

Students please affix one of your self-adhesive identification labels to this space. Do not obscure other parts of this page with the label. If you do not have a self-adhesive identification label, please complete the following information. Write your name as it appears on your badge.

Your Name: _____

Participation Number:

Two letter state abbreviation. →

State code (0301, 0302, to 0350)

Team member number (01, 02, 03, or 04)

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Students please do not write or mark within this box.

Judges, after this skill sheet has been scored and double checked, write the total score for this activity in the blank below.

Skill Activity Score: _____

Judges Initials: _____

2017 National Agricultural Technology & Mechanical Systems Career Development Event Compact Engines

Materials Provided: Kohler KD 420 diesel engine and workshop manual, hex key, and feeler gauge.

Scenario: The Kohler KD 420 diesel engine is used as the power source for several types of generators. This use creates the need for this motor to maintain a constant RPM level to supply enough kilowatts. This requires the routine check of several systems such as fuel delivery and lubrication systems. Improperly installed fuel injectors can cause improper running of the engine. The malfunction of the oil pump can also cause the engine to slow and ultimately fail. Your job is to install a replacement injector and check the oil pump rotor for wear. **USE engine model KD 440 for all answers when looking up recommended specification in the workshop manual.**

NOTE: BECAUSE THIS IS A SIMULATION, YOU WILL NOT TORQUE THE BOLTS. USE THE DRIVE HANDLE AND SOCKET TO TIGHTEN THE BOLTS UNTIL SNUG. DO NOT OVER TIGHTEN!!

Instructions:

1. Read each question carefully; use the resources provided to answer the questions; record your answers in the spaces provided.
2. Read the skill practicum instructions carefully; use the tools and resources provided to complete each numbered task. **Include all measurements units to receive full credit.**

Questions and steps to completing this activity:

1. What is the model number for the engine? (Use the picture of the disassembled engine at your station to determine the model number) **Enter model number on line 1 of your scan sheet (1 pt.)**
2. The crankshaft orientation of the engine connected to the pump is best described as which of the following: **Bubble in crankshaft orientation on line 2 of your scan sheet (2 pts.)**
 (A) Vertical Shaft (B) Horizontal Shaft
3. According to the specifications listed in the Kohler KD workshop manual at your station, what is the recommended injector projection from the cylinder head plane? **Record the injector projection on line 3 of your scan sheet. Include the unit of measurement for full credit. (2 pts.)**
4. Set the injector projection utilizing the materials and tools at your station. **(4 pts.)**
When the activity is over, a CDE official will check the projection and score this line on your scan sheet.
5. According to the workshop manual, what is the oil supply with a filter included? **Record oil supply on line 5 of your scan sheet Include the unit of measurement for full credit (2 pts.)**

6. According to the workshop manual specifications, what is the recommended SAE oil grade for this engine?
Record oil grade on line 6 of your scan sheet (2 pts.)
7. Using the workshop manual, determine the wear limit between the oil pump rotors.
Record the wear limit on line 7 of your scan sheet.
Include the unit of measurement for full credit (2 pts.)
8. Measure and record the current clearance between the oil pump rotors.
Record the rotor clearance on line 8 of your scan sheet
Include the unit of measurement for full credit (4 pts.)
9. Based on the oil pump rotor clearance, should this oil pump rotor be rejected or kept?
Bubble your answer on line 9 of your scan sheet ☐ (A) Reject ☐ (B) Keep (2 pts.)
10. What tool is needed to conduct an oil pressure check? Be specific.
Record the name of the tool on line 10 of your scan sheet (3 pts.)
11. What engine idle speed must be maintained when completing an oil pressure check?
Record idle speed (RPM) on line 11 of your scan sheet (3 pts.)
12. According to the specifications chart, what is the approximate temperature when the oil pressure is at 1.5 Bar?
Record temperature on line 12 of your scan sheet
Include the unit of measurement for full credit. (3 pts.)

When you have completed this activity, turn in both your scan sheet and this sheet.