

# Engine Repair: Engine Mechanical Testing

## Student/intern information:

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

## Vehicle used for this activity:

Year \_\_\_\_\_ Make \_\_\_\_\_ Model \_\_\_\_\_

Odometer \_\_\_\_\_ VIN \_\_\_\_\_

Learning Objective/Task	CDX Tasksheet Number	2013 MLR NATEF Reference Number; Priority Level	2013 AST NATEF Reference Number; Priority Level	2013 MAST NATEF Reference Number; Priority Level
• Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.	C004	1A3; P-1	1A4; P-1	1A4; P-1
• Verify operation of the instrument panel engine-warning indicators.	C898	1A2; P-1	1A3; P-1	1A3; P-1
• Perform cranking sound diagnosis.	N/A	N/A	N/A	N/A
• Perform engine vacuum tests; determine necessary action.	C392	8A2; P-1	8A5; P-1	8A5; P-1
• Perform cylinder power balance tests; determine necessary action.	C393	8A3; P-2	8A6; P-2	8A6; P-2
• Perform cylinder cranking and running compression tests; determine necessary action.	C709	8A4; P-1	8A7; P-1	8A7; P-1
• Perform cylinder leakage tests; determine necessary action.	C395	8A5; P-1	8A8; P-1	8A8; P-1

Time off \_\_\_\_\_

Time on \_\_\_\_\_

Total time \_\_\_\_\_

## Materials Required

- Vehicle or simulator
- Vacuum gauge
- Tachometer (hand-held if the vehicle is not equipped with an in-dash tachometer)
- Insulated spark plug wire pliers (if using this method to disable the cylinders)
- Scan tool (if using this method to disable the cylinders)
- Compression tester
- Cylinder leakage tester
- Stethoscope
- Flashlight

## Some Safety Issues to Consider

- You will be working under the hood of a running vehicle. Keep your hands and fingers away from moving belts, fans, and other parts.
- Be sure to only disconnect the proper vacuum hose. Many other hoses look alike but could carry gasoline or hot coolant under high pressure.

- During this test, you may be disabling the ignition or fuel systems. Be sure you only do so for the minimum amount of time to get your readings. Operating the engine with cylinders disabled may lead to damage of the catalytic converter or other parts. If in doubt, ask your supervisor/instructor.
- If you disable the cylinders by disconnecting the spark plug wires, you may expose yourself to extremely high voltage (up to 100,000 volts). Reduce the possibility of electrical shock by using appropriate insulated spark plug wire pliers.
- When running any vehicles in the shop, make sure you use the shop's exhaust ventilation system to discharge all exhaust gas safely outside.
- Always follow your supervisor's/instructor's directions on how to get the piston to top dead center. Failure to do so could cause injury or damage to the vehicle.
- Use caution when turning the engine to top dead center. If you do this by hand, be sure your fingers, hands, etc. stay clear of belts and pulleys that could cause severe pinching.
- Make sure the ignition switch is in the "off" position and the key is removed from the ignition switch during this job to prevent someone from inadvertently cranking the engine over while you are working on it.
- Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

### Performance Standard

**0—No exposure:** No information or practice provided during the program; complete training required

**1—Exposure only:** General information provided with no practice time; close supervision needed; additional training required

**2—Limited practice:** Has practiced job during training program; additional training required to develop skill

**3—Moderately skilled:** Has performed job independently during training program; limited additional training may be required

**4—Skilled:** Can perform job independently with no additional training