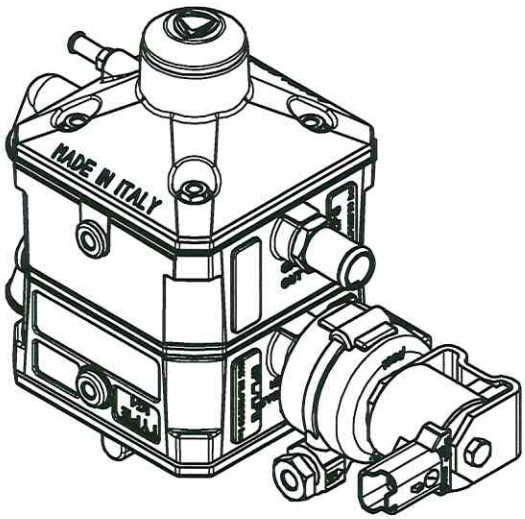
ENG **ASSEMBLY INSTRUCTIONS FOR "IG1" PRESSURE REGULATOR**

(code: 536717000-536725000-536727000-536729000-536740000-536744000)

OVERHAUL KIT

674211000 / 674084000
674212000 / 674083000
674213000 / 674142000



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190 100 077 - REV. 0 GB - 04/2011

ENG

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• WARNINGS

- **The operations described in this manual must be carried out by qualified personnel explicitly authorised by Landi Renzo.**
- **To perform the operations described, it is mandatory to remove the pressure regulator from the vehicle.**
- **Maintenance work must be carried out in a clean tidy environment and care must be taken not to compromise or contaminate spare parts.**
- **All personnel must comply with current standards and use personal protection equipment in compliance with such legislation (gloves, goggles etc.).**
- **The operations described in this manual are the same for all pressure regulator models.**
- **The various stages of disassembly/assembly where not otherwise stated, always refer to "1st Version" regulators.**
- **Always use all the new components that come in the overhaul kit box even if the components on the existing regulator seem to be in good condition.**
- **Component reference numbers are shown by:**
  - **numbers on a coloured background - existing components on the pressure regulator;**
  - **numbers on a white background - new components;**
  - **letters on a coloured background - existing components on the pressure regulator that are not to be replaced.**
- **O-rings with the reference: (8)/(9), (14), (15), are to be lubricated with suitable oil after they have been fitted to their components. O-rings with the reference: (5) and (6), are to be lubricated with suitable grease after they have been fitted to the separator disc.**

• External identification of pressure regulator version

1st version: 1st stage cover with compensation nozzle seat on the heating fluid coupling side (see F1)

2nd version: 1st stage cover with compensation nozzle seat on the same side as the holes of the regulator mounting and Landi Renzo name on the electrovalve side (see F2).

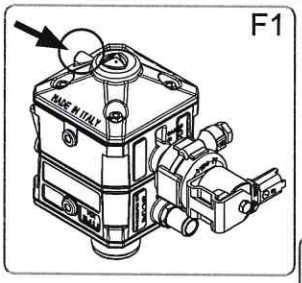
• Internal identification of pressure regulator version

1st version: cover with polarisation pin (see F3)

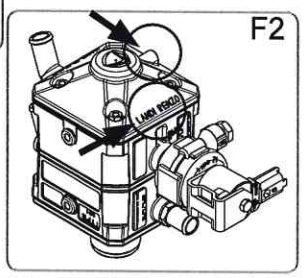
2nd version: cover ***WITHOUT*** polarisation pin (see F4)

1ST STAGE COVER

1st version ***2nd version***



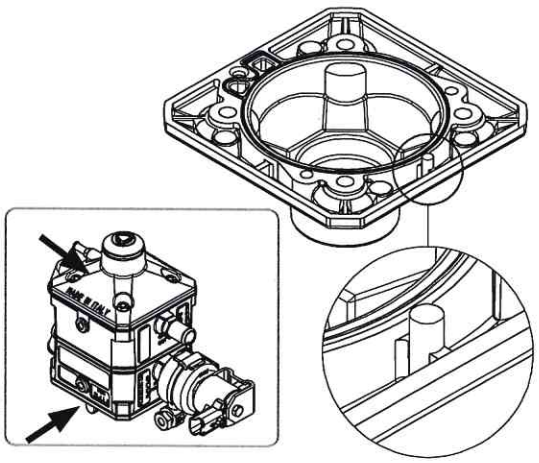
F1



F2

PRESSURE REGULATOR COVERS

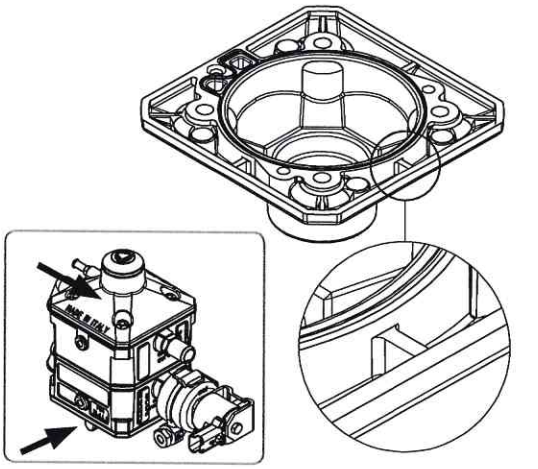
1st VERSION



F3

PRESSURE REGULATOR COVERS

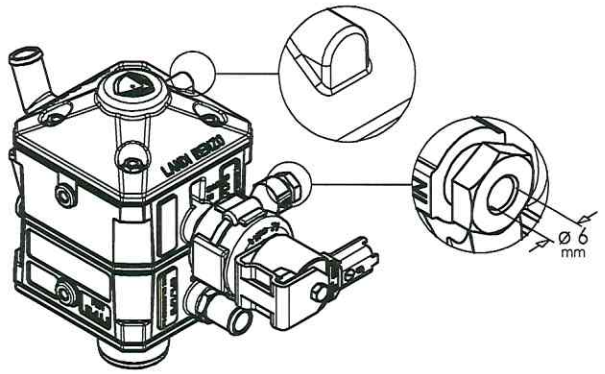
2nd VERSION



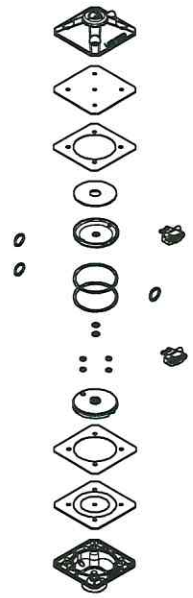
F4

• PRESSURE REGULATOR AND OVERHAUL KIT IDENTIFICATION

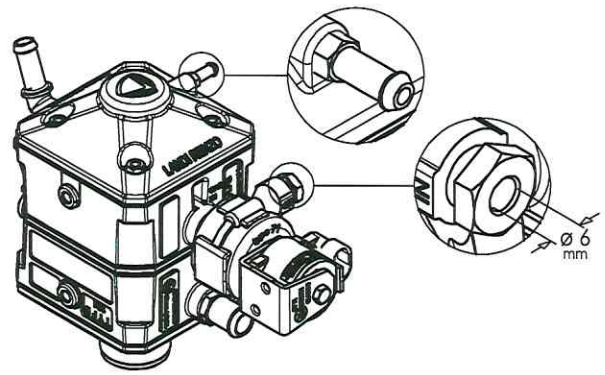
PRESSURE REGULATOR
IG1 536 717 000
IG1 TURBO 536 725 000



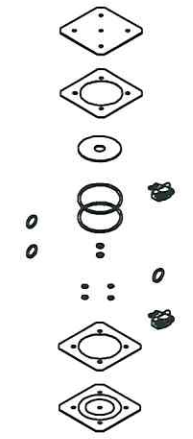
OVERHAUL KIT
674 084 000
1st VERSION REGULATOR



PRESSURE REGULATOR
IG1 DOUBLE COMPENSATOR
536 744 000

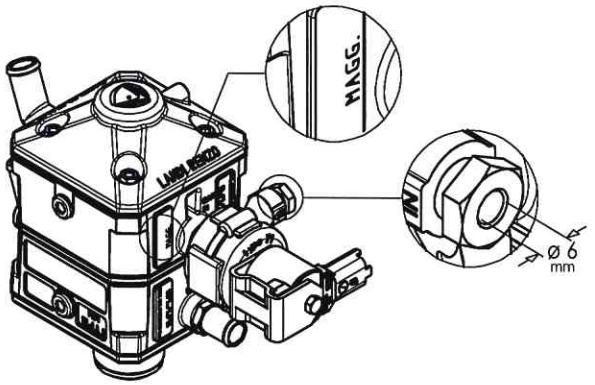


OVERHAUL KIT
674 211 000
2nd VERSION REGULATOR

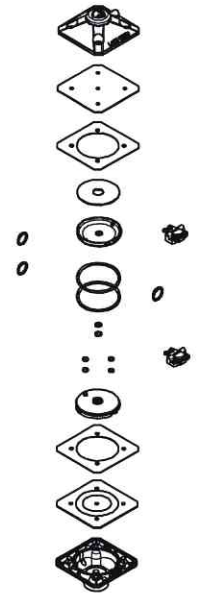


• PRESSURE REGULATOR AND OVERHAUL KIT IDENTIFICATION

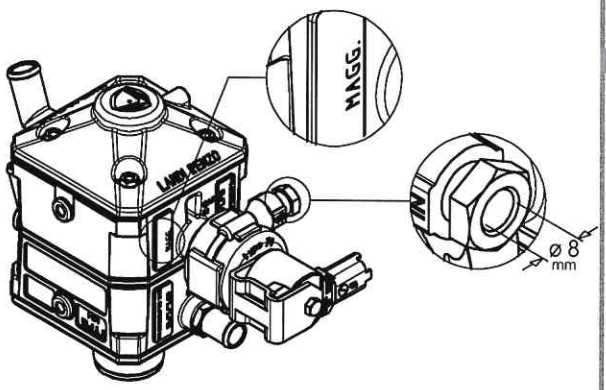
PRESSURE REGULATOR
IG1 SUPER-ENHANCED
536 727 000



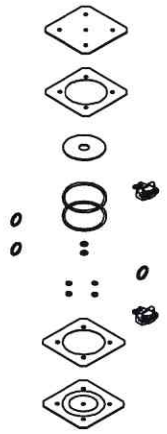
OVERHAUL KIT
674 083 000
1st VERSION REGULATOR



PRESSURE REGULATOR
IG1 SUPER-ENHANCED WITH ENHANCED ELECTROVALVE
536 729 000

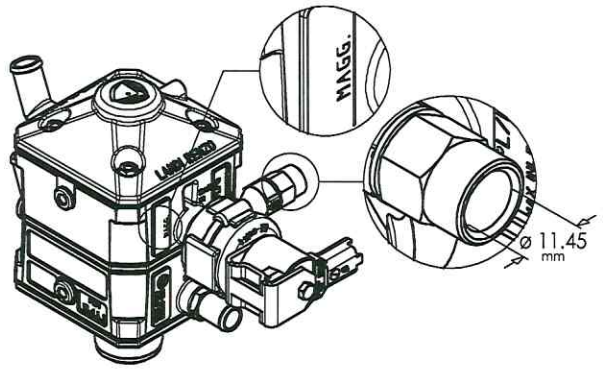


OVERHAUL KIT
674 212 000
2nd VERSION REGULATOR

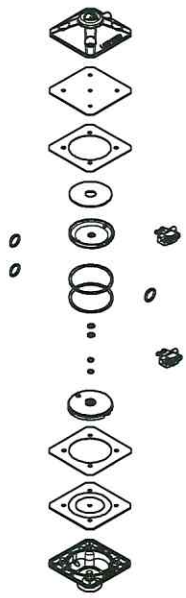


• PRESSURE REGULATOR AND OVERHAUL KIT IDENTIFICATION

PRESSURE REGULATOR
IG1 HIGH RESISTANCE (CANADA)
536 740 000



OVERHAUL KIT
674 142 000
1st VERSION REGULATOR

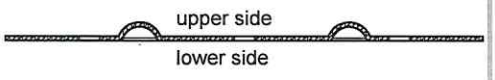


IDENTIFICATION OF SIMILAR COMPONENTS

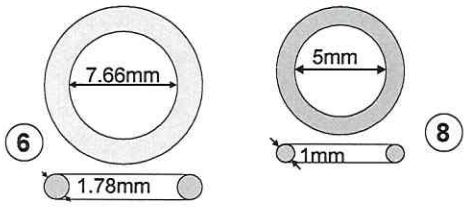
DIAPHRAGM (cross section)

1ST stage

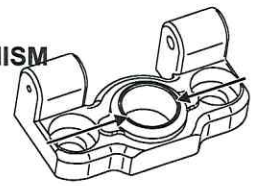
2ND stage



O-RING



LEVER MECHANISM



1st stage
Ø = 4 mm
Ø = 4.75 mm

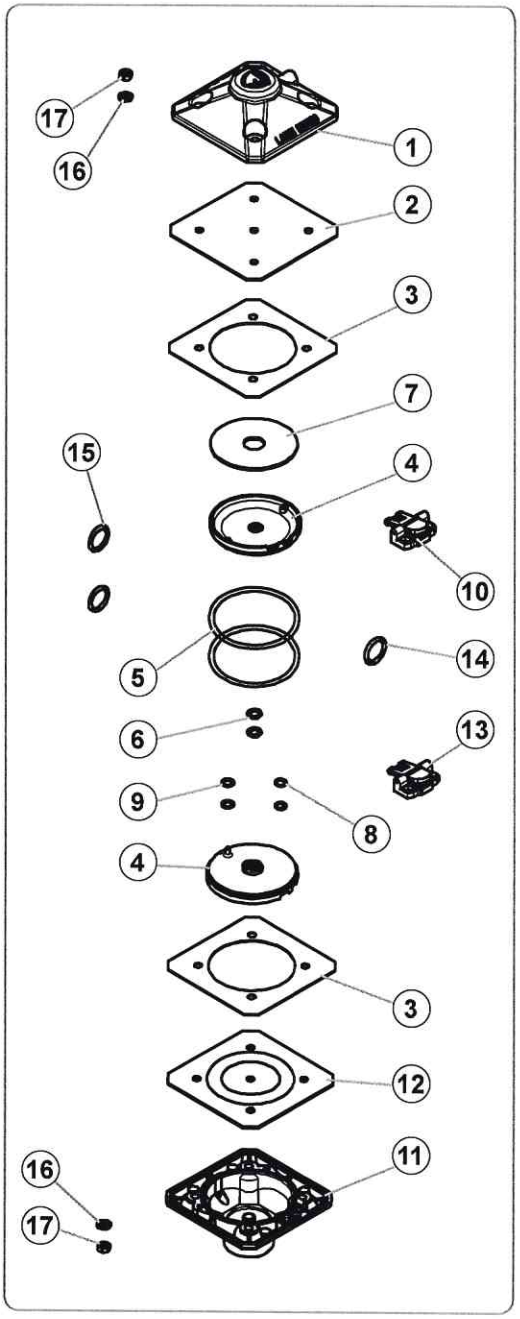
2nd stage
Ø = 7 mm
Ø = 8 mm

OVERHAUL KIT
674 213 000
2nd VERSION REGULATOR

• CONTENTS - OVERHAUL KIT 674 084 000

FOR 1st VERSION REGULATOR

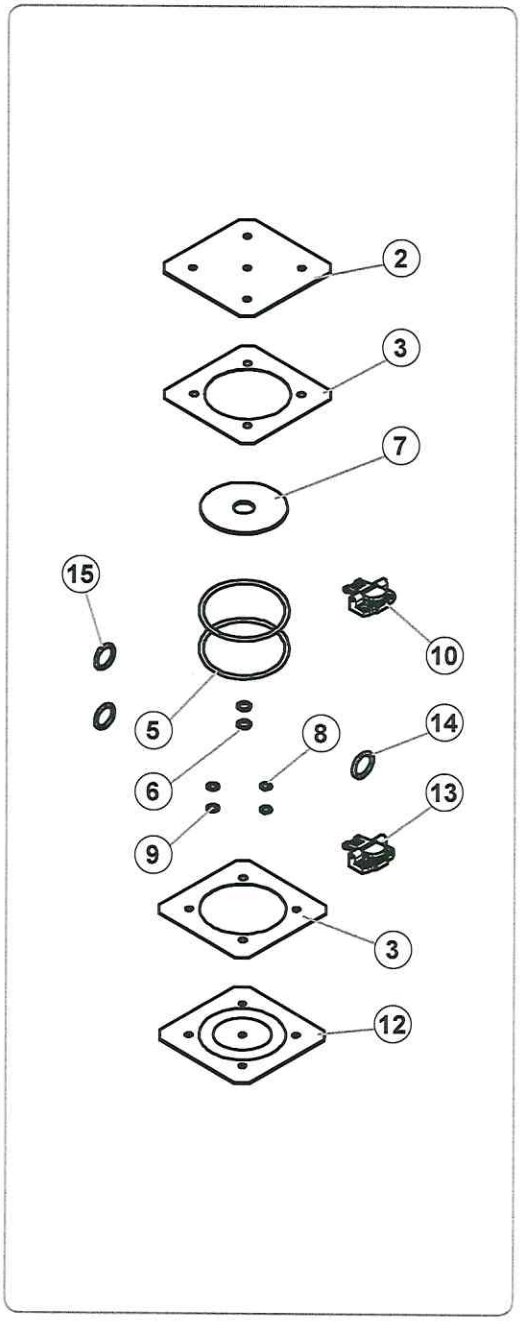
POS.	CODE	DESCRIPTION	QUANTITY	UOM
1	620700342	1st stage cover	1	N°
2	206079370	1st stage diaphragm	1	N°
3	170052440	Diaphragm gasket	2	N°
4	620700327	Separator disc	2	N°
5	173116371	O-Ring gasket 2224 56.87x1.78	2	N°
6	173118381	O-Ring gasket 2031 7.87x1.78	2	N°
7	173208400	Evaporator gasket	1	N°
8	173156381	O-Ring gasket 5x1 FKM	2	N°
9	173209370	Joint gasket	2	N°
10	470058000	1st stage lever mechanism	1	N°
11	620700344	2nd stage cover	1	N°
12	206078370	2nd stage diaphragm	1	N°
13	620314000	2nd stage lever mechanism	1	N°
14	173084371	O-Ring gasket 114 11.87x1.78	1	N°
15	173009371	O-Ring gasket 112 9.87x1.78	2	N°
16	254282031	Conical washer D.12x6.1x1.2	8	N°
17	143103121	Medium nut 8 M5	8	N°



• CONTENTS - OVERHAUL KIT 674 211 000

FOR 2nd VERSION REGULATOR

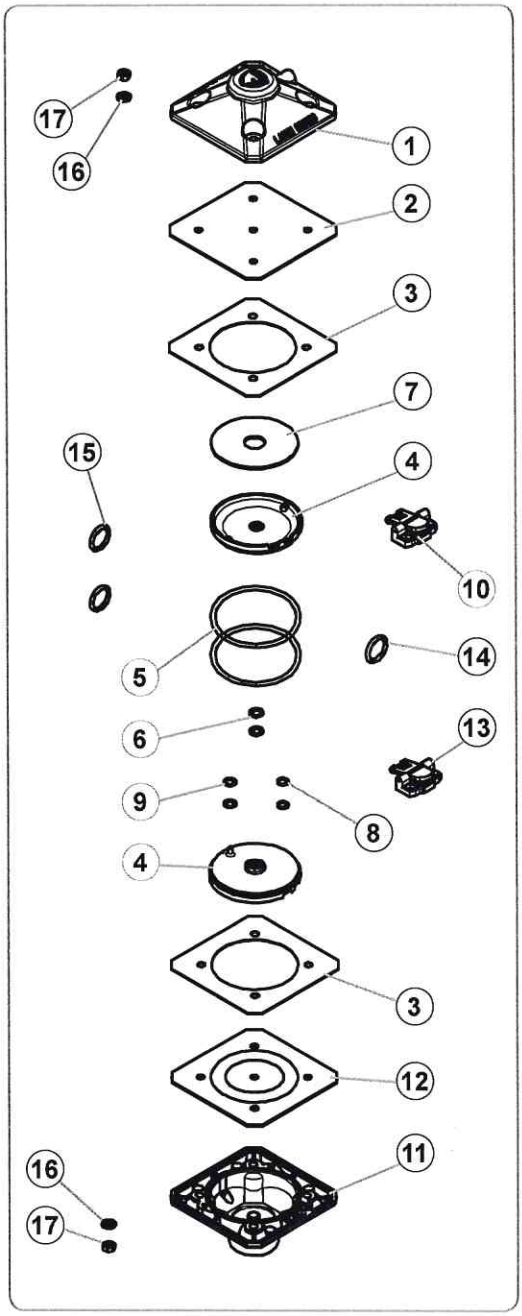
POS.	CODE	DESCRIPTION	QUANTITY	UOM
2	206079370	1st stage diaphragm	1	N°
3	170052440	Diaphragm gasket	2	N°
5	173116371	O-Ring gasket 2224 56.87x1.78	2	N°
6	173118381	O-Ring gasket 2031 7.87x1.78	2	N°
7	173208400	Evaporator gasket	1	N°
8	173156381	O-Ring gasket 5x1 FKM	2	N°
9	173209370	Joint gasket	2	N°
10	470058000	1st stage lever mechanism	1	N°
12	206078370	2nd stage diaphragm	1	N°
13	620314000	2nd stage lever mechanism	1	N°
14	173084371	O-Ring gasket 114 11.87x1.78	1	N°
15	173009371	O-Ring gasket 112 9.87x1.78	2	N°



• CONTENTS - OVERHAUL KIT 674 083 000

FOR 1st VERSION REGULATOR

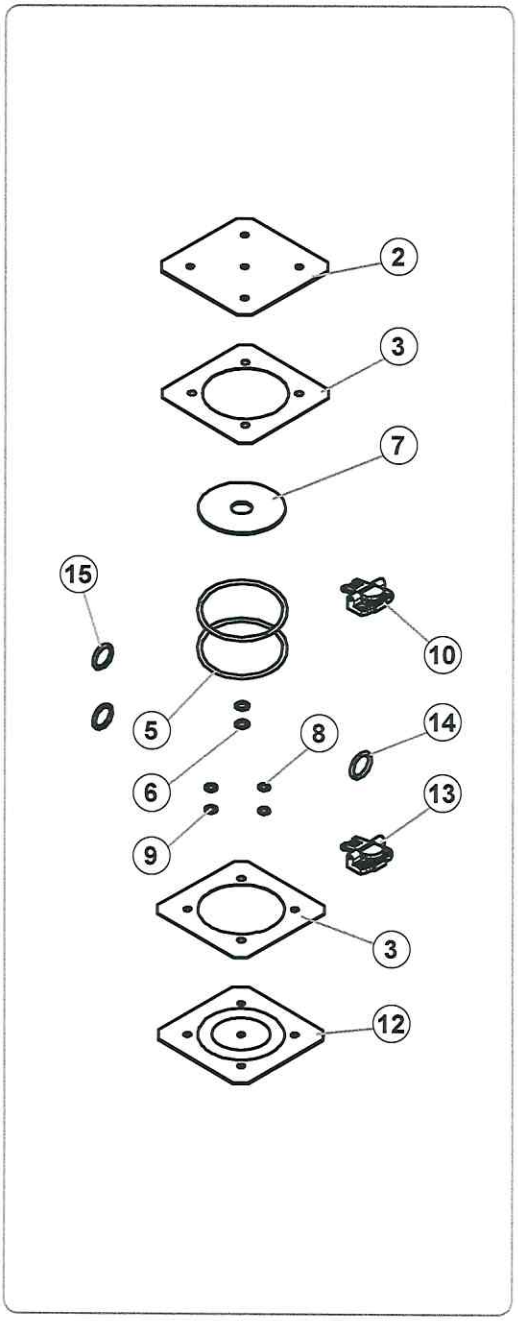
POS.	CODE	DESCRIPTION	QUANTITY	UOM
1	620700342	1st stage cover	1	N°
2	206079370	1st stage diaphragm	1	N°
3	170052440	Diaphragm gasket	2	N°
4	620700327	Separator disc	2	N°
5	173116371	O-Ring gasket 2224 56.87x1.78	2	N°
6	173118381	O-Ring gasket 2031 7.87x1.78	2	N°
7	173208400	Evaporator gasket	1	N°
8	173156381	O-Ring gasket 5x1 FKM	2	N°
9	173209370	Joint gasket	2	N°
10	620311000	1st stage lever mechanism	1	N°
11	620700344	2nd stage cover	1	N°
12	206078370	2nd stage diaphragm	1	N°
13	620313000	2nd stage lever mechanism	1	N°
14	173084371	O-Ring gasket 114 11.87x1.78	1	N°
15	173009371	O-Ring gasket 112 9.87x1.78	2	N°
16	254282031	Conical washer D.12x6.1x1.2	8	N°
17	143103121	Medium nut 8 M5	8	N°



• CONTENTS - OVERHAUL KIT 674 212 000

FOR 2nd VERSION REGULATOR

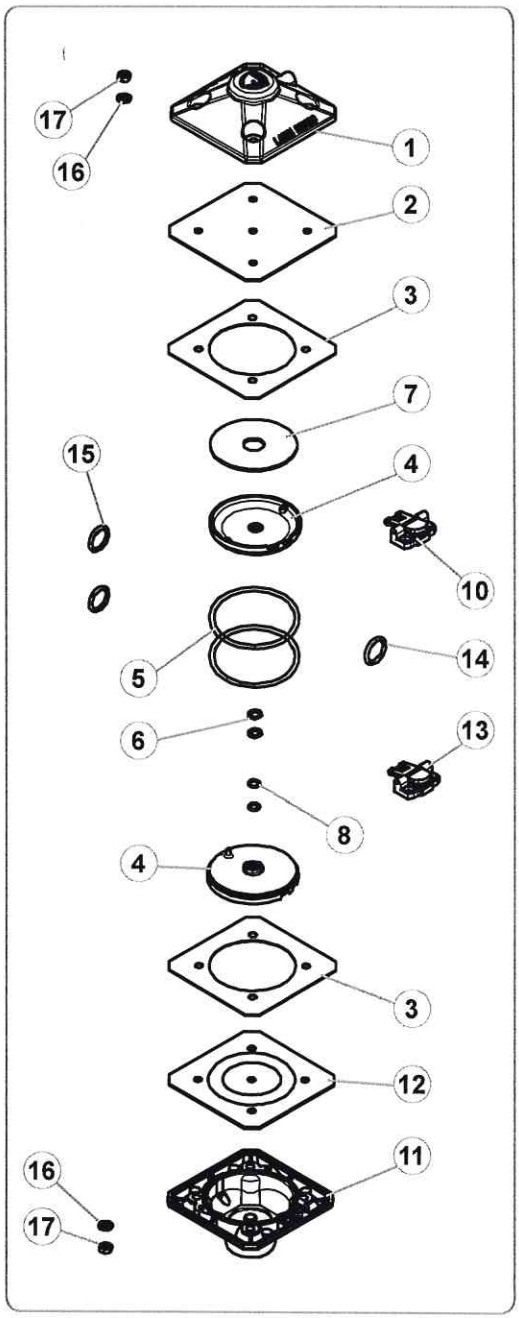
POS.	CODE	DESCRIPTION	QUANTITY	UOM
2	206079370	1st stage diaphragm	1	N°
3	170052440	Diaphragm gasket	2	N°
5	173116371	O-Ring gasket 2224 56.87x1.78	2	N°
6	173118381	O-Ring gasket 2031 7.87x1.78	2	N°
7	173208400	Evaporator gasket	1	N°
8	173156381	O-Ring gasket 5x1 FKM	2	N°
9	173209370	Joint gasket	2	N°
10	620311000	1st stage lever mechanism	1	N°
12	206078370	2nd stage diaphragm	1	N°
13	620313000	2nd stage lever mechanism	1	N°
14	173084371	O-Ring gasket 114 11.87x1.78	1	N°
15	173009371	O-Ring gasket 112 9.87x1.78	2	N°



• CONTENTS - OVERHAUL KIT 674 142 000

FOR 1st VERSION REGULATOR

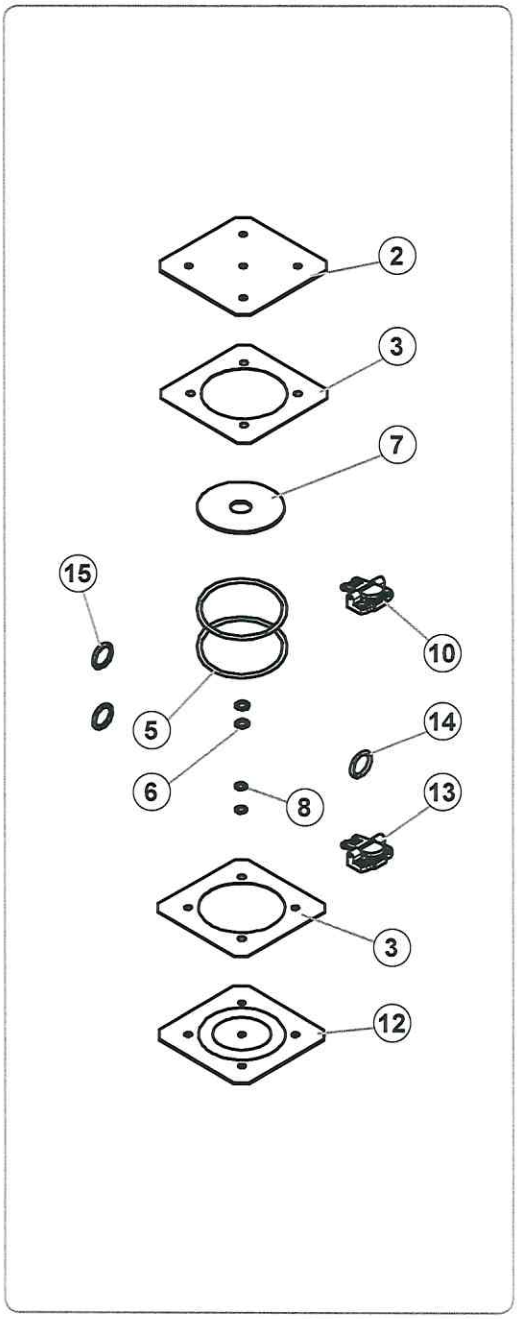
POS.	CODE	DESCRIPTION	QUANTITY	UOM
1	620700342	1st stage cover	1	N°
2	206079370	1st stage diaphragm	1	N°
3	170052440	Diaphragm gasket	2	N°
4	620700327	Separator disc	2	N°
5	173193380	O-Ring gasket 2224 56.87x1.78	2	N°
6	173191380	O-Ring gasket 2031 7.87x1.78	2	N°
7	173208400	Evaporator gasket	1	N°
8	173190380	O-Ring gasket 5x1 FKM	2	N°
10	620700274	1st stage lever mechanism	1	N°
11	620700344	2nd stage cover	1	N°
12	206078370	2nd stage diaphragm	1	N°
13	620313000	2nd stage lever mechanism	1	N°
14	173192380	O-Ring gasket 114 11.87x1.78	1	N°
15	173009371	O-Ring gasket 112 9.87x1.78	2	N°
16	254282031	Conical washer D.12x6.1x1.2	8	N°
17	143103121	Medium nut 8 M5	8	N°



• CONTENTS - OVERHAUL KIT 674 213 000

FOR 2nd VERSION REGULATOR

POS.	CODE	DESCRIPTION	QUANTITY	UOM
2	206079370	1st stage diaphragm	1	N°
3	170052440	Diaphragm gasket	2	N°
5	173193380	O-Ring gasket 2224 56.87x1.78	2	N°
6	173191380	O-Ring gasket 2031 7.87x1.78	2	N°
7	173208400	Evaporator gasket	1	N°
8	173190380	O-Ring gasket 5x1 FKM	2	N°
10	620700274	1st stage lever mechanism	1	N°
12	206078370	2nd stage diaphragm	1	N°
13	620313000	2nd stage lever mechanism	1	N°
14	173192380	O-Ring gasket 114 11.87x1.78	1	N°
15	173009371	O-Ring gasket 112 9.87x1.78	2	N°



• REQUIRED TOOLS AND CONSUMABLES

- Wrenches		
Hex nut wrench	*(mm)*	8
Hex nut wrench	*(mm)*	16
Wrench for countersunk hex bolts (Allen Key)	*(mm)*	3

- Torque wrenches			
			Torque setting (Nm)
Hex nut wrench	*(mm)*	8	4.5
Hex nut wrench	*(mm)*	8	6
Hex nut wrench	*(mm)*	16	15
Wrench for countersunk hex bolts (Allen Key)	*(mm)*	3	3
Torque wrenches with tolerance of less than 10% can be used			

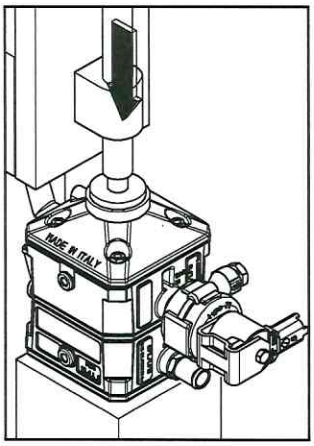
- Other tools
O-Ring remover
Pin punch Ø1.8 mm. max
2 screws M3x0.5 (x20 min.) (V)
Workbench clamp for positioning pressure regulator
Drill or similar equipment for making holes

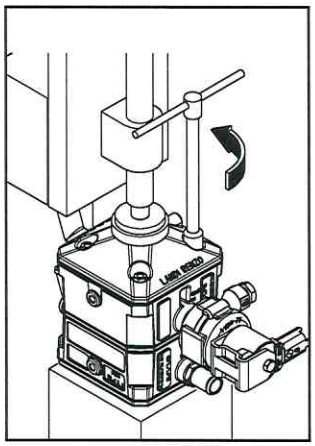
- Consumables
Thread sealant - such as Permabond A131 or equivalent
Lubricant: white oil such as FUCHS Renopal W505 or equivalent
Lubricant: mineral grease with 100 viscosity, temperature range (-35+100°C) such as TECNOLUBE BC 180HY/L or equivalent

NOTE

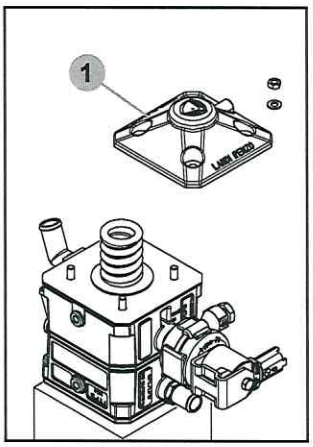
• OPERATIONS REQUIRED FOR THE 1ST STAGE

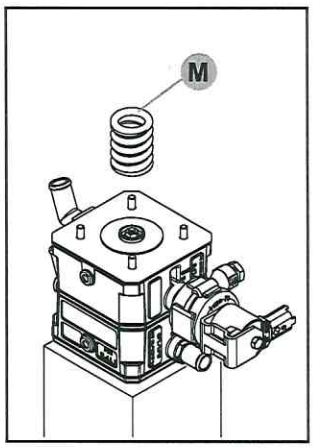
(DISASSEMBLY)



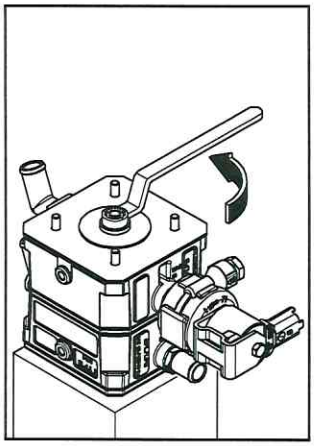


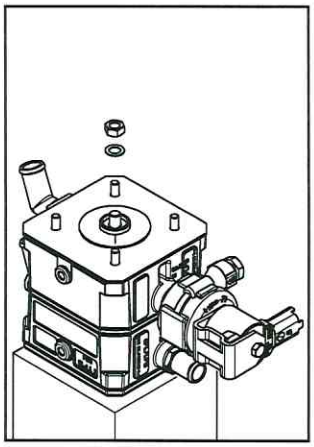
- Position the regulator on the workbench with the 1st stage face up.
- For operator safety purposes, immobilise the cover with a suitable piece of equipment to prevent the spring inside from escaping.
- Loosen the 4 nuts of the cover with a 8 mm wrench.



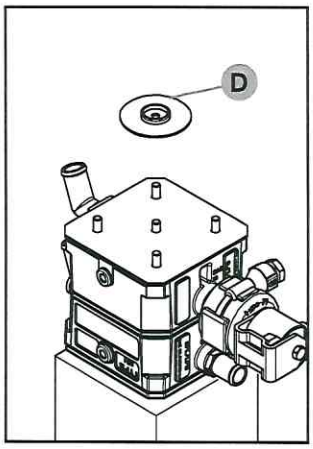


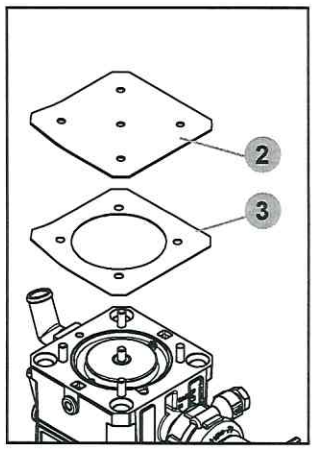
- Remove the nuts and washers.
- Gently release the cover (1).
- Remove the spring (M).





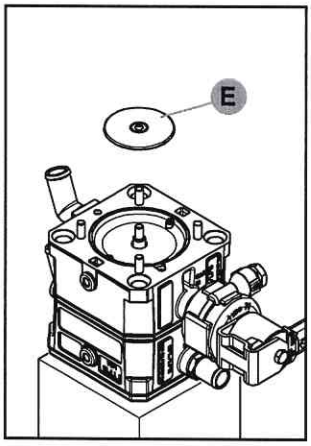
- Use an 8 mm wrench to undo the bolt that holds the disc.
- Remove the nut and spring washer.

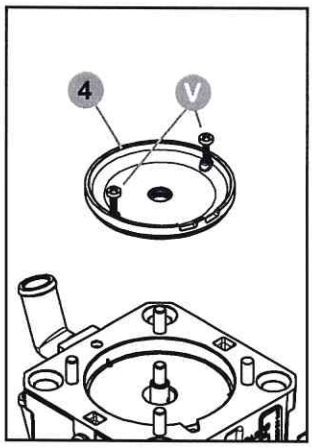




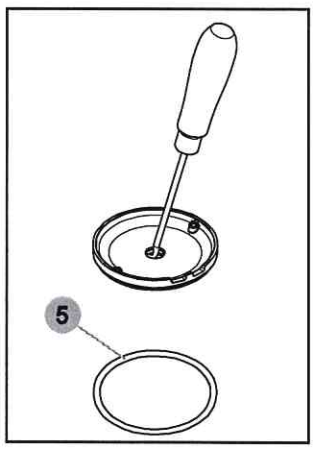
- Remove the upper disc (D).
- Lift off the diaphragm (2) and gasket (3).

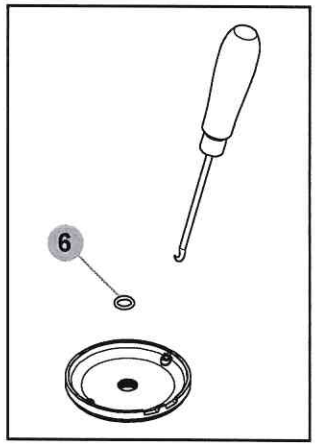
(DISASSEMBLY)



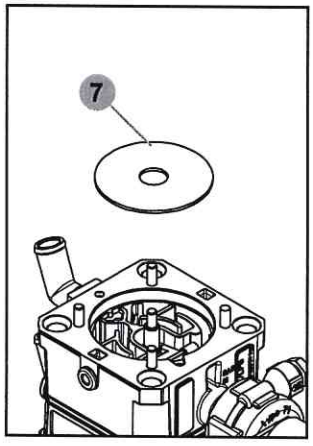


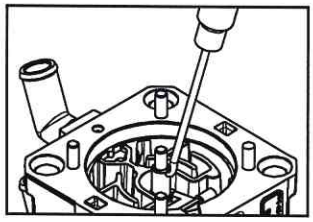
- Remove the lower disc E.
- To extract the separator disc 4 fit the two M3 bolts V in the threaded holes.

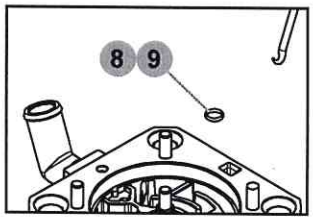




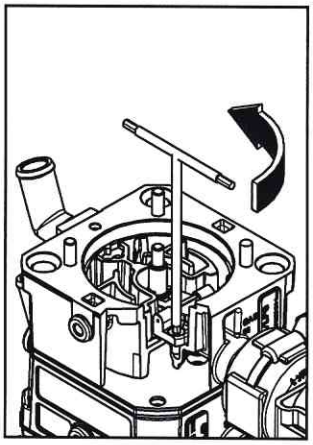
- Remove the external O-ring from the separator disc 5 and use the extractor to remove the inner O-Ring 6.

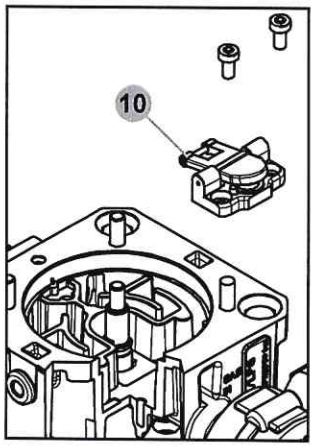






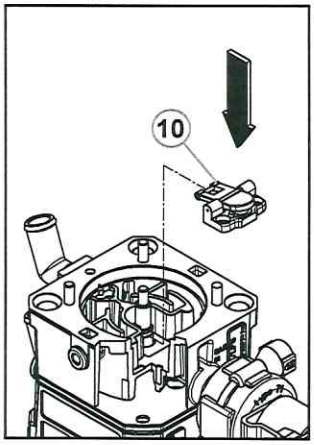
- Remove the felt gasket 7.
- Use the special tool to remove O-ring 8 or 9 (depending on the version fitted) from the joint stud.

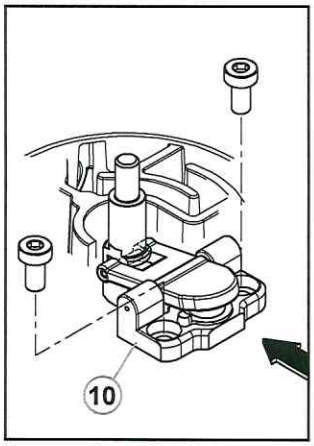




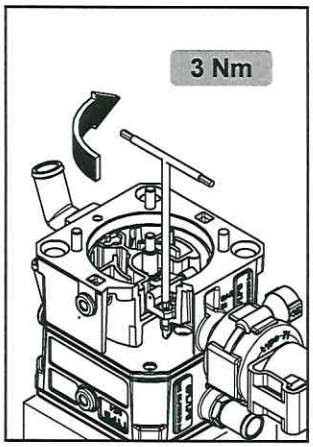
- Use the 3 mm hex wrench to undo the 2 bolts that hold the 1st stage lever mechanism.
- Remove the lever mechanism 10.

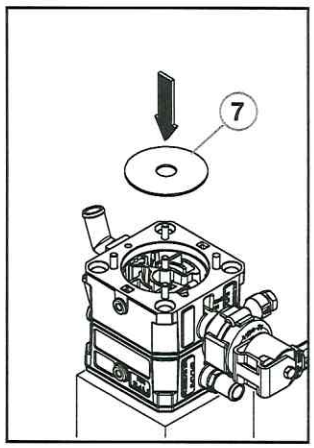
(ASSEMBLY)



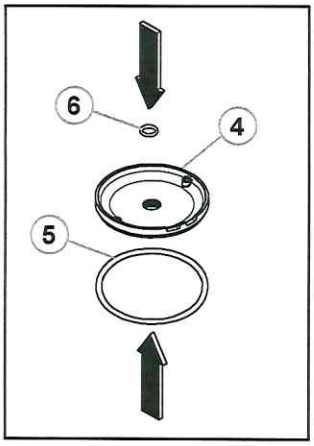


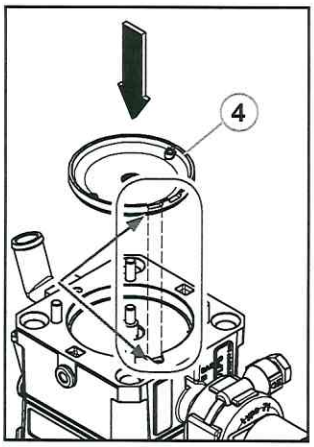
- Position the new lever mechanism (10) and fit it into the slot in the joint.



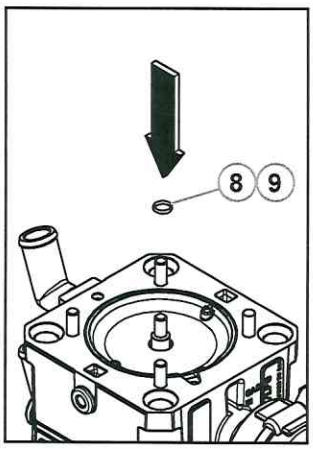


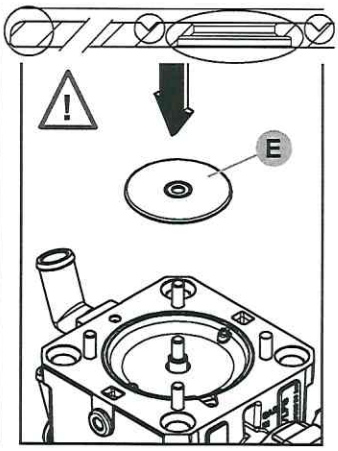
- Fix the lever mechanism in position with the two bolts. Tighten to 3Nm with a 3 mm torque wrench.
- Position the felt gasket (7) in its seat.





- Fit the O-Rings (5) (6) to the separator disc (4)
- GREASE the O-Rings with suitable grease (5) (6).
- Insert the separator disc (4) lining up the slot on the disc with the regulator body as shown.

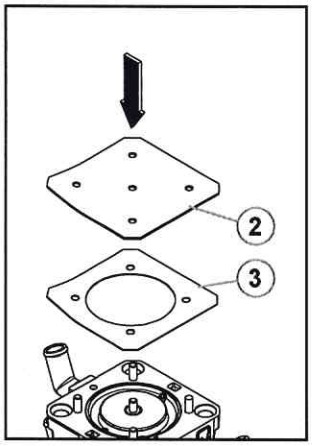


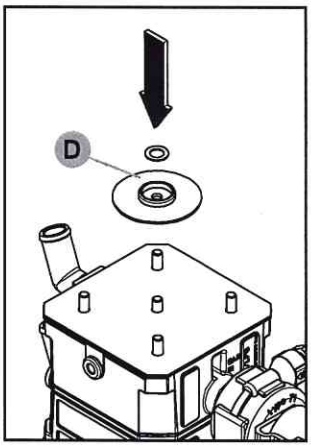


- Fit the new O-ring (8) or (9) (depending on version) to the centre stud.
- Insert the lower disc (E) on the centre stud.

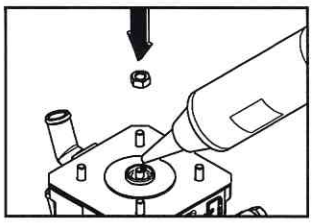
ATTENTION - the O-RING seat must be face down, while the chamfered edge and rounded Ø 10.5mm slot should be face up.

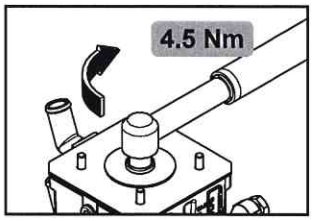
(ASSEMBLY)

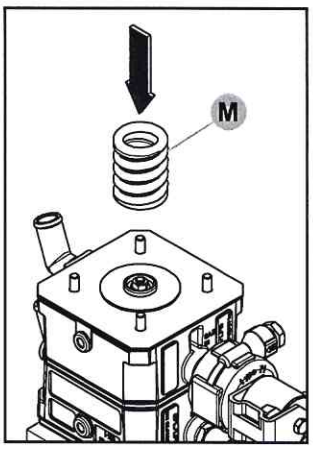




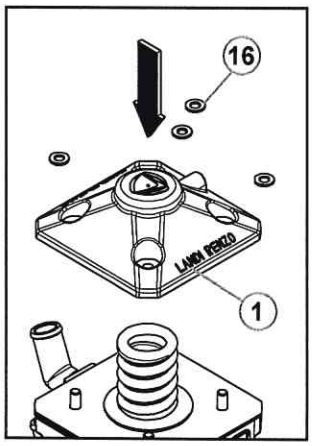
- Position the gasket and (3) diaphragm (2) above the pressure regulator body.
- Position the upper disc (D) and spring washer on the centre stud.

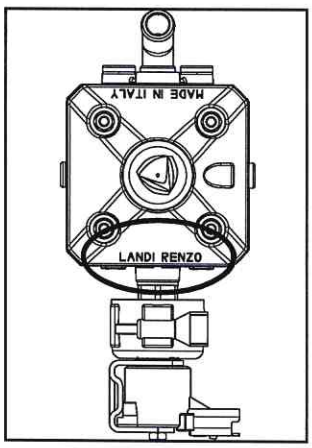




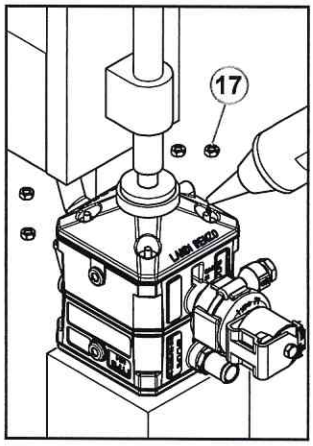


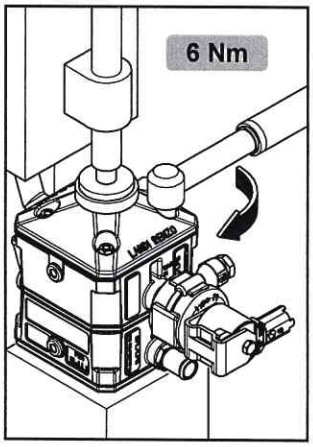
- Apply a little Permabond A131 thread sealant to the stud threads.
- Hand tighten the nut.
- Tighten to 4.5 Nm with a 8 mm torque wrench.
- Position the spring (M) on the upper disc.





- Position the cover (1).
- N.B. Take care to fit the cover correctly with the words LANDI RENZO on the electrovalve side. Incorrect fitting could result in a dangerous gas leak to the exterior.

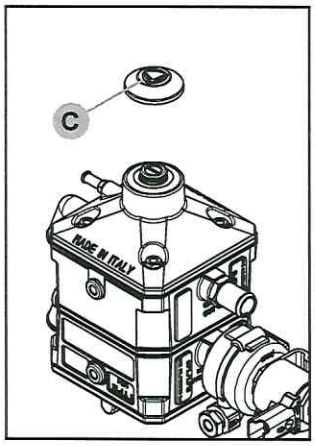


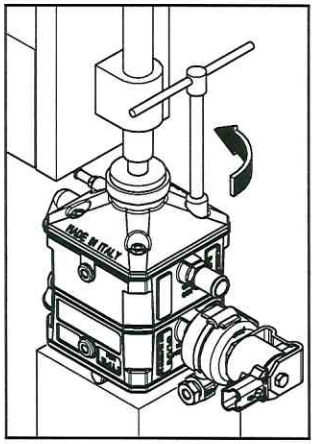


- Use the special tool to hold the cover in position and fit the 4 washers (16).
- Apply a little Permabond A131 thread sealant to the locating stud threads.
- Hand tighten the 4 nuts (17).
- Tighten to 6 Nm with a 8 mm torque wrench.

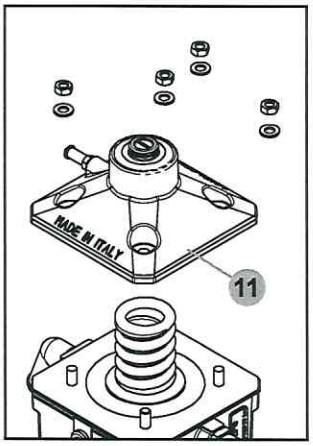
• OPERATIONS REQUIRED FOR THE 2ND STAGE

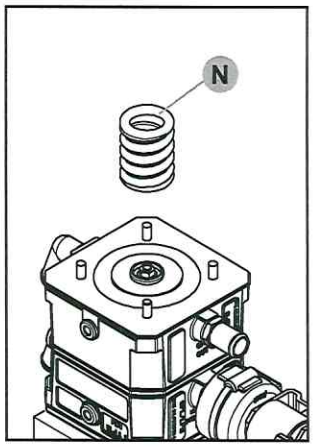
(DISASSEMBLY)



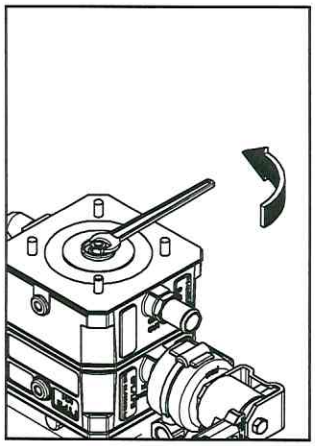


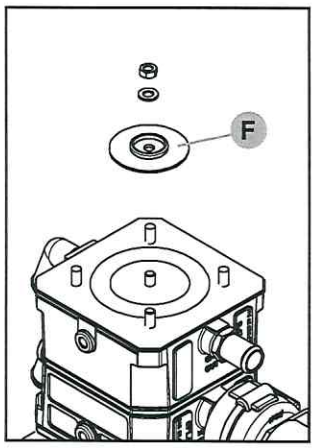
- Remove the protective cover **C** from the 2nd stage pressure adjusting bolt.
- Position the regulator on the workbench with the 2nd stage face up.
- For operator safety purposes, immobilise the cover with a suitable piece of equipment to prevent the spring inside from escaping.
- Loosen the 4 nuts of the cover with a 8 mm wrench.



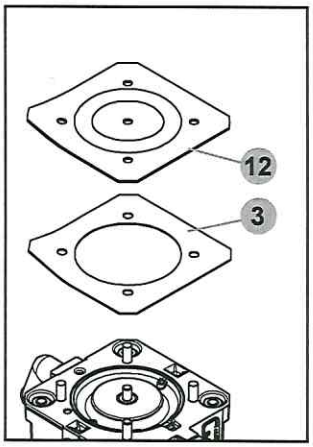


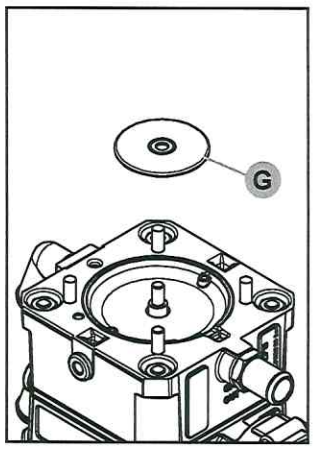
- Remove the nuts and washers.
- Gently release the cover **11**.
- Remove the spring **N**.





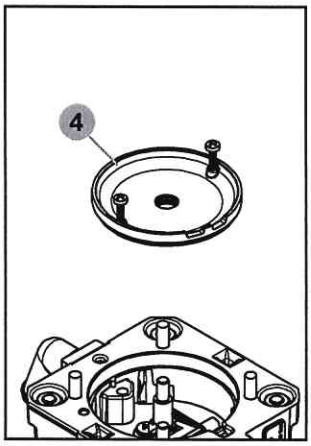
- Use an 8 mm wrench to undo the bolt that holds the disc.
- Remove the nut, the spring washer and the upper disc **F**.

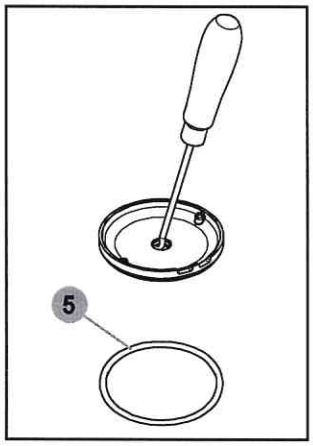




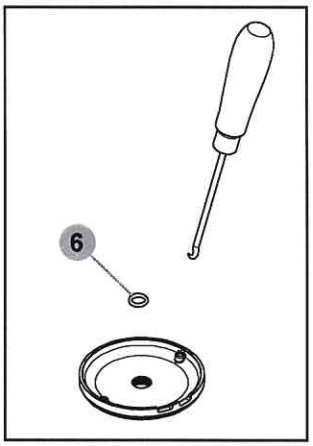
- Remove the 2 diaphragms **12** and **3**.
- Remove the lower disc **G** from the diaphragm.

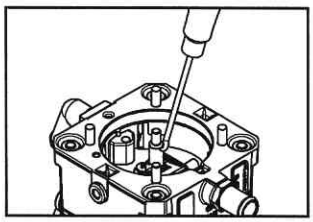
(DISASSEMBLY)

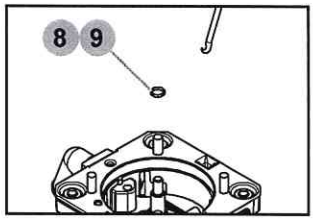




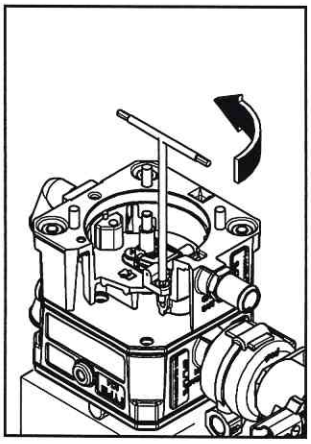
- Using the two M3 bolts, remove the separator disc 4 as shown in the diagram
- Remove the outer O-ring 5.

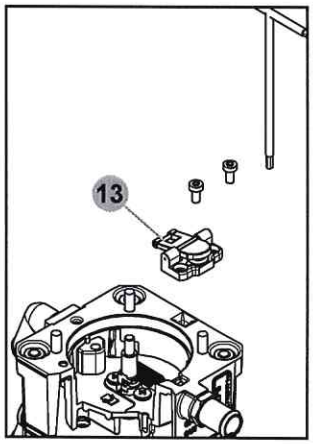






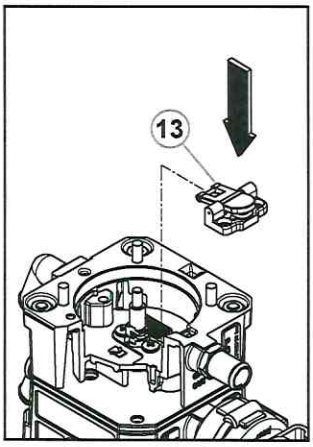
- Use the special tool to remove the inner O-ring 6 from its seat in the separator disc.
- Use the special tool to remove O-ring 8 or 9 (depending on the version fitted) from the coupling stud.

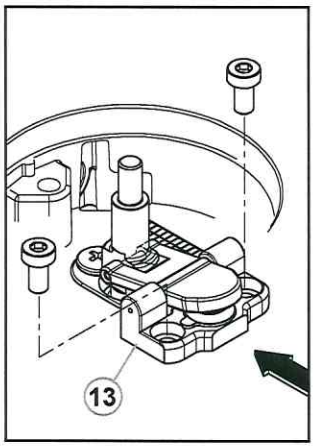




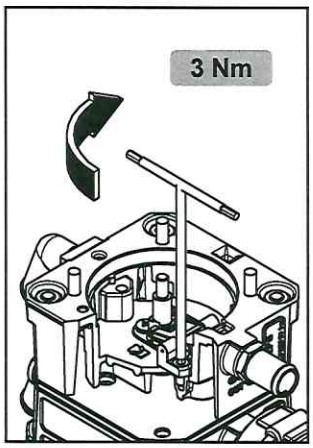
- Use the 3 mm hex wrench to undo the 2 bolts that hold the 13 2nd stage lever mechanism in position.
- Remove the lever mechanism.

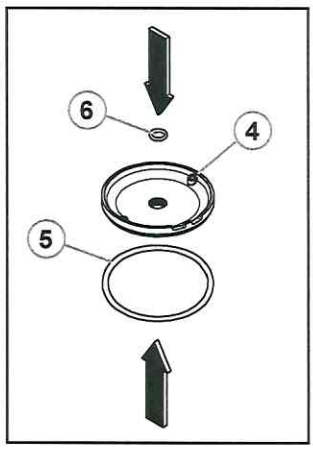
(ASSEMBLY)



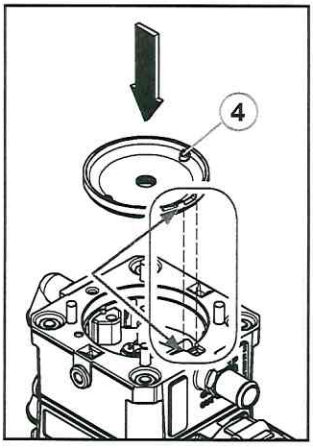


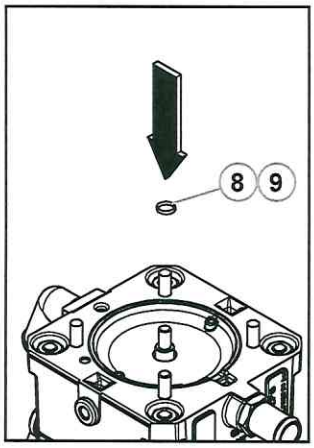
- Position the new lever mechanism (13) and fit it into the slot in the joint.
- Insert the separator disc (4) lining up the slot on the disc with the regulator body as shown.



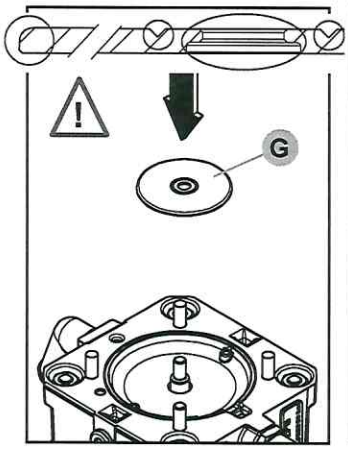


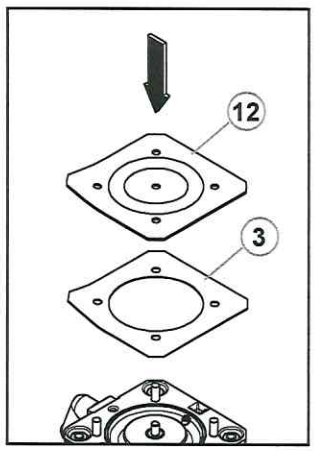
- Fix the lever mechanism in position with the two bolts. Tighten to 3 Nm with a 3 mm torque wrench.
- Fit the O-rings (5) and (6) to the separator disc (4).
- GREASE the O-rings with a suitable grease (5) e (6).





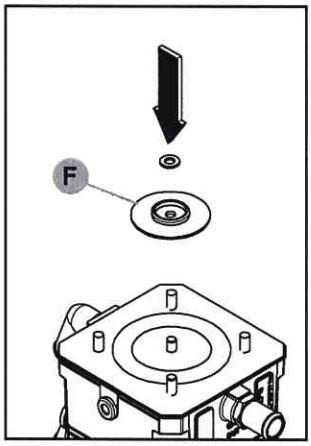
- Insert the separator disc (4) lining up the slot on the disc with the regulator body as shown.
- Fit the new O-ring (8) or (9) (depending on version) to the centre stud.

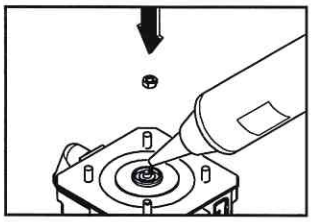


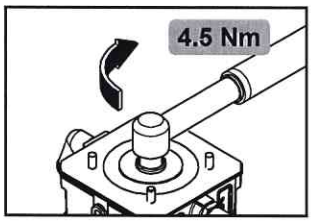


- Insert the lower disc (G) on the centre stud. **ATTENTION - the O-RING seat must be face down, while the chamfered edge and rounded Ø 10.5mm slot should be face up.**
- Position the gasket and (3) diaphragm (12) above the pressure regulator body.

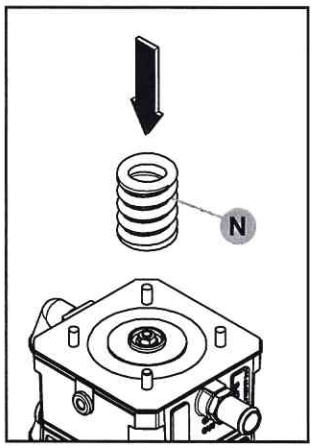
(ASSEMBLY)

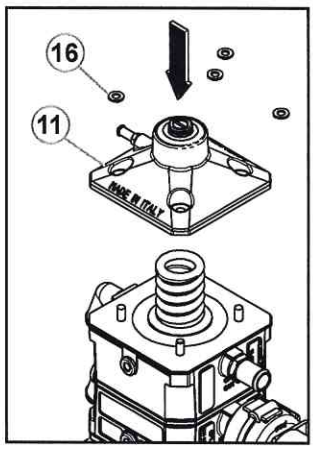




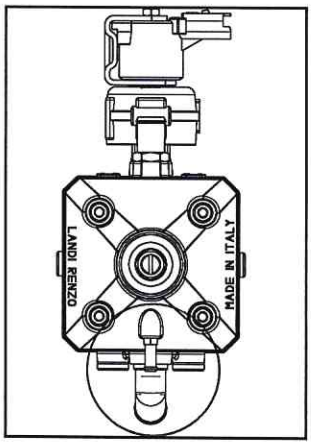


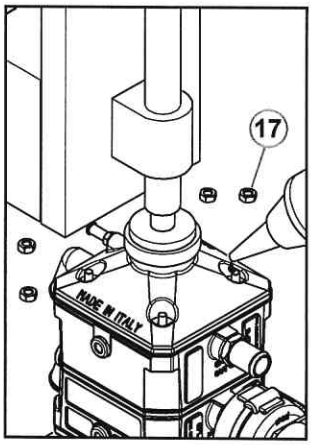
- Position the upper disc (F) and spring washer on the centre stud.
- Apply a little Permabond A131 thread sealant to the stud threads.
- Hand tighten the nut.
- Tighten to 4.5 Nm with a 8 mm torque wrench.



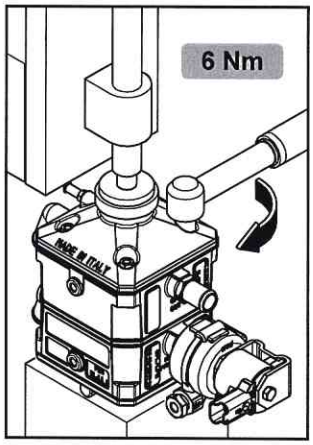


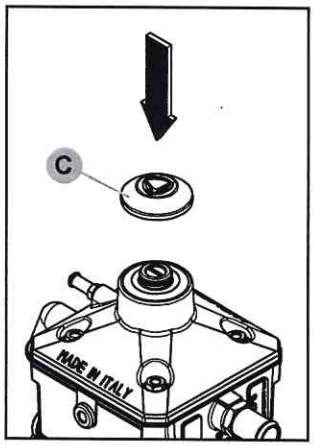
- Position the spring (N) on the upper disc.
- Position the cover (11).





- N.B. Make sure that the cover is in the right position with the compensation joint on the same side as the cooling fluid joints. Incorrect fitting could result in a dangerous gas leak to the exterior.
- Use the special tool to hold the cover in position and fit the 4 washers (16).
- Apply a little Permabond A131 thread sealant to the locating stud threads.

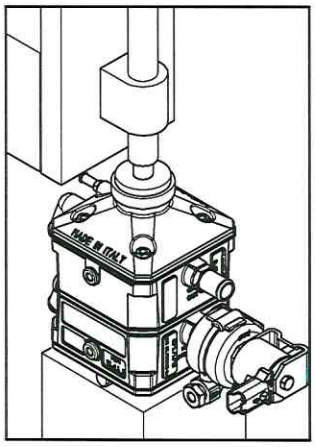


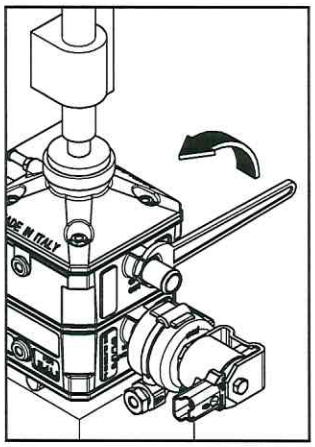


- Hand tighten the 4 nuts (17).
- Tighten to 6 Nm with a 8 mm torque wrench.
- Remove the pressure regulator from the clamp.
- Position the protective cover (C) on the 2nd stage pressure adjusting bolt.

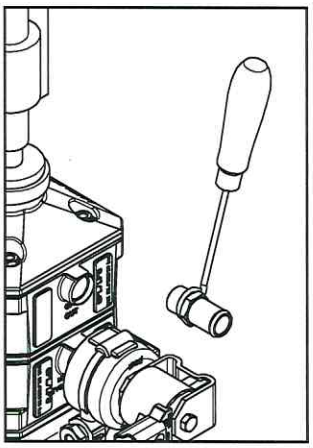
• GAS OUTLET COUPLING OPERATIONS

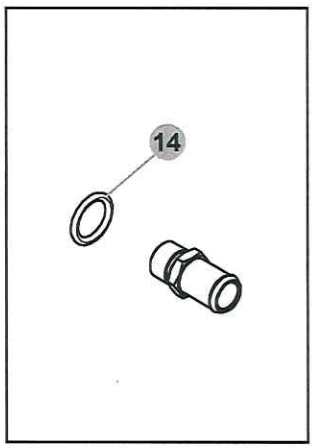
(DISASSEMBLY)





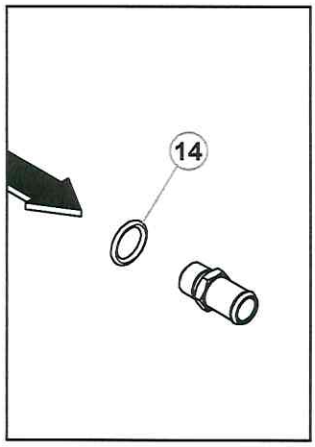
- Position the regulator on the workbench with the gas coupling facing the operator.
- Undo the gas coupling with a 16 mm wrench.

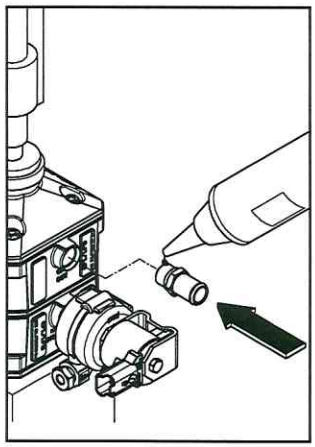




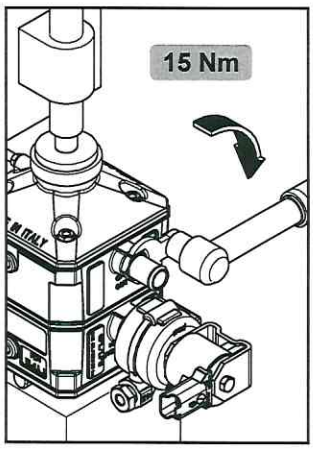
- Use the special tool to remove the O-ring (14) from the coupling.

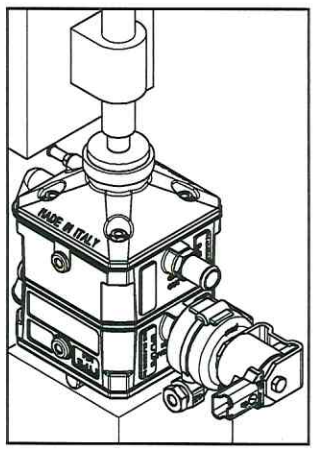
(ASSEMBLY)





- Fit the new O-ring to the gas outlet coupling (14).
- Apply a little Permabond A131 thread sealant to the threads on the gas outlet coupling.

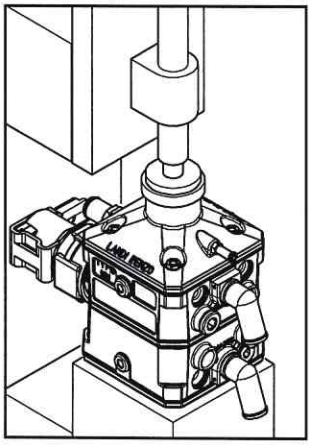
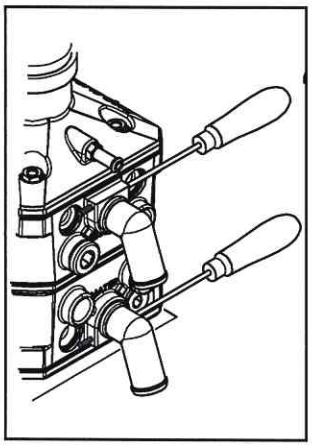




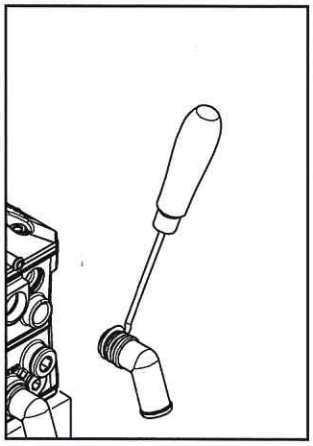
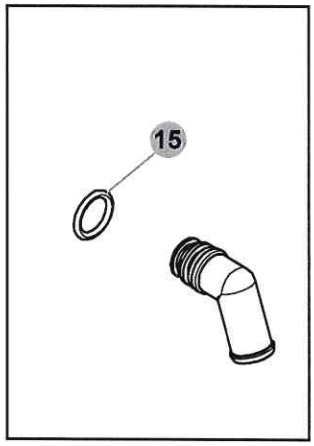
- Hand tighten the gas coupling
- Tighten to 15 Nm with a 16 mm torque wrench.

• PRESSURE REGULATOR HEATING FLUID COUPLING OPERATIONS

(DISASSEMBLY) ----------

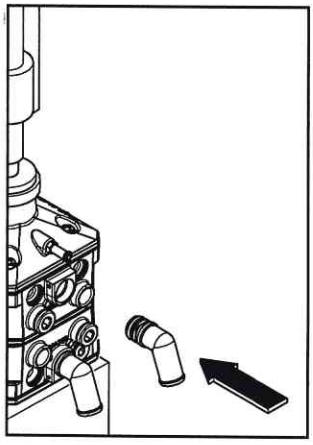
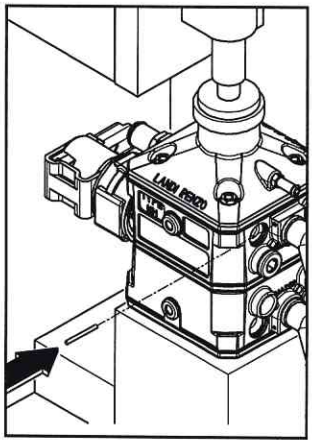



- Position the regulator on the workbench with the heating fluid couplings facing the operator.
- Insert the special tool in the holes on the coupling retentions pins and apply pressure until the pins come out. Remove the tool and slide the couplings off

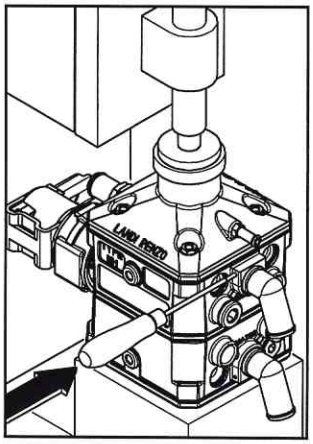
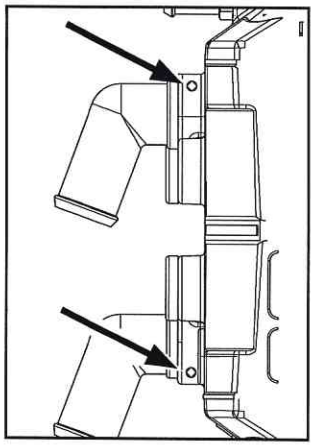



- Remove the O-ring with the special tool **15**.
- Fit the new O-ring to the coupling.
- Lubricate the O-ring with a film of oil.
- Repeat the operation with the second coupling.

(ASSEMBLY) ----------

- Manually fit the joints into their seats on the regulator body.

- Use the special tool to insert the studs in their seats.
- Use a punch or drift on both sides of the holes on the aluminium body to ensure that the pins are properly located in their seats.

ATTENTION

If you do not have the special tools needed for these operations, be very careful when tapping the pin holes as you could easily damage the regulator body.

• FINAL NOTES

NOTE

Before connecting the regulator to the vehicle and preferably immediately after having completed the physical installation, you must carry out the workbench test and calibration cycle.

In the event that the regulator test is not usually carried out immediately after installation or if there is a supply of untested regulators in stock, these must be marked as untested until such time as they are in fact tested.

The regulators that do not pass testing must be identified as items to repair or re-machine.