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Experienced Worker Assessment Blueprint

Air Cooled Gas Engine Repair

Test Code: 0256 / Version: 02

Specific Competencies and Skills Tested in this Assessment:

Fuel System, Lubricating System, Carburetion

- Inspect and service lubricating system
- Check oil level and fuel/oil mixture
- Identify classification and selection of lubricants
- Identify types of lubricating mechanisms
- Service crankcase breathers, filters, strainers, and seals
- Disassemble diaphragm and/or float carburetor
- Inspect and adjust carburetor
- Inspect and clean filters
- Check fuel tank and lines
- Adjust idle and high speed (rated rpm)
- Reassemble carburetor
- Identify carburetor types
- Disassemble and clean carburetor
- Adjust and service fuel systems controls and linkages
- Check fuel supply systems, gravity feed, suction, fuel pump, pressurized
- Identify recommended fuel types

Compression

- Check and record compression
- Diagnose and service compression problems
- Remove and inspect cylinder head and gasket
- Remove and inspect valves (seats, guides, stems, and faces)
- Check and adjust valve and tappet clearance
- Install cylinder head and gasket
- Torque cylinder head bolts
- Inspect and service exhaust system

Ignition

- Disassemble ignition system (flywheel covering points)
- Inspect ignition components
- Check condenser capacity; leakage and shorts
- Check coil output
- Check and adjust armature air gap
- Solid state ignition testing
- Reassemble ignition system

Specific Competencies and Skills continued:

Governor

- Inspect, service, and reassemble governor
- Operate governor
- Identify governor problems (hunting or surging)
- Adjust governor speed

Engine Disassembly

- Demonstrate ability to use parts catalogs or microfiche
- Write a parts and labor invoice
- Demonstrate recordkeeping on worksheet and job ticket
- Classify the types of engines
- Identify the various head types
- Determine the horsepower, efficiency, and indicated horsepower
- Determine piston displacement
- Determine compression ratio
- Determine bore and stroke relationship
- Check valve operation
- Check timing, camshafts, and positioning of components
- Check clearances, types of valves, seats, and types of cylinder heads
- Check and determine the condition of the power-producing components
- Check piston and connecting rod assemblies
- Determine piston types and design
- Identify types of rings
- Identify types and conditions of bearings, gears and types of fittings
- Identify sequence and process for valve and seat reconditioning
- Demonstrate process for inspecting and measuring cylinder and piston rod assembly
- Demonstrate break-in procedures
- Do final inspection

Engine Assembly

- Use proper techniques in the care and use of tools and equipment
- Use proper safety procedures
- Perform tasks within assigned time limits

Specific Competencies and Skills continued:

Maintenance

- Demonstrate procedures and checks necessary before engine storage
- Demonstrate checks necessary to put engine into service
- Demonstrate checks necessary while engine is in service

Engine Technology

- Check crankshaft, crankpin and main journals
- Check connecting rod crankpin bearing
- Check ring groove side clearance
- Inspect and/or measure cylinder and piston condition
- Inspect and service cooling system
- Service air-cooled system
- Service water-cooled system
- Inspect/service safety devices
- Identify types of power transmissions
- Identify principles of power transmissions

Failure

- Preliminary exam
- Valve failure
- Piston and ring failure
- Connecting rod failure
- Troubleshooting two-stroke engine
- Troubleshooting four-stroke engine
- Diagnose engine noises
- Recognize cause of trouble
- Determine faults by isolation, testing, and process of elimination

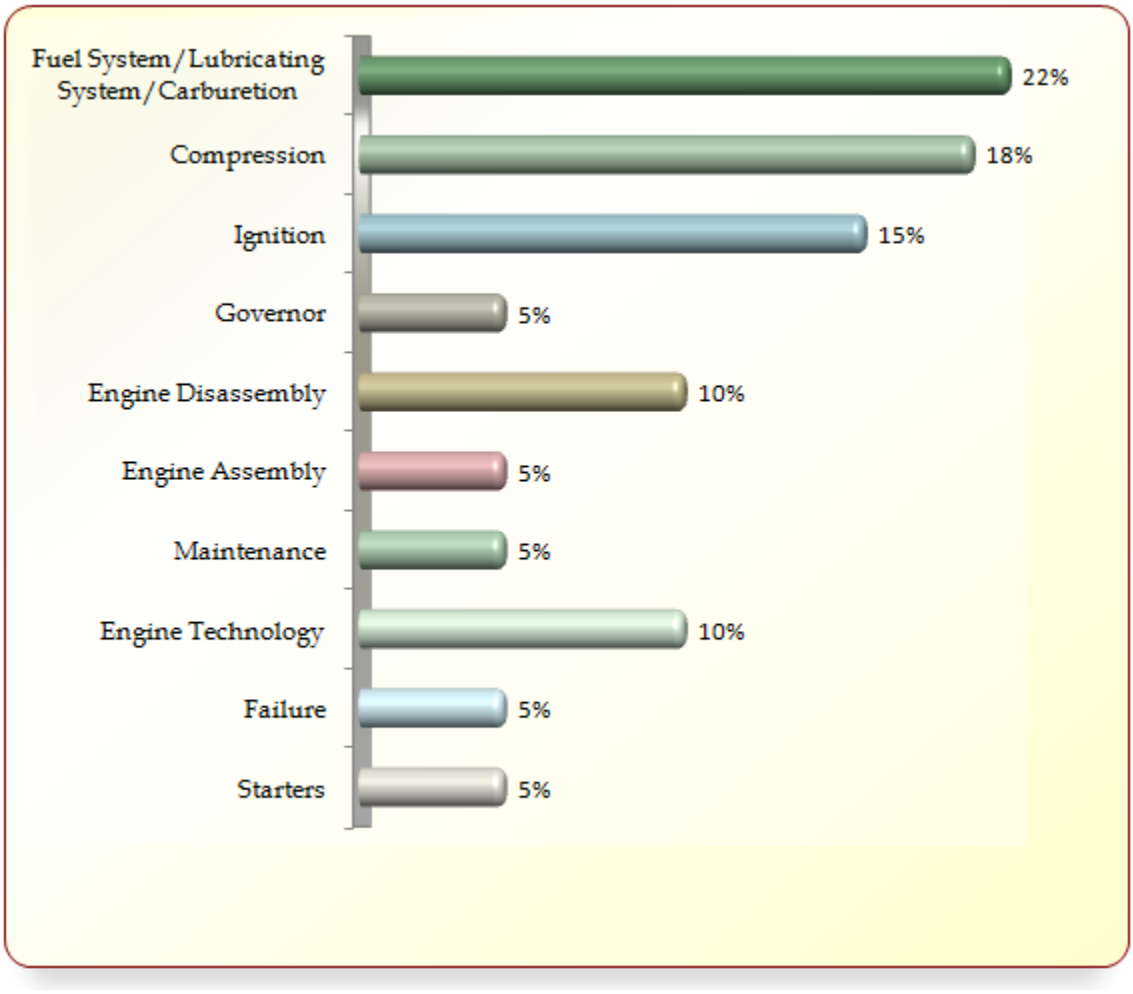
Starters

- Inspect manual and/or electric starter system
- Disassemble, service and adjust manual or electric starter system
- Check wiring, controls, and battery
- Explain precautions necessary in troubleshooting
- Service starters: manual, recoil, battery, and alternating current

Written Assessment:

Administration Time: 3 hours
Number of Questions: 195

Areas Covered:



Sample Questions:

A pulsa-jet carburetor uses which of the following to pump fuel?

A. engine crankcase vacuum
B. differences in temperature
C. pressure differences created by the piston
D. none of the above

On the compression stroke of a four-stroke cycle engine,

A. both valves remain open
B. only the exhaust valve is closed
C. only the intake valve is closed
D. both valves remain closed

Interlock systems that prevent starting the engine on riding lawnmowers and garden tractors are primarily

A. saving wear on the engine
B. saving fuel
C. safety-related
D. a pain to work with

Which of the following instruments is used to find the proper setting of the governor?

A. dial indicator
B. tachometer
C. vacuum gauge
D. manometer

The sequence of operation of the four stroke cycle engine is

A. intake, power, compression, and exhaust
B. intake, compression, power, and exhaust
C. intake, compression, combustion, and power
D. intake, compression, exhaust, and power

Performance Assessment:

Administration Time: 3 hours and 15 minutes
Number of Jobs: 6

Areas Covered:

30% **Rebuild Carburetor and Adjust Engine**
Remove screw, bowl, idle mixture screw, float, clip, inlet needle, needle seat, primer bulb, Welch plugs, and main nozzle; clean components, check condition of components, replace Welch plugs, assemble carburetor, initial adjustment, install carburetor to engine, connect linkage, engine starting procedure, operating temperature established, adjust high, low, and idle speed circuits.

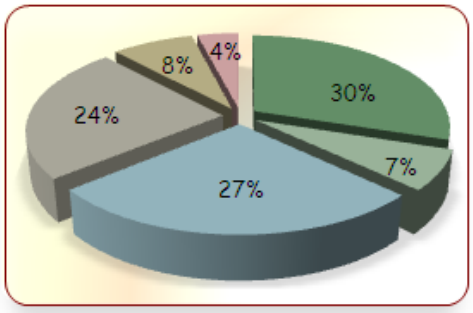
7% **Ignition Troubleshooting**
Troubleshoot ignition problems, correct ignition system problems, run and adjust engine.

27% **Recondition a Worn Engine Cylinder**
Disassemble engine block, measure cylinder bore, piston ring end gap, spec literature, hone cylinder, clean cylinder bore, remeasure cylinder bore, install piston rings, sequence of piston cylinder assembly, torqued to specifications and remainder of engine parts replaced.

24% **Grind Valves**
Removal of head, inspection of head gasket, removal of breather, removal of valves, measurement of valve guides, measurement of valve stem, measurement of seat width, measurement of margin, cutting of angle on exhaust valve and intake valve, cutting of seat angle on exhaust and intake valve, installation of valves, check of tappet clearance, replacement of head, compression test.

8% **Grind and Balance a Lawnmower Blade**
Grinding and balancing of blades.

4% **Test Starter**
Correct use of growler, and procedure for testing commutator.



Sample Job: Rebuild Carburetor and Adjust Engine

Estimated Job Time: 45 minutes

Participant Activity: The participant will remove, rebuild and reinstall a Briggs and Stratton float carburetor, run the engine and adjust to manufacturer's specifications.