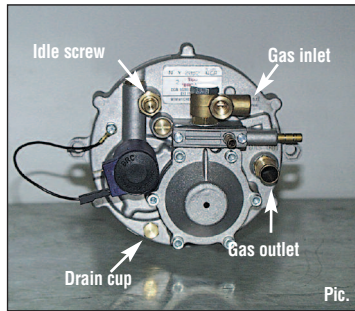


## REDUCER DISASSEMBLY

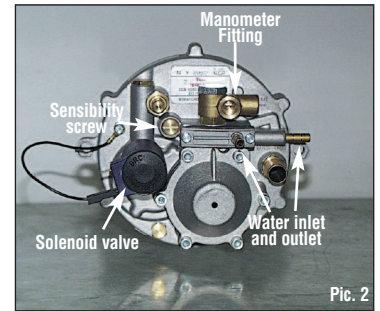
- 1) Place the regulator on a clean surface with the solenoid upright and the first stage towards yourself.
- 2) Disconnect the fast-on connector from negative of the coil and remove the solenoid valve group made of parts (37) to (47). Required tools: flat screwdriver, and 22 mm wrench. **N.B.:** don't separate components numbered (42), (43) and (44).
- 3) Replace O-Ring (41), shutter (37), spring (39) and cover (47). To replace shutter (37) clamp component (38) into a vice between two aluminium sheets to protect its surface against scratches. Then, using a flat screwdriver and taking care of not damaging the shutter site, take component (37) off and put the new one. **N.B.:** shutter (37) has truncated-cone section, place it with the smaller surface up.
- 4) With a flat screwdriver unscrew sensibility screw (50) and take spring (48) out. Replace O-Ring (49).
- 5) With a 16 mm wrench, disassemble cap (83) and replace O-Ring (82).
- 6) With two 22 mm wrenches, unscrew screw (2) holding, with the second wrench, gas inlet (8); to avoid its rotation.
- 7) With an 8-mm wrench, disassemble the water room cover (91), take the gasket (90) off and replace it.
- 8) With a 19 mm wrench, unscrew part (86) and replace O-Ring (85).
- 9) With a 13 mm wrench, remove drain cap (89) and replace washer (88). A flat screwdriver may be necessary to take the washer out.
- 10) With a 5 mm Allen key take the first stage cover (22) out and keep screws (24). The correct procedure is the following: unscrew of 1/2 turn all screws than keeping the cover closed, unscrew it completely following the sequence A-D-F-C-B-E (Pic. 3).
- 11) Take spring (21) out and replace vibration-damping (20).
- 12) With a 13 mm wrench, unscrew screw (19) and dismount the first stage diaphragm.
- 13) With a Phillips screwdriver, unscrew the first stage lever working on components (11) to (15) keeping part (14).
- 14) Take out the valve made up of body (10), shutter (9), spring (39) and pivot (97) with a screwdriver through the whole of the part (8). Replace valve, spring (39) and pivot (97) by the new components contained in the overhaul kit.
- 15) Remove idle screw control valve made up of parts (64), (78), (66) and (67) and replace O-Rings (64) and (66). To dismount component (78) clamp the regulator body in a vice taking care of closing it between the first stage edge and the third stage. Then operate with a 19 mm wrench.
- 16) Slew the regulator with the third stage bottom up and the brass water inlet to the right as in picture 4. With an 8 mm wrench take the third stage cover (62) out. Unscrew of 1/2 turn all screws (63) than, keeping the cover closed; unscrew it completely following the sequence A-D-F-C-B-E (Pic. 4).
- 17) Take out the third stage diaphragm parts (57) to (61) keeping the third stage lever (55). Replace it by that contained in the overhaul kit.
- 18) With a 7 mm wrench unscrew the third stage lever screws (29), take out the lever keeping part (54). Take components (51)+(52) out of lever (55), cutting the rubber tail, than take part (51) out from (52) using a screw driver or the pivot (54). Replace part (51) and mount it again into part (52) and both into (52) that has never been removed from its original position into lever (55). Keep nut (56) up right and using a flat nose pliers pull the tail into its definitive site.
- 19) With a 13 mm wrench remove the safety valve (81), take spring (80), part (79) and shutter (65) out. Separate shutter (65) from its own body (79) with a compressed air flow or with a flat screwdriver. Replace shutter (65) by that contained in the overhaul kit.
- 20) With a 3 mm Allen key, remove the second stage cover (35), keep the screws (36). Unscrew of 1/2 turn all screws, then keeping the cover closed, unscrew it completely following the sequence A-B-C-D.
- 21) Take the spring (34) out and replace vibration-damping (33).
- 22) Take out the second stage diaphragm device made up by parts (30), (31), (32), (96) and (98) lifting part (31) a little bit up and pulling it to left. With a 15 and 8 mm wrenches, separate the different parts and replace the diaphragm (31). Then assemble it again taking care that the cutting burr of the washer (32) shouldn't touch the rubber. Mount the washer (33) convex on washer (32). Put some thread locking glue (suggested product Loctite 83-37) on component (30) and tight it with a 4-Nm-torque.
- 23) With a 7 mm wrench (better if it is a socket spinner wrench with handle), unscrew the second stage lever screws (28) and take it out from its place. Keep part (27).
- 24) Take out the second stage shutter (25) with a compressed air flow or with a flat screwdriver in order to separate parts (25) and (26). Replace shutter (25) by that contained in the overhaul kit. **N.B.:** shutter (25) is truncated-cone section and it is necessary to place it with the smaller surface up.
- 25) Clean regulator body (1). Check that the contact surfaces of the first, second and third stage shutters on the regulator body, the contact surface of the solenoid valve shutter and the regulator body are not damaged. Should they be damaged, replace the regulator body.

## REDUCER RE-ASSEMBLY

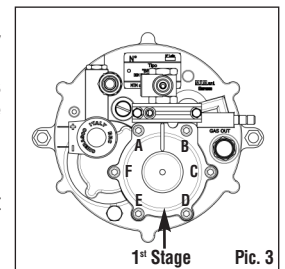
- 1) Place regulator body on a clean surface with the second stage towards you and the brass water inlet to left.
- 2) Fit the second stage lever made by components from (25) up to (28). With a 7 mm wrench (better if it is a socket spinner wrench with handle), screw screws (29) with a 2-Nm-torque, taking care of executing this operation in two times: at first it is necessary to approach the screws at their final position, than tight the screws with the correct torque.
- 3) Fit the new second stage diaphragm hooking it at the lever. Mount components (33), (34) and (35).
- 4) Keeping down the second stage cover, place the screws (36) with the new washers (95) contained in the overhaul kit. Then close screws (36) with an Allen key of 3 mm using the following procedure:
  - a) fit the screws following the sequence A-C-B-D;
  - b) screw two complete turns following the sequence C-A-D-B;
  - c) repeat (b) operation until all screws will not be at their final position;
  - d) tight with a 2-Nm- torque following the sequence A-C-B-D.
- 5) Fit the safety valve group made by components (65), (79), (80) and (81). Tight with a 13 mm wrench applying a 6-Nm-torque.
- 6) Turn out the regulator body and put it with the first stage towards you and the brass water inlet to right.
- 7) Insert the valve (10) including spring (39) and pivot (97) into fitting (8) taking care to place it with shutter (9) right up oriented.



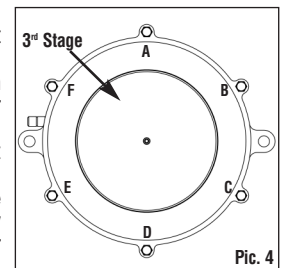
Pic. 1



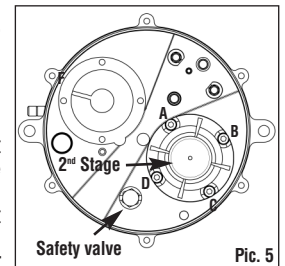
Pic. 2



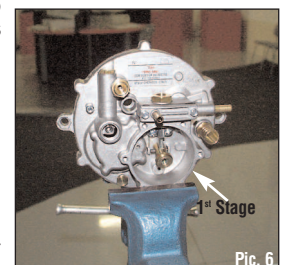
Pic. 3



Pic. 4



Pic. 5



Pic. 6



Pic. 7

8) Assemble the first stage lever made by components from (11) up to (15). With a Phillips screw driver tight screws (11) with a 2,5-Nm-torque taking care of executing this operation in two times: at first it is necessary to approach the screws at their final position, than tight the screws with the correct torque.

9) Verify, with a thickness gauge than between valve (10) and lever (13), there is a space between 0,6 and 0,9 mm. If the previous steps has been done correctly, no more operation are needed, otherwise disassemble again the first stage lever and file or rivet it as per the pictures 6 and 7.

10) Re-assemble the first stage diaphragm made by components (16), (17) e (18), paying attention that diaphragm rabbet corresponds to that on the regulator's body. Take care that the cutting burr of washers (16) and (18) shouldn't touch the rubber. On screw (19) put some thread locking glue (suggested product Loctite 83-37) and tight it with a 15-Nm-torque. Part (94) must be changed by that contained in the overhaul kit.

11) Re-assemble components (20), (21) and (22); keeping down the first stage cover (22), place the screws (24) with the new washers (23) contained in the overhaul kit. Then close screws (24) with an Allen key of 5 mm using the following procedure:

a) fit the screws following the sequence A-D-B-E-F-C;

b) screw two complete turns following the sequence A-D-B-E-F-C;

c) screw two complete turns following the sequence E-B-F-C-D-A;

d) screw two complete turns following the sequence C-F-B-E-D-A;

e) repeat (b), (c), (d) operation until all screws will not be at their final position;

f) tight with a 6-Nm-torque following the sequence A-D-B-E-F-C.

12) Fit component (86) and its O-Ring (85) and tight it with a 19 mm wrench with a 12-Nm-torque.

13) Re-assemble water room cover (91) and gasket (90) tightening screws (93) with an 8 mm wrench using a 3-Nm-torque.

14) Insert into fitting (8) filters (5) and (6) and re-assemble the fitting (4) with the O-Rings (3). Lock with screw (2) with a 22 mm wrench using a 45-Nm-torque.

15) Screw sensibility screw (50) with O-Ring (49) closing, with a flat screwdriver, four complete turns.

16) Fit component (78) and O-Ring (64) closing, with a 19 mm wrench using a 12-Nm-torque. Re-assemble idle screw (67) and O-Ring (66) screwing it of two turns.

17) Fit component (83) and O-Ring (82) closing it with a 16 mm wrench using a 12-Nm-torque.

18) Re-assemble the coil made by components (37) and (38) (assembled before), (39), (41) and (42) taking care spring (39) does not escape from its own site into component (38). Tight, with a 21 mm wrench component (42) on regulator body (1) with a 12-Nm-torque. Place coil (45) and cap (47) taking care of using the new one contained in the overhaul kit. Connect the earth wire at the negative pole of coil (45). 19) Fit the cap (89) with the gasket (88). Close it with a 13 mm wrench using a 15-Nm-torque. 20) Turn up the regulator placing it with the second stage towards you and the brass water inlet to right.

21) Insert the sensibility spring into its own site. Fit the third lever stage made by components from (51) up to (56). With a 7 mm wrench, tight screws (29) with a 2-Nm-torque taking care of executing this operation in two times: at first it is necessary to approach the screws at their final position, than tight the screws with the correct torque. **N.B.:** calibration grain (56) must never been removed from the original position.

22) Hook third stage diaphragm (59) and lever (55). Keeping down the first stage cover (62), place the screws (63). Then close the screws (24) with an 8 mm wrench using the following procedure:

a) fit the screws following the sequence A-D-B-E-F-C;

b) screw two complete turns following the sequence E-B-F-C-D-A;

c) screw two complete turns following the sequence C-F-B-E-D-A;

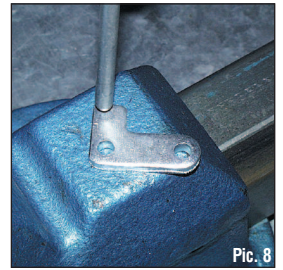
d) screw two complete turns following the sequence F-C-E-B-D-A;

e) repeat (b), (c), (d) operation until all screws will not be at their final position;

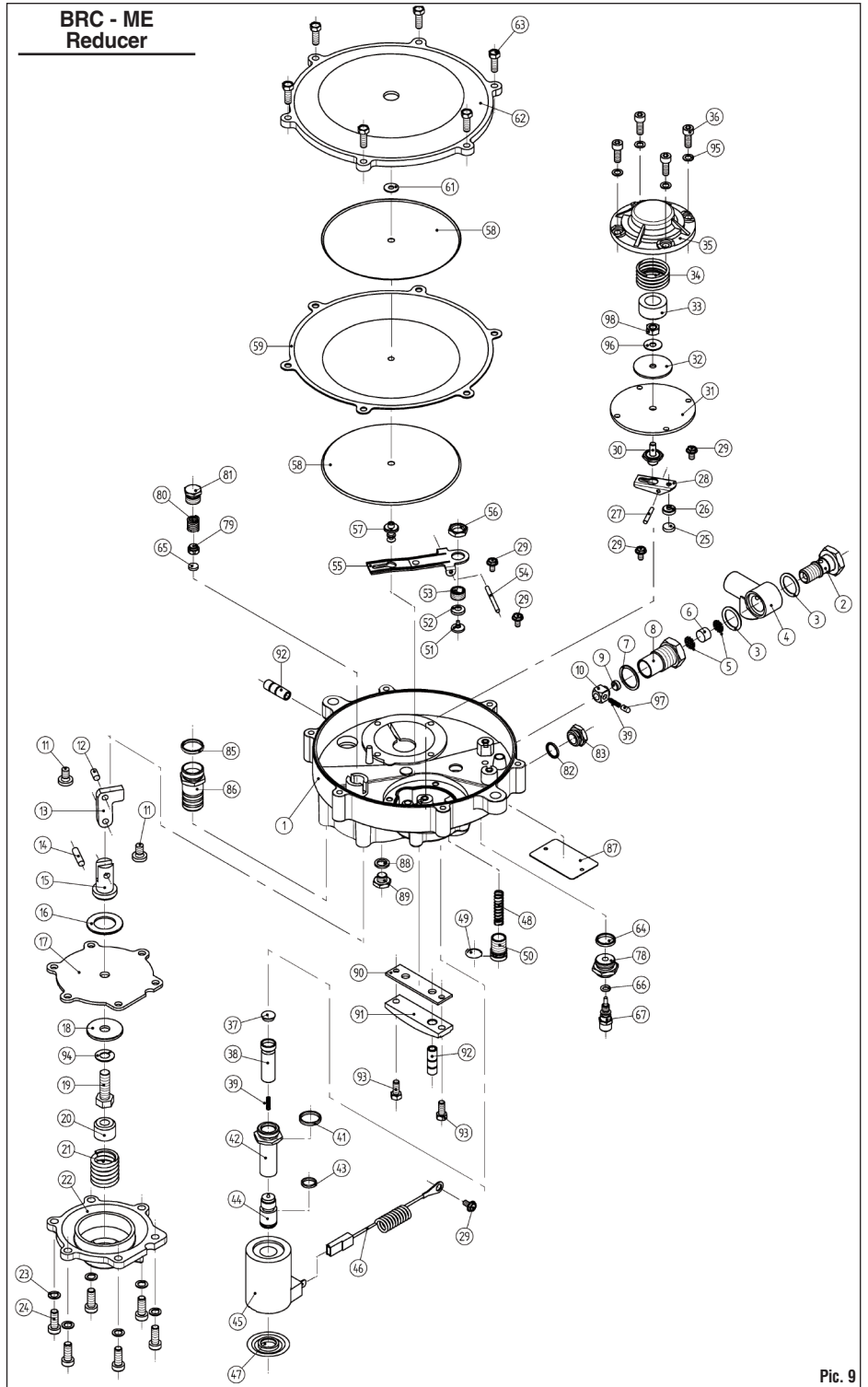
f) tight with a 3,5-Nm-torque following the sequence A-D-B-E-F-C.

23) Turn up the regulator placing it with the idle screw towards you and the brass water inlet to left. With a correct fitting connect the CNG inlet fitting (4) to the air-compressed pipeline. Connect the coil positive pole to a 12 Volts signal and verify that the coil open (it is clearly audible). Close completely sensibility screw (50) and idle screw (67). Open the compressed air flow with a maximum pressure of 6 – 7 bars. Unscrow sensibility screw (50) unless a small leakage from regulator output (86) will be perceptible. Close the compressed air flow and switch off the electrical power to the positive pole of regulator coil (45). Open the idle screw of 3/4 turn.

**N.B.:** All torques indicated in this manual must be considered with a tolerance range from – 0 to + 10%.



Pic. 8



Pic. 9