UNIT 1 : VEHICLE STABILITY MANAGEMENT SYSTEMS

1. CONDITIONS OF ACCESS TO THE UNIT:

TECHNICAL PRE-REQUISITES :

Before starting the training course, the student must be able to :

- Complete the maintenance on a standard breaking system (excluding ABS)

METHODOLOGY PRE-REQUISITES :

Before starting the training course, the student must be able to :

- Read an electrical diagram
- Identify the interactions of the peripheral systems
- Use an oscilloscope to visualise the signals from vehicle's systems
- Do tests with the help of a diagnostic tool
- Choose the appropriate documents for the job to be done

2. VALIDATION OF UNIT 1 :

Test: practical assessment in a real situation allowing the acquisitions obtained during the training course to be assessed

Objective of the assessment : Assess the capacities of the candidate to establish a diagnostic on a vehicle stability management system using the appropriate information and testing methods, and to repair the fault.

Duration: 2 hours 30 maximum
Material Necessary:
Written information about the problem
Vehicle presenting a malfunction on the vehicle stability management system
All useful technical documents
Equipped work station/ multimeter/ oscilloscope/ diagnostic tool….
NB
The assessment is to be done by at least two instructors competent in the professional field of automobile maintenance.

UNIT 1: VEHICLE STABILITY MANAGEMENT SYSTEMS

KNOWLEDGE	SKILLS	COMPETENCE
K1: Wheel anti lock break systems: K1.1: Theory of Operation Integrated system Additional system K1.2: Study of the Circuits Electrical Circuit (input/output) Hydraulic Circuit K1.3: Strategy of the logic controller K1.4: Diagnostic, maintenance and servicing **K2:** Antiskid systems: K2.1: Theory of Operation K2.2: The electrical circuits (inputs/outputs) K2.3: The hydraulic circuits K2.4: Interaction between the auxiliary systems K2.5: Diagnostic, maintenance and servicing K2.6: Particularities of the control of the four-wheel drive system **K3:** Stability control systems: K3.1: Theory of Operation K3.2: The electrical circuits K3.3: The hydraulic circuits K3.4: Sensors (inputs/outputs) K3.5: Diagnostic, maintenance and servicing	**S1:** Identify the elements constituting the wheel anti lock break system, the electrical and hydraulic connections and the particularities of the antiskid system and stability control **S2:** Establish a diagnostic procedure taking into account the possible interactions between the peripheral systems **S3:** Apply a testing procedure **S4:** Choose the nature of the action to be taken **S5:** Repair / Replace the components of vehicle stability management systems	**C1:** Diagnose and repair a vehicle stability management system C1.1: Identify with precision the symptoms of the fault C1.2: Select the hypotheses of the fault depending on the symptoms C1.3: Test the system C1.4: Validate the malfunction and choose the appropriate action to be done C1.5: Respect the methods and schedule **C2:** Organise the work respecting health and safety rules

CREDIT POINTS

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2	8	5	3

UNIT 2 : INJECTION AND IGNITION SYSTEMS IN PETROL ENGINES

3. CONDITIONS OF ACCESS TO THE UNIT:

TECHNICAL PRE-REQUISITES :

Before starting the training course, the student must be able to :

- Undertake basic maintenance on a petrol engine

METHODOLOGY PRE-REQUISITES :

Before starting the training course, the student must be able to :

- Read a basic electrical diagram
- Explain the basic theory of combustion
- Use an oscilloscope to visualise the signals from vehicle's systems
- Choose the appropriate documents for the job to be done

4. VALIDATION OF UNIT 2 :

Test: practical assessment in a real situation allowing the acquisitions obtained during the training course to be assessed.

Objective of the assessment : Assess the capacities of the candidate to establish a diagnostic on injection and ignition systems in petrol engines using the appropriate information and testing methods, and to repair the fault.

Duration: 2 hours 30 maximum
Material Necessary:
Written information about the problem
Vehicle presenting a malfunction on the injection and ignition systems.
All useful technical documents
Equipped work station/ multimeter/ oscilloscope/ diagnostic tool….
NB
The assessment is to be done by at least two instructors competent in the professional domain of automobile maintenance.

UNIT 2 : INJECTION AND IGNITION SYSTEMS IN PETROL ENGINES

KNOWLEDGE	SKILLS	COMPETENCE
K1: General description K1.1: Combustion K1.2: Fuel K1.3: Advanced theory of combustion **K2:** Indirect injection system K2.1: Fuel supply system K2.2: Fuel pressure K2.3: Air supply system K2.4: Electrical circuits K2.5: The different ignition systems K2.6: Control unit input and output signals K2.7: Diagnostic tools K2.8: Diagnostic, maintenance and servicing **K3:** Direct injection system K3.1: Air fuel ratio K3.2: Diagnostic, maintenance and servicing	**S1:** Explain physical phenomena of combustion in petrol engines **S2:** Identify the elements of the injection and ignition systems **S3:** Explain how each element of the injection and ignition system works **S4:** Use electrical diagrams for fault diagnosis **S5:** Measure pressure and flow **S6:** Establish a diagnostic procedure to identify the fault **S7:** Apply the diagnostic procedure using the diagnostic tools	**C1:** Diagnose and repair a vehicle stability management system C1.1: Identify with precision the symptoms of the fault C1.2: Identify the causes of the fault C1.3: Test the system C1.4: Validate the malfunction and choose the appropriate action to be done C1.5: Respect the methods and schedule **C2:** Organise the work respecting health and safety rules

CREDIT POINTS

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3	4	9	4

UNIT 3 : WHEEL ALIGNMENT

5. CONDITIONS OF ACCESS TO THE UNIT:

TECHNICAL PRE-REQUISITES :

Before starting the training course, the student must be able to :

- Complete basic maintenance on suspension and steering systems

METHODOLOGY PRE-REQUISITES :

Before starting the training course, the student must be able to :

- Choose the appropriate documents for the job to be done
- Use suspension and steering terminology

6. VALIDATION OF UNIT 3 :

Test: practical assessment in a real situation allowing the acquisitions obtained during the training course to be assessed

Objective of the assessment : Assess the capacities of the candidate to establish a diagnostic on the wheel alignment using the appropriate information and testing method, and to repair the fault.

Duration: 2 hours 30 maximum

Material Necessary:
Written information about the problem
Vehicle presenting a malfunction on the wheel alignment.
All useful technical documents
Equipped work station
4-wheel alignment testing equipment
NB
The assessment is to be done by at least two instructors competent in the professional domain of automobile maintenance.

UNIT 3 : WHEEL ALIGNMENT

KNOWLEDGE	SKILLS	COMPETENCE
K1: General description K1.1: Mathematic measures and values K1.2: Trigonometry K1.3: Mapping on a axis or a plane K1.4: 2D and 3D geometry **K2:** Wheel Alignment K2.1: Angles of wheel alignment K2.2: Variation of the angles depending on the movement of the vehicle K2.3: Testing conditions depending on manufacturers' recommendations K2.4: Diagnostic angles : - swivel axis inclination (SAI) - king pin offset - camber and caster - over steer and under steer - left and right offset - rear and front offset K2.5: Geometry of the vehicle K2.6: Height of the vehicle K2.7: Dish of the wheel	**S1:** Explain the use of angles **S2:** Put the vehicle into position and condition **S3:** Establish a diagnostic procedure **S4:** Check the geometry of the wheel alignment **S5:** Establish the relationship between the behaviour of the vehicle and the wheel alignment **S6:** Analyse the test report **S7:** Adjust the geometry of the wheel alignment **S8:** Identify the faulty parts	**C1:** Complete a diagnostic and maintenance on the wheel alignment C1.1: Complete all of the preliminary test C1.2: Check the geometry of the wheel alignment C1.3: Analyse and justify orally the test bench report C1.4: Adjust the wheel alignment C1.5: Respect the methods and schedule **C2:** Organise the work respecting health and safety rules

CREDIT POINTS

FINLAND	FRANCE	HUNGARY	ROMANIA
2	8	3	2

UNIT 4 : ENGINE EMISSIONS IN PETROL AND DIESEL ENGINES

7. CONDITIONS OF ACCESS TO THE UNIT:

TECHNICAL PRE-REQUISITES :

Before starting the training course, the student must be able to :

- Complete basic maintenance and operation of petrol engine ignition and injection system
- Complete basic maintenance and operation of diesel injection systems
- Use the exhaust-gas measuring devices

METHODOLOGY PRE-REQUISITES :

Before starting the training course, the student must be able to :

- Explain the basic theory of combustion
- Explain the operation of petrol and diesel fuel system and their major components
- Choose the appropriate documents for the job to be done

8. VALIDATION OF UNIT 4 :

Test: practical assessment in a real situation allowing the acquisitions obtained during the training course to be assessed

Objective of the assessment : Assess the capacities of the candidate to establish a diagnostic on engine emissions test in petrol engines or diesel engines using the appropriate information and testing methods, and to repair the possible engine running fault.

Duration: 2 hours 30 maximum
Material Necessary:
Written information about the problem
Vehicle presenting a malfunction on the engine emissionns
All useful technical documents
Equipped work station/ multi gas analyzer/ diesel smoke meter/ OBD-diagnostic tool
NB
The assessment is to be done by at least two instructors competent in the professional domain of automobile maintenance.

UNIT 4 : ENGINE EMISSIONS IN PETROL AND DIESEL ENGINES

KNOWLEDGE	SKILLS	COMPETENCE
K1: Exhaust Gases K1.1: Composition K1.2: Air – fuel ratio K1.3: European anti-pollution standards **K2:** Pollution Control K2.1: Catalytic converter K2.2: Exhaust gas recycling K2.3: Particle filter K2.4: On Board Diagnosis (OBD) K2.5: Diagnostic, maintenance and servicing	**S1:** Perform diagnostic test to enable the assessment of exhaust gas values with diagnostic information. **S2:** Use OBD diagnostic for the evaluation of engine faults. **S3:** Carry out On Board Diagnosis (OBD) **S4:** Read stored diagnostic trouble codes and diagnose the causes of emissions or driveability problems. **S5:** Carry out emissions inspections on diesel and petrol engines (Certificates of Emissions Control)	**C1:** Diagnose and repair malfunctions of engine emission systems in petrol and diesel engines C1.1: Identify with precision the symptoms of the fault C1.2: Select the hypotheses of the fault depending on the symptoms C1.3: Test the system C1.4: Validate the malfunction and choose the appropriate action to be done C1.5: Respect the methods and schedule **C2:** Organise the work respecting health and safety rules

CREDIT POINTS

FINLAND	FRANCE	HUNGARY	ROMANIA
2	3	7	2