National Occupational Standards – Maintenance & Repair - Caravans and Motorhomes

NOS G1 – Contribute to Housekeeping in Motor Vehicle Environments

NOS OVERVIEW

This NOS is about the routine maintenance of the workplace, carrying out basic, non-specialist checks of work tools and equipment, cleaning the work area and using resources economically.

SCOPE OF THIS NOS:

1. **Equipment maintenance** covers
   a. routine checks on work tools and equipment
   b. cleaning work tools and equipment
   c. replacing minor parts
   d. visual inspection of electrical equipment

2. **Housekeeping activities** cover
   a. day to day work area cleaning
   b. clearing away
   c. dealing with spillages
   d. disposal of waste, used materials and debris

3. **Work tools and equipment** are
   a. hand
   b. electrical
   c. mechanical
   d. pneumatic
   e. hydraulic

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the scope of your job responsibilities for the use and maintenance of hand tools, equipment and your work area.
2. workplace policies and schedules for **housekeeping activities** and **equipment maintenance**.

3. the manufacturer's requirements for the cleaning and general, non-specialist maintenance of the tools and equipment for which you are responsible.
4. the regulations and information sources applicable to workshop cleaning and maintenance activities for which you are responsible.
5. the importance of reporting faults quickly to the relevant person.
6. the importance of reporting anticipated delays to the relevant person(s) promptly.

Equipment maintenance

7. how to select and use equipment used for basic hand tool maintenance activities.
8. how to store hand tools safely and accessibly.
9. how to report faulty or damaged **work tools and equipment.**
10. how to work safely when cleaning and maintaining **work tools and equipment**.

General work area housekeeping

11. how to select and use cleaning equipment
12. how to use resources economically.
13. how to use work area cleaning materials and agents.
14. how to clean and maintain the **work tools and equipment** and work areas for which you are responsible.
15. how to dispose of unused cleaning agents, materials and debris.
16. the properties and hazards associated with the use of cleaning agents and materials.
17. the importance of wearing personal protective equipment.
18. the importance of using resources economically and for their intended purpose only.

PERFORMANCE OBJECTIVES

To be competent you must:

a. wear suitable personal protective equipment throughout all **housekeeping** and **equipment maintenance activities**.
b. select and use cleaning equipment which is:
    - of the right type
    - suitable for the task.
c. use resources economically and for their intended purpose only, following manufacturers' instructions and workplace procedures.
d. follow workplace policies, schedules and manufacturers' instructions when cleaning and maintaining hand tools and equipment.
e. clean the work area(s), for which you are responsible, at the specified time and frequency.
f. carry out **housekeeping activities** safely and in a way which minimises inconvenience to customers and staff.
g. follow the manufacturer's instructions when using cleaning and sanitising agents.
h. ensure your **housekeeping activities** keep your work area clean and free from

debris and waste materials.

i. ensure your **equipment maintenance** activities keep your **work tools and equipment** fit for purpose.

j. dispose of used cleaning agents, materials and debris to comply with legal and workplace requirements.

k. store your **work tools and equipment** in a safe manner which permits ease of access and identification for use.

l. report any faulty or damaged tools and equipment to the relevant person(s) clearly and promptly.

m. report any anticipated delays in completion to the relevant person(s) promptly.

NOS G2 – Reduce Risks to Health and Safety in the Motor Vehicle Environment

NOS OVERVIEW

This NOS covers the basic, legally required health and safety duties of everyone in the workplace. It describes the competence required to ensure that:

- our own actions do not create any health and safety risks
- you do not ignore significant risks in your workplace, and
- you take sensible action to put things right, including reporting situations which pose a danger to people in the workplace, and seeking advice from others

This NOS does **not** require you to undertake a full Risk Assessment. It is about having an appreciation of significant risks in the workplace and knowing how to identify them and deal with them.

When you have completed this NOS, you will have proved you can:

1. Identify hazards and evaluate risks in your workplace
2. Reduce the risks to health and safety in your workplace

SCOPE OF THIS NOS:

1. Risks resulting from

a. the use and maintenance of machinery or equipment
b. the use of materials or substances
c. working practices which do not conform to laid down policies
d. unsafe behaviour
e. accidental breakages and spillages
f. environmental factors
g. working at height
h. lifting operations and manual handling
i. incorrect use of personal protective equipment

2. Workplace policies covering

a. the use of safe working methods and equipment
b. the safe use of hazardous substances
c. smoking, eating, drinking and drugs
d. what to do in the event of an emergency
e. personal presentation
f. personal protective equipment

g. lifting operations and manual handling
h. working at height
i. mobile phones and personal stereo equipment

ESSENTIAL KNOWLEDGE

You need to understand:

Health and Safety Legislation and Workplace Policies

1. your legal duties for health and safety in the workplace as required by the Health and Safety at Work Act 1974, and any other policies or procedures that govern your working practices.
2. your duties for health and safety as defined by any specific legislation covering your job role.
3. **agreed workplace policies relating to controlling risks to health and safety.**
4. responsibilities for health and safety in your job description.
5. the responsible persons to whom you report health and safety matters.

Risks to Health and Safety

6. what hazards may exist in your workplace, (eg. Slips, trips and falls).
7. health and safety risks which may be present in your own job role and the precautions you must take.
8. the importance of remaining alert to the presence of hazards in the whole workplace.
9. how to deal with and report risks.
10. the importance of dealing with or promptly reporting risks.
11. the requirements and guidance on the precautions.
12. the specific workplace policies covering your job role.
13. suppliers' and manufacturers' instructions for the safe use of equipment, materials and products.
14. safe working practices for your own job role.
15. the importance of personal presentation in maintaining health and safety in the workplace.
16. the importance of personal conduct in maintaining the health and safety of yourself and others.
17. the importance of personal protective equipment, when and where it should be used and the importance of maintaining it correctly.
18. your scope and responsibility for rectifying risks.
19. workplace procedures for handling risks which you are unable to deal with.

PERFORMANCE OBJECTIVES

To be competent you must:

Identify the hazards and evaluate the risks

a. name correctly and locate the persons responsible for health and safety in the

workplace.

b. identify correctly **all** workplace polices relevant to your working practices.
c. identify working practices in your job role which could harm yourself or other persons.
d. identify those aspects of the workplace which could harm yourself or other persons.
e. evaluate which of the potentially harmful working practices and the potentially harmful aspects of the workplace pose the highest **risk** to yourself or to others.
f. report those hazards which present a high **risk** to the persons responsible for health and safety in the workplace.
g. identify and deal with low **risk** hazards in accordance with workplace policies and legal requirements.

Reduce the risks to health & safety in your workplace:

To be competent you must:

a carry out your working practices in accordance with legal requirements.
b identify the correct personal and vehicle protective equipment required to correctly carry out your workplace practices.
c carry out your workplace practices using the correct personal protective equipment.
d follow the most recent **workplace policies** for your job role.
e rectify health and safety **risks** that are within your capability and scope of your job responsibilities.
f pass on any suggestions for reducing **risks** to health and safety within your job role to the responsible persons.
g ensure your personal conduct in the workplace does not endanger the health and safety of yourself or other persons.
h follow the **workplace policies** and suppliers' or manufacturers' instructions for the safe use of equipment, materials and products.
i report any differences between **workplace policies** and suppliers' or manufacturers' instructions as appropriate.
j ensure your personal presentation at work:
- ensures the health and safety of yourself and others,
- meets any legal duties, and
- is in accordance with workplace policies

NOS G3 – Maintain Working Relationships in the Motor Vehicle Environment

NOS OVERVIEW

This NOS is about maintaining good working relationships with all colleagues in the working environment by using effective communication and support skills.

SCOPE OF THIS NOS:

1. **Colleagues** are
   a. immediate work colleagues
   b. supervisors and managers

2. **Requests for assistance** covering
   a. technical assistance
   b. personal assistance

ESSENTIAL KNOWLEDGE

You need to understand:

Your responsibilities and constraints

1. your own and your colleague's job role and limits of responsibility for giving advice and support.
2. the operational constraints which may affect interaction with colleagues.
3. lines of communication within your workplace.

Communication skills and working relationships

4. how to use suitable and effective spoken communication skills when responding to and interacting with others.
5. how to adapt written and spoken communication methods to satisfy the needs of colleagues.
6. how to report problems using written and spoken methods of communication.
7. the importance of developing positive working relationships with colleagues – the effect on morale, productivity, and company image.
8. the importance of accepting other peoples' views and opinions.
9. the importance of making and honouring realistic commitments to colleagues.

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PERFORMANCE OBJECTIVES

To be competent you must:

a. contribute actively to team working by initiating ideas and co-operating with colleagues.
b. respond promptly and willingly to requests for assistance from **colleagues** which fall within the limits of your own job responsibilities and capabilities.
c. where requests fall outside your responsibility and capability, refer colleagues to the relevant person(s).
d. give colleagues sufficient, accurate information and support to meet their work needs.
e. make **requests for assistance** to **colleagues** clearly and courteously.
f. use methods of communication which meet the needs of colleagues.
g. treat colleagues in a way which shows respect for their views and opinions and promotes goodwill.
h. make and keep achievable commitments to **colleagues**
i.. inform colleagues promptly of any problems or information likely to affect their own work.

NOS G6 – Enable Learning Through Demonstration and Instruction

(Imported ENTO unit L11)

NOS OVERVIEW

This NOS is about demonstrating skills and methods to learners and instructing learners in procedures and processes.

These include; demonstrating how equipment is used, showing a learner how to do something, giving learners instructions on what to do or how to carry out a particular activity, deciding when you should use demonstration or instruction to encourage learning, reviewing the potential use of technology-based learning, checking on the progress of learners and giving feedback to learners.

ESSENTIAL KNOWLEDGE

You need to understand:

The nature and role of demonstrations and instruction

1. the separate areas of demonstrations which encourage learning.
2. which types of learning are best achieved and supported through demonstrations.
3. how to identify and use different learning opportunities.
4. how to structure demonstrations and instruction sessions.
5. how to choose from a range of demonstration techniques.

Principles and concepts

6. how to put learners at their ease and encourage them to take part.
7. how to choose between demonstration and instruction as learning methods.
8. how to identify individual learning needs.
9. which factors are likely to prevent learning and how to overcome them
10. how to check learners' understanding and progress.
11. how to put information in order and decide whether the language you will be using is appropriate.
12. how to choose and prepare appropriate materials, including technology based materials.
13. the separate areas of instructional techniques which encourage learning
14. which types of learning are best achieved and supported through instruction.

External factors influencing human resource development

15. how to make sure everybody acts in line with health, safety and environmental protection l legislation and best practice.
16. how to analyse and use developments in learning and new ways of delivery, including technology-based learning.

PERFORMANCE OBJECTIVES

Demonstrate skills and methods to learners

To be competent you must:

a. base the demonstration on an analysis of the skills needed and the order they must be learned in.
b. ensure that the demonstration is accurate and realistic.
c. structure the demonstration so the learner can get the most out of it.
d. encourage learners to ask questions and get explanation at appropriate stages in the demonstration.
e. give learners the opportunities to practise the skill being demonstrated and give them positive feedback.
f. give extra demonstrations of the skills being taught to reinforce learning.
g. ensure that demonstrations take place in a safe environment and allow learners to see the demonstration clearly.
h. respond to the needs of learners during the demonstration.
i. reduce distractions and disruptions as much as possible.

Instruct learners

To be competent you must:

a. match instruction to the needs of the learners.
b. identify which learning outcomes will be achieved through instruction.
c. ensure that the manner, level and speed of the instruction encourages learners to take part.
d. regularly check that learners understand and adapt instruction as appropriate.
e. give learners positive feedback on the learning experience and the outcomes achieved.
f. identify anything that prevents learning and review this with the learners.

NOS G8 – Identify and Agree the Motor Vehicle Customer Needs

NOS OVERVIEW

This NOS is about: gaining information from customers on their perceived needs; giving advice and information and agreeing a course of action; contracting for the agreed work and completing all necessary records and instructions.

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the fundamental legal requirements of current consumer legislation and the consequences of your own actions in respect of this legislation.
2. the content and limitations of company and product warranties for the vehicles dealt with by your company.
3. the limits of your own authority for accepting vehicles.
4. the importance of keeping customers informed of progress.
5. your workplace requirements for the completion of records.
6. how to complete and process all the necessary documentation.

Customer communication and care

7. How to communicate effectively with, and listen to, customers.
8. how to adapt your language when explaining technical matters to non-technical customers.
9. how to use effective questioning techniques.
10. how to care for customers and achieve customer satisfaction.

Company products and services

11. the range of options available to resolve vehicle problems.
12. the range and type of services offered by your company.
13. the effect of resource availability upon the receipt of customer vehicles and the completion work.
14. how to access costing and work completion time information.

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PERFORMANCE OBJECTIVES

To be competent you must:

a. obtain sufficient, relevant information from the customer to make an assessment of their own and perceived vehicle needs.
b. provide customers with accurate, current and relevant advice and information on:
    - suitable vehicle inspection, repair and/or service procedures
    - potential courses of action
    - the implications of courses of action
    - the estimated costs.
c. provide advice and information clearly and in a form and manner which the customer will understand.
d. actively encourage customers to ask questions and seek clarification during your conversation.
e. support the accurate identification and clarification of customer and vehicle needs, by referring to:
    - vehicle data
    - operating procedures.
f. before accepting the vehicle, agree with the customer and record:
    - the extent and nature of the work to be undertaken
    - the terms and conditions of acceptance
    - the cost
    - the timescale.
g. confirm your customer's understanding of the agreement you have made.
h. ensure your recording systems are complete, accurate, in the format required and signed by the customer where necessary.
i. pass all completed records to the next person in the process promptly.
j. gain further customer approval where the contracted agreement is likely to be exceeded.

NOS CO01 – Carry Out Routine Caravan and Motorhome Maintenance

NOS OVERVIEW

This unit is about conducting routine maintenance, adjustment and replacement activities as part of the periodic servicing of caravan and motorhomes.

KEY WORDS AND PHRASES

Agreed timescales:

Examples include: manufacturer's recommended work times, job times set by your company or a job time agreed with a specific customer.

Adjustments:

Examples include: adjustments to clearances, gaps, settings, alignment pressures, tensions, and adjustments to brakes, lights, tyres and body fittings.

Caravans

For the purpose of this occupational standard a caravan is defined as a touring caravan including: folding types, folding campers, trailer tents.

Motorhomes

These are converted vehicles, including: A-class, coach built and van conversions.

Note: This standard applies only to the habitation area of motorhomes.

Components:

Examples include: water filters, brake linings, stabiliser pads, lubricants and fluids, bulbs and fuses.

Conformity:

Examples include conformity to manufacturer's specifications, recognised industry codes of practice (e.g. NCC), UK and European legal requirements where applicable.

Systems testing equipment:

Examples include: test instruments, gas pressure test equipment, tyre pressure gauge,tread depth gauges, torque wrench, electronic damp meter, hydraulic lifts, jacks.
Maintenance records:

Examples include: records of vehicle inspection, manufacturers', company or customer

job cards, water ingress report, gas inspection report, electrical test report, wheel torque check (caravans only).

Annual service:

As defined by recognised national industry specifications (e.g. NCC) and manufacturers' specifications appropriate to the caravan or motorhome being worked upon.

Routine vehicle maintenance:

Examples include: conducting scheduled maintenance, adjustments, replacements and replenishment of, or to, components and systems in accordance with manufacturer's instructions for the period interval.

Vehicle technical data:

Examples include: hard copy manufacturers' and component manufacturers' manuals, data on computer and data obtained from on-board diagnostic displays

SCOPE OF THIS UNIT:
All of the items listed below form part of this National Occupational Standard.

1. Sources of technical information are:

a. caravan and motorhome technical data
b. schedules of inspection
c. regulations and legislation

2. Examination methods are:

a. aural
b. visual
c. functional
d. measurements

3. Assessments are for:

a. malfunction
b. damage
c. fluid levels (where applicable)
d. leaks
e. wear
f. security
g. condition and serviceability
h. conformity
i. necessity for adjustment(s)

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the manufacturer's, warranty providers and legal requirements relating to routine maintenance activities for caravan/motorhome systems and components.

2. the legal requirements relating to the caravan/motorhome.

3. the health and safety legislation and workplace procedures relevant to caravan/motorhome maintenance activities including Personal Protective Equipment (PPE), COSHH and other safe working practices.

4. your workplace procedures for:

    - recording caravan/motorhome maintenance work and any variations from the original specification.
    - the referral of problems.
    - reporting delays to the completion of work.
    - the referral of identified non-standard equipment and the potential for additional work.

5. the importance of documenting caravan/motorhome maintenance information.

6. the importance of working to agreed timescales and keeping others informed of progress.

7. the relationship between time and costs.

8. the importance of reporting anticipated delays to the relevant person(s) promptly.

Use of technical information

9. how to find, interpret and use **sources of technical information** for scheduled maintenance activities, including diagnostic displays.

10. the importance of using the correct **sources of technical information.**

Caravan/motorhome system operation

11. how suspension systems, braking systems, wheels and tyres operate for the type of caravan/motorhome on which you are working.

12. the purpose, operating principles and location of power supply systems (including batteries), transformers and charging systems, lighting systems, water systems, gas systems, 12v and 230v electrical supply systems, on-board generators and ancillary equipment for the type of caravan/motorhome on which

you are working.

13. the operation and function of fixtures and fittings within the habitation area.

Routine maintenance requirements

14. how to conduct scheduled, routine **examination methods** and **assessments** against caravan/motorhome specifications to identify damage, corrosion, inadequate fluid levels (where applicable), water ingress and system leaks, wear, security problems and general condition and serviceability.

15. check and make adjustments to clearances, gaps, settings, pressures, tension, caravan chassis running gear, electrical system, gas system, water systems and body.

16. how to replenish and replace routine service components and materials, including water filters, brake linings, stabiliser pads, lubricants and fluids, bulbs and fuses.

17. how to recognise and report cosmetic damage to vehicle components and units outside normal service items

18. how to identify codes and grades of lubricants.

19. how to work safely avoiding damage to the caravan/motorhome and its systems.

PERFORMANCE OBJECTIVES

To be competent you must:

a. use suitable personal protective equipment and protective coverings throughout all caravan/motorhome maintenance activities.

b. use suitable **sources of technical information** to support all your caravan/motorhome maintenance activities.

c. adhere to the correct specifications and tolerances for the caravan/motorhome when making **assessments** of system and component performance.

d. where the customer's vehicle falls outside the manufacturer's original specification, record details accurately and use this adapted specification as the basis for your examination and assessment.

e. examine the caravan/motorhome's systems and components following:

- the manufacturer's or component manufacturer's approved **examination methods.**
- recognised repair methods.
- health and safety requirements.

f. ensure your **examination methods** identify accurately any caravan/motorhome system and component problems falling outside the maintenance schedule specified.

g. carry out adjustments, replacement of vehicle components and replenishment of consumable materials following the manufacturer's current specification for:

- the particular maintenance interval
- working methods and procedures
- use of equipment
- the tolerances for the caravan/motorhome.

h. where system adjustments cannot be made within the manufacturer's specification, record the details accurately, noting any safety implications, and inform the customer.

i. work in a way which minimises the risk of damage to the caravan/motorhome and its systems and the surrounding area.

j. use suitable testing methods to evaluate the performance of all replaced and adjusted components and systems accurately, prior to returning the caravan/motorhome to the customer.

k. report any problems or issues relating to the caravan's/motorhome's condition or conformity to the relevant person(s) promptly.

l. ensure your maintenance records are accurate, complete and passed to the relevant person(s) promptly in the format required.

m. complete all maintenance activities within the agreed timescale.

n. report any anticipated delays in completion to the relevant persons(s) promptly.

NOS CO02: Carry out Non-structural Minor Internal and External Caravan/Motorhome Repairs

NOS OVERVIEW

This unit is about removing and fitting non-structural internal and external body components on caravans and motorhomes.

Note: For the purpose of this occupational standard a caravan is defined as: Folding camper, touring caravan, trailer tent.

SCOPE OF THIS UNIT:

All of the items listed below form part of this National Occupational Standard.

1. Examples of external components covered in this unit are:

- skirting
- road light clusters
- windows
- cover extrusions
- doors
- frames
- roof lights

2. Examples of internal components covered in this unit are:

- worktops
- locker doors
- drawers
- lights
- blinds/flyscreens
- curtains
- soft furnishings

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the health, safety and legal requirements relating to the removal and fitting of non-structural caravan and motorhome body components

2. your workplace procedures for:

    - the referral of problems
    - reporting of delays to the completion of work

- completion of work records

3. the work that needs to be done and the standard required
4. the requirements for protecting the caravan/motorhome and contents from damage before, during and after removing and fitting activities
5. the importance of selecting, using and maintaining the appropriate personal protective equipment when removing and fitting non structural external body panels

Removing and fitting non structural caravan body components

6. how to find, interpret and use sources of information applicable to the removal and fitting of basic non structural body components

7. how to select, check and use all the tools and equipment required to remove and fit basic non structural body components
8. the different types of mechanical fixings for non structural body components and when and why they should be used
9. the correct procedures and processes for removing and fitting non structural body components
10. the need for correct alignment of panels and the methods used to achieve this
11. the types of quality control checks that can be used to ensure correct alignment and contour of panels and operation of components to manufacturer's specification
12. the methods of storing removed components and the importance of storing them correctly and in accordance with legal requirements

PERFORMANCE OBJECTIVES

To be competent you must:

a use the appropriate personal protective equipment when removing and fitting non structural fixed body components
b protect the caravan/motorhome, its contents and systems effectively when removing and fitting non structural body components
c select and use the correct tools and equipment for the components you are going to remove or fit
d ensure that the tools and equipment you require are in a safe working condition
e remove and fit non structural body components following:

- manufacturers' methods/instructions
- recognised researched repair methods
- your workplace procedures
- health, safety and legal requirements

f avoid damaging other components, units and panels on the caravan/motorhome
g store all removed components safely in the correct location and in accordance with relevant legislation.
h realign the components you have fitted correctly in a way which regains their original manufactured tolerance and water tightness (where applicable).
i check that the components you have fitted operate correctly following the

manufacturer's specification

j report any faults you notice during the course of your work to the relevant person(s) promptly

k report any delays in completing your work to the relevant person(s) promptly

l complete all activities within the agreed timescale

m complete work records accurately, in the format required and pass them to the relevant person(s) promptly

NOS CO03 - Remove and Replace Caravan and Motorhome Electrical (12v & 230v) Auxiliary Units and Components

NOS OVERVIEW

This unit is about removing and replacing units and components previously identified as faulty, damaged, deteriorated or where the customer has requested replacements. It is also about evaluating the performance of replaced units and components. The units and components concerned are those outside those replaced as part of normal routine, caravan maintenance (servicing) activities.

KEY WORDS AND PHRASES

Units and components:
Any unit or component from the electrical systems defined in the Scoping Statement below.

SCOPE OF THIS UNIT:

All of the items listed below form part of this National Occupational Standard

1. **Equipment** is, for example:

a. hand tools
b. special workshop tools
c. general workshop equipment
d. electrical meters

2. **Testing methods** are:

a. visual
b. aural
c. functional

3. **Electrical auxiliary units and components** are for

a. lighting systems
b. alarm systems (inc. security, smoke)
c. entertainment systems
d. power supply systems
e. water supply systems
f. control systems
g. heating & ventilation systems
h. domestic appliances
i. external electrical assessories (e.g. steps)

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the legal requirements relating to the caravan/motorhome.

2. the health and safety legislation and workplace procedures relevant to caravan maintenance activities and personal and caravan/motorhome protection.

3. your workplace procedures for

    - recording removal and replacement information
    - the referral of problems
    - reporting delays to the completion of work

4. the importance of documenting removal and replacement information

5. the importance of working to agreed timescales and keeping others informed of progress.

6. the relationship between time and costs.

7. the importance of reporting anticipated delays to the relevant person(s) promptly.

Use of technical information

8. how to find, interpret and use sources of information applicable to electrical unit and component removal and replacement.

9. the importance of using the correct sources of technical information

Electrical auxiliary system operation and construction

11. how electrical auxiliary units and components are constructed, removed and replaced for the type/classification of caravan/motorhome worked upon.

12. how electrical auxiliary units and components operate for the type/classification of caravan/motorhome worked upon.

Equipment

13. how to prepare, test and use all the removal and replacement equipment required.

Electrical and electronic principles

14. caravan/motorhome earthing principles and earthing methods.

15. electrical and electronic principles associated with electrical auxiliary systems, their application and operation

16. types of circuit protection and why these are necessary.

17. electrical safety procedures.

18. how lighting, warning, and auxiliary circuits work.

19. electric symbols, units and terms.

20. electrical/electronic control system principles

Electrical unit and component removal and replacement

21. how to remove and replace **electrical auxiliary units and components** for the classification of caravan/motorhome worked upon.

22. how to test and evaluate the performance of replacement electrical auxiliary units and components and the reassembled system against the caravan/motorhome operating specifications and any legal requirements.

23. the manufacturer's specification for the type and quality of electrical auxiliary units and components to be used.

24. how to work safely avoiding damage to other caravan/motorhome systems, components and units and contact with leakage and hazardous substances.

PERFORMANCE OBJECTIVES

To be competent you must:

a. wear suitable personal protective equipment and use coverings throughout all removal and replacement activities.

b. support your removal and replacement activities by reviewing

- caravan/motorhome technical data
- removal and replacement procedures
- legal requirements.

c. prepare, test and use all the equipment required following manufacturers' instructions.

d. carry out all removal and replacement activities following;

- manufacturers' instructions
- your workplace procedures
- health and safety requirements.

e. you work in a way which minimises the risk of:

- damage to other caravan/motorhome systems
- damage to other caravan/motorhome components and units
- contact with leakage
- contact with hazardous substances.

f. ensure replaced electrical auxiliary units and components conform to the caravan/motorhome operating specification and any legal requirements.

g. record and report any additional faults you notice during the course of your work promptly.

h. use suitable testing methods to evaluate the performance of the reassembled system accurately.

i. ensure the reassembled system performs to the caravan/motorhome operating specification and meets any legal requirements prior to return to the customer.

j. ensure your records are accurate, complete and passed to the relevant person(s) promptly in the format required.

k. complete all removal and replacement activities within the agreed timescale.

l. you report any expected delays in completion to the relevant person(s) promptly

NOS CO04 – Remove and Replace Caravan Chassis and Running Gear Components

NOS OVERVIEW

This unit is about removing and replacing caravan/motorhome units and components where dismantling and re-assembly of chassis systems is required. It is also about evaluating the performance of replaced units and components. The units and components concerned are those outside those replaced as part of normal routine, caravan/motorhome maintenance (servicing) activities.

KEY WORDS AND PHRASES

Units and components:

Any unit or component from the chassis systems defined in the Scoping Statement below.

Functional testing:

Examples include: overrun damper, brake testing auto-reverse functionality, .

Suspension system:

For the purposes of this unit this will include axle, axle components including wheels, tyres and dampers.

SCOPE OF THIS UNIT:

All of the items listed below form part of this National Occupational Standard

1. **Equipment** is

    a. hand tools
    b. special workshop tools
    c. general workshop equipment
    d. electrical testing equipment

2. **Testing methods** are:

    a. visual
    b. aural
    c. functional

3. **Chassis system, units and components** are:

    a. braking system components
    b. corner steadies

c. hitch/coupling
d. overrun device/damper
e. chassis fixing systems
f. jockey wheel
g. spare wheel carrier
h. chassis mounted anti-theft devices
i. anti-snaking devices

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the legal requirements relating to the caravan (including road safety requirements).

2. the health and safety legislation and workplace procedures relevant to caravan/motorhome maintenance activities and personal and caravan/motorhome protection.

3. your workplace procedures for

   - recording removal and replacement information
   - the referral of problems
   - reporting delays to the completion of work

4. the importance of documenting removal and replacement information

5. the importance of working to agreed timescales and keeping others informed of progress.

6. the relationship between time and costs.

7. the importance of reporting anticipated delays to the relevant person(s) promptly.

Use of technical information

8. how to find, interpret and use sources of information applicable to unit and component removal and replacement within chassis systems.

9. the importance of using the correct sources of technical information

Electrical and electronic principles

11. caravan earthing principles and earthing methods.

12. electrical and electronic principles associated with chassis systems, their application and operation.

13. types of circuit protection and why these are necessary.

14. electrical safety procedures.

15. electric symbols, units and terms.

16. electrical and electronic control system principles.

Chassis system operation and construction

17. how caravan chassis systems and their related units and components are constructed, removed and replaced.

18. how chassis systems and their related **units** and components operate.

19. the importance of the condition of the caravan floor to the structural integrity of the chassis system

Equipment

19. how to prepare, test and use all the removal and replacement equipment required.

Chassis system unit and component removal and replacement

20. how to remove and replace caravan chassis system mechanical, electrical, hydraulic units and components.

21. how to select and use seals, fittings and fasteners.

22. how to test and evaluate the performance of replacement chassis system units and components and the reassembled system against the caravan operating specifications and any legal requirements.

23. the relationship between testing methods and the chassis system units and components replaced – the use of appropriate test methods.

24. when replacement units and components must meet the original equipment specification (OES) for warranty or other requirements.

25. how to work safely avoiding damage to other caravan systems, components and units and contact with leakage and hazardous substances.

PERFORMANCE OBJECTIVES

To be competent you must:

a. wear suitable personal protective equipment and use vehicle coverings

throughout all removal and replacement activities.

b. support your removal and replacement activities by reviewing

- caravan technical data
- removal and replacement procedures
- legal requirements.

c. prepare, test and use all the equipment required following manufacturers' instructions.

d. carry out all removal and replacement activities following;

- manufacturers' instructions
- your workplace procedures
- health and safety requirements.

e. you work in a way which minimises the risk of:

- damage to other caravan systems
- damage to other caravan components and units
- contact with leakage
- contact with hazardous substances.

f. ensure replaced chassis units and components conform to the caravan operating specification and any legal requirements.

g. record and report any additional faults you notice during the course of your work promptly.

h. use suitable testing methods to evaluate the function of the reassembled system accurately.

i. ensure the reassembled chassis system functions to the caravan operating specification and meets any legal requirements prior to return to the customer.

j. ensure your records are accurate, complete and passed to the relevant person(s) promptly in the format required.

k. complete all removal and replacement activities within the agreed timescale.

l. report any expected delays in completion to the relevant person(s) promptly.

NOS CO05 – Conduct Pre and Post Work Caravan/Motorhome Inspections

NOS OVERVIEW

This unit is about carrying out pre and post work inspections of caravan and motorhomes using a variety of basic inspection methods and defect recording.

KEY WORDS AND PHRASES

Agreed timescales:
Examples include: manufacturer's recommended work times, job times set by your company or a job time agreed with a specific customer.

Sources of technical information:
Examples include inspection schedules, manufacturers' manuals and Trade Association check lists, workplace procedures.

SCOPE OF THIS UNIT:

All of the items listed below form part of this National Occupational Standard

1. Inspections are

a. pre-work
b. post work

2. Test methods are

a. visual
b. aural
c. functional

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the health and safety legislation and workplace procedures relevant to conducting pre and post work vehicle inspections and personal and caravan protection.

2. your workplace procedures for
   - recording pre and post work inspections and any variations from specifications
   - the referral of problems

- reporting delays to the completion of work

3. the importance of making accurate records of the results of your inspections and interpreting them correctly.

4. the importance of working to agreed timescales and keeping others informed of progress.

5. the relationship between time and costs.

6. the importance of reporting anticipated delays to the relevant person(s) promptly.

Sources of information

7. how to find, interpret and use recommended sources of information, for example tester's manual, owner's handbook.

8. the importance of using recommended sources of information to assist your inspection of caravans/motorhomes.

Inspection and fault recording methods and the conduct of Inspections

10. how to follow workplace procedures for the systematic pre and post work inspection of caravans/motorhomes.

11. how to check the basic operation of caravan/motorhome systems and caravan/motorhome condition.

12. how to compare inspection results against caravan/motorhome specifications and legal requirements.

13. how to record faults and inspection results in the format required.

14. the importance of discussing findings based upon the results of your inspections to the relevant person(s).

PERFORMANCE OBJECTIVES

To be competent you must:

a. use suitable personal protective equipment throughout all inspection activities.

b. use suitable sources of technical information to support your inspection activities.

c. carry out systematic caravan/motorhome inspections following:

- your workplace procedures
- health and safety requirements.
- the manufacturer's instructions (if appropriate)

d. ensure your comparison of the caravan/motorhome against specification accurately identifies any:

- differences from the caravan/motorhome specification
- caravan/motorhome appearance and condition faults

e. work in a way which minimises the risk of damage to the caravan/motorhome and its systems, other people and their property.

f. make suitable recommendations for future action based upon the results of your inspections.

g. ensure your records are accurate, complete and passed to the relevant person(s) promptly in the format required.

h. complete all inspection activities within the agreed timescale and to specification.

i. report any anticipated delays in completion to the relevant person(s) promptly.

NOS CO06 – Diagnose and Rectify Caravan Chassis System Faults

NOS OVERVIEW

This unit is about diagnosing and rectifying faults occurring within suspension systems, braking systems and other systems fitted to caravan chassis.

KEY WORDS AND PHRASES

Agreed timescales:

Examples include: manufacturer's recommended work times, job times set by your company or a job time agreed with a specific customer.

Chassis or Frame Area

Suspension systems, braking systems, wheels and tyres, jockey wheels, corner steadies.

Caravan

For the purpose of this occupational standard a caravan is defined as a touring caravan including: folding types, folding campers, trailer tents.

Chassis system faults

These are faults that require a two or more step diagnostic activity using a prescribed process or format to identify the cause.

Diagnostic information

This relates to mechanical condition, including wear, run out, pressures, leakage, alignment, contamination, damage, corrosion, sensor measurements and control unit outputs and/or signals (depending upon body type and equipment fitted).

Functional testing

Examples include: performance testing and road testing where relevant.

Hydraulic systems

Examples are: shock absorbers and overrun dampers

Recommendations

Examples include: servicing, dismantling for further inspection and test, repair and replacement.

SCOPE OF THIS UNIT:
All of the items listed below form part of this National Occupational Standard

1. Chassis systems are

a. suspension
b. braking
c. support
d. stabilising systems

2. Diagnostic methods are

a. measurement
b. functional testing
c. electrical and electronic systems testing
d. visual

3. Equipment is

a. diagnostic and rectification equipment for chassis mechanical systems
b. diagnostic and rectification equipment for chassis electrical systems
c. specialist repair tools
d. general workshop equipment

4. Faults are:

a. mechanical
b. electrical and electronic
c. hydraulic
d. pneumatic

5. Rectification activities are:

a. dismantling
b. replacement of units and components
c. adjustment of units and components
d. repairs to wiring and connectors

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the health and safety legislation and workplace procedures relevant to workshop practices and personal and caravan protection when diagnosing and rectifying chassis faults.

2. legal requirements relating to the caravan (including road safety requirements).

3. your workplace procedures for

- recording diagnostic and **rectification activities**
- the referral of problems
- reporting delays to the completion of work

4. the importance of, documenting diagnostic and rectification information.

5. the importance of working to agreed timescales and keeping others informed of progress.

6. the relationship between time, costs and profitability.

7. the importance of reporting anticipated delays to the relevant person(s) promptly.

Electrical and electronic principles

8. electrical and electronic principles associated with chassis systems, including types of sensors and actuators, their application and operation.

9. how electrical and electronic chassis systems operate, including electrical component function and electrical inputs.

10. the interaction between electrical, electronic and mechanical components within caravan chassis systems.

11. electrical symbols, units and terms.

12. electrical safety procedures.

Use of diagnostic and rectification equipment

13. how to prepare and test the accuracy of diagnostic testing equipment.

14. how to use diagnostic and rectification equipment for chassis mechanical, electrical, hydraulic and fluid systems, specialist repair tools and general workshop equipment

Chassis faults, their diagnosis and correction

15. how chassis mechanical, electrical, electronic, pneumatic and hydraulic are constructed, dismantled, reassembled and operate.

16. the types and causes of chassis mechanical, electrical, electronic, pneumatic and hydraulic component and unit faults and failures

17. chassis mechanical, electrical, electronic, pneumatic, hydraulic and fluid component and unit replacement procedures, the circumstances which will necessitate replacement and other possible courses of action.

18. how to find, interpret and use sources of information on chassis electrical and electronic operating specifications, diagnostic test procedures, repair procedures and legal requirements.

19. caravan or equipment operating specifications for limits, fits and tolerances relating to chassis mechanical, electrical, electronic and hydraulic systems for the caravan(s) on which you work.

20. how to select the most appropriate diagnostic testing method for the symptoms presented.

21. how to carry out systematic diagnostic testing of chassis mechanical, electrical and electronic, pneumatic, hydraulic and fluid systems using a prescribed process or format.

22. how to assess the condition evident within chassis mechanical, electrical, electronic and hydraulic components and units.

23. how to interpret test results and caravan data in order to identify the location and cause of caravan system faults.

24. how to carry out the rectification activities listed in the Scoping Statement for this unit in order to correct faults in the chassis mechanical, electrical, electronic, pneumatic and hydraulic and fluid systems.

25. the relationship between test methodology and the faults repaired – the use of appropriate testing methods

26. how to make cost effective recommendations for rectification.

PERFORMANCE OBJECTIVES

To be competent you must:

a. wear suitable personal protective equipment and use protective coverings when using diagnostic methods and carrying out rectification activities.

b. support the identification of faults, by reviewing caravan:

- technical data
- diagnostic test procedures.

c. prepare, connect and test all the required equipment following manufacturers' instructions prior to use.

d. use diagnostic methods which are relevant to the symptoms presented.

e. collect diagnostic information in a systematic way relevant to the diagnostic methods used.

f. collect sufficient diagnostic information to enable an accurate diagnosis of chassis system faults.

g. identify and record any system deviation from acceptable limits accurately.

h. ensure your assessment of dismantled sub-assemblies, components and units identifies their condition and suitability for repair or replacement, accurately.

i. inform the relevant person(s) promptly where repairs are uneconomic or unsatisfactory to perform.

j. use the equipment required, correctly and safely throughout all rectification activities.

k. carry out all rectification activities following:

- manufacturers' instructions
- your workplace procedures
- health and safety requirements.

l. work in a way which minimises the risk of :

- damage to other systems
- damage to other components and units
- contact with leakages
- contact with hazardous substances.

m. ensure all repaired and replaced components and units conform to the caravan operating specification and any legal requirements.

n. when necessary, adjust components and units correctly to ensure that they operate to meet system requirements.

o. record and report any additional faults you notice during the course of work promptly.

p. use testing methods which are suitable for assessing the performance of the system rectified.

q. ensure the chassis system rectified performs to the caravan operating specification and any legal requirements prior to return to the customer.

r. ensure your records are accurate, complete and passed to the relevant person(s) promptly in the format required.

s. complete all system diagnostic activities within the agreed timescale.

t. report any anticipated delays in completion to the relevant person(s) promptly.

NOS CO07 – Diagnose and Rectify Caravan/Motorhome Electrical (12v & 230v) Unit and Component Faults

NOS OVERVIEW

This unit is about identifying and rectifying electrical faults occurring within a variety of electrical systems, excluding motorhome base vehicle electrical systems.

SCOPE OF THIS UNIT:

All of the items listed below form part of this National Occupational Standard

1. Electrical faults occurring within

a. Entertainment systems
b. heating and ventilation, including air conditioning
c. lighting systems
d. alarm systems
e. power supply systems
f. control supply systems
g. domestic appliances
h. external electrical assessories (steps, motor movers)

2. Electrical and electronic testing equipment covers:

a. volt meters,
b. ammeters,
c. ohmmeters
d. multimeters
f. battery testing equipment
h. dedicated and computer based diagnostic equipment

3. Tools and equipment:

a. hand tools
b. special purpose tools
c. general workshop equipment

4. Diagnostic testing is defined as:

a. Verify the fault
b. Collect further information
c. Evaluate the evidence
d. Carry out further tests in a logical sequence
e. Rectify the problem
f. Check all systems

5. Electrical and electronic testing techniques are:

a. voltage, resistance and current measuring
b. frequency measuring
c. visual
d. dedicated and computer based testing
e. temperature measurement/flow assessment

6. Rectification activities are defined as:

A suitable repair or replacement that rectifies the fault(s) identified from the diagnostic activities carried out.

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the health and safety legislation and workplace procedures relevant to workshop practices and personal and vehicle protection when diagnosing and rectifying complex electrical faults.

2. legal requirements relating to the caravan/motorhome electrics (including road safety).

3. your workplace procedures for

- recording fault location and correction activities
- reporting the results of tests.
- the referral of problems
- reporting delays to the completion of work

4. the importance of working to recognised diagnostic procedures and processes and obtaining the correct information for diagnostic activities to proceed

5. the importance of, documenting diagnostic and rectification information.

6. the importance of working to agreed timescales and keeping others informed of progress.

7. the relationship between time, costs and profitability.

8. the importance of reporting anticipated delays to the relevant person(s) promptly.

Electrical and electronic principles

9. electrical and electronic principles, including Ohms Law, voltage, power, current (AC/DC) and resistance.

10. electrical symbols, units and terms.

11. electrical safety procedures.

12. how electrical and electronic units and components are constructed, dismantled and reassembled.

13. how electrical and electronic units and components operate, including electrical component function, electrical inputs, outputs, voltages and patterns.

14. the interaction between electrical, electronic and mechanical components within the systems defined.

15. how electrical systems interlink and interact, including multiplexing.

Use of electrical testing equipment

17. how to prepare and test the accuracy of diagnostic testing equipment.

18. how to use **electrical and electronic testing equipment** to correctly and safely diagnose electrical faults

Auxiliary equipment electrical faults, their diagnosis and correction

19. the types and causes of electrical system, component and unit faults and failures.

20. electrical component and unit replacement procedures, the circumstances which will necessitate replacement and other possible courses of action.

21. how to find, interpret and use sources of information on electrical operating specifications, diagnostic test procedures, repair procedures and legal requirements.

22. how to carry out systematic diagnostic testing of electrical and electronic systems using **electrical testing techniques.**

23. how to select the most appropriate diagnostic testing method for the symptoms presented.

24. how to interpret test results and data in order to identify the location and cause of system faults.

25. how to rectify electrical and electronic faults

26. how to make suitable adjustments to components and units.

27. how to make cost effective recommendations for rectification.

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PERFORMANCE OBJECTIVES

To be competent you must:

a. wear suitable personal protective equipment and use vehicle coverings when using **electrical testing techniques** and carrying out **rectification activities**.

b. support the identification of **electrical faults**, by reviewing the caravan/motorhome:

- technical data
- diagnostic test procedures.

c. prepare, connect and test all the required **electrical and electronic testing equipment** following manufacturers' instructions prior to use.

d. use **electrical and electronic testing techniques** which are relevant to the symptoms presented.

e. collect sufficient diagnostic information in a systematic way to enable an accurate diagnosis of electrical system faults.

f. identify and record any system deviation from acceptable limits accurately.

g. make cost effective recommendations for rectification based upon your analysis of the diagnostic information gained.

h. use all **tools and equipment** required for your diagnostic and rectification activities, correctly and safely throughout.

i. carry out all **diagnostic & rectification activities** following:

- manufacturers' instructions
- recognised researched repair methods(see guidance document)
- health and safety requirements.

j. work in a way which minimises the risk of :

- damage to other caravan/motorhome systems
- damage to other components and units
- contact with leakages
- contact with hazardous substances.

k. ensure all repaired and replaced electrical components and units conform to the operating specification and any legal requirements.

l. when necessary, adjust components and units correctly to ensure that they operate to meet system requirements.

m. ensure the electrical system rectified performs to the operating specification and

any legal requirements prior to return to the customer.

n. ensure your records are accurate, complete and passed to the relevant person(s) promptly in the format required.

o. complete all diagnostic and rectification activities within the agreed timescale.

p. report any anticipated delays in completion to the relevant person(s) promptly.

NOS CO08 – Diagnose and Rectify Caravan/Motorhome Gas Appliance and Component Faults

NOS OVERVIEW

This unit is about identifying and rectifying faults occurring within gas appliances and system components.

SCOPE OF THIS UNIT:

All of the items listed below form part of this National Occupational Standard

1. **faults** occurring within

a. Gas appliances
b. Gas supply systems (inc. pigtail, regulator, changeover valves)
c. Gas appliance venting systems

2. **testing equipment** covers:

a. flue check testing equipment
b. regulator testing equipment
c. dedicated diagnostic equipment
d. pressure test equipment
e. leak test equipment

3. **Tools and equipment:**

a. hand tools
b. special purpose tools
c. general workshop equipment

4. **Diagnostic testing is defined as:**

g. Verify the fault
h. Collect further information
i. Evaluate the evidence
j. Carry out further tests in a logical sequence
k. Rectify the problem
l. Check all systems

5. **Rectification activities** are defined as:

A suitable repair or replacement that rectifies the fault(s) identified from the diagnostic activities carried out.

ESSENTIAL KNOWLEDGE

You need to understand:

Legislative and organisational requirements and procedures

1. the health and safety legislation and workplace procedures relevant to workshop practices and personal and caravan/motorhome protection when diagnosing and rectifying faults.

2. legal requirements relating to the caravan/motorhome gas appliance/system.

3. your workplace procedures for

    - recording fault location and correction activities
    - reporting the results of tests.
    - the referral of problems
    - reporting delays to the completion of work

4. the importance of working to recognised diagnostic procedures and processes and obtaining the correct information for diagnostic activities to proceed

5. the importance of, documenting diagnostic and rectification information.

6. the importance of working to agreed timescales and keeping others informed of progress.

7. the relationship between time, costs and profitability.

8. the importance of reporting anticipated delays to the relevant person(s) promptly.

Use of gas testing equipment

9. how to prepare and test the accuracy of diagnostic testing equipment.

10. how to use **gas flue analysis testing equipment** to correctly and safely diagnose gas exhaust/combustion faults

11. the types and causes of gas system, component and unit faults and failures.

12. gas cylinder grade and type, security and replacement procedures, the circumstances which will necessitate replacement and other courses of action.

13. how to find, interpret and use sources of information on gas appliances, gas systems operating specifications, diagnostic test procedures, repair procedures and legal requirements.

14. how to carry out systematic diagnostic testing of gas appliances and gas systems using appropriate testing techniques**.**

15. how to select the most appropriate diagnostic testing method for the symptoms presented.

16. how to interpret test results and data in order to identify the location and cause of gas system faults.

17. how to rectify gas appliance and system faults

18. how to make suitable adjustments to gas appliances,components and units.

19. how to make cost effective recommendations for rectification.

PERFORMANCE OBJECTIVES

To be competent you must:

a. wear suitable personal protective equipment and use protective coverings when using gas testing techniques and carrying out rectification activities.

b. support the identification of gas system faults, by reviewing caravan/motorhome:

- technical data
- diagnostic test procedures.

c. prepare, connect and test all the required testing equipment following manufacturers' instructions prior to use.

d. use gas appliance and system testing techniques which are relevant to the symptoms presented.

e. collect sufficient diagnostic information in a systematic way to enable an accurate diagnosis of gas system faults.

f. identify and record any system deviation from acceptable limits accurately.

g. make cost effective recommendations for rectification based upon your analysis of the diagnostic information gained.

h. use all tools and equipment required for your diagnostic and rectification activities, correctly and safely throughout.

i. carry out all diagnostic & rectification activities following:

- manufacturers’ instructions
- recognised researched repair methods
- health and safety requirements.

j. work in a way which minimises the risk of :

- damage to other systems
- damage to other components and units
- contact with leakages
- contact with hazardous substances.

k. ensure all repaired and replaced gas appliances, components and units conform to the caravan/motorhome operating specification and any legal requirements.

l. when necessary, adjust components and units correctly to ensure that they operate to meet system requirements.

m. ensure the gas system rectified performs to the manufacturer's operating specification and any legal requirements prior to return to the customer.

n. ensure your records are accurate, complete and passed to the relevant person(s) promptly in the format required.

o. complete all diagnostic and rectification activities within the agreed timescale.

p. report any anticipated delays in completion to the relevant person(s) promptly