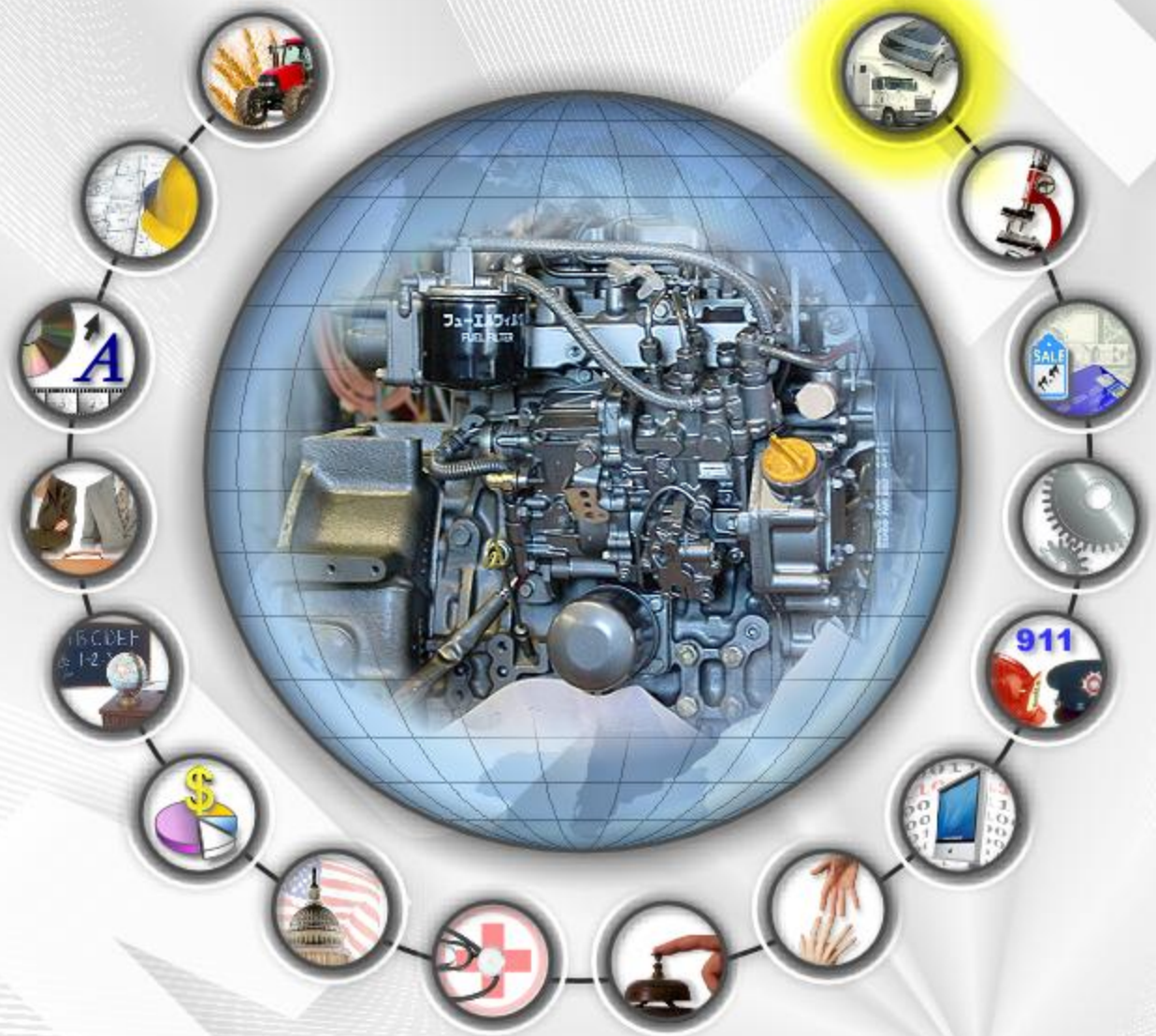




Job Ready Assessment Blueprint

Diesel Engine Technology



Test Code: 3027 / Version: 01

“Measuring What Matters”

Specific Competencies and Skills Tested in this Assessment:

Safety and General Shop Practices

- Demonstrate understanding of fire safety
- Demonstrate understanding of personal safety
- Demonstrate understanding of environmental safety
- Perform precision measuring
- Exhibit familiarity with basic fabrication techniques
- Exhibit understanding of professional workplace protocol



Diesel Engine Terminology and Theory

- Display knowledge of diesel engine terminology
- Display knowledge of diesel engine operation
- Demonstrate familiarity with diesel theory and history

Preventive Maintenance

- Display understanding of cooling system maintenance procedures
- Display understanding of lubricating system maintenance procedures
- Display understanding of fuel system maintenance procedures
- Display understanding of electrical system maintenance procedures
- Display understanding of induction/exhaust system maintenance procedures
- Exhibit familiarity with diesel engine accessories

Engine Construction

- Identify components and functions of cooling systems
- Identify components and functions of lubricating systems
- Identify components and functions of fuel systems
- Identify components and functions of electrical systems
- Identify components and functions of induction/exhaust systems
- Identify components and functions of accessories
- Identify components and functions of engine foundation assembly

Specific Competencies and Skills continued:

Service Induction and Exhaust Systems

- Troubleshoot induction and exhaust systems
- Inspect and repair the turbocharger system
- Inspect and repair exhaust system components

Diesel Fuel Systems

- Troubleshoot diesel fuel systems
- Identify various types of fuel systems
- Identify various fuel system components
- Diagnose and replace test injector nozzles



Cylinder Heads

- Evaluate cylinder head serviceability
- Identify cylinder head components
- Provide basic service of cylinder heads
- Display understanding of cylinder head installation

Block Assembly

- Identify block assembly components and functions
- Determine block assembly serviceability
- Evaluate flywheels and flywheel housings
- Evaluate ancillary drive components
- Demonstrate understanding of electronic control systems
- Demonstrate knowledge of charging and starting systems

Engine Electrical/Electronic Systems

- Display knowledge of mechanical engine issues
- Demonstrate understanding of switches and controls
- Demonstrate understanding of electronic control systems
- Demonstrate knowledge of charging and starting systems

Specific Competencies and Skills continued:

Engine Diagnosis and Failure Analysis

- Display knowledge of electrical diagnostic procedures
- Display knowledge of mechanical engine issues
- Determine fault-to-symptom correlation
- Perform failure analysis

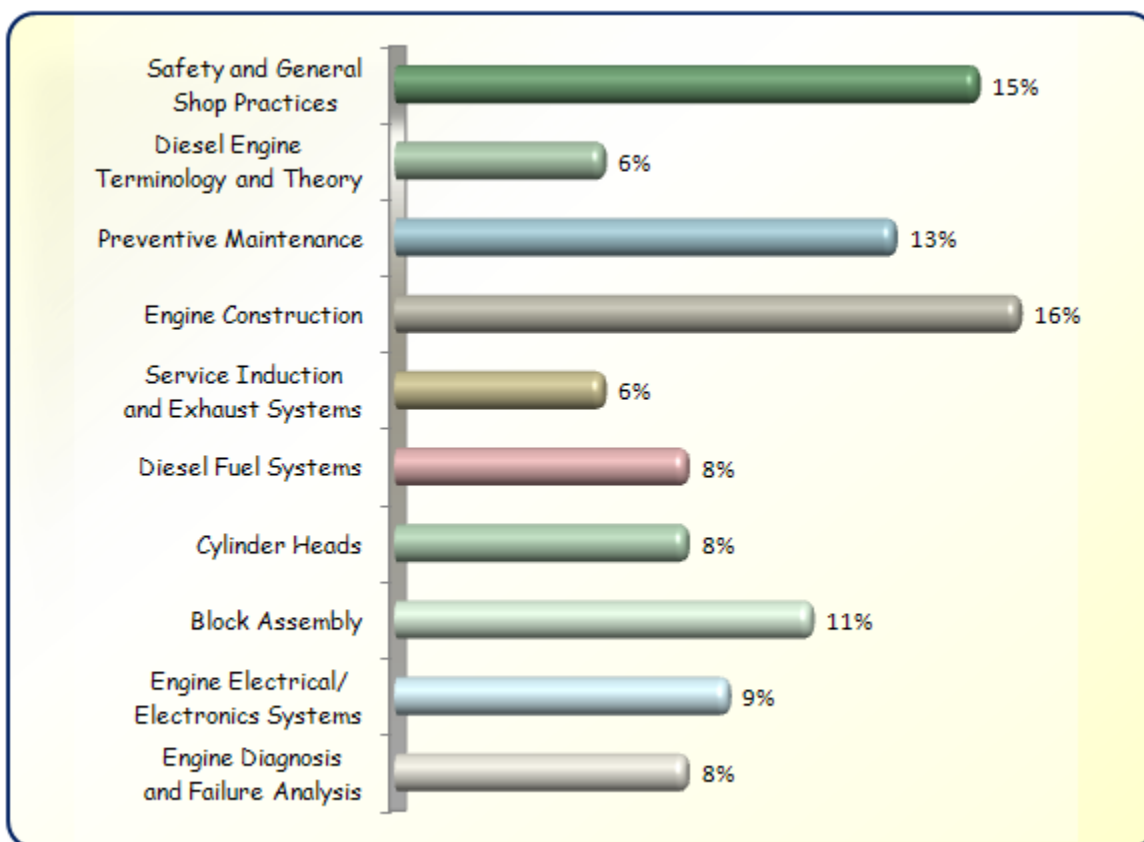


Written Assessment:

Administration Time: 3 hours

Number of Questions: 126

Areas Covered:



Sample Questions:

One complete revolution of the thimble of an English (non-metric) micrometer is equal to

- A. 0.025 inches
- B. 0.050 inches
- C. 0.075 inches
- D. 0.100 inches

In setting up a piping system for exhaust gases, keep the number of sharp bends to a minimum to

- A. raise exhaust gas temperature
- B. permit use of a larger diameter pipe
- C. eliminate the need for a silencer
- D. prevent excessive back pressure

The fuel output of the injectors used on different General Motors' engines is controlled by the

- A. size of the spray tip holes
- B. angle of the helix
- C. length of the spill deflector
- D. size of the plunger

In a typical alternator charging system, the function of a rectifier is to

- A. change AC to DC current
- B. change DC to AC current
- C. step up voltage
- D. step down voltage

A hole in the crown of a piston could be caused by

- A. excessive valve clearance
- B. an air induction leak
- C. a faulty nozzle
- D. a turbocharger oil seal leak



Performance Assessment:

Administration Time: 3 hours

Number of Jobs: 5

Areas Covered:

19% Check and Adjust Rocker Level Clearance

Use of manual, procedures for checking and adjusting valves and injectors, accuracy, and timeliness of job.

20% Measurement of Crankshaft Bearing Clearances

Use of manual, procedures for removing and replacing main cap, placement and measurement of plastigage and crankshaft, accuracy, and timeliness of job.

30% Cylinder Liner Installation

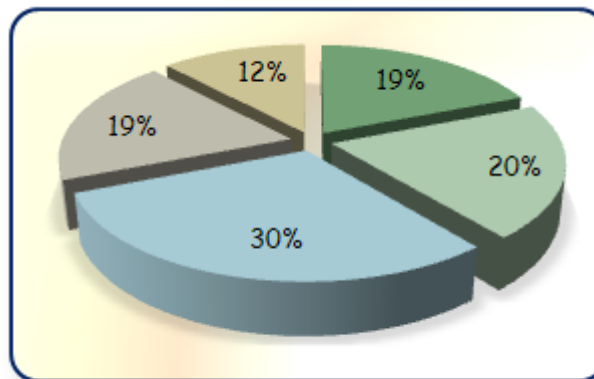
Accuracy of specifications and measurements, procedures for installing liner with hold-downs, calculation of liner protrusion, quality of installation, documentation of steps, and timeliness of job.

19% Electrical Testing

Use of meters to perform tests, methods and procedures for testing, interpretation and recording of readings, accuracy of test results, knowledge of amperes, voltage, and maximum output reading, and timeliness of job.

12% Perform a Coolant System Inspection

Pressure test the engine cooling system, record test pressure used for system, pressure test the pressure cap and serviceability, record the maximum pressure held by pressure cap, perform a litmus test on a coolant sample, calculate the necessary change to coolant additive level, observe and record temperature and specific gravity, determine the freeze point of sample, record recommendations for adjusting freeze point, and timeliness of job.



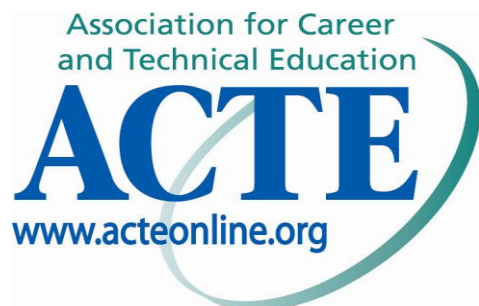
Sample Job: Check and adjust rocker level clearance

Maximum Time: 20 minutes

Participant Activity: The participant will check and adjust rocker lever clearance in the engine provided for this job. Locate procedures and specifications in the manual to check and adjust rocker level clearance. Locate and record rocker lever clearance specifications. Place assigned cylinder in proper position to measure clearance. Record findings in the Data Worksheet provided. Adjust rocker levers to specifications.



The



workplace. Good Luck!

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for Career and Technical Education (ACTE), the leading professional organization for career and technical educators, commends all students who participate in career and technical education programs and choose to validate their educational attainment through rigorous technical assessments. In taking this assessment you demonstrate to your school, your parents and guardians, your future employers and yourself that you understand the concepts and knowledge needed to succeed in the