

Transport Trailer Technician Level 2

Transport Trailer Technician

Unit: A8 Welding II: MiG/TiG

Level: Two

Duration: 49 hours

Theory: 4 hours

Practical: 45 hours

Overview:

This unit is designed to provide the apprentice with the knowledge about the welding and cutting equipment used when working with today's transport trailer equipment. Beginning with the types of welding and cutting equipment, this unit covers the procedures and other considerations when operating such equipment.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology associated with welding.	5%
2. Describe the types of welding and cutting equipment for transport trailer applications. <ul style="list-style-type: none">a. Welding equipment<ul style="list-style-type: none">• Oxyacetylene• MiG/TiGb. Cutting equipment<ul style="list-style-type: none">• Plasmac. Other related equipment	5%
3. Describe the procedures and other considerations in the operation of welding and cutting equipment. <ul style="list-style-type: none">a. Proper set up proceduresb. Proper maintenance procedures<ul style="list-style-type: none">• Cleaning• Lubrication• Adjustmentsc. Additional safety considerations	5%
4. Describe considerations in MiG/TiG. <ul style="list-style-type: none">a. Information from designated characters (characteristics)<ul style="list-style-type: none">• Tensile strength• Positions of use• Polarity• Choice of wire• Determination of starting amperage (in conjunction with amperage charts)	5%

- 5. Demonstrate the procedures in the operation of welding and cutting equipment. 60%**
- a. Proper set up procedures
 - b. Proper maintenance procedures
 - Cleaning
 - Lubrication
 - Adjustments
 - c. Additional safety considerations
- 6. Demonstrate basic weld positions. 20%**
- a. Flat weld
 - b. Other positions as per instructor

Transport Trailer Technician

Unit: B2 Trade Related Math II

Level: Two

Duration: 14 hours

Theory: 14 hours

Practical: 0 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and ability to use and apply trade-related mathematics. Beginning with an overview of the trade-related calculations and applied trade-related concepts for this level of technical training, the unit covers and provides opportunities to demonstrate and apply these skills.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe trade-related calculations as specified by instructor.	15%
a. Ratio and Proportion	
b. Three variable equations	
c. Mathematical statements	
2. Describe applied trade-related concepts.	25%
a. Simple machine and mechanical advantage	
b. Applied laws of hydraulics	
c. Applied laws of gases	
d. Applied laws of pneumatics	
e. Applied laws of electrical control circuits	
3. Demonstrate trade-related calculations as specified by instructor.	30%
a. Ratio and Proportion	
b. Three variable equations	
c. Mathematical statements	
4. Demonstrate applied trade-related concepts.	30%
a. Simple machine and mechanical advantage	
b. Applied laws of hydraulics	
c. Applied laws of gases	
d. Applied laws of pneumatics	
e. Applied laws of electrical control circuits	

Transport Trailer Technician

Unit: C4 Air Ride/Spring Ride Suspension Systems and Related Components

Level: Two

Duration: 35 hours

Theory: 12 hours

Practical: 23 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and ability to inspect and repair suspension systems and their related main components. Building upon associated terminology first introduced in the Level 1 Unit, this unit covers the inspection and repair considerations for suspension components, including main frame, hangers and cross members. The unit then covers additional components such as the height control valve, torque arm and axles. Both theory and practical aspects of suspension system and related components are covered.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe suspension systems and related main components.	5%
a. Review of associated terminology	
b. Main frame	
c. Hangers	
d. Cross members	
e. Torque arm and bushing	
f. Axle	
g. Height control valve	
2. Describe inspection and repair considerations for suspension components.	5%
a. Repair techniques and procedures, including use of heating torch	
• Main frame	
• Hangers	
• Cross members	
b. Damage and/or wear characteristics and limits	
c. Manufacturers' specifications	
3. Describe inspection and repair of height control valve.	5%
a. Design characteristics	
b. Adjustment techniques and procedures	
c. Removal, inspection and installation techniques and procedures	
d. Manufacturers' specifications	

- 4. Describe inspection and 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
- 5. Describe inspection and repair of axles and axle connections. 5%**
- a. Review of design characteristics
 - Axle sizes
 - Axle types
 - Axle connection and 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
- 6. Describe tire wear analysis. 15%**
- 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
- 7. Demonstrate inspection and repair techniques for suspension components. 10%**
- a. Repair techniques and procedures, including use of heating torch
 - Main frame
 - Hangers
 - Cross members
 - b. Damage and/or wear characteristics and limits
 - c. Manufacturers' specifications
- 8. Demonstrate inspection and repair techniques for height control valve. 15%**
- a. Design characteristics
 - b. Adjustment techniques and procedures
 - c. Removal, inspection and installation techniques and procedures
 - d. Manufacturers' specifications
- 9. Demonstrate inspection and repair techniques for torque arm. 10%**
- 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

10. Demonstrate inspection and repair techniques for axles and axle connections. 10%

- a. Review of design characteristics
 - Axle sizes
 - Axle types
 - Axle connection and 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

11. Demonstrate tire wear analysis techniques. 15%

- a. Main techniques
 - Selection of equipment for mounting of rim systems
 - Mounting of rim systems and procedures
 - Selection of tools or equipment for tire measurement of pressure and tread depth
 - Visual inspection of tires, rims, and mounting systems
 - Inspection of mismatched tires and rims systems
- b. Adjustment techniques and procedures (checks and measurements)
- c. Removal, inspection and installation techniques and procedures of wheel mounting hardware on single and multi-piece rims
- d. Knowledge of safe handling of tire and rim systems, including mounting systems
- e. Manufacturers' specifications

Transport Trailer Technician

Unit: D2 Van/Flatdeck Trailer Body Structures and Related Components

Level: Two

Duration: 21 hours

Theory: 7 hours

Practical: 14 hours

Overview:

This unit is designed to provide the apprentice with the knowledge about the van/flatdeck trailer body structures and related components. Beginning with an overview of body structures, the unit proceeds to covering inspection and repair considerations of the body structures and related components.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology and characteristics associated with body structures.	10%
a. Types and structures of doors <ul style="list-style-type: none">• Dry freight• Refrigerated• Barn• Roll-u	
b. Types of units <ul style="list-style-type: none">• Vans• Flat beds• Low beds• Dump trailers	
c. Types of materials used (structure, tensile strength) <ul style="list-style-type: none">• Aluminum• Steel• Stainless steel	
2. Describe inspection and repair considerations for body structures and related components.	10%
a. Repair techniques and procedures: <ul style="list-style-type: none">• Types of doors• Types of units• Types of materials	
b. Straightening techniques and procedures <ul style="list-style-type: none">• Types of doors• Types of units• Types of materials	
c. Damage and/or wear characteristics and limits <ul style="list-style-type: none">• Types of doors	

- Types of units
- Types of materials
- d. Other techniques
 - Riveting and caulking
 - Stretching procedures
 - Leveling procedures
 - Insulation removal
 - Flooring techniques (wood, steel, aluminum)
 - Welding and riveting requirements, and compatible related structures
- e. Manufacturers' specifications

3. Demonstrate inspection and repair considerations for body structures and related components. 80%

- a. Repair techniques and procedures:
 - Types of doors
 - Types of units
 - Types of materials
- b. Straightening techniques and procedures
 - Types of doors
 - Types of units
 - Types of materials
- c. Damage and/or wear characteristics and limits
 - Types of doors
 - Types of units
 - Types of materials
- d. Other techniques
 - Riveting and caulking
 - Stretching procedures
 - Leveling procedures
 - Insulation removal
 - Flooring techniques (wood, steel, aluminum)
 - Welding and riveting requirements, and compatible related structures
- e. Manufacturers' specifications

Transport Trailer Technician

Unit: D3 Coupling Units and Landing Gear

Level: Two

Duration: 21 hours

Theory: 5 hours

Practical: 16 hours

Overview:

This unit is designed to provide the apprentice with the knowledge about the coupling units and their related components found in today's transport trailers. Beginning with an overview of related terminology for coupling units and landing gear, the unit also covers design characteristics, removal/installation procedures, and techniques for checking/measuring units.

Objectives and Content:

**Percent of
Unit Mark (%)**

1. **Define terminology and design characteristics of coupling units, landing gear, and related components.** 10%
 - a. Safety chains and cables
 - Sizes
 - Types
 - Capacities
 - Wear characteristics and limits
 - b. Attachments for safety chains and cables
 - Eye
 - Clevis
 - Safety hook and latch
 - Cable clamps brackets
 - Safety cable/chain eye
 - c. Draw bar function and attachments
 - Hinged brackets
 - Pins bushings
 - Bolts and mechanisms
 - d. Pintle hook assembly

2. **Describe design characteristics of landing gears and related components.** 10%
 - a. Landing gears
 - Types
 - Makes and models
 - Ratios
 - Mounting patterns
 - b. Brackets and braces
 - Types

- Sizes
 - c. Support legs
 - Types
 - Models
- 3. Describe removal and installation techniques for coupling units and related components. 10%**
- a. Types and sizes of fasteners, brackets and braces
 - b. Manufacturer's specifications
 - c. Removal and installation techniques for coupling unit components such as:
 - Safety chains and cables
 - Attachments for safety chains and cables
 - Draw bar function and attachments
 - Pintle hook assembly
 - Turntable
- 4. Describe landing gear removal and installation techniques. 10%**
- a. Types and sizes of fasteners, brackets and braces
 - b. Manufacturer's specifications
 - c. Removal and installation techniques for landing gear components such as:
 - Support legs
 - Manual support legs
 - Fastener, brackets, braces, shaft pins, bushings, spacers.
- 5. Perform checks and measurements on coupling units and related components. 15%**
- a. Alignment of axle to draw bar eye
 - b. Torque specifications, procedures and sequence
 - c. Damage and/or wear characteristics and limits
 - d. Evaluate component conditions such as checking for worn or damaged parts, or excessive wear on draw bar eyes and bushing
 - e. Manufacturer's specifications
 - f. Verification of service performed
- 6. Perform removal and installation techniques for coupling units and related components. 15%**
- a. Types and sizes of fasteners, cable clamps, brackets and lock components
 - b. Manufacturer's specifications
 - c. Removal and installation techniques for coupling units and their related components such as:
 - Safety chains and cables
 - Attachments for safety chains and cables
 - Draw bar function and attachments
 - Pintle hook assembly
 - Turntable
- 7. Perform checks and measurements on landing gear and related components. 15%**
- a. Alignment of landing gear to shaft
 - b. Appropriate mounting pattern
 - c. Height of landing gears
 - d. Evaluate component conditions (checking for cracked, stretched, bent, missing, loose or broken parts and/or components)
 - e. Manufacturer's specifications
 - f. Verification of service performed

- 8. Perform removal and installation techniques for landing gear. 15%**
- a. Types and sizes of fasteners, brackets and braces
 - b. Manufacturer's specifications
 - c. Removal and installation techniques for landing gear components such as:
 - Support legs
 - Manual support legs
 - Fastener, brackets, braces, shaft pins, bushings, spacers

Transport Trailer Technician

Unit: E2 Pneumatic Brake Systems II

Level: Two

Duration: 49 hours

Theory: 12 hours

Practical: 37 hours

Overview:

This unit is designed to provide the apprentice with the knowledge about the principles of pneumatic brake systems found in today's transport trailer equipment, including pre- and post-121, ABS and EBS. The unit covers diagnostic techniques and procedures when inspecting pneumatic brake system from both theoretical and practical perspectives.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define truck supply and control circuits.	5%
2. Define terminology and components used in pre-121 pneumatic brake systems.	5%
a. Review of terminology	
b. Review of characteristics/function	
c. Review of components	
• Pneumatic Valves: RE – 6, RE – 6NC, A1000 s/l	
• Convertor – Plumbing schematics	
d. Review of pre-121 pneumatic circuits	
3. Define terminology and components used in post-121 pneumatic brake systems.	10%
a. Review of terminology	
b. Review of characteristics/function	
c. Review of components	
• Designated circuits	
• Spring brake control valves	
• Service control valves	
d. Review of post-121 pneumatic circuits	
4. Define terminology and components used in ABS pneumatic brake systems.	10%
a. Review of terminology	
b. Review of characteristics/function	
c. Review of components	
• Designated circuits	
• Spring brake control valves	
• Service control valves	
• Meritor – “Easy-Stop” and “Enhanced”	

- Haldex – Gen1 and Gen2
 - Wabash – MBS 1/MBS 2
- d. Review of specific ABS pneumatic circuits
- 5. Define terminology and components of EBS. 5%**
- a. Review of terminology
 - b. Review of characteristics/function
 - c. Review of components
 - Introduction to PLC and “Multiplexing”
- 6. Demonstrate truck supply and control circuits. 15%**
- 7. Demonstrate diagnostic techniques and procedures when inspecting pre-121 pneumatic brake systems. 5%**
- a. Types and operating conditions
 - b. Removal and installation techniques for related components such as:
 - c. Brake adjustment techniques and procedures
 - d. Use of electronic testing equipment
- 8. Demonstrate diagnostic techniques and procedures when inspecting post-121 pneumatic brake systems. 20%**
- a. Types and operating conditions
 - b. Removal and installation techniques for related components such as:
 - c. Brake adjustment techniques and procedures
 - d. Use of electronic testing equipment
- 9. Demonstrate diagnostic techniques and procedures when inspecting ABS pneumatic brake systems. 20%**
- a. Types and operating conditions
 - b. Removal and installation techniques for related components such as:
 - c. Brake adjustment techniques and procedures
 - d. Use of electronic testing equipment
- 10. Demonstrate diagnostic techniques and procedures when inspecting EBS. 10%**
- a. Types and operating conditions
 - b. Removal and installation techniques for related components such as:
 - c. Brake adjustment techniques and procedures
 - d. Use of electronic testing equipment

Transport Trailer Technician

Unit: F2 Electricity and Wiring I: Introduction to “Electronics”/ABS

Level: Two

Duration: 35 hours

Theory: 14 hours

Practical: 21 hours

Overview:

This unit is designed to provide the apprentice with the knowledge about the principles of electrical theory and circuitry found in today’s transport trailer equipment.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
<p>1. Define terminology of trailer electrical systems.</p> <ul style="list-style-type: none"> a. Review of basic terminology related to electrical/electricity concepts. b. Trailer electrical systems c. Types of electrical test equipment 	5%
<p>2. Describe characteristics of trailer electrical and related systems.</p> <ul style="list-style-type: none"> a. Types of electrical test equipment b. Wiring colour codes c. Sizes and types of fasteners d. Location, sizes and types of sockets e. System types and operation f. Control systems g. Manufacturers’ specifications h. Safety features related to electrical brake systems such as: <ul style="list-style-type: none"> • Brake away (manual and automated) i. Problem and troubleshooting procedures 	15%
<p>3. Describe diagnostic techniques and procedures when inspecting trailer electrical and related systems.</p> <ul style="list-style-type: none"> a. Repair, removal and installation techniques and procedures <ul style="list-style-type: none"> • Electrical test equipment • Diagnostic testers • Nose box and components • Sockets b. Troubleshoot circuits c. Review of common electrical faults d. Identify electrical defects, including: <ul style="list-style-type: none"> • Short circuits • Grounds 	15%

- Broken wires
 - e. Correct measurement of wear limits of components
 - f. Verification of diagnostic procedures performed
- 4. Describe diagnostic techniques and procedures when inspecting trailer ABS systems – “pneumatic and electrical”. 15%**
- a. Repair, removal and installation techniques and procedures
 - “Service/Modulation” valves
 - Wheel end sensors (electro-magnetic type; hall)
 - Circuit analysis (configuration)
 - b. Troubleshoot circuits
 - c. Review of common electrical faults
 - d. Correct measurement of wear limits of components
 - e. Verification of diagnostic procedures performed
- 5. Demonstrate diagnostic techniques and procedures when inspecting trailer electrical and related systems. 25%**
- a. Repair, removal and installation techniques and procedures
 - Electrical test equipment
 - Diagnostic testers
 - Nose box and components
 - Sockets
 - b. Troubleshoot circuits
 - c. Identify electrical defects, including:
 - Short circuits
 - Grounds
 - Broken wires
 - d. Correct measurement of wear limits of components
 - e. Verification of diagnostic procedures performed
- 6. Demonstrate diagnostic techniques and procedures when inspecting trailer ABS systems – “pneumatic and electrical” 25%**
- a. Repair, removal and installation techniques and procedures
 - “Service/Modulation” valves
 - Wheel end sensors (electro-magnetic type; hall)
 - Circuit analysis (configuration)
 - b. Troubleshoot circuits
 - c. Review of common electrical faults
 - d. Correct measurement of wear limits of components
 - e. Verification of diagnostic procedures performed

Transport Trailer Technician

Unit: F3 Hydraulic Systems I

Level: Two

Duration: 56 hours

Theory: 16 hours

Practical: 40 hours

Overview:

This unit is designed to provide the apprentice with the knowledge about the principles of hydraulic systems found in today's transport trailer equipment.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology and characteristics associated with hydraulic systems.	15%
a. Components	
• Cylinders	
• Fittings	
• Hoses	
• Piping	
• Pumps and motors	
• Cargo pumps	
• Valves (control, check and hydro pack)	
• Tank/reservoir	
• Cooling fans, fluids and filters	
2. Describe concepts of hydraulic brake systems.	5%
a. Knowledge of types of hydraulic brake systems such as surge, air-actuated and vacuum-actuated	
b. Knowledge of operation of hydraulic brake systems	
c. Knowledge of component functions	
d. Knowledge of manufacturers' specifications	
3. Describe diagnostic procedures on hydraulic systems and related components.	15%
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. Damage and/or wear characteristics and limits
 - c. Auxiliary equipment such as hoists, fan control valves and hydraulic motors
 - d. Verification of diagnostic procedures performed
- 4. Describe diagnostic procedures on hydraulic brake systems and related components. 15%**
- 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
- 5. Demonstrate diagnostic procedures on hydraulic systems and related components. 35%**
- 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
- 6. Demonstrate diagnostic procedures on hydraulic brake systems and related components. 15%**
- 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
