BULLETIN K129
MODELS AFFECTED: MC-6, MC-10, MC-20
SUBJECT: Capillary Seal Replacement

The Capillary Seal, P/N 55690B, used in McCulloch Carburetors, P/N 48811B, and P/N 48890, sometimes becomes plugged with dirt or water. (Carburetor #48811B is used on MC-6 and MC-10 engines and Carburetor #48890 on the MC-20 engine.)

When the seal becomes plugged, the high speed mixture goes lean and the engine can be seriously damaged by the resulting lack of lubrication. The symptoms of a plugged screen are evident when continued backing out of the high speed needle does not enrich the mixture or correct the lean condition at high speeds.

Replacement of the capillary seal with a new seal will correct this condition. A new Expansion Plug, P/N 102758 will also be required.

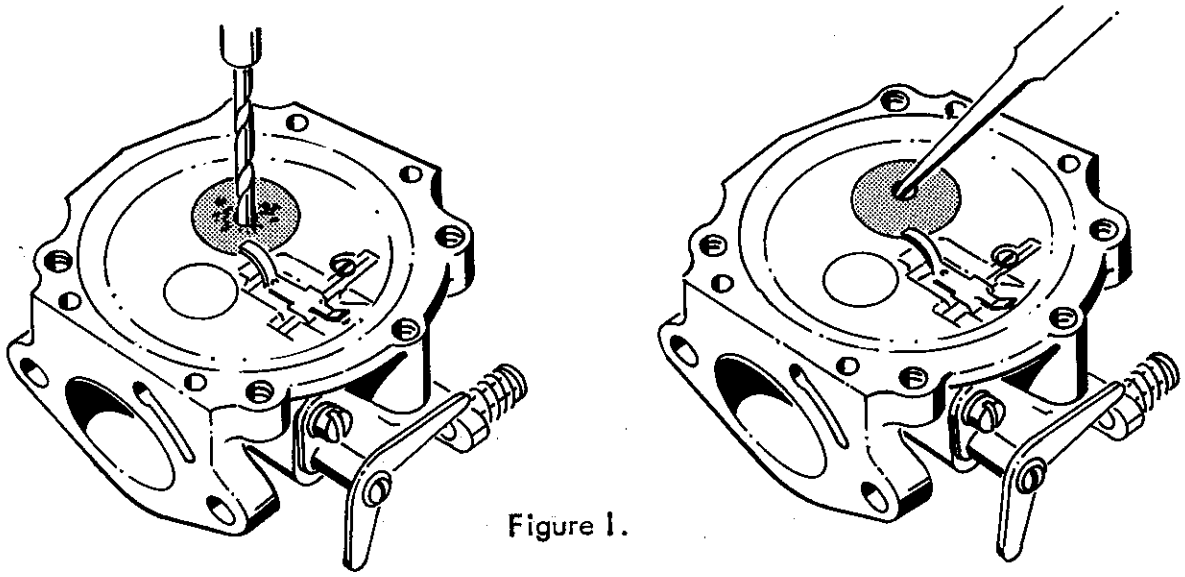
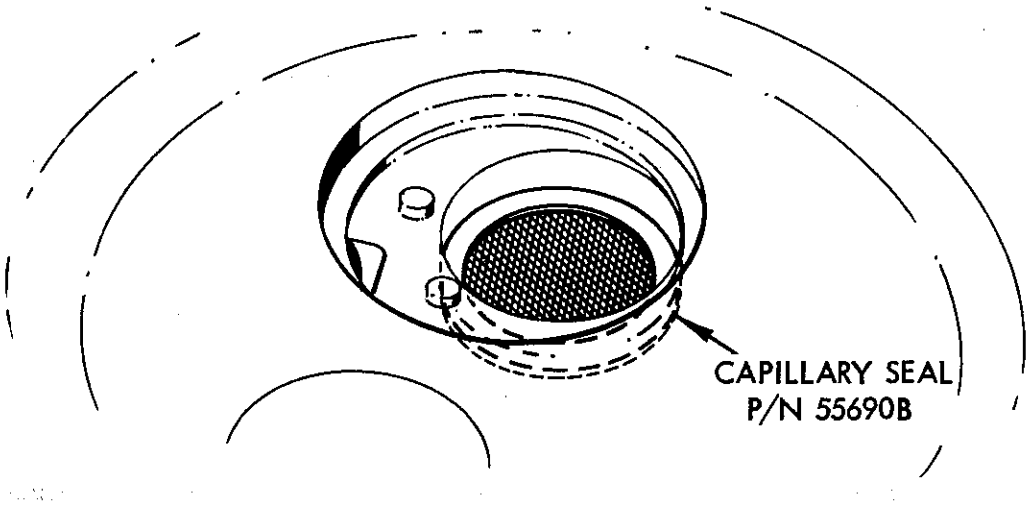


Figure 1.

1. Drill an 1/8-inch diameter hole in the center of the expansion plug (see figure 1).

CAUTION

Be extremely careful that the drill penetrates through the thickness of the plug only. Serious damage to the carburetor body can occur if the drill penetrates too deep.



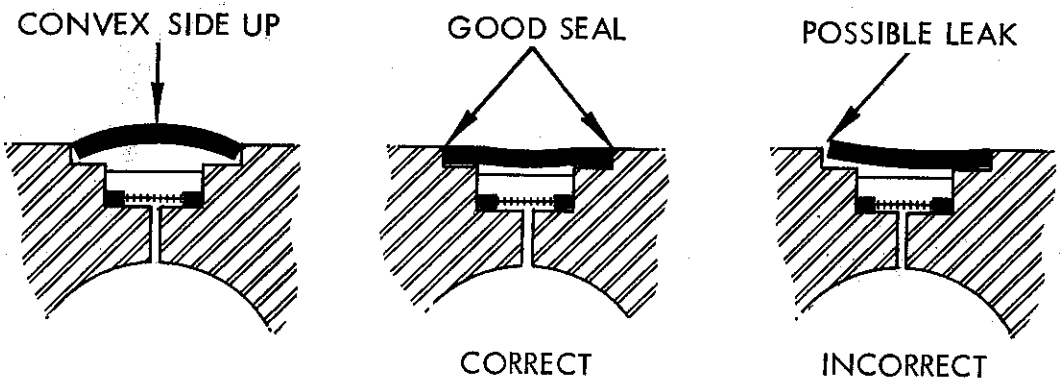

2. Insert a sharp pointed tool, such as a punch or the handle end of a file into the hole and carefully pry out the expansion plug (see figure 1).

3. Using the sharp pointed tool, pry the plugged capillary seal out of its cavity.

4. Thoroughly clean the cavity with solvent to remove the oil film.

5. Press a new Capillary Seal, P/N 55690B, into the cavity until it bottoms.

6. Coat the edge of a new Expansion Plug, P/N 102758, with Pliobond cement or the equivalent, and place it on the shoulder of the cavity, convex side up. Tap the plug lightly with a small hammer to seat it. Then, to insure a tight fit, upset the plug with a 1/2-inch diameter pin punch and a heavier hammer.




CAUTION

Do not over-depress or cut the expansion plug with the edge of the punch!

BULLETIN K130
MODELS AFFECTED: All
SUBJECT: Use of Correct Type Rings in 2-Cycle Engines

When installing piston rings in a McCulloch kart engine, make sure the rings are designed for 2-Cycle operation. Installing rings designed for 4-Cycle operation will result in ring breakage and possible cylinder damage.

A 2-Cycle piston ring is designed to have low outward pressure at the ring points or ends (see figure 1).

This low outward pressure at the ring ends provides clearance for the port openings and prevents the rings from snagging in the ports.

A ring designed for 4-Cycle operation will have the same outward pressure completely around the circumference of the ring, including the ring ends (see figure 2). When a 4-Cycle ring is used in a 2-Cycle engine, the outward pressure on the ring ends causes the ends to snag in the ports, breaking the ring.

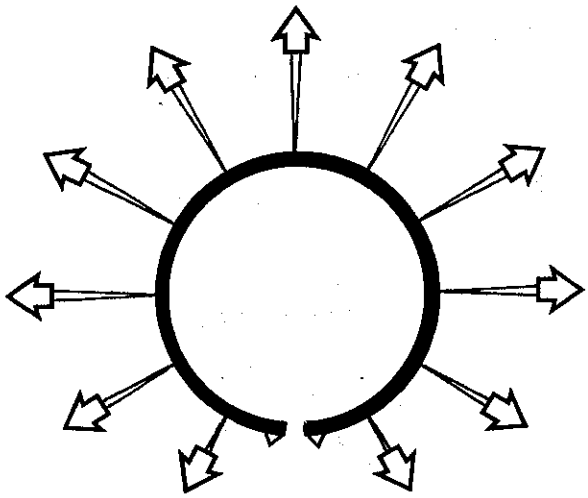


FIGURE 1. 2-Cycle Ring.
Low outward pressure at ring ends.

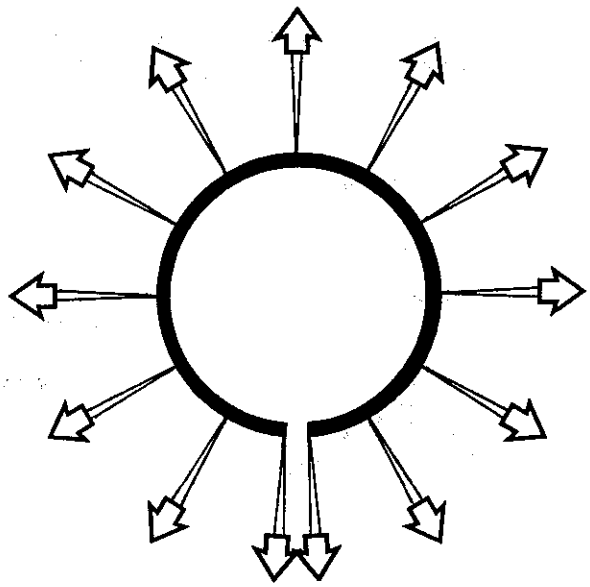


FIGURE 2. 4-Cycle Ring.
The outward pressure is the same, including the ring ends, for full circumference of the ring.

BULLETIN K138
MODELS AFFECTED: All
SUBJECT: Elimination of Thrust Washers

Current production engines (MC-8, -40, -70) do not use thrust washers on the piston pin between the connecting rod eye and piston pin bosses, as did earlier models (MC-1, -2, -5, -6, -7, -10, -20, -30) shown in figure 1. Eliminating thrust washers improves balance and reduces vibration.

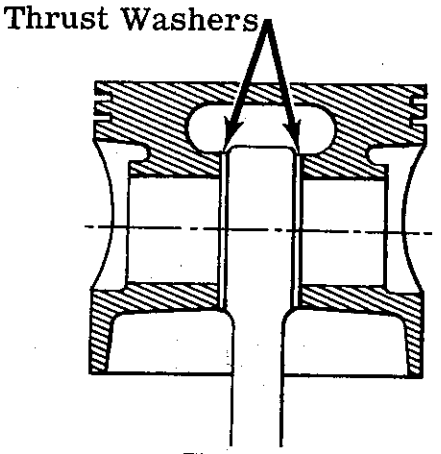


FIGURE 1

Elimination of thrust washers has resulted in new design pistons which have extended piston pin bosses (see figure 2). The bosses guide the connecting rod and limit its side motion to a minimum. Narrow boss pistons, as used on earlier models, are no longer available. Service replacement pistons are the new design. Since the inside edges of the piston pin bearings are installed flush with inner surfaces of the bosses, this changes piston pin length requirements.

Pin bosses extended to eliminate thrust washers

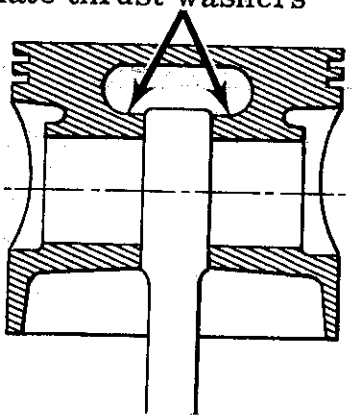


FIGURE 2

It is extremely important that the correct piston pin be used when assembling new design piston and connecting rod. When the correct length piston pin is installed, the outer end of pin can be pressed in flush to 0.010 inch (0.254 mm) below outer edge of open end bearing without inner end of the pin touching the shield of the closed end bearing.

NOTE: This does not apply to the MC-1 kart engine which uses piston pin bushings instead of bearings.

Two piston pins, having the same diameter but with different lengths, are available for service replacement in all models except MC-70, which uses a piston pin with a slightly larger diameter. Figure 3 shows each piston pin, its part number, length, diameter, and models where used.

Before placing a pin in the piston, make sure that both piston bearings are installed with inner edges flush with the inner side of the pin bosses (figure 4).

Fit the pins by placing them in the piston and bearings. If pin extends beyond the surface of the open end bearing, the pin is too long (figure 5A). If pin goes below the surface of the open end bearing (figure 5B), it is too short. The correct pin will have a

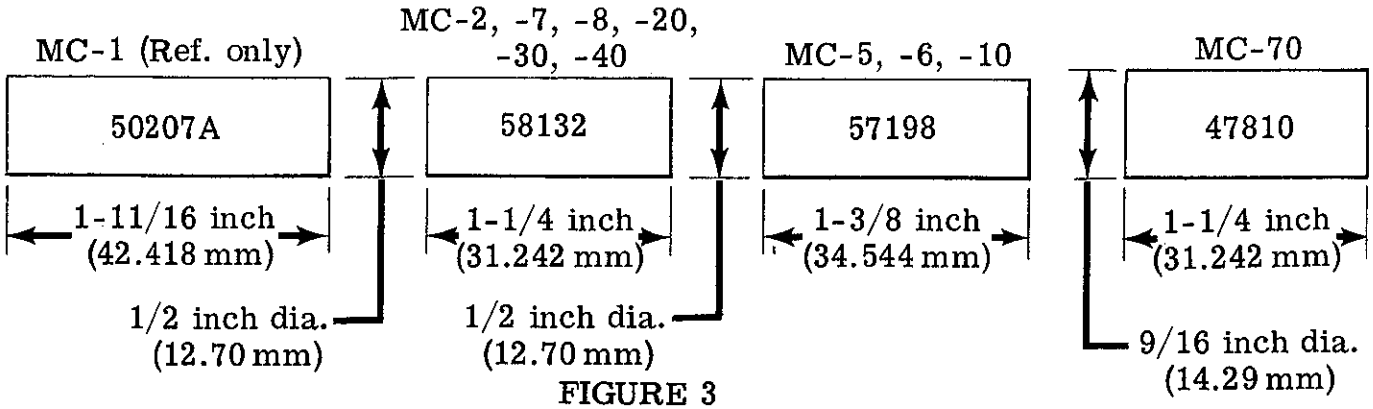
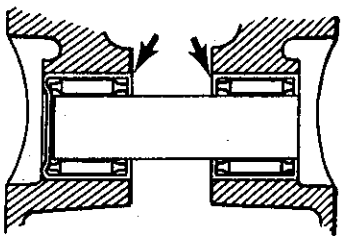



FIGURE 3

minor clearance at "a" (figure 5C) and will be flush to 0.010 inch (0.254 mm) below the surface at "b".

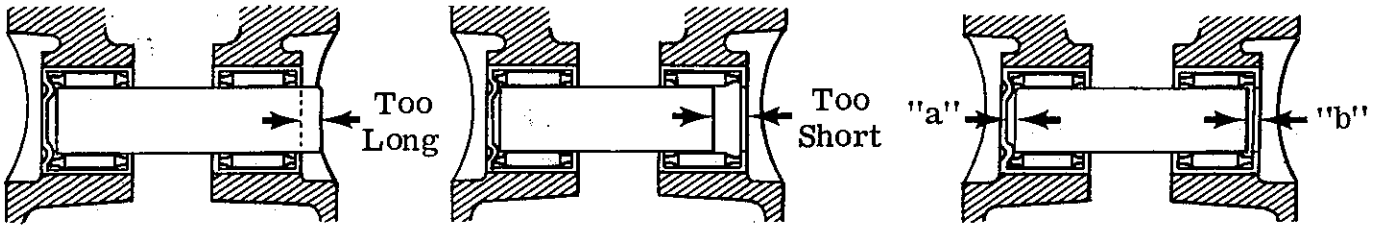
Connecting rods having different thicknesses at piston pin end are available for service replacement. These thicknesses are shown in figure 6.



Inside edge of bearings flush with pin bosses.

FIGURE 4

To fit connecting rods to the piston, place the pin end of the rod between the piston pin bearings or bosses. Measure the clearance between the rod and bearings or bosses with a feeler gauge. If clearance is approximately 0.010 to 0.025 inch (0.25 to 0.64 mm), the rod is the correct one to use and can be installed without use of thrust washers. If clearance is approximately 0.085 to 0.095 inch (2.16 to 2.41 mm), two thrust washers, P/N 51209, should be installed with the connecting rod - one washer on each side of the rod. If clearance is more than 0.140 inch (3.56 mm), use a connecting rod which has a thicker end.




(A)
Pin is too long – end extends beyond surface of open end bearing.

(B)
Pin is too short – end is below surface of open end bearing.

(C)
Correct length pin – when installed will have clearance at "a" and will be flush to 0.010 inch (0.254 mm) low at "b".

FIGURE 5

CAUTION: When the correct piston pin and connecting rod have been selected, be careful that the pin is not pressed more than 0.010 inch (0.25 mm) below the outer surface of the open end bearing. If this should happen and the engine run, the closed end bearing will be damaged.

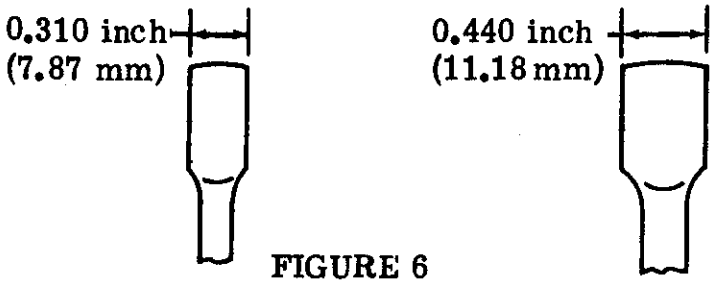



FIGURE 6

BULLETIN K139
MODELS AFFECTED: All
SUBJECT: Breakage of Crankshaft Keyways

It is possible to induce fracturing of the crankshaft keyway by improper installations of sprockets or clutches.

This fracturing can result because the crankshaft drive end taper is not designed to be a locking taper like the flywheel end. Because of this, the securing or locking of the clutch or sprocket relies more upon the Woodruff key and the locking nut and not the crankshaft taper.

With such conditions, breaking and failure of the keyway is affected by:

1. Improper installation or alignment of the Woodruff key.
2. Insufficient torque on the clutch or sprocket retaining nut.

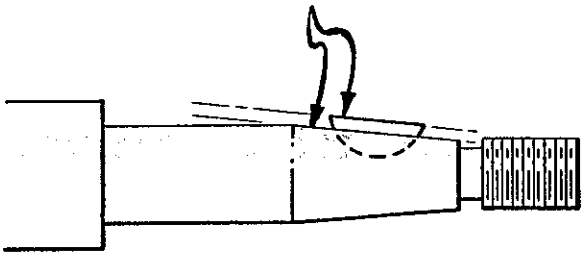



FIGURE 1

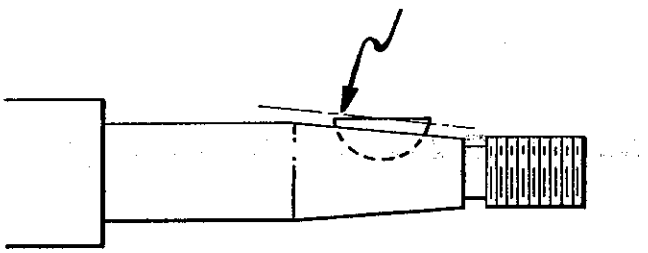



FIGURE 2

For most installations the Woodruff key should be installed in such a manner that it will bottom solidly in the keyway with its upper surface parallel with the shaft taper as shown in Figure 1.

In other installations it may not be desirable to set the key parallel to the taper because the sprocket or clutch keyway is too shallow and will come in contact with the crankcase end of the Woodruff key.

When this occurs, the accessory (clutch or sprocket) will be lifted or cocked at this point and its taper will not fit the crankshaft taper. This will cause a false bottoming and incorrect torqueing for the retaining nut. As a result the nut will have a tendency to loosen during engine operation with the possibility of crankshaft keyway failure.

To eliminate this possibility, measure the minimum depth of the clutch or sprocket keyway and install the Woodruff key with its crankcase end slightly lower than this dimension as shown in Figure 2.

The torque values for the retaining nut are 260 to 300 inch-pounds (22 to 25 foot-pounds).

NOTE: Because there are many sprockets in use today that are not of McCulloch manufacture, it is advisable to check the machined taper to insure that it is compatible with the McCulloch crankshaft. Prussian blue or similar indicating agents can be used to check the accuracy of the engagement and, in cases where slight differences exist, the sprocket might be worked with lapping compound to improve the fit.

BULLETIN K144
MODELS AFFECTED: All
SUBJECT: Identification of Kart Engine Head Gaskets

The 1964 McCulloch Kart Engines MC-9, MC-45 and MC-75 all have removable cylinder heads. The head gaskets used with these engines are quite similar in appearance and it would be easy to slip up and install the wrong gasket in an engine. This is especially true concerning the head gaskets for the MC-75 and the MC-45, as both gaskets have the same thickness and the only difference between them is in the diameter of the cylinder bore. The engine model, the part number of the head gasket required, the gasket thickness and the bore diameter are given in the following list.

| MODEL | PART NUMBER | THICKNESS | BORE DIAMETER |
|---|---|---|---|
| MC-75 | 47901 | 0.032 in. (0.812 mm) | 2.300/2.310 in. (58.4/58.7 mm) |
| MC-45 | 47835 | 0.032 in. (0.812 mm) | 2.215/2.225 in. (56.26/56.52 mm) |
| MC-9 | 48742A | 0.017 in. (0.432 mm) | 2.215/2.225 in. (56.26/56.52 mm) |

To prevent any possibility of mistaking a MC-45 gasket for the slightly larger bore MC-75 head gasket, the MC-75 Head Gasket, P/N 47901, can be identified by a bronze colored Alodine finish. This finish does not change any characteristics of the gasket and is used only for identification purposes.

A list of all cylinder head gaskets currently available for McCulloch Kart Engines are given in the chart below.

| MODEL | PART NUMBER | THICKNESS | USE |
|---|---|---|---|
| MC-5 | 55012B | 0.064 in. (1.63 mm) | Standard |
| | 48816 | 0.080 in. (2.03 mm) | Optional |
| | 48742A | 0.017 in. (0.432 mm) | Optional |
| MC-6 | 55012B | 0.064 in. (1.63 mm) | Standard |
| | 48816 | 0.080 in. (2.03 mm) | Optional |
| | 48742A | 0.017 in. (0.432 mm) | Optional |
| MC-7 | 48742A | 0.017 in. (0.432 mm) | Standard |

(Chart Continued)

| MODEL | PART NUMBER | THICKNESS | USE |
|---|---|---|---|
| MC-8 | 48742A | 0.017 in. (0.432 mm) | Standard |
| | 47835 | 0.032 in. (0.81 mm) | Optional |
| MC-9 | 48742A | 0.017 in. (0.432 mm) | Standard |
| MC-10 | 55012B | 0.064 in. (1.63 mm) | Standard |
| | 48672 | 0.050 in. (1.27 mm) | Optional |
| | 48698 | 0.125 in. (3.18 mm) | Stroked Model |
| MC-20 | 48742A | 0.017 in. (0.432 mm) | Standard |
| MC-30 | 48742A | 0.017 in. (0.432 mm) | Standard |
| MC-40 | 48735 | 0.032 in. (0.81 mm) | Standard |
| MC-45 | 47835 | 0.032 in. (0.81 mm) | Standard |
| MC-75 | 47901 | 0.032 in. (0.81 mm) | Standard |

BULLETIN K146

MODELS AFFECTED MC-2, MC-6, MC-7, MC-8, MC-9, MC-20, MC-30, MC-40, MC-45, MC-70, MC-75

SUBJECT: Proper Installation of McCulloch Fuel Pump Diaphragm, P/N 47274A

A number of instances have occurred in which carburetor malfunction in the subject models has been traced to air and fuel leaks past the fuel pump diaphragm gasket. The most common complaint caused by this leakage is a continual need to readjust carburetor needles.

Leakage past the diaphragm gasket can be prevented if the diaphragm and gasket are soaked in fuel mixture prior to being installed in the carburetor.

When installing a new fuel-soaked diaphragm, always torque the fuel pump body attaching screws to 30 inch-pounds (0.35 mkg). After running the engine for a short period, the screw torque should again be checked since the gasket will tend to compress. If the torque has fallen below 20 inch-pounds (0.23 mkg), the screws should be retorqued to 30 inch-pounds (0.35 mkg).

Following the above procedure (pre-soaking the diaphragm in fuel mixture and tightening the screws to a torque of 30 inch-pounds) will assist in preventing many carburetor-fuel mixture troubles.