Fall 2004

SET 177T.01: Motorcycle and ATV Electrical and Fuel Systems

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COURSE NUMBER AND TITLE: SET 177T MOTORCYCLE and ATV ELECTRICAL and FUEL SYSTEMS

DATE REVISED: Fall 2004

SEMESTER CREDIT: 4

CONTACT HOURS PER SEMESTER: 125 (5 week class)
   Lecture hours per week: 10
   Lab hours per week: 15

PREREQUISITES: SET 160 BASIC ELECTRICITY
   SET 176 MOTORCYCLES and ATV’S ENGINES, SUSPENSION & CHASSIS

INSTRUCTOR: Jim Lizotte
E-MAIL: jim.lizotte@mso.umt.edu
PHONE: 406-243-7642
OFFICE LOCATION: T & T II, West Campus
OFFICE HOURS: Mondays, 8 am to 11 am

RELATIONSHIP TO PROGRAM:
Recreational Power Equipment technicians must have the fundamental knowledge and skills necessary to service and repair motorcycle and ATV electrical systems. This course, along with the prerequisites, provides the foundation necessary for entry level technicians to be successful on the job.

COURSE DESCRIPTION: Principles of ignition, charging, and cranking systems and the design and function of carburetor, fuel injection, and lubrication systems. Includes the diagnosis and testing of these systems.

STUDENT PERFORMANCE OUTCOMES:
   Occupational Performance Objectives
Upon completion of this course, the student will be able to:
1. Test various electrical components and systems with a multi-meter
2. Test and adjust ignition and components used on motorcycles and ATV’s
3. Trace and troubleshoot wiring diagram simulated problems
4. Identify various types of carburetors, identify their circuits and troubleshoot associated problems
5. Adjust and synchronize carburetors to factory specifications
REQUIRED TEXT:  Common Service Manual by Honda  
Motorcycles by Johns and Edmundson & Scharff  
Goodhart Willcox Pub.

NOTE: a digital multi-meter with a minimum of 10 amp D.C. capabilities is also required.

STUDENT PERFORMANCE ASSESSMENT METHODS AND GRADING PROCEDURES:  
The following criteria will be used for grading SET 177T MOTORCYCLE and ATV ELECTRICAL and FUEL SYSTEMS:

1. Written Tests 25%  
2. Written Final Test 15%  
3. Lab 45%  
   a. Accuracy and quality of required worksheet completion  
   b. Good use of lab time and following instructions  
   c. Use of shop manuals and forethought  
4. Complete, neat and organized notebook of all handout materials and notes 5%  
5. Demonstrating skills on a daily basis 5%  
6. Lab organization, management, and neatness 5%  

Safety glasses will be worn at ALL times when working in the lab; and in the classroom when working with storage batteries, chemicals, and soldering.

GRADING SCALE:  
A= 93-100  
B= 86-92  
C= 75-85  
D= 65-74  
F= Below 65  

NOTE: If you will not be able to attend class, you MUST call Lizotte at 243-7642. You are responsible for all make-up. Tests will be announced in advance. There will be no make-up tests except for very extenuating circumstances.

SAFETY: College of Technology safety rules will be followed at all times. Each student will receive a copy. A list is also posted on the classroom bulletin board. Failure to follow the rules can result in removal from class.

Suggestions for success in the RPE program:  
1. Attitude is everything  
2. Regular attendance is critical; tardiness is unacceptable  
3. Take good notes  
4. Pay attention  
5. Study all assigned material on a regular basis and for tests
HOW VARIOUS ASSESSMENT METHODS WILL BE USED TO IMPROVE THE COURSE:
1. Student course evaluations
2. Peer feedback
3. Advisory committee feedback

COURSE OUTLINE:
1. Ignition Systems
   A. Types
      a. Energy Transfer
      b. Battery
      c. TPI
      d. CDI
   B. Principles of operation
   C. Components
   D. Service and adjustment
   E. Ignition suppression
2. Charging Systems
   A. Principles of operation
   B. Testing
      a. Components
      b. Voltage
      c. Resistance
      d. Amperage
   C. Types
      a. Half wave
      b. Full wave
      c. Three phase
3. Fuel Systems
   A. Parts
      a. Float
      b. Float valve
      c. Idle Jet
      d. Main Jet
      e. Metering needle
      f. Needle jet
      g. Accelerator pump
      h. Slide
      i. Pilot screw
   B. Carburetor types
      a. Slide controlled
      b. Vacuum controlled
      c. Butterfly controlled
   C. Carburetor circuits
      a. Float
      b. Idle
      c. Mid-range
      d. High sped
      e. Enrichment
D. Electronic Fuel Injection
   a. ECM
   b. Sensors
   c. ECM Self-Diagnostics
E. Carburator synchronization
F. Carburator rebuilding
G. Emission control systems
H. Four-Stroke Cycle lubrication
   1. Functions of oil
      a. Clean
      b. Cool
      c. Seal
      d. Lubricate
   2. Oil classifications and types
      a. API
      b. SAE
   3. Four-stroke lubricating systems
      a. Dry sump
      b. Wet sump
   4. Types of oil pumps
      a. Gear
      b. Plunger
      c. Rotor
   5. Valves
      a. Check
      b. Relief
   6. Filters
   7. Coolers