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ABSTRACT

This is a course in which the student will receive the general information, technical knowledge, basic skills, attitudes, and values required for job entry level as an auto body repair helper. Course content includes general and specific goals, orientation, instruction in service tools and bench skills, and auto mechanics as applied to auto body. A bibliography and post-test are appended. (NH)

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# AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM



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Course Outline  
AUTO BODY REPAIR AND REFRESHING 3  
(Automotive Mechanics as Applied to Auto Body)  
Department 48 - Course 9037.02

DIVISION OF INSTRUCTION • 1973

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Course Outline

AUTO BODY REPAIR AND REFINISHING 3  
(Automotive Mechanics as Applied to Auto Body)

Department 18 - Course 9037.02

county office of

VOCATIONAL AND ADULT EDUCATION

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Miami, Florida 33132

December, 1972

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Course Description

<u>9037</u> State Category Number	<u>48</u> County Dept. Number	<u>9037.02</u> County Course Number	<u>AUTOMOTIVE MECHANICS AS APPLIED TO AUTO BODY</u> Course Title
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This quinmester course is designed as one of a group of quinmester courses offered in the field of auto body repairs. The student will receive the general information, technical knowledge, basic skills, attitudes and values that are required for job entry level as auto body repair helper. This course will be given in a 9-week period.

Indicators of success: The applicant must demonstrate an eighth grade equivalency score in reading and math. Also have average ability in mechanical aptitudes.

Clock Hours: 135

## PREFACE

The following quinmester course outline is a guide to help students become employable with skills, knowledge attitudes and values necessary for performing the required service of the automotive mechanics as applied to auto body.

This course is designed as a foundation quinmester course for the auto body repairman. This outline consists of four blocks of instruction which are subdivided into several units each. It is only one part of a series of quinmester outlines designed for the complete auto body repairman. This course is 135 hours in length.

Prerequisites for this course is as follows: The student should have an eighth grade equivalency score in reading, comprehension, arithmetic fundamentals and mechanical aptitude. The student must be physically and mentally able to profit from this training.

Prior to entry into this course, the vocational student will display mastery of the skills indicated in Unibody Construction and Frame Alignment (9037.01).

Instruction will consist of demonstrations, lectures, group discussions audio visual aids and resource people from industry. Instruction will be flexible to meet individual needs and abilities.

The bibliography appearing on the last page of this outline lists several basic references, also supplementary references and audio visual aids.

This outline was developed through the cooperative efforts of the instructional and supervisory personnel, the Quinmester Advisory Committee, and the Vocational Curriculum Materials Service and has been approved by the Dade County Vocational Curriculum Committee.

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with Suggested Hourly Breakdown

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## GOALS

The Auto Body Repair trainee must be able to demonstrate:

1. The ability to identify, diagnose and perform minor repairs to the automotive engine and related components.
2. The ability to identify, diagnose and perform minor repairs to the automotive cooling system.
3. The ability to identify, diagnose and perform minor repairs to the automotive electrical system.
4. The ability to identify, diagnose and perform minor repairs to the automotive front suspension.
5. The ability to identify, diagnose and perform minor repairs to the automotive air condition.
6. Pride and respect of craftsmanship for this occupational field.
7. Safe work habits and proper shop behavior to guard against accidents.
8. Positive attitudes regarding the value and dignity of work.
9. An incentive to continue with more advanced training within this occupational field.



## SPECIFIC BLOCK OBJECTIVES

### BLOCK I - ORIENTATION

The student must be able to:

1. List the opportunities that are available for career in auto body occupation by written assignment.
2. State what will be expected of him in auto mechanics as applied to auto body repairs, oral or written.
3. Exhibit pride and respect for craftsmanship by his actions in shop or laboratory.
4. Demonstrate skills and knowledge which will prepare him for safe working life by performing shop assignments.
5. Demonstrate understanding and acceptance of his duties and responsibilities by his performance in shop or laboratory.
6. Demonstrate an understanding of shop organization, safety rules and regulations by observance and performance.

### BLOCK II - SERVICE TOOLS AND BENCH SKILLS

The student must be able to:

1. Define the general type of tools and use by selection and identification test.
2. Exhibit the ability to practice safety precautions in the use of tools and equipment by observance and practice of shop rules and regulations.
3. Exhibit the ability to use the applicable tools and bench skills by selection and use.
4. Demonstrate proper care and maintenance of tools and equipment by study and observance of written instructions.

### BLOCK III - AUTO MECHANICS AS APPLIED TO AUTO BODY

The student must be able to:

1. Exhibit the ability to identify types of engines and components by study of text and motor manuals.
2. Diagnose minor damage to automotive engine by visual inspection and testing methods.
3. Exhibit the ability to perform minor repairs by shop performance and instructions.
4. Demonstrate the ability to identify types of cooling systems and components by study of text and service manuals.
5. Diagnose collision damage to cooling system by visual inspection.
6. Exhibit the ability to perform minor repairs by following oral and written instruction.
7. Demonstrate the ability to identify components of the electrical system by written test.
8. Diagnose collision damage by visual inspection and testing methods.

9. Exhibit the ability to perform minor repairs by actual shop practice.
10. Demonstrate the ability to identify components of the automotive front suspension by studying charts and service manuals.
11. Diagnose collision damage by visual inspection, testing equipment and charts.
12. Demonstrate the ability to perform minor repairs by using equipment and tools.
13. Demonstrate the ability to identify types of automotive air condition and components by study of texts and service manuals.
14. Diagnose collision damage by visual inspection and testing equipment.
15. Exhibit the ability to perform minor repairs by using tools, material and equipment.

#### BLOCK IV - QUINMESTER POST TEST

The student must be able to:

Satisfactorily complete the quinmester post test.

## Course Outline

### AUTO BODY REPAIR AND REFINISHING 3 (Automotive Mechanics as Applied to Auto Body)

Department 48 - Course 9037.02

#### I. ORIENTATION

##### A. Objectives of Course

1. Standards
2. Methods of evaluation
  - a. Oral test
  - b. Written test
  - c. Manipulation
  - d. Diagnosis and job performance
3. Teaching methods

##### B. Student Benefits

1. Opportunities for employment
  - a. Job opportunities
  - b. Scope of trade
2. Qualification for employment
  - a. Job competency
  - b. Attitude
  - c. Dependability
  - d. Pride of workmanship
  - e. Experience
  - f. Trade certificate
  - g. Foundation for more education and training

##### C. Student Responsibilities

1. Safety regulations
2. School policies and expenses
3. Shop rules and procedures
  - a. Use and care of equipment
  - b. Care of hand tools
  - c. Appropriate dress
  - d. Reporting loss of equipment
  - e. Reporting defective equipment
  - f. Housekeeping
  - g. Materials and supplies
  - h. Employee-employer relations
  - i. Employee-customer relations

#### II. SERVICE TOOLS AND BENCH SKILLS

##### A. Automotive Hand Tools

1. Types and sizes
2. Uses and safety precautions
  - a. Drilling and reaming
  - b. Taps and dies
  - c. Tube flaring tools
  - d. Power tools

## II. SERVICE TOOLS AND BENCH SKILLS

- e. Arbor presses
- f. Soldering tools
- g. Vises and clamps
- h. Lifting devices
- i. Wrenches
- j. Reamer
- k. Hack saws
- l. Hone

### B. Measuring Devices and Their Use

- 1. Micrometers
- 2. Dial indicators
- 3. Pressure gauges

## III. AUTO MECHANICS AS APPLIED TO AUTO BODY

### A. The Automotive Engine Assembly

- 1. Identification
- 2. Types and sizes
- 3. Inspection and minor collision repairs
  - a. Engine block
  - b. Cylinder head
  - c. Valve cover
  - d. Oil pan
  - e. Manifold
  - f. Motor mounts
  - g. Spark plugs
  - h. Wiring
  - i. Fuel pump
  - j. Starter
  - k. Distributor
  - l. Generator or alternator
  - m. Carburetor

### B. The Automotive Cooling System

- 1. Identification
- 2. Types
- 3. Inspection and minor collision repairs
  - a. Radiator
  - b. Water pump
  - c. Fan blade
  - d. Fan belt
  - e. Thermostat
  - f. Oil cooler
  - g. Air

### C. The Automotive Electrical System

- 1. Identification
- 2. Types

### III. AUTO MECHANICS AS APPLIED TO AUTO BODY (Contd.)

3. Inspection and minor collision repairs
  - a. Battery
  - b. Headlights
  - c. Signal horn
  - d. Park lights
  - e. Signal lights
  - f. Wiring
  - g. Voltage regulator
  - h. Switches
  
- D. The Automotive Front Suspension
  1. Identification
  2. Types
  3. Inspection and minor collision repairs
    - a. Front wheels
    - b. Lower control arms
    - c. Upper control arms
    - d. Ball joint
    - e. Spindle
    - f. Knuckle
    - g. Steering arms
    - h. Tie rods
    - i. Brake drum
    - j. Wheel balance
  
- E. The Automotive Air Condition
  1. Identification
  2. Types
  3. Inspection and minor collision repair
    - a. Condenser
    - b. Compressor
    - c. Receiver
    - d. Expansion valve
    - e. Evaporator
    - f. Belts
    - g. Pulleys

### IV. QUINTESTER POST TEST

## BIBLIOGRAPHY

### (Auto Mechanics as Applied to Auto Body)

#### Basic References:

1. Crouse, William H. Automotive Chassis and Body Construction, Operation and Maintenance. New York: Webster Division, McGraw-Hill Book Co. 1949, Pp. 609.
2. \_\_\_\_\_ . Automotive Electrical Equipment Construction Operation and Maintenance. New York: Webster Division, McGraw-Hill Book Co. 1966. Pp. 489.
3. \_\_\_\_\_ . Automotive Engines. New York: Webster Division, McGraw-Hill Book Co. 1966. Pp. 623.
4. \_\_\_\_\_ . Automotive Mechanics. New York: Webster Division, McGraw-Hill Book Co. 1965. Pp. 616.
5. Dwiggin, Boyce H. Automotive Air Conditioning. Albany: Delmar Publishers, Inc. Mountainview Avenue. Pp. 417.

#### Supplementary References:

6. Chilton Auto Repair Manual. 35 ed. Phila: Chilton Co., 1964. Pp. 1250.
7. Gleason Auto Repair Manual. 3rd Ed. Phila: Chilton Co., 1962. Pp. 478.
8. Motors Auto Repair Manual. 27th ed. New York: Motor Magazine, 1964. Pp. 1280.
9. Stockel, Martin W. Auto Mechanics. Chicago: Goodheart-Wilcox Co., Inc. 1963. Pp. 480.
10. Tobolt, William K. and Johnson, Larry. Motor Services Automotive Encyclopedia. Illinois: Goodheart-Wilcox Co., Inc. 1970. Pp. 768.

#### Films:

- |   | <u>Dade Co.<br/>Number</u> |
|---|----------------------------|
| 1. <u>ABC of Hand Tools.</u> Part I, 16mm, 18 min, color, sound, General Motors.  | 1-11397                    |
| 2. <u>ABC of Hand Tools.</u> Part II, 16mm, 16 min, color, sound, General Motors. | 1-11399                    |
| 3. <u>Accidents Happen to Sam,</u> 16mm, 13 min, B/W, Sound, National Safety.     | 1-11339                    |
| 4. <u>I Want a Job,</u> 16mm, 26 min, B/W, Sound, Ford Motor Co.                  | 1-11568                    |

APPENDIX  
QUINMESTER POST-TEST SAMPLE

6/7

## Quinmester Post Test

Name \_\_\_\_\_ Date \_\_\_\_\_ Score \_\_\_\_\_

The following items are multiple choice. Select the one you believe correct. Circle the number provided at left of item.

1. When drilling steel 1/8 inch or more in thickness, which of the following lubricants should be used:
  1. Mineral spirits
  2. Oil
  3. Water
  4. Wheel bearing grease
  
2. Tube flaring tools are used to:
  1. Enlarge tubing
  2. Flare tubing for union connections
  3. Stretch exhaust pipe connections
  4. Ignite warning flares
  
3. A tap is used to:
  1. Make threads in hole
  2. Screw on bolt
  3. Cut threads on rod or pipe
  4. None of above
  
4. A vise is used to:
  1. Squeeze
  2. Hold
  3. Press
  4. All of above
  
5. The type socket used on a square nut is:
  1. 6 point
  2. 12 point
  3. 8 point
  4. All of above
  
6. An impact wrench is used to:
  1. Drill
  2. Ream
  3. Remove or replace bolts
  4. All of above



7. A die is used to:
  1. Ream
  2. Cut threads on rod or pipe
  3. Cut threads in hole
  4. Drill
  
8. Hack saws are used to:
  1. Cut fiber glass
  2. Cut rod or bolt
  3. Cut sheet metal
  4. All of above
  
9. A timing light is used to:
  1. Check compression
  2. Check timing
  3. Check oil pressure
  4. Check manifold pressure
  
10. The result of incorrect timing will cause:
  1. Loss of power
  2. Spark knock
  3. Rough idling
  4. All of above
  
11. Feeler gauges are used to:
  1. Adjust carburetor
  2. Set timing
  3. Set spark plug tap
  4. None of above
  
12. High compression motors require:
  1. Low octane gas
  2. High octaine gas
  3. Octane immaterial
  4. Diesel fuel
  
13. Broken motor mounts will cause:
  1. Motor to shift forward into radiator
  2. Disruption of gear shift linkage
  3. Motor to shift backward
  4. All of above
  
14. The cooling system consists of the following components:
  1. Radiator
  2. Water pump
  3. Fan blade
  4. All of above

15. Transmission oil cooling lines function by:

1. Oil flowing through cooler
2. Oil mixed with water
3. Oil cooled by fan
4. None of above

16. Damaged radiators, depending on extent of damage are either:

1. Recored
2. Replaced
3. Repaired
4. All of above

The following sentences need a word or phrase to complete. Fill in the blank spaces with correct word or phrases.

17. The older model automobiles were equipped with a six volt system. The current model automobiles are equipped with \_\_\_\_\_ system.
18. Current model automobiles are equipped with alternators. Prior to this they were equipped with \_\_\_\_\_.
19. Most all passenger vehicles are equipped with coil spring front suspension. Prior to this \_\_\_\_\_ were used.
20. For years manufacturers have used hydraulic brake shoe system, but recently \_\_\_\_\_ have been used extensively.
21. Some wheel balancing machines are designed to balance wheels on the automobile; others require wheels be \_\_\_\_\_.
22. In order to balance wheels \_\_\_\_\_ are placed as need on rim of wheels.
23. It is impossible to align front wheels if a wheel is \_\_\_\_\_.
24. The three major front suspension settings are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
25. Incorrect front end alignment will cause tire to \_\_\_\_\_ and hard \_\_\_\_\_.
26. Before checking front end alignment, three important preliminary checks must be made. 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_.
27. The first automobile manufacturer to install air condition was \_\_\_\_\_.
28. In 1962 the percentage of automobile passenger cars equipped with factory air condition was \_\_\_\_\_%.

29. A gas leak can be detected by the use of \_\_\_\_\_.
30. When recharging air conditions some require the use of \_\_\_\_\_ gauges, some require \_\_\_\_\_ gauges.

Answer Key to Quinmester Post Test

1. 2
2. 2
3. 1
4. 4
5. 3
6. 3
7. 2
8. 4
9. 2
10. 4
11. 3
12. 2
13. 4
14. 4
15. 1
16. 4
17. Twelve volt
18. Generator
19. Leaf springs
20. Disc brakes
21. Removed
22. Weights
23. Bent
24. Caster - camber - toe-in
25. Wear - steering
26. Tire inflation - wheel bearings - steering linkage
27. Packard Motor Company
28. 11.31%
29. Halide gas torch
30. Two - three