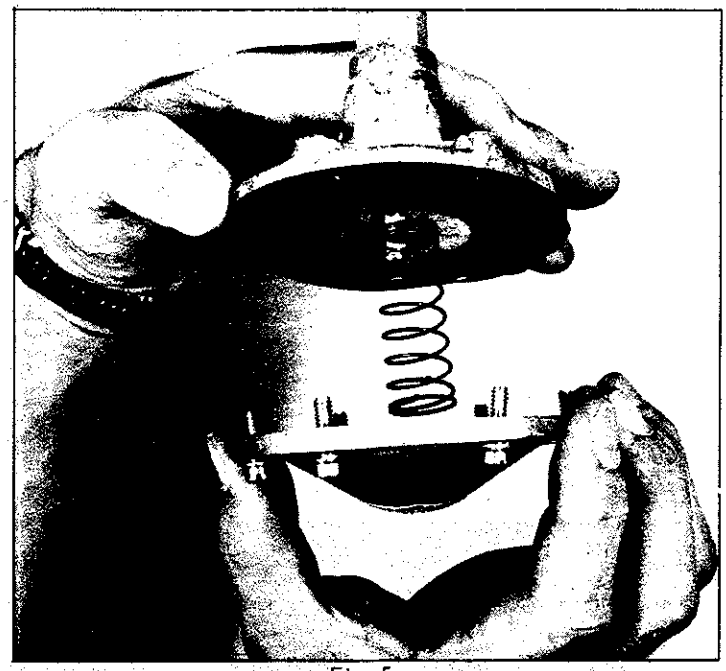


Fig. 5

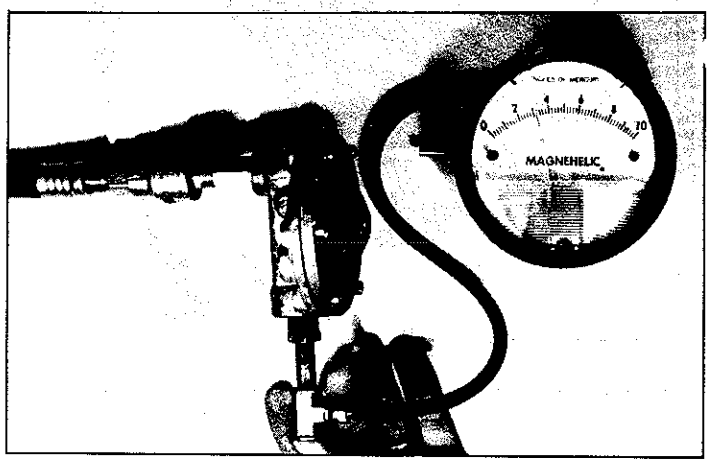


Fig. 6

To test unit, apply 100 P.S.I. air pressure to the fuel inlet. Connect a pressure gauge to a tee installed in the fuel outlet. Turn on air; slowly cover open leg of the tee through which air is discharging and observe the pressure gauge. Outlet pressure should read as follows:

MINIMUM LOCKUP PRESSURE

3.0 HG", or 1.47 P.S.I., or 23.5 oz.

MAXIMUM LOCKUP PRESSURE

3.7 HG", or 1.82 P.S.I., or 29.1 oz.

Use soap and water test around diaphragm and orifice for leakage.

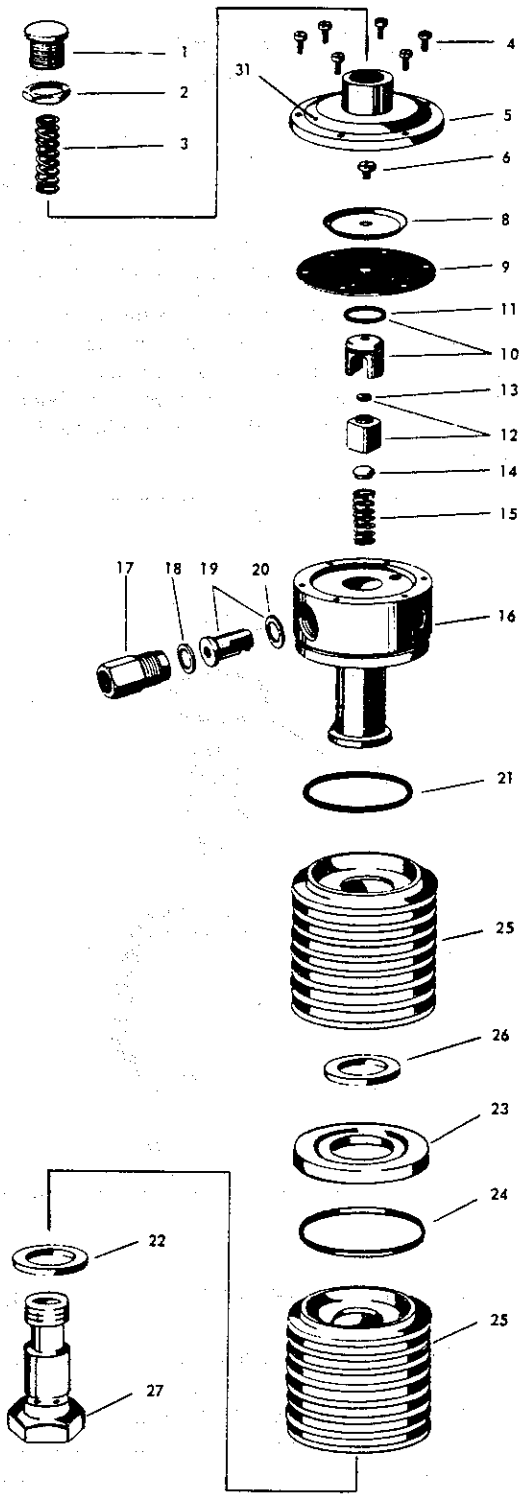


Fig. 4

I. ENGINE WILL NOT START

Before investigating the L.P.G. equipment, be sure that engine's malfunction does not exist in the ignition system. Reference can be made to the Engine Instruction Book for **TROUBLES, CAUSES** and **REMEDIES.**

(A) Check for fuel flow to carburetor.

1. Fuel storage cylinder empty.
2. Cylinder outlet valve closed.
3. Excess flow valve closed. (This may occur soon after fuel cylinder is filled). Close cylinder valve and open slowly.
4. Check fuel line, and for damaged or stopped-up fuel filter.

(B) Adhere to starting procedure.

1. Regulate carburetor idle and main adjustments.

(C) Primary pressure regulator adjustment.

Refer to Page 5 of this form for vaporizer-primary pressure regulator adjustment procedure. Because special gauges are required, it is recommended that the regulator be checked by an authorized service dealer.

II. FROST – DURING OPERATION

(A) Frost on fuel filter, shut-off valve, or inlet line caused by opening outlet valve on fuel cylinder too rapidly. Caution must be taken in opening fuel supply valve **slowly.**

(B) If carburetor, vapor lines, and vaporizer-regulator are frosted over, close fuel cylinder valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

1. Frost on vapor lines between vaporizer and pressure-carburetor is caused by inadequate vaporizing; engine taking load too rapidly.
2. Frost on connection fittings. Check for fuel leaking, kinked lines, or restriction at frosted area.

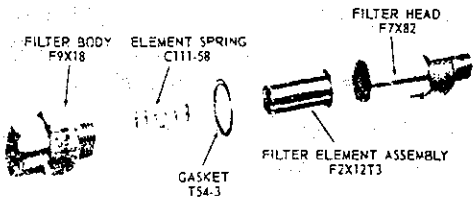
LP51 LPG Vapor Withdrawal Fuel System (Zenith No. GF483)

(C) Frost on fuel storage cylinder can be caused:

1. By a dip tube fracture in fuel cylinder.

III. FLOODED SYSTEM

If system is flooded, crank engine with throttle wide open, to dissipate rich mixture. It may be necessary to shut off fuel supply at fuel storage cylinder to clear carburetion system.



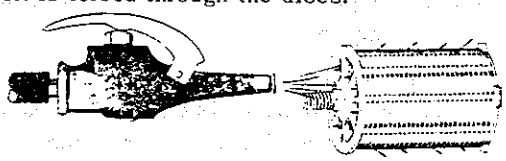
ZENITH PART NUMBERS SHOWN

MAINTENANCE

This filter is designed to be installed in the fuel line. It is made to operate under working pressures up to 250 p.s.i. and is approved by UL for such use.

The filter is made to protect the equipment on which it is used, by removing all foreign particles of .003" or larger. Consequently, from time to time it will be necessary to clean the filter element.

To clean the filter it is necessary to detach the fuel line from the filter head. The head may then be unscrewed from the filter body. Remove the element assembly from the head. Wash the element in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, we suggest a short soaking period in solvent cleaner. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW -- FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT. The element may then be reassembled in the filter head with the assurance that none of the dirt that has been separated can possibly enter the system. None of the dirt is forced through the discs.

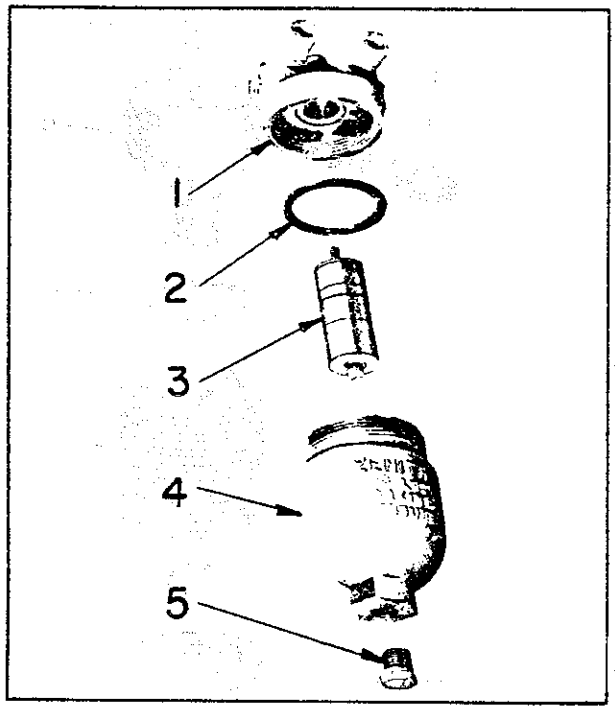


NEVER DIP ELEMENT IN 'BRIGHT DIP' OR OTHER ACID SOLUTION

LP50 LPG Liquid Withdrawal Fuel System (Zenith No. GF462)

In reassembling the filter, it is important that the element be inserted into the filter head with the round washer entering first into the opening. The gasket is put on the filter body and the spring is located into the filter body so that when the filter is put together the spring holds the element against the head.

The two principle parts should be assembled with 75 foot pounds torque. After the unit has been reinstalled, the joint at the gasket should be checked with a soap bubble solution to be sure there is no leak. The fuel line connections should also be checked.



ITEM	PART NO.	DESCRIPTION	QTY
1	F7X169	Filter head	1
2	F1X127	Gasket	1
3	F3X9T2	Filter element	1
4	F8X76	Filter bowl	1
5	CT91-3	Plug, 1/8"	1

MAINTENANCE

Fuel filter can be drained by removing plug (5) at bottom of the filter body (4).

To clean filter, it is necessary to unscrew body (4) from its head (1). Remove the element assembly (3) from the head. Element can be washed in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, a short soaking period is suggested. The element should then be rinsed and dried. Check "O" ring (2). Replace if necessary.

I. ENGINE WILL NOT START

Before starting work on any LP gas equipment, be sure that engine's malfunction does not exist in the ignition system. Reference can be made to the Engine Instruction Book for TROUBLES, CAUSES and REMEDIES.

(A) Check for fuel flow to carburetor.

1. Fuel tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after tank is filled). Close tank valve and open slowly.
4. Check fuel line, and for damaged or stopped-up fuel filter.

(B) Adhere to starting procedure.

1. Regulate carburetor idle and main adjustments.
2. Reset starting by-pass valve in pressure carburetor by closing choke fully.

(C) Primary regulator adjustment.

Refer to Form ML-14-2 for primary regulator adjustment procedure. Because special gauges are required, it is recommended that the regulator be checked by an authorized service dealer.

II. FROST – DURING OPERATION

(A) Frost on fuel filter, shut-off valve, or inlet line caused by opening outlet valve on tank too rapidly. Caution must be taken in opening fuel supply valve **slowly.**

(B) If carburetor, vapor lines, and regulator are frosted over, close tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

1. Frost on vapor lines between vaporizer and pressure carburetor is caused by inadequate vaporizing; engine taking load too rapidly.
2. Frost on connection fittings. Check for fuel leaking, kinked lines, or restriction at frosted area.

(C) Frost on tank can be caused:

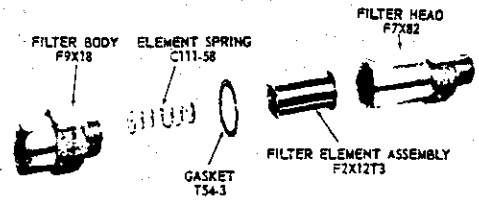
1. In liquid system by a dip tube fracture.
2. In vapor system by too rapid fuel withdrawal for tank size. Larger tank may need to be used.

NOTE: On a vapor system, caution should be taken that connection is made to the vapor outlet valve.

III. FLOODED SYSTEM

If system is flooded, crank engine with throttle wide open, to dissipate rich mixture. It may be necessary to shut off fuel supply at fuel tank to clear carburetion system.

LP51 LPG Vapor Withdrawal Fuel System (Zenith No. GF483)



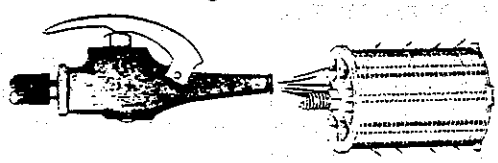
ZENITH PART NUMBERS SHOWN

MAINTENANCE

This filter is designed to be installed in the fuel line. It is made to operate under working pressures up to 250 p.s.i. and is approved by UL for such use.

The filter is made to protect the equipment on which it is used, by removing all foreign particles of .003" or larger. Consequently, from time to time it will be necessary to clean the filter element.

To clean the filter it is necessary to detach the fuel line from the filter head. The head may then be unscrewed from the filter body. Remove the element assembly from the head. Wash the element in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, we suggest a short soaking period in solvent cleaner. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW — FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT. The element may then be reassembled in the filter head with the assurance that none of the dirt that has been separated can possibly enter the system. None of the dirt is forced through the discs.

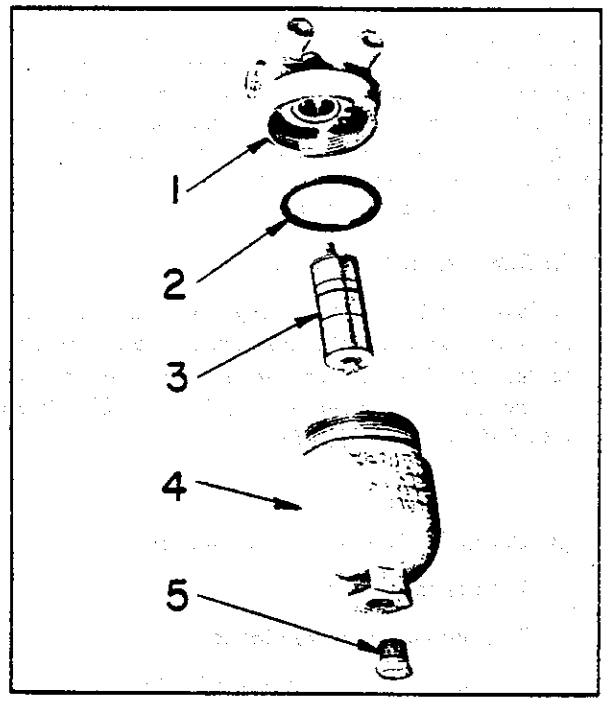


NEVER DIP ELEMENT IN 'BRIGHT DIP' OR OTHER ACID SOLUTION

In reassembling the filter, it is important that the element be inserted into the filter head with the round washer entering first into the opening. The gasket is put on the filter body and the spring is located into the filter body so that when the filter is put together the spring holds the element against the head.

The two principle parts should be assembled with 75 foot pounds torque. After the unit has been reinstalled, the joint at the gasket should be checked with a soap bubble solution to be sure there is no leak. The fuel line connections should also be checked.

LP50A LPG Liquid Withdrawal Fuel System (Zenith No. GF4662-1-2)



ITEM	PART NO.	DESCRIPTION	QTY
1	———	Filter head	1
2	† F1X127	Gasket	1
3	† F3X9T2	Filter element	1
4	———	Filter bowl	1
5	93T91-3	Plug, 1/8"	1

† Not available separately.

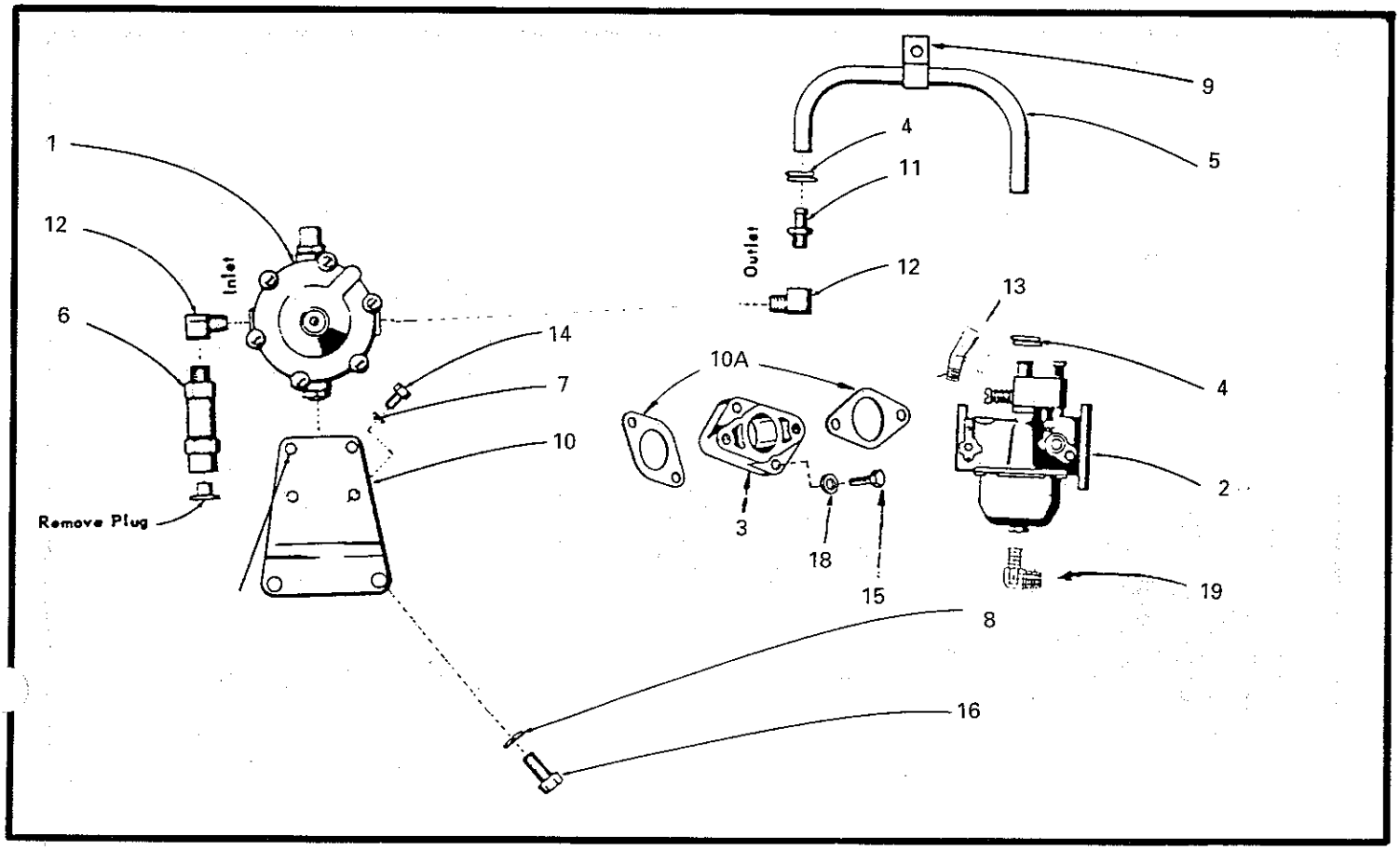
MAINTENANCE

Fuel filter can be drained by removing plug (5) at bottom of the filter body (4).

To clean filter, it is necessary to unscrew body (4) from its head (1). Remove the element assembly (3) from the head. Element can be washed in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, a short soaking period is suggested. The element should then be rinsed and dried. Check "O" ring (2). Replace if necessary.

LFA101, LPG111 LPG Vapor Withdrawal Fuel Systems

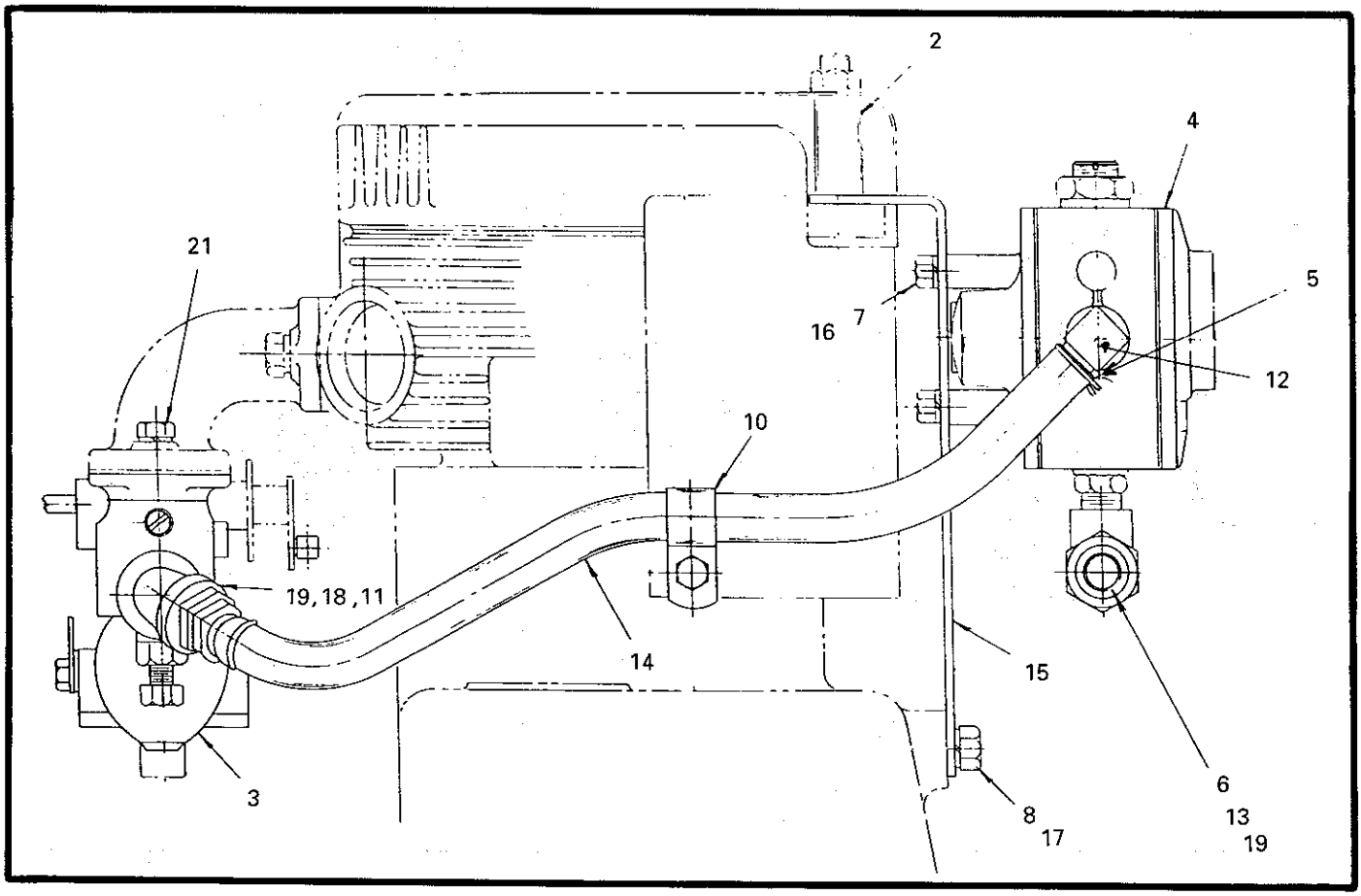
USE WITH MODELS S12D, S14D



ITEM	PART NO.	DESCRIPTION	QTY
1	L109	Regulator, Garretson model S2	1
2	L110	Carburetor (includes 2-QC12A gaskets)	1
3	LF146-1	Adapter	1
4	LK27	Hose clamp for fuel line	2
5	LL207-20	Fuel line	1
6	LP51	Fuel filter	1
7	PE3	Lock washer, 1/4"	2
8	PE5	Lock washer, 3/8"	2
9	PG725	Clip	1
10	PG1332	Regulator bracket	1
10A	QC12A	Gasket	2
11	RF1485	Hose connector	1
12	RF1531	Elbow for fuel filter	2
13	RF1121	Tube	1
14	XA34	Screw, 1/4"-20 thread x 1/2" long	2
15	XD16B	Screw, 5/16"-18 thread x 7/8" long	4
16	XD27A	Screw, 3/8"-16 thread x 1" long	2
17	PF155	Plug	1
18	PH14D	Washer	4
19	RF1519	Hose connection (elbow)	1
—	YD35	Spark plug, Champion no. D9	1

LPG101 LPG Vapor Withdrawal Fuel System

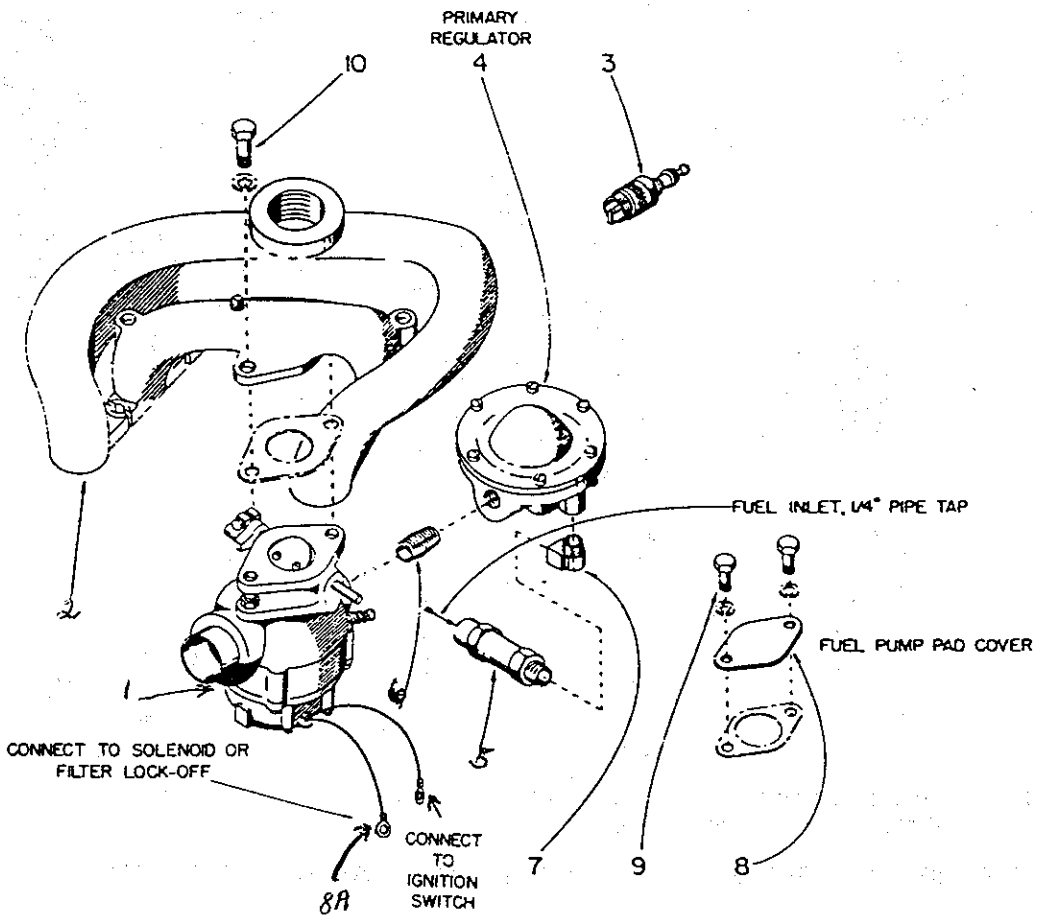
USE WITH MODEL AENL



ITEM	PART NO.	DESCRIPTION	QTY
1	BI291S1	Air cleaner bracket (not illustrated)	1
2	HF432A	Spacer	1
3	L65S1	Carburetor with gasket	1
4	L109	Regulator	1
5	LK27	Hose clamp for fuel line	2
6	LP51	Fuel filter	1
7	PE3	Lock washer, 1/4"	2
8	PE5	Lock washer, 3/8"	2
9	PF129	Plug	1
10	PG725	Clip for fuel line	1
11	RF1485	Street connector, 3/8" I.D.	1
12	RF1519	Elbow	1
13	RF1531	Elbow	1
14	LL207-13	Fuel line	1
15	PG1021A	Bracket	1
16	XA34	Cap screw, 1/4"-20 thread x 1/2" long	2
17	XD27A	Cap screw, 3/8"-16 thread x 1" long	2
18	XK16	Reducer bushing	1
19	XK132	Street ell, 45°	1
20	YD35	Spark plug, Champion D9J (not illustrated)	1
21	XD15	Cap screw, 5/16"-18 thread x 3/4" long	1

LPG110 Algas LPG Vapor Withdrawal Fuel System

USE WITH MODEL VH4DG

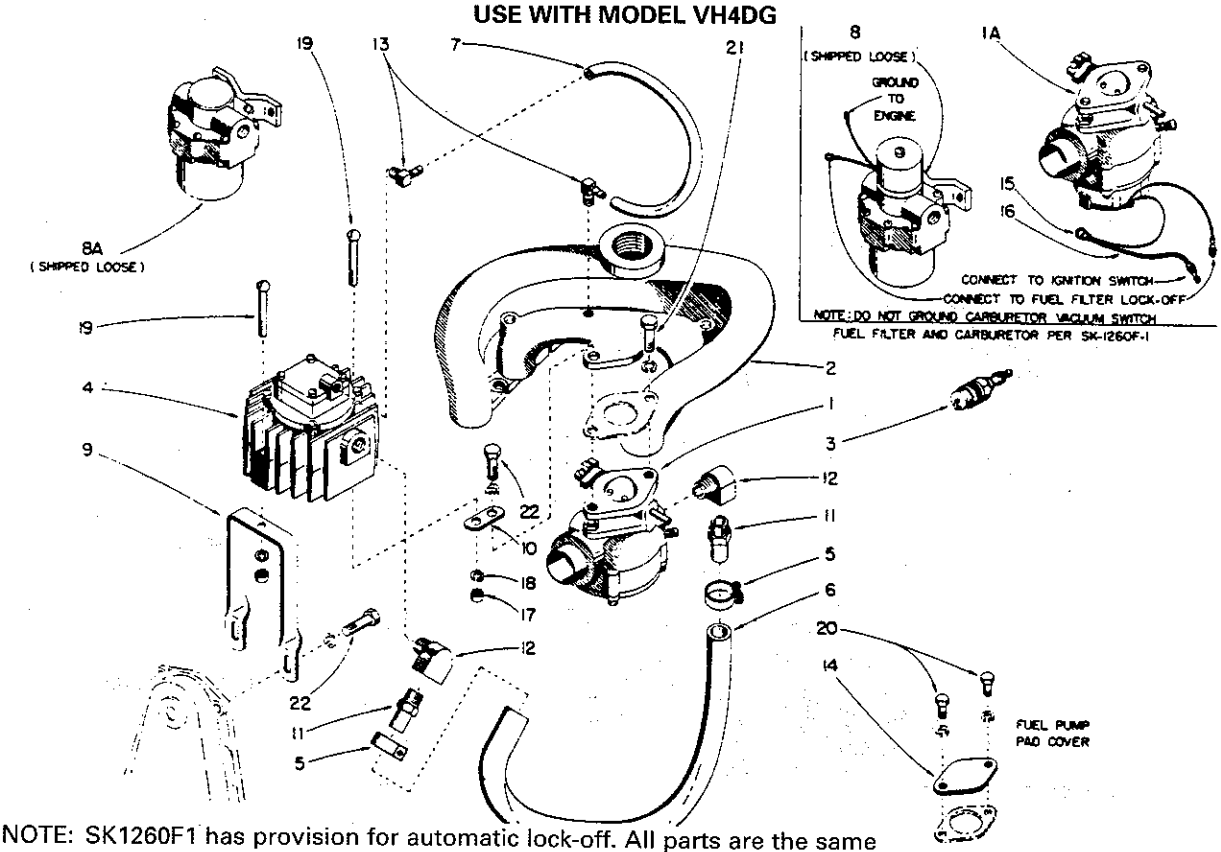


NOTE: L92A has provision for automatic lock-off.

ITEM	PART NO.	DESCRIPTION	QTY
—	AB100B	Cylinder head (not illustrated)	2
1A	L92A	Carburetor, Algas ind. no. 5504-5	1
2	LD253B	Manifold (open engine)	1
—	LD253B1	Manifold (power unit)	1
—	WE199A78	Rear panel (not illustrated) (NLA)	1
3	YD35	Spark plug, Champion no. D9J	4
4	L93BS1	Primary regulator, Algas ind. no. 1000-17	1
5	LP51	Fuel filter	1
6	RF1487	Pipe nipple, 3/8" thread x 1" long	1
7	RF1099	Elbow fitting	1
8	SA69	Cover	1
8A	YL394A12	Wire assembly	1
9	XD4	Screw, 1/4"-20 thread x 1/2" long	2
10	XD16	Screw, 5/16"-18 thread x 7/8" long	2

SK1260F, SK1260F1 Algas LPG Liquid Withdrawal Fuel Systems

USE WITH MODEL VH4DG



NOTE: SK1260F1 has provision for automatic lock-off. All parts are the same for both SK1260F and SK1260F1 except where noted.

ITEM	PART NO.	DESCRIPTION	QTY
—	AB100B	Cylinder head (not illustrated)	2
1	L92	Carburetor, SK1260F Algas ind. no. 5508-5	1
1A	L92A	Carburetor, SK1260F1 Algas ind. no. 5504-5	1
2	LD253B	Manifold (open engine)	1
—	LD253B1	Manifold (power unit)	1
3	YD35	Spark plug, Champion no. D9J	4
4	L90	Converter, Algas ind. no. C250AH4	1
5	LK20	Hose clamp, 7/8" I.D.	2
6	LL202-18	Fuel line	1
7	LL172-6	Vacuum hose	1
8	LP60	Filter lock-off, SK1260F1 Algas ind. no. 820-12	1
8A	LP60A	Fuel filter, SK1260F Algas ind. no. 830	1
9	PG1217	Bracket	1
10	PG1218	Bracket	1
11	RF1310A	Hose connector	2
12	RF1405	Elbow fitting	2
13	RF1439	Elbow	2
14	XA69	Cover	1
15	YD270	Wire connector, SK1260F1	1
16	YL352B13	Wire, SK1260F1	1
17	PD77	Nut, 1/4"-20 thread	2
18	PE3	Lock washer, 1/4"	2
19	XA61	Screw, 1/4"-20 thread x 1-3/4" long	2
20	XD4	Screw, 1/4"-20 thread x 1/2" long	2
21	XD16	Screw, 5/16"-18 thread x 7/8" long	1
22	XD17	Screw, 5/16"-18 thread x 1" long	3

LPG110, SK1260F, SK1260F1, SK1260G, SK1260G1 LPG Liquid And Vapor Withdrawal Fuel Systems

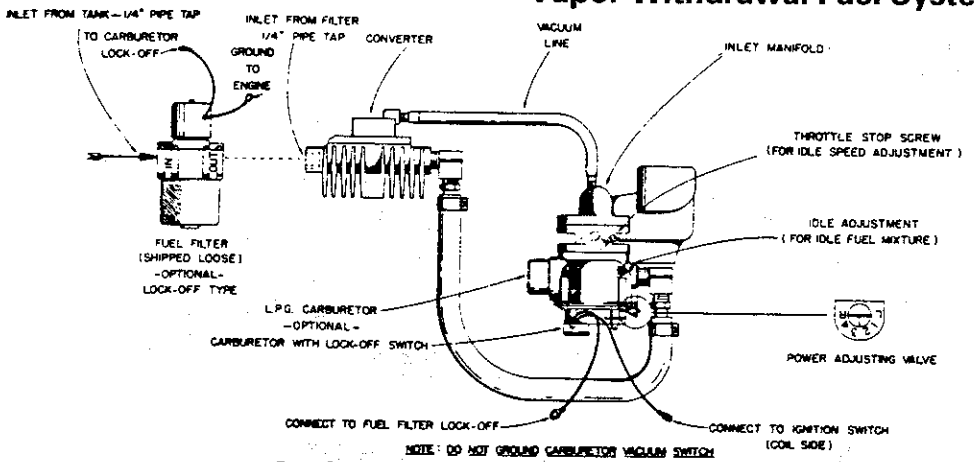


Fig. 1. LIQUID WITHDRAWAL SYSTEM

FUEL

If available, use PROPANE HD 5 in place of commercial propane. This is a special grade of fuel specifically developed for internal combustion engines.

Pressure in an L.P. gas tank, approximately 80% full of liquid fuel, will be in the vicinity of 100 pounds per square inch at 70° F. An increase in temperature will increase pressure, while lower temperatures will reduce pressure.

Due to local climatic changes, information on size of fuel tank should be received from your local L.P.G. distributor. (Fuel inlet line and fuel tank furnished by customer.) Fuel tanks are also referred to as fuel or storage cylinders.

FUEL SYSTEMS

LIQUID WITHDRAWAL (Fig. 1)

Liquid fuel is taken from the bottom of the storage cylinder, under tank pressure, and flows thru a **fuel filter.** The fuel then enters a **converter,** which vaporizes the fuel as a heat exchanger and controls the outlet pressure to the **carburetor** as a regulator. The carburetor receives vaporized fuel under pressure from the **converter** and measures it relative to the quantity of air entering the carburetor.

The regulator section of the **converter** reduces the tank pressure to 1-1/4 P.S.I. for engine idle, and 1-3/4 P.S.I. at full load.

VAPOR WITHDRAWAL (Fig. 3)

On engines requiring limited amounts of fuel for operation, connections are made for VAPOR WITHDRAWAL from tank. The **primary regulator** reduces tank pressure to the 1-1/4 to 1-3/4 P.S.I. required.

Fuel is taken from the top of storage cylinder and enters the **primary regulator,** (Ref. 4, Fig. 3) in a vapor state. No heat exchanger is required. However, if fuel is used at an excessive rate, freezing may occur in the tank. This problem can be eliminated by selecting a larger fuel cylinder or by locating tank in a warmer place.

SAFETY FEATURES

Lock-off filter and carburetor with lock-off vacuum switch can be furnished, if engine is equipped with battery ignition.

Lock-off filter will automatically shut off the flow of gas to the converter when engine is stopped. **Carburetor lock-off vacuum switch** shuts off the ignition if engine inadvertently stops.

STARTING PROCEDURE

No choking or priming are required: positive pressure maintains vaporized fuel at carburetor for instantaneous injection into engine at first movement of piston.

1. CAUTION: **'Slowly'** open main gas valve in fuel tank. An abrupt full opening of the valve will induce dirt from within the tank to enter the fuel line. Too rapid an opening can also cause frost to form on the fuel filter, main valve and inlet line. **Check for gas leaks with soap suds solution. There must be no leaks.**
2. If the engine is equipped with a variable speed governor control, set throttle about ½ open; with a two-speed control, start in full load position.
3. Disengage clutch, if furnished.
4. With the magneto or ignition switch in the running position, pull up briskly on the starting crank — do not attempt to **spin** engine with crank.

   With electric starting motor: Depress starter button in place of hand cranking.
5. Allow engine to warm up a few minutes before applying load. **New engines** should be "run-in" gradually. SEE INSIDE COVER OF INSTRUCTION MANUAL.

   The **idle** and **power valve adjustments** should be regulated for smooth operation, if **necessary.** These adjustments **may be** required on new engines due to climatic conditions. See 'CARBURETOR ADJUSTMENT' paragraphs for procedure.

Refer to **Trouble Shooting** section, Page 4, if starting troubles or frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

CARBURETOR ADJUSTMENT

There are three external adjustments as illustrated in Fig. 1: **Power adjusting valve** (for load speed), **idle adjustment** (for idle fuel mixture) and **throttle stop screw** (for idle speed).

Note: All adjustments are made when engine is tested at the factory. If engine starts, idles smoothly and goes from low to high speed without hesitation, do not change carburetor settings.

Idle Adjustment: If engine idle is rough or is too fast, adjust in the following manner: Turn **idle adjustment** out 4 turns from its seat. Start engine and set throttle control at low idle. Turn **throttle stop screw** until engine is running slightly faster than normal idle speed. Next, turn **idle adjustment** screw in until engine begins to stall, then turn screw out until engine runs steadily and smoothly. Engine will be idling faster than required at this point, so back out **throttle stop screw** until a slow smooth idle is obtained.

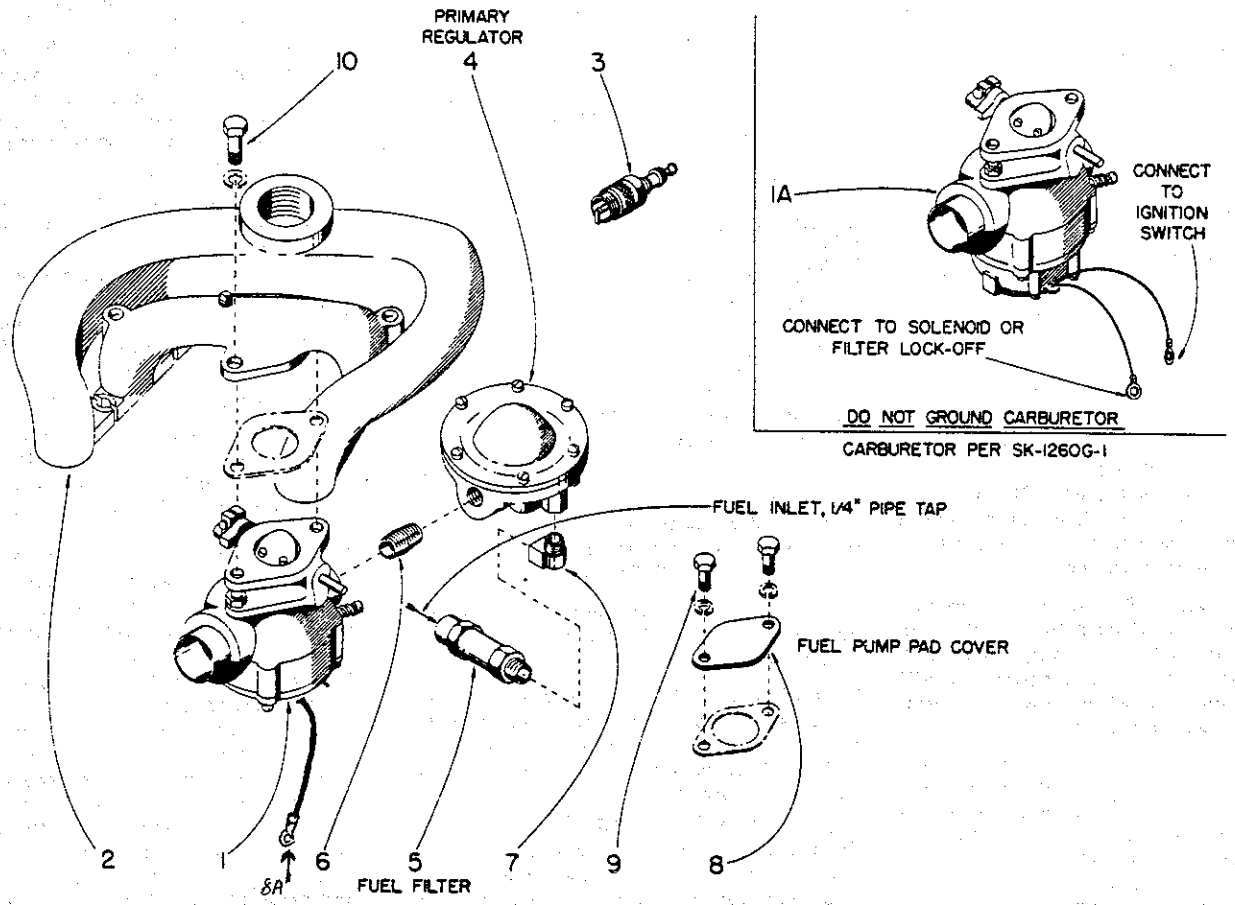
If a **vacuum gauge** is available, adjust to highest manifold vacuum, with engine running at low idle speed. The intake manifold has 1/8" pipe tap for vacuum check.

Power adjusting valve is of a simple air bleed design. A dial on the carburetor diaphragm body indicates the rich and lean settings. By means of a screw driver, **set scribe mark** on head of **power adjusting valve,** between number 2 and 3 on dial. This setting has been calibrated to **meet** average loading and operating conditions.

A more accurate, and recommended **adjustment,** is accomplished with a **fuel or exhaust analyzer:** with the engine warmed up and operating at FULL LOAD, turn **power adjusting valve** clockwise, toward **rich** marking on dial, until a reading of 13 to 1 air fuel ratio is registered by the **gas analyzer** (14 to 1 if gasoline analyzer is used). A very **slight movement** of the power valve between number 2 and 3 on dial is required for an efficient setting. Turn adjustment clockwise for a **rich mixture,** counter-clockwise for a **lean mixture.**

SK1260G, SK1260G1 Algas LPG Vapor Withdrawal Fuel Systems

USE WITH MODEL VH4DG



NOTE: SK1260G1 has provision for automatic lock-off. All parts are the same for both SK1260G and SK1260G1 except where noted.

ITEM	PART NO.	DESCRIPTION	QTY
—	AB100B	Cylinder head (not illustrated)	2
1	L92	Carburetor, SK1260G, Algas ind. no. 5508-5	1
1A	L92A	Carburetor, SK1260G1, Algas ind. no. 5504-5	1
2	LD253B	Manifold (open engine)	1
—	LD253B1	Manifold (power unit)	1
—	WE199A78	Rear panel (not illustrated) (NLA)	1
3	YD35	Spark plug, Champion no. D9J	4
4	L93BS1	Primary regulator, Algas ind. no. 1000-17	1
5	LP51	Fuel filter	1
6	RF1487	Pipe nipple, 3/8" thread x 1" long	1
7	RF1099	Elbow fitting	1
8	SA69	Cover	1
8A	YL394A14	Wire assembly	1
9	XD4	Screw, 1/4"-20 thread x 1/2" long	2
10	XD16	Screw, 5/16"-18 thread x 7/8" long	2

L.P.G. TROUBLE SHOOTING

I. ENGINE WILL NOT START

Before investigating the L.P.G. equipment, be sure that engine's malfunction does not exist in the **ignition system.** Refer to Engine Instruction Book for **TROUBLES, CAUSES** and **REMEDIES.**

(A) Check for fuel flow to carburetor.

1. Fuel storage tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after fuel tank is filled, or if valve is opened too abruptly). Close tank valve, listen for *'click'*, and then open **very slowly.**
4. Check fuel line for leaks, and damaged or stopped-up fuel filter. Use a soap solution on hose joints.
5. Disconnect air cleaner hose at carburetor, and crank engine with ignition on, for 3 or 4 seconds. Then, reach inside carburetor and depress diaphragm very lightly. If the sound of fuel rushing out is heard, the diaphragm is not lifting fuel valve off the seat, indicating a punctured or crinkled diaphragm. *See Form* **ML-32** *for Carburetor Service and Parts.* If the rush of fuel is **not** heard, the problem is either in the vacuum switch or lock-off filter.
6. Check solenoid lock-off filter and vacuum switch (if furnished). Turn ignition on and crank engine. If the solenoid *'click'* can be heard, both lock-off and vacuum switches are working. If not; disassemble, clean and repair.

(B) Test pressures.

1. A fuel pressure check between the converter (or primary regulator) and carburetor should show:
   Static Pressure – 1-3/4 P.S.I. max.
   Running Pressure at Idle – 1-1/4 P.S.I.
   Pressure is critical and should not climb.
2. A correct reading indicates no trouble exists in the gas system from tank to carburetor.
3. If fuel pressure is too high or climbs – trouble is in the converter (or primary regulator). *See Form* **ML-26** *for Converter Service and Parts,* or **ML-29** for primary regulator (vapor withdrawl).

(C) Adhere to starting procedure.

1. Regulate carburetor idle and power adjustments.

II. FROST

(A) Frost on fuel filter, shut-off valve, or inlet line – caused by opening outlet valve on fuel tank too rapidly. Open fuel supply valve **slowly.**

1. Frost at filter – restricted filter element. Replace or clean per *Fuel Filter* paragraphs.

(B) If carburetor, fuel lines, and converter (or primary regulator) frosted over, close storage tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

1. Frost on fuel lines between converter (or primary regulator) carburetor is caused by inadequate vaporizing – engine taking load too rapidly.
2. Frost on connection fittings. Check for fuel leaking, kinked lines, or restriction at frosted area.

(C) Frost at converter.

1. Engine stopped – indicates fuel leaking through both lock-off and carburetor.
2. Engine running – insufficient heat at converter. Warm engine thoroughly before applying load.

(D) Frost on fuel storage tank.

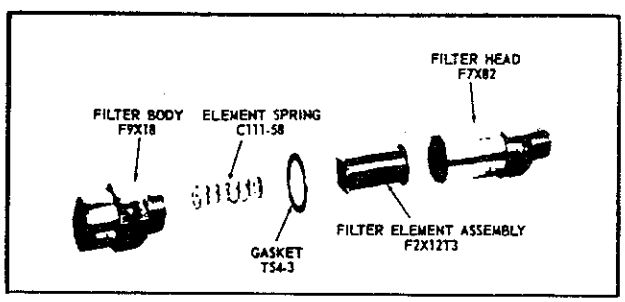
1. Fractured dip tube in fuel cylinder.

FUEL FILTER FOR LIQUID WITHDRAWAL
WISCONSIN No. LP-60 or LP-60-A

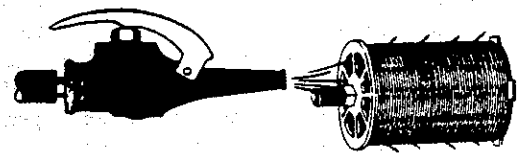
At least once a year remove sediment bowl; clean interior of bowl and replace filter with a new Algas No. 701 element. If contaminated fuel conditions exist, it will be necessary to replace cartridge element more frequently.

A dirty element will cause a frosting condition to occur at the fuel filter, and will also result in loss of power.

IN-LINE FUEL FILTER FOR VAPOR WITHDRAWAL
WISCONSIN No. LP-51



To clean filter, unscrew head from filter body, remove element and wash in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, soak in solvent. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW–FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT.



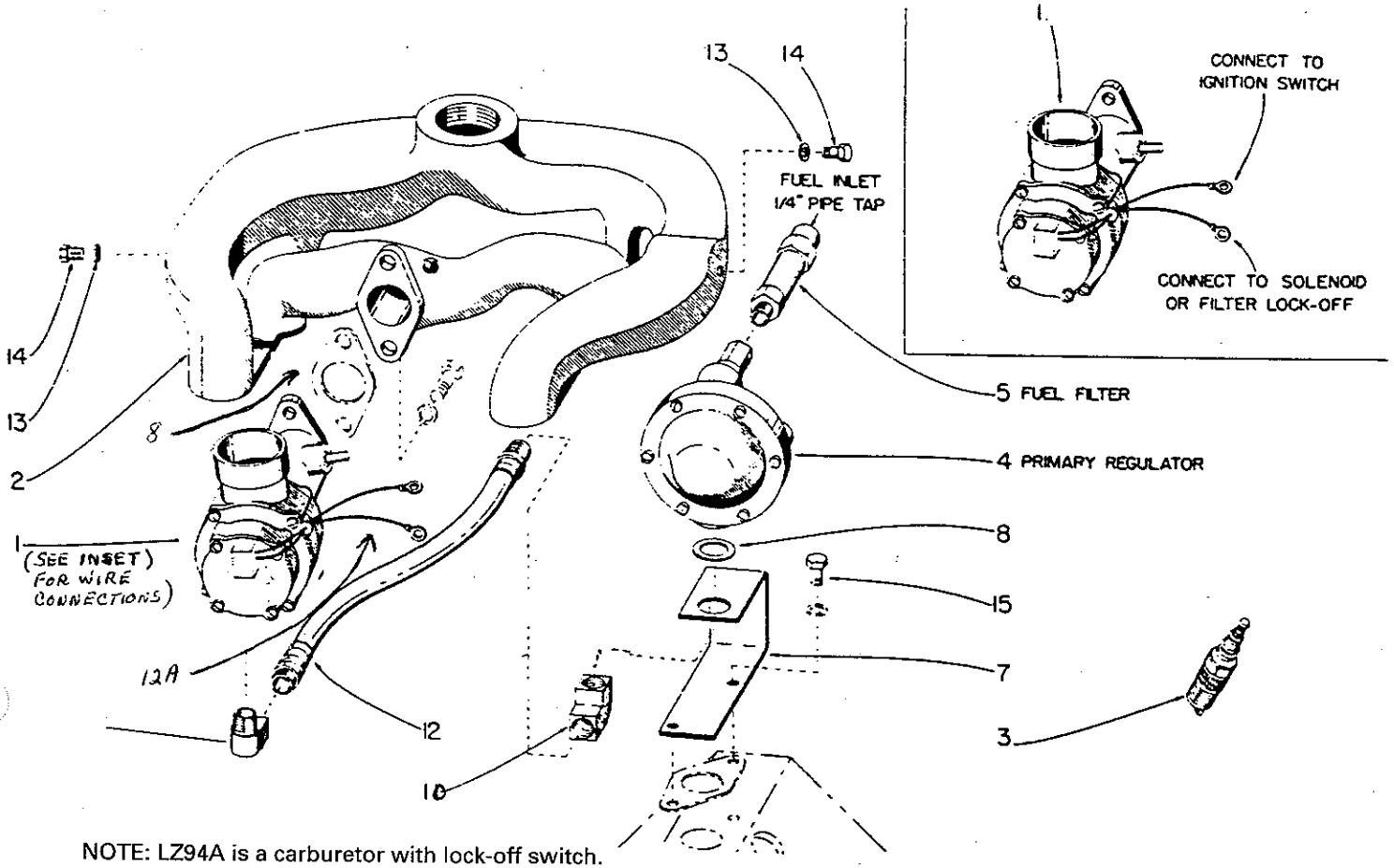
NEVER DIP ELEMENT
IN 'BRIGHT DIP' OR OTHER ACID SOLUTION

In reassembly, it is important that the element be inserted into filter head with round washer entering first into opening. The gasket is put on the filter body and the spring is located into body so that when filter is put together the spring holds the element against the head.

Assemble head to body with 75 foot pounds torque. After unit has been reinstalled, the joint at gasket and fuel line connections should be checked with a soap bubble solution to be sure there are no leaks.

LPG119 Algas LPG Vapor Withdrawal Fuel System

USE WITH MODEL VG4DG



NOTE: LZ94A is a carburetor with lock-off switch.

ITEM	PART NO.	DESCRIPTION	QTY
—	AB97B	Cylinder head (not illustrated)	2
1	LZ94A	Carburetor, SK1262H1 Algas ind. no. 5670	1
2	LD240B3	Inlet and exhaust manifold	1
3	YD35	Spark plug, Champion no. D9J	4
4	L93BS1	Primary regulator, Algas ind. no. 1000-17	1
—	LK27	Hose clamp	1
5	LP51	Fuel filter	1
7	PG845-1	Bracket	1
8	QC12A	Gasket	8
10	RF1519	Elbow	2
12	LL207-8	Fuel line	1
12A	YL394A12	Wire assembly	1
—	PE89	Lock washer	1
13	PH30A	Washer	2
—	XA4	Screw, 8"-32 thread x 3/8" long	1
14	XD3	Screw, 1/4"-20 thread x 3/8" long	2
—	XD21	Cap screw, 5/16"-18 thread x 1-1/2" long	1
15	XD4	Screw, 1/4"-20 thread x 1/2" long	2
16	XK16	Reducer bushing	1

LPG119, SK1262E, SK1262E1, SK1262H, SK1262H1 LPG Liquid And Vapor Withdrawal Fuel Systems

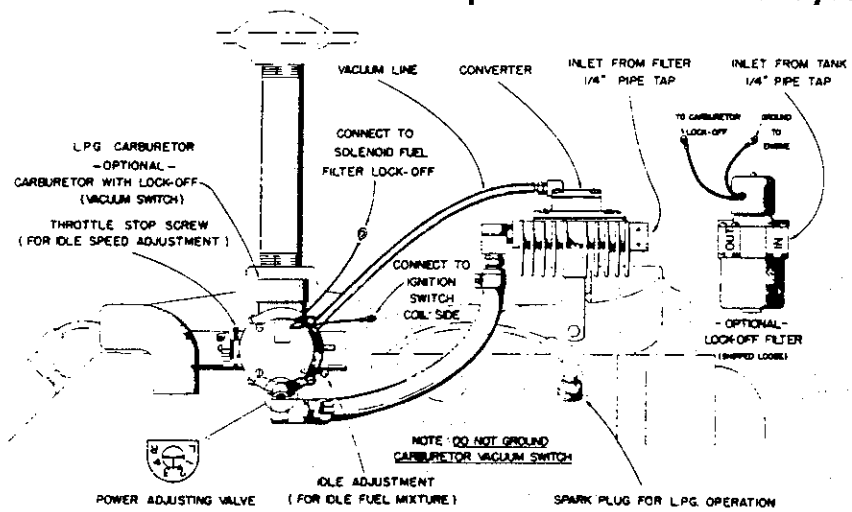


Fig. 1. LIQUID WITHDRAWAL SYSTEM

FUEL

If available, use PROPANE HD 5 in place of commercial propane. This is a special grade of fuel specifically developed for internal combustion engines.

Pressure in an L.P. gas tank, approximately 80% full of liquid fuel, will be in the vicinity of 100 pounds per square inch at °F. An increase in temperature will increase pressure, while lower temperatures will reduce pressure.

Due to local climatic changes, information on size of fuel tank should be received from your local L.P.G. distributor. (Fuel inlet line and fuel tank furnished by customer.) Fuel tanks are also referred to as fuel or storage cylinders.

FUEL SYSTEMS

LIQUID WITHDRAWAL (Fig. 1)

Liquid fuel is taken from the bottom of the storage cylinder, under tank pressure, and flows thru a **fuel filter**. The fuel then enters a **converter**, which vaporizes the fuel as a heat exchanger and controls the outlet pressure to the **carburetor** as a regulator. The carburetor receives vaporized fuel under pressure from the **converter** and measures it relative to the quantity of air entering the carburetor.

The regulator section of the **converter** reduces the tank pressure to 1-1/4 **P.S.I.** for engine idle, and 1-3/4 **P.S.I.** at full load.

VAPOR WITHDRAWL (Fig. 3)

On engines requiring limited amounts of fuel for operation, connections are made for a VAPOR WITHDRAWAL installation at the tank. The **primary regulator** reduces tank pressure to the 1-1/4 to 1-3/4 **P.S.I.** required.

Fuel is taken from the top of storage cylinder and enters the **primary regulator**, (R , Fig. 3) in a vapor state. No heat exchanger is required. However, if fuel is used at an excessive rate, freezing may occur in the tank. This problem can be eliminated by selecting a larger fuel cylinder or by locating tank in a warmer place.

SAFETY FEATURES

Liquid withdrawal system can be furnished with a **lock-off filter** and **carburetor** with **lock-off vacuum switch**, if engine is equipped with battery ignition.

Lock-off filter will automatically shut off the flow of gas to the converter when engine is stopped. **Carburetor lock-off vacuum switch** shuts off the ignition if engine inadvertently stops.

STARTING PROCEDURE

No choking or priming are required: positive pressure maintains vaporized fuel at carburetor for instantaneous injection into engine at first movement of piston.

1. CAUTION: **'Slowly'** open main gas valve in fuel tank. An abrupt full opening of the valve will induce dirt from within the tank to enter the fuel line. Too rapid an opening can also cause frost to form on the fuel filter, main valve and inlet line. **Check for gas leaks with soap suds solution. There must be no leaks.**
2. If the engine is equipped with a variable speed governor control, set throttle about ½ open; with a two-speed control, start in full load position.
3. Disengage clutch, if furnished.
4. With the magneto or ignition switch in the running position, pull up briskly on the starting crank – do not attempt to **spin** engine with crank.

   With electric starting motor: Depress starter button in place of hand cranking.
5. Allow engine to warm up a few minutes before applying load. **New engines** should be "run-in" gradually. SEE INSIDE COVER OF INSTRUCTION MANUAL.

   The **idle** and **power valve adjustments** should be **regulated** for smooth operation, **if necessary.** These adjustments may be required on new engines due to climatic conditions. See **'CARBURETOR ADJUSTMENT'** paragraphs for adjustment procedure.

Refer to **Trouble Shooting** section, Page 4, if starting troubles or frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

CARBURETOR ADJUSTMENT

There are three external adjustments as illustrated in Fig. 1: **Power adjusting valve** (for load speed), **idle adjustment** (for idle fuel mixture) and **throttle stop screw** (for idle speed).

Note: All adjustments are made when engine is tested at the factory. If engine starts, idles smoothly and goes from low to high speed without hesitation, do not change carburetor settings.

Idle Adjustment: If engine idle is rough or is too fast, adjust in the following manner: Turn **idle adjustment** out 4 turns from its seat. Start engine and set throttle control at low idle. Turn **throttle stop screw** until engine is running slightly faster than normal idle speed. Next, turn **idle adjustment** screw in until engine begins to stall, then turn screw out until engine runs steadily and smoothly. Engine will be idling faster than required at this point, so back out **throttle stop screw** until a slow smooth idle is obtained.

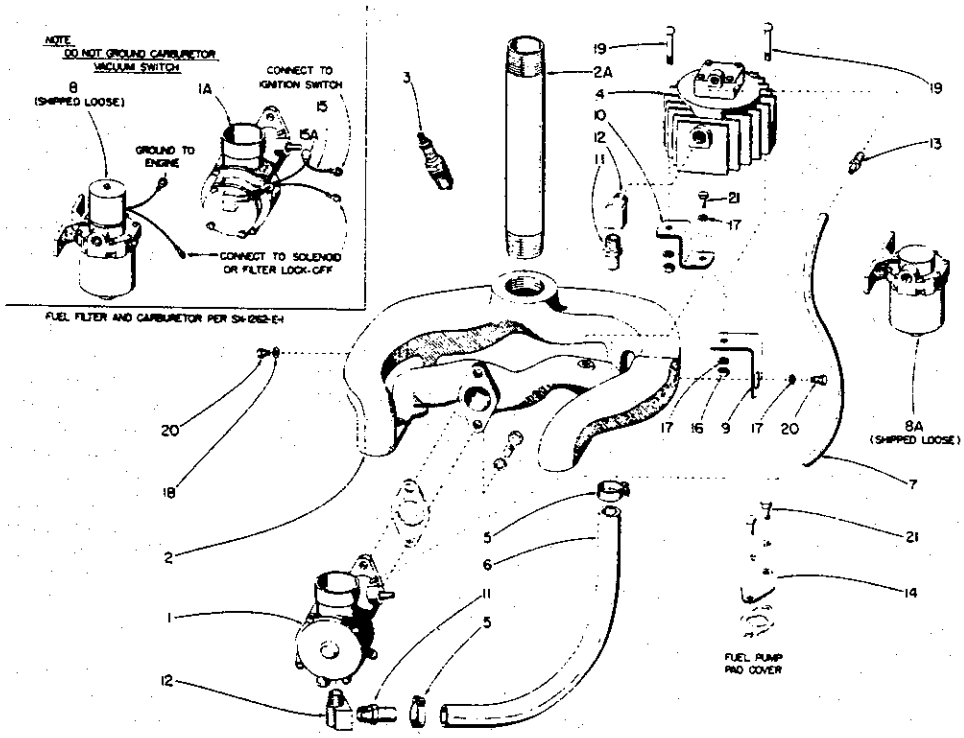
If a **vacuum gauge** is available, adjust to highest manifold vacuum, with engine running at low idle speed. The intake manifold has 1/8" pipe tap for vacuum check.

Power adjusting valve is of a simple air bleed design. A dial on the carburetor diaphragm body indicates the rich and lean settings. By means of a screw driver, set **scribe mark** on head of **power adjusting valve**, between number 2 and 3 on dial. This setting has been calibrated to meet average loading and operating conditions.

A more accurate, and recommended adjustment, is accomplished with a **fuel** or **exhaust analyzer:** with the engine warmed up and operating at FULL LOAD, turn **power adjusting valve** clockwise, toward rich marking on dial, until a reading of 13 to air fuel ratio is registered by the **gas analyzer** (14 to 1 if gasoline analyzer is used).

A very **slight movement** of the power valve between number 2 and 3 on dial is required for an efficient setting. Turn adjustment clockwise for a **rich mixture**, counter-clockwise for a **lean mixture.**

SK1262E, SK1262E1 Algas LPG
Liquid Withdrawal Fuel Systems



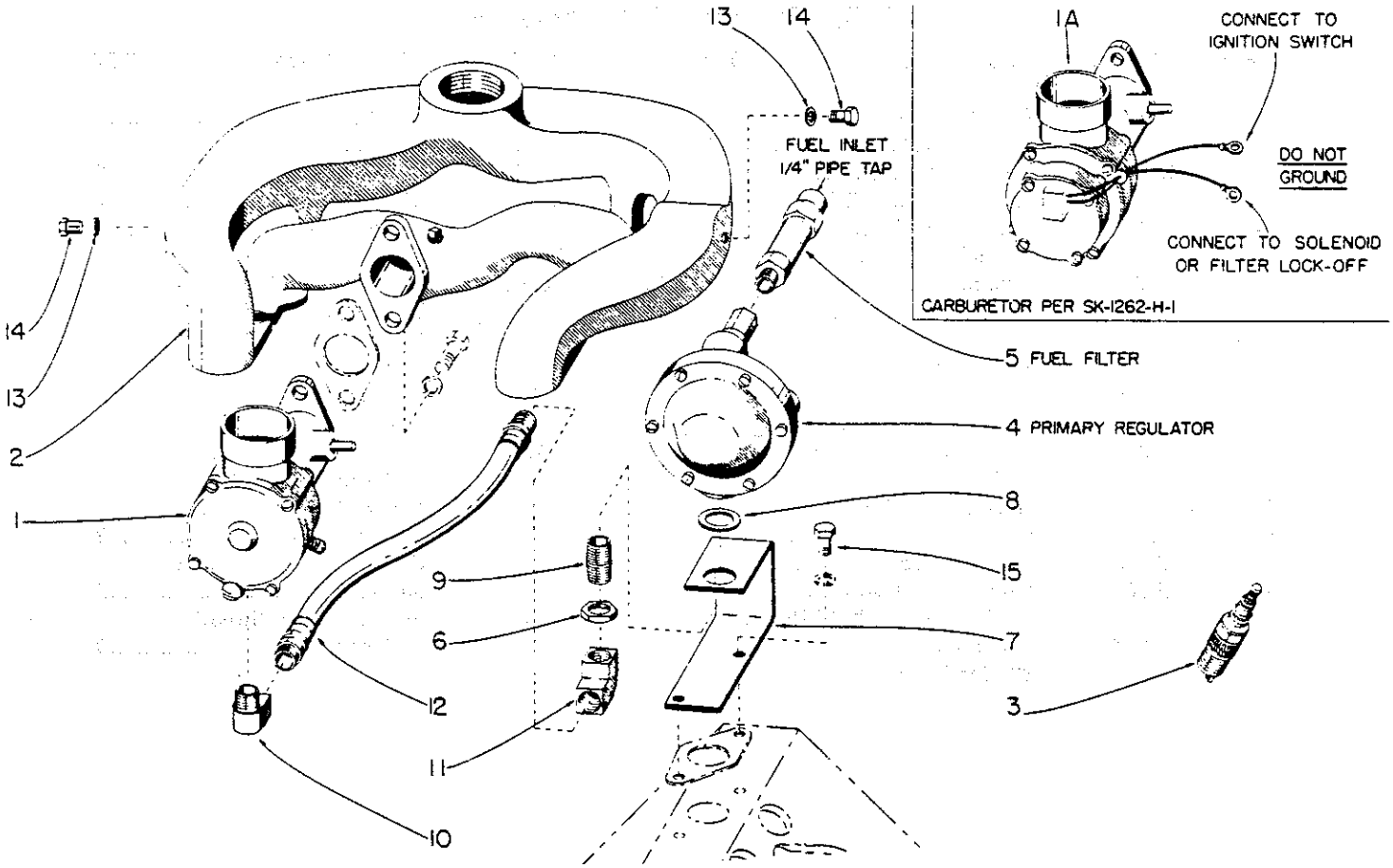
SK1262E, SK1262E1 Algas LPG Liquid Withdrawal Fuel Systems

USE WITH MODEL VG4DG (see pg. 76)

ITEM	PART NO.	DESCRIPTION	QTY
—	AB97B	Cylinder head (not illustrated)	2
1	L94	Carburetor, SK1262E Algas ind. no. 5674	1
1A	L94A	Carburetor, SK1262E1 Algas ind. no. 5670	1
2	LD240B9	Inlet and exhaust manifold	1
2A	LJ337	Pipe nipple, 1-1/2" thread x 9-1/4" long (NLA)	1
3	YD35	Spark plug, Champion no. D9J	4
4	L90	Converter, Algas ind. no. C250AH4	1
5	LK20	Hose clamp, 7/8" I.D.	2
6	LL202-14	Fuel line	1
7	LL186	Vacuum hose	1
8	LP60	Filter lock-off, Algas ind. no. 820-12 for SK1262E1	1
8A	LP60A	Fuel filter, Algas ind. no. 830 for SK1262E	1
9	PG1232-1	Bracket	1
10	PG1233	Bracket	1
11	RF1310A	Hose connector	2
12	RF1405	Elbow fitting	2
13	RF1480	Hose connector	1
14	SA69	Cover	1
15	YL352B13	Wire assembly, SK1262E1	1
15A	YD270	Wire connector, SK1262E1	1
16	PD77	Nut, 1/4"-20 thread	2
17	PE3	Lock washer, 1/4"	4
18	PH30A	Washer, 1/4"	1
19	XA61	Screw, 1/4"-20 thread x 1-3/4" long	2
20	XD3	Screw, 1/4"-20 thread x 3/8" long	2
—	XD6	Screw, 1/4"-20 thread x 3/4" long	2
21	XD4	Screw, 1/4"-20 thread x 1/2" long	3

LPG119, SK1262H, SK1262H1 Algas LPG Vapor Withdrawal Fuel Systems

USE WITH MODEL VG4DG



NOTE: SK1262H1 has carburetor with lock-off. All parts are the same for SK1262H and SK1262H1 except where noted.

ITEM	PART NO.	DESCRIPTION	QTY
—	AB97B	Cylinder head (not illustrated)	2
1	LZ94	Carburetor, SK1262H Algas ind. no. 5674 (NLA)	1
1A	LZ94A	Carburetor, SK1262H1 Algas ind. no. 5670	1
2	LD240B2	Inlet and exhaust manifold (NLA)	1
3	YD35	Spark plug, Champion no. D9J	4
4	L93BS1	Primary regulator, Algas ind. no. 1000-17	1
5	LP51	Fuel filter	1
6	PD216	Lock nut, 3/8" thread	1
7	PG845	Bracket	1
8	QD740	Gasket	1
9	RF936	Pipe nipple, 3/8" thread x 1" long	1
10	RF1302	Elbow	1
11	RF1491	Elbow	1
12	RM1303	Fuel line	1
13	PH30A	Washer	2
14	XD3	Screw, 1/4"-20 thread x 3/8" long	2
15	XD4	Screw, 1/4"-20 thread x 1/2" long	2

LPG119, SK1262H, SK1262H1 Algas LPG Vapor Withdrawal Fuel Systems

I. ENGINE WILL NOT START

Before investigating the L.P.G. equipment, be sure that engine's malfunction does not exist in the **ignition system.** Refer to Engine Instruction Book for **TROUBLES, CAUSES** and **REMEDIES.**

(A) Check for fuel flow to carburetor.

1. Fuel storage tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after fuel tank is filled, or if valve is opened too abruptly). Close tank valve, listen for *'click'*, and then open **very slowly.**
4. Check fuel line for leaks, and damaged or stopped-up fuel filter. Use a soap solution on hose joints.
5. Disconnect air cleaner hose at carburetor, and crank engine with ignition on, for 3 or 4 seconds. Then, reach inside carburetor and depress diaphragm very lightly. If the sound of fuel rushing out is heard, the diaphragm is not lifting fuel valve off the seat, indicating a punctured or crinkled diaphragm. *See Form* **ML-28** *for Carburetor Service and Parts.* If the rush of fuel is **not** heard, the problem is either in the vacuum switch or lock-off filter.
6. Check solenoid lock-off filter and vacuum switch (if furnished). Turn ignition on and crank engine. If the solenoid *'click'* can be heard, both lock-off and vacuum switches are working. If not; disassemble, clean and repair.

(B) Test pressures.

1. A fuel pressure check between the converter (or primary regulator) and carburetor should show:
   Static Pressure – 1-3/4 P.S.I. max.
   Running Pressure at Idle – 1-1/4 P.S.I.
   Pressure is critical and should not climb.
2. A correct reading indicates no trouble exists in the gas system from tank to carburetor.
3. If fuel pressure is too high or climbs – trouble is in the converter (or primary regulator). *See Form* **ML-26** *for Converter Service and Parts,* or **ML-29** for primary regulator (vapor withdrawl).

(C) Adhere to starting procedure.

1. Regulate carburetor idle and power adjustments.

II. FROST

(A) Frost on fuel filter, shut-off valve, or inlet line – caused by opening outlet valve on fuel tank too rapidly. Open fuel supply valve **slowly.**

1. Frost at filter – restricted filter element. Replace or clean per *Fuel Filter* paragraphs.

(B) If carburetor, fuel lines, and converter (or primary regulator) frosted over, close storage tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

1. Frost on fuel lines between converter (or primary regulator) carburetor is caused by inadequate vaporizing – engine taking load too rapidly.
2. Frost on connection fittings. Check for fuel leaking, kinked lines, or restriction at frosted area.

(C) Frost at converter.

1. Engine stopped – indicates fuel leaking through both lock-off and carburetor.
2. Engine running – insufficient heat at converter. Warm engine thoroughly before applying load.

(D) Frost on fuel storage tank.

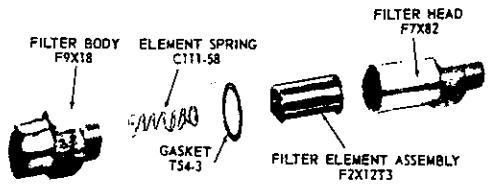
1. Fractured dip tube in fuel cylinder.

FUEL FILTER FOR LIQUID WITHDRAWAL
WISCONSIN No. LP-60 or LP-60-A

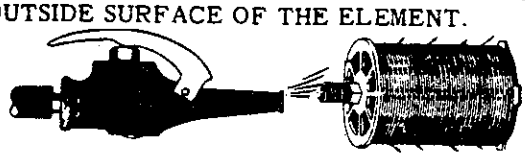
At least once a year remove sediment bowl; clean interior of bowl and replace charcoal filter with a new Algas No. 701 filter element. If contaminated fuel conditions exist, it will be necessary to replace cartridge element more frequently.

A dirty element will cause a frosting condition to occur at the fuel filter, and will also result in loss of power.

IN-LINE FUEL FILTER FOR VAPOR WITHDRAWAL
WISCONSIN No. LP-51



To clean filter disassemble fuel line from filter head. The head can then be unscrewed from the filter body. Remove element assembly from head and wash in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, soak in solvent cleaner. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW—FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT.



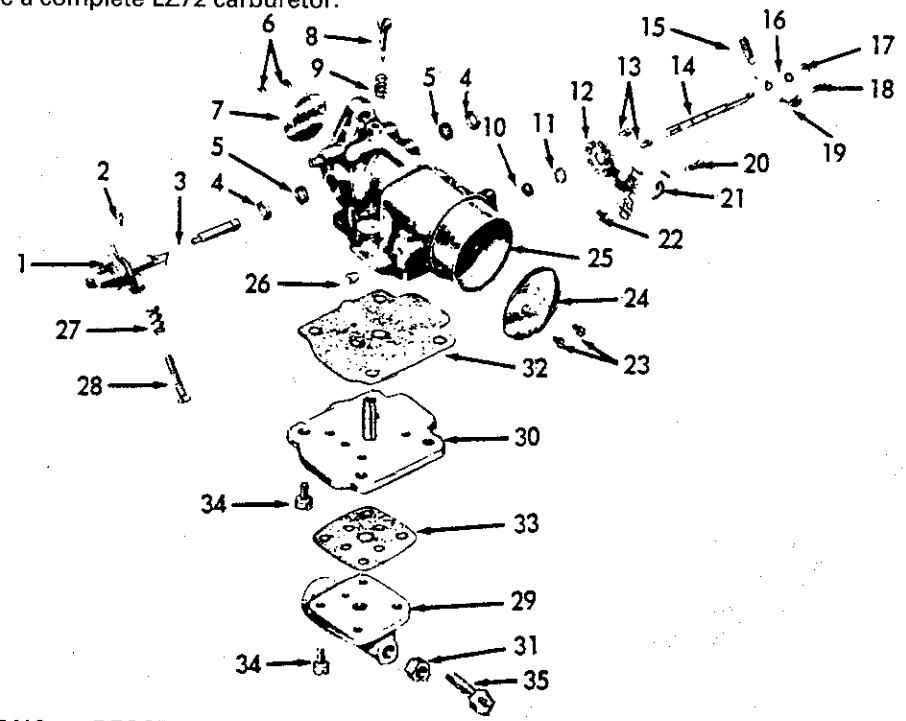
In reassembly, it is important that the element be inserted into filter head with round washer entering first into opening. The gasket is put on the filter body and the spring is located into body so that when filter is put together the spring holds the element against the head.

The body and head should be assembled with 75 foot pounds torque. After the unit has been reinstalled, the joint at the gasket and fuel line connection should be checked with a soap bubble solution to be sure there is no leak.

LZ72 LPG Carburetor Service Parts List

USE WITH MODEL VR4DG

NOTE: A complete carburetor is not available from Zenith. The upper body assembly (Zenith No. G-12302, Model LP12A10) is purchased from them, and the remaining parts are furnished by Wisconsin Motor, to make a complete LZ72 carburetor.



ITEM	PART NO.	DESCRIPTION	QTY
1	CR27-284	Lever (includes 27, 28)	1
2	T63-9	Taper pin	1
3	C23-625	Shaft	1
4	C131-33	Retainer	2
5	T48-10	Seal	2
6	T315S5-4	Screw	2
7	C21-52	Plate	1
8	C46-53	Needle	1
9	C111-17	Spring	1
10	T48-7	Seal	1
11	T52-13	Retainer	1
12	C109-60C	Bracket (includes 20-22)	1
13	C140-58	Screw	2
14	C105-268	Shaft	1
15	C112-6	Spring	1
16	T45-8	Lock washer	1
17	T22S8	Nut	1
18	T8S8-7	Screw	1
19	C106-2	Lever (includes item 18)	1
20	T8S8-8	Screw	1
21	C110-7	Clamp	1

ITEM		PART NO.	DESCRIPTION	QTY
22		T21S8	Nut	1
23		T315B6-4	Screw	2
24		C102-116	Plate	1
25		A802-19-1	Body (includes 4, 5, 10, 11, 26)	1
26		CR137-19	Plug	1
27		C111-62	Spring	1
28		T8S10-16	Screw	1
28		LF136	Metering block	1
30	†	LF137A	Adapter plate (includes RF1341)	1
31	†	PD11-1	Lock nut	1
32	†	QD750	Gasket	1
33	†	QD751	Gasket	1
34	†	XB99	Screw, no. 10-32 thread x 9/16" long	8
35	†	XB100	Screw	1

† Wisconsin motor parts, all others are part numbers of the Zenith carburetor division, Bendix aviation corporation.

SK1249 LPG Liquid And Vapor Withdrawal Fuel System

Fig. 3

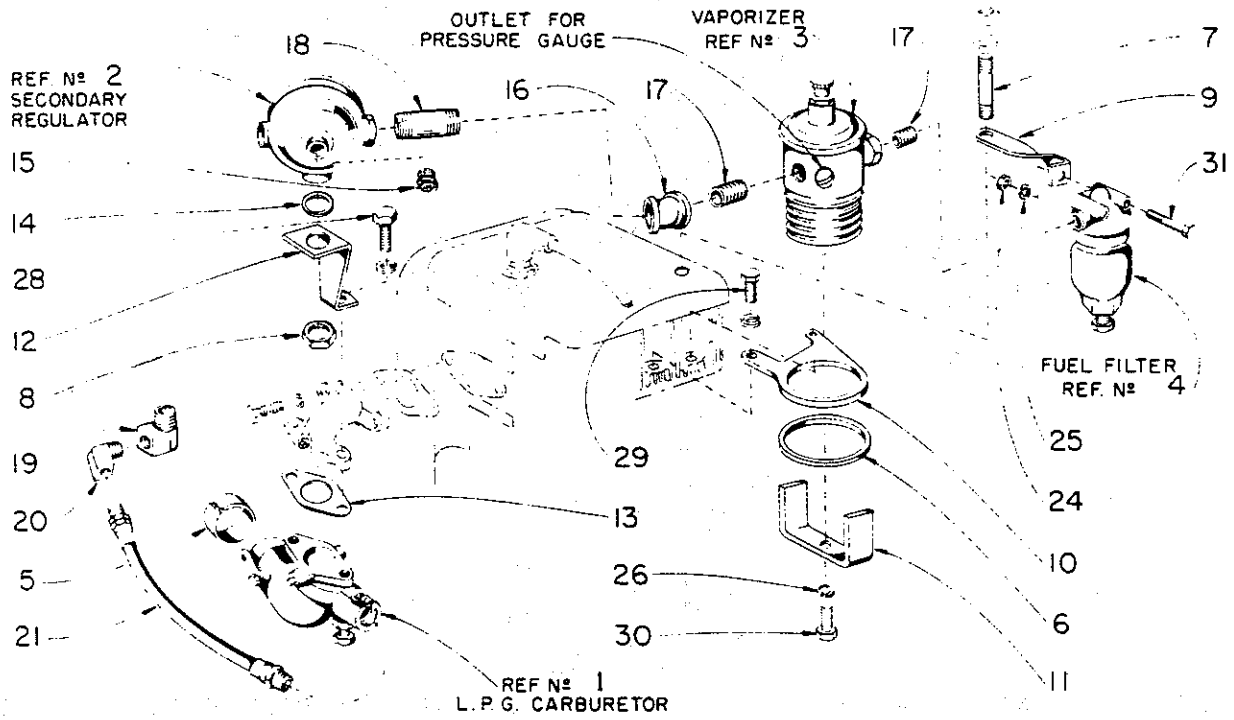


Fig. 3

SK1249 LPG Liquid Withdrawal Fuel System

USE WITH MODELS AENLDG, AENL (see pg. 80)

ITEM	PART NO.	DESCRIPTION	QTY
—	† AE75D	Exhaust valve	1
—	† AF54	Valve spring	1
—	† AG31	Valve rotator and spring seat	1
—	† BI291S1	Air cleaner bracket	1
—	† HF445	Spacer	1
—	† HG273D	Exhaust valve seat insert	1
—	† SD53H	Instruction plate (NLA)	1
—	† YD35	Spark plug, Champion no. D9J	1
1	L65S1	LPG carburetor, Zenith model LPEU71, no. GO12161	1
2	L66B	Secondary stage regulator, Zenith no. B806D36	1
3	L67	Vaporizer and primary regulator, Zenith no. A965A25A (NLA)	1
4	LP50A	Fuel filter, Zenith no. GF462-1-2 (replaces LP50)	1
5	HF536	Spacer	1
6	HF553A	Spacer (NLA)	1
7	PC458	Stud, 3/8" x 3-1/4" long (replaces PC115, PC228)	1
8	PD209A	Lock nut, 3/4"-16 thread (replaces PD209)	1
9	PG823	Support brace (NLA)	1
10	PG824	Bracket (NLA)	1
11	PG825	Brace (NLA)	1
12	PG833	Bracket (NLA)	1
13	QC71	Gasket	1
14	QD740	Gasket	1
15	RD135	Vent screen	2
16	RF214	Elbow, 1/4" pipe x 45° (NLA)	1
17	RF503	Pipe nipple, 1/4" x 7/8" long	2
18	RF851	Pipe nipple, 1/4" x 2-1/2" long (NLA)	1
19	RF1300A	Elbow	1
20	RF1302	Elbow	1
21	RM1303	Flexible fuel line (replaces RM1300) (NLA)	1
24	PD77	Nut, 1/4"-20 thread	1
25	PE3	Lock washer, 1/4"	1
26	PE5	Lock washer, 3/8"	1
27	PH26	Washer, 3/8" I.D. (not illustrated)	2
28	XD17	Screw, 5/16"-18 thread x 1" long	1
29	XD31	Screw, 3/8"-16 thread x 1-3/4" long	2
30	XD114	Screw, 3/8"-16 thread x 1/2" long	3
31	XD147	Screw, 1/4"-20 thread x 2-1/2" long	1

† Not included in the SK1249 conversion kit.

SK1249 LPG Liquid And Vapor Withdrawal Fuel System

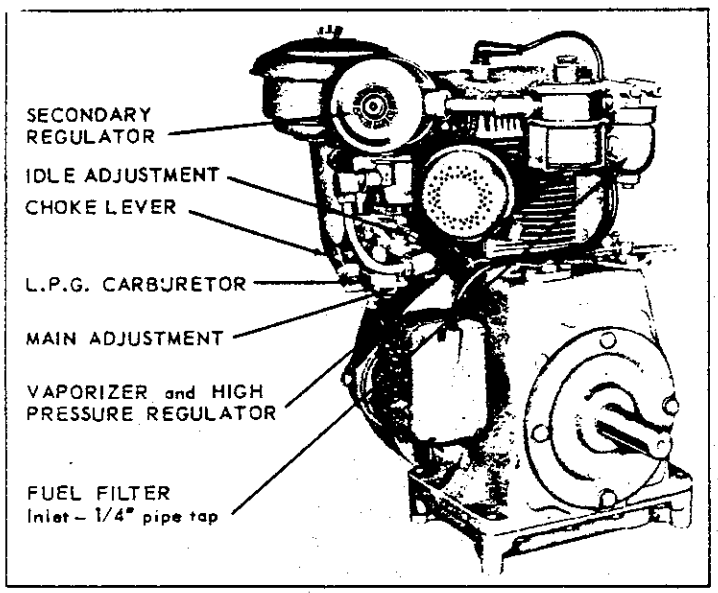


Fig. 1, LIQUID WITHDRAWAL SYSTEM

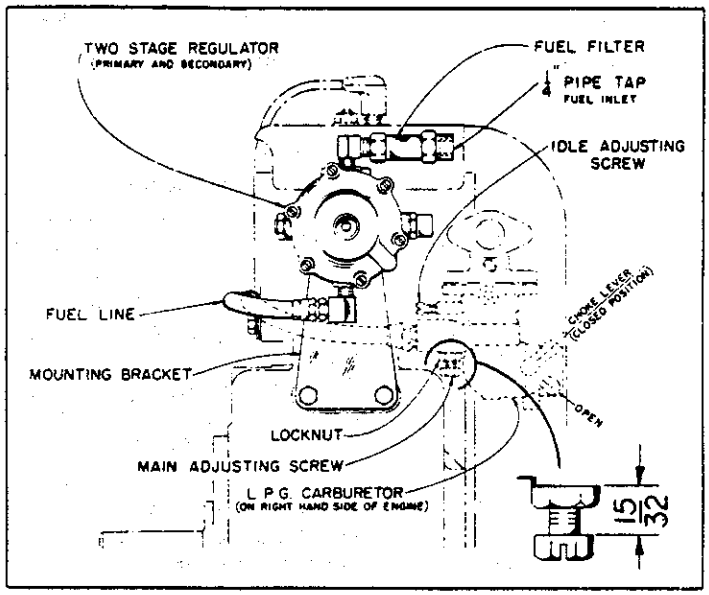


Fig. 2, VAPOR WITHDRAWAL SYSTEM

FUEL

If available, use PROPANE HD 5 in place of commercial propane. This is a special grade of fuel specifically developed for internal combustion engines.

When L.P. gases are pressurized they assume a liquid state, making it more suitable and economical for handling. Pressure in a new cylinder, approximately 80% full of liquid fuel, will be in the vicinity of 100 pounds per square inch at 70° F. An increase in temperature will increase pressure, while lower temperatures will reduce pressure. The **two-stage regulator** controls the fuel pressure to carburetor regardless of the temperature changes, except when temperature falls below -20° F.

Due to local climatic differential, information on size of storage tank should be received from your local L.P.G. distributor. (Fuel inlet line and storage tank furnished by customer.)

FUEL SYSTEM

LIQUID WITHDRAWAL, Fig. 1

When the fuel is removed from the bottom of cylinder (LIQUID WITHDRAWAL SYSTEM) fuel expansion and vaporization takes place in the **high pressure regulator.** To prevent this regulator from freezing, which occurs due to a refrigeration effect, it is necessary to add heat. A heat exchanger or **vaporizer** is therefore added around the regulator to prevent such freezing.

The dry gas passes from the **secondary regulator,** which has a discharge pressure slightly below atmospheric pressure, to the **carburetor** as required by speed and load of the engine.

VAPOR WITHDRAWAL, Fig. 2

Fuel removed from the top of cylinder (VAPOR WITHDRAWAL SYSTEM) enters the in-line fuel filter and two-stage regulator in a vapor state and thus no heat exchanger is required. However, if fuel is used at an excessive rate, freezing may occur in the tank. In this case, a liquid withdrawal system is recommended, to obtain better control of fuel through the use of a vaporizer.

The 'Wisconsin' **two-stage vapor regulator** is designed to reduce fuel storage pressure to a pre-determined and dependable discharge pressure required for optimum engine performance.

Due to local climatic differential, information for proper cylinder selection should be received from your local L.P.G. distributor. (Fuel inlet line and storage cylinder furnished by customer.)

Connect fuel inlet line from storage cylinder to fuel filter.

STARTING PROCEDURE

1. Open fuel tank shut off valve, injecting fuel into regulation system. **Check for gas leaks with soap suds solution. There must be no leak.**

Before starting the engine, refer to Fig. 2 and adjust carburetor as follows

   a. Loosen **main adjusting screw locknut.** Adjust screw to 15/32 inch dimension shown. Tighten locknut. (After the engine is started and warmed up for several minutes, adjust the **idle** and **main adjusting** screws for smoothest operation.)

2. **Prime engine** by cranking through 2 or 3 suction strokes, with the carburetor **choke closed.** (Choke closed when lever is in upward position).

3. With the magneto or ignition switch in the running position, **open choke halfway** from full closed position.

4. Crank engine over slowly to compression stroke, then turn back one-half turn. Wind rope fully on starter sheave and pull briskly in a clockwise direction. After engine starts, open choke fully.

Refer to **Trouble Shooting** section if starting troubles or frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

SK-1249 and SK-1249-B CONVERSION KIT INSTRUCTIONS on Page 4.

SK1249A LPG Vapor Withdrawal Fuel System (Replaced By SK1249B)

USE WITH MODELS AENLDG, AENL

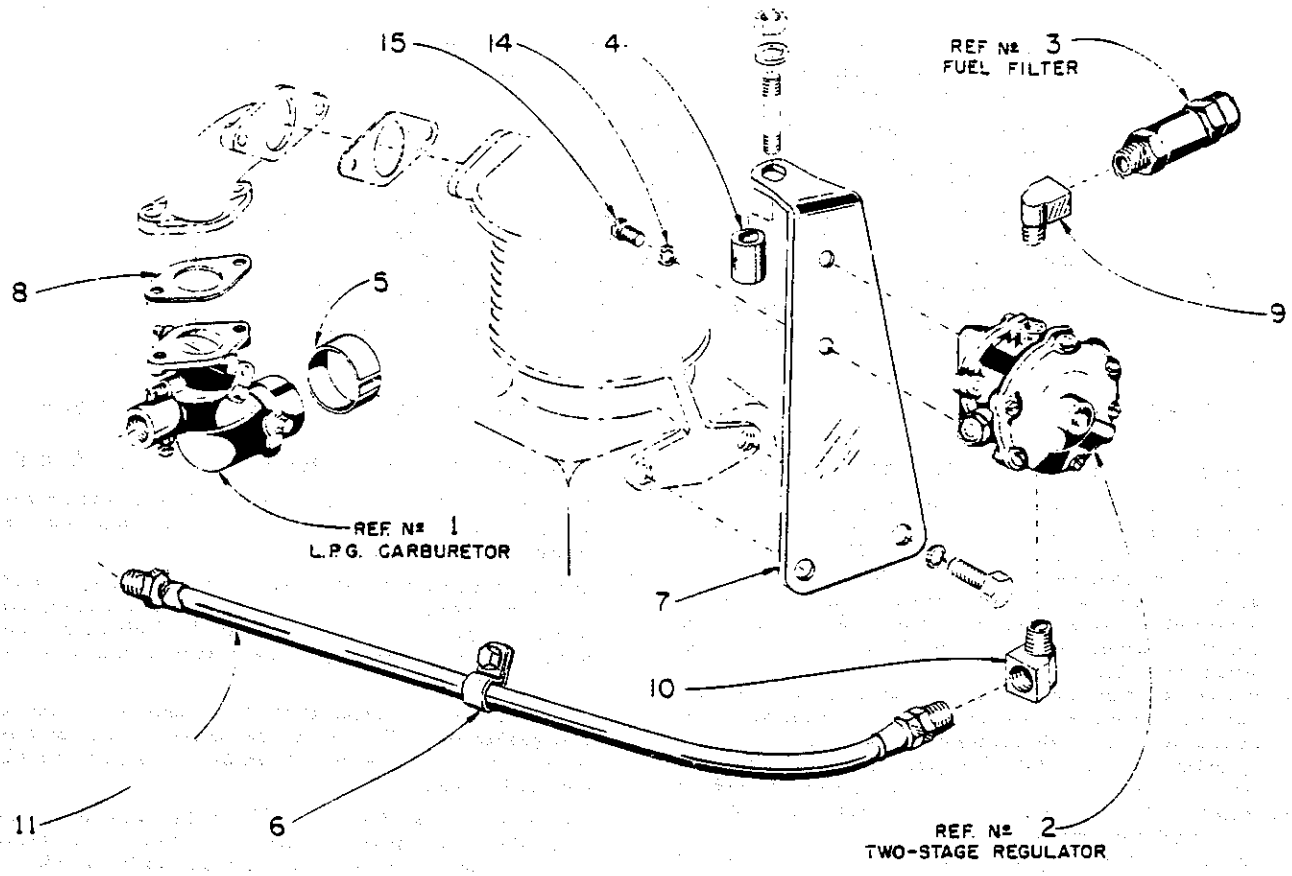


Fig. 4

Fig. 4

ITEM	PART NO.	DESCRIPTION	QTY
—	† AE75D	Exhaust valve	1
—	† AF54	Valve spring	1
—	† AG31	Valve rotator and spring seat	1
—	† BI291S1	Air cleaner bracket	1
—	† HG273D	Exhaust valve seat insert	1
—	† SD53H	Instruction plate (NLA)	1
—	† YD35	Spark plug, Champion no. D9J	1
1	L65S1	LPG carburetor, Zenith model LPEU71, no. GO12161	1
2	L109	Garretson regulator (replaces L121 Beam regulator)	1
3	LP51	Fuel filter, Zenith no. GF483	1
4	HF432A	Spacer	1
5	HF536	Spacer	1
6	PG725	Clip	1
7	PG1021A	Regulator bracket	1
8	QC71	Gasket	1
9	RF1099	Elbow, 1/4"	1
10	RF1311	Elbow, 1/4" pipe thread, 5/8"-18 tap	1
11	RM1303B	Flexible fuel line (NLA)	1
14	PE3	Lock washer, 1/4"	2
15	XA34	Screw, 1/4"-20 thread x 1/2" long	2

† Not included in the SK1249B conversion kit.

SK1249A LPG Vapor Withdrawal Fuel System (Replaced By SK1249B)

CONVERSION SUGGESTIONS

Engines to be converted to L.P.G. must be in good mechanical condition. Those which have poor compression, weak ignition, or similar defects cannot and will not produce the engine's ultimate capabilities.

The spark plug furnished with your gasoline engine will successfully ignite L.P.G. However, improved performance and longer spark plug life can be achieved by using a colder plug. These are available from your WISCONSIN dealer.

Factory built L.P.G. burning engines are furnished with STELLITE exhaust valve and seat insert along with a positive type valve rotator. For conversion purposes, the regular valves in the engine will last as long on L.P.G. as they do under the same conditions on gasoline. However, if valve replacement is necessary, you can obtain from 3 to 5 times longer valve life by installing a STELLITE exhaust valve Conversion kits for this purpose are also available at your WISCONSIN dealer.

LIQUID WITHDRAWAL – Fig. 1 and Fig. 3

I. CONVERSION PROCEDURE: PER SK-1249 KIT

1. Remove gasoline carburetor, fuel strainer, and fuel tank from engine. Plug tank bracket taps in crankcase with washers (Ref. 27) and screws (Ref. 30).
2. If inlet manifold does not have a 1/8" pipe plug located above the carburetor flange, remove manifold and tap for a manifold pressure checking outlet (1/8" pipe tap). Assemble a square head pipe plug in tapped hole and remount manifold.
3. Remove air shroud cover. Install vaporizer bracket (Ref. 10) to cylinder head mounting bosses at location shown. Secure in place with capscrews provided. Install new cylinder head stud (Ref. 7) in place of present stud. Remount air shroud cover and add vaporizer brace (Ref. 9).
4. Install L.P.G. carburetor (Ref. 1) to intake manifold. Insert regulator bracket (Ref. 12) to manifold flange as shown. Carburetor air horn diameter 1½" – use air horn spacer (Ref. 5) for adaption to air cleaner bracket.
5. Pre-assemble fuel filter (Ref. 4) to vaporizer (Ref. 3) inlet with pipe nipple (Ref. 17). Secure secondary regulator (Ref. 2) in place by connecting pipe nipples (Ref. 17 and 18) and pipe elbow (Ref. 16) to vaporizer outlet as illustrated in Fig's. 1 and 3.
6. Mount pre-assembled regulator unit to vaporizer bracket (Ref. 10), locking vaporizer in place with spacer (Ref. 6), support brace (Ref. 11) and capscrew shown. Align fuel filter and secure in place to brace (Ref. 9). Align secondary regulator and fasten to bracket (Ref. 12) with elbow (Ref. 19), locknut (Ref. 8) and gasket (Ref. 14).
7. Mount elbow (Ref. 20) to fitting (Ref. 19) and connect fuel line to carburetor.
8. Install vent screens (Ref. 15) to secondary regulator.
9. Connect fuel inlet line from storage cylinder to fuel filter inlet. Inlet line must be approved L.P. fuel hose and should be flexible. (Fuel inlet line and storage cylinder furnished by customer). **Check all connections for gas leaks with soap suds solution. There must be no leaks.**
10. Start engine and adjust idle speed.
11. After warm-up period, increase engine speed and regulate main adjustment on carburetor for smooth operation.

VAPOR WITHDRAWAL – Fig. 2 and Fig. 4

II. CONVERSION PROCEDURE: PER SK-1249-B KIT

1. Remove gasoline carburetor, fuel tank and bracket assembly. Retain bracket screws and lockwashers for mounting regulator bracket.
2. If inlet manifold does not have a 1/8" pipe plug located above the carburetor flange, remove manifold and tap for a manifold pressure checking outlet (1/8" pipe tap). Assemble a square head pipe plug in tapped hole and remount manifold.
3. Mount L.P.G. carburetor (Ref. 1) to manifold, using a new gasket (Ref. 8). Carburetor air horn is 1½" diameter – use air horn spacer (Ref. 5) for adaption to air cleaner bracket.
4. Assemble elbows (Ref. 9 and 10) to the two-stage regulator. Mount two-stage regulator (Ref. 2) to bracket (Ref. 7) with screws (Ref. 15) and lockwashers (Ref. 14).
5. Mount bracket (Ref. 7) with regulator attached, to engine crankcase and cylinder head stud. Use tank bracket screws for mounting pad on side of crankcase. Use new spacer (Ref. 4) for mounting bracket to cylinder head.
6. Connect fuel line (Ref. 11), from carburetor to regulator, using support clip (Ref. 6) mounted to cylinder at take-off end.
7. Mount fuel filter (Ref. 3) to fitting at regulator inlet.
8. Install fuel line from storage tank to fuel filter. Inlet line must be approved L.P. fuel hose and should be flexible. (Fuel inlet line and storage cylinder furnished by customer). **Check all connections for gas leaks with soap suds solution. There must be no leaks.**
9. Start engine and adjust idle speed. See **Starting Procedure**, Page 1.
10. After warm-up period, increase engine speed and regulate main adjusting screw on carburetor for smooth operation.

SK1254F1 LPG Liquid Withdrawal Fuel System

USE WITH MODELS THDG, TJDG

Fig. 2

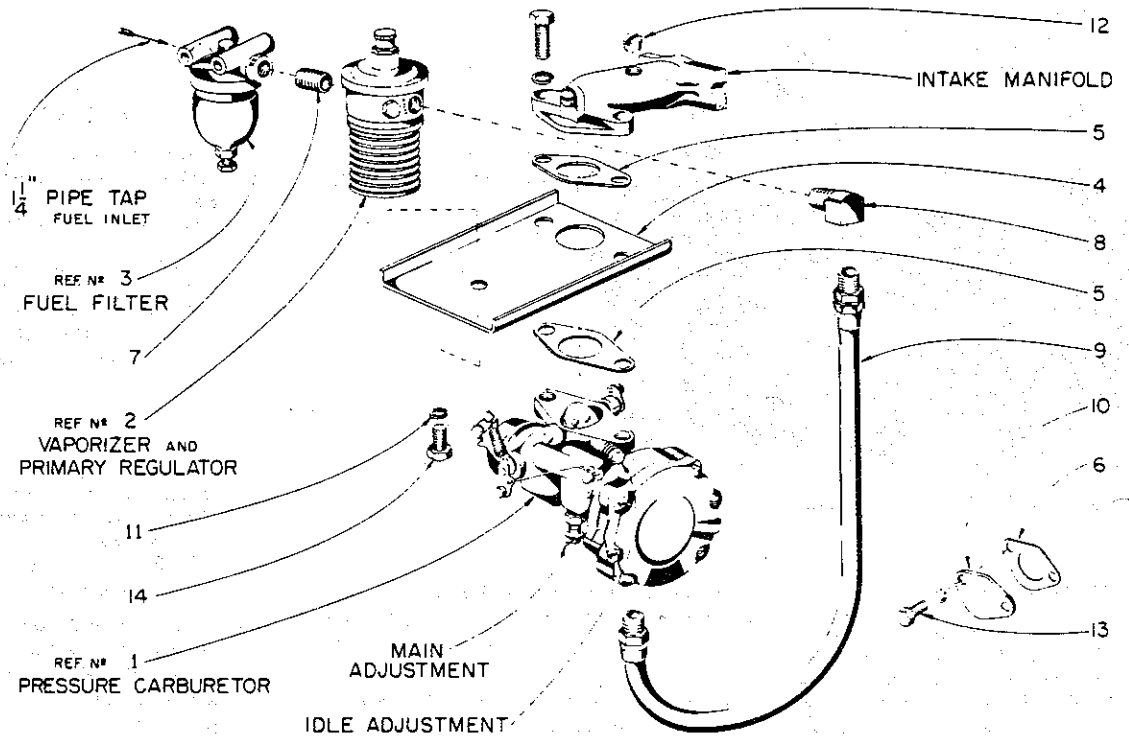


Fig. 2

ITEM	PART NO.	DESCRIPTION	QTY
—	† AE75D	Exhaust valve	2
—	† AF54	Valve spring	2
—	† AG31	Valve rotator and spring seat	2
—	† HG273D	Exhaust valve seat insert	2
—	† LC266A3	Inlet manifold	1
—	† YD35	Spark plug, Champion no. D9	2
1	L79AS1	Pressure carburetor, Zenith no. GO12723	1
2	L114	Garretson vaporizer and primary regulator	1
3	LP50A	Fuel filter	1
4	PG830	Bracket	1
5	QC71A	Gasket	2
6	QD670	Gasket	1
8	RF1311	Elbow, 1/4" pipe thread, 5/8"-18 tap	1
9	RM1303D	Fuel line	1
10	SA92	Cover	1
11	PE5	Lock washer, 3/8"	1
12	PF18	Pipe plug, 1/8"	2
13	XD4	Screw, 1/4"-20 thread x 1/2" long	2
14	XD114	Screw, 3/8"-16 thread x 1/2" long	1
—	XK16	Reducer bushing	1

† Not included in the SK1254F1 conversion kit.

SK1254F1, SK1254G1 LPG Liquid And Vapor Withdrawal Fuel Systems

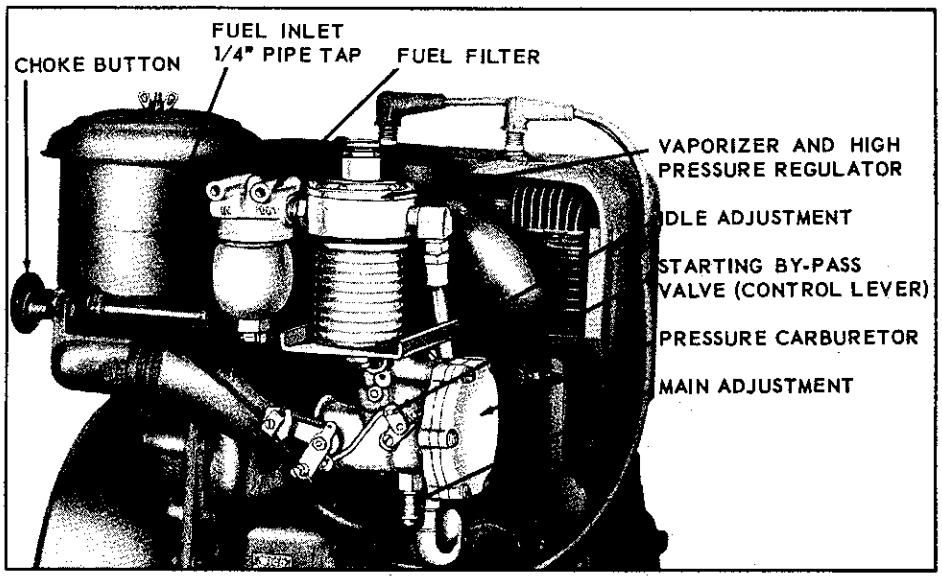


Fig. 1. LIQUID WITHDRAWAL – See Fig. 3 for Vapor Withdrawal

GENERAL INFORMATION

Liquefied petroleum gas (L.P.G.) consists of petroleum fractions or derivatives known and identified commercially as BUTANE, PROPANE, or a mixture of the two gases. When these gases are pressurized, they assume a liquid state which is more suitable and economical for handling. At normal atmospheric temperature and pressure, L.P. fuel is in a vapor state. As one receives this fuel in a container, it is compressed so that the storage tank is approximately 80% full of liquid fuel. The pressure in this container at 70°F will be in the vicinity of 100 pounds per square inch (p.s.i.). Depending on the mixture of the fuel and the effect of ambient temperature, it can be noted that as the temperature decreases, the pressure decreases. For example, at 0°F, the pressure will be approximately 20 p.s.i. in the cylinder.

FUEL SYSTEM

LIQUID WITHDRAWAL, Fig. 1

When the fuel is removed from the bottom of cylinder (LIQUID WITHDRAWAL SYSTEM) fuel expansion and vaporization takes place in the **high pressure regulator.** To prevent this regulator from freezing, which occurs due to a refrigeration effect, it is necessary to add heat. A heat exchanger or **vaporizer** is therefore added around the regulator to prevent such freezing.

The fuel is discharged from the vaporizer at a pressure of 10 p.s.i. and passes to the regulator inlet of the carburetor. The **pressure carburetor** is designed to deliver fuel for the required speed and load of the engine.

VAPOR WITHDRAWAL, Fig. 3

Fuel removed from the top of cylinder (VAPOR WITHDRAWAL SYSTEM) enters the in-line **fuel filter** and **primary regulator** in a **vapor** state and thus no heat exchanger is required. However, if fuel is used at an excessive rate, freezing may occur in the tank. In this case, a liquid withdrawal system is required to obtain better control of the fuel through the use of a vaporizer.

The fuel discharged from the **primary regulator** enters the **pressure carburetor** in the same manner as noted in the liquid withdrawal system.

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Due to local climatic differential, information for proper cylinder selection should be received from your local L.P.G. distributor. (Fuel inlet line and storage cylinder furnished by customer).

Connect fuel inlet line from storage cylinder to fuel filter.

STARTING PROCEDURE

1. Open fuel tank shut off valve, injecting fuel into regulation system. **Check for gas leaks with soap suds solution. There must be no leaks.**
2. Before starting a new engine, refer to Fig. 1 and adjust carburetor as follows: Turn **idle adjustment** screw in until it seats. **Caution:** Do not use excessive force. Adjust 1¾ turns out from its seat. Next, turn **main adjustment** screw in until it seats, then turn back 1½ turns.
3. With the magneto or ignition switch in the running position, pull choke button to full outward position. This closes choke completely and opens **starting bypass valve.**
   NOTE: Choke must be closed at every starting attempt.
4. Pull up briskly on the starting cra - do not attempt to **spin** the engine a the crank. After engine starts, immediately release choke button to full open position.
5. Allow engine to warm up a few minutes before applying load. The idle and main adjustments should be regulated for smooth operation. These adjustments need only be made the first time the engine is started, or if there is an extensive change in weather temperatures.

Refer to **Trouble Shooting** section if starting troubles or frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

SK-1254-F-1 LIQUID WITHDRAWAL AND SK-1254-G-1 VAPOR WITHDRAWAL CONVERSION KIT INSTRUCTIONS on Page 4.

SK1254G1 LPG Vapor Withdrawal Fuel System

USE WITH MODELS THDG, TJDG

Fig. 3

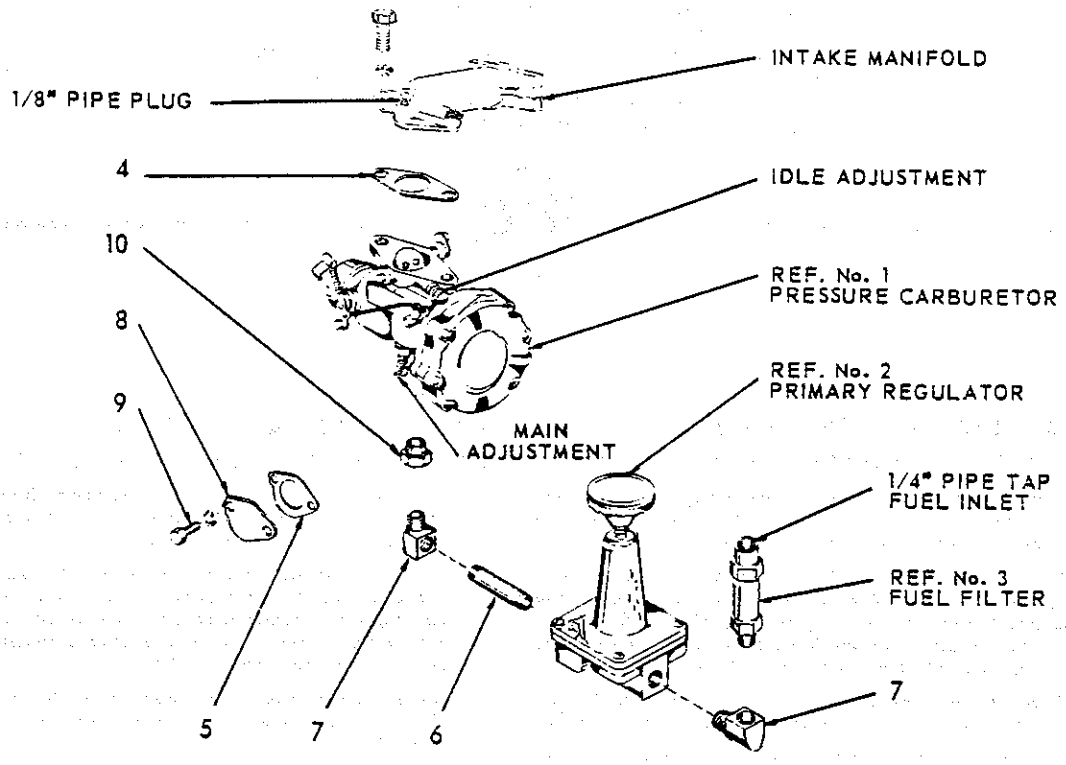


Fig. 3

ITEM	PART NO.	DESCRIPTION	QTY
—	† AE75D	Exhaust valve	2
—	† AF54	Valve spring	2
—	† AG31	Valve rotator and spring seat	2
—	† HG273D	Exhaust valve seat insert	2
—	† YD35	Spark plug, Champion no. D9	2
1	L79AS1	Pressure carburetor, Zenith model PC1Y8SD, no. GO12723	1
2	L69B2	Primary regulator, Rego Regulator Co. no. 567EA (replaces Watts regulator MZ5 mounted to manifold flange with PG1026 bracket, PD215 lock nut)	1
3	LP51	Fuel filter, Zenith no. GF483	1
4	QC71A	Gasket	1
5	QD670	Gasket	1
6	RF376	Pipe nipple, 1/4" thread x 2-3/4" long (NLA)	1
7	RF1099	Elbow, 1/4"	2
8	SA92	Cover	1
9	XD4	Screw, 1/4"-20 thread x 1/2" long	2
10	XK16	Reducer bushing, 3/8" to 1/4" pipe	1

† Not included in the SK1254G1 conversion kit.

SK1254F1, SK1254G1 LPG Liquid And Vapor Withdrawal Fuel Systems

Engines to be converted to L.P.G. must be in good mechanical condition. Those which have poor compression, weak ignition, or similar defects cannot and will not produce the engine's ultimate capabilities.

Spark plugs furnished with your gasoline engine will successfully ignite L.P.G. However, improved performance and longer spark plug life can be achieved by using colder plugs. These are available from your WISCONSIN dealer.

LIQUID WITHDRAWAL, Fig. 1 and 2

I. CONVERSION PROCEDURE for SK-1254-F-1 Kit

1. Remove gasoline carburetor, fuel pump, fuel strainer, fuel tank and bracket assembly from engine. Retain carburetor screws and lockwashers.
2. Remove intake manifold and add a 1/8" pipe tap on top, as shown in Fig. 2. This tap is for checking manifold pressure. Insert pipe plug (Ref. 12) into tap and also replace square head pipe plug at carburetor flange, with slotted head plug. Remount manifold.
3. Mount gasket (Ref. 6) and cover (Ref. 10) to fuel pump pad on crankcase, with lockwasher and screw (Ref. 13).
4. Pre-assemble fuel filter (Ref. 3) to inlet of vaporizer (Ref. 2), secure with pipe nipple (Ref. 7). Mount unit to vaporizer bracket (Ref. 4). Secure vaporizer in place with capscrew and lockwasher (Ref. 11 and 14).
5. Mount pressure carburetor (Ref. 1) to inlet manifold, inserting vaporizer-bracket assembly in between, using flange gaskets (Ref. 5) and standard screws and washers.
6. Assemble elbow (Ref. 8) to vaporizer outlet and connect fuel line (Ref. 9) to carburetor inlet.
7. Connect fuel inlet line from storage cylinder to fuel filter inlet. Inlet line must be approved L.P. fuel hose and should be flexible. (Fuel inlet line and storage cylinder furnished by customer.) Check all connections for gas leaks with soap suds solution. There must be no leaks.
8. Start engine and adjust idle speed. See Starting Procedure, Page 1.
9. After warm-up period, increase engine speed and regulate main adjustment on carburetor for smooth operation.

VAPOR WITHDRAWAL, Fig. 3

II. CONVERSION PROCEDURE for SK-1254-G-1 Kit

1. Remove gasoline carburetor, fuel pump, fuel strainer, fuel tank and bracket assembly from engine. Retain carburetor screws and lockwashers.
2. If inlet manifold does not have a 1/8" pipe plug located above the carburetor flange, remove manifold and tap for a manifold pressure checking outlet (1/8" pipe tap). Assemble a square head pipe plug in tapped hole and remount manifold.
3. Mount gasket (Ref. 5) and cover (Ref. 8) to fuel pump pad on crankcase, with lockwasher and capscrew (Ref. 9).
4. Pre-assemble reducer bushing (Ref. 10) and elbow (Ref. 7) to inlet tap at bottom of carburetor. Note; the elbow (Ref. 7) should be positioned so that primary regulator (Ref. 2) will be directly in back of carburetor. Mount primary regulator pipe nipple (Ref. 6) to elbow.
5. Pre-assemble fuel filter (Ref. 3) to primary regulator (Ref. 2) with elbow (Ref. 7). Mount this assembly to pipe nipple (Ref. 6) at bottom of carburetor.
6. Mount pressure carburetor (Ref. 1) with primary regulator and fuel filter attached, to intake manifold. Use new flange gasket (Ref. 4), and standard screws with lockwashers retained per paragraph 1.
7. Connect fuel inlet line from storage cylinder to fuel filter inlet. Inlet line must be approved L.P. fuel hose and should be flexible. (Fuel inlet line and storage cylinder furnished by customer). Check all connections for gas leaks with soap suds solution. There must be no leaks.
8. Start engine and adjust idle speed. See Starting Procedure, Page 1.

   After warm-up period, increase engine speed and regulate Main Adjustment on carburetor for smooth operation.

I. ENGINE WILL NOT START

Before starting work on any LP gas equipment, be sure that engine's malfunction does not exist in the ignition system. Reference can be made to the Engine Instruction Book for **TROUBLES, CAUSES** and **REMEDIES.**

(A) Check for fuel flow to carburetor.

1. Fuel tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after tank is filled). Close tank valve and open slowly.
4. Check fuel line, and for damaged or stopped-up fuel filter.

(B) Adhere to starting procedure.

1. Regulate carburetor idle and main adjustments.
2. Reset starting by-pass valve in pressure carburetor by closing choke fully.

(C) Primary regulator adjustment.

Refer to Form ML-14-2 for primary regulator adjustment procedure. Because special gauges are required, it is recommended that the regulator be checked by an authorized service dealer.

II. FROST – DURING OPERATION

(A) Frost on fuel filter, shut-off valve, or inlet line caused by opening outlet valve on tank too rapidly. Caution must be taken in opening fuel supply valve **slowly.**

(B) If carburetor, vapor lines, and regulator are frosted over, close tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

1. Frost on vapor lines between vaporizer and pressure-carburetor is caused by inadequate vaporizing; engine taking load too rapidly.
2. Frost on connection fittings. Check for fuel leaking, kinked lines, or restriction at frosted area.

(C) Frost on tank can be caused:

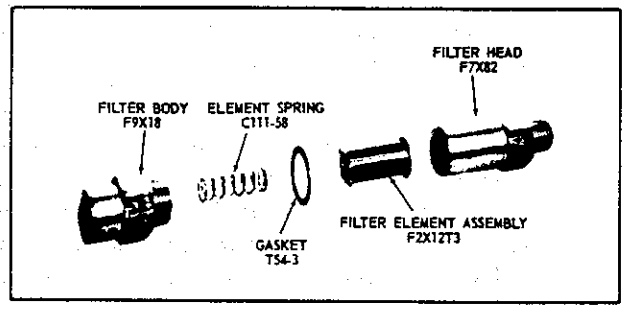
1. In liquid system by a dip tube fracture.
2. In vapor system by too rapid fuel withdrawal for tank size. Larger tank may need to be used.

NOTE: On a vapor system, connection must be made to the vapor outlet valve.

III. FLOODED SYSTEM

If system is flooded, crank engine with throttle wide open, to dissipate rich mixture. It may be necessary to shut off fuel supply at fuel tank to clear carburetion system.

LP51 LPG Vapor Withdrawal Fuel System (Zenith No. GF483)



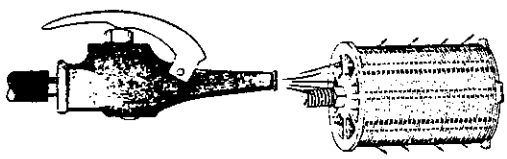
ZENITH PART NUMBERS SHOWN

MAINTENANCE

This filter is designed to be installed in the fuel line. It is made to operate under working pressures up to 250 p.s.i. and is approved by UL for such use.

The filter is made to protect the equipment on which it is used, by removing all foreign particles of .003" or larger. Consequently, from time to time it will be necessary to clean the filter element.

To clean the filter it is necessary to detach the fuel line from the filter head. The head may then be unscrewed from the filter body. Remove the element assembly from the head. Wash the element in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, we suggest a short soaking period in solvent cleaner. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW — FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT. The element may then be reassembled in the filter head with the assurance that none of the dirt that has been separated can possibly enter the system. None of the dirt is forced through the discs.

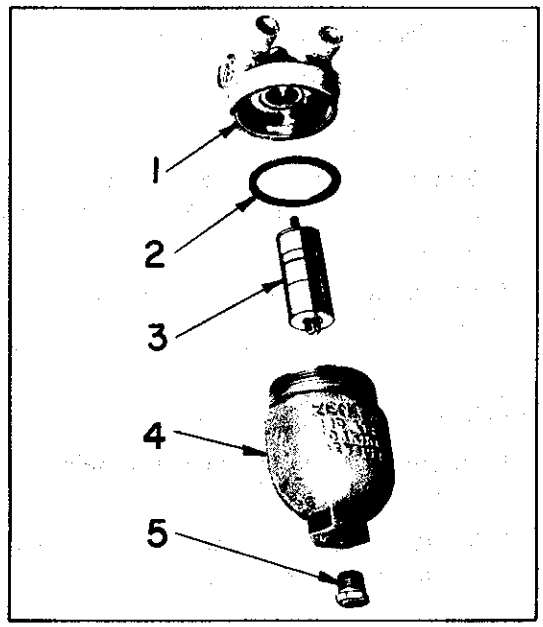


NEVER DIP ELEMENT IN 'BRIGHT DIP' OR OTHER ACID SOLUTION

In reassembling the filter, it is important that the element be inserted into the filter head with the round washer entering first into the opening. The gasket is put on the filter body and the spring is located into the filter body so that when the filter is put together the spring holds the element against the head.

LP50A LPG Liquid Withdrawal Fuel System (Zenith No. GF462-1-2)

The two principle parts should be assembled with 75 foot pounds torque. After the unit has been reinstalled, the joint at the gasket should be checked with a soap bubble solution to be sure there is no leak. The fuel line connections should also be checked.



Ref No	ZENITH Part Number	Description	No Req
1		**FILTER HEAD**	1
2	F1X127	**GASKET** for bowl	1
3	F3X9T2	**FILTER ELEMENT**	1
4		**FILTER BOWL**	1
5	CT91-3	**PLUG** for bowl drain 1/8" hexagon head pipe.	1

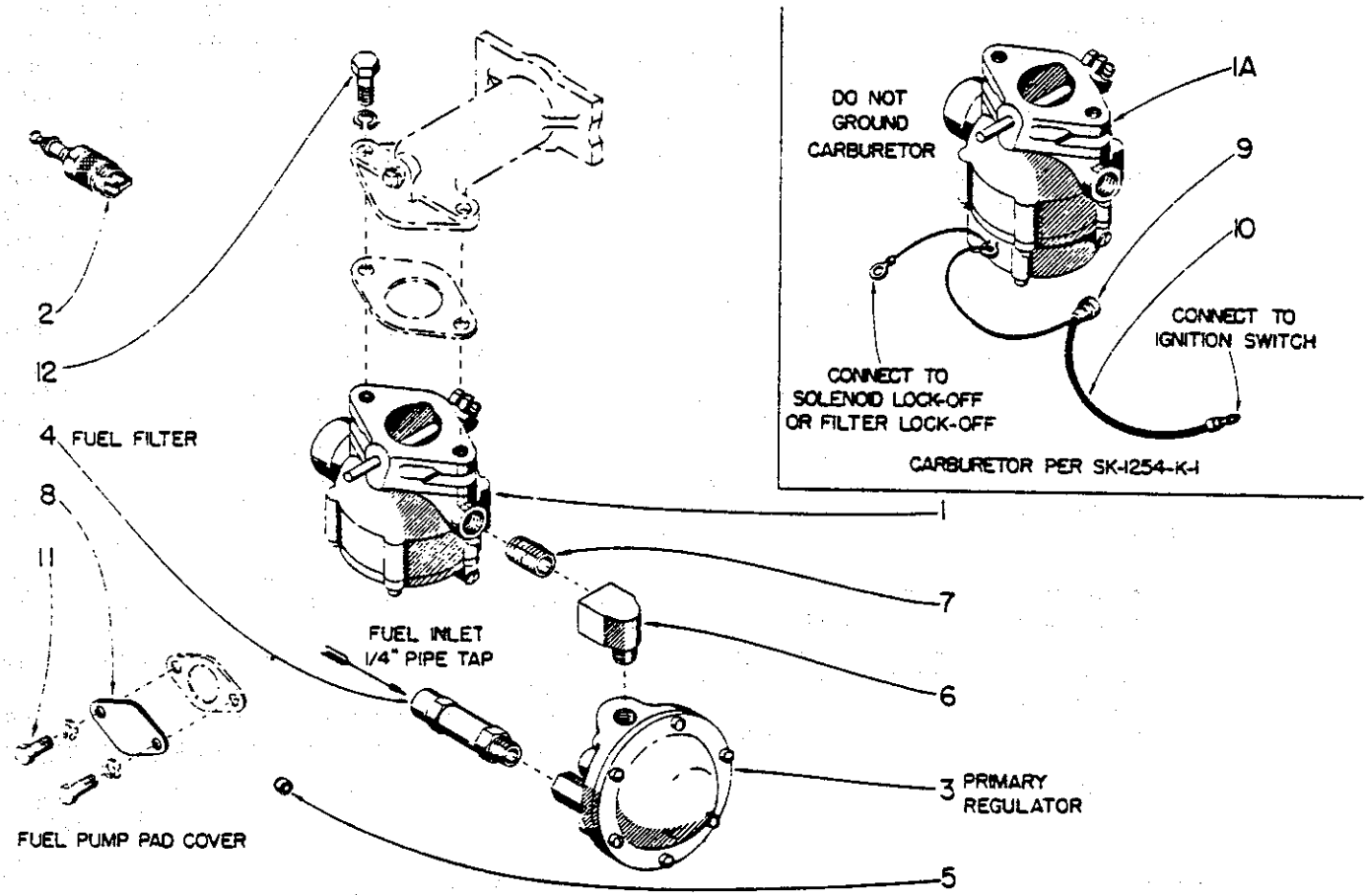
MAINTENANCE

Fuel filter can be drained by removing plug (5) at bottom of the filter body (4).

To clean filter, it is necessary to unscrew body (4) from its head (1). Remove the element assembly (3) from the head. Element can be washed in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, a short soaking period is suggested. The element should then be rinsed and dried. Check "O" ring (2). Replace if necessary.

SK1254K, SK1254K1 Algas LPG Vapor Withdrawal Fuel Systems

USE WITH MODEL THDG OPEN ENGINE AND POWER UNIT



NOTE: SK1254K1 has provision for automatic lock-off. All parts are the same for both SK1254K and SK1254K1 except where noted.

ITEM	PART NO.	DESCRIPTION	QTY
1	L92	Carburetor, SK1254K Algas ind. no. 01-0012 (was 5508-5)	1
1A	L92A	Carburetor, SK1254K1 Algas ind. no. 01-0013	1
2	YD35	Spark plug, Champion no. D9J	2
3	L92BS1	Primary regulator, Algas ind. no. 1000-17	1
4	LP51	Fuel filter	1
5	PF131	Plug	1
6	RF1405	Elbow	1
7	RF1487	Pipe nipple	1
8	SA92	Cover	1
9	YD270	Wire connector, SK1254K1	1
10	YL352B13	Wire assembly, SK1254K1	1
11	XD4	Screw, 1/4"-20 thread x 1/2" long	2
12	XD15	Screw, 5/16"-18 thread x 3/4" long	2

SK1254K, SK1254K1 Algas LPG Vapor Withdrawal Fuel Systems (Cont.)

L.P.G. TROUBLE SHOOTING

I. ENGINE WILL NOT START

Before investigating the L.P.G. equipment, be sure that engine's malfunction does not exist in the **ignition system.** Refer to Engine Instruction Book for **TROUBLES, CAUSES** and **REMEDIES.**

(A) Check for fuel flow to carburetor.

1. Fuel storage tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after fuel tank is filled, or if valve is opened too abruptly). Close tank valve, listen for *'click'*, and then open **very slowly.**
4. Check fuel line for leaks, and damaged or stopped-up fuel filter. Use a soap solution on hose joints.
5. Disconnect air cleaner hose at carburetor, and crank engine with ignition on, for 3 or 4 seconds. Then, reach inside carburetor and depress diaphragm very lightly. If the sound of fuel rushing out is heard, the diaphragm is not lifting fuel valve off the seat, indicating a punctured or crinkled diaphragm. *See Form* **ML-32** *for Carburetor Service and Parts.* If the rush of fuel is **not** heard, the problem is either in the vacuum switch or lock-off filter.
6. Check solenoid lock-off filter and vacuum switch (if furnished). Turn ignition on and crank engine. If the solenoid *'click'* can be heard, both lock-off and vacuum switches are working. If not; disassemble, clean and repair.

(B) Test pressures.

1. A fuel pressure check between the converter (or primary regulator) and carburetor should show:
   Static Pressure – 1-3/4 P.S.I. max.
   Running Pressure at Idle – 1-1/4 P.S.I.
   Pressure is critical and should not climb.
2. A correct reading indicates no trouble exists in the gas system from tank to carburetor.
3. If fuel pressure is too high or climbs – trouble is in the converter (or primary regulator). *See Form* **ML-26** *for Converter Service and Parts,* or **ML-29** for primary regulator (vapor withdrawl).

(C) Adhere to starting procedure

1. Regulate carburetor idle and power adjustments.

II. FROST

(A) Frost on fuel filter, shut-off valve, or inlet line – caused by opening outlet valve on fuel tank too rapidly. Open fuel supply valve **slowly.**

1. Frost at filter – restricted filter element. Replace or clean per *Fuel Filter* paragraphs.

(B) If carburetor, fuel lines, and converter (or primary regulator) frosted over, close storage tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

1. Frost on fuel lines between converter (or primary regulator) carburetor is caused by inadequate vaporizing – engine taking load too rapidly.
2. Frost on connection fittings. Check for fuel leaking, kinked lines, or restriction at frosted area.

(C) Frost at converter.

1. Engine stopped – indicates fuel leaking through both lock-off and carburetor.
2. Engine running – insufficient heat at converter. Warm engine thoroughly before applying load.

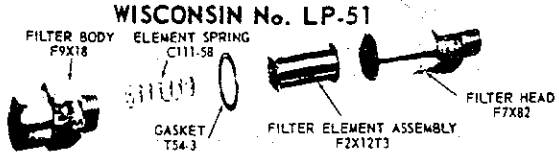
(D) Frost on fuel storage tank.

1. Fractured dip tube in fuel cylinder.

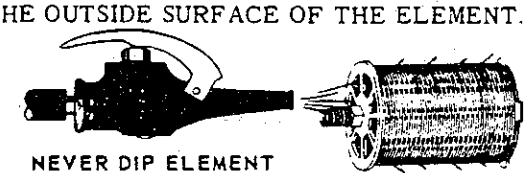
FUEL FILTER FOR LIQUID WITHDRAWAL
WISCONSIN No. LP-60 or LP-60-A

At least once a year remove sediment bowl; clean interior of bowl and replace filter with a new Algas No. 701 element. If contaminated fuel conditions exist, it will be necessary to replace cartridge element more frequently. A dirty element will cause a frosting condition to occur at the fuel filter, and will also result in loss of power.

IN-LINE FUEL FILTER FOR VAPOR WITHDRAWAL
WISCONSIN No. LP-51



To clean filter, unscrew head from filter body, remove element and wash in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, soak in solvent. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW–FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT.



NEVER DIP ELEMENT
IN 'BRIGHT DIP' OR OTHER ACID SOLUTION

In reassembly, it is important that the element be inserted into filter head with round washer entering first into opening. The gasket is put on the filter body and the spring is located into body so that when filter is put together the spring holds the element against the head.

Assemble head to body with 75 foot pounds torque. After unit has been reinstalled, the joint at gasket and fuel line connections should be checked with a soap bubble solution to be sure there are no leaks.

SK1254K, SK1254K1, SK1254L, SK1254L1 LPG Liquid And Vapor Withdrawal Fuel Systems

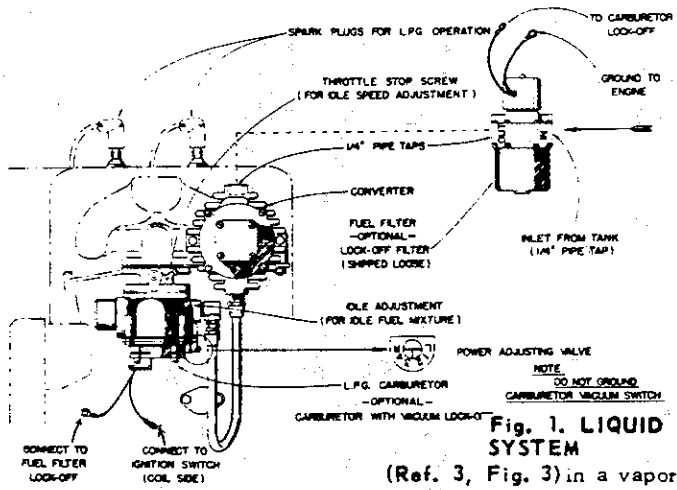


Fig. 1. LIQUID WITHDRAWAL SYSTEM

FUEL

If available, use PROPANE HD 5 in place of commercial propane. This is a special grade of fuel specifically developed for internal combustion engines.

Pressure in an L.P. gas tank, approximately 80% full of liquid fuel, will be in the vicinity of 100 pounds per square inch at 70° F. An increase in temperature will increase pressure, while lower temperatures will reduce pressure.

Due to local climatic changes, information on size of fuel tank should be received from your local L.P.G. distributor. (Fuel inlet line and fuel tank furnished by customer.) Fuel tanks are also referred to as fuel or storage cylinders.

FUEL SYSTEMS

LIQUID WITHDRAWAL (Fig. 1)

Liquid fuel is taken from the bottom of the storage cylinder, under tank pressure, and flows thru a fuel filter. The fuel then enters a converter, which vaporizes the fuel as a heat exchanger and controls the outlet pressure to the carburetor as a regulator. The carburetor receives vaporized fuel under pressure from the converter and measures it relative to the quantity of air entering the carburetor.

The regulator section of the converter reduces the tank pressure to 1-1/4 P.S.I. for engine idle, and 1-3/4 P.S.I. at full load.

VAPOR WITHDRAWAL (Fig. 3)

On engines requiring limited amounts of fuel for operation, connections are made for VAPOR WITHDRAWAL from tank. The primary regulator reduces tank pressure to the 1-1/4 to 1-3/4 P.S.I. required.

Fuel is taken from the top of storage cylinder and enters the primary regulator, (Ref. 3, Fig. 3) in a vapor state. No heat exchanger is required. However, if fuel is used at an excessive rate, freezing may occur in the tank. This problem can be eliminated by selecting a larger fuel cylinder or by locating tank in a warmer place.

SAFETY FEATURES

Lock-off filter and carburetor with lock-off vacuum switch can be furnished, if engine is equipped with battery ignition.

Lock-off filter will automatically shut off the flow of gas to the converter when engine is stopped. Carburetor lock-off vacuum switch shuts off the ignition if engine inadvertently stops.

STARTING PROCEDURE

No choking or priming are required: positive pressure maintains vaporized fuel at carburetor for instantaneous injection into engine at first movement of piston.

1. CAUTION: 'Slowly' open main gas valve in fuel tank. An abrupt full opening of the valve will induce dirt from within the tank to enter the fuel line. Too rapid an opening can also cause frost to form on the fuel filter, main valve and inlet line. Check for gas leaks with soap suds solution. There must be no leaks.
2. If the engine is equipped with a variable speed governor control, set throttle about ½ open; with a two-speed control, start in full load position.
3. Disengage clutch, if furnished.
4. With the magneto or ignition switch in the running position, pull up briskly on the starting crank – do not attempt to spin engine with crank.
   With electric starting motor: Depress starter button in place of hand cranking.
5. Allow engine to warm up a few minutes before applying load. New engines should

"run-in" gradually. SEE INSIDE COVER OF INSTRUCTION MANUAL.

The idle and power valve adjustments should be regulated for smooth operation, if necessary. These adjustments may be required on new engines due to climatic conditions. See 'CARBURETOR ADJUSTMENT' paragraphs for procedure.

Refer to Trouble Shooting section, Page 4, if starting troubles or frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

CARBURETOR ADJUSTMENT

There are three external adjustments as illustrated in Fig. 1: Power adjusting valve (for load speed), idle adjustment (for idle fuel mixture) and throttle stop screw (for idle speed).

Note: All adjustments are made when engine is tested at the factory. If engine starts, idles smoothly and goes from low to high speed without hesitation, do not change carburetor settings.

Idle Adjustment: If engine idle is rough or is too fast, adjust in the following manner: Turn idle adjustment out 4 turns from its seat. Start engine and set throttle control at low idle. Turn throttle stop screw until engine is running slightly faster than normal idle speed. Next, turn idle adjustment screw in until engine begins to stall, then turn screw out until engine runs steadily and smoothly. Engine will be idling faster than required at this point, so back out throttle stop screw until a slow smooth idle is obtained.

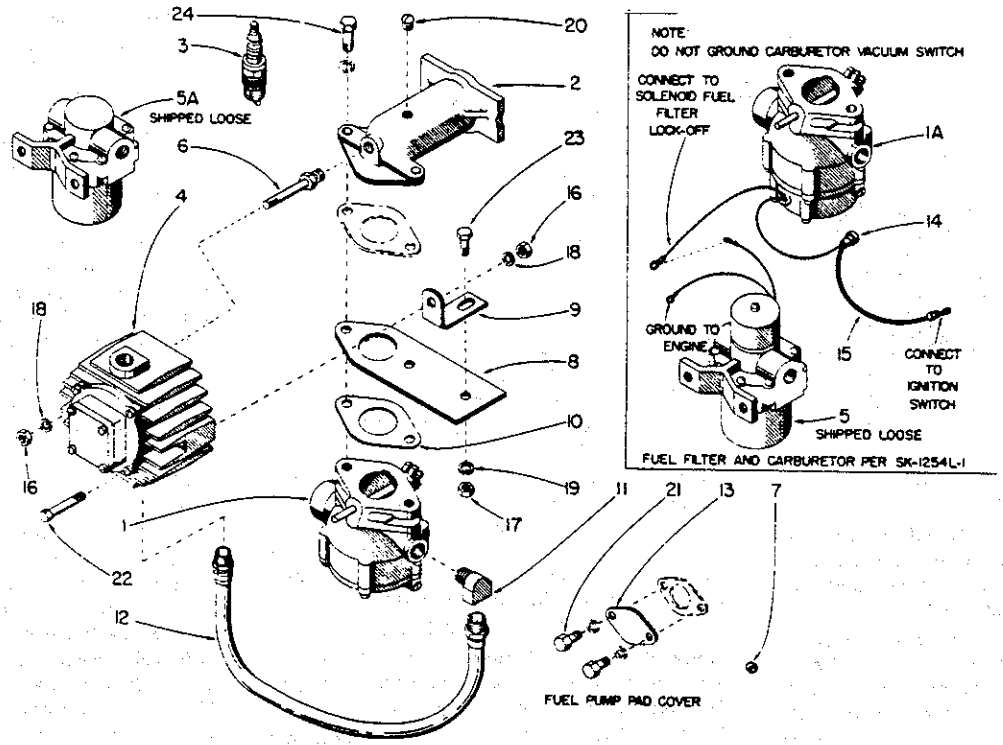
If a vacuum gauge is available, adjust to highest manifold vacuum, with engine running at low idle speed. The intake manifold has 1/8" pipe tap for vacuum check.

Power adjusting valve is of a simple air bleed design. A dial on the carburetor diaphragm body indicates the rich and lean settings. By means of a screw driver, set scribe mark on head of power adjusting valve, between number 2 and 3 on dial. This setting has been calibrated to meet average loading and operating conditions.

A more accurate, and recommended adjustment, is accomplished with a fuel or exhaust analyzer: with the engine warmed up and operating at FULL LOAD, turn power adjusting valve clockwise, toward rich marking on dial, until a reading of 13 to 1 air fuel ratio is registered by the gas analyzer (14 to 1 if gasoline analyzer is used). A very slight movement of the power valve between number 2 and 3 on dial is required for an efficient setting. Turn adjustment clockwise for a rich mixture, counter-clockwise for a lean mixture.

SK1254L, SK1254L1, SK1254L2 Algas LPG Liquid Withdrawal Fuel Systems

USE WITH MODEL THDG OPEN ENGINE AND POWER UNIT

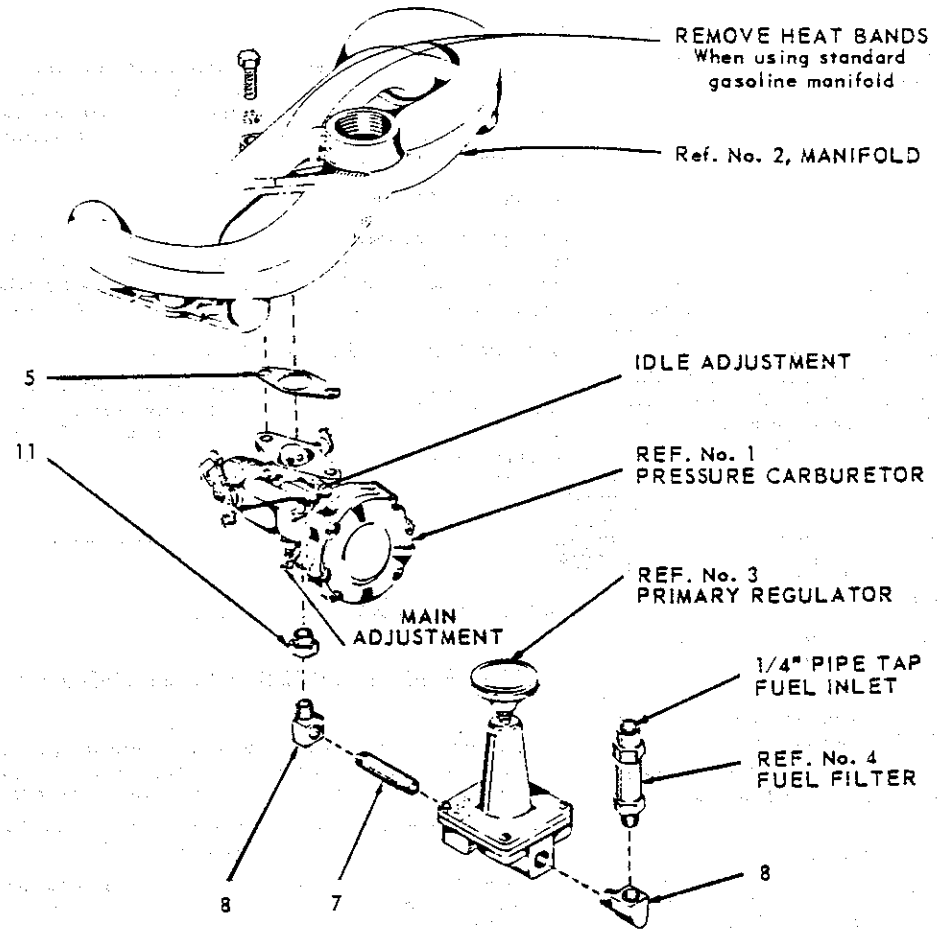


NOTE: SK1254L1 has provision for automatic lock-off. All parts are the same for both SK1254L and SK1254L1 except where noted. SK1254L2, same as SK1254L except reversed carburetor mounting. LZ92 carburetor replaces L92 (carburetor bowl rotated 180°) and LO67C breather assembly added.

ITEM	PART NO.	DESCRIPTION	QTY
1	L92	Carburetor, SK1254L Algas ind. no. 01-0012 (was 5508-5)	1
1A	L92A	Carburetor, SK1254L1 Algas ind. no. 01-0013	1
2	LC266A3	Inlet manifold	1
3	YD35	Spark plug, Champion no. D9J	2
4	L90A	Converter, Algas ind. no. C250AH5 (NLA)	1
5	LP60	Filter lock-off, SK1254L1 Algas ind. model 820-12	1
5A	LP60A	Fuel filter, SK1254L Algas ind. no. 830	1
6	PC616	Stud (NLA)	1
7	PF131	Plug	1
8	PG1026B	Bracket (NLA)	1
9	PG1226	Brace	1
10	QC71A	Gasket	1
11	RF1302	Elbow	1
12	RM1303	Fuel line (NLA)	1
13	SA92	Cover	1
14	YD270	Wire connector, SK1254L1	1
15	YL352B13	Wire, SK1254L1	1
16	PD77	Nut, 1/4"-20 thread	2
17	PD79	Nut, 5/16"-18 thread	1
18	PE3	Lock washer, 1/4"	2
19	PE5	Lock washer, 3/8"	1
20	PF18	Pipe plug, 1/8"	1
21	XD4	Screw, 1/4"-20 thread x 1/2" long	2
22	XD10	Screw, 1/4"-20 thread x 1-3/4" long	1
23	XD15B	Screw, 5/16"-18 thread x 3/4" long	1
24	XD16B	Screw, 5/16"-18 thread x 7/8" long	2

SK1260D LPG Vapor Withdrawal Fuel System

USE WITH MODELS VH4DG, VH4D



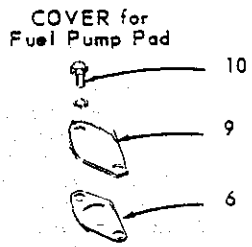


Fig. 4

Fig. 4

ITEM	PART NO.	DESCRIPTION	QTY
—	† AB100B	Cylinder head	2
—	† AE75D	Exhaust valve	4
—	† AF54	Valve spring	4
—	† AG31	Valve rotator and spring seat	4
—	† HG273D	Exhaust valve seat insert	4
—	† YD35	Spark plug, Champion no. D9	4
1	L79BS1	Pressure carburetor, Zenith no. GO12720 (NLA)	1
2	† LD253B	Manifold (open engine)	1
—	† LD253B1	Manifold (power unit)	1
3	L69B2	Primary regulator, Rego Regulator Co. no. 567EA (replaces Watts regulator MZ5)	1
4	LP51	Fuel filter, Zenith no. GF483	1
5	QC71A	Gasket	1
6	QD67	Gasket	1
7	RF376	Pipe nipple, 1/4" thread x 2-3/4" long (NLA)	1
8	RF1099	Elbow, 1/4" pipe	2
9	SA69	Cover	1
10	XD4	Screw, 1/4"-20 thread x 1/2" long	2
11	XK16	Reducer bushing, 3/8" to 1/4" pipe	1

† Not included in the SK1260D conversion kit.

SK1260D LPG Vapor Withdrawal Fuel System (Cont.)

Engines to be converted to L.P.G. must be in good mechanical condition. Those which have poor compression, weak ignition, or similar defects cannot and will not produce the engine's ultimate capabilities.

CYLINDER HEADS

When burning L.P. fuel, it is necessary to increase the engine compression ratio to achieve optimum performance. Special cylinder heads are installed on factory built engines to accomplish compression increase and are not part of the conversion kit. Such cylinder heads are available from your authorized Wisconsin dealer. However, satisfactory operation is obtainable with present cylinder heads, although a small percentage of power loss, compared to gasoline operation, can be expected.

MANIFOLD

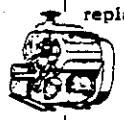
In order to vaporize gasoline, a metal band connects the inlet and exhaust portion of the manifold. As L.P.G. is already a gas by the time it reaches the inlet manifold, this heat band MUST be severed or removed as shown in the installation sketches.

SPARK PLUGS

Spark plugs furnished with your gasoline engine will successfully ignite L.P.G. However, improved performance and longer spark plug life can be acheived by using colder plugs. These are available from your WISCONSIN dealer.

VARIABLE SPEED GOVERNOR CONTROL

Engines equipped with a knob type speed control at the flywheel end of the engine, will encounter interference between the control lever and pressure carburetor. A TT-45L-11 variable speed governor control assembly is available for replacement.



LIQUID WITHDRAWAL, Fig. 1 and 3

I. CONVERSION PROCEDURE for SK-1260-E Kit

1. Disconnect air cleaner elbow and remove gasoline carburetor, fuel strainer, fuel pump, and fuel pump adapter.
2. Remove manifold from engine and cut away heat bands as illustrated in Fig. 3. Reassemble manifold.
3. Mount fuel pump pad cover plate (Ref. 12) and gasket (Ref. 7) with capscrews (Ref. 14) and standard lockwashers.
4. Assemble elbow (Ref. 10) to carburetor, then, mount pressure carburetor (Ref. 1) to manifold flange, inserting vaporizer bracket (Ref. 5) in between, using new flange gaskets (Ref. 6), screws (Ref. 15) and standard lockwashers.
5. Pre-assemble elbow (Ref. 9) to outlet in vaporizer. Mount fuel filter (Ref. 4) to vaporizer inlet with pipe nipple (Ref. 8).
6. Mount vaporizer assembly (Ref. 3) to bracket (Ref. 5) with lockwasher (Ref. 13) and screw (Ref. 16).

   NOTE: On power units, it will be necessary to cut a 2" dia. hole in the partition plate of the house canopy, for vaporizer clearance.
7. Attach fuel line (Ref. 11), from vaporizer elbow (Ref. 9) to carburetor elbow (Ref. 10).

   NOTE: Fuel line must not touch manifold.
8. Connect fuel inlet line from storage cylinder to fuel filter inlet. Inlet line must be approved L.P. fuel hose and should be flexible. (Fuel inlet line and storage cylinder furnished by customer). Check all connections for gas leaks with soap suds solution. There must be no leaks.
9. Start engine and adjust idle speed as per Starting Procedure on Page 1.
10. After warm-up period, increase engine speed and regulate main adjustment on carburetor for smooth operation.

VAPOR WITHDRAWAL, Fig. 2 and 4

II. CONVERSION PROCEDURE for SK-1260-D Kit

1. Disconnect air cleaner elbow and remove gasoline, carburetor, fuel strainer, fuel pump, and fuel pump adapter. Retain carburetor screws and lockwashers.
2. Remove manifold from engine and cut away heat bands as illustrated in Fig. 4. Reassemble manifold.
3. Mount fuel pump pad cover plate (Ref. 9) and gasket (Ref. 6) with capscrews (Ref. 10) and standard lockwashers.
4. Pre-assemble reducer bushing (Ref. 11) and elbow (Ref. 8) to inlet tap at bottom of carburetor. Note; the elbow (Ref. 8) should be positioned so that primary regulator (Ref. 3) will be directly in back of carburetor. Mount primary regulator pipe nipple (Ref. 7) to elbow.
5. Pre-assemble fuel filter (Ref. 4) to primary regulator (Ref. 3) with elbow (Ref. 8). Mount this assembly to pipe nipple (Ref. 7) at bottom of carburetor.
6. Mount pressure carburetor (Ref. 1) with primary regulator and fuel filter attached, to manifold (Ref. 2). Use new flange gasket (Ref. 5), and standard screws with lockwashers retained per paragraph 1.
7. Connect fuel inlet line from storage cylinder to fuel filter inlet. Inlet line must be approved L.P. fuel hose and should be flexible. (Fuel inlet line and storage cylinder furnished by customer). Check all connections for gas leaks with soap suds solution. There must be no leaks.
8. Start engine and adjust idle speed. See Starting Procedure, Page 1.

   After warm-up period, increase engine speed and regulate Main Adjustment on carburetor for smooth operation.

SK1260E LPG Liquid Withdrawal Fuel System

USE WITH MODELS VH4DG, VH4D

Fig. 3

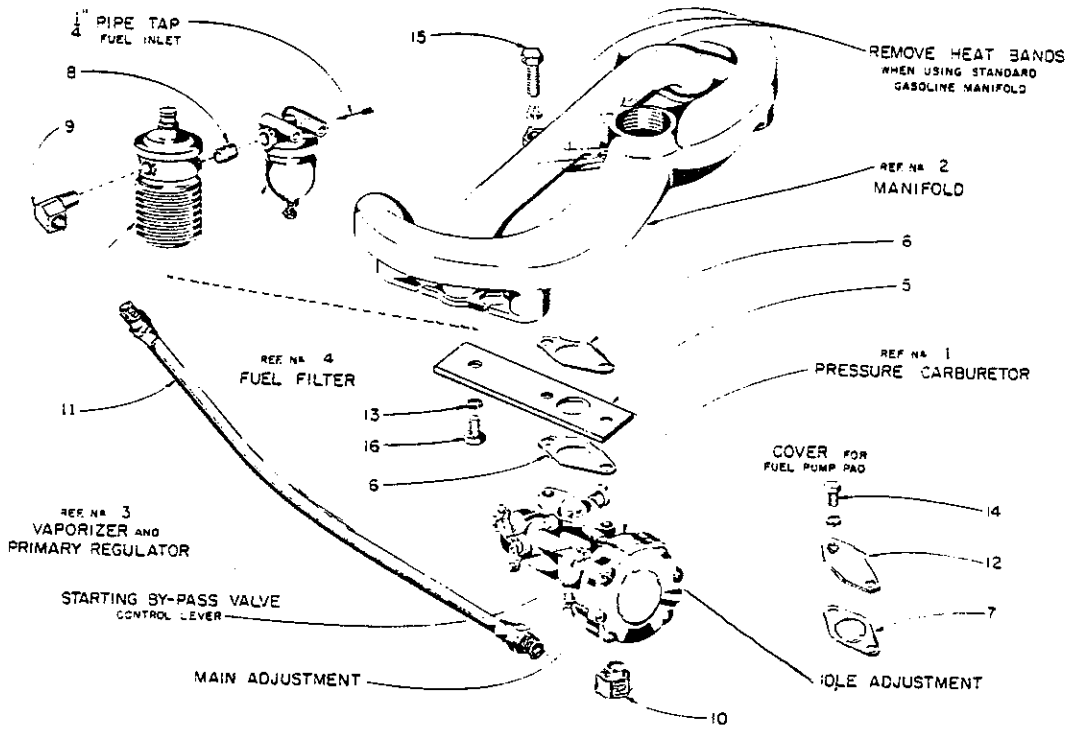


Fig. 3

ITEM	PART NO.	DESCRIPTION	QTY
—	† AB100B	Cylinder head	2
—	† AE75D	Exhaust valve	4
—	† AF54	Valve spring	4
—	† AG31	Valve rotator and spring seat	4
—	† HG273D	Exhaust valve seat insert	4
—	† YD35	Spark plug, Champion no. D9	4
1	L79BS1	Pressure carburetor, Zenith no. GO12720 (NLA)	1
2	† LD253B	Manifold (open engine)	1
—	† LD253B1	Manifold (power unit)	1
3	L114	Garretson vaporizer and primary regulator	1
4	LP50A	Fuel filter	1
5	PG849	Bracket	1
6	QC71A	Gasket	2
7	QD67	Gasket	1
8	RF503	Pipe nipple, 1/4" pipe x 7/8" long	1
9	RF1311	Elbow, 1/4" pipe thread, 5/8"-18 tap	1
10	RF1405	Street elbow, 3/8" pipe	1
11	RM1303A	Fuel line	1
12	SA69	Cover	1
13	PE5	Lock washer, 3/8"	1
14	XD4	Screw, 1/4"-20 thread x 1/2" long	2
15	XD19	Screw, 5/16"-18 thread x 1-1/4" long	2
16	XD114	Screw, 3/8"-16 thread x 1/2" long	1

† Not included in the SK1260E conversion kit.

SK1260D, SK1260E LPG Liquid And Vapor Withdrawal Fuel Systems

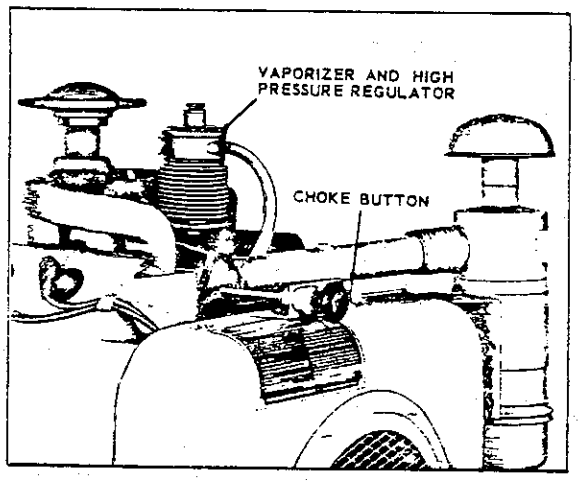


Fig. 1, LIQUID WITHDRAWAL SYSTEM

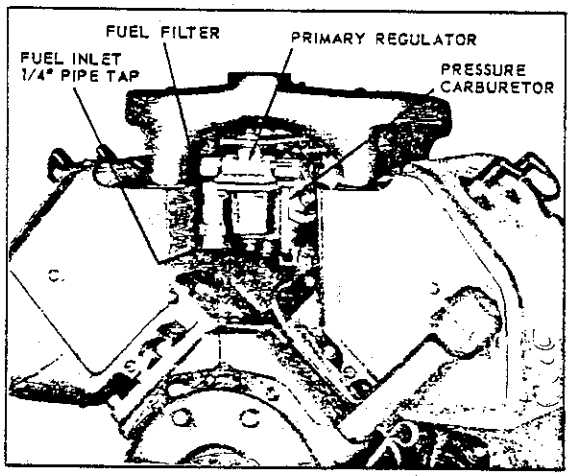


Fig. 2, VAPOR WITHDRAWAL SYSTEM

GENERAL INFORMATION

Liquefied petroleum gas (L.P.G.) consists of petroleum fractions or derivatives known and identified commercially as BUTANE, PROPANE, or a mixture of the two gases. When these gases are pressurized, they assume a liquid state which is more suitable and economical for handling. At normal atmospheric temperature and pressure, L.P. fuel is in a vapor state. As one receives this fuel in a container, it is compressed so that the storage tank is approximately 80% full of liquid fuel. The pressure in this container at 70°F will be in the vicinity of 100 pounds per square inch (p.s.i.). Depending on the mixture of the fuel and the effect of ambient temperature, it can be noted that as the temperature decreases, the pressure decreases. For example, at 0°F, the pressure will be approximately 20 psi in the cylinder.

FUEL SYSTEM

LIQUID WITHDRAWAL, Fig. 1 and 3

When the fuel is removed from the bottom of cylinder (LIQUID WITHDRAWAL SYSTEM) fuel expansion and vaporization takes place in the high pressure regulator. To prevent this regulator from freezing, which occurs due to a refrigeration effect, it is necessary to add heat. A heat exchanger or vaporizer is therefore added around the regulator to prevent such freezing.

The fuel is discharged from the vaporizer at a pressure of 10 p.s.i. and passes to the regulator inlet of the carburetor. The pressure carburetor is designed to deliver fuel for the required speed and load of the engine.

VAPOR WITHDRAWAL, Fig. 2 and 4

Fuel removed from the top of cylinder (VAPOR WITHDRAWAL SYSTEM) enters the in-line fuel filter and primary regulator in a vapor state and thus no heat exchanger is required. However, if fuel is used at an excessive rate, freezing may occur in the tank. In this case a liquid withdrawal system is required to obtain better control of the fuel through the use of a vaporizer.

The fuel discharged from the primary regulator enters the pressure carburetor in the same manner as noted in the liquid withdrawal system.

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Due to local climatic differential, information for proper cylinder selection should be received from your local L.P.G. distributor. (Fuel inlet line and storage cylinder furnished by customer).

Connect fuel inlet line from storage cylinder to fuel filter.

STARTING PROCEDURE

1. Open fuel tank shut-off valve, injecting fuel into regulation system. Check for gas leaks with soap suds solution. There must be no leaks.
2. Before attempting to start a new engine, refer to Fig. 3 or 4 and adjust the carburetor as follows: Turn idle adjustment screw in until it seats. Caution: Do not use excessive force. Then, adjust 1¼ turns out from its seat. Next, turn main adjustment screw in until it seats, then turn back 1½ turns.
3. With the magneto or ignition switch in the running position, pull choke button to full outward position. This closes choke completely and opens starting bypass valve.
   NOTE: Choke must be closed at every starting attempt.
4. Pull up briskly on the starting crank — do not attempt to spin the engine with the crank. After engine starts, immediately release choke button to full open position.

   With electric starting motor: Depress starter button in place of hand cranking.
5. Allow engine to warm up a few minutes before applying load. The idle and main adjustments should be regulated for smooth operation. These adjustments need only be made the first time the engine is started, or if there is an extensive change in weather temperatures.

Refer to Trouble Shooting section if starting troubles or frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

SK-1260-E LIQUID WITHDRAWAL AND SK-1260-D VAPOR WITHDRAWAL CONVERSION KIT INSTRUCTIONS on Page 4.

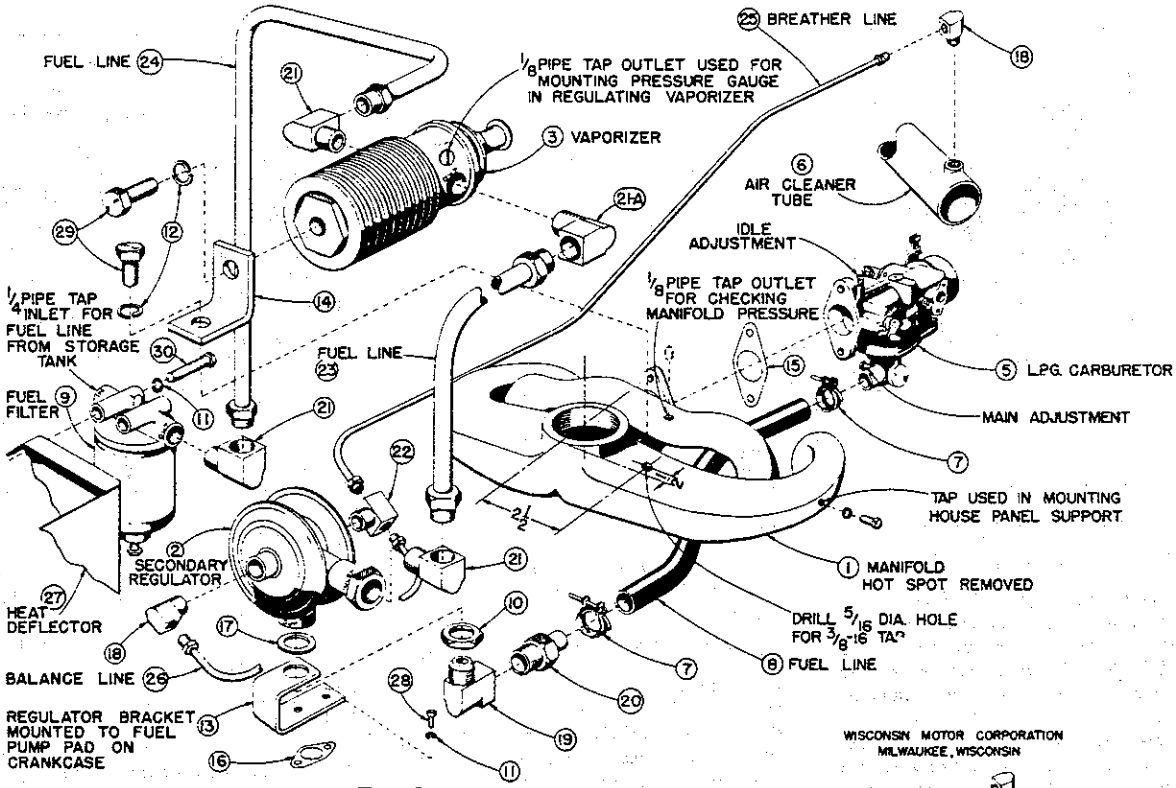


Fig. 2. LIQUID WITHDRAWAL

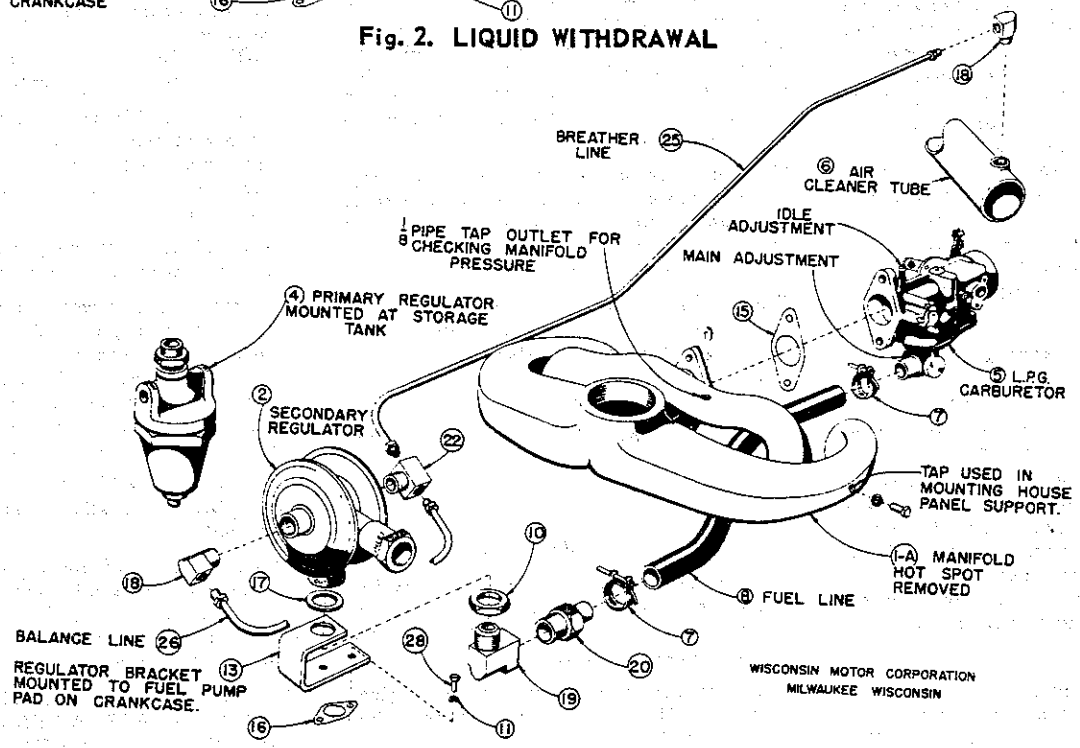


Fig. 3. VAPOR WITHDRAWAL

SK1262A, SK1262B LPG Burning Engines

USE WITH MODEL VG4DG OPEN ENGINE (see pg. 99)

ITEM	PART NO.	DESCRIPTION	QTY
—	AB97B	Cylinder head	2
1	LD240B2	Manifold (liquid system) (NLA)	1
1A	LD240B3	Manifold (vapor system)	1
—	PH30A	Flat washer	2
—	SD115Q	Instruction and name plate (NLA)	1
—	XD3	Cap screw, 1/4"-20 thread x 3/8" long	2
—	YD35	Spark plug	4
2	L66B	Secondary stage regulator, Zenith model B806B	1
3	L67C	Vaporizer and primary regulator, Zenith model A963B2 (liquid system) (NLA)	1
4	L69B	Primary regulator, Zenith model B806-26 (vapor system)	1
5	L70	LPG carburetor, Zenith model LP87A8	1
6	LJ131B	Air cleaner tube	1
7	LK23	Hose clamp, 15/16" I.D.	2
8	LL130	Fuel line, 9/16" I.D. 15/16" O.D. (NLA)	1
9	LP50A	Fuel filter, Zenith model GF462 (liquid system)	1
10	PD209A	Lock nut, 3/4"-16 thread	1
11	PE3	Lock washer, 1/4" I.D.	4
12	PE5	Lock washer, 3/8" I.D. (liquid system)	2
13	PG845	Secondary regulator bracket	1
14	PG846	Vaporizer support (liquid system) (NLA)	1
15	QC12A	Carburetor gasket (standard)	3
16	QD67	Gasket	1
17	QD740	Regulator gasket	1
18	RF1123	Inverted flare male elbow, 1/8" P.T. (NLA)	2
19	RF1300A	Male elbow, 3/4"-16 thread	1
20	RF1310A	Straight hose connector	1
21	RF1333	Inverted flare male elbow, 1/4" P.T. (liquid system) (NLA)	3
21A	RF1331	Inverted flare male elbow, 3/8"P.T. (liquid system) (NLA)	1
22	RF1312	Inverted flare male tee, 1/8" P.T. (NLA)	1
23	RM1067A	Fuel line (liquid system) (NLA)	1
24	RM1337A	Fuel line (liquid system) (NLA)	1
25	RM1083A	Breather line (NLA)	1
26	RM1304	Balance line (NLA)	1
27	SE128D	Cylinder heat deflector (liquid system)	1
28	XD4	Cap screw, 1/4"-20 thread x 1/2" long	2
29	XD114	Cap screw, 3/8"-16 thread x 5/8" long (liquid system)	2
30	XD147	Cap screw, 1/4"-20 thread x 2-1/2" long (liquid system)	2

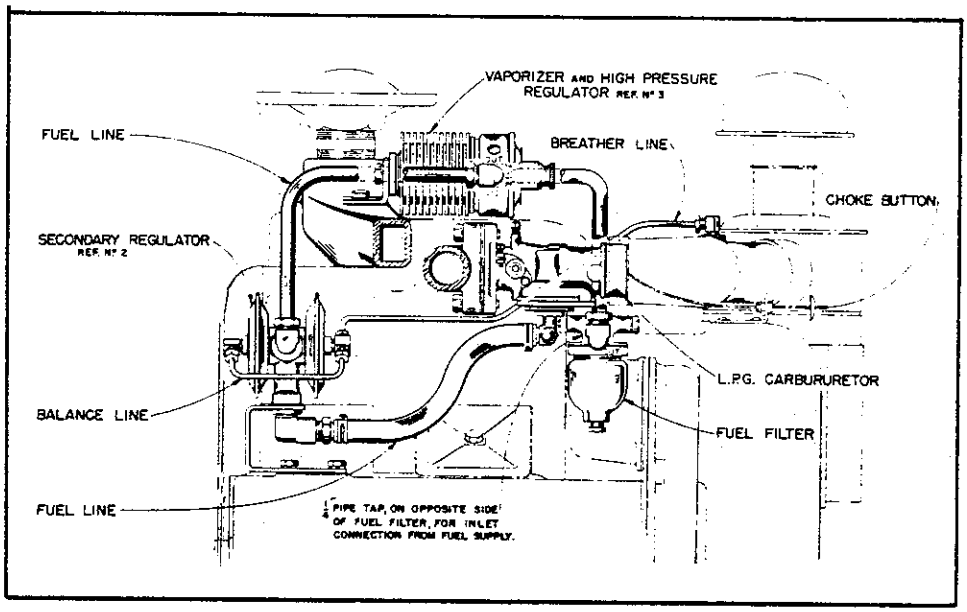


Fig. 1. LIQUID WITHDRAWAL SYSTEM

GENERAL INFORMATION

Liquefied petroleum gas (L.P.G.) consists of petroleum fractions or derivatives known and identified commercially as BUTANE, PROPANE, or a mixture of the two gases. When these gases are pressurized, they assume a liquid state which is more suitable and economical for handling. At normal atmospheric temperature and pressure, L.P. fuel is in a vapor state. As one receives this fuel in a container, it is compressed so that the storage tank is approximately 80% full of liquid fuel. The pressure in this container at 70°F will be in the vicinity of 100 pounds per square inch (p.s.i.). Depending on the mixture of the fuel and the effect of ambient temperature, it can be noted that as the temperature decreases, the pressure decreases. For example, at 0°F, the pressure will be approximately 20 psi in the cylinder. **Selection of fuel cylinder size and withdrawal system are very important for satisfactory operation.** The fuel may be taken from the top of the tank as a vapor, or from the bottom of the tank as a liquid. In either case, the heat of vaporization is about 790 BTU per gallon.

Due to local climatic differential, information for proper cylinder selection should be received from your local L.P.G. distributor.

FUEL SYSTEM

When the fuel is removed from the bottom of cylinder (LIQUID WITHDRAWAL SYSTEM) fuel expansion and vaporization takes place in the **high pressure regulator.** To prevent this regulator from freezing, which occurs due to a refrigeration effect, it is necessary to add heat. A heat exchanger is therefore added around this regulator to prevent such freezing. The **Wisconsin heat exchanger, (VAPORIZER, Ref. 3, Fig. 1, 2 and 4),** has been located and calibrated to supply this need.

Fuel removed from the top of cylinder (VAPOR WITHDRAWAL SYSTEM) enters the **primary regulator, (Ref. 4, Fig. 3** and 5) in the vapor state and needs no heat exchanger. However, if fuel is required at an excessive rate, freezing may occur in the tank. This problem can be eliminated by selecting a larger fuel container or by locating tank in a warmer place.

Under the influence of tank pressure, the fuel passes through a **fuel filter,** and in some cases, through a solenoid lock-off valve, actuated by the ignition switch, before reaching the **primary regulator.** This regulator reduces the 100 psi tank pressure to 6 to 8 (p.s.i.). As the liquid fuel is converted from 100 psi line pressure to the lower pressure, it tends to vaporize. The resulting drop in temperature must be offset by a transfer of heat from the engine. This is accomplished by passing warm air over the heat exchanger restoring heat normally lost in vaporization of the fuel.

The dry gas then passes to the **secondary, or low pressure regulator, (Ref. 2),** which has a discharge pressure slightly below atmospheric pressure. The fuel is then delivered to the **carburetor** from the **secondary regulator** as required by speed and load of the engine.

On engines requiring limited amounts of fuel for operation, connections are made for a VAPOR WITHDRAWAL installation at the tank. On such installations, the addition of external heat for vaporization is not required, as noted above. Pressure regulation is required to reduce tank pressure to required values in the same manner as for liquid withdrawal system.

STARTING PROCEDURE

Connect fuel inlet line from storage cylinder to **fuel filter inlet** on a liquid withdrawal system or to the **primary regulator** on a vapor withdrawal system. Inlet line must be approved L.P. fuel hose and should be flexible **(fuel inlet line and storage cylinder furnished by customer).**

Open fuel tank shut off valve, injecting fuel into regulation system. Check for gas leaks with soap suds solution. There must be no leak.

With the magneto switch or ignition switch in running position, prime engine by hav- choke fully closed. The choke is closed when button is pulled out, and open when button is pushed in. Turn engine through two or three suction strokes, resulting in fuel entering the carburetion system.

Open choke slightly by pushing choke inward approximately 1/4 to 3/8 travel from full closed position. Crank engine briskly- engine should fire after a few turns. If necessary, repeat cranking engine.

When engine fires, choke should be opened gradually as engine warms up.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

SK1275 LPG Burning Engine

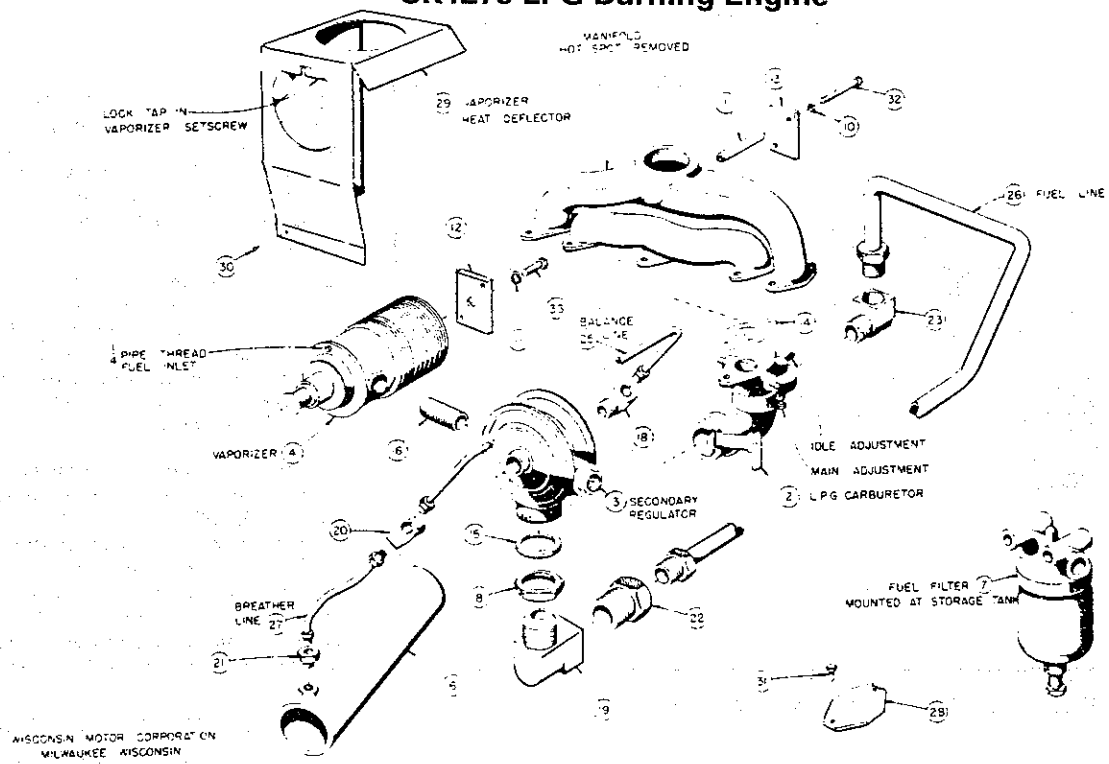


Fig. 2. LIQUID WITHDRAWAL

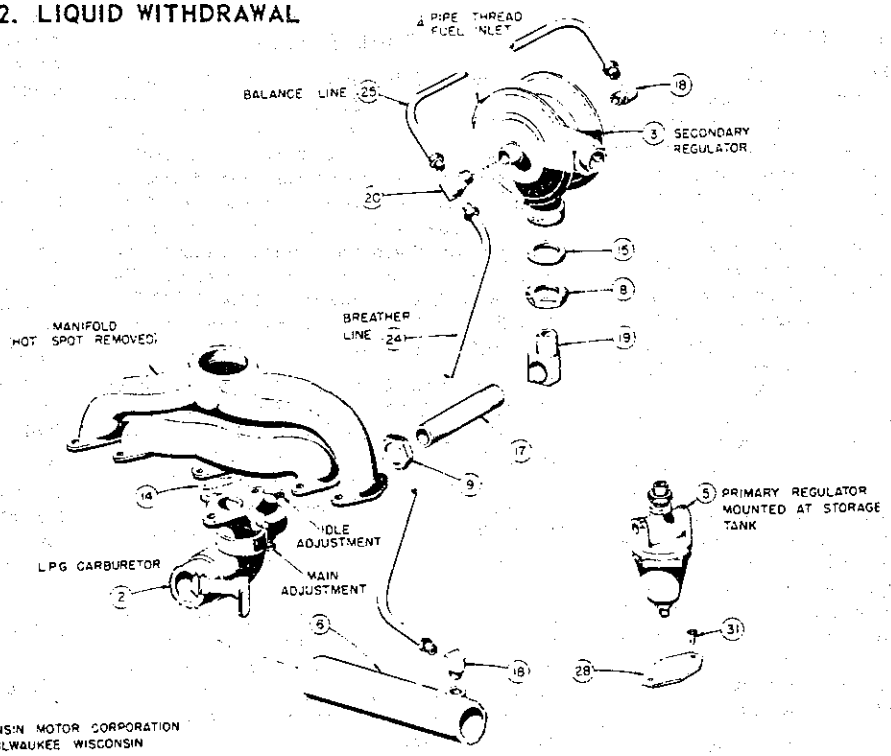


Fig. 3. VAPOR WITHDRAWAL

SK1275 LPG Burning Engine

USE WITH MODEL VF4DG OPEN ENGINE (see pg. 102)

ITEM	PART NO.	DESCRIPTION	QTY
—	AB100B	Cylinder head	2
—	AE75D	Stellite exhaust valve	4
—	AF54	Exhaust valve spring	4
—	AG31	Roto cap	4
—	LC264	Inlet manifold	1
—	LD233	Exhaust manifold (NLA)	1
—	HG273D	Stellite exhaust valve seat	4
—	SD115Q	Instruction and name plate (NLA)	1
—	YD35	Spark plug	4
1	HF440	Spacer (liquid system) (NLA)	1
2	L65A	LPG carburetor, Zenith model LPE71 (NLA)	1
3	L66B	Secondary stage regulator, Zenith model B806B	1
4	L67B	Vaporizer and primary regulator, Zenith model A963B (liquid system)	1
5	L69B	Primary regulator, Zenith model B806-26 (vapor system)	1
6	LJ120A	Air cleaner tube (NLA)	1
7	LP50A	Fuel filter, Zenith no. GF462 (liquid system)	1
8	PD209A	Lock nut, 3/4"-16 thread	1
9	PD216	Lock nut, 3/8" (vapor system)	1
10	PE3	Lock washers, 1/4" I.D. (liquid system)	2
11	PE5	Lock washer, 3/8" I.D. (liquid system)	1
12	PG860	Vaporizer mounting plate (liquid system) (NLA)	1
13	PG860A	Vaporizer support plate (liquid system) (NLA)	1
14	QC71A	Carburetor gasket	3
15	QD740	Regulator gasket	1
16	RF503	Pipe nipple, 1/4" x 7/8" long (liquid system)	1
17	RF1086A	Pipe nipple, 3/8" x4" long (vapor system)	1
18	RF1123	Inverted flare male elbow, 1/8 P.T. (NLA)	2
19	RF1300A	Male elbow, 3/4"-16 thread	1
20	RF1312	Inverted flare male tee, 1/8 P.T. (NLA)	1
21	RF1314	Inverted flare male connector (liquid system) (NLA)	1
22	RF1330	Inverted flare male connector, 3/8 P.T. (liquid system) (NLA)	1
23	RF1331	Inverted flare male elbow, 3/8 P.T. (liquid system) (NLA)	1
24	RM1157A	Breather line (vapor system) (NLA)	1
25	RM1304	Balance line (NLA)	1
26	RM1317	Fuel line (liquid system) (NLA)	1
27	RM1318	Breather line (liquid system) (NLA)	1
28	SA69	Cover plate	1
29	SE230	Vaporizer heat deflector (liquid system) (NLA)	1
30	XA67	Self-tapping screw (liquid system)	2
31	XD4	Cap screw, 1/4"-20 thread x 1/2" long	2
32	XD11	Cap screw, 1/4"-20 thread x 2" long (liquid system)	2
33	XD25	Cap screw, 3/8"-16 thread x 3/4" long (liquid system)	1

SK1275 LPG Burning Engine

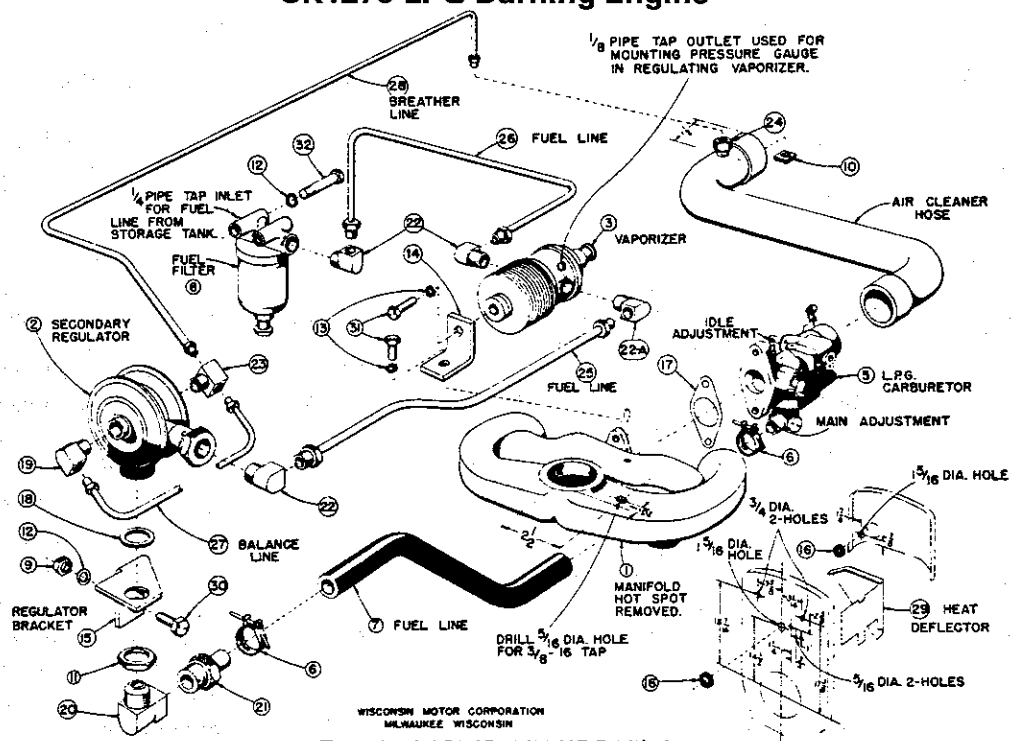


Fig. 4. LIQUID WITHDRAWAL

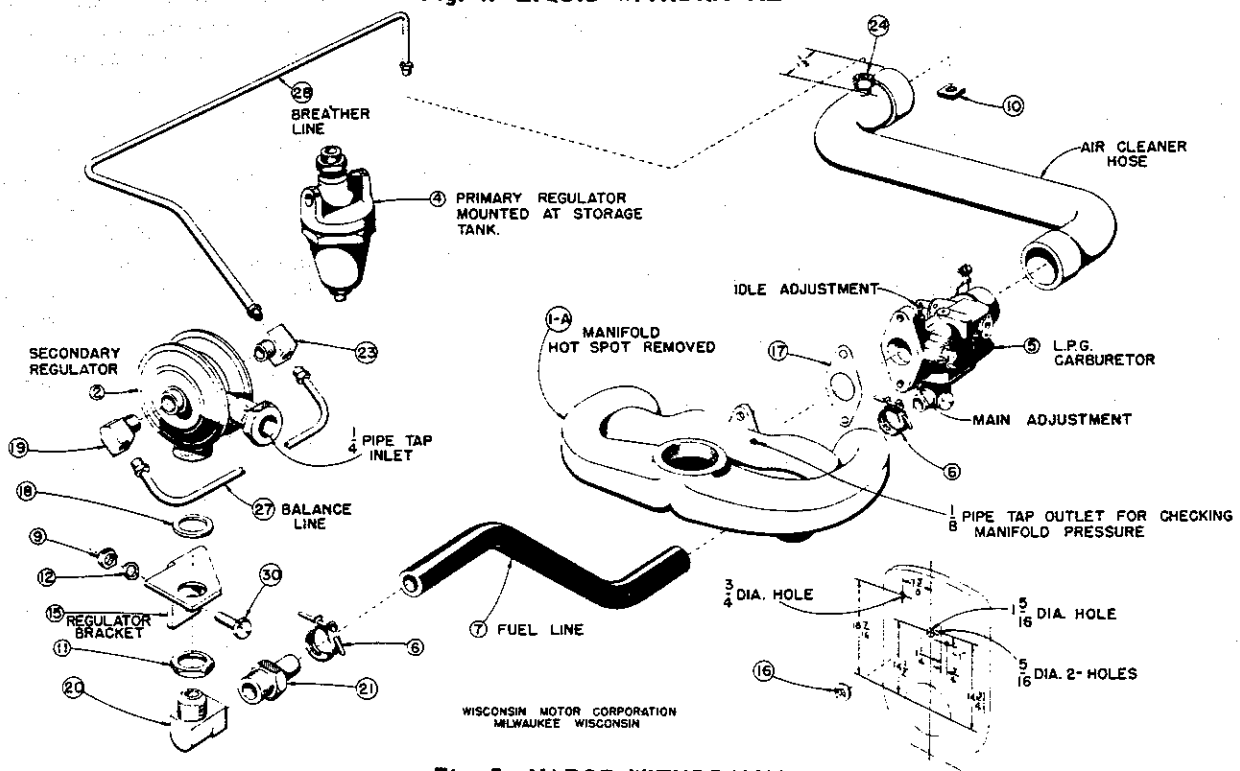


Fig. 5. VAPOR WITHDRAWAL

SK1275 LPG Burning Engine

USE WITH MODEL VG4DG POWER UNIT (see pg. 105)

ITEM	PART NO.	DESCRIPTION	QTY
—	AB97B	Cylinder head	2
1	LD240B2	Manifold (liquid system) (NLA)	1
1A	LD240B3	Manifold (vapor system)	1
—	SD115Q	Instruction and name plate (NLA)	1
—	WE248-37	Front panel (NLA)	1
—	WE251A23	Rear panel (NLA)	1
—	YD35	Spark plug	4
2	L66B	Secondary stage regulator, Zenith model B806B	1
3	L67C	Vaporizer and primary regulator, Zenith model A963B2 (liquid system) (NLA)	1
4	L69B	Primary regulator, Zenith model B806-26 (vapor system)	1
5	L70	LPG carburetor, Zenith model LP87A8	1
6	LK23	Hose clamp, 15/16" I.D.	2
7	LL130A	Fuel line, 9/16" I.D. 15/16" O.D. (NLA)	1
8	LP50A	Fuel filter, Zenith model GF462 (liquid system)	1
9	PD77	Nut, 1/4"-20 thread	2
10	PD180	Nut, 1/8" P.T.	1
11	PD209A	Lock nut, 3/4"-16 thread	1
12	PE3	Lock washer, 1/4" I.D.	4
13	PE5	Lock washer, 3/8" I.D. (liquid system)	2
14	PG846	Vaporizer support (liquid system) (NLA)	1
15	PG850	Regulator bracket (NLA)	1
16	PH460	Grommet, 1-1/8" I.D. dia. (NLA)	2
17	QC12A	Carburetor gasket	3
18	QD740	Regulator gasket	1
19	RF1123	Inverted flare male elbow (NLA)	1
20	RF1300A	Male elbow, 3/4"-16 thread	1
21	RF1310A	Straight hose connector	1
22	RF1333	Inverted flare male elbow, 1/4" P.T. (liquid system) (NLA)	3
22A	RF1331	Inverted flare male elbow, 3/8" P.T. (liquid system) (NLA)	1
23	RF1312	Inverted flare male tee, (NLA)	1
24	RF1314	Inverted flare straight connector (NLA)	1
25	RM1067B	Fuel line (liquid system) (NLA)	1
26	RM1337A	Fuel line (liquid system) (NLA)	1
27	RM1304	Balance line (NLA)	1
28	RM1313	Breather line (NLA)	1
29	SE128D	Cylinder heat deflector	1
30	XD5	Cap screw, 1/4"-20 thread x 5/8" long	2
31	XD114	Cap screw, 3/8"-16 thread x 5/8" long (liquid system)	2
32	XD147	Cap screw, 1/4"-20 thread x 2-1/2" long (liquid system)	2

SK1275 LPG Fuel System

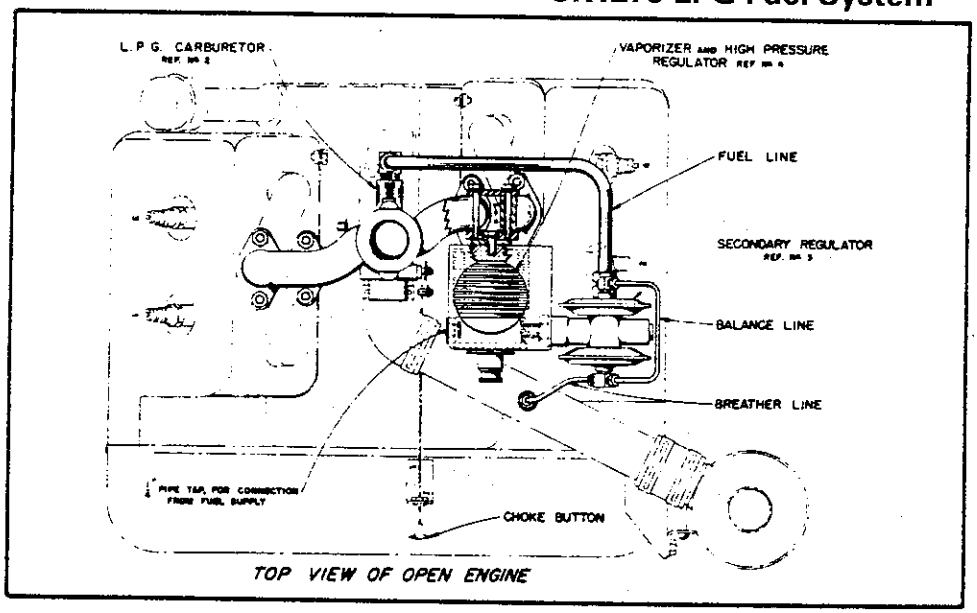


Fig. 1. LIQUID WITHDRAWAL SYSTEM

GENERAL INFORMATION

iquefied petroleum gas (L.P.G.) consists of petroleum fractions or derivatives known and identified commercially as BUTANE, PROPANE, or a mixture of the two gases. When these gases are pressurized, they assume a liquid state which is more suitable and economical for handling. At normal atmospheric temperature and pressure, L.P. fuel is in a vapor state. As one receives this fuel in a container, it is compressed so that the storage tank is approximately 80% full of liquid fuel. The pressure in this container at 70°F will be in the vicinity of 100 pounds per square inch (p.s.i.). Depending on the mixture of the fuel and the effect of ambient temperature, it can be noted that as the temperature decreases, the pressure decreases. For example, at 0°F, the pressure will be approximately 20 p.s.i. in the cylinder. **Selection of fuel cylinder size and withdrawal system are very important for satisfactory operation.** The fuel may be taken from the top of the tank as a vapor, or from the bottom of the tank as a liquid. In either case, the heat of vaporization is about 790 BTU per gallon.

Due to local climatic differential, information for proper cylinder selection should be received from your local L.P.G. distributor.

FUEL SYSTEM

When the fuel is removed from the bottom of cylinder (LIQUID WITHDRAWAL SYSTEM) fuel expansion and vaporization takes place in the **high pressure regulator.** To prevent this regulator from freezing, which occurs due to a refrigeration effect, it is necessary to add heat. A heat exchanger is therefore added around this regulator to prevent such freezing. The **Wisconsin heat exchanger, (VAPORIZER, Fig. 1, 2 and 4; Ref. 4)** has been located and calibrated to supply this need.

Fuel removed from the top of cylinder (VAPOR WITHDRAWAL SYSTEM) enters the **primary regulator (Fig. 3 and 5; Ref. 5)** in the vapor state and needs no heat exchanger. However, if fuel is required at an excessive rate, freezing may occur in the tank. This problem can be eliminated by selecting a larger fuel container or by locating tank in a warmer place.

Under the influence of tank pressure, the fuel passes through a **fuel filter,** and in some cases, through a solenoid lock-off valve, actuated by the ignition switch, before reaching the first or **primary regulator.** This regulator reduces the 100 p.s.i. tank pressure to a pressure of 6 to 8 p.s.i. As the liquid fuel is converted from 100 p.s.i. line pressure to the lower pressure, it tends to vaporize. The resulting drop in temperature must be offset by a transfer of heat from the engine. This is accomplished by passing warm air over the heat exchanger restoring heat normally lost in vaporization of the fuel.

The dry gas then passes to the **secondary,** or **low pressure regulator, (Ref. 3),** which has a discharge pressure slightly below atmospheric pressure. The fuel is then delivered to the carburetor from the secondary regulator as required by speed and load of the engine.

On engines requiring limited amounts of fuel for operation, connections are made for a VAPOR WITHDRAWAL installation at the tank. On such installations, the addition of external heat for vaporization is not required, as noted above. Pressure regulation is required to reduce tank pressure to required values in the same manner as for liquid withdrawal system.

STARTING PROCEDURE

On a liquid withdrawal system open engine, connect **fuel filter** to storage cylinder and attach inlet line to **vaporizer.** On a liquid system power unit, attach inlet line from storage cylinder to engine mounted fuel filter.

Mount **primary regulator** to storage cylinder and connect fuel line to engine mounted **secondary regulator** on a vapor withdrawal system.

Open fuel tank shut off valve, injecting fuel into regulation system. **Check for gas leaks with soap suds solution. There must be no leak.**

With the magneto switch or ignition switch in running position, prime engine by having choke fully closed. (Choke closed when button is in outward position.) Turn engine through two or three suction strokes, resulting in fuel entering the carburetion system.

Open choke slightly by pushing choke inward approximately 1/4 to 3/8 travel from full closed position. Crank engine briskly-engine should fire after a few turns. If necessary, repeat cranking engine.

When engine fires, choke should be opened gradually as engine warms up.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

SK1275 LPG Burning Engine

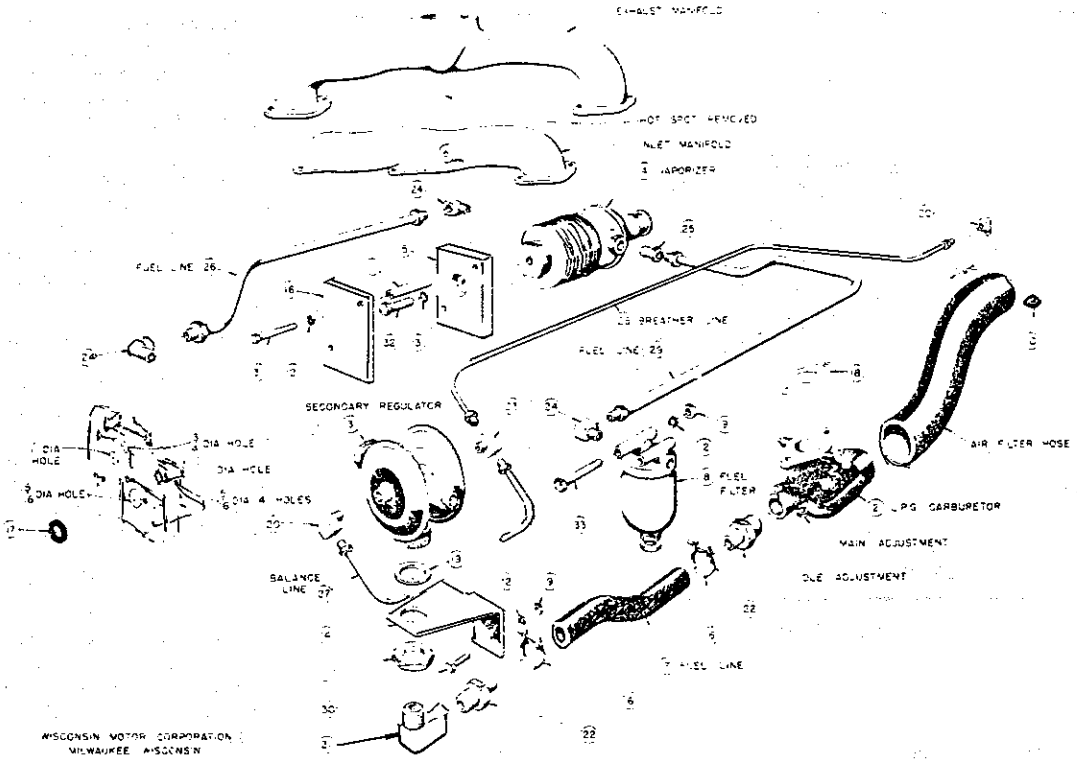


Fig. 4. LIQUID WITHDRAWAL

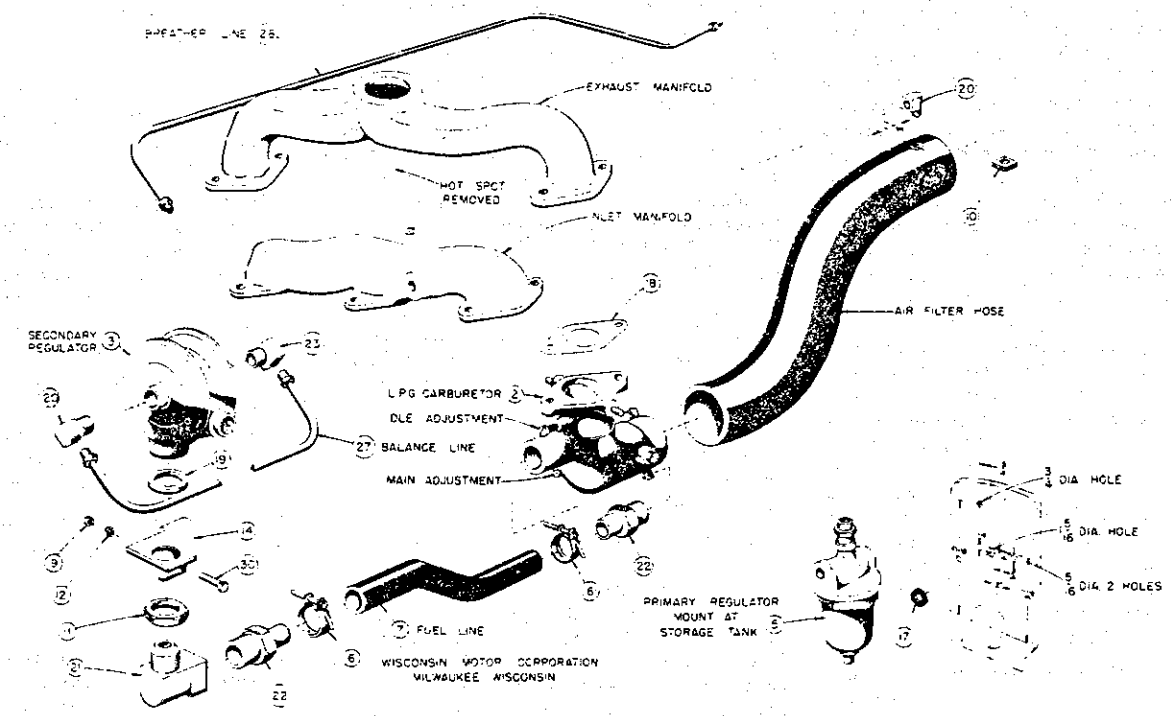


Fig. 5. VAPOR WITHDRAWAL

SK1275 LPG Burning Engine

USE WITH MODEL VF4DG POWER UNIT (see pg. 108)

ITEM	PART NO.	DESCRIPTION	QTY
—	AB100B	Cylinder head	2
—	AE75D	Stellite exhaust valve	4
—	AF54	Exhaust valve spring	4
—	AG31	Roto cap	4
—	HG273D	Stellite exhaust valve seat insert	4
—	LC264	Inlet manifold	1
—	LD233	Exhaust manifold (NLA)	1
—	LL64A1	Air filter hose assembly (NLA)	1
—	WE199A57	Rear panel (liquid system) (NLA)	1
—	WE199A58	Rear panel (vapor system) (NLA)	1
—	SD115Q	Instruction and name plate (NLA)	1
—	YD35	Spark plug	4
1	HF440	Spacer (liquid system) (NLA)	1
2	L65A	LPG carburetor, Zenith model LPE71 (NLA)	1
3	L66B	Secondary stage regulator, Zenith model B806B	1
4	L67B	Vaporizer and primary regulator, Zenith model A963B	1
5	L69B	Primary regulator, Zenith model B806-26 (vapor system)	1
6	LK23	Hose clamps, 15/16" I.D.	2
7	LL132	Fuel line, 9/16" I.D., 15/16" O.D. (NLA)	1
8	LP50A	Fuel filter, Zenith model GF462 (liquid system)	1
9	PD77	Nut, 1/4"-20 thread	4
10	PD180	Pipe tap nut, 1/4"	1
11	PD209A	Lock nut, 3/4"-16 thread	1
12	PE3	Lock washer, 1/4" I.D.)62	
13	PE5	Lock washer, 3/8" I.D. (liquid system)	1
14	PG850	Regulator bracket (NLA)	1
15	PG860A	Vaporizer mounting plate (liquid system) (NLA)	1
16	PG860A	Vaporizer support plate (liquid system) (NLA)	1
17	PH460	Grommet, 1-1/8" I.D. (NLA)	1
18	QC71A	Carburetor gasket	3
19	QD740	Regulator gasket	1
20	RF1123	Inverted flare male elbow, 1/8 P.T. (NLA)	2
21	RF1300A	Male elbow, 3/4"-16 thread	1
22	RF1310A	Straight hose connector	2
23	RF1312	Inverted flare male tee, (NLA)	1
24	RF1333	Inverted flare male elbow, 1/4 P.T. (NLA)	3
25	RF1340	Straight inverted male connector (liquid system) (NLA)	1
26	RM554	Fuel line (liquid system) (NLA)	1
27	RM1304	Balance line (NLA)	1
28	RM1316	Breather line (NLA)	1
29	RM1322	Fuel line (liquid system) (NLA)	1
30	XD5	Cap screw, 1/4"-20 thread x 5/8" long	2
31	XD11	Cap screw, 1/4"-20 thread x 2" long (liquid system)	2
32	XD25	Cap screw, 3/8"-16 thread x 3/4" long (liquid system)	1
33	XD147	Cap screw, 1/4"-20 thread x 2-1/2" long (liquid system)	2

SK1275D, SK1275D1 Algas LPG Liquid Withdrawal Fuel Systems

USE WITH MODEL VF4DG

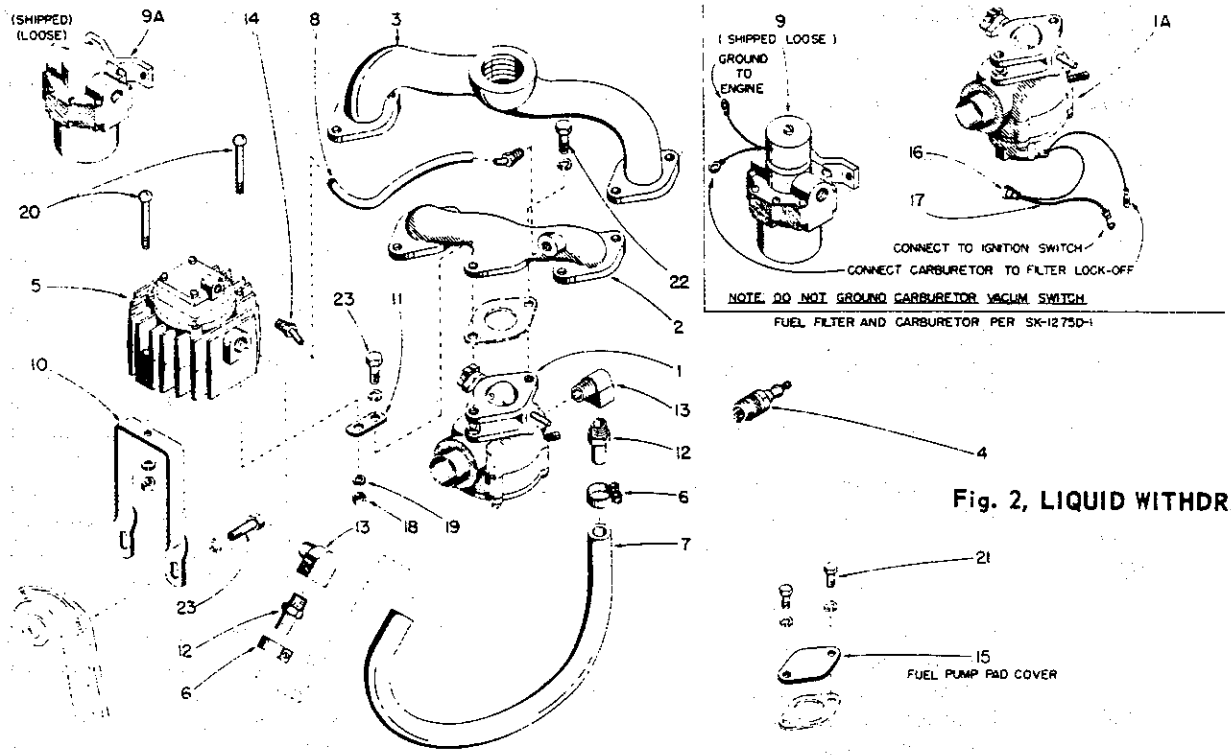


Fig. 2, LIQUID WITHDRAWAL

NOTE: SK1275D1 has provision for automatic lock-off. All parts are the same for both SK1275D and SK1275D1 except where noted.

ITEM	PART NO.	DESCRIPTION	QTY
—	AB100B	Cylinder head (not illustrated)	2
1	L92	Carburetor, SK1275D Algas ind. no. 01-0012	1
1A	L92A	Carburetor, SK1275D1 Algas ind. no. 01-0013	1
2	LC264	Lower branch manifold	1
3	LD233	Upper branch manifold (NLA)	1
4	YD35	Spark plug, Champion no. D9J	4
5	L90	Converter, Algas ind. no. C250AH4	1
6	LK20	Hose clamp, 7/8" I.D.	2
7	LL202-18	Fuel line	1
8	LL172-6	Vacuum hose	1
9	LP60	Filter lock-off, SK1275D1 Algas ind. no. 820-12	1
9A	LP60A	Fuel filter, SK1275D Algas ind. no. 830	1
10	PG1217	Bracket	1
11	PG1218	Bracket	1
12	RF1310A	Hose connector	2
13	RF1405	Elbow fitting	2
14	RF1458	Elbow (45°) (NLA)	2
15	SA69	Cover	1
16	YD270	Wire connector, SK1275D1	1
17	YL352B13	Wire, SK1275D1	1
18	PD77	Nut, 1/4"-20 thread	2
19	PE3	Lock washer, 1/4"	2
20	XA61	Screw, 1/4"-20 thread x 1-3/4" long	2
21	XD4	Screw, 1/4"-20 thread x 1/2" long	2
22	XD16	Screw, 5/16"-18 thread x 7/8" long	1
23	XD17	Screw, 5/16"-18 thread x 1" long	3

SK1275D, SK1725D1, SK1275E, SK1275E1 Algas LPG Liquid And Vapor Withdrawal Fuel Systems

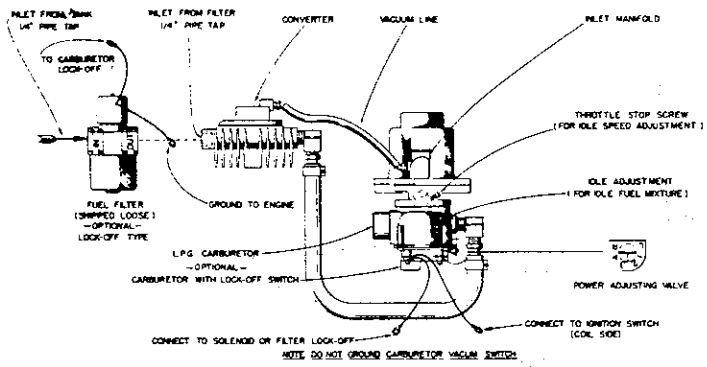


Fig. 1. LIQUID WITHDRAWAL SYSTEM

FUEL

If available, use PROPANE HD 5 in place of commercial propane. This is a special grade of fuel specifically developed for internal combustion engines.

Pressure in an L.P. gas tank, approximately 80% full of liquid fuel, will be in the vicinity of 100 pounds per square inch at 70° F. An increase in temperature will increase pressure, while lower temperatures will reduce pressure.

Due to local climatic changes, information on size of fuel tank should be received from your local L.P.G. distributor. (Fuel line and fuel tank furnished by customer.) Fuel tanks are also referred to as fuel or storage cylinders.

FUEL SYSTEMS

LIQUID WITHDRAWAL (Fig. 1)

Liquid fuel is taken from the bottom of the storage cylinder, under tank pressure, and flows thru a **fuel filter.** The fuel then enters a **converter,** which vaporizes the fuel as a heat exchanger and controls the outlet pressure to the **carburetor** as a regulator. The carburetor receives vaporized fuel under pressure from the converter and measures it relative to the quantity of air entering the carburetor.

The regulator section of the **converter** reduces the tank pressure to 1-1/4 P.S.I. for engine idle, and 1-3/4 P.S.I. at full load.

VAPOR WITHDRAWAL (Fig. 3)

On engines requiring limited amounts of fuel for operation, connections are made for VAPOR WITHDRAWAL from tank. The **primary regulator** reduces tank pressure to the 1-1/4 to 1-3/4 P.S.I. required.

Fuel is taken from the top of storage cylinder and enters the primary regulator, **(Ref. 5, Fig. 3)** in a vapor state. No heat exchanger is required. However, if fuel is used at an excessive rate, freezing may occur in the tank. This problem can be eliminated by selecting a larger fuel cylinder or by locating tank in a warmer place.

SAFETY FEATURES

Lock-off filter and **carburetor** with **lock-off vacuum switch** can be furnished, if engine is equipped with battery ignition.

Lock-off filter will automatically shut off the flow of gas to the converter when engine is stopped. **Carburetor lock-off vacuum switch** shuts off the ignition if engine inadvertently stops.

STARTING PROCEDURE

No choking or priming are required: positive pressure maintains vaporized fuel at carburetor for instantaneous injection into engine at first movement of piston.

1. CAUTION: **'Slowly'** open main gas valve in fuel tank. An abrupt full opening of the valve will induce dirt from within the tank to enter the fuel line. Too rapid an opening can also cause frost to form on the fuel filter, main valve and inlet line. **Check for gas leaks with soap suds solution. There must be no leaks.**
2. If the engine is equipped with a variable speed governor control, set throttle about ½ open; with a two-speed control, start in full load position.
3. Disengage clutch, if furnished.
4. With the magneto or ignition switch in the running position, pull up briskly on the starting crank — do not attempt to **spin** engine with crank.
   With electric starting motor: Depress starter button in place of hand cranking.
5. Allow engine to warm up a few minutes before applying load. **New engines** should be "run-in" gradually. SEE INSIDE COVER OF INSTRUCTION MANUAL.

The **idle** and **power valve adjustments** should be regulated for smooth operation, **if necessary. These adjustments may be** required on new engines due to **climatic** conditions. See **'CARBURETOR ADJUSTMENT'** paragraphs for procedure.

Refer to **Trouble Shooting** section, Page 4, if starting troubles or frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

CARBURETOR ADJUSTMENT

There are three external adjustments as illustrated in Fig. 1: **Power adjusting valve** (for load speed), **idle adjustment** (for idle fuel mixture) and **throttle stop screw** (for idle speed).

Note: All adjustments are made when engine is tested at the factory. If engine starts, idles smoothly and goes from low to high speed without hesitation, do not change carburetor settings.

Idle Adjustment: If engine idle is rough or is too fast, adjust in the following manner: Turn **idle adjustment** out 4 turns from its seat. Start engine and set throttle control at low idle. Turn **throttle stop screw** until engine is running slightly faster than normal idle speed. Next, turn **idle adjustment** screw in until engine begins to stall, then turn screw out until engine runs steadily and smoothly. Engine will be idling faster than required at this point, so back out **throttle stop screw** until a slow smooth idle is obtained.

If a **vacuum gauge** is available, adjust to highest manifold vacuum, with engine running at low idle speed. The intake manifold has 1/8" pipe tap for vacuum check.

Power adjusting valve is of a simple air bleed design. A dial on the carburetor diaphragm body indicates the rich and lean settings. By means of a screw driver, set **scribe mark** on head of **power adjusting valve,** between number 2 and 3 on dial. This setting has been calibrated to meet average loading and operating conditions.

A more accurate, and recommended adjustment, is accomplished with a **fuel or exhaust analyzer:** with the engine warmed up and operating at FULL LOAD, turn **power adjusting valve** clockwise, toward **rich** marking on dial, until a reading of 13 to 1 air fuel ratio is **registered** by the **gas analyzer** (14 to 1 if gasoline analyzer is used).

A very **slight movement** of the power valve between number 2 and 3 on dial is required for an efficient setting. Turn adjustment clockwise for a **rich mixture,** counter-clockwise for a **lean mixture.**

SK1275E, SK1275E1 Algas LPG Vapor Withdrawal Fuel Systems

USE WITH MODEL VF4DG

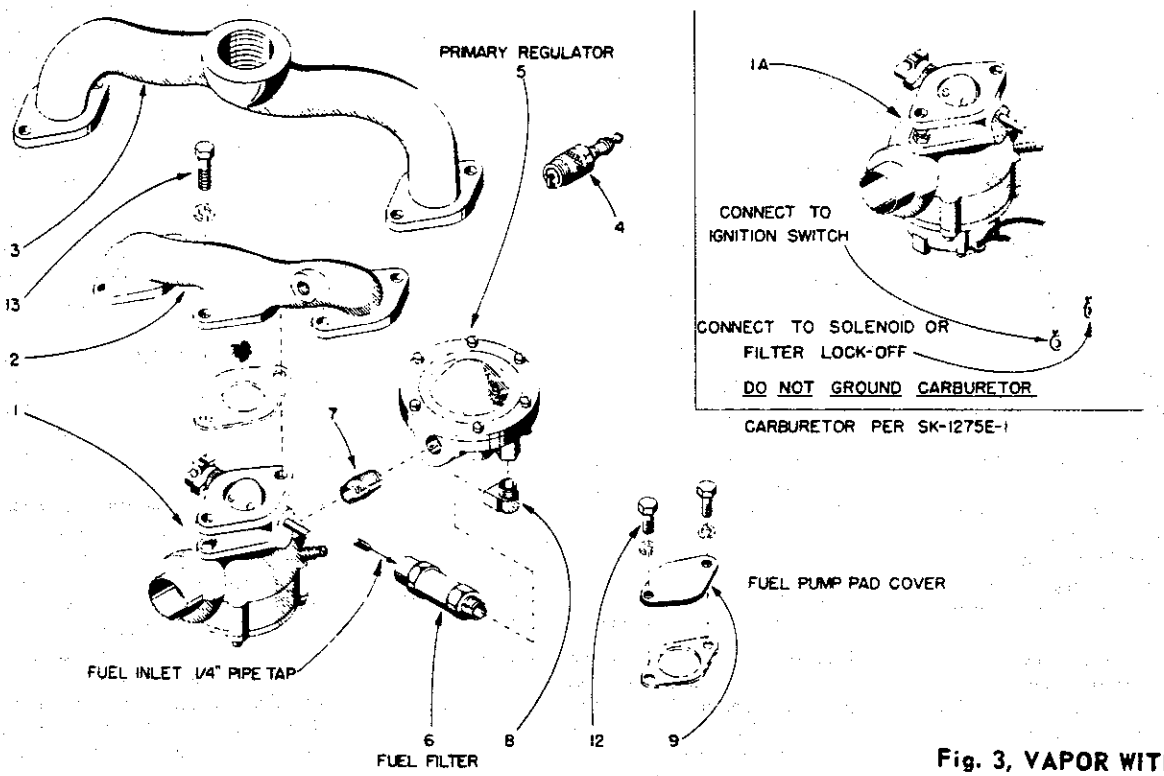


Fig. 3, VAPOR WITHDRAWAL

NOTE: SK1275E1 has provision for automatic lock-off. All parts are the same for both SK1275E and SK1275E1 except where noted.

ITEM	PART NO.	DESCRIPTION	QTY
—	AB100B	Cylinder head (not illustrated)	1
1	L92	Carburetor, SK1275E Algas ind. no. 01-0012	1
1A	L92A	Carburetor, SK1275E1 Algas ind. no. 01-0013	1
2	LC264	Lower branch manifold	1
3	LD233	Upper branch manifold (NLA)	1
4	YD35	Spark plug, Champion no. D9J	4
5	L93BS1	Primary regulator, Algas ind. no. 1000-17	1
6	LP51	Fuel filter	1
7	RF1487	Pipe nipple, 3/8" x 1" long	1
8	RF1099	Elbow fitting	1
9	SA69	Cover	1
10	WE199A78	Rear panel (not illustrated) (NLA)	1
12	XD4	Screw, 1/4"-20 thread x 1/2" long	2
13	XD16	Screw, 5/16"-18 thread x 7/8" long	2

SK1275D, SK1725D1, SK1275E, SK1275E1 Algas LPG Liquid And Vapor Withdrawal Fuel Systems

L.P.G. TROUBLE SHOOTING

I. ENGINE WILL NOT START

Before investigating the L.P.G. equipment, be sure that engine's malfunction does not exist in the **ignition system.** Refer to Engine Instruction Book for **TROUBLES, CAUSES** and **REMEDIES.**

(A) Check for fuel flow to carburetor.

1. Fuel storage tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after fuel tank is filled, or if valve is opened too abruptly). Close tank valve, listen for *'click'*, and then open **very slowly.**
4. Check fuel line for leaks, and damaged or stopped-up fuel filter. Use a soap solution on hose joints.
5. Disconnect air cleaner hose at carburetor, and crank engine with ignition on, for 3 or 4 seconds. Then, reach inside carburetor and depress diaphragm very lightly. If the sound of fuel rushing out is heard, the diaphragm is not lifting fuel valve off the seat, indicating a punctured or crinkled diaphragm. *See Form* **ML-32** *for Carburetor Service and Parts.* If the rush of fuel is **not** heard, the problem is either in the vacuum switch or lock-off filter.
6. Check solenoid lock-off filter and vacuum switch (if furnished). Turn ignition on and crank engine. If the solenoid *'click'* can be heard, both lock-off and vacuum switches are working. If not; disassemble, clean and repair.

(B) Test pressures.

1. A fuel pressure check between the converter (or primary regulator) and carburetor should show:
   Static Pressure – 1-3/4 P.S.I. max.
   Running Pressure at Idle – 1-1/4 P.S.I.
   Pressure is critical and should not climb.
2. A correct reading indicates no trouble exists in the gas system from tank to carburetor.
3. If fuel pressure is too high or climbs – trouble is in the converter (or primary regulator). *See Form* **ML-26** *for Converter Service and Parts*, or **ML-29** for primary regulator (vapor withdrawl).

(C) Adhere to starting procedure.

1. Regulate carburetor idle and power adjustments.

II. FROST

(A) Frost on fuel filter, shut-off valve, or inlet line – caused by opening outlet valve on fuel tank too rapidly. Open fuel supply valve **slowly.**

1. Frost at filter – restricted filter element. Replace or clean per *Fuel Filter* paragraphs.

(B) If carburetor, fuel lines, and converter (or primary regulator) frosted over, close storage tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

1. Frost on fuel lines between converter (or primary regulator) carburetor is caused by inadequate vaporizing – engine taking load too rapidly.
2. Frost on connection fittings. Check for fuel leaking, kinked lines, or restriction at frosted area.

(C) Frost at converter.

1. Engine stopped – indicates fuel leaking through both lock-off and carburetor.
2. Engine running – insufficient heat at converter. Warm engine thoroughly before applying load.

(D) Frost on fuel storage tank.

1. Fractured dip tube in fuel cylinder.

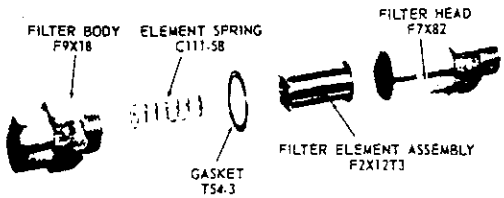
FUEL FILTER FOR LIQUID WITHDRAWAL

WISCONSIN No. LP-60 or LP-60-A

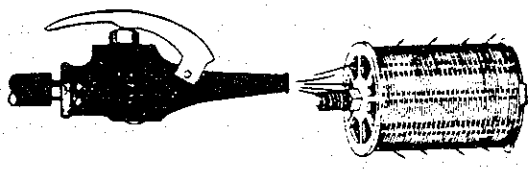
At least once a year remove sediment bowl; clean interior of bowl and replace filter with a new Algas No. 701 element. If contaminated fuel conditions exist, it will be necessary to replace cartridge element more frequently. A dirty element will cause a frosting condition to occur at the fuel filter, and will also result in loss of power.

IN-LINE FUEL FILTER FOR VAPOR WITHDRAWAL

WISCONSIN No. LP-51



To clean filter, unscrew head from filter body, remove element and wash in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, soak in solvent. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW–FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT.



Assemble head to body with 75 foot pounds torque. After unit has been reinstalled, the joint at gasket and fuel line connections should be checked with a soap bubble solution to be sure there are no leaks.

In reassembly, it is important that the element be inserted into filter head with round washer entering first into opening. The gasket is put on the filter body and the spring is located into body so that when filter is put together the spring holds the element against the head.

SK1323A, SK1330C LPG Vapor Withdrawal Fuel Systems

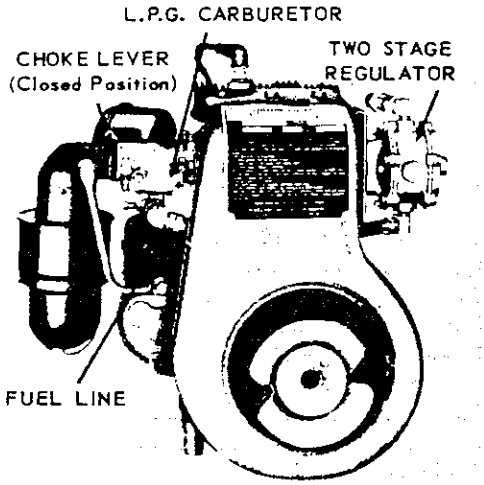


Fig. 1 G-51619

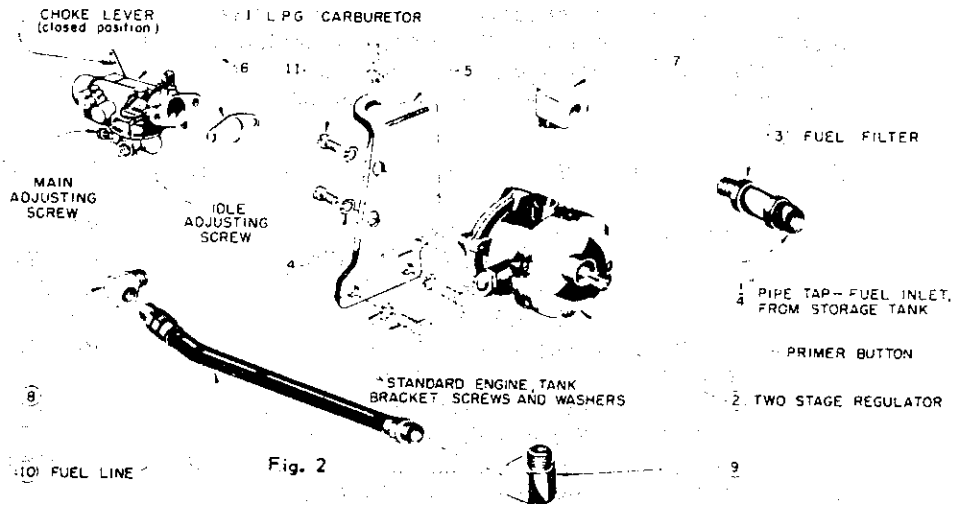


Fig. 2

FUEL

If available, use PROPANE HD 5 in place of commercial propane. This is a special grade of fuel specifically developed for internal combustion engines.

When L.P. gases are pressurized they assume a liquid state, making it more suitable and economical for handling. Pressure in a new cylinder, approximately 80% full of liquid fuel, will be in the vicinity of 100 pounds per square inch at 70°F, an increase in temperature will increase pressure, while lower temperatures will reduce pressure. The **two-stage regulator** controls the fuel pressure to carburetor regardless of the temperature changes, except when temperature falls below -20°F.

Due to local climatic differential, information on size of storage tank should be received from your local L.P.G. distributor. (Fuel inlet line and storage tank furnished by customer.)

FUEL SYSTEM

These models of engines are equipped with a **vapor withdrawal** L.P.G. system only. Since fuel requirements for this size engine are quite low, tank capacity is usually large enough to supply the engine with enough gas without sustaining any tank freeze-up. Thus, the more expensive liquid withdrawal system is not essential.

The Wisconsin **two-stage regulator** is designed to reduce fuel storage pressure to a pre-determined and dependable discharge pressure required for optimum engine performance. **No primary regulator or high pressure reducing valve** are required at the fuel storage tank.

STARTING PROCEDURE

1. Open fuel tank shut off valve, injecting fuel into regulation system. **Check for gas leaks with soap suds solution.** There must be no leak.

   Before starting the engine, refer to Fig. 3 and adjust carburetor as follows:

   a. Turn in the **idle adjusting screw** until it seats. Caution: Do not use excessive force. Then, turn back from its seat 1½ turn.

   b. Loosen **main adjusting screw locknut.** Adjust screw to 15/32 inch dimension shown. Tighten locknut. (After the engine is started and warmed up for several minutes, adjust the **idle** and **main adjusting** screws for smoothest operation.)

2. **Prime engine** by cranking through 2 or 3 suction strokes, with the carburetor **choke closed.**

   A **primer button** is provided on the regulator, as an optional method of starting. In this case, the carburetor choke is left open while the primer button is depressed and quickly released. The engine is then cranked. Because of the possibilities of over priming and flooding, this method of starting is not highly recommended.

3. With the magneto switch or ignition switch in running position, **open choke half-way** from full closed position.

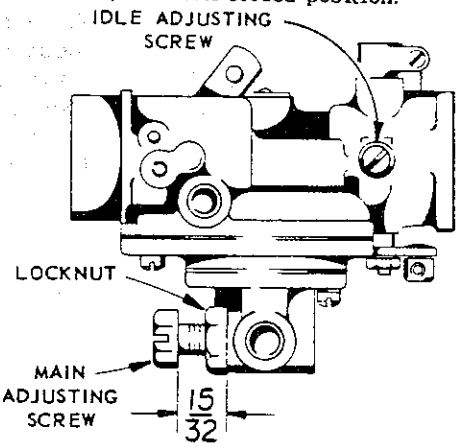


Fig. 3

4. Crank engine over slowly to compression stroke, then turn back one-half turn. Wind rope fully on starter sheave and pull briskly in a clockwise direction. After engine starts, open choke fully.

   Refer to **Trouble Shooting** section if starting troubles or frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation, carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

CONVERSION KIT INSTRUCTIONS FOR MODELS ACN, BKN PER SK-1330-C AND FOR MODELS HACN, HBKN PER SK-1323A ARE LOCATED ON PAGE 2.

SK1323A, SK1330C LPG Vapor Withdrawal Fuel Systems

USE WITH MODELS ACNDG, HACNDG, BKNDG, HBKNDG (see pg. 115)

Also included, are field conversion kits and instructions:
SK1330C for Models ACN and BKN. SK1323A for Models HACN and HBKN.
NOTE: The following list of special parts are in addition to, or replace parts found in applicable standard ACN-BKN or HACN-HBKN Instruction and Parts List manual.

ITEM		PART NO.	DESCRIPTION	QTY
—	†	AB99R	Cylinder head (standard on ACN, HACN) (replaces standard for BKN, HBKN)	1
—	†	AE74C	Inlet valve	1
—	†	AE74D	Stellite exhaust valve	1
—	†	AG31	Roto-cap and seat	1
—	†	HG273D	Stellite exhaust valve seat insert	1
—	†	SD53H	Instruction plate (NLA)	1
—	†	YD35	Spark plug, Champion no. D9J	1
1		L68S1	LPG carburetor, Zenith no. G12213B, model LP87BY6	1
2		L109	Garretson regulator, (replaces L121 Beam regulator)	1
3		LP51	Fuel filter, Zenith no. GF483	1
4		PE14	Lock washer, no. 10	2
5		PG1021	Regulator bracket	1
6		QC53	Gasket	1
7		RF1099	Elbow, 1/4"	1
8		RF1311	Elbow, 1/4" pipe thread, 5/8"-18 tap	1
9		RF1099	Elbow	1
—		RF1457	Adapter	1
10	††	RM1303	Fuel line, 11" long (included in SK1330C kit)	1
—	††	RM1303A	Fuel line, 13" long (included in SK1323A kit)	1
11		XA12	Screw, no. 10-24 thread x 1/2" long (NLA)	2

† Not included in the SK1330C, SK1323A conversion kits.

†† SK1330C and SK1323A kits are identical, except for length of fuel ine.

CONVERSION SUGGESTIONS

Engines to be converted to L.P.G. must be in good mechanical condition. Those which have poor compression, weak ignition, or similar defects cannot and will not produce the engine's ultimate capabilities.

When burning L.P. fuel, it is necessary to increase the engine compression ratio to achieve optimum performance. Special cylinder heads are installed on factory built engines to accomplish compression increase and are not part of the conversion kit. Such cylinder heads are available from your authorized Wisconsin dealer. However, satisfactory operation is obtainable with present cylinder heads, although a small percentage of power loss, compared to gasoline operation, can be expected.

The spark plug furnished with your gasoline engine will successfully ignite L.P.G. However, improved performance and longer spark plug life can be achieved by using colder plugs. These are available from your **WISCONSIN** dealer.

CONVERSION PROCEDURE FOR SK-1330-C AND SK-1323-A CONVERSION KITS

Use a pipe thread compound for all threaded connections.

1. Remove gasoline carburetor, fuel tank, tank bracket and fuel strainer from engine and discard. Retain tank bracket capscrews and lockwashers, as they are necessary for mounting regulator bracket to crankcase. Also retain air cleaner and bracket assembly.
2. Install L.P.G. carburetor **(Ref. 1)** to engine, with new gasket **(Ref. 6)** and use the two nuts that were used for mounting the gasoline carburetor. Assemble elbow **(Ref. 8)** into carburetor inlet. **NOTE:** Carburetor air horn is 1-5/16" diameter. If discarded carburetor was **ZENITH**, then present air cleaner bracket is suitable. If carburetor was **MARVEL-SCHEBLER**, which has a 1-3/16" air horn, then new air cleaner bracket will have to be used.
3. Mount elbows **(Ref. 7)** to inlet of regulator and **(Ref. 9)** to the outlet. Assemble two stage regulator **(Ref. 2)** to bracket **(Ref. 5)** with lockwashers **(Ref. 4)** and screws **(Ref. 11)**. Mount bracket and regulator assembly to engine at the same location the gasoline tank bracket was mounted, using the same screws and lockwashers.
4. Install fuel line **(Ref. 10)** from regulator to carburetor. Insert fuel line between rear of shroud and crankcase.
5. Assemble fuel filter **(Ref. 3)** to elbow at regulator inlet. Remove plug from inlet of fuel filter and install fuel line from storage tank. The thread size at the filter inlet is a ¼" pipe tap. Line must be approved L.P. fuel hose and should be flexible **(Fuel inlet line and storage cylinder furnished by customer).**
6. **Check for gas leaks with soap suds solution. There must be no leaks.**
7. Adjust carburetor and start engine in accordance with Starting Procedure on Page 1.

SK1394A LPG Liquid Withdrawal Fuel System

USE WITH MODEL V461DG

Fig. 2

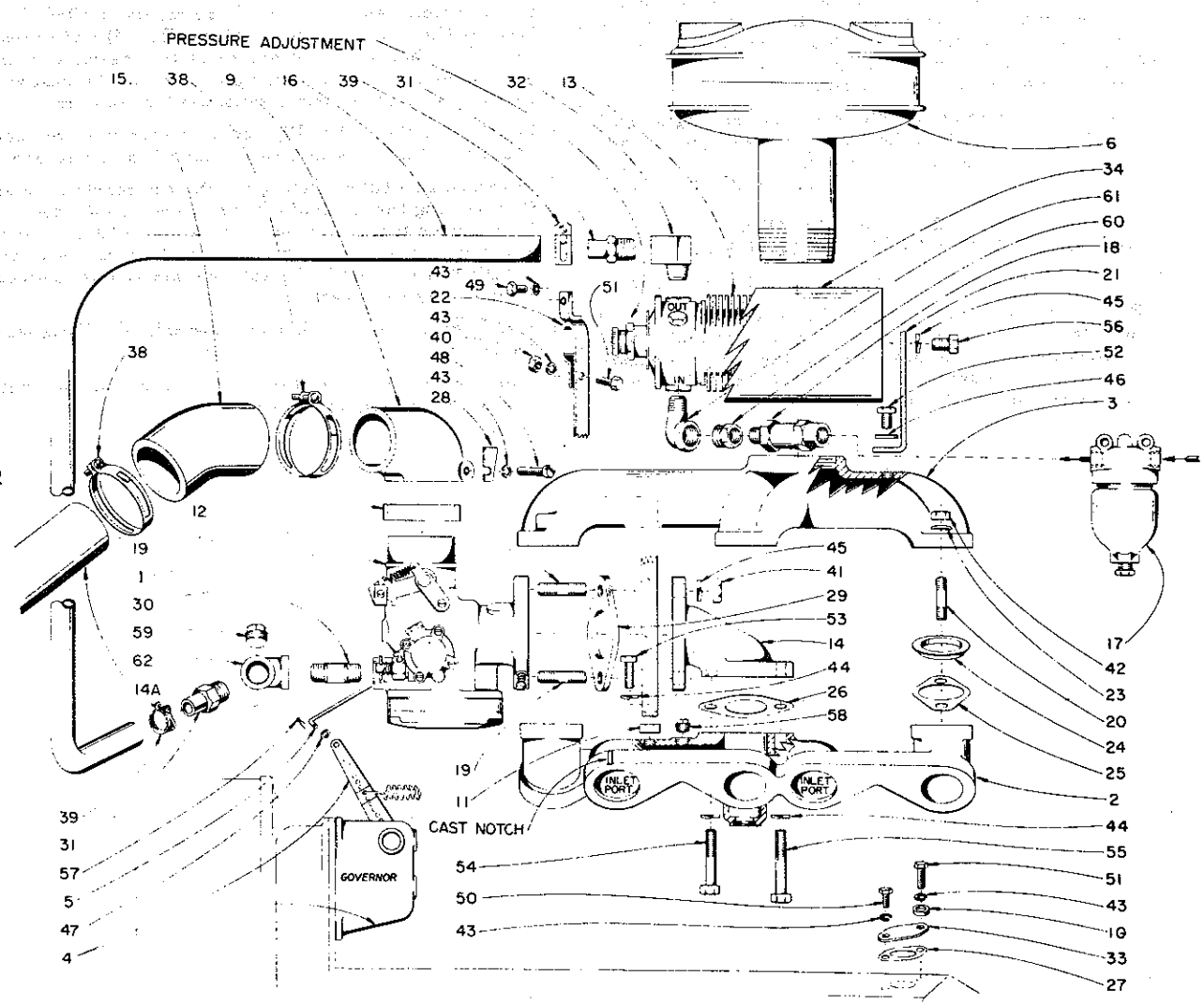


Fig. 2

SK1394A LPG Liquid Withdrawal Fuel System

USE WITH MODEL V461DG (see pg. 118)

ITEM	PART NO.	DESCRIPTION	QTY
1	L83S1	Pressure carburetor, Zenith no. GO12836 (NLA)	1
2	LD257B3S1	Lower branch inlet manifold assembly (includes PC171, SA10, XK1) (replaces LD257A3S1) (NLA)	1
3	LD258C1S1	Upper branch exhaust manifold assembly (includes PC171) (NLA)	1
4	TC395S8	Governor housing assembly (NLA)	1
5	VE549E	Control rod (NLA)	1
6	WD58D	Exhaust muffler (NLA)	1
9	BI331-1S1	Elbow assembly (includes PE3, QD647, XB20) (NLA)	1
10	HF276	Spacer, 3/16" thick	1
11	HF394	Spacer, 5/16" (NLA)	1
12	HF605	Spacer, 7/16" (NLA)	1
13	L67D	Vaporizer and primary regulator assembly (NLA)	1
14	LC280	Elbow	1
14A	LJ358	Tube	1
15	LL174	Elbow (replaces LL161A)	2
16	LL163	Molded hose (NLA)	1
17	LP50A	Fuel filter	1
18	LP51	Fuel filter	1
19	PC604	Stud (replaces PC133)	2
20	PC171	Stud	8
21	PG1074	Brace (NLA)	1
22	PG1077	Strap (NLA)	1
23	PH501	Washer	8
24	QB85	Insert bushing	4
25	QC67	Gasket	4
26	QC70	Gasket	1
27	QD538A	Gasket	1
28	QD647	Gasket	1
29	QF109	Gasket (NLA)	1
30	RF1186	Pipe nipple, 3/8" x 1-1/2" long	1
31	RF1310A	Connector	2
32	RF1405	Street elbow	1
33	SA69	Cover	1
34	SE276	Cover (NLA)	1
38	LK9	Hose clamp, 2-3/8" I.D.	4
39	LK23	Hose clamp, 1" I.D.	2
40	PD77	Nut, 1/4"-20 thread	1
41	PD83	Nut, 3/8"-24 thread	2
42	PD205	Nut, 5/16"-24 thread	8
43	PE3	Lock washer, 1/4"	5
44	PE4	Lock washer, 5/16"	3
45	PE5	Lock washer, 3/8"	3
46	PH77A	Plain washer, 5/16" I.D.	1
47	PH332	Plain washer, 1/8" I.D. x 5/16" O.D.	1
48	XB20	Screw, 1/4"-20 thread x 1" long	1
49	XD3	Screw, 1/4"-20 thread x 3/8" long	1
50	XD4	Screw, 1/4"-20 thread x 1/2" long	1
51	XD6	Screw, 1/4"-20 thread x 3/4" long	2
52	XD13	Screw, 5/16"-18 thread x 1/2" long	1
53	XD16	Screw, 5/16"-18 thread x 7/8" long	1
54	XD22	Screw, 5/16"-18 thread x 1-3/4" long	1
55	XD23	Screw, 5/16"-18 thread x 2" long	1
56	XD114-1	Screw, 3/8"-16 thread x 1/2" long (NLA)	1
57	XI32	Cotter pin, 3/64 dia. x 3/8" long	1
58	XK1	Pipe plug, 1/8"	1
59	XK3	Pipe plug, 3/8"	1
60	XK16	Reducer bushing, 3/8" to 1/4"	1
61	XK37	Street ell, 1/4" x 90°	1
62	XK49	Pipe tee, 3/8" (NLA)	1

SK1394A LPG Liquid Withdrawal Fuel System (Cont.)

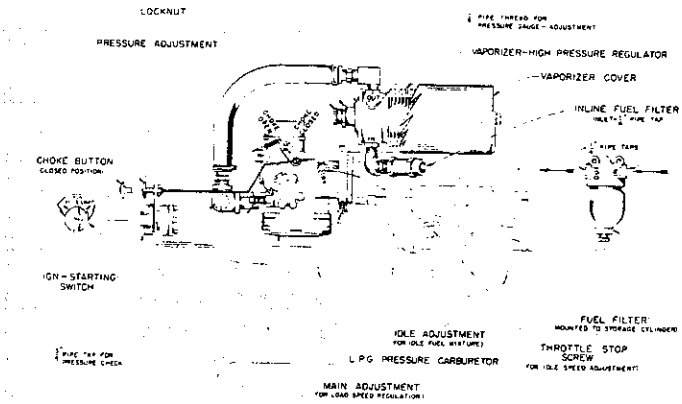


Fig. 1. LIQUID WITHDRAWAL SYSTEM

GENERAL INFORMATION

Liquefied petroleum gas (L.P.G.) consists of petroleum fractions or derivatives known and identified commercially as BUTANE, PROPANE, or a mixture of the two gases. When these gases are pressurized, they assume a liquid state which is more suitable and economical for handling. At normal atmospheric temperature and pressure, L.P. fuel is in a vapor state. As one receives this fuel in a container, it is compressed so that the storage tank is approximately 80% full of liquid fuel. The pressure in this container at 70°F will be in the vicinity of 100 pounds per square inch (p.s.i.). Depending on the mixture of the fuel and the effect of ambient temperature, it can be noted that as the temperature decreases, the pressure decreases. For example, at 0°F, the pressure will be approximately 20 psi in the cylinder.

Due to local climatic differential, information for proper cylinder selection should be received from your local L.P.G. distributor. (Fuel inlet line and storage cylinder furnished by customer).

FUEL SYSTEM

LIQUID WITHDRAWAL, Fig. 1 and Fig. 2

When the fuel is removed from the bottom of cylinder (LIQUID WITHDRAWAL SYSTEM) fuel expansion and vaporization takes place in the **high pressure regulator.** To prevent this regulator from freezing, which occurs due to a refrigeration effect, it is necessary to add heat. A heat exchanger or **vaporizer** is therefore added around the regulator to prevent such freezing. This combination unit, which reduces the 100 pound tank pressure to approximately 10 p.s.i., is referred to as a **vaporizer and high pressure regulator.**

The dry gas is discharged from the **vaporizer-pressure regulator** to a **pressure carburetor.** The carburetor further reduces the gas pressure and regulates the flow of fuel for the required speed and load of the engine.

An **in-line fuel filter** is mounted to the inlet opening on the vaporizer and high pressure regulator. A second **fuel filter** is shipped loose, and is to be installed at the L.P.G. fuel cylinder. Connect fuel line from filter at storage cylinder to filter at vaporizer-regulator.

STARTING PROCEDURE

1. CAUTION: **'Slowly'** open main gas valve in fuel cylinder. An abrupt full opening of the valve will induce dirt from within the cylinder to enter the fuel line. Too rapid an opening can also cause frost to form on the fuel filter, main valve and inlet line. **Check for gas leaks with soap suds solution. There must be no leaks.**
2. If the engine is equipped with a variable speed governor control, set throttle about ½ open; with a two-speed control, start in full load position.
3. Pull **choke button out** and hold in full closed position.
4. Turn **ignition-starting switch** to the start position and **hold** for about 3 seconds while slowly releasing the **choke** to **half opening** and continuing very slowly to **full opening.** Engine should start between half and full choke opening. Switch will return to **run position** when released.
5. Allow engine to warm up a few minutes before applying load. The **idle** and **main adjustments** should be regulated for smooth operation. These adjustments need only be made the first time a new engine is started, or if there is a change in the load and operating speed or weather temperatures. See 'CARBURETOR ADJUSTMENT' paragraphs below for adjustment procedure.

Refer to **Trouble Shooting** section, Page 7, if starting troubles or frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

CARBURETOR ADJUSTMENT

There are three external adjustments as illustrated in Fig. 1: **Main adjustment** (for load speed), **idle adjustment** (for idle fuel mixture) and **throttle stop screw** (for idle speed).

Idle Adjustment: If engine idle is rough is too fast, adjust in the following manner. Turn **idle adjustment** out 3½ turns from its seat. Start engine and set throttle control at low idle. Turn **throttle stop screw** until engine is running slightly faster than normal idle speed. Next, turn idle adjustment screw in until engine begins to stall, then turn screw out until engine runs steadily and smoothly. Engine will be idling faster than required at this point, so back out throttle stop screw until a slow smooth idle is obtained.

Main Adjustment: (No load) With engine operating at low idle speed turn **main adjustment screw** out 2¾ turns from its seat. Rapidly accelerate engine (without load) to operating speed; if engine goes from low to high speed without hesitation, main adjustment is ok. If engine cuts out, spits or pops irregularly, fuel mixture is too lean. If engine loafs or rolls unevenly during the acceleration, adjustment is too rich.

Turn main adjustment screw as required, ¼ turn at a time during each acceleration trial, until proper adjustment is obtained. Turning adjusting screw in leans the fuel mixture, while turning out riches the mixture. A slight re-adjustment may be necessary after load is applied.

SK1394A LPG Liquid Withdrawal Fuel System (Cont.)

CONVERSION PROCEDURE:

I. DISASSEMBLY

1. Disconnect: Choke control and fuel line at carburetor, and anti-diesel valve wire at starting switch.

2. Remove cotter pin from governor lever and unhook throttle rod. Disconnect governor control bracket from bottom of intake manifold and unhook spring from governor housing lever.

3. Remove and retain 4 nuts and clamp washers for mounting manifold to cylinder heads. The complete manifolds with muffler and gasoline carburetor attached can be removed and discarded.

   NOTE: Exhaust port gaskets will remain in cylinder head, but the inlet port gaskets and insert bushings will have to be taken out of the manifold and retained for assembly of the L.P.G. manifold to the cylinder heads. If the 4 QC-65 gaskets and QB-85A inserts are not in reusable condition, order new ones.

4. Take off and discard governor housing, but retain the 4 mounting screws and lockwashers.

5. Remove and discard fuel pump adapter with pump, strainer and fuel line attached.

II. ASSEMBLY

1. Mount fuel pump pad cover (Ref. 33) to crankcase, using gasket (Ref. 27), lockwashers and screws (Ref. 43, 50, 51). Spacer (Ref. 10) is used for mounting the L.H. heat deflector bracket.

2. Mount governor housing assembly (Ref. 4) and gasket, to gear cover spacer, using the 4 screws and washers retained in disassembly.

3. Sub-assemble lower manifold (Ref. 2) to upper manifold (Ref. 3) using new gaskets and inserts (Ref. 25, 24) and 8 studs, nuts and washers (Ref. 20, 42 and 23). Torque nuts, 12 to 15 ft. lbs.

4. Sub-assemble carburetor (Ref. 1): Mount pipe nipple (Ref. 30), pipe tee (Ref. 62), plug (Ref. 59) and connector (Ref. 31) to fuel inlet at bottom of carburetor. Assemble 2 studs (Ref. 19) to carburetor flange. Mount carburetor assembly to manifold elbow (Ref. 14) using gasket (Ref. 29), lockwashers (Ref. 45) and nuts (Ref. 41). Mount carburetor and elbow assembly to lower manifold branch (Ref. 2) using gasket (Ref. 26), lockwashers (Ref. 44) and capscrews (Ref. 54 and 55).

5. Place the 4 insert bushings and gaskets, retained in paragraph 3 of disassembly, into the inlet ports of the lower manifold. Mount the complete manifolding with carburetor attached, to the cylinder heads, using the 4 clamp washers and nuts retained from disassembly of the gasoline manifold. NOTE: Be sure and line up cast notch on lower manifold flange, at either No. 2 or 3 cylinder, with notch on cylinder head inlet port. Tighten manifold nuts to 32 ft. lbs. torque.

6. Screw governor control rod (Ref. 5) into throttle lever on carburetor, until the bent end of the rod will register with the top hole in governor lever when lever is pushed toward take-off end of engine as far as it will go. Then, screw rod in one more turn. Mount plain washer (Ref. 47) onto end of rod, insert rod into hole in governor lever and assemble cotter pin (Ref. 57). Mount governor control bracket to bottom of manifold and hook spring into proper hole of governor lever.

7. Attach vaporizer brace (Ref. 21) to top of upper branch manifold with plain washer (Ref. 46) and screw (Ref. 52), but do not tighten.

8. Sub-assemble vaporizer (Ref. 13): Mount street ell (Ref. 61), reducer bushing (Ref. 60) and inline fuel filter (Ref. 18) to inlet tap in vaporizer. Mount street elbow (Ref. 32) and gas line connector (Ref. 31) to outlet tap. Slip top of vaporizer strap (Ref. 22) onto neck of vaporizer diaphragm cover and tighten in place with clamp screw, nut and washer (Ref. 51, 40 and 43). CAUTION: Vaporizer pressure of 9 to 10 P.S.I. is pre-set at the factory. Therefore, do not remove locknut and adjusting screw from end of vaporizer to mount support strap (Ref. 22), or pressure setting will be disturbed.

9. Assemble vaporizer (Ref. 13) to manifold: Attach support strap (Ref. 22) to lower manifold with spacer (Ref. 11), lockwasher (Ref. 44) and screw (Ref. 53). Mount vaporizer to rear brace (Ref. 21) with lockwasher (Ref. 45) and screw (Ref. 56), but slip cover (Ref. 34) over vaporizer before tightening screw. Tighten capscrew (Ref. 52) after alignment of vaporizer, support cover (Ref. 34) to front strap (Ref. 22) with capscrew and washer (Ref. 49, 43).

10. Assemble gas line (Ref. 16), from vaporizer to carburetor, using 2 hose clamps (Ref. 39).

11. Connect choke control to carburetor and mount muffler (Ref. 6).

12. Slip spacer (Ref. 12) over air horn on carburetor. Mount air cleaner elbow (Ref. 9) to carburetor air horn using gasket (Ref. 28), lockwasher (Ref. 43) and clamp screw (Ref. 48). Make connection to air cleaner using 2 rubber elbows (Ref. 15), tube (Ref. 14A) and 4 clamps (Ref. 38).

13. Mount fuel filter (Ref. 17) to L.P.G. fuel cylinder. Connect fuel line from filter at storage cylinder to filter at vaporizer. Inlet line must be approved L.P. fuel hose and should be flexible. (Fuel inlet line and storage cylinder furnished by customer.) Check all connections for gas leaks with soap suds solution. There must be no leaks.

14. Start engine and adjust idle speed. See Starting Procedure, Page 1.

    After warm-up period, increase engine speed and regulate main adjustment on carburetor for smooth operation.

SK1394B Algas LPG Fuel System

USE WITH MODELS V461DG, V465DG

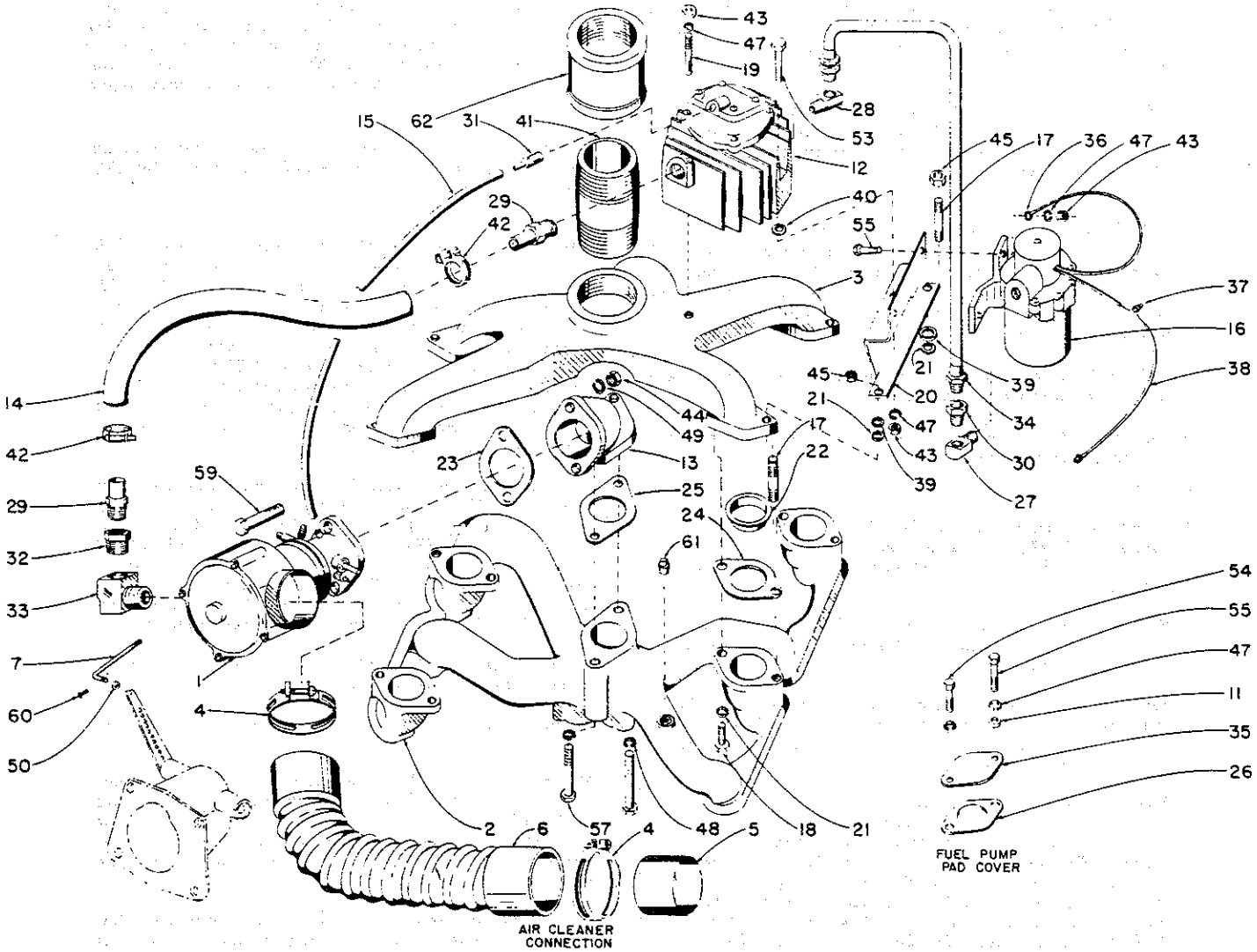


Fig. 2

SK1394B Algas LPG Fuel System

USE WITH MODELS V461DG, V465DG (see pg. 122)

ITEM		PART NO.	DESCRIPTION	QTY
1		L91	Carburetor, Algas ind. no. 6584	1
2		LD257C2S1	Lower branch inlet manifold assembly (includes PC154, SA10, XK1)	1
3		LD258C3	Upper branch exhaust manifold	1
4		LK12	Hose clamp, 2-5/8" I.D.	2
5		LL30A1	Bushing	1
6		LL187	Flexible hose	1
7		VE875S1	Control rod	1
11	†	HF276	Spacer, 3/16"	1
12		L90B	Converter, Algas ind. no. C250AH	1
13		LC280	Elbow	1
14		LL202-14	Fuel line	1
15		LL186	Vacuum line	1
16		LP60	Filter lock-off, Algas in. no. 820-12	1
17	†	PC154	Stud, 1-1/2" long	2
18	†	XD17B	Screw, 5/16"-18 thread x 7/8" long (S.A.E. grade 5)	6
19		PC590	Stud, 1/4"-20 thread x 2-1/8" long (replaces XA52)	1
20		PG1207	Bracket	1
21	†	PH501	Washer	8
22	†	QB85	Insert bushing	4
23		QC64	Gasket	2
24	†	QC67	Gasket	4
25	†	QC70	Gasket	1
26	†	QD538A	Gasket	1
27		RF1099	Elbow fitting	1
28		RF1311	Elbow fitting	1
29		RF1310A	Hose connector	2
30		RF1457	Adapter fitting	1
31		RF1480	Hose connector	1
32		RF1481	Reducer, 1/2" to 3/8" pipe thread	1
33		RF1482	Elbow	1
34		RM1303	Fuel line assembly, 11" long (replaces RM635C)	1
35		SA69	Cover	1
36		YD62	Terminal	1
37		YD270	Wire connector	1
38		YL352B20	Wire assembly	1
39		HF474	Spacer, 11/32" x 5/8" O.D. x 1/8" long	2
40		HF488	Spacer, 11/32" I.D. x 3/4" O.D. x 1/4" long	1
41		LJ147	Pipe nipple, 2" x 3" long	1
42		LK20	Hose clamp, 7/8" I.D.	2
43		PD77	Nut, 1/4"-20 thread	4
44		PD58	Nut, 3/8"-16 thread	2
45	†	PD205	Nut, 5/16"-24 thread	2
47		PE3	Lock washer, 1/4"	6
48		PE4	Lock washer, 5/16"	2
49		PE5	Lock washer, 3/8"	2
50	†	PH332	Plain washer, 1/8" I.D. x 5/16" O.D.	1
53		XD11	Screw, 1/4"-20 thread x 2" long	1
54		XD4	Screw, 1/4"-20 thread x 1/2" long	1
55		XD6	Screw, 1/4"-20 thread x 3/4" long	3
57		XD23	Screw, 5/16"-18 thread x 2" long	2
59		XD29	Screw, 3/8"-16 thread x 1-1/4" long	2
60	†	XI32	Cotter pin, 3/64" dia. x 3/8" long	1
61	†	XK1	Pipe plug, 1/8"	1
62		XK123	Coupling, 2"	1

† Standard engine parts.

SK1394B Algas LPG Fuel System (Cont.)

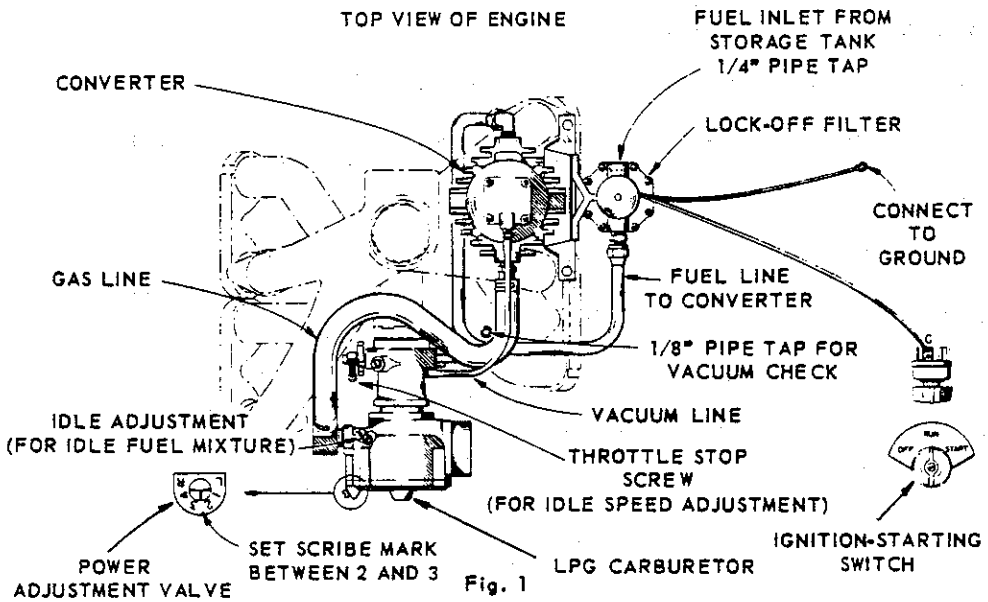


Fig. 1

FUEL

If available, use PROPANE HD 5 in place of commercial propane. This is a special grade of fuel specifically developed for internal combustion engines.

When L.P. gases are pressurized they assume a liquid state, making it more suitable and economical for handling. Pressure in an L.P. gas tank, approximately 80% full of liquid fuel, will be in the vicinity of 100 pounds per square inch at 70°F. An increase in temperature will increase pressure, while lower temperatures will reduce pressure. The converter vaporizes the fuel and regulates the pressure to carburetor regardless of any temperature changes.

Due to local climatic differential, information on size of fuel tank should be received from your local L.P.G. distributor. (Fuel inlet line and fuel tank furnished by customer.) Fuel tanks are also referred to as fuel or storage cylinders.

FUEL SYSTEM

LIQUID WITHDRAWAL

Liquid fuel is taken from the bottom of the storage cylinder, under tank pressure, and goes thru a **lock-off filter.** The fuel then enters a **converter,** which vaporizes the fuel as a heat exchanger and controls the outlet pressure to the **carburetor** as a regulator. The carburetor receives vaporized fuel under pressure from the **converter** and measures it relative to the quantity of air entering the carburetor. The **lock-off filter** is a safety device that stops the flow of gas when engine is off.

The regulator section of the **converter** reduces the tank pressure to 1-1/4 P.S.I. for engine idle, and 1-3/4 P.S.I. at full load.

No choking or priming are required: positive pressure maintains vaporized fuel at carburetor for instantaneous injection into engine at first movement of piston.

STARTING PROCEDURE

1. CAUTION: **'Slowly'** open main gas valve in fuel tank. An abrupt full opening of the valve will induce dirt from within the tank to enter the fuel line. Too rapid an opening can also cause frost to form on the fuel filter, main valve and inlet line. **Check for gas leaks with soap suds solution. There must be no leaks.**
2. If the engine is equipped with a variable speed governor control, set throttle about ½ open; with a two-speed control, start in full load position.
3. Disengage clutch, if furnished.
4. Turn **ignition-starting switch** to the **start position.** After engine starts, release switch to **run position.**
5. Allow engine to warm up a few minutes before applying load. **New engines** should be **"run-in"** gradually. SEE INSIDE COVER OF INSTRUCTION MANUAL.

The **idle** and **power valve adjustments** should be regulated for smooth operation, if **necessary.** These adjustments may be required on new engines due to climatic conditions. See 'CARBURETOR ADJUSTMENT' paragraphs below for adjustment procedure.

Refer to **Trouble Shooting** section, Page 2, if starting troubles of frosting conditions are encountered.

All components of carburetion equipment supplied to Wisconsin Motor Corporation for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

CARBURETOR ADJUSTMENT

There are three external adjustments as illustrated in Fig. 1: **Power adjusting valve** (for load speed), **idle adjustment** (for idle fuel mixture) and **throttle stop screw** (for idle speed).

Note: All adjustments are made when engine is tested at the factory. If engine starts, idles smoothly and goes from low to high speed without hesitation, do not change carburetor settings.

Idle Adjustment: If engine idle is rough or is too fast, adjust in the following manner: Turn **idle adjustment** out 4 turns from its seat. Start engine and set throttle control at low idle. Turn **throttle stop screw** until engine is running slightly faster than normal idle speed. Next, turn **idle adjustment** screw in until engine begins to stall, then turn screw out until engine runs steadily and smoothly. Engine will be idling faster than required at this point, so back out **throttle stop screw** until a slow smooth idle is obtained.

If a **vacuum gauge** is available, adjust to highest manifold vacuum, with engine running at low idle speed. The intake manifold has 1/8" pipe tap for vacuum check.

Power adjusting valve is of a simple air bleed design. A dial on the carburetor diaphragm body indicates the rich and lean settings. By means of a screw driver, set **scribe mark** on head of **power adjusting valve,** between number 2 and 3 on dial. This setting has been calibrated to meet average loading and operating conditions.

A more accurate, and recommended adjustment, is accomplished with a **fuel or exhaust analyzer:** with the engine warmed up and operating at FULL LOAD, turn **power adjusting valve** clockwise, toward **rich** marking on dial, until a reading of 13 to 1 air fuel ratio is registered by the **gas analyzer** (14 to 1 if gasoline analyzer is used). FULL LOAD conditions can be simulated by disconnecting the **vacuum line** from the converter to the carburetor — run engine at wide open throttle and set **power adjustment** to the richest mixture possible while obtaining a 13 to 1 reading on gas analyzer.

A very **slight movement** of the power valve between number 2 and 3 on dial is required for an efficient setting. Turn adjustment clockwise for a **rich mixture,** counter-clockwise for a **lean mixture.**

I. ENGINE WILL NOT START

Before investigating the L.P.G. equipment, be sure that engine's malfunction does not exist in the **ignition system.** Reference can be made to the Engine Instruction Book for **TROUBLES, CAUSES** and **REMEDIES.**

(A) Check for fuel flow to carburetor.

1. Fuel storage tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after fuel tank is filled, or if valve is opened too abruptly). Close tank valve, listen for *'click'*, and then open **very slowly.**
4. Check fuel line for leaks, and for damaged or stopped-up fuel filter. Use a soap solution on hose joints and watch for bubbles, which indicate leakage.
5. Disconnect air cleaner hose at carburetor, and crank engine with ignition on, for 3 or 4 seconds. Then, reach inside carburetor and depress diaphragm very lightly. If the sound of fuel rushing out is heard, the diaphragm is not lifting fuel valve off the seat, indicating a punctured or crinkled diaphragm. *See Form* **ML-27** *for Carburetor Service and Parts.* If the rush of fuel is **not** heard, the problem is either in the vacuum switch or lock-off filter.
6. Check solenoid lock-off filter and vacuum switch (if furnished). Turn ignition on and crank engine. If the solenoid *'click'* can be heard, both lock-off and vacuum switches are working. If not; disassemble, clean and repair.

(B) Test pressures.

1. A fuel pressure check between the converter and carburetor should show:
   Static Pressure – 1-3/4 P.S.I. max.
   Running Pressure at Idle – 1-1/4 P.S.I.
   Pressure is critical and should not climb.
2. A correct reading indicates no trouble exists in the gas system from tank to carburetor.
3. If fuel pressure is too high or climbs – trouble is in the converter. *Refer to Form* **ML-26-2** *for Converter Service and Parts.*

(C) Adhere to starting procedure.

1. Regulate carburetor idle and power adjustments, per instructions.

II. FROST

(A) Frost on fuel filter, shut-off valve, or inlet line – caused by opening outlet valve on fuel tank too rapidly. Caution must be taken in opening fuel supply valve **slowly.**

1. Frost at filter – restricted filter element. Replace element and clean per *Fuel Filter* paragraph.

(B) If carburetor, fuel lines, and converter are frosted over, close storage tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

1. Frost on fuel lines between converter and carburetor is caused by inadequate vaporizing – engine taking load too rapidly.
2. Frost on connection fittings. Check for fuel leaking, kinked lines, or restriction at frosted area.

(C) Frost at converter.

1. Engine stopped – indicates fuel leaking through both lock-off and carburetor.
2. Engine running – insufficient heat at converter. Warm engine thoroughly before applying load.

(D) Frost on fuel storage tank.

1. Fractured dip tube in fuel cylinder.

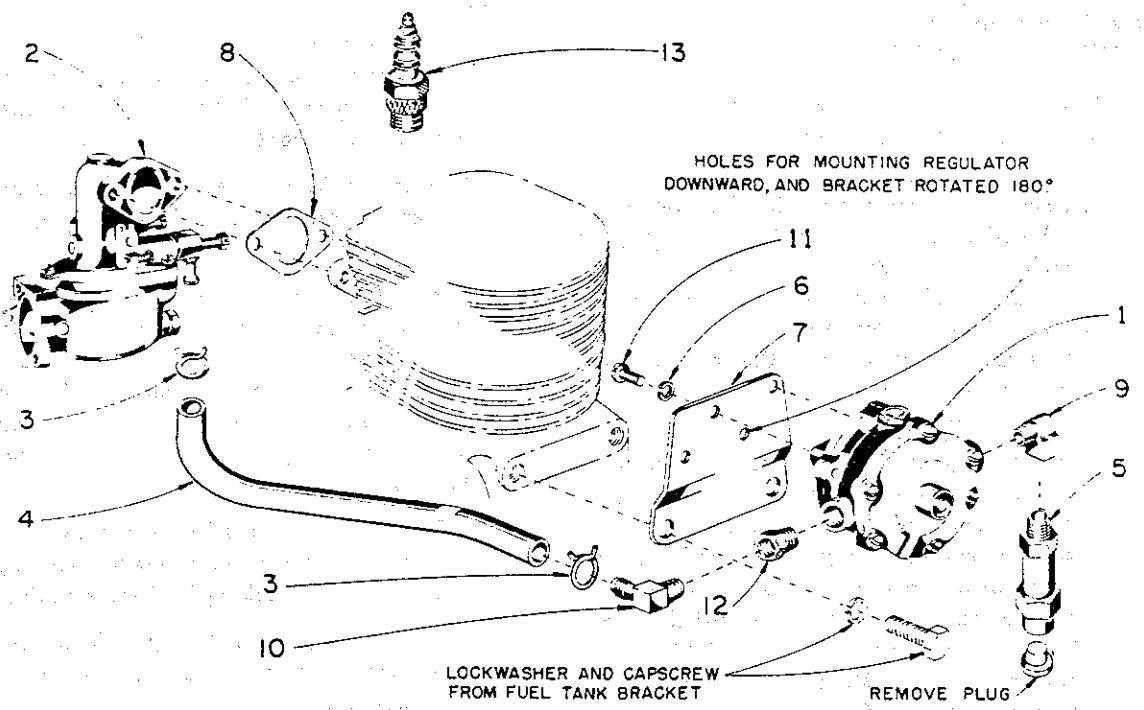
FUEL FILTER

At least once a year remove sediment bowl; clean interior of bowl and replace charcoal filter with a new Algas No. 701 filter element. If contaminated fuel conditions exist, it will be necessary to replace cartridge element more frequently.

A dirty element will cause a frosting condition to occur at the fuel filter, and will also result in loss of power.

SK1427 Conversion Kit And Parts List

USE WITH MODELS S7DG, S8DG



ITEM	PART NO.	DESCRIPTION	QTY
1	L109	Garretson regulator, model S2, no. 074-131 (replaces L121 Beam regulator)	1
2	L88S1	LPG carburetor, Zenith no. 12976	1
3	LK26	Hose clamp	2
4	LL172-16	Fuel line hose	1
5	LP51	Fuel filter, Zenith no. GF483	1
6	PE14	Lock washer, no. 10	2
7	PG1133	Regulator bracket	1
8	QC53	Gasket	3
9	RF1099	Elbow	1
10	RF1439	Hose connector	1
11	XA12	Screw, no. 10-24 thread x 1-1/2" long (NLA)	2
12	XK21	Reducer bushing, 1/4" to 1/8"	1
13	† YD35	Spark plug, Champion no. D9	1

† Not included in the SK1427 conversion kit.

SK1427 Conversion Kit And Parts List (Cont.)

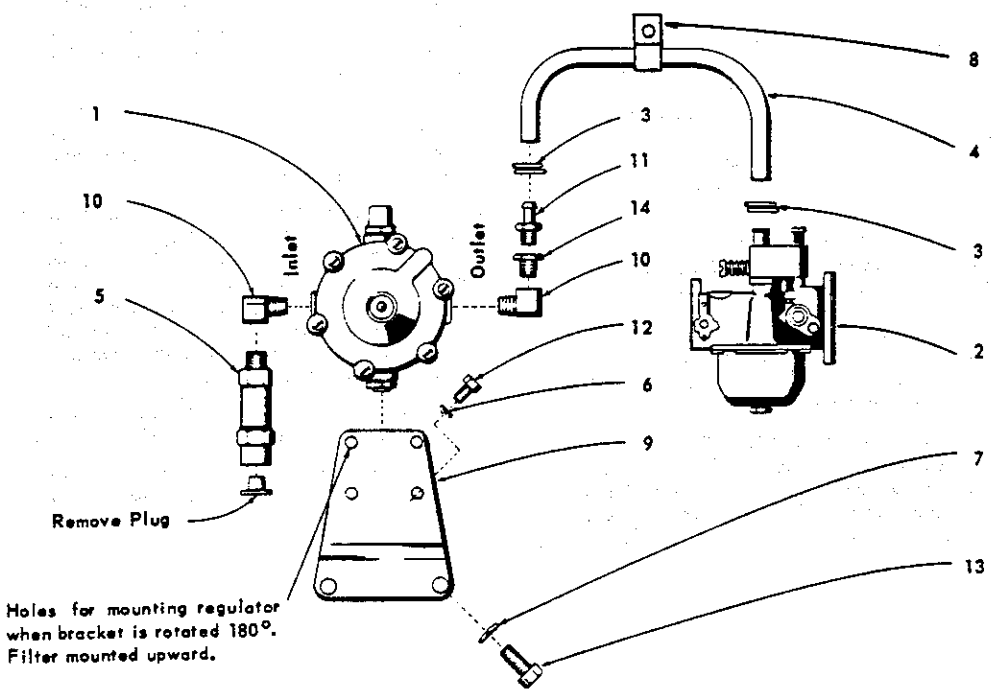
CONVERSION PROCEDURE

Use a pipe thread compound for all threaded connections.

1. Remove gasoline carburetor, fuel tank-bracket assembly and fuel line from engine and discard. Retain tank bracket capscrews and lockwashers, as they are necessary for mounting regulator bracket to crankcase. Also retain air cleaner-bracket assembly and carburetor screws and washers.
2. Mount L.P.G. carburetor (Ref. 2) to crankcase using one new flange gasket (Ref. 8) for model S-8D and two gaskets for S-7D engine. Use same capscrews and lockwashers that were used for mounting gasoline carburetor. Attach air cleaner-bracket assembly to carburetor and connect breather line.
3. Sub-assemble elbow (Ref. 9) to "inlet" tap of two-stage regulator (Ref. 1), and reducer bushing (Ref. 12) with hose connector (Ref. 10) to "outlet" tap. Mount two-stage regulator (Ref. 1) to bracket (Ref. 7) with screws (Ref. 11) and lockwashers (Ref. 6).
4. Mount bracket and regulator assembly to engine at the same location the gasoline tank bracket was mounted, using the original screws and lockwashers.
5. Insert fuel line (Ref. 4) between rear of shroud and crankcase. Attach to carburetor valve and regulator hose connector, using clamps (Ref. 3).
6. Assemble fuel filter (Ref. 5) to elbow at regulator inlet. Remove plug from inlet of fuel filter and install fuel line from storage tank. The thread size at the filter inlet is a ¼" pipe tap. Line must be approved L.P. fuel hose and should be flexible (Fuel inlet line and storage cylinder furnished by customer).
7. Check for gas leaks with soap suds solution. There must be no leaks.
8. Adjust carburetor and start engine in accordance with Starting Procedure on Page 1.

SK1484 Conversion Kit And Parts List (Replaced By LPG111)

USE WITH MODELS S10D, S12D, S14D



ITEM	PART NO.	DESCRIPTION	QTY
—	† AB114	Cylinder head (standard on S10D) (replaces standard for S12D)	1
—	† YD35S1	Spark plug, Champion no. D9	1
1	L109	Garretson regulator, model S2 (replaces L121 Beam regulator)	1
2	L89S1	LPG carburetor, Zenith no. GO13158 (NLA)	1
3	LK25	Hose clamp	2
4	LL188-16	Gas line, 3/8" I.D. x 5/8" O.D. (replaces LL172-19 - 1/4" I.D.)	1
5	LP51	Fuel filter, Zenith no. GF483	1
6	PE3	Lock washer, 1/4"	2
7	PE5	Lock washer, 3/8"	2
8	PG725	Clip	1
9	PG1332	Regulator bracket	1
10	RF1099	Elbow	2
11	RF1485	Hose connector, 3/8" I.D. (replaces RF1476) (NLA)	1
12	XA34	Screw, 1/4"-20 thread x 1/2" long	2
13	XD27A	Screw, 3/8"-16 thread x 1" long	2
14	XK21	Reducer bushing, 1/4" to 1/8"	1
15	PF163	Plug (not illustrated)	2
16	XD31	Screw, 3/8"-16 thread x 1-3/4" long	3

† Not included in the SK1484 conversion kit.

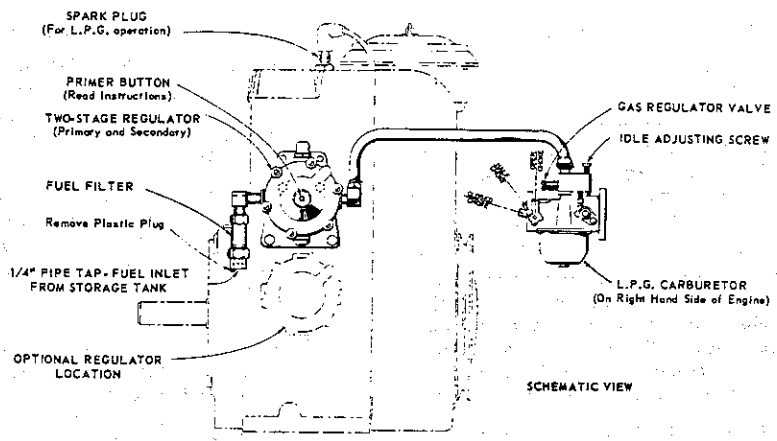
SK1484 Conversion Kit And Parts List (Replaced By LPG111) (Cont.)

CONVERSION PROCEDURE

Use a pipe thread compound for all threaded connections.,

1. Remove gasoline carburetor, fuel tank-bracket assembly, mounting studs and fuel line from engine and discard. Retain stud washers, air cleaner-bracket assembly, carburetor nuts and washers.
2. Mount L.P.G. carburetor (Ref. 2), to cylinder block using two new flange gaskets. Attach air cleaner-bracket assembly to carburetor and connect breather line. Screw governor control rod into carburetor throttle lever and adjust per instructions in engine manual.
3. Sub-assemble elbows (Ref. 10), to inlet and outlet of two-stage regulator (Ref. 1), and reducer bushing (Ref. 14) with hose connector (Ref. 11) to outlet elbow. Mount two-stage regulator (Ref. 1) to bracket (Ref. 9) with screws (Ref. 12) and lockwashers (Ref. 6).
4. Mount bracket and regulator assembly to the two tapped holes in the upper left hand side of the crankcase, with screws (Ref. 13) and lockwashers (Ref. 7).
5. Connect gas line (Ref. 4) from carburetor, over cylinder head, to regulator with hose clamps (Ref. 3). Close up fuel line holes in shroud with button plugs (Ref. 15).
6. Assemble the three cylinder head screws (Ref. 16) with plain washers. Attach clip (Ref. 8), for supporting gas line, to the head screw which also secures the flywheel shroud. Torque screws to 32 ft. lbs.
7. Assemble fuel filter (Ref. 5) to elbow at regulator inlet. Remove plug from inlet of fuel filter and install fuel line from storage tank. The thread size at the filter inlet is a ¼" pipe tap. Line must be approved L.P. fuel hose and should be flexible. (Fuel inlet line and storage cylinder furnished by customer).
8. Check for gas leaks with soap suds solution. There must be no leaks.
9. Adjust carburetor and start engine per Starting Procedure on Page 1.

SK1484 Conversion Kit And Parts List (Replaced By LPG111) (Cont.)



FUEL

If available, use PROPANE HD 5 in place of commercial propane. This is a special grade of fuel specifically developed for internal combustion engines.

When L.P. gases are pressurized they assume a liquid state, making it more suitable and economical for handling. Pressure in an L.P. gas tank, approximately 80% full of liquid fuel, will be in the vicinity of 100 pounds per square inch at 70°F. An increase in temperature will increase pressure, while lower temperature will reduce pressure. The two-stage regulator controls the fuel pressure to carburetor regardless of the temperature changes, except when temperature falls below -20°F.

Due to local climatic differential, information on size of fuel tank should be received from your local L.P.G. distributor. (Fuel inlet line and fuel tank furnished by customer.) Fuel tanks are also referred to as fuel or storage cylinders.

FUEL SYSTEM

These models of engines are equipped with a vapor withdrawal L.P.G. system only. Since fuel requirements for this size engine are quite low, tank capacity is usually large enough to supply the engine with enough gas without sustaining any tank freeze-up. Thus, the more expensive liquid withdrawal system is not essential.

The Wisconsin two-stage regulator is designed to reduce fuel storage pressure to a pre-determined and dependable discharge pressure required for optimum engine performance. No primary regulator or high pressure reducing valve are required at the fuel storage cylinder.

Connect fuel inlet line from storage cylinder to fuel filter.

STARTING PROCEDURE

1. CAUTION: 'Slowly' open main gas valve in fuel tank. An abrupt full opening of the valve will induce dirt from within the tank to enter the fuel line. Too rapid an opening can also cause frost to form on the fuel filter, main valve and inlet line. Check for gas leaks with soap suds solution. There must be no leaks.

Before starting engine, refer to illustration above and adjust carburetor as follows:

   a. Turn the idle adjusting screw in until it seats. Caution: Do not use excessive force. Then, turn back from its seats about 3¼ turns.

   b. Turn gas regulator valve on carburetor, out approximately 3 full turns from its seat. (After the engine is started and warmed up for several minutes, adjust the idle adjusting screw and gas regulator valve for smoothest operation.) These adjustments need only be made the first time a new engine is started, or if there is a change in the load and operating speed or temperatures.

2. Prime engine by cranking through 2 or 3 suction strokes, with the carburetor choke closed. (Choke closed when lever is pointing outward.)

   A primer button is provided on the regulator, as an optional method of starting. In this case, the carburetor choke is left open while the primer button is depressed and quickly released. The engine is then cranked. Because of the possibilities of over priming and flooding, this method of starting is not highly recommended.

3. If the engine is equipped with a variable speed governor control, set throttle about ½ open.

4. Disengage clutch, if furnished.

5. With the magneto switch or ignition switch in running position, open choke half-way from full closed position.

6. Crank engine over slowly to compression stroke, then turn back one-half turn. Wind rope fully on starter sheave and pull briskly in a clockwise direction. After engine starts, open choke fully.

   With starting motor, pull out ignition switch (tag reads 'To Stop Push In'') and depress starter button.

7. Allow engine to warm up a few minutes before applying load. New engines should be "run-in" gradually.

Refer to Trouble Shooting section, page 3, if starting troubles or frosting conditions are encountered.

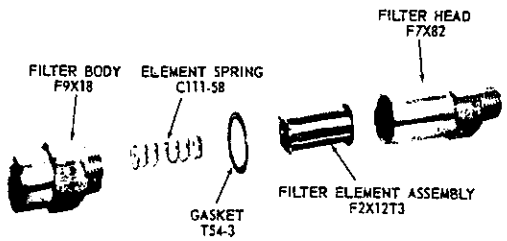
All components of carburetion equipment supplied to Teledyne Wisconsin Motor for installation carry U.L. approval and are fabricated to traditional "WISCONSIN" high quality standards.

CONVERSION SUGGESTIONS

Engines to be converted to L.P.G. must be in good mechanical condition. Those which have poor compression, weak ignition, or similar defects cannot and will not produce the engine's ultimate capabilities.

The spark plug furnished with your gasoline engine will successfully ignite L.P.G. However, improved performance and longer spark plug life can be achieved by using a colder plug. These are available from your WISCONSIN dealer. Refer to parts list for correct spark plug number.

LP51 LPB Vapor Withdrawal Fuel System (Zenith No. GF483)

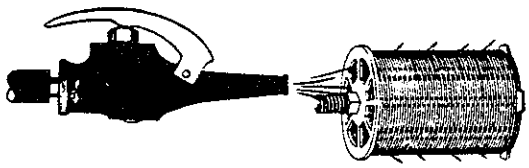


MAINTENANCE

This filter is designed to be installed in the fuel line. It is made to operate under working pressures up to 250 p.s.i. and is approved by UL for such use.

The filter is made to protect the equipment on which it is used, by removing all foreign particles of .003" or larger. Consequently, from time to time it will be necessary to clean the filter element.

To clean the filter it is necessary to detach the fuel line from the filter head. The head may then be unscrewed from the filter body. Remove the element assembly from the head. Wash the element in commercial solvent cleaner or gasoline. If the accumulated dirt is gummy, we suggest a short soaking period in solvent cleaner. The element should then be rinsed in clean gasoline and blown out with compressed air. ALWAYS USE REVERSE FLOW—FROM THE INSIDE OUT. NEVER USE COMPRESSED AIR ON THE OUTSIDE SURFACE OF THE ELEMENT. The element may then be reassembled in the filter head with the assurance that none of the dirt that has been separated can possibly enter the system. None of the dirt is forced through the discs.



NEVER DIP ELEMENT IN 'BRIGHT DIP' OR OTHER ACID SOLUTION

In reassembling the filter, it is important that the element be inserted into the filter head with the round washer entering first into the opening. The gasket is put on the filter body and the spring is located into the filter body so that when the filter is put together the spring holds the element against the head.

The two principle parts should be assembled with 75 foot pounds torque. After the unit has been reinstalled, the joint at the gasket should be checked with a soap bubble solution to be sure there is no leak. The fuel line connections should also be checked in the same manner.

L.P.G. TROUBLE SHOOTING

I. ENGINE WILL NOT START

Before starting work on any LP gas equipment, be sure that engine's malfunction does not exist in the ignition system. Reference can be made to the engine instruction manual for **TROUBLES, CAUSES and REMEDIES** section.

(A) Check for fuel flow to carburetor.
1. Fuel tank empty.
2. Tank outlet valve closed.
3. Excess flow valve closed. (This may occur soon after tank is filled). Close tank valve and open slowly.
4. Fuel lines plugged up.
5. Damaged or stopped-up fuel filter.

(B) Check for too much fuel to carburetor.
1. Regulator valve seat leaking.
2. Carburetor main adjustment too rich.

II. FROST – DURING OPERATION

(A) Frost on fuel filter, shut-off valve, or inlet line; Opening outlet valve on tank too rapidly will cause excess flow valve to close when inlet line and filter are empty. Caution must be taken in opening fuel supply valve **slowly.**

(B) Frost on carburetor, vapor lines, and regulator; Close tank valve and allow excess fuel to dissipate. Open fuel supply valve slowly for approximately 1/4 travel. Start engine and idle until warm-up occurs. Open valve completely before adding load to engine.

(C) Frost on connection fittings; Check for fuel leaking, kinked lines, or restriction at frosted area.

(D) Frost on tank; Can be caused by too rapid a fuel withdrawal for tank size. Larger tank may be necessary.

III. FLOODED SYSTEM

If system is flooded, crank engine with throttle wide open. Engine will not start until rich mixture dissipates. It may be necessary to shut off fuel supply at fuel tank to clear carburetion system.