



INTRODUCTION

For the reducer complete overhaul all the phases described hereunder have to be followed. We suggest to carefully clean all the components that are not replaced during the overhaul.

PRELIMINARY OPERATIONS

- Place the reducer in a vice with the gas outlet connection (21) towards the high.
- By using a 17 mm hexagonal wrench, unscrew the temperature sensor (23). During this operation be careful not to twist the sensor electric harness.
- With a 4 mm Allen key turn clockwise the adjustment screw (9) till reaching the maximum.
- Remove and disassemble the rotary coupling from the water cover (24) as indicated in Part. X. To do this operation it is necessary to use two 22 mm wrenches in order to avoid the rotation of part (30).
- Take out parts (65), (66) and (67).

1ST STAGE DISASSEMBLY AND OVERHAUL

- Turn the reducer upside down with the water cover (24) towards the high.
- Using a 5 mm Allen key unscrew the screws (49) taking care to recover the washers (50). The correct procedure is the following: unscrew 1/2 turn all screws than, keeping the cover closed, unscrew it completely following the sequence A-B-C-D as shown on PART. R.
- With suitable pliers take the two seeger (40) and the bush (46) out from the cover (47).
- Take spring (45) out.
- Lifting a little bit up and pulling it towards you, take out the 1st stage diaphragm device composed by parts from (39), (42), (48), (38), (41), (72) and (43). With a 13 and 10 mm wrenches, separate the different parts and replace the diaphragm (48). Then assemble it again taking care that the cutting burr of the washers (41) and (42) shouldn't touch the rubber. Mount the washer (72) convex on washer (41). Put some thread locking glue (suggested product Loctite 83-37) on component (39) and tight it with a 4-Nm-torque.
- With a 5 mm Allen key unscrew the screws (52) from the body (24) and take the lever (37) out recovering part (51).
- With a \varnothing 2 mm pin punches remove the 1st stage shutter consisting of the following parts: (33), (34), (35) and (36).

2ND STAGE DISASSEMBLY AND OVERHAUL

- Turn the reducer till having the gas outlet coupling (21) towards the high.
- With a 3 mm Allen key unscrew the external 6 screws (18) of the gas cover (6) taking care of recover washers (71). The correct procedure is the following: unscrew 1/2 turn all screws than, keeping the cover closed, unscrew it completely following the sequence E-F-G-H-I-J as shown on PART. S.
- Remove from the water cover (24) the group consisting in the body (2), the 2nd stage and the gas cover (6). Turn it till the gas coupling (21) is upwards and put it in a wrench taking care to hold it on the body (2).
- Unscrew the 6 internal screws (18) taking care of recover washers (71) making a pressure on the gas cover (6). The correct procedure is the following: unscrew 1/2 turn all screws than, keeping the cover closed, unscrew it completely following the sequence K-L-M-N-O-P as shown on PART. S.
- Take water cover (6) and spring (7) out.
- With a 8 mm hexagonal wrench unscrew the piston (14) and replace O-Rings (15b).
- With a flat screwdriver, take parts 73, 11, 12, 15a and 13 out. Replace diaphragm (12) and O-Ring (15a).
- With a Phillips screwdriver unscrew screws (19) from the body (2) and remove the lever composed by parts (1), (3), (4) and (5) recovering parts (4) and (17).
- Using compressed air flow or a \varnothing 2 mm pin punches, separate shutter (5) from part (1).
- With a light pressure on the component (9) remove parts from 8 to 10.
- Take the O-Ring (25) out of the body (2).
- Wash carefully all components using BRC liquid cleaner (code 90AV990054).
- Check the integrity of the contact areas for the shutters in the 1st and 2nd stage. In case the areas are damaged, replace the aluminium component.

ASSEMBLY

- Introduce the bush (46) and its seeger (40) in the cover (47) taking care the conic part of the bush (46) exit from first stage cover (47).
- Replace the O-Ring (10) on the component (9) and assembly it in the cover (6).
- Place the new O-Ring (25) on the component (2).
- Mount new shutter (5) in the component (1). **N.B.:** the shutter (25) has a truncated-cone section and it is necessary to put it with the smaller surface up.
- Place the body (2) in a wrench with the gas inlet hole downward taking care not to damage the O-Ring (25).
- Insert part (17) in the lever (3).
- Mount lever (3) with two screws (19) using a torque of 2 N•m.
- Introduce the washer (13) with convexity to part (17). Mount the new O-Ring (15a) and the new diaphragm (12) taking care the component (27) passes through the hole of the rubber.
- Insert washer (11) with the smaller diameter toward washer (73).
- Mount washer (73) with convexity to piston (14).
- Insert the new O-Rings (15b) on the piston (14).
- Put some Loctite on the pivot thread (17) (suggested product Loctite 83-37). Screw the piston (14) on the pivot (17) using a 8 mm hexagonal spanner applying a torque of 1,5 N•m.
- Mount the spring (7) and the cover (6) with the components (8), (9) and (10) taking care the component (27) pairs with the gas outlet connection (21).
- Screw the 6 internal screws (18) and washers (71) of the cover (6) using a torque of 2,5 N•m. **N.B.:** Washers (71) have to be assembled with the concave part towards the cover (6).
- Remove the obtained group from the wrench.
- Pair the water cover (24) and the gas one (6) taking care to follow the indication in the exploded view with the gas outlet connection (21) corresponding to the water ones (28).
- Close the regulator in a wrench tightening it into water cover (24). Screw the external screws (18) and washers (71) of the cover (6) using a torque of 2,5 N•m. **N.B.:** Washers (71) have to be assembled with the concave part towards the cover (6).
- Turn the regulator with water cover (24) bottom up. Mount parts from 33 to 36 in the gas inlet (30) and be sure the component (33) stays to the external part of the reducer.
- Assemble the lever (37) and pivot (51) with the two screws (52) using a torque of 2,5 N•m.
- Hook the 1st stage diaphragm on the lever (37).
- Replace de vibration-damping (44) in the spring (45) mounting it with the smaller diameter toward first stage cover (47), then place them on the diaphragm (48).
- To close the 1st stage follow these steps:
 - place the cover (47) with the compensation hole towards the water connections (28),
 - slightly press the cover to pair it with the body,
 - close with the 4 screws (49) and washers (50) using a torque of 5 N•m.
- Insert parts (65), (66) and (67) in the rotary coupling and mount it on the water cover (24) as indicated by the item X. With two 22mm hexagonal wrenches close the screw (68) holding component (30) to avoid its rotation. Apply a torque power of 30 N•m.
- Replace the O-Ring (29) and with a 17 mm hexagonal wrench assemble again the temperature sensor (23) using a torque of 9 N•m. During this phase, pay attention not to twist the sensor electric wire.
- Close one of the two water connections (28).
- Connect the free one with a manometer for compressed air and feed a pressure of 4-5 bar. Control on the manometer the pressure does not decrease. **N.B.:** a possible pressure fall means a wrong assembly.

REDUCER ADJUSTMENT

- Install the reducer in the vehicle.
- Connect the PC and open BRC software-diagnosis page.
- Start the engine and change to gas.
- Unscrew the adjustment screw (9) till reaching a ΔP value of 2500 mbar \pm 50 mbar.