



ECVET – Curriculum

UNIT TEMPLATE

Institution:	Cyprus Productivity Center
Programme/Training Title:	Automotive Technician
Unit Title / Code:	Hybrid Cars. Service, Maintenance, Inspection and diagnostic methods to repair hybrid cars / CPC 10
Unit Type (e.g. major, minor, elective):	Non- Formal
Unit Level:	EQF Level 4
Duration:	36 Hours
Pre-requisites:	Professional Mechanics
Instructor:	Philippos Philippou
Number of ECVET credits:	N/A

Learning Outcomes

By completion of this unit the learner should be able to:

1. Recognize the types of hybrid technology in cars
2. Inspect hybrid cars
3. Repair hybrid cars
4. Maintain hybrid cars

Automotive Technician Hybrid Cars. Service, Audits, Inspection and Diagnostic Methods to Repair Hybrid Cars				
Learning outcomes By the end of this course a learner is expected to:	Method of assessment	KSC Breakdown (Knowledge – Skill - Competence)		Estimated student work time in hours
1. Recognize the types of hybrid technology in cars	<ul style="list-style-type: none"> • Oral theoretical examination • Practical examination 	K	• Describe the kinds of hybrid technology	3
		S	• Present the kinds of hybrid technology	3
		C	• Compare the kinds of hybrid technology	3
2. Inspect hybrid cars	<ul style="list-style-type: none"> • Oral theoretical examination • Practical examination 	K	• Indicate check points of hybrid cars	3
		S	• Inspect hybrid cars	3
		C	• Assess full inspection of hybrid cars	3
3. Repair hybrid cars	<ul style="list-style-type: none"> • Oral theoretical examination • Practical examination 	K	• Categorize troubleshooting of Hybrid Cars	3
		S	• Perform troubleshooting of Hybrid Cars	3

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		C	<ul style="list-style-type: none"> Justify troubleshooting of Hybrid Cars 	3
4.Maintainn hybrid cars	<ul style="list-style-type: none"> Oral theoretical examination Practical examination 	K	<ul style="list-style-type: none"> Perform maintenance of hybrid cars 	3
		S	<ul style="list-style-type: none"> Implement maintenance in Hybrid Cars 	3
		C	<ul style="list-style-type: none"> Evaluate maintenance of hybrid cars 	3
			TOTAL HOURS	36

Course Content:

1. Introduction to Hybrid.
2. What is hybrid vehicle
3. Characteristics of hybrid vehicles
4. Types of hybrid systems
5. Evolution of the hybrid system, history
6. Technical declared a nature hybrid vehicles
7. Report hybrid vehicle parts
8. Notes required during maintenance,
9. Diagnosis and repair of hybrid vehicles.



10. Precautions for high-voltage currents
11. Notes required during periodic vehicle maintenance
12. Car Handling in case of accident
13. Hybrid gearbox
14. Analysis hybrid transmission parts
15. Explanation power distribution system and method of operation
16. Explanation electric motor MG1 & MG2 and mode
17. Three-phase and single-phase current
18. Speed and Position Sensors
18. Parking and locking mechanism
19. Lubrication and Cooling System
20. Nomogram of Hybrid Vehicle
21. Explanation Nomogram of hybrid vehicle
22. Analysis of all possible scenarios during hybrid vehicle drive
23. Hybrid Vehicle Systems mode.
24. Detailed hybrid vehicle diagram
25. Internal combustion engine, Atkinson cycle explanation
26. Analysis and explanation
27. Analysis and explanation air conditioning system, hybrid battery, braking, stability and additional functions
28. Self-diagnosis system. Audit methodology, diagnosis and detection of faults.
29. diagnostic tool functions in hybrid vehicle
30. Hybrid Vehicle Diagnosis Methodology
31. Self-diagnosis system
32. Behaviors stand out hybrid
33. Analysis and explanation of the main faults (DTC) that may arise and ways of dealing with them.
34. Addressing various failures based on symptoms
35. Diagnostic Control Methodology
36. Locating faults in hybrid car (Internship)
37. Using diagnostic tools

- 38. Presentation and analysis of hybrid vehicle
- 39. Comparison of technologies of compatible vehicles.
- 40. Presentation of future technologies and hybrid vehicles.
- 41. Analysis and explanation hybrid production vehicle
- 42. Comparison of various systems (refrigeration, air conditioning, comfort, etc.) With those of conventional vehicles
- 43. Reference to future technologies and next-generation hybrid vehicles
- 44. Practice in hybrid car

Teaching Methods:

- The theoretical part will be conducted in specially arranged technology room, equipped with all the necessary teaching aids (sections). It also includes 3D simulators, where trainee will demonstrate the principle of operation of Hybrid Cars.
- The workshop part will take place in a special workshop laboratory, with special equipments and tools for Hybrid Vehicle Technology

Assessment Methods:

Assessment Methods:	Description	Evaluation criteria's	Proportion of the final mark
Examination trainees at theoretical training	Multiple choice type	The multiple choice test consisting of 40 multiple choice exercises with 4 options. The maximum score is 40/40. Each wrong answer in every question will result in 0.5 points subtracted from the total score.	Degree of success in theoretical training: the trainee should be get 20/40 points of total of 40/40
Individual Practice Examination	Practical assessment in laboratory. Trainer creates 40 real fault codes in HV	Trainee must be able to find out fault codes and solve them using	Trainee is graded by two trainers / assessors in each

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	<p>(Hybrid Vehicle) divided 10 fault codes in each category (Power train, chassis, body and Hybrid)</p>	<p>diagnostic tools or other appropriate equipment in real HV</p> <p>Trainee is considered to have passed the practical training if they successfully resolve 50% of troubleshooting in each category. (Power train, chassis, body and Hybrid). Also trainee must be able to perform troubleshooting in the appropriate time given by the manufacturer.</p>	<p>practical assessment.</p>
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Bibliography:

Author	Title	Publisher	Year	ISBN
Gianfranco Pistoia	Electric and Hybrid Vehicles	Elsevier	27 Jul 2010	978-0-444-535-65-8
Mandy Concepcion	Advanced Hybrid Automotive Systems: (including Toyota & Honda Models)	Automotive Diagnostics and Pub	2011	9781463552077



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