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| **Information for disassembly** |
| **KDI-TCP 3404E5 Workshop Manual (Rev. 01.1)** |



**Registration of modifications to the document**

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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)

[1.1. Asdfsdfsdf 2](#_Toc495648771)

[1.2. Asdfsdfsdfggg 2](#_Toc495648772)

# Information for disassembly

## Recommendations for disassembly

Z_importante.jpg **Important**

* The mark ( operazione_utile.gif ) after the title of a paragraph, indicates that the procedure is not required in order to disassemble the engine, however the procedures are featured in order to illustrate the disassembly of components.
* The operator should prepare all equipment and tools in order to enable him to carry out the operations correctly and safely.
* Before disassembly, perform the operation described in [**Chap. 5**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=553&parent=1273) .
* Before proceeding with operation, carefully read [**Chap. 3**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=114&parent=1000) .
* In order to operate safely and easily, we recommend positioning the engine on a rotating stand for engine overhauling.
* Seal all injection component unions as illustrated in [**P** **ar. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=560&parent=1273) during assembly.
* Protect all disassembled components and coupling surfaces subject to oxidation with lubricant.
* Where necessary, reference to special tools to use during disassembly operations is indicated (es. [**ST\_05**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) ), identified in [**Tab. 13.1 - 13.2 - 13.3**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) .

## ATS disassembly

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| **1 -** Perform the operations described in **Par. 6.3.1.1 \***    **2 -** Loosen clamp **B** through screws **A.**    **3 -** Disengage ATS **C** from exhaust line **D.** | Cap_6_I_SOST_283_TCP_E5.png |
| **4 -** Disengage tubes **E** .    **5 -** Loosen screws **F** and open clamps **G** .    **6 -** Remove the ATS **C** . | Cap_7_ISM_275_TCP_E5.png  Cap_7_ISM_276_TCP_E5.png |
| **7 -** Loosen the screws **H1** and remove the support **L1** .    **8 -** Loosen nuts **M** and remove tube **N** . | Cap_7_ISM_284_TCP_E5.png |
| **9 -** Loosen the screws **H2** and **H3** and remove the support **L2** . | Cap_7_ISM_279_TCP_E5.png  Cap_7_ISM_278_TCP_E5.png tt  Cap_7_ISM_282_TCP_E5.png |
| **10 -** Svitare le viti **H2** , **H3** rimuovere il supporto **L3** . \* | Cap_7_ISM_280_TCP_E5.png  Cap_7_ISM_281_TCP_E5.png |

## Coolant recirculation components disassembly

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| **7.3.1 Oil Cooler manifold**   1. Release the clamps **A** . 2. Undo the screw **B**  and remove hoses **C** **(** [**ST\_05**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) **)** . | 7.4.jpg   **Fig 7.4** |
| 1. Release the clamp **D**  and remove hoses **E** . | 7.5.jpg   **Fig 7.5** |
| **7.3.2** **Coolant pump**    Z_importante.jpg **Important**       * The pump **B** is not repairable.  1. Perform the operations described in [**Par. 6.5.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=584&parent=1273) **.** 2. Undo capscrews **F** and remove flange **G** with the relative gasket. | 7.6.jpg   **Fig 7.6** |
| **7.3.3 Thermostatic valve**   1. Undo the screws **A** and remove the thermostatic valve cover **B** . 2. Remove the thermostatic valve **C** and its gasket.         Z_importante.jpg **Important**       * Always replace the gasket **D** every time it is disassembled.  1. Check that the air bleeding hole is not clogged or blocked ( [**Par. 2.11.4**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=562&parent=1273) ). | 7.7.jpg   **Fig 7.7** |

## Electric components disassembly

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| **7.4.1 Electric wiring**    Z_importante.jpg **Important**       * Refer to [**Par. 2.13**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=564&parent=1273) prior to proceeding with disassembly.  1. Disconnect the connector **A** . 2. Undo the screw **B** . 3. Release the clamp **C** . | 7.8.jpg **Fig 7.8** |
| 1. Disconnect the connector **D** . | 7.9.jpg **Fig 7.9** |
| 1. Disconnect the connectors **E** and **F** . | 7.10.jpg **Fig 7.10** |
| 1. Disconnect the connector **G** . | 7.11.jpg **Fig 7.11** |
| 1. Remove nuts **H** and disconnect cables **L** and **M** . 2. Release the clamp **P** . 3. Undo the screw **Q** . | 7.12.jpg **Fig 7.12** |
| 1. Disconnect the connectors **R** , **S** , **T** , **U** . 2. Undo the screws **V** **(** [**ST\_06**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) **)** and remove the wiring support **Z** . | 7.13.jpg **Fig 7.13** |
| **7.4.2 Starter motor**    Z_importante.jpg **Important**       * The motor is not repairable.  1. Perform the operations from point 2 to 3 of  [**Par. 6.6.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=585&parent=1273) .   **7.4.3 Alternator**   1. Undo the screws **A1** and **B1** and remove the alternator **C1** . | 7.14.jpg **Fig 7.14** |
| **7.4.5 Sensors and switches**    Z_importante.jpg **Important**       * After disassembly, protect the sensors suitably against knocks, dampness and any high temperature sources. * The sensors and switches cannot be repaired, therefore they must be replaced in the event of anomalies.     **7.4.5.1 Oil pressure switch** ( operazione_utile.gif )   1. Unscrew and remove the oil pressure switch **AD** . | 7.16.jpg **Fig 7.16** |
| **7.4.5.2 Coolant temperature sensor** ( operazione_utile.gif )   1. Unscrew and remove the coolant temperature sensor **AE** . | 7.17.jpg **Fig 7.17** |
| **7.4.5.3 Speed sensor** ( operazione_utile.gif )   1. Undo the screw **H1** and remove the sensor **L1** with the relative spacer **(** [**ST\_06**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) **)** . 2. Undo the screws **M1** and remove the sensor **N1** . | 7.18.jpg **Fig 7.18** |
| **7.4.5.4 Camshaft phase sensor**   1. Undo the screw **P1** and remove the sensor **Q1** with the relative spacer. | 7.19.jpg **Fig 7.19** |
| **7.4.5.5 T-MAP Sensor** ( operazione_utile.gif )   1. Undo the screw **R1** and remove the sensor **S1 (** [**ST\_06**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) **).** | 7.20.jpg  **Fig 7.20** |
| **7.4.5.6 Fuel filter water detection sensor** ( operazione_utile.gif )    Z_Avvertenza.jpg **Warning**       * The fuel filter is not always mounted on the engine. * When disassembling the sensor **U1** , use a suitable container to recover the fuel contained in the cartridge **T1** .      1. Unscrew the sensor **U1** from the cartridge **T1** . | 7.21.jpg  **Fig 7.21** |

## Turbocharger disassembly

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| 1. Unscrew the fittings **A** and remove the pipe **B** with the relative gaskets **C** . | 7.22.jpg **Fig 7.22** |
| 1. Undo the screws **D** and remove pipe **E** and the relevant gaskets. | 7.23.jpg **Fig 7.23** |
| 1. Undo the nuts **F** and remove the turbocharger **G** . | 7.24.jpg **Fig 7.24** |

## Exhaust manifold disassembly

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| 1. Remove nuts **A** , capscrews **B** and spacers **C** , manifold **D** and gaskets **E** . 2. Close the openings and manifolds to prevent foreign bodies from entering. | 7.25.jpg **Fig 7.25** |

## Crankshaft and target wheel pulley disassembly

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| * Perform the operations from point **4** to **5** of [**Par. 6.6.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=585&parent=1273) **.** | |

## Flange unit disassembly

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| **7.8.1 Flywheel**   1. Perform the operations of **point** **2** [**Par. 6.2.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=581&parent=1273) **.** 2. Loosen, but not remove, nut **A** .       Z_importante.jpg **Important**       * Leave the special tool [**ST\_34**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) for blocking the flywheel **(** [**Par. 7.7**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=597&parent=1273) **).**     Z_Pericolo.jpg **Danger**       * The flywheel **E** is very heavy. Pay the utmost attention while removing it in order to prevent it dropping or falling, as this may have serious consequences for the operative.  1. Undo the screws **B** and remove the flywheel **C** by means of tool [**ST\_43**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) . | 7.26.jpg **Fig 7.26** |
| **7.8.2 Flange housing**      Z_Pericolo.jpg **Danger**       * The flange housing **F** is very heavy. Pay the utmost attention while removing it in order to prevent it dropping or falling, as this may have serious consequences for the operative  1. Secure tool [**ST\_41**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) onto gear **D** by means of capscrews **B** . 2. Undo capscrews **E** by following the order indicated in the figure. 3. Remove the engine housing **F** by means of tool [**ST\_44**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) . | 7.27.jpg **Fig 7.27**  7.27.jpg  **Fig 7.28** |

## Lubrication circuit disassembly

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| **7.9.1 Oil pump**    Z_importante.jpg **Important**         * The oil pump is not repairable.      1. Undo the screws **A** and remove the pump unit **B** . | 7.28.jpg **Fig 7.29** |
| 7.9.2 Oil pressure valve  ( operazione_utile.gif **)**   1. Remove cotter pin **C** . 2. Remove disk **D** , spring **E** , piston valve **F** using a magnet. | 7.29.jpg **Fig 7.30** |
| **7.9.3 Oil Cooler unit and oil filter**   1. Perform the operations of [**Par. 6.8.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=589&parent=1273) **.**     **NOTE** : To replace the oil cartridge, refer to operations of [**Par. 6.8.2**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=589&parent=1273) **.** | |
| **7.9.4 Oil vapour separator unit**   1. Perform the operations of [**Par. 6.7.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=588&parent=1273) **.** 2. Undo the screws **G** and remove the support **H** . 3. Loosen clamp **B** and remove hose **M** . 4. Undo the screw **N** and remove hoses **P** . 5. Remove quick fitting **R** and remove hose **S** . | 7.30.jpg **Fig 7.31** |

## Fuel system disassembly

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| Z_importante.jpg **Important**       * Seal all injection component unions as illustrated in [**Par. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=560&parent=1273) .   **7.10.1 Fuel return pipes**   1. Release the clip **A** . 2. Disconnect unions **B** from electronic injectors **C** .     Z_Avvertenza.jpg **Warning**       * After removing the union, the clip **A** must automatically return to its initial position; otherwise it must be replaced.  1. Undo the screw **D.** 2. Disconnect the pipe **E** . 3. Undo and remove the screw **F** with the relative gaskets and put the cap on the Common Rail pressure relief valve **G** . 4. Remove the fuel return pipes. | 7.31.jpg **Fig 7.32**7.32.jpg **Fig 7.33** |
| **7.10.2 Fuel flow pipes**     1. Remove the pipes **H, L.** | 7.33.jpg **Fig 7.34** |
| **7.10.3 High pressure fuel pipes**    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 one of the nuts **N** .      1. Undo the screw **M** . 2. Loosen the nuts **N, P** in sequence. 3. Fully undo the nuts **N, P** in sequence and remove the high pressure pipes **Q, R.** | 7.34.jpg **Fig 7.35** |
| **7.10.4 Common Rail**   1. Undo the screws **S** and remove the Common Rail **T** .     **NOTE:** Take care to protect te sensor **U** from knocks, moisture and any high temperature source. The internal parts of the rail cannot be repaired. | 7.35.jpg **Fig 7.36** |
| **7.10.5 Electronic injectors**    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 **(Fig. 7.38)** . * The electronic injectors cannot be repaired. * If one or more electronic injectors are to be replaced, the new calibration data must be inserted in the ECU via a specific instrument ( [**ST\_01**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) ). * Be careful not to damage the gaskets **V** .      1. Undo capscrews **J** and remove them together with the relative washers **K** and then brace **W** . 2. Pull out the electronic injector **C** .     **NOTE:** Should you be unable to remove the electronic injector (acting only on point **X** ), use an open-ended spanner (Ø 34 mm), by applying small rotations to unblock the component.     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) . 2. Ensure that gasket **Y** has remained in the correct position **(Fig. 7.38)** . Otherwise, recover the gasket from inside the electronic injector **Z** . | 7.36.jpg **Fig 7.437**7.37.jpg **Fig 7.38** |
| 7.10.6 Fuel filter ( operazione_utile.gif )   1. Undo the fuel cartridge **A1** from support **B1** . 2. Undo the screws **C1** and remove the filter support **B1** . | 7.38.jpg **Fig 7.39** |
| **7.10.7 High-pressure fuel injection pump**    Z_importante.jpg **Important**       * Before disassembling, carefully read [**Par. 2.17**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=638&parent=1273) . * 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) .      1. Undo the nut **D1** . 2. Screw the tool [**ST\_13**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) on the thread of the gear **E1** . 3. Redo the capscrew **F1** of tool **ST\_13** to disconnect the pump H1 from gear **E1** . 4. Undo the screws **G1** , remove pump **H1** and the relative gasket  **L1** . 5. Seal all injection component unions as illustrated in [**Par. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=560&parent=1273) . | 7.39.jpg **Fig 7.40**7.40.jpg **Fig 7.41** |

## Intake manifold disassembly

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| 1. Undo the screws **A** and remove the semi-manifold **B (** [**ST\_05**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) **)** . 2. Remove the separation plate **C** and the gaskets **D** . | 7.41.jpg **Fig 7.42** |
| 1. Undo the screws **E** . 2. Remove the semi-manifold **F** and the gasket **G** . | 7.42.jpg **Fig 7.43** |

## Cylinder head unit disassembly

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| **7.12.1 Rocker arms cover**   1. Undo the screws **A** . 2. Remove the rocker arms cover **B** . 3. Remove the gasket **C** . | 7.43.jpg **Fig 7.44** |
| **7.12.2 Rocker arm pin**   1. Undo the screws **D** . 2. Remove the rocker arm pin unit **E** . | 7.44.jpg **Fig 7.45** |
| 7.12.2.1 Rocker arm ( operazione_utile.gif )   1. Remove the retainer ring **F** . 2. Remove the shoulder rings **G** . 3. Remove the rocker arms **H** . | 7.45.jpg **Fig 7.46** |
| **7.12.3 Valve rods and bridges**   1. Remove the valve control U-bolts **M** . 2. Remove the rocker arm control rods **N** . | 7.46.jpg **Fig 7.47** |
| **7.12.4 Cylinder head**    Z_importante.jpg **Important**       * Fix special tool **ST\_60** on the cylinder head **Q** (tightening torque of **20 Nm** ). |  |
| Z_importante.jpg **Important**       * The capscrews **P** must be replaced every time they are disassembled. * Do **NOT** remove the capscrews completely, first loosen them by turning them a whole cycle following the order shown in the figure.      1. Loosen fastening screws **P** , turning them by one turn following the order shown in the figure. 2. Undo capscrews **P** by following the order indicated in the figure.         Z_importante.jpg **Important**       * To lift cylinder head **Q** , only use both eyebolts **Y** provided by **KOHLER** (refer to **Fig. 7.55** ). * When removing the cylinder head **Q** and subsequent disassembly, control, and assembly operations, it is necessary to protect the contact surface **W** of cylinder head **Q** and crankcase **J** against impacts.  1. Remove the cylinder head **Q** . 2. Remove the head gasket **R** . | 7.49a.jpg **Fig 7.48**7.48.jpg **Fig 7.49** |
| **7.12.4.1 Valves** ( operazione_utile.gif )   1. Mount the tool [**ST\_07**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) on the head **Q** fixing it on one of the holes for fixing the rocker arm cover.     **NOTE:** Change the fixing hole according to the position of the valves to be removed.     1. Position the tool [**ST\_07**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) on the valve as shown in the figure. | 7.49.jpg **Fig 7.50** |
| 1. Push the lever of the tool [**ST\_07**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=573&parent=1273) downwards, in order to lower the valve plates **S** in the direction of the arrow **T** , remove cotters **U** using a magnet.   **NOTE:** Repeat all the operations for all the valves concerned. | 7.50.jpg **Fig 7.51** |
| Z_importante.jpg **Important**       * Before removing the valves, make some marks to record their original position, in order to avoid confusing them when reassembling (if they are not replaced).  1. Remove the valves **V** . | 7.51.jpg **Fig 7.52** |
| **7.12.4.2 Electronic injector sleeves** ( operazione_utile.gif )   1. Unscrew and remove the sleeves **Z** from the head **Q** . 2. Remove the gaskets **J, K** . | 7.52.jpg **Fig 7.53** |
| **7.12.4.3 Valve stem gasket** ( operazione_utile.gif )   1. Remove the gaskets **W** . | 7.53.jpg **Fig 7.54** |

## Timing system gear disassembly

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| Z_importante.jpg **Important**       * For the following operation, turn the engine by bringing the cylinder head surface downwards.  1. Remove the gear **A** . 2. Unscrew screw **B** and remove the gear **C** .   NOTE: Gear **A** is assembled on the camshaft by press-fit; remove gear **A** to also remove the camshaft. | 7.56A.jpg **Fig 7.56** |

## Oil sump unit disassembly

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| **7.14.1 Oil sump**   1. Undo the screws **A** . 2. Remove the oil sump **B** by inserting a plate between surface **C** of crankcase **D** and oil sump **B** . 3. Remove the oil dipstick **E** . | 7.57A.jpg **Fig 7.57** |
| **7.14.2 Oil suction pipe**   1. Undo the screws **F** and remove the oil pipe **G** . | 7.58A.jpg **Fig 7.58** |
| 7.14.3 Oil drain pipe ( operazione_utile.gif )   1. Undo the screws **H** and remove the pipe **L** . | 7.59A.jpg **Fig 7.59** |

## Engine block disassembly

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| **7.15.1 Piston unit/connecting rod**    Z_importante.jpg **Important**       * Mark some numerical references (cylinder n°) on the connecting rods, connecting rod caps **N** , pistons and gudgeon pins to prevent unintentionally confusing the components not replaced during assembly. Failure to do this may result in engine malfunctions. * References on connecting rod **M** and cap **N** must only be carried out on a side in correspondence with **K1** and **K2** , as illustrated in **Fig. 7.61** .  1. Screw the bolt **M** temporarily. | 7.59.jpg **Fig 7.60** |
| **NOTE** : coupling cap **N** on the connecting rod can be carried out with centring taper pins **(Fig. 7.62)** or broken ( **Fig. 7.63** - without centring taper pins).    7.72.png  **Fig. 7.62**  7.72b.png  **Fig. 7.63** | 7.60.jpg  **Fig 7.61** |
| 1. Pull out the connecting rod - piston assembly from position **2 and 3** by manually applying pressure on the connecting rod big end **L** in the direction of arrow **X** . 2. Couple the connecting rod big end caps **N** with the relevant piston and connecting rod unit **L** . 3. Rotate the crankshaft by 180°. 4. Repeat points **2 to 5** to disassemble the connecting rod-piston assembly to position **1 and 4** . | 7.63.jpg  **Fig 7.64** |
| Z_Avvertenza.jpg **Warning**       * The connecting rod half-bearings **P** are made of special material. Therefore, they must be replaced every time they are removed to prevent seizures. | 7.64.jpg **Fig 7.65** |
| **7.15.2 Lower semi-crankcase**    Z_importante.jpg **Important**       * The capscrews **Q** must be replaced every time they are disassembled. * Do **NOT** remove the capscrews completely, first loosen them by turning them a whole cycle following the order shown in the figure.  1. Loosen fastening screws **Q** , turning them by one turn following the order shown in the figure. 2. Undo capscrews **Q** by following the order indicated in the figure. | 7.65.jpg **Fig 7.66** |
| Z_importante.jpg **Important**       * The capscrews **R** must be replaced every time they are disassembled. * Do **NOT** remove the capscrews completely, first loosen them by turning them a whole cycle following the order shown in the figure.  1. Loosen fastening screws **R** , turning them by one turn following the order shown in the figure. 2. Undo capscrews **R** by following the order indicated in the figure. 3. Remove the lower semi-crankcase **D1** and store it in a suitable container for washing. | 7.74.jpg  **Fig 7.67** |
| **7.15.3 Crankshaft**   Remove:   1. Crankshaft **S** . 2. The shoulder semi-rings **T** . 3. gasket **U** from crankshaft **S** . | 7.67.jpg **Fig 7.68** |
| 7.15.4 Piston ( operazione_utile.gif )   1. Remove the retainer ring **V** . 2. Remove the pin **Z** to separate the piston **J** from the connecting rod **L** .       Z_importante.jpg **Important**       * If they are not replaced, keep the components together (connecting rod - piston - gudgeon pin) by using references in order to prevent them from getting mixed up during assembly. | 7.68.jpg **Fig 7.69** |
| **7.15.4.1 Rings** ( operazione_utile.gif )   1. Remove the rings **K** . | 7.69.jpg **Fig 7.70** |
| **7.15.5 Oil spray nozzles** ( operazione_utile.gif )   1. Undo the screws **W** and remove the spray nozzles **X** from the upper semi-crankcase **D2** . | 7.70.jpg **Fig 7.71** |
| **7.15.6 Camshaft tappets**   1. With a magnet, remove the tappets **Y** from the upper semi-crankcase **D2** . | 7.71.jpg **Fig 7.72** |
| **7.15.7 Crankshaft bushings**   1. Remove the crankshaft bushings **A1** from the upper crankcase **D2** .     Z_importante.jpg **Important**         * The crankshaft half-bearings **A1, B1** are made of special material. Therefore, they must be replaced every time they are removed to prevent seizures. | 7.72.jpg **Fig 7.73** |
| 1. Remove the crankshaft bushings **B1** from the lower semicrankcase **D2** . | 7.73.jpg **Fig 7.74** |

