AUTO 297: CYLINDER BLOCK DEVELOPMENT

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2023
Credits:	4
Total Contact Hours:	108
Lecture Hours :	54
Lab Hours:	54
Hours Arranged:	0
Outside of Class Hours:	108
Total Student Learning Hours:	216
Prerequisite:	AUTO 151 or AUTO 295 or one year work experience in the automotive field with an emphasis on engine machining or repair.
Strongly Recommended:	ENGL 101.
Transferable to CSU:	No
Transferable to UC:	No
Grading Method:	Standard Letter, Pass/No Pass

Catalog Course Description

A course designed to teach the skills necessary to develop and rebuild a cylinder block for total performance. Emphasis will be placed on cylinder block development and reconditioning, including operation of align-honing, surfacing, boring, honing machine operation and engine dynamic balancing. 54 lecture hours, 54 lab hours.

Course Objectives

- explain the theory of operation of the four stroke internal combustion engine
- identify the proper methods and procedures for cleaning cylinder blocks and components
- measure all cylinder block components using the proper measuring instruments and procedures
- set-up and complete required machine operations on lower engine components
- machine and assemble lower engine components to manufacture specifications

Major Course Content

1. Orientation
2. EPA and OSHA regulation
3. Shop safety
4. Engine Theory of Operation
5. Nomenclature
6. Four stroke principle
7. Review of cylinder block design and function
8. Cylinder Block Disassembly Procedures
9. Cleaning and inspecting cylinder block components
10. Performing non-destructive testing.
11. Measuring cylinder block components and checking against factory specifications
12. Evaluating needed service and repairs from measurements and inspections
13. Cylinder Block Machining
14. Setting up various types of automotive machine equipment
15. Machine operations
16. Holding machine operations to factory specifications
17. Performing dynamic engine balancing
18. Cylinder Short Block Assembly
19. Assembling cylinder block components to factory specifications
20. Checking and cylinder block component assemblies and comparing to factory specifications

Lab Content

1. Cylinder block teardown and inspection
   a. Short-block disassembly
   b. Piston/Rod disassembly
   c. Block cleaning
   d. Cylinder wall thickness inspection
   e. Cylinder and Main Bore Inspection
   f. Piston cleaning and inspection
   g. Connecting rod cleaning and Inspection
2. Cylinder block and component machining
   a. Align-honing of block
   b. Surfacing of deck
   c. Boring of cylinders
   d. Honing of cylinders
3. Cylinder Block Assembly
   a. Cleaning of block
   b. Final inspection
   c. Piston/Rod assembly
   d. Installation of cam bearings
   e. Installation of main bearings
   f. Installation of crankshaft
   g. Installation of connecting rod and pistons
   h. Final measurements
   i. Degreeing of camshaft if necessary

Suggested Reading Other Than Required Textbook

Automotive technical articles or internet related material as approved by the instructor.

Examples of Required Writing Assignments

An analysis and evaluation of a given automotive technical article or internet related material as approved by the instructor.

Examples of Outside Assignments

Typically two written papers are required that provide the student the opportunity to read and evaluate an automotive technical article or

internet related material (related to the class - cylinder blocks) for technical accuracy and the value of the information to the subject area.

Instruction Type(s)

Lab, Lecture, Online Education Lecture