SEMAUT3059

Carrying out motorsport vehicle inspections during a competition

Overview

This standard identifies the competences you need to inspect a motorsport vehicle during a competition, in a recognised sequence and to a high standard. It covers motorsport vehicles such as single seaters, rally cars, sports cars, karts, historic vehicles and other specific approved competition vehicles. The inspection activities will cover a range of motorsport vehicle areas, such as chassis, suspension, engine, transmission, steering, braking, fuel and lubrication, electrical and other specific areas. This will involve inspecting a motorsport vehicle immediately before it enters the competition, checking for system leaks, low fluid levels, loose fastenings and fixings; arming of the fire extinguisher system; checking driver safety equipment; checking correct fuel levels, correct cold tyre and damper pressures and other potential problem areas, using hand tools, specialist tools and test equipment, in accordance with approved procedures.

In carrying out the activities, you will be required to use a range of inspection techniques, tools and equipment. You must be able to use recognised methods for checking components for wear, chafing, damage and `play' within the team's guidelines. You will be expected to follow the team's procedures for motorsport vehicle inspections being carried out during a competition. You must also understand and use the correct coolants, oils, fluids and agents for the system being inspected.

Your responsibilities will require you to comply with organisational policy and procedures for the inspection activities undertaken, and to report any problems with these activities, or with the tools and equipment used that you cannot personally resolve, to the relevant people. You must ensure that all tools, equipment and materials used in the inspection activities are removed from the vehicle and work area on completion of the activities, and that all necessary job/task documentation is completed accurately and legibly.

You will be expected to work as a member of a team, with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out. Where team working is involved, you must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard, and competence in all the areas required by the standard must be demonstrated.

You must be able to show that you can competently clean the work area that you are responsible for, including tidying up bays or garages to a standard that will reflect the professional image of the team. You must show that you can maintain the tools and equipment needed for the inspection activities, and return them to their recognised storage area ready for further use.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying the appropriate inspection procedures during a motorsport event or competition. You will know how the equipment functions, the common problems that can occur, the purpose of the individual components and associated defects, in adequate depth to provide a sound basis for carrying out the inspection activities, and for ensuring that any faults found are corrected.

You will understand the safety precautions required when carrying out motorsport inspection activities, especially those for lifting and supporting vehicles. You will be required to demonstrate safe working practices throughout, and will understand your responsibility for taking the necessary safeguards to protect yourself and others in the workplace.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. obtain all the information you need for the motorsport vehicle inspection activities to be carried out
3. plan the inspection activities before you start them
4. obtain and prepare tools and ancillary equipment for the inspection work to be carried out
5. carry out the inspection activities, using approved tools, methods and techniques
6. take suitable precautions to prevent damage to components and surrounding systems
7. report any instances where the inspection activities cannot be fully met, or where there are identified issues outside the planned activities
8. discuss the findings of the inspection with the relevant person before deciding on any modifications needed
9. use the evidence you have gained during the inspection activities to improve future reliability and performance of the motorsport vehicle
10. ensure that work records are completed, stored securely and available to others as per organisational requirements
11. leave the work area in a safe condition on completion of the activities, as per organisational and legal requirements

Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken whilst carrying out the activities (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)
2. the health and safety requirements of the work area and the activities, and the responsibility these requirements place on you
3. the hazards associated with the activities, and how to minimise them and reduce risks
4. the personal protective equipment and clothing (PPE) to be worn during the activities
5. good housekeeping practices within the working area (leaving the work area free of debris and used materials, cleaning and maintaining tools and equipment, returning equipment to the designated storage area, leaving the work area in a safe and tidy condition) and good personal presentation to ensure quality representation of the team or organisation
6. the need to ensure that suitable storage space is readied for all bodywork, panels, fairings and covers, once the vehicle has been stopped after its initial running period and before any checks are made
7. preparations to be carried out on the vehicle (removing bodywork or fairings, covers and panels, cleaning away dirt, dust, oil or track debris, making visual checks of the systems and components for obvious signs of damage, insecurity and leaks)
8. the importance of communicating with others, and of using inspection check sheets or other relevant documentation to ensure that the inspection is carried out in a systematic way within the time restraints, and of determining what consumables and or components may be needed
9. the techniques used to check components and systems without damaging the motorsport vehicle or disabling it from immediate use
10. how to use a range of hand tools (spanners, sockets, screwdrivers, torque wrenches, pressure gauges) to check the security of a range of vehicle systems and sub-assemblies (engine, transmission, suspension, steering, cooling, lubrication, electrical)
11. how to pressurise tyres, dampers, cooling systems and fuel systems; how to

check for leaks and understand the specifications of fluids, fuels and lubricants used to top up the vehicle systems following a leak or other problems
12. the various mechanical fasteners that will need to be removed and replaced, and their method of removal and replacement (such as threaded fasteners, special securing devices)
13. how to make adjustments to components/assemblies to ensure that they function correctly (travel and working clearance, timing and sequence)
14. why securing devices need to be tightened to the correct torque, locked, and the different methods that are used
15. the tools and equipment used in the inspection activities; their calibration/care and control procedures, and the need to control and account for all tools and equipment used during the inspection activities at an event or competition
16. dealing with problems (what to do if components are damaged or insecure, the correct equipment, fluids or lubricants not available), when to act on your own initiative and when to seek help from others
17. reporting any alterations that you have made, or losses of fluids, lubricants, pressures, or abnormally excessive wear of components, to the relevant person
18. completing the relevant documentation, stating the tasks completed and any adjustments made (such as setting of pressures, levels, geometry changes)
19. the procedure for the safe disposal of waste materials, scrap components, hydraulic fluids, or contaminated fuel
20. the extent of your own authority and to whom you should report if you have a problem that you cannot resolve
21. how to access, use and maintain information to comply with organisational requirements and legislation

Scope/range related to performance criteria

1.

Carry out all of the following in preparation for the inspection of the motorsport vehicle during a competition:

1.1 ensure that there is enough time available to complete the inspection
1.2 adhere to procedures or systems in place for risk assessment, hazardous substances, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
1.3 ensure that the driver or engineer is fully aware of the estimated completion time of the inspection
1.4 obtain the relevant inspection documentation
1.5 obtain all the required tools and equipment, and check that they are in a safe, tested and usable condition
1.6 ensure that the motorsport vehicle is safely jacked and supported on the appropriate stands
1.7 remove all bodywork, fairings, covers and hatches, and store correctly
1.8 obtain the appropriate fluids and lubricants
1.9 obtain the correct auxiliary engine starting devices (where appropriate)
1.10 obtain and wear the correct personal protective equipment for the tasks being undertaken

2.

Inspect one of the following types of motorsport vehicle during a competition:

2.1 single seater
2.2 sports car
2.3 historic vehicle
2.4 rallying
2.5 kart
2.6 other specific approved competition vehicle

3.

Carry out inspection procedures, to include eight of the following, as appropriate to the motorsport vehicle being inspected:

3.1 using a torque wrench to spanner-check nuts, bolts and other critical fastenings
3.2 ensuring that fuel tanks are filled to their required capacity
3.3 checking that suitable tyres are fitted, they are free from damage and are set to the correct cold pressures
3.4 checking for correct oil pressure prior to engine warm-up
3.5 checking engine temperatures and pressures during warm-up
3.6 pressurising the cooling system after initial warm-up
3.7 testing that the throttle operation reaches 100% opening
3.8 checking that power steering fluid levels are correct and free from leaks
3.9 checking that hydraulic brake and clutch fluids are at the correct levels, and

that the brake balance is set
3.10 inflating damper bump canisters to the correct pressure, using the appropriate gases
3.11 checking that clutch operating clearance is correct, and that gear selection is satisfactory through all gears
3.12 checking the capacity of the `onboard' fire extinguisher bottle
3.13 testing to ensure that all electrical systems are operating correctly
3.14 checking spherical bearings and wheel bearings for play
3.15 checking emergency kill switch operation

4.

Carry out eight of the following before the vehicle leaves the pit/service area:

4.1 checking that all bodywork, fairings, wings, covers and hatches are correctly secured
4.2 ensuring that the driver has the appropriate vehicle information prior to entering the vehicle or competition (such as amount of fuel, type of tyres and pressures, track conditions, vehicle geometry changes, brake balance, brake condition)
4.3 checking that the driver is fitted correctly into the seat, and that seat belts are securely fastened
4.4 checking that correct event authorisation documentation is displayed on the vehicle
4.5 checking that the fire extinguisher system is armed, and that all safety clips are removed
4.6 checking that wheel safety pins are fitted to the torqued wheels
4.7 ensuring that bodywork, fairings, windscreen and other relevant areas of the vehicle are clean
4.8 ensuring that the work area/vehicle track access lane is free from tools, equipment and foreign objects
4.9 checking that the vehicle is permitted to enter a `live' area prior to releasing it
4.10 ensuring that all other personnel have completed their work
4.11 checking that all auxiliary power supplies have been removed once the engine has been started
4.12 checking that radio communication between driver/rider is working
4.13 ensuring that access onto the track/course is clear of people

5.

Carry out four of the following procedures when the vehicle returns from the track/course:

5.1 ensure that auxiliary power is connected to vehicle
5.2 jack the vehicle and place on stands/supports
5.3 adjust the tyre pressures to correct settings
5.4 remove fairings, bodywork and cowlings, and check for leaks, wear, blockages, insecurity or damage
5.5 remove wheels and visually check the brake calliper/discs or linings
5.6 check fuel levels, and top up as appropriate
5.7 check lubricant and fluid levels and top up/apply as required

5.8 carry out set up adjustments to the vehicle

6.

Check that motorsport vehicle inspections in comply with one of the following:

6.1 race associations vehicle manufacturer's specification
6.2 team/company standards and procedures
6.3 specific vehicle requirements

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