

# **HERCULES “H”**

## **MOBILE GANTRY CRANE**

### **ASSEMBLY, TESTING, OPERATING AND MAINTENANCE INSTRUCTION MANUAL**

**CRANE SERIAL No.** .....

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## Contents

<b>1</b>	<b>General Safety Instructions and Warnings for Assembly .....</b>	<b>2</b>
1.1	Safety Instructions:.....	2
1.2	Warnings:.....	2
<b>2</b>	<b>Crane Owner's Responsibilities.....</b>	<b>3</b>
2.1	Information.....	3
2.2	Operation.....	3
2.3	Maintenance, Inspection & Repair .....	3
2.4	Records .....	4
<b>3</b>	<b>General Site Preparation Guidelines .....</b>	<b>5</b>
<b>4</b>	<b>Assembly .....</b>	<b>6</b>
4.1	Mechanical Assembly .....	6
4.2	Electrical Assembly .....	6
<b>5</b>	<b>Testing.....</b>	<b>7</b>
5.1	Documentation.....	7
<b>5.2</b>	<b>Function Testing (No Load).....</b>	<b>7</b>
<b>5.3</b>	<b>Function Load and Deflection Test.....</b>	<b>7</b>
<b>5.4</b>	<b>Overload Test .....</b>	<b>8</b>
<b>6</b>	<b>Crane Operation.....</b>	<b>9</b>
6.1	Operational Restrictions.....	9
6.2	General Operation .....	10
6.3	Crane Pre-operation Inspection Checks by the operator.....	10
6.4	Starting Operation .....	11
6.5	Trolley Travel .....	11
6.6	Hoisting.....	12
6.7	Shut Down .....	13

## Appendices

Appendix A – PERSONNEL TRAINING REGISTER

# **1 GENERAL SAFETY INSTRUCTIONS AND WARNINGS FOR ASSEMBLY**

## **1.1 Safety Instructions:**

1. Use only trained experienced installers.
2. Read all the instructions first and become familiar with the equipment supplied.
3. Wear the appropriate approved PPE, fall protection where applicable
4. Use appropriate capacity slings/lifting devices for the installation.
5. Ensure adequate space is available to install and to store whilst the crane is not in use.

## **1.2 Warnings:**

1. Check for installation hazards such as uneven surface, overhead live electrical wires, pressurised gas, water or airlines and hidden live electrical cable runs near the where the crane is to be assembled.
2. Crane is not to be pushed, pulled or towed by motorised vehicles.

## **2 CRANE OWNER'S RESPONSIBILITIES**

### **2.1 Information**

To supply sufficient information to allow the manufacturer/crane supplier to ascertain the suitability of the crane for the purpose intended.

REF: AS 1418.1 & 3

### **2.2 Operation**

To ensure operational instructions are available and issued to operators as part of their training.

The operator must have adequate clearances to work and have sufficient headroom to the moving components.

The supporting ground surface must be of adequate strength and be a level, hard, smooth surface, free from obstruction.

REF: AS 2550.1 & 3

### **2.3 Maintenance, Inspection & Repair**

Preventative maintenance programs shall be established.

Inspections shall be carried out at sufficient frequencies to ensure the crane is kept in a safe and satisfactory condition.

Major inspections are required during and after the crane has reached the end of its design life.

Repairs to be managed and carried out in accordance with AS 2550.1.

REF: AS 2550.1 & 3

## **2.4 Records**

Continuous working records to be kept and maintained.

REF: AS 2550.1 & 3

### 3 GENERAL SITE PREPARATION GUIDELINES

1. The Hercules is a mobile crane; however, it should not be moved unnecessarily. Care should be taken to ensure that the Hercules is assembled close to where it is to be stored and used.
2. The Hercules may be used outdoors in winds up to 20km/hr but is to be stored indoors or in a similarly sheltered location.
3. Ensure the floor is of adequate strength suitable for the wheel loads imposed.
4. Ensure the floor surface is hard, smooth, level and free from obstructions.
5. Ensure the area is clear for the installation, movement of installation lifting equipment and there is adequate lighting.
6. Check positioning of the crane for adequate clearances between the crane and neighbouring obstructions.
7. Check positioning of the crane that there is adequate clearance for installation and slinging of the components.
8. Ensure all crane components are on site and are not damaged.
9. Fixings or other components supplied by the end user needs to be of the correct quality and quantity.
10. Electrical feed that is supplied by the end user needs to be adequate and in accordance with relevant standards and codes.
11. If there any discrepancies in these instructions with any General Arrangement drawing or special project drawings supplied, please consult the crane supplier.
12. Some equipment other than the crane may be supplied with or by others for installation on the crane, such as a Hoist, Trolley and/or electrics. If this equipment is supplied it may come partly assembled and fitted to the crane, if not please refer to that equipment's instructions when installing, commissioning, and testing.

## 4 ASSEMBLY

### 4.1 Mechanical Assembly – Ref. Bolt Schedules

1. Check that all components are in good condition and of correctly quantity. Clear a suitable assembly area.
2. Bolt the castor wheels to the two end carriages with the bolts supplied, ensure that they are secure.
3. Bolt the columns (and bracings if supplied) to the end carriages (in the laid down position) with the bolts supplied.
4. Three (3) person operation – Raise each column at a suitable distance apart and secure with ropes or other suitable stays, ensure the wheels are chocked or the wheel brakes are applied.
5. Assemble the catenary (if supplied) on the beam and ensure it is secure.
6. Lift the beam up onto the top of the columns, ensuring the catenary is on the same side as the junction box.
7. Align and bolt securely.
8. Fix the hoist and trolley (if supplied) to the beam and secure it to the beam (until assembly is complete).
9. Unsecure the hoist and trolley from the beam.
10. Check that the assembly is stable and that the castor wheels rotate freely.

### 4.2 Electrical Assembly

1. Check that all components are in good condition and of correctly quantity.
2. All electrical works to be carried out by licensed electrician with appropriate experience.
3. Ensure cabling intact and secure from isolator to junction box prior to mechanical assembly.
4. Fix the trolley and hoist to the beam and secure it to the beam (until assembly is complete).
5. Connect flat cable to hoist assembly and insert tow arm into end catenary trolley.
6. Connect the flat cable to the junction box on the column.
7. Ensure cabling to power source is intact and secure.

## 5 TESTING

### 5.1 Documentation

Vector Lifting requests that a copy of the test certification is provided for their records.

### 5.2 Function Testing (No Load)

Crane may not include some or all of these functions. Should your Hercules not include these options, modify the list accordingly.

If a radio controller or other controlling device is supplied as well as or instead of a pendant, check all controlling devices.

A suitably competent person(s) is to carry the following tests:

1. Inspect and ensure the mechanical and electrical assembly is correct and complete for workmanship.
2. Check the crane moves smoothly and all wheels are operating freely.
3. Test the brake function on all wheels. Keep the brakes on all wheels whilst testing the trolley and hoist.
4. Check the trolley runs smoothly in both directions.
5. Check the end stops stop the trolley correctly.
6. Plug in and energise the Crane. Turn the isolator to ON.
7. Using the pendant, check the emergency stop. If there are any faults **do not proceed**.
8. Using the pendant, check the LEFT and RIGHT function on the unloaded hoist.
9. Check the slow down and stop functions on the left and right side
10. Using the pendant, check the UP and DOWN function on the unloaded hoist.

### 5.3 Function Load and Deflection Test

For measurements use a laser (or surveyor). Ensure the crane is stationary for the test duration with all available brakes applied or wheels chocked.

1. Using 100% load, lift the load approximately 50mm off the floor and check the hoist brake holds the load.
2. Check the trolley and load can be moved along the beam to each end.
3. Position the load central along the beam and measure the height to the underside of the loaded beam.

4. Lower the load to the floor and re-measure in the same position.
5. Calculate the difference between the two measurements and record it on the load test and examination sheet.
6. The allowable test deflection is in accordance with AS 1418.1.

#### **5.4 Overload Test**

1. Safely lift a 110% load.
2. Hold for 30 seconds. Ensure the load holds. Lower.
3. Visual inspection after all tests have been carried out to ensure the integrity of the crane.

## 6 CRANE OPERATION

### 6.1 Operational Restrictions



## WARNING

**Do NOT use the Crane in any of the following circumstances:**

- If outdoors, in-service wind speed exceeding 20 m/s.
- Temperatures below zero degrees C and above 50 degrees C.
- Using unskilled/trained operators.
- Operators without the appropriate approved PPE.
- The use of the crane above its rated classification in regards load cycles.
- Using a hoist/trolley on the Jib of a weight that exceeds the original design weight.
- Lifting greater loads than that for which the crane was designed or approved for.
- The use of the crane in an explosive atmosphere.
- The use of crane before completion of commissioning and satisfactory load testing.
- Off vertical lifting the load or dragging the load.
- Using the crane to pull something free that may be jammed.
- Lifting of lids that may be held in position by a vacuum.
- Trying to push or pull the crane in the opposite direction to which it is driven.
- Moving any part of the crane by pulling on the pendant control even if there is no load.



## WARNING

**The Hercules Crane is not designed to move on the wheels with a load on the Hook. Should the Operator wish to use the wheels to move the load, further design verification is to be carried out by Vector Lifting along with additional instructions. The Owner must do a specific risk assessment and procedure for using the Crane in this manner.**

## 6.2 General Operation

Prior to use, incorporate the following checklist into any prestart or job analysis:

ITEM	CHECKLIST	[ ✓ ]
1.	Crane operators are to be suitably authorised, qualified and trained for the crane to be used and not impaired in any way due to drugs, alcohol and or any medical condition.	
2.	Perform the pre-operation inspection checks before starting to use the crane for the day and or shift duration.	
3.	Appropriate approved PPE to be worn.	
4.	Be aware particularly of the hazards around connecting the hook to the lifted load in regards keeping the hook clear of the body and the hands/fingers clear of getting caught.	
5.	Make use of the wheel brakes (where provided) to ensure maximum control of the lift.	
6.	Correct slinging/rigging equipment to be used where applicable.	
7.	Do not use the crane/trolley or hoist for lifting personnel.	
8.	Do not move loads over or near a person.	
9.	Ensure the load pathway is clear for the load to be moved.	
10.	If the crane is to be moved when the load is engaged, lower the load as far as practical to maximise stability (refer Warning).	
11.	Never leave unattended a load suspended from the hoist.	
12.	Check the load to be lifted is homogenous and will not fall apart as it is being lifted/moved.	
13.	Check all loads are within the crane capacity before lifting with the crane/trolley/hoist.	

## 6.3 Crane Pre-operation Inspection Checks (by the Operator)

Crane may not include brakes on wheels or power supply. Should your Hercules not include these options, modify the checklist accordingly.

The following checklist is completed prior to each shift:

ITEM	CHECKLIST	[✓]
1.	Check visually the crane is not damaged.	
2.	Check the crane capacity is clearly shown and understood.	
3.	Check the end stops are in place.	
4.	Check the wheels are secured, running freely and the brakes can be effectively applied, where provided.	
5.	Check the structural fixings for appearance of looseness and or damaged structure.	
6.	Check no outstanding issues recorded in the logbook from previous use.	
7.	Check the area that the crane is to be used is clear of obstructions/electrical hazards.	
8.	Check the additional equipment (trolley and hoist) manual documentation for additional pre-start check lists.	
9.	Where applicable, function test the isolator, operating and emergency controls, brakes, safety switches and hook safety catch.	

## 6.4 Starting Operation

Crane may not include electric lead or power supply. Should your Hercules not include these options, modify the checklist accordingly.

ITEM	CHECKLIST	[✓]
1.	Move the crane to a suitable position for commencing the task by unlocking all wheel brakes and pushing it slowly.	
2.	Connect to power supply.	
3.	Ensure all loose cables are adequately protected and will not be obstructed or cause a trip hazard.	
4.	Ensure loose cabling will not be run over by the Hercules during operation.	
5.	Turn on at the isolator.	

## 6.5 Trolley Travel

Trolley may not be electric, may only have one speed, may not include an Emergency Stop button. Should your Hercules not include these options, modify the checklist accordingly.

ITEM	CHECKLIST	[✓]
1.	Be aware of the trolley's position on the jib in relation to its end stops, avoid running into these.	
2.	Reset the "Emergency Stop" Button (if applicable).	
3.	Press the LEFT/RIGHT function or operate the LEFT/RIGHT function for the trolley to position the lifting hook above the centre of gravity of the load to be lifted.	
4.	Use the slow speed initially (if provided), then the fast speed, avoid jerky motions.	

## 6.6 Hoisting

Hoist may not be electric, may only have one speed, may not include an Emergency Stop button. Should your Hercules not include these options, modify the checklist accordingly.

ITEM	CHECKLIST	[✓]
1.	Be aware that the hoist has upper and lower limits, avoid using these limits to stop the hoisting motion, use the pendant control buttons.	
2.	Reset the "Emergency Stop" Button	
3.	Press the down/up function or operate the down / up function for the hoist to position the lifting hook above the centre of gravity of the load to be lifted. Attach to the Hoist hook the load using appropriate slings and or the lifting point provided, ensure the sling / lifting point sits centrally on the hook with the safety catch closed.	
4.	<p>Perform an initial lift in slow speed to take up any slack, then lift the load about 50mm to see if the load is being lifted evenly, the load is balanced, the brake holds and the lifting points are firmly attached, if satisfactory continue lifting using initially the slow speed, then fast speed, avoid jerky hoisting operations.</p> <p><b>NOTE:</b> Best practice is to move the lifted load with it in the lowest position then lift it up to the desired position.</p>	
5.	Once the load is in its desired position, lower it until it rests in place and is supported, then continue to lower the hook so the slings/hook can be removed from the load.	
6.	Once the load is removed raise the hook up above head height.	

## 6.7 Shut Down

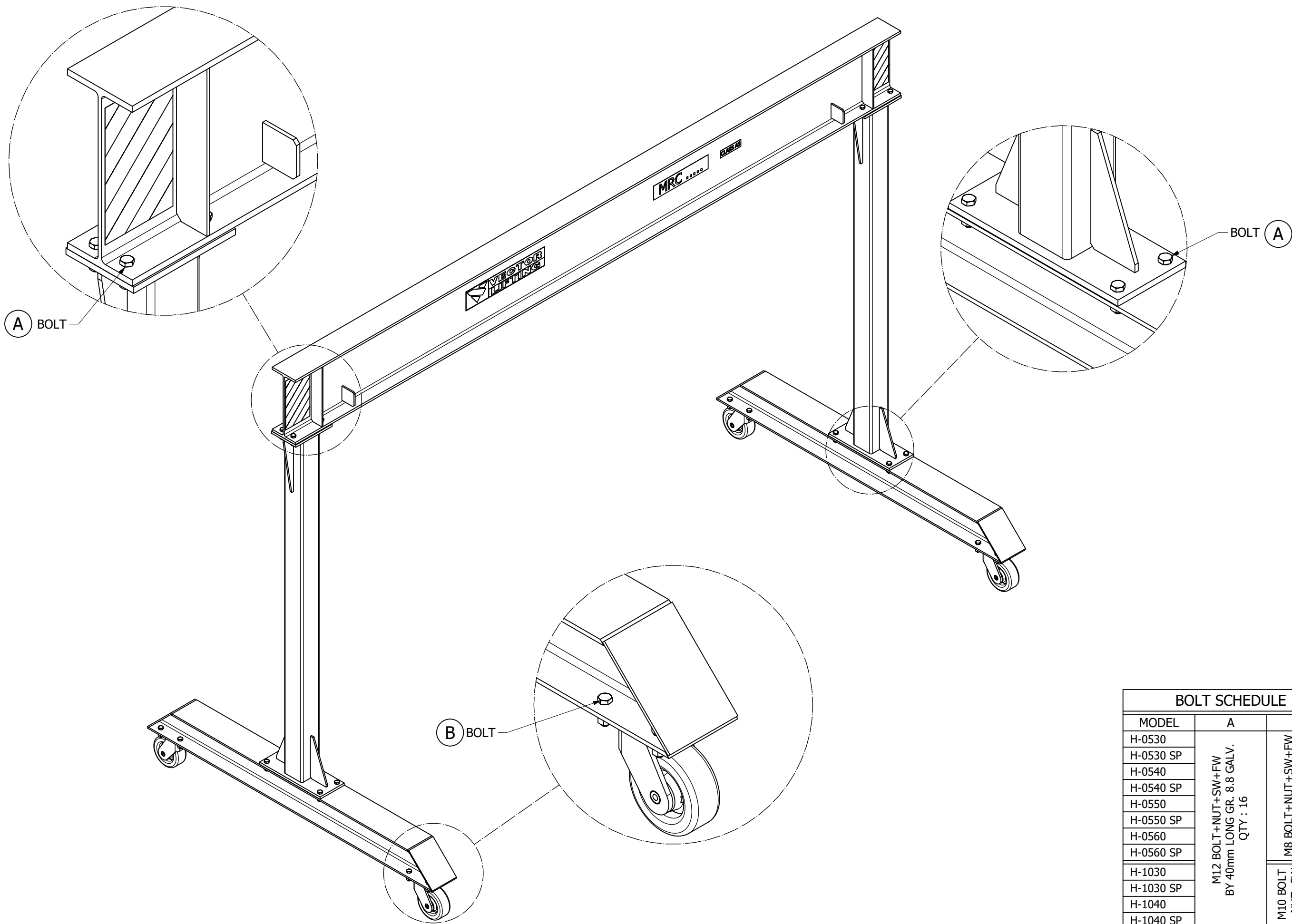
Immediately after use, carry out the following steps to ensure safe storage of the crane. Delete all steps that relate to options not included on your Hercules crane.

ITEM	CHECKLIST	[✓]
1.	Without a load, raise the hoist hook up way above head height.	
2.	Move the trolley in against the inner end stops.	
3.	Press the Emergency Stop button.	
4.	Turn off the crane's power isolator.	
5.	Disconnect power lead and coil onto the bracket.	
6.	Push to storage location.	
7.	Apply the wheel brakes.	
8.	Report/log any faults experienced with the crane.	

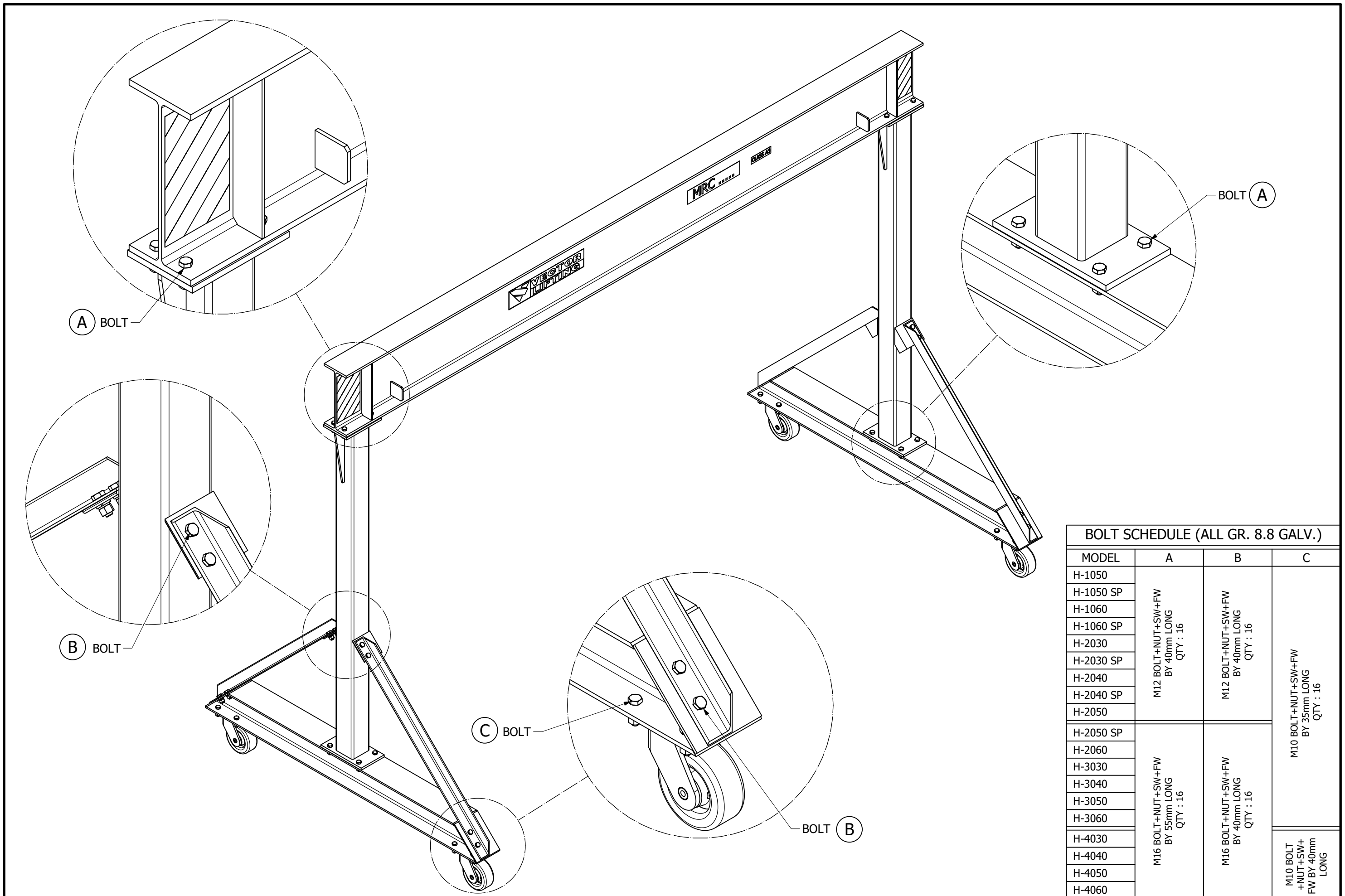
## APPENDIX A – PERSONNEL TRAINING REGISTER

PROJECT TITLE:			
VECTOR LIFTING PROJECT #:		DATE:	
CLIENT:		CLIENT CONTRACT #:	
<b><u>DOCUMENT TITLE:</u></b>	<b>PERSONNEL TRAINING REGISTER</b>		

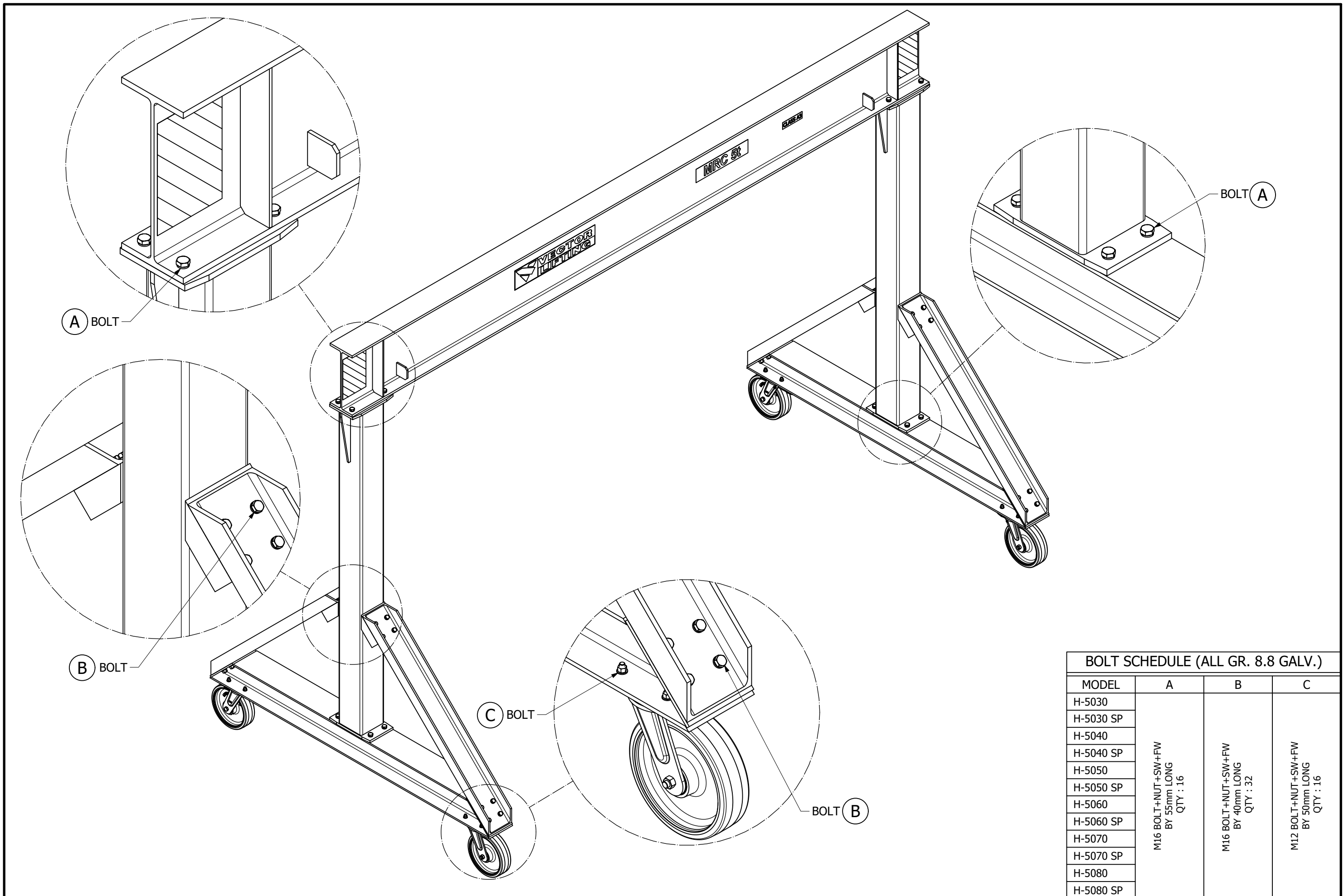
ITEM #	ITEM DESCRIPTION	DETAILS
1	EQUIPMENT NAME	
2	EQUIPMENT SERIAL #:	
3	TRAINING DATE:	
4	TRAINER:	
<b>PERSONS TRAINED</b> (The following people have been trained as per the guidelines of the above-mentioned document)		
P1	NAME:	SIGNATURE:
P2	NAME:	SIGNATURE:
P3	NAME:	SIGNATURE:
P4	NAME:	SIGNATURE:
P5	NAME:	SIGNATURE:
P6	NAME:	SIGNATURE:
P7	NAME:	SIGNATURE:
P8	NAME:	SIGNATURE:
P9	NAME:	SIGNATURE:
P10	NAME:	SIGNATURE:



BOLT SCHEDULE		
MODEL	A	B
H-0530	M12 BOLT+NUT+SW+FW BY 40mm LONG GR. 8.8 GALV. QTY : 16	M8 BOLT+NUT+SW+FW BY 30mm LONG S/S 316 QTY : 16
H-0530 SP		
H-0540		
H-0540 SP		
H-0550		
H-0550 SP		
H-0560		
H-0560 SP	M10 BOLT +NUT+SW +FW BY 30 mm LONG	
H-1030		
H-1030 SP		
H-1040		
H-1040 SP		



BOLT SCHEDULE (ALL GR. 8.8 GALV.)			
MODEL	A	B	C
H-1050	M12 BOLT+NUT+SW+FW BY 40mm LONG QTY : 16	M12 BOLT+NUT+SW+FW BY 40mm LONG QTY : 16	M10 BOLT+NUT+SW+FW BY 35mm LONG QTY : 16
H-1050 SP			
H-1060			
H-1060 SP			
H-2030			
H-2030 SP			
H-2040			
H-2040 SP			
H-2050			
H-2050 SP	M16 BOLT+NUT+SW+FW BY 55mm LONG QTY : 16	M16 BOLT+NUT+SW+FW BY 40mm LONG QTY : 16	
H-2060			
H-3030			
H-3040			
H-3050			
H-3060			
H-4030			
H-4040			
H-4050			
H-4060			
			M10 BOLT +NUT+SW+ FW BY 40mm LONG



BOLT SCHEDULE (ALL GR. 8.8 GALV.)			
MODEL	A	B	C
H-5030	M16 BOLT+NUT+SW+FW BY 55mm LONG QTY : 16	M16 BOLT+NUT+SW+FW BY 40mm LONG QTY : 32	M12 BOLT+NUT+SW+FW BY 50mm LONG QTY : 16
H-5030 SP			
H-5040			
H-5040 SP			
H-5050			
H-5050 SP			
H-5060			
H-5060 SP			
H-5070	M16 BOLT+NUT+SW+FW BY 55mm LONG QTY : 16	M16 BOLT+NUT+SW+FW BY 40mm LONG QTY : 32	M12 BOLT+NUT+SW+FW BY 50mm LONG QTY : 16
H-5070 SP			
H-5080			
H-5080 SP			