Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

P111-SROM20220818A

May 2019 - Rev. GLX./1
Ed. E/19

CRESSI SINCE 1946

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Table of contents and legends of symbols used in the text

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Chapters

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Table of contents and legends of symbols used in the text

Arrows legend

- ..... *indication*
- ..... *point and motion*
- ..... *force and direction*
- ..... *indication on a drawing*
- ..... *flow chart direction*

Legend of symbols used in the text

HZ 709002

indicates a product code, generally a tool code

Note:

indicates a highlighted note

Warning:

steps requiring special attention

Important

text marked as especially important

DANGER!

text marked because it indicates a danger

10 N x m

force in Newton-meters to use with the torque wrench

IP
9.5 - 10 bar
138 ÷ 146 psi

indicates the internal pressure in the regulator

Service and Repair Operative Manual

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WARNING!

- This manual is intended for use by technical experts who are about to receive or have already received training on the maintenance and/or repair of Cressi-sub equipment.
- We decline all responsibility for any maintenance and/or repair performed by personnel not authorized by Cressi-sub.
- Consulting this manual does not constitute an implicit concession or authorization by Cressi-sub to perform any type of operation on the product(s) in question.
- Avoid performing maintenance and/or repair operations on the equipment without the proper training required to conduct these operations.
- Equipment maintenance and/or repair must NOT be performed by users. These operations may only be performed by a Cressi-sub Authorized Center.
- If the information provided in this document is unclear or not fully intelligible, please contact Cressi-sub before proceeding with any equipment disassembly and/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 to avoid omitting any part of the sequence.
- All operations must be conducted strictly in the sequential order provided in this document; failure to do so could lead the equipment to function poorly, or worse, result in an accident during use.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

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. The HZ 820080 is for the Galaxy, Galaxy Adjustable R, and MG Balanced models.
- 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 a malfunction in the equipment, or worse, an accident.
- The document below in no way replaces the equipment's instruction and user manual.
- In accordance with the current European Standards in force, limited to EEC countries, the procedures described in this document pertain exclusively to the disassembly, maintenance, and assembly of equipment intended for use with air (oxygen at 21% and 79% nitrogen).
- Additional information about the greasing and cleaning of components during equipment maintenance and/or repair can be consulted in a section of this document provided in the following pages, as well as in specific documents in the "Professional Area" section of the **www.cressi.com** website.
- The instructions provided in this manual are based on information regarding the most up-to-date equipment available before publication of this document. Cressi-sub reserves the right to make changes to the content of this document at any time.

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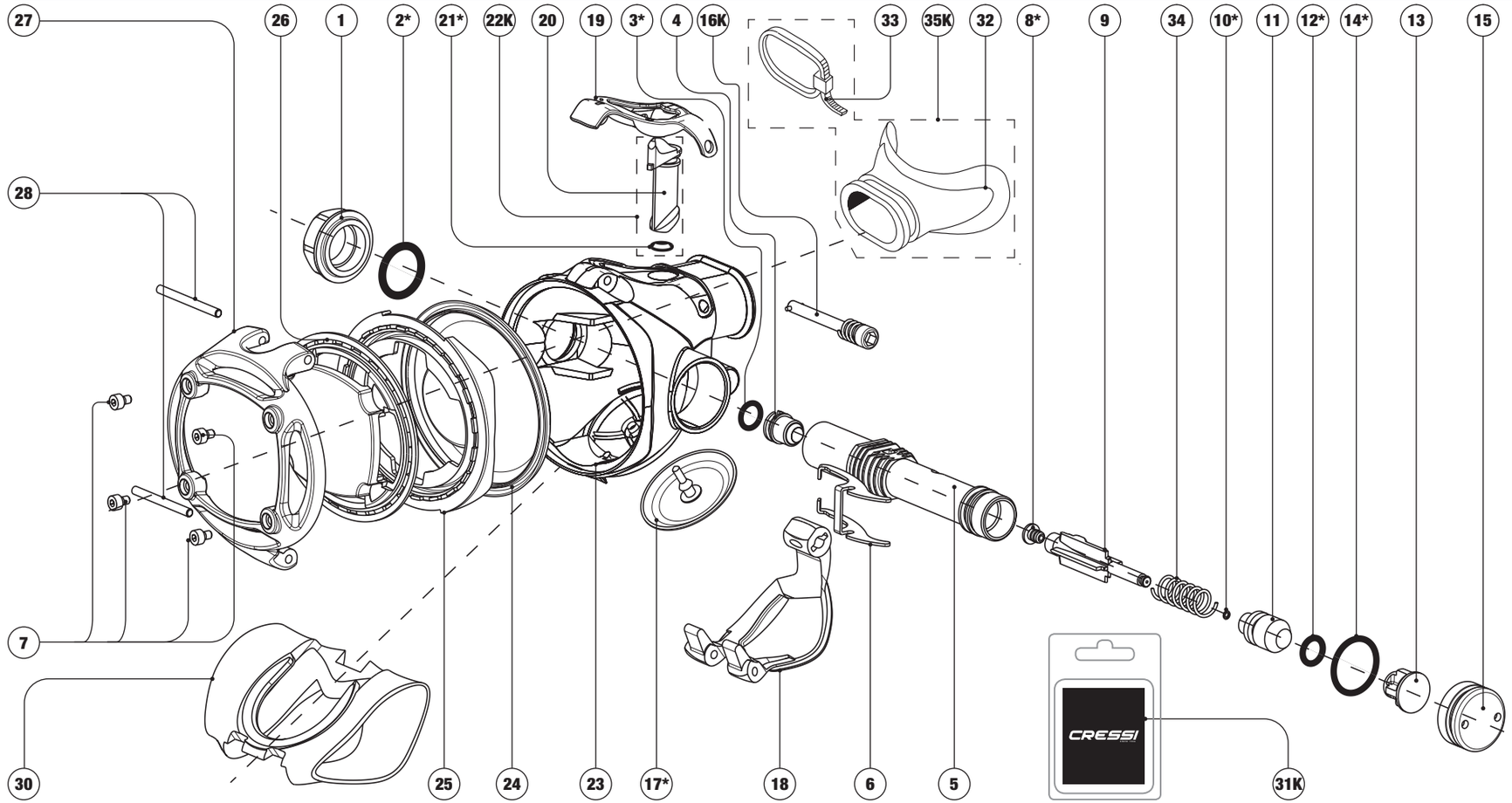
Galaxy – Replacement parts



Pos	Cod	Pos	Cod
1	HZ820050	19	HZ820067
2	~~HZ820051*~~	20	HZ820068
3	~~HZ810095*~~	21	~~HZ820069*~~
4	HZ810094	22k	HZ820070
5	HZ820052	23	HZ820071
6	HZ820053	24	HZ820072
7	HZ820087	25	HZ820073
8	~~HZ820055*~~	26	HZ820088
9	HZ820056	26	HZ780083
10	~~HZ820057*~~	27	HZ820089
11	HZ820058	28	HZ820076
12	~~HZ820059*~~	29	HZ820077
13	~~HZ820083~~	30	HZ820078
14	~~HZ820060~~*	31k	HZ820080*
15	HZ820085	32	~~HZ790094~~
16k	HZ810077	33	~~HZ730202~~
17	~~HZ782097*~~	34	HZ820049
18	HZ820066	35k	HZ790094

HZXXXXXX* *Only available in the maintenance kit; not available separately./* ***HZXXXXXX*** *not available.*

GALAXY ADJ R
GALAXY
ELLIPSE
MASTER
BALANCED
ELLIPSE
BLACK
BALANCED
2nd stage
(HZ 820080)
Annual replacement of the Kit

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Galaxy Adj R / Galaxy / Master / Ellipse Black Balanced Annual Maintenance kit - Cod. N° HZ 820080

GALAXY ADJUSTABLE R-MASTER-GALAXY-OCTOPUS MG BALANCED - ELLIPSE BALANCED (HZ 820080)

O-RING Reference Table — *ANNUAL REPLACEMENT KIT CHART*

HZ 820060	HZ 820051	HZ 820054	HZ 820059	HZ 810095	HZ 820069	HZ 820062 (Galaxy Adj/Master/ Ell.Balanced Only)	HZ 820057

SPARE PARTS Reference Table

1 Exhaust Valve HZ 782097	1 Poppet LP Seat HZ 820055	1 Adjustment Knob Clip (Galaxy Adj/Master/Ell. Balanced Only) HZ 820065	1 Adjustment Knob Insert (Ell. Balanced Only) HZ 820064	1 Balancing Chamber HZ 820058

REAL SIZE

☞ **USE ONLY ORIGINAL CRESSI-SUB REPLACEMENT PARTS**

☞ **Note:** we recommend that complete maintenance be performed on the regulator at least once a year, or more frequently if used intensively.

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Annual Maintenance

Annual Maintenance

- Cressi-sub recommends complete regulator maintenance at least once a year, or more frequently in the case of particularly intense use.
- We recommend regular maintenance for your regulator at least once a year by an authorized CRESSI dealer, no matter how much it was used. This is because extended or inadequate storage can still cause corrosion and/or internal deterioration of the O-rings, and this makes it impossible to say with certainty that a regulator is in good condition simply because it has not been used much since maintenance was last performed!
- One example is regulators used in pools (chlorinated water), which are particularly deteriorating environments for dive equipment because of the high levels of chlorine and chemical products used to balance the pH of the water. These can lead to rapid deterioration in certain components of the equipment.
- Maintenance must begin with an inspection of the equipment, followed by a complete overhaul and/or repair operations where necessary, performed by a Cressi-sub Authorized Center. Any operation performed on the equipment, whether overhaul or repair, must be documented on the support sheet that Cressi provides. It is available in the User Manual provided in the original packaging and can also be downloaded in a section of this document (see the last page);
- Maintenance must include replacement of all components provided in the annual equipment maintenance kit.
- The tools required for maintaining this equipment are shown in a section of this document in upcoming pages.

Annual Maintenance

- Plastic, rubber, and anodized aluminum parts must only be cleaned with warm water and soap, using a soft-bristled brush, being careful to avoid scratching or scraping rubber or plastic components, especially near the pneumatic seal.
- After cleaning, rinse thoroughly with running water and dry with low-pressure air. Afterward make sure there are no imperfections, cracks, or scratches significant enough to disallow its use.
- Do not use acids or solvents or ultrasound baths on rubber or plastic components.
- Metal parts can be washed with warm water and a neutral cleanser, and rinsed in freshwater. Then, any encrustations on metal parts must be removed using ultrasound cleaning or diluted acid solutions, which must always be followed by lengthy and thorough rinsing under running water.
- More information on cleaning components while performing maintenance and/or repairs on equipment is available in a specific section of this document below, and also in specific documents that can be downloaded from the Professional Area of www.cressi.com.
- New seals can be greased with a thin layer of lubricant to reduce to a minimum the risk of damage, nicks, or abrasions when assembling equipment components and to correctly grease the components themselves.
  Specific instructions on the recommended type of lubricant can be found in a special section of this document in the pages that follow, as well as in documents that can be downloaded from the Professional Area of www.cressi.com.

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Annual Maintenance

Annual Maintenance

- The metal threads can be greased with a thin layer of lubricant in the first two turns of thread to help the components join together and protect the assembly.
- In accordance with the current European Standards in force, limited to EEC countries, the procedures described in this document pertain exclusively to the disassembly, maintenance, and assembly of equipment intended for use with air (oxygen at 21% and 79% nitrogen).
- Equipment maintenance and/or repair must NOT be performed by users. These operations may only be performed by a Cressi-sub Authorized Center.
- We decline all responsibility for any maintenance and/or repair performed by personnel not authorized by Cressi-sub.
- 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: info@cressi.com.
- Specific instructions on the recommended type of lubricant can be found in a special section of this document in the pages that follow, as well as in documents that can be downloaded from the Professional Area of www.cressi.com.

☞ **USE ONLY ORIGINAL CRESSI-SUB REPLACEMENT PARTS.**

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Galaxy – General tools

Ref	Code	Description of replacement parts
1	HZ709030	CRESSI PORTABLE REGULATOR ADJUSTING DEVICE
2	HZ710001	STANDARD TOOLS FOR CRESSI REGULATOR MAINTENANCE
3	HZ709044	30-MM COMBINATION WRENCH
4	HZ709043	24-MM COMBINATION WRENCH
5	HZ709042	22-MM COMBINATION WRENCH
6	HZ709041	19-MM COMBINATION WRENCH
7	HZ709040	17-MM COMBINATION WRENCH
8	HZ709080	SPECIAL O-RING GASKET TOOLS (TIPS)

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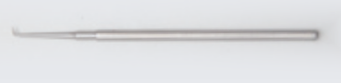
Galaxy – Special tools

1

2



3

4

5

6

7

8

Ref	Code	Description of replacement parts
1	HZ710011	2ND STAGE CALIBRATION PRESSURE GAUGE
2	HZ709011	SPRING PUSHER TOOL
3	HZ709016	NOZZLE REMOVAL TOOL
4	HZ709004	EXTRACTOR TIP
5	HZ709007	4-MM HEX WRENCH
6	HZ709021	FULL TORQUE WRENCH SET
7	HZ709017	EXTRACTION PLIERS
8	HZ710002	BAG FOR SPECIAL CRESSI REGULATOR TOOLS

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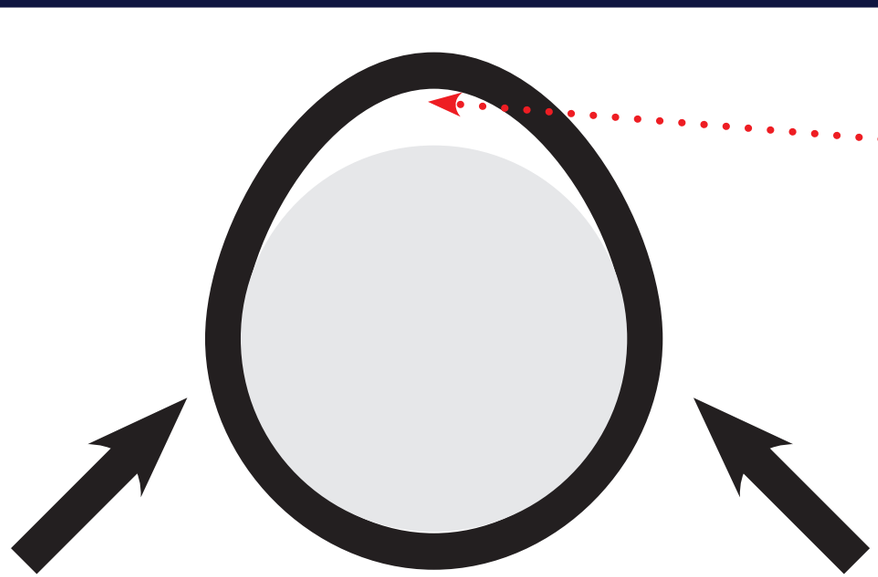
Disassembly phases



Remove and replace all gaskets in the 1st stage.
To remove the O-Rings, use a plastic tool, or a metal one, but with a rounded tip in order to avoid damaging the gasket seat.
To replace the gaskets correctly, press on the sides of the O-Rings to create a protuberance under which you can insert the tool with the rounded tip used for removing O-Rings, as shown in the figure.

Important: ONLY USE ORIGINAL Cressi-sub GASKETS

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Disassembly phases

Removing the low-pressure hose

Using a 19-mm and a 17-mm wrench, remove the low-pressure hose, holding the check nut firm with the first wrench and unscrewing the hose with the second.
In the annual overhaul, the O-Rings inside the hose must be replaced.
Check that the low pressure hose shows no clear signs of wear, cuts, or scrapes, especially near the threaded connections. If that's the case, remove the hose and replace it with a new one.

Cam-lock – Regulator Disassembly

Insert a 4-mm allen wrench in the cam-lock seat, press gently, and turn 90° counter-clockwise.
The internal spring will push the cam-lock outward so it can be removed easily.

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Disassembly phases

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After removing the cam-lock, press the soft dome with your fingers while levering the central deflector door outward so that it opens as shown in the photo.

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Disassembly phases

Proceed to open the dome, holding the regulator case firm with one hand while removing the soft dome (or button), the diaphragm retaining ring, and the regulator diaphragm.

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Disassembly phases

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Disassembly phases

Loosen the side cap with the caliper tool, unscrewing it slightly from the regulator.

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Disassembly phases

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20 Use a 19-mm wrench to remove the check nut from the regulator.

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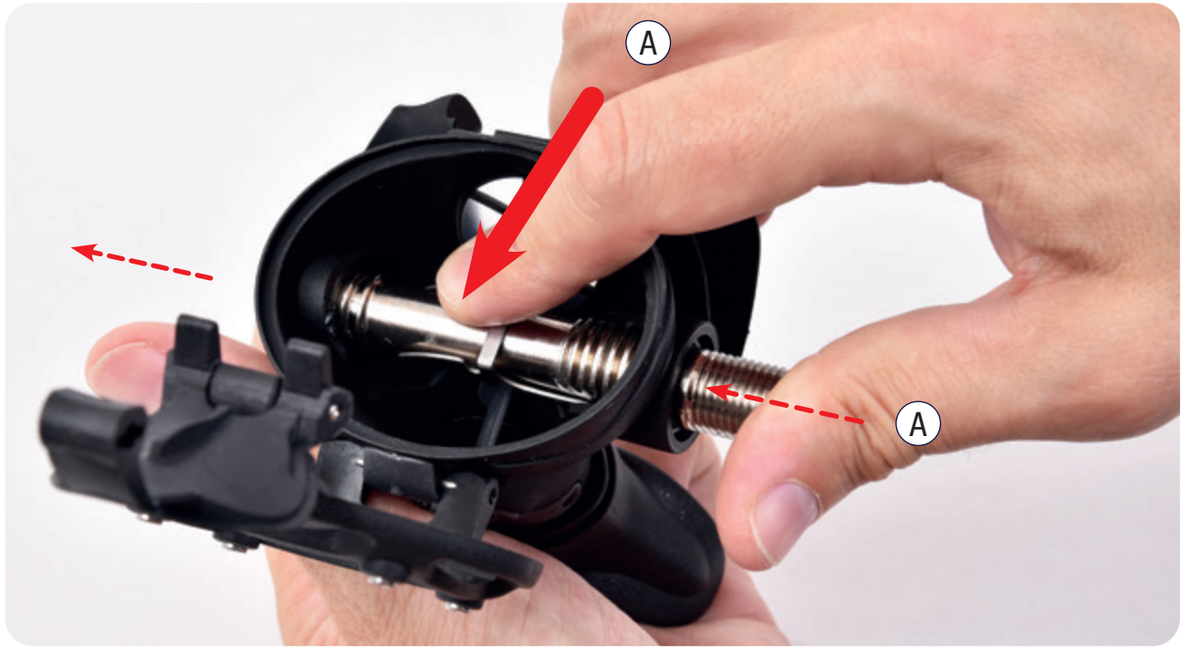
Disassembly phases



Press down the lever and simultaneously press (A) and pull out the complete mechanics of the 2nd stage, extracting it from the regulator case (B), as shown in the figure. Then remove the valve body OR from its seat.

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Remove the deflector from the regulator case by pushing on the sides as shown in the figure, then pull out the discharge valve from its housing.

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Disassembly phases

Remove the side cap, unscrewing it completely from the 2nd stage valve body (1). Remove the spacer from the 2nd stage valve body (2).

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Disassembly phases

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Disassembly phases

Use a flathead screwdriver to fully unscrew the adjustable nozzle ahead of its removal from its seat, which will take place in later steps.

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Disassembly phases

Extract the nozzle from the regulator valve body using the HZ 709011 tool (designed to prevent damage to the edge) as shown in the photo.

☞ **Note:** a certain amount of force will be required to overcome the friction that the balancing chamber O-ring creates against the wall of the valve body before the full valve will come out completely. Remove the O-ring from the nozzle.

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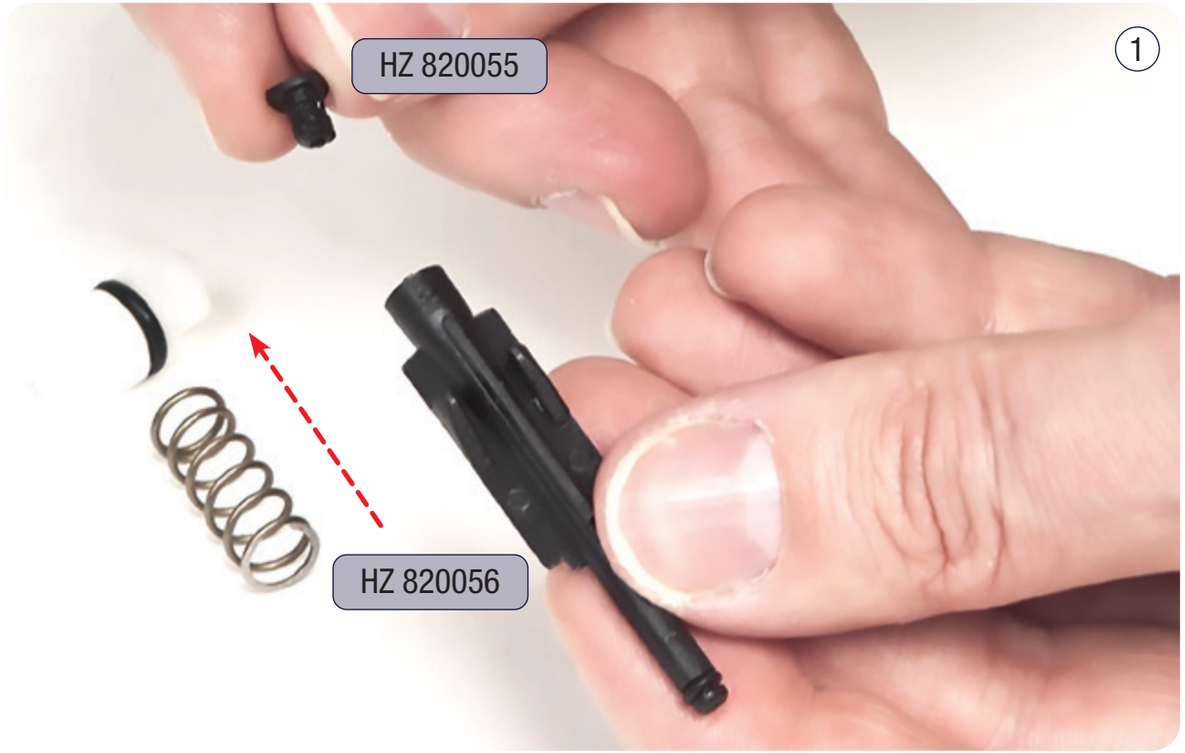
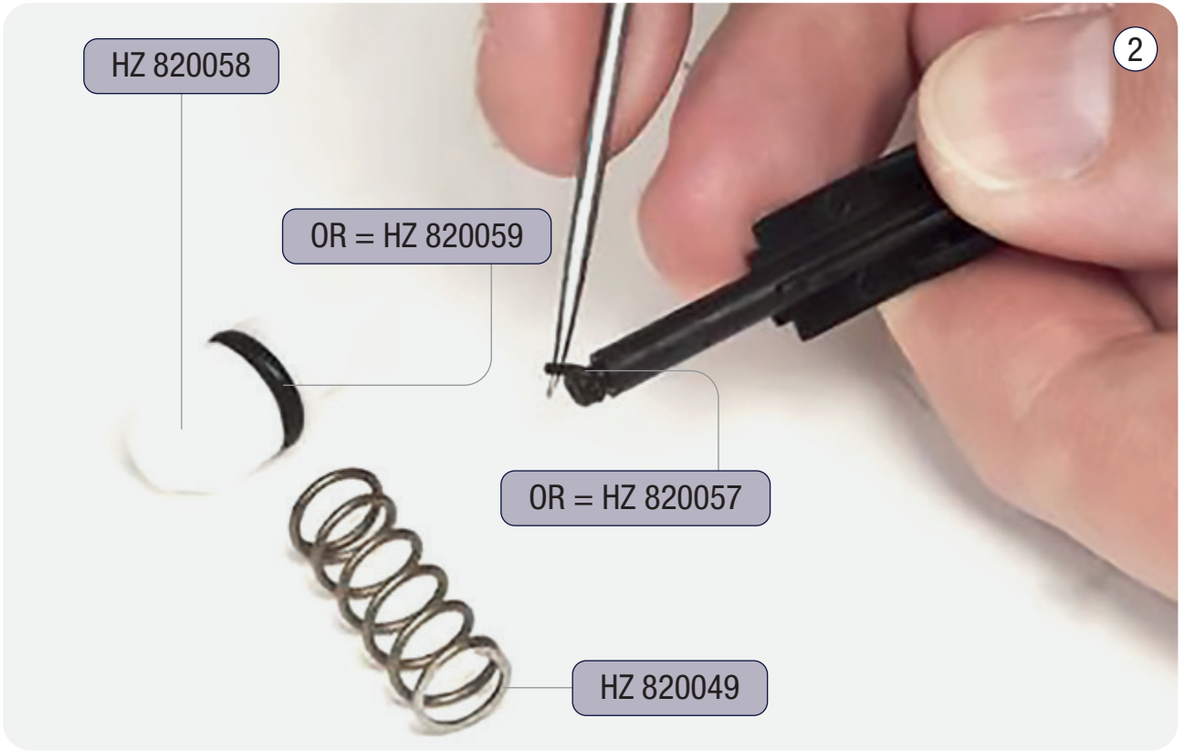
Disassembly phases





Remove the closing seat from the 2nd stage poppet, and the poppet spring and balancing chamber from their operating housing.
Remove the poppet O-ring.

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Disassembly phases

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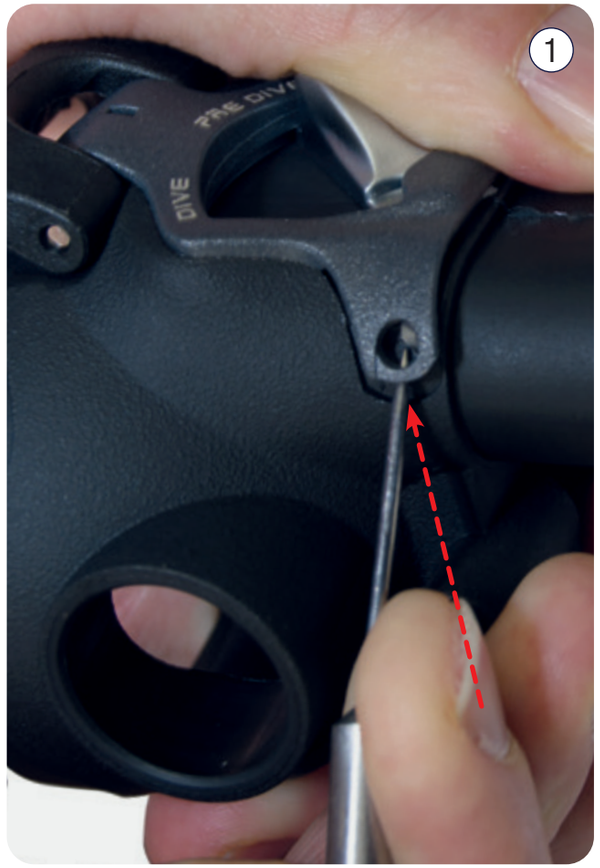
Prying up the ends, lift and remove the fastenings on the upper mask on the 2nd stage case, as shown in the figure.



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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Disassembly phases

Use a 2-mm pin punch to push on the upper titanium dome pin in the direction shown in the photo to push it out of its housing.

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Disassembly phases

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30 Pull the upper mask from its seat, as shown.

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Disassembly phases

Pull out the flow deviator from its seat as shown (1).
Remove the flow deviator O-ring (2).

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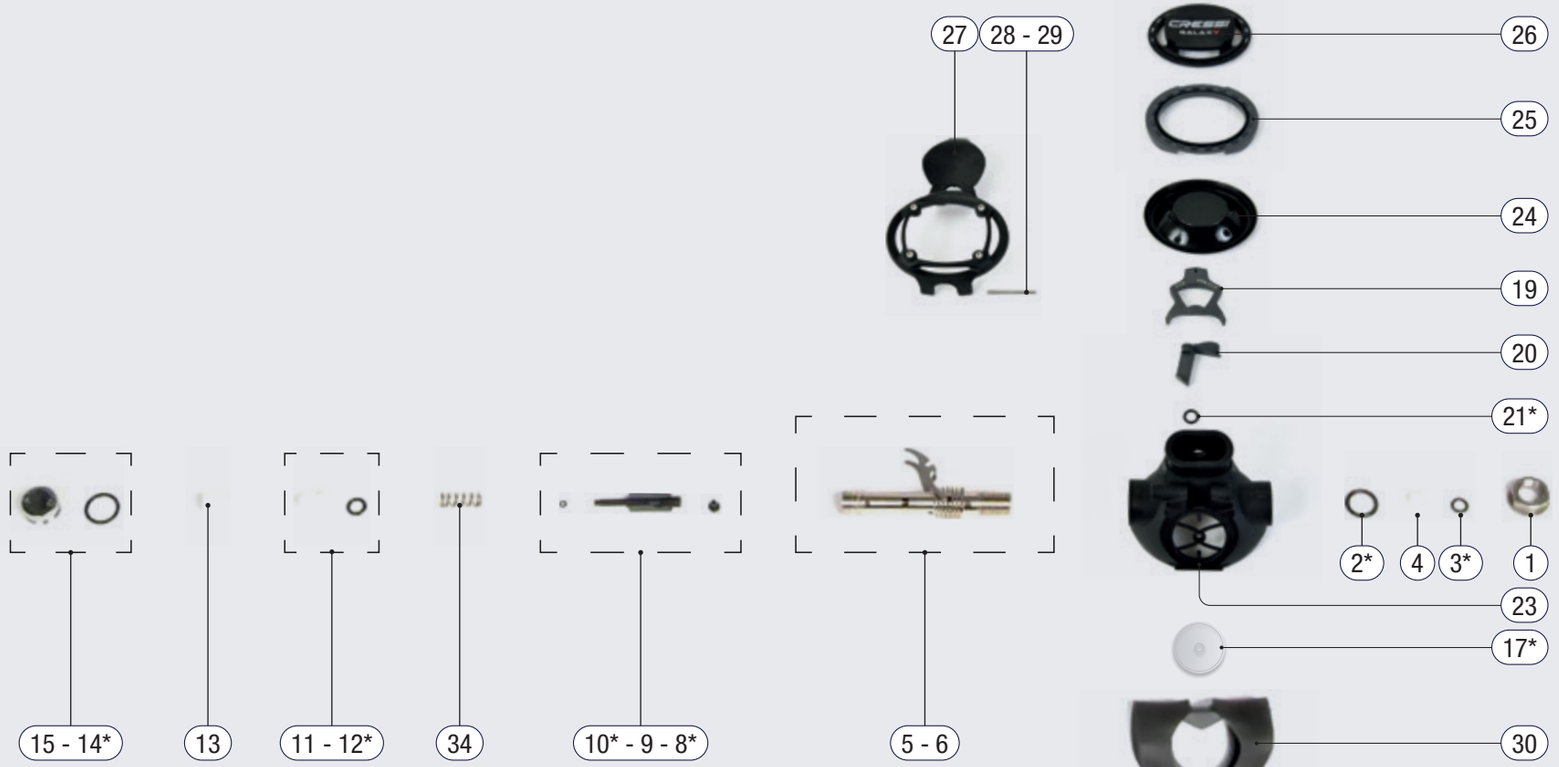

Ref	Code	Description of replacement parts
1	HZ820050	LOOK NUT 2ND STAGE ELLIPSE
2	HZ820051	O RING NUT 2ND STAGE ELLIPSE
3	HZ810095	*O-RING ADJUSTMENT ORIFICE ELLIPSE/T
4	HZ810094	ADJUSTMENT ORIFICE ELLIPSE/T
5	HZ820052	VALVE BODY 2ND STAGE ELLIPSE
6	HZ820053	LEVER 2ND STAGE ELLIPSE
7	HZ820087	GALAXY COVER SCREW
8	HZ820055	LP SEAT 2ND STAGE ELLIPSE
9	HZ820056	POPPET 2ND STAGE ELLIPSE
10	HZ820057	POPPET O RING 2ND STAGE ELLIPSE
11	HZ820058	BALANCING CHAMBER 2ND STAGE ELLIPSE
12	HZ820059	O RING BALANCING CHAMBER 2ND STAGE ELLIPSE
13	HZ820083	SPACER 2ND STAGE ELLIPSE BLACK BALANCED
14	HZ820060	O-RING INHALATION EFFORT KNOB 2ND STAGE ELLIPSE
15	HZ820085	BLACK END 2ND STAGE ELLIPSE
16k	HZ810077	CAM-LOCK 2ND STAGE ELLIPSE/T
17	HZ782097	SILICONE EXHAUST VALVE XS COMPACT PRO / XS COMPACT
18	HZ820066	EXHAUST TEE CLOSING CAP 2ND STAGE ELLIPSE
19	HZ820067	UPER MASK 2ND STAGE MASTER
20	HZ820068	FLOW DEVIATOR 2ND STAGE MASTER
21	HZ820069	*O-RING FLOW CONTROL 2ND STAGE ELLIPSE
22k	HZ820070	COMPLETE VENTURI FLOW CONTROL 2ND STAGE ELLIPSE
23	HZ820071	2ND STAGE ELLIPSE BLACK BALANCED BODY
24	HZ820072	DIAPHRAGM 2ND STAGE ELLIPSE
25	HZ820073	BUTTON RING 2ND STAGE MASTER
26	HZ820088	GALAXY II STAGE PURGE BOTTOM
26	HZ780083	COVER GALAXY OCTOPUS MG BALANCED
27	HZ820089	GALAXY II STAGE COVER
	~~HZXXXXXX~~	*NOT AVAILABLE*

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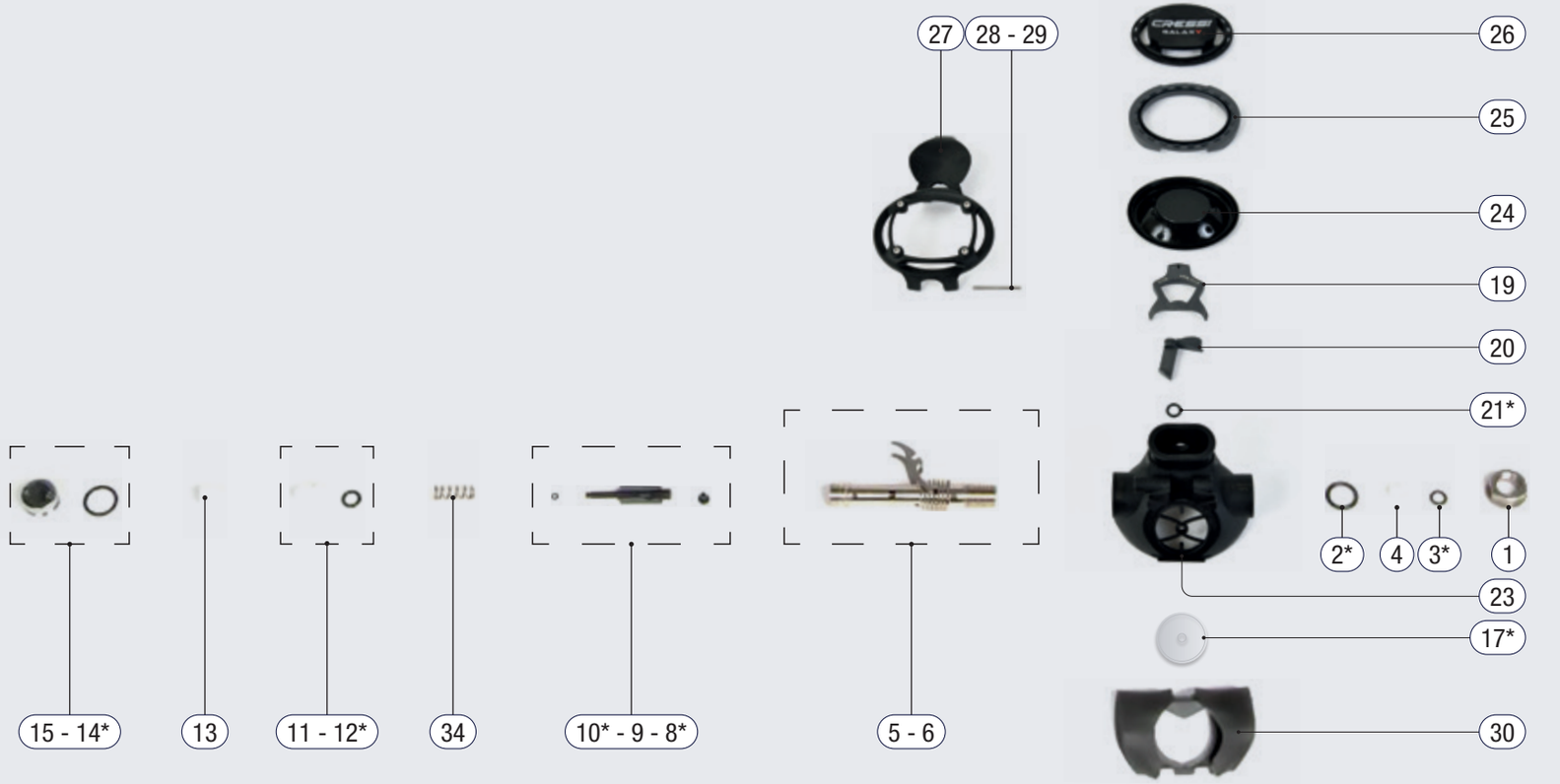
GALAXY / OCTOPUS MG BALANCED 2ND STAGE



Ref	Code	Description of replacement parts
28	HZ820076	FRONT COVER LARGE PIN 2ND STAGE ELLIPSE
29	HZ820077	FRONT COVER SMALL PIN 2ND STAGE ELLIPSE
30	HZ820078	EXHAUST TEE 2ND STAGE ELLIPSE
31k	HZ820080	MAINTENANCE KIT 2ND STAGE MASTER/GAL/ELL.BAL/MG BAL.
32	HZ790094	MOUTHPIECE + TIE WRAP 2ND STAGE
33	HZ730202	TIE WRAP
34	HZ820049	PISTON SPRING 2ND STAGE ELLIPSE
35k	HZ790094	MOUTHPIECE + TIE WRAP 2ND STAGE
	~~HZXXXXXX~~	*NOT AVAILABLE*

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Steps for cleaning components

Once the regulator requiring overhaul and/or maintenance is fully disassembled, before beginning reassembly you must check its condition and clean the newly disassembled components.

Cleaning plastic and rubber parts

- Plastic, rubber, and anodized aluminum parts can only be cleaned using warm soapy water (no warmer than 50°C), using for example a small solution of dish soap.
- Using a soft nylon brush can make this easier.
  However, be careful not to scratch or scrape the rubber or plastic components, especially near the pneumatic seal area.
- After cleaning, immediately rinse thoroughly with running water (we recommend using distilled water to avoid mineral residues), and dry with clean, filtered, low-pressure air. Then check that the cleaned parts have no gaps, cracks, or scratches significant enough to disallow their use.

Do NOT use acids, solvents, or ultrasound cleaning solutions on plastic, rubber, silicone, or aluminum parts.

Cleaning metal components made of brass or stainless steel

- After disassembly, perform an initial cleaning by immersing all the metal components of the regulator in a solution of warm soapy water. In many cases, this first step is all that's needed to clean most metallic parts.
- However, if any brass or stainless steel parts still have concretion on them or signs of corrosion or of lubricant, we recommend that you proceed with an ultrasound cleaning with a gentle acid detergent solution specifically for these applications, such as:

JFD Biological BIOX, normally diluted at a ratio of 1:X of clean water

and warmed by the ultrasound cleaner to a temperature of 60°C. Leave the metal components immersed for about 5-10 minutes, depending on the level of concretion on them.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Steps for cleaning components

It's important that whatever product is used, the concentration and period of contact with the components follows the instructions given by the manufacturer of the solution, and that you visually check the condition of the components during the cleaning process to ensure that their chrome is not damaged.

☞ **Note:** when handling acids it's advisable to use adequate protection for your hands, eyes, and skin. Do not use aggressive acids such as muriatic acid.

- When the cleaning cycle is complete, remove the components from the cleaner and rinse them with clean running water (we recommend using distilled water to avoid mineral residues), and dry them with clean, filtered, low-pressure air.
  Inspect them carefully to ensure adequate cleaning, and check that they are in like-new condition.
- Make sure that the solution you use is compatible with equipment components for breathing and that it does not leave behind residues or films.
- Once the cleaning cycle is complete, check all the sealing surfaces that are in contact with the O-rings or other seals, and the newly cleaned metal parts to check that are no scratches, chipping, poor-quality chrome, or foreign particles, any of which could compromise the future pneumatic seal, and consequently compromise the operation of the regulator.

☞ **Note:** If the opportunity to wash the metal parts of the regulator using ultrasound is not available to you, perform a preliminary cleaning using a solution of 40% white wine vine vinegar and 60% water. The parts must be treated until no traces of hydrocarbons remain. Then rinse with clean running water (we recommend using distilled water to avoid mineral residues), and dry with low-pressure filtered air.

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Steps for lubricating components

Lubricating the seals

- Before assembling the regulator components, all the new O-rings provided in the annual maintenance kit must be lubricated as recommended in the manual.
  Lubricating before installation will minimize the risk of damage during reassembly and will favor ideal operation of the regulator.
- First, visually inspect the new seals to check that they have no cuts, warping, or foreign particles. The presence of any of these defects may result in leakage.
- Then, when selected the lubricating grease for the seals, we recommend for example Christo-lube® MCG 111™, PerFluoroLube® 20/1, or Krytox® DuPont™ for all the watertight seals. For seals in contact with the water, a silicone grease (such as Versilube® G 322L™ or equivalent, or Dow Corning111™) is sufficient.
- In any case, it is essential that an oxygen-compatible lubricating grease - such as Christo-lube® MCG 111™ or PerFluoroLube® 20/1, or Krytox® DuPont™ - always be used if the regulator will be used with hyperoxygenated mixtures.
- It is recommended that you lubricate the O-rings with a minimal quantity of grease in order to prevent excess grease from attracting particles of contaminants, causing malfunctions in the regulator.

Do NOT apply Vaseline or spray silicone to the seals or silicone rubber parts. This can cause chemical rupture and premature deterioration of the material.

- Therefore, before proceeding with reassembly procedures you must make sure that all tools and equipment needed for reassembly are perfectly clean. We recommend that you clean your tools, possibly using trichloroethylene or white wine vinegar, rinse with clean running water (we recommend using distilled water to avoid mineral residues), and dry with low-pressure filtered air.

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Steps for lubricating components

- Finally, assemble all components in a clean work space, with clean hands, and try to handle each individual component as little as possible to reduce the risk of contamination (especially in the case of equipment that will potentially be used with hyperoxygenated mixtures).

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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

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Insert the flow deviator into its seat as shown after you have replaced and greased the O-ring.

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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Position the upper mask on the 2nd stage case, and then press on the sides of the mask, fastening it to the case as shown in the photo.

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

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Insert the upper dome pin <u>in the direction shown</u> in the photo (1).
Position the dome fastenings in the corresponding seats
on the 2nd stage case as shown in the photo (2).

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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Rest one side of the regulator case on a hard surface as shown. Then, holding the case firmly with one hand, knock the upper pin (using a plastic hammer for example) into the corresponding housing in the second stage case as shown.
The pin is inserted correctly when the ends are inserted flush with the case, thereby allowing the dome to pivot correctly.

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

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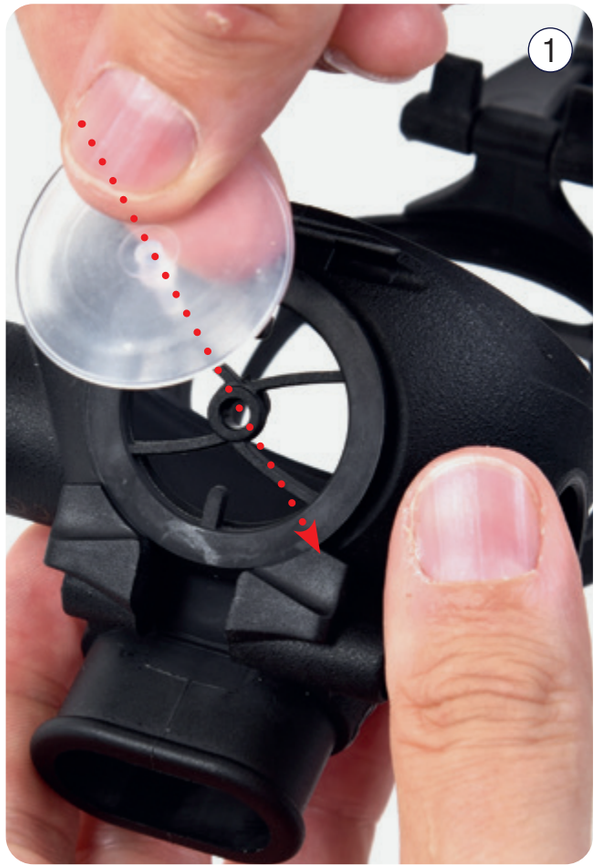
Insert the discharge valve (1), making sure to position the valve stem correctly in its seat, pulling it from inside the regulator (2).



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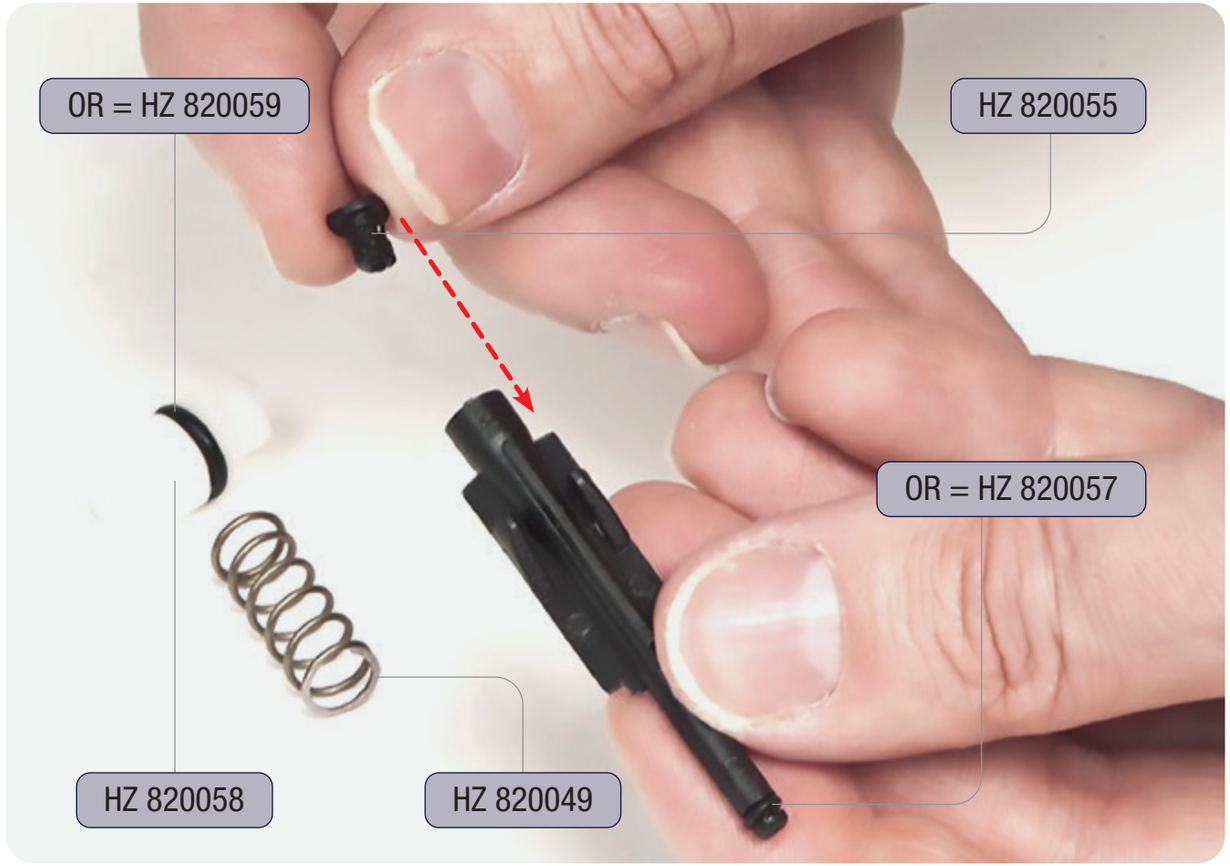
GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Make sure that the hole through the poppet is NOT blocked by any foreign bodies. Insert the new closing seat by pushing it into its seat in the poppet.
Note the two bulges on the seat stem. These ensure that the seat and the poppet couple correctly.
Replace and lubricate the poppet O-ring and the balancing chamber O-ring.

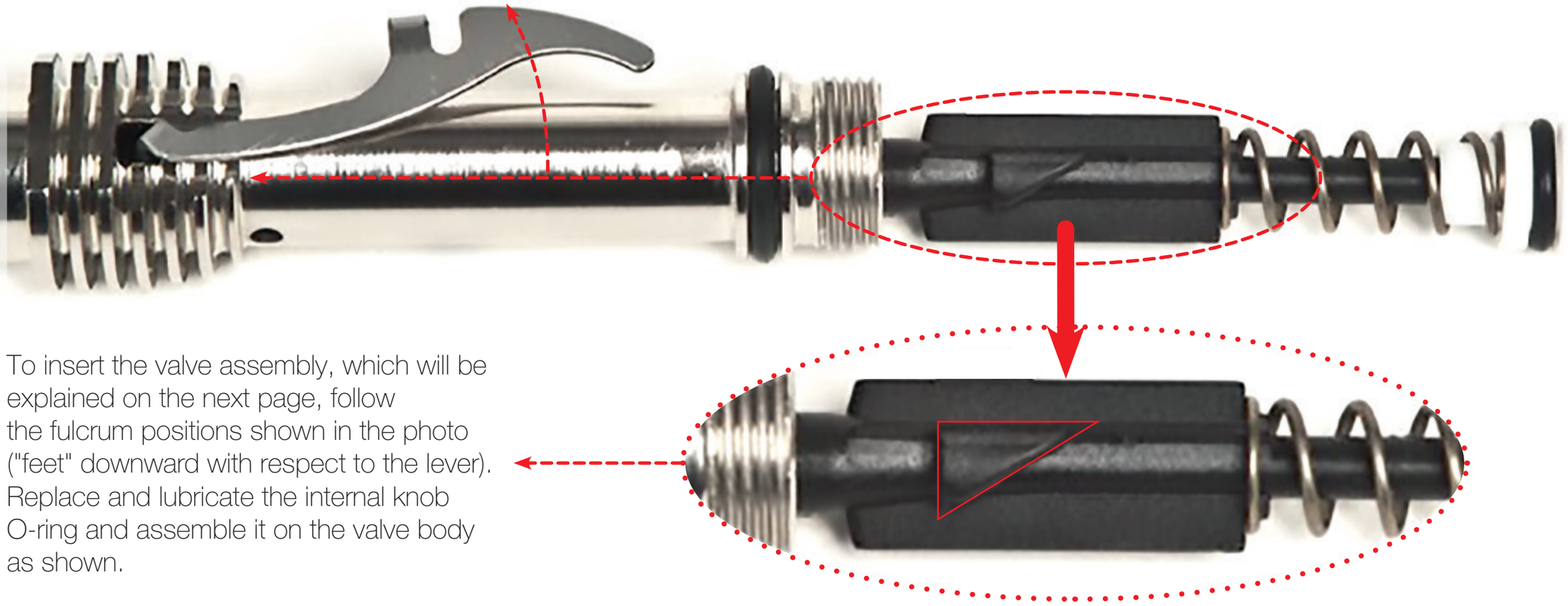
☞ **Note:** good lubrication is crucial to the proper operation of the regulator.



Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

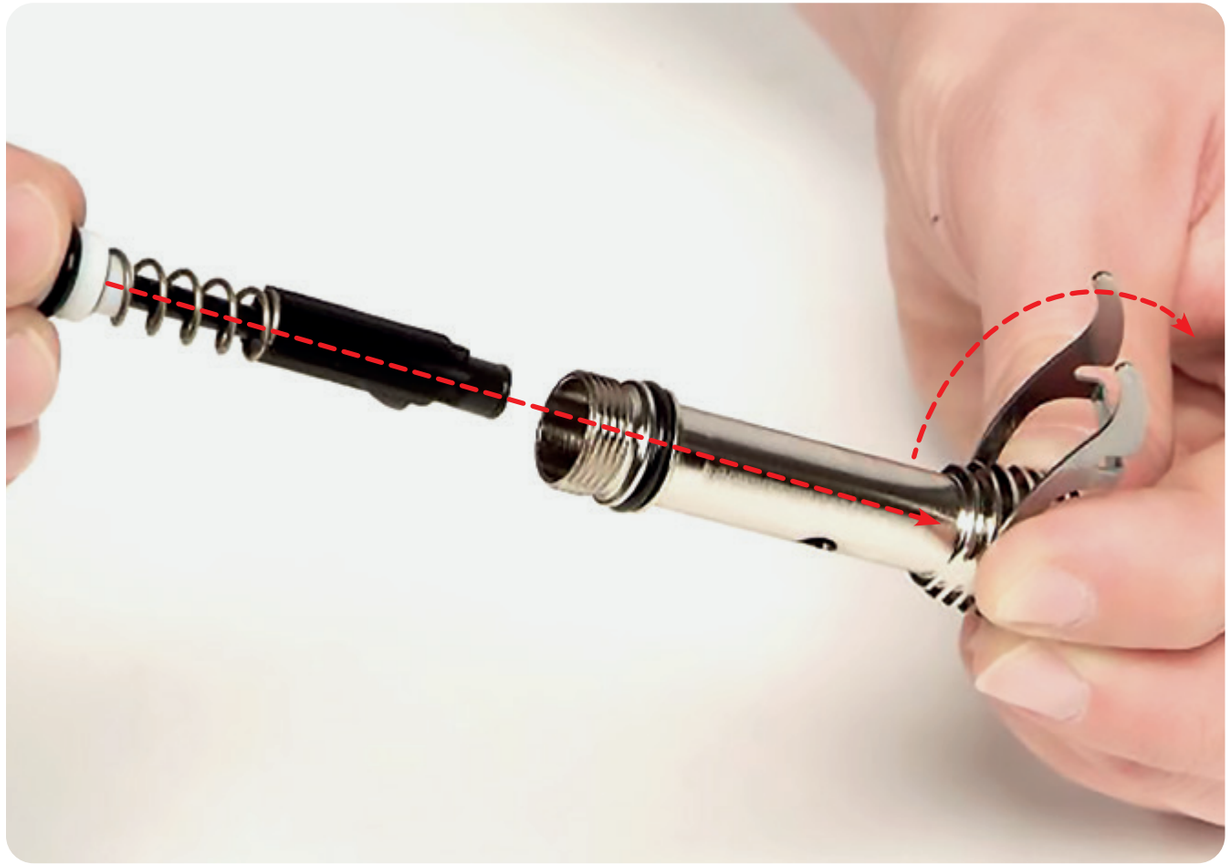


To insert the valve assembly, which will be explained on the next page, follow the fulcrum positions shown in the photo ("feet" downward with respect to the lever). Replace and lubricate the internal knob O-ring and assemble it on the valve body as shown.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Then, with the lever lifted, insert the valve assembly into the regulator valve body as shown in the photo.



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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

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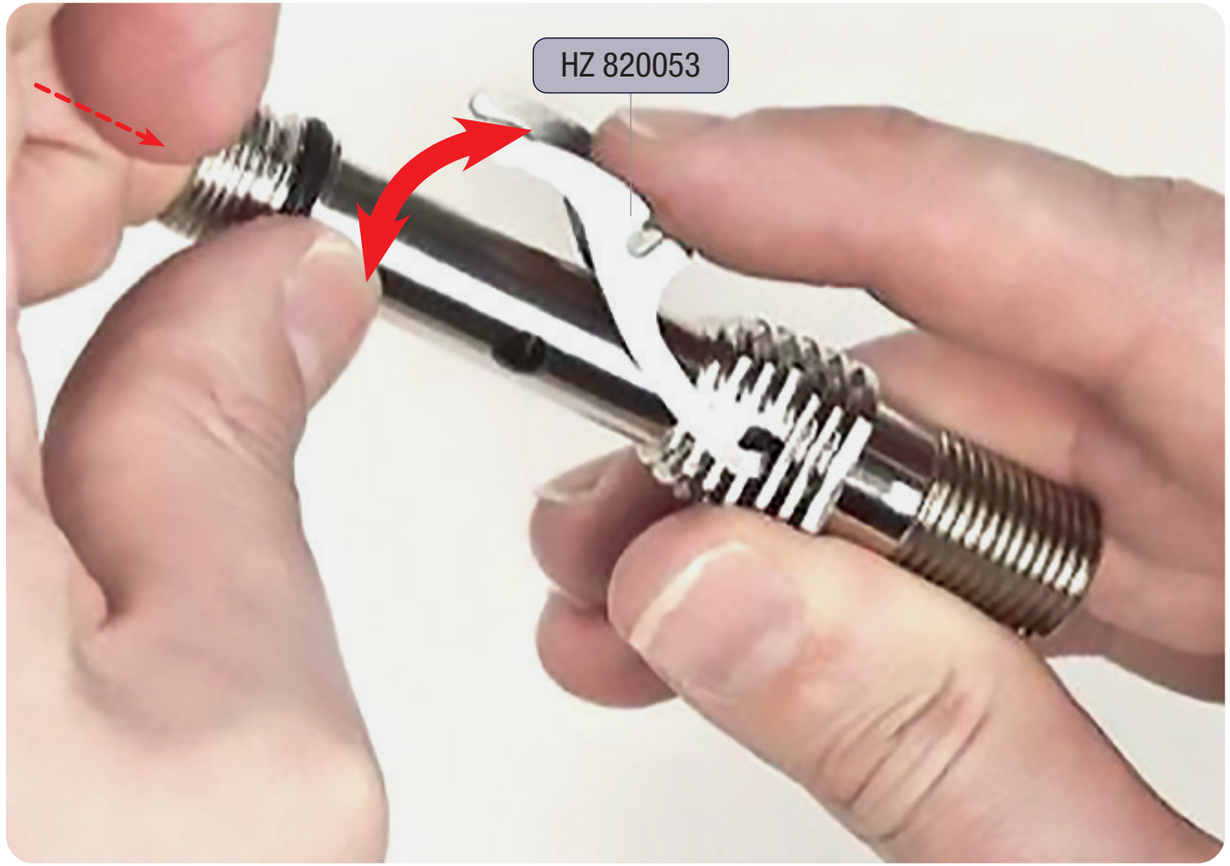
Check for proper operation by pressing the lever a few times.
It must be able to pivot fluidly without snags, returning automatically to the vertical position after each press.



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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Insert the spacer into the valve body so that once it is screwed down, the valve body's flat wall will line up with the inside of the side cap. Screw the side cap for now; correct tightening is done in a later step.

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Replace and lubricate the nozzle O-ring. Screw the nozzle a few turns in the valve body, holding down second stage lever to prevent the sharp edge from damaging the poppet closing seat.
Correct calibration will be done when the regulator is assembled.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Press down the lever (1) and fully insert (2) the regulator mechanics into the case, using the direction shown in the figure.

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

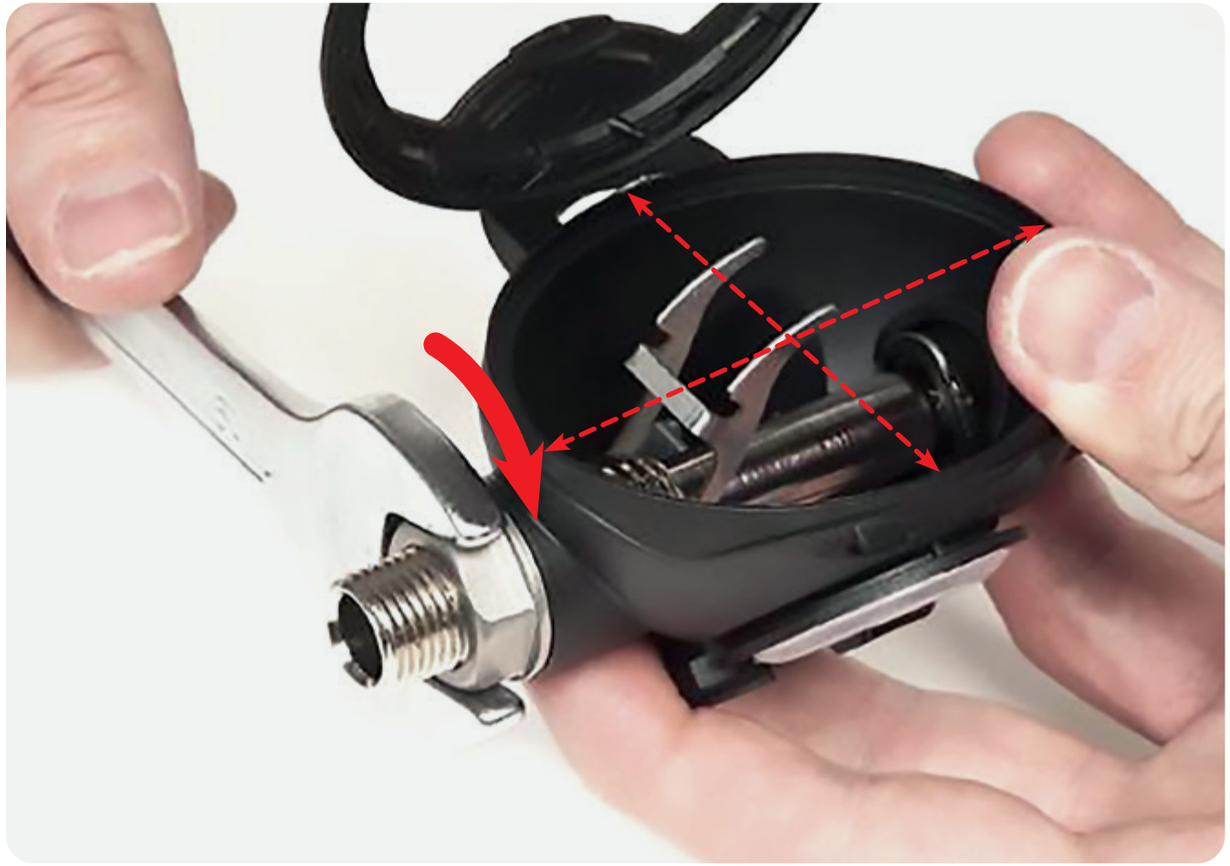
Phases of assembly

Replace and lubricate the valve body O-ring, and then position it in its seat as shown in the photo. Once tightened, a tab on the inside of the check nut titanium closing wall will ensure that the O-ring is seated correctly in position on the 2nd stage case.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Tighten the titanium check nut using a 19-mm open end wrench.
Check the parallelism of the lever with respect to the case.



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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

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Tighten the side cap using a caliper tool until the head of the tool is flush with the case.

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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Connect the second stage deflector, inserting it and pushing it into the sliding seats inside the 2nd stage, as shown.

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Position the diaphragm on the button ring as shown.
Then check that the button ring and diaphragm are coupled correctly, as shown in the photo.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Insert the button ring, complete with the correctly positioned diaphragm, on the second stage case, being careful to ensure that all the vertices on the ring coincide perfectly on the 2nd stage case, as shown in the photo.

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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

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Grasp the button ring firmly with one hand while simultaneously pulling the diaphragm plate gently outward to make sure that the outside edges of the diaphragm are housed perfectly in the regulator case.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Insert the button on the button ring, making all the tabs on the ring line up with the corresponding slots in the button. The correct coupling is shown in the photo.

Service and Repair Operative Manual

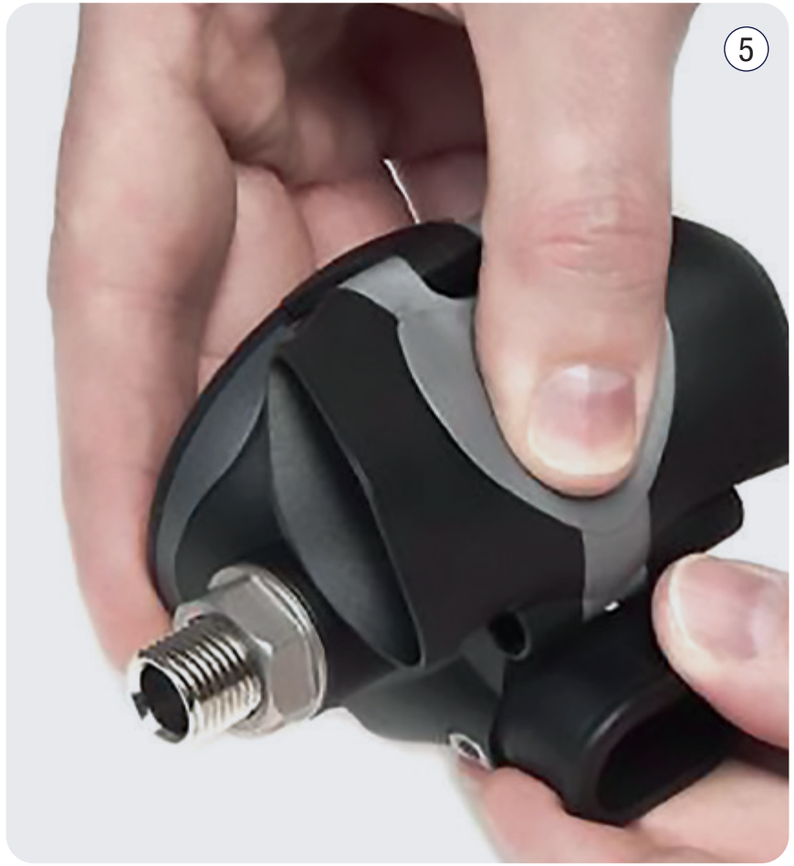
GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly



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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

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60 Rotate the pivoting dome toward the exhaust valve seat.

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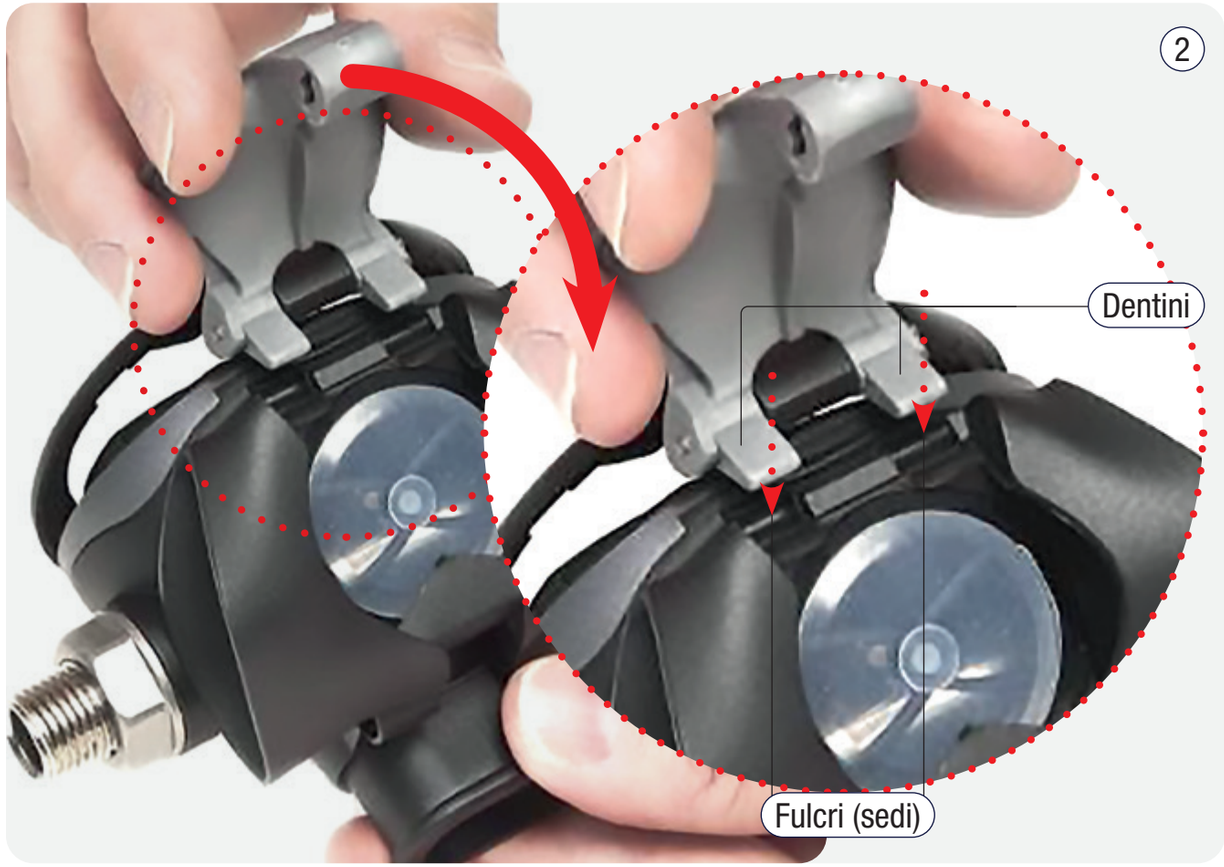
GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

When closing, make sure that the tabs shown in the figure **sit and rotate** of necessity in the appropriate seats on the 2nd stage case. These function as the closure fulcrum for the dome.



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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

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62 Finish rotating the pivoting dome until the regulator is fully closed.

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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Press the central part of the deflector (in grey in the photo)
until the regulator is closed.
Complete closure will be achieved once the "Cam-lock" safety key
is inserted in the regulator.

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Phases of assembly

Position the "Cam-lock" in the direction shown in the photo. Then insert an Allen wrench in the corresponding socket, push gently, and simultaneously rotate 90° clockwise. The spring in the "Cam-lock" will push the key toward the regulator closed position, as shown in the photo.

Calibration steps

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

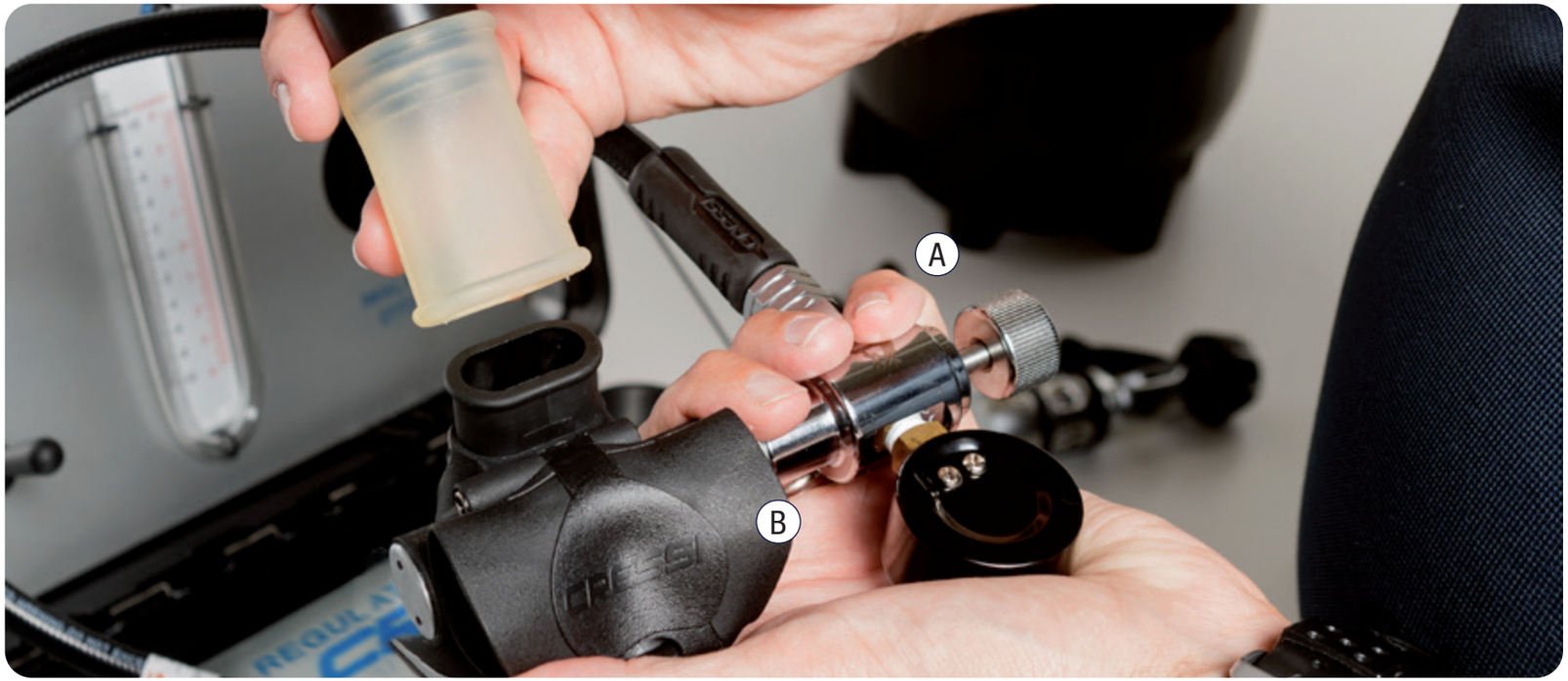
Calibration steps with Test Bench

HZ 709030

The most accurate regulator calibration is achieved using the portable Cressi test bench, code HZ 709030. Thanks to its pressure gauges with advanced reading class, it offers the possibility to calibrate both the first and second stages at the same time, providing a clear reading of the regulator calibration parameters, which otherwise remain entirely empirical.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Calibration steps with Test Bench



Before proceeding with calibration of the 2nd stage, the 1st stage to which it is connected and which feeds it must be properly calibrated according to the instructions in the specific maintenance manual for that model of 1st stage. Follow the procedures provided in the manual for the specific model of 1st stage in order to calibrate the 1st stage IP.

Then, screw the HZ 710011 calibration pressure gauge to the 2nd stage end of the intermediate pressure hose (A) that connects it to the 1st stage of the regulator, which must be duly calibrated (IP between 9.5-10 bar/138-146 psi). Then screw the 2nd stage to the HZ 710011 calibration second stage (B) as shown.

☞ **Note:** the following calibration and inspection steps for the second stage must be performed ONLY with pressurized regulators, fed at a constant pressure of 200 bar (2900 psi) and with the 1st stage duly calibrated to its IP.

Service and Repair Operative Manual

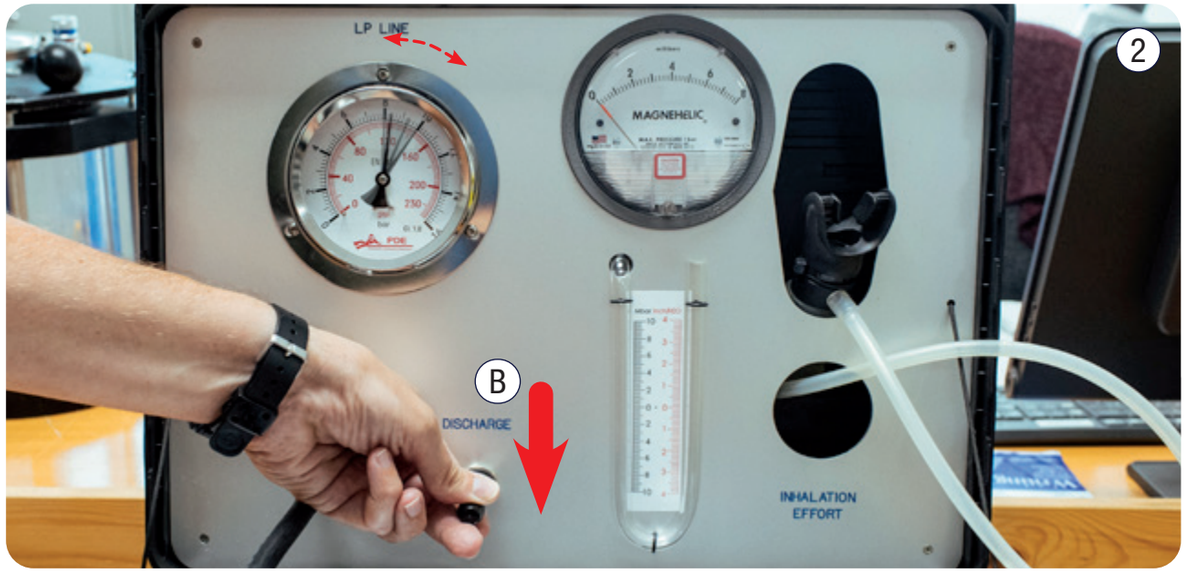
GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Calibration procedures and connections

Calibration procedures and connections

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Calibration procedures and connections



Once the regulator first stage is connected to the valve on the portable test bench, slowly open the air valve (B) (fig. 2), while simultaneously pressing on the test bench discharge lever (B) as shown in fig. 2 a few times to prevent the "water hammer" effect from occurring in the 1st stage HP valve and to stabilize the 1st stage IP value.

Service and Repair Operative Manual

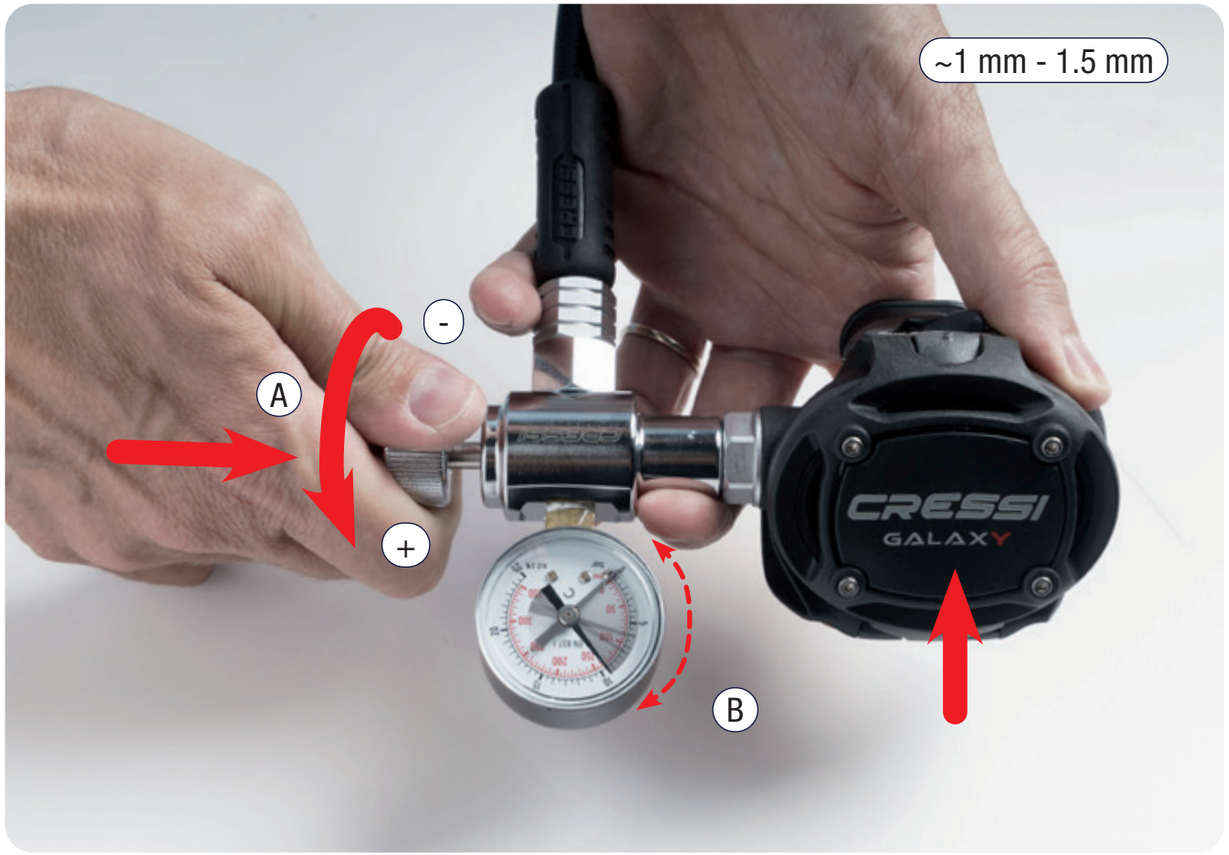
GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Calibration procedures and connections

If this operation is done without the Cressi portable test bench, open the valve on the cylinder (1) (2) and simultaneously press the 2nd stage purge button (C) a few times to prevent the "water hammer" effect from occurring in the 1st stage HP valve and to stabilize the 1st stage IP value.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Calibration procedures and connections



If the 2nd stage releases slowly, press and simultaneously rotate (A) the calibration gauge ring (HZ 710011) clockwise (+) until flow ceases. This way, the sharp valve edge of the 2nd stage rests against the closing seat, ensuring proper operation.
With the regulator still pressurized, and with the inhalation effort knob completely open, press and simultaneously turn the calibration pressure gauge ring nut (A) just over an additional 1/4 turn in order to correctly settle the sharp edge of the valve against the 2nd stage valve closure.

Once the valve nozzle has been adjusted correctly, the gauge indicates the correct calibration of the 1st stage (9.5 - 10 bar / 138 - 146 psi) (B).

In these conditions, the lever has about 1 - 1.5 mm of idle travel with respect to the diaphragm plate. This can be judged by pressing the second stage demand button and noticing the idle travel mentioned above before the 2nd stage begins delivery.

☞ **Note:** Be careful not to screw the valve nozzle too far, or the closing seat could cut be pressed into significantly, resulting in inhalation effort due to excessive compression of the valve spring.

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Calibration procedures and connections

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Final checks can be performed once all 2nd stage calibration steps are complete, keeping the regulator under pressure, connected to its duly calibrated 1st stage, again using the Cressi portable calibration bench.

First, insert the special silicone mouthpiece from the Cressi test bench in the delivery conduit of the 2nd stage as shown in the photo.

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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Calibration procedures and connections

Then, with the regulator pressurized, positioning the 2nd stage Venturi control level in the "Dive +" position, take a few breaths from the test bench mouthpiece connected to the 2nd stage, as in the figure, in order to register and read the cracking pressure on the "Magnehelic" differential pressure gauge, or, if filled with water, in a similar fashion on the water column of the test bench calibrated in mbar and inwg, as shown. On the inhale, the intermediate pressure, indicated on the IP pressure gauge, will obviously also decrease. In order for the 2nd stage to be correctly calibrated, the cracking pressure value for this type of regulator, indicated by the differential pressure gauge or the water column, must fall between the following values:

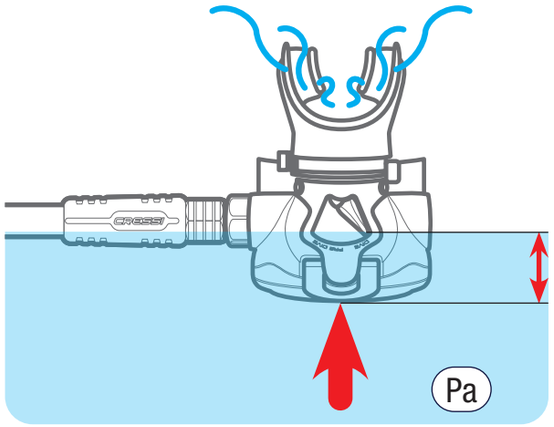
2.5 – 3.5 mbar (~2.5 – 3.5 cm $H_2$0) 1.1 – 1.4 inwg

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Calibration procedures and connections

In the absence of a test bench, you can still perform an approximate check on the cracking pressure by immersing the second stage slowly in water with the Venturi control lever in the "Dive +" position and the mouthpiece facing upward, without letting water into the 2nd stage. Referring to the 2nd stage purge button (see figure), when the level of water in the immersed regulator reaches an average value of approximately 4 cm of water column (~1.6 inwg), the regulator must begin to deliver air until the second stage free-flows.
Next, check that the Venturi flow deviator works properly by rotating the level to the "-" pre-dive position: the continuous flow must cease.



If the Cracking Pressure value does not fall within the interval indicated above, the calibration steps must be repeated, referring to the previous pages in this manual. Keep in mind that if the value of the cracking pressure is higher, you generally need to decrease the load on the spring, following the instructions provided above. Avoid calibrating the regulator to be overly sensitive to avoid spontaneous free-flows.

Once the 2nd stage is correctly calibrated, conduct the seal testing protocol on the regulator, immersing it completely in water with the flow deviator in the "-" pre-dive position. Wait about a minute, and then check that there are no leaks by looking for any columns of bubbles that would indicate one.
Do not confuse these with the exit of air trapped in the 2nd stage which is correctly expelled from the regulator case through the mouthpiece once it's immersed in water.

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Calibration procedures and connections

In the event of a continuous column of bubbles from the 2nd stage mouthpiece, refer to the pages in this manual on calibration.

Additional information on troubleshooting the equipment in question is provided in the last pages of this document.

Finally, check the proper seal for the regulator, plugging the valve seat air inlet and taking a few deep breaths from the mouthpiece to check that the diaphragm and exhaust valve are properly sealed.

During the inhale (vacuum), no incoming air should be detected. Instead, there should be a certain level of effort on the inhale, typical of a perfectly sealed regulator.

If after this procedure you detect an infiltration of air through a continuous flow on the inhale after having plugged the side air inlet, refer to the manual for the steps on closing the regulator and replacing the exhaust valve, carefully checking that both the demand diaphragm and the air supply valve have no scrapes, cuts, tears, or any other damage that could compromise their perfect operation, and therefore the perfect seal of the regulator.
Then repeat the procedure to check that the problem has been corrected and that the regulator is perfectly sealed..

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Common Problems and Solutions - Troubleshooting

Common Problems and Solutions - Troubleshooting

☝ **Warning:** This is a partial list of possible common issues and the corresponding solutions recommend for Cressi-sub regulators.
Please consult the maintenance and repair manuals for each specific model for more information, or contact Cressi-sub support before proceeding with disassembly or maintenance related to situations or problems not described in this document.

The recommended solutions are performed by disassembling the regulator, and therefore entail a full overhaul to be done following the procedures described in the general maintenance document for the model in question. Do not perform partial maintenance on the regulator.

Equipment maintenance and/or repair must NOT be performed by users. These operations may only be performed by a Cressi-sub Authorized Center.

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GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Common Problems and Solutions - Troubleshooting

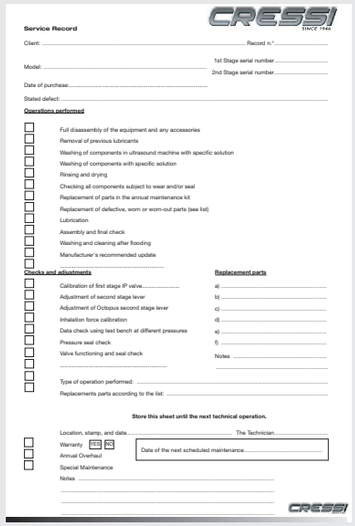
Problem	Possible cause	Solutions
CONTINUOUS LOSS OR FLOW (FREE-FLOW) FROM THE SECOND STAGE	1. Elevated intermediate pressure in the first stage (should be 9.5 - 10 bar)	1. Consult the Guide on solving 1st stage problems.
	2. Venturi effect triggered	2. Cover the mouthpiece with a finger or rotate the flow deviator to pre-dive and immerse the regulator in water, directing the mouthpiece downward.
	3. LP orifice nozzle adjusted incorrectly or lever too high	3. Restore the preliminary calibration settings for the regulator, referring to the maintenance manual for the correct model.
	4. Orifice nozzle sealing surface damaged, or LP seat damaged, scratched, or worn	4. Replace the orifice nozzle or LP sealing seat.
	5. Poppet valve spring damaged.	5. Replace the spring.
POOR AIR FLOW AND/OR EXCESSIVE BREATHING EFFORT (REGULATOR PRESSURIZED WITH CYLINDER AT MAX OPERATING CHARGE)	1. Intermediate pressure to 1st stage low (should be 9.5 - 10 bar)	1. Consult the Guide on solving 1st stage problems.
	2. Orifice nozzle adjusted incorrectly or lever adjusted too low. Poppet clogged	2. Restore the orifice to preliminary settings and repeat the adjustment procedures, referring to the maintenance manual for that model. Replace the poppet if clogged (check by blowing inside).
	3. 2nd stage balancing chamber damaged	3. Check and replace the balancing chamber.
	4. Lever bent or damaged	4. Replace the lever.
WATER SEEPAGE INSIDE THE SECOND STAGE	1. Hole in the mouthpiece	1. Replace the mouthpiece.
	2. Discharge diaphragm dirty or defective, and/or discharge diaphragm sealing seat on the 2nd stage body scratched or damaged	2. Replace the discharge diaphragm. Check the discharge diaphragm sealing seat on the 2nd stage body and replace the body if necessary.
	3. Demand diaphragm punctured or damaged	3. Replace the demand diaphragm.
	4. OR sealing ring on the Venturi flow deviator lever dirty, damaged, or worn	4. Remove and replace the sealing ring.
	5. Demand diaphragm or discharge diaphragm NOT assembled correctly	5. Reassemble correctly, checking the coupling with the case. Block the valve seat air inlet with a finger and take a few deep breaths from the mouthpiece to check the seals and correct coupling of the diaphragms.
	6. LP hose OR, Valve body OR	6. Replace the sealing ring where the problem was detected.

Service and Repair Operative Manual

GALAXY / OCTOPUS MG BALANCED 2ND STAGE

Product serial number tracking – Service Records

When you have finished, document the work you performed by filling out the service/ maintenance/overhaul record shown below (1). It summarizes and links to procedures performed on the equipment and can be downloaded at the links provided below.



CRESSI SINCE 1946

Service Record

Client: ..... Record n.° .....

Model: ..... 1st Stage serial number .....
2nd Stage serial number .....

Date of purchase: .....

Stated defect: .....

Operations performed

- ☐ Full disassembly of the equipment and any accessories
- ☐ Removal of previous lubricants
- ☐ Washing of components in ultrasound machine with specific solution
- ☐ Washing of components with specific solution
- ☐ Rinsing and drying
- ☐ Checking all components subject to wear and/or seal
- ☐ Replacement of parts in the annual maintenance kit
- ☐ Replacement of defective, worn or worn-out parts (see list)
- ☐ Lubrication
- ☐ Assembly and final check
- ☐ Washing and cleaning after flooding
- ☐ Manufacturer's recommended update

....

Checks and adjustments

- ☐ Calibration of first stage IP valve .....
- ☐ Adjustment of second stage lever
- ☐ Adjustment of Octopus second stage lever
- ☐ Inhalation force calibration
- ☐ Data check using test bench at different pressures
- ☐ Pressure seal check
- ☐ Valve functioning and seal check

....

Replacement parts

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

Notes .....

Type of operation performed: .....

Replacements parts according to the list: .....

Store this sheet until the next technical operation.

Location, stamp, and date ..... The Technician .....

- ☐ Warranty YES NO
- ☐ Annual Overhaul

Date of the next scheduled maintenance .....

- ☐ Special Maintenance

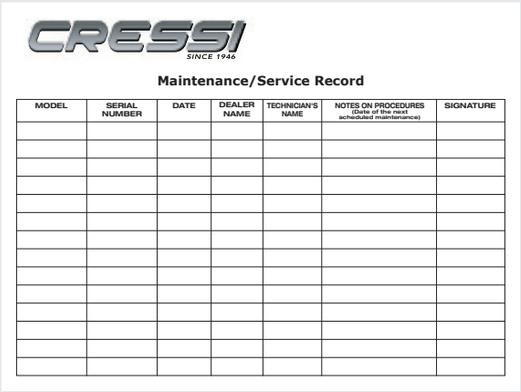
Notes .....

.....

.....

CRESSI

Next, complete the maintenance/record card associated with the regulator and documenting the history of maintenance procedures performed on the equipment. It is found in the user manual that accompanies the regulator. A sticker on the cover of the manual provides the S/N (Serial Number) of the regulator so that the product can be tracked and the history of the maintenance procedures performed on it over time will be associated with and referred to that regulator alone (2). This will help ensure the efficacy of its operation, thanks to the frequency of scheduled maintenance.



CRESSI SINCE 1946

Maintenance/Service Record

MODEL	SERIAL NUMBER	DATE	DEALER NAME	TECHNICIAN'S NAME	NOTES ON PROCEDURES (Date of the next scheduled maintenance)	SIGNATURE

(1) Link to the intervention form:

https://www.cressi.com/easyUp/file/maintenance/SchedaRevisioneErogatoriCressiSub_en.pdf

(2) Link to the maintenance form:

https://www.cressi.com/easyUp/file/maintenance/ServiceRecordErogatoriCressiSub_en.pdf