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| **Information for replacing the functional units** |
| **KDI 3404 TCR-SCR Workshop Manual (Rev. 10.4)** |



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**Translated from the original manual in Italian language**

Data reported in this issue can be modified at any time by KOHLER.

Sommario

[1. TITOLO 1 2](#_Toc495648770)

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# Information for replacing the functional units

## Electronic injector replacement

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| Z_importante.jpg **Important**         * Before proceeding with operation, read [**Par. 3.3.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=642&parent=1273&txts=3.3.2) . * In the event of the electronic injectors being disassembled (not necessarily replaced) their position with respect to individual cylinders must not be changed when re-assembled. Refer to the reference between each injector and respective cylinder number. * Seal all injection component unions as illustrated in [**Par. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=560&parent=1273) during disassembly. * Handle the components as described in [**Par. 2.17**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=638&parent=1273) . * Replace all seal gaskets after each assembly for all components on which they are provided. * The high pressure pipes must be replaced every time they are disassembled. * Before disassembling the electronic injectors, make sure the new high pressure pipes are available. * If a new (or different) electronic injector is fitted on the engine, the new calibration data must be entered in the ECU through a specific instrument **(** [**ST\_01**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) **)** . * Electronic injectors are not repairable. * This procedure may be performed on one or more electronic injectors.     **NOTE:**   In the event of a leak upon replacement (oil - coolant - fuel - air), do not intervene with the engine running, but stop it and wait for 5/10 minutes before checking and solving the problem. | 6.1.jpg **Fig 6.1** |
| **6.1.1 Fuel return pipes disassembly (Common Rail/electronic injectors)**     1. Disconnect the connector **C** . | 6.2.jpg **Fig 6.2** |
| 1. Remove clips **E** from the electronic injector **F** . 2. Disconnect the junction **G** from the electronic injector **F** .       Z_Avvertenza.jpg **Warning**       * After removing the fittings, the clips **E** must automatically return to their initial position; otherwise they must be replaced.  1. Seal all injection component unions as illustrated in [**Par. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=560&parent=1273) ***.*** | 6.3.jpg **Fig 6.3** |
| **6.1.2 High pressure fuel pipes disassembly (Common Rail/electronic injectors)**    Z_Pericolo.jpg **Danger**       * The fuel injection circuit is under high pressure, use safety protections as described in [**Par 3.4.3**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=199&parent=1273) . * Ensure that the Common Rail is not under pressure by slowly and carefully unscrewing one of the nuts **H** .      1. Undo the nut **H** on the Common Rail **L** and then the nut **M** on the electronic injector **F** and remove the pipe **N** .       Z_importante.jpg **Important**       * In the event that the electronic injectors are disassembled (not necessarily replaced), mark them with the relevant cylinder number from which they originate so as not to confuse them during re-assembly. * Seal all injection component unions as illustrated in [**Par. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=560&parent=1273) . | 6.4.jpg **Fig 6.4** |
| **6.1.3 Electronic injectors disassembly**   1. Undo and remove the screw **P** with the washer **R** e and then the bracket **Q** .     Z_importante.jpg **Important**       * Be careful not to damage the gaskets **X** . * Replace rings **X** , if damaged.   2. Pull out the electronic injector **F** . **NOTE:** Should you be unable to remove the electronic injector (acting only on point **BC** ), use an open-ended spanner (Ø 34 mm), by applying small rotations to unblock the component.  3. Seal all injection component unions as illustrated in [**Par. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=560&parent=1273) . 4. Ensure that gasket **S** has remained in the correct position **(Fig. 6.6)** . Otherwise, recover the gasket from inside the electronic injector **T** manifold. | 6.5.jpg **Fig 6.5**6.6.jpg **Fig 6.6** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/slELtJW2bFE?showinfo=0&rel=0> |
| **6.1.4 Electronic injector assembly**    Z_importante.jpg **Important**       * Always replace and lubricate the gaskets **AA** and **S** of the electronic injectors **F** with fuel, every time they are replaced. * Reposition the electronic injectors (not replaced) by following the references made for disassembly, as indicated in **Par.** **6.1.2.** * If the engine is painted or protected with clear paint, clean the paint off the diesel injector **F** near to the part in contact with the gasket **AB** .  1. Insert the gasket **S** on the electronic injectors **F (Fig. 6.7)** . 2. Insert electronic injector **F** into manifold **T** , being extra careful not to damage gasket **AB** and direct it as indicated in **Fig. 6.7** .   **NOTE** : to replace gaskets **AB** , follow the operations in [**Para. 7.12.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=603&parent=1982) **and** [**9.5.9**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=612&parent=1982) . | 6.7.jpg **Fig 6.7** |
| **6.1.5 High pressure fuel pipes assembly**    Z_importante.jpg **Important**       * Always replace the pipes **N** after each assembly. * If the engine is painted or protected with clear paint, replace the fastening screws **P**  to ensure the gaskets are sealed properly.  1. Position tube **N** in the Common Rail seat of the electronic injector; correct the position of the electronic injector by means of the entrance of the electronic injector unions **F** and Common Rail **L** . 2. Apply the nuts **H** and **M** by hand without tightening them. 3. Position the fastening brace of electronic injectors **Q** on capscrew surface **AD** , insert capscrews **P** in brace **Q** inserting washer **R** . | 6.8.jpg **Fig 6.8** |
| Z_importante.jpg **Important**       * Ensure that brace **S** is perfectly positioned onto the electronic injector.   4.  Tighten the fixing screws **P** of the electronic injector bracket (tightening torque at **20 Nm** ). 5.  Tighten the nut **M** (tightening torque at **25 Nm** ). 6.  Tighten the nut **H** (tightening torque at **30 Nm** ).    Z_importante.jpg **Important**       * Replace the pipes **N** **(Fig. 6.8)** if the screws **P** are stiff when tightened. | 6.9.jpg **Fig 6.9** |
| **6.1.6 Fuel return pipes assembly**   1. Check the condition of the gaskets **AE** . | 6.10.jpg **Fig 6.10** |

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| 1. Insert unions **G** onto electronic injectors **F** and block them with clips **E** . 2. Mount the connectors **C** on the electronic injectors **F** .     Z_Avvertenza.jpg **Warning**       * Slightly move the wiring support to check that there is no voltage in the electrical wire of connector **C** in correspondence with the outlet hole **AF** . | 6.11.jpg  **Fig 6.11** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/IVoumDwS7oY?showinfo=0&rel=0> |

## High-pressure fuel injection pump replacement

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| Z_Pericolo.jpg **Danger**       * The fuel injection circuit undergoes high pressure, use safety protections as described in [**Par 3.4.3**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=199&parent=1273) . * Ensure that the Common Rail is not under pressure by slowly and carefully unscrewing nut **A** .       Z_importante.jpg **Important**       * Before proceeding with operation, read [**Par. 3.3.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=642&parent=1273&txts=3.3.2) . * Always replace the high pressure pipes after each disassembly. * Before disassembling the injection pump, make sure the new high-pressure pipe is available. * The injection pump is not repairable. * Should the fuel feeding pump need to be replaced, after assembly, it is necessary to perform the Pump Learning procedure by means of instrument [**ST\_01** .](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) . * Seal all injection component unions as illustrated in [**Par. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=560&parent=1273) * To handling components refer to [**Par. 2.17**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=638&parent=1273) * Always replace the gaskets (where are provided) after each disassembly. | 6.12.jpg **Fig 6.12** |
| **6.2.1 High-pressure fuel line disassembly (from the injection pump to the Common Rail).**   1. Undo the nut **A** . | 6.13.jpg **Fig 6.13** |
| 1. Undo nut **D** from Common Rail **E** . | 6.14.jpg **Fig 6.14** |
| 1. Undo the nut **B1** on the intake manifold **C.** 2. Undo the nut **B2** on the intake manifold **C** and remove the pipe **F (Fig. 6.16)** . | 6.15.jpg **Fig 6.15** |
| **6.2.2 Timing system carter oil filling flange disassembly**   1. Remove starter motor **(** [**Par. 6.6.1 point 2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=585&parent=1273) **)** and assemble special tool [**ST\_34**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) **(** [**Par. 6.6.1 point 3**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=585&parent=1273) **)** . 2. Undo the screws **G** ,remove the plate **H** . | 6.16.jpg **Fig 6.16** |
| 1. Undo and remove nut **L** fixing the fuel feeding pump control gear **M** .     Z_importante.jpg **Important**       * Be careful that the nut **L** does not fall into the timing cover.  1. Tighten tool [**ST\_13**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) on the gear **M** . | 6.17.jpg **Fig 6.17** |
| Z_importante.jpg **Important**       * Do **NOT** use the cylinder connection pipe **W** as a handle, to prevent damage or fuel leaks. * Before disassembling, care read [**Par. 2.17**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=638&parent=1273) . * Seal all injection component unions as illustrated in [**Par. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=560&parent=1273)  1. Disconnect tubes **P** and **Q** from fuel feeding pump **R** . 2. Disconnect connectors **S** and **T** . 3. Loosen and distance capscrews **U** . 4. Redo the capscrew of tool [**ST\_13**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) to disconnect injection pump **R** from gear **M** . 5. Undo capscrews **U** and extract injection pump **R** with the relevant gasket **V** .     Z_importante.jpg **Important**     * Do **NOT** remove tool [**ST\_13**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) in order to prevent gear M inside the distribution carter from falling. | 6.18.jpg **Fig 6.18**6.19.jpg **Fig 6.19** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/jPnRSYu0sKM?showinfo=0&rel=0> |
| **6.2.3 High-pressure fuel injection pump assembly**    Z_importante.jpg **Important**       * Before assembling, carefully read [**Par. 2.17**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=638&parent=1273) * Always replace the gasket **V** after each assembly. The gasket **V** can only be fitted in one direction. * Do **NOT** use the cylinder connection pipe W as a handle, to prevent damage or fuel leaks. * Remove the protection caps only when reconnecting the hoses. | 6.20.jpg **Fig 6.20** |
| 1. Check that the contact surfaces **AA** are free from impurities. 2. Make sure reference key **K** is properly inserted into the **Z** shaft seat. 3. Assemble the new gasket **V** on injection pump **R** . Insert injection pump **R** in its housing on crankcase **AA** making key **K** coincide with key seat **AH** of gear **M** . | 6.21.jpg **Fig 6.21** |
| 1. Remove the tool [**ST\_13**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) from the pump control gear ( **Ref. M** **of Par. 6.2.3** ) if applicable.       Z_importante.jpg **Important**       * Pay the utmost attention when executing the operation in point **5** so as to prevent nut **L** from falling inside the distribution carter.      1. Fully tighten the nut **L** on the shaft **Z** of the injection pump.       Z_importante.jpg **Important**       * Apply nut **L** by hand, but do not tighten. * It is mandatory to replace the screws **U** or apply a few drops of **Loctite 2701** . | 6.22.jpg **Fig 6.22** |
| 1. Clamp the screws **U** on the crankcase **AB** (tightening torque at **25 Nm** ). 2. Clamp the nut **L (Fig. 6.22)** (tightening torque at **70 Nm** ). 3. Disassemble the special tool [**ST\_34**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) and assemble  the starter motor (tightening torque **45 Nm** ).     **NOTE:** Always replace the gasket AE after each assembly.       1. Position the gasket **AE** in the set on the plate **H** . 2. Fix the plate **H** on the crankcase **AF** with the screws **G** (tightening torque at **10 Nm** ). | 6.23.jpg **Fig 6.23** |
| 1. Fit the connector **T** on the sensor **J** . 2. Fit the connector **S** on the sensor **Y** . 3. Remove the protection caps. 4. Fit the pipe **Q** on the fitting **AA** . 5. Fit the pipe **P** on the fitting **AB** . | 6.24.jpg **Fig 6.24** |
| **6.2.4 High-pressure line assembly (injection pump / Common Rail)**   1. Remove the protection cap. 2. Position the pipe **F** . 3. Manually tighten the nut **A** . | 6.25.jpg **Fig 6.25** |
| 1. Manually tighten the nut **D** . | 6.26.jpg **Fig 6.26** |
| 1. Secure clamps **F1** and **F2** by means of capscrews **B1** and **B2** onto intake manifold **C** (tightening torque **10** **Nm** ). 2. In order, tighten nut **D** (tightening torque **30** **Nm** ) and **A** (tightening torque **25** **Nm** ). | 6.27.jpg **Fig 6.27** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/3ULD_PiHEaw?showinfo=0&rel=0> |

## Unit EGR Cooler replacement

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| **6.3.1 Disassembly**    Z_importante.jpg **Important**         * Before proceeding with operation, read [**Par. 3.3.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=642&parent=1273&txts=3.3.2) . * To handling components refer to [**Par. 2.17**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=638&parent=1273) * Always replace the gaskets (where are provided) after each disassembly.     **NOTE:** Perform the operations described in [**Par. 5.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=553&parent=1273) .     1. Undo the screws **B** of pipe **C** . 2. Release the clamps **F** and remove the hose **M** . | 6.28.jpg **Fig 6.28** |
| 1. Undo the screws **C** of pipe **E** . 2. Release the clamp **F** and remove the hose **G.** | 6.29.jpg **Fig 6.29** |
| 1. Undo the screws **H** and remove the EGR Cooler **L** and the relevant metal gaskets  ( [**ST\_05**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) ). 2. Should the passage ducts of the gas exhaust be clogged by soot or carbon, replace EGR Cooler **L** . | 6.30.jpg **Fig 6.30** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/A8fU76g4nUQ?showinfo=0&rel=0> |
| **6.3.2 Assembly**   1. Fit the EGR Cooler **L** with the screws **H** on the intake manifold **S** (tightening torque at **22 Nm -** [**ST\_05**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) ). | 6.31.jpg **Fig 6.31** |
| 1. Insert the gasket **N** between the hoses **B-E** and the EGR Cooler **L** . | 6.32.jpg **Fig 6.32** |
| 1. Fit the screws **A** and **C** (tightening torque at **25 Nm** ). 2. Insert the hose **M** on the fitting **V1** and **G** on **V2** . 3. Secure the clamps **F** .   **NOTE:** Perform the operations described in [**Par. 10.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=556&parent=1273) . | 6.33.jpg **Fig 6.33** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/vTWVObqWIGE?showinfo=0&rel=0> |

## EGR valve replacement

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| **6.4.1 Disassembly**    Z_importante.jpg  **Important**       * Before proceeding with operation, read [**Par. 3.3.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=642&parent=1273&txts=3.3.2) .   **NOTE:** Perform the operations described in [**Par. 5.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=553&parent=1273) .   1. Disconnect the connector **A** from the valve **C** . 2. Undo the screws **B** and remove the EGR valve **C** with the relevant gasket. | 6.34.jpg **Fig 6.34** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/JZWXxa3UssY?showinfo=0&rel=0> |
| **6.4.2 Assembly**    Z_importante.jpg **Important**         * Always replace gasket **D** after each assembly. * The EGR valve is not a serviceable item, and if faulty / worn out, should be replaced with a new one. * Handle the components as described in [**Par. 2.17**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=638&parent=1273) .      1. Mount the new gasket **D** on the valve **C** . 2. Fit the valve **C** on the flange **E** with screws **B** (tightening torque at **10 Nm** ). | 6.35.jpg **Fig 6.35** |
| 1. Fit the connector **A** on the valve **C** .     **NOTE:** Perform the operations described in [**Par. 10.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=556&parent=1273) . | 6.36.jpg **Fig 6.36** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/JZWXxa3UssY?showinfo=0&rel=0> |

## Coolant pump and Poly-V belt replacement

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| **6.5.1 Disassembly  NOTE:** Perform the operations described in [**Par. 5.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=553&parent=1273) .    Z_importante.jpg **Important**         * Before proceeding with operation, read [**Par. 3.3.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=642&parent=1273&txts=3.3.2) .  1. Loosen the screws **A** and **B** . 2. Loosen capscrew **C** and disconnect voltage from belt **D** and remove belt **D** . 3. Undo the screws **E** and remove the pulley **F** . | 6.37.jpg **Fig 6.37**6.38.jpg **Fig 6.38** |
| 1. Undo the screws **G** and remove the pump **H** with the relevant gasket. | 6.39.jpg **Fig 6.39** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/tgDL1w2AUd0?showinfo=0&rel=0> |
| **6.5.2 Assembly**    Z_importante.jpg **Important**         * Always replace the gaskets **J** , after each disassembly. * Always replace the belt **D** after each assembly. * To handling components refer to [**Par. 2.17**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=638&parent=1273) * Always replace the gaskets (where are provided) after each disassembly  1. Fit the coolant pump **G** with the screws **H** interposing the new gasket **J** (tightening torque at **25 Nm** ). | 6.40.jpg **Fig 6.40** |
| 1. By means of capscrews **E** , secure pulley **F** to crankcase **K** . | 6.41.jpg **Fig 6.41** |
| 1. Insert the belt **D** on the pulleys **M** . 2. Tighten screw **C** and bring block **L** at **10 mm** from bracket **N** (value **C1** ). 3. Fit the screw **A** (tightening torque at **25** **Nm** ). 4. Fit the screw **B (Fig. 6.37 -** tightening torque at **see service letter 710007** ). 5. Start the engine and run it for some minutes, then turn off it, and let it cool down at ambient temperature. Check by the appropriate tool that at point p the tension value is between **135 and 178 Hz.**   **NOTE:** If the poly-v belt tension results out of the above mentioned values, proceed with the replacement. | 6.42.jpg  Alternator_Belt_tension_10mm.png  **Fig 6.42** |
| **NOTE:** Click by side to play the procedure. | <https://www.youtube.com/embed/Zrhc5qTwPRM?showinfo=0&rel=0> |

## Target wheel replacement

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| **6.6.1 Disassembly**    Z_importante.jpg  **Important**       * Before proceeding with operation, read [**Par. 3.3.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=642&parent=1273&txts=3.3.2) .  1. Remove the alternator belt following steps **1 and 2 (** [**Par. 6.5.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=584&parent=1273) **)** . 2. Undo the screws **N** and Remove starter motor **A** . 3. Mount the tool [**ST\_34**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) in the seat of the starter motor **B** and fit it with the two starter motor fixing screws. | 6.43.jpg **Fig 6.43** |
| Z_importante.jpg **Important**       * Pay the utmost attention when executing the operation in point **4** so as to prevent knocking speed sensor **E** .        1. Undo the screws **C** and remove the pulley **D** . | 6.44.jpg **Fig 6.44** |
| 1. Undo the screws **F** and remove the target wheel **G** . | 6.45.jpg **Fig 6.45** |
| **6.6.2 Assembly**   1. Check that the pin **H** is mounted properly on the pulley **D** . 2. Position the phonic wheel **G** on the pulley **D** respecting the reference of the pin **H** . 3. Fit the phonic wheel **G** with the screws **F** (tightening torque **10 Nm** ). | 6.46.jpg **Fig 6.46** |
| 1. Check that the pin **L** is mounted properly on the crankshaft **M** .     Z_importante.jpg **Important**       * Pay the utmost attention when executing the operation in point **4** so as to prevent knocking speed sensor **E** .  1. Position the pulley unit **D** on the crankshaft M respecting the reference with the pin **L** . 2. Apply **Molyslip** grease onto the thread and under the head of capscrew **C** . 3. Clamp the pulley unit **D** with the screw **C** (tightening torque at **100** **Nm** ). 4. Perform the operations from point **3** to **7** of **Par. 6.5.2.** | 6.47.jpg **Fig 6.47** |
| 1. Undo the screws **N** and remove special tool [**ST\_34**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) . 2. Secure motor **A** by means of capscrews **N** (tightening torque at **45** **Nm** ). | 6.48.jpg **Fig 6.48** |

## Oil vapour separator replacement

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| **6.7.1 Disassembly**    Z_importante.jpg  **Important**       * Before proceeding with operation, read [**Par. 3.3.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=642&parent=1273&txts=3.3.2) .  1. Remove quick fitting **A** .      1. Release the clamps **B** and **C** .      1. Remove hose **D** from breather body **E** . | 6.49.jpg **Fig 6.49** |
| 1. Remove capscrews **F** and remove breather body **E** . | 6.50.jpg **Fig 6.50** |
| **6.7.2 Assembly**    Z_Avvertenza.jpg **Warning**       * Always carefully inspect the condition of the tubes, and replace them if there is any doubt regarding their integrity. * Always replace the gasket **M** after each assembly.      1. Secure breather body **E** by means of capscrews **F** .     **NOTE** : Insert clamp **G** between capscrew **F** and breather body **E** .   1. Fit hose **D** onto breather body **E (Fig. 6.49)** .        1. Secure the clamps **B** and **C (Fig. 6.49).** | 6.51.jpg **Fig 6.51** |

## Oil cooler unit and oil filter replacement

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| **6.8.1 Oil Cooler unit disassembly**    Z_importante.jpg **Important**       * Before proceeding with operation, read [**Par. 3.3.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=642&parent=1273&txts=3.3.2) . * Perform the operations described in [**Par 5.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=553&parent=1273) and [**Par 5.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=554&parent=1273) **.** * Oil Cooler unit **E** is not repairable.  1. Release the clamps **A** . 2. Remove the manifolds **B** out of the Oil Cooler unit **E** . | 6.52.jpg **Fig 6.52** |
| Z_Avvertenza.jpg **Warning**       * Electric/pneumatic screwdrivers are forbidden. * Use a suitable container to recover any residue oil.  1. Unscrew cartridge holder cover **H** by performing three complete turns and wait 1 minute.   **NOTE** : this operation allows to oil contained in the support **E** to flow into the oil sump in the correct way.   1. Unscrew cartridge holder cover **H** and check that the oil in the lub. oil filter support **E** has flowed towards the oil sump. 2. Undo the screws **C and D** and remove the Oil Cooler unit **E** . | 6.53.jpg **Fig 6.53** |
| 1. Remove the gaskets **F** and **G** from the Oil Cooler unit **E** . | 6.54.jpg **Fig 6.54** |
| **6.8.2** **Oil filter cartridge replacement**   1. Remove gaskets **L, M** and **N** from element holder cover **H** . 2. Remove cartridge **P** from element holder cover **H** . | 6.55.jpg **Fig 6.55** |
| 1. Lubricate and insert gaskets **L, M and N** in the **L1, M1 and N1** seats of element holder cover **H** . 2. Insert element **P** into element holder cover  **H** . | 6.56.jpg **Fig 6.56** |
| **6.8.3 Oil Cooler unit assembly**    Z_importante.jpg **Important**       * In the event of assembly of union **U** on crankcase **S** , manual tightening torque with **Loctite 2701** on the thread).      1. Check that the surface **Q** on the support **E** and on the crankcase **S** are free from impurities. 2. Lubricate and insert the gasket **T** on the fitting **U** . 3. Lubricate and insert the gaskets on the support **E** : **F** in seat **F1** ; **G** in seat **G1** . 4. Fit the support **R** with the screws **C and D** (tightening torque at **10** **Nm** ). 5. Insert and tighten the cartridge support **H** on the filter support **E** (tightening torque at **25** **Nm** ). 6. Fit the hoses **B** on the support **E** and secure the hoses **B** with the clamps **A** . | 6.57.jpg **Fig 6.57**6.58.jpg **Fig 6.58** |

## Fuel filter replacement

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| **6.9.1 Disassembly**    Z_importante.jpg  **Important**       * Before proceeding with operation, read [**Par. 3.3.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=642&parent=1273&txts=3.3.2) .     Z_Avvertenza.jpg **Warning**       * The fuel filter is not always mounted in the engine. * When disassembling the sensor **E** , use a suitable container to recover the fuel contained in the cartridge **F** .  1. Release the clamps **A** and pull the pipes **B** out of the support **H** . 2. Unscrew the sensor **E** from the cartridge **F** . 3. Unscrew the cartridge **F** from the support **H** . 4. Undo the screws **C** and remove the support **H** . | 6.59.jpg **Fig 6.59**6.60.jpg **Fig 6.60** |
| Z_Avvertenza.jpg **Warning**       * Check that the fuel supply pump filter is present, and replace if necessary.  1. Release the clamp **D** . 2. Demount the hose **E** . 3. Unscrew the filter **G** from the pump **Q** . | CAP_6_Prefiltro_FACET_01.png |
| 1. Screw the new filter **G** onto the pump **Q** (tightening torque **20 Nm** ). 2. Connect the hose **E** to the filter **G** and fasten with the clamp **D** . | CAP_6_Prefiltro_FACET_02.png |
| **6.9.2 Assembly**   1. Secure the fuel filter support **H** with the screws **C** on the crankcase **M** (tightening torque at **25 Nm** ). 2. Fit the pipes **B** on the support **H** . 3. Secure the pipes **B** with the clamps **A** . | 6.61.jpg **Fig 6.61** |
| 1. Lubricate the gasket **N** with fuel. 2. Tighten the cartridge **F** on the support **H** (tightening torque at **17 Nm** ). 3. Assemble gasket **J** onto sensor **E** and lubricate with fuel. 4. Tighten the sensor **E** on the cartridge **F** (tightening torque at **5 Nm** ). | 6.62.jpg **Fig 6.62** |

## Replacement of SCV valve

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| **Warning**   * Before starting any replacement operations, make sure the work area is free from dust (part **X** of valve **B** is extremely sensitive to micro-dust). * Pay the utmost attention to cleaning in order to prevent any type of contamination during replacement operations * - Before proceeding with the replacement, clean the outer part of pump **A** thoroughly - Avoid any type of contact with part **X** of the valve during replacement. * Lubricate part **X** of valve **B** with oil spray. * Before starting any replacement operations, make sure that the key on the vehicle’s panel is **OFF** . * Assemble the new valve in the same position as the previous one. | 6.70.jpg  **Fig. 6.60** |
| **6.** **10 .1 Disassembly**    **1 -** Disconnect connector **C** from valve **B** .    **2 -** Loosen screws **D** .    **3 -** Remove valve **B** from pump **A** . | 6.71.jpg  **Fig. 6.61** |
| **6.** **10 .2 Assembly**    **1 -** Insert studs **E** supplied with valve **B** in the fastening holes of pump **A** and insert gasket **F** in the seat of pump **A** .    **2 -** Assemble valve **B** on pump **A** using studs **E** as positioning guides.    **3 -** Remove studs **E** and secure valve **B** with screws **D** (tightening torque of 6 Nm).    **4 -** Fasten valve **B** by means of screws **D** (tightening torque of 10 Nm). | 6.72.jpg  **Fig. 6.62** |
| 6.73.jpg  **Fig. 6.63** | 6.74.jpg  **Fig. 6.64** |

## Replacement of DEF filter (SCR versions only)

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| **Warning**   * Do not lubricate gaskets **A** with oil or fuel. * Filter **D** includes gaskets **A** in the package. * Avoid any type of contamination during replacement. * Before starting any operations, make sure the key on the machine’s panel is **OFF** and the DEF pump has executed the circuit emptying operation. | |
| **6.11.1 Disassembly**  **1** - Loosen cap **B** .  **2** - Remove cap B and extract filter bracket **C** .  **3** - Extract filter **D** .  **4** - Use warm DEF to clean the seat of filter **D** on pump **E** if impurities are detected. | 6.63.jpg  **Fig. 6.65** |
| **6.11.2 Assembly**  **1**  - Lubricate the **A** gaskets with DEF or distilled water.  **2** - Place the filter bracket C together with filter **D** inside pump **E** .  **3** - Tighten cap **B** (tightening torque of 20 Nm). | 6.64.jpg  **Fig.6.66** |

## Replacement of DEF pump inlet filter (SCR versions only)

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| **Warning**   * Do not lubricate union **C** or connector **A** with oil or fuel. * Union **C** comes with gasket **E** in the package. * Avoid any type of contamination during replacement. * Before starting any replacement operations, make sure the key on the machine’s panel is **OFF** and the DEF pump has executed the circuit emptying operation. | 6.67.jpg  **Fig. 6.67** |
| **6.12.1 Disassembly**    **1 -** Disconnect tube **A** .    **2 -** Remove lock ring **B** .    **3 -** Remove union **C** . | 6.68.jpg  **Fig. 6.68** |
| **6.12.2 Assembly**    **Warning**   * Make sure gasket **E** is on union **C** .   **1 -** Insert union **C** in pump **D** .    **2 -** Insert lock ring **B** on pump **D** and union **C** .    **3 -** Fit tube **A** on the union **C** . | 6.69.jpg  **Fig. 6.69** |

## Replacement of DEF injector (SCR versions only)

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| Z_Avvertenza.jpg Warning   * If injector **E** is not replaced, gasket **F** must be replaced with every disassembly. * Injector **E** cannot be repaired. * It is forbidden to remove injector **E1** from injector body **E2** . * Gasket **F** is pre-assembled on the new component E. * Before starting any operations, make sure the key on the machine’s panel is OFF and the DEF pump has executed the circuit emptying operation. * The connectors on the SCR wiring for the connection of the DEF injector ( **C** ) and SCR-T are identical, mark the connectors in order to tell them apart and avoid inverting the connection upon assembly. | 6.65.jpg  CAP_6_AdBlue_inj_connector.png  **Fig. 6.70** |
| **6.13.1 Disassembly**     1. Remove pipes **A** and **B** . 2. Disconnect connector **C** . 3. Loosen screws **D** and remove injector **E** .         **6.13.2 Assembly**   1. Place injector **E** on support **G** of SCR **H** . 2. Fasten injector **E** by means of screws **D** (tightening torque of 8 Nm). 3. Fit connector **C** . 4. Fit tubes **A** and **B** . | 6.66.jpg  **Fig.6.71** |

## Replacement of DEF tank inlet filter (SCR versions only)

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| **Warning**  Avoid any type of contamination during replacement.  This information applies if the DEF tank is supplied by **KOHLER.** | |
| **6.14.1 Disassembly**    **1 -** Release and remove cap  **A** of tank **B.** | 6.75.jpg  **Fig. 6.72** |
| **2 -** Press release tabs **C1** and **C2** and remove lock ring **C** from tank **B.** | 6.76.jpg  **Fig. 6.73** |
| **3 -** Remove filter **D.** | 6.77.jpg  **Fig. 6.74** |
| **6.14.2 Assembly**    **1 -** Insert filter **D** inside the seat of tank **B** (Fig. 6.74).  **2** - Insert lock ring **C** inside the seat of tank **B** and push it until it locks tabs **C1** and **C2** (Fig. 6.73).  **3** - Assemble cap **A** on tank **B** securing it in a locked position | 6.78.jpg  **Fig. 6.75** |

## SCR sensor replacement (SCR VERSIONS ONLY)

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| Z_Avvertenza.jpg Warning     * The NOx sensors are identical, the Upstream and Downstream sensors0 can be distinguished by their assembly position on SCR ( **Upstream = SCR Input | Downstream = SCR Output** ). This position allows distinguishing also the connection of the SCR wiring ( **D1 > SCR Input = 5-pin connector | D2 > SCR Output = 4-pin connector** ). * The NOx sensors can be without **Upstream** and **Downstream** identification label (SCR Input/Output). * The NOx sensors supplied as spare parts are without **Upstream** and **Downstream** identification label (SCR Input/Output). After assembly, mark them for a future identification ( **GREEN = SCR Input | YELLOW = SCR Output** ). * The connectors on the SCR wiring for the connection of the AdBlue® injector and SCR-T are identical, mark the connectors in order to tell them apart and avoid inverting the connection upon assembly. | |
| **6.15.1 SCR-T**  **6.15.1.1 Disassembly**    **1 -** Disengage connector **A** .    **2 -** Unscrew and remove SCR-T sensor **B** .  **6.15.1.2 Assembly**    **1 -** Screw SCR-T sensor **B** on SCR **C** .    **2 -** Tighten SCR-T sensor **B** to SCR **C** (tightening torque of **45 Nm** ).  **3 -** Fit connector **A** to SCR-T sensor **B** . | CAP_6_SCR-T.png  **Fig. 6.76** |
| **6.15.2 NO x**  **6.15.2.1 Disassembly**  **1 -** Disengage connectors **D1** and **D2** .    **2 -** Loosen screws **E** and remove SCUs **F** .  **3 -** Loosen and remove NOx sensors **G** from SCR **C** .  **6.15.2.2 Assembly**  **1 -** Screw NOx sensor **G** on SCR **C** .  **2 -** Tighten NOx sensors **G** to SCR **C** (tightening torque of **60 Nm** ).  **3 -** Fasten SCUs **F** with screws **E** (tightening torque of **3 Nm** ).  **4 -** Fit connector **D1** and **D2** as described in the connection plates ( **D1 > Upstream = 5-pin connector | D2 > SCR Downstream = 4-pin connector** ). | CAP_6_SCU_NOx.png  **Fig. 6.77**  CAP_6_Nox_probe_01.png  **Fig. 6.78**  CAP_6_Nox_probe_02.png  **Fig.6.79** |

## SCR Replacement

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| **6.16.1** **Disassembly**    **1 -** Perform the operations indicated in **Par. 6.12.1 point 3, 6.15.1.1 and 6.15.2.1.**  **2 -** Loosen clamp **B** through screws **A** .  **3 -** Disengage SCR **C** from exhaust line **D** . | CAP_6_SCR.png  **Fig. 6.80** |
| Z_Avvertenza.jpg **Warning**       * Avoid tensioning the assembly of the SCR **C** on the exhaust line, the **MAX** misalignment allowed on the junction point is of **1°** .   **6.16.2** **Assembly**    **1 -** Fit SCR **C** on the exhaust line.    **2 -** Insert clamps **B** on the junctions and tighten screw **A** (tightening torque of **12 Nm** ).  **3 -** Perform the operations indicated in **Par. 6.12.2 point 1 and 2, 6.15.1.2 and 6.15.2.2** . | CAP_6_SCR_fixing.png  **Fig. 6.81** |

