

Testbed 3

Removing Motor Standard Operating Procedure

Lab: POETS Research and Development Center

Department: MechSE

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Section 1: Overview

Type of SOP: ☐ Process ☐ Hazardous Material ☐ Hazardous Class of Materials ☒ Equipment

Synopsis:

This SOP describes the proper operation to remove a motor from the Testbed 3 dynamometer test stand. The testbed has dangerous electrical and mechanical hazards and this SOP works to minimize risk to the operators.

Section 2: Risk Assessment Summary (Hazards and control measures)

Materials:

Material (name, CAS #, other ID)	Hazards
None	

Relevant References for Material Hazards:

N/A

Equipment Hazards:

Electric Drives – High voltage (400+ VAC, 600+ VDC) and high current (500+ A)

Electric Motor – High voltage, high current, rotation

Dynamometer – High voltage, high current, rotation

Hazardous Conditions:

Conditions are considered low hazard

Technique Hazards:

Techniques are considered low hazard

Personal Protective Equipment

The following are in addition to proper dress for work in a laboratory:

Safety glasses
Hard Hat
Steel Toed Shoes
Work Gloves

Engineering Controls

None

Section 3: Procedures

Before beginning any maintenance action, ensure that the gantry crane is rated to lift the weight of the motor to be mounted. Verify that the testbed software application is shut down and the motors are no longer spinning. Open the two breakers switches on the wall next to the testbed (labeled “DYNO” and “DUT”) and follow the PRDC LOTO procedure in order to ensure the testbed will not be energized during the maintenance action. Remove all stanchions and machine guarding.

Once the testbed is properly locked out, remove the safety stanchions and machine guarding from the testbed. Follow the instructions for removing the coupler connecting the motor to the torquemeter assembly. Remove the cables connecting the motor to the drive and position them out of the way.

Position the gantry crane above the motor that is to be removed and lower the hook to a few feet above the motor. Use properly rated straps to attach the motor to the hook and have a second person verify that they are connected properly and in a balanced manner. While wearing a hard hat, use the chain attached to the crane to slowly raise the motor to a height that will clear the testbed, while the other person watches the motor for any signs of tipping.

Slowly wheel the crane to the desired location for the motor. Lower the motor in place and ensure it is stable before removing the straps and returning the gantry crane to its storage location.

Follow the Testbed 3 – Motor Mounting SOP if a new motor is to be mounted in place of the old one. If no motor is to be mounted, do not remove the LOTO device until any remaining exposed electrical connections are securely isolated.

Section 4: Waste Disposal/Cleanup

No waste disposal/cleanup is necessary.

Section 5: Emergency Response

A class ABC fire extinguisher and first aid kit is located at the door of the lab Bay.

In case of a fire, exit through either of the two doors to the lab bay.

In the case of out of control rotation or equipment malfunction, wait for rotation to stop after using the emergency off button as dislodged parts may be thrown from the testbed.

In the case of a gantry crane malfunction, clear the immediate area and ensure that no-one is injured.

Section 6: Additional Information

Advice:

1.

Checklist:

- ☐ Proper fire extinguisher is nearby.
- ☐ Another researcher is nearby and knows the hazards present.
- ☐ Emergency off button is within reach
- ☐ Testbed is properly locked out

References:

The supervisor is the person that acknowledges you took the training and understand the procedure. They can be a lab manager or researcher assigned by the PI to oversee this particular SOP.

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