

MODEL L

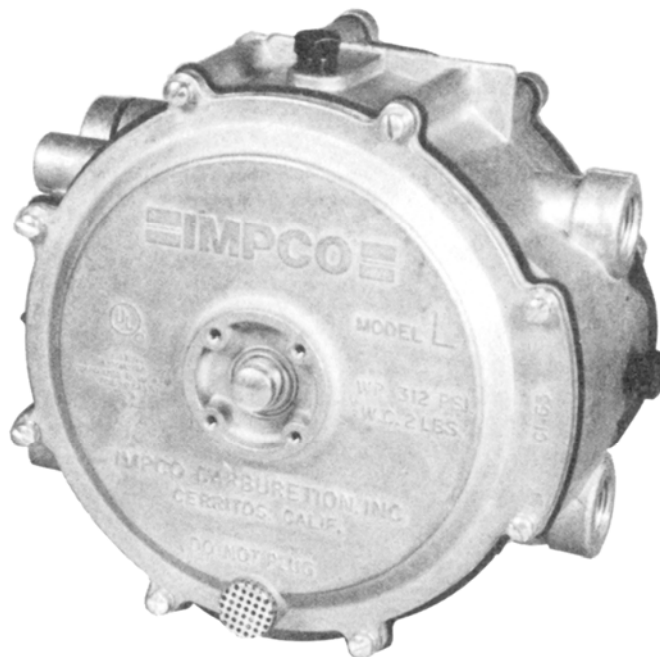
TWO-STAGE REGULATOR REPAIR KIT INSTRUCTIONS

Important: Any maintenance, service or repair should be performed by trained and experienced service technicians. Proper tools and equipment should be used to prevent injury to the servicing technician, property or system components. Service repairs should always be performed in a safe environment and the technician should always wear protective clothing to prevent injury.

The IMPCO PPI-16 repair kit instructions will provide the technician information to successfully repair the Model L regulator. Always inspect the major casting pieces for damage, corrosion or cracks before attempting a service repair. Be sure the repair kit part number you are using is correct for the regulator being serviced. Diaphragms are color coded and have different performance characteristics:

BLACK: Hydrin diaphragm material is the standard material and is well suited for the most common applications.

YELLOW: Silicone diaphragm material is the optional upgrade material that provides excellent flexibility in cold weather climates and is more resistant to chemical contamination.



Model L Two Stage Converter



WARNING

Do not use Teflon tape to seal any fuel fittings. Failure to follow this warning may cause the regulator to leak internally, possibly resulting in serious injury and/or property damage and may void any warranty coverage.

REPAIR KIT PART NUMBERS

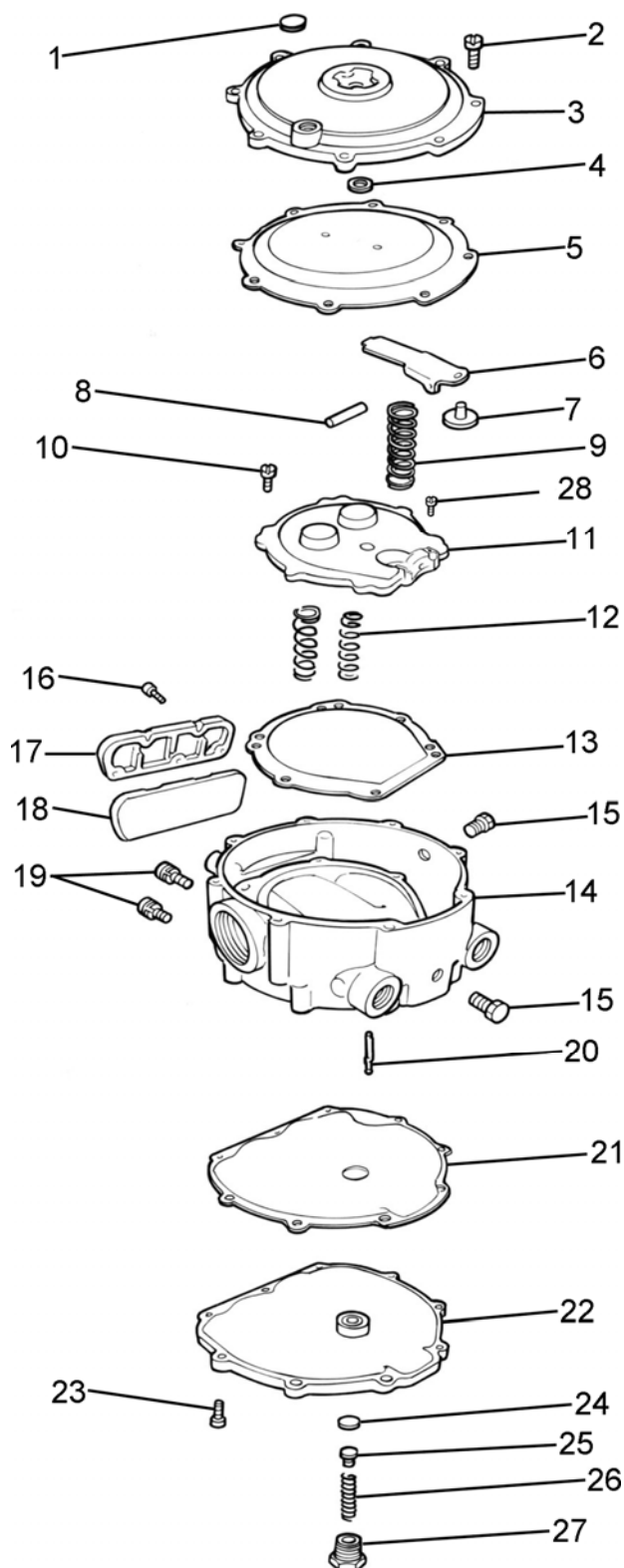
Part #	Description
RK-L	Repair Kit Model L, Hydrin Diaphragm
RK-L-2	Repair Kit Model L, w/Silicone Diaphragm

MODEL L SERIES CONVERTERS

ITEM#	PART#	DESCRIPTION
1	S7-1 NSS	Screen, atmospheric vent
2	S1-59* NSS	Screw, 8-32 x 5/8" SEMS (8)
3	AC1-63 NSS	Cover ass'y, secondary
4	W1-27* NSS	Washer, hand primer
5	AD1-30* NSS	Diaphragm ass'y, secondary, Hydrin
	AD1-31* NSS	Diaphragm ass'y, secondary, Silicone
6	L1-87* NSS	Lever, secondary
7	S4-37* NSS	Seat, secondary
8	P1-7 NSS	Pin, sec. lever fulcrum (early models)
	P1-8 NSS	Pin, sec. lever fulcrum (later models)
9	S2-97 NSS	Spring, secondary regulator (blue)
10	S1-59* NSS	Screw, 8-32 x 5/8" SEMS (6)
11	C1-62 NSS	Cover, primary diaphragm (early models)
	C1-50816-001 NSS	Cover, primary diaphragm (later models)
12	S2-92 NSS	Spring, primary regulator (2)
13	AD1-32* NSS	Diaphragm ass'y, primary
14	AB1-57 NSS	Body ass'y
15	P3-13 NSS	Plug, hex head, 1/8 NPT (2)
16	S1-59* NSS	Screw, 8-32 x 5/8" SEMS (5)
17	C1-61 NSS	Cover, water passage
18	G1-118* NSS	Gasket, water passage
19	S1-5 NSS	Screw, 1/4-20 x 5/8" SEMS (2)
20	P1-34 NSS	Pin, primary valve
21	G1-119* NSS	Gasket, vaporizing chamber
22	AC1-64 NSS	Cover, vaporizing chamber
23	S1-3* NSS	Screw, 10-24 x 5/8" SEMS (9)
24	S4-18* NSS	Seat, primary
25	S4-23* NSS	Seat support, primary
26	S2-93 NSS	Spring primary valve
27	B3-25551 NSS	Bushing, fuel inlet
28	S1-1560-004 NSS	Pan HD, Torx (2)--later models

* Item included in repair kit

NSS=Not Sold/Service Separately

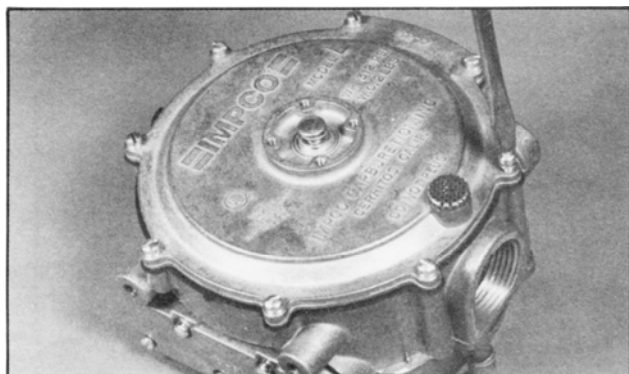


REBUILD INSTRUCTIONS

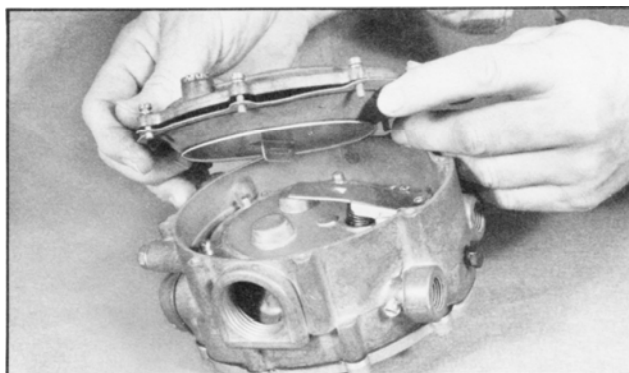


1. Model L Repair Kit (RK-L) contains all necessary parts to replace components subject to deterioration (see page 2 for repair kit components). Installation of repair kit should be necessary only at the time of a major overhaul or when converter has been out of service for a significant length of time.

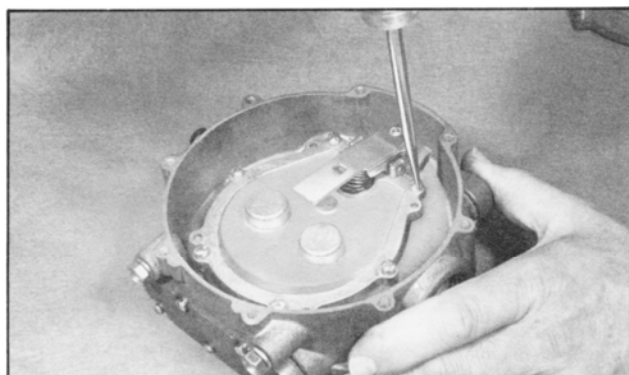
Note: Gaskets and diaphragms deteriorate if converter is stored after use.



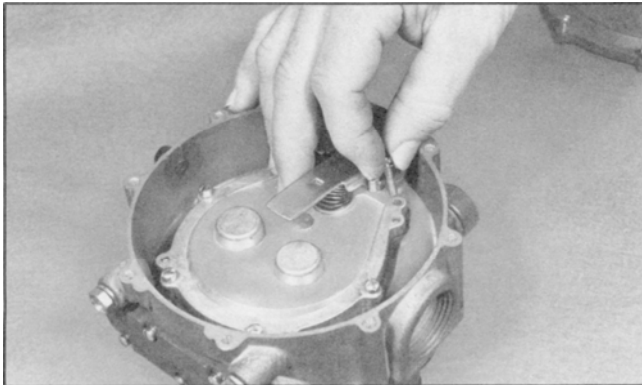
2. Inspect repair kit component parts to ensure the kit is complete. Start disassembly by removing the eight screws (2) securing secondary cover assembly (3).



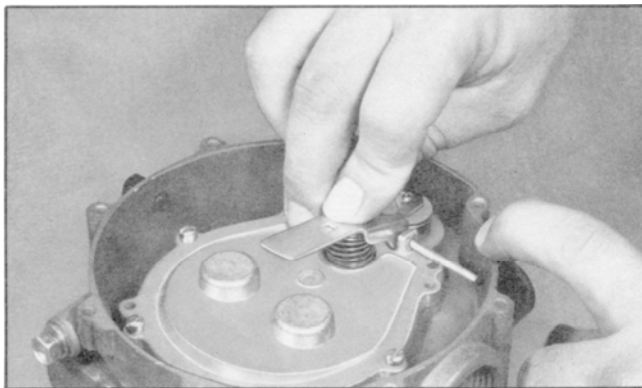
3. Tap cover (3) loose with plastic screwdriver handle and remove secondary diaphragm assembly (5). The diaphragm assembly must be moved away from water inlet-outlet to disengage diaphragm link from the lever assembly. Discard diaphragm assembly.



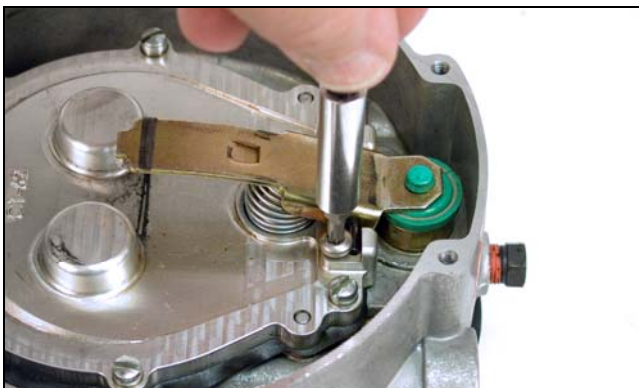
4. **Early Models Only** For later models, skip to step 7. Loosen screw (10) which retains fulcrum pin (8).



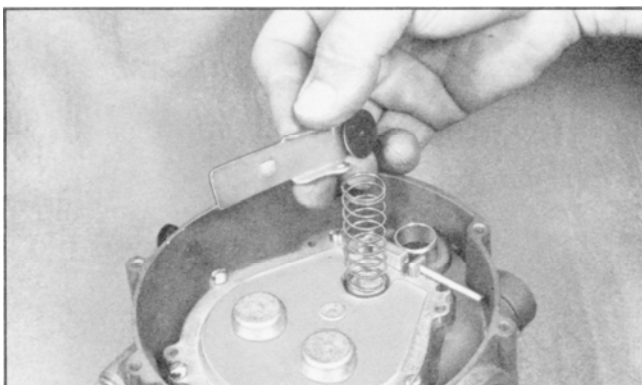
5. Remove screw (10).



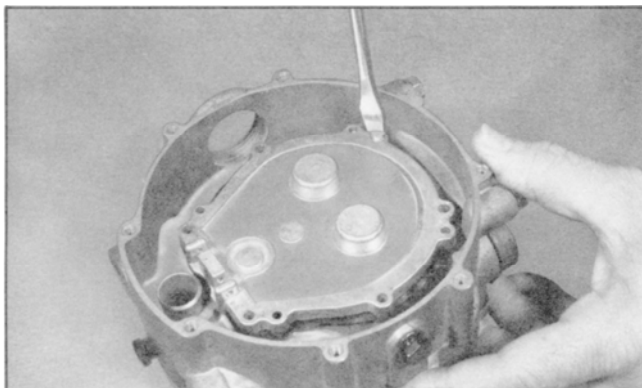
6. Slide fulcrum pin (8) to side as shown to release lever assembly (6 & 7). In some cases, the pin may come out entirely. Retain it for reassembly steps. Skip to Step 8.



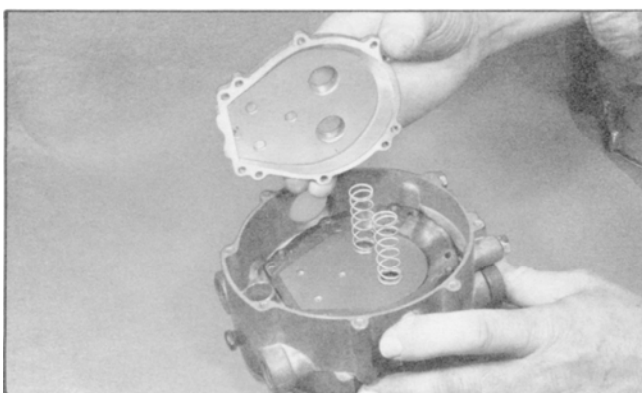
7. **Later Models Only** For early models, skip to Step 8. Remove two screws (28) with T-20 Torx tool to release the fulcrum pin (8).



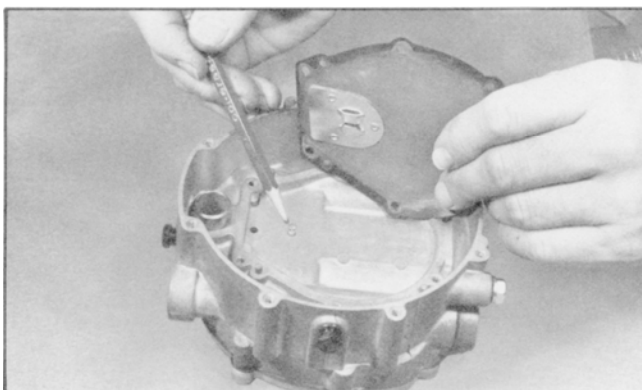
8. Remove secondary lever and seat assembly (6 & 7) and secondary regulator spring (9). Retain pin and spring; discard lever and seat.



9. Remove remaining screws (10) securing primary diaphragm cover (11) and remove the cover.

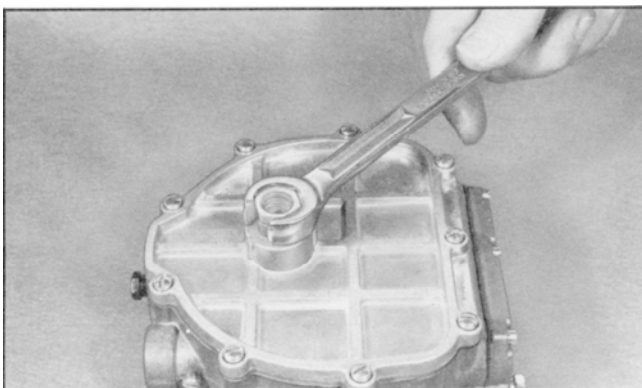


10. Removal of primary diaphragm cover (11) frees two primary springs (12) and primary diaphragm assembly (13). Remove springs and retain for reuse.

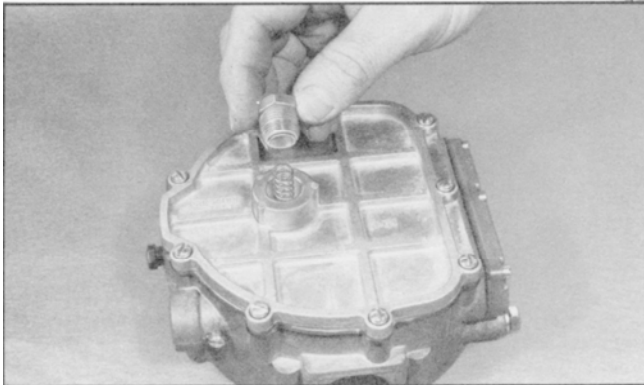


11. Remove primary diaphragm assembly (13). Slide the diaphragm assembly to disengage slot from primary valve pin (20). Discard primary diaphragm assembly. Pencil tip points out pin.

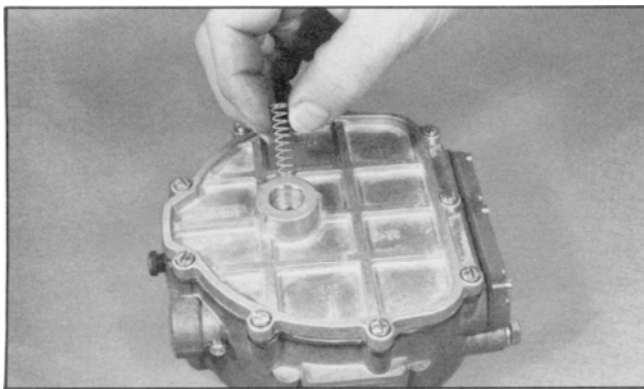
Note: Primary valve is actuated by this pin through the body. This isolates the diaphragm from any contact with liquid propane.



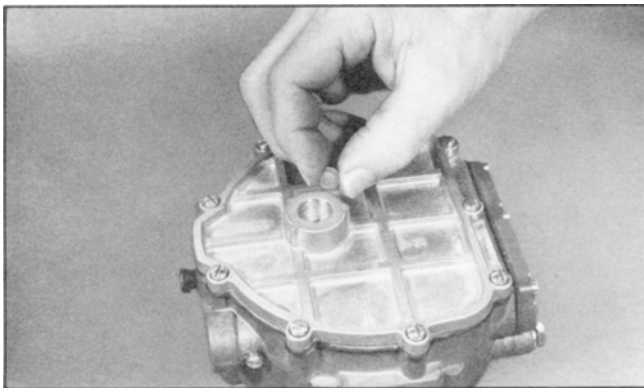
12. Turn over and loosen fuel inlet bushing (27) using a tube wrench or six sided socket.



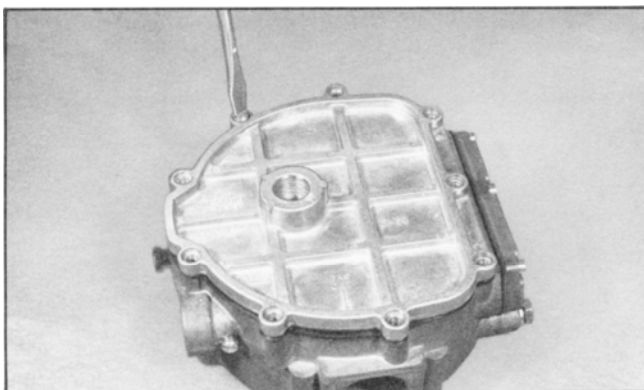
13. Removal of fuel inlet bushing (27) releases primary valve spring (26).



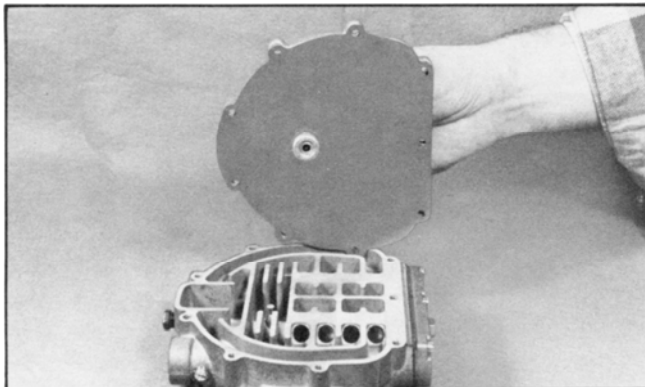
14. Remove primary valve spring (26) and retain for reuse.



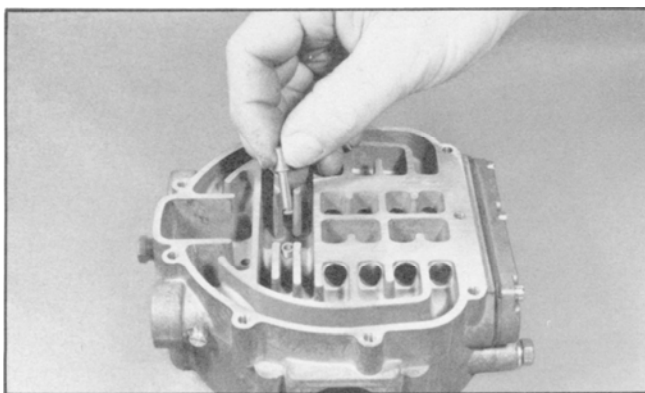
15. Remove primary valve seat (24) and support (25) and discard.



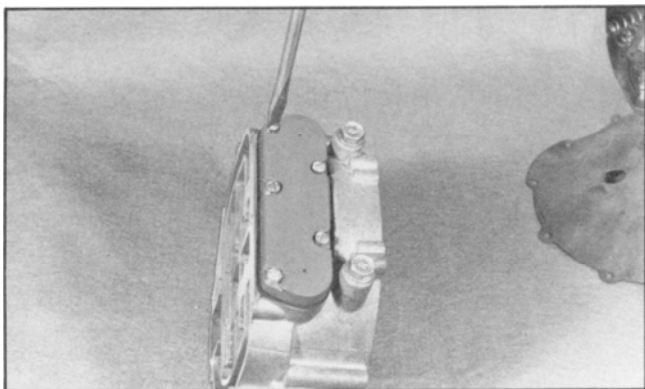
16. Loosen and remove nine screws (23) in vaporizing chamber cover (22).



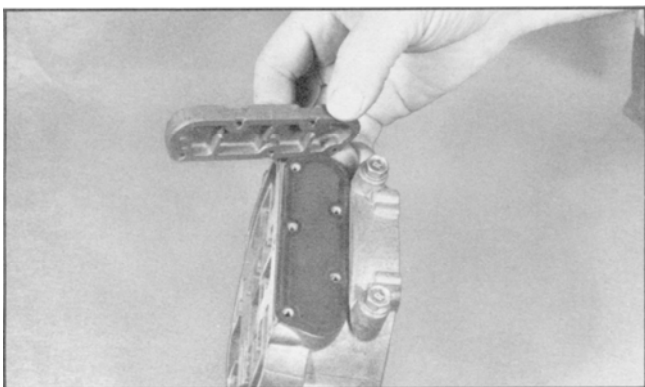
17. Break cover (22) loose by tapping with a screw driver handle. Remove cover and vaporizing chamber gasket (21). Discard gasket.



18. Remove primary valve pin (20) from converter body and retain for reuse.

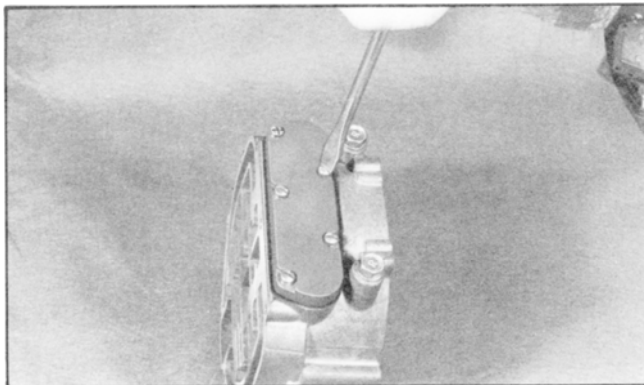


19. Remove five screws (16) from water passage cover (17).

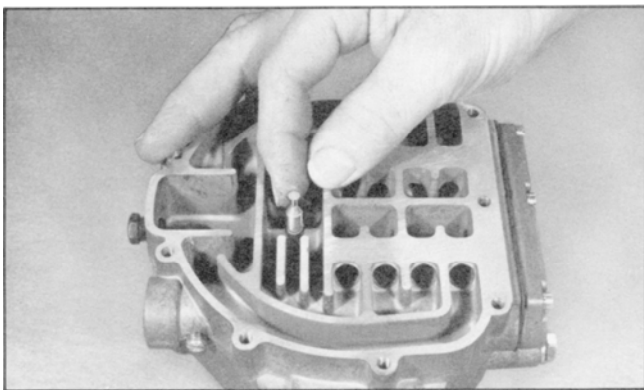


20. Tap cover to loosen and remove cover (17) and water passage gasket (18). Discard gasket.

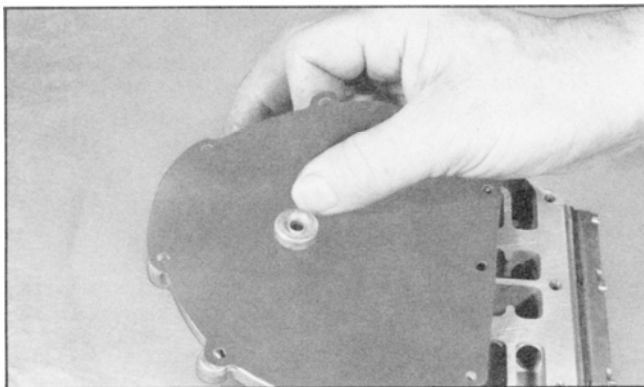
Clean covers, body and metal parts as necessary with a safety solvent and allow to dry prior to reassembly. Do not use harsh solvents such as brake or carburetor cleaner on any of the non-metallic components as they will damage the material.



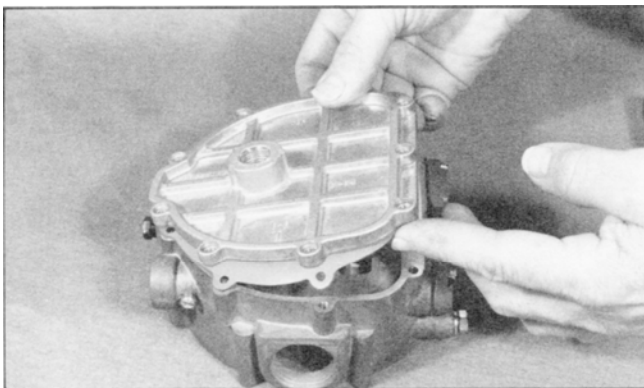
21. Replace water passage cover gasket (18) and cover (17). Tighten screws (16), alternating from side to side. Torque to 25-35 in-lbs. (1.8-4.0 Nm).



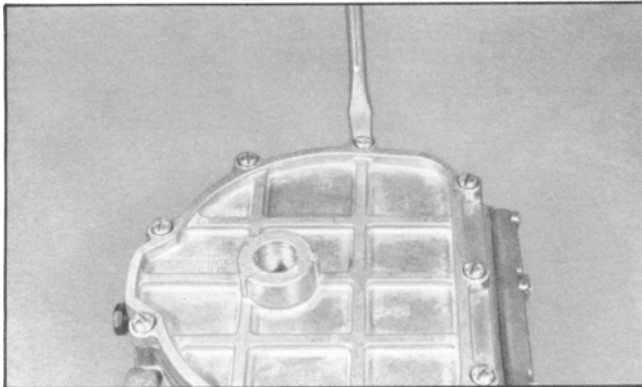
22. Install primary valve pin (20) as shown, in converter body (14). Check that pin moves up and down freely.



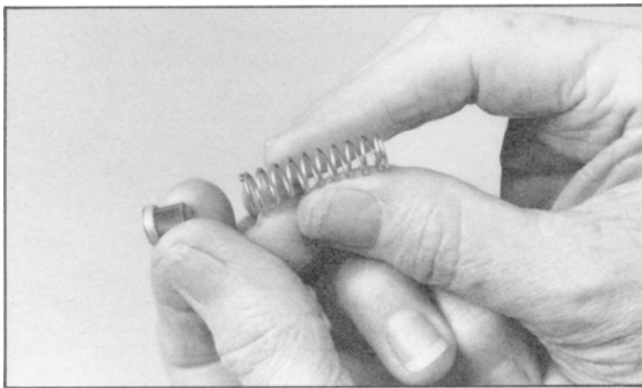
23. Put new vaporizing chamber gasket (21) in place on vaporizing chamber cover (22). Press gasket firmly.



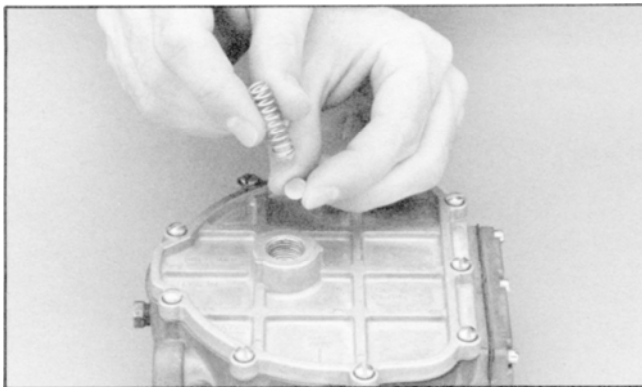
24. Reassemble cover (22) and gasket (21) to heat exchanger body (14). Check to assure gasket is not folded under cover at any point.



25. Hand tighten nine screws (23) in place. Then tighten from side to side until all are firmly seated and torque to 25-35 in-lbs. (1.8-4.0 Nm). Replace any screws damaged during use or disassembly.



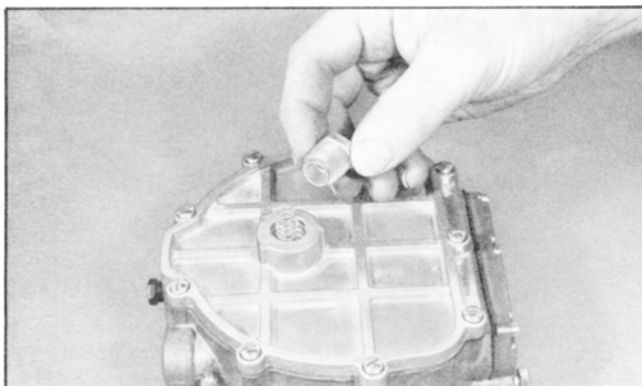
26. Insert new primary valve seat support (25) into primary valve spring (26). Tapered neck of valve seat will slide inside spring (26) opening at either end.



27. Place the primary valve seat (24), seat support (25) and spring (26) in vaporizing chamber cover. Clean seat area with compressed air or a rag.

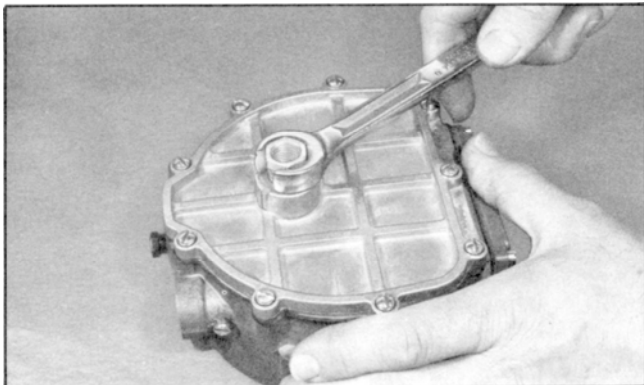


Note: The seat (24) must be installed with the rubber side against the pin, not against the primary seat support (25).

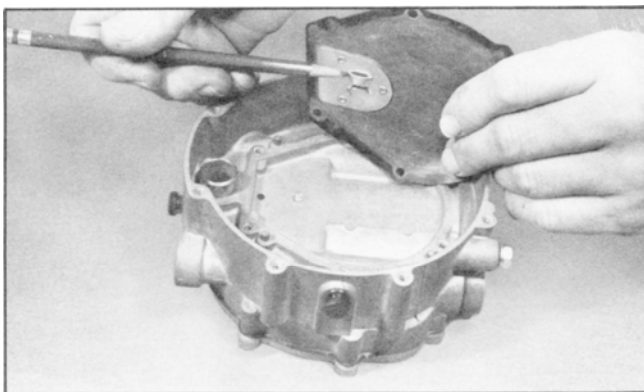


28. Fuel inlet bushing (27) ready to insert over primary spring (26).

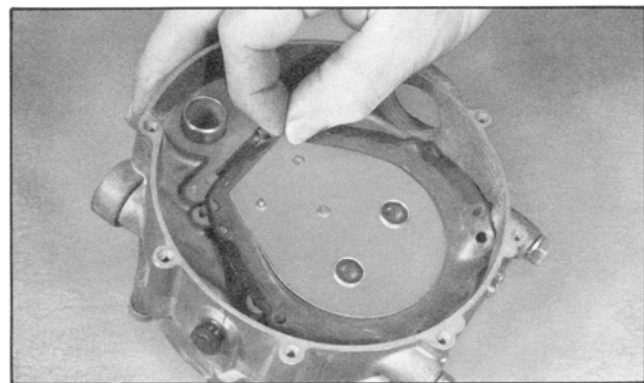
Note: Apply Loctite® 567 or equivalent to ensure a gas tight seal. **DO NOT USE TEFLON TAPE.**



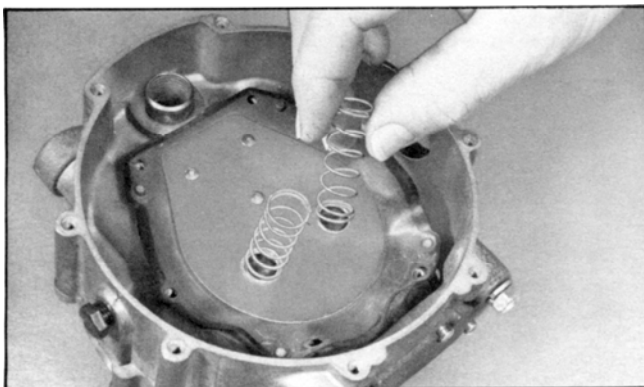
29. Tighten fuel inlet bushing (27) 2 to 3 turns past finger tight using a tube wrench or 6 sided socket.



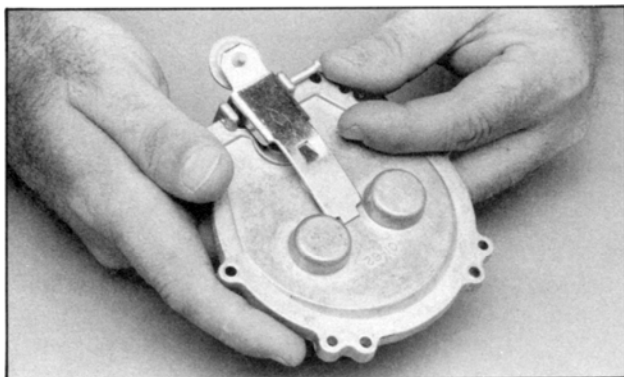
30. New primary diaphragm assembly (13) ready to be put in place. Extrusions on plate on underside of diaphragm slide into groove on primary pin (20) to connect two components. Be sure the extruded slot is engage in the pin groove.



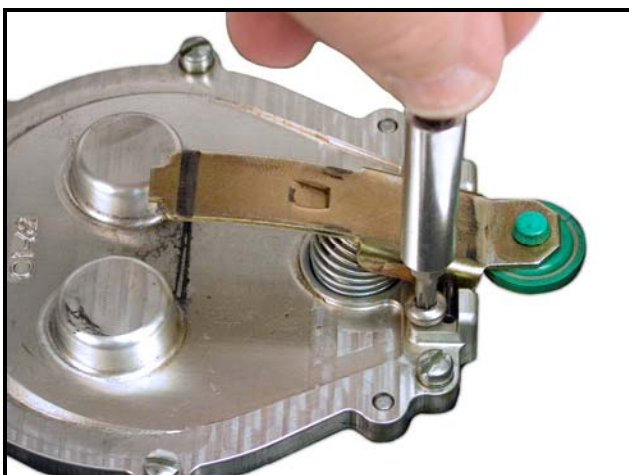
31. After diaphragm (13) is in place, pull up gently on diaphragm to verify that it is firmly connected to primary pin (20).



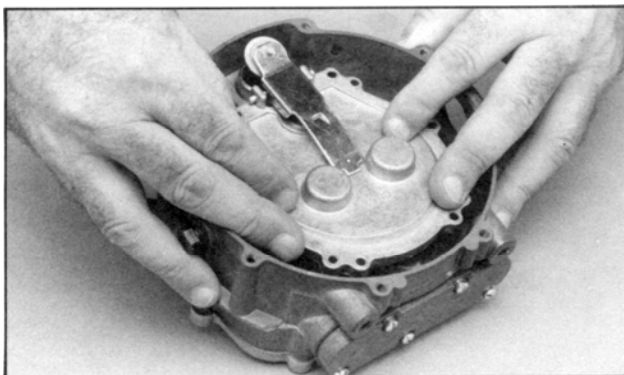
32. Place two primary regulator springs (12) upon locating perches extruded from back-up plate on primary diaphragm assembly (13).



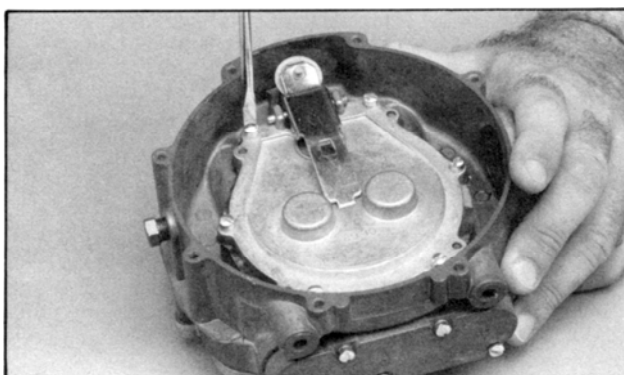
33. **Early Models Only** *For later models, skip to Step 34.* Press the nub of the seat (7) through the lever (6), ensuring a proper fit. Place secondary lever and seat assembly (6 & 7) on primary diaphragm cover (11). Push fulcrum pin (8) into place to retain lever.



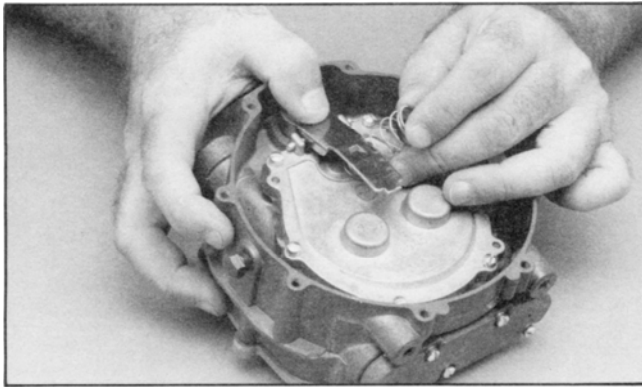
34. **Later Models Only** *For early models, skip to 35.* Press the nub of the seat (7) through the lever (6), ensuring a proper fit. Place the fulcrum pin (8) through the lever and seat assembly (6 & 7), center, then place the lever on the cover (11) with the fulcrum pin seated inside the slot. Secure the fulcrum pin with two screws with a T-20 Torx tool and torque to 17-23 in-lbs. (1.9-2.6 Nm).



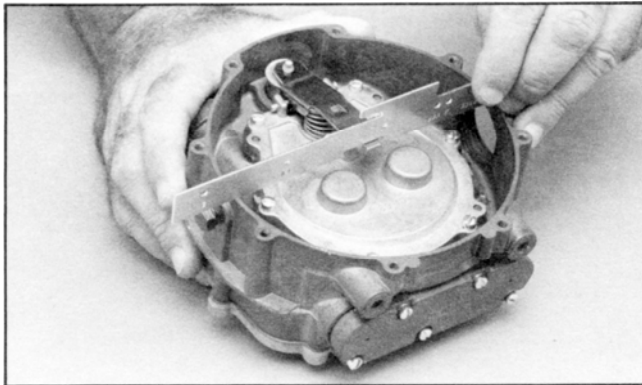
35. Press primary cover (11) in place over the primary springs (12) and diaphragm (13). Be sure to place over locator pins closest to water passage cover first, then over pins at opposite end. Check that diaphragm is equally visible all around the cover and that no portion is folded under.



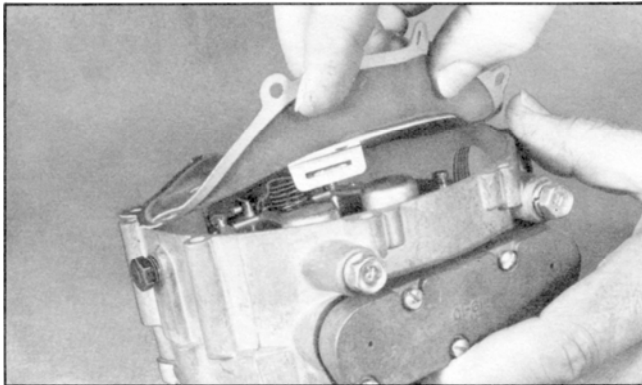
36. Replace all screws (10) and tighten until they just contact body. (Use new screws from repair kit if old ones are damaged). Then tighten again solidly, first on one side then diagonally across body on the opposite side until all screws are firmly tightened and torque to 25-35 in-lbs. (1.8-4.0 Nm).



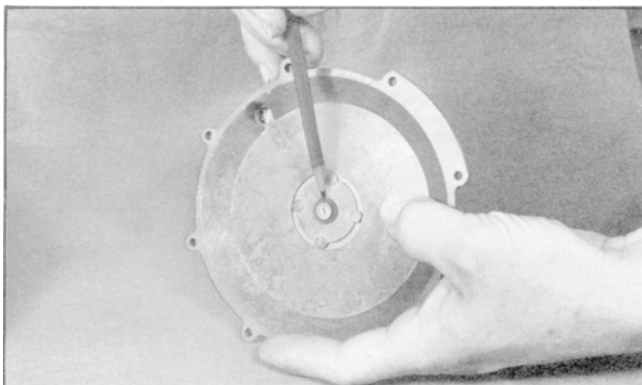
37. Insert secondary regulator spring (9) in place between secondary lever and seat assembly (6 & 7) spring perch on primary cover. Make sure springs snaps into place ahead of detent in lever.



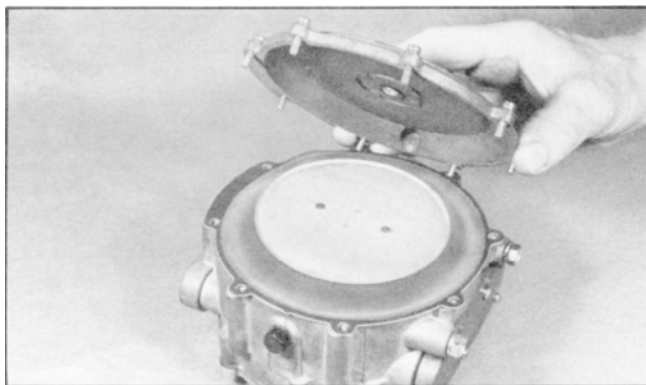
38. Use IMPCO G2-2 gauge or a straight edge to check lever height. When using a straight edge, the lever should be $\frac{5}{32}$ " above the body (lightly pull the lever up against the secondary seat to measure). If adjustment is needed, bend lever as close to the fulcrum as possible.



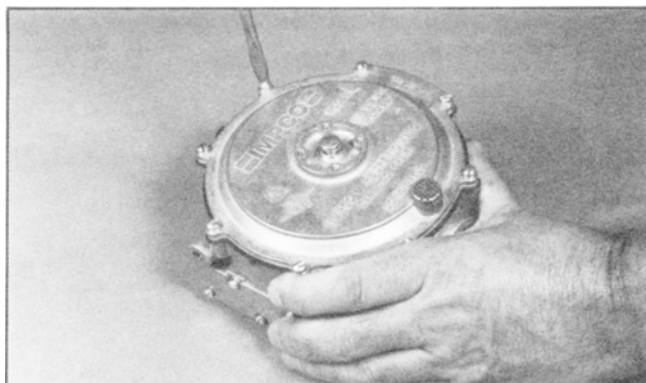
39. Install new secondary diaphragm (5). Note slot in position to slide into place and engage secondary lever (6).



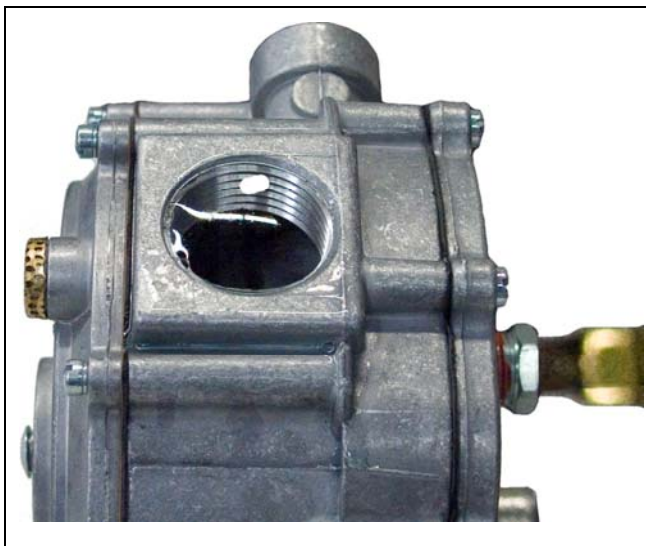
40. Replace hand primer seal washer (4) indicated by pencil.



41. Secondary cover (3) with screws (2) in place, positioned over diaphragm (5).



42. Replace cover (3). Finger tighten eight screws (2) until all contact the cover. Tighten screws, alternating sides, until all screws are firmly seated and torque to 25-35 in-lbs. (1.8-4.0 Nm).



43. Apply 100 psi of air pressure to the inlet side of the regulator and test for leaks. Draw a soap bubble across the regulator outlet to verify that no air is flowing through the outlet. If air escapes, the rebuild has failed and the regulator must be replaced. Actuate the primer button and the soap bubble should burst and air flow should be noted at the converter outlet. Use soap and/or a commercial leak detector solution to inspect the gasket seals around the perimeter of the converter for leaks. If leaks are found, the regulator must be replaced. If no leaks are found, the regulator can be re-installed and returned to service.

Note: Use only brass or plastic fittings in the water inlet and outlet passages. A steel fitting will cause the casting to deteriorate due to electrolysis.



WARNING:

IMPROPER INSTALLATION OR USE OF THIS PRODUCT MAY CAUSE SERIOUS INJURY, DEATH AND/OR PROPERTY DAMAGE

SERVICE TECHNICIANS AND USERS SHOULD CAREFULLY READ AND ABIDE BY THE PROVISIONS SET FORTH IN NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #37 FOR STATIONARY ENGINES, #52 FOR CNG VEHICULAR FUEL SYSTEMS OR #58 FOR LPG SYSTEMS.

INSTALLERS LPG INSTALLATIONS IN THE UNITED STATES MUST BE DONE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL LAWS AND NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #58, STANDARD FOR STORAGE AND HANDLING OF LIQUEFIED PETROLEUM GASES, TO THE EXTENT THESE STANDARDS ARE NOT IN VIOLATION OF FEDERAL, STATE OR LOCAL LAW.

COUNTRIES OUTSIDE OF USA REFER TO THE GOVERNING AGENCIES OVERSEEING CNG AND PROPANE APPLICATIONS.

CNG INSTALLATIONS IN THE UNITED STATES MUST BE DONE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL LAW AND NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #52, COMPRESSED NATURAL GAS (CNG) VEHICULAR FUEL SYSTEMS, TO THE EXTENT THESE STANDARDS ARE NOT IN VIOLATION OF FEDERAL, STATE OR LOCAL LAW.

LPG AND/OR NATURAL GAS INSTALLATIONS ON STATIONARY ENGINES MUST BE DONE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL LAW AND NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #37, STATIONARY COMBUSTION ENGINES AND GAS TURBINE ENGINES, TO THE EXTENT THESE STANDARDS ARE NOT IN VIOLATION WITH FEDERAL, STATE OR LOCAL LAW. FAILURE TO ABIDE BY THE ABOVE WILL VOID ANY IMPCO WARRANTY ON THE PRODUCTS AND MAY CAUSE SERIOUS INJURY OR PROPERTY DAMAGE.

SERVICE TECHNICIANS DUE TO THE INHERENT DANGER OF GASEOUS FUELS, IMPCO PRODUCTS SHOULD NOT BE INSTALLED OR USED BY PERSONS NOT KNOWLEDGEABLE OF THE HAZARDS ASSOCIATED WITH THE USE OF GASEOUS FUELS. ANY MAINTENANCE, SERVICE OR REPAIR SHOULD BE PERFORMED BY TRAINED AND EXPERIENCED SERVICE TECHNICIANS.

PROPER TOOLS AND EQUIPMENT PROPER TOOLS AND EQUIPMENT SHOULD BE USED TO PREVENT INJURY TO THE SERVICING TECHNICIAN, PROPERTY OR SYSTEM COMPONENTS. SERVICE REPAIRS SHOULD ALWAYS BE PERFORMED IN A SAFE ENVIRONMENT AND THE TECHNICIAN SHOULD ALWAYS WEAR PROTECTIVE CLOTHING TO PREVENT INJURY.

INSPECT BEFORE USE ALWAYS INSPECT THE MAJOR CASTING PIECES FOR DAMAGE, CORROSION OR CRACKS BEFORE ATTEMPTING A SERVICE REPAIR. BE SURE THE REPAIR KIT PART NUMBER YOU ARE USING IS CORRECT FOR THE COMPONENT(S) BEING SERVICED.

NO TEFLON TAPE DO NOT USE TEFLON TAPE TO SEAL ANY FUEL FITTINGS. FAILURE TO FOLLOW THIS WARNING MAY CAUSE THE REGULATOR TO LEAK INTERNALLY, POSSIBLY RESULTING IN SERIOUS INJURY, DEATH AND/OR PROPERTY DAMAGE AND MAY VOID ANY WARRANTY COVERAGE.