

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR AUTOMOTIVE INDUSTRY

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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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Qualifications Pack-Auto Engine Repair Technician

Introduction

SECTOR: AUTOMOTIVE

SUB-SECTOR: AUTOMOTIVE VEHICLE SERVICE

OCCUPATION: TECHNICAL SERVICE & REPAIR

JOB ROLE: AUTOENGINE REPAIR TECHNICIAN

REFERENCE ID: ASC/ Q 1409

ALIGNED TO : NCO-2004/ 7231.20

Auto Engine Repair Technician is also known as Mechanic, Technician, Vehicle/Automobile Mechanic, Repair and Maintenance Technician.

Brief Job Description: An **Auto Engine Repair Technician** is responsible for the repair of vehicle engines and aggregates.

Personal Attributes: An individual on this job must have good communication and interpersonal skills in addition to being a team player, as the job requires coordination with other Technicians as well. The individual must have a technical bend of mind to understand the technical aspects related to engine and allied aggregates (like turbocharger), which would also help in understanding the fault diagnosis in the engine. Keeping oneself abreast of the latest developments and newer technologies used in the mechanical systems of engine aggregates is highly desirable.

Job Details	Qualifications Pack Code	ASC/ Q 1409		
	Job Role	Auto Engine Repair Technician		
	Credits(NSQF)	TBD	Version number	1.1
	Industry	Automotive	Drafted on	10/06/13
	Sub-sector	Automotive Vehicle Service	Last reviewed on	10/06/13
	Occupation	Technical Service & Repair	Next review date	Under revision expected date of revised version 31-Dec-15
NSQC Clearance on			24/07/15	

Job Role	Auto Engine Repair Technician
Role Description	Carry out routine servicing and simple repairs and maintenance of vehicles
NSQF level	4
Minimum Educational Qualifications	ITI in Automobile
Maximum Educational Qualifications	Diploma in Automotive Repair
Entry Age	<p>1 ASDC recommends that candidates should seek full employment not before attaining an age of 18 years.</p> <p>2 However, as per Factories Act 1948 and Shops & Establishment Act 1953:</p> <p>- No one can be employed before attaining the age of 14</p> <p>3 Please note that under the Factories Act 1948, and Shops & Establishment Act 1953 different States may have slightly varying provision which need to be adhered to.</p>
Training (Suggested but not mandatory)	<p>On the job training:</p> <ul style="list-style-type: none"> Desirable for ASDC Auto Engine Repair Technician Certificate or Diploma in Automotive Repair Compulsory for all other qualifications
Experience	<ul style="list-style-type: none"> 1-2 years if ASDC Auto Engine Repair Technician Certificate or Diploma in Automotive Repair 3-5 years for other qualifications
Occupational Standards (OS)	<p>Compulsory:</p> <p>ASC/ N 1418: Carry out repairs of engine and other related mechanical aggregates</p> <p>ASC/ N 0001: Plan and organise work to meet expected outcomes</p> <p>ASC/ N 0002: Work effectively in a team</p> <p>ASC/ N 0003: Maintain a healthy, safe and secure working environment0</p>
Performance Criteria	As described in the relevant NOS units

Definitions

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.
Vehicle	Mode of personal transport including 2-wheelers, 3-wheelers and 4-wheelers (including passenger vehicles and commercial vehicles). This includes gasoline, petrol, CNG, electrical and hybrid vehicles
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

ASC/ N 1418: Carry out repairs of engine and other related mechanical aggregates

National Occupational Standards



Overview

This Occupational Standard describes the knowledge, understanding and skills required of an individual to carry out repairs of engine and other related mechanical aggregates in a vehicle, including 2-wheelers, 3-wheelers and 4-wheelers (including passenger vehicles and commercial vehicles). This also includes diesel, petrol, CNG, electrical and hybrid vehicles.

ASC/ N 1418: Carry out repairs of engine and other related mechanical aggregates

National Occupational Standard	Unit Code	ASC/ N 1418
	Unit Title (Task)	Carry out repairs of engine and other related mechanical aggregates
	Description	This NOS unit is about an individual carrying out, repairs activities in the engine and other allied mechanical aggregates (like turbocharger).
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> carry out service and repair activities in the engine and other related mechanical aggregates (like turbocharger) carry out disassembly and assembly of the engine and its aggregates to solve the problems in the vehicle due to some fault in the engine aggregates
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Carry out the repair and assemble / disassemble of the engine & related aggregates	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. understand the auto component manufacturer specifications related to the various engine components/ aggregates in the vehicle (including turbocharger)</p> <p>PC2. follow standard operating procedures for using workshop tools and equipment for service and repairs of engine and its aggregates</p> <p>PC3. conduct test drives to assess need for repairs, calibration or any other adjustments in the engine and its related mechanical aggregates</p> <p>PC4. review the job card and understand work to be carried out in the engine and related aggregates</p> <p>PC5. in case of non-routine service or repair, confirm tasks to be carried out with superior</p> <p>PC6. ensure that the correct spare parts, lubricants, tools and other materials required have been obtained</p> <p>PC7. calibrate, align and adjust settings, alignment and other tolerance levels relevant to the following engine and allied aggregates:</p> <ul style="list-style-type: none"> engine and aggregates (including flywheel) allied engine aggregates (like radiator etc.) air intake and exhaust systems like (like turbocharger, intercooler etc.) cooling & lubrication system fuel ignition system (like injectors, fuel injection high pressure lines etc.) transmission system (including gearbox, differential, propeller shaft and axles) steering system clutch and brake assembly electrical and electronic components (related to engine including alternator, wire harness etc.) <p>PC8. repair and replace:</p> <ul style="list-style-type: none"> cylinder block cylinder head

ASC/ N 1418: Carry out repairs of engine and other related mechanical aggregates

	<ul style="list-style-type: none"> • piston liner • piston (including piston rings) • crankshaft (including main and BE journal) • camshaft • connecting rod • air compressor • flywheel (including ring gear and damper) • fuel systems (diesel, petrol, electrical, gas etc.) • radiator • emission and exhaust system • steering system • various lubrication systems connected to the engine <p>PC9. carry out repair activities on the engine aggregates safely to ensure:</p> <ul style="list-style-type: none"> • no damage to the vehicle or other vehicles • no damage to vehicle components and systems • no contact with hazardous materials <p>PC10. dismantle, assess, repair, clean, replace, adjust and reassemble vehicle mechanical engine aggregates</p> <p>PC11. identify and change engine components requiring change due to continuous wear and tear(including oil and air filters)</p> <p>PC12. ensure all dismantled engine components are cleaned and conditioned prior to reassembly</p> <p>PC13. ensure disposal of materials (including waste oil, scrap of failed parts/ aggregates) in accordance with the organisation’s policies</p> <p>PC14. refill correct grade of coolants, lubricants, engine oil and other fluids in the engine aggregates as per OEM guidelines</p> <p>PC15. understand the various precautions to be taken to avoid damage to the vehicle and its components while working on the engine aggregates and sub-assemblies</p> <p>PC16. record all service and repairs carried out on the engine and allied aggregates and ensure completeness of tasks assigned before releasing vehicle for the next repair or maintenance procedure</p> <p>PC17. ensure all workshop tools, equipment and workstations are adequately maintained by carrying out scheduled checks, calibration and timely repairs where necessary</p> <p>PC18. ensure any malfunctions observed in tools and equipment are reported to the concerned persons</p> <p>PC19. ensure any other repair requirements observed in the other components/ aggregates systems (like engine, gear box etc.) while repairing/ overhauling of braking systems are reported to Supervisor/ Service Advisor for further inspection by other specialists</p> <p>PC20. use resources responsibly (e.g. use of grease and other consumables)</p> <p>PC21. measure/ inspect the machining or any other repair done from an outside source/ local machining garages</p> <p>PC22. recognise when to seek assistance from a senior technician in case of diagnosis</p>
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ASC/ N 1418: Carry out repairs of engine and other related mechanical aggregates

	<p>of the engine related aggregates</p> <p>PC23. ensure that trainings organized by the OEM from time-to-time are attended and knowledge levels are upgraded (esp. in case of newly launched products, product refreshes)</p> <p>PC24. drive a relevant 2/3/4 wheeler vehicle which is an important part of the diagnosis of the type of vehicle that is dealt by the relevant OEM</p>
Knowledge and Understanding (K) w.r.t. the scope	
Element	Knowledge and Understanding
<p>A. Organisational Context (Knowledge of the Company/ Organisation and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. standard operating procedures for servicing and repair of the engine components and aggregates in the vehicle</p> <p>KA2. standard schedules and checklists recommended by the OEM for servicing and repair of the engine components and aggregates in the vehicle</p> <p>KA3. identification codes, nomenclature of various engine components and aggregates in a vehicle</p> <p>KA4. correct and appropriate grade of engine oil, coolant or lubricant to be used for the corresponding engine variants as specified by the OEM/ Engine Manufacturer</p> <p>KA5. standard operating procedures recommended by the Dealership/ Suppliers/OEM for using tools and equipment to be followed related to various engine aggregates and components in a vehicle as per the Tool Manufacturer instructions</p> <p>KA6. standard operating procedures for rectification of errors in information (e.g. rectification of job card, reissue of correct tools and equipment etc.)</p> <p>KA7. safety requirements for equipment and components prescribed by the OEM (e.g. preventing/ dealing with oil spillage and inflammable materials)</p> <p>KA8. documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/ auto component manufacturer</p> <p>KA9. organisational and professional code of ethics and standards of practice</p> <p>KA10. safety, health and environmental policies and regulations for the workplace as well as for automotive trade in general(e.g. safe working practices inside pits/ under vehicles)</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. the basic technology used for various types of engine and allied aggregates:</p> <ul style="list-style-type: none"> • working cycle (2 stroke and 4 stroke) • fuel (petrol, diesel, CNG, LPG, electric/ hybrid types) • cylinder type <ul style="list-style-type: none"> - single cylinder - multi cylinder (including inline, straight, horizontal, inline “V” shape)

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	<ul style="list-style-type: none"> • cooling system (air or water cooled) <p>KB2. the functioning of of various components and component systems in the engine and its aggregates(including the various repair requirements) including:</p> <ul style="list-style-type: none"> • air intake and exhaust systems <ul style="list-style-type: none"> - air filter - turbocharger - intercooler - exhaust and intake manifold - intake and exhaust valve • cooling system <ul style="list-style-type: none"> - water pump • fuel system <ul style="list-style-type: none"> - fuel tank - fuel injectors - FIP (fuel injection pump) • lubrication system <ul style="list-style-type: none"> - oil pump (including pressure relieve valve) - oil filter & heat exchanger <p>KB3. the functioning of other aggregates (other than engine and allied aggregates) including :</p> <ul style="list-style-type: none"> • clutch assembly • transmission systems (manual, automatic etc.) • hydraulic and pneumatic system • brake system • drive-train assembly • steering system • suspension system • electrical, ignition, electronic and air-conditioning system etc. <p>KB4. typical causes and symptoms of operational faults and failures of a vehicle which are related to engine and it aggregates :</p> <ul style="list-style-type: none"> • poor pickup • HEOC (high engine oil consumption) • low power generation • low oil pressure • blow-by • excessive black smoke • noisy turbocharger • oil leakage • unusual noise from the engine or allied aggregates • any other complaint/ fault related to mainly the engine and its aggregates <p>KB5. the tools used to assess deviations from specifications during routine servicing,</p>
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	<p>including use of:</p> <ul style="list-style-type: none"> • pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc. • pullers: ball joint separators, bearing pullers, gear puller tools, slide hammers etc. • specialty wrenches: alignment wrenches, chain wrenches, locking wrenches, lug wrenches etc. • trim or moulding tools: carbon scrapers, gasket scrapers, scrapers, spoons etc. • measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc. • other tools: hand tools, power tools, lifting and jacking equipment, tensioning equipment, brake roller tester, chassis dynamometer, suspension activation, security activator etc. • tools for other tasks such as cleaning of vehicles, tools, equipment and workshop <p>KB6. how to repair, routine service and maintenance of the major aggregates within the engine including:</p> <ul style="list-style-type: none"> • cylinder block • cylinder head • piston liner • piston (including piston rings) • crankshaft (including main and BE journal) • camshaft • connecting rod • air compressor • flywheel (including ring gear and damper) • fuel systems (diesel, petrol, electrical, gas etc.) • radiator • emission and exhaust system <p>KB7. how to select the right materials for the job such as seals, sealants, fittings, gaskets, joints, fasteners etc.</p> <p>KB8. how to carry out routine maintenance including:</p> <ul style="list-style-type: none"> • checking engine condition in the vehicle against OEM specifications to identify damage, corrosion, wear and tear, fluid levels, leaks and other problems in serviceability • make adjustments to settings, alignment and tolerance levels relevant to: <ul style="list-style-type: none"> - engine and aggregates (including flywheel) - allied engine aggregates (like radiator etc.) - air intake & exhaust system like (like turbocharger, intercooler etc.) - cooling & lubrication system
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	<ul style="list-style-type: none"> - fuel ignition system (like injectors, fuel injection high pressure lines etc.) - transmission system (including gearbox, differential, propeller shaft and axles) - steering system - clutch and brake assembly - electrical and electronic components (related to engine including alternator, wire harness etc.) <p>KB9. how to measure/ inspect the machining or any other repair done from an outside source/ local machining garages on the various engine aggregates (like machining of the piston, cylinder head, cylinder block)</p> <p>KB10. how to carry out the full overhaul of the engines (with support from the other technicians and machine shops from local garages)</p> <p>KB11. the various sources of information available for assessing service and repair requirements of the engine and allied aggregates in a vehicle including:</p> <ul style="list-style-type: none"> • diagnostic displays • visual inspections • test drives • various manuals from OEM and engine manufacturer • vehicle/equipment manufacturer specifications • standard operating procedures <p>KB12. procedures recommended by the OEM and Dealership to be used during routine servicing of the various engine and its aggregates</p> <p>KB13. the type and quality of components specified by the OEM for use as replacement parts</p> <p>KB14. The correct and appropriate grade of engine oil, coolant or lubricants for the corresponding engine variants as specified by the OEM/ engine manufacturer for use</p> <p>KB15. corrective action to be taken for common engine and aggregate system faults and failures</p> <p>KB16. faults and failures in the engine and allied aggregates that necessitate replacement of components and other units</p> <p>KB17. how to dispose -off replaced failed components and changed oil, lubricant, grease etc. in accordance with safety, health and environmental policies and regulations</p> <p>KB18. precautions to be taken to ensure the following while working on the engine aggregates and components (including specific precautions to be taken when working with alternative fuel/ hybrid vehicles):</p> <ul style="list-style-type: none"> • no damage to the electrical / other advanced systems (in case of hybrid/ electrical vehicles) • no damage to the vehicle on which work is being done along with other vehicles parked besides • no damage to vehicle components sub-assemblies and other systems (other
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	<p>than the engine aggregates on which the repair is being done)</p> <ul style="list-style-type: none"> • no contact with hazardous materials <p>KB19. when to ask for assistance from a superior</p>
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. create documentation required on the job (including job cards, work sheets, etc.) regarding the basic details of repair, maintenance and service performed on the engine and its allied aggregates
	SA2. write any additional requirement of work on the vehicle reported for engine service, maintenance or repair found during the work done as specified in the job card (for e.g. while working on the engine and transmission system, if low level of engine oil/ greasing or coolant, then convey to the superiors)
	SA3. write in at least one language
Reading skills	
The user/individual on the job needs to know and understand how to:	
SA4. read job cards and instructions from Supervisors and the Service Advisor regarding the repair and service of engine aggregates	
SA5. read various sources of information available for assessing service and repair requirements of the engine aggregates in a vehicle including service manual and diagnostic and visual displays put up in the workshop	
SA6. read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the engine and its aggregates	
Oral Communication (Listening and Speaking skills)	
The user/individual on the job needs to know and understand how to:	
SA7. clearly communicate workplace information and ideas with workplace colleagues (verbal & non-verbal)	
SA8. use terms, names, grades and other nomenclature pertaining to the Automotive trade, tools, specific workshop equipment etc.	
SA9. communicate with colleagues to handle verbal enquiries, such as clarifying instructions and responding to requests for information	
SA10. interact with the customer through Service Advisor/ Supervisor in case any additional work needs to be done on the engine aggregates as a result of diagnosis of some complaint leading to additional repair in the vehicle in the engine aggregate	
B. Professional Skills	Decision making
	The user/individual on the job needs to know and understand how to:
	SB1. analyse information and evaluate results to choose the best solution and solve

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	<p>problems</p> <p>SB2. decide on the repair/ replacement of any engine aggregate post the diagnosis (with help from a superior in case required)</p> <p>SB3. judge when to ask for help from a Superior or senior diagnosis technician</p>
	<p>Plan and Organise</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. plan work according to the required schedule and location</p> <p>SB5. plan the assigned engine repair work (including the specific engines that needs to be overhauled)and provide estimates of time required for each engineoverhaul repair</p> <p>SB6. organise theschedule to complete work on the engine aggregate timely in case other aggregate repairs/ maintenance work is also required to be done</p>
	<p>Customer centricity</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. interpret the customer needs basis the complaint which may be as a result of some fault in the engine aggregates (like high engine oil consumption, noisy engine, engine oil leakage)are assessed and every effort is made to resolve the complaints</p> <p>SB8. ensure that the service provided is of the highest order to ensure higher levels of customer satisfaction</p> <p>SB9. ensure timely communication of the additional work on the engine aggregates while carrying out other repairs in the engine aggregates to the Service Advisor/ Supervisor who in turn communicates it to the customer</p> <p>SB10. follow up with the Service Advisor on any unfavourable feedback received from customer on the service and repair on the engine aggregates</p>
	<p>Problem solving</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB11. recognise a workplace problem or a potential problem and take action (e.g. leaks or oil spills in the workshop)</p> <p>SB12. determine problems needing priority action (e.g. while working on the engine, crank / pistons require machining as they have been worn out, inform the service advisor or supervisor for urgent action)</p> <p>SB13. refer problems outside area of responsibility to appropriate person (e.g. unavailability of required spare parts or materials in the workshop)</p> <p>SB14. gather information while working on engine aggregate/ components and take appropriate action, by consulting superiors</p>
	<p>Analytical thinking</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB15. assess repairs required based on technical faults identifiedas specified in the job card/ supervisor notes</p> <p>SB16. refer complex problems(outside the current scope of work) to a superior in case any additional work requirement comes up</p>
	<p>Critical thinking</p>

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	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB17. analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently</p> <p>SB18. use the diagnosis results to take an appropriate decision on repair/ replacement of engine aggregates in consultation with the supervisor/ aggregate specialist/ service advisor</p>
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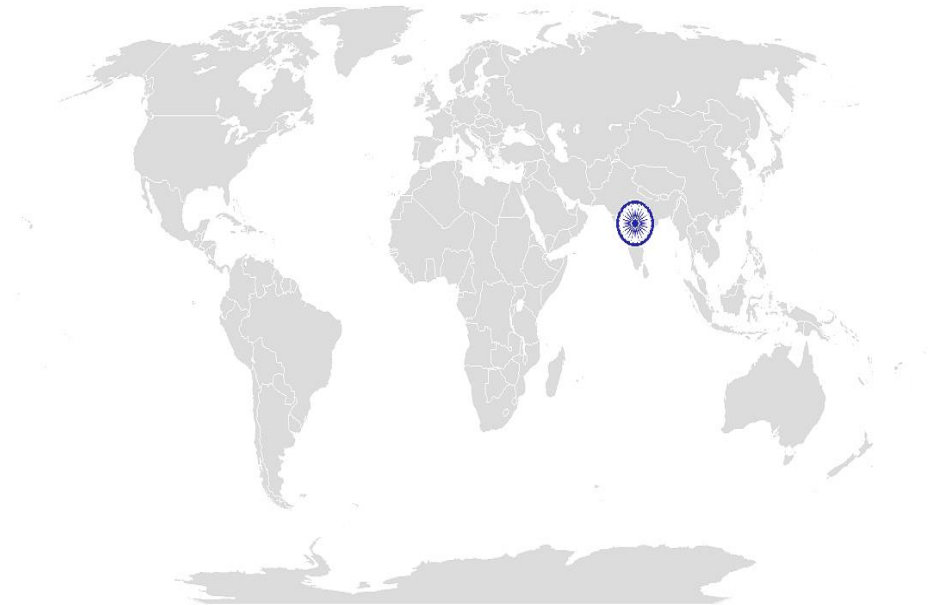
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NOS Version Control

NOS Code	ASC/ N1418		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	10/06/13
Industry Sub-sector	Automotive Vehicle Service	Last reviewed on	10/06/13
		Next review date	Under revision expected date of revised version 31- Dec-15
		NSQC Clearance on	24/07/15

ASC/N0001: Plan and organise work to meet expected outcomes

National Occupational Standards



Overview

This unit is about planning and organising an individual's work in order to complete it to the required standards, on time and within budget in terms of cost and material.

ASC/N0001: Plan and organise work to meet expected outcomes

National Occupational Standard	Unit Code	ASC/N0001
	Unit Title (Task)	Plan and organise work to meet expected outcomes
	Description	This NOS unit is about planning and organising an individual's work in order to complete it to the required standards on time.
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> work requirements including various activities, deliverables or work output required in the given time, maintain set quality standards appropriate use of resources (both material / equipment's and manpower)
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Work requirements including various activities within the given time and set quality standards	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC1. keep immediate work area clean and tidy PC2. treat confidential information as per the organisation's guidelines PC3. work in line with organisation's policies and procedures PC4. work within the limits of job role PC5. obtain guidance from appropriate people, where necessary PC6. ensure work meets the agreed requirements
	Appropriate use of resources	<ul style="list-style-type: none"> PC7. establish and agree on work requirements with appropriate people PC8. manage time, materials and cost effectively PC9. use resources in a responsible manner
	Knowledge and Understanding (K) w.r.t. the scope	
	Element	Knowledge and Understanding
A. Organisational Context (Knowledge of the Company/Organisation and its processes)	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> KA1. the organisation's policies, procedures and priorities for area of work, role and responsibilities in carrying out that work KA2. the limits of responsibilities and when to involve others KA3. specific work requirements and who these must be agreed with KA4. the importance of having a tidy work area and how to do this KA5. how to prioritize workload according to urgency and importance and the benefits of this KA6. the organisation's policies and procedures for dealing with confidential information and the importance of complying with these KA7. the purpose of keeping others updated with the progress of work KA8. who to obtain guidance from and the typical circumstances when this may be required KA9. the purpose and value of being flexible and adapting work plans 	

ASC/N0001: Plan and organise work to meet expected outcomes

	to reflect change
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. how to complete tasks accurately by following standard procedures KB2. technical resources needed for work and how to obtain and use these
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 in at least one language
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. read instructions, guidelines/procedures
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA3. ask for clarification and advice from appropriate persons SA4. communicate orally with colleagues
B. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: SB1. make a decision on a suitable course of action appropriate for accurately completing the task within resources
	Plan and Organise
	The user/individual on the job needs to know and understand how to: SB2. agree objectives and work requirements SB3. plan and organise work to achieve targets and deadlines
	CustomerCentricity
	The user/individual on the job needs to know and understand how to: SB4. deliver consistent and reliable service to customers SB5. check own work and ensure it meets customer requirements
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB6. refer anomalies to the concerned persons
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB7. analyse problems and identify work -arounds taking help from

ASC/N0001: Plan and organise work to meet expected outcomes

	concerned persons where required
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB8. apply own judgement to identify solutions in different situations



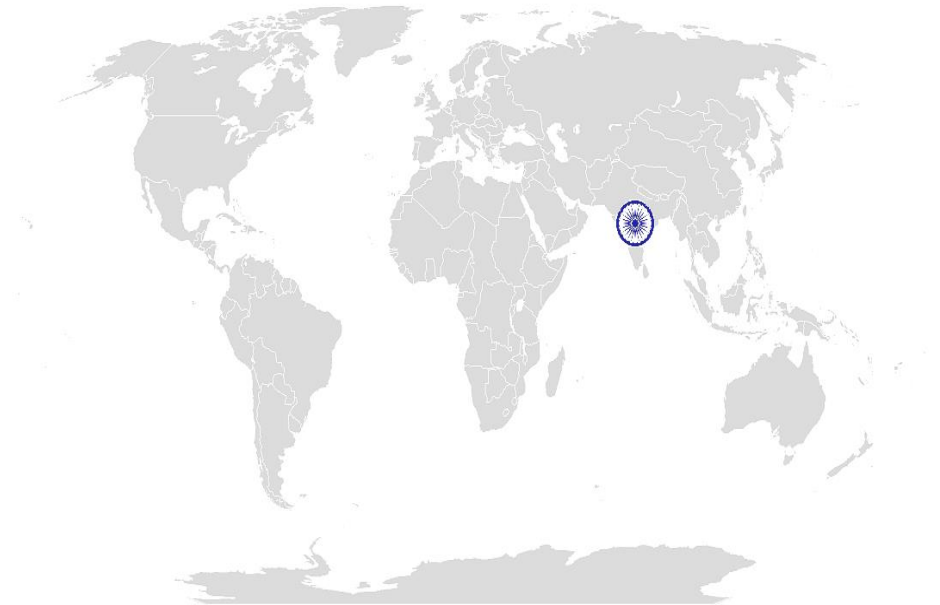
ASC/N0001: Plan and organise work to meet expected outcomes

NOS Version Control

NOS Code	ASC/N0001		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	10/06/13
Industry Sub-sector	NA	Last reviewed on	10/06/13
		Next review date	Under revision expected date of revised version 31-Dec-15
		NSQC Clearance on	24/07/15

ASC/N0002: Work effectively in a team

National Occupational Standards



Overview

This unit is about working effectively with colleagues, either in own work group or in other work groups within organisation.

ASC/N0002: Work effectively in a team

National Occupational Standard	Unit Code	ASC/N0002
	Unit Title (Task)	Work effectively in a team
	Description	This NOS unit is about working effectively within a team, either in individual's own work group or in other work groups outside the organisation.
	Scope	This unit/task covers the following: Colleagues: <ul style="list-style-type: none"> Interact & communicate effectively with colleagues including member in the own group as well as other groups
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Interact & communicate effectively with colleagues including member in the own group as well as other groups	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC1. maintain clear communication with colleagues (by all means including face-to-face, telephonic as well as written) PC2. work with colleagues to integrate work PC3. pass on information to colleagues in line with organisational requirements both through verbal as well as non-verbal means PC4. work in ways that show respect for colleagues PC5. carry out commitments made to colleagues PC6. let colleagues know in good time if cannot carry out commitments, explaining the reasons PC7. identify problems in working with colleagues and take the initiative to solve these problems PC8. follow the organisation's policies and procedures for working with colleagues PC9. ability to share resources with other members as per priority of tasks
	Knowledge and Understanding (K) w.r.t. the scope	
	Element	Knowledge and Understanding
	A. Organisational Context (Knowledge of the Company/Organisation and its processes)	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> KA1. the organisation's policies and procedures for working with colleagues, role and responsibilities in relation to this KA2. the importance of effective communication and establishing good working relationships with colleagues KA3. different methods of communication and the circumstances in which it is appropriate to use these KA4. the importance of creating an environment of trust and mutual respect KA5. the implications of own work on the work and schedule of others

ASC/N0002: Work effectively in a team

B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. different types of information that colleagues might need and the importance of providing this information when it is required</p> <p>KB2. the importance of helping colleagues with problems, in order to meet quality and time standards as a team</p>
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. complete written work with attention to detail
	Reading Skills
	The user/individual on the job needs to know and understand how to:
	SA2. read instructions, guidelines/procedures
B. Professional Skills	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to:
	SA3. listen effectively and orally communicate information
	SA4. ask for clarification and advice from the concerned person
	Decision Making
	The user/individual on the job needs to know and understand how to:
SB1. make decisions on a suitable course of action or response keeping in view resource utilization while meeting commitments	
B. Professional Skills	Plan and Organise
	The user/individual on the job needs to know and understand how to:
	SB2. plan and organise work to achieve targets and deadlines
	CustomerCentricity
	The user/individual on the job needs to know and understand how to:
	SB3. check that the work meets customer requirements
SB4. deliver consistent and reliable service to customers	
B. Professional Skills	Problem Solving
	The user/individual on the job needs to know and understand how to:
	SB5. apply problem solving approaches in different situations
	Critical Thinking
	The user/individual on the job needs to know and understand how to:
	SB6. apply balanced judgements to different situations

ASC/N0002: Work effectively in a team

NOS Version Control

NOS Code	ASC/N0002		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	10/06/13
Industry Sub-sector	NA	Last reviewed on	10/06/13
		Next review date	Under revision expected date of revised version 31-Dec-15
		NSQC Clearance on	24/07/15

ASC/N0003: Maintain a healthy, safe and secure working environment

National Occupational Standards



Overview

This unit is about monitoring work place practices and making sure they meet requirements for health, safety, security and environmental concerns.

ASC/N0003: Maintain a healthy, safe and secure working environment

National Occupational Standard	Unit Code	ASC/N0003
	Unit Title (Task)	Maintain a healthy, safe and secure working environment
	Description	This NOS unit is about monitoring the working environment and making sure it meets requirements for health, safety and security.
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> Resources (both material & manpower) needed to maintain a safe working environment as per the prevalent norms & government policies including emergency procedures for illness, accidents, fires or any other reason which may involve evacuation of the premises
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Resources needed to maintain a safe, secure working environment	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC1. comply with organisation's current health, safety and security policies and procedures PC2. report any identified breaches in health, safety, and security policies and procedures to the designated person PC3. Coordinate with other resources at the workplace to achieve the healthy, safe and secure environment for all incorporating all government norms esp. for emergency situations like fires, earthquakes etc. PC4. identify and correct any hazards like illness, accidents, fires or any other natural calamity safely and within the limits of individual's authority PC5. report any hazards outside the individual's authority to the relevant person in line with organisational procedures and warn other people who may be affected PC6. follow organisation's emergency procedures for accidents, fires or any other natural calamity PC7. identify and recommend opportunities for improving health, safety, and security to the designated person PC8. complete all health and safety records are updates and procedures well defined
	Knowledge and Understanding (K) w.r.t. the scope	
	Element	Knowledge and Understanding
	A. Organisational Context (Knowledge of the Company/Organisation and its processes)	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> KA1. legislative requirements and organisation's procedures for health, safety and security and individual's role and responsibilities in relation to this KA2. what is meant by a hazard, including the different types of health and safety hazards that can be found in the workplace KA3. how and when to report hazards

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	KA4. the limits of responsibility for dealing with hazards KA5. the organisation’s emergency procedures for different emergency situations and the importance of following these KA6. the importance of maintaining high standards of health, safety and security KA7. implications that any non-compliance with health, safety and security may have on individuals and the organisation
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. different types of breaches in health, safety and security and how and when to report these KB2. evacuation procedures for workers and visitors KB3. how to summon medical assistance and the emergency services, where necessary KB4. how to use the health, safety and accident reporting Procedures and the importance of these
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. complete accurate, well written work with attention to detail
	Reading Skills
	The user/individual on the job needs to know and understand how to:
	SA2. read instructions, guidelines/procedures/rules
B. Professional Skills	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to:
	SA3. listen to and orally communicate information with all concerned
	Decision Making
	The user/individual on the job needs to know and understand how to:
	SB1. make decisions on a suitable course of action or response
B. Professional Skills	Plan and Organise
	The user/individual on the job needs to know and understand how to:
	SB2. plan and organise work to achieve targets and deadlines
	CustomerCentricity
	The user/individual on the job needs to know and understand how to:
	SB3. build and maintain positive and effective relationships with colleagues and customers
B. Professional Skills	Problem Solving
	The user/individual on the job needs to know and understand how to:

ASC/N0003: Maintain a healthy, safe and secure working environment

	SB4. apply problem solving approaches in different situations
	Analytical Thinking
	The user/individual on the job needs to know and understand how to:
	SB5. analyse data and activities
	Critical Thinking
	The user/individual on the job needs to know and understand how to:
	SB6. apply balanced judgements to different situations



ASC/N0003: Maintain a healthy, safe and secure working environment

NOS Version Control

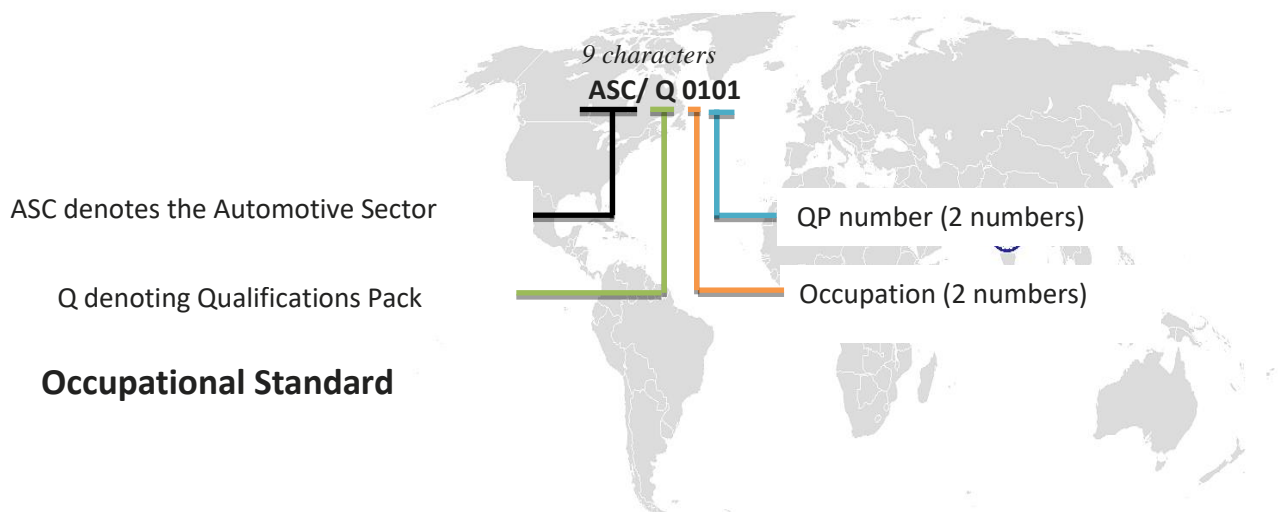
NOS Code	ASC/ N 0003		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	10/06/13
Industry Sub-sector	NA	Last reviewed on	10/06/13
		Next review date	Under revision expected date of revised version 31-Dec-15
		NSQC Clearance on	24/07/15

Qualification Pack for Automotive Engine Repair Technician

Annexure

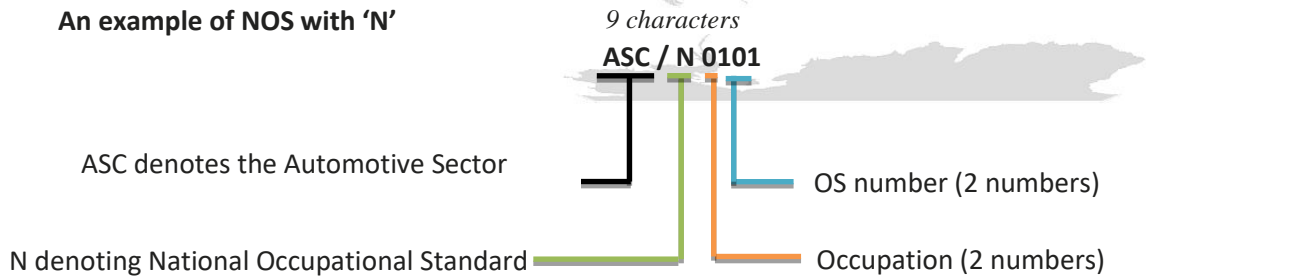
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'




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Qualification Pack for Automotive Engine Repair Technician

The following acronyms/ codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Manufacturing	31 - 45 & 61 - 68
Research & Development	81 - 84
Sales & Service	01 - 21
Road Transportation	96 - 97

Sequence	Description	Example
Three letters	Automotive	ASC
Slash	/	 /
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	10
Next two numbers	OS number	12

Qualification Pack for Automotive Engine Repair Technician

Criteria for assessment of Trainees

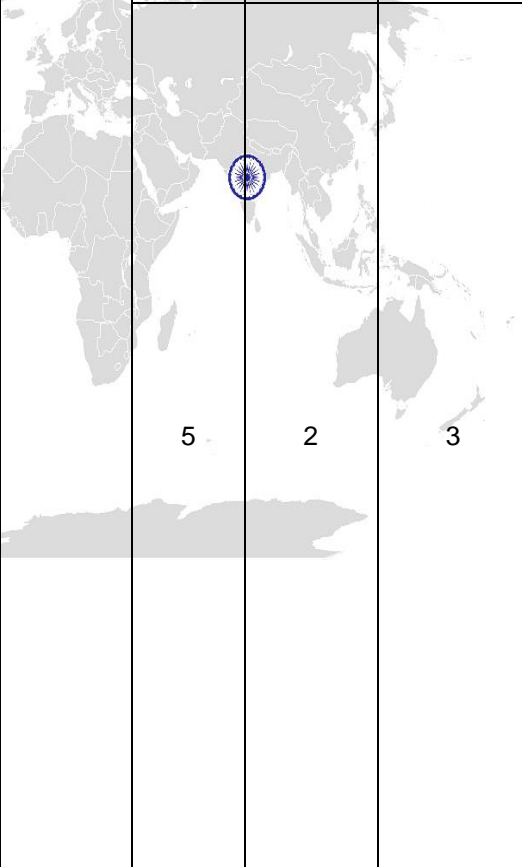
JOB ROLE	Auto Engine Repair Technician L4
Qualification Pack	ASC/Q 1409
No. Of NOS	1 Role specific ,3 generic

ASDC assessor would be conducting Practical and Viva as per the criteria provided in the NOS/QP.

<u>Guidelines for Assessment:</u>
1. Assessment to be conducted by ASDC as per competency output defined in the NOS/QP and the assessment criteria provided in the NOS/QP.
2. Assessment to be carried out by a third-party Assessment Body duly affiliated to the SSC.
3. ASDC assessments will be comprehensive and cover all aspects of acquired knowledge, practical skills and also basic ability to communicate. Accordingly, evaluation process would include: i. Theory/Knowledge test ii. Practical demonstration test iii. Face to Face
4. Theory/Knowledge assessment will be carried out on line through a link provided for each assessment that generates a random paper from a bank of questions available at the back end. •On line test would be conducted in the presence of an ASDC assessor till web enabled proctoring is deployed.
5. ASDC assessor would be conducting Practical and Viva as per the criteria provided in the NOS/QP.
6. Cut off criteria for certification (Marks obtained in %):70%

Assessment Outcomes	Assessment Criteria for Outcomes	Total Marks	Out Of	Theory	Skills Practical
ASC/N1418 Carry out repairs of engine and other related mechanical aggregates	PC1. Understand the auto component manufacturer specifications related to the various engine components/aggregates in the vehicle (including turbocharger)	100	5	2	3
	PC2. Follow standard operating procedures for using workshop tools and equipment for service and repairs of engine and its aggregates		3	1	2
	PC3. Conduct test drives to assess need for repairs, calibration or any other adjustments in the engine and its related mechanical aggregates		4	1	3

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	PC4. Review the job card and understand work to be carried out in the engine and related aggregates		4	1	3
	PC5. In case of non-routine service or repair, confirm tasks to be carried out with superior		3	1	2
	PC6. Ensure that the correct spare parts, lubricants, tools and other materials required have been obtained		3	1	2
	PC7. Calibrate, align and adjust settings, alignment and other tolerance levels relevant to the following engine and allied aggregates: <ul style="list-style-type: none"> • engine and aggregates (including flywheel) • allied engine aggregates (like radiator etc.) • air intake and exhaust systems like (like turbocharger, intercooler etc.) • cooling & lubrication system • fuel ignition system (like injectors, fuel injection high pressure lines etc.) • transmission system (including gearbox, differential, propeller shaft and axles) • steering system • clutch and brake assembly • electrical and electronic components (related to engine including alternator, wire harness etc.) 		5	2	3
	PC8. Repair and replace: <ul style="list-style-type: none"> • cylinder block • cylinder head • piston liner • piston (including piston rings) • crankshaft (including main and BE journal) • camshaft • connecting rod • air compressor • flywheel (including ring gear and 		7	2	5

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	<p>damper)</p> <ul style="list-style-type: none"> • fuel systems (diesel, petrol, electrical, gas etc.) • radiator • emission and exhaust system • steering system • various lubrication systems connected to the engine 				
	<p>PC9. Carry out repair activities on the engine aggregates safely to ensure:</p> <ul style="list-style-type: none"> • no damage to the vehicle or other vehicles • no damage to vehicle components and systems • no contact with hazardous materials 		7	2	5
	<p>PC10. Dismantle, assess, repair, clean, replace, adjust and reassemble vehicle mechanical engine aggregates</p>		7	2	5
	<p>PC11. Identify and change engine components requiring change due to continuous wear and tear(including oil and air filters)</p>		6	2	4
	<p>PC12. Ensure all dismantled engine components are cleaned and conditioned prior to reassembly</p>		4	1	3
	<p>PC13. Ensure disposal of materials (including waste oil, scrap of failed parts/ aggregates) in accordance with the organisation's policies</p>		4	1	3
	<p>PC14. Refill correct grade of coolants, lubricants, engine oil and other fluids in the engine aggregates as per OEM guidelines</p>		4	1	3
	<p>PC15. Understand the various precautions to be taken to avoid damage to the vehicle and its components while working on the engine aggregates and subassemblies</p>		3	1	2
	<p>PC16. Record all service and repairs carried out on the engine and allied aggregates and ensure completeness of tasks assigned</p>		3	1	2

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	before releasing vehicle for the next repair or maintenance procedure				
	PC17. Ensure all workshop tools, equipment and workstations are adequately maintained by carrying out scheduled checks, calibration and timely repairs where necessary		4	1	3
	PC18. Ensure any malfunctions observed in tools and equipment are reported to the concerned persons		3	1	2
	PC19. Ensure any other repair requirements observed in the other components/ aggregates systems (like engine, gear box etc.) while repairing/overhauling of braking systems are reported to Supervisor/ Service Advisor for further inspection by other specialists		4	1	3
	PC20. Use resources responsibly (e.g. use of grease and other consumables)		3	1	2
	PC21. Measure/ inspect the machining or any other repair done from an outside source/ local machining garages		4	1	3
	PC22. Recognise when to seek assistance from a senior technician in case of diagnosis of the engine related aggregates		3	1	2
	PC23. Ensure that trainings organized by the OEM from time-to-time are attended and knowledge levels are upgraded (esp. in case of newly launched products, product refreshes)		3	1	2
	PC24. Drive a relevant 2/3/4 wheeler vehicle which is an important part of the diagnosis of the type of vehicle that is dealt by the relevant OEM		4	1	3
		Total	100	30	70
ASC/N0001	PC1. Keep immediate work area clean and tidy	100	11	2	9

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Plan & organize work to meet expected outcome	PC2. Treat confidential information as per the organisation's guidelines	100	8	2	6
	PC3. Work in line with organisation's policies and procedures		11	3	8
	PC4. Work within the limits of job role		9	3	6
	PC5. Obtain guidance from appropriate people, where necessary		10	3	7
	PC6. Ensure work meets the agreed requirements		14	3	11
	PC7. Establish and agree on work requirements with appropriate people		12	3	9
	PC8. Manage time, materials and cost effectively		14	3	11
	PC9. Use resources in a responsible manner		11	3	8
			Total	100	25
ASC/N0002 Work effectively in a team	PC1. Maintain clear communication with colleagues	100	14	4	10
	PC2. Work with colleagues to integrate work		9	2	7
	PC3. Pass on information to colleagues in line with organisational requirements		11	3	8
	PC4. Work in ways that show respect for colleagues		11	3	8
	PC5. Carry out commitments made to colleagues		10	2	8
	PC6. Let colleagues know in good time if cannot carry out commitments, explaining the reasons		10	2	8
	PC7. Identify problems in working with colleagues and take the initiative to solve these problems		13	4	9
	PC8. Follow the organisation's policies and procedures for working with colleagues		12	3	9
	PC9. ability to share resources with other members as per priority of tasks		10	2	8
	Total	100	25	75	
ASC/N0003 Maintain a healthy, safe and secure working environment	PC1. Comply with organisation's current health, safety and security policies and procedures	100	12	3	9
	PC2. Report any identified breaches in health, safety, and security policies and procedures to the designated person		13	3	10
	PC3. Coordinate with other resources at the workplace to achieve the healthy, safe and secure environment for all incorporating all government norms esp. for emergency situations like fires,		13	3	10

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	earthquakes etc.				
	PC4. Identify and correct any hazards like illness, accidents, fires or any other natural calamity safely and within the limits of individual's authority		15	5	10
	PC5. Report any hazards outside the individual's authority to the relevant person in line with organisational procedures and warn other people who may be affected		12	3	9
	PC6. Follow organisation's emergency procedures for accidents, fires or any other natural calamity		13	3	10
	PC7. Identify and recommend opportunities for improving health, safety, and security to the designated person		11	3	8
	PC8. Complete all health and safety records are updates and procedures well defined		11	2	9
		Total	100	25	75
	Grand Total		400	105	295
	Percentage Weightage:			30%	70%
	Minimum Pass % to qualify (aggregate):				70%