

Provincial Scope Document

AUTOMOTIVE SERVICE (Post-Secondary) 2021

Purpose of the Challenge:

To evaluate performance in areas such as theory, diagnosis and repair of automotive systems.

Provincial Skills will be done in two parts:

First part: An online interactive skill and knowledge test.

Second part: The top three competitors will have a face to face hands-on skills and knowledge test.

Part 1 - Online Interactive Skills & Knowledge Test:

Competition Topics May Include:

1. DRIVABILITY PROBLEM – FUEL / IGNITION / EMISSION

May Include:

- a) Use of fuel pressure testing equipment.
- b) Primary and secondary ignition scope pattern analysis (ignition scope will be connected to vehicle).
- c) Use of “scan tool” to access data stream trouble codes and information.
- d) Use of “four gas analyzer” for testing vehicle emissions.
- e) Testing emission control devices or systems.
- f) Use of service manuals or electronic information systems for accessing test procedures or technical data.

2. “MIL” LIGHT – DIAGNOSE CAUSE

May Include:

- a) Use of “scan tool” to retrieve fault codes and/or clear codes.
- b) Use of service manuals or electronic information systems for accessing test procedures or technical data.

3. ELECTRICAL SYSTEMS – LIGHT OR ACCESSORY CIRCUITS

May Include:

- a) Visual inspection of components and/or wiring/connection integrity.
- b) Use of digital “D.V.O.M.” for testing components and/or wiring/connection integrity.
- c) Use of service manuals or electronic information systems for accessing test procedures, wiring schematics or technical data.

4. CRANKING SYSTEMS – DIAGNOSIS

May Include:

- a) Use of “A.V.R.” tester for battery, alternator, starter and circuit testing.
- b) Use of digital “D.V.O.M.” for “voltage drop” testing and/or wiring/connection integrity.
- c) Use of service manuals or electronic information systems for accessing test procedures or technical data.

5. COMPONENT TESTING – ELECTRICAL / ELECTRONIC

May Include:

- a) Use of digital “D.V.O.M.” for circuit testing.
- b) Use of service manuals or electronic information systems for accessing test procedures or technical data.

6. C.V. JOINT – DISASSEMBLE, INSPECT, REASSEMBLE

May Include:

- a) Use of hand tools required to disassemble and reassemble component.
- b) Visual inspection of parts and written recommendations.
- c) Use of service manuals or electronic information systems for accessing test procedures or technical data.

7. DIFFERENTIAL RWD – INSPECT AND ADJUST

May Include:

- a) Visual inspection of parts and written recommendations.
- b) Testing and/or adjusting pinion bearing preloads.
- c) Testing and/or adjusting differential side bearing preloads.
- d) Testing and/or adjusting pinion and ring gear backlash.
- e) Use of “marking” compounds to interpret “drive and coast” patterns.
- f) Use of service manuals or electronic information systems for accessing test procedures or technical data.

8. BRAKES – INSPECT, EVALUATION AND REASSEMBLY

May Include:

- a) Visual inspection or parts and written recommendations.
- b) Use of applicable measuring tools (micrometer, calipers, drum gauge, etc.).
- c) Reassembly of brake system.
- d) Use of service manuals or electronic information systems for accessing test procedures or technical data.

9. ENGINE BLOCK – COMPONENT INSPECTION AND MEASUREMENT

May Include:

- a) Visual inspection of parts and written recommendations.
- b) Use of applicable measuring tools (bore gauge, micrometers, calipers, etc.).
- c) Use of service manuals or electronic information systems for accessing test procedures or technical data.

10. THEORY EXAM – COMPONENT IDENTIFICATION AND WRITTEN EXAM

May Include:

- a) Multiple choice exam that includes questions from all automotive mechanical systems.
- b) Multiple choice questions/answers for identifying various automotive components.

11. TOOLS AND EQUIPMENT – FABRCATION

May Include:

- a) Select and operate appropriate fabricating hand tools
- b) Select and operate appropriate fabricating shop equipment

12. WHEELS, TIRES AND HUBS

May Include:

- a) Mounting and balancing tires
- b) Repairing tire punctures
- c) Measuring and analyzing tire wear
- d) Suspension Diagnosis

13. SUSPENSION AND STEERING

May Include:

- a) Identify components of suspension and steering systems
- b) Inspection and testing of suspension and steering systems
- c) Assembly/disassembly of suspension and steering systems
- d) Routine maintenance/adjustments of suspension and steering systems
- e) Diagnostics of suspension and steering systems

14. MANUAL TRANSMISSION / TRANSAXLES:

May Include:

- a) Identify components of a manual transmission/transaxle
- b) Analyze gear ratios of a manual transmission/transaxle
- c) Power flow through a manual transmission/transaxle
- d) Clutch operation of a manual transmission/transaxle
- e) Assembly/disassembly procedures of a manual transmission/transaxle
- f) Routine maintenance/adjustments of a manual transmission/transaxle
- g) Component fault diagnosis of a manual transmission/transaxle

15. AUTOMATIC TRANSMISSION / TRANSAXLE

May Include:

- a) Identify components of a automatic transmission/transaxle
- b) Routine maintenance/adjustments of a automatic transmission/transaxle
- c) Assembly/disassembly procedures of a automatic transmission/transaxle
- d) Electrical/hydraulic diagnosis of a automatic transmission/transaxle
- e) Power flow through a automatic transmission/transaxle
- f) Component fault diagnosis of a automatic transmission/transaxle

16. TURBOCHARGER / SUPERCHARGER

May Include:

- a) Identify components of a turbocharger/supercharger
- b) Inspection and testing of a turbocharger/supercharger

17. HEATING / COOLING SYSTEMS (excluding A/C)

May Include:

- a) Identify components of a heating/cooling system
- b) Inspection and testing of a heating/cooling system
- c) Assembly/disassembly of a heating/cooling system

Part 2 - Hands on Skill and Knowledge Test

1. ELECTRICAL SYSTEMS – LIGHT OR ACCESSORY CIRCUITS

May Include:

- a) Visual inspection of components and/or wiring/connection integrity.
- b) Use of digital “D.V.O.M.” for testing components and/or wiring/connection integrity.
- c) Use of service manuals or electronic information systems for accessing test procedures, wiring schematics or technical data.

2. BRAKES – INSPECT, EVALUATION AND REASSEMBLY

May Include:

- a) Visual inspection or parts and written recommendations.
- b) Use of applicable measuring tools (micrometer, calipers, drum gauge, etc.).
- c) Reassembly of brake system.
- d) Use of service manuals or electronic information systems for accessing test procedures or technical data.

3. WHEELS, TIRES AND HUBS

May Include:

- a) Mounting and balancing tires
- b) Repairing tire punctures
- c) Measuring and analyzing tire wear
- d) Suspension Diagnosis

4. SUSPENSION AND STEERING

May Include:

- a) Identify components of suspension and steering systems
- b) Inspection and testing of suspension and steering systems
- c) Assembly/disassembly of suspension and steering systems
- d) Routine maintenance/adjustments of suspension and steering systems
- e) Diagnostics of suspension and steering systems

5. CRANKING SYSTEMS – DIAGNOSIS

May Include:

- a) Use of “A.V.R.” tester for battery, alternator, starter and circuit testing.
- b) Use of digital “D.V.O.M.” for “voltage drop” testing and/or wiring/connection integrity.
- c) Use of service manuals or electronic information systems for accessing test procedures or technical data.
- d) Disassemble/Assemble an Alternator

Specific Requirements:

- CSA safety footwear and safety glasses, Coveralls, Face Masks to be supplied by the contestant.
- Tools, and equipment will be supplied by the committee.
- Contestants may supply and use their own DVOM.
- All Covid-19 safety protocols will be implemented.
- FACE MASKS ARE REQUIRED

Safety Instructions:

Safety awareness/requirements will be maintained within minimum industry standards at all times. A contestant will not be allowed to compete without the safety equipment noted on this document.

Equipment / Tools / Materials

Supplied by Committee:

- All necessary tools and equipment
- Latex Gloves

Supplied by Contestant:

- CSA Approved or Similar Safety Footwear
- Safety Glasses
- Coveralls or shop shirt and pants
- Face Masks

Judging / Distribution of Marks

Each contestant will be evaluated on:

- | | |
|--|------------------|
| a) Diagnosis / Repair / Adjustment procedures and sequences | 20 points |
| b) Accuracy of Diagnosis / Repairs / Adjustments | 20 points |
| c) Correct use of equipment and tools | 20 points |
| d) Correct Safety Procedures | 20 points |
| e) Efficient use of written and electronic information systems | <u>20 points</u> |

Total **100 points**

Note: If Theory Exam is used it will be based on **100 points**

Technical Committee:

VCC Skills Representative – Ryan Lee and Cateno Vassallo

Alex Romashenko
 Robert Kunka
 Greg Henderson – Department Head
 Jason Devisser – Skills Canada Technical Chair
 Bill Barnes
 Gary Mui
 Louis Lui
 Andu Keddis
 Mike Coard
 Alex Wu
 Ralph Spolowicz
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