SCUBAPRO®

#267

Engineering Bulletin

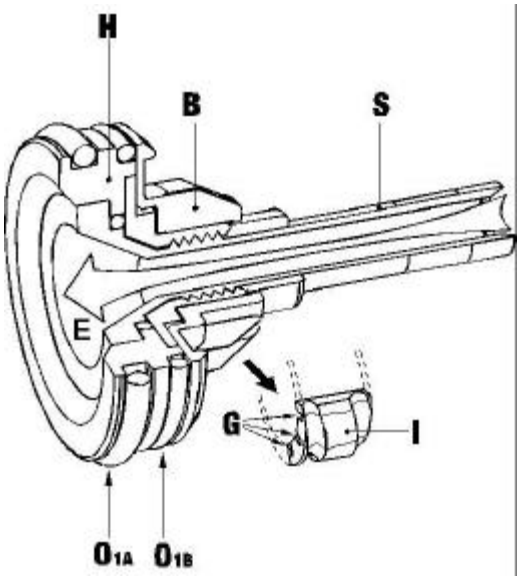
February 14, 2000

Composite Piston: New Product Information and Installation Procedure

SCUBAPRO has introduced a new patented Composite Piston (10.600.155) into the MK 20 and MK 20 UL first stages. This new piston is made from several different materials:

- The stem (S) is made from AISI 316 Stainless Steel in order to provide the finest finish for the seating edge and for resistance to mechanical wear.

- The piston head (H) is made from a special technopolymer material that provides better insulating qualities than metal. This means that the piston head is less prone to freezing under the conditions that can produce ice.



- An additional piston head o'ring (O_{1B}) has been added which protects the "main" o'ring (O_{1A}) from debris, and helps trap lubricant. This insures that the piston head o'ring is always well lubricated during use and between warranty service visits. To reduce friction, the O_{1B} o'ring groove is recessed below the level of the O_{1A} groove, but both o'rings are identical in size and composition. The effect of having this second o'ring is to seal the compression chamber and O_{1A} o'ring completely from the environment.

- Ridges have been added to the Thermal Insulating Sleeve (B) to assist in aligning the spring on the piston. These ridges also retard ice growth and make it more difficult for ice to remain if it does form. Note that any ice (I) that forms around the ridges (G) will contain grooves that cause it to break away easily.

- The composite materials also make this piston assembly lighter and more responsive, improving depth and low pressure performance.

Integrating previous piston changes
SCUBAPRO implemented a change to the MK 20 and MK 20 Ultralight first stage pistons in September 1999, changing from brass and alloy versions to a solid stainless steel version (See Engineering Bulletin #263 - June 1999). The new composite piston can be used in lieu of the stainless piston and fits all MK 20 and MK 20 UL first stages.

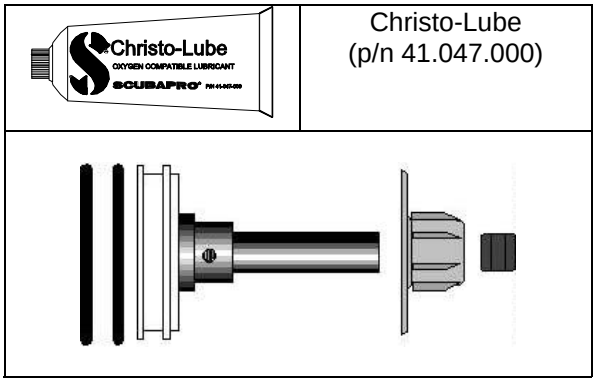
Because of the several recent design and materials changes technicians will encounter MK 20 and MK 20 UL first stages in the marketplace with pistons made from several different materials: Brass, Alloy, Stainless and Composite. All versions of the piston may be re-used in the original first stage bodies after inspection, cleaning, installation and successful testing, but effective immediately the composite piston will be the only version available as a replacement part.

Change in MK 20 and MK 20UL Piston Installation Procedure

In addition to changes in the piston itself, the MK 20 and MK 20 Ultralight Annual Service kits have been modified to give better performance, as described in Engineering Bulletin # 263 (June 1999). Some of these annual replacement components retain the original part numbers. Others have received new part numbers. See the table on page five of that bulletin for more information.

The procedure for installing the composite piston during service is slightly different than that for the pistons made from other materials. The new procedure is outlined below.



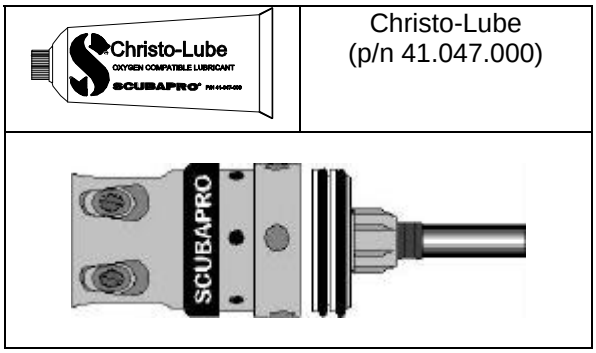


Christo-Lube
(p/n 41.047.000)

Install the Thermal Insulating Bushing on to the piston head. Install the two o'rings on the piston head, then install the soft thermal sleeve.

Be certain to lubricate the piston head o'rings to dynamic specifications.





Christo-Lube
(p/n 41.047.000)

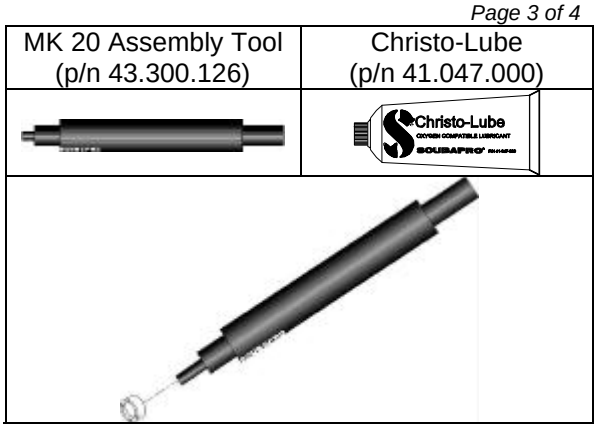
Install the piston assembly into the regulator body (swivel cap side). Be certain that the piston head is pushed firmly into the body.

Be certain to lubricate the piston head o'rings to dynamic specifications.



Install the Ultra-Glide Bushing on the MK 20 Assembly Tool. Note that the "blind" holes on the bushing face outward.

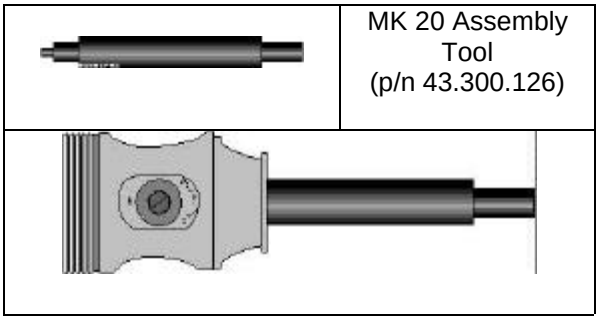
DO NOT INSTALL THE STEM O'RING, OR THE SHOULDERED BUSHING AT THIS TIME.





Using the MK 20 Assembly Tool, carefully insert the Ultra-Glide Bushing into the regulator body.

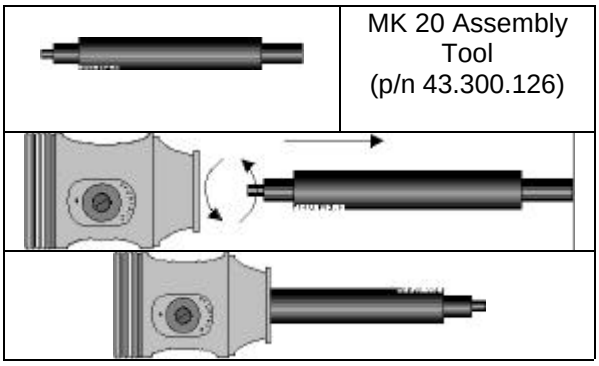
Note: The stem o'ring and shouldered bushing are NOT to be installed at this time.





Remove the MK 20 tool by rotating it slightly as it is extracted. Be certain that the Ultra-Glide Bushing remains inside the regulator body.

Turn the tool around and re-insert it so that the hollow end is resting on the top bushing.



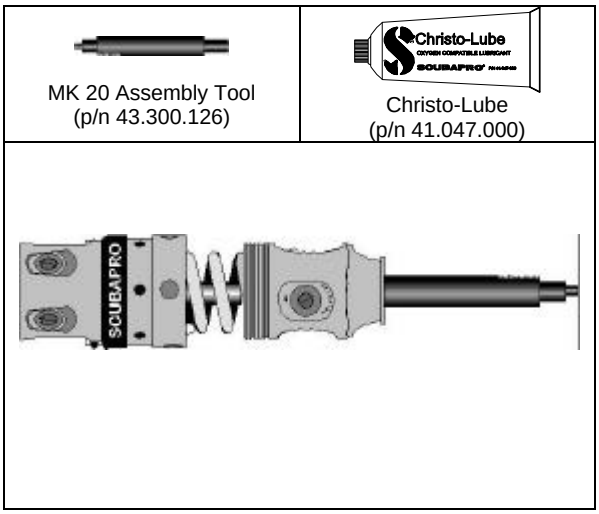


Lubricate the end of the stem with Christo-Lube. This will ensure that the stem travels smoothly through the bushings.

While holding the MK 20 Assembly Tool in place, insert the intermediate spring and piston assembly into the regulator body.

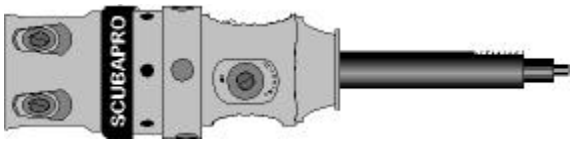


Caution: When assembling the piston Into the body, avoid touching the piston sealing edge to the spring, regulator body or assembly tool.





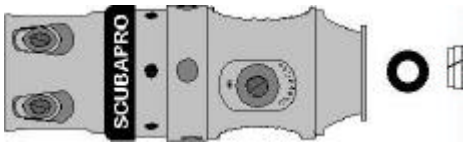
	MK 20 Assembly Tool (p/n 43.300.126)



Keeping the MK 20 Assembly Tool in place, carefully thread the swivel port and regulator body together. Tighten by hand while holding the MK 20 Assembly Tool.

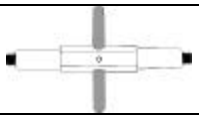


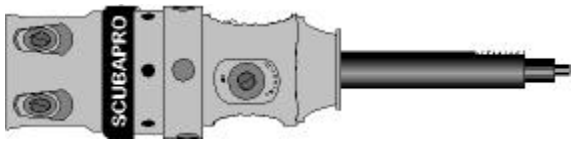
	No tools needed this step



Install the stem o'ring carefully over the seating edge of the piston stem. Once it is in place, install the shouldered bushing over the piston stem.



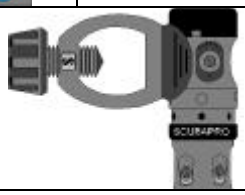
MK 20 Assembly Tool (p/n 43.300.126)	Field Handle (p/n 43.300.114)	Universal Tool (p/n 43.040.000)
		



Using the MK 20 Assembly Tool, check to see that the Ultra-Glide Bushing System is correctly installed. Tighten using the Field Handle. If the bushing system shifts during the final tightening process, use the MK 20 Assembly Tool to push it securely down.



	SCUBAPRO MK 20 Repair Guide



Use the SCUBAPRO MK 20 Repair Guide to complete the re-assembly of the regulator after installation of the annual service kit.

If you have any additional questions, please contact:	***SCUBAPRO Technical Services 1-800-382-2211***