APPRENTICESHIP ROUTE TOWARDS CERTIFICATION

APPLICATION

CONTRACT AND RECORD BOOK

REALTEMPT

ENTRANCE EXAMINATION

EDUCATIONAL IMPROVEMENT COURSE

FAIL

PASS

* PROOF OF EDUCATIONAL PRE-REQUISITE

HEAVY EQUIPMENT TECHNICIAN

PERIOD 1
1600 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

PERIOD 2
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

PERIOD 3
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

PERIOD 4
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

* JOURNEYMAN CERTIFICATE

COMM. TECHNICAL TRAINING

HEAVY DUTY EQUIPMENT MECHANIC

OFF ROAD)

PERIOD 1
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

PERIOD 2
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

PERIOD 3
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

* JOURNEYMAN CERTIFICATE

COMM. TECHNICAL TRAINING

TRUCK AND TRANSPORT MECHANIC

PERIOD 1
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

PERIOD 2
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

PERIOD 3
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

* JOURNEYMAN CERTIFICATE

COMM. TECHNICAL TRAINING

TRANSPORT-TRAILER MECHANIC

PERIOD 1
1500 HOURS INCLUDING ON THE JOB TRAINING AND PASSING OF TECHNICAL TRAINING

PERIOD 2
1600 HOURS ON THE JOB TRAINING

* JOURNEYMAN CERTIFICATE

COMM. TECHNICAL TRAINING

* FOR ENTRANCE REQUIREMENTS RECOMMENDED PATH AS WELL AS MINIMUM REQUIREMENTS, REFER TO <www.tradesecrets.gov.ab.ca>

** A PERSON HOLDING A "JOURNEYMAN HEAVY EQUIPMENT TECHNICIAN" CERTIFICATE WILL RECEIVE THE TRANSPORT-TRAILER MECHANIC, TRUCK AND TRANSPORT MECHANIC, AND THE HEAVY DUTY EQUIPMENT MECHANIC (OFF ROAD) CERTIFICATES. CANDIDATES ARE ALSO ELIGIBLE TO RECEIVE THE INTERPROVINCIAL RED SEAL FOR TRUCK AND TRANSPORT MECHANIC AND THE HEAVY DUTY EQUIPMENT MECHANIC (OFF ROAD).
Heavy Equipment Technician Training Profile
FIRST PERIOD
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE
STANDARD WORKPLACE
SAFETY, MATERIALS AND
TOOLS
40 HOURS

A  Safety Legislation,
Regulations and Industry
Policy in the Trades
2 Hours

B  Climbing, Lifting, Rigging
and Hoisting
3 Hours

C  Hazardous Materials and
Fire Protection
3 Hours

D  Communications
1 Hour

E  Lifting Procedures and
Wire Rope
4 Hours

F  Materials and Fastening
Devices
4 Hours

G  Hand, Shop and Power
Tools

H  Measuring Tools

I  Oxyacetylene
Equipment, Heating and
Cutting

SECTION TWO
SUSPENSIONS, WHEELS
AND SYSTEMS
53 HOURS

A  Frame and Suspension
Fundamentals
7 Hours

B  Frame and Suspension
Service
9 Hours

C  Bearings and Seals
6 Hours

D  Wheels, Tires, and Hubs
9 Hours

E  Trailer Systems and
Components
3 Hours

F  Coupling Units
Fundamentals and
Service
6 Hours

G  Landing Gear
Fundamentals and
Service
3 Hours

H  Orientation to Trailer
Inspection
4 Hours

I  Preventive Maintenance
6 Hours

SECTION THREE
HYDRAULICS 1 AND
HYDRAULIC BRAKE
SYSTEMS
49 HOURS

A  Hydraulic Brake System
Fundamentals
3 Hours

B  Hydraulic Brake System
(Drum and Disc)
7 Hours

C  Hydraulic Brake System
Diagnosis and Service
7 Hours

D  Hydraulic Brake Booster
System Fundamentals
and Service
11 Hours

E  Parking Brake System
Fundamentals and
Service
3 Hours

F  Electric Brake
Fundamentals and
Service
2 Hours

G  Hydraulic Fundamentals

H  Hydraulic System
Components: Reservoir,
Filters, Hoses and
Coolers
6 Hours

I  Hydraulic System
Components: Pumps,
Valves and Cylinders

SECTION FOUR
ELECTRICAL I AND
ELECTRONICS I
53 HOURS

A  Electrical Theory
4 Hours

B  Electrical Circuits
7 Hours

C  Magnetism
5 Hours

D  Test Equipment
6 Hours

E  Battery Fundamentals
and Service
8 Hours

F  Electrical Wiring,
Lighting Circuits and
Circuit Protection
9 Hours
### SECTION FIVE

**AIR BRAKES**

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<td>G</td>
<td>H</td>
<td>A</td>
<td>B</td>
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<tr>
<td></td>
<td>Basic Electronics</td>
<td>Electronic Control Systems</td>
<td>Air Brake System Fundamentals</td>
<td>Air Brake System Mechanical Components</td>
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<td></td>
<td>6 Hours</td>
<td>8 Hours</td>
<td>4 Hours</td>
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<tr>
<td></td>
<td>Truck/Tractor Air Brake System Components</td>
<td>Air Antilock Brake System Fundamentals</td>
<td>12 Hours</td>
<td>6 Hours</td>
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<td></td>
<td>Trailer Air Brake System Components</td>
<td>Air Brake Testing and Service</td>
<td>8 Hours</td>
<td>9 Hours</td>
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<td>8 Hours</td>
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## SECOND PERIOD
(8 Weeks 30 Hours per Week – Total of 240 Hours)

### SECTION ONE
**ENGINE FUNDAMENTALS, SERVICE AND REPAIR**

<table>
<thead>
<tr>
<th>Column</th>
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<tbody>
<tr>
<td>A</td>
<td>Engine Fundamentals</td>
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<tr>
<td>B</td>
<td>Engine Block and Cylinder Liner Fundamentals</td>
<td>6</td>
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<tr>
<td>C</td>
<td>Engine Block and Cylinder Liner Service</td>
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<tr>
<td>D</td>
<td>Piston, Piston Rings and Connecting Rod Fundamentals</td>
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<tr>
<td>E</td>
<td>Piston, Piston Rings and Connecting Rod Service</td>
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<tr>
<td>F</td>
<td>Crankshaft, Bearings and Related Component Fundamentals</td>
<td>6</td>
</tr>
<tr>
<td>G</td>
<td>Crankshaft, Bearings and Related Component Service</td>
<td>6</td>
</tr>
<tr>
<td>H</td>
<td>Camshaft and Follower Fundamentals</td>
<td>6</td>
</tr>
<tr>
<td>I</td>
<td>Camshaft and Follower Service</td>
<td>6</td>
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<tr>
<td>J</td>
<td>Cylinder Head Fundamentals</td>
<td>9</td>
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<tr>
<td>K</td>
<td>Cylinder Head Service</td>
<td>6</td>
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<tr>
<td>L</td>
<td>Engine Braking System Fundamentals and Service</td>
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### SECTION TWO
**ENGINE SYSTEMS**

<table>
<thead>
<tr>
<th>Column</th>
<th>Content</th>
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<tbody>
<tr>
<td>A</td>
<td>Air Induction and Exhaust Systems</td>
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<tr>
<td>B</td>
<td>Turbo Charged Air Systems</td>
<td>5</td>
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<tr>
<td>C</td>
<td>Lubrication Systems and Crankcase Ventilation</td>
<td>9</td>
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<tr>
<td>D</td>
<td>Cooling Systems (Liquid and Air)</td>
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</table>

### SECTION THREE
**DIESEL FUEL INJECTION SYSTEMS**

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<thead>
<tr>
<th>Column</th>
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<tbody>
<tr>
<td>A</td>
<td>Diesel Fuel and Storage Tanks (Machine and Bulk Storage)</td>
<td>3</td>
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<tr>
<td>B</td>
<td>Combustion Process and Starting Aids</td>
<td>4</td>
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<tr>
<td>C</td>
<td>Fuel System Service</td>
<td>5</td>
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<tr>
<td>D</td>
<td>Mechanical Fuel Injection System</td>
<td>6</td>
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<tr>
<td>E</td>
<td>Advanced Mechanical Fuel Injection System</td>
<td>9</td>
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<tr>
<td>F</td>
<td>Basic Diesel Engine and Fuel System Testing and Adjusting</td>
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<tr>
<td>G</td>
<td>Emergency Shutdown Systems</td>
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</tbody>
</table>

### SECTION FOUR
**ELECTRONICS FUEL MANAGEMENT**

<table>
<thead>
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<th>Column</th>
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<tbody>
<tr>
<td>A</td>
<td>Electronic Fuel System Fundamentals</td>
<td>15</td>
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<tr>
<td>B</td>
<td>Electronic Controlled Fuel Injection Systems</td>
<td>12</td>
</tr>
<tr>
<td>C</td>
<td>Electronic Fuel System Diagnosis</td>
<td>12</td>
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<tr>
<td>D</td>
<td>Emission Control / After Treatment</td>
<td>15</td>
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</table>
SECTION FIVE

HEAVY DUTY CHARGING AND CRANKING SYSTEMS
50 HOURS

A | Charging System and Control Circuit Fundamentals | 12 Hours

B | Charging System Testing and Service | 18 Hours

C | Cranking System Fundamentals and Motor Drives | 3 Hours

D | Cranking System Control Circuits | 3 Hours

E | Cranking System Testing and Service | 12 Hours

F | Non-Electric Cranking Systems | 2 Hours
### THIRD PERIOD
(8 Weeks 30 Hours per Week – Total of 240 Hours)

#### SECTION ONE
**HYDRAULICS II**
- **A** Hydraulic Principles 9 Hours
- **B** Hydraulic Pump Fundamentals 9 Hours
- **C** Hydraulic Pump Service 12 Hours
- **D** Hydraulic Actuator Fundamentals 6 Hours
- **E** Hydraulic Actuator Service 9 Hours
- **F** Hydraulic Valve II 18 Hours
- **G** Hydraulic System Types 18 Hours
- **H** Hydraulic System Testing and Service 15 Hours
- **I** Electrohydraulics 6 Hours

#### SECTION TWO
**STEERING AND SUSPENSION SYSTEMS AND ACCESSORIES**
(SPECIFIC TO OFF-ROAD) AND APPRENTICESHIP
- **A** Wheeled Equipment Steering Fundamentals and Service 6 Hours
- **B** Suspension System Fundamentals and Service 5 Hours
- **C** Off-Road Equipment Accessories and Attachments 5 Hours
- **D** Off-Road Electrical Circuit Fundamentals 8 Hours
- **E** Off-Road Electrical Circuit Service 6 Hours
- **F** Workplace Coaching Skills 1 Hour
- **G** Advisory Network 1 Hour
- **H** Interprovincial Standards 1 Hour

#### SECTION THREE
**POWERTRAIN (SPECIFIC TO OFF-ROAD)**
- **A** Gearing Principles 3 Hours
- **B** Torque Converter Fundamentals and Service 9 Hours
- **C** Powershift and Automatic Transmission Mechanical/Electronic Components 14 Hours
- **D** Powershift and Automatic Transmission Control and Shifting 9 Hours
- **E** Hydraulic Retarder Fundamentals 3 Hours
- **F** Powershift and Automatic Transmission Testing and Service 9 Hours
- **G** Tracked Equipment Steering Fundamentals and Service 10 Hours
- **H** Undercarriage Systems Fundamentals and Service 11 Hours
- **I** Final Drive Fundamentals and Service (Off-Road) 10 Hours
- **J** Drive Axle and Carrier Fundamentals and Service (Off-Road) 12 Hours
- **K** Clutch Fundamentals and Service 3 Hours
FOURTH PERIOD
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE

POWERTRAIN (SPECIFIC TO TRUCK AND TRANSPORT) 122 HOURS

A
Clutch Fundamentals and Service 9 Hours

B
Driveline Fundamentals and Service 12 Hours

C
Gearing Principles 3 Hours

D
Transmission Fundamentals 13 Hours

E
Transmission Shifting 12 Hours

F
Transmission Service 27 Hours

G
Transfer Case and Auxiliary Drives 4 Hours

H
Drive Axle Assembly Fundamentals (On Road) 12 Hours

I
Drive Axle Assembly Service (On Road) 30 Hours

SECTION TWO

STEERING AND ANTILOCK BRAKE SYSTEMS 48 HOURS

A
Steering Fundamentals 8 Hours

B
Steering Service 10 Hours

C
Steering Angles and Alignment 8 Hours

D
Air Antilock Brake Systems 6 Hours

E
Air Antilock Brake System Diagnosis 8 Hours

F
Hydraulic Antilock Brake Systems 8 Hours

SECTION THREE

AIR CONDITIONING 36 HOURS

A
Air Conditioning Fundamentals 8 Hours

B
Heating, Ventilation and Air Conditioning (HVAC) Control Systems 12 Hours

C
Air Conditioning Testing and Service 16 Hours

SECTION FOUR

VEHICLE ELECTRICAL DIAGNOSIS, FAILURE ANALYSIS AND APPRENTICESHIP 34 HOURS

A
Truck Electrical Circuit Fundamentals 8 Hours

B
Truck Electrical Circuit Service 9 Hours

C
Failure and Fluid Analysis 8 Hours

D
Orientation to Vehicle Inspection 6 Hours

E
Workplace Coaching Skills 1 Hour

F
Advisory Network 1 Hour

G
Interprovincial Standards 1 Hour

NOTE: The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.