



Cressi-sub
Regulators repair and maintenance

XS2 2nd stage





WARNING !

- This document is intended for experienced technical personnel who have already attended a Cressi-sub training course on equipment repair and maintenance.
- We decline any responsibility for any maintenance and/or repair operation carried out by unauthorized personnel.
- Avoid carrying out maintenance and repair operations on the equipment without the correct training required.
- Should the information reported in this manual be unclear or not fully understandable, please contact Cressi-sub before carrying out any disassembling or maintenance operation.
- Before carrying out any operation, Cressi-sub recommend to read this manual carefully in order to get to know thoroughly all necessary **tools** and techniques to carry out a correct maintenance and repair of the equipment.



WARNING !

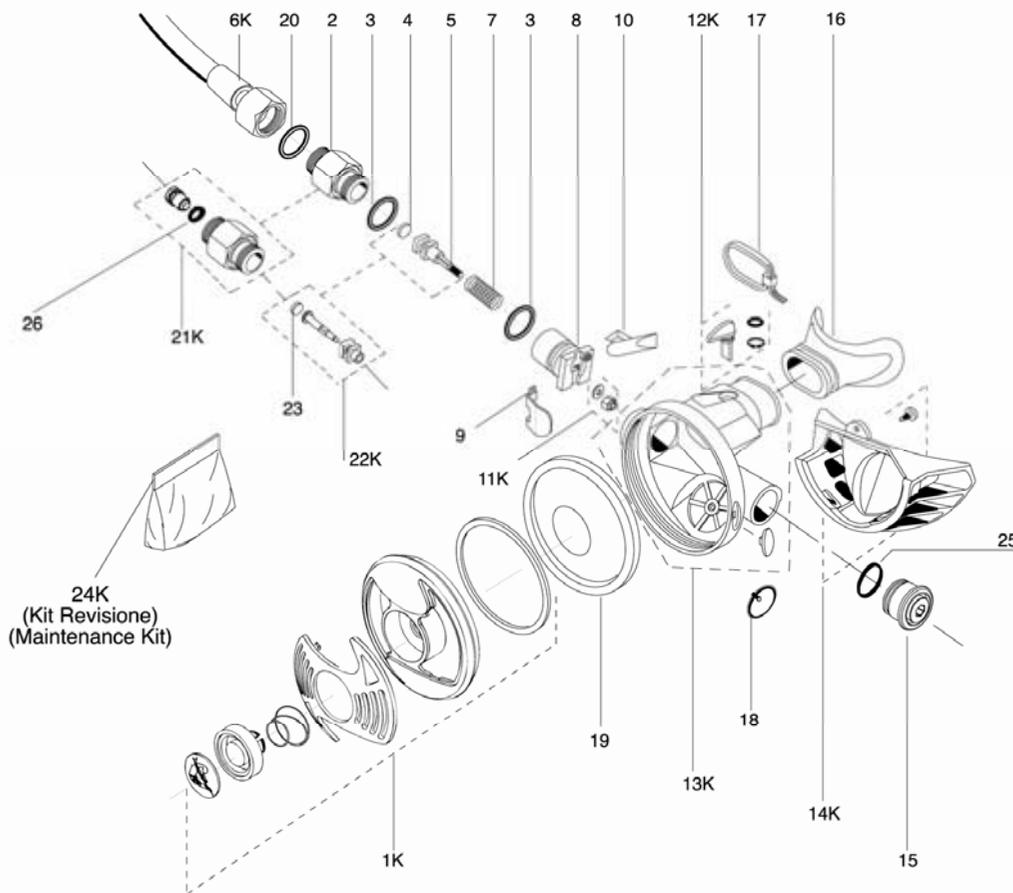
- Before any operation, Cressi-sub recommend to read carefully the present document in order to get to know thoroughly all necessary tools and techniques to carry out a correct maintenance and repair of the equipment.
- Use this document during every phase of the equipment maintenance and repair, in order not to leave out any sequence.
- On the contrary, bad working or even accidents might occur.
- Pay particular attention to the advices written on the sides of the pictures representing the different phases of maintenance and repair, in order to avoid any possible problem that might cause accidents.
- All operations described in this manual are relating and destined *only* to disassembling, maintenance and assembly of equipments to be used with air (21% oxygen, 79% nitrogen).



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Regulators repair and maintenance

XS2 2nd stage: spare parts



POS.	CODICE / CODE
1K	HZ 780050 Nero
1K	HZ 780051 Giallo
2	HZ 742007
3	HZ 730218
4	HZ 730208
5	HZ 742008
6K	HZ 730222 Nero
6K	HZ 730225 Giallo
7	HZ 730207
8	HZ 770096
9	HZ 770095
10	HZ 770094
11K	HZ 746094
12K	HZ 770099
13K	HZ 770097
14K	HZ 790096
15	HZ 790095
16	HZ 790094
17	HZ 730202
18	HZ 746006
19	HZ 730212
20	HZ 730221
21K	HZ 742006
22K	HZ 742012
23	HZ 742013
24K	HZ 790090 (kit Revisione/Maintenance Kit)
25	HZ 790091
26	HZ 790092

2° Stadio XS2 / 2nd Stage XS2

Ed./Issue	XS2/1
A/04	N° Tav./Rev.

**XS2 2nd STAGE HZ 790090
ANNUAL REPLACEMENT KIT CHART
(Real Size)**



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XS2 2nd stage

- XS2 2nd stage servicing kit



HZ 790090

(Real Size) XS2 2nd STAGE (HZ 790090) ANNUAL REPLACEMENT KIT CHART

O-RING Reference Table



SPARE PARTS Reference Table

1 Exhaust Valve HZ 746006	1 Clip HZ 770099	1 Poppet LP Seat HZ 742013	1 Demand Lever Nut HZ 746094	1 Washer HZ 746094
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Use only Cressi-sub original replacement units

Note: we recommend to carry out a complete maintenance of your regulator once a year or more in case of a particularly intensive use.



- **Yearly maintenance**

- Cressi-sub recommend a complete maintenance of the regulator at least once a year, and more frequently in case of a particular intensive use. Please replace all the parts contained in the yearly maintenance kit (cod.HZ 790090).
- The required tools to carry out the maintenance are described in a section of this manual.
- Wash the metal parts in warm water and soap, then rinse them in fresh water. Remove any concretion by means of ultra-sound cleaning or diluted acid solutions and rinse them carefully in fresh water.



- **Yearly maintenance**

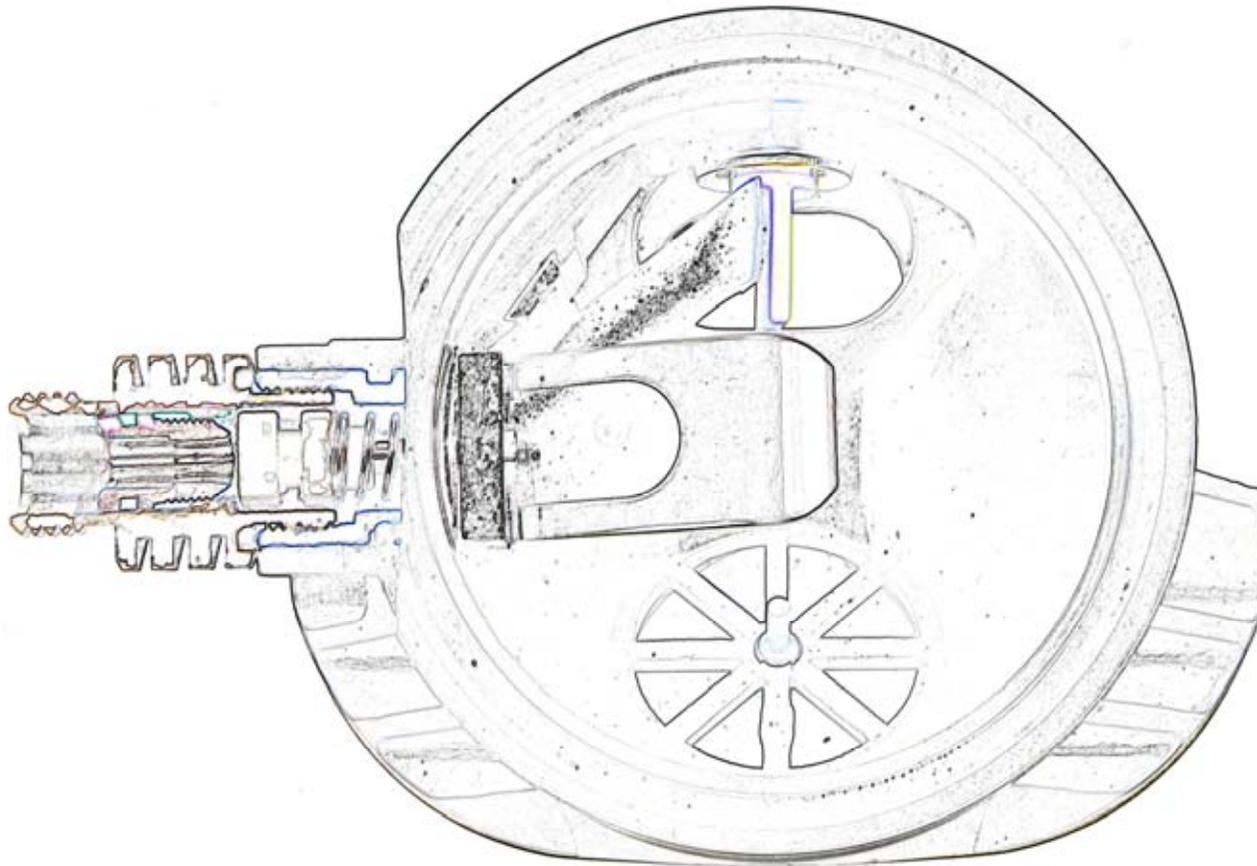
- Grease all new OR with a thin silicone film: this will reduce to the minimum the risk of damage during the assembly phases.
- You may grease the first two turns of the metal threads.
- All operations described in this manual are relating and destined *only* to disassembling, maintenance and assembly of equipments to be used with air (21% oxygen, 79% nitrogen).

- **Use only original Cressi-sub spare parts**



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XS2 2nd stage



XS2 2nd stage: disassembling



- Use a 0,75" (19 mm) and a 0,67" (17 mm) spanner to remove the low pressure pipe, by holding the valve seat nut steady with the former, and unscrewing the pipe with the latter.
- By yearly servicing, always replace the OR inside the pipe.





- Remove the cap holder out of its seat, using a pointed tool, as shown in the picture.





- Unscrew the cap,
using the special
spanner - code HZ
709013



HZ 780050 Black
HZ 780051 Octopus



- Remove the cap out of its seat.





- Remove the seal out of its seat.





- Unscrew the 2nd stage adjusting cap, using a 0,24" (6 mm). Allen wrench, as shown in the picture.





- Insert the special spring-pushing tool in the valve seat and keep it pressed - by placing it against your body or a surface – in order to compress the spring, while the shaft moves towards the inside of the case. Remove the lever, the setting nut and the corresponding metal washer, using a 0,22" (5,5 mm) screwdriver.





**XS2 2nd stage:
disassembling**





- Unscrew the anchoring screw of the expiration fin, by levering on its edges.



- Remove the discharge valve out of its seat.



- Place the regulator's case on the work bench, as shown in the picture, and loosen the adjustable nozzle seat using a 0,75" (19 mm) spanner.



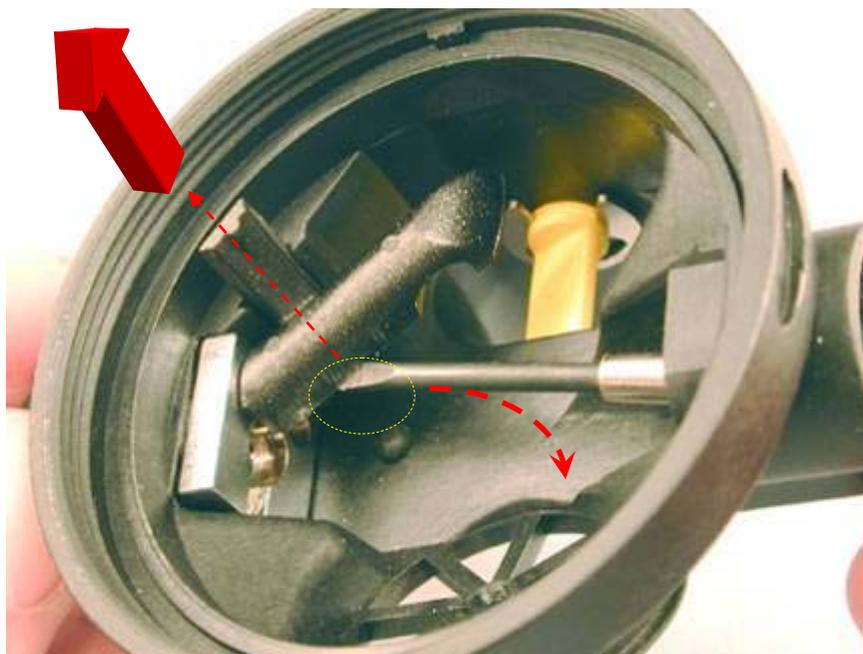
- Unscrew the adjustable nozzle completely out of its seat.
- NOTE: the adjustable nozzle seat HZ 742006 – being completely interchangeable - replaces the previous fixed version HZ 742007, which *has not been produced* since year 1999 ([see on page 5](#))



- Remove the nozzle by inserting a plastic cylindrical tool in the opposite side, taking care you do not damage the nozzle sharp edge, and push it out of its seat.
- **NOTE:** you have to use some strength in order to win the OR' s friction on the case wall and to push out the whole nozzle.



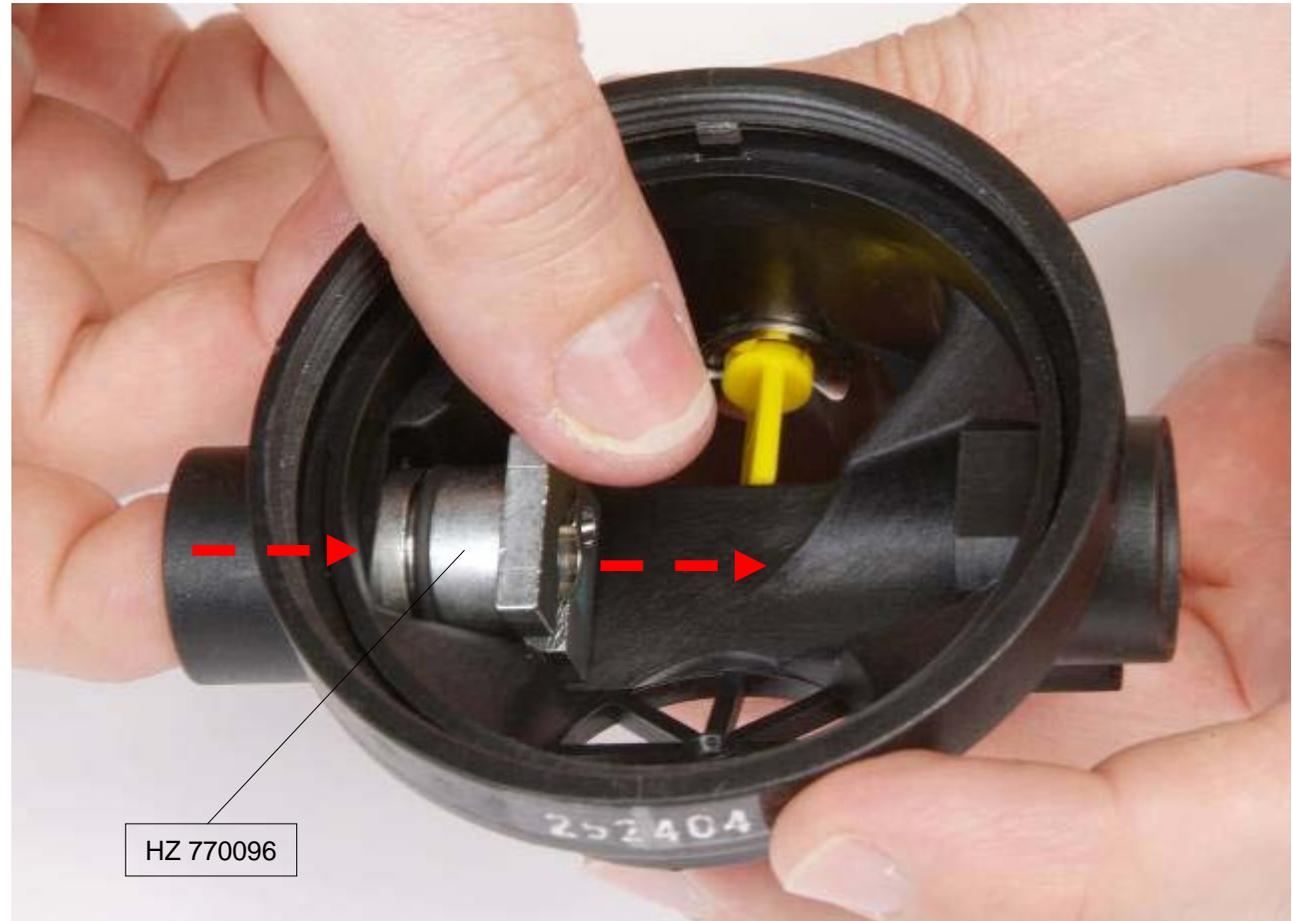
- Remove the valve shaft and the spring out of their seat.

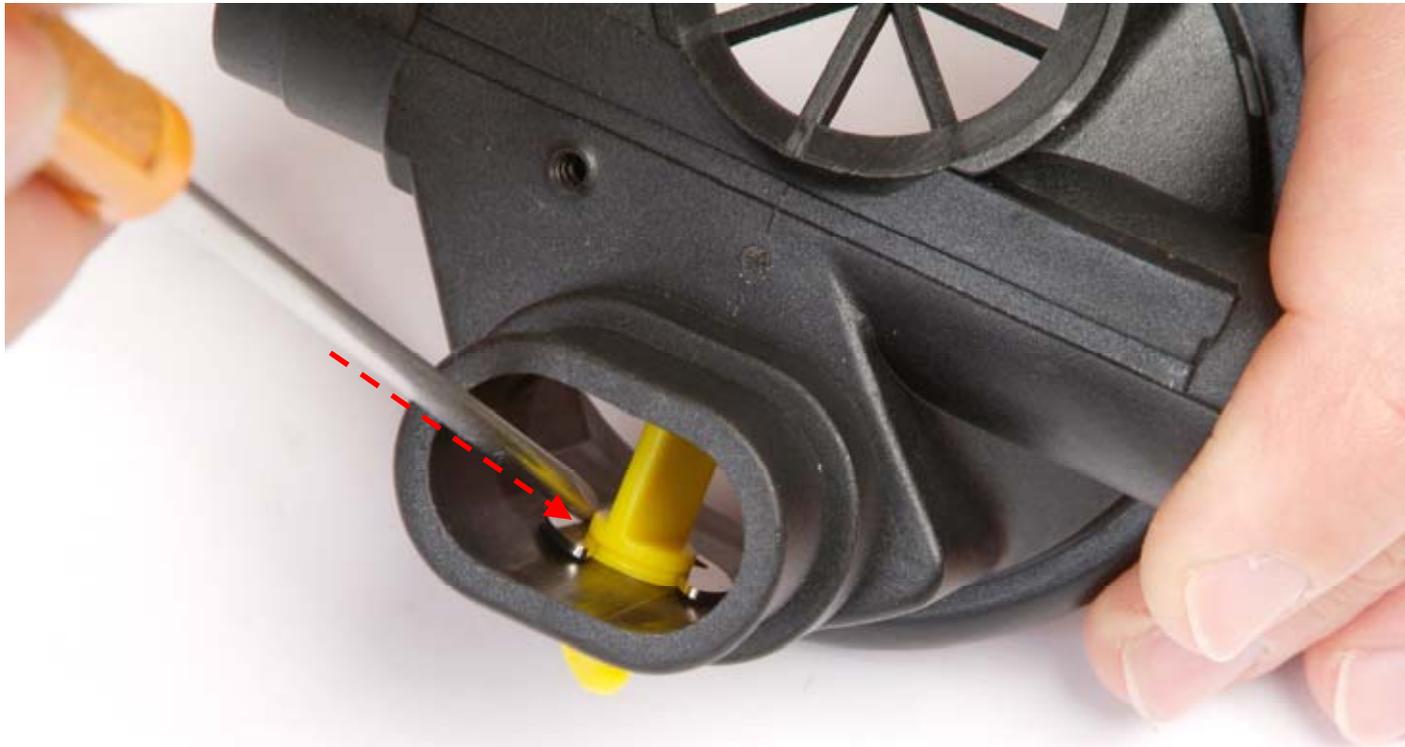


- Remove the injector, inserting a small screwdriver in the space between the injector and the case. Levering, let the injector come out of its seat, as shown in the picture.



- Remove the valve set, pushing it towards the inside of the case.



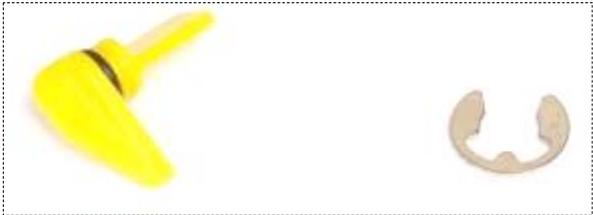


- Using a flat pointed tool, remove the flux diverter lock ring, pushing it towards the outside.
- Take it out of its seat.



**XS2 2nd stage:
disassembling**

- Replace and grease the flux diverter's OR.



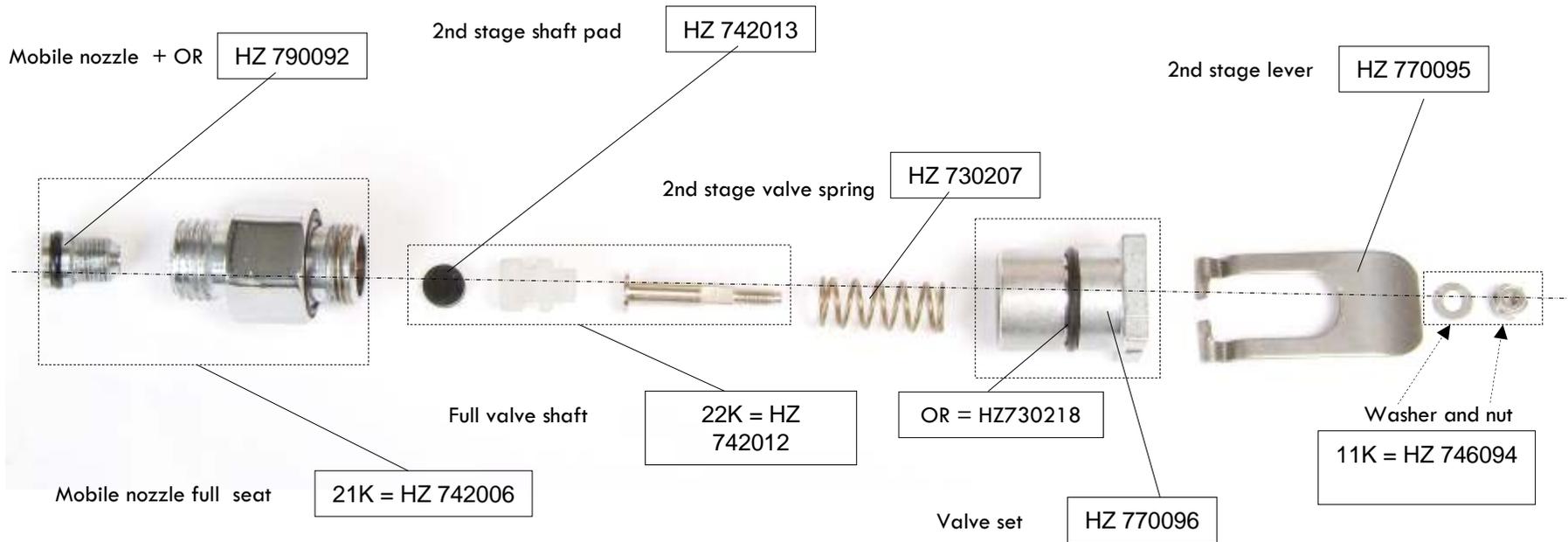
12K = HZ 770099



13K = HZ 770097



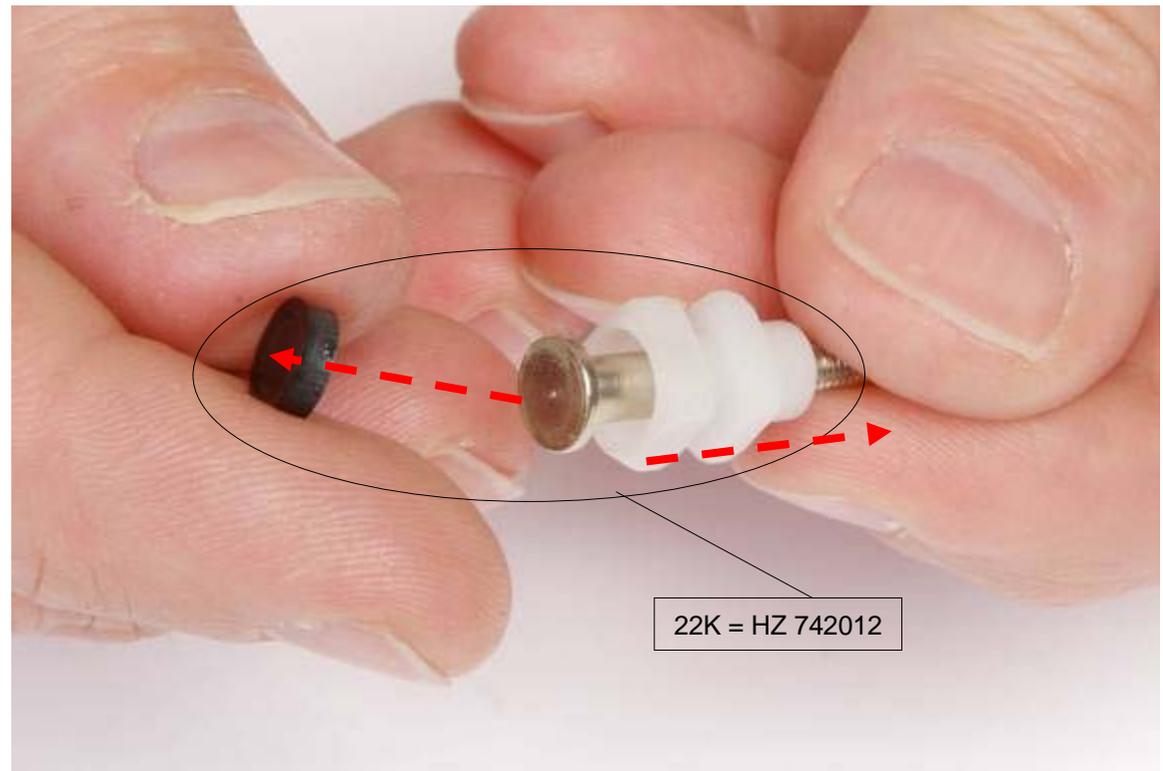
XS2 2nd stage



- We have got, at this point, to having all the elements of XS2 2nd stage valve mechanism on our workbench.

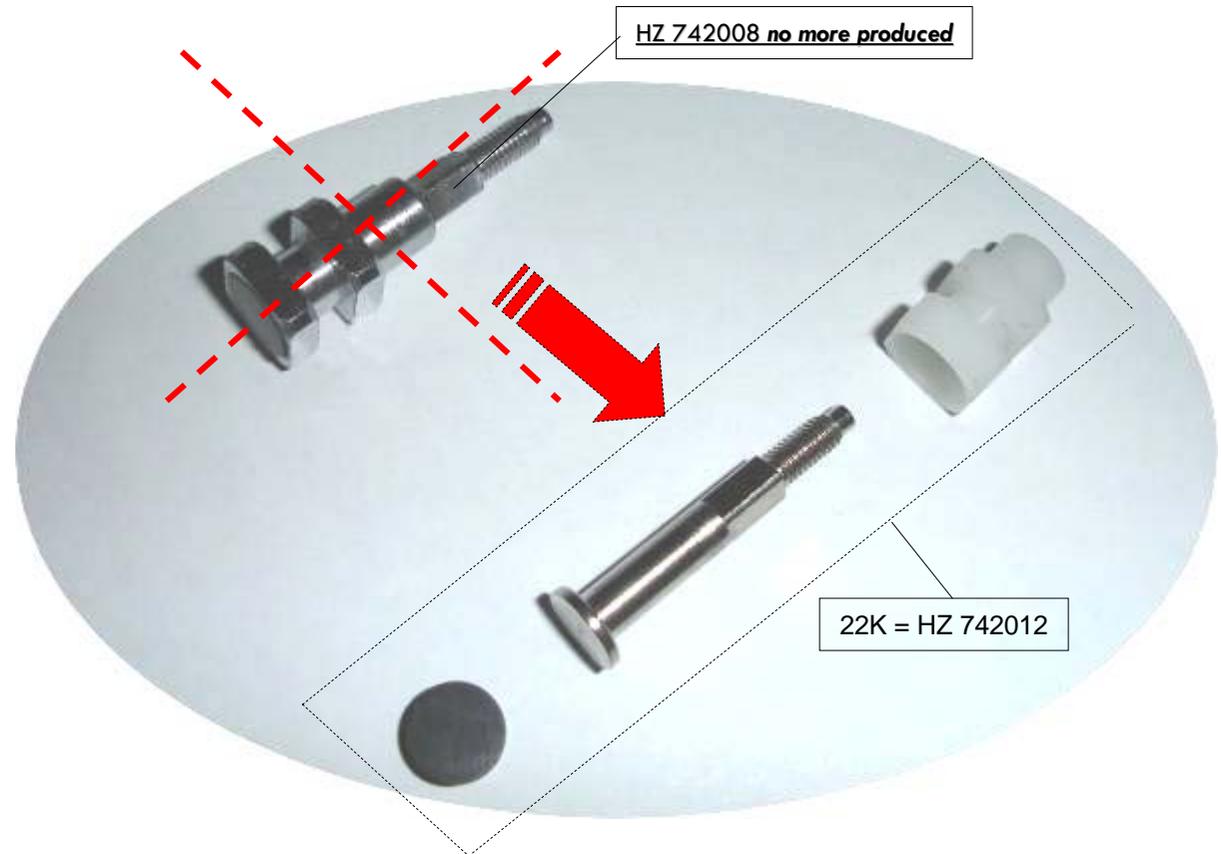


- Replacing the 2nd stage valve pad is very easy: you just have to let the shaft bush slide, and remove the pad out of its seat.





- NOTE: the modular piston HZ 742012 replaces the previous version HZ 742008, which *has not been produced* since year 1999. Both pistons are identical in size and interchangeable.





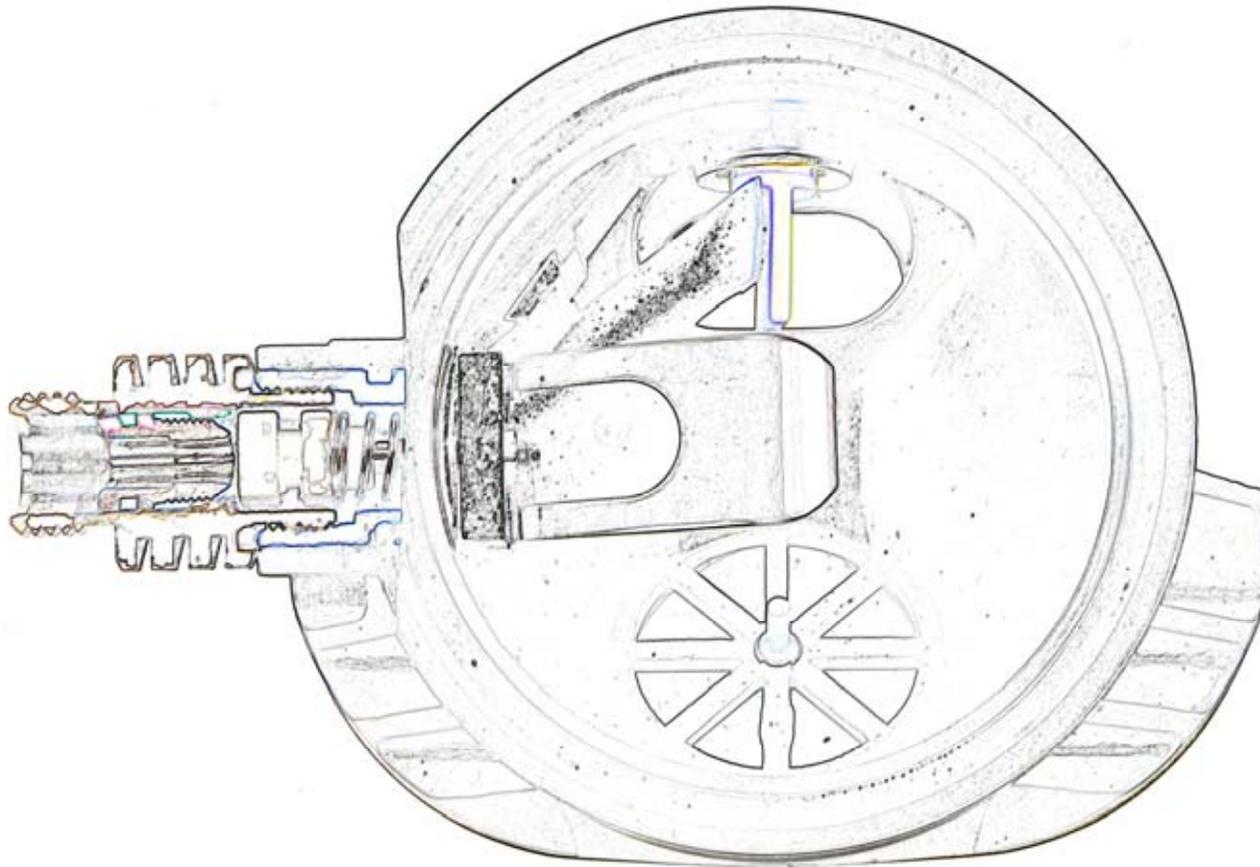
- Remove and replace all the seals of the 2nd stage.
- Remove the OR using a plastic or metal blunt tool, in order not to damage the seals' seat.
- **Warning: ALWAYS USE ORIGINAL CRESSI-SUB SEALS**





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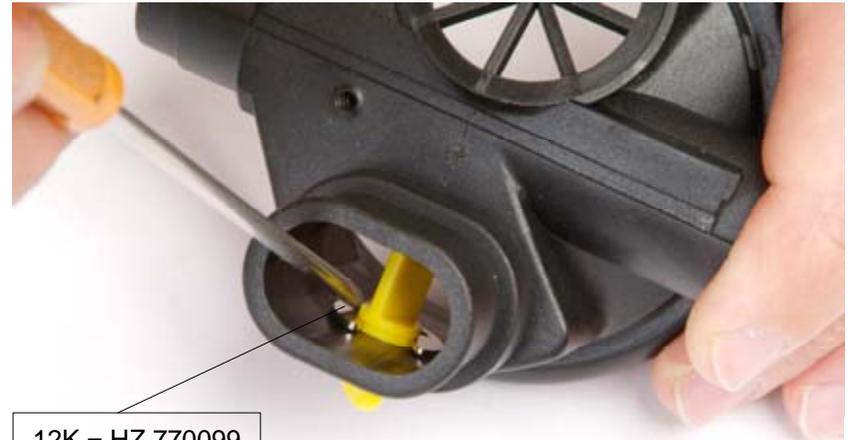


XS2 2nd stage: assembling



- After greasing its OR, insert the flux diverter in its seat.





12K = HZ 770099

- Push the flux diverter seeger ring in its seat, first with your hand, then with a flat pointed tool.



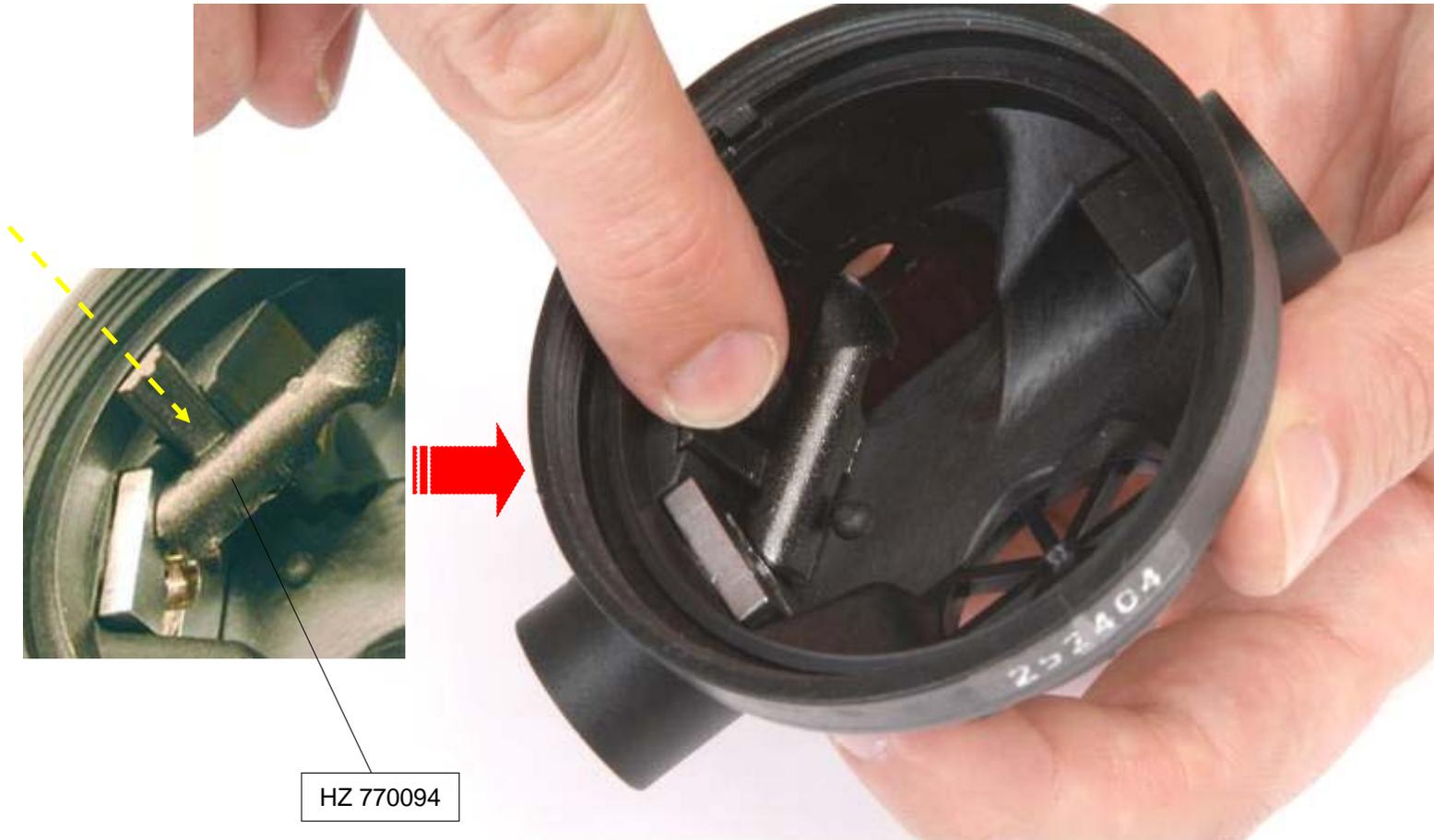
- Insert the discharge valve in its seat. The small picture shows the correct position of the valve stem inside the regulator.



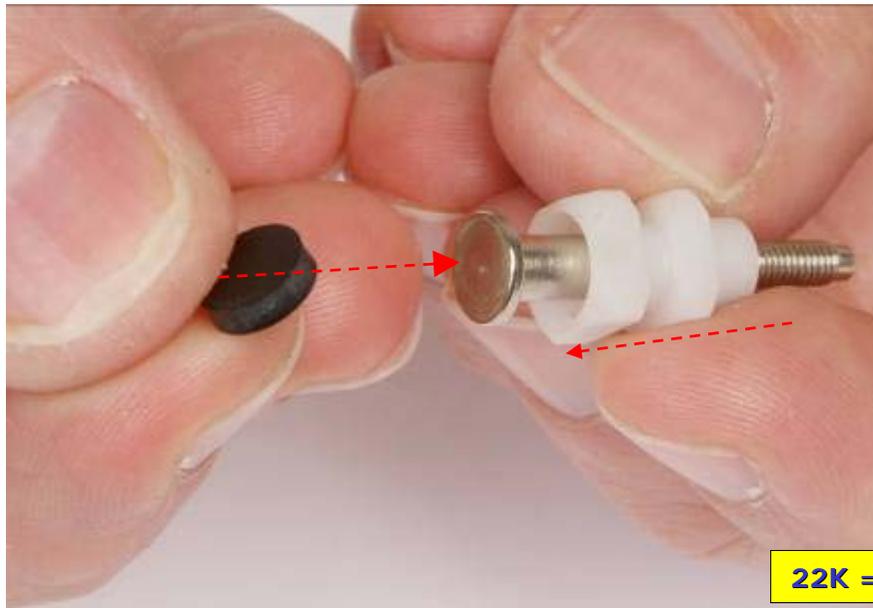
**XS2 2nd stage:
assembling**



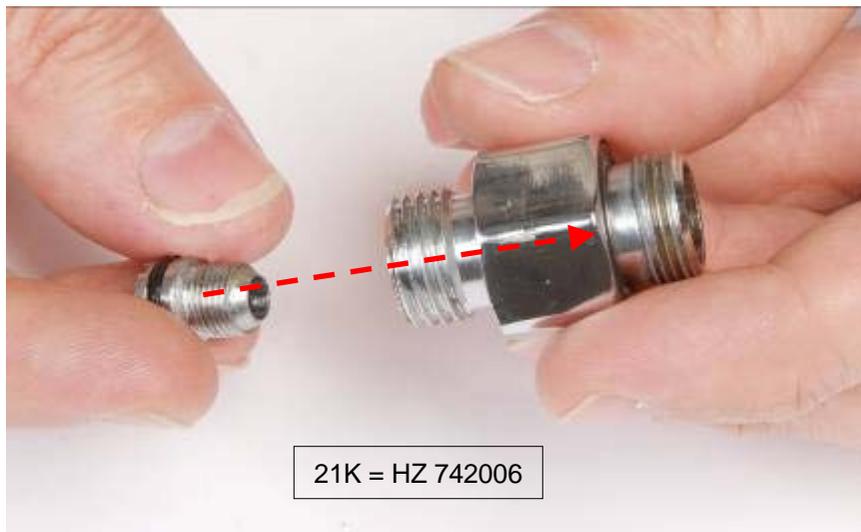
- After greasing its OR, insert the metal valve set in its seat in the case, taking care the air outlet port is placed in correspondence with the injector, as shown in the picture.



- Insert the injector in its dovetail seat in the case and push it to the bottom, as shown in the picture.



- Insert a fresh pad in the pad holder bush of the valve shaft.



- Insert and push the mobile nozzle in its seat until the beginning of the thread, after greasing all the OR.
- Turn the nozzle in its seat for a couple of times, though not too tight, in order to prevent its sharp edge from damaging the pad.
- The regulator is to be correctly set, when it is completely assembled.

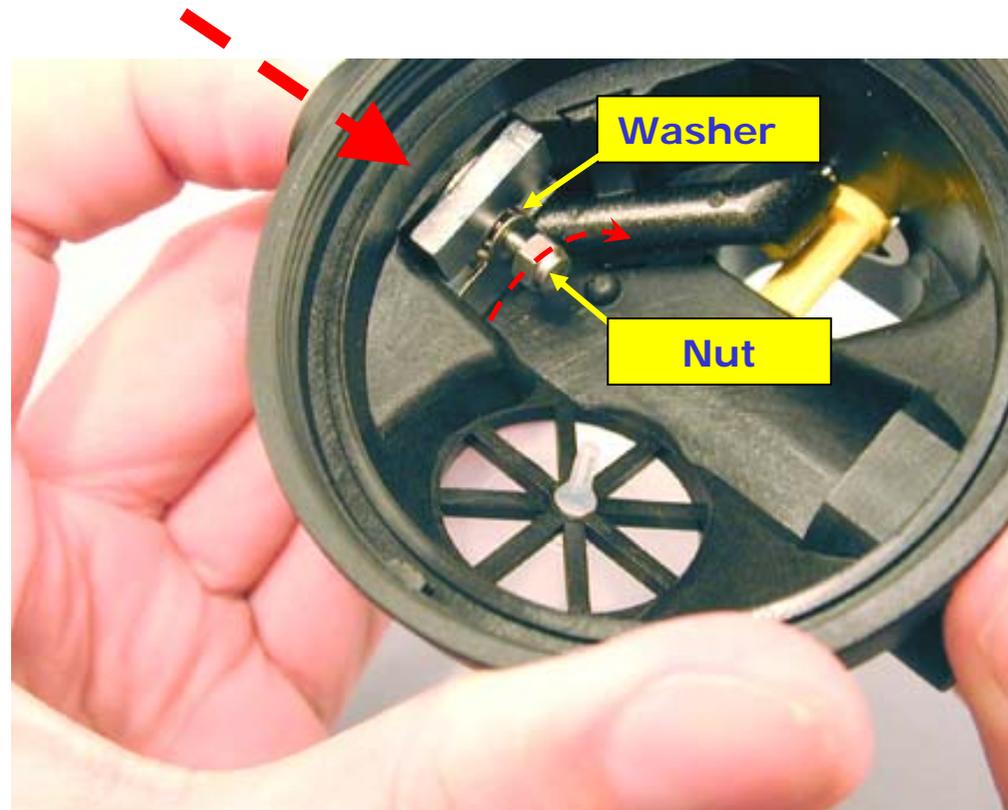


- Insert the whole spring and shaft in the valve set, taking care the square section of the shaft is inserted correctly and fits together with the corresponding square section of the valve set.



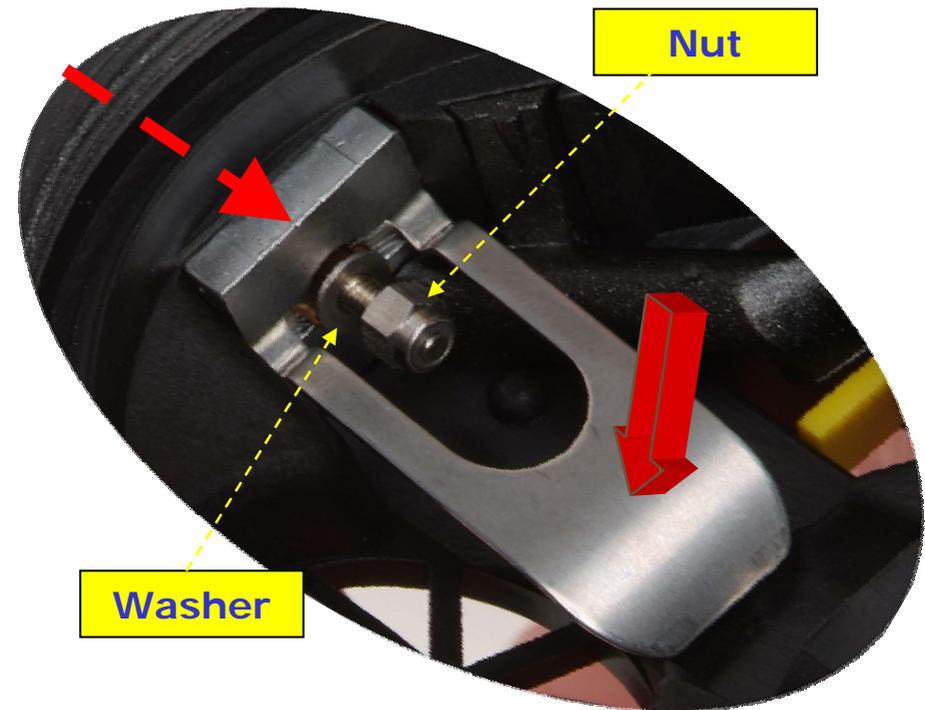


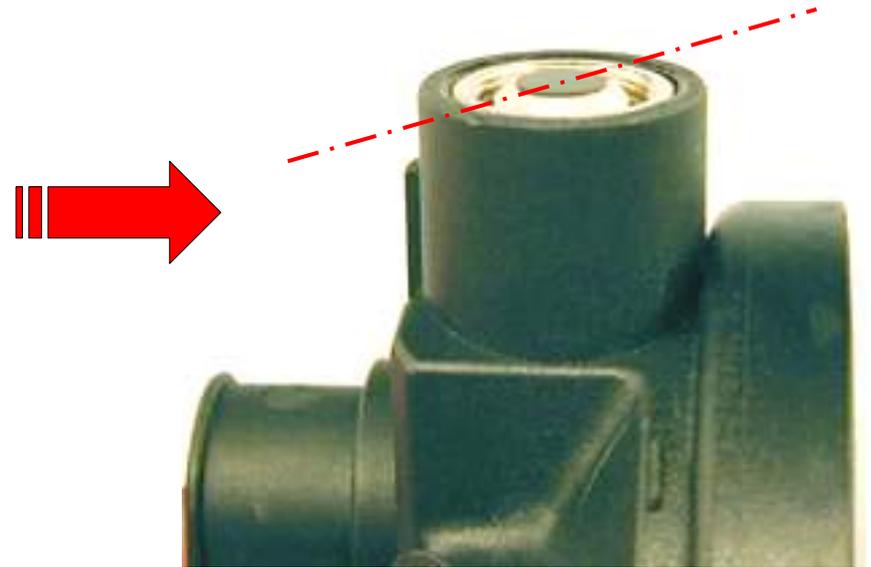
- Push the spring and the valve shaft from the outside, while inserting at the same time the washer and the set nut, then turn the latter a couple of times. Check the square section of the shaft is inserted correctly in the corresponding square section of the valve set.





- Always keeping the piston pressed, insert the lever between the valve set and the washer, as shown in the picture. Take care the lever can be lowered to the bottom, until it touches the 2nd stage case. In this way, you will be certain of the perfect correspondence between the square seat of the valve set and the square section of the valve shaft.





- Screw the set nut with a 0,22" (5,5 mm) spanner, until the shaft pad lies along the regulator's case, as shown in the picture. Check the piston slides along the corresponding square seat of the valve set, allowing the lever to travel perfectly.



- By pressing the lever, screw the nozzle seat using a 0,75" (19 mm) spanner.
- Lastly, check the square walls of the metal valve case are placed correctly inside both stops of the case. On the contrary, unscrew the nozzle seat just a little - using a 0,75" (19 mm) spanner - so that the walls of the valve case and the stops of the 2nd stage case lie parallel with each other. That will guarantee the lever to be correctly placed as to the seal.





- **XS2 2nd stage setting: *adjusting the valve nozzle***

- Connect the 2nd stage to the correctly set 1st stage.
- Place the whole regulator (1st + 2nd stage) either on a 200 bar pressurized tank or on an equally pressurized test bench; open the air tap softly, while pressing at the same time the 2nd stage discharge air button.
- Should the regulator release air, close the air tap, unscrew the pipe and use a sharp tool to screw the valve nozzle, as shown in [picture T1 on page 45](#).
- Repeat the last operation until the air stops flowing: the valve sharp edge should be hardly touching the lock pad, that guarantees its correct working.
- **NOTE:** take care you do not screw the valve nozzle too tight, otherwise the lock pad might be pressed upon too much, causing the inspiration to become too tiresome, because of the valve spring being too compressed.
- **NOTE:** the same setting operation can be carried out using the special setting tool, as shown in [picture T2 on page 46](#).



- **XS2 2nd stage setting: *adjusting the valve nozzle***



Fig. T1
[Go back to](#)



- **XS2 2nd stage setting: *adjusting the valve nozzle***



Fig. T2
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- **XS2 2nd stage setting: *adjusting the valve nozzle***

- After adjusting the correct depth of the valve nozzle, you may carry out the final setting, by adjusting the height of the lever.
- Keeping the tap open and the regulator under pressure, the final setting can be carried out in the following ways:
 - 1) Cressi-sub original dima setting (optional).
 - 2) Direct setting on the 2nd stage seal.



- XS2 2nd stage setting: *adjusting the lever height*

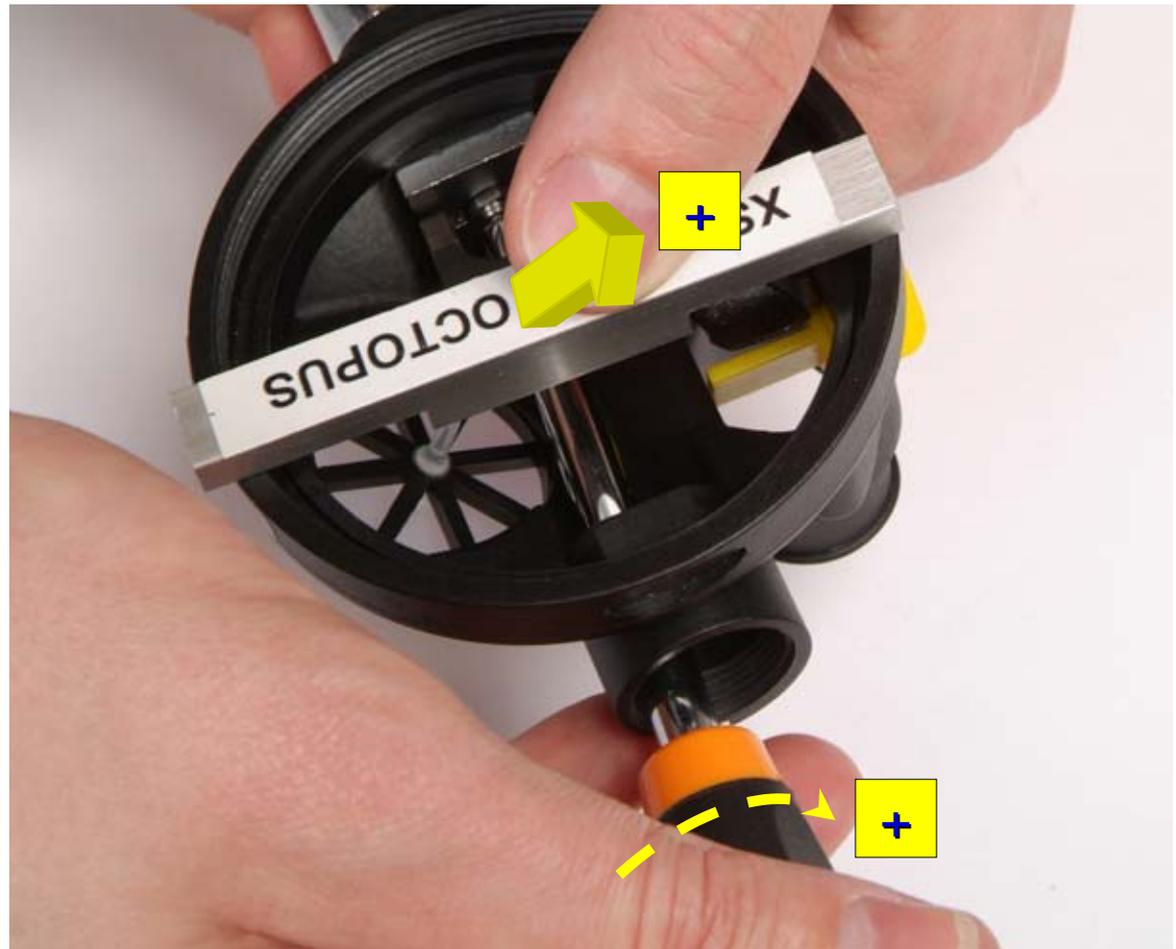
- Use a 0,24" (6 mm) Allen wrench to unscrew the 2nd stage adjusting cap, as shown in the picture.





- XS2 2nd stage dima setting

- Insert a 0,22" (5,5 mm) screwdriver (HZ 709009) in the side slot and turn the valve nut clockwise, until the regulator starts releasing air slightly





- XS2 2nd stage dima setting

- Then, turn the setting nut anticlockwise, until the air stops flowing; turn a little more, until the lever is allowed a short idle stroke.





- **XS2 2nd stage dima setting**

- XS2 2nd stage is correctly set, when
- under pressure -
the lever is allowed
a short idle stroke of
about 0,06 – 0,08”
(1,5 – 2 mm) as to
the dima.

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- **XS2 2nd stage direct setting**

- **XS2 2nd stage can be also finally set directly: place the outlet seal in its seat, turn the valve nut clockwise, until the regulator starts releasing air slightly. Then, turn the setting nut anticlockwise, until the air stops flowing; turn a little more, until the lever is allowed a short idle stroke. XS2 2nd stage is correctly set, when - under pressure - the lever is allowed a short idle stroke of about 0,06 – 0,08" (1,5 – 2 mm) as to the seal washer.**

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- After setting the 2nd stage correctly, turn the side screw completely, without forcing, using a 0,24" (6 mm) Allen wrench.
- Note: check the side cap's OR and, when necessary, replace it.





- Assemble the expiration fin, by fitting it in the special points, as shown in the picture. Lock it with its special screw.
- Warning: use only the special screw supplied by Cressi-sub. A different length screw might perforate the valve set and allow the water getting into the case!



- Insert the seal, by fitting its seats in the corresponding stops of the case, in order to prevent the seal from rotating, once the cap is locked.





- After assembling the seal in its seat correctly, insert the cap anti-friction ring.



1K = HZ 780050 Black
1K = HZ 780051 Octopus



1K = HZ 780050 Black
1K = HZ 780051 Octopus



- Turn the cap until the cap lock port fits in with the corresponding one of the case.



- Lock the cap using the special stop, as shown in the picture.



13K = HZ 770097



XS2 2nd stage: tools

Small spanner

HZ 709013



0,22 in. (5.5 mm) screwdriver

HZ 709009



Point

HZ 709004



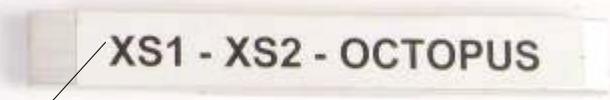
HZ 709006

0,24" (6 mm) hexagonal spanner



HZ 709011

2nd stage spring-pushing tool



XS2 2nd stage setting dima

HZ 709014

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XS2 2nd stage: tools



2° Stage Setting Gauge

HZ 710011

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