

Diesel Equipment Mechanic (DEM)

Level 2

Diesel Engine Mechanic (DEM)

Unit: B4 Diesel Engine Fuel and Exhaust Systems

Level: Two

Duration: 63 hours

Theory: 28 hours

Practical: 35 hours

Overview:

This unit of instruction provides the DEM apprentice an overall understanding of fuel characteristics and systems. It also provides the working knowledge required to diagnose and repair fuel injection, exhaust and emission control systems. The unit also provides the apprentice with the working knowledge required to diagnose engine problems and perform other related testing procedures.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe special safety hazards and precautions as they relate to diesel engine fuel injection and exhaust systems, such as: high pressure fuel and extreme temperatures.	5%
2. Describe/demonstrate diesel engine fuel injection systems.	35%
3. Describe diesel engine fuel characteristics, including the combustion process.	15%
4. Describe/demonstrate cleanup and testing procedures for diesel engine fuel systems.	35%
5. Describe/demonstrate diesel engine exhaust, emission controls and testing.	10%

Diesel Engine Mechanic (DEM)

Unit: C1 Driven Systems

Level: Two

Duration: 28 hours

Theory: 14 hours

Practical: 14 hours

Overview:

This unit of instruction provides the Diesel Engine Mechanic (DEM) apprentice with the working knowledge of driven systems, from the safety hazards and precautions to the components and operation of such systems. As well, apprentices will learn to diagnose, inspect and service diesel engine driven systems.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe special safety hazards and precautions as they relate to diesel engine driven systems, such as: rotating equipment, high temperature and shock.	10%
2. Describe/demonstrate the types, components and operation of diesel engine driven system systems and their components.	10%
3. Describe/demonstrate diagnostic, maintenance (servicing), and testing procedures for the air compressor systems, including component removal/installation/replacement, including alignment.	25%
4. Describe/demonstrate diagnostic, maintenance (servicing), and testing procedures for the main generator/alternator, including removal/installation/replacement of components, including alignment.	25%
5. Describe/demonstrate diagnostic, maintenance (servicing), and testing procedures for the electric drive motor, including removal/installation/replacement of components.	10%
6. Describe/demonstrate diagnostic, maintenance (servicing), and testing procedures for other diesel engine driven systems, such as: shaft-drive, stator frame, commutator, armature, frame, blowers, and cooling-fans.	20%

Diesel Engine Mechanic (DEM)

Unit: C2 Drivetrains

Level: Two

Duration: 28 hours

Theory: 14 hours

Practical: 14 hours

Overview:

This unit of instruction provides the Diesel Engine Mechanic (DEM) apprentice with the working knowledge of drivetrains, from the safety hazards and precautions to the components and operation of such systems. As well, apprentices will learn to diagnose, inspect and service diesel engine drivetrains.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe special safety hazards and precautions as they relate to diesel engine drivetrains, such as: rotating equipment, high temperature, and pinch points.	10%
2. Describe/demonstrate the types, components and operation of diesel engine drivetrain systems and their components.	45%
3. Describe/demonstrate diagnostic, maintenance (servicing), and testing procedures for the drivetrain, including component removal/installation/replacement.	45%

Diesel Engine Mechanic (DEM)

Unit: D1 Braking Systems

Level: Two

Duration: 28 hours

Theory: 21 hours

Practical: 7 hours

Overview:

This unit of instruction provides the Diesel Engine Mechanic (DEM) apprentice with the working knowledge of diesel engine braking systems, from the safety hazards and precautions to the components and operation of such systems. As well, apprentices will learn to diagnose, inspect and service diesel engine braking systems.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe special safety hazards and precautions as they relate to diesel engine braking systems, such as: high temperature, high pressure, and pinch points.	10%
2. Describe/demonstrate design and classifications of diesel engine hydraulic, pneumatic and electric braking systems, including types of braking fluids.	20%
3. Describe/demonstrate the components and principles of operation of diesel engine hydraulic, pneumatic and electric braking systems, including the use of schematics and component evaluation, removal/installation.	35%
4. Describe/demonstrate servicing procedures, including repairing/replacing/setting tolerances, for diesel engine hydraulic, pneumatic and electric braking systems.	35%

Diesel Engine Mechanic (DEM)

Unit: D2 Suspension Systems

Level: Two

Duration: 14 hours

Theory: 7 hours

Practical: 7 hours

Overview:

This unit of instruction offers the Diesel Engine Mechanic (DEM) apprentice with a working knowledge of diesel engine suspension systems, including their structure, function and servicing requirements.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe special safety hazards and precautions as they relate to diesel engine suspension systems, such as: pinch points, high pressures and heavy loads.	10%
2. Describe/demonstrate the components and principles of operation of diesel engine suspension systems, including shocks and stabilizers.	30%
4. Describe/demonstrate diagnostic and inspection procedures for diesel engine suspension systems, including shocks and stabilizers.	30%
5. Describe/demonstrate servicing procedures, including repairing/reconditioning/replacing components and interpreting schematic diagrams, for diesel engine suspension systems, including shocks and stabilizers.	30%

Diesel Engine Mechanic (DEM)

Unit: D3 Wheel Assemblies / Traction-Motor

Level: Two

Duration: 28 hours

Theory: 14 hours

Practical: 14 hours

Overview:

This unit of instruction provides the Diesel Engine Mechanic (DEM) apprentice with the working knowledge of diesel engine wheel assemblies and traction-motors, from the safety hazards and precautions to the components and operation of such systems. As well, apprentices will learn to diagnose, inspect and service diesel engine wheel assemblies and traction-motors.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe special safety hazards and precautions as they relate to working with wheel assemblies and traction motors, such as: pinch points, heavy equipment and shock.	10%
2. Describe/demonstrate components and operation of traction-motor and wheel assembly, including assembly/disassembly and component removal/installation.	45%
3. Describe/demonstrate diagnostic, qualification and maintenance (servicing) procedures for working with wheel sets and traction motors.	45%

Diesel Engine Mechanic (DEM)

Unit: D4 Undercarriage Trucks

Level: Two

Duration: 21 hours

Theory: 14 hours

Practical: 7 hours

Overview:

This unit of instruction provides the Diesel Engine Mechanic (DEM) apprentice with the working knowledge of diesel engine undercarriage trucks, from the safety hazards and precautions to the components and operation of such systems. As well, apprentices will learn to diagnose, inspect and service diesel engine undercarriage trucks.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe special safety hazards and precautions as they relate to diesel engine undercarriage trucks, such as: pinch points, high pressure, heavy equipment and ergonomics.	10%
2. Describe/demonstrate principles and procedures regarding design, assembly/disassembly, installation/removal/replacement as they relate to undercarriage trucks/suspension and their components, such as draft-gear system and components, and trucks.	35%
3. Describe/demonstrate maintenance (servicing) procedures for undercarriage trucks/suspension and their components, such as draft-gear system and components, and trucks.	35%
4. Describe/demonstrate diagnostic and qualification procedures for draft-gear system components, de-trucking and system truck removal.	20%

Diesel Engine Mechanic (DEM)

Unit: E3 Diesel Engine Starting and Charging Systems

Level: Two

Duration: 21 hours

Theory: 14 hours

Practical: 7 hours

Overview:

This unit of instruction provides the Diesel Engine Mechanic (DEM) apprentice with the working knowledge of diesel engine starting and charging systems, from the safety hazards and precautions to the components and operation of such systems. As well, apprentices will learn to diagnose, inspect and service diesel engine starting and charging systems.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe special safety hazards and precautions as they relate to diesel engine starting and charging systems, such as: shock, chemical, fire hazards, vapours and explosives.	15%
2. Describe/demonstrate design, components (including batteries) and operation of diesel engine electrical, pneumatic and mechanical starting systems, including component removal/installation.	25%
3. Describe/demonstrate design, components and operation of diesel engine electrical and mechanical charging systems, including component removal/installation.	20%
4. Describe/demonstrate diagnostic and inspection procedures for diesel engine starting and charging systems.	20%
5. Describe/demonstrate servicing procedures for diesel engine starting and charging systems.	20%

Diesel Engine Mechanic (DEM)

Unit: E4 Diesel Engine Accessory Systems

Level: Two

Duration: 14 hours

Theory: 7 hours

Practical: 7 hours

Overview:

This unit of instruction provides the Diesel Engine Mechanic (DEM) apprentice with the working knowledge of diesel engine accessory systems, from the safety hazards and precautions to the components and operation of such systems. As well, apprentices will learn to diagnose, inspect and service diesel engine accessory systems.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe special safety hazards and precautions as they relate to diesel engine accessory systems, such as: rotating equipment, high temperatures, fumes and harmful noise levels.	10%
2. Describe/demonstrate design, components and operation of electrical, pneumatic and mechanical accessory systems, including component removal/installation.	40%
3. Describe/demonstrate diagnostic and inspection procedures for diesel engine accessory systems.	30%
4. Describe/demonstrate servicing procedures for diesel engine accessory systems.	20%
