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| **Information for disassembly** |
| **KDI 3404 TM Workshop Manual (Rev. 08.3)** |



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=744&parent=1545) .
* Before proceeding with operation, carefully read [**Chap. 3**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=114&parent=1545) .
* 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 [**Par. 2.9.8**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=786&parent=1545) 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=812&parent=1545) ), identified in [**Tab. 13.1 - 13.2 - 13.3**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=812&parent=1545) .

## Turbocharger disassembly

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| 1. Unscrew the fittings **A** and remove the pipe **B** with the relative gaskets **C** . | 7.1.jpg **Fig 7.1** |
| 1. Undo the screws **D** and remove pipe **E** and the relevant gaskets. | 7.2.jpg **Fig 7.2** |
| 1. Undo the nuts **F** and remove the turbocharger **G** . | 7.3.jpg **Fig 7.3** |

## 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** . | 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. 6.2.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=747&parent=1545) **.** 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. 2.11.3**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=732&parent=1545) ). | 7.7.jpg   **Fig 7.7** |

## Electric components disassembly

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| **7.4.1 Starter motor**    Z_importante.jpg **Important**       * The motor is not repairable.  1. Perform the operations from point 2 to 3 of [**Par. 6.1.5**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=746&parent=1545) .   **7.4.2 Alternator**   1. Undo the screws **A1** and **B1** and remove the alternator **C1** . | 7.14.jpg **Fig 7.8** |
| **7.4.2 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.     **7.4.2.1 Oil pressure switch** ( operazione_utile.gif )   1. Unscrew and remove the oil pressure switch **AD** . | 7.9.jpg **Fig 7.9** |
| **7.4.2.2 Coolant temperature sensor** ( operazione_utile.gif )   1. Unscrew and remove the coolant temperature sensor **AE** . | 7.10.jpg **Fig 7.10** |

## 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. | 7.11.jpg **Fig 7.11** |

## 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=786&parent=1545) during disassembly.   **7.6.1** **Injection fuel pipes**   1. Perform the operations of  [**Par. 6.1.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=746&parent=1545) **.** | |
| **7.6.2** **Rocker arms cover**     1. Perform the operations of  [**Par. 6.1.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=746&parent=1545) **.** | |
| **7.6.3 Fuel return pipes**   1. Perform the operations of  [**Par. 6.1.3**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=746&parent=1545) **.** 2. Perform the operations of point 18 of  [**Par. 6.1.5**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=746&parent=1545) **.** 3. Loosen union **A** from cylinder head **B** and remove return line **C** . | 7.12.jpg  **Fig. 7.12** |
| **7.6.4 Injectors**     1. Perform the operations of  [**Par. 6.1.4**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=746&parent=1545) **.** | |
| **7.6.5 Injection pump**     1. Perform the operations of  [**Par. 6.1.5**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=746&parent=1545) **.** | |
| **7.6.6 Fuel filter**     1. Perform the operations of [**Par. 6.5.1**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=750&parent=1545) **.** | |

## Crankshaft pulley disassembly

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| 1. Undo the screws **A** and remove the pulley **B** . | 7.13.jpg **Fig 7.13** |

## Flange unit disassembly

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| **7.8.1 Flywheel**    Z_Pericolo.jpg **Danger**       * The flywheel **A** 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 **A** by means of tool [**ST\_43**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=812&parent=1545) . 2. Secure tool [**ST\_41**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=812&parent=1545) onto gear **C** by means of capscrews **B** . | 7.14.jpg **Fig 7.14** |
| **7.8.2 Flange housing**      Z_Pericolo.jpg **Danger**       * The flange housing **D** 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 capscrews **E** by following the order indicated in the figure. 2. Remove the engine housing **D** by means of tool [**ST\_44**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=812&parent=1545) . | 7.15.jpg  **Fig 7.15** |

## 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 7.16** |
| 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 7.17** |

## Cylinder head unit disassembly

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| **7.10.1 Rocker arm pin**   1. Undo the screws **D** . 2. Remove the rocker arm pin unit **E** . | 7.44.jpg **Fig 7.18** |
| 7.10.1.1 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 7.19** |
| **7.10.3 Valve rods and bridges**   1. Remove the valve control U-bolts **M** . 2. Remove the rocker arm control rods **N** . | 7.46.jpg **Fig 7.20** |
| **7.10.4 Cylinder head**    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 **AE** provided by **KOHLER** (refer to **Fig. 7.28** ). * 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 7.21**7.48.jpg **Fig 7.22** |
| **7.10.4.1 Valves** ( operazione_utile.gif )   1. Mount the tool [**ST\_07**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=812&parent=1545) 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=812&parent=1545) on the valve as shown in the figure. | 7.49.jpg **Fig 7.23** |
| 1. Push the lever of the tool [**ST\_07**](https://iservice.lombardini.it/jsp/Template2/manuale.jsp?id=812&parent=1545) 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 7.24** |
| 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 7.25** |
| **7.10.4.2 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 7.26** |
| **7.10.4.3 Valve stem gasket** ( operazione_utile.gif )   1. Remove the gaskets **W** . | 7.53.jpg **Fig 7.27** |
| **7.10.4.4 Lifting eyebolts** ( operazione_utile.gif )   1. Undo the screws **X** and remove the eyebolts **Y** . 2. Thoroughly wash the cylinder head **Q** . | 7.54.jpg **Fig 7.28** |

## Oil sump unit disassembly

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| **7.11.1 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 7.29** |
| **7.11.2 Oil suction pipe**   1. Undo the screws **F** and remove the oil pipe **G** . | 7.58A.jpg **Fig 7.30** |
| 7.11.3 Oil drain pipe ( operazione_utile.gif )   1. Undo the screws **H** and remove the pipe **L** . | 7.59A.jpg **Fig 7.31** |

## Engine block disassembly

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| **7.12.1 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. 7.35** .  1. Screw the bolt **M** temporarily. | 7.59.jpg **Fig 7.32** |
| **NOTE** : coupling cap **N** on the connecting rod can be carried out with centring taper pins **(Fig. 7.33)** or broken ( **Fig. 7.34** - without centring taper pins).    7.72.png  **Fig. 7.33**  7.72b.png  **Fig. 7.34** | 7.60.jpg  **Fig 7.35** |
| 1. Pull out the connecting rod - piston assembly from position **2 and 3** by manually applying pressure on the connecting rod big end **M** in the direction of arrow **AK** . 2. Couple the connecting rod big end caps **L** with the relevant piston and connecting rod unit **M** . 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 7.36** |
| Z_Avvertenza.jpg **Warning**       * The connecting rod half-bearings **Z** are made of special material. Therefore, they must be replaced every time they are removed to prevent seizures. | 7.64.jpg **Fig 7.37** |
| **7.12.2** **Timing system gear disassembly**     1. Unscrew screws **A** and remove the gear **B** . 2. Remove the gear **C** . 3. Unscrew screws **D** and remove the gear **E** . | 7.38.jpg  **Fig 7.38**  7.39.jpg  **Fig 7.39** |
| **7.12.3 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 7.40** |
| 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 7.41** |
| **7.12.4 Crankshaft**   Remove:   1. Crankshaft **S** . 2. The shoulder semi-rings **T** . 3. gasket **U** from crankshaft **S** . | 7.67.jpg **Fig 7.42** |
| 7.12.5 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 7.43** |
| **7.12.5.1 Rings** ( operazione_utile.gif )   1. Remove the rings **K** . | 7.69.jpg **Fig 7.44** |
| **7.12.6 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 7.45** |
| **7.12.7** **Camshaft**   1. Remove the lock ring **C** . 2. Extract the camshaft **F** from the upper semi-crankcase **D2** . | 7.46.jpg  **Fig 7.46** |
| **7.12.8 Camshaft tappets**   1. With a magnet, remove the tappets **Y** from the upper semi-crankcase **D2** . | 7.71.jpg **Fig 7.72** |
| **7.12.9 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** |

