



Service and Repair Operative Manual

T10 SC - T10 SC CROMO 1st STAGES

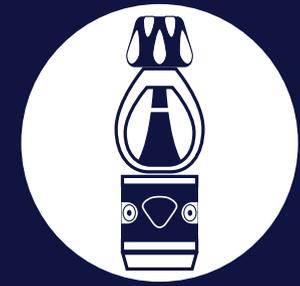


T10 SC - T10 SC CROMO 1st STAGES

WARNING!

- This manual is intended for use by expert technicians who should attend or have already received training in equipment repairs and maintenance from Cressi-sub.
- Avoid performing maintenance and/or repair operations on the equipment without the proper training required to conduct these operations.
- Users must never perform maintenance themselves; all maintenance must be performed **EXCLUSIVELY** by an authorized Cressi-Sub center.
- If the information provided in this document is unclear or not fully intelligible, please contact Cressi-sub before proceeding with any disassembly or maintenance procedures.
- Before proceeding, Cressi-sub recommends that you read the following document carefully to familiarize yourself with all the tools and techniques needed to perform proper equipment maintenance and/or repair.
- Use this document as a guide during the various steps of maintaining and/or repairing the equipment.
- All operations must be done strictly in the order provided in this document.
Failure to do so could cause the equipment to function poorly, or worse, result in an accident.

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WARNING!

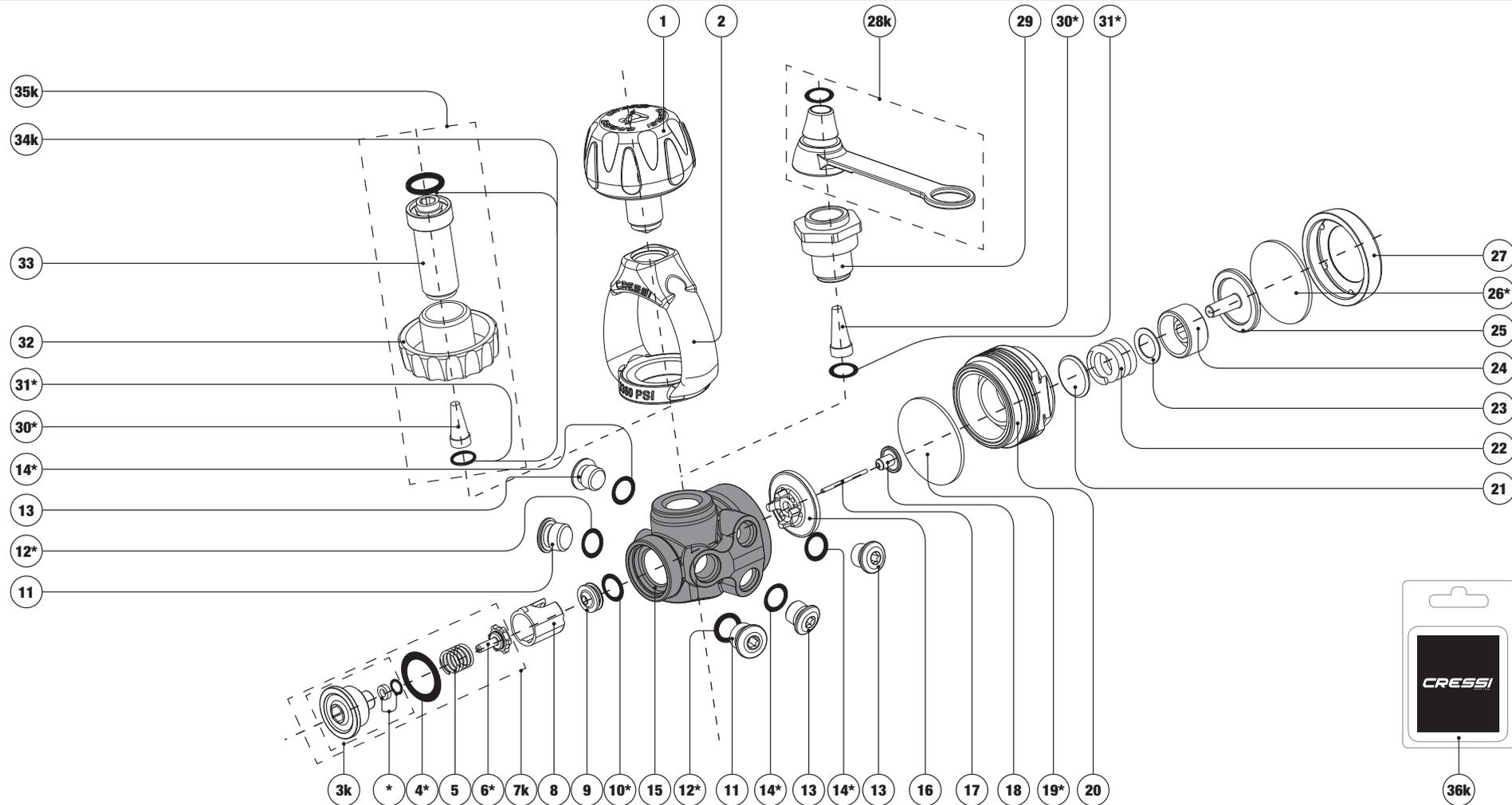
- To prevent any assembly errors when performing maintenance and/or repairs, we recommend using all the replacement parts provided by Cressi-Sub in every operation.
- Pay special attention to the recommendations provided in the margin of the figures that show the various sequences of equipment maintenance and/or repair in order to avoid any problems that could result in an accident.
- The document below in no way replaces the equipment's instruction manual.
- According to the European Standard, the procedures described in this document are pertinent to and intended only for the disassembly, maintenance, and assembly of equipment meant for use with air (21% oxygen, 79% nitrogen - EEC Countries Only).
- Further information about of lubrication and cleaning of components are shown within the professional area on www.cressi.com site.
- The instructions provided in this document are based on information referring to the most update equipment available before printing. This document was created on the knowledge of the state of the art of the equipment during creation of this documentation. Cressi Sub reserves the right to make changes at any time.

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T10 SC spare parts

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Pos	Cod	Pos	Cod
1	HZ730027	19	HZ800082*
2	HZ770080	20	HZ830080
3k	HZ830081*	21	HZ800081
4	HZ830082*	22	HZ800080
5	HZ800086	23	HZ800064
6	HZ800085*	24	HZ800065
7k	HZ830083	25	HZ800010
8	HZ830084	26	HZ800011*
9	HZ800042	27	HZ800079
10	HZ800043*	28k	HZ800090
11	HZ730127	29	HZ830090
12	HZ730132*	30	HZ830091*
13	HZ730106	31	HZ730108*
14	HZ730108*	32	HZ830092
15	HZ830085	33	HZ830093
16	HZ830086	34k	HZ830094
17	HZ800038	35k	HZ830035
18	HZ830088	36k	HZ800045*

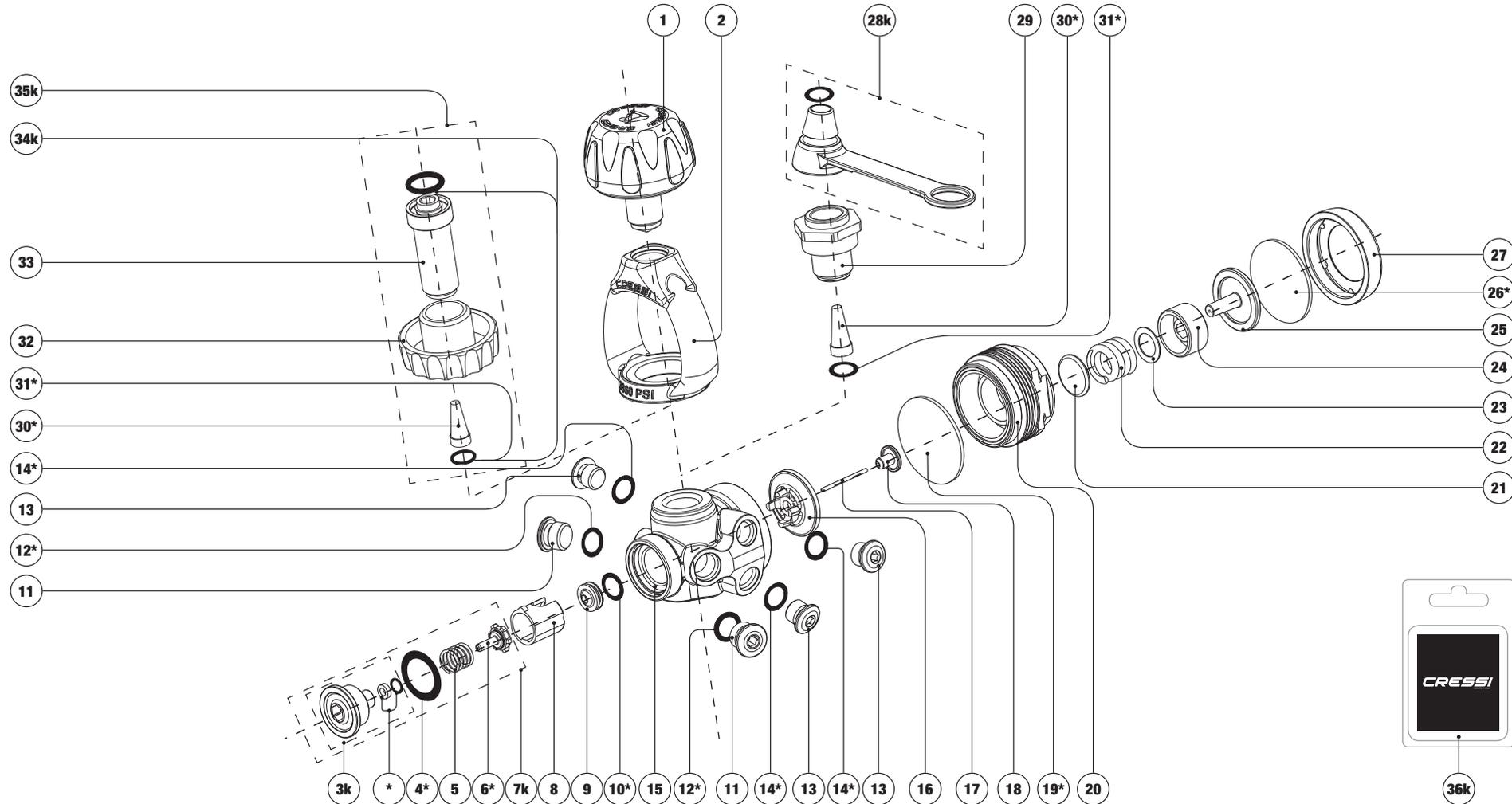
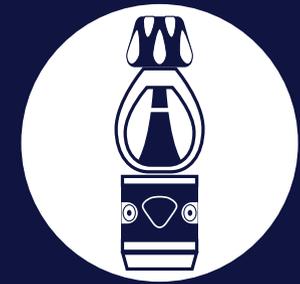
**T10
T10 SC
T10 SC CROMO
1st STAGES
(HZ 800045)
ANNUAL
REPLACEMENT
KIT**

HZXXXXXX Contenuto nel kit revisione e non disponibile singolarmente. / Only available in maintenance kit; not available individually. / HZXXXXXX non disponibile not available.*

Ed/Issue	02/15
N°Tav./Rev.	T10 SC/A

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T10 SC CROMO spare parts



Pos	Cod	Pos	Cod
1	HZ730027	19	HZ800082*
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5	HZ800086	23	HZ800064
6	HZ800085*	24	HZ800065
7k	HZ830083	25	HZ800010
8	HZ830084	26	HZ800011*
9	HZ800042	27	HZ800079
10	HZ800043*	28k	HZ800090
11	HZ730127	29	HZ830090
12	HZ730132*	30	HZ830091*
13	HZ730106	31	HZ730108*
14	HZ730108*	32	HZ830092
15	HZ830089	33	HZ830093
16	HZ830086	34k	HZ830094
17	HZ800038	35k	HZ830035
18	HZ830088	36k	HZ800045*

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1st STAGES
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Ed/Issue	02/15
N°Tav./Rev.	T10 SC/A

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Kit T10-T10 SC Code N° HZ800045 Annual Replacement Kit Chart



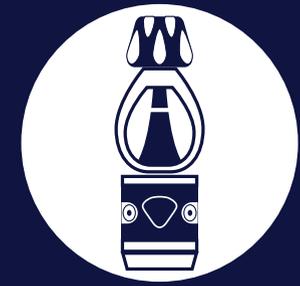
T10 / T10 S.C./ T10 CROMO 1st STAGE (HZ 800045) ANNUAL REPLACEMENT KIT CHART

O-RING Reference Table						
1 Diaphragm HZ800082	1 Back-up Ring HZ800081	SPARE PARTS Reference Table		1 HP poppet valve HZ800085	1 External Hydrostatic Diaphragm (T10 S.C. Only) HZ800011	

REAL SIZE

Use only original
Cressi-sub spare parts

Note: Cressi-sub recommend a full maintenance of the regulator at least once a year or more in case of intensive use.



Annual replacement

- Cressi-Sub recommends complete regulator maintenance at least once a year, or more frequently in the case of particularly intense use.
- Maintenance must include replacement of all components provided in the annual equipment maintenance kit.
- The special tools for maintenance of this device are illustrated on one of next pages.
- Metal parts must be washed with hot water and neutral detergent and rinsed in fresh water. Any concretions must be removed using ultrasound cleaning or with diluted acid solutions, always followed by long and thorough rinsing under running water. For more information, please refer to the general procedure.
- Do not use acids or solvents on rubber components.
- The new ORs must be greased with a thin layer of lubricant: this procedure reduces to a minimum the risk of damage during assembly.
- The metal threading can be lubricated with grease on the first two rings of threading.

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Annual replacement

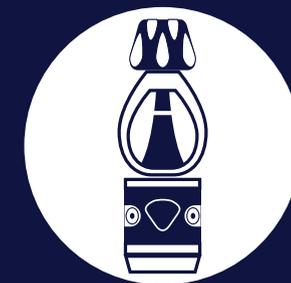
Annual replacement

- According to the European Standard, the procedures described in this document are pertinent to and intended only for the disassembly, maintenance, and assembly of equipment meant for use with air (21% oxygen, 79% nitrogen - EEC Countries Only).
- Users must never perform maintenance themselves; all maintenance must be performed **EXCLUSIVELY** by an authorized Cressi-Sub center.
- You can find your authorized Cressi-Sub center by asking your dealer, or Cressi Sub S.p.A. itself by sending an e-mail to:

Use only original
Cressi-sub spare parts

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Special tools



HZ 709004
extration
point tool



HZ 709016
tool to remove
the orifice



HZ 709008
threaded bar
to tighten the
regulator in
the vice



HZ 709012
yoke nut socket
and wrench



HZ 709011
push tool



HZ 709006
allen key
6 mm



HZ 709003
Big compass
spanner



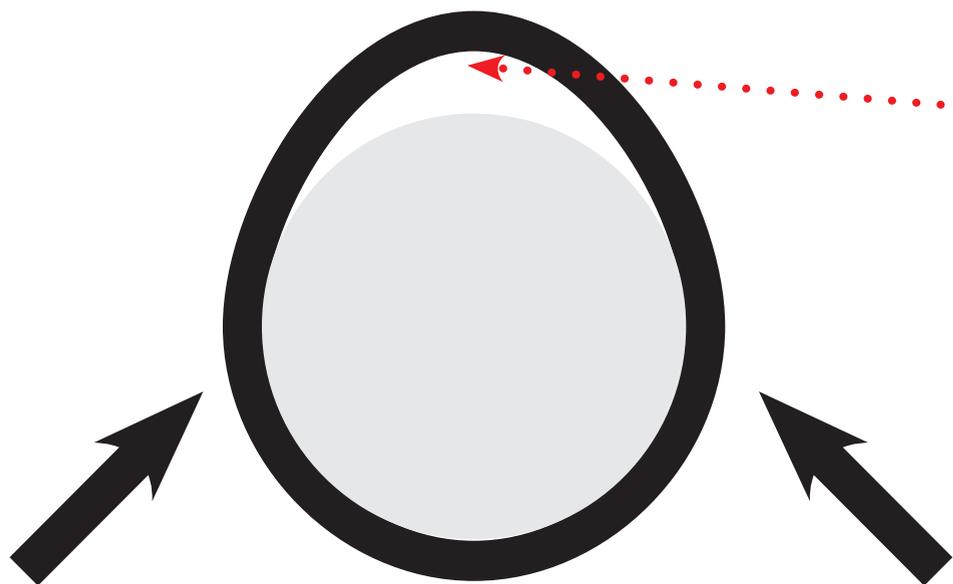
dynamometric
wrench
(unavailable)



HZ 710010
1st stage setting
pressure gauge

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Disassembling procedures



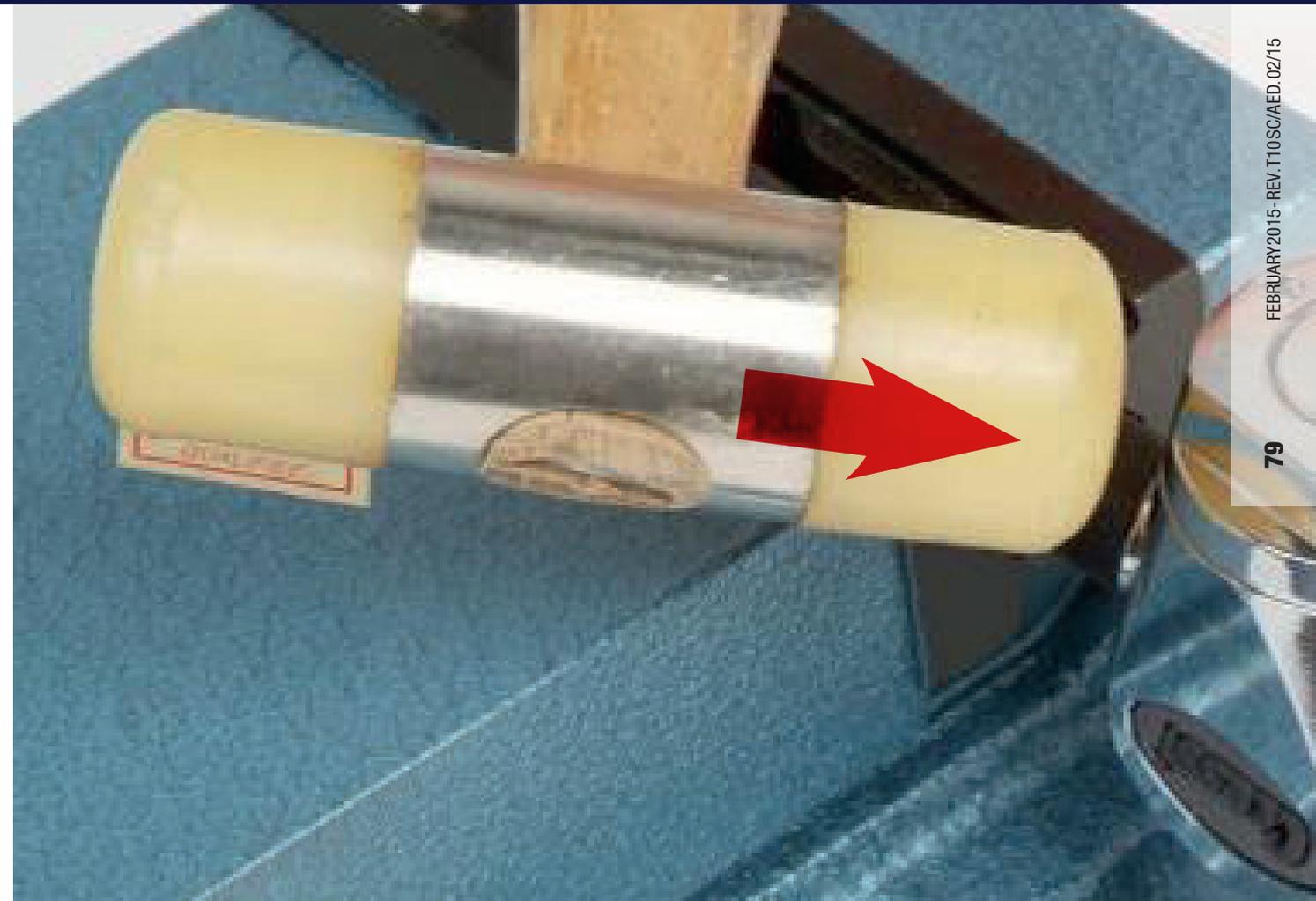
- Remove and replace all O-rings;
- Use a plastic tool or a round pointed metal one in order not to damage the O-ring seat;
- To replace the O-ring correctly, press its sides to create a bulge inside which to insert the round pointed tool, as shown in the pictures;
- **Attention: USE ONLY ORIGINAL CRESSI-SUB SPARE PARTS**

T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures



If the regulator has worked extensively in water and shows signs of oxidation, it can be helpful to use a synthetic hammer to give a series of taps along the perimeter of the area to be unscrewed.



T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures



Preliminarily block the regulator in a vise, after tightening the appropriate threaded tool in one of the 1st stage ports. Then remove the plug of the dry chamber (SC) from its seat by unscrewing it with a compass wrench as shown in the figure. Be careful not to damage the silicone diaphragm in the cap.

T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures



Then unscrew the calibration screw using a 6 mm Allen wrench as shown in the figure;



T10 SC - T10 SC CROMO 1st STAGES

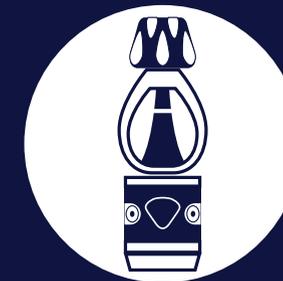
Disassembling procedures



Remove the calibration spring and the spring pusher disk from the 1st stage.

T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures



Preemptively block the regulator in a vise, after tightening the appropriate threaded tool into one of the 1st stage ports. Then remove the locking disc using a 30 mm hex wrench as shown in the figure.



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Disassembling procedures

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Remove the diaphragm from its seat by introducing low pressure air through a 3/8" LP port.



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Disassembling procedures



Remove the pin pusher and thrust pin as shown in the figure.



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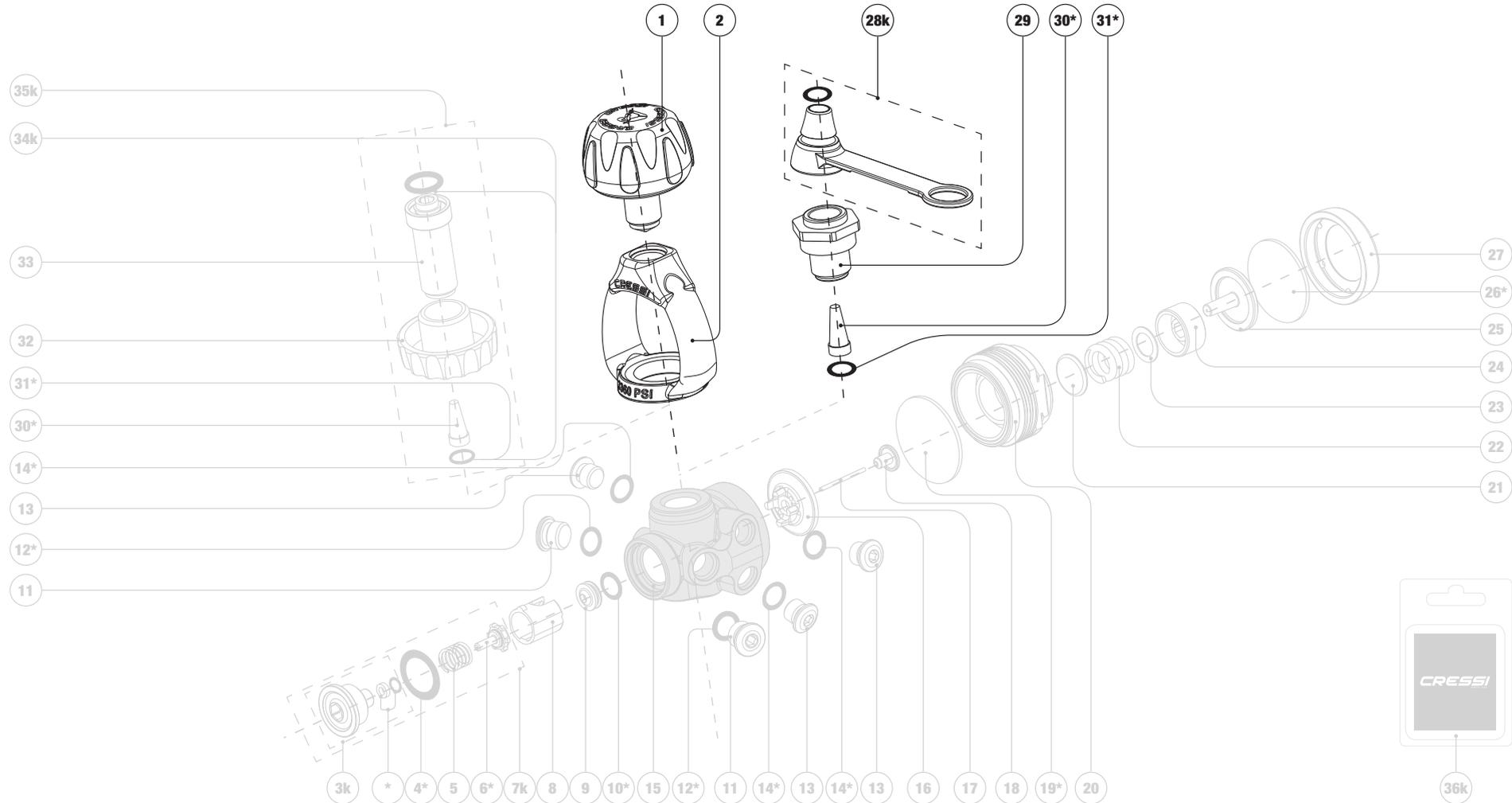
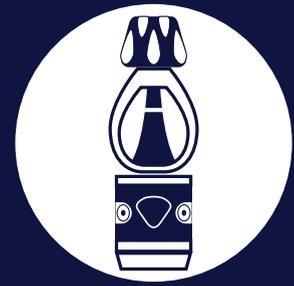
Disassembling procedures

Remove the disk guide from the 1st stage body.



T10 SC - T10 SC CROMO INT 1st STAGES

Disassembling procedures



T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures

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Preliminarily lock the regulator in a vise after tightening the appropriate threaded tool in one of the 1st stage ports. Then disassemble the bracket-lock nut using the wrench to remove the bracket, as shown in the figure.



T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures

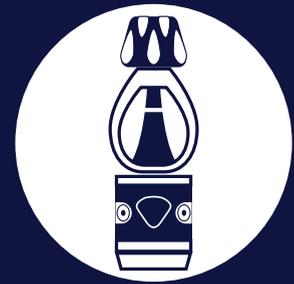


Remove the bracket-lock nut and the 1st stage bracket. Then remove the O-ring and filter from their seat.



T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures



Preliminarily lock the regulator in a vise after tightening the appropriate threaded tool in one of the 1st stage ports. Unscrew the DIN filter body using a 6 mm Allen wrench as shown in the figure.



T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures

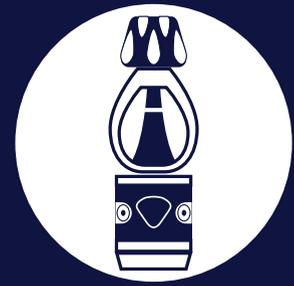
⚠ Warning: if disassembly is difficult, do not perform the maneuver with wrench extensions used for disassembly as this may irreversibly damage the part being disassembled!

In such a case, please contact Cressi-sub before undertaking any disassembly operations.

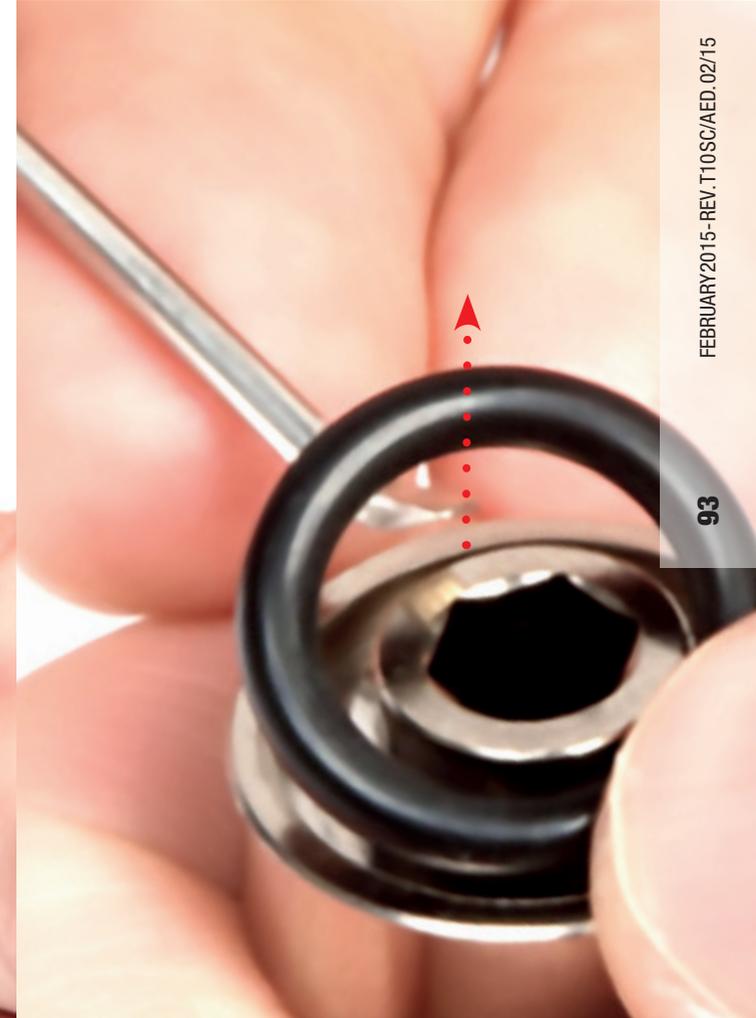


T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures



After removing the DIN filter body from the 1st stage, remove the O-ring and filter from their seat; Remove the regulation O-ring paying special attention to not cut the sealing surface because it provides the O-ring sealing function between the regulator and tap.



T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures

Preliminarily lock the regulator in a vise after tightening the appropriate threaded tool in one of the 1st stage ports.

Then unscrew the balancing chamber with a 6mm Allen key as shown in the figure;

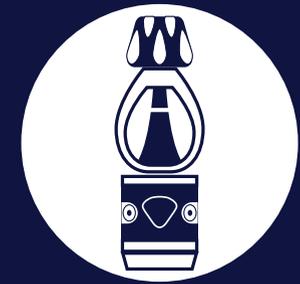


Note:

Use caution because loosening the thread results in a lower resistance of the internal valve spring, making the latter fly from its seat

T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures



⚠ Warning: if disassembly is difficult, do not perform the maneuver with extensions of the wrench used for disassembly as it may irreversibly damage the part being disassembled!

In such a case it is advisable to contact Cressi-sub before undertaking any disassembly operations.



Note:

If the regulator has worked extensively in water and shows signs of oxidation, the maneuver can be facilitated by using a synthetic hammer to give a series of taps along the perimeter of the area to be unscrewed.

T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures

Remove the balancing chamber and the HP valve spring; then remove the HP valve from the 1st stage.

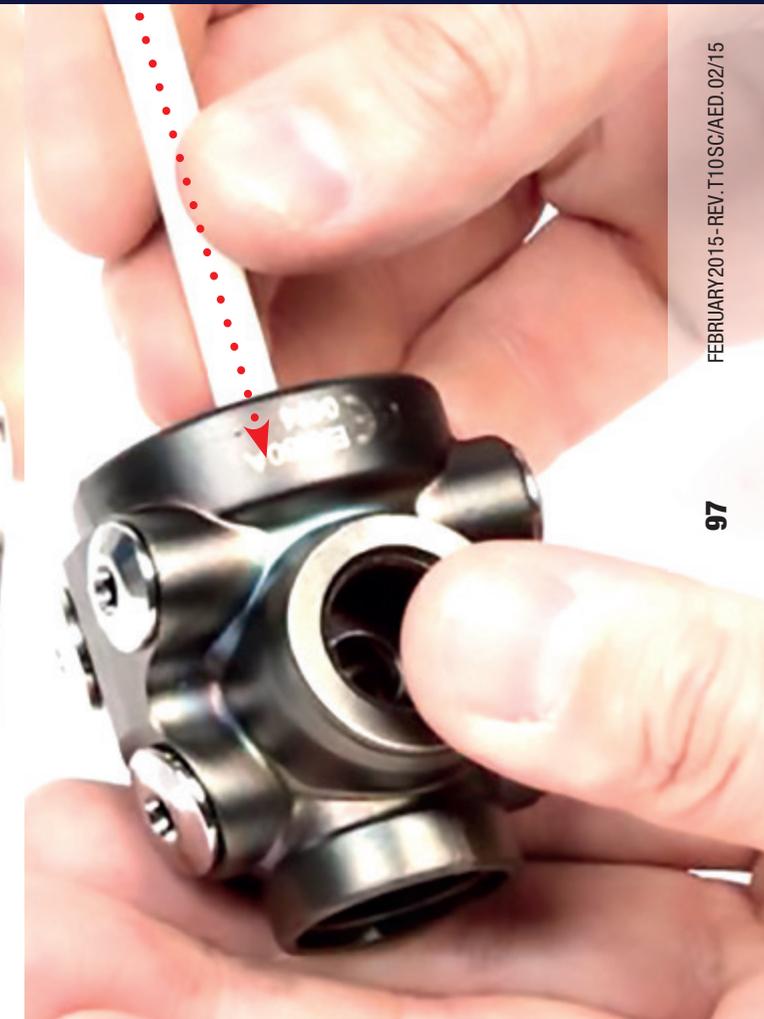


T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures



Remove the piston cover and orifice from their seat by using the universal extraction tool and pushing as shown in the figure.



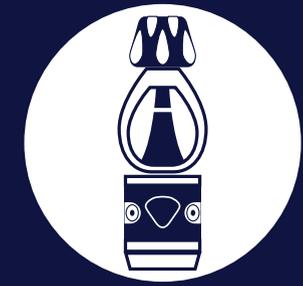
T10 SC - T10 SC CROMO 1st STAGES

Disassembling procedures

Note: Use your hand to prevent discharge of the orifice from the 1st stage body, thereby preventing the edge of the pneumatic seal from being damaged.



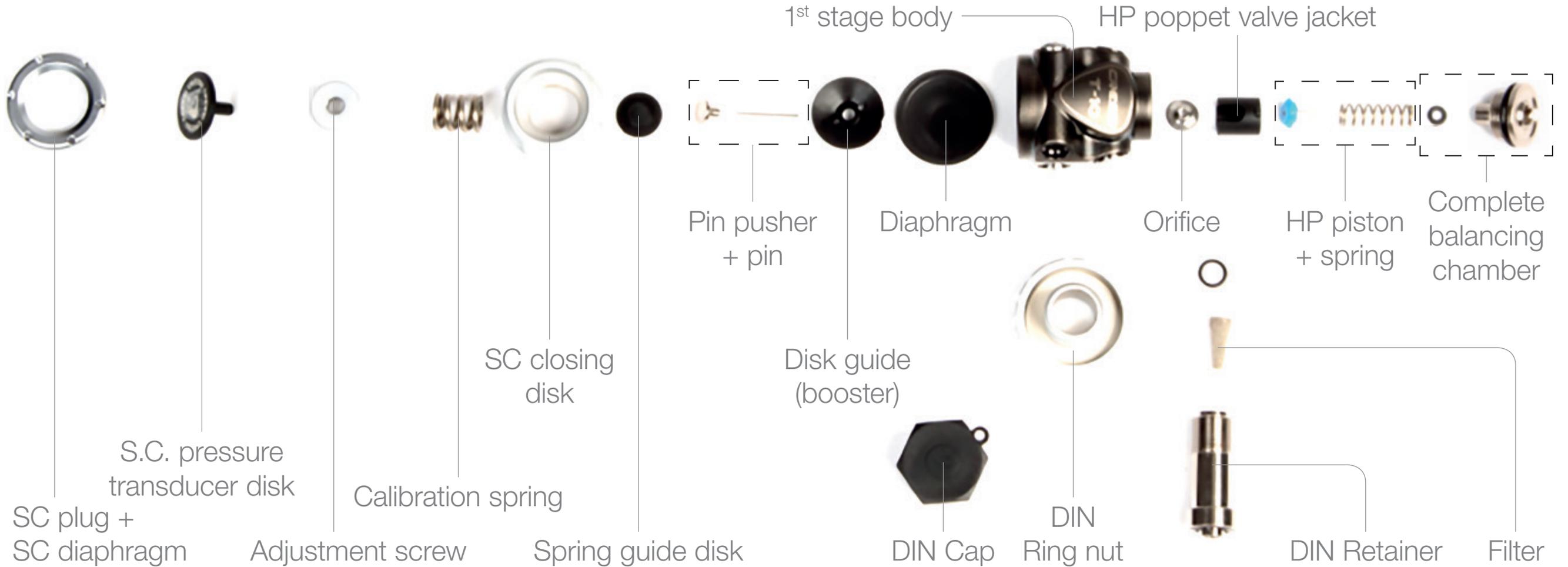
T10 SC - T10 SC CROMO 1st STAGES



T10 SC - T10 SC CROMO 1st STAGES

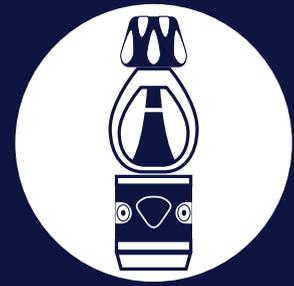
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T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Replace and lubricate the O-ring of the orifice;
Then insert the appropriate plastic tool inside the 1st stage body as shown in the figure to support and center the orifice opposite the edge on the end part.
This will facilitate insertion of the edge into its seat in the regulator.



T10 SC - T10 SC CROMO 1st STAGES

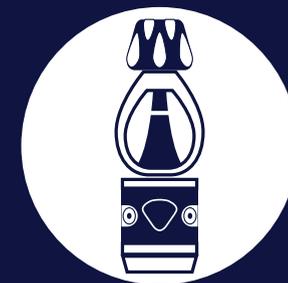
Assembling procedures

Once it has been centered and seated, move the special plastic tool downward, accompanying the descent orifice toward its own operating seat in the 1st stage, preserving the surface of the edge from impacts that might compromise the airtightness of the regulator.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Set the orifice on the contour of its seat located in the 1st stage, then push the orifice into the seat with the aid of a special plastic tool to overcome the natural friction created by the O-ring so as not to damage the pneumatic sealing edge of the orifice.



T10 SC - T10 SC CROMO 1st STAGES

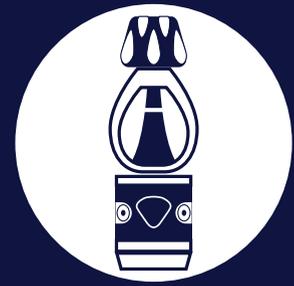
Assembling procedures

Replace the backup ring in the balancing chamber. Be careful not to scratch its inner sealing wall.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Replace the O-ring in the balancing chamber after suitably lubricating it.
Note: abundant lubrication is essential for the proper functioning of the HP valve



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

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Insert the HP piston cover in the 1st stage body. Take care to line up the centering tooth in the housing on the body as shown in the figure.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Note: Before inserting the new poppet inside the 1st stage, check that the through-hole in the stem of the HP piston is NOT obstructed by foreign bodies.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

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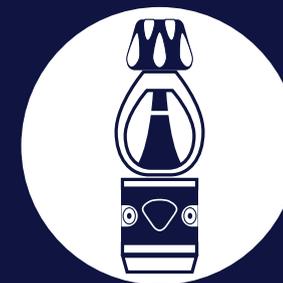
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Then, insert the new HP piston into the 1st stage body taking care to line up the key tooth on the piston cover with any one of the piston slots as shown in the figure.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Insert the HP piston spring into the slot, as shown in the figure.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

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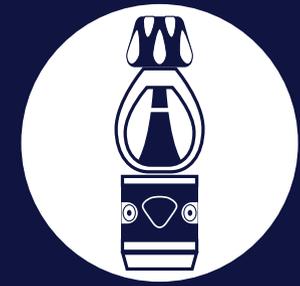
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Insert the end of the balancing chamber into the HP valve spring. Use a 6mm Allen wrench to press and overcome the spring resistance, until reaching the thread in the 1st stage body. Then screw all the way down to the setscrew till you reach the correct dynamometric torque.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Tighten the balancing chamber to the body with a dynamometric wrench provided with a 6 mm hex insert. Apply a tightening torque of 10 N x m (88.5 in-lbs).



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

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After fixing the HP valve, rotate the body and insert the thrust pin into place;
Then insert the disk guide respecting the direction shown in the figure.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Insert the push pin and verify, by applying light pressure to it, that the mechanism is functioning properly.



T10 SC - T10 SC CROMO 1st STAGES

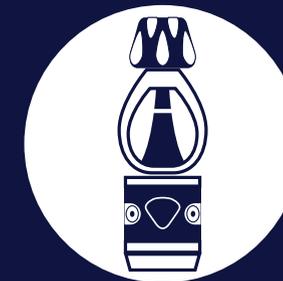
Assembling procedures

Insert the diaphragm into the seat inside the body, making sure it is properly sitting in its working position; Then lightly press the center of the diaphragm to make sure the mechanism is correctly situated in its working position.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Screw the diaphragm closing disk until it stops at the setscrew; tighten it with a dynamometric wrench fitted with a 30 mm insert, applying a torque of 30 N x m (266 in-lbs).



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

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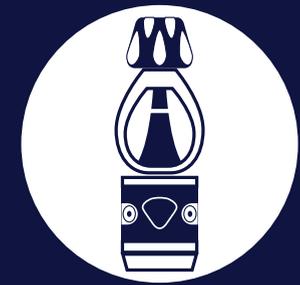
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Put the spring trimmer in the adjustment screw of the 1st stage.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Insert the spring in the 1st stage adjustment screw, and then superimpose the push-spring disk as shown in the figure.



T10 SC - T10 SC CROMO 1st STAGES

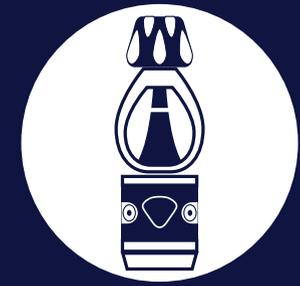
Assembling procedures

On the 1st stage mount the adjustment screw, complete with the spring and disk, **from the bottom upwards** in the direction shown in the figure; Then, screw (not excessively) the adjustment screw into the threaded seat till the spring-pusher **adheres** to the diaphragm.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

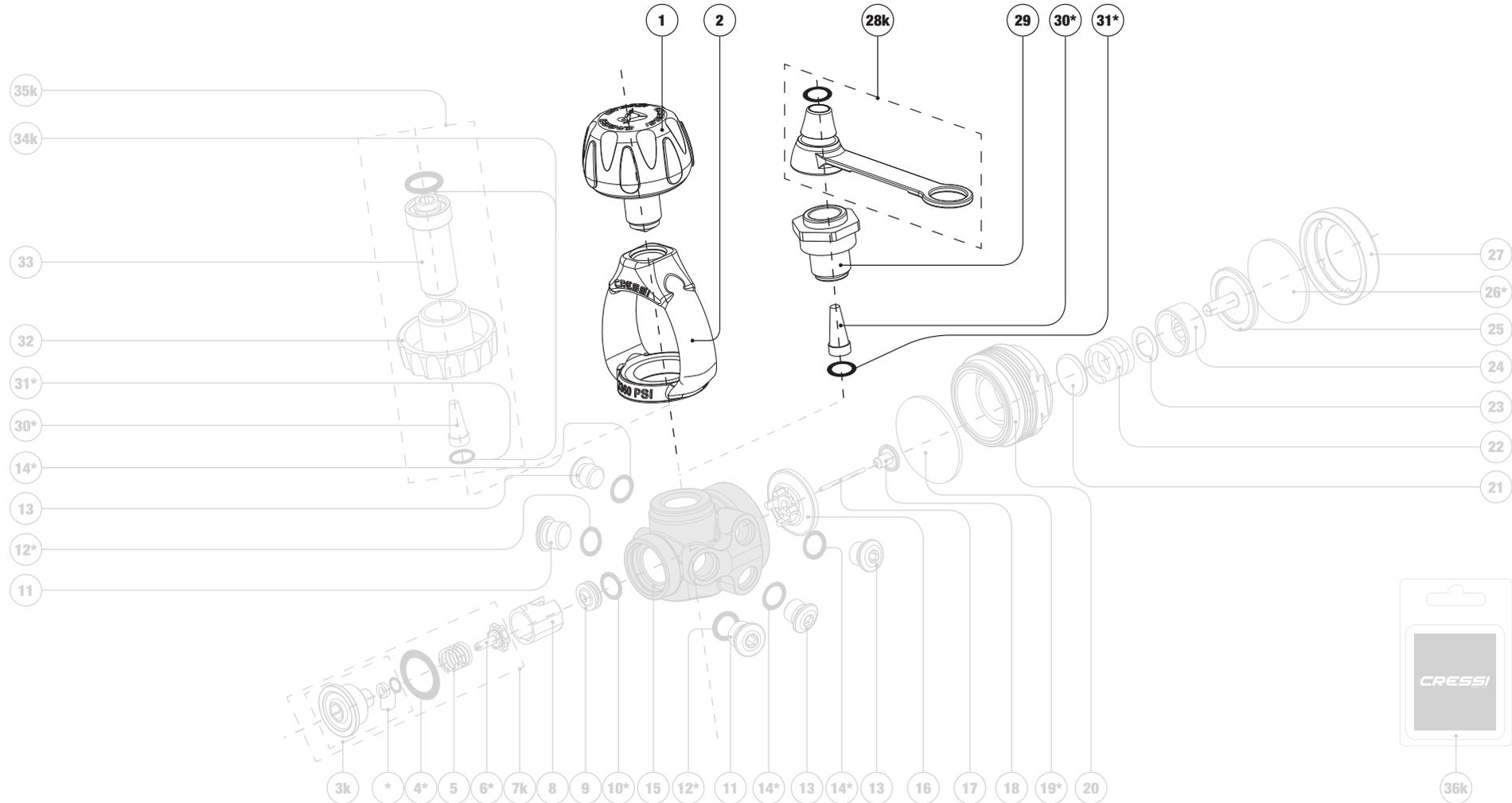


Then screw the adjustment screw into the threaded seat of the diaphragm closing disk using a 6 mm Allen wrench until reaching the correct calibration of the 1st stage.



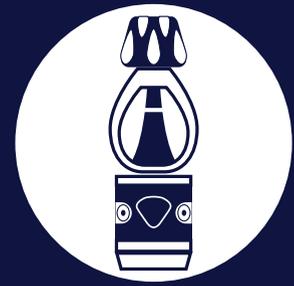
T10 SC - T10 SC CROMO INT 1st STAGES

Assembling procedures



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Replace and lubricate the O-ring and insert the filter in its seat in the bracket-lock nut as shown in the figure. The elasticity of the O-ring will keep it in place to ensure proper housing.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

After replacing the O-ring and the filter, insert the bracket-lock nut between the INT bracket and the 1st stage body. Then screw the bracket-lock nut **from the bottom to the top**, following the direction shown in the figure until reaching the correct dynamometric torque; Note: Make sure there are no marks or abrasions on the sealing surface of the bracket-lock nut because it determines the correct air seal between the 1st stage and the tank valve.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

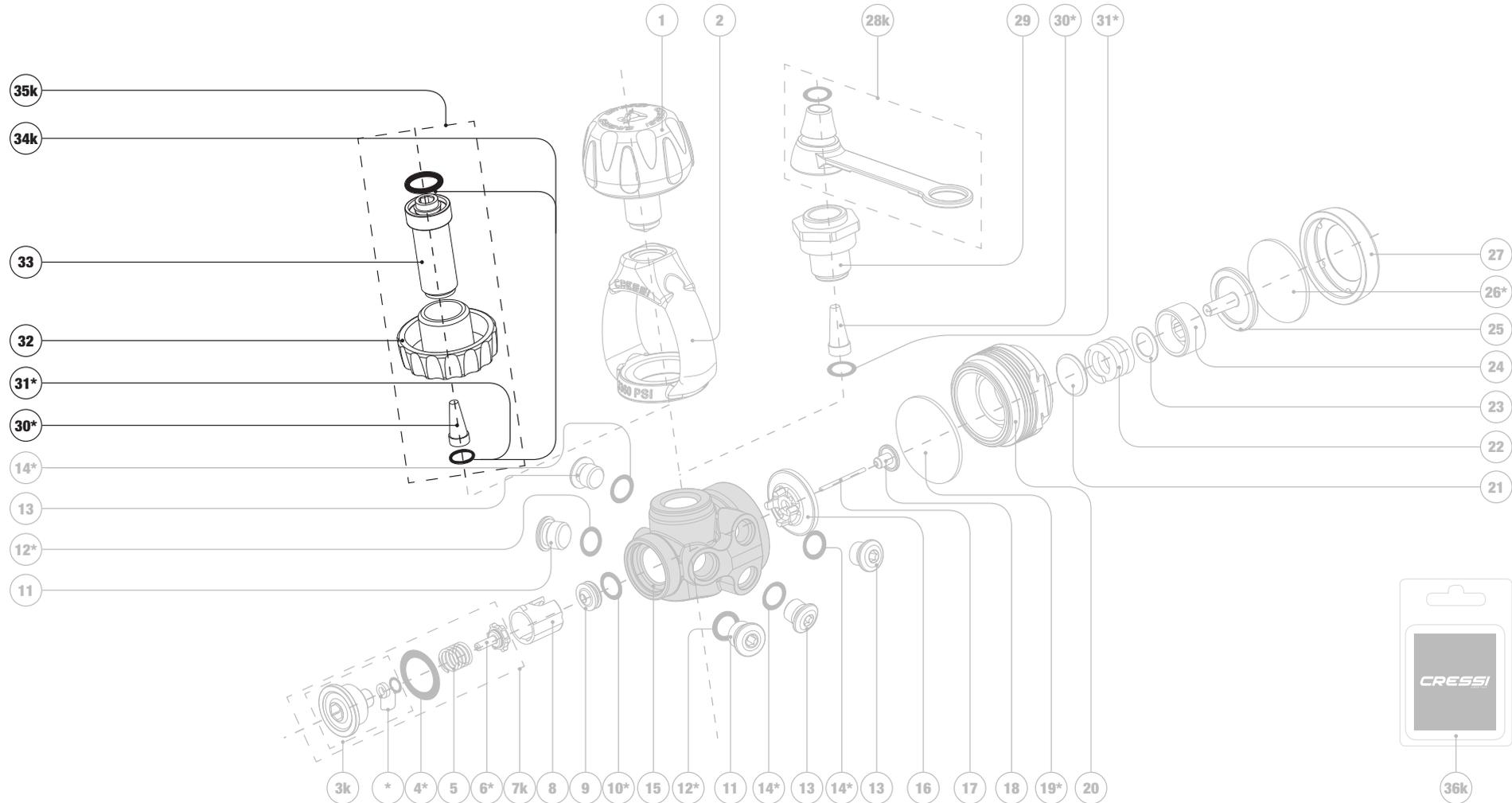


Use the threaded bar to lock the 1st stage body in a vise. Then tighten the bracket-lock nut using a dynamometric wrench and applying a tightening torque of 30 N x m (266 in-lbs).



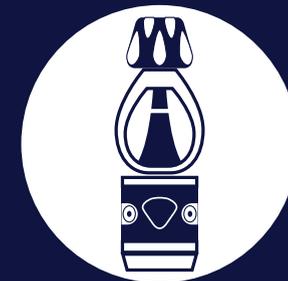
T10 SC - T10 SC CROMO DIN 1st STAGES

Assembling procedures



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



Replace the regulation O-ring used for sealing the DIN regulator on the tank tap after having suitably lubricated it;

Note: verify its perfect integrity as this will determine the proper air seal between the 1st stage and the tank tap.



T10 SC - T10 SC CROMO 1st STAGES

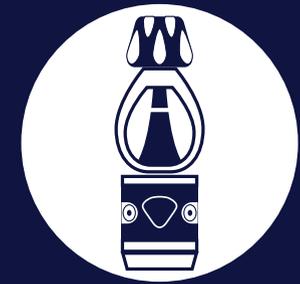
Assembling procedures

Replace and lubricate the O-ring and insert the filter in its seat in the DIN filter body as shown in the figure. The elasticity of the O-ring will keep the filter in place to ensure its proper housing.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures



After replacing the O-ring and the filter, insert the DIN ring nut in the filter body in the same direction as shown in the figure. Then screw the DIN filter body complete with ring nut into the body, following the direction shown in the figure **from the bottom upwards** until reaching the proper dynamometric torque.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

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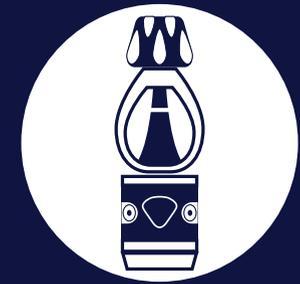
Use the threaded bar to lock the 1st stage body in a vise. Then tighten the DIN filter body with a dynamometric wrench provided with a 6 mm hex insert. Exert a torque of 10 N x m (88.5 in-lbs).

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T10 SC - T10 SC CROMO 1st STAGES

Setting



- **Calibration procedures of T10 1st stage, with reference to the image on page 131:**
- Mount the calibration gauge on a LP 1st stage port
- Mount the complete regulator (1st + 2nd stage) on a loaded tank at 200 bar / 2900 psi or on a test bench having similar pressure.
- Note: although the regulator is hyper-balanced (i.e., the intermediate pressure increases as the tank pressure decreases), it is recommended to calibrate the 1st stage to 200 bar / 2900 psi to properly control its operation. The intermediate pressure will rise slightly as the tank pressure decreases (about + 0.6 bar/9 psi at 50 bar/725 psi pressure tank).
- Slowly open the air valve and simultaneously press the second stage air purge. Repeat the operation a few times.

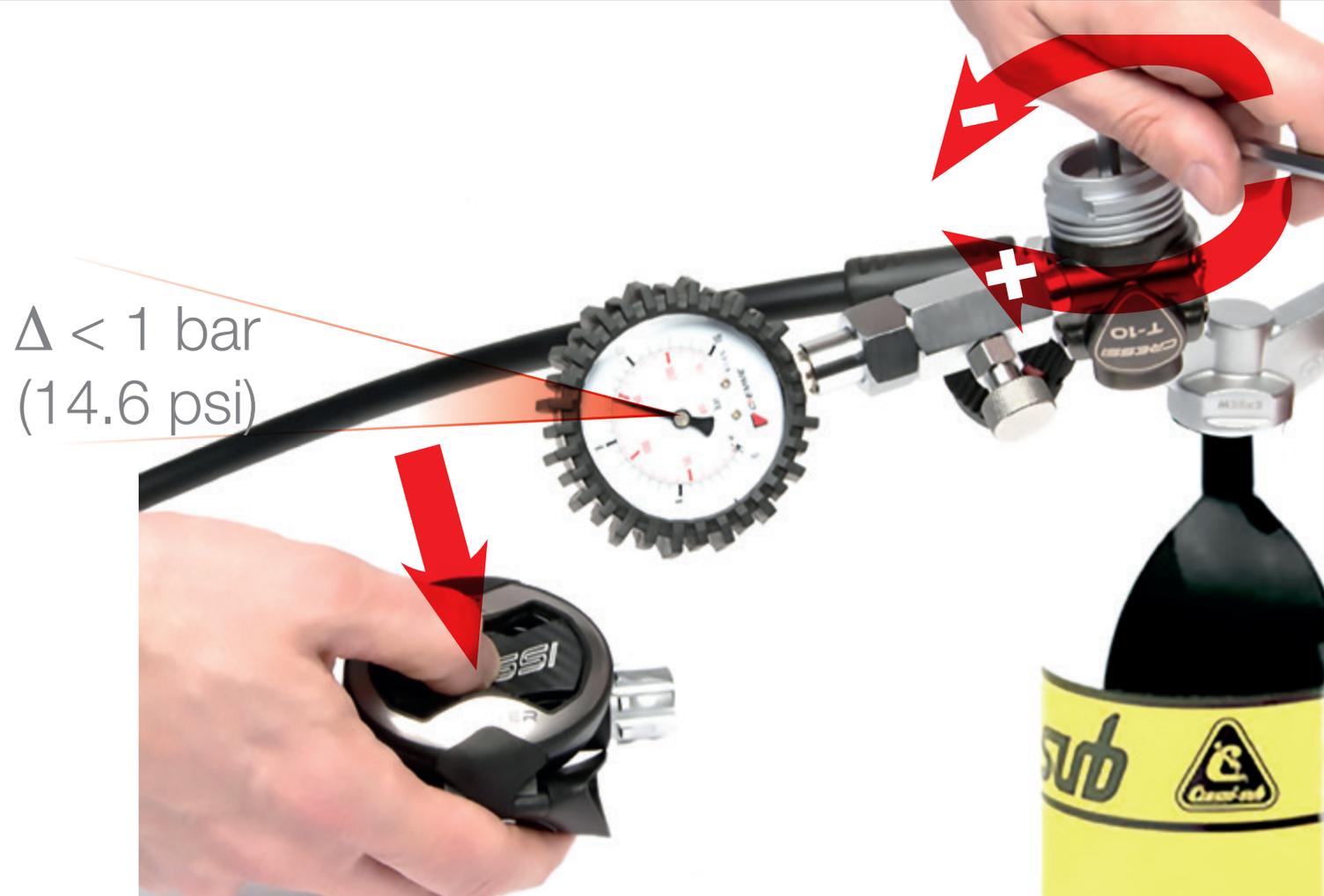
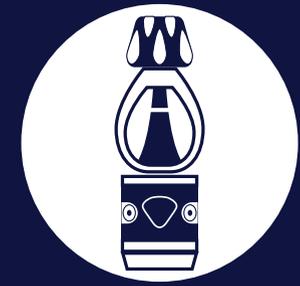
T10 SC - T10 SC CROMO 1st STAGES

Setting

- Check the pressure indicated on the gauge. The correct calibration of the T10 1st stage provides an intermediate pressure of 10 bar/146 psi. If it does not, close the air valve and purge the regulator. Insert a 6 mm Allen wrench in the adjustment screw and screw clockwise (+) to increase the intermediate pressure of the 1st stage. By turning it counterclockwise (-), the pressure decreases.
- Note: reemember to purge the regulator before any adjustment of the intermediate pressure to avoid inaccurate readings on the gauge.
- Check that the intermediate pressure is quickly reached and remains stable, with no increase, after repeatedly pressing the second stage purge button.
- After the calibration procedure is completed, the 1st stage pressure drop, must be less than 1 bar / 14.6 psi when pressing the second stage purge button.

T10 SC - T10 SC CROMO 1st STAGES

Setting



$\Delta < 1 \text{ bar}$
(14.6 psi)

T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

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Only after properly calibrating
the 1st stage is it possible
to insert the pressure transducer
disk into the adjustment screw
as shown in the figure.

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T10 SC - T10 SC CROMO 1st STAGES

Setting



Only after properly calibrating the 1st stage is it possible to insert the transparent silicone SC diaphragm inside the SC plug as shown in the figure.



T10 SC - T10 SC CROMO 1st STAGES

Assembling procedures

After inserting the silicone diaphragm inside the SC plug, with the 1st stage connected to a loaded tank, open the tap and start to screw in the disk with the compass wrench, as indicated in the figure, simultaneously pressing the diaphragm and venting, as shown in the figure, at each small rotation of the closure disk, the connected second stage. This way, the formation of an air pocket in the dry chamber of the 1st stage SC is avoided because such a pocket would create a convexity of the diaphragm, thus altering the calibration of the intermediate pressure, which must be 10 bar (146 psi).



