

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR AUTOMOTIVE INDUSTRY

What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack-Test Driver

SECTOR: AUTOMOTIVE

SUB-SECTOR: R&D

OCCUPATION: TESTING

JOB ROLE: TEST DRIVER

REFERENCE ID: ASC/Q8402

ALIGNED TO: NCO-2004/ Nil

Test Driver: This role is largely responsible for conducting on road testing of vehicles in the road testing environment to ensure fulfilment of performance parameters for the final prototype vehicle.

Brief Job Description: This role is responsible for conducting various types of outdoor tests on automobile prototype in a simulated on road test environment and actual conditions to ensure proper measurement of the performance of the running proto vehicle and documenting all observations during the tests.

Personal Attributes: The individual should have a passion for driving and be willing to work in a risky and physically enduring environment of long hours and doing repetitive work. The role holder should have good physique, sound physical & mental health and good eyesight w/o colour blindness. The role holder should have good hand to eye coordination. The individual should have good listening and observation skills & good communication. He/she should demonstrate analytical reasoning, technology savvy, customer orientation, ability to provide correct feedback, high level of alertness, quick decision making, dependability, reliability and safety orientation.

Job Details

Qualifications Pack Code	ASC/Q/8402		
Job Role	Test Driver		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	10/01/2014
Sub-sector	R&D	Last reviewed on	20/1/2014
Occupation	Testing	Next review date	20/1/2016

Job Role	Test Driver
Role Description	This role is responsible for driving the prototype vehicle and conducting on road tests to validate the performance of the vehicle and share feedback with the testing and design team for improvements
NSQF level	5
Minimum Educational Qualifications	ITI – Mechanical/ BSc with a valid driving license for commercial/ light motor vehicle
Maximum Educational Qualifications	Diploma in Engineering (Mechanical /Automobile) with a valid driving license for commercial/ light motor vehicle
Training (Suggested but not mandatory)	<ul style="list-style-type: none"> Driving techniques in various conditions Testing apparatus and automobile instrumentation Fundamentals of automobile working Driving rules under Motor Vehicle Act Stress management techniques 5S and Safety aspects
Experience	4-5 years in on road testing of vehicle/ driving of vehicles
Occupational Standards (OS)	<ol style="list-style-type: none"> ASC/N8403: Understanding the testing requirement & preparing for On Road Testing of prototyping vehicles ASC/N8404: Conduct vehicle Performance evaluation through On Road tests ASC/N0006C: Maintain a safe and healthy working environment at the work place ASC/N0021: Maintaining 5S at the work premises
Performance Criteria	As described in the relevant NOS units

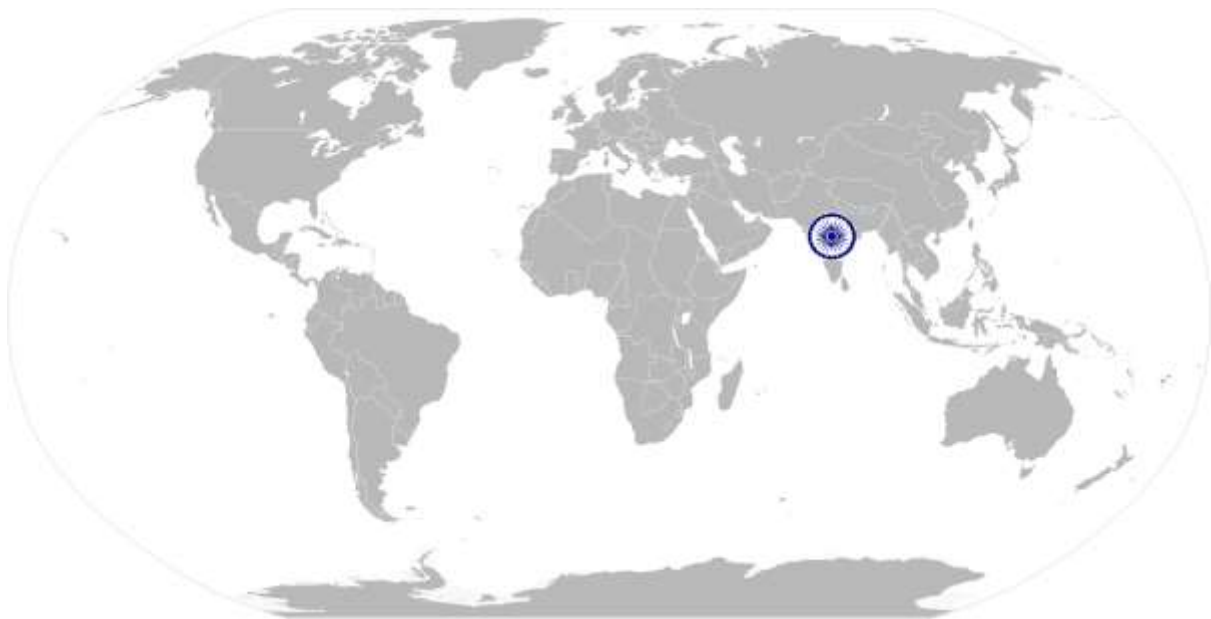
Definitions

Keywords /Terms	Description
Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of performance required.
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.

Sub-Sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Unit Code	Unit Code is a unique identifier for a NOS unit, which can be denoted with an 'N'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.
Keywords /Terms	Description
NOS	National Occupational Standard(s)
NVEQF	National Vocational Education Qualifications Framework
NVQF	National Vocational Qualifications Framework
NSQF	National Skills Qualifications Framework
OEM	Original Equipment Manufacturer
OS	Occupational Standard(s)
QP	Qualifications Pack
NVH	Noise, Vibrations and Harshness

ASC/N8403: Understanding the testing requirement & preparing for On Road Testing of prototyping vehicles

National Occupational Standards



Overview

This unit is about understanding the testing requirements for conducting various on road tests to validate the performance of the prototype vehicle

ASC/N8403: Understanding the testing requirement & preparing for On Road Testing of prototyping vehicles

Unit Code	ASC/N8403
Unit Title (Task)	Understanding the testing requirements and preparing for On Road testing of prototype vehicles
Description	This NOS is about understanding the various tests which need to be undertaken to complete the on road performance testing of the prototype vehicles and understanding the related information
Scope	<p>The role holder will be responsible for:</p> <ul style="list-style-type: none"> understanding the testing requirement and the process understanding various procedures, types of driving tests , driving symbols and vehicle performance parameters
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Understanding the testing requirement and the process	<p>PC1. Ensure that a complete information briefing on the types of tests and performance parameters to be observed is received from the testing engineer/ manager</p> <p>PC2. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors</p> <p>PC3. Understand the vehicle specifications of the test vehicle and the test specifications</p> <p>PC4. Confirm with the test engineer/ test manager, the test procedure to be applied for conducting the various types of outdoor testing of vehicles</p> <p>PC5. Understand the different types of roads, environment test conditions, track conditions, loading conditions, testing route etc. from the test engineer/ test manager before initiation of the test procedure</p> <p>PC6. Ensure that the checklist of complete testing of vehicle manoeuvrability, durability, vehicle performance, structural durability, ride comfort, NVH and vehicle safety is received before initiation of the testing process</p> <p>PC7. Confirm with the test engineer/ test manager, the various data points which need to be captured and analyzed during the running test of the vehicle</p> <p>PC8. Understand the instruments which will be used for recording the observations during the road tests</p> <p>PC9. Ensure that the technician has properly connected of the various data capturing meters and instruments such as load cells, pneumatic/ PLC testing gauges, strain gauges, displacement transducers, accelerometers, GPS data collection devices and data loggers to capture the data points during the vehicle running condition</p>

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	<p>PC10. Confirm the test drive parameters like speed, acceleration, braking, oil & fuel level etc. before initiating the test so that the test results are not adversely impacted</p> <p>PC11. Understand the observation sheet formats and the data which needs to be captured while driving the vehicle</p> <p>PC12. Understand the traffic rules, driving regulations and norms as per the tests which are to be undertaken</p> <p>PC13. Confirm that all the safety features required for the vehicle under running condition are working and are checked as per the vehicle safety check list provided</p> <p>PC14. Ensure that the fitter/ technician has checked of fuel level, oil/ lubricant level, cooling, water level, tyre pressure etc. are checked as per the checklist provided before starting the on road testing of the vehicle prototype</p> <p>PC15. Ensure that any type of system warning indicators showing system, failures, loose connections, malfunctioning etc. are addressed before starting the various types of road test</p>
Knowledge and Understanding (K)w.r.t. the scope	
Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. products manufactured by the company</p> <p>KA2. internal product standards finalized within the organization</p> <p>KA3. quality norms and standards prescribed in the Quality Manual by the organization</p> <p>KA4. 5S and Safety norms practiced in the organization</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. the working of the internal combustion engine (Petrol/ Diesel)/ CNG engines</p> <p>KB2. different parts of the automobile and basic working principle of automobile aggregates</p> <p>KB3. different parameters used to evaluate the performance of the automobile</p> <p>KB4. various regulations and norms governing vehicle driving – as mentioned in Motor Vehicle Act etc.</p> <p>KB5. impact of various types of roads, different environmental conditions, loading conditions etc. on the overall vehicle performance</p> <p>KB6. various defects related to running automobiles and potential impact on the working of the final vehicle</p> <p>KB7. various sources of noise and vibrations in the vehicle and potential causes of the noise and vibrations</p> <p>KB8. how to use jack for changing tires, troubleshooting during low battery charging etc.</p> <p>KB9. various symbols used on the roads assisting/ alerting drivers during on road vehicle driving</p>

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	<p>KB10. good driving principles and good driving skills which impact performance of the vehicle e.g. usage of brakes, clutches, overloading of vehicles, stationary engine raise, over speeding</p> <p>KB11. how to drive in a social environment – speed limits, overtaking vehicles, using indicators, usage of proper headlights and horns etc.</p> <p>KB12. mandatory checks which need to be conducted on the vehicle before trial run</p> <p>KB13. potential health and safety hazards and related safety precautions</p> <p>KB14. personal safety norms such as usage of seat belts, door locking mechanism, helmets, goggles, boots etc. while driving vehicles</p> <p>KB15. emergency response measures while driving on the roads and contact details in case of emergency</p>
Skills (S)w.r.t. the scope	
Elements	Skills
A. Core Skills/ Generic Skills	Writing and reading skills <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information from the manuals, discussion notes, process charts etc.</p> <p>SA2. create small notes/ work documents/ diagrams/ maps for self-help to understand the process</p> <p>SA3. read equipment manuals and process documents to understand the equipment and processes better</p> <p>SA4. read internal information memos send by internal customers (other functions within the organization)</p>
	Oral Communication (Listening and Speaking skills) <p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. discuss task lists, schedules, and work-loads with the supervisor</p> <p>SA6. answer the queries raised by the engineer and supervisor as well as intercompany departments</p> <p>SA7. effectively communicate with others in making them aware of work expectations, targets, policies, processes etc.</p> <p>SA8. attentively listen with full attention to the speaker and comprehend the information given by the speaker</p>
	Analytical Thinking <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. break the problem into smaller issues and tasks to arrive at a solution</p> <p>SB2. understand inter process relationship and establish relationship between various parts of the problem</p> <p>SB3. leverage experience to find effective solutions to problems</p> <p>SB4. use basic analytical tools to arrive at solutions</p>
B. Professional Skills	

ASC/N8403: Understanding the testing requirement & preparing for On Road Testing of prototyping vehicles

	Plan and Organize
	The user/individual on the job needs to know and understand how to:
	SB5. plan, organize and prioritize the work order and jobs received from the manager
	SB6. validate all process/ equipment manuals so that the final process selected is correct
	SB7. organize information, tools, manuals etc. so that sorting becomes easy
	SB8. reorganize resources on the line/ shift in case of change of plans
	Judgment and Critical Thinking
	The user/individual on the job needs to know and understand how to:
	SB9. use common sense and make judgments during day to day basis
	SB10. use reasoning skills to identify and resolve problems
	SB11. use intuition to detect any potential problems which could arise during operations
	Quality Consciousness
	The user/individual on the job needs to know and understand how to:
	SB12. identify faulty/ flawed part and processes during the process and highlight the same to the concerned persons with the required time framework
	SB13. link the fault observed with the overall impact on the performance of the component/ automobile
	SB14. support and contribute in monitoring and delivering high quality output from self and others
	Problem solving and decision making
	The user/individual on the job needs to know and understand how to:
	SB15. gather information skilfully from multiple sources
	SB16. analyse information in depth and identifies the problem in a timely manner
	SB17. Work tireless in spite of repeat activities in a diligent manner to resolve problems on a day to day basis
	SB18. use previous experience in resolving problems and taking decisions
	SB19. make timely and independent decisions within the boundaries of the delegation matrix of the organization
	Customer Orientation
	The user/ individual on the job needs to know and understand how to
	SB20. identify the needs of the customer
	SB21. ensure that the product designed meets the expectation of the customer
	Team work and collaboration
	The user/ individual on the job needs to know and understand how to:

ASC/N8403: Understanding the testing requirement & preparing for On Road Testing of prototyping vehicles

	SB22. contribute to building a positive team spirit SB23. exhibit objectivity & openness to others' views SB24. collaborate with stakeholders to achieve the desired state of final result
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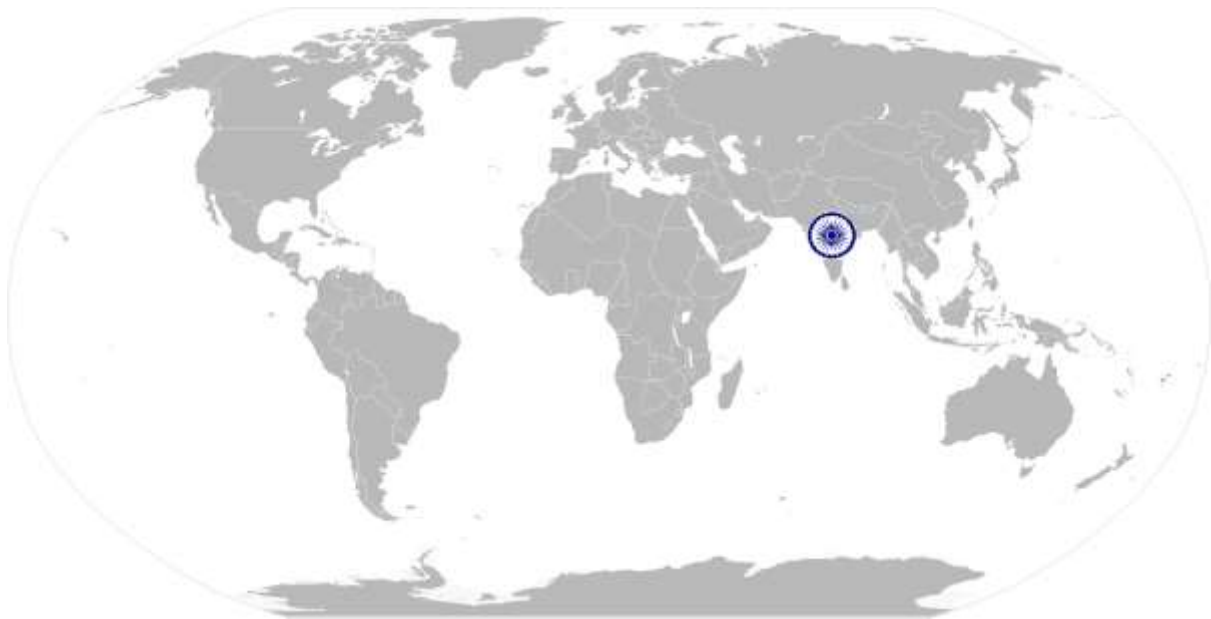
NOS Code	ASC/N8403		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	10/01/2014
Industry Sub-sector	R & D	Last reviewed on	20/1/2014
Occupation	Testing	Next review date	20/1/2016

NOS Version Control



ASC/8404: Conduct vehicle performance evaluation through On road tests

National Occupational Standard



Overview

This unit is about conducting the vehicle performance tests in a simulated manner within an indoor laboratory/ road test conditions

ASC/8404: Conduct vehicle performance evaluation through On road tests

Unit Code	ASC/N8404
Unit Title (Task)	Conduct vehicle performance evaluation thorough On Road tests
Description	This NOS is about driving the vehicle as per the testing norms of the organization, observe defects during various driving scenarios and report the observations to the testing engineer and the testing manager to improve the overall performance of the proto vehicle.
Scope	<p>The role holder will be responsible for:</p> <ul style="list-style-type: none"> conducting the mandatory vehicle checks before the tests drive the vehicle through various vehicle testing scenarios document observations and share feedback on vehicle performance , vehicle handling and vehicle reliability
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Conduct all mandatory checks and drive the vehicle through different testing scenarios to measure vehicle performance	<p>PC1. Conduct a thorough check up of vehicle system displays, gauges, lighting system, signals, levels for lube, water, fuel in the vehicle for correct operations</p> <p>PC2. Check the working of various navigation systems on board the vehicle before the test procedure</p> <p>PC3. For all tests to be conducted outside the company premises/ general road, ensure that all relevant papers are available before initiating the test procedure</p> <p>PC4. Check operations of safety measures like brakes, seat belts, wipers, door locking/ opening mechanisms before carrying out detailed road tests</p> <p>PC5. Drive the vehicle of different types of roads like long distance endurance testing roads, paved roads, stone tracks, mud tracks, corrugated roads etc. as specified in the vehicle testing checklist</p> <p>PC6. Ensure that vehicle performance parameters like torque, braking, vibrations, pickup, overall vehicle handling, driver comfort etc. on various torture tracks like rough stone track, corrugated tracks, bumpy tracks, potholed tracks, sand & mud tracks etc. are observed and comments are entered manually by the driver</p> <p>PC7. Ensure that the vehicle performance parameters like torque, braking, vibration, acceleration/ deceleration, driver comfort, tyre grip etc. on paved road tracks with different loading conditions are captured and observations are noted in the data observation sheets provided by the testing engineer</p> <p>PC8. Ensure capturing of various vehicle performance parameters like torque, vibrations, pickup, water seepage, ease of tyre movement, engine stalling etc. during the water trough wading test and ensure that the various levels of water depth/ vehicle depth in water are recorded</p> <p>PC9. Ensure that the vehicle performance is measured at various slope levels by performing the vehicle gradient test. Observe for any engine stalling, power drop, braking problems observed during the slope gradient test</p>

ASC/8404: Conduct vehicle performance evaluation through On road tests

	<p>PC10. Ensure that parameter like steering comfort, braking power, acceleration/ deceleration, vibrations, tyre grip, turning radius, durability, reliability and vehicle handling ability at different loading conditions are captured on steering pads, flat straight roads and serpentine tracks to collect data for analyzing manoeuvrability</p> <p>PC11. Conduct the 80 km/hour speed braking test, low speed braking test and short distance breaking test to validate the braking distance, vehicle performance, driver comfort, durability and vehicle stability during various braking conditions under various environment conditions like dry roads, wet roads, muddy tracks etc. as well as setting conditions</p> <p>PC12. Capture relevant data such as driving comfort, vehicle mileage, engine performance etc. during long distance endurance testing of vehicles on cross country drives. Note any driving related stresses, loss of concentration, fatigue due to long distance travel</p> <p>PC13. Capture all types of noises like squeaks, rattles and all types of vibrations in the running vehicle especially the ones coming from engine, transmission, gear changing, suspension, exhaust system, air conditioning & internal cabin noise during different running on road tests</p> <p>PC14. Test the operations of the lighting systems such as lamps, head lights and fog lamps using the lamp focus test and lamp brightness test as per the safety norms prescribed by the organization</p> <p>PC15. Test the operations of the signalling systems like reflectors and indicators including brightness, visibility, blinking speeds etc. as per the checklist provided for signal testing</p> <p>PC16. Ensure completion of dust shower, mist chamber and water shower test and check for any leakages of dust, mist and water inside the vehicle to determine any structural flaws with the test vehicle</p> <p>PC17. Check the working of safety measures like windshield wiper movement, rear view and side view mirror visibility while performing the dust, mist and water shower test</p> <p>PC18. Check the durability of the wind shield and side view mirror glass to detect any flaws like cracks, dust/ water accumulation on the glass etc.</p> <p>PC19. Ensure that all safety norms are adhered to while driving. Ensure that the vehicle is immediately stopped if any usual behaviour is observed during driving for self or the vehicle</p> <p>PC20. While driving in traffic conditions, ensure that all traffic rules are adhered to and due care is taken of other vehicle and pedestrians on the road while driving</p> <p>PC21. Record all the observations during different types of test in the formats shared by the testing engineer</p> <p>PC22. Ensure that the correct and relevant feedback on overall vehicle driving experience and vehicle performance is shared with the testing engineer and testing manager. Ensure that the smallest defect observed during driving is highlighted to the engineer</p>
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ASC/8404: Conduct vehicle performance evaluation through On road tests

Adherence to safety requirements	<p>PC23. Ensure that all safety guidelines related to vehicle testing are adhered to while driving</p> <p>PC24. Ensure that safety measures like seat belts, helmets, gloves, boots, knee guards, shoulder guards etc. are worn as per the relevance of the tests</p> <p>PC25. Ensure that safety measures on vehicles like fire extinguishers, emergency brakes, wipers, signals etc. are in the working condition and are tested before the test trial</p> <p>PC26. Maintain safety parameters while driving and keep the vehicle within safe running parameters as specified in the testing manual</p> <p>PC27. Demonstrate the application of emergency safety procedures at the time of emergency observed by the driver during the vehicle running test</p> <p>PC28. Inform the testing engineer of any safety related issues observed during testing of the automobile on the road</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. new products manufactured by the company</p> <p>KA2. internal product standards finalized within the organization</p> <p>KA3. 5S and Safety norms practiced in the organization</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. the working of various automobile components and basic working principle of automobile aggregates</p> <p>KB2. general working of automobiles and linkage & impact of one parameter to another</p> <p>KB3. the working of the internal combustion engine (Petrol/ Diesel)/ CNG engines</p> <p>KB4. different parameters used to evaluate the performance of the automobile</p> <p>KB5. various regulations and norms governing vehicle driving – as mentioned in Motor Vehicle Act etc.</p> <p>KB6. impact of various types of roads, different environmental conditions, loading conditions etc. on the overall vehicle performance</p> <p>KB7. various defects related to running automobiles and potential impact on the working of the final vehicle</p> <p>KB8. various sources of noise and vibrations in the vehicle and potential causes of the noise and vibrations</p> <p>KB9. how to use jack for changing tires, troubleshooting during low battery charging etc.</p> <p>KB10. various symbols used on the roads assisting/ alerting driver during on road vehicle driving</p> <p>KB11. good driving principles and good driving skills which impact performance of the vehicle e.g. usage of brakes, clutches, overloading of vehicles, stationary engine raise, over speeding etc.</p> <p>KB12. how to drive in a social environment – speed limits, overtaking</p>

ASC/8404: Conduct vehicle performance evaluation through On road tests

	<p>vehicles, using indicators, usage of proper headlights and horns etc.</p> <p>KB13. mandatory checks which need to be conducted on the vehicle before trial run</p> <p>KB14. potential health and safety hazards and related safety precautions</p> <p>KB15. personal safety norms such as usage of seat belts, door locking mechanism, helmets, goggles, boots etc. while driving vehicles</p> <p>KB16. emergency response measures while driving on the roads and contact details in case of emergency</p> <p>KB17. impact of environmental parameters like rain, mist, dust, sunlight, snow on overall vehicle and aggregate performance</p> <p>KB18. probable sources of vehicle noise and possible impacts</p> <p>KB19. basic road driving skills and fundamentals of vehicle movement in various conditions</p> <p>KB20. impact of various types of roads, gradient, sand etc. on the performance of the vehicle</p> <p>KB21. impact of wind, water flow, hot & cold conditions, pressure on the performance of the vehicle</p> <p>KB22. potential health and safety hazards and related safety precautions during driving</p> <p>KB23. emergency response methodology in case of accidents</p> <p>KB24. first aid methods at the time of accidents during road testing</p>
Skills (s) [optional]	
A. Core Skills/ Generic Skills	Writing and reading skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information from the manuals, discussion notes, process charts etc.</p> <p>SA2. create small notes/ work documents/ diagrams/ maps for self-help to understand the process</p> <p>SA3. read equipment manuals and process documents to understand the equipment and processes better</p> <p>SA4. read internal information memos send by internal customers (other functions within the organization)</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. discuss task lists, schedules, and work-loads with the supervisor</p> <p>SA6. answer the queries raised by the engineer and supervisor as well as intercompany departments</p> <p>SA7. effectively communicate with others in making them aware of work expectations, targets, policies, processes etc.</p> <p>SA8. attentively listen with full attention to the speaker and comprehend the information given by the speaker</p>
B. Core Skills/ Generic	Analytical Thinking
	The user/individual on the job needs to know and understand how to:

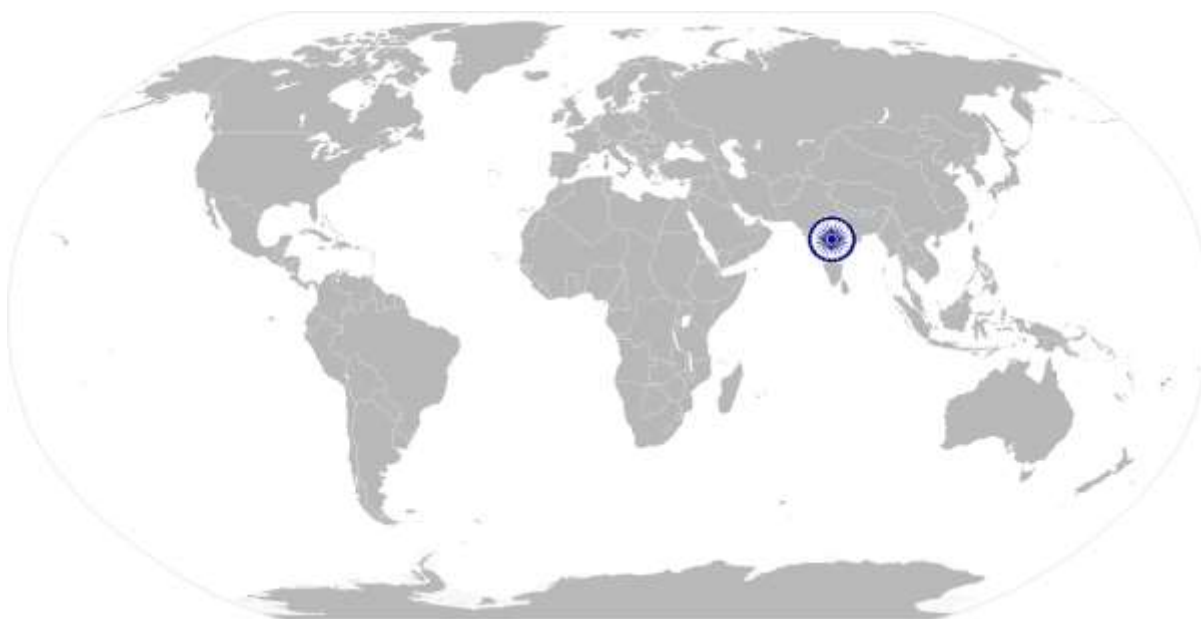
ASC/8404: Conduct vehicle performance evaluation through On road tests

Skills	SB1. break the problem into smaller issues and tasks to arrive at a solution SB2. understand inter process relationship and establish relationship between various parts of the problem SB3. leverage experience to find effective solutions to problems SB4. use basic analytical tools to arrive at solutions
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB5. plan, organize and prioritize the work order and jobs received from the manager SB6. validate all process/ equipment manuals so that the final process selected is correct SB7. organize information, tools, manuals etc. so that sorting becomes easy SB8. reorganize resources on the line/ shift in case of change of plans
	Judgment and Critical Thinking
	The user/individual on the job needs to know and understand how to: SB9. use common sense and make judgments during day to day basis SB10. use reasoning skills to identify and resolve problems SB11. use intuition to detect any potential problems which could arise during operations
	Problem solving and decision making
	The user/individual on the job needs to know and understand how to: SB12. gather information skilfully from multiple sources SB13. analyse information in depth and identifies the problem in a timely manner SB14. develop alternate solutions and resolves problems in early stages SB15. work tireless in spite of repeat activities in a diligent manner to resolve problems on a day to day basis SB16. use previous experience in resolving problems and taking decisions
	Out of Box thinking
	The user/ individual on the job needs to know and understand how to: SB17. familiarise with leading practices available in the market SB18. represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team
	Collaboration
	The user/ individual on the job needs to know and understand how to: SB19. exhibit objectivity & openness to others' views SB20. collaborate with stakeholders to achieve the desired state of final result
	Customer Orientation
	The user/ individual on the job needs to know and understand how to: SB21. identify the needs of the customer SB22. ensure that the product designed meets the expectation of the customer

ASC/8404: Conduct vehicle performance evaluation through On road tests

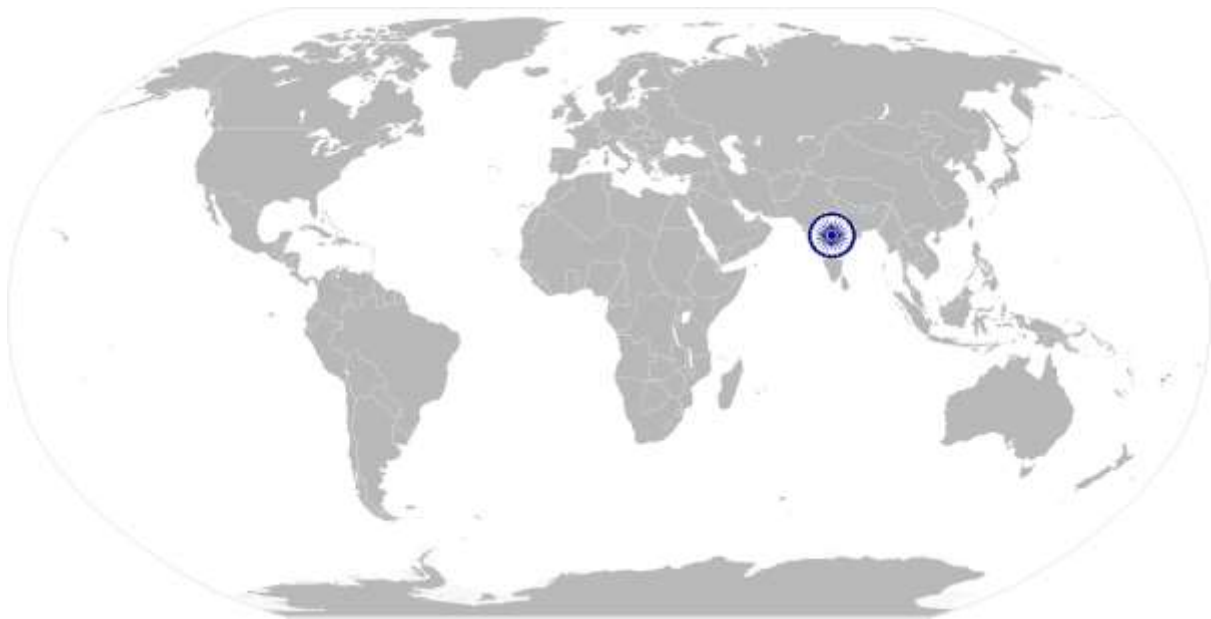
NOS Version Control

NOS Code	ASC/N8404		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	10/01/2014
Industry Sub-sector	R &D	Last reviewed on	20/1/2014
Occupation	Testing	Next review date	20/1/2016



ASC/N0006C: Maintain a safe and healthy working environment at the work place

National Occupational Standards



Overview

This unit is about maintaining a Safe and Healthy working environment

ASC/N0006C: Maintain a safe and healthy working environment at the work place

National Occupational Standard

Unit Code	ASC/N0006C
Unit Title (Task)	Maintain a safe and healthy working environment at the work place
Description	This NOS unit is about creating a Safe and Healthy work place, adhering to the safety guidelines in the working area, following practices which are not impacting the environment in a negative manner and training team members on health and safety related issues
Scope	<p>The role holder will be responsible for:</p> <ul style="list-style-type: none"> identifying and reporting risks creating and sustaining a safe, clean and environmental friendly work place <p>This NOS will be applicable to all Automotive sector manufacturing job roles</p>
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Display awareness to the potential safety risks	<p>PC1. Display understanding of the activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise</p> <p>PC2. Be aware of the areas in the plant/ lab facility which are potentially hazardous/ unhygienic in nature</p> <p>PC3. Understand all risk involving and hazardous areas near the work place are marked/ tagged in order to caution the users of the work area/ machinery</p> <p>PC4. Attend awareness drives held amongst other on sharing information on the identified risks.</p> <p>PC5. Attend periodic awareness sessions are conducted</p>
Display awareness towards maintaining a Safe, clean and environment friendly work place	<p>PC6. Wear the recommended Personal Protective Equipment (PPE) and also ensure self-usage of the required PPEs when entering the plant premises</p> <p>PC7. Display awareness of the instructions given on the equipment manual describing the operating process of the equipment to prevent any hazard</p> <p>PC8. Be aware of the first aid safety kit at the work place/ shop floor location and the requisite items to respond to minor injuries.</p> <p>PC9. Attend all safety and fire drills to be self-aware of safety hazards and preventive techniques and ensure that the team participate in all the required safety and fire drills</p> <p>PC10. Participate in all safety related initiatives like Safety Committee participations, Safety Day Celebrations etc.</p> <p>PC11. Maintain high standards of personal hygiene at the work place</p> <p>PC12. Inform the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others</p>
Knowledge and Understanding (K)w.r.t. the scope	

ASC/N0006C: Maintain a safe and healthy working environment at the work place

Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards, procedures and policies related to Health, Safety and Environment followed in the company KA2. emergency handling procedures & hierarchy for escalation
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. basic knowledge of Safety procedures(fire fighting, first aid) within the organization KB2. knowledge of various types of PPEs and their usage KB3. basic knowledge of risks/hazards associated with each occupation in the organization KB4. how to safely operate various tools and machines and risks associated with the tools/ equipment KB5. knowledge of personal hygiene and how an individual can contribute towards creating a highly safe and clean working environment
Skills (S)w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. write basic level notes and observations SA2. note down observations (if any) related to the process SA3. write information documents to internal departments/ internal teams
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA4. read safety instructions put up across the plant premises SA5. read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA6. effectively communicate information to team members SA7. inform employees in the plant and concerned functions about events, incidents & potential risks observed related to Safety, Health and Environment. SA8. question the process head/ safety team in order to understand the safety related issues SA9. attentively listen with full attention and comprehend the information given by the speaker during safety drills and training programs
B. Professional Skills	Judgmental Thinking
	The user/individual on the job needs to know and understand how to:

ASC/N0006C: Maintain a safe and healthy working environment at the work place

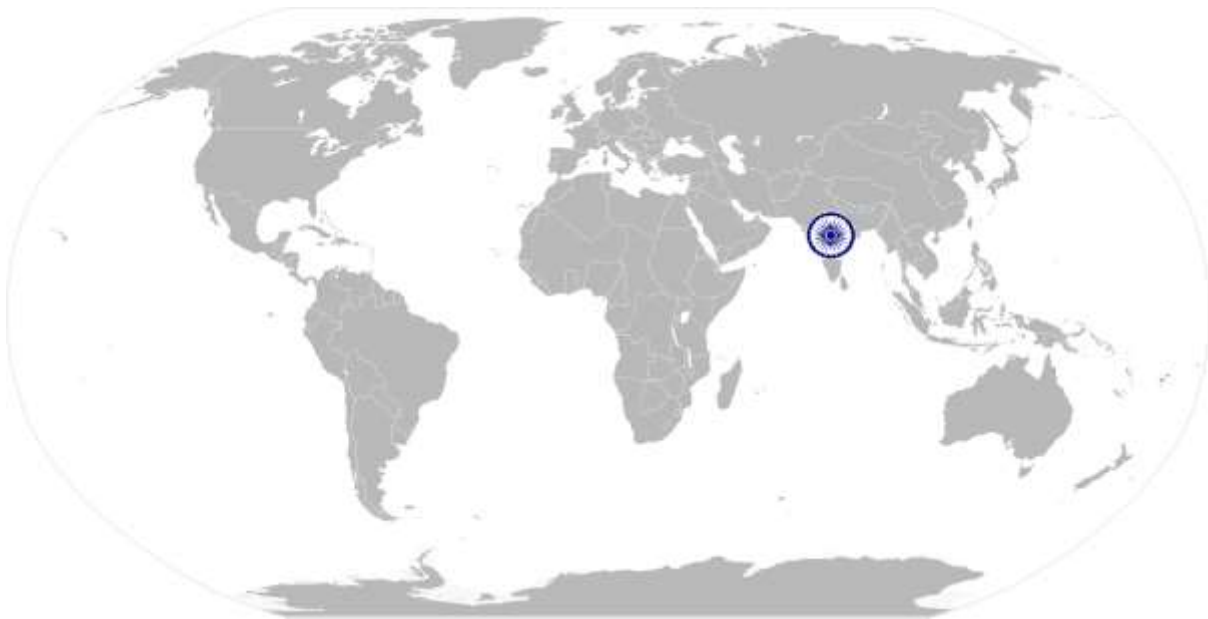
	SB1. use common sense and make judgments during day to day basis
	SB2. use reasoning skills to identify and resolve basic problems
	Persuasion skills
	The user/ individual on the jobs needs to know and understand how to:
	SB3. persuade team members to wear Personal Protective Equipment as per requirement
	SB4. ensure that the team understands the importance of using various machines and equipment without creating any risk to human/ machine
	SB5. train team members on various risks identified
	Analytical Thinking
	The user/individual on the job needs to know and understand how to:
	SB6. break the problem into smaller issues and tasks to arrive at a solution
	SB7. understand inter process relationship and establish relationship between various parts of the problem
	SB8. leverage experience to find effective solutions to problems
	SB9. use basic analytical tools to arrive at solutions

NOS Version Control

NOS Code	ASC/N0006C		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	20/12/2013
Industry Sub-sector	R & D	Last reviewed on	25/12/2013
Occupation	All	Next review date	25/12/2015

ASC/N0021: Maintaining 5S at the work premises

National Occupational Standard



Overview

This unit is about the understanding all principles of 5S and follow the given guidelines to ensure a clean and efficient working environment in the organization

ASC/N0021: Maintaining 5S at the work premises

National Occupational Standard

Unit Code	ASC/N0021
Unit Title (Task)	Maintaining 5S in the work premises
Description	This NOS is about ensuring all 5 S activities both at the shop floor and the office area to facilitate increase in work productivity
Scope	<p>The individual needs to</p> <ul style="list-style-type: none"> Ensure sorting, streamlining & organizing, storage and documentation, cleaning, standardization and sustenance across the plant and office premises of the organization
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Ensure sorting	<p>PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and unnecessary items are not cluttering the workbenches or work surfaces.</p> <p>PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions</p> <p>PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP</p> <p>PC4. Segregate the items which are labelled as red tag items for the process area and keep them in the correct places</p> <p>PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions</p> <p>PC6. Ensure that areas of material storage areas are not overflowing</p> <p>PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required</p> <p>PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area</p> <p>PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards</p>
Ensure proper documentation and storage (organizing , streamlining)	<p>PC10. Follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists</p> <p>PC11. Check that the items in the respective areas have been identified as broken or damaged</p> <p>PC12. Follow the given instructions and check for labelling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.</p> <p>PC13. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions</p>

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Ensure cleaning of self and the work place	<p>PC14. Check whether safety glasses are clean and in good condition</p> <p>PC15. Keep all outside surfaces of recycling containers are clean</p> <p>PC16. Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards</p> <p>PC17. Check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up</p> <p>PC18. Ensure workbenches and work surfaces are clean and in good condition</p> <p>PC19. Follow the cleaning schedule for the lighting system to ensure proper illumination</p> <p>PC20. Store the cleaning material and equipment in the correct location and in good condition</p> <p>PC21. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene</p>
Ensure sustenance	<p>PC22. Follow the daily cleaning standards and schedules to create a clean working environment</p> <p>PC23. Attend all training programs for employees on 5 S</p> <p>PC24. Support the team during the audit of 5 S</p> <p>PC25. Participate actively in employee work groups on 5S and encourage team members for active participation</p> <p>PC26. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions</p>
Knowledge and Understanding (K) w.r.t. the scope	
Element	Knowledge and Understanding
C. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA3. relevant standards, procedures and policies related to 5S followed in the company</p>
D. Technical Knowledge	<p>The user/individual on the job needs to :</p> <p>KB6. have basic knowledge of 5S procedures</p> <p>KB7. know various types 5s practices followed in various areas</p> <p>KB8. understand the 5S checklists provided in the department/ team</p> <p>KB9. have skills to identify useful & non useful items</p> <p>KB10. have knowledge of labels , signs & colours used as indicators</p> <p>KB11. Have knowledge on how to sort and store various types of tools, equipment, material etc.</p> <p>KB12. know , how to identify various types of waste products</p> <p>KB13. understand the impact of waste/ dirt/ dust/unwanted substances on the process/ environment/ machinery/ human body</p> <p>KB14. have knowledge of best ways of cleaning & waste disposal</p>

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	<p>KB15. understand the importance of standardization in processes</p> <p>KB16. understand the importance of sustainability in 5S</p> <p>KB17. have knowledge of TQM process</p> <p>KB18. have knowledge of various materials and storage norms</p> <p>KB19. understand visual controls, symbols, graphs etc.</p>
Skills (S)w.r.t. the scope	
Element	Skills
C. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA10. write basic level notes and observations</p> <p>SA11. note down observations (if any) related to the process</p> <p>SA12. write information documents to internal departments/ internal teams</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA13. read 5S instructions put up across the plant premises</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA14. effectively communicate information to team members inform employees in the plant and concerned functions about 5S</p> <p>SA15. question the process head in order to understand the 5S related issues</p> <p>SA16. attentively listen with full attention and comprehend the information given by the speaker during 5S training programs</p>
D. Professional Skills	Judgmental Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB10. use common sense and make judgments during day to day basis</p> <p>SB11. use reasoning skills to identify and resolve basic problems using 5S</p>
	Persuasion
	<p>The user/ individual on the jobs needs to know and understand how to:</p> <p>SB12. persuade co team members to follow 5 S</p> <p>SB13. ensure that the co team members understand the importance of using 5 S tool</p>
	Creativity
	<p>The user/individual on the job needs to know and understand how to :</p> <p>SB14. use innovative skills to perform and manage 5 S activities at the work desk and the shop floor</p> <p>SB15. exhibit inquisitive behaviour to seek feedback and question on the existing set patterns of work</p>
	Self –Discipline

ASC/N0021: Maintaining 5S at the work premises

	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB16. do what is right, not what is a popular practices</p> <p>SB17. follow shop floor rules& regulations and avoid deviations; make 5S an integral way of life</p> <p>SB18. ensure self-cleanliness on a daily basis</p> <p>SB19. demonstrate the will to keep the work area in a clean and orderly manner</p>
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NOS Version Control

NOS Code	ASC/N0021		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	1/03/2014
Industry Sub-sector	Manufacturing/ R&D	Last reviewed on	15/03/2014
Occupation	All	Next review date	15/03/2016

Qualification Pack for Vehicle test driver L5

Criteria for assessment of Trainees

JOB ROLE	Vehicle Test Driver L5
Qualification Pack	ASC/Q 8402
No. Of NOS	2 Role specific ,2 generic

NOS Title/ NOS Elements	NOS & Performance Criterion Description	Marks allocation	
		Viva	Practical
ASC/N 8403	Understand the testing requirements & the process for carrying out the tests on the vehicle		
Understanding the testing requirement and the process	PC1. Ensure that a complete information briefing on the types of tests and performance parameters to be observed is received from the testing engineer/ manager	10	30
	PC2. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors		
	PC3. Understand the vehicle specifications of the test vehicle and the test specifications		
	PC4. Confirm with the test engineer/ test manager, the test procedure to be applied for conducting the various types of outdoor testing of vehicles		
	PC5. Understand the different types of roads, environment test conditions, track conditions, loading conditions, testing route etc. from the test engineer/ test manager before initiation of the test procedure	20	50
	PC6. Ensure that the checklist of complete testing of vehicle manoeuvrability, durability, vehicle performance, structural durability, ride comfort, NVH and vehicle safety is received before initiation of the testing process		
	PC7. Confirm with the test engineer/ test manager, the various data points which need to be captured and analyzed during the running test of the vehicle		
	PC8. Understand the instruments which will be used for recording the observations during the road tests		
	PC9. Ensure that the technician has properly connected of the various data capturing meters and instruments such as load cells, pneumatic/ PLC testing gauges, strain gauges, displacement transducers, accelerometers, GPS data collection devices and data loggers to capture the data points during the vehicle running condition	20	50
	PC10. Confirm the test drive parameters like speed, acceleration, braking, oil & fuel level etc. before initiating the test so that the test results are not adversely impacted		

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	PC11. Understand the observation sheet formats and the data which needs to be captured while driving the vehicle PC12. Understand the traffic rules, driving regulations and norms as per the tests which are to be undertaken PC13. Confirm that all the safety features required for the vehicle under running condition are working and are checked as per the vehicle safety check list provided PC14. Ensure that the fitter/ technician has checked of fuel level, oil/ lubricant level, cooling, water level, tyre pressure etc. are checked as per the checklist provided before starting the on road testing of the vehicle prototype PC15. Ensure that any type of system warning indicators showing system, failures, loose connections, malfunctioning etc. are addressed before starting the various types of road test	20	50
	subtotal	70	180
ASC/N 8404	Conduct Vehicle performance evaluation by on road tests	Viva	Practical
Conduct all mandatory checks and drive the vehicle through different testing scenarios to measure vehicle performance	PC1. Conduct a thorough check up of vehicle system displays, gauges, lighting system, signals, levels for lube, water, fuel in the vehicle for correct operations PC2. Check the working of various navigation & data logging systems on board the vehicle before the test procedure PC3. For all tests to be conducted outside the company premises/ general road, ensure that all relevant papers are available before initiating the test procedure PC4. Check operations of safety measures like brakes, seat belts, wipers, door locking/ opening mechanisms before carrying out detailed road tests PC5. Drive the vehicle of different types of roads like long distance endurance testing roads, paved roads, stone tracks, mud tracks, corrugated roads etc. as specified in the vehicle testing checklist PC6. Ensure that vehicle performance parameters like torque, braking, vibrations, pickup, overall vehicle handling, driver comfort etc. on various torture tracks like rough stone track, corrugated tracks, bumpy tracks, potholed tracks, sand & mud tracks etc. are observed and comments are entered manually by the driver PC7. Ensure that the vehicle performance parameters like torque, braking, vibration, acceleration/ deceleration, driver comfort, tyre grip etc. on paved road tracks with different loading conditions are captured and observations are noted in the data observation sheets provided by the testing engineer	50	100

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	<p>PC8. Ensure capturing of various vehicle performance parameters like torque, vibrations, pickup, water seepage, ease of tyre movement, engine stalling etc. during the water trough wading test and ensure that the various levels of water depth/ vehicle depth in water are recorded</p> <p>PC9. Ensure that the vehicle performance is measured at various slope levels by performing the vehicle gradient test. Observe for any engine stalling, power drop, braking problems observed during the slope gradient test</p> <p>PC10. Ensure that parameter like steering comfort, braking power, acceleration/ deceleration, vibrations, tyre grip, turning radius, durability, reliability and vehicle handling ability at different loading conditions are captured on steering pads, flat straight roads and serpentine tracks to collect data for analyzing manoeuvrability</p> <p>PC11. Conduct the 80 km/hour speed braking test, low speed braking test and short distance breaking test to validate the braking distance, vehicle performance, driver comfort, durability and vehicle stability during various braking conditions under various environment conditions like dry roads, wet roads, muddy tracks etc. as well as setting conditions</p> <p>PC12. Capture relevant data such as driving comfort, vehicle mileage, engine performance etc. during long distance endurance testing of vehicles on cross country drives. Note any driving related stresses, loss of concentration, fatigue due to long distance travel</p> <p>PC13. Capture all types of noises like squeaks, rattles and all types of vibrations in the running vehicle especially the ones coming from engine, transmission, gear changing, suspension, exhaust system, air conditioning & internal cabin noise during different running on road tests</p> <p>PC14. Test the operations of the lighting systems such as lamps, head lights and fog lamps using the lamp focus test and lamp brightness test as per the safety norms prescribed by the organization</p> <p>PC15. Test the operations of the signalling systems like reflectors and indicators including brightness, visibility, blinking speeds etc. as per the checklist provided for signal testing</p> <p>PC16. Ensure completion of dust shower, mist chamber and water shower test and check for any leakages of dust, mist and water inside the vehicle to determine any structural flaws with the test vehicle</p>	50	100
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Qualification Pack for Vehicle test driver L5

	<p>PC17. Check the working of safety measures like windshield wiper movement, rear view and side view mirror visibility while performing the dust, mist and water shower test</p> <p>PC18. Check the durability of the wind shield and side view mirror glass to detect any flaws like cracks, dust/ water accumulation on the glass etc.</p> <p>PC19. Ensure that all safety norms are adhered to while driving. Ensure that the vehicle is immediately stopped if any usual behaviour is observed during driving for self or the vehicle</p> <p>PC20. While driving in traffic conditions, ensure that all traffic rules are adhered to and due care is taken of other vehicle and pedestrians on the road while driving</p> <p>PC21. Record all the observations during different types of test in the formats shared by the testing engineer</p> <p>PC22. Ensure that the correct and relevant feedback on overall vehicle driving experience and vehicle performance is shared with the testing engineer and testing manager. Ensure that the smallest defect observed during driving is highlighted to the engineer</p>	30	50
Adherence to safety requirements	<p>PC23. Ensure that all safety guidelines related to vehicle testing are adhered to while driving</p> <p>PC24. Ensure that safety measures like seat belts, helmets, gloves, boots, knee guards, shoulder guards etc. are worn as per the relevance of the tests</p> <p>PC25. Ensure that safety measures on vehicles like fire extinguishers, emergency brakes, wipers, signals etc. are in the working condition and are tested before the test trial</p> <p>PC26. Maintain safety parameters while driving and keep the vehicle within safe running parameters as specified in the testing manual</p> <p>PC27. Demonstrate the application of emergency safety procedures at the time of emergency observed by the driver during the vehicle running test</p> <p>PC28. Inform the testing engineer of any safety related issues observed during testing of the automobile on the road</p>	20	50
	subtotal	150	300
ASC/N 0006	Maintain safe , healthy environment friendly workplace	Viva	Practical
Identify and report the risks identified	<p>PC1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise</p> <p>PC2. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc.</p>		

	<p>PC3. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations</p> <p>PC4. Create awareness amongst other by sharing information on the identified risks</p>	20	50
Create and sustain a Safe, clean and environment friendly work place	<p>PC5. Follow the instructions given on the equipment manual describing the operating process of the equipment</p> <p>PC6. Follow the Safety, Health and Environment related practices developed by the organization</p> <p>PC7. Operate the machine using the recommended Personal Protective Equipment (PPE)</p> <p>PC8. Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc.</p> <p>PC9. Maintain high standards of personal hygiene at the work place</p> <p>PC10. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.</p> <p>PC11. Inform appropriately the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others</p>	50	40
	subtotal	70	90
ASC / N 0021	Maintain 5 S activities at the workplace	Viva	practical
Ensure sorting	<p>PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un-necessary items are not cluttering the workbenches or work surfaces.</p> <p>PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions</p> <p>PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP</p> <p>PC4. Segregate the items which are labelled as red tag items for the process area and keep them in the correct places</p> <p>PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions</p> <p>PC6. Ensure that areas of material storage areas are not overflowing</p> <p>PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required</p> <p>PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area</p> <p>PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the</p>	<p>10</p> <p>10</p>	<p>20</p> <p>20</p>

Qualification Pack for Vehicle test driver L5

	prescribed instructions and standards		
Ensure proper documentation and storage (organizing, streamlining)	PC10. Follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists PC11. Check that the items in the respective areas have been identified as broken or damaged PC12. Follow the given instructions and check for labelling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc. PC13. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions	10	20
Ensure sustenance	PC14. Follow the daily cleaning standards and schedules to create a clean working environment PC15. Attend all training programs for employees on 5S PC16. Support the team during the audit of 5S PC17. Participate actively in employee work groups on 5S and encourage team members for active participation PC18. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions	20	30
	Sub total	60	130
	Total	350	700