Objective: To familiarize student with the procedures of disassembling, measuring, inspecting and reassembling a typical engine.

Cylinder head:

- Remove timing cover, timing belt, valve cover, manifolds and other accessories.
- Check camshaft endplay and record. ________________________________
- Remove head using reverse head bolt-torquing procedure.
- Inspect head for damage or cracks and record. _______________________
- Check head for excessive warpage and record. ________________________
- Disassemble heads removing valves and valve train.
  - Measure and record valve stem diameter. _____________ OK?
  - Measure and record valve guide diameter. _____________ OK?
  - Record stem to guide clearance. _____________ OK?
  - Measure and record spring free length and squareness. ________ OK?
  - Measure and record spring pressures. _____________ OK?
  - Grind valve(s) and seat(s).
  - Check valve margins, seat width and contact patterns. ________ OK?
  - Measure and record installed spring height. _____________ OK?
  - Check and record lifter to bore clearance. _____________ OK?
  - Check and record camshaft bearing clearance. _____________ OK?
  - Measure and record valve clearance with lifter collapsed. ________ OK?
  - Measure and record cam lobe lift. _____________ OK?
- Reassemble heads and lubricate valves with oil and cam with assembly lube.
Cylinder block:

- Remove oil pan, oil pump pickup and oil pump.
- Mark all main bearing and rod bearing caps and remove.
- Check cylinders for ridge wear and ream ridge if necessary.
- Install rod cap bolt protectors and remove connecting rods and pistons.
- Measure and record crank endplay. In specs? YES / NO
- Remove main bearing caps and crankshaft.
- Visually inspect crankshaft journals for wear or pits. OK?  
- Measure crankshaft main and rod journals for diameter, taper and out of round and record results.
- Clean, measure and record piston diameter. OK?  
- Clean (deglaize) cylinder bores and measure for diameter, taper and out of round and record results.
- Record piston clearance. OK?  
- Remove piston rings using proper methods and clean grooves if necessary.
- Measure piston ring end gaps and record. OK?  
- Reinstall rings on piston using proper methods.
- Measure and record ring side clearance and record. OK?
- Clean bearing and crankshaft surfaces and install crankshaft in block.
- Using Plastigage® measure main bearing oil clearance and record results below.
- Reinstall pistons in block facing correct direction with ring end gaps in proper positions.
- Using Plastigage® measure rod bearing oil clearance and record results below.
- Measure and record connecting rod side clearance. OK?
- Disassemble oil pump and inspect cover and housing for wear and scoring. OK?
- Measure and record oil pump rotor backlash, gear to housing clearance and endplay and record. OK?
- Lube oil pump and reinstall.
- Reinstall cylinder head using proper torque procedure.
- Reassemble engine complete.

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