

**SAN DIEGO COMMUNITY COLLEGE DISTRICT
MIRAMAR COLLEGE
ASSOCIATE DEGREE COURSE OUTLINE**

SECTION I

SUBJECT AREA AND COURSE NUMBER: Diesel Technology 220

COURSE TITLE: Undercarriage

Units: 3
Grade Only

CATALOG COURSE DESCRIPTION:

Students learn the fundamentals of operation, wear analysis, preventive maintenance, and major service of track-type undercarriages.

REQUISITES:

Corequisite: Completion of or concurrent enrollment in:
DIES 100 with a grade of "C" or better, or equivalent

FIELD TRIP REQUIREMENTS: May be required

TRANSFER APPLICABILITY: Associate Degree Credit & transfer to CSU and/or private colleges and universities

TOTAL LECTURE HOURS: 32 - 36

TOTAL LAB HOURS: 48 - 54

STUDENT LEARNING OBJECTIVES:

Upon successful completion of the course the student will be able to:

1. Demonstrate fundamental knowledge of tractor undercarriage systems
2. Identify and compare the purpose and operation of low-type and high-type tracks; demonstrate how to remove and install them
3. Describe the purpose and operation of rubber-type tracks; demonstrate how to remove and install them
4. Identify the purpose and types of track roller frames; demonstrate how to remove and install them
5. Identify the purpose and differentiate types of sprockets; demonstrate how to remove and install them
6. Describe the purpose and operation of front and rear idlers; demonstrate how to remove and install them
7. Describe the purpose and operation of track rollers; demonstrate how to remove and install them
8. Describe the purpose, types, and operation of carrier rollers; demonstrate how to remove and install them
9. Describe the purpose, types, and operation of track chains; demonstrate how to remove and install chains
10. Describe the purpose, operation, and types of track shoes; demonstrate how to remove and install shoes
11. Describe maintenance procedures; inspect and determine need for repairs; demonstrate how to adjust tracks.

SECTION II

1. COURSE OUTLINE AND SCOPE:

A. **Outline Of Topics:**

The following topics are included in the framework of the course but are not intended as limits on content. The order of presentation and relative emphasis will vary with each instructor.

- I. Introduction to undercarriages
 - A. Fundamentals
 - B. Purpose
 - C. Operation
 - D. Types
 - E. Component handling
 - F. Machine controls.
- II. Low-type tracks
 - A. Purpose
 - B. Operation
 - C. Components
 - D. Inspection
 - E. Wear
 - F. Repair
 - G. Removal and installation
 - H. Adjustment.
- III. High-type tracks
 - A. Purpose
 - B. Operation
 - C. Components
 - D. Inspection
 - E. Wear
 - F. Repair
 - G. Removal and installation
 - H. Adjustment.
- IV. Rubber-type tracks
 - A. Purpose
 - B. Operation
 - C. Components
 - D. Inspection
 - E. Wear
 - F. Repair
 - G. Removal and installation
 - H. Adjustment.
- V. Track roller frames
 - A. Purpose
 - B. Components
 - C. Types
 - D. Inspection
 - E. Wear
 - F. Repair
 - G. Removal and installation.
- VI. Drive sprockets
 - A. Purpose
 - B. Types
 - C. Inspection
 - D. Wear
 - E. Removal and installation.
- VII. Front idlers
 - A. Purpose
 - B. Operation
 - C. Components

- D. Inspection
 - E. Wear
 - F. Repair
 - G. Removal and installation.
- VIII. Rear idlers
- A. Purpose
 - B. Operation
 - C. Components
 - D. Inspection
 - E. Wear
 - F. Repair
 - G. Removal and installation.
- IX. Track rollers
- A. Purpose
 - B. Operation
 - C. Components
 - D. Inspection
 - E. Wear
 - F. Repair
 - G. Removal and installation.
- X. Carrier rollers
- A. Purpose
 - B. Operation
 - C. Components
 - D. Inspection
 - E. Wear
 - F. Repair
 - G. Removal and installation.
- XI. Track chains
- A. Purpose
 - B. Operation
 - C. Components
 - D. Types
 - E. Inspection
 - F. Wear
 - G. Repair
 - H. Removal and installation.
- XII. Track shoes
- A. Purpose
 - B. Operation
 - C. Types
 - D. Inspection
 - E. Wear
 - F. Repair
 - G. Removal and installation.
- XIII. Undercarriage service
- A. Inspection
 - B. Maintenance
 - C. Adjustment.

B. Reading Assignments:

Reading assignments are required and may include but, are not limited to, the following:

- I. 1. Chapters from course textbook(s)
- II. 2. Articles related to diesel repair in professional journals such as Service Tech, Diesel Progress, Commercial Carrier Journal (CCJ), Utility Fleet, Fleet Owner, and Transportation Equipment News
- III. 3. Reviewing reports, repair manuals, on-line resources, and laboratory guides associated with diesel technology.

C. Appropriate Assignments that Demonstrate Critical Thinking:

Critical thinking assignments are required and may include, but are not limited to, the following:

- I. 1. Analyzing methods learned in class and utilizing appropriate methods for completing laboratory tasks
- II. 2. Evaluating and recording the serviceability of major undercarriage components
- III. 3. Formulating repair plans for major undercarriage components
- IV. 4. Calculating and solving mathematical problems.

D. Appropriate Outside Assignments:

Outside assignments may include, but are not limited to, the following:

- I. 1. Conducting research relating to updates on track-type undercarriages at Caterpillar websites
- II. 2. Completing all reading and writing assignments, including a shop notebook and a drive sprocket wear analysis report
- III. 3. Completing a field assignment report on a site visit to a local heavy equipment repair shop.

E. Writing Assignments:

Writing assignments are required and may include, but are not limited to, the following:

- I. 1. Preparing a shop notebook
- II. 2. Writing an undercarriage inspection report
- III. 3. Responding to short essay questions about related topics such as the operation and service of track-type undercarriages.

2. METHODS OF EVALUATION:

A student's grade will be based on multiple measures of performance unless the course requires no grade. Multiple measures may include, but are not limited to, the following:

- I. Performing manipulative skills as needed to complete laboratory assignments satisfactorily
- Successfully applying theory to laboratory assignments
- Performing on written, oral, and/or practical examinations
- Performing on out-of-class assignments including diesel engine reports and projects
- Contributing to class discussion
- Maintaining attendance per current department policy.

3. METHODS OF INSTRUCTION:

Methods of instruction may include, but are not limited to, the following:

- * Lecture
- * Laboratory
- * Lecture-Lab Combination
- * Other (Specify)
- * A. Demonstration
- * B. Field trips and/or field assignments
- * C. Computer-assisted instruction.

4. REQUIRED TEXTS AND SUPPLIES:

Textbooks may include, but are not limited to:

TEXTBOOKS:

1. Caterpillar, Inc.. SIS DVDA0005-29, Machines, 1st ed. Caterpillar, Inc., 2001,
2. Caterpillar, Inc.. Works and Wear, SENA9020-34, 3rd ed. Caterpillar, Inc., 1999,
3. Lewis, Jim. DIES-M Daily Reports, 2nd ed. Miramar Reprographics, 1982,

MANUALS:

PERIODICALS:

SOFTWARE:

SUPPLIES:

1. Safety glasses
2. Hearing protection
3. Calculator
4. Appropriate clothing and footwear for shop work
5. Scantron answer sheets

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CO-CONTRIBUTOR(S)

DATE: 03/05/2003