COMPETENCY STANDARDS

ADAS TECHNOLOGY DIAGNOSIS

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Luzon Expressway (SLEX), Taguig City, Metro Manila

Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

Section 22, “Establishment and Administration of the National Trade Skills Standards” of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skill standards. The Authority shall develop and implement a certification and accreditation program in which private industry groups and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Competency Standards (CS) serve as the basis for the development of:

1 Competency-Based Curriculum
2 Micro-Credential
3 Institutional Assessment Instruments

The CS has two sections:

Section 1 **Definition** describes and defines the competencies that comprise the of Competency Standards.

Section 2 **Competency Standards** gives the specifications of competencies required for effective work performance.

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COMPETENCY STANDARDS FOR ADAS TECHNOLOGY DIAGNOSIS

SECTION 1 DEFINITION

The **ADAS TECHNOLOGY DIAGNOSIS** competency standards consist of competencies that a person must apply to diagnose and service ADAS Technology

The Core Competency comprising this Competency Standards:

UNIT CODE	UNIT TITLE
CS-ALT311502	Diagnose and Service ADAS Technology

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the units of competency required in **ADAS TECHNOLOGY DIAGNOSIS.**

CORE COMPETENCIES

UNIT OF COMPETENCY : **DIAGNOSE AND SERVICE ADAS TECHNOLOGY**

UNIT DESCRIPTOR : This unit covers the skills, knowledge, and attitudes required to service and maintain key features of autonomous driver assistance systems (ADAS) when undertaking a pre-repair scan of a vehicle. It involves identifying ADAS components, undertaking a diagnostic scan of the ADAS present to identify the damage for repair, and evaluating their knowledge of ADAS.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the ADAS used in the vehicle.	1.1 Safety practices are applied following OSHS. 1.2 ***Job requirements*** are determined from workplace instructions. 1.3 Apply workplace procedures to locate ***ADAS technology*** and identify its components according to manufacturers' specifications 1.4 Diagnosis information is sourced and interpreted according to workplace procedures. 1.5 Hazards associated with the work are identified and risks are managed following ***industry criteria***	1.1 Types of ADAS 1.2 OSHS 1.3 Waste management 1.4 Sourcing out and interpretation of repair information 1.5 Service/Repair manual 1.6 Tools, equipment, supplies, and materials in inspecting ADAS components 1.7 Interpretation of job requirements 1.8 Different job requirements	1.1 Interpreting job requirements from workplace instructions 1.2 Clarifying instructions 1.3 Locating appropriate sources of information 1.4 Selecting and checking tools and equipment 1.5 Reporting defective tools and equipment 1.6 Preparing of supplies and materials 1.7 Applying safety practices

	1.6 ***Tools and equipment*** are selected and checked for serviceability according to industry criteria. 1.7 Defective tools and equipment are reported following workplace procedures.	1.9 Serviceability of tools and equipment 1.10 Work hazards 1.11 Repair Order Checklist 1.12 Identification and function of ADAS components	
2. Prepare to diagnose and service ADAS	2.1 Safety practices are applied following OSHS. 2.2 Job requirements are determined from workplace instructions. 2.3 Diagnosis information is sourced and interpreted according to workplace procedures. 2.4 Hazards associated with the work are identified and risks are managed following ***industry criteria*** 2.5 ***Tools and equipment*** are selected and checked for serviceability according to industry criteria. 2.6 Defective tools and equipment are reported following workplace procedures.	2.1 Key features, components and operating principles of ADAS 2.2 OSHS 2.3 Waste management 2.4 Sourcing out and interpretation of repair information 2.5 Service/Repair manual 2.6 Tools, equipment, supplies, and materials in inspecting and repairing ADAS 2.7 Interpretation of job requirements 2.8 Different job requirements 2.9 Serviceability of tools and equipment 2.10 Work hazards 2.11 Repair Order Checklist	2.1 Interpreting job requirements from workplace instructions 2.2 Clarifying instructions 2.3 Locating appropriate sources of information 2.4 Selecting and checking tools and equipment 2.5 Reporting defective tools and equipment 2.6 Preparing of supplies and materials 2.7 Applying Safety Practices

		2.12 Identification and function of ADAS components	
3. Diagnose ADAS	3.1 Safety practices are applied following the Occupational Health and Safety (OSH) procedure. 3.2 Diagnostic symptoms are determined and analyzed using a ***troubleshooting guide***, repair manual, ***technical information sheet,*** and most appropriate to the circumstances. 3.3 Technical campaigns, including recall, are checked based on the manufacturer's published data and information. 3.4 Diagnostic tests are carried out according to industry criteria. 3.5 Faults are identified based on diagnostic test specifications. 3.6 Diagnostic findings and recommendations are prepared and reported according to industry criteria.	3.1 Diagnostic testing procedures for ADAS and their limitations 3.2 Accessing and interpreting scan tool system data and Diagnostic Trouble Codes (DTCs) 3.3 Identification and function of ADAS components 3.4 Mensuration 3.5 Arithmetic operations 3.6 Use of measuring devices 3.7 Reporting procedures 3.8 OSHS 3.9 Wearing of PPEs 3.10 Industry criteria 3.11 Attitude: ● Patience ● Attention to details ● Time conscious Honest	3.1 Analyzing diagnostic symptoms 3.2 Interpreting information from manufacturer and workshop 3.3 Interpreting and comparing diagnostic data using troubleshooting guide and manufacturer's manual 3.4 Diagnosing ADAS 3.5 Reporting inspection findings, recommendations, and repair instructions 3.6 Applying safety practices 3.7 Mensuration skills 3.8 Applying arithmetic operations

4. Repair ADAS	4.1 ***Repairs*** are carried out according to the manufacturer's manual. 4.2 3.2 Repair options and solutions are analyzed and selected based on the manufacturer's manual and the circumstances at hand. 4.3 ***Post-service testing*** is carried out according to workplace procedures 4.4 Safety practices are applied following the Occupational Health and Safety (OSH) procedure.	4.1 Variations in scan tool system data 4.2 Harness assembly 4.3 Different Repairs for ADAS 4.4 Identification and Function ADAS 4.5 Arithmetic operations 4.6 Mensuration 4.7 Use of measuring devices 4.8 Service/Repair Manual 4.9 Service testing for ADAS 4.10 Isolation and elimination approach 4.11 OSHS 4.12 Wearing of PPEs 4.13 Attitude: ● Patience ● Attention to details ● Time conscious Honest	4.1 Applying Safety Practices 4.2 Mensuration skills 4.3 Applying arithmetic operations 4.4 Repairing ADAS 4.5 Performing post- service testing

5. Complete work processes	5.1 Final inspection is conducted based on workplace procedure. 5.2 Vehicle is turned over to immediate superior for quality control following workplace procedure. 5.3 The work area is restored following 5S of good housekeeping. 5.4 Wastes are managed following environmental rules and regulations. 5.5 Tools and equipment are checked and stored according to workplace procedures. 5.6 ***Workplace documents*** are accomplished according to workplace procedures.	5.1 Final inspection procedure: 5.1.1 Visual inspection 5.1.2 Checking of tightening of torque 5.2 Turn-over of vehicle 5.3 Accomplishment of the repair order and other forms 5.4 OSHS 5.5 Wearing of PPEs 5.6 3Rs 5.7 5S of Good Housekeeping 5.8 Waste management 5.9 Checking and storage of tools and equipment 5.10 Workplace documents	5.1 Filling out workplace documentation 5.2 Conducting final inspection 5.3 Performing vehicle turn-over 5.4 Restoring work area 5.5 Managing wastes 5.6 Checking and storing tools and equipment 5.7 Wearing of PPEs 5.8 Applying Safety Practices

RANGE OF VARIABLES

VARIABLE	RANGE
1. Job Requirements	Job requirements may include: 1.1 Diagnosis of ADAS 1.2 Replacement of sensor 1.3 Replacement of Multiview Camera 1.4 Replacement of Millimeter Wave Radar 1.5 Replacement of electrical wirings/connectors 1.6 Replacement of electronic control unit (ECU) 1.7 Repair of electrical wirings and connectors 1.8 Inspection for Short Circuit 1.9 Inspection for Open Contact 1.10 Inspection of Unwanted Resistance 1.11 Aiming procedures of ADAS 1.12 Calibration Procedures of ADAS
2. ADAS Technology	ADAS may include: 2.1 Adaptive Cruise Control (ACC) 2.2 Lane Departure Warning (LDW) 2.3 Lane Keeping Assist (LKA) 2.4 Forward Collision Warning (FCW) 2.5 Autonomous Emergency Braking (AEB) 2.6 Blind Spot Detection (BSD) 2.7 Parking Assistance Systems 2.8 Traffic Sign Recognition (TSR) 2.9 Night Vision Systems 2.10 Driver Monitoring Systems
3. Industry criteria	Industry criteria may include: 3.1 Repair Manual 3.2 Workplace procedures 3.3 Safety and environmental requirements 3.4 Service history
4. Tools and equipment	Tools and equipment may include: 4.1 Tools: 4.1.2 Standard technician hand tools 4.1.3 Digital multi-tester 4.1.5 Battery Tester 4.1.7 Soldering kit 4.1.8 Trouble light 4.2 Equipment: 4.2.1 Lifter

	4.2.2 Battery Charger 4.2.3 Scan Tools (Can connect to a diagnostic laptop) 4.2.4 Diagnostic Laptop Computer 4.2.5 ADAS Aiming SSTs (Special Service Tools)
5. Supplies and Materials	Supplies and Materials may include: 5.1 Rags 5.2 Grease 5.3 Contact Cleaners 5.4 Penetrating oil 5.5 Soldering Paste 5.6 Soldering led 5.7 Electrical tape 5.8 Shrinkable tube 5.9 Sand Paper 5.10 PPEs
6. Electrical parts	Electrical parts may include: 6.1 Electrical System ECU 6.2 Connectors and terminals 6.3 Wires 6.4 Sensors 6.5 Multiview Camera (Sensor example) 6.6 Millimeter Wave Radar (Sensor example)
7. Troubleshooting guide	The troubleshooting guide includes: 7.1 Verification 7.2 Determine 7.3 Analyze 7.4 Isolate 7.5 Repair 7.6 Confirm
8. Technical information sheet	Technical information sheet may include: 8.1 Service bulletin 8.2 Technical service information 8.3 Recall information
9. Repair of ADAS	Repair of the electrical system may include: 9.1 Removal and installation of sensors 9.2 Removal and installation of electrical wirings 9.3 Soldering of wires 9.4 Replacement of connectors and terminals 9.5 Replacement of Electrical ECU 9.6 ADAS aiming procedures using SSTs 9.7 ADAS calibration procedure using vehicle diagnostic equipment.
10. Workplace documents	Workplace documents may include:

	10.1 Repair order 10.2 Inspection form 10.3 Diagnostic form

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Prepared to diagnose and repair ADAS 1.2 Identified and Diagnosed ADAS 1.3 Repaired ADAS 1.4 Performed final inspection 1.5 Completed work processes 1.6 Applied Safety Practices
2. Resource implications	The following resources should be provided: 2.1 Actual or simulated workplace 2.2 Tools, materials, and equipment needed to perform the required task 2.3 References and Manuals 2.4 PPEs 2.5 Training vehicle 2.6 First Aid Kit
3. Method of assessment	Competency in this unit shall be assessed through: 3.1 Demonstration/Observation with Oral Questioning 3.2 Written Test
4. Context for assessment	4.1 Competency maybe assessed in an actual workplace or at the designated TESDA-accredited Assessment Center

GLOSSARY OF TERMS

Adjustment	A small alteration or movement made to achieve a desired fit, appearance, or result.
Advanced Driver Assistance Systems (ADAS)	Primarily focused on collision avoidance technologies (for example, lane departure warning and blind-spot applications) and driver aids, such as night vision, driver alertness and adaptive cruise control
Diagnose	Identify the nature of the problem by inspection of the symptoms.
Diagnostic symptoms	A physical manifestation that is regarded as indicating a condition of malfunction.
Evaluation of components	The making of a judgment about the condition of a part/component.
Final inspection	Includes road testing, oil leakage, functionality, etc.
Maintenance	The regular or periodic maintenance servicing of vehicles to keep them in top condition.
Out of standard	Worn-out, unserviceable components, not conforming to manufacturer's standard.
Overhaul	Take apart a major automobile component to examine it and repair/replace a part if necessary to bring back the major component of working conditions.
Repair	Fix or return to working condition a part/component. It refers to cleaning, adjustment, and replacement.
Service	The act of rendering maintenance service and repair/replacement of parts of an automobile to keep it in top condition.

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INDUSTRY EXPERTS/VALIDATORS

NAME	COMPANY	POSITION/ DESIGNATION
Mr. Frankhil Ramos	Don Bosco Technical Institute - Makati	Automotive Trainer
Mr. Jeffrey B. Andrada	Don Bosco Technical Institute - Makati	Automotive Trainer
Mr. Marlon Padaoan	Honda Cars Philippines Inc.	Technical Training Specialist
Mr. Ashley Lapastora	Toyota Motor Philippines – School of Technology	Technical Trainer
Mr. Apolinar Rampola	Toyota Motor Philippines – School of Technology	Technical Trainer
Mr. Gener Vergara	Toyota Motor Philippines – School of Technology	Technical Trainer
Mr. Johnel G. Nazareno	ITE College West-Singapore	Automotive Engineering Lecturer
Mr. Jesus R. Boces Jr.	Autohub Group/ Autohub Institute of Technology	Assistant Vice President – After Sales Support/ School Administrator
Mr. Johmel O. Peniero	Autohub Institute of Technology	Technical Trainer
Mr. Nelson Crucis Jr.	Autohub Institute of Technology	Head Trainer
Mr. Richard A. Pangan	R-Tech Auto Care Center	Owner/ Technician
Mr. Marco B. Cantalejo	Mitsubishi Motors Philippines Corporation	Supervisor
Mr. Undrico D. Corpuz	APTi (Automotive Professionals and technician Inc.)/ Lyceum Alabang	Vice President/ Trainer-Assessor
Mr. Allen R. Rufo	VSO Group	Chief Technology Officer
Mr. Christopher H. Suarez	Pampanga Manpower Training Center	Trainer/ Assessor
Mr. Charlie Rham A. Posadas	Administrator	University of Pangasinan

Mr. Roderick B. Laurena	RJ Ilocandia Technical and Vocational School	School Administrator
Mr. Mike E. Joaquin II	Davao Institute of Technical Education, Inc. (DITE)	School Administrator
Mr. Constantino B. Panes	Regional Training Center – KorPhil Davao	Center Administrator
Mr. Allen Glen G. Malaluan	Bondoc Peninsula Technological Institute (BPTI)	Instructor
Mr. Joel Dominador C. Canapi	Regional Training Center - Tuguegarao	Senior TESD Specialist
Mr. Elpidio R. Tuboro	Cabugao School of Handicraft and Cottage Industries	Vocational School Administrator III
Mr. Marjon L. Duayao	Regional Training Center - Iligan	ATS and MSES Trainer
Mr. Jovert M. Cabaces	Regional Training Center - Batangas	Supervising TESDS
Mr. Alexander T. Aguilar	Provincial Training Center - Tarlac	Trainer
Mr. Angelo L. Manalili	Wangan National Agricultural School	Trainer
Mr. Roland D. Lopina	Zamboanga Sibugay Polytechnic Institute	Trainer
Mr. Michael M. Neo	Regional Training Center - Pili	Senior TESD Specialist
Mr. Edgardo T. Galicia	Wangan National Agricultural School	Assistant Professor I
Mr. Eduardo C. Lagayan Jr.	Southern Isabela College of Arts and Trades	Instructor I
Mr. Edgar Allan M. Abrea	Davao Oriental Polytechnic Institute	Trainer
Mr. Edgar Martin R. Salcedo	Simeon Suan Vocational and Technical College	Trainer
Mr. Marnilo S. Sugano	Davao National Agricultural School	Instructor III

The MANAGEMENT and STAFF of the TESDA Secretariat

Qualifications and Standards Office (QSO)

- **DIR. EL CID H. CASTILLO**, Executive Director
- **MS. MERCEDES E. JAVIER**, Division Chief
- **MR. VENZEL Y. CONCOLES,** Supervising TESD Specialist