

Transport Trailer Technician Level 1

Transport Trailer Technician

Unit: A1 Orientation I: Structure and Scope of Transport Trailer Technician Trade Learning

Level: One

Duration: 7 hours

Theory: 7 hours

Practical: 0 hours

Overview:

Jobsite learning and teaching have long been fundamental to Transport Trailer Technician trade-practice, including its safety, health, and environmental implications. The chance to gain maximum benefit from workplace trade learning can be shaped by such complex factors as production schedules and jobsite politics. As adult trade-learners, Transport Trailer Technician apprentices at all levels of skill-development are encouraged to use their eyes, ears, prior knowledge, and interpersonal skills to encourage journeypersons to teach as well as to supervise them. This requires understanding the trade's dynamics, including the roles and responsibilities that order jobsite activity. Unit content outlines the trade's skill-requirements and long-term career possibilities. It includes suggestions about trade-related learning styles/strategies. It also introduces the concept of skills stewardship, stressing the obligations that trainees incur in learning from journeypersons to 'pay it forward' by assisting other newcomers who will follow them into the trade. The unit's purpose is to provide this essential information about learning to learn as a Manitoba Transport Trailer Technician trainee. Elsewhere in technical training, senior trainees explore the importance of learning to teach in trade workplaces – a central function of Transport Trailer Technician journeywork.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe the structure and scope of the trade.	10%
a. Historical background, including trainee experiences	
b. Structure/scope of the trade	
• International and national characteristics	
• Important features of practicing the trade in Manitoba	
• Trade and construction industry organizations	
c. Historical background, including trainee experiences	
• Generalists and specialists	
• Lead hands and other immediate supervisors	
• Geographic mobility	
• Job hierarchies and innovations	
2. Describe the Manitoba Transport Trailer Technician Apprenticeship Program.	20%
a. Concept and significance of skills stewardship	
• To the trade	
• To trainees	
• To journeypersons	

- To employers
- b. Practical Training: on-site component of program
 - Roles/responsibilities of employer and journeyperson(s)
 - Roles/responsibilities of Apprenticeship Training Coordinator
 - Roles/responsibilities of trainee, including record-keeping re: job experience
- c. Technical Training: off-site component of program
 - Roles/responsibilities of instructors (including Related'-area faculty)
 - Roles/responsibilities of trainees
- d. Attendance requirements
- e. Progression requirements
- f. Reporting of grades
- g. Other

3. Describe special opportunities and challenges re: Transport Trailer Technician training. 70%

- a. Adapting personal learning goals to program contexts
 - Principles of adult learning (including importance of self-direction)
 - Description/recognition of learning and teaching styles
 - Significance of work culture and interpersonal skills re: trade-learning
 - Integrating technical training and practical training content
 - Possibilities and perils of peer learning
 - Budgeting and other necessary personal arrangements
 - Identifying sources of support (e.g., upgrading trade-related math skills)
- b. On-site learning challenges and opportunities
 - Significance of jobsite supervision roles and teaching styles (e.g., journey-level skills-coach vs. mentor)
 - Communication with journeypersons and employers
 - Coverage of prescribed tasks/subtasks that define the scope of trade, and the content of the certification exam administered to apprentices who are completing their program
 - Getting help and fixing mistakes
 - Maintaining personal record of trade-learning challenges/achievements (e.g., a learning journal, and/or a personal training plan, if possible, discussed with employers and others supporting the apprenticeship journey to certification)
 - Significance of jobsite supervision roles and teaching styles (e.g., journey-level skills-coach vs. mentor)
 - Communication with journeypersons and employers
- c. In-school opportunities/challenges
 - Personal arrangements that support progress in technical training
 - "Baggage-handling" – self-assessing potential impacts of previous experiences (favourable/unfavourable) on current learning; availability of supports
 - Techniques for note-taking, record-keeping, and review
 - Relations with instructors (including 'related'-area faculty)
 - College resources (library, support services, etc.)

Transport Trailer Technician

Unit: A2 Trade Safety Awareness

Level: One

Duration: 14 hours

Theory: 8 hours

Practical: 6 hours

Overview:

Safe working procedures and conditions, injury prevention, and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers, and employees. It is imperative that all parties become aware of circumstances that may lead to injury or harm. Safe learning experiences and environments can be created by controlling the variables and behaviours that may contribute to incidents or injury. It is generally recognized that safety-conscious attitudes and work practices contribute to a healthy, safe, and accident-free working environment. It is imperative to apply and be familiar with the Workplace Safety and Health Act and Regulations. As well, it's essential to determine workplace hazards and take measures to protect oneself, co-workers, the public, and the environment. Safety education is an integral part of Insulator apprenticeship training both in school and on-the-job. Unit content is supplemented throughout technical training by trade-specific information about Insulator safety hazards and precautions presented in the appropriate contexts of discussion and study. **Note: No percentage-weightings for test purposes are prescribed for this unit's objectives. Instead, a 'Pass/Fail' grade will be recorded for the unit in its entirety.**

Objectives and Content:

**Percent of
Unit Mark (%)**

1. Identify safety and health requirements.

n/a

- a. Overview of The Workplace Safety and Health Act
 - Rights and responsibilities of employees under the Act
 - Rights and responsibilities of employers under the Act
 - Rights and responsibilities of supervisors under the Act
- b. Fourteen (14) regulations
- c. Codes of practice
- d. Guidelines
- e. Right to refuse
 - Explanation of right to refuse process
 - Rights and responsibilities of employees
 - Rights and responsibilities of employers
 - Rights and responsibilities of supervisors under the Act

2. Identify personal protective equipment (PPE) and procedures.

n/a

- a. Employer and employee responsibilities as related to personal protective equipment
- b. Standards: ANSI (U.S.A. standards), etc.
- c. Work protective clothing and danger if it fits poorly
- d. Gloves – Importance of proper glove selection (when handling chemicals, cold items, slivers, etc.)

- e. Headwear – appropriate protective headwear when required and the approved type of headwear
 - f. Eye protection – comparison and distinction of everyday eyeglasses, industrial safety glasses and safety goggles
 - g. Foot protection – when required according to safety standards
 - h. Hearing protection
 - Hazards of various noise levels (hearing protection must be worn)
 - Laws
 - Types of hearing protection
 - i. Respiratory protection – types, overview of proper selection
 - j. Fall protection – Manitoba requirements standards guidelines
 - ANSI (U.S.A. standards), etc.
 - k. Ladders and scaffolding
 - l. Safety principles for working with or around industrial trucks site-specific (forklifts, pallet trucks, etc.)
- 3. Identify electrical safety.** **n/a**
- a. Effects of electric current on the human body
 - b. Three factors that affect the severity of an electric shock
 - c. The effects of ARC and blast on the human body and equipment
 - d. Work with energized equipment
- 4. Identify fire safety.** **n/a**
- a. Types of fires
 - b. Types of fire fighting equipment
 - c. Classifications of fire extinguishers (A, B and C)
 - d. Location of fire extinguishers and fire exits
 - e. Fire alarms and drills
- 5. Identify ergonomics.** **n/a**
- a. Definition of ergonomics and conditions that may affect the body
 - Working postures
 - Repetition
 - Force
 - Lifting
 - Tools
 - Identify tool and safety equipment
 - Causes of hand tool accidents
 - Equipment
- 6. Hazard recognition and control.** **n/a**
- a. Safe work practices
 - b. Basic risk assessment
 - c. Injury prevention and control measures
 - d. Identification of hazards involved in pneumatic tool use and explanation of how to guard against them
- 7. Hazard of confined space entry:** **n/a**
- a. Identification of a confined space
 - b. Hazards of a confined space
 - Physical
 - Biological

- c. Working in a confined space
- d. Emergency response plan
- e. Self contained breathing apparatus (SCBA)

8. Identify First Aid/CPR:

n/a

- a. Overview of First Aid Regulation
- b. Obligations of employers regarding First Aid
 - Who is certified to provide First Aid?
 - What to do while waiting for help?
 - Where is First Aid kit?
- c. Describe basic First Aid requirements and techniques
 - Scope and limits of First Aid intervention
 - Specific interventions (cuts, burns, abrasions, fractures, suffocation, shock, electrical shock, etc.)
 - What is it?
 - Interface with other services and agencies (e.g., Workers Compensation claims)
- d. Describe basic CPR requirements and techniques
 - How do you get certified?
 - Scope and limits of CPR intervention (include varieties of CPR certification)

9. Identify the safety requirements as they apply to WHMIS with emphasis on:

n/a

- a. WHMIS is a system
- b. Provincial Regulation under the Safety and Health Act
 - Each province has a WHMIS regulation
- c. Federal Hazardous Products Act
- d. WHMIS generic training:
 - WHMIS defined and the format used to convey information about hazardous materials in the workplace
 - Information found on supplier and workplace labeling using WHMIS
 - Hazardous materials in accordance with WHMIS
 - Compliance with government safety standards and regulations
- e. Description of WHMIS (include varieties of WHMIS Certification)
 - Typology of WHMIS labels, symbols, and classifications
 - Scope and use of Materials Safety Data Sheets (MSDS)

10. Identifying and controlling hazards:

n/a

- a. Basic control measures (injury prevention)
- b. Safe work procedures
- c. Explanation on the importance of industrial housekeeping
- d. Employer responsibilities
- e. How and where to store materials
- f. Safety measures related to walkways, stairs and floor openings
- g. Explanation of how to protect the worker and others when working in traffic paths

Transport Trailer Technician

Unit: A4 Shop/Hand/Measuring Tools & Equipment

Level: One

Duration: 21 hours

Theory: 6 hours

Practical: 15 hours

Overview:

This unit is designed to provide the apprentice with the knowledge about the tools and equipment used when working with today's transport trailer equipment. Beginning with the use of hand tools and electric, pneumatic and hydraulic tools, the unit covers the wide variety of tools used when working with transport trailers and related equipment. Because of the new electronic and computerized equipment on transport trailers, diagnostic equipment has evolved. Electronic manuals and service bulletins are becoming more common.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe the use of hand tools.	5%
a. Hand tools as listed in Appendix "A", such as: <ul style="list-style-type: none">• Bushing installer• Crimping tool• Flaring tool• Torque multiplier• Torque wrench	
2. Describe the use of electric, pneumatic and hydraulic tools.	5%
a. Electric, pneumatic and hydraulic tools as listed in Appendix "A", such as: <ul style="list-style-type: none">• Air cutoff tools• Angle grinder• Electric saws• Heat guns• Sanders	
3. Describe the use of lifting, access and staging tools.	6%
a. Lifting, access and staging tools as listed in Appendix "A", such as: <ul style="list-style-type: none">• Axle stands• Brake drum dolly• Hoists• Scissor lift• Wheel chocks	
4. Describe the use of diagnostic and measuring tools.	6%

- a. Diagnostic and measuring tools as listed in Appendix "A", such as:
 - 5th wheel adjustment tool
 - Calipers
 - Dial indicator
 - Plumb bob
 - Trailer alignment equipment

- 5. Describe the use of cutting and welding tools. 6%**
 - a. Cutting and welding tools as listed in Appendix "A", such as:
 - Arc-air gouging tool
 - Arc welder
 - Oxy-acetylene torch
 - Plasma cutter
 - Propane torch

- 6. Describe the use of stationary tools. 6%**
 - a. Stationary tools as listed in Appendix "A", such as:
 - Band saws
 - Bench grinders
 - Drum lathe
 - Spring press
 - Table saws

- 7. Describe the use of personal protective equipment (PPE) and safety equipment. 6%**
 - a. PPE and safety equipment as listed in Appendix "A", such as:
 - Eye protection
 - Face shields
 - First aid station
 - Hearing protection
 - Welder's helmet

- 8. Demonstrate safe and correct use of hand tools. 8%**
 - a. Hand tools as listed in Appendix "A", such as:
 - Bushing installer
 - Crimping tool
 - Flaring tool
 - Torque multiplier
 - Torque wrench

- 9. Demonstrate safe and correct use of electric, pneumatic and hydraulic tools. 8%**
 - a. Electric, pneumatic and hydraulic tools as listed in Appendix "A", such as:
 - Air cutoff tools
 - Angle grinder
 - Electric saws
 - Heat guns
 - Sanders

- 10. Demonstrate safe and correct use of lifting, access and staging tools. 8%**
 - a. Lifting, access and staging tools as listed in Appendix "A", such as:
 - Axle stands
 - Brake drum dolly

- Hoists
- Scissor lift
- Wheel chocks

- 11. Demonstrate safe and correct use of diagnostic and measuring tools. 9%**
- a. Diagnostic and measuring tools as listed in Appendix "A", such as:
- 5th wheel adjustment tool
 - Calipers
 - Dial indicator
 - Plumb bob
 - Trailer alignment equipment
- 12. Demonstrate safe and correct use of cutting and welding tools. 9%**
- a. Cutting and welding tools as listed in Appendix "A", such as:
- Arc-air gouging tool
 - Arc welder
 - Oxy-acetylene torch
 - Plasma cutter
 - Propane torch
- 13. Demonstrate safe and correct use of stationary tools. 9%**
- a. Stationary tools as listed in Appendix "A", such as:
- Band saws
 - Bench grinders
 - Drum lathe
 - Spring press
 - Table saws
- 14. Demonstrate safe and correct use of personal protective equipment (PPE) and safety equipment. 9%**
- a. PPE and safety equipment as listed in Appendix "A", such as:
- Eye protection
 - Face shields
 - First aid station
 - Hearing protection
 - Welder's helmet

Transport Trailer Technician

Unit: A5 Communication and Computer Skills

Level: One

Duration: 14 hours

Theory: 14 hours

Practical: 0 hours

Overview:

This unit is designed to provide the apprentice with the knowledge about the communication skills required, including familiarity with trade related documents, when working in today's transport trailer equipment workplace. Beginning with the types of customers encountered, this unit covers the importance of the customer, the effective techniques in communicating with customers and fellow workers. Because of the new electronic and computerized equipment on transport trailers and related advances, electronic manuals and service bulletins are becoming more common.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe the communication skills/modes used in the workplace.	5%
a. Verbal communications	
• Face to face contact	
• Telephone	
b. Written communications	
• Letters and memos	
• Fax	
• Email	
2. Describe the importance of the customer.	5%
a. Costs and benefits of retaining a customer	
b. Costs and benefits of gaining new customers	
c. Value of repeat business	
d. Techniques for recovering 'lost' customers	
3. Describe effective techniques for addressing customer complaints.	5%
a. Written complaints	
b. Difficult situations with customers	
• Angry customers	
• Impatient customers	
• Indecisive customers	
• Other situations	
4. Describe techniques for maintaining good communications in the workplace.	5%
a. Internal communications	

- Support staff
 - Fellow staff (colleagues)
 - Supervisors
 - Management
- b. External communications
- Tradespeople
 - Retail customers
 - Wholesale customers
 - Suppliers
 - Authorities (insurance appraisers, safety inspectors)
- 5. Describe general organization and basic reading strategies for trade-related documents. 20%**
- a. Service bulletins
 - b. Tech bulletins
 - c. Service manuals
 - d. Other publications
 - e. Computer-based resources
 - f. Online resources
- 6. Demonstrate use of trade-related documents as specified by instructor. 20%**
- a. Identify make, model and year of trailer
 - Locate and refer to OEM – VIN plate
 - b. Identify make and model of trailer components
 - c. Demonstrate cross referencing to manufacturers' bulletins and parts catalogues
 - d. Distinguish between major and minor index systems
- 7. Demonstrate trade-related computer skills as specified by instructor. 40%**
- a. Basic computer skills
 - Application programs
 - Common computer commands
 - File management tasks [create and organize]
 - Create and understand spreadsheets
 - Be able to work within Learning Management Systems (LMSs) in a computer environment
 - b. Internet searching skills for trade-related research
 - Search engines via Universal Resource Locator (URL) addresses
 - Key word search
 - Filtering results
 - c. Using email for work related communications
 - Public email service
 - Email addresses
 - Sending and replying to email
 - Adding attachments to email (text, documents, graphs)
 - Email website links

Transport Trailer Technician

Unit: A6 Hoisting, Lifting and Staging Equipment

Level: One

Duration: 7 hours

Theory: 3 hours

Practical: 4 hours

Overview:

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

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Describe the types and operation of hoisting, lifting and staging equipment.	10%
a. Hoisting equipment	
b. Lifting equipment	
c. Securing equipment	
d. Jacking equipment	
e. Other related equipment	
2. Describe the procedures and other considerations in the operation of hoisting, lifting and staging equipment.	10%
a. Proper set up procedures	
• Use of bases	
• Use of blocks	
b. Proper maintenance procedures	
• Cleaning	
• Lubrication	
• Adjustments	
c. Additional safety considerations	
• Slings and rigging (rope tightening procedures)	
• Straight line force	
3. Describe considerations in selection of hoisting, lifting and staging equipment.	20%
a. Lifting capability vs. load capacity	
b. Use of air jack vs. hydraulic jack	

4. **Demonstrate the procedures in the operation of hoisting, lifting and staging equipment.** **60%**
- a. Proper set up procedures
 - Use of bases
 - Use of blocks
 - b. Proper maintenance procedures
 - Cleaning
 - Lubrication
 - Adjustments
 - c. Additional safety considerations
 - Slings and rigging (rope tightening procedures)
 - Straight line force

Transport Trailer Technician

Unit: A7 Welding I: Oxyacetylene, SMAW/Arc

Level: One

Duration: 77 hours

Theory: 12 hours

Practical: 65 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.	5%
a. Welding equipment	
• Arc welding	
• Oxyacetylene welding	
b. Cutting equipment	
• Gas	
• Plasma	
• Oxyacetylene	
c. Other related equipment	
• Carbon arc	
3. Describe the procedures and other considerations in the operation of welding and cutting equipment.	5%
a. Proper set up procedures	
b. Proper maintenance procedures	
• Cleaning	
• Lubrication	
• Adjustments	
c. Additional safety considerations	
4. Describe considerations in standard arc welding.	5%
a. Information from electrode designated characteristics	
• Tensile strength	
• Positions of use	
• Polarity	

- Choice of rod for application
- Determination of starting amperage (in conjunction with amperage charts)

5. Demonstrate the procedures in the operation of welding and cutting equipment. 20%

- Proper set up procedures
- Proper maintenance procedures
 - Cleaning
 - Lubrication
 - Adjustments
- Additional safety considerations

6. Demonstrate the following weld positions with welding and cutting equipment. 60%

- Butt Joint
 - Welded union between two plates lying in the same plane
- Tee Joint
 - Welded union between members located at right angle to each other with one member in the horizontal plane
- Lap Joint
 - Welded union between two overlapping members
- Corner Joint
 - Welded union between members located at right angles to each other with an exposed weld area (neither member in the horizontal plane)
- Edge Joint
 - Welded union between the edges of parallel members (fill weld may be required)

Transport Trailer Technician

Unit: B1 Trade Related Math I

Level: One

Duration: 7 hours

Theory: 7 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. This unit is intended to help make the world of numbers and ratios work for, rather than against, the transport trailer apprentice. Beginning with an overview of the importance of math to the trade, the unit covers strategies to address math anxiety, a review of general mathematical concepts including the use of calculators, and an overview of trade-related mathematics.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
<p>1. Describe the practical importance of math disciplines to the Transport Trailer Technician trade.</p> <ul style="list-style-type: none"> a. Definition and scope of relevant math disciplines b. Time-sheets, wages, and personal budgeting c. Engineering of tools and equipment d. Manufacture and packaging of transport trailer materials and products e. Trade documents, including manufacturers' specifications f. Computer technology/applications g. Design/technical drawing h. Work order preparation i. Machinery and equipment set-up j. Measurement and related test readings <ul style="list-style-type: none"> • Temperatures • Pressures • Other measured quantities k. Customer relations/perceptions (e.g., schedules, timetables, etc.) l. Business management 	<p>10%</p>
<p>2. Describe "math anxiety" and its remedies.</p> <ul style="list-style-type: none"> a. Definition b. Recognition c. Options, resources, and techniques for overcoming math anxiety d. Other common problems <ul style="list-style-type: none"> • Importance of adult learner's recognition of existing math strengths and weaknesses • Importance of early resolution during term of apprenticeship 	<p>10%</p>

- Options/resources for remedial math instruction and other assistance

3. Review general math concepts and use of electronic calculators. 50%

- a. Basic operations
 - Addition
 - Subtraction
 - Multiplication
 - Division
 - Order of operations
 - Fractions and decimals
- b. Ratio and proportion
- c. Percentage calculations
- d. Constructing/solving simple equations
- e. Trigonometry functions
- f. Units of measure
 - Imperial
 - Metric (SI)
 - Conversion factors
- g. Calculator use
 - Basic operation keys/functions
 - Percentage keys/functions
 - Trig keys/functions
 - Keys/functions re: memory and constants

4. Demonstrate trade-related calculations as specified by instructor. 30%

- a. Linear measurement
- b. Area and volume
- c. Ratio/proportion
 - Ratios
 - Percentages
 - Rates
- d. SI/Metric Units (including Conversions)

Transport Trailer Technician

Unit: C1 Suspensions I

Level: One

Duration: 21 hours

Theory: 7 hours

Practical: 14 hours

Overview:

This unit is designed to provide the apprentice with the 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. 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.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology associated with suspensions and related components.	5%
2. Describe design characteristics of suspension system.	10%
a. Operation and durability	
b. Types of suspensions	
c. Types of subcomponents such as: fasteners, torque arms	
d. Manufacturer's specifications	
• Torquing	
• Rating capacity (wheel base of suspensions / length of torque arm)	
• Type, size, capacity and construction of spring assembly	
• Air spring servicing	
3. Describe suspension identification and inspection processes.	15%
a. Alignment inspection techniques and procedures	
b. Worn bushings	
c. State of components such as: U-bolts, centre bolts and axle connections	
d. Locating manufacturer's number on air spring	
e. Manufacturer's specifications	
4. 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	

- e. Air leak detection techniques and procedures

- 5. Perform checks and measurements on main components of suspension system. 20%**
 - a. Evaluate component conditions (connections, wear characteristics)
 - b. Manufacturer's specifications
 - c. Verification of service performed

- 6. Perform removal and replacement procedures and sequences for suspension systems. 40%**
 - a. Air suspension systems
 - b. Spring suspension systems
 - c. Rubber block suspension systems
 - d. 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

Transport Trailer Technician

Unit: C2 Wheel End Assemblies

Level: One

Duration: 7 hours

Theory: 3 hours

Practical: 4 hours

Overview:

This unit is designed to provide the apprentice with the knowledge about the principles of axle systems and related components such as wheel end assemblies and tires found in today's transport trailers. Beginning with an overview of related axle system terminology, this unit covers basic suspension principles, the main components of a typical suspension, and the suspension identification and inspection process. Automatic inflation systems have become more common, especially in fleets. Nitrogen inflated tires are increasing in popularity. Nitrogen maintains a constant inflation pressure regardless of ambient temperature. More self-steering axles are being used on trailers.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology associated with axles and related components.	5%
2. Describe design characteristics of axle systems.	5%
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. Manufacturer's specifications	
3. Describe the characteristics and specifications of wheel end assemblies and tires.	15%
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. Manufacturer's specifications for tires:
 - Pre-certification requirements
 - Construction
 - Weight capacity
 - Performance designations
 - Recommended tire pressure

4. Describe axle system removal and installation techniques. 25%

- a. Types and grades of oil and grease
- b. Manufacturer's 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

5. Perform checks and measurements on axle system and related components. 10%

- a. Axle System and related components
 - Axle alignment and position
- b. Evaluate component conditions (connections, wear characteristics)
- c. Manufacturer's specifications
- d. Verification of service performed

6. Perform axle system removal and installation techniques. 20%

- a. Manufacturer's 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

7. Perform removal and replacement procedures and sequences for suspension systems. 10%

- a. Types and grades of oil and grease
- b. Manufacturer's specifications (including OEM 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

8. Perform checks/measurements and removal/installation procedures for wheel assemblies and tires. 10%

- a. Tire demounting techniques and procedures
- b. Inspection techniques and procedures for spacers and components
- c. Torque requirements and sequence
- d. Visual inspection of tire defects such as:
 - Tread wear
 - Separations
 - Recap separations
- e. Safe handling and inspection procedures
 - Zippered
 - Flats
 - Cuts

Transport Trailer Technician

Unit: C3 Wheel-off Certification

Level: One

Duration: 14 hours

Theory: 7 hours

Practical: 7 hours

Overview:

This unit builds on the unit on Wheel End Assemblies and is provides the apprentice with the knowledge and skills, and safety training for wheel-off certification (Tire Industry Association (TIA) Certificate of Completion). Apprentices must also demonstrate practical skills as per TIA requirements. **Note: The unit grade to be recorded is based entirely on the apprentice's performance on the TIA written examination. A complete examination submission includes a completed TIA Skills Demonstration Form. Those who successfully pass earn a TIA Certificate of Completion.**

Objectives and Content:	Percent of <u>Unit Mark (%)</u>
1. Demonstrate knowledge and skills required to meet the requirements of the Tire Industry Association (TIA)'s Basic CTS Program (200-level).	100%

Transport Trailer Technician

Unit: D1 Trailer Body

Level: One

Duration: 14 hours

Theory: 6 hours

Practical: 8 hours

Overview:

This unit is designed to provide the apprentice with the 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 the types, structures and construction of trailer bodies, the unit also covers inspection techniques and operational/maintenance considerations and procedures.

Objectives and Content:

Percent of Unit Mark (%)

1. Describe the types/structures and construction of trailer bodies.

40%

- 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 wenchers (belt, steel)
 - Nylon straps
 - Chain cinches

2. Describe the considerations in the operation/use of trailer bodies

25%

- 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
- c. Additional safety considerations
 - Sizes and types of fastening devices
 - Load security positioning, fastening, and replacement procedures

- 3. Perform inspection techniques and procedures** **10%**
- a. Manufacturers' specifications
 - b. Welding techniques and procedures
 - c. Straightening equipment operation
 - d. Insulation removal techniques and procedures
- 4. Perform checks/measurements and removal/installation procedures for trailer bodies** **25%**
- 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, wenchers)
 - b. Maintenance procedures
 - Welding requirements
 - Rivetting requirements
 - Straightening equipment operation
 - c. Additional safety considerations

Transport Trailer Technician

Unit: E1 Pneumatic Brake Systems I

Level: One

Duration: 49 hours

Theory: 21 hours

Practical: 28 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. 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 and repair procedures. The unit ends with an opportunity to demonstrate and perform those diagnostic and repair procedures, plus discussion about verifying service performed. There is an increased use of disc brake systems. ABSs are being refined to decrease their failure rate and to improve the braking efficiencies of trailers. In addition to the ABS functions, roll stability controls are being incorporated to increase safety of operation

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology and characteristics associated with pneumatic brake systems.	5%
2. Identify components of air brake systems.	5%
a. Components and their location	
b. Types, sizes and material and other characteristics	
• Lining	
• Fasteners	
• Push-rod	
• Slack adjustors	
• Shoes	
• Rotors	
3. Describe the principles of operation of pneumatic brake systems.	10%
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	
4. Describe diagnostic procedures on pneumatic brake systems.	10%
a. Operating specifications	
b. Damage and/or wear characteristics or tolerances	

- c. Commercial Vehicle Inspection Manual (CVIM)
 - d. Manufacturers' specifications
- 5. Describe repair procedures on pneumatic brake systems. 10%**
- a. Installation and removal procedures
 - Reline
 - Overall
 - b. Adjustment techniques and procedures
- 6. Demonstrate diagnostic procedures on pneumatic brake systems. 30%**
- a. Evaluate component conditions (damage/wear characteristics or tolerances)
 - b. Commercial Vehicle Inspection Manual (CVIM)
 - c. Manufacturers' specifications
- 7. Perform repair procedures on pneumatic brake systems. 30%**
- a. Installation and removal procedures
 - b. Adjustment techniques and procedures
 - c. Maintenance procedures
 - d. Verification of service performed

Transport Trailer Technician

Unit: F1 Electrical Theory and Circuitry

Level: One

Duration: 28 hours

Theory: 14 hours

Practical: 14 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>
1. Define terminology and describe basic concepts associated with electrical theory and circuitry.	15%
a. Terminology <ul style="list-style-type: none">• Ions• Forms of electricity	
b. Atomic structure and its effects on electrical flow	
c. Static Electricity effect	
d. Distinguish between these theories and apply to electrical flow/current: <ul style="list-style-type: none">• Electron/Hole theory• Conventional theory	
e. Laws of Magnetism <ul style="list-style-type: none">• Basic principles• Electro-magnetism• Rules applied to a magnetic field• Science that applies to the lines of force within a magnetic field	
2. Describe electrical circuits.	25%
a. Diagram simple electrical circuits <ul style="list-style-type: none">• Series• Parallel• Series-parallel	
b. Perform electrical measurements and calculations within specific circuits	
c. Analyze and interpret results	
3. Apply principles and laws that govern electrical circuits and relate to electrical theory.	25%
a. Circuit calculations using relevant mathematical and scientific principles	
b. Ohm's Law as it applies to circuitry and components within a circuit	
c. Joule's Law for determining electrical power throughout a circuit	

- d. Kirchoff's Law of Voltage and Law of Amperage as it applies to a specific type of electrical circuit
- e. Construct, calculate and compare the three types of simple circuits based on principles of electricity
 - Series
 - Parallel
 - Series-parallel

4. Demonstrate the use of measuring instruments to analyze electrical flow through or within specific electrical circuits. 25%

- 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. Common electrical faults
 - "Open circuit"
 - "Short circuit"
 - "Ground fault"

5. Describe the functions and operation of basic electrical components. 10%

- a. Use of conductors, non-conductors and semi-conductors
- b. Use of circuit protection devices
 - Fuses
 - Circuit breakers
 - Fusible links
- c. Use of types of resistors
- d. Use, installation and testing of electrical resistors
- e. Function, installation and testing of a relay within a simple circuit
- f. Function, installation and testing of a diode within a simple circuit
- g. Function and operation of a solenoid within a specific circuit
