

### New Course Checklist

1. NEED FOR THIS COURSE:

- a. Diesel truck technology has changed tremendously over the past decade. Students wishing to enter the field of diesel truck service and repair need a broad understanding of the new technologies. It is imperative that we expose our students to new technologies as much possible as to ensure their successful transition into the labor force. Technician certification programs are in great demand as the demand for qualified technicians far exceeds supply. Students completing this course will be ready to meet the challenge of the certification tests.
- b. Some documented evidence of the need for this course include:
  - Direct contact with Mr. Bill Johnson, Mr. Dave Flaming, Mr. Mike Koehler, and Mr. Don Snow of Johnson Machinery. These representatives of Johnson Machinery, the local CAT dealer and repair/sales center of Riverside, indicated their strong commitment to support this training by providing much needed expertise, equipment, training materials, and most importantly, job placement for our successful students.
  - Recent and rapid growth in the rail transport industries – Santa Fe Railroad’s newly expanded Intermodal Transport Depot in San Bernardino and the expansion of various truck/warehouse facilities throughout the inland valley communities has created much needed employment opportunities for individuals entering the heavy-duty truck repair/service industry.
- c. This course will provide our students the needed skills and training to enter this newly created job market in this rapidly expanding career field.

2. CULTURAL DIVERSITY:

This course is technical in nature and is culturally neutral.

3. RATIONALE FOR OTHER REQUESTS:

- a. Course Repeatability: Not Applicable
- b. Credit/No Credit Grading Only: Not Applicable
- c. Cross-listed Courses: Not Applicable

4. FEASIBILITY—BUDGET IMPLICATIONS:

- a. Is new equipment needed? No
- b. Will new faculty need to be hired? No
- c. Are facilities adequate? Yes

**I. CATALOG DESCRIPTION:**

- A. Department Information:  
Division: Technical  
Department: Automotive  
Course ID: DIESEL 023  
Course Title: Heavy-Duty Truck Suspension and Steering  
Units: 2  
Lecture: 1.5 Hours  
Laboratory: 1.5 Hours  
Prerequisite: None
- B. Catalog and Schedule Description:  
Theory and practical shop work in the construction, operation, and repair of heavy-duty truck suspension and steering components. Includes principles of hydraulic and pneumatic steering and suspension systems.

**II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One**

**III. EXPECTED OUTCOMES FOR STUDENTS:**

Upon completion of the course the student should be able to:

- A. Identify procedures for the safe use and care of tools and chemicals, the proper placement and storage of parts and components, and the correct protective clothing and safety gear for various situations.
- B. Disassemble, inspect, and repair parts, which are reusable in a manner consistent with accepted trade practices.
- C. Assemble hydraulic and pneumatic suspension and steering systems in accordance with manufacturer instructions and specifications. The student will identify and order new suspension parts as required.
- D. Perform all necessary adjustments, demonstrate sequential steps taken in diagnosing heavy-duty truck suspension and steering systems, and remove and replace components in a manner consistent with accepted industry standards.
- E. Identify various design, operating principles, and the component parts of the heavy-duty truck suspension and steering systems.
- F. Differentiate the hydraulic heavy-duty truck steering system from the pneumatic heavy-duty truck steering system.
- G. Write a comprehensive failure analysis report about a failed heavy-duty truck suspension/steering system or component.

**IV. COURSE CONTENT:**

- A. Shop Safety
  1. Personal safety
  2. Work area safety
  3. Shop tool safety
  4. Hazardous materials
  5. Handling and disposal of hazardous waste
  6. Shop records
- B. Tools & Equipment
  1. Hand tools
  2. Power Tools
  3. Measuring tools
  4. Manufacturers' service publications
  5. Fasteners

- C. Fundamentals & Service
  - 1. Spring Type Suspensions
  - 2. Equalizing Beam Suspensions
  - 3. Torsion Bar Suspensions
  - 4. Air Bag (Spring) Suspensions
  - 5. Steering Systems
    - a) System component
    - b) Front-end alignment
    - c) Advanced alignment equipment
    - d) Power steering systems
    - e) Air-assisted steering systems
    - f) High-performance truck steering
- D. Suspension Alignment

**V. METHODS OF INSTRUCTION:**

Methods of instruction will vary from instructor to instructor but may include:

- A. Lecture
- B. Demonstration
- C. Audio/Visual media presentations
- D. Computer research using Internet
- E. Guided practice of tools and techniques by students using training platforms

**VI. TYPICAL ASSIGNMENTS:**

Typical assignments will vary from instructor to instructor but may include:

- A. Reading selections from textbook and answering questions
  - Typical Questions:
    - 1. Identify the types of manual steering gears used in heavy-duty trucks.
    - 2. What is the main purpose of the suspension system?
- B. Researching information from Internet WEB sites
- C. Writing detailed descriptions of service procedures for suspension systems and components
- D. Performing routine service and repair labor tasks on suspension system training module/platform

**VII. EVALUATION(S):**

A. Methods of evaluation will vary from instructor to instructor but may include:

- 1. Short quizzes on select topic
- 2. Demonstration of mastery by student performing labor task
- 3. Comprehensive written exam

Typical Questions:

- a) What term is used to describe the forward or rearward tilt of the king pin?
- b) The driver of a truck equipped with a rear air-suspension system complains that the truck rides too high. Describe the diagnosis procedure and the repair steps required to solve this problem.

B. Frequency of evaluation will vary from instructor to instructor but may include:

- 1. Summary questions at the end of each class meeting
- 2. Quizzes on selected topics – weekly
- 3. Student demonstrations of skills – by course unit – unit tests
- 4. One mid-term exam
- 5. One final exam

**VIII. TYPICAL TEXT(S):**

Ian Andrew Norman, Robert Scharff, John A. Corinchock, Heavy Duty Truck Systems, 2<sup>nd</sup> Edition, Delmar, New York, 1996  
Frank J. Thiessen, Diesel Fundamentals and Service, 3<sup>rd</sup> Edition, Prentice-Hall, Upper Saddle River, New Jersey, 2000

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Robert N. Bradey, Heavy Duty Trucks: Powertrains, Systems, and Service, 2<sup>nd</sup> Edition,  
Prentice-Hall, Upper Saddle River, New Jersey, 1997  
Andrew Norman, Heavy Duty Truck Systems, 2<sup>nd</sup> Edition, Delmar, Albany, New York, 1995

**IX. OTHER SUPPLIES REQUIRED OF STUDENTS:**

Safety glasses