

# Transport Trailer Technician Level 2

## Transport Trailer Technician

**Unit:** B1 Common Work Practices and Procedures

**Level:** Two

**Duration:** 7 hours

Theory: 7 hours

Practical: 0 hours

### Overview:

This unit is designed to provide the apprentice with knowledge of common work practices and procedures associated with today's transport trailers. This unit covers basic maintenance procedures as well as uses of fasteners, sealants, adhesives and gaskets. Types of hoses, piping, tubing and various fittings are also addressed in this unit.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Describe the use of fluids and lubricants in the maintenance of trailers.</b>	<b>25%</b>
a. Identify types and grades of fluids and lubricants	
b. Identify fluid and lubricant applications	
c. Identify disposal of fluids and lubricants	
d. Identify safe work practices pertaining to fluids and lubricants	
<b>2. Describe the importance of lubricating and cleaning parts and components.</b>	<b>25%</b>
a. Identify hazards and describe safe work practices pertaining to use of cleaning solutions and solvents	
b. Correct disposal of cleaning solutions and solvents	
<b>3. Describe the uses of fasteners, sealants, adhesives and gaskets.</b>	<b>25%</b>
a. Removal and replacement procedures and sequences for fasteners	
b. Selecting and installing fasteners, bolts and straps	
c. Torquing specifications, procedures and sequence	
d. Removing and installing U-bolts and rebound bolts	
<b>4. Identify and describe the purpose of hoses, tubing and fittings in the context of tire pressure monitoring systems, suspension systems, braking systems, hydraulic systems and refrigeration and heating systems.</b>	<b>25%</b>
a. Pipe sizes vs tubing sizes	
b. Society of Automotive Engineers (SAE) fittings vs Joint Industry Council (JIC) fittings	
c. Flare fittings	
d. Push to connect fittings	
e. Brass Department of Transportation (DOT) air brake fittings	
f. Hydraulic hose classifications	

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## Transport Trailer Technician

**Unit:** B2 Tools and Equipment

**Level:** Two

**Duration:** 7 hours

Theory: 2 hours

Practical: 5 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about the use of trailer alignment equipment and related tools when working with today's transport trailers. New electronic and computerized equipment on transport trailers and diagnostic equipment has evolved. The unit covers the use of hand tools, electric and pneumatic tools. The unit also covers confined entry tools and equipment used when working with transport trailer vehicles.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Describe the use of trailer alignment equipment.</b>	<b>25%</b>
a. Fifth wheel adjustment tool	
b. Plumb bob	
c. Digital devices	
d. Kingpin extension alignment tool	
e. Axle spindle extender tools	
<b>2. Demonstrate the use of trailer alignment equipment.</b>	<b>25%</b>
a. Fifth wheel adjustment tool	
b. Plumb bob	
c. Digital devices	
d. Kingpin extension alignment tool	
e. Axle spindle extender tools	
<b>3. Describe confined entry tools and equipment.</b>	<b>50%</b>

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## Transport Trailer Technician

**Unit:** B3 Trade Related Mathematics

**Level:** Two

**Duration:** 28 hours

Theory: 28 hours

Practical: 0 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and ability to use mathematics with precision, resourcefulness and confidence. It will help make the world of numbers and ratios work for, rather than against, the transport trailer apprentice. Additionally, the unit provides a review of general mathematical concepts including the use of calculators and an overview of trade-related mathematics.

### Objectives and Content:

#### Percent of Unit Mark (%)

- |   |            |
|---|------------|
| <b>1. Use mathematical properties to solve problems involving real numbers and place-value notation systems, with an emphasis on trade-related problems. The skills studied will include techniques to:</b> | <b>20%</b> |
| a. Add and subtract fractions when presented as proper, improper or mixed fractions   |            |
| b. Multiply, divide, reduce and expand common fractions using prime factorization   |            |
| c. Perform standard operations with whole, integer and decimal numbers, with and without a calculator, using both decimal fractions and common fractions  |            |
| d. Conversion between common fractions and decimal number   |            |
| e. Perform calculations involving exponents and roots   |            |
| f. Apply the order of operations correctly  |            |
| g. Isolate and compare relevant features of different problems, objects and the like  |            |
| <b>2. Solve problems using direct and indirect proportion. The skills studied may include how to:</b>   | <b>15%</b> |
| a. Apply direct proportions for scaling objects and processes, and other such problems  |            |
| b. Apply the properties of percentages and multiples to problems involving scaling, wastage, material discounts and sales taxes   |            |
| c. Apply indirect proportions to work-scheduling problems, gear and cutting speed problems and other such problems  |            |
| <b>3. Solve algebraic problems involving one to three variables. The skills studied will include how to:</b>  | <b>10%</b> |
| a. Use the Addition and Multiplication Properties of Equality, additive and multiplicative inverses and order of operations to manipulate equations and isolate variables                                   |            |
| b. Write simple algebraic equations that help organize, simplify and solve other problems using formula transposition   |            |
| <b>4. Use metric and customary measurement systems to perform trade-related operations and problems. The skills studied will include how to:</b>  | <b>10%</b> |
| a. Explain the metric and customary systems of measurement, including common units used in both systems and the metric system's use of base units and prefixes  |            |

- b. Perform calculations using metric and customary units of measurement
  - c. Convert within and between measurement systems using the unity fraction conversion method and student-created conversion factors
- 5. Calculate the perimeter, area and volume of simple and complex shapes, using both metric and customary units of measurement. The skills studied may include how to: 10%**
- a. Calculate the perimeters and areas of triangles (including Heron's Formula), quadrilaterals (including trapezoids and parallelograms such as rhombi, rectangles and squares) and regular polygons
  - b. Calculate the circumferences and areas of circles, including arc lengths, sectors and segments
  - c. Calculate the volumes of prisms, spheres and tetrahedrons (including board foot measure)
- 6. Solve problems relating to hydraulics. The skills studied will include how to: 10%**
- a. Apply the laws of hydraulics in solving problems relating to pistons
  - b. Solve problems involving pressure force and area using hydraulic laws
- 7. Solve problems relating to simple machines. The skills studied will include how to: 10%**
- a. Apply laws of simple machines to calculate resistance, effort, lengths and mechanical advantage for levers of different classes
  - b. Apply laws of simple machines to calculate resistance, effort, lengths and mechanical advantage for wheel and axle setup
  - c. Apply laws of simple machines to calculate resistance, effort, lengths and mechanical advantage for screw and inclined planes
  - d. Apply laws of simple machines to calculate resistance, effort, lengths and mechanical advantage for pulleys
- 8. Solve problems relating to pneumatics. The skills studied will include how to: 15%**
- a. Apply Boyle's law to pressure and volume calculations
  - b. Apply Charles's law to volume and temperature calculations
  - c. Apply ideal gas law to pressure, volume and temperature calculations
  - d. Apply gas laws to density calculations

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## Transport Trailer Technician

**Unit:** B4 Suspension Systems I: Diagnoses/Services

**Level:** Two

**Duration:** 28 hours

Theory: 14 hours

Practical: 14 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about the principles of suspension and related components found in today's transport trailers. Beginning with an overview of related suspension terminology, this unit covers basic suspension principles, the main components of a typical suspension and the suspension identification and inspection process. Apprentices will also learn about the selection of and procedures for hoisting, lifting and staging equipment. The removal and replacement procedures and sequences for suspension systems and components will be examined, as well as the repair of torque arm, axles and axle connections.

New technologies provide lighter, stronger suspension systems such as composite spring suspensions. Multi-functional air bags are now available, acting as both a suspension system during normal operation and as a lifting device for loading and unloading. This provides easier access to loading docks. Some technologies — such as on-board scales — are being developed to improve safety.

<b>Objectives and Content:</b>	<b>Percent of Unit Mark (%)</b>
<b>1. Define terminology associated with suspension systems and related main components.</b>	<b>10%</b>
a. Main frame	
b. Hangers	
c. Cross members	
d. Torque arm and bushing	
e. Axle	
f. Height control valve	
<b>2. Identify hazards and describe safe work practices when working with suspension systems and related components.</b>	<b>5%</b>
<b>3. Describe suspension identification and inspection processes.</b>	<b>15%</b>
a. Alignment inspection techniques and procedures	
b. Worn bushings	
c. State of components such as: U-bolts, centre bolts and axle connections	
d. Locating manufacturers' number on air spring	
e. Manufacturers' specifications e.g.	
• Torquing	
• Rating capacity (wheel base of suspensions/torque arm)	

- Type, size, capacity and construction of spring assembly
4. **Describe and demonstrate the selection of and procedures for hoisting, lifting and staging equipment.** **15%**
    - a. Lifting capability vs. load capacity
    - b. Use of air jack vs. hydraulic jack
    - c. Proper set up procedures
      - Use of bases
      - Use of blocks
  
  5. **Demonstrate how to perform suspension identification and inspection processes.** **10%**
    - a. Select and position suspension
    - b. Evaluate component conditions (worn or damaged parts, wear limits)
    - c. Driver's report (for leaning and dog tracking)
    - d. Estimating retorquing time
  
  6. **Demonstrate how to perform checks and measurements on the main components of a suspension system.** **10%**
    - a. Evaluate component conditions (connections, wear characteristics)
    - b. Manufacturers' specifications
    - c. Verification of service performed
    - d. Height control valve
    - e. Axle connections
  
  7. **Perform removal and replacement procedures and sequences for suspension systems and components.** **15%**
    - a. Spring suspension systems
    - b. Rubber block suspension systems
    - c. Other tasks and procedures as required
      - Select and install fasteners, bolts and straps
      - Torquing specifications, procedures and sequence
      - Torque arm removal and installation
      - Alignment of axle to king pin
      - Construction of multi-leaf assembly
      - Remove U-bolts; rebound bolts
      - Shock absorber removal and installation
      - Splicing techniques and procedures
      - Supply circuit analysis
    - d. Repair techniques and procedures, including use of heating torch
      - Main frame
      - Hangers
      - Cross members
    - e. Damage and/or wear characteristics and limits
    - f. Manufacturers' specifications
  
  8. **Describe the repair of torque arm.** **5%**
    - a. Design characteristics
      - Types of torque arm (fixed, solid)
      - Wear limits of torque arm (bent, worn)
      - Types of bushings (oversized, standard)
    - b. Adjustment techniques and procedures

- c. Removal, inspection and installation techniques and procedures
- d. Manufacturers' specifications

**9. Describe the repair of axles and axle connections.**

**10%**

- a. Review of design characteristics
  - Axle sizes
  - Axle types
  - Axle connection, trunnion shaft assembly and related components
- b. Adjustment techniques and procedures (checks and measurements)
- c. Removal, inspection and installation techniques and procedures
  - Axles
  - Axle connection and trunnion shaft assembly
  - Related components
- d. Manufacturers' specifications

**10. Describe tire wear analysis.**

**5%**

- a. Review of design characteristics
  - Types and sizes of tires and rims
  - Tire wear limits and inflation pressures
  - Normal and irregular tire wear
  - Tire and rim components such as multi-piece rims and valve stems
  - Automatic inflation systems
- b. Adjustment techniques and procedures (checks and measurements)
- c. Removal, inspection and installation techniques and procedures
- d. Knowledge of safe handling of tire and rim systems, including mounting systems
- e. Manufacturers' specifications

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## Transport Trailer Technician

**Unit:** B5 Brake Systems I: Diagnoses/Services

**Level:** Two

**Duration:** 21 hours

Theory: 10 hours

Practical: 11 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about the principles of pneumatic brake systems found in today's transport trailer equipment. Beginning with an overview of pneumatic brake systems terminology, the unit covers the components of air brake systems and their principles of operation, as well as diagnostic procedures. The unit also provides an opportunity to demonstrate and perform those diagnostic procedures, plus discussion about verifying service performed. The unit ends by examining repair and replacement procedures for automatic slack adjusters and spring break chambers.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Define terminology associated with mechanical aspects of air brake systems.</b>	<b>5%</b>
<b>2. Identify hazards and describe safe work practices when working with mechanical aspects of air brake systems.</b>	<b>5%</b>
<b>3. Identify components of air brake systems.</b>	<b>20%</b>
a. Components and their location	
b. Types, sizes and material and other characteristics	
• Lining	
• Fasteners	
• Push-rod	
• Slack adjustors	
• Shoes	
• Rotors	
• Spring brake chambers	
• Air disc	
<b>4. Describe the principles of operation of pneumatic brake systems.</b>	<b>20%</b>
a. Operation and function	
b. Relationship between pressure, force and area	
c. Operating air pressure	
d. Operating specifications	
e. Damage and/or wear characteristics or tolerances	
f. Commercial Vehicle Inspection Manual (CVIM)	
g. Manufacturers' specifications	

- 5. Describe diagnostic procedures on pneumatic foundation brake systems. 10%**
- a. Operating specifications
  - b. Wear characteristics and tolerances
  - c. Commercial Vehicle Inspection Manual (CVIM)
  - d. Manufacturers' specifications
- 6. Demonstrate diagnostic procedures on pneumatic brake systems. 5%**
- a. Evaluate component conditions
    - Wear characteristics
    - Tolerances
  - b. Commercial Vehicle Inspection Manual (CVIM)
  - c. Manufacturers' specifications
- 7. Describe repair procedures on pneumatic brake systems. 10%**
- a. Installation and removal procedures
    - Reline
    - Overall
  - b. Adjustment techniques and procedures
- 8. Demonstrate repair procedures on pneumatic brake systems. 10%**
- a. Installation and removal procedures
  - b. Adjustment techniques and procedures
  - c. Maintenance procedures
  - d. Verification of service performed
- 9. Demonstrate repair and replacement procedures for automatic slack adjusters (ASA). 10%**
- a. Meritor
  - b. Haldex
  - c. Crewson Brunner
  - d. Bendix
  - e. Gunitite
- 10. Demonstrate repair and replacement procedures for spring break chambers. 5%**
- a. Long stroke
  - b. Short stroke

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## Transport Trailer Technician

**Unit: B6 Axle and Wheel End Assemblies I: Diagnoses/Services**

**Level:** Two

**Duration:** 14 hours

Theory: 6 hours

Practical: 8 hours

### Overview:

This unit is designed to provide the apprentice with knowledge of practical checks and measurements related to axle and wheel end assemblies (diagnoses) as well as the removal/installation procedures for wheel assemblies and tires. It also looks at providing the apprentice with knowledge and practical repair procedures related to the removal, installation and replacement of axle systems and related components.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Define terminology associated with axles, wheel end assemblies and related components.</b>	<b>5%</b>
<b>2. Identify hazards and describe safe work practices when working with axles, wheel end assemblies and related components.</b>	<b>5%</b>
<b>3. Describe design characteristics of axle systems.</b>	<b>10%</b>
a. Axle alignment and position	
b. Types and sizes of axle and hub components such as:	
• Seals	
• Bearings	
• Dust shields	
• Studs	
• Nuts	
• Lugs	
• Caps (oil and grease)	
• Seal drivers	
• Wear rings	
c. Manufacturers' specifications	
<b>4. Describe the characteristics and specifications of wheel end assemblies and tires.</b>	<b>20%</b>
a. Types of wheel end assemblies, such as:	
• Stud pilot wheel mount (disc)	
• Hub pilot (disc)	
• Dayton/spoke wheel mount (rim)	
b. Types of tires	
• Radial	

- Bias ply
  - c. Application of tires
    - Single
    - Dual
    - Super single
  - d. Wheel assembly components such as:
    - Clamps
    - Studs
    - Nuts
    - Spacers
    - Valve stem and cap
  - e. Manufacturers specifications for tires:
    - Pre-certification requirements
    - Construction
    - Weight capacity
    - Performance designations
    - Recommended tire pressure
- 5. Perform checks and measurements on axle systems and related components. 10%**
- a. Axle systems and related components
    - Axle alignments and position
  - b. Evaluate component conditions (connections, wear characteristics)
  - c. Manufacturers' specifications
  - d. Verification of service performed
- 6. Perform diagnostic procedures for wheel assemblies and tires. 10%**
- a. Tire demounting techniques and procedures
  - b. Checks, measurements and inspection techniques
    - Spacers
    - Wheels
    - Fastener systems
    - Other components
  - c. Torque requirements and sequence
  - d. Visual inspection of tires
    - Tread wear
    - Separations
    - Recap separations
    - Other defects
  - e. Safe handling and inspection procedures
    - Zippered
    - Flats
    - Cuts
- 7. Describe axle system removal and installation techniques. 10%**
- a. Types and grades of oil and grease
  - b. Manufacturers' specifications (including OEM specifications)
  - c. Removal and installation techniques for axle system components such as:
    - Axles
    - Hubs
    - Seals
    - Bearings

- Dust shields
- Studs
- Nuts
- Lugs
- Caps (oil and grease)
- Seal drivers
- Wear rings

**8. Perform axle system and wheel end assembly removal and installation techniques. 30%**

- a. Manufacturers' specifications
- b. Removal and installation techniques for axle system components such as:
  - Axles
  - Hubs
  - Seals
  - Bearings
  - Dust shields
  - Studs
  - Nuts
  - Lugs
  - Caps (oil and grease)
  - Seal drivers
  - Wear rings

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## Transport Trailer Technician

**Unit:** B7 Trailer Chassis and Bodies I: Diagnoses/Services

**Level:** Two

**Duration:** 14 hours

Theory: 7 hours

Practical: 7 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about the trailer body when working with today's transport trailer equipment. The focus of this unit is the flat-deck structure, beginning with an overview of terminology, types, structures and construction of trailer bodies, followed by inspection techniques and operational/maintenance considerations and procedures.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Define terminology associated with trailer chassis and bodies.</b>	<b>5%</b>
<b>2. Identify hazards and describe safe work practices when working with trailer chassis and bodies.</b>	<b>5%</b>
a. Sizes and types of fastening devices	
b. Load security positioning, fastening and replacement procedures	
<b>3. Describe the types, structures and construction of trailer chassis and bodies.</b>	<b>15%</b>
a. Types	
• Flat bed	
• Van	
• Cattle pots	
• Dump trailer	
• Tankers	
b. Materials (structure, tensile strength)	
• Aluminum	
• Steel	
• Stainless steel	
• Fibreglass	
• Rubber	
c. Load control materials	
• Load bars	
• Cable winches (belt, steel)	
• Nylon straps	
• Chain cinches	
<b>4. Describe the considerations in the operation/use of trailer chassis and bodies.</b>	<b>15%</b>
a. Manufacturers' operating specifications	

- b. Use of load control materials and types of loads being transported
  - c. Use of fastening devices
  - d. Jacking and leveling techniques and procedures
- 5. Perform diagnostic procedures and repair techniques for trailer chassis and bodies. 30%**
- a. Manufacturers' specifications
  - b. Welding techniques and procedures
  - c. Straightening equipment operation
  - d. Insulation removal techniques and procedures
- 6. Perform removal and installation procedures for trailer chassis and bodies. 30%**
- a. Identification of location and extent of damage to interior/exterior trailer such as:
    - Structural damage (floors, main rails, panels, side posts)
    - Doors (seals, rollers, warn tracks, hardware)
    - Roofs/side walls (water leaks, corrosion)
    - Hardware (loose fasteners/rivets, kick panels, scuff liner, broken chains, locks, cables, wenches)
  - b. Maintenance procedures
    - Welding requirements
    - Riveting requirements
    - Straightening equipment operation

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## Transport Trailer Technician

**Unit:** B8 Lighting and Wiring Systems: Diagnoses/Services

**Level:** Two

**Duration:** 28 hours

Theory: 7 hours

Practical: 21 hours

### Overview:

This unit reviews terminology associated with lighting and wiring systems, hazards and safe work practices, electrical circuits, isolation of electrical and electronic system faults, repair of lighting and wiring systems, the use of measuring instruments to analyze electrical flow through or within specific electrical circuits, repair on trailer electrical systems and types of electrical test equipment and diagnostic and servicing procedures on lighting and wiring systems.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Review terminology associated with lighting and wiring systems.</b>	<b>5%</b>
a. Trailer electrical systems	
b. Types of electrical test equipment	
c. Auxiliary electrical systems	
• ABS brake	
• Electric brake	
• Electronic loading system	
• Lift axles	
• Power tail gates	
• Auxiliary lights	
• Backup alarms	
• Other auxiliary equipment	
<b>2. Identify hazards and describe safe work practices when working with lighting and wiring systems.</b>	<b>5%</b>
<b>3. Review electrical circuits.</b>	<b>10%</b>
a. Diagram simple electrical circuits	
• Series	
• Parallel	
• Series-Parallel	
b. Perform electrical measurements and calculations within specific circuits	
<b>4. Describe isolation of electrical and electronic system faults.</b>	<b>10%</b>
a. Test point verification procedures	
b. Back-probing techniques for identifying faults	
c. Interpretation of diagnostic fault codes	



- 5. Describe and demonstrate repair of lighting and wiring systems. 10%**
- a. Repair, removal and installation techniques and procedures
    - Electrical test equipment
    - Diagnostic testers
    - Sockets
  - b. Troubleshoot circuits
  - c. Review of common electrical faults
  - d. Correct measurement of wear limits of components
  - e. Verification of diagnostic procedures performed
- 6. Demonstrate the use of measuring instruments to analyze electrical flow through or within specific electrical circuits. 20%**
- a. Application of Ohm's Law, Joule's Law and Kirchoff's Law of Voltage and Law of Amperage when measuring the following electrical circuits:
    - Series
    - Parallel
    - Series-parallel
  - b. Test equipment (e.g., Voltage Ohmmeter (VOM)) to measure and determine the main aspects of electrical flow within a specific circuit
  - c. Relationships between:
    - Voltage and amperage
    - Resistance and amperage
    - Simple electrical circuits
  - d. Analyze and interpret results
    - Voltage and amperage
    - Resistance and amperage
    - Simple electrical circuits
  - e. Common electrical faults
    - Open circuit
    - Short circuit
    - Ground fault
- 7. Demonstrate repair on trailer electrical systems and types of electrical test equipment. 10%**
- a. Diagnostic test procedures
  - b. Characteristics of components
    - Wiring colour codes and diagrams
    - Size and type of fasteners
    - Nose box location and related components
    - Socket size, type and location
    - Auxiliary harness (power tailgate; auxiliary lighting)
    - Other related components
  - c. Auxiliary electrical systems
    - Electronic loading system
    - Lift axles
    - Power tail gates
    - Auxiliary lights
    - Backup alarms
    - Other auxiliary equipment
    - High-Voltage electric, hybrid and alternative drive systems
  - d. Manufacturers' specifications

- 8. Perform diagnostic and servicing procedures on lighting and wiring systems. 30%**
- a. Operation of diagnostic testers
  - b. Wiring diagrams
    - Interpret wiring diagrams
    - Select wiring
    - Select and replace wiring harnesses
    - Support and secure wiring
  - c. Electrical defects
    - Short circuits
    - Grounds
    - Broken wires
    - Test light
    - Isolate electrical fault
    - Disconnect and reconnect wiring
    - Splice wires
    - Strip wire
  - d. Nose boxes
    - Identify cracked, corroded, bent and loose nose boxes
    - Select and replace fasteners and mounting brackets
    - Disassemble nose box
  - e. Fault analysis, including use of isolation techniques
    - Open fault
    - Ground fault
    - Short circuit

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## Transport Trailer Technician

**Unit:** B9 Hydraulic Systems: Diagnoses/Services

**Level:** Two

**Duration:** 63 hours

Theory: 28 hours

Practical: 35 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about the principles of hydraulic systems found in today's transport trailer equipment. It reviews terminology associated with hydraulic systems, hazards and describes safe work practices when working with hydraulic systems and related components, hydraulic brake systems concepts, diagnostic procedures on hydraulic systems and related components, inspection techniques and procedures for hydraulic systems and diagnostic procedures on hydraulic systems and related components.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Define terminology associated with hydraulic systems.</b>	<b>5%</b>
a. Components	
b. Cylinders	
c. Fittings	
d. Hoses	
e. Piping	
f. Pumps and motors	
g. Cargo pumps	
h. Valves (control, check and hydro pack)	
i. Tank reservoir	
j. Cooling fans, fluids and filters	
<b>2. Identify hazards and describe safe work practices when working with hydraulic systems and related components.</b>	<b>5%</b>
<b>3. Describe concepts of hydraulic brake systems.</b>	<b>20%</b>
a. Types of hydraulic brake systems	
• Surge	
• Air-actuated	
• Vacuum-actuated	
b. Operation of hydraulic brake systems	
c. Component functions	
d. Manufacturers' specifications	
<b>4. Describe diagnostic procedures on hydraulic systems and related components.</b>	<b>20%</b>
a. Repair, removal and installation techniques and procedures	
• Cylinders	

- Fittings
  - Hoses
  - Piping
  - Pumps and motors
  - Cargo pumps
  - Valves (control, check and hydro pack)
  - Tank/reservoir
- b. Cooling fans, fluids and filters
  - c. Damage and/or wear characteristics and limits
  - d. Auxiliary equipment such as hoists, fan control valves and hydraulic motors
  - e. Verification of diagnostic procedures performed
- 5. Describe and demonstrate diagnostic procedures on hydraulic systems and related components. 10%**
- a. System troubleshooting procedures
  - b. Brake component repair, removal and installation techniques and procedures
  - c. Inspection and identification of worn or defective hydraulic brake components
  - d. Verification of diagnostic procedures performed
  - e. End dump trailer
  - f. Tail gate lift
  - g. Walking floor
  - h. Side dump trailer
  - i. Material loading
- 6. Perform inspection techniques and procedures for hydraulic systems. 20%**
- a. Determine causes of component failure/troubleshooting
  - b. Hydraulic systems and components
    - Pumps
    - Hydraulic tank/reservoir
    - Cylinders
    - Hoses
    - Other main components
  - c. Auxiliary equipment
    - Hoists
    - Fans
    - Control valves
    - Hydraulic motors
    - Other auxiliary equipment
  - d. Manufacturers' specifications
- 7. Perform diagnostic procedures on hydraulic systems and related components. 20%**
- a. Repair, removal and installation techniques and procedures
    - Cylinders
    - Fittings
    - Hoses
    - Piping
    - Pumps and motors
    - Cargo pumps
    - Valves (control, check and hydro pack)
    - Tank/reservoir

- Cooling fans, fluids and filters
- b. Auxiliary equipment such as hoists, fan control valves and hydraulic motors
- c. Verification of diagnostic procedures performed
- d. System troubleshooting procedures
- e. Brake component repair, removal and installation techniques and procedures
- f. Inspection and identification of worn or defective hydraulic brake components
- g. Verification of diagnostic procedures performed

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## Transport Trailer Technician

**Unit:** B10 Welding II

**Level:** Two

**Duration:** 70 hours

Theory: 10 hours

Practical: 60 hours

### Overview:

This unit is designed to provide the apprentice with knowledge about the tools and equipment used when working with today's transport trailer equipment. Specifically, the unit reviews terminology and hazards and safe work practices associated with welding, the use and operation of cutting, gas cutting and welding equipment, as well as demonstrating the use and operation of welding and associated equipment.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Define terminology associated with welding.</b>	<b>5%</b>
a. Cutting equipment	
b. Welding equipment (SMAW)	
<b>2. Identify hazards and describe safe work practices when working with welding tools and equipment.</b>	<b>5%</b>
<b>3. Describe the use and operation of cutting equipment.</b>	<b>5%</b>
a. Arc-air gouging tool	
b. Arc welder	
c. Plasma cutter	
d. Propane torch	
<b>4. Describe the use and operation of welding equipment.</b>	<b>5%</b>
a. Arc welder (SMAW)	
b. Other	
<b>5. Demonstrate the use and operation of gas cutting and welding equipment.</b>	<b>40%</b>
a. Arc welder (SMAW)	
b. Plasma arc cutter (PAC)	
c. Air Carbon Arc Cutting (CAC-A)	
<b>6. Perform various types of welds and joints.</b>	<b>40%</b>
a. Joint	
• Lap	
• Butt with backing	
• Open butt	

- b. Welds
  - Plug
  - Tack
  - Stitch
- c. Positions
  - Flat
  - Vertical
  - Horizontal
  - Overhead

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