

Figure #1

SCUBAPRO[®]

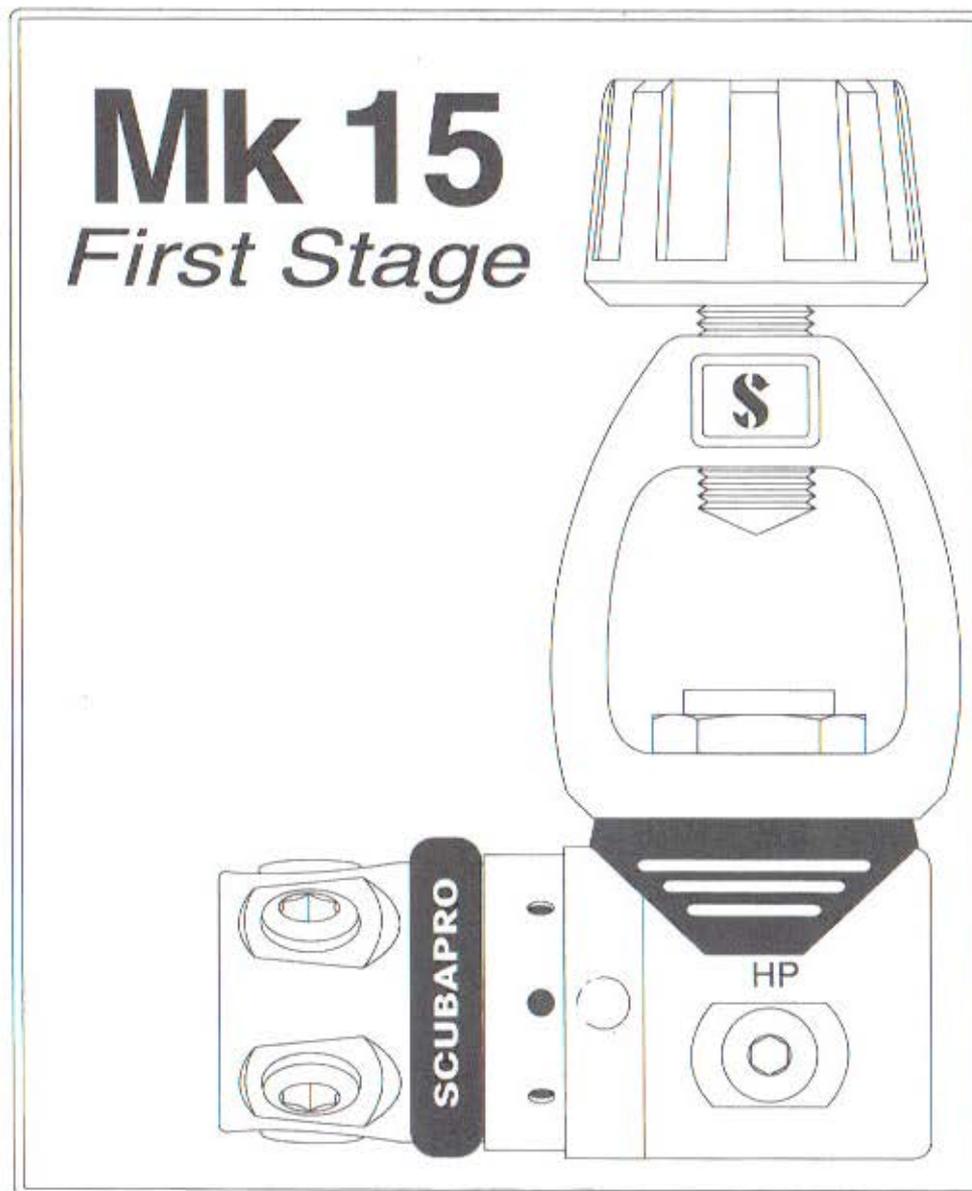
Technical Service Reference & Repair Guide

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Technical Service Upgrade:

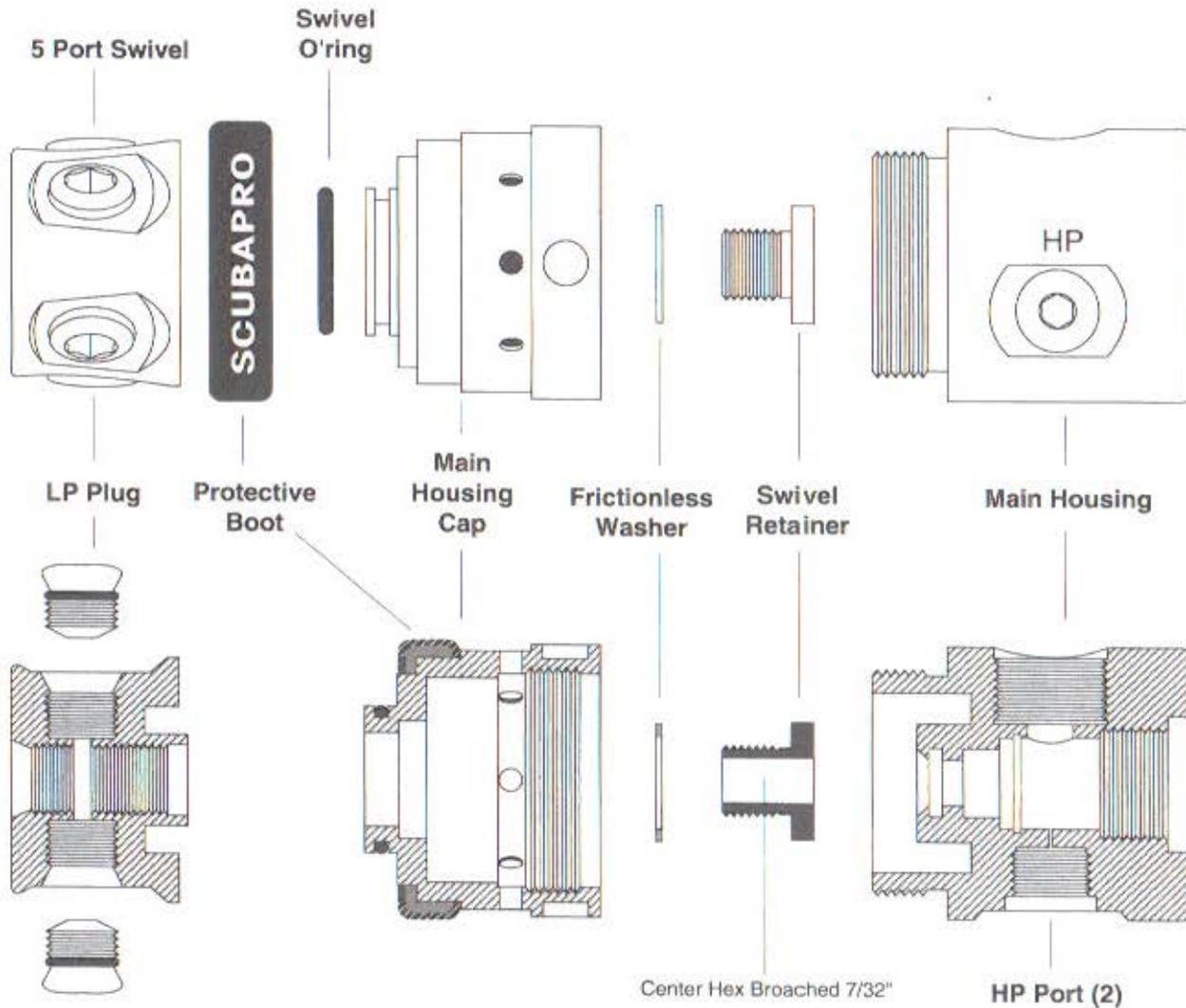
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Important Note: The following information "is not" designed to be a complete training guide for infield servicing of the Mark 15 first stage. All Scubapro technicians are required to attend an annual repair clinic to insure safe handling and servicing of Scubapro products.

Figure #2

SCUBAPRO® Mark 15 First Stage Main Housing & Swivel Assembly



Notes:

The Mark 15 main housing and swivel parts are detailed to the left in both the external and cut-away views. The assembly of these components is reasonably straight forward. Observe the following procedures when doing the final assembly.

- Torque the swivel retainer to 55-70 inch lbs. via the 7/32" center hex broach.
- Replace and lubricate the swivel port o'ring.
- Tighten the main housing and main housing cap using the multi-tool. The tension should be secure enough to prevent disassembly by hand.
- The SPEC boot may be installed after the Mark 15 is completely assembled.

Figure #3

SCUBAPRO® Mark 15 First Stage Piston Bushing System

Notes:

The Mark 15 first stage utilizes a replaceable piston bushing system. This special guide system minimizes o'ring pinch and provides an ultra smooth surface that reduces friction. The front bushing is "not" replaced during service. The back bushing, o'ring, and shouldered bushing are replaced to renew the system each time the first stage is repaired. A beryllium copper snap ring retains the bushing system in the main body. Due to its recessed location, special snap ring pliers are required to remove & install this snap ring. See important note below.

Important Note:

Special snap ring pliers are available to assist in installing the back bushing, o'ring, and shouldered bushing. Instructions for using this tool are included with the tool.

After the snap ring has been positioned using the special snap ring pliers, be sure to reinsert the bushing tool and press inward firmly. This insures that the tips of the snap ring are completely seated in the groove. Failure to do this step may allow the bushing system to work loose while the first stage is in use.

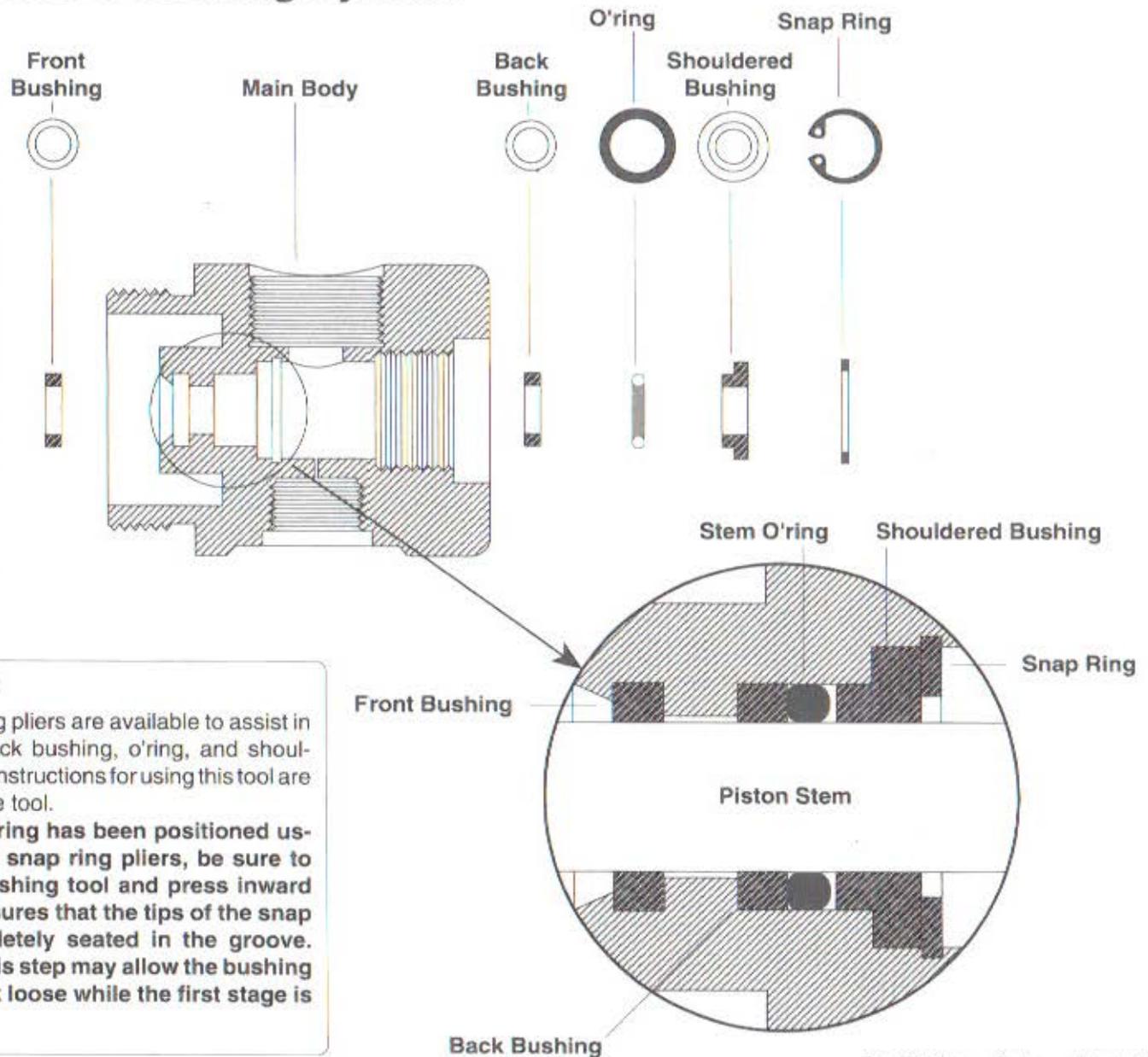
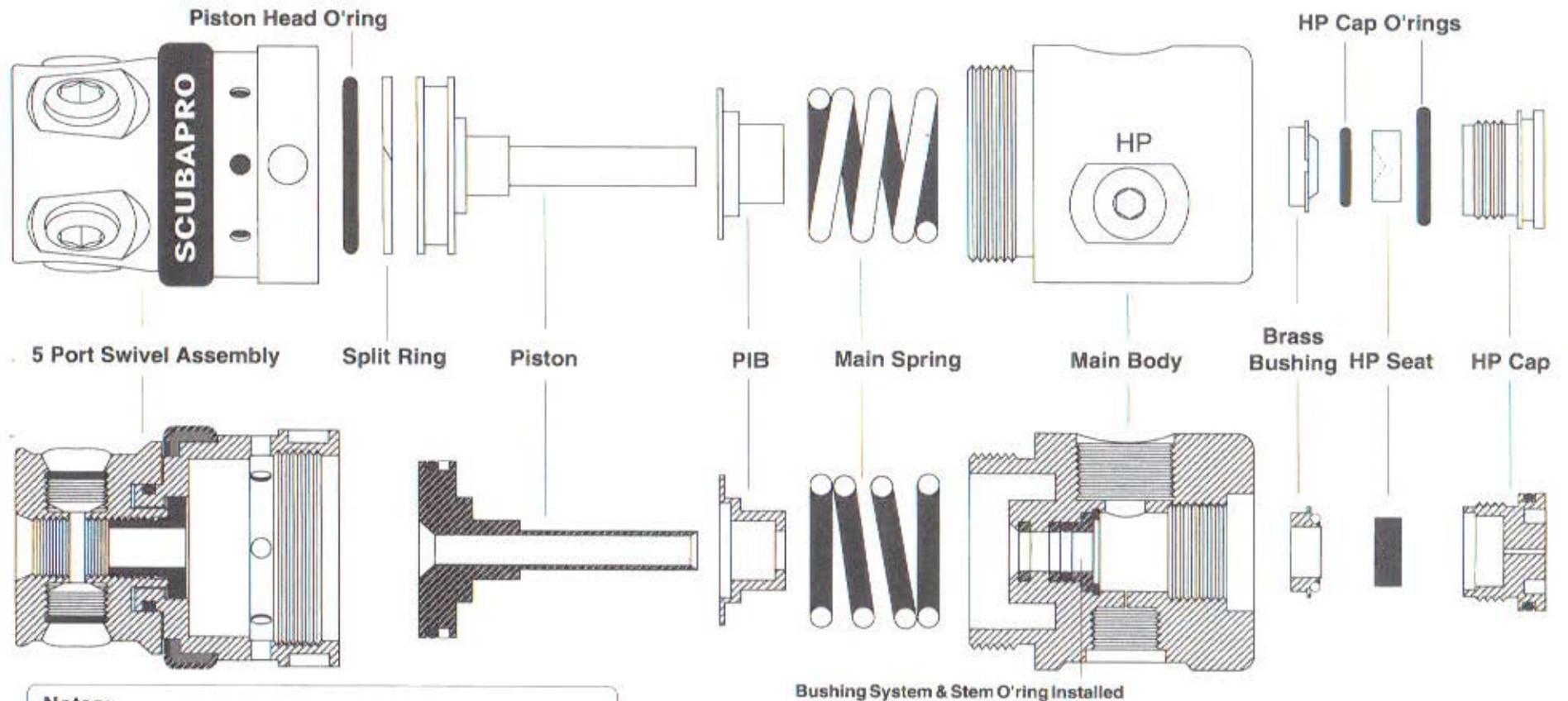


Figure #4

SCUBAPRO® Mark 15 First Stage Piston & HP Seat Components



Notes:

The illustration above shows the piston and high pressure seat components. The swivel o'ring, piston head o'ring, piston stem o'ring, HP seat, and rear bushing system should be replaced during annual service. The PIB should be packed to the piston with silicone grease to prevent water exchange in this area. Lubricate all dynamic o'rings using the proper procedure. Be sure to stay up-to-date on the latest engineering information regarding HP seats available as replacement parts.

The components to the right are the original HP seat components used in the Mark 15 first stage. These were downgraded to 3000 psi. Replace with the components shown in the main illustration at the service interval.

Original 3000 psi HP Seat Parts

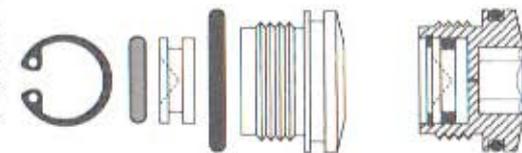


Figure #3

Assembly Procedure:

1. Preassemble the HP cap, HP cap o'ring, and HP seat. Be sure that the cave cone recess in the HP seat is facing out (see illustration).
2. Press the white backup ring, piston stem o'ring, and brown shouldered guide bushing into the main body using the Mark 15 bushing tool (see the illustration for the correct part orientation and the order of installation).
3. Install the beryllium copper snap ring into the recessed groove inside the main body to retain the bushing system using the Mark 15 snap ring pliers. Always reinsert the bushing tool into the body after the snap ring has been installed and push inward firmly. This insures that the snap ring is completely seated in the internal groove.
4. Install the original spring (natural stainless steel) into the spring cavity in the main body as shown. The number of shims installed should be the same as removed from the original assembly. Maximum of 3.
5. Insert the piston assembly into the main body using a piston bullet to avoid damaging the piston o'ring. The piston bullet can be removed from the opposite end of the main body.
6. Install the swivel and cap assembly and tighten firmly using the multi-tool.
7. Insert the metal bushing into the main body with the beveled side up.
8. Install the metal bushing o'ring on the protruding beveled edge of the metal bushing.
9. Thread the HP seat assembly into the main body and tighten firmly using the small pin spanner on the multi-tool. (See figure #4 for IP Adjustments.)

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Mark 15 Upgrade
Assembly

4350 PSI Bushing System:

The 4350 psi bushing system consists of three parts: the white backup ring, the piston stem o'ring, and the brown shouldered bushing. These parts must be installed in the order and orientation shown. The copper beryllium snap ring retains these parts in the main body. Be sure to chase the snap ring with the Mark 15 bushing tool after it is installed to be certain that it is completely seated in the groove.

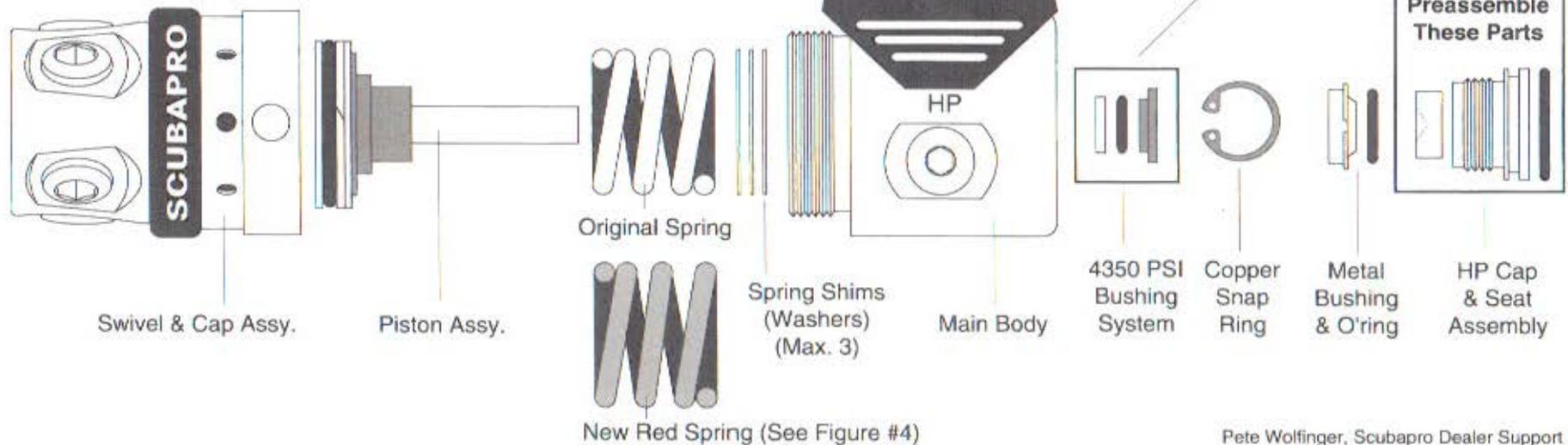
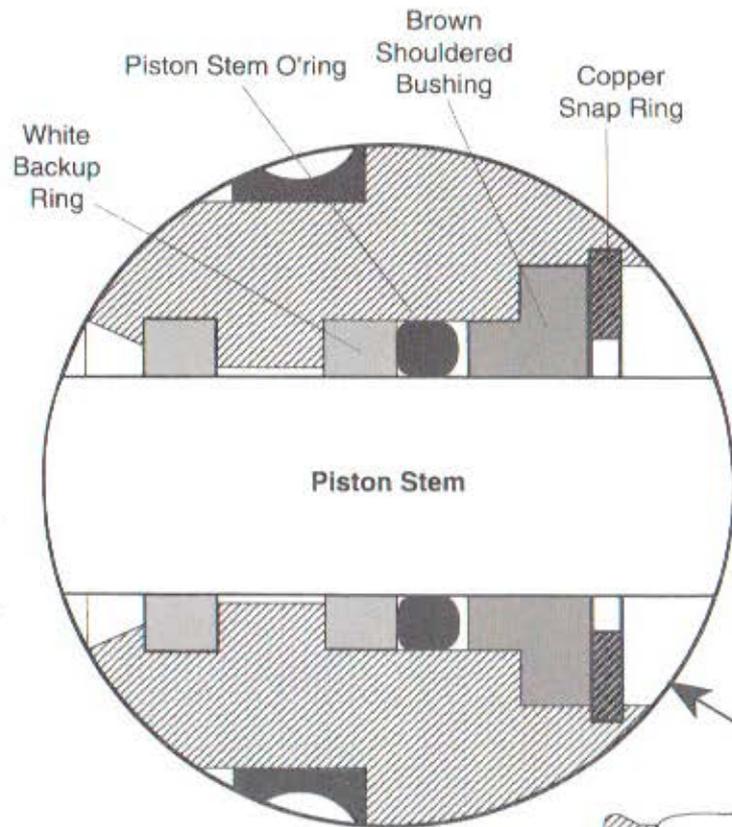


Figure #4



Bushing System Detail:

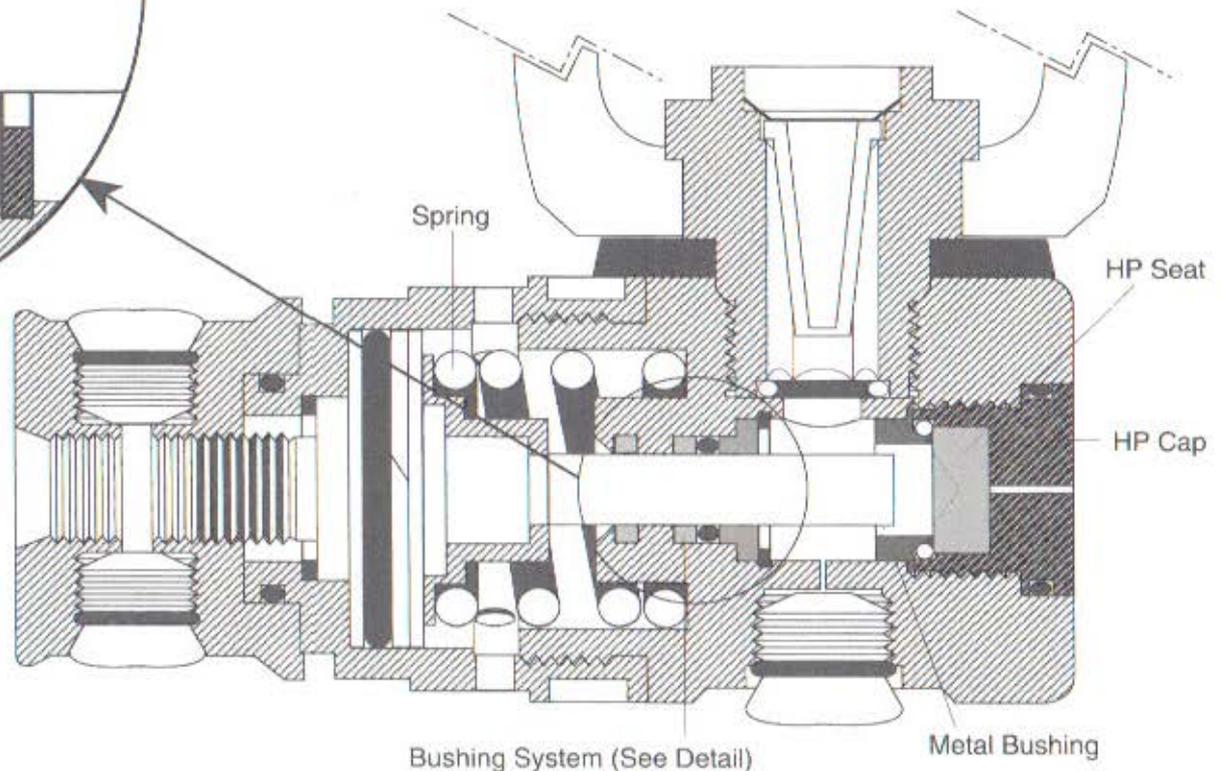
The detail above shows the Mark 15 bushing system installed inside the main body. Be sure that the piston stem o-ring is adequately lubricated to dynamic standards and the snap ring is fully seated in the main body groove. Always use a piston bullet when installing the piston into the main body to avoid damaging the piston stem o-ring.

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Mark 15 Upgrade
Intermediate Pressure Adjustments:

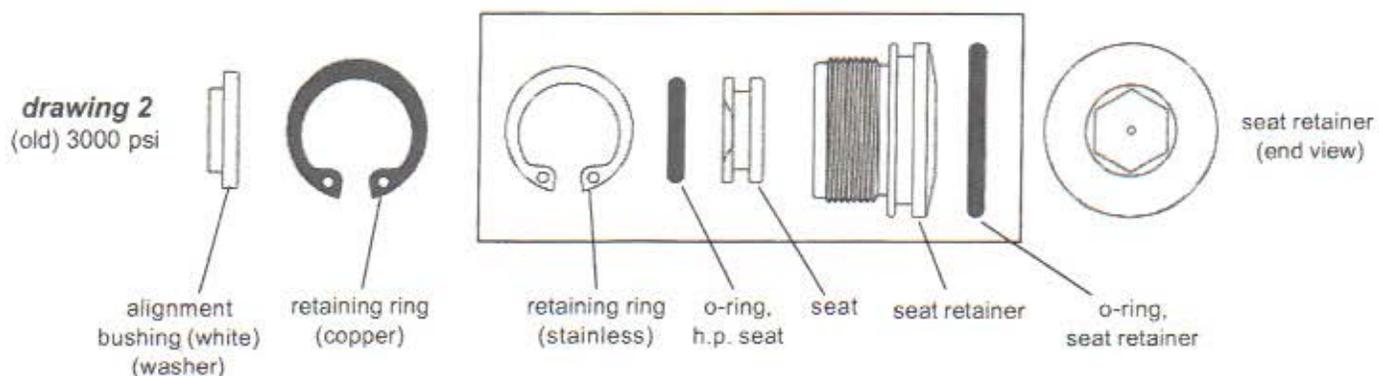
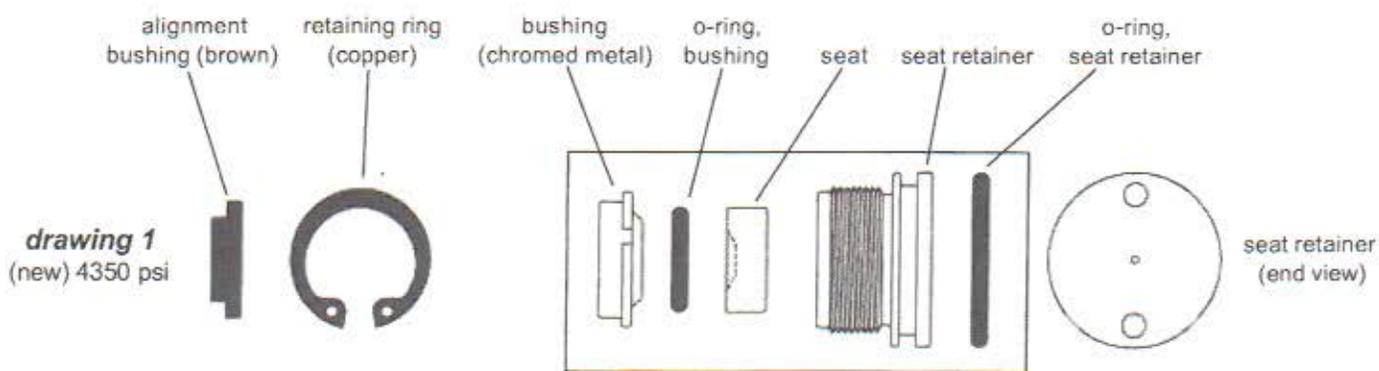
Intermediate Pressure Standards And Adjustments:

The Mark 15 first stage will produce intermediate pressures from 125 psi - 145 psi over the supply pressure range of 4350 psi - 300 psi. This pressure gradient can be adjusted by two methods. The red spring, included in the upgrade kit, is slightly softer and will decrease IP output. Shims (washers) can also be used, up to a maximum of three, to modify the IP. Cycle the first stage 8-10 times after installing the kit and then check to be sure that the IP is "locked up" and does not creep upward. If IP problems are encountered beyond the scope of these standards, please contact Scubapro Technical Service Department.



New parts are as follows: see drawing #1

o-ring, seat retainer	01-050-398
seat retainer	10-600-125
seat, h.p.	10-600-123
o-ring, bushing	01-050-401
bushing (chromed metal)	10-600-124
retaining ring (copper)	01-073-112
alignment bushing (brown plastic)	10-600-129
spring, (optional) not shown	01-020-601



Old parts to be discarded are: see drawing #2

o-ring, seat retainer	01-050-398
seat retainer	10-600-106
seat, h.p.	10-600-122
o-ring, h.p. seat	01-050-142
retaining ring (stainless)	01-073-114
retaining ring (copper)	01-073-112
bushing (white plastic)	10-600-105
decals, 3000 psi	01-006-431