



South Central College

# AGME 1822 Gas/Diesel Engine Repair I

## Common Course Outline

### Course Information

<b>Description</b>	This course covers overhauling an engine. Students will rebuild gas and diesel heads. Steps covered include grinding valves, seats and rocker arms; replacing worn guides; testing springs and reassembling heads. In addition, students will perform such tasks as engine removal/replacement; and crankshaft, camshaft, sleeve, piston, bearing, and rod measuring. The reassembled engine will be timed, adjusted and tested on the dynamometer.
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<b>Total Credits</b>	3
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<b>Total Hours</b>	96
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### Types of Instruction

#### Instruction Type

#### Credits/Hours

Lab

### Pre/Corequisites

None

### Course Outcomes

#### 1. Identify safety precautions.

##### Learning Objectives

- Always use safety glasses in shop.
- Identify flammable storage cabinet.
- Practice safe lifting techniques.
- Identify fire triangle.
- Identify fire extinguisher location.
- Identify eyewash stations.
- Identify first aid station.
- Identify MSDS safety sheet location.
- Identify proper tractor splitting procedure.
- Obtain forklift certification.

#### 2. Perform engine removal.

##### Learning Objectives

- Identify proper lift points.
- Identify proper engine stand mounting.

Identify tear-down procedure.  
Identify proper splitting stand installation.

**3. Disassemble engine.**

**Learning Objectives**

Identify component parts to be removed.  
Inspect components to aid in engine problem diagnosis.  
Keep injectors, lines and pump openings sealed to prevent dirt from entering.  
Identify bearing and connecting rod caps by stamping numbers on them.  
Identify proper piston removal.

**4. Identify proper head repair procedure.**

**Learning Objectives**

Demonstrate cylinder head dis-assembly.  
Perform cylinder head cleaning.  
Perform warpage and crack detection on head.  
Perform valve guide knurling or replacement.  
Perform valve seat checking and reconditioning.  
Perform valve cleaning and refacing.  
Perform valve spring testing.  
Perform valve rotator check.  
Perform valve seat installation.  
Reassemble head.

**5. Identify procedures used in inspection, overhaul, and testing of a cylinder block.**

**Learning Objectives**

Perform check of cylinder block top surface.  
Perform check of main bearing size for diameter and out of round.  
Perform check or recondition cylinder sleeve bores.  
Perform cam bearing removal and installation.  
Identify removal and replacement of galley plugs expansion plugs, cover plates and oil pressure relief valves.

**6. Identify procedure used in inspection of crankshaft.**

**Learning Objectives**

Perform measurement for out-of-roundness on main and rod journals.  
Perform measurement for taper on main and rod journals.  
Check crankshaft thrust surfaces.  
Explain procedure for crack detection.  
Perform main bearing and crank shaft installation.  
Perform rear main seal installation.  
Perform damper and flywheel inspection and reassembly.

**7. Identify procedure used in inspection of connecting rods, pistons, and piston rings.**

**Learning Objectives**

Perform piston inspection to determine if piston can be used again.  
Perform ring groove cleaning and groove measurement.  
Perform connecting rod inspection.

**8. Identify procedure used for inspection of camshaft and related parts.**

**Learning Objectives**

Demonstrate correct procedure for measuring camshaft lobe.  
Identify lifter and cam lobe follower inspection.  
Identify timing gear inspection.

**9. Reassemble engine.**

**Learning Objectives**

Check all bearings to see that they align to all oil galleries.  
Check to see that all bearing caps are installed correctly.  
Check to all rods and pistons are installed correctly.

Check to see that engine is timed correctly.  
Check to see that head gasket and head is installed correctly.  
Perform all torquing specifications.  
Perform valve lash setting.  
Pressurize oil system.  
Perform static timing.

**10. Identify start-up/break in procedure.**

**Learning Objectives**

Check immediately for oil pressure.  
Run engine till it is at operating temperature and re-torque head and recheck valve lash.  
Perform dynaometer testing.  
Check for leaks.  
Wash tractor and and do final inspection.

**SCC Accessibility Statement**

Disability Services provides accommodations and other supports to students with permanent and temporary disabilities that affect their SCC experience. Disabilities may include mental health (anxiety, depression, PTSD), ADHD, learning disabilities, chronic health conditions (migraine, fibromyalgia), sensory disabilities, and temporary disabilities (broken arm, surgery). Common accommodations are extended test time, private room for testing, audiobooks, and sign language interpreter.

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