Higher Level Award

Installation

Overview

The 'Installation' module enables the candidate to show that he/she has the specific and general knowledge, and the practical experience, to review the installation requirements, assessing and securing the necessary resources in terms of facility, equipment, materials and labour. The candidate will show that they can plan and coordinate the effective use of the resource to meet the technical and timing requirements and complete the installation as specified by the customer.

Scope

This module covers the activities you may need to carry out, and the specific and general knowledge you will need, in order to plan, organise and implement an engine installation.

Performance Requirements

By means of documentary evidence and/or practical demonstration to your assessor, show that you have met the following requirements for two separate engine tests or test programmes (preferably of different engine types):

1. Select the most appropriate installation method for the test or test programme.
2. Identify the installation requirements and the resources necessary to carry out the installation, securing the resources as per your company procedures.
3. Plan the separate installation activities in a logical manner to make the most effective use of the resources and meet the installation timing requirements.
4. Identify potential problems and the means by which they can be avoided or overcome.
5. Carry out and control the installation process to meet the technical and timing requirements.
6. Using the appropriate company systems, record all necessary information for future reference.

Knowledge Requirements

You will need to understand, and may be requested to explain the following:

(i) Specific knowledge

1. How to identify and secure all of the resources that you need for the installation process.
2. Different installation methods and evidence of selecting the most appropriate for this particular test or test programme.
3. What installation activities need to be carried out, in what sequence and how the activities fit together to meet the overall installation and test programme timing.
4. An appreciation of potential installation problems and evidence of any contingency planning. Note that a detailed review of installation problems makes up a separate module.
5. An understanding of the relevant company procedures for installation and any legislative requirements, ensuring that the procedures are followed.
6. How to monitor the installation process and identify deviations from the plan, taking corrective action as appropriate.
7. How to demonstrate that the completed installation meets the customer requirements as identified in the original specification.

(ii) General knowledge

1. Organisational procedures and systems
2. Health & Safety rules
3. Environmental concerns

Higher Level Award

Installation – Foundation Questions

These foundation questions cover the activities you may need to carry out, and the specific and general knowledge you will need, in order to define the appropriate requirements for a test installation, to ensure subsequent successful completion of the work

1. Define and discuss the installation requirements for a particular test.

2. List the resources that would typically be required for a test installation.

3. Identify all the risks associated with the installation, including Health, Safety and environmental.

4. What improvements could have been made to the installation? What was successful / not successful? How could this be used to improve future installations?

The Following colours have been used to help identify various sections in the folder;

All Questions are in blue ink

All Answers are printed in black ink

All references are printed in red ink
Each reference has an individual number to direct you to its location in the evidence folder.

A007, A008
B001
C001, C009

HL/05

Installation

Foundation Questions

Q1. Define and discuss the installation requirements for a particular test.

There are many aspects of installing an engine into a test cell from choosing what equipment is to be used down to fabricating rigs that the engine can be mounted to. Example A is a standardised test and installation is carried out in accordance to the guidelines of the test procedure documentation provided by the CEC.

EvNo A007 and A008 are copies of some of the installation requirements needed to comply with the regulations set out by the CEC to run this test. EvNo A007 shows what is required to install the smoke meter probe to the engine rig. It describes distance's, position and orientation to ensure that anyone carrying out the test have the same set-up giving the same results.

EvNo A008 shows the recommended intake air pressure control system. It again shows measurements and locations to fit instrumentation. Again as this is a standardised test, the idea is to have the same setup for every company that runs the test ensuring that results are comparable.

Example B is a test that an external customer has asked us to perform. In their test procedure that they have provided gives me information that I would use to install the engine into the test cell.

EvNo B001 is the external customers test procedure for installing their engine into a test cell. It gives me a complete rundown on how the customer would like the engine installed, such as, a list of parts often referred to as a dress kit or installation kit that will be provided, details on how to mount the various engine systems such as the coolant or oil system as well as any parts that would need modifying or blanked such as the engine thermostats or cabin heater pipes, the installation angle of the engine as well as what type of prop shaft and adaptor plate to use to simulate the vehicle's actual clutch and flywheel assembly.

Q2. List the resources that would typically be required for a test installation.

There are many resources available that must be and are used in the process of installing an engine into a test cell. One such resource is the raw materials such as steel that is used to create the engine frames to mount the engine. Another resource used is the equipment and instrumentation that has to be used to measure the various elements required to satisfy the test. Other resources include electricity, water, fuel and gas that are used to power the cell, the engine and the building. However the main resource for installing an engine into a test cell is man power. Without someone to carry out the work, the engine would never be installed.

Q3. Identify all the risks associated with the installation, including Health, safety and environmental.

There are many risks associated whilst carrying out an engine install, however these risks are managed and controlled by following company procedure and policies. For example, whilst working on the workshop floor, I would ensure that I am using the correct PPE such as safety boots, overalls and gloves. When carrying out fabrication work of an engine test rig, I would ensure that I would work in compliance with the company's procedure on working ion the rigging area, and, if I used any specialist equipment such as a welder, I would ensure that I follow the procedures for using that equipment. There are environmental risks when rigging an engine such as the use and handling of various substances such as oils, fuels and coolants. In such cases, I would follow the correct handling procedures set out in the material safety data sheets or COSHH sheets as well as company procedures that outline the correct handling and disposal of the substances in a test cell and workshop environment.

EvNo C009 is an example of a risk assessment, similar to one which would be carried out before work is started to ensure all hazards and risks are identified and minimalised.

EvNo C001 is a copy of a material hazard data sheet or COSHH sheet detailing information regarding certain substances.

Q4. What improvements could have been made to the installation? What was successful/not successful? How could this be used to improve future installations?

Usually when an engine comes to the company for the first time, we don't really know what the methods are of carrying out work on the engine throughout the test will be like. The fundamental components don't really see any change or improvements unless specified by the customer, however, the rig that is fabricated to mount the engine, as well as its ancillary's can experience change and improvements to make working on the engine much easier and time effective. For example if I was to carry out an oil change, I may find that certain components may need changing or adjusting so as to be able to fit a

container under the engines sump to drain the oil into, without causing too much work or making it difficult to manoeuvre. Other examples could be the location of heat exchangers that are used in the cell. Sometimes, when carrying out a job on the engine, the heat exchangers may become a trip hazard or an inconvenience and I would then change the setup to allow better access to the engine which ultimately decreases down time and allows me to manage time more effectively.