Engine Mechanical Repair

UNIT 1: Safe Working Practices

ESSENTIAL QUESTION	BIG IDEAS
What are the practices to create a safe working environment with the tools and machines used to repair engines in an automotive repair setting?	Students will: • Learn and demonstrate safe working practices with tools and machines • Identify and learn the safe use of tools and machines associated with engine repair • Learn and follow the safety procedures outlined in OSHA guidelines

GUIDING QUESTIONS

- Content
  - What are the tools and machines most commonly used to work on engines?
  - What are the safety procedures outlined by OSHA guidelines that should be applied in an automotive repair setting?
- Process
  - What does the safe use of the tools and machines most commonly used to work on engines look like?

FOCUS STANDARDS

- 1.4 Identify and safely use and maintain the tools needed to perform mechanical repairs, including precision measurement tools.

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UNIT 2: Base Engine Repair

ESSENTIAL QUESTION	BIG IDEAS
What are the skills and techniques required to perform base engine mechanical repair?	Students will: • Correctly identify the parts of an internal combustion engine • Inspect engine assemblies for potential leaks and determine action • Identify machining processes • Demonstrate knowledge of the removal and installation of an engine • Demonstrate knowledge of various repair techniques on an internal combustion engine

GUIDING QUESTIONS

- Content
  - What are the various parts of an internal combustion engine?
  - What are the various repair techniques needed to service an internal combustion engine?
- Process
  - How do you determine an engine assembly has a leak?
  - What are the various machining processes used to service an internal combustion engine?
- Reflective
  - How do you determine an internal combustion engine is repaired and ready for use?

FOCUS STANDARDS

- 1.1 Correctly identify the parts and describe the operation of an internal combustion engine (diesel, gas, 2-stroke, 4-stroke).
- 1.2 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.
- 1.3 Disassemble and reassemble an internal combustion engine correctly, including finding engine torque and assembly specifications. This may be done in modules. (Example: Cylinder Head Gasket, valve train, and crankshaft).
- 1.5 Identify the machining processes involved with engine mechanical repair.
- 1.6 Clean and inspect engine parts to determine their quality and usability, including magna-fluxing and dye testing.
- 1.7 Demonstrate knowledge of the removal and installation of an engine.
- 1.8 Inspect, repair, or service cooling and lubrication system components.
- 1.9 Demonstrate knowledge of broken fasteners and thread repair techniques.
- 1.10 Demonstrate knowledge of the various types of gaskets, sealers, and thread lockers and their usages.