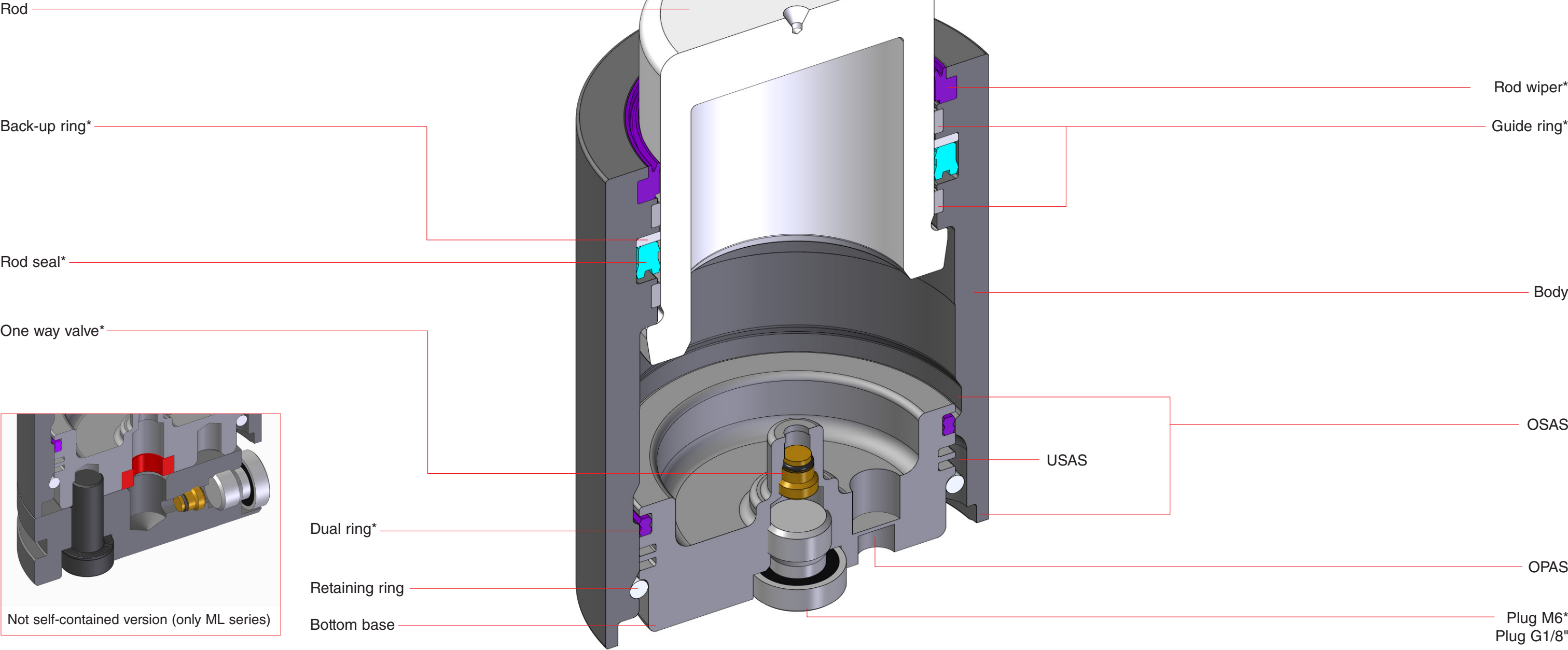


MP 1000 A ÷ MP 3000 A
ML 1000 C ÷ ML 12000 C

* included in the maintenance kit



Cod. 39DMA

Complete device for checking, decreasing/increasing pressure. It consists of two units:
- Main 39DMCILA
- Secondary 39DMCPVA



Cod. 39DMCILA

Multi device for charging, discharging and adjust gas pressure.



Cod. 39DMCPVA

3 meters of high pressure hose, 1 female Cejin quick fit, 1/2-20 UNF male coupling to connect to the nitrogen bottle.



Cod. QDFV01 for 1/8"G hole
Cod. QDFV02 for M6 hole

Cejin male quick fit adapter for direct charging.



Cod. 58CE03 for M6
Cod. 58CE05 for 1/8"G thread

Hex T-key to remove charging hole plug and valve retaining screw.



Cod. 39DDS01A

Discharging device. BLUE side for M6 hole GOLD side for 1/8"G hole



Cod. 39RFG

Special Springs gas detector to check gas leakage.



Cod. 58KNIPEX

Multipurpose pliers with spouts.



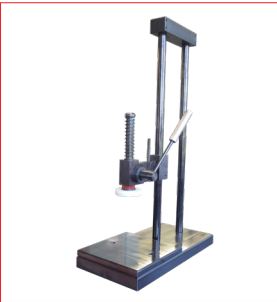
Cod. 58CD01

Torque wrench for one way valve.



Cod. 39PM02A

Table manual press for easy and safe positioning of components.



Cod. 49TB017.5 (ML 1000C - MP 1000A)
Cod. 49TB026.5 (ML 1800C - MP 2000A)
Cod. 49TB035.5 (ML 3000C - MP 3000A)
Cod. 49TB048.5 (ML 4700C)
Cod. 49TB061.5 (ML 7500C)
Cod. 49TB081.5 (ML 12000C)

Reassembly guiding tube + reassembly positioning tube for the retaining C-ring.



Cod. 49TC017.5 (ML 1000C - MP 1000A)
Cod. 49TC026.5 (ML 1800C - MP 2000A)
Cod. 49TC035.5 (ML 3000C - MP 3000A)
Cod. 49TC048.5 (ML 4700C)
Cod. 49TC061.5 (ML 7500C)
Cod. 49TC081.5 (ML 12000C)

Reassembly positioning tube.



Cod. 49TN023 (ML 1000C - MP 1000A)
Cod. 49TN032 (ML 1800C - MP 2000A)
Cod. 49TN036 (ML 3000C - MP 3000A)
Cod. 49TN045 (ML 4700C)
Cod. 49TN055 (ML 7500C)
Cod. 49TN070 (ML 12000C)

Anti scratch nylon tube.



The complete assembled kit along with this step-by-step service manual is result of Special Springs research for the most useful maintenance operation for Special Springs nitrogen gas cylinders. Few minutes and the Special Springs nitrogen gas cylinders are regenerated as new one.

Special Springs along with its own global network are pleased to help you anytime for the best result of your work.

Before starting any maintenance work, carefully check if the rod or the body of the cylinder are damaged or worn-out. If yes, it is recommended to replace the cylinder immediately and do not proceed with the maintenance operation.

Before starting any maintenance operation, carefully check that the maintenance kit corresponds to the model of cylinder for which it is required.

Before starting any maintenance operation, carefully check that this step-by-step manual corresponds to the model of cylinder for which it is required.

Instructions and pictures of this step-by-step manual could slightly differ from practice, depending on the cylinder's model.



All Special Springs step-by-step manuals are available for download from our web site: www.specialsprings.com



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**NITROGEN GAS
CYLINDERS MAINTENANCE
INSTRUCTIONS**

**ML 1000 C
ML 1800 C
ML 3000 C
ML 4700 C
ML 7500 C
ML 12000 C
MP 1000 A
MP 2000 A
MP 3000 A**

I. DISCHARGING AND VALVE REMOVAL for self-contained cylinders



1. Remove the protective plug from the charging hole by using the appropriate tool. Preserve the protective plug for further reassembly.
58CE05 for the 1/8 G port.
58CE03 for the M6 port.



2. Thread DDS discharging device on the charging port then exhaust completely the pressure. Point away from the operator for maximum safety.
39DDSO1A BLUE side for M6 hole
39DDSO1A GOLD side for 1/8"G hole



3. Be sure the pressure is completely exhausted by pressing down the piston rod into the cylinder body. Then unthread the discharging device from the discharging hole.



4. Unscrew and remove the one way valve from the hole by using the appropriate tool. It would be normal some oil leak from the hole when unscrew down the cylinder.
58CD01 Torque wrench for one way valve

II. DISCHARGING linked cylinders

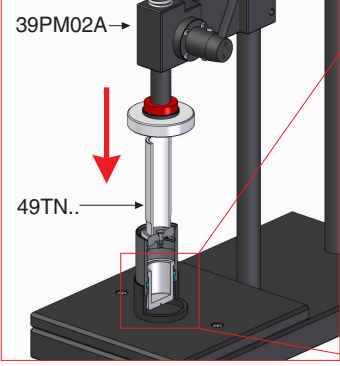


A. To exhaust pressure of linked cylinders open the discharging valve on the control panel.

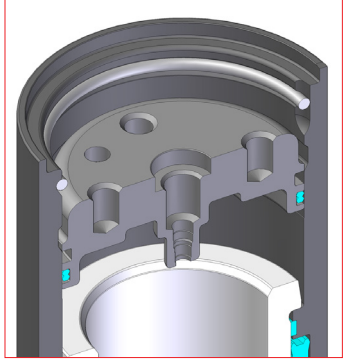
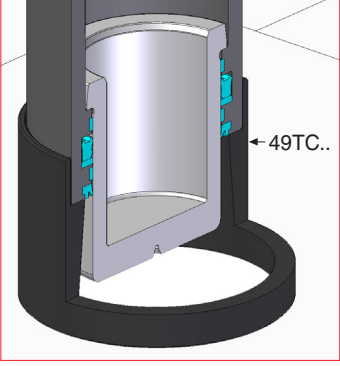


B. Be sure the pressure is completely exhausted by pressing down the piston rod into the cylinders body.

III. RETAINING RING REMOVAL



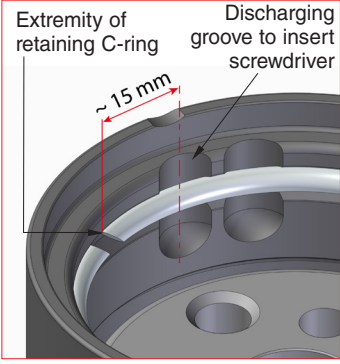
5. Press the bottom base inside the body using the manual press (**39PM02A**), the suitable anti-scratches nylon tube (**49TN..**) and the positioning tube (**49TC**) for an easy removal of the retaining C-ring.



6. Cross-section view of cylinder to see the right position of the bottom base and C-ring after operation.



7. Position and clamp the cylinder into a self - centring chuck or a vice.

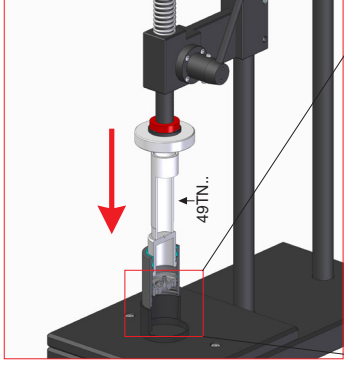


8. Position the extremity of the retaining ring at about 15 mm from the groove centre.

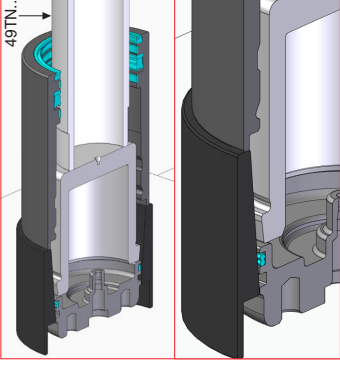
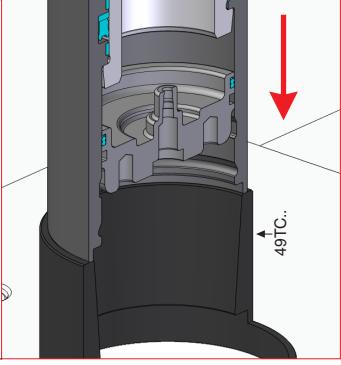


9. By inserting the screwdriver into the appropriate discharging groove, between the retaining ring and the body border, remove the ring as indicated. Use the **flat screwdriver 2,5x75**.

IV. REMOVING BOTTOM BASE + ROD



10. Press the rod inside the body using the manual press (**39PM02A**), the suitable anti-scratches nylon tube (**49TN..**) and the positioning tube (**49TB..**). Remove the rod and the bottom base from the body.

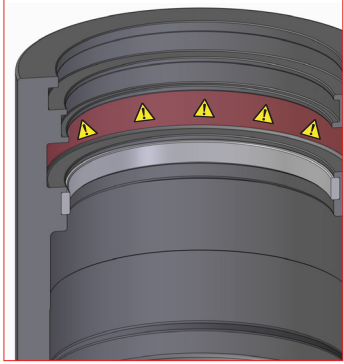


11. Example with the bottom base and the rod out of the cylinder body.

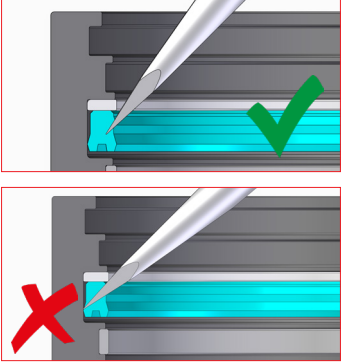


12. Remove from the cylinder body all the seals and guiding elements.

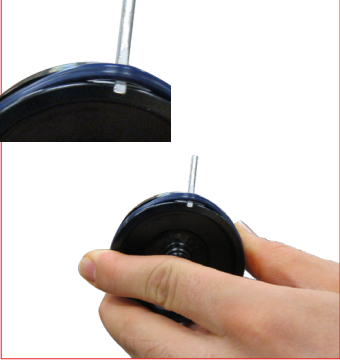
V. REMOVING SEALING COMPONENTS



13. While removing the sealing and guiding elements, pay attention NOT to damage the internal lodging grooves.



13.1 Remove the gas seal without scratching the internal lodging grooves with the screwdriver.



14. Remove the seal from the bottom base without scratching the internal groove.



15. Carefully check and clean the cylinder body, blowing inside pressurized air to remove residuals from the grooves. If the body shows any wear or damage DO NOT use it again and replace it with a new one.

VI. CLEANING AND INSPECTION



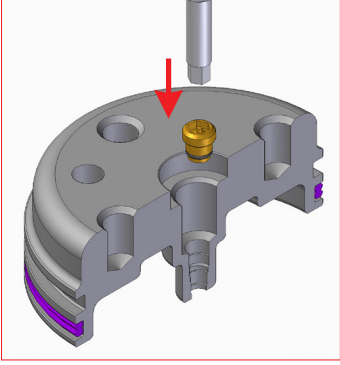
16. Carefully check and clean the rod. If the rod shows any damage, wear or scratch DO NOT use it again and replace it with a new one



17. Carefully check and clean the bottom base, blowing inside pressurized air to remove residuals from the dual-ring groove and charging port. If the bottom base shows any wear or damage DO NOT use it again and replace it with a new one.

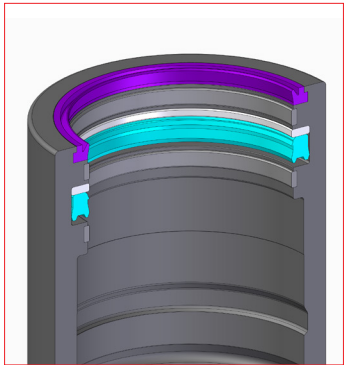


18. Assembly the dual ring on the bottom base as shown on the picture. Pay attention NOT to twist the dual-ring.

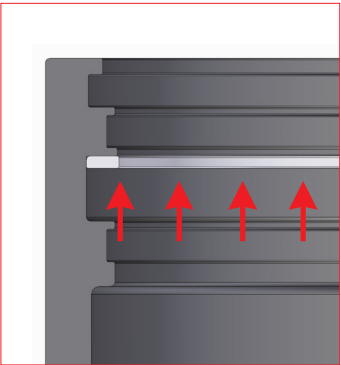


19. Return the one way valve into the original position. Screw it by using the torque wrench for one way valve until a "CLICK".
58CD01 torque wrench for one way valve

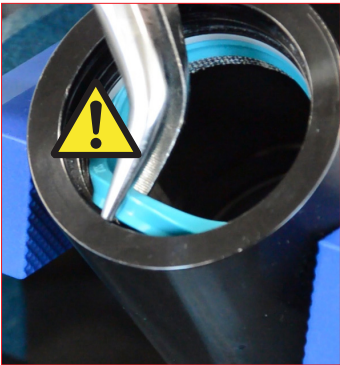
VII. REASSEMBLY OF COMPONENTS



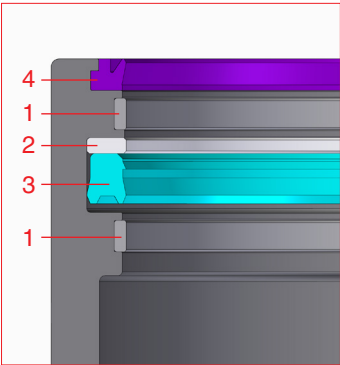
20. Assembly all the gas seals and guides (as shown on the picture) on the following order:
1 Guiding ring
2 Back-up rod seal
3 Rod seal
4 Rod wiper



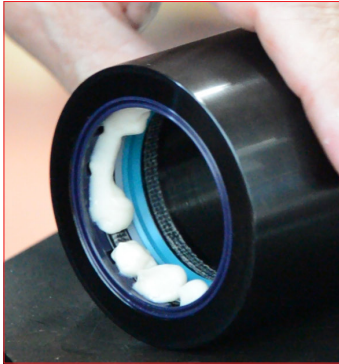
21. Once the back up ring is installed inside the groove, push it upward.



22. Install in the same groove the gas seal. If necessary, use the pliers avoiding damaging the lips of the gas seal ring.
58KNIPEX pliers



23. Cross-section view of a correct assembling.



23. Lubricate all the internal elements using the Special Springs grease.
590GRASSO Special Springs grease



24. Lubricate all the installed elements using the Special Spring grease.
590GRASSO Special Springs grease

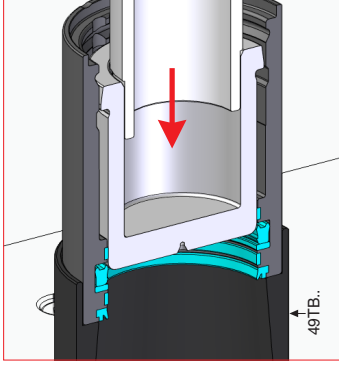


25. Lubricate the bottom grooves using the Special Springs grease.
590GRASSO Special Springs grease

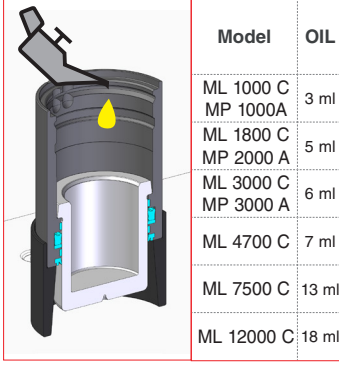


26. Lubricate the top of the rod using the Special Springs grease.
590GRASSO Special Springs grease

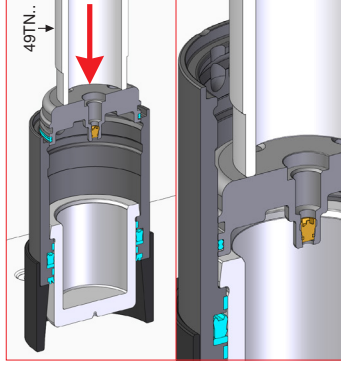
VIII. REASSEMBLY OF THE ROD AND BOTTOM BASE



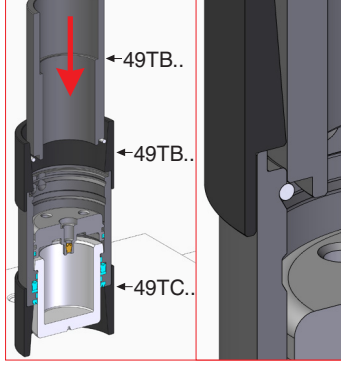
27. Using the manual press (**39PM02**), the proper anti-scratches nylon tube (**49TN..**) and the positioning tube (**49TB..**), push the rod down into the body till the mechanical stop.



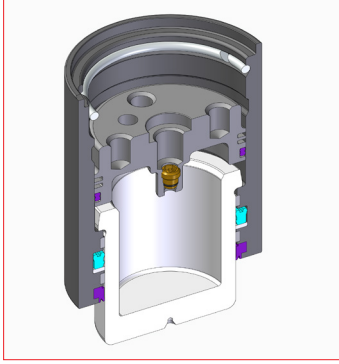
28. Put inside the cylinder the lubricating oil in the correct quantity as mentioned above.
590OLIO Special Springs Oil
NOTE: each cartridge contains 5 ml oil volume.



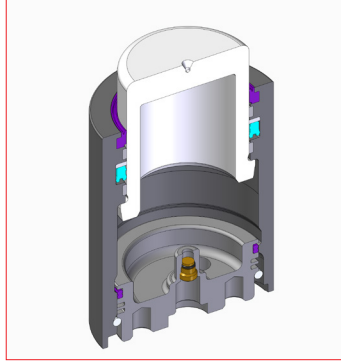
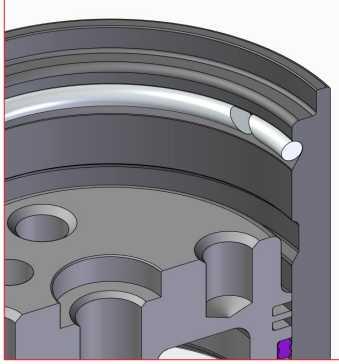
29. Using the manual press (**39PM02**), the proper anti-scratches nylon tubes (**49TN..**) and the positioning tube (**49TB..**), press into the original position the bottom base, leaving enough space for the assembly of the retaining C-ring.



30. Using the manual press (**39PM02**), the proper anti-scratches nylon tubes (**49TN..**) and the positioning tube (**49TB..**), press into the original position the retaining C-ring. The correct positioning will make a "click" sound.



30.1. Cross section of correct retaining-ring assembling. ALWAYS check the correct and complete positioning of the c-ring into the proper groove.



IX. CHARGING AND FORCE TEST for self-contained cylinders



33. Check the correct assembly of the pressure regulation valve on the gas bottle, then open the main tap. The gauge on the left will indicate the bottle pressure.
39R... pressure regulation valve.



34. Adjust the required maximum pressure brought the regulation valve. The gauge on the right will indicate the maximum allowed pressure to charge the cylinder.
39R... pressure regulation valve.



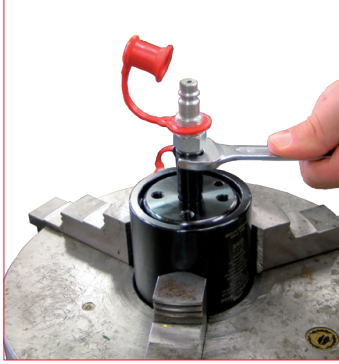
35. Select and assemble the desired charging adapter and thread it on the charging port. For an easy and safe operation carefully follow the instructions supplied with the charging unit. DO NOT exceed the maximum pressure indicated for any specific model.
39DMA charging unit.



36. Once reached and stabilized the desired pressure, for an easy and safe operation carefully follow the instructions supplied with the charging unit.
39DMA charging unit.



37. When directly charging through the adapter and desired pressure is reached, shut off the hose and bottle valves and disconnect the quick fit coupling. For an easy and safe operation carefully follow the instructions supplied with the charging unit.
39DMCPVA charging unit.
39QDFV... adapter for direct charging.



38. Unthread and release the adapter from the charging hole.



39. A more precise force control can be carried out by using the digital force testing rigs.
FT... Digital force tester
IPCDIG Digital force tester



40. It is always recommended to check leaks on the charging port after the maintenance work and before re-using the cylinders by using the special gas detector.
39RFG Special Springs gas detector.

X. CHARGING AND FORCE TEST for linked cylinders



41. It is always recommended to check leaks on the upper side of the cylinders after the maintenance work and before re-using the cylinders by using the special gas detector.
39RFG Special Springs gas detector



42. Thread the protective plug into the charging hole by using the appropriate tool.
58CE05 for 1/8G charging port.
58CE03 for M6 charging port.



A. After positioning and hosing all the cylinders, proceed through the quick fit device in the control panel for charging all the cylinders.
39DMCPVA control panel charging unit.



B. Adjust the required pressure on the regulation valve on the bottle. The gauge on the right will indicate the maximum allowed pressure to charge the cylinders.
39R... pressure regulation valve.



C. Connect the female quick fit on the male quick fit on the panel and open the gas tap. For an easy and safe operation carefully follow the instructions supplied with the charging unit.
39DMCPVA control panel charging unit.



D. It is always recommended to check leaks on all connections to and from the cylinder by using the special gas detector.
39RFG Special Springs gas detector.



E. It is always recommended to check leaks on the upper side of the cylinders after the maintenance work and before re-using the cylinders by using the special gas detector.
39RFG Special Springs gas detector.