

BEAM®

120A*



for the conversion of

**TAXIS — FORK LIFTS — TRACTORS
DOOR-TO-DOOR DELIVERY TRUCKS**



FEATURES

- Weight — 4 1/2 Pounds
- Capacity — 150 H.P.
- Size: 5 3/4" Diam., 4" Deep
- Built-in Idle Screw
- Built-in Vacuum Shut-off
- 100% Shut-off when Engine stops
- No Priming, No Choking
- No Idle Plates

Pat. Nos. 2,775,981 and 2,926,682

With the idle adjustment built in, the BEAM 120 A requires only two mounting bolts. No primers or chokes are necessary as starting aids.

An additional feature is the automatic vacuum shut-off which locks off fuel completely when the engine stops rotating.

For use with any LP-Gas carburetor, carburetor adapter, or as a simple spud-in to the gasoline carburetor.

120A* Standard Production. Two vapor outlets; 1/2" pipe at 10:00 o'clock position and 3/4" pipe at 2:00 o'clock. Optional primer as pictured on page 4.

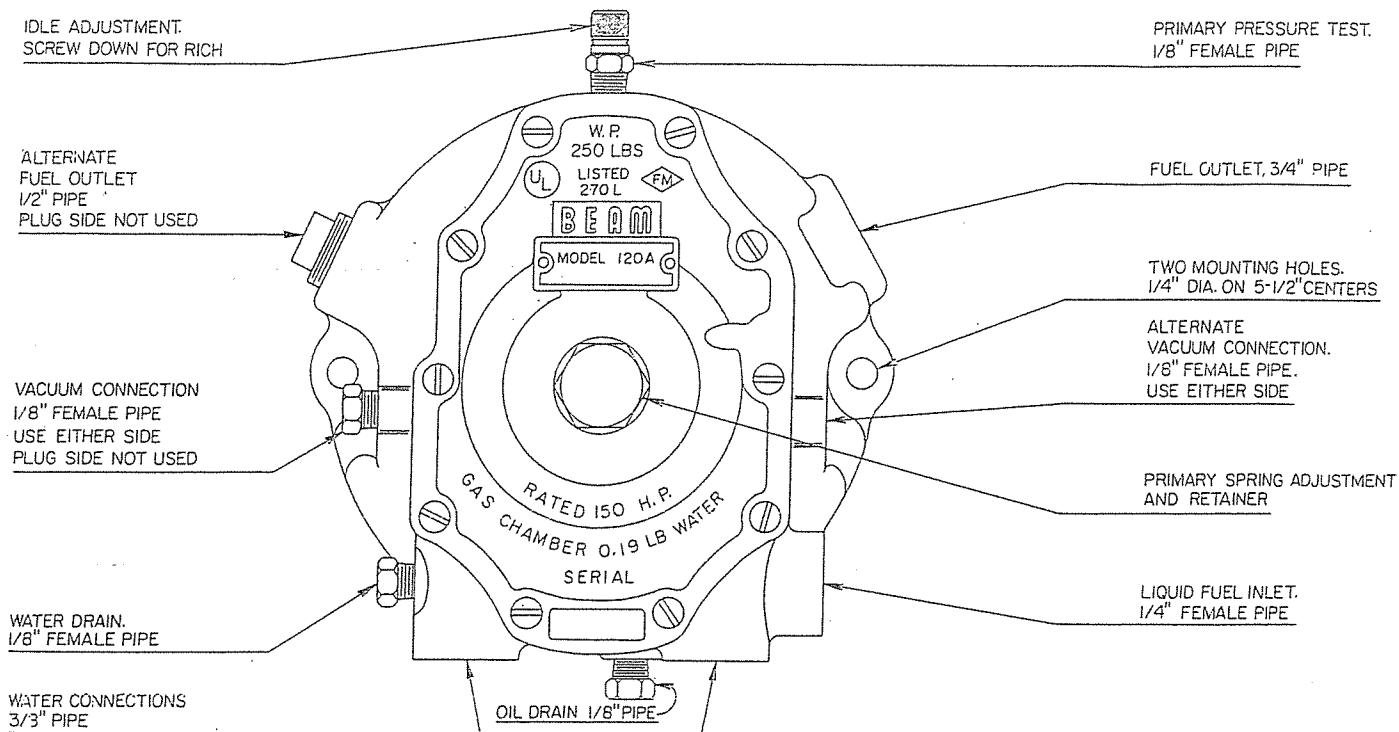
120A-E Standard Production, but less vacuum-lock diaphragm assembly. These installations must be equipped with a fuel solenoid valve and an engine controlled safety switch.

120A-D No freeze plug, otherwise standard production. For use with high pressure hot oil or exhaust gas for vaporizing medium. (Not for use with water.)

120A-P Extended Manual Primer added to the Standard Production Model 120A.

BEAM PRODUCTS MFG. CO.

OCT. 1980, FORM H-170C



INSTALLATION INSTRUCTIONS for the BEAM 120A

GENERAL INSTALLATION

Plan the complete installation before actually mounting any item. The regulator should be mounted vertically, below the top radiator water level, and as near the carburetor as possible. The 120 should be placed in a spot convenient to the various fuel and water lines. It may be mounted directly to the vehicle or to a suitable bracket. If the engine block position is selected, a flexible liquid fuel line should be installed between the frame and vaporizer as a protection against vibration. The two mounting holes are drilled on 5½" centers. Never mount the regulator too near the exhaust manifold or the excessive heat will deteriorate the neoprene valves and diaphragms in a short time.

FUEL CONNECTION

On new installations, before connecting the line to the regulator, open the tank valve a moment and blow out the fuel line to free it from all tank impurities and metallic chips loosened during the installation. Complete fuel connection from tank through LPG filter, to lower right side ¼" female pipe inlet. Use pipe compound carefully so none gets inside to clog the internal valves. Turn on the fuel tank valve (open slowly so as not to close the excess-flow tank valve) and test all points for leaks with soap and water.

VACUUM CONNECTION

Make vacuum connection from ⅛" pipe hole on either side to any spot on the intake manifold. Neoprene or copper tubing may be used. This vacuum line is essential in order to open the vacuum lockoff which is built into the low pressure section. This line does not carry the idle mixture. Note: When starting with a closed throttle, a one quarter turn of the engine will open this vacuum lockoff.

WATER CONNECTIONS

Mount regulator vertically, with water connections at the bottom. Direction of water flow is not important — connect for best appearance or simplicity. If installation is being made on a small truck or taxi which has a hot water heater installed, it will be necessary to connect up in parallel using ⅜" pipe tees.

FUEL OUTLETS

This 120 regulator may be used with carburetor adapter, straight LP carburetor, or as a spud-in to the regular gasoline carburetor. Connect dry-gas hose to whichever fuel outlet is handiest for neat installation. Be sure to plug whichever of the fuel outlets that are not used.

STARTING

Starting a cold motor will require a closed throttle position. Or a pumping action that allows the throttle to completely close for a moment (while the starter is turning the engine) will be satisfactory. If the engine does not start immediately, releasing of starter a moment actually primes the unit. On a new installation, before the idle adjustment has been set, it may be necessary to hand choke. This priming may also be done by applying suction to the vacuum connection

ADJUSTING

Once the engine is running and has heated up to operating temperatures, the idle and power adjustments should be made. The idle screw is at the top of the unit. Adjust for smoothest IDLE or highest vacuum by turning IN for RICH—and OUT for LEAN. Power adjustment is made by turning the POWER screw IN for LEAN and OUT for RICH. If an exhaust analyzer is available, it is good practice to check the final adjustments. Power reading should be set at 13.0 or 13.2 air fuel ratio on the gasoline scale.

NOTE

As an added convenience in changing fuels it may be desirable to install electric solenoid valves in both fuel lines. On straight LP conversions, similar to fork lifts, where storage is primarily indoors, an LPG Lockoff is recommended as an added safety precaution.

BEAM 120A GENERAL SERVICING AND ADJUSTING

SPECIFICATIONS

Capacity	Up to 150 h.p.
Type	Liquid withdrawal
Source of Heat	Engine coolant (water)
Regulation	Two stages
Mounting Position	Vertical
Fuel Lockoff	Built-in vacuum-lock
Primary Pressure	5 p.s.i.
Primary Orifice	1/8" diameter
Secondary Orifice	1/4" diameter
Weight	4 1/2 pounds
Size	5 3/4" dia., 4 3/4" depth

OPERATION OF VACUUM LOCKOFF

The instant an engine begins to turn, (starting with closed throttle) the vacuum-lock diaphragm is drawn down and then the secondary regulator, with the Beam idle system, becomes a slightly positive unit ready for immediate starting. Such a secondary overcomes the necessity of primers or chokes as starting aids.

This diaphragm remains down, out of the way, while the motor is running. Although a vacuum gauge may show a zero reading during heavy pulling, the air velocity past the manifold vacuum connection is still great enough to hold down this relatively large vacuum diaphragm so that it does not interfere with normal operation. When the engine is stopped, the release of manifold vacuum allows the vacuum-lock spring to push the diaphragm bumper against the secondary regulator lever and exert an especially tight closing force to insure 100% shutoff.

VACUUM CONNECTION

This vacuum connection is necessary to open the built-in vacuum lockoff. Any vacuum leaks in this line or fittings will prevent satisfactory operation of the regulator. The diaphragm is held down by vacuum while the engine is in operation. A strong coil spring under the diaphragm insures tight lockoff of the secondary chamber whenever the engine stops and vacuum is released.

Use whichever side of the two possible vacuum connections on the Beam 120A that makes the neatest installation. Be positive that the opposite (not used) 1/8" pipe hole is plugged tightly or the vacuum lockoff will not open.

NOTE: This vacuum connection should be made to the intake manifold. Never connect to the vacuum booster pump as this will hold a vacuum after the motor stops and not allow the diaphragm to close. However, installation can be made to this booster by drilling a small 1/16" hole in the vacuum fitting so as to release this suction several seconds after the engine is stopped.

FUEL TEST BAR Special order only

~~The aluminum push pin near the idle adjustment screw may be pushed toward the back cover in order to give a test shot of fuel or to determine if fuel is reaching the regulator. This also enables priming of small refrigerated units which have a governor and hence do not permit starting with a closed throttle. This test bar is an aid to starting new installations before idle and power adjustments have been made. After a unit has been properly adjusted this priming should no longer be necessary.~~

PRIMARY SECTION

If inspection discloses that the primary pressure is above normal, either: (a) the loop spring on the diaphragm has not been hooked under the lever, (b) the primary valve is not seating squarely, or the valve is damaged, (c) the orifice fitting is leaking at the gasket (either loose or damaged), or (d) the primary diaphragm is torn or has worked loose from one of the outside hold down screws. (Although rare, the primary diaphragm breather may be plugged).

If the primary pressure shows too low, check the fuel supply. You may be out of LP-Gas or running on vapor. Also check the fuel line, the excess flow check valve in the tank, or the chance of a dirty fuel filter. After corrections are made, set the tail end of the primary lever at the proper distance from the floor (9/32").

NEOPRENE VALVES (3BRV)

Both the primary and secondary valves are identical and have a swiveling feature which permits easy replacement in the field. Install the shakeproof washer with the cupped side down so as to hold the valve in firm position.

To seat squarely, pull up firmly on the tail end of the lever and with a pointed instrument held against the metal top of the valve, move it around slightly until you feel it seat flat with the orifice. Check both levers for correct height setting of the tail end of the lever.

REGULATOR LEVERS

The proper settings of the two levers are shown in the sectional drawing on the reverse side. When held shut, the tail end of the primary lever should be from 1/4" to 9/32" from the floor of the casting. In order to take out the primary lever, the two screws and entire hinge bracket must be removed.

The tail end of the secondary lever must be flush or very slightly above level of the casting, and can be removed simply by pulling the pivot pin. This is held in place by a spring wire keeper which must be sprung back to remove or replace the pivot pin.

DIAPHRAGMS

Both the primary and secondary diaphragms are hooked to their respective levers. When reinstalling the primary diaphragm, be sure that the ends of the flat balance spring ride on each side of the center fuel passage. The loop spring must be hooked under the primary regulator lever.

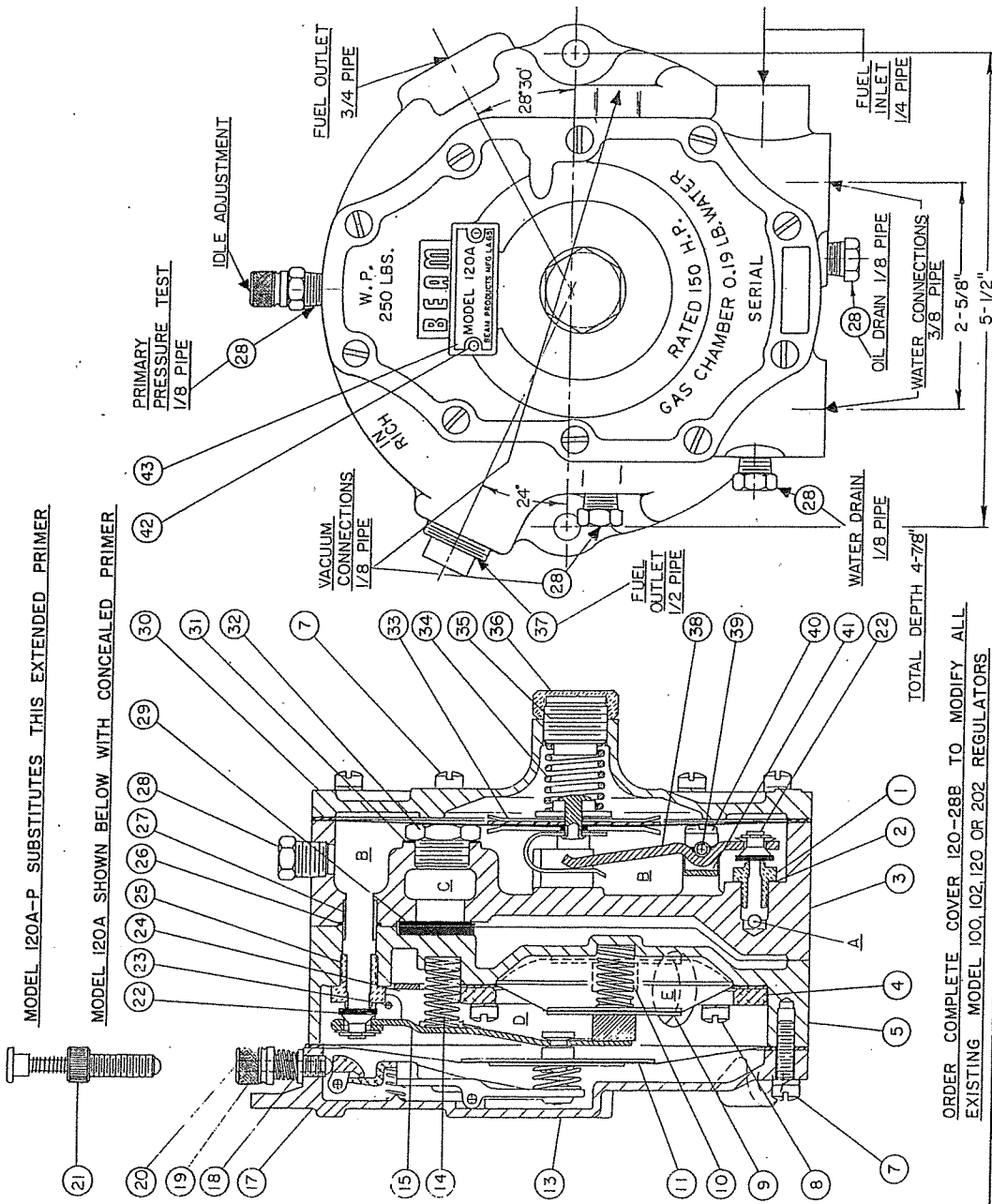
To remove or replace the secondary diaphragm, it is necessary to unhook the diaphragm center pin from the secondary lever. Depress the vacuum-lock to get this pin past the vacuum bumper peg.

IDLE

The idle mixture in the Beam system is supplied to the venturi through the main fuel passages. This is a great aid in keeping the idle and power adjustments independent. The idle spring holds the secondary valve open slightly. However, this starting and idle mixture is shut off tightly by the vacuum lockoff whenever the engine stops.

MODEL 120A-P SUBSTITUTES THIS EXTENDED PRIMER

MODEL 120A SHOWN BELOW WITH CONCEALED PRIMER



120A	STANDARD PRODUCTION WITH CONCEALED PRIMER, AS PICTURED	UL LISTED 270L	WT. 4 LBS. 9 OZ.
120A-D	FOR USE WITH HIGH PRESSURE OIL OR EXHAUST GAS AS VAPORIZING MEDIUM		
120A-E	USE PRIMARY BODY No. 130-1C, ITEM (3). DELETE ITEM (29) 130-5 PLUG		
120A-P	STANDARD 120A MINUS VACUUM-LOCK. REMOVE ITEMS (4) 120-16 RING, (8) 103208-FS SCREWS, (9) 120-15A DIAPHRAGM, (10) 120-14 SPRING		
	ADD ONE ITEM (28) 3152 X2 PLUG TO OPEN VACUUM CONNECTION		
	STANDARD 120A WITH PRIMER. REMOVE ITEMS (19) PS-25-1 SCREW, (20) PS-25-4 PIN. ADD ITEM (21) PS-25 SCREW.		

QTY	DESCRIPTION	ITEM	UNIT	PART NO.
1	NS	1	NS	1 7/8x1 1/2x8 3/4 BOX
1	NS	1	NS	1 6 1/2x5 1/8x6 7/8 BOX
1	NS	1	NS	1 H-170 FORM
1	NS	1	NS	1 H-169 FORM
1	NS	1	NS	1 H-167 FORM
1	NS	1	NS	1 H-165 FORM
1	NS	1	NS	1 PS-20A SCREW--IDLE ADJUSTMENT
1	NS	1	NS	1 400-21 SPRING--IDLE ADJUSTMENT
1	NS	1	NS	1 120-26 KEEPER--PIVOT PIN
1	NS	1	NS	1 130-6 SEAL--"O" RING
2	NS	2	NS	2 103205-FS SCREW--MACHINE / LOCKWASHER
43	1	43	1	43 120-9TA TAG--NAME
42	1	42	1	42 3P-107 SCREW--DRIVE
41	1	41	1	41 120-5 BRACKET--PRIMARY LEVER
40	2	40	2	40 103205-P SCREW--MACHINE
39	1	39	1	39 120-7 PIN--PRIMARY PIVOT
38	1	38	1	38 120-6A LEVER--PRIMARY REGULATOR
37	1	37	1	37 P-48 PLUG--1/2 PIPE SQ. HEAD
36	1	36	1	36 60-32 CAP--SPRING RETAINER
35	1	35	1	35 120-36 RETAINER--SPRING ADJUSTMENT
34	1	34	1	34 120-12 SPRING--PRIMARY PRESSURE
33	1	33	1	33 120-10R DIAPHRAGM--PRIM. REG. W/GASKET
32	1	32	1	32 120-2 PLUG--WATER CORE
31	1	31	1	31 G-25 GASKET--PLUG
30	1	30	1	30 120-9 COVER--PRIMARY REGULATOR
29	1	29	1	29 130-5 PLUG--NEOPRENE EXPANSION
28	4	28	4	28 4 3152 X2 PLUG--1/8 PIPE, HEX HEAD
27	1	27	1	27 130-3 TUBE--FUEL PASSAGE
26	1	26	1	26 130-4 SEAL--"O" RING
25	1	25	1	25 120-23 ORIFICE--SECONDARY REGULATOR
24	1	24	1	24 120-18 BRACKET--SECONDARY LEVER
23	1	23	1	23 400-19 PIN--SECONDARY PIVOT
22	2	22	2	22 2 3BRV VALVE--NEOPRENE FACE
21	1	21	1	21 PS-25 SCREW--IDLE ADJ. W/PRIMER
20	1	20	1	20 PS-25-4 PIN--CONCEALED PRIMER
19	1	19	1	19 PS-25-1 SCREW--IDLE ADJUSTMENT
18	1	18	1	18 2S-120 SPRING--IDLE ADJUSTMENT
17	1	17	1	17 120-45 COVER--SECONDARY W/21 MANUAL PRIMER
15	1	15	1	15 120-24B LEVER--SECONDARY REGULATOR
14	1	14	1	14 120-39 LEVER--SECONDARY REGULATOR
13	1	13	1	13 120-27 SPRING--SECONDARY LEVER
11	1	11	1	11 120-42 COVER--SECONDARY W/18(9)20 CONCEALED PRIMER
10	1	10	1	10 120-22 DIAPHRAGM--SECONDARY
9	1	9	1	9 120-14 SPRING--VACUUM-LOCK
8	1	8	1	8 120-15A DIAPHRAGM--VAC-LOCK W/GASK.
6	2	6	2	6 103208-FS SCREW--MACHINE / LOCKWASHER
2	2	2	2	2 103212-FS SCREW--MACHINE / LOCKWASHER
5	1	5	1	5 130-2 CASTING--SECONDARY BODY
4	1	4	1	4 120-16 RING--VACUUM-LOCK COVER
3	1	3	1	3 130-1C CASTING--PRIMARY BODY
2	1	2	1	2 130-1-1 CASTING--PRIMARY BODY
1	1	1	1	1 120-4C GASKET--PRIMARY ORIFICE
1	1	1	1	1 120-4 ORIFICE--PRIMARY REGULATOR

TOLERANCE		DESCRIPTION	
UNLESS OTHERWISE SPECIFIED	FRACTIONAL	1/16	1/32
3 PLACE DECIMAL	2-IMP		
ANGLE	30/45		
BREAK ALL SHARP CORNERS UNLESS OTHERWISE NOTED			
FINISH: IRIDIUM			
MATERIAL: ALUMINUM			
DRAWN BY: E.F.J.		DATE: 1-17-75	
NAME		VAPORIZER -- REGULATOR	
SCALE		1:1	
PART NO.		120A	
DRAWING NUMBER		C-4135	
BEAM PRODUCTS MFG. CO. 3060 ROSSELLEN ST., LOS ANGELES, CALIF. 90005 REGULATOR - CARBURETTOR - VALVE - 2-27-7020			

BEAM 120 REGULATOR TESTING AND SERVICING

EQUIPMENT NEEDED: A 0-15 or 0-30 pound pressure gauge, air pressure at 100 to 200 p. s. i., screw driver and end wrenches.

NOTE: Whenever unit is taken apart, clean the oil and foreign deposits from all chambers and parts. Do not apply liquid cleaners to the diaphragms and neoprene faced valves.

CHECKING UNIT BEFORE SERVICING

1. Attach pressure gauge at 1/8" pipe test hole at top of Vaporizer-Regulator. Connect air line to fuel inlet. If primary pressure is over 6 pounds, this section requires servicing.
2. Be certain fuel outlet is open. Prime unit by blowing into breather of the secondary regulator cover. Air should flow through regulator with an audible hiss.
3. Place a soap film over fuel outlet which should hold. Be certain only one fuel outlet is open.
4. Test secondary diaphragm for rupture. Hold fuel outlet shut and prime unit again to allow the pressure to build up in secondary fuel chamber. Place soap film over secondary diaphragm breather hole. It should not leak through.
5. Check for possible gas leakage into water chamber. With air connected to fuel inlet, place a soap film over both water connections. This should hold a film. If it does not, there is a leak into water chamber and a defective casting is indicated.
6. Remove the secondary regulator cover. Unhook and remove the secondary diaphragm.
7. The pressure gauge should read 3 to 4 pounds. With idle adjustment screw backed out, depress secondary lever to open valve and then release. Pressure should not build up excessively. If it does, a new primary valve is required. If this does not correct trouble, see note at No. 14.
8. Hold your finger over the primary diaphragm breather vent. ~~This is the small 1/8" diameter hole in the casting floor on left side of vacuum-lock diaphragm.~~ Also hold secondary valve firmly shut and observe pressure gauge for build-up. A rapid increase in pressure would indicate a leaking primary diaphragm that requires replacement.
9. If primary regulator section does not require attention, proceed to step 15.

SERVICING PRIMARY REGULATOR

10. If tests in 7 or 8 above indicate that primary section requires servicing, then disconnect air line and remove the spring retainer (large hex nut) and primary pressure spring, found in center boss of primary regulator cover.
11. Remove the 10 screws holding down primary regulator cover. Lift off cover and unhook the primary diaphragm from under primary regulator lever.
12. If a new diaphragm is indicated in 8, replace it. If a new neoprene valve is indicated in 7, then remove the 2 screws holding lever assembly. Replace 3BR (valve, washer and hair pin assembly). This is the same 3BR part as in secondary regulator chamber. Check to see if orifice needs replacement.
13. Replace primary lever assembly and reswivel the neoprene valve for flat contact with the orifice. This is accomplished by using a pointed tool inserted at the depression in the top of the 3BR valve. Slight pressure is applied downward, with a rotary motion. When valve is closed, tail end of lever should be 1/4" from casting floor. The lever must be taken out for bending if change is required. Hook and replace primary diaphragm, being sure that ends of flat balance spring ride on each side of center fuel passage. Line up the holes on regulator cover and insert all ten screws carefully before starting to tighten them. Last, replace the primary pressure spring and spring retainer.
14. Reconnect air line and recheck pressure (test steps 7 and 8) to be certain parts have been properly replaced.

NOTE: Primary pressure build-up, which continues after 3BR valve has been replaced and properly set, can be caused by a leak at some point ahead of the orifice. To check for leak at the primary orifice gasket, or even in the casting itself, use the under-water, pencil-eraser test as follows: (a) Remove all levers, diaphragms and pressure gauge. (b) Hold the eraser end of a pencil tightly against primary orifice. Apply high pressure air at fuel inlet. (c) Submerge casting in water and watch for pin hole leak at some point either under primary orifice or in casting. (d) Repair as necessary. Use oil or sealing compound on gasket or peen over any small porosity in casting. (e) Recheck under-water and proceed to assemble regulator.

(CONTINUED ON REVERSE SIDE)