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| **Maintenance procedures** |
| **KSD 1403 Workshop Manual (Rev. 00\_DRAFT\_01)** |



**Registration of modifications to the document**

Any modifications to this document must be registered by the drafting body, by completing the following table.

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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

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# Maintenance procedures

## Cleaning and checking

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Z_Avvertenza.jpg **Warning**       * Inspections must be made when the engine is off and cold. * Place engine on level sur face to ensure accurate measurement of oil level.     Z_Pericolo.jpg    **Danger**       * For safety precautions see  **Chap. 3** .   The intervals of preventive maintenance in  **Tab. 4.1, Tab. 4.2, Tab. 4.3 and Tab. 4.4**  refer to the engine operating under normal operating conditions with fuel and oil meeting the approved specifications.  x.x   |  |  |  | | --- | --- | --- | | **CLEANING AND CHECKING** | | | | **OPERATION DESCRIPTION** | **PERIOD (HOURS)** | | | **100** | **500** | | Engine oil level  (8) |  |  | | Coolant level  (8) (9) |  |  | | Water presence in fuel filter |  |  | | Alternator belt  (8) |  |  | | Rubber hoses (intake air / coolant) - Fuel hose  (3) |  |  | | Starter Motor  (1) |  |  | | Alternator  (1) |  |  |   (1) - In case of low use: 12 months. (2) - The period of time that must elapse before checking the filter element depends on the environment in which the engine operates. The air filter must be cleaned and replaced more frequently under very dusty conditions.    (3) - In case of low use: 36 months.  (4) - In case of low use: 5 years. (6) - Contact authorized  **KOHLER**  workshops.  (7) - The replacement interval is only an indication, it strongly depends from environmental condition and hose status detected during regular visual inspection.  (8) - The first check must be done after 10 hours.  (9) - Test the coolant condition annually with coolant test strips. (10) - It is recommended to have SCA (Supplemental Coolant Additives) added at the first maintenance interval. | |
| **Engine oil level**   1. Before checking oil engine needs to be level. 2. Remove the oil dipstick  **B**  and check that the level is up to but does not exceed the  **MAX** . 3. If level is not at the  **MAX** . level, add additional oil. 4. Re-tighten the cap  **A,** **C** . | Cap_4_04_Tavola%2520disegno%25201.png    Cap_4_05_Tavola_disegno_1.png  Cap_4_01.png  Cap_4_02.png  Cap_4_03.png |
| **Coolant level**   1. Loosen the cap  **A** . 2. Top liquid up until the pipes inside the radiator are covered by about 5 mm. 3. For engines equipped with expansion tank, pour in fluid until reaching the max level mark. 4. Tighten the radiator cap  **A**  or the expansion tank ( **C** ) cap  **B** . | Cap_4_29.png  Cap_4_33.png  5.8.jpg |
| **Water presence in fuel filter**    Z_importante.jpg **Important**       * Before proceeding with operation, read  **Par. 3.2.2** .     Z_Pericolo.jpg    **Danger**       * For safety precautions see  **Chap. 3.**  1. Gently loosen the water drain plug  **A**  without removing it. 2. Spill out the water if present. 3. Re-tighten the water drain plug  **A**  as soon as the fuel spills. | Cap_4_12.png |
| **Check of the radiator heat - exchanger surface**    Z_Pericolo.jpg    **Danger**       * For safety precautions see  **Chap. 3 .**   **NOTE:**  Component not necessarily supplied by  **KOHLER** .    Z_importante.jpg **Important**       * Before proceeding with operation, read  **Par. 3.2.2** . * Wear safety goggles when using compressed air. * The radiator heat-exchange surface must be cleaned on both.      1. Check the radiator heat-exchange surface  **A** . 2. Clean the surface with a brush soaked in special detergent if it is clogged. | Cap_4_34.png |
| **Alternator belt**    Z_importante.jpg **Important**       * Before proceeding with operation, read  **Par. 3.2.2** .     Z_Pericolo.jpg **Danger**       * For safety precautions see  **Chap. 3 .**   **NOTE** : The belt is not adjustable.     1. Check the belt  **A**  condition, if worn out or deteriorated,  **replace it.**     **NOTE** : Make sure that the ribs of the belt  **A**  are inserted correctly into the grooves of the pulleys  **B** . | Cap_4_19_23.png |
| **Rubber hoses (intake air / coolant / fuel)**  Pericolo.png  **Danger**   * For safety precautions see  **Cap. 3.**     The check is carried out by exerting a slight deflection or bending along the pipe and near the hose clamps. Components must be replaced if they have clear signs of cracks, tears, cuts, leaks and do not retain a certain degree of elasticity.      Importante.png  **Important**   * Before proceeding with operation, read  **Par. 3.2.2** . * If hoses are damaged contact an authorized KOHLER workshop. * For other pipes not illustrated refer to the technical documentation of the vehicle.  1. Check the integrity of the pipes and hoses  **A** . | Cap_4_16.png  Cap_4_17.png |
| 1. Externally check the condition and clean motor  **A**  using compressed air. | Cap_4_35.png |
| 1. Externally check the condition and clean the alternator  **A**  using compressed air. | Cap_4_36.png |

## Replacement

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| * Periodic inspection and maintenance operations must be carried out as indicated in this manual and are the responsability of the user. * Failure to comply with these service and maintenance intervals increases the risk of technical damage to the engine. Any non compliance makes the warranty become null and void. * In order to prevent personal and property damage read carefully the instructions listed below before proceeding with any operation of the engine.     Z_Avvertenza.jpg **Warning**       * Inspections must be made when the engine is off and cold. * Place engine on level sur face to ensure accurate measurement of oil level. * Before starting, to avoid spillages of oil make sure that: - the oil dipstick is inserted correctly;     - also check that:    oil drain plug and    oil filler cap are tightened firmly.        Z_importante.jpg **Important**       * Before proceeding with operation, read  **Par. 3.2.2** .     Z_Pericolo.jpg    **Danger**       * For safety precautions see  **Chap. 3** .   The intervals of preventive maintenance in  **Tab. 4.1, Tab. 4.2, Tab. 4.3 and Tab. 4.4**  refer to the engine operating under normal operating conditions with fuel and oil meeting the approved specifications.  x.x   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **REPLACEMENT** | | | | | | | **OPERATION DESCRIPTION** | | | **PERIOD (HOURS)** | | | | **500** | **2000** | **4000** | | Air filter Cartridge  (2 ) | | |  |  |  | | Alternator belt  ( 3 ) | | |  |  |  | | Rubber hoses (intake air / coolant)  (4 )  (6) (7) | | |  |  |  | | Fuel line hose  ( 4 )  (6) (7) | | |  |  |  | | Coolant |  | OAT  ( 4 )  (6) |  |  |  | |  | HOAT  ( 4 )  (6)  (10) |  |  |  |   x.x   |  |  |  |  | | --- | --- | --- | --- | | **ENGINE OIL AND OIL FILTER CARTRIDGE REPLACEMENT** | | | | | **ENGINE VERSION** |  | **PERIOD (HOURS)** | | |  | **500** | **1000** | | Cap_4_Compact_Sump.png  Compact Sump  (1) |  |  |  | | Cap_4_Deep_Sump.png  Deep Sump  (1) |  |  |  |   x.x   |  |  |  |  | | --- | --- | --- | --- | | **FUEL FILTER AND PREFILTER CARTRIDGE REPLACEMENT** | | | | | **ENGINE VERSION** |  | **PERIOD (HOURS)** | | |  | **500** | **1000** | | _.Cap_04_Fuel_500h.png  STD Filtration  (1) |  |  |  | | _.Cap_04_Fuel_1000h.png  High Filtration  (1) |  |  |  |   (1) - In case of low use: 12 months. (2) - The period of time that must elapse before checking the filter element depends on the environment in which the engine operates. The air filter must be cleaned and replaced more frequently under very dusty conditions.    (3) - In case of low use: 36 months.  (4) - In case of low use: 5 years. (6) - Contact authorized  **KOHLER**  workshops.  (7) - The replacement interval is only an indication, it strongly depends from environmental condition and hose status detected during regular visual inspection.  (8) - The first check must be done after 10 hours.  (9) - Test the coolant condition annually with coolant test strips. (10) - It is recommended to have SCA (Supplemental Coolant Additives) added at the first maintenance interval. | |
| **Engine oil and oil filter** | |
| **NOTE** : Perform this operation with warm engine, to get a better fluidity of the oil and get a full discharge of oil and impurities contained in it.     * Loosen the oil filler cap  **A**  or the oil filler cap  **C**  if the cap  **A**  is not accessible. | Cap_4_01.png  Cap_4_02.png |
| * Unscrew the oil filter  **F** with appropriate wrench. * Assembly and tighten the new oil filter cartridge  **F** (torque to  **20** **Nm** ). | Cap_4_08.png  Cap_4_09.png |
| * Remove the oil dipstick  **B** . * Remove the oil drain plug  **D**  and the gasket  **E**  (the oil drain plug is on both sides of the oil sump). * Drain oil in an appropriate container. * Replace gasket  **E** . * Tighten the drain oil plug  **D**  (tightening torque at  **40** **Nm** ). | Cap_4_04_Tavola%2520disegno%25201.png    Cap_4_06_Tavola%2520disegno%25201.png  Cap_4_07_Tavola%2520disegno%25201.png    Cap_4_20_Tavola%2520disegno%25201.png |
| * Add the type of oil approved ( **Tab. 2.2** ). * Fit and remove the oil dipstick  **B**  to check the level. * Pour in fluid until reaching the  **MAX**  level mark. * Upon completion, reinstall the oil dipstick  **B**  completely. * Tighten the cap  **A,** **C** . | Cap_4_03.png  Cap_4_04_Tavola%2520disegno%25201.png    Cap_4_05_Tavola_disegno_1.png |
|  | |
| **Fuel filter cartridge** | |
| Z_importante.jpg **Important**       * Do not fill the new cartridge  **B** with fuel.      * Procure a suitable container to collect the fuel. * Loosen and remove cartridge  **B** . * Lubricate the gasket  **C** . * Tighten the new cartridge  **B** onto support  **D** (tighten manually). | Cap_4_13.png  Cap_4_14.png |
| * Replace the prefilter  **H**  if present. * Perform the operations described in  **Par. xx** . | Cap_4_15.png |
|  | |
| **Air filter cartridge** | |
| Z_importante.jpg **Importante**       * Before proceeding with operation, read  **Par. 3.2.2** .   **NOTE** : Components not necessarily supplied by  **KOHLER** .     * Release the two fastenings  **F**  of the cover  **A** . * Remove the cartridge  **B** . * Clean the inside components  **A and D**  with a damp cloth. * Reinstall:   - the new cartridge  **B** . -the cover  **A**  checking the right tightness of fastenings  **F** . | Cap_4_27.png  Cap_4_28.png |
|  | |
| **Alternator belt** | |
| 1. Remove the belt  **A**  using tool  **ST\_57** . 2. Install the new belt  **A**  using tool  **ST\_57** . | Cap_4_19_23.png  poly_v_belt_removal.png  **REMOVE**  poly_v_belt_installation.png  **INTALL** |
|  | |
| **Rubber hoses** | |
| * Undo the cap  **A**  carefully (circuit under pressure). * Drain all the liquid inside the radiator via shut-off valve  **D**  into a suitable container. | Cap_4_29.png  Cap_4_30.png |
| * Loosen the screws  **E**  and remove the fuel filter bracket  **G** . * Unscrew cap  **F** , remove gasket  **H**  to allow all the system fluid contained inside the pipes in the engine crankcase to drain. * Tighten the plug  **F**  (tightening torque at **35 Nm** ). * Fasten the fuel filter bracket  **G**  with screws  **E**  (tightening torque  **25 Nm** ). | Cap_4_31.png  Cap_4_32.png  Cap_4_24.pngCap_4_25.png  Cap_4_26.png |
| Replace the hoses  **B** . | Cap_5_02.png  Cap_5_01.png |
| * Loosen the cap  **A**  and fill the radiator with coolant composed of: 50% ANTIFREEZE and 50% decalcified water. * Top liquid up until the pipes inside the radiator are covered by about 5 mm. Do not overfill the radiator, but leave room for the coolant to expand. * For engines equipped with expansion tank, pour in fluid until reaching the max level mark. * Re-tighten the cap  **A** . * Keep it running at idle speed until the cooling liquid level goes down and becomes steady (the waiting times varies according to the ambient temperature). * Stop the engine and allow it to cool. * If there is an expansion tank ( **C** ) top liquid up to the mark  **MAX** . * Without expansion tank top liquid up until the pipes inside the radiator are covered by 5 mm. Do not overfill the radiator, but leave room for the coolant to expand. * Tighten the radiator cap  **A**  or the expansion tank cap. | Cap_4_33.png  Cap_4_29.png |
|  | |
| **Fuel line hose** | |
| Replace the hoses  **B** . | Cap_5_03.png |

