Apprenticeship Training Standard

Automotive Service Technician

Trade Code: 310S

Development Date: January 2003
AUTOMOTIVE SERVICE TECHNICIAN

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1. **Program Definition: Automotive Service Technician** is defined as a person who, on motor vehicles and light trucks, inspects/diagnoses and troubleshoots/repairs/verifies repairs on:

- engine systems, electrical systems – starting and charging
- engine management systems; electrical systems – body
- fuel delivery systems
- transmission systems
- drive shafts, differentials, and drive axle assemblies
- suspension systems and frames
- steering systems, braking systems, tires, wheels, rims & hubs, heating, ventilation and air-conditioning systems, body and trim, exhaust, and intake and emission control systems.

Automotive Service Technician is an approved apprenticeship program for the purposes of the *Apprenticeship and Certification Act, 1998* (ACA).

2. **Program Guidelines**

- **On-The-Job Training Duration** (*for apprentices*)
  The Industry Committee has identified 6500 hours as the duration generally necessary for any apprentice to become competent in the skills required. There may be individual circumstances where the duration varies from this guideline.

- **In-School Training Duration**
  The Industry Committee has identified 720 hours of in-school training as the duration generally necessary for an apprentice to complete the in-school curriculum for this program, except where an apprentice has been exempted from any level of that curriculum.

- **Ratio**
  The Industry Committee has identified a journeyperson-to-apprentice ratio of one journeyperson or individuals who are deemed equivalent to a journeyperson status to one apprentice as the ratio generally necessary for an apprentice to be properly trained on the job in this program. There may be individual circumstances where the ratio varies from this guideline.
3. **Program Requirements**

- **Restricted Skill Sets**
  This program does not contain any restricted skill sets as per Ontario Regulation 565/99, Restricted Skill Sets. Therefore, an individual is not required to be registered apprentice or possess certification in order to perform skills contained in the program.

- **Academic Standard**
  The Industry Committee has identified the minimum academic standard for entry to this program as completion of Grade 12 or ministry-approved equivalent.

  (See ACA Policy 102, Confirming Academic Requirements)

- **Eligibility for Exam Challenge (for Non-apprentice C of Q Applicants)**
  The challenger must:
  - provide proof of competency in all mandatory (unshaded) skills as identified in the Training Standard or Schedule of Training; and
  - demonstrate that he/she has acquired 7220 hours of on-the-job training.

  (See ACA Policy 150, Assessing Applicants for the Certificate of Qualification)

- **Eligibility for Program Completion (for Apprentices)**
  The apprentice must:
  - achieve competency in all mandatory (unshaded) skills as identified in the Training Standard or Schedule of Training.
  - complete the in-school training as outlined in the industry and ministry-approved Curriculum Standard.

  (ACA Policy 309, Completion of an Apprenticeship Program)

- **Other Information**

- **Other Resources**
  Complete program requirements, policies, and standards can be obtained by referring to the following resources:
  - *Apprenticeship and Certification Act, 1998 (ACA)*;
  - ACA General Regulation 573/99;
  - ACA Exemption Regulation 566/99;
  - Program-specific Apprenticeship Training Standards or Schedules of Training; and
  - ACA Program and Policy Manual
AUTOMOTIVE SERVICE TECHNICIAN

- **Other Required Certification**
  N/A

- **Academic Background**
  Industry has identified relevant secondary school course(s) likely to increase an individual’s chances of success if completed prior to program entry. For details, see the document Apprenticeship Subject Pathways.
# COMPETENCY ANALYSIS PROFILE

## AUTOMOTIVE SERVICE TECHNICIAN – 310S

*(All unshaded skill sets must be demonstrated/completed)*

### SKILL SETS

<table>
<thead>
<tr>
<th>OCCUPATIONAL HEALTH &amp; SAFETY PRACTICES</th>
<th>SKILLS</th>
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</thead>
<tbody>
<tr>
<td>U5160.0</td>
<td></td>
</tr>
<tr>
<td>Identify potential workplace health and safety hazards</td>
<td>Handle, store and dispose of hazardous materials</td>
</tr>
<tr>
<td>5160.01</td>
<td>5160.02</td>
</tr>
<tr>
<td>Wear and maintain personal protective equipment</td>
<td>Comply with workplace-related legislation</td>
</tr>
<tr>
<td>5160.03</td>
<td>5160.04</td>
</tr>
<tr>
<td>Interpret and apply service related information</td>
<td></td>
</tr>
<tr>
<td>5160.05</td>
<td></td>
</tr>
<tr>
<td>Practice good housekeeping in the workplace</td>
<td>Comply with WHMIS guidelines</td>
</tr>
<tr>
<td>5160.06</td>
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### ENGINE SYSTEMS

<table>
<thead>
<tr>
<th>ENGINE SYSTEMS</th>
<th>SKILLS</th>
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<tbody>
<tr>
<td>U5161.0</td>
<td></td>
</tr>
<tr>
<td>Perform visual inspection</td>
<td>Diagnose and troubleshoot cooling system and components</td>
</tr>
<tr>
<td>5161.01</td>
<td>5161.02</td>
</tr>
<tr>
<td>Repair cooling system and components</td>
<td>Verify repair of cooling system and components</td>
</tr>
<tr>
<td>5161.03</td>
<td>5161.04</td>
</tr>
<tr>
<td>Diagnose and troubleshoot engine lubricating systems and components</td>
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<td>5161.05</td>
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<td>Repair engine lubricating system and components</td>
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<td>Diagnose and troubleshoot cylinder head and components</td>
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<td>5161.10</td>
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</tr>
<tr>
<td>Diagnose and troubleshoot engine block assemblies and components</td>
<td>Repair engine block assemblies and components</td>
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<tr>
<td>5161.11</td>
<td>5161.12</td>
</tr>
<tr>
<td>Verify repair of engine block assemblies and components</td>
<td></td>
</tr>
<tr>
<td>5161.13</td>
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## AUTOMOTIVE SERVICE TECHNICIAN

### SKILL SETS

#### ELECTRICAL SYSTEMS - STARTING AND CHARGING

<table>
<thead>
<tr>
<th>U5162.0</th>
<th>Perform visual inspection</th>
<th>Diagnose and troubleshoot batteries</th>
<th>Service and boost/charge batteries</th>
<th>Diagnose and troubleshoot starting system and components</th>
<th>Repair starting system and components</th>
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</thead>
<tbody>
<tr>
<td>5162.01</td>
<td>5162.02</td>
<td>5162.03</td>
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<tr>
<td>Verify repair of starting system and components</td>
<td>Diagnose and troubleshoot charging system and components</td>
<td>Repair charging system and components</td>
<td>Verify repair of charging system and components</td>
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#### ENGINE MANAGEMENT SYSTEMS

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<thead>
<tr>
<th>U5163.0</th>
<th>Perform visual inspection</th>
<th>Diagnose and troubleshoot fuel control system and components</th>
<th>Repair fuel control system and components</th>
<th>Verify repair of fuel control system and components</th>
<th>Diagnose and troubleshoot ignition system and components</th>
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<tbody>
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<td>5163.04</td>
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<tr>
<td>Repair ignition system and components</td>
<td>Verify repair of ignition system and components</td>
<td>Diagnose &amp; troubleshoot computer-controlled systems &amp; components</td>
<td>Repair computer-controlled systems and components</td>
<td>Verify repair of computer-controlled systems and components</td>
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<td>5163.08</td>
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<td>Perform gasoline engine service</td>
<td>Perform electronic diesel engine service</td>
<td>Perform mechanical diesel engine service</td>
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<td>ELECTRICAL SYSTEMS - BODY</td>
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<td>U5164.0</td>
<td>Perform visual inspection</td>
<td>Diagnose and troubleshoot body electrical and computer-controlled systems and components</td>
<td>Repair body electrical and computer-controlled systems and components</td>
<td>Verify repair of body electrical and computer-controlled systems and components</td>
<td>Diagnose and troubleshoot supplemental restraint systems (SRS) and components</td>
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<td>Repair supplemental restraint systems (SRS) and components</td>
<td>Verify repair of supplemental restraint systems (SRS) and components</td>
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<td>FUEL DELIVERY SYSTEMS</td>
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<td>U5165.0</td>
<td>Perform visual inspection</td>
<td>Diagnose and troubleshoot gasoline fuel systems and components</td>
<td>Repair gasoline fuel systems and components</td>
<td>Verify repair of gasoline fuel systems and components</td>
<td>Diagnose and troubleshoot diesel fuel systems and components</td>
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<tr>
<td>Repair diesel fuels systems and components</td>
<td>Verify repair of diesel fuel systems and components</td>
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### AUTOMOTIVE SERVICE TECHNICIAN

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<thead>
<tr>
<th>TRANSMISSION SYSTEMS</th>
<th>SKILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perform visual inspection</strong></td>
<td><strong>Diagnose and troubleshoot clutch systems and components</strong></td>
</tr>
<tr>
<td>U5166.0</td>
<td>5166.01</td>
</tr>
<tr>
<td><strong>Repair manual transmissions/ transaxles and components</strong></td>
<td><strong>Verify repair of manual transmission/ transaxle and components</strong></td>
</tr>
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<td>5166.07</td>
</tr>
<tr>
<td><strong>Diagnose and troubleshoot computer-controlled systems and components</strong></td>
<td><strong>Repair computer-controlled systems and components</strong></td>
</tr>
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<td>5166.11</td>
<td>5166.12</td>
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<tr>
<td><strong>Verify repair of transfer cases and components</strong></td>
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<td>5166.16</td>
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<tr>
<th>DRIVE SHAFTS, DIFFERENTIALS, AND DRIVE AXLE ASSEMBLIES</th>
<th>SKILLS</th>
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<tbody>
<tr>
<td><strong>Perform visual inspection</strong></td>
<td><strong>Diagnose and troubleshoot drive shafts, differentials, drive axle assemblies and components</strong></td>
</tr>
<tr>
<td>U5167.0</td>
<td>5167.01</td>
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<tr>
<th>SUSPENSION SYSTEMS AND FRAMES</th>
<th>SKILLS</th>
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<tbody>
<tr>
<td><strong>Perform visual inspection</strong></td>
<td><strong>Diagnose and troubleshoot suspension systems, frames/ sub-frames and components</strong></td>
</tr>
<tr>
<td>U5168.0</td>
<td>5168.01</td>
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## SKILL SETS

<table>
<thead>
<tr>
<th>Steering Systems</th>
<th>Skills</th>
</tr>
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<tr>
<td>U5169.0 5169.01</td>
<td>Perform visual inspection</td>
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<td>U5169.0 5169.02</td>
<td>Diagnose and troubleshoot steering systems and components</td>
</tr>
<tr>
<td>U5169.0 5169.03</td>
<td>Repair steering systems and components</td>
</tr>
<tr>
<td>U5169.0 5169.04</td>
<td>Verify steering systems and components</td>
</tr>
<tr>
<td>U5169.0 5169.05</td>
<td>Align steering, axles, and suspension</td>
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</table>

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<thead>
<tr>
<th>Braking Systems</th>
<th>Skills</th>
</tr>
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<tbody>
<tr>
<td>U5170.0 5170.01</td>
<td>Perform visual inspection</td>
</tr>
<tr>
<td>U5170.0 5170.02</td>
<td>Diagnose and troubleshoot hydraulic braking systems and components</td>
</tr>
<tr>
<td>U5170.0 5170.03</td>
<td>Repair hydraulic braking systems and components</td>
</tr>
<tr>
<td>U5170.0 5170.04</td>
<td>Verify repair of hydraulic braking systems and components</td>
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<tr>
<td>U5170.0 5170.05</td>
<td>Diagnose and troubleshoot anti-lock braking systems traction and stability control systems and components</td>
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<tr>
<td>U5170.0 5170.06</td>
<td>Repair anti-lock braking systems (ABS) traction and stability control systems and components</td>
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<td>U5170.0 5170.07</td>
<td>Verify repair of anti-lock braking systems (ABS), traction and stability control systems and components</td>
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<tr>
<td>U5170.0 5170.08</td>
<td>Diagnose and troubleshoot anti-skid/traction control systems and components</td>
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<tr>
<td>U5170.0 5170.09</td>
<td>Repair anti-skid/traction control systems and components</td>
</tr>
<tr>
<td>U5170.0 5170.10</td>
<td>Verify repair of anti-skid/traction control systems and components</td>
</tr>
<tr>
<td>U5170.0 5170.11</td>
<td>Measure and resurface brake drums, linings and rotors</td>
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<table>
<thead>
<tr>
<th>Tires, Wheels, Rims, and Hubs</th>
<th>Skills</th>
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<tr>
<td>U5171.0 5171.01</td>
<td>Perform visual inspection</td>
</tr>
<tr>
<td>U5171.0 5171.02</td>
<td>Diagnose and troubleshoot tires and components</td>
</tr>
<tr>
<td>U5171.0 5171.03</td>
<td>Repair tires and components</td>
</tr>
<tr>
<td>U5171.0 5171.04</td>
<td>Verify repair of tires and components</td>
</tr>
<tr>
<td>U5171.0 5171.05</td>
<td>Balance tires and components</td>
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**SKILL SETS**

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<tr>
<th>AUTOMOTIVE SERVICE TECHNICIAN</th>
<th>SKILLS</th>
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<tbody>
<tr>
<td><strong>HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS</strong></td>
<td><strong>5172.0</strong></td>
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<tr>
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<td>Perform visual inspection</td>
</tr>
<tr>
<td>5172.01</td>
<td>5172.02</td>
</tr>
<tr>
<td>Repair heating and ventilation systems</td>
<td>Verify repair of heating and ventilation systems</td>
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<table>
<thead>
<tr>
<th><strong>BODY AND TRIM</strong></th>
<th><strong>5173.0</strong></th>
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<tr>
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<td>Perform visual inspection</td>
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<td>5173.01</td>
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<thead>
<tr>
<th><strong>EXHAUST, INTAKE AND EMISSION CONTROL SYSTEMS</strong></th>
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<td>U5174.0</td>
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<td>5174.01</td>
<td>5174.02</td>
</tr>
<tr>
<td>Repair turbocharger/supercharger system and components</td>
<td>Verify repair of turbocharger/supercharger system and components</td>
</tr>
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<td>5174.06</td>
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<tr>
<td>Diagnose and troubleshoot diesel emission control systems and components</td>
<td>Repair diesel emission control systems and components</td>
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### SKILL SETS

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<th>HYBRID VEHICLE SYSTEMS</th>
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<tr>
<td>Perform visual inspection</td>
<td>Diagnose and troubleshoot hybrid vehicle systems and components</td>
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PREFACE

This training standard was developed by the Ministry of Training Colleges and Universities (MTCU), in partnership with the Provincial Advisory Committee and in consultation with representatives from the industry. This document is intended to be used by apprentice, supervisor/trainer and sponsor/employer as a "blueprint" for training and as a prerequisite for completion and certification.

This training document becomes the apprentice’s only record of workplace training performance.

Supervisor/trainer and apprentice are required to sign off and date the skills following each successful acquisition, unless a skill is shaded (optional).

The care and maintenance of this training document are the joint responsibility of the apprentice and the sponsor/employer. By signing off the skill, the supervisor/trainer and the apprentice are indicating that the apprentice has demonstrated competence in the skill. This training standard has been developed specifically for documenting the apprentice’s acquisition of skills in the trade.

Please Note: Apprenticeship Training and Curriculum Standards were developed by the Ministry of Training, Colleges and Universities (MTCU). As of April 8th, 2013, the Ontario College of Trades (College) has become responsible for the development and maintenance of these standards. The College is carrying over existing standards without any changes.

However, because the Apprenticeship Training and Curriculum Standards documents were developed under either the Trades Qualification and Apprenticeship Act (TQAA) or the Apprenticeship and Certification Act, 1998 (ACA), the definitions contained in these documents may no longer be accurate and may not be reflective of the Ontario College of Trades and Apprenticeship Act, 2009 (OCTAA) as the new trades legislation in the province. The College will update these definitions in the future.

Meanwhile, please refer to the College’s website (http://www.collegeoftrades.ca) for the most accurate and up-to-date information about the College. For information on OCTAA and its regulations, please visit: http://www.collegeoftrades.ca/about/legislation-and-regulations
DEFINITIONS

ACA
Apprenticeship and Certification Act, 1998

Certificate of Apprenticeship (CofA)
Certification issued to individuals who have demonstrated that they have completed an apprenticeship in Ontario.

Certificate of Qualification (CofQ)
Certification issued to C of Q applicants who have achieved a passing grade on the certification exam for their trade.

Competency Analysis Profile
A document that identifies the training needs of an individual trade and details the skills/skill sets that must be demonstrated.

Competence
The ability of an individual to perform a skill repeatedly and without assistance in the workplace to the standard set out in the Training Standard or Schedule of Training.

General Performance Objective (On-the-job Skill Set)
Describes set of skills which include all performance objectives under that skill set.

Industry Committee (IC) - under the ACA and Provincial Advisory Committee (PAC) under the TQAA
Under the ACA and TQAA, the Minister may appoint a provincial committee in any trade or group of trades to advise the Minister in matters relating to the establishment and operation of apprenticeship training programs and trades qualifications.

Journeyperson or Equivalent
A person who has acquired the knowledge and skills in a trade, occupation or craft as attested to by a provincial or territorial authority.

Mandatory
Status assigned to unshaded individual skills, skill sets or general performance objective which must be signed off for the apprentice to complete their program.

Optional
Status assigned to shaded individual skills, skills sets or general performance objective for which sign-off is not required for the apprentice to complete the program.
Sign-off
Signature of the sponsor/employer of record or an individual, to whom that sponsor or employer has delegated signing authority, indicating an apprentice’s achievement of competence.

Skill
Individual skill described in the Training Standard (note: does not mean the larger skill groups referred to in the Training Standard as Skill Sets, Training Units, or General Performance Objective, but the individual skills that make up those groups).

Skill Sets
Group of individual skills found in the Training Standard (may also be called Training Unit or General Performance Objective)

Skill Set Completion Form
Lists all skill sets and includes space for sign-off by sponsor/employer of record.

Sponsor/Employer
Means a person that has entered into a registered training agreement under which the person is required to ensure that an individual is provided with workplace-based training in a trade, other occupation or skill set as part of an apprenticeship program approved by the Director.

Sponsor/Employer of Record
Refers to the sponsor or employer documented as the signatory to the current training agreement or contract. In order for a sponsor/employer to be considered for the training of apprentices, they must identify that the workplace has qualified journeypersons or equivalent on site and can identify that the workplace has the tools, equipment, materials, and processes which have been identified by Provincial Advisory Committees (PACs) or Industry Committees (ICs) to be required for the trade.

Supervisor
An individual who oversees the execution of a task, oversees the actions or work of others.

Trainer
A qualified trainer in a compulsory trade is a journeyperson with a Certificate of Qualification or in a voluntary trade is an individual who is considered equivalent to a journeyperson with a Certificate of Qualification.

TQAA
Trades Qualification and Apprenticeship Act.

Training Standard
A document that has been written in concise statements, which describe how well an apprentice must perform each skill in order to become competent. In using the document, trainers will be able to ensure that the apprentice is developing skills detailed for the occupation.
IMPORTANT DIRECTIONS

Apprentice

1. All complete skills or skill sets must be signed and dated by both the apprentice and sponsor/employer when either all terms of the contract have been completed or the apprentice leaves the employ of the employer.

2. It is the responsibility of the apprentice to inform the apprenticeship staff at the local Ministry of Training, Colleges and Universities office regarding the following changes:
   - change of sponsor/employer address;
   - change of apprentice name or address;
   - transfer to a new sponsor/employer.

3. The Skill Set Completion Form must be completed and signed by the current sponsor/employer and presented to the local Apprenticeship Client Services Office at the fulfillment of all terms of a Contract of Apprenticeship/Training Agreement.

4. The apprentice completion form with the Completed and Authorized Training Standard must be presented to the local Apprenticeship Client Services Unit.

Sponsors/Employers and Supervisors/Trainers

The Training Standard identifies skills required for this trade/occupation and its related training program.

This Training Standard has been written in concise statements which describe how an apprentice must perform each skill in order to become competent. Competence means being able to perform the task to the required standard.

In using this Training Standard, supervisors/trainers will be able to ensure that the apprentice is developing the skills detailed for the trade/occupation.

Supervisors/Trainers and apprentices are required to sign off and date the skills following each successful acquisition.

Sponsors/Employers participating in this training program will be designated as the Signing Authority and are required to attest to successful achievement by signing the appropriate box included at the end of each skill set.
NOTICE OF COLLECTION OF PERSONAL INFORMATION

1. At any time during your apprenticeship training, you may be required to show this training standard to the Ministry of Training, Colleges and Universities (the Ministry). You will be required to disclose the signed Apprenticeship Completion form to the Ministry in order to complete your program. The Ministry will use your personal information to administer and finance Ontario’s apprenticeship training system, including confirming your completion and issuing your certificate of apprenticeship.

2. The Ministry will disclose information about your program completion and your certificate of apprenticeship to the Ontario College of Trades, as it is necessary for the College to carry out its responsibilities.

3. Your personal information is collected, used and disclosed by the Ministry under the authority of the Ontario College of Trades and Apprenticeship Act, 2009.

4. Questions about the collection, use and disclosure of your personal information by the Ministry may be addressed to the:

Manager, Employment Ontario Contact Centre
Ministry of Training, Colleges and Universities
33 Bloor St. E, 2nd floor, Toronto, Ontario M7A 2S3
Toll-free: 1-800-387-5656; Toronto: 416-326-5656
ROLES & RESPONSIBILITIES OF APPRENTICE, SPONSOR/EMPLOYER AND SUPERVISOR/TRAINER

**Apprentice** “Apprenticeship is Learning On-the-job”

- Practice safe work habits.
- Use your apprenticeship training standard as a journal to keep track of which skills you have achieved.
- Talk over your training plan with your Training Consultant, Employer, Union, or Sponsor.
- Know what tools are required for your trade and how to use them.
- Ask questions and keep asking.
- Talk to your employer about your training needs.
- Demonstrate enthusiasm and good work habits.
- Ensure that you and your supervisor/trainer sign off skill/skill sets upon demonstration of competency.

**Sponsor/Employer** “Training is an Investment”

- Demonstrate safe work habits.
- Attest to successful achievement by signing the skill/skills sets.
- Provide opportunities and time for the apprentice to learn the trade.
- Offer practical trade training experiences that cover all of the skill sets.
- Foster work ethics that support training while minimizing productivity losses.
- Set out clear expectations, then recognize or reward performance excellence.
- Involve both the apprentice and supervisor/trainer in developing the training plan.
- Use the Training Standard as a monitoring tool and part of regular performance evaluations.
- Select supervisors/trainers with good communication skills and who work well with others.
- Encourage supervisors/trainers to take upgrading courses - (e.g. Train the Trainer, Mentor Coach, etc.).
- Complete the Skill Set Completion Form once the apprentice has demonstrated competency in the training.
- Ensure that the apprentice always works under the direction of or has access to a qualified supervisor/trainer.
- Vary the apprentice’s exposure to all the skills set out in the training standard.
Supervisor/Trainer

- Demonstrate safe work habits.
- Treat apprentices fairly and with respect.
- Use the Training Standard as a guide to evaluating competence in each skill area. In using the Training Standard, supervisors/trainers will be able to ensure that the apprentice is developing skills detailed for the trade/occupation.
- Review the Training Standard with the apprentice and develop a training plan.
- Respond fully to all questions.
- Be patient. Explain what is to be done then, show how it is done, and then let the apprentice demonstrate the task.
- Provide continuous feedback.
- Sign off individual skills/skill sets once the apprentice demonstrates competence in the skill.

Suggestions for Assessing the Progress of the Apprentice in the Workplace

- Use informal daily observation.
- Provide constructive feedback to build confidence.
- Allow the supervisor/trainer time to teach and demonstrate the skills.
- Take prompt action wherever problems occur.
- Conduct regular performance reviews involving the apprentice, supervisor/trainer and sponsor/employer.
- Use the Training Standard as the reference for establishing the competency of the apprentice.
# SKILL SET COMPLETION FORM

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## NOTE ON SHADED PERFORMANCE OBJECTIVES AND SKILLS:

- Shaded performance objectives and skill sets are optional. The shaded skills do not have to be demonstrated or signed-off for completion of the on-the-job component of the apprenticeship.
- The in-school curriculum learning outcomes will cover all of the skill sets, both shaded and unshaded.
- The Certificate of Qualification examination will test the whole of the trade and may test both shaded and unshaded performance skill sets.
U5160.0 OCCUPATIONAL HEALTH AND SAFETY PROCEDURES

GENERAL PERFORMANCE OBJECTIVE

Comply with occupational health and safety procedures by: identifying potential workplace health and safety hazards; handling, storing and disposing of hazardous materials; wearing and maintaining personal protective equipment; complying with workplace-related legislation; interpreting and applying service-related information; practising good housekeeping in the workplace; complying with Workplace Hazardous Materials Information System (WHMIS) guidelines, according to the Occupational Health and Safety Act, government regulations, company policy and manufacturer’s recommendations.

PERFORMANCE OBJECTIVES

SKILLS

5160.01 Identify potential workplace health and safety hazards, including: excessive exhaust and/or explosive fumes, dust, sound levels, electrical and mechanical hazards (i.e., damaged or faulty air lines and/or inadequate ventilation); so that the potential for personal injury, damage to equipment, vehicles, and the environment are minimized; according to government regulations and company policy.

Date Completed ___________ Apprentice ___________ Supervisor/Trainer ___________

5160.02 Handle, store and dispose of hazardous materials, including: cleaning solvents, anti-freeze, transmission and brake fluids, engine oil, brake dust, battery acid, refrigerants, and gases; using personal protective equipment (PPE) and specified handling and storage equipment; so that individuals are protected from injury, the environment from contamination and safety procedures are followed; according to government regulations and company policy.

Date Completed ___________ Apprentice ___________ Supervisor/Trainer ___________
U5160.0  OCCUPATIONAL HEALTH AND SAFETY PROCEDURES...cont’d

5160.03 Wear and maintain personal protective equipment, including: eye, ear, hand, respiratory, body, and foot protection; ensuring that correct fit and optimum protection is provided to the wearer for the specific task performed; according to the government regulations, manufacturer’s specifications and company policy.

Date Completed  Apprentice  Supervisor/Trainer

5160.04 Comply with workplace-related legislation, relating to highway traffic safety, parts, warranties, occupational health/safety, environmental protection, and business and trade practices, including: Occupational Health and Safety Act, Motive Vehicle Repair Act, Highway Traffic Act and the Environmental Protection Act; by identifying the personal and legal liabilities of automotive service technicians, and vehicle owners, when performing and/or conducting vehicle safety inspections, emissions tests, work estimates and repairing and/or replacing defective parts; according to government regulations.

Date Completed  Apprentice  Supervisor/Trainer

5160.05 Interpret and apply service-related information, including: service bulletins, manuals, and parts catalogues, by: locating and identifying vehicle identification number (VIN), accessing computerized service information systems, so that service/repair is performed; according to company policy and/or manufacturer’s recommendations.

Date Completed  Apprentice  Supervisor/Trainer

5160.06 Practice good housekeeping in the workplace, by: applying fire hazard prevention methods, including: maintaining a clean and orderly work area; identifying, removing and disposing of potential fire hazards; cleaning up grease, oil spills and/or fluids; ensuring work area is free of obstructions; and safely storing tools and shop equipment, to minimize accident or injury to self and others; according to government regulations and company policy.

Date Completed  Apprentice  Supervisor/Trainer
5160.07  Comply with Workplace Hazardous Materials Information System (WHMIS) guidelines, including: reading and interpreting labels and Material Safety Data Sheets (MSDS), ensuring receipt of training in WHMIS regulations and practices; according to the Occupational Health and Safety Act.

Date Completed  Apprentice  Supervisor/Trainer

Sponsor/Employer Name  Sponsor/Employer Signature
GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair engines, by: performing a visual inspection; diagnosing and troubleshooting cooling systems and components; repairing cooling systems and components, verifying repairs of cooling systems and components, diagnosing and troubleshooting engine lubricating systems and components; repairing engine lubricating systems and components; verifying repair of engine lubricating systems and components; diagnosing and troubleshooting cylinder heads and components; repairing cylinder heads and components; verifying repair of cylinder heads and components; diagnosing and troubleshooting engine blocks and components, repairing engine blocks and components, and verifying repair of engine blocks and components; according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5161.01 Perform visual inspection, identifying system types and applications, by: checking for: worn, loose, damaged, missing, leaking, or defective components, including: coolant, radiators, reservoirs, surge tanks, coolant fans, hubs, pumps, controls, actuators, belts, hoses, lines, fittings, heat exchangers, gaskets, o-rings, seals, pipes, valves, sensors, temperature control devices, drive mechanisms, wiring harnesses, and fastening and mounting devices; according to manufacturer's recommendations, specifications, and safety requirements.
U5161.0 ENGINE SYSTEMS...cont’d

5161.02 Diagnose and troubleshoot cooling systems and components, including: coolant, radiators, reservoirs, surge tanks, fans, hubs, coolant pump, controls, actuators, belts, hoses, lines, fittings, heat exchangers, seals, gaskets, o-rings, pipes, valves, sensors, relays, temperature control devices, drive mechanisms, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; checking for: leaks, odour, temperature, corrosion, colour, vibration/noise, coolant type, quantity and condition; using: hand, power, electronic service and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer’s recommendations, specifications and safety requirements.

Date Completed ____________ Apprentice ____________ Supervisor/Trainer ____________

5161.03 Repair cooling systems and components, including: coolant, radiators, reservoirs, surge tanks, fans, hubs, coolant pumps, controls, actuators, belts, hoses, lines, fittings, heat exchangers, seals, gaskets, o-rings, pipes, valves, sensors, relays, temperature control devices, drive mechanisms, wiring harnesses, and fastening and mounting devices; by: exchanging, reconditioning, or servicing; using: hand, power, electronic service, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed ____________ Apprentice ____________ Supervisor/Trainer ____________

5161.04 Verify repair of cooling systems and components, including: coolant, radiators, reservoirs, surge tanks, fans, hubs, coolant pumps, controls, actuators, belts, hoses, lines, fittings, heat exchangers, seals, gaskets, o-rings, pipes, valves, sensors, temperature control devices, drive mechanisms, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; using: hand, power, electronic service and specialized tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed ____________ Apprentice ____________ Supervisor/Trainer ____________
U5161.0    ENGINE SYSTEMS...cont’d

5161.05    Diagnose and troubleshoot engine lubricating systems and components, including: oil, pumps, filters, housings, lines, fittings, seals, lubrication jets, gaskets, o-rings, heat exchangers, bypass valves, auxiliary devices, sensors, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; checking for: leaks, odour, temperature, distortion, corrosion, colour, vibration/noise, pressure, contamination, oil type and condition; using: hand, power, electronic service, and specialized tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed              Apprentice              Supervisor/Trainer

5161.06    Repair engine lubricating systems and components, including: oil, pumps, filters, housings, lines, fittings, seals, lubrication jets, gaskets, o-rings, heat exchangers, bypass valves, auxiliary devices, sensors, wiring harnesses, and fastening and mounting devices, by: exchanging, reconditioning, or servicing; using: hand, power, electronic service, and specialized tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed              Apprentice              Supervisor/Trainer

5161.07    Verify repair of engine lubricating systems and components, including: oil, pumps, filters, housings, lines, fittings, seals, lubrication jets, gaskets, o-rings, heat exchangers, bypass valves, auxiliary devices, sensors, wiring harnesses, and fastening and mounting devices, by: visually inspecting, testing, and analyzing performance and function; using: hand, power, electronic and specialized tools; according to manufacturer’s recommendations, specifications, and safety requirements.

Date Completed              Apprentice              Supervisor/Trainer
Diagnose and troubleshoot cylinder head and components, including: seats, guides, seals, gaskets, o-rings, springs, retainers, rotators, injector tubes, expansion plugs, valves, actuating mechanisms, camshafts, drive mechanisms, and fasteners and mounting devices; by: testing, and analyzing performance and function, checking for: corrosion, erosion, vibration/noise, carbon build-up, fractures, leaks, distortion, temperature and pressure, using hand, power, electronic service and specialized tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Repair cylinder head and components, including: cylinder heads, seats, guides, seals, gaskets, o-rings, springs, retainers, rotators, injector tubes, expansion plugs, valves and actuating mechanisms, drive mechanisms, and fastening and mounting devices; by: exchanging, reconditioning, or servicing; using: hand, power, electronic service and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Verify repair of cylinder heads and components, including: cylinder heads, seats, guides, seals, o-rings, springs, retainers, rotators, injector tubes, expansion plugs, valves and actuating mechanisms, drive mechanisms, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; using: hand, power, electronic service, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations,
Diagnose and troubleshoot engine block assemblies and components, including: engine blocks, expansion plugs, piston assemblies, connecting rods, bearings, seals, gaskets, liners, counter balancers, crankshafts, flywheel assemblies, balance shafts, gear trains, camshafts, follower assemblies, harmonic balancers, pulleys, auxiliary drives, oil pans, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function, checking for: temperature, corrosion, erosion, vibration/noise, carbon build-up, fractures, distortion, alignment, leaks and pressure, using: hand, power, electronic service, specialized and precision measuring tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Repair engine block assemblies and components, including: engine blocks, expansion plugs, piston and connecting rod assemblies, bearings, seals, gaskets, sealants, liners, counter balancers, crankshafts, flywheel assemblies, balance shafts, gear trains, camshafts and follower assemblies, harmonic balancers, pulleys, auxiliary drives, oil pans, and fastening and mounting devices; by: exchanging, reconditioning, or servicing, using hand, power, electronic service, specialized and precision measuring tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
ENGINE SYSTEMS...cont’d

5161.13 Verify repair of engine block assemblies and components, including: engine blocks, expansion plugs, piston and connecting rod assemblies, bearings, seals, gaskets, sealants, liners, counter balancers, crankshafts, flywheel assemblies, balance shafts, gear trains, camshafts and follower assemblies, harmonic balancers, pulleys, auxiliary drives, oil pans, and mounts, by: visually inspecting, testing, and analyzing performance and function; using: hand, power, electronic service, specialized and precision measuring tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Sponsor/Employer Name  Sponsor/Employer Signature
U5162.0  ELECTRICAL SYSTEMS - STARTING AND CHARGING

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair electrical systems - starting and charging, by: performing a visual inspection; diagnosing and troubleshooting batteries; servicing and boosting, or charging batteries; diagnosing and troubleshooting starting systems and components; repairing starting systems and components; verifying repair of starting systems and components; diagnosing and troubleshooting charging systems and components; repairing charging systems and components, and verifying repair of charging systems and components, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5162.01  Perform visual inspection, identifying system types and applications, by: checking for worn, damaged, corroded, loose, or defective components, including: batteries, starters, cables, connectors, solenoids, relays, sensors, modules, regulators, circuit protection devices, wiring harnesses, gauges, alternating current (AC) generators (alternators), and fastening and mounting devices; according to manufacturer's recommendations, specifications, and safety requirements.

5162.02  Diagnose and troubleshoot batteries, by testing, and analyzing performance and function, checking for: corrosion, distortion, contamination, state of charge, voltage, amperage, temperature, and leaks, using: electronic service tools, load testers, chargers, and hydrometers; according to manufacturer's recommendations, specifications, and safety requirements.
Service and boost/charge batteries, including: single- and multi battery group, by: removing, cleaning, charging and/or replacing; using: hand tools, booster cables, booster packs, chargers, pullers, special cleaning tools; according to manufacturer's recommendations, specifications, and safety requirements.

Diagnose and troubleshoot starting systems and components, including: batteries, cables, connectors, circuit protection devices, neutral safety devices, solenoids, relays, switches, starting motors, wiring harnesses, and fasteners and mounting devices, by: visually inspecting, testing, and analysing performance and function; checking for: wear, noise, odour, corrosion, temperature, opens/shorts/grounds, resistance, voltage and amperage; using: hand, power, and electronic service tools, and load testers, according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Repair starting systems and components, including: batteries, cables, connectors, circuit protection devices, solenoids, relays, switches, starting motors, wiring harnesses, and fastening and mounting devices, by: exchanging, reconditioning or servicing; using: hand, power, specialized, electronic service tools, and lifting, rigging and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Verify repair of starting systems and components, including: batteries, cables, connectors, circuit protection devices, solenoids, relays, switches, starting motors, drive mechanisms, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; using: hand, power, specialized, and electronic service tools; according to manufacturer's recommendations, specifications, and safety requirements.
U5162.0 ELECTRICAL SYSTEMS - STARTING AND CHARGING...cont’d

5162.07 Diagnose and troubleshoot charging systems and components, including: alternating current (AC) generators (alternators), drive belt mechanisms, batteries, cables, terminals, wiring harnesses, voltage regulators, relays, switches, sensors, modules, warning devices, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; checking for: opens/shorts/grounds, voltage, amperage, resistance, vibration/noise, alignment, odour, corrosion and temperature; using: amperes, volts, resistance (AVR) testers, and electronic service tools, according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed _______________ Apprentice _______________ Supervisor/Trainer _______________

5162.08 Repair charging systems and components, including: alternating current (AC) generators (alternators), drive mechanisms, batteries, cables, hardware, voltage regulators, switches, relays, sensors, modules, wiring harnesses, and fastening and mounting devices, by: exchanging, reconditioning, or servicing; using: hand, power, electronic service, and specialized tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed _______________ Apprentice _______________ Supervisor/Trainer _______________

5162.09 Verify repair of charging systems and components, including: alternating current (AC) generators (alternators), drive mechanisms, batteries, cables, hardware, voltage regulators, switches, relays, sensors, modules, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; using: hand, power, electronic service, and specialized tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed _______________ Apprentice _______________ Supervisor/Trainer _______________

Sponsor/Employer Name _______________ Sponsor/Employer Signature _______________
U5163.0 ENGINE MANAGEMENT SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair engine management systems, by: performing a visual inspection; diagnosing and troubleshooting fuel control systems and components; repairing fuel control systems and components; verifying repair of fuel control systems and components; diagnosing and troubleshooting ignition systems and components; repairing ignition systems and components; verifying repair of ignition systems and components; diagnosing and troubleshooting computer-controlled systems and components; repairing computer-controlled systems and components; verifying repair of computer-controlled systems and components; performing gasoline engine service; performing electronic diesel engine service and compression tests, and performing mechanical diesel engine service, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5163.01 Perform visual inspection, identifying system types and applications, by: checking: for worn, loose, damaged, leaking, missing, or defective components, including: mechanically- and electronically controlled gasoline and diesel engines, electronic fuel injection, ignition systems, switches, resistors, sensors, modules, information/warning displays, wiring harnesses, and fastening and mounting devices; according to manufacturer’s recommendations, specifications and safety requirements.

Date Completed        Apprentice        Supervisor/Trainer
5163.02 Diagnose and troubleshoot fuel control systems and components, including: fuel, malfunction indicator lights (MIL), warning devices, solenoids, relays, sensors, modules, injectors, pumps, actuator modules, interfaces, data links, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; checking for: odour, temperature, corrosion, colour, vibration/ noise, pressure, diagnostic codes, and leaks, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5163.03 Repair fuel control systems and components, including: fuel, malfunction indicator lights (MIL), warning devices, sensors, wiring harnesses, modules, solenoids, relays, injectors, pumps, actuator modules, interfaces, data links, and fastening and mounting devices; by: exchanging, reconditioning, or servicing, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5163.04 Verify repair of fuel control systems and components, including: fuel, malfunction indicator lights (MIL), warning devices, sensors, wiring harnesses, modules, solenoids, relays, injectors, pumps, actuator modules, interfaces, data links, and fastening and mounting devices, by: visually inspecting, testing, and analyzing performance and function; using: hand, power, specialized, and electronic service tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
5163.0 ENGINE MANAGEMENT SYSTEMS...cont’d

5163.05 Diagnose and troubleshoot ignition systems and components, including: system voltage, distributor components, coils, resistors, ignition modules, switches, sensors, wiring harnesses, ignition spark control, high tension wires, spark plugs, data links, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function, checking for: voltage, amperage, opens/shorts/grounds, diagnostic codes, resistance, pressure, temperature, corrosion and vibration/noise; using: hand, power, specialized, and electronic service, and precision measuring tools; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer

5163.06 Repair ignition systems and components, including: system voltage, distributor components, coils, resistors, ignition modules, switches, sensors, modules, wiring harnesses, ignition spark control, high tension wires, spark plugs, data links, and fastening and mounting devices, by: exchanging, reconditioning, or servicing, using: hand, power, specialized, electronic service and precision measuring tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer

5163.07 Verify repair of ignition systems and components, including: system voltage, distributor components, coils, resistors, ignition modules, switches, sensors, modules, wiring harnesses, ignition spark control, high tension wires, spark plugs, data links, and fastening and mounting devices; by: visually inspecting, testing, analysing performance and function, using: hand, power, specialized, and electronic service and precision measuring tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer
5163.0 ENGINE MANAGEMENT SYSTEMS...cont’d

5163.08 Diagnose and troubleshoot computer-controlled systems and components, including: system voltage, module programming, sensors, fuses, fusible links, wiring harnesses, data links, modules, drivers, and fastening and mounting devices, by: visually inspecting, testing, and analysing performance and function, checking for: temperature, corrosion, diagnostic codes, and vibration/noise; using hand, power, specialized, electronic service and precision measuring tools; according to manufacturer's recommendations, specifications, schematic diagrams, safety requirements, and the Society of Automotive Engineers (SAE) On-Board Diagnostics (OBD) standards.

Date Completed ________________ Apprentice ________________ Supervisor/Trainer ________________

5163.09 Repair computer-controlled systems and components, including: system voltage, module programming, actuators, sensors, modules, circuit protection devices, wiring harnesses, connectors, and fastening and mounting devices, by: exchanging, reconditioning, or servicing; using: hand, power, specialized, and electronic service and precision measuring tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed ________________ Apprentice ________________ Supervisor/Trainer ________________

5163.10 Verify repair of computer-controlled systems and components, including: system voltage, module programming, actuators, sensors, modules, circuit protection devices, wiring harnesses, connectors, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function, using: specialized, electronic service and precision measuring tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed ________________ Apprentice ________________ Supervisor/Trainer ________________
5163.11 Perform gasoline engine service, by: testing compression/vacuum, and checking and/or replacing spark plugs, air filters and intake systems, high-tension wires, exhaust restriction, distributor components, fuel filters, and positive crankcase ventilation (PCV) valves; timing control, governors, idle speed, and emission control devices; using: hand, power, specialized, and electronic service tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer

5163.12 Perform electronic diesel engine service, by: testing compression and checking and/or replacing: fuel filters, air filters and intake system components, exhaust restriction, manifold boost pressure, electrical system and valve adjustment, including: electronic unit injectors (EUI), and electronic unit pump (EUP); checking and/or adjusting injection timing, idle speed, and emission control devices; using: hand, power, specialized, and electronic service tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer

5163.13 Perform mechanical diesel engine service, by: checking and/or replacing: fuel and air filters, intake system components, exhaust restriction, manifold boost pressure and controls, and valve adjustment, including: mechanical unit injectors, valves, pressure-time injectors, and injection pump static timing; testing and reconditioning injectors, fuel return system, distributor pumps, glow plugs, and pre-heat systems; using: hand, power, specialized, and electronic service tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer
U5164.0  ELECTRICAL SYSTEMS - BODY

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair electrical systems - body electrical; by: performing a visual inspection; diagnosing and troubleshooting body electrical and computer-controlled systems and components; repairing body electrical and computer-controlled systems and components; verifying repair of body electrical and computer-controlled systems and components; diagnosing and troubleshooting supplemental restraint systems (SRS) and components; repairing supplementary restraint systems (SRS) and components, verifying repair of supplementary restraint systems (SRS) and components, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5164.01  Perform visual inspection, identifying system types and applications, by: checking for worn, loose, damaged, missing, or defective components, including: batteries, relays, boards/blocks, connectors, cables, sensors, wiring harnesses, modules, lighting/illumination, circuit protection and theft-deterrent devices, electrical accessories, and fastening and mounting devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5164.02  Diagnose and troubleshoot body electrical and computer-controlled systems and components, including: batteries, boards/blocks, cables, connectors, display panels, switches, relays, solenoids, motors, sensors, modules, wiring harnesses, data links, proximity warning devices, buzzers, auditory alarms, diagnostic lights, lighting/illumination, circuit protection, theft-deterrent devices, electrical accessories, and fastening and mounting devices; by: visually inspecting, testing, testing programming, re-programming, and analysing performance and function; checking for: opens/shorts/grounds, corrosion, vibration/noise, and parasitic draw; using: hand, power, specialized, electrical service and precision measuring tools; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
U5164.0  ELECTRICAL SYSTEMS - BODY...cont’d

5164.03  Repair body electrical and computer-controlled systems and components, including: batteries, boards/blocks, cables, connectors, display panels, switches, relays, solenoids, motors, sensors, modules, wiring harnesses, data links, proximity warning devices, buzzers, auditory alarms, diagnostic lights, lighting/illumination, circuit protection, theft-deterrent devices, electrical accessories, and fastening and mounting devices, by: exchanging, reconditioning, or servicing; using: hand, power, electronic service, specialized and precision measuring tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5164.04  Verify repair of body electrical and computer-controlled systems and components, including: batteries, boards/blocks, cables, connectors, display panels, switches, relays, solenoids, motors, sensors, modules, wiring harnesses, data links, proximity warning devices, buzzers, auditory alarms, diagnostic lights, lighting/illumination, circuit protection, theft-deterrent devices, electrical accessories, and fastening and mounting devices; by: visually inspecting, testing, testing programming and analyzing performance and function; using: hand, power, electronic service, specialized and precision measuring tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5164.05  Diagnose and troubleshoot supplemental restraint systems (SRS) and components, including: batteries, air bag assemblies, activating and shorting devices, sensors, modules, wiring harnesses, and fastening and mounting devices; by visually inspecting, testing, and analyzing performance and function; using: hand, power, electronic service, and specialized service tools; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
U5164.0 ELECTRICAL SYSTEMS - BODY...cont’d

5164.06 Repair supplemental restraint systems (SRS) and components, including: batteries, air bag assemblies, activating and shorting devices, sensors, modules, wiring harnesses, and fastening and mounting devices, by: exchanging; using: hand, power, electronic service, and specialized kits and tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed   Apprentice   Supervisor/Trainer

5164.07 Verify repair of supplemental restraint system (SRS) and components, including: batteries, air bag assemblies, activating and shorting devices, sensors, modules, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; using: hand, power, electronic service, and specialized kits and tools; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed   Apprentice   Supervisor/Trainer

____________________________________   _____________________________
Sponsor/Employer Name                   Sponsor/Employer Signature
U5165.0 FUEL DELIVERY SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair fuel delivery systems, by: performing a visual inspection; diagnosing and troubleshooting gasoline fuel systems and components; repairing gasoline fuel systems and components; verifying repair of gasoline fuel systems and components; diagnosing and troubleshooting diesel fuel systems and components, repairing diesel fuel systems and components, and verifying repair of diesel fuel systems and components, according to manufacturer’s recommendation, specification, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5165.01 Perform visual inspection, identifying system types and applications, by: checking for: worn, loose, damaged, leaking, missing, or defective components, including: pumps, injectors, routing of lines and hoses, fittings, filters, vents, tanks, heaters, sensors, modules, wiring harnesses, throttle actuation systems, and fastening and mounting devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed _______________ Apprentice _______________ Supervisor/Trainer _______________

5165.02 Diagnose and troubleshoot gasoline fuel systems and components, including: fuel, tanks, vents, pumps, filters, routing of lines and hoses, fittings, switches, solenoids, relays, sensors, modules, wiring harnesses, pressure control mechanisms, linkages, accumulators, fuel injectors, throttle actuation systems, gauges, and fastening and mounting devices, by: visually inspecting, testing, and analysing performance and function; checking for: odour, temperature, corrosion, vibration/noise, pressure, leaks, flow, and fuel condition; using: hand, power, specialized, and electronic service tools, vacuum and pressure gauges; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed _______________ Apprentice _______________ Supervisor/Trainer _______________
U5165.0  FUEL DELIVERY SYSTEMS...cont’d

5165.03  Repair gasoline fuel systems and components, including: fuel, tanks, vents, pumps, filters, routing of lines and hoses, fittings, switches, solenoids, relays, sensors, modules, wiring harnesses, pressure control mechanisms, linkages, accumulators, fuel injectors, throttle actuation systems, gauges, and fastening and mounting devices; by: exchanging, reconditioning, or servicing, using: hand, power, electronic service, and specialized tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed   Apprentice       Supervisor/Trainer

5165.04  Verify repair of gasoline fuel systems and components, including: fuel, tanks, vents, pumps, filters, routing of lines and hoses, fittings, switches, solenoids, relays, sensors, modules, wiring harnesses, pressure control mechanisms, linkages, accumulators, fuel injectors, throttle actuation systems, gauges, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; using: hand, power, electronic service, and specialized tools; according to manufacturer's recommendations, specifications and safety requirements.

Date Completed   Apprentice       Supervisor/Trainer

5165.05  Diagnose and troubleshoot diesel fuel systems and components, including: fuel, tanks, lines, fittings, filters, heaters, valves, injection pressure and transfer pumps, linkages, cables, hydraulic injectors, electronic and mechanical unit injectors, sensors, modules, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; checking for: odour, temperature, colour, corrosion, noise, fuel condition, and leaks; using: pressure and vacuum gauges, hand, power, electronic service, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed   Apprentice       Supervisor/Trainer
Repair diesel fuel systems and components, including: fuel, tanks, hoses and lines, fittings, filters, heaters, valves, injection pressure pumps, linkages, cables, hydraulic injectors, electronic and mechanical unit injectors, sensors, modules, wiring harnesses, and fastening and mounting devices; by: exchanging, reconditioning, servicing, or programming; using: hand, power, electronic service, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Verify repair of diesel fuel systems and components, including: fuel, tanks, hoses and lines, fittings, filters, heaters, valves, injection pressure pumps, linkages, cables, hydraulic injectors, electronic and mechanical unit injectors, sensors, modules, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, testing programming, and analysing performance and function; using: hand, power, electronic service, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Sponsor/Employer Name  Sponsor/Employer Signature
AUTOMOTIVE SERVICE TECHNICIAN

U5166.0       TRANSMISSION SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair transmission systems, by: performing a visual inspection; diagnosing and troubleshooting clutch systems and components; repairing clutch systems and components; verifying repair of clutch system and components, diagnosing and troubleshooting manual transmissions/transaxles, and components; repairing manual transmissions/transaxles, and components; verifying repair of manual transmissions/transaxles and components; diagnosing and troubleshooting automatic transmissions/transaxles, and components; repairing automatic transmissions/transaxles, and components; diagnosing and troubleshooting computer-controlled systems and components; repairing computer-controlled systems and components; verifying repair of computer-controlled system and components; diagnosing and troubleshooting transfer cases and components, repairing transfer cases and components, and verifying repair of transfer cases and components, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5166.01 Perform visual inspection, identifying system types and applications, by: checking for: worn, loose, damaged, leaking, missing, or defective components, including: housings, shafts, gears, bearings, seals, bushings, linkages, cables, controls, actuators, clutches, pressure plates, flywheels, sensors, modules, wiring harnesses, fluids/lubricants, coolers, power take-off units (PTO), pumps, filters, level indicators, tubes, yokes, flanges, data displays, and fastening and mounting devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer
U5166.0 TRANSMISSION SYSTEMS...cont’d

5166.02 Diagnose and troubleshoot clutch systems and components, including: pressure plate assemblies, friction materials, cables, linkages, release mechanisms, bearings, hydraulic cylinders, lines, fluids, flywheel assemblies, pilot bearings, input (pilot) shafts, intermediate plates, drive mechanisms, switches, solenoids, sensors, concentric alignment, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; checking for: odour, temperature, corrosion, contamination, vibration/noise, colour, fluid level/condition, pressure, free play, internal adjustments, slippage, disengagement and dragging; using: hand, power, electronic service, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5166.03 Repair clutch systems and components, including: pressure plate assemblies, friction materials, cables, linkages, release mechanisms, bearings, hydraulic cylinders, lines, fluids, flywheel assemblies, pilot bearings, input (pilot) shafts, intermediate plates, drive mechanisms, switches, solenoids, sensors, concentric alignment, and fastening and mounting devices; by: exchanging, reconditioning, or servicing; using: hand, power, electronic service, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5166.04 Verify repair of clutch systems and components, including: pressure plate assemblies, friction materials, cables, linkages, release mechanisms, bearings, hydraulic cylinders, lines, fluids, flywheel assemblies, pilot bearings, input (pilot) shafts, intermediate plates, drive mechanisms, switches, solenoids, sensors, concentric alignment, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; using: hand, power, electronic service, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
Diagnose and troubleshoot manual transmission/transaxle and components, including: housings, gear trains, synchronizers, differentials, shift mechanisms, power take-off (PTO) units, alignment, sensors, modules, switches, bearings, seals, lubrication systems, wiring harnesses, and fastening and mounting devices, by: visually inspecting, testing, and analyzing performance and function, checking for: odour, temperature, corrosion, colour, fluid level/condition, leaks, vibration/noise, wear, and gear clash; using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed       Apprentice       Supervisor/Trainer

Repair manual transmission/transaxle and components, including: housings, gear trains, synchronizers, differentials, shift mechanisms, power take-off (PTO) units, alignment, sensors, modules, switches, bearings, seals, lubrication systems, wiring harnesses, and fastening and mounting devices; by: exchanging, reconditioning, or servicing, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed       Apprentice       Supervisor/Trainer

Verify repair of manual transmission/transaxle and components, including: housings, gear trains, synchronizers, differentials, shift mechanisms, power take-off (PTO) units, alignment, sensors, modules, switches, bearings, seals, lubrication systems, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed       Apprentice       Supervisor/Trainer
Diagnose and troubleshoot automatic transmission/transaxle and components, including: housings, oils, differentials, power take-off (PTO) units, torque converter assemblies, modulators/throttles, solenoids, sensors, modules, wiring harnesses, valve bodies, gear trains, shafts, bearings, seals, clutch packs, one-way clutches, band and servo assemblies, data links, diagnostic lights and codes, and fastening and mounting devices; by: stall testing, and analysing performance and function, checking for: odour, temperature, slippage, shift points and quality, vibration/noise, corrosion, colour, fluid level/condition, leaks, contamination, pressure, alignment and wear; using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Repair automatic transmission/transaxle and components, including: housings, oils, differentials, power take-off (PTO) units, torque converter assemblies, modulators/throttles, solenoids, sensors, modules, wiring harnesses, valve bodies, clutch packs, one-way clutches, band and servo assemblies, data links, diagnostic lights and codes, and fastening and mounting devices; by: exchanging, reconditioning, or servicing, using hand, power, specialized, electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer’s recommendations, specifications and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Verify repair of automatic transmission/transaxle and components, including: housings, oils, differentials, power take-off (PTO) units, torque converter assemblies, modulators/throttles, solenoids, sensors, modules, wiring harnesses, valve bodies, clutch packs, one-way clutches, band and servo assemblies, data links, diagnostic lights and codes, and fastening and mounting devices, by: visually inspecting, testing, and analyzing performance and function; using: hand, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer’s recommendations, specifications and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
Diagnose and troubleshoot computer-controlled transmission/transaxle systems and components, including: diagnostic codes, warning devices, relays, solenoids, sensors, modules, wiring harnesses, controls, actuators, data links, and fastening and mounting devices, by: visually inspecting, testing, and analysing performance and function, checking for: colour, temperature, vibration/noise, and corrosion, using: hand, power, specialized, and electronic service tools; according to manufacturer’s recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Repair computer-controlled transmission/transaxle systems and components, including: warning devices, relays, solenoids, sensors, modules, wiring harnesses, controls, actuators, data links, and fasteners and mounting hardware; by: replacing module, data reprogramming, or servicing; using: hand, specialized, and electronic service tools; according to manufacturer’s recommendations, specifications and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Verify repair of computer-controlled transmission/transaxles systems and components, including: warning devices, relays, solenoids, sensors, modules, wiring harnesses, controls, actuators, data links, and fasteners and mounting hardware; by: visually inspecting, testing, and analysing performance and function; using: hand, specialized, and electronic service tools; according to manufacturer’s recommendations, specifications and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
Diagnose and troubleshoot transfer cases and components, including: housings, linkages, bearings, seals, gear trains, locking devices, viscous couplings, lubrication systems, warning devices, relays, solenoids, controls, actuators, sensors, wiring harnesses, modules, information/warning displays, data links, and fastening and mounting devices, by: visually inspecting, testing, and analyzing performance and function, checking for: temperature, colour, fluid level/condition, leaks, odour, vibration/noise, corrosion, and diagnostic codes; using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer’s recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Repair transfer cases and components, including: housings, linkages, bearings, seals, gear trains, locking devices, viscous couplings, lubrication systems, warning devices, relays, solenoids, controls, actuators, sensors, wiring harnesses, modules, information/warning displays, data links, and fastening and mounting devices, by: exchanging, reconditioning, or servicing, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
U5166.0 TRANSMISSION SYSTEMS...cont’d

5166.16 Verify repair of transfer cases and components, including: housings, linkages, bearings, seals, gear trains, locking devices, viscous couplings, lubrication systems, warning devices, relays, solenoids, controls, actuators, sensors, wiring harnesses, modules, information/warning displays, data links, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed       Apprentice       Supervisor/Trainer

Sponsor/Employer Name       Sponsor/Employer Signature
U5167.0  DRIVE SHAFTS, DIFFERENTIALS, AND DRIVE AXLE ASSEMBLIES

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair drive shafts, differentials, and drive axle assemblies, by: performing a visual inspection; diagnosing and troubleshooting drive shaft, differential and drive assemblies, and components, repairing drive shafts, differential, drive assemblies, and components, and verifying repair of drive shafts, differential, drive assemblies, and components, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5167.01  Perform visual inspection, identifying system types and applications, by: checking for: worn, loose, damaged, leaking, missing, or defective components, including: drive shafts, universal and constant velocity (CV) joint assemblies, hanger bearing and locking hub assemblies, lubrication systems, flanges, yokes, housings, vents, carriers, differentials, axle shafts, gear sets, bearings, seals, wheel end assemblies, controls, actuators, sensors, and wiring harnesses, and fastening and mounting devices; according to manufacturer’s recommendations, specifications, and safety requirements.

Date Completed           Apprentice           Supervisor/Trainer

5167.02  Diagnose and troubleshoot drive shafts, differentials, drive axle assemblies, and components, including: housings, vents, hanger bearing assemblies, flanges, yokes, carriers, differentials, universal and constant velocity (CV) joints, axle shafts, bearings, seals, locking hub assemblies, controls, actuators, sensors, modules, wiring harnesses, fluids/lubricants, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function, checking for: wear, temperature, colour, fluid level/condition, tolerances, vibration/noise, leaks, gear clash, run out, phasing, and corrosion; using: hand, power, contamination, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer’s recommendations, specifications, and safety requirements.

Date Completed           Apprentice           Supervisor/Trainer
5167.03 Repair drive shafts, differentials, drive axle assemblies, and components, including: housings, vents, hanger bearing assemblies, flanges, yokes, carriers, differentials, universal and constant velocity (CV) joints, axle shafts, bearings, seals, locking hub assemblies, controls, actuators, sensors, modules, wiring harnesses, fluids/lubricants, and fastening and mounting devices; by: reconditioning, exchanging, or servicing, using: hand, power, specialized, and electronic service tools; according to manufacturer’s recommendations, specifications, and safety requirements.

Date completed
Apprentice
Supervisor/Trainer

5167.04 Verify repair of drive shafts, differentials, drive axle assemblies, and components, including: housings, vents, hanger bearing assemblies, flanges, yokes, carriers, differentials, universal and constant velocity (CV) joints, axle shafts, bearings, seals, locking hub assemblies, controls, actuators, sensors, modules, wiring harnesses, fluids/lubricants, and fastening and mounting devices; by: visually inspecting, testing, analyzing performance and function; using: hand, power, specialized, and electronic service tools; according to manufacturer’s recommendations, specifications, and safety requirements.

Date completed
Apprentice
Supervisor/Trainer

Sponsor/Employer Name
Sponsor/Employer Signature
AUTOMOTIVE SERVICE TECHNICIAN

U5168.0 SUSPENSION SYSTEMS AND FRAMES

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair suspension systems and frames, by: performing a visual inspection; diagnosing and troubleshooting suspension systems and components; repairing suspension systems, frames/sub-frames, and components, and verifying repair of suspension systems, frames/sub-frames and components, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5168.01 Perform visual inspection, identifying system types and applications, by checking for: worn, loose, missing, leaking, damaged, or defective components; including: frames/sub-frames, control arms, shock absorbers, springs (leaf, rubber block, air, and torsion bar), equalizers, shackles, bushings, active and air suspension, electronic level controls, strut assemblies, sway bars, hangers, lines, fittings, gauges, valves, controls, radius/torque rods, controls, actuators, sensors, modules, data links, wiring harnesses, and fastening and mounting devices; according to manufacturer's recommendations, specifications, and safety requirements.

________________  _______________  __________________
Date Completed   Apprentice       Supervisor/Trainer

5168.02 Diagnose and troubleshoot suspension systems, frames/sub-frames and components, including: frames/sub-frames, control arms, shock absorbers, springs (leaf, rubber block, air, and torsion bar), equalizers, shackles, bushings, active and air suspension, electronic level controls, strut assemblies, sway bars, hangers, lines, valves, controls, radius/torque rods, controls, actuators, sensors, modules, information/warning displays, data links, wiring harnesses, and fastening and mounting devices, by: visually inspecting, testing, and analyzing performance and function, checking for: vibration/noise, corrosion, fractures, leaks, pressure, colour, alignment, stability, ride height, load distribution, controls, and diagnostic codes; using: hand, power, and specialized electronic service tools, and lifting, rigging, and blocking devices, according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

________________  _______________  __________________
Date Completed   Apprentice       Supervisor/Trainer
U5168.0  SUSPENSION SYSTEMS AND FRAMES...cont’d

5168.03  Repair suspension systems, frames/sub-frames and components, including: control arms, shock absorbers, springs (leaf, rubber block, air, and torsion bar), equalizers, shackles, bushings, active and air suspension, electronic level controls, strut assemblies, sway bars, hangers, lines, fittings, valves, controls, radius/torque rods, controls, actuators, sensors, modules, information/warning displays, data links, wiring harnesses, and fastening and mounting devices, by: exchanging, reconditioning, aligning, or servicing, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices, and heating, welding and cutting equipment; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed       Apprentice       Supervisor/Trainer

5168.04  Verify repair of suspension systems, frames/sub-frames, and components, including: control arms, shock absorbers, springs (leaf, rubber block, air, and torsion bar), equalizers, shackles, bushings, active and air suspension, electronic level controls, strut assemblies, sway bars, hangers, lines, fittings, valves, controls, radius/torque rods, controls, actuators, sensors, modules, information/warning displays, data links, wiring harnesses, and mounting hardware, by: visually inspecting, testing, and analyzing performance and function, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed       Apprentice       Supervisor/Trainer

Sponsor/Employer Name       Sponsor/Employer Signature
U5169.0 STEERING SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair steering systems, by: performing a visual inspection; diagnosing and troubleshooting steering systems and components; repairing steering systems and components, verifying repair of steering systems and components, and aligning steering axles and suspensions, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5169.01 Perform visual inspection, identifying system types, including: manual, electric/hydraulic assist and applications; by: checking for: oil level/condition, leaking, worn, loose, defective, or missing components, including: pumps and drive mechanisms, cylinders, reservoirs, valves, controls, fittings, lines, hoses, seals, gaskets, steering boxes/racks/motors, linkages, tie rod ends, seals, bearings, bushings, guides, variable assist systems, column assemblies, ball joints, transfer boxes, switches, relays, sensors, modules, wiring harnesses, diagnostic codes, information/warning displays, data links, and fastening and mounting devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed __________________ Apprentice __________________ Supervisor/Trainer __________________
U5169.0 STEERING SYSTEMS...cont’d

5169.02 Diagnose and troubleshoot steering systems and components, including: pumps, drive mechanisms, cylinders, reservoirs, valves, controls, lines, fittings, hoses, steering boxes/racks/motors, linkages, tie rod ends, seals, gaskets, bearings, bushings, guides, variable assist systems, column assemblies, ball joints, transfer boxes, switches, relays, sensors, modules, wiring harnesses, information/warning displays, data links, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function, checking for: odour, temperature, colour, alignment, vibration/noise, corrosion, fluid type, contamination, pressure, leaks, flow, and diagnostic codes; using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer

5169.03 Repair steering systems and components, including: pumps, drive mechanisms, cylinders, reservoirs, valves, controls, lines, fittings, hoses, steering boxes/racks/motors, linkages, tie rod ends, seals, gaskets, bearings, bushings, guides, variable assist systems, column assemblies, ball joints, transfer boxes, switches, relays, sensors, modules, wiring harnesses, information/warning displays, data links, and fastening and mounting devices, by: exchanging, reconditioning, aligning, or servicing; using: hand, power, specialized, and electronic service tools, alignment equipment, lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer
5169.04 Verify repair of steering systems and components, including: pumps, drive mechanisms, cylinders, reservoirs, valves, controls, lines, fittings, hoses, steering boxes/racks/motors, linkages, tie rod ends, seals, gaskets, bearings, bushings, guides, variable assist systems, column assemblies, ball joints, transfer boxes, switches, relays, sensors, modules, wiring harnesses, information/warning displays, data links, and fastening and mounting devices, by: visually inspecting, testing, and analysing performance and function; using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

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5169.05 Align steering, axles, and suspensions, by: adjusting alignment geometry, and verifying, using alignment equipment, hand, power, specialized, and electronic service tools; according to manufacturer’s recommendation, specification and safety requirements.

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Sponsor/Employer Name ____________________________  Sponsor/Employer Signature ____________________________
U5170.0 BRAKING SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair braking systems by: performing a visual inspection; diagnosing and troubleshooting hydraulic braking systems and components; repairing hydraulic braking systems and components; verifying repair of hydraulic braking systems and components, diagnosing and troubleshooting anti-lock braking systems and components; repairing anti-lock braking systems and components, and verifying repair of anti-lock braking system and components; diagnosing and troubleshooting anti-skid/traction control systems and components; repairing anti-skid/traction control systems and components, and verifying repair of anti-skid/traction control systems and components; diagnosing and troubleshooting stability control systems and components; repairing stability control systems and components; measuring and resurfacing brake drums, linings, and rotors, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5170.01 Perform visual inspection, identifying system types and applications, by: checking for: hydraulic fluid level/condition, worn, loose, missing, or damaged components, including: drums, callipers, rotors, backing plates, dust shields, friction material, hoses, lines, routing, mounting hardware, bushings, slack adjusters, valves, brake chambers, wheel and master cylinders, boosters, switches, relays, sensors, modules, wiring harnesses, safety devices, anti-lock brake systems (ABS), anti-skid/traction and stability control systems, information/warning displays, and data links; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed __________________  Apprentice __________________  Supervisor/Trainer __________________
U5170.0  BRAKING SYSTEMS...cont’d

5170.02  Diagnose and troubleshoot hydraulic braking systems and components, including: drums, calipers, rotors, friction materials, backing plates, routing of hoses and lines, valves, master and wheel cylinders, fluids, boosters, actuators, switches, relays, sensors, wiring harnesses, valves, safety devices, information warning displays, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; checking for: wear, vibration/noise, pressure, corrosion, colour, fluid level/condition, leaks, contamination, and temperature; using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5170.03  Repair hydraulic braking systems and components, including: drums, calipers, rotors, friction materials, backing plates, routing of hoses and lines, valves, master and wheel cylinders, fluids, boosters, actuators, switches, relays, sensors, wiring harnesses, valves, safety devices, information warning displays, and fastening and mounting devices; by: exchanging, reconditioning, or servicing; using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5170.04  Verify repair of hydraulic braking systems and components, including: drums, calipers, rotors, friction materials, backing plates, routing of hoses and lines, valves, master and wheel cylinders, fluids, boosters, actuators, switches, relays, sensors, wiring harnesses, valves, safety devices, information warning displays, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
U5170.0  BRAKING SYSTEMS...cont’d

5170.05  Diagnose and troubleshoot anti-lock braking systems (ABS), traction and stability control systems and components, including: fluids, boosters, accumulators, actuators, switches, solenoids, relays, wheel speed sensors, reluctors, motors, pumps, actuators, reservoirs, modules, wiring harnesses, valves, safety devices, information warning displays, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; checking for: opens/shorts/grounds, vibration/noise, pressure, corrosion, colour, fluid level/condition, leaks, contamination, and temperature; using hand, power, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer’s recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed       Apprentice       Supervisor/Trainer

5170.06  Repair anti-lock braking systems (ABS), traction and stability control systems and components, including: routing of hoses and lines, valves, accumulators, actuators, switches, solenoids, relays, sensors, rotor sensors, motors, pumps, reservoirs, reluctors, modules, wiring harnesses, valves, safety devices, information warning displays, and fastening and mounting devices; by: exchanging, reconditioning, or servicing, using: hand, power, and specialized tools, and lifting, rigging, and blocking devices; according to manufacturer’s recommendations, specifications, and safety requirements.

Date Completed       Apprentice       Supervisor/Trainer

5170.07  Verify repair of anti-lock braking systems (ABS), traction and stability control systems and components, including: routing of hoses and lines, valves, fluids, accumulators, actuators, switches, solenoids, relays, sensors, rotor sensors, motors, pumps, reservoirs, reluctors, modules, wiring harnesses, valves, safety devices, information warning displays, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function, using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed       Apprentice       Supervisor/Trainer
5170.08 **Diagnose and troubleshoot anti-skid/traction control systems and components**, including: drums, calipers, rotors, backing plates, friction materials, hoses, lines, master and wheel cylinders, switches, solenoids, relays, boosters, sensors, modules, accumulators, motors, pumps, actuators, reservoirs, reluctors, wiring harnesses, information/warning displays, safety devices, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; checking for: opens/shorts/grounds, vibration/noise, pressure, corrosion, colour, leaks, contamination, fluid level/condition and temperature, routing of hoses and lines, using hand, power, specialized and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer’s recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed        Apprentice        Supervisor/Trainer

5170.09 **Repair anti-skid/traction control systems and components**, including: drums, calipers, rotors, backing plates, friction materials, hoses, lines, routing, valves, master and wheel cylinders, boosters, switches, relays, solenoids, sensors, modules, accumulators, motors, pumps, actuators, reservoirs, reluctors, wiring harnesses, information/warning displays, safety devices, and fastening and mounting devices; by: exchanging, reconditioning and servicing; using: hand, power, and specialized electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer’s recommendations, specifications, and safety requirements.

Date Completed        Apprentice        Supervisor/Trainer
5170.10 Verify repair of anti-skid/traction control systems and components, including: drums, calipers, rotors, backing plates, friction materials, hoses, lines, routing, valves, master and wheel cylinders, boosters, switches, relays, solenoids, sensors, modules, accumulators, motors, pumps, actuators, reservoirs, relactors, wiring harnesses, information/warning displays, safety devices, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer

5170.11 Measure and resurface brake drums, linings, and rotors, by: using hand, power, electronic service and specialized tools and resurfacing equipment; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed    Apprentice    Supervisor/Trainer

Sponsor/Employer Name    Sponsor/Employer Signature
U5171.0 TIRES, WHEELS, RIMS, AND HUBS

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair tires, wheels, rims, and hubs, by: performing a visual inspection; diagnosing and troubleshooting tires and components; repairing tires and components, and verifying repairs to tires and components, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5171.01 Perform visual inspection, identifying system types and applications, by:
checking for: worn, loose, damaged, overheated, leaking, missing, or defective components, tire ratings and sizes, including: tires, tubes, valves, caps, mounting arrangements, rims, hubs, bearings, seals, spacers, and fastening and mounting devices; according to manufacturer's recommendations, specifications, and safety requirements.

5171.02 Diagnose and troubleshoot tires and components, including: tires, tubes, valves, stems, caps, wear indicators, mounting arrangements, rims, hubs, bearings, seals, spacers, flanges, and fastening and mounting devices, by: visually inspecting, testing, and analysing performance and function, checking for: corrosion, contamination, pressure, temperature, vibration/noise, lubrication, leaks, fractures, run-out, tire-matching and condition; using: hand, power, and specialized tools, balancing equipment, torque wrenches, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.
### 5171.03 Repair tires and components
- **Definition:** Repair tires and components, including: tires, tubes, valves, stems, caps, wear indicators, mounting arrangements, rims, hubs, bearings, seals, spacers, flanges, fastening and mounting devices; by: exchanging, reconditioning, or servicing; using: hand, power, specialized and service tools, balancing equipment, safety cages, torque wrenches, heating, welding and cutting equipment, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

### 5171.04 Verify repair of tires and components
- **Definition:** Verify repair of tires and components, including: tires, tubes, valves, stems, caps, wear indicators, mounting arrangements, rims, hubs, bearings, seals, spacers, flanges, fastening and mounting devices, by: visually inspecting, testing, and analyzing performance and function; using: hand, power, specialized, and electronic service tools, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

### 5171.05 Balance tires and components
- **Definition:** Balance tires and components, using static and dynamic wheel balancers, weights, jacks, and safety stands; according to manufacturer's recommendations, specifications, and safety requirements.

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**Sponsor/Employer Name**

**Sponsor/Employer Signature**
U5172.0 HEATING, VENTILATION, AND AIR-CONDITIONING SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair heating, ventilation, and air-conditioning systems, by: performing a visual inspection; diagnosing and troubleshooting air-conditioning systems and components; repairing air-conditioning systems and components; verifying repair of air-conditioning systems and components; diagnosing and troubleshooting heating and ventilation systems and components, repairing heating and ventilation systems and components, and verifying repair of heating systems and components, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5172.01 **Perform visual inspection**, identifying system types and applications, by checking for: worn, loose, damaged, leaking, missing, or defective components, including: controls, actuators, cables, valves, switches, relays, sensors, modules, wiring harnesses, warning devices, compressors, drive mechanisms, motors, pumps, filters, lines, hoses, fittings, heat exchangers, auxiliary heaters/coolers, receiver/driers, accumulators, ducting, and fastening and mounting devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
HEATING, VENTILATION, AND AIR-CONDITIONING SYSTEMS
...cont’d

5172.02 Diagnose and troubleshoot air-conditioning systems and components, including: hoses, lines, fittings, controls, actuators, cables, valves, switches, relays, sensors, modules, wiring harnesses, modules, compressors, drive mechanisms, motors, pumps, filters, refrigerant, heat exchangers, receiver/dryers, accumulators, ducting, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function, checking for: opens/shorts/grounds, odour, colour, corrosion, temperature, contamination, vibration/noise, diagnostic codes, pressure, leaks, refrigerant type, quality and condition, using: hand, power specialized, electronic service tools, manifold gauge sets, and leak-detection devices; according to manufacturer's recommendations, specifications, schematic diagrams, safety requirements, and government regulations.

Date Completed  Apprentice  Supervisor/Trainer

5172.03 Repair air-conditioning systems and components, including: hoses, lines, fittings, controls, actuators, cables, valves, switches, relays, sensors, modules, wiring harnesses, compressors, drive mechanisms, motors, pumps, filters, refrigerant, heat exchangers, receiver/dryers, accumulators, ducting, and fastening and mounting devices; by: exchanging, reconditioning, or servicing; using: hand, power specialized, electronic service tools, manifold gauge sets, leak-detection devices, and refrigerant recovery and charge equipment, according to manufacturer's recommendations, specifications, safety requirements, and government regulations.

Date Completed  Apprentice  Supervisor/Trainer
5172.04 Verify repair of air-conditioning systems and components, including: hoses, lines, fittings, controls, actuators, cables, valves, switches, relays, sensors, modules, wiring harnesses, modules, compressors and drive mechanisms, motors, pumps, filters, refrigerant, heat exchangers, receiver/dryers, accumulators, ducting, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; using: hand, power specialized, electronic service tools, manifold gauge sets, and leak-detection devices; according to manufacturer's recommendations, specifications, safety requirements, and government regulations.

5172.05 Diagnose and troubleshoot heating and ventilation systems and components, including: hoses, lines, fittings, controls, actuators, cables, valves, switches, relays, resistors, sensors, modules, circuit protection devices, wiring harnesses, warning devices, drive mechanisms, motors, pumps, filters, heat exchangers, ducting, and fasteners and mounting hardware; by: visually inspecting, testing, and analyzing performance and function, checking for: opens/shorts/grounds, odour, colour, corrosion, temperature, contamination, vibration/noise, pressure and leaks, fluid levels, types, and condition; using: hand, power, specialized, and electronic service tools, leak-detection devices, lifting, rigging and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, safety requirements, and government regulations.
U5172.0 HEATING, VENTILATION, AND AIR-CONDITIONING SYSTEMS
...cont’d

5172.06 **Repair heating and ventilation systems and components**, including: hoses, lines, fittings, controls, actuators, cables, valves, switches, relays, resistors, sensors, modules, circuit protection devices, wiring harnesses, warning devices, drive mechanisms, motors, pumps, filters, heat exchangers, ducting, fasteners and mounting devices; by: exchanging, replacing, or servicing; using: hand, power, specialized, and electronic service tools, leak-detection devices, lifting, rigging and blocking devices; according to manufacturer's recommendations, specifications, safety requirements, and government regulations.

Date Completed  Apprentice  Supervisor/Trainer

5172.07 **Verify repair of heating and ventilation systems and components**, including: hoses, lines, fittings, controls, actuators, cables, valves, switches, relays, resistors, sensors, modules, circuit protection devices, wiring harnesses, warning devices, drive mechanisms, motors, pumps, filters, heat exchangers, ducting, and fasteners and mounting hardware; by: visually inspecting, testing, and analyzing performance and function; using: hand, power, specialized, and electronic service tools, leak-detection devices, lifting, rigging and blocking devices; according to manufacturer's recommendations, specifications, safety requirements, and government regulations.

Date Completed  Apprentice  Supervisor/Trainer

Sponsor/Employer Name  Sponsor/Employer Signature
U5173.0 BODY AND TRIM

GENERAL PERFORMANCE OBJECTIVE

Diagnose and repair body and trim, by: performing a visual inspection; diagnosing and troubleshooting body and trim, repairing body and trim, and verifying repair of body and trim, according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

5173.01 **Perform visual inspection**, identifying system types and applications, by: checking for: worn, loose, damaged, leaking or missing components, including: exterior body panels and trim, weather stripping, locks, hinges, latches, window regulator channels, trunk and hood supports, bumpers, hitches, anchoring devices, glass, lenses and housings, mirrors, antennae, sun roofs, convertible and t-roofs, adhesives, interior trim, carpets, panels, upholstery, roof lining, seats, hoods, fenders, trunks, doors, lighting assemblies, reinforcement bars, bumper shocks, electronic mirror controls, switches, solenoids, relays, sensors, modules, and occupant restraints systems; according to manufacturer’s recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5173.02 **Diagnose and troubleshoot body and trim**, including: exterior body panels and trim, weather stripping, locks, hinges, latches, window regulator channels, trunk and hood supports, bumpers, hitches and anchoring devices, glass, lenses and housings, mirrors, antennae, sun roofs, convertible and t-roofs, adhesives, interior trim, carpets, panels, upholstery, roof linings, carpeting, seats, hoods, fenders, trunks, doors, lighting assemblies, reinforced bars, bumper shocks, electronic mirror controls, switches, solenoids, relays, sensors, modules, occupant restraints systems, latching mechanisms, and fastening and mounting devices, by: visually inspecting, testing, and analyzing performance and function, checking for: opens/shorts/grounds, vibration, corrosion, pressure, noise, and leaks; using: hand, power, specialized, electronic service tools; according to manufacturer’s recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer
5173.03 **Repair body and trim**, including: exterior body panels and trim, weather stripping, locks, hinges, latches, window regulator channels, trunk and hood supports, bumpers, hitches and anchoring devices, glass, lenses and housings, mirrors, antennae, sun roofs, convertible and t-roofs, adhesives, interior trim, carpets, panels, upholstery, roof linings, carpeting, seats, hoods, fenders, trunks, doors, lighting assemblies, reinforced bars and bumper shocks, electronic mirror controls, switches, solenoids, relays, sensors, modules, occupant restraint systems, latching mechanisms, and fastening and mounting devices; by: exchanging, replacing, or servicing; using: hand, power, specialized, and electronic service tools; according to manufacturer’s recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

5173.04 **Verify repair of body and trim**, including: exterior body panels and trim, weather stripping, locks, hinges, latches, window regulator channels, trunk and hood supports, bumpers, hitches and anchoring devices, glass, lenses and housings, mirrors, antennae, sun roofs, convertible and t-roofs, adhesives, interior trim, carpets, panels, upholstery, roof linings, carpeting, seats, hoods, fenders, trunks, doors, lighting assemblies, reinforced bars, bumper shocks, electronic mirror controls, switches, solenoids, relays, sensors, modules, occupant restraint systems, latching mechanisms, and fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; using: hand, power, specialized, and electronic service tools; according to manufacturer’s recommendations, specifications, and safety requirements.

Date Completed  Apprentice  Supervisor/Trainer

Sponsor/Employer Name  Sponsor/Employer Signature
U5174.0  EXHAUST, INTAKE, AND EMISSION CONTROL SYSTEMS

GENERAL PERFORMANCE OBJECTIVES

Diagnose and repair exhaust, intake, and emission systems and components, by:
performing a visual inspection; diagnosing and troubleshooting exhaust and intake components; repairing exhaust and intake components; verifying the repair of exhaust and intake components; diagnosing and troubleshooting turbocharger/supercharger systems and components, repairing turbocharger/supercharger systems and components, and verifying repair of turbocharger/supercharger systems and components; diagnosing and troubleshooting Level I emission control systems and components; repairing Level I emission control systems and components; verifying repair of Level I emission control systems; diagnosing and troubleshooting Level II emission control systems and components; repairing Level II emission control systems and components, and verifying repair of Level II emission control systems and components; according to manufacturer’s recommendations, specifications, and safety requirements.

PERFORMANCE OBJECTIVES

SKILLS

Perform visual inspection, identifying system types and applications, by:
checking for: worn, loose, damaged, leaking, missing, or defective components, including: manifolds, piping, gaskets, mufflers, catalytic converters, turbochargers/superchargers, heat shields, charge air coolers, particulate traps, filters, indicators, emission control devices, actuators, sensors, modules, and wiring harnesses, according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed _______________  Apprentice _______________  Supervisor/Trainer _______________
U5174.0  EXHAUST, INTAKE, AND EMISSION CONTROL SYSTEMS...cont’d

5174.02  **Diagnose and troubleshoot exhaust and intake systems and components**, including: manifolds, piping, gaskets, seals, mufflers, heat shields, catalytic converters, resonators, filters, indicators, ducting, air pumps, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function, checking for: odour, pressure, vibration/noise, and leaks; using: hand, power, specialized tools, gauges, manometers, vacuum gauges, infrared thermometers, exhaust gas analyzing equipment, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

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5174.03  **Repair exhaust and intake systems and components**, including: manifolds, piping, gaskets, seals, mufflers, heat shields, catalytic converters, resonators, filters, indicators, ducting, air pumps, and fastening and mounting devices; by exchanging, reconditioning, or servicing; using: hand, power, specialized tools, gauges, lifting, heating, welding, and cutting equipment, rigging, blocking, and welding equipment; according to manufacturer's recommendations, specifications, and safety requirements.

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5174.04  **Verify repair of exhaust and intake systems and components**, including: manifolds, piping, gaskets, seals, mufflers, heat shields, catalytic converters, resonators, filters indicators, ducting, air pumps, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; using: hand, power, specialized tools, gauges, manometers, vacuum gauges, infrared thermometers, and lifting, rigging, and blocking equipment; according to manufacturer's recommendations, specifications, and safety requirements.

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U5174.0  EXHAUST, INTAKE, AND EMISSION CONTROL SYSTEMS...cont’d

5174.05  Diagnose and troubleshoot turbocharger/supercharger systems and components, including: housings, shafts, bearings, seals, turbines, waste gates, variable volume controls, manifold boost control devices, boost pressure sensors, piping, actuators, sensors, modules, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function, checking for: opens/shorts/grounds, pressure, temperature, corrosion, lubrication, wear, leaks, and noise/vibration, using: hand, power, specialized, and electronic service tools, gauges, precision measuring instruments, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

Date Completed   Apprentice       Supervisor/Trainer

5174.06  Repair turbocharger/supercharger systems and components, including: housings, shafts, bearings, seals, turbines, waste gates, variable volume controls, manifold boost control devices, boost pressure sensors, piping, actuators, sensors, modules, wiring harnesses, and fastening and mounting devices; by: exchanging, reconditioning, or servicing; using: hand, power, specialized, and electronic service tools, gauges, and precision measuring instruments, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed   Apprentice       Supervisor/Trainer

5174.07  Verify repair of turbocharger/supercharger systems and components, including: housings, shafts, bearings, seals, turbines, waste gates, variable volume controls, manifold boost control devices, boost pressure sensors, piping, actuators, sensors, modules, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; using: hand, power, specialized, and electronic service tools, gauges, and precision measuring instruments, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

Date Completed   Apprentice       Supervisor/Trainer
U5174.0 EXHAUST, INTAKE, AND EMISSION CONTROL SYSTEMS...cont’d

5174.08 Diagnose and troubleshoot emission control systems and components (Positive Crankcase Ventilation (PCV), Exhaust Gas Recirculation (EGR), Catalytic Converters and Evaporative Fuel Systems, including: PCV and EGR valves, tubing, hoses, evaporative fuel canisters, switches, solenoids, wiring harnesses, catalytic converters, and fastening and mounting devices, by: visually inspecting, testing, and analyzing performance and function, checking for: opens/shorts/grounds, colour, pressure, temperature, corrosion, wear, leaks, and noise/vibration, using: hand, power, specialized, and electronic service tools, gauges, precision measuring instruments, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.

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Date Completed   Apprentice       Supervisor/Trainer

5174.09 Diagnose and troubleshoot emission control systems and components (Positive Crankcase Ventilation (PCV), Exhaust Gas Recirculation (EGR), Catalytic Converters and Evaporative Fuel Systems, including: PCV and EGR valves, tubing, hoses, evaporative fuel canisters, switches, solenoids, wiring harnesses, catalytic converters, and fastening and mounting devices; by: exchanging, reconditioning, or servicing; using: hand, power, specialized, and electronic service tools, gauges, precision measuring instruments, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

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Date Completed   Apprentice       Supervisor/Trainer

5174.10 Diagnose and troubleshoot emission control systems and components (Positive Crankcase Ventilation (PCV), Exhaust Gas Recirculation (EGR), Catalytic Converters and Evaporative Fuel Systems, including: PCV and EGR valves, tubing, hoses, evaporative fuel canisters, switches, solenoids, wiring harnesses, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function, using: hand, power, specialized, and electronic service tools, gauges, precision measuring instruments, and lifting, rigging, and blocking devices, according to manufacturer's recommendations, specifications, and safety requirements.

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Date Completed   Apprentice       Supervisor/Trainer

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<th>EXHAUST, INTAKE, AND EMISSION CONTROL SYSTEMS...cont’d</th>
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<tr>
<td>5174.11</td>
<td>Diagnose and troubleshoot diesel emission control systems and components, (Exhaust Gas Recirculation (EGR), Diesel Particulate Control (DPC)), Diesel Exhaust Fluid, including: EGR valves, switches, solenoids, sensors, modules, wiring harnesses, pre-heat devices (glow plugs), injection and monitoring systems; by: visually inspecting, testing, and analyzing performance and function, pressure, checking for: opens/shorts/grounds, temperature, corrosion, wear, leaks, noise, and vibration, using: hand, power, specialized, and electronic service tools, exhaust gas analyzing equipment, gauges, precision measuring instruments, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, schematic diagrams, and safety requirements.</td>
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<tr>
<td>5174.12</td>
<td>Repair diesel emission control systems and components, (Exhaust Gas Recirculation (EGR), Diesel Particulate Control (DPC)), Diesel Exhaust Fluid, including: EGR valves, switches, solenoids, sensors, modules, wiring harnesses, pre-heat devices (glow plugs), injection and monitoring systems and fastening and mounting devices; by: exchanging, reconditioning, or servicing; using: hand, power, specialized, and electronic service tools, gauges, precision measuring instruments, exhaust gas analyzing equipment, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.</td>
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U5174.0  EXHAUST, INTAKE, AND EMISSION CONTROL SYSTEMS...cont’d

5174.13  Verify repair of diesel emission control systems and components, (Exhaust Gas Recirculation (EGR), Diesel Particulate Control (DPC)), Diesel Exhaust Fluid), including: EGR valves, switches, solenoids, sensors, modules, wiring harnesses, pre-heat devices (glow plugs), injection and monitoring systems, and fastening and mounting devices; by: visually inspecting, testing, and analyzing performance and function; using: hand, power, specialized, and electronic service tools, gauges, precision measuring instruments, exhaust gas analyzing equipment, and lifting, rigging, and blocking devices; according to manufacturer's recommendations, specifications, and safety requirements.

__________________________________________________________________________  __________________________________________________________________________
Date Completed  Apprentice  Supervisor/Trainer

__________________________________________________________________________  __________________________________________________________________________
Sponsor/Employer Name  Sponsor/Employer Signature
U5175.0 HYBRID VEHICLE SYSTEMS

GENERAL PERFORMANCE OBJECTIVES

Diagnose and repair hybrid systems and components by: performing a visual inspection; diagnosing and troubleshooting hybrid systems and components; repairing hybrid systems and components, and verifying repair of hybrid systems and components.

PERFORMANCE OBJECTIVES

SKILLS

5175.01 Perform visual inspection, identifying system types and applications, by: checking for: worn, loose, damaged, leaking, missing, or defective components, including:

Date Completed Apprentice Supervisor/Trainer

5175.02 Diagnose and troubleshoot hybrid systems and components, including: fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function, checking for: odour, pressure, vibration/noise, and leaks; using: hand, power, specialized hybrid tools, and recommendations, specifications, and safety requirements.

Date Completed Apprentice Supervisor/Trainer
AUTOMOTIVE SERVICE TECHNICIAN

U5175.0 HYBRID VEHICLE SYSTEMS…con’t

5175.03 Repair hybrid systems and components, including: fastening and mounting devices; by exchanging, reconditioning, or servicing; using: hand, power, specialized hybrid tools, lifting, heating, welding, and cutting equipment, rigging, blocking, and welding equipment; according to manufacturer’s recommendations, specifications, and safety requirements.

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Date Completed Apprentice Supervisor/Trainer

5175.04 Verify repair of hybrid systems and components, including: fastening and mounting devices; by: visually inspecting, testing, and analysing performance and function; using: hand, power, specialized hybrid tools, gauges, lifting, rigging, and blocking equipment; according to manufacturer’s recommendations, specifications, and safety requirements.

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Date Completed Apprentice Supervisor/Trainer

_______________________________ _____________________________
Sponsor/Employer Name Sponsor/Employer Signature
# Automotive Service Technician

## Apprentice Record

### Apprentice Name (Print):

<table>
<thead>
<tr>
<th>Sponsor/Employer Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training Agreement #</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Address</td>
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<tr>
<td>Telephone</td>
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<tr>
<td>E-mail Address</td>
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</tbody>
</table>

### Summary of Training

<table>
<thead>
<tr>
<th>Employment Start Date</th>
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<tbody>
<tr>
<td>Employment End Date</td>
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<tr>
<td>Total hours of training &amp; instruction between dates of employment.</td>
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Date Completed: ________________________  Apprentice: ________________________  Supervisor/Trainer: ________________________
# AUTOMOTIVE SERVICE TECHNICIAN

## APPRENTICE RECORD

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Date Completed 
Apprentice 
Supervisor/Trainer
# APPRENTICE RECORD

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________________  _______________  __________________
Date Completed   Apprentice       Supervisor/Trainer
APPRENTICE COMPLETION FORM

APPRENTICE INFORMATION

<table>
<thead>
<tr>
<th>Name (Print)</th>
<th>Signature</th>
<th>Client ID</th>
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</table>

Skill Sets when completed should be signed by the Supervisor/Trainer and presented with this completion form to your local Apprenticeship Client Services Office. Any supporting documentation should also be attached.

- In-school Completed (Proof to be Provided)  Yes ( )  No ( )  Not applicable ( )
- Hours completed as Per Contract:  Yes ( )  No ( )  Not applicable ( )

SPONSOR/EMPLOYER INFORMATION

<table>
<thead>
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<table>
<thead>
<tr>
<th>Telephone</th>
<th>E-mail Address</th>
<th>Signature of Signing Authority</th>
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You will be required to disclose this signed form to the Ministry of Training, Colleges and Universities in order to complete your program. The Ministry will use your personal information to administer and finance Ontario’s apprenticeship training system. For further information please see the notice/declaration for collection of personal information that is referenced in the table of contents of this training standard.