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Advanced Ground Systems Engineering LLC.

AGSE-Y002-G01

Light Weight Self-Erecting Gantry

For Rolls-Royce Trent 700 & Trent 800 Engines

ORIGINAL MANUAL DATED 05/14/04

LATEST MANUAL REVISION DATE (LEVEL) 3/10/2023 (REV D)

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NOTICE

1. Alteration, Modification, Reengineering, or Reproduction of Equipment

The alteration, modification, reengineering, or reproduction of AGSE equipment and/or parts is not permitted without prior written authorization from AGSE.

These modifications include but are not limited to:

- Structural changes to AGSE-supplied parts
- Substitution of AGSE-supplied parts, including hardware, with an alternate source or supplier
- Reverse engineering of AGSE equipment and parts.

Requests for modifications should be submitted to AGSE for review – please send modification requests to support@agsecorp.com.

Once reviewed by our Engineering team, a Customer Support Letter (Subject: No Technical Objection) will be issued for any approved modifications.

NOTE

Modifications executed without prior authorization by AGSE may result in a non-compliant product that is unsafe for operation.

Unauthorized modifications void AGSE's and the OEM's (Engine and/or Airframer) approval and authority to use the product for its intended application.

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1.0 – Revisions

The following is an itemized record of all changes from previous revision.

PAGE	REV	DESCRIPTION OF CHANGE	DATE
2.0	D	Updated Figure 2.0-1	3/10/2023
2.1-2.3	D	Added Figure 2.0-2 - 2.0-4	3/10/2023
4.1	D	Updated Figure 4.3-1	3/10/2023
5.4-5.8	D	Updated Figure 5.6-1 - 5.6-5	3/10/2023
8.1	D	Updated Item 17 & 21 Part Number	3/10/2023
8.1	D	Removed Item 19	3/10/2023
8.2	D	Updated Item 24, 25	3/10/2023
8.2	D	Removed Items 31 & 32	3/10/2023
8.2	D	Updated Item 33-44, 54 & 57 Part Numbers	3/10/2023
8.3	D	Added Item 58-62	3/10/2023
8.4	D	Updated Item 1 Part Number	3/10/2023
8.4	D	Removed Item 4, 12, & 16	3/10/2023
8.4	D	Added Item 19-27	3/10/2023

2.0 – Illustrations

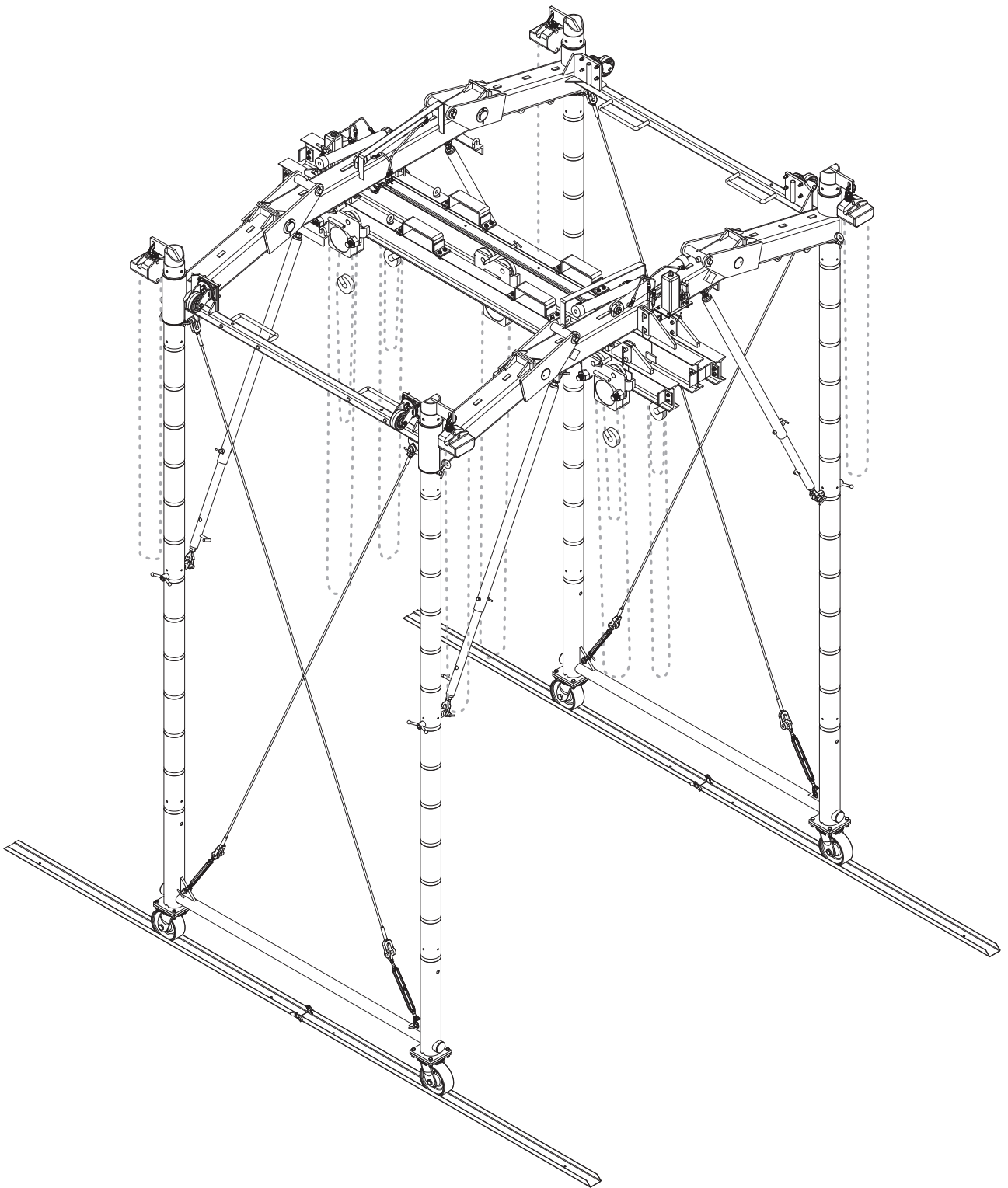


Figure 2.0-1. AGSE-Y002-G01 - Light Weight Self Erecting Gantry

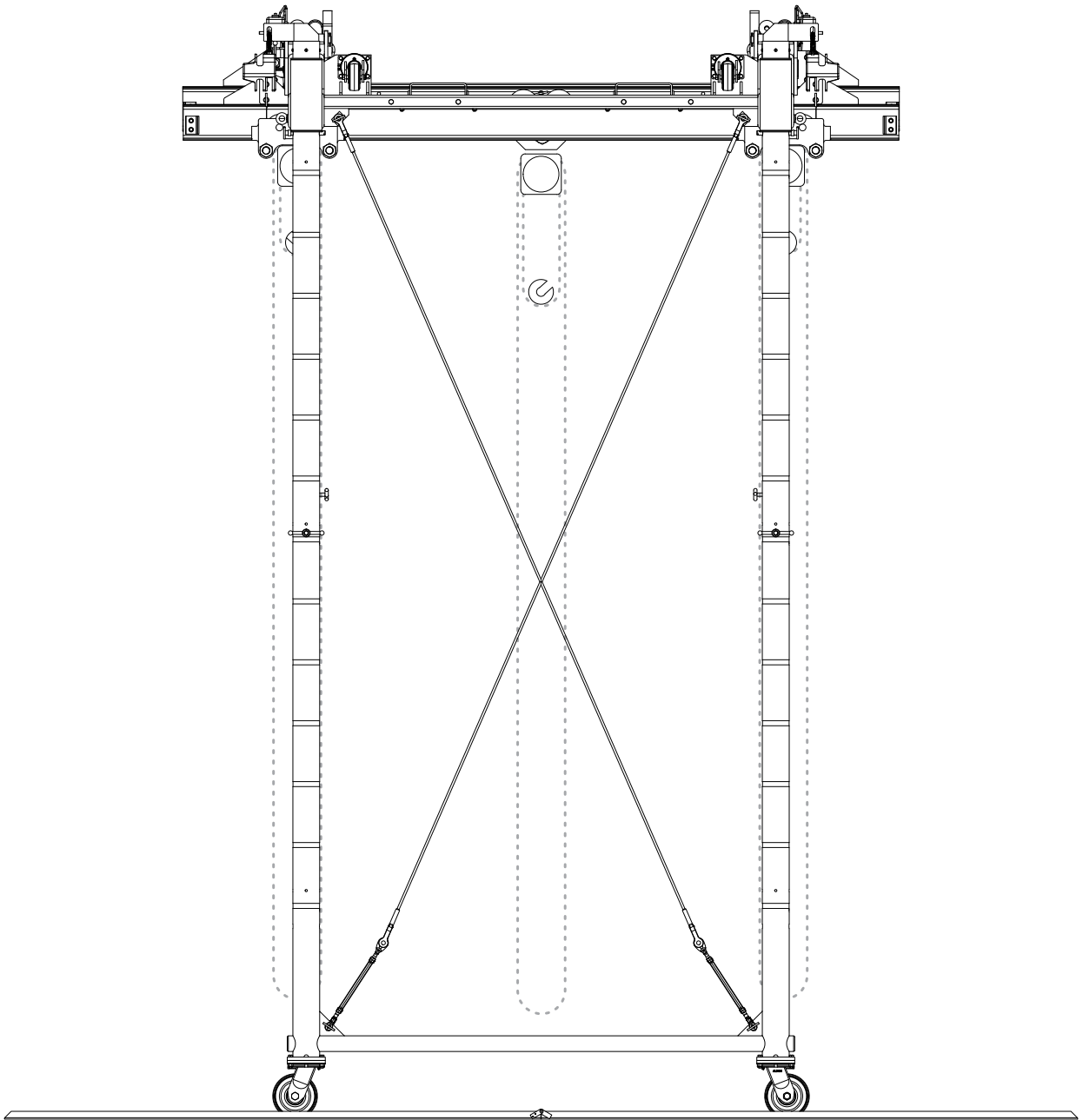


Figure 2.0-2. AGSE-Y002-G01 - Side View (Chains Not Shown)

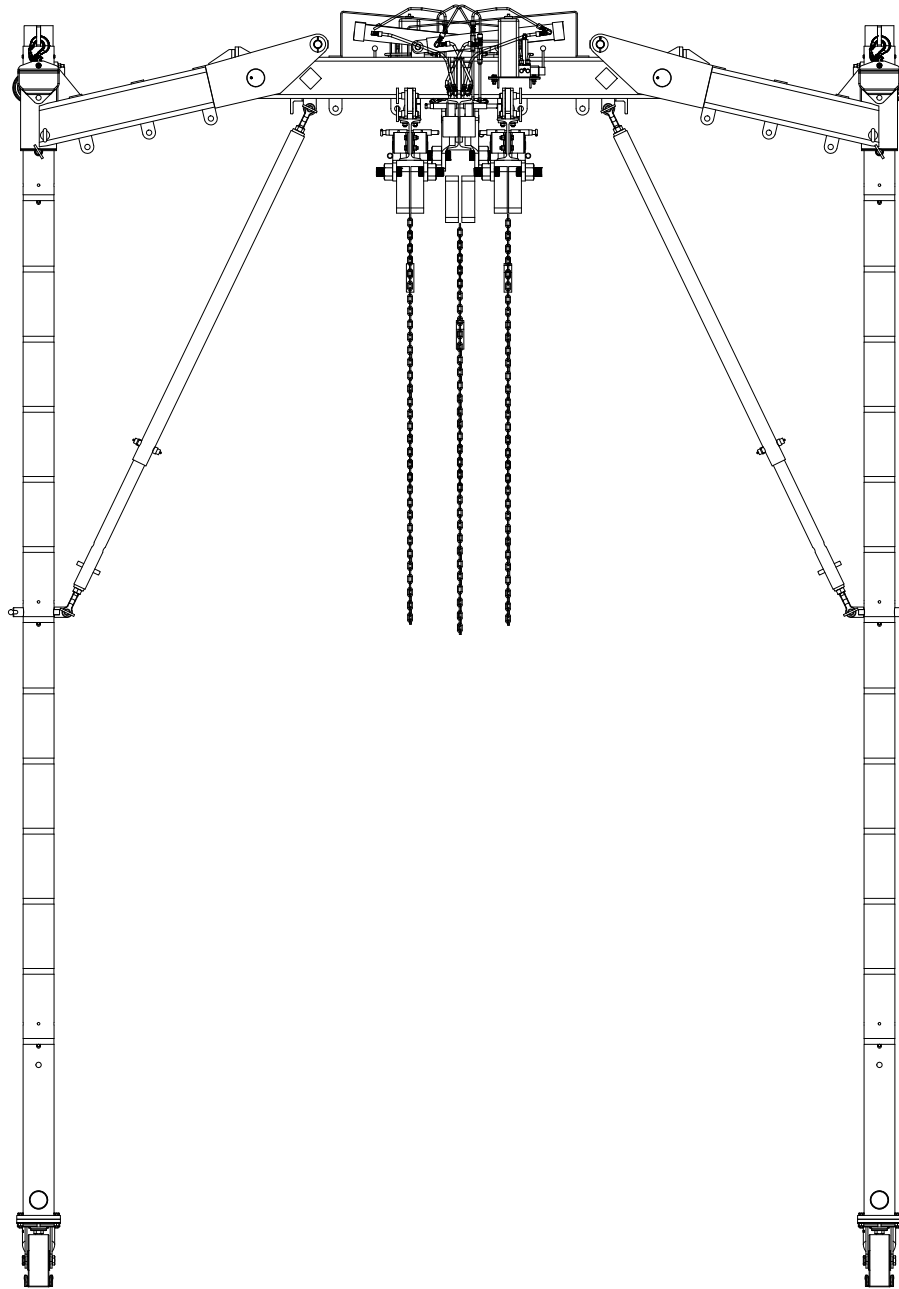


Figure 2.0-3. AGSE-Y002-G01- Front

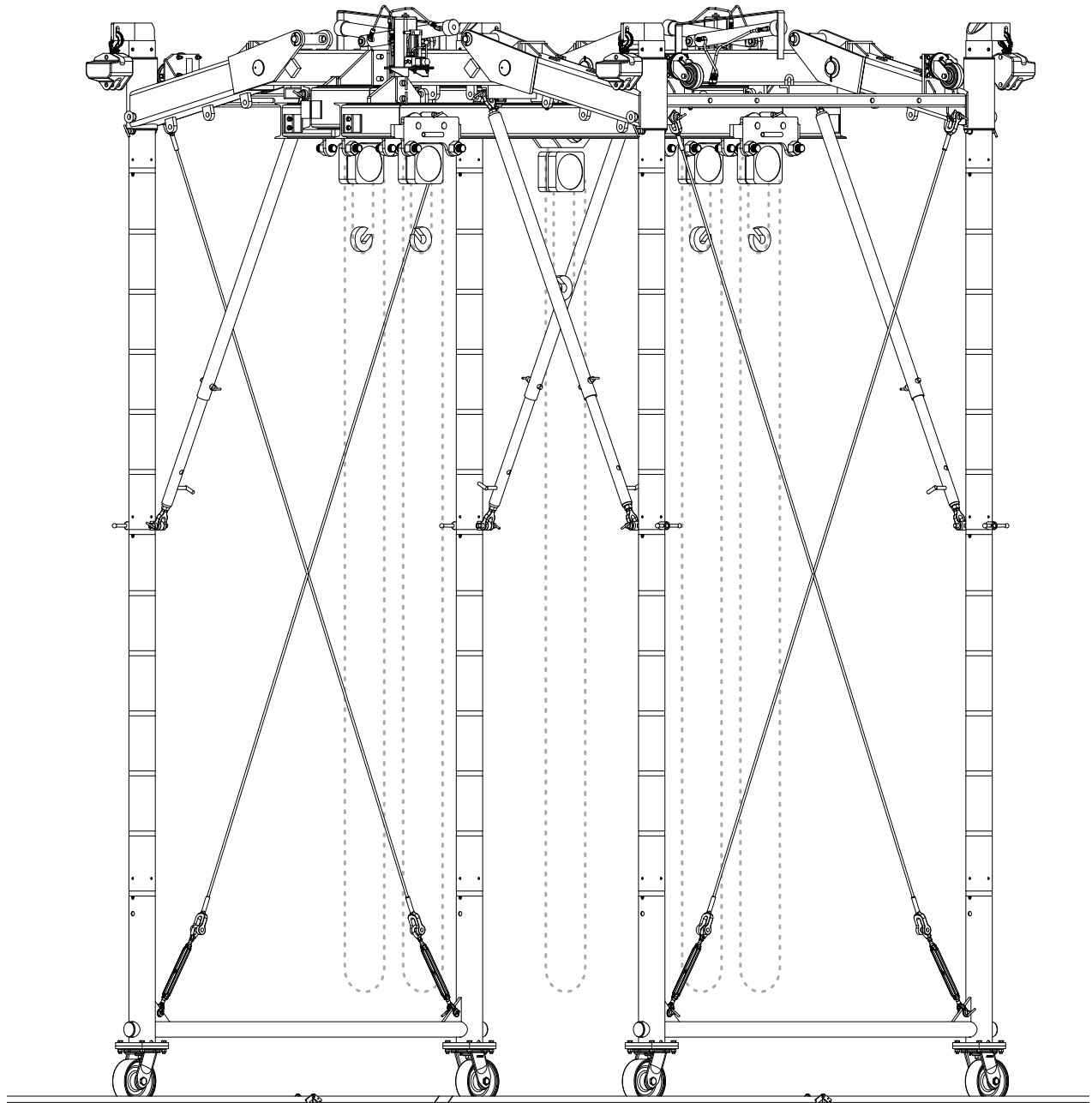


Figure 2.0-4. AGSE-Y002-G01 Light Weight Self Erecting Gantry (Chains Not Shown)

3.0 – Specification

3.1 General

The AGSE-Y002-G01 Light Weight Self Erecting Gantry is designed and capable of supporting large aircraft engines (120 inch diameter fans) during field assembly (engine split operations), module replacement, and stand transfer. Hoist capacity and location will dictate gantry capabilities. The gantry is suitable for complete engine module replacement, thus eliminating the need to ship complete engines. It can also be used at main base maintenance facilities to provide extra capability during peak workloads. The unit knocks down to a compact 64 inch high x 96 inch wide x 125 inch long volume for shipping. The gantry is self erecting, requiring only a forklift to remove it from a pallet dolly, separate it from its pallet support frame, and remove the storage container. A ladder is also required to install the bridge locking pins. An optional self deployment kit (AGSE-Y005) eliminates the need for the forklift.

3.2 Mobility

When erected, the gantry is mounted on casters and can be moved by hand along tracks provided. The gantry should not be moved when supporting loads.

3.3 Design

The gantry includes three hoist rails (one centered) and two adjustable with rail spacings of 144, 120, 96, 58, and 48 inches. The outboard rails include one 8-Ton hoist. The outboard rails include two 4-Ton hoists each. The gantry has a minimum of loose components and moving parts. Storage for components is provided by a removable steel container.

3.4 Fabrication and Finish

The Gantry is fabricated from structural steel shapes conforming to ASTM A500, A513, and A36 materials. All bolted connections use A325 structural bolts or SAE Grade 5 commercial hardware. Unit is primed and painted with high-grade, Skydrol resistant enamel, with color optional. Pins and miscellaneous hardware are manufactured from corrosion resistant materials, or plated as required.

3.5 Characteristics

	Stored	Erected
Height (in.)	64	243
Length (in.)	125	160
Width (in.)	96	170
Weight (LB)	9,500	9,500

4.0 – Maintenance and Inspection

4.1 General

Life expectancy of this equipment can be extended if it is properly maintained. By design, there is only minimal periodic inspections required. Annual inspections for damage, weld cracks, or corrosion are recommended. Prior to each use, the equipment should be inspected for obvious signs of abuse or shipping damage. Observed damage should require complete inspection of the affected area to ensure structural integrity is not compromised.

4.2 Cleaning and Painting

The Gantry should be cleaned periodically with a soap and water solution and rinsed thoroughly.

CAUTION

Re-Lubricate Wheel Bearings After Cleaning Gantry

Damaged paint should be touched-up with Skydrol resistant high-grade enamel paint. Superficial scratches are expected during normal usage and will not affect function.

4.3 Scheduled Service

All grease fittings should be lubricated every 90 days with the following extreme pressure grease or equivalent grease. See Figure 4.3-1 for location of grease fittings. The hydraulic pump reservoir should be replenished with MIL-H-5606 or equivalent hydraulic fluid.

Manufacturer	Product
Mobil Oil Company	Mobilplex E.P. #1
Texaco Oil Company	Texaco E.P. #1
Gulf Oil Corporation	Gulf Crown E.P. #1
Shell Oil Company	Shell Alavania E.P. #1

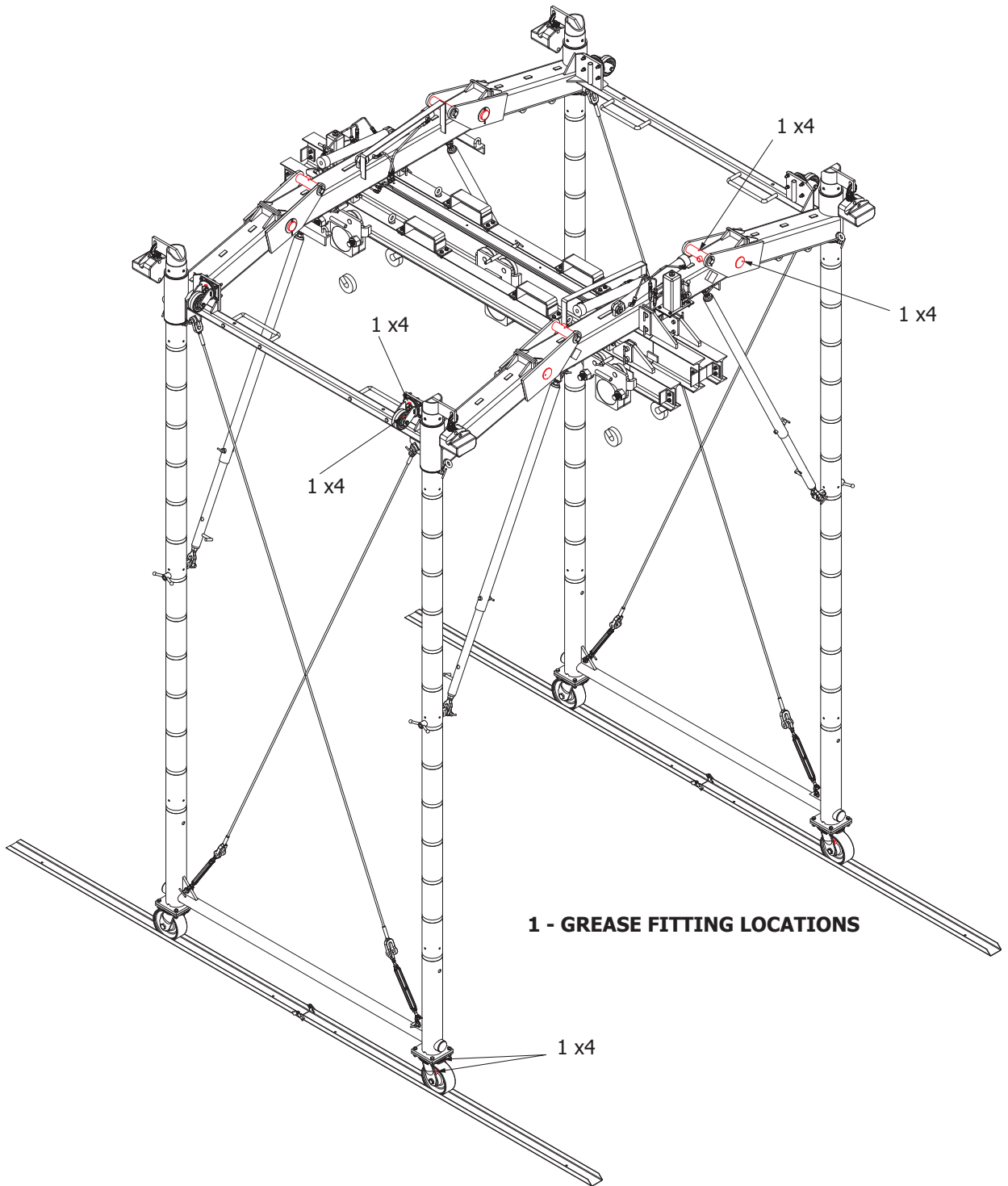


Figure 4.3-1. Grease Fitting Locations

4.4 Scheduled Inspection

CAUTION

Prior to each use, the gantry should be inspected for obvious signs of abuse or shipping damage. Observed damage should require complete inspection of the affected area to ensure gantry integrity is not compromised.

Annual inspections of machined surfaces, pins, fasteners, and structure, and hoists are recommended. The machined surfaces (wheels, legs) are to be visually inspected for signs of wear or corrosion. Action is to be taken immediately if areas are determined to be potentially dangerous to operating personnel, or a detriment to the equipment. Pins and fasteners are to be visually inspected for cracks, damage, or corrosion. Loose fasteners should be tightened. The gantry bridge structure is to be visually inspected for damage, weld cracks, or corrosion. The 2-Ton hoists must be inspected in accordance with the manufacturer's recommendations. The 8-Ton and 4-Ton hoists must be inspected as recommended in Section 4.5.

4.5 Inspection, Preventive Maintenance and Testing

A preventive maintenance program should be initiated for this hoist immediately after it is entered into service. The preventive maintenance program should comply with recommendations in this Service Guide, the applicable Yale Parts and Instruction Manual, and all pertinent Federal, State, and local regulations. Regular inspections, maintenance, and testing recommendations should be followed for the life of the hoist and written inspection records kept as specified. Extra inspection check lists can be obtained from your nearest authorized CM/Yale Distributor.

If you do not have a parts and instruction manual you should contact your nearest authorized CM/Yale distributor. Procurement of the parts and instruction manual should be done immediately. It should be preserved and kept easily accessible to the person responsible for maintenance throughout the life of the hoist.

4.5.1 Inspection is Important:

The replacing of parts when worn, at small expense, will make your chain hoist last longer, maintain its efficiency and help prevent accidents due to breakage. The following recommended inspection periods are based on an average duty, single shift operation of forty (40) hours per week under normal environmental conditions. If the hoist is used in heavier applications or in adverse environmental conditions, the inspections should be made more frequently.

4.5.2 Daily Inspection

Inspect the following listed items (A-C) before using the hoist.

A. Braking Mechanism

Check for slipping brake.

B. Load Chain

Check for worn, broken or cracked links. Check for grit, dirt or other foreign matter which may be carried into the hoist mechanism. Check for proper lubrication. Check chain for twists or kinks. If a crack, excessive wear or stretch is observed, see instructions under annual inspection below.

C. Hook

Check for cracks, chemical damage, or deformation. The bottom hook must swivel freely. If a crack, excessive damage, or excessive deformation is observed, see instructions under annual inspection below.

NOTE

Bent or twisted hook, indicates overloading or abuse of the unit. Other load bearing components of the hoist should be inspected for damage.

CAUTION

Do not operate the hoist if it is functioning improperly or if damage is noted.

4.5.3 Annual Inspection

Inspect the following items at least once every year, or more often if need is indicated by daily inspections.

A. All items under Daily Inspection.

B. Load Chain and Sheaves

Check for excessive wear or corrosion of chain, driving load sheaves and bottom block load sheaves. Check for chain stretch. Carefully inspect link chain for wear between the links in section of chain that most often passes over the load sheaves. Check several links, as wear is seldom even from one link to another. The chain should be replaced if wear or stretch has increased the specified gauge length. If the load chain is worn or stretched and requires replacing, also examine the driving load sheave and load chain guide and stripper. If these parts are worn they should be replaced to avoid damaging the new load chain. The new load chain should be installed with weld on vertical link. The load chain guide should fit so there is approximately 1/8 clearance between the load chain guide side and the outside diameter of the driving load sheave.

C. Hooks

Dye penetrant, magnetic particle or other suitable crack detecting inspection should be performed if need is indicated by external appearance. Replace hook, if throat opening is in excess of maximum or if there is 10 degrees or more twist from normal plane of hook.

D. Hardware

Check hook retaining nut, collars or pins for wear. Check for loose bolts, nuts or rivets. Check for missing or damaged hook latch.

E. Braking Mechanism

Check for worn, glazed or oil contaminated friction discs, and worn, broken or cracked pawls or ratchet teeth, corroded, stretched or broken pawl springs.

F. Load Brake

Turn the hand wheel to check the backlash and wear on the load brake parts. Normally, the hand wheel should have a back movement equivalent to 1 or 1 1/2 pockets. If this backlash is equivalent to 20 more pockets on the hand wheel, some of the load brake parts are worn. Inspect the brake disc, oilite disc and spring washer for possible replacement.

G. Load Bearing Parts

Check for worn, cracked or distorted parts such as hook blocks, suspension housing, chain attachments, clevises, yokes, suspension bolts, gears, shafts, bearings, and trolley wheels.

H. Load Limiting Device

If hoist is equipped with a load limiting device check device with 175% of rated capacity. If this load can be lifted device must be repaired or replaced. See applicable parts and instruction manual and function testing instructions below.

I. Warning Labels

Check for absence or illegibility of warning decals and tags and replace as necessary.

J. Check List

Fill out an inspection check list sign date and file for future reference.

4.5.4 Function Testing After Hoist Repair

After repair of hoist test with a light load for proper function. If load sustaining parts have been altered load test unit with 125% of the rated capacity by lifting and lowering through a short distance. If a load limiting device has been repaired or replaced load test unit with 100% of rated capacity and check function of load limiting device with 175% of rated capacity. Also test operation of any other brakes limit devices and locking or safety devices etc. involved in the repair. (If no load sustaining parts were repaired or altered a normal load lift may be used for test and test of the load limiting device may be omitted).

A written report of the test should be prepared by the person responsible and kept on file for future reference.

CAUTION

Do not load test hoist on Gantry after hoist repair.

CAUTION

Prior to testing all supporting structures anchorages and/or suspensions must be approved by the appointed person for the test loads used.

5.0 – Operation

5.1 General Preparation:

1. Required Equipment -
 - a) 10,000 lbs. (4550kg) fork lift with 8 feet (2.5m) long forks
 - b) Basket or man lift with 20 feet (6.1m) reach.
2. 20 feet (6.1m) x 60 feet (18.3m) clear, level, hard surfaced area.
3. Minimum of (4) persons

5.2 Pre-Erection

1. Position gantry/pallet near erection site. Approximate weight 9,500 lbs. (4,300 kg).
2. Remove component storage box (Figure 5.6-1)
 - a) Remove track assemblies and set aside.
 - b) Release straps retaining box cover.
 - c) Use forklift to lift loaded storage box (approximate weight 2,000 lbs).
 - d) Place box near center and along side of erection area.
3. Separate gantry from pallet frame (Figure 5.6-1)
 - a) Remove retaining pins at four (4) places.
 - b) Insert forklift tines through bar loops on gantry and raise gantry straight up (approximate weight 6,000 lbs).
 - c) Rotate and lock caster swivel locks with caster brake handles facing upward.
 - d) Open storage box and remove contents. Inventory contents to ensure the following are present:
 - 1 - (4) lower column leg sections
 - 2 - (4) mid column leg sections
 - 3 - (4) upper column leg sections
 - 4 - (4) side rail extensions
 - 5 - (2) center rail extensions
 - 6 - (4) cable turnbuckle assemblies
 - 7 - (2) pump handles
 - 8 - (4) 2-Ton chain hoists
 - 9 - (4) eyebolts with speed handle attachments
 - e) Position components as shown in Step 1 through 6
4. Release chain baskets from rails and set aside.

5.3 Erection

1. Set brakes on casters on one side of gantry frame.
2. Using the frame mounted hydraulic hand pumps, set the selector valve to the “out” position and open pump reservoir vent. Operate the pump to partially unfold the side frames to facilitate column leg section assembly. The leg sections should be approximately 5° from horizontal during assembly.
3. Insert leg segments into gantry base, by matching letter marks (i.e. “A” to “A” and “B” to “B”). Ensure pin is engaged into slot. Continue until all leg segments are assembled as shown in Figure 5.6-2.
4. Install 2-Ton hoists onto brackets located on upper column leg sections. Ensure hooks are properly set and chains are not tangled.
5. Unfold gantry by using hand pumps in unison, until side frames hit stops. Column legs sections will now be vertical.
6. Remove chain baskets.
7. Move side rails to proper position. Retain pins with safety clip.
8. Install rail extensions as shown in Figure 5.6-3.
9. Remove hoist stowage pins and store on trolley hoist.
10. Rotate casters as shown in Figure 5.6-4.
11. Raise gantry bridge by raising 2-Ton hoists. Four (4) people are required. The hoists must be raised in unison. The painted bands on the legs can be used to ensure even raising of the bridge. The bridge will bind if raised unevenly.
12. Stop raising bridge at sixth leveling band (from bottom) and install side braces and cable turnbuckle assembly to the gantry bridge.
 - a) Attach brace to lug marked “Side Brace”
 - b) Extend brace until red band is exposed and re-pin.

CAUTION

Use caution when extending the side braces. The inner leg of the brace is not retained and may slip when the safety pin is removed.

- c) Attach cable turnbuckle assembly to side frame of gantry bridge
13. Continue raising gantry bridge until the bridge passes the support pin hole in the upper column leg section.
14. Using a man-lift, install the support pin at each corner. The flat on the pin must be aligned with the bottom of the gantry bridge. Lower the bridge until the support pin supports the bridge. Repeat for all four corners of the bridge.

15. Using a man-lift, install the eyebolt and speed handle to the mid column leg section. Adjust the brace length as required to pin the brace to the eyebolt. Tighten the jam nut once the proper length has been reached.
16. Attach cable turnbuckle assemblies to the lower gantry frame and tighten by hand for light tension load.
17. Orient gantry casters as shown in Figure 5.6-4 and set swivel lock.
18. Lay gantry tracks in front of gantry casters and move the gantry (by hand) until its casters rest on the track.

WARNING

The gantry must be on flat level ground with casters resting on the gantry tracks prior to supporting any loads.

19. Position gantry as required on the tracks and set caster brakes.
20. Prior to use, check the following:
 - a) all column chain hoists are slack and bridge is supported by pins.
 - b) side braces are tight and columns are straight.
 - c) cable turnbuckle assemblies are hand tight.

5.4 Tri-Rail Gantry

1. See Figure 5.6-5 for moving side rails if gantry is completely erected.
2. Column sections are coated with spray-on lubrication. This coating is required for corrosion prevention and to ease bridge erection. Reapply periodically.
3. Four 2-Ton hoist chains are coated with spray on lubricant for corrosion prevention. Gloves should be worn when handling/operating hoist. Reapply periodically.

5.5 Gantry Tear-Down

1. Move the gantry (by hand) until its casters are clear of the tracks.
2. Loosen and detach the cable turnbuckle assemblies from the lower gantry frame.
3. Using a man-lift, unpin the lower end of the leg braces. Remove the eyebolt and speed handle from the mid column leg section.
4. Raise the gantry bridge until the support pins are unloaded. Using a man-lift, remove the support pins from the top of each gantry leg.
5. Lower the gantry bridge by lowering 2-Ton hoists. Four (4) people are required. The hoists must be raised in unison. The painted bands on the legs can be used to ensure even lowering of the bridge. The bridge will bind if lowered unevenly.

6. Stop lowering the bridge at the sixth leveling band (from bottom). Remove the cable turnbuckle assemblies and leg braces. Retract the leg braces and set aside.
7. Continue to lower gantry bridge until it reaches its stops and the 2-Ton hoist chains are slack.
8. Position rail hoists to their storage locations and install the hoist stowage pins.
9. Remove rail extensions and set aside.
10. Move side rails to storage position. Retain pins with safety clip.
11. Rotate gantry casters as shown in Figure 5.6-4 and set swivel lock. Set caster brakes on one end of gantry only.
12. Using the frame mounted hydraulic hand pumps, set the selector valve to the “in” position and open reservoir vent. Operate the pumps to fold the side frames.
13. Stop pumping when the legs are approximately 5° from horizontal.
14. Remove the 2-Ton hoists and set aside.
15. Remove leg sections and set aside.
16. After all leg sections have been removed, continue to pump cylinders until the legs hit the bridge stops.
17. Close reservoir vent.
18. Pack gantry tool box following the procedure in the next section.
19. Using a forklift, lift the folded gantry by the loops on the gantry frame.
20. Lower the gantry onto the pallet frame and pin into place.
21. Using a forklift, lift the packed tool box and place on top of the gantry.
22. Attach the straps on the tool box cover to the gantry frame and tighten.
23. Store track assembly.

5.6 Special Instructions for Packing Gantry Tool Box

1. Place 2-Ton hoists, rail extensions, and cable turnbuckle assemblies as shown in “Step 1.”
2. Place truck jack adapters as shown in “Step 2.” The adapters are part of AGSE-Y005 and may not be included with all gantries.
3. Place upper column leg sections as shown in “Step 3.”
4. Place all remaining column leg sections as shown in “Step 4.”
5. Place leg braces as shown in “Step 5.”
6. Place jib cranes as shown in “Step 6.” The jib cranes are part of AGSE-Y005 and may not be included with all gantries.

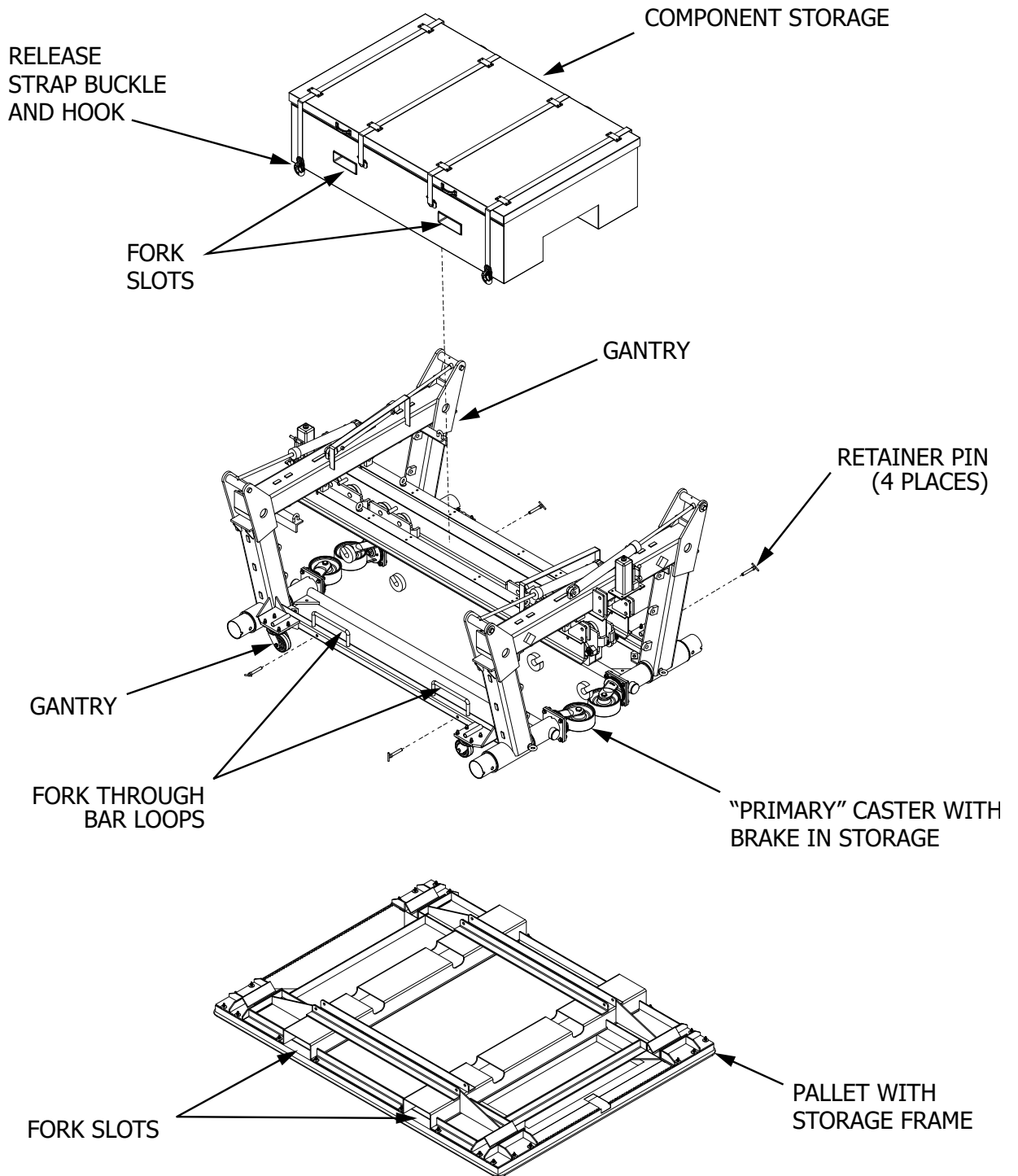


Figure 5.6-1 - General Preparation - Packing and Unpacking

WARNING

Bridge side frames should be slightly unfolded to ease assembly of column sections. Use hand pump with selector valve in "out" position.

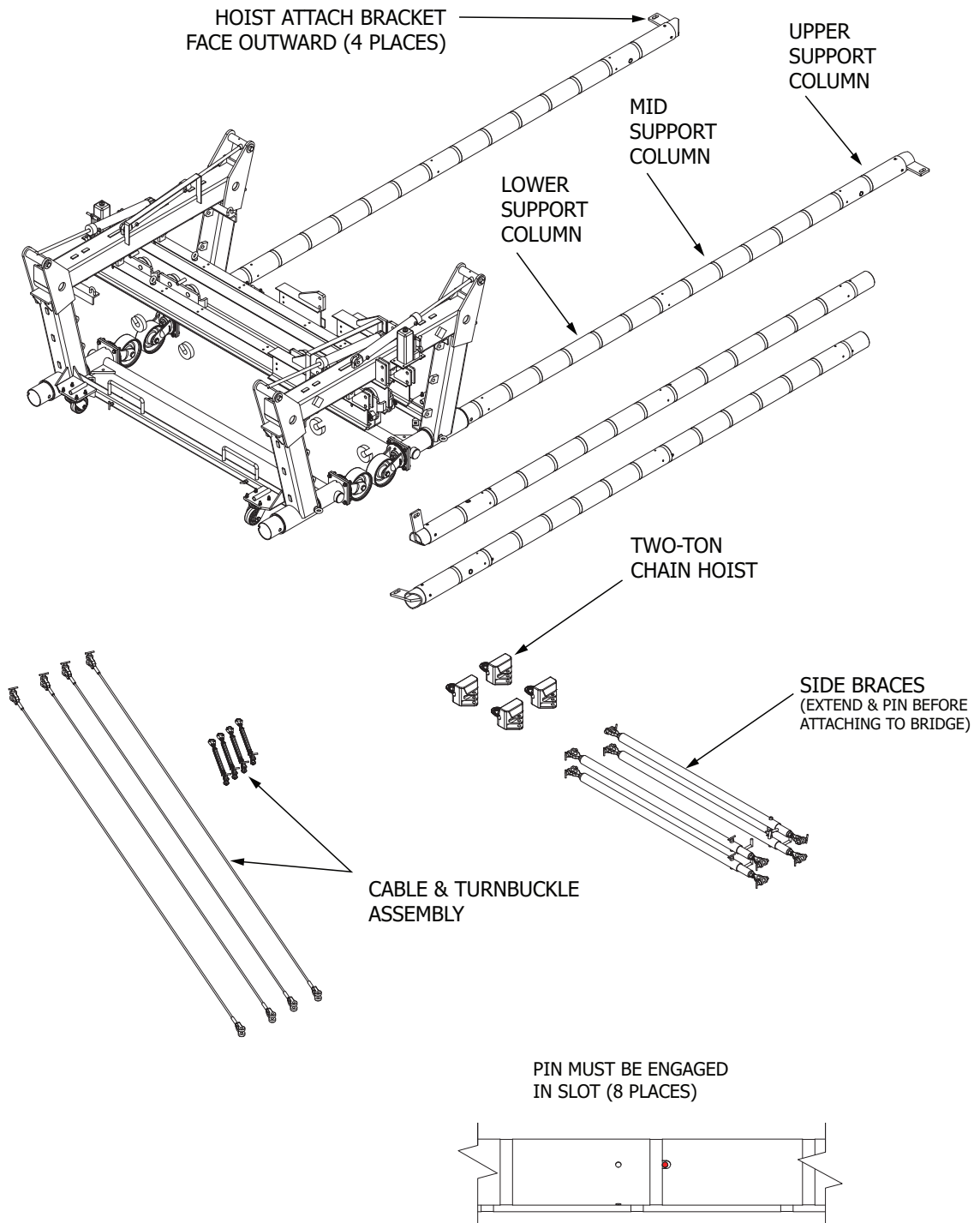
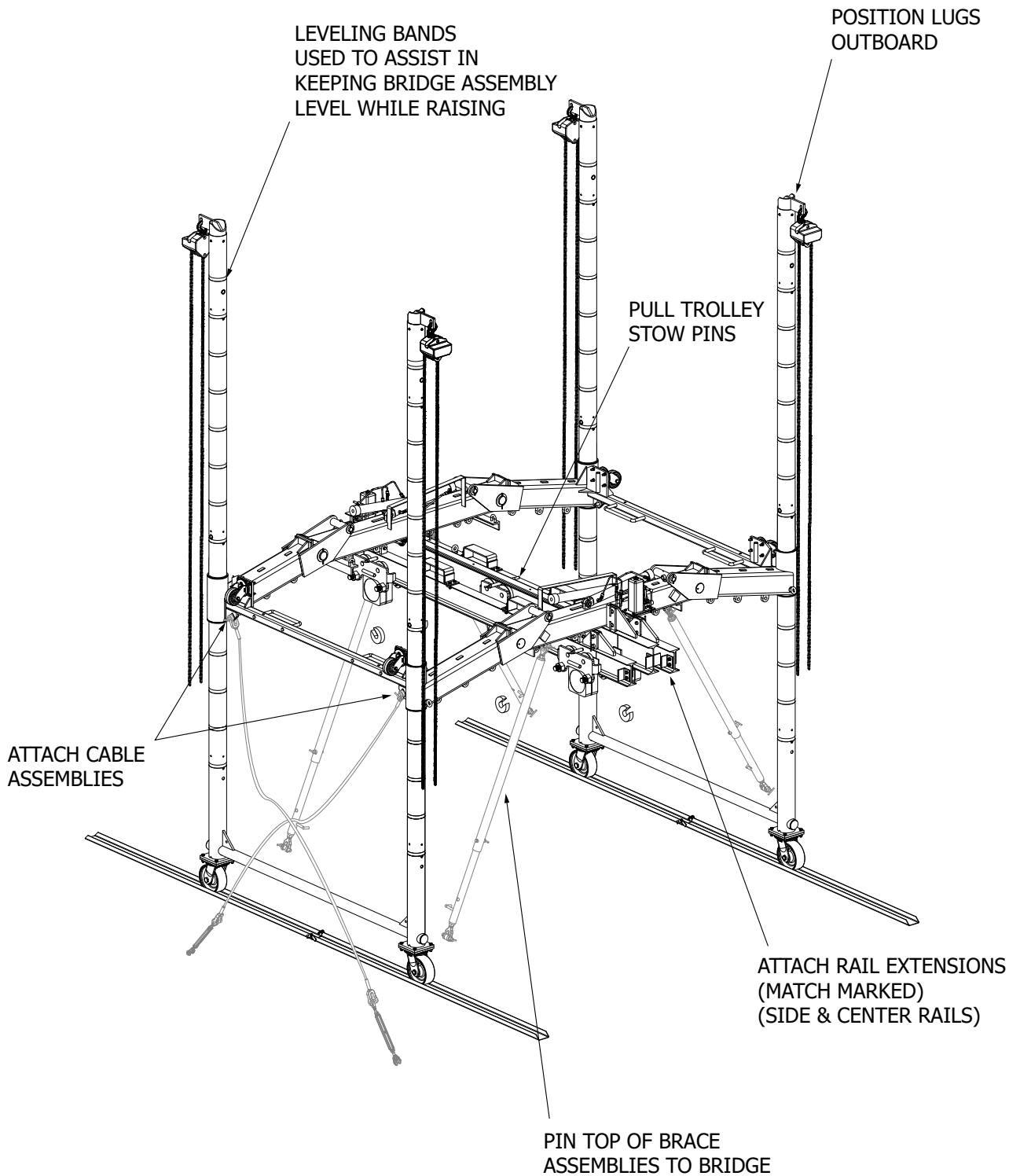


Figure 5.6-2.



NOTE

Remove Chain Brackets. Position side rails as required.

Figure 5.6-3.

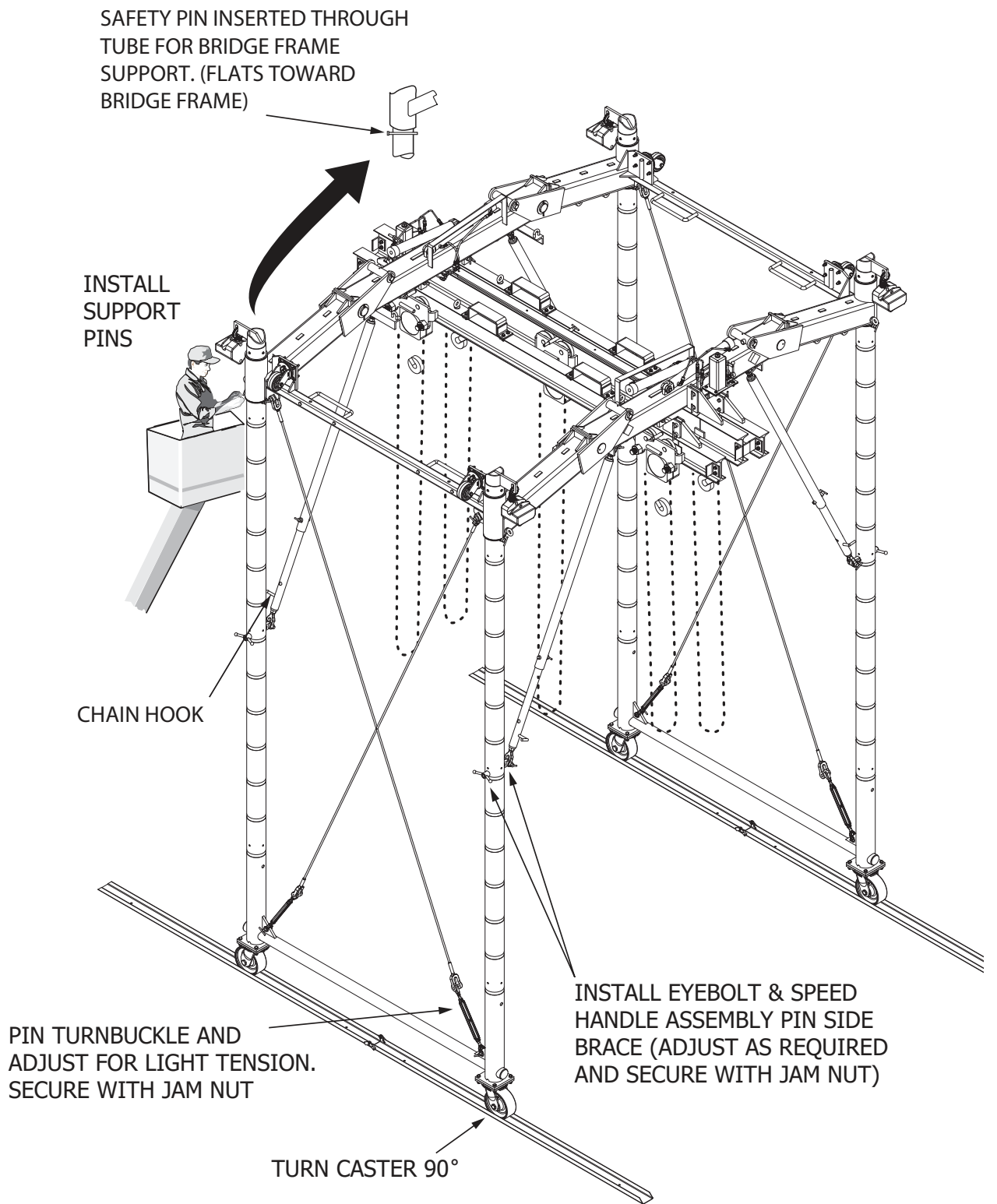


Figure 5.6-4.

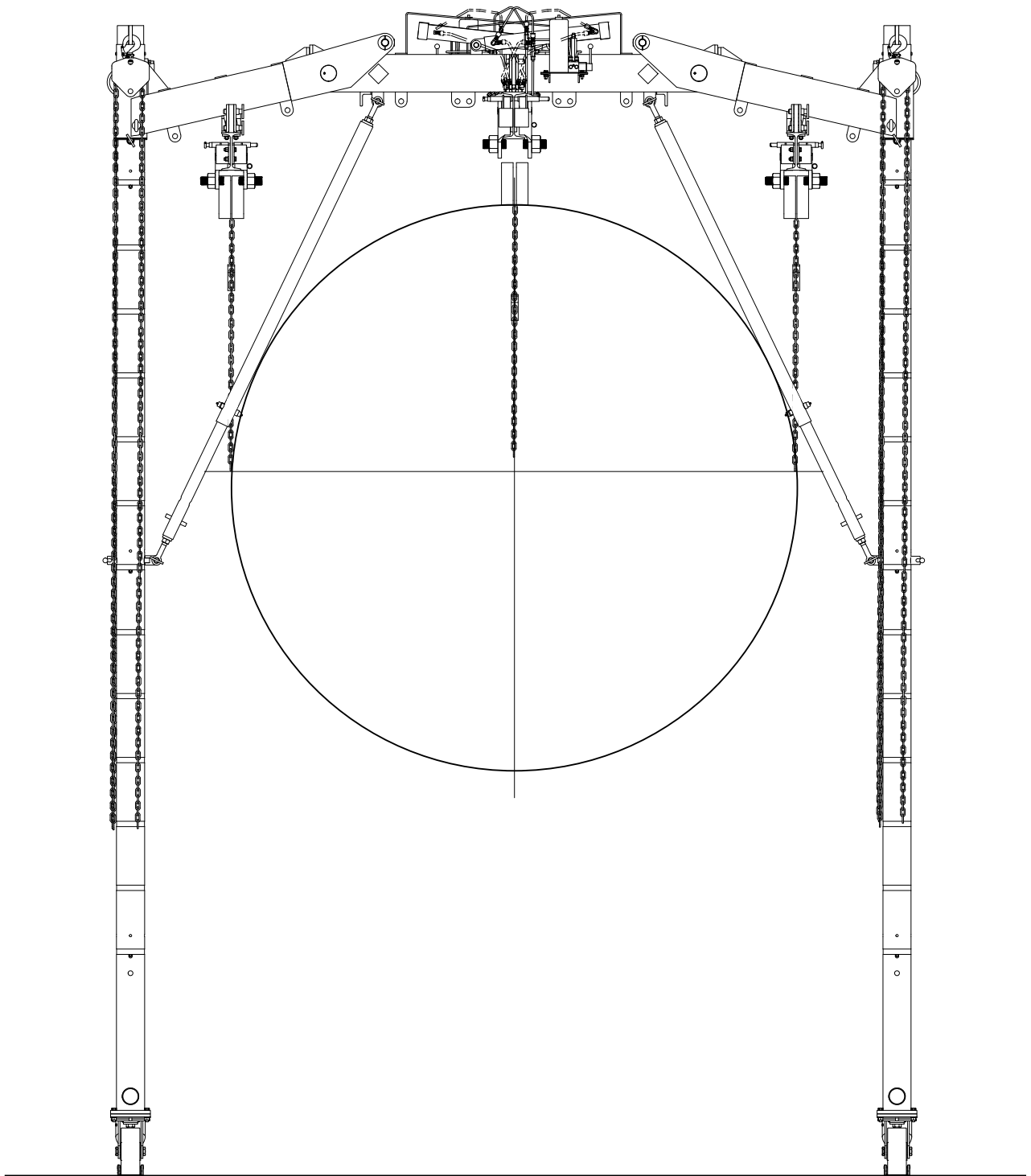
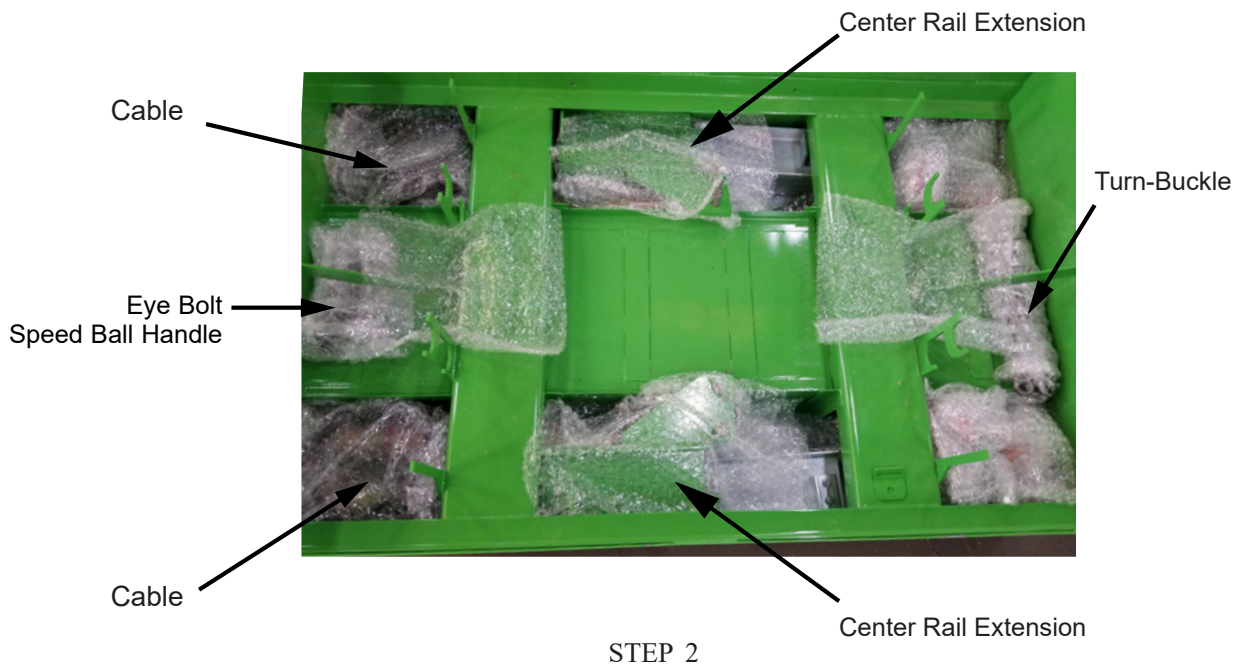
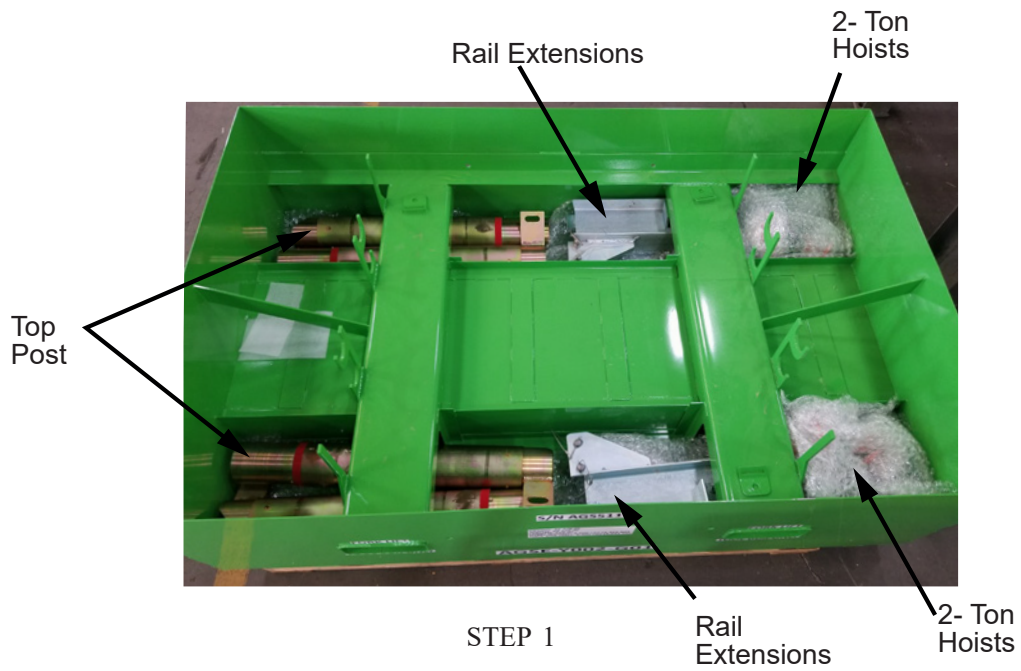
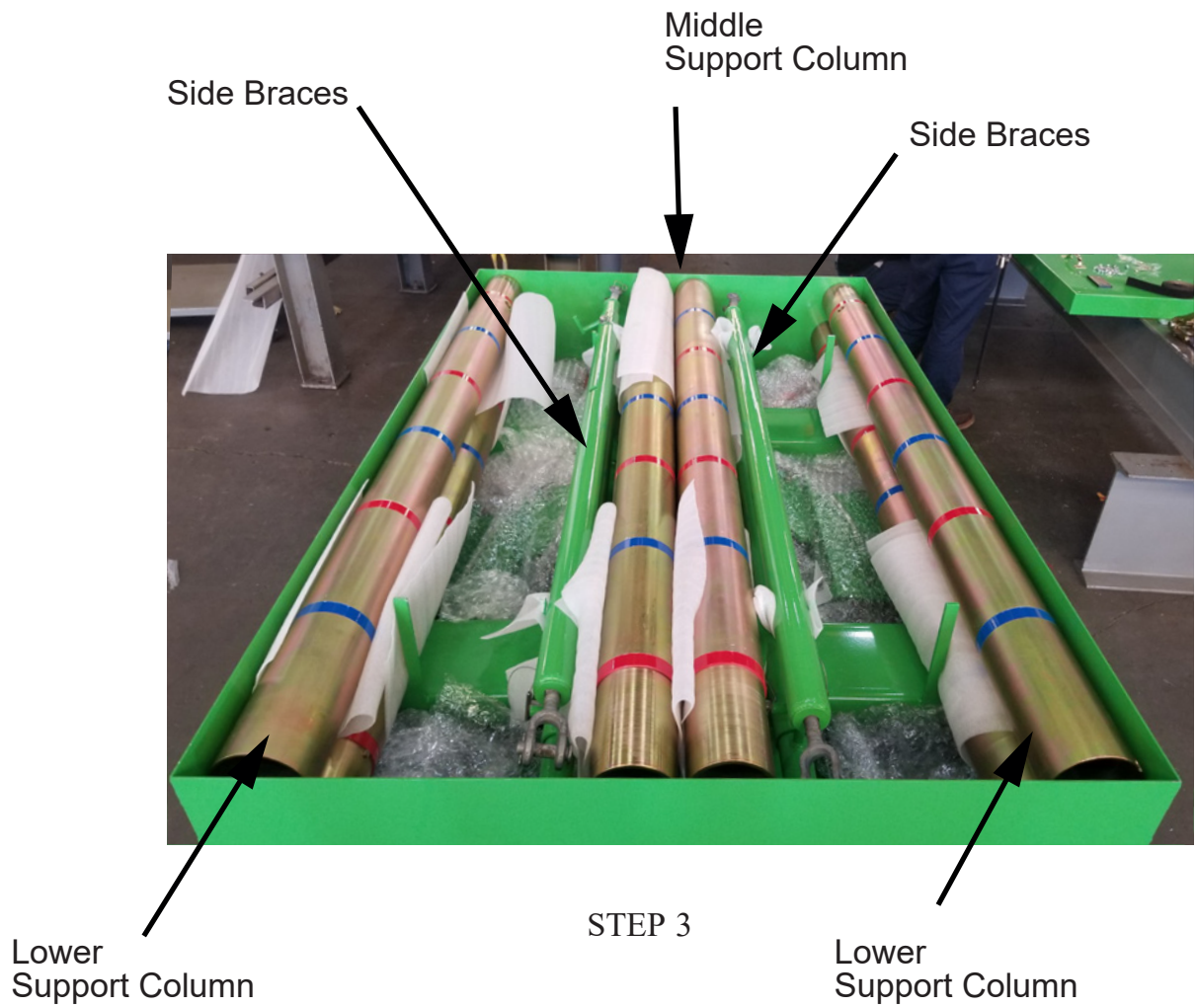


Figure 5.6-5.

General Preparation (Packing/Unpacking)





6.0 – SAFETY

6.1 Stress

Design stress safety factors are compliant with OSHA and commercial standards (ASME B30.17 Overhead and Gantry Cranes). The equipment is provided with necessary safety devices and guards to properly operate the equipment.

6.2 General

Most accidents are the result of violating standard safety rules in operation or improper servicing and maintenance of the equipment.

Many safety features have been provided to assist in safe operation of this equipment. These items do not fool-proof the equipment nor do they replace the operator's responsibility to operate the equipment in a safe manner.

6.3 Prevention

A good preventative maintenance program should include periodic lubrication, adjustment, and immediate correction of defects revealed through inspections. Preventive maintenance will not only contribute to safe operation of the equipment, but will also extend its useful service life as well.

Regular and periodic inspection is essential for continued safe performance of the equipment. A careful inspection, on a regular basis, will reveal potentially dangerous conditions. This inspection will result in corrective action, before the condition becomes dangerous.

6.4 Safe Hoisting Practices

CM/Yale Hand Hoist

For your own safety and that of your fellow workers, Material Handling Equipment must be used and maintained as recommended by the Manufacturer. Failure to heed the following recommendations could endanger your life. Use good judgment and common sense at all times. Safety is the responsibility of the operator of the equipment. You must be competent and attempt to foresee and avoid all hazardous conditions. To be safe as possible, the hoist must be given proper preventive maintenance and testing as described in the ANSI B30 16 Safety Code for Overhead Hoists and this Service Guide.

6.4.1 Before Operating Hoist:

1. Do not operate hoist unless you are properly trained, physically fit, and authorized to do so. You must be familiar with all operating controls of the hoist, warnings, and instructions on the hoist, the safe hoisting practices listed in this Service Guide, ANSI B30 16 Safety Code for Overhead Hoists, and all pertinent Federal, State, and local regulations before beginning operation.
2. Do not allow unqualified personnel to operate the hoist.
3. Be familiar with the equipment and its proper care. Do not operate hoist if adjustments or repairs are necessary, if any damage or undue wear is known or suspected, or if any warning, operating, or capacity instructions normally attached to hoist are damaged, obscured or missing. Report such conditions promptly to the proper person and also notify next operator when changing shifts.
4. Conduct periodic visual inspections as described in Preventive Maintenance Section of this Guide and make sure necessary lubrication and repairs are made.
5. Do not operate hoist if it is functioning improperly.
6. Do not operate hoist with an out of order sign attached until sign has been removed by a properly authorized person.
7. Do not adjust or repair hoist unless qualified for maintenance of hoist.
8. Do not use chain as ground for welding.
9. Do not touch a welding electrode to the chain.
10. Never attempt to motorize or mechanically operate a hoist designed for manual operation .

6.4.2 Applying the Load

1. Never wrap the hoist chain around the load, or allow it to drag under load.
2. Use slings or other approved devices to attach load as necessary.
3. Be sure the load or sling is properly seated in the saddle of the hook. Do not allow hook latch to support any part of load.
4. Do not apply a load to tip of hook, or in such a way as to cause bending or prying forces on the hook or hook support block.
5. Be sure chains are not kinked or twisted or that multiple part chains are not twisted about each other.
6. Do not operate hoist if chain is not seated properly in the sheaves.
7. Center hoist unit over the load before lifting. Avoid side pull.
8. Never pick up a load beyond the rated capacity appearing on the hoist, except for properly authorized tests. Do not use a load limiting device to measure the maximum load to be lifted; it is a safety device only.

6.4.3 Moving the Load

1. Do not allow more than one operator per hand chain.
2. Do not engage in any activity which will divert your attention while operating hoist.
3. Respond to signals from designated personnel only, except for stop signals.
4. Never lift a load with the hoist until you and all other personnel are clear of load.
5. Make sure a load has proper clearance before moving.
6. Do not lift load more than a few inches until it is well balanced in the sling or lifting device.
7. Each time a load approaching rated capacity is lifted, check load brake action by raising load just clear of supports and continuing only after you are sure brake is operating properly.
8. Do not transport load over personnel.
9. Never carry personnel on the hook or the load.
10. Avoid swinging of load or load hook when traveling the hoist.
11. On trolley mounted hoists, avoid sharp contact between trolleys, or between trolleys and rail stops.

6.4.4 Parking

1. Do not leave a load suspended in the air for extended or unattended periods.
2. Keep load block above head level when not in use.

6.5 Installation Instructions For Trolley Type Units

For installation on I Beam other than the size preset at the factory, or if final adjustment to beam is required, follow the instructions below:

Measure the I Beam flange width and temporarily install the trolley side plates on the hoist before installation to determine the exact distribution of washers.

The distance between track wheel flanges should be 3/16" greater than the beam flange width or straight runway beams, or 3/16" to 1/4" on runway systems that include sharp curves. To keep the hoist centered under the I Beam, the number of adjusting plates or washers between the side plates and the suspension lug should be the same, or differ only by one adjusting plate or washer. The distribution of adjusting plates or washers outside the trolley side plates is unimportant except that the total number used must be sufficient to keep the nuts engaged.

6.5.1 Function Testing of Trolley

After the hoist and trolley are installed on the I Beam, check for proper fit, then operate the trolley over the entire length of the beam with a capacity load to be sure that adjustment and operation is satisfactory.

6.6 Risk Assessment

6.6.1 Limits of the Machinery

The AGSE-Y002-G01 Light Weight Self Erecting Gantry is a commercial product designed to provide support for the Rolls Royce Trent 700 & Trent 800 Engines during field assembly (Engine split operation) module replacement, and stand transfer. The equipment is to be used only by trained mechanics free from physical impairment and who are familiar with this or similar fixture. The equipment will not to be used or available to the general public.

6.6.2 Risk Assessment and Residual Risk

The risk evaluation performed was based on objective observation based on the experience of AGSE with similar equipment. Necessary Warning and Caution Notes have been incorporated into the Operation Section of the Light Weight Self Erecting Gantry along with instructions. Stencils also have been put on the equipment to identify hazardous and/or potential risk areas.

The operation of the Light Weight Self Erecting Gantry can be with medium risk of injury and is considered safe to use under supervision. Low residual risks include potential pinch points during operation of the equipment.

Equipment detailed in this manual has undergone stringent safety analyzing using methods and standards set forth withi European Standard EN 1050 and is considered to be safe for its intended use. Reports on risk analysis and evaluation according to 2006/42/EC Machinery Directive (17 May 2006) are available upon request.



EC DECLARATION OF CONFORMITY

The machinery listed below fulfills all relevant provisions of the directives listed:

- 2006/42/EC Machinery Directive (2006/05/17)

Machinery covered by this Declaration:

Description: Light Weight Self-Erecting Gantry, Trent 700/800
Model: AGSE-Y002
Part Number: AGSE-Y002-G01
Serial Number: _____

Harmonized Standards:

- ISO 12100:2010 Safety of Machinery - General Principles for Design - Risk Assessment and Risk Reduction
- ISO/TR 14121-2:2012 Safety of Machinery - Risk Assessment - Part 2: Practical Guidance and Examples of Methods

Standards and Specifications:

- AGSE Quality System Procedure Number QSP-006
- Aerospace Recommended Practice Standard, SAE ARP 1840, 2007/02 Rev B

Place: Santa Fe Springs, California, USA

Date: _____

Signed: _____

Quality Representative

Technical File: Pedro Fernandes
Advanced Ground Systems Engineering
Pct Ana Maria Bastos, N20
A-dos-Cunhados, Portugal 2560-005
+351-96-520-4851

7.0 – Statement of Warranty

7.1 Statement of Warranty

Advanced Ground Systems Engineering LLC (AGSE) warrants to original purchasers that its products will be free of defects in material and workmanship under normal use and conditions for claims received within a period of one year from date of purchase (final billing date), and to the extent that if any AGSE product fails in operation because of such defect, the company will replace or repair, at its option, the defective article. Prior to the repair or replacement of any defective product, the company shall be notified in writing as to the nature of the defect. The company shall assume no liability for freight, disassembly, removal, refitting and installation charges on any article returned unless such charge(s) is approved by AGSE in writing prior to the return. On component items purchased by AGSE for incorporation into an AGSE manufactured product, only the component manufacturer's warranty (if any) shall apply to that component. Said manufacturer's warranty shall be passed on to AGSE's customer to the extent permitted. This warranty is applicable only when AGSE products are operated for intended purposes within the recommended procedures, load limits, properly maintained, not damaged or abused, etc., including as indicated in company manuals, catalogs, and drawings. All warranty claims must be applied for within sixty days from when the defect becomes known. The foregoing warranty is in lieu of all other warranties, or liabilities, either expressed or implied, and AGSE expressly excludes all implied warranties of merchantability and fitness for a particular purpose and all non-infringement warranties as well as disclaims all liabilities to third parties. In no event shall AGSE be liable for any amounts in excess of the purchase price of the product.

NOTICE

Failure to conduct periodic inspections, routine maintenance, or improper operation will result in the voiding of the warranty.

8.0 – Parts Breakdown

8.1 General

The following pages can be used in the identification of components used in the product described in this manual. Parts Lists are broken down by “ITEM,” “PART NUMBER,” “QTY,” and “DESCRIPTION.”

NOTICE

“ITEM” numbers are for reference to the Illustrated Parts Breakdown (IPB) only. Do not order replacement parts by “ITEM” number. Order parts by “PART NUMBER” only.

8.2 Illustrated Part Breakdown

IPB Figure 1 - AGSE-Y002-G01 Light Weight Self Erecting Tri-Rail Gantry

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-Y002-G01	-	Light Weight Self Erecting Tri-Rail Gantry Assembly (Figure 8.1-1 through Figure 8.1-3)
1	AGSE-Y00201-P01	2	Lower Side Frame Weldment
2	AGSE-Y00201-P02	4	Lower Post
3	AGSE-Y00202-P03	4	Eye Bolt
4	AGSE-Y00202-P04	4	Speed Ball Handle
5	AGSE-Y00202-S01	4	Brace Assembly
6	AGSE-Y00201-P03	4	Mid Post
7	AGSE-Y00202-P06	4	Safety Pin
8	AGSE-Y00201-P04	4	Top Post
9	AGSE-Y00211-S01	2	Side Rail Assembly
10	AGSE-Y00204-P01	2	Upper Side Frame Weldment
11	AGSE-Y00205-P03	4	Pivot Pin
12	AGSE-Y00205-P04	4	Washer
13	AGSE-Y00205-P01	4	Cylinder Clevis Weldment
14	AGSE-Y00205-P02	4	Cylinder Clevis Pin
15	AGSE-Y00206-P01	1	Bridge Frame Weldment
16	AGSE-Y00207-S01	2	Track Assembly
17	AGSE-Y00203-S02	2	Center Rail Extension
18	AGSE-Y00202-P05	1	Cover
20	AGSE-Y00208-P01	1	Pallet Frame
21	34782-509 (Alt. 47161-101)	1	Pallet - 96" x 125"
22	95-FS-10709-S-TRL SL95-PCB-95	4	Swivel Caster with Lock Brake
23	90-PY-06501-S-SL90	4	Swivel Caster with Lock

IPB Figure 1 - AGSE-Y002-G01 Light Weight Self Erecting Gantry (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
24	AGSE-Y00210-P03	1	Chain Hoist 8 Tons
25	AGSE-Y00210-P01	4	Chain Hoist 4 Tons
26	CM2233A	4	Chain Hoist 2 Tons
28	SA152-16	4	Cable
29	HG-227-3/4x12	4	Turnbuckle Assembly
30	40191-12	24	Track Fitting
33	AGSE-S00104-10C040A01	16	Hex Head Cap Screw - 5/8"-11 UNC x 2-1/2" Lg - Gr. 5 - Zinc Plt
34	AGSE-S00135-10A17	16	Lock Washer - 5/8" - Stl - Zinc Plt
35	AGSE-S00150-10CA01	16	Hex Nut - 5/8"-11 UNC - Gr. 5 - Zinc Plt
36	AGSE-S00166-250D080A07	4	Cotter Pin - Ø1/4" x 5" - Lg - Zinc Plt
37	AGSE-S00131-24A17	8	Flat Washer - 1-1/2" - Stl - Zinc Plt
38	AGSE-S00166-187D040A07	8	Cotter Pin - Ø3/16" x 2-1/2" Lg - Zinc Plt
39	AGSE-S00104-08C036A01	16	Hex Head Cap Screw - 1/2"-13 UNC x 2-1/4" Lg - Gr. 5 - Zinc Plt
40	AGSE-S00135-08A17	16	Lock Washer - 1/2" - Stl - Zinc Plt
41	AGSE-S00150-08CA01	16	Hex Nut - 1/2"-13 UNC -Gr. 5 - Zinc Plt
42	AGSE-S00114-04C016A07	4	HDFHS - 1/4"-20 UNC x 1" Lg - Stl -Zinc Plt
44	AGSE-S00153-06FA01	24	Locking Hex Nut - 3/8"-24 UNF - Gr. 5 -Zinc Plt
45	AM-90875-48T	4	Safety Pin
46	AM-90625-34T	4	Safety Pin
47	AM-90750-64T	4	Safety Pin
54	AGSE-10711-P03	24	Special Pallet Washer
57	AGSE-Y00201-P05	2	Top Post Section

**IPB Figure 1 - AGSE-Y002-G01
Light Weight Self Erecting Gantry (Continued)**

ITEM	PART NUMBER	QTY	PART DESCRIPTION
58	AGSE-Y00209-S01	1	Hydraulic System Assy
59	AM-1204-800	1	Container Assembly
60	AGSE-Y00215-S01	3	Chain Basket Assembly
61	AM-90750-192T	1	Safety Pin
62	AM-90750-148T	4	Safety Pin

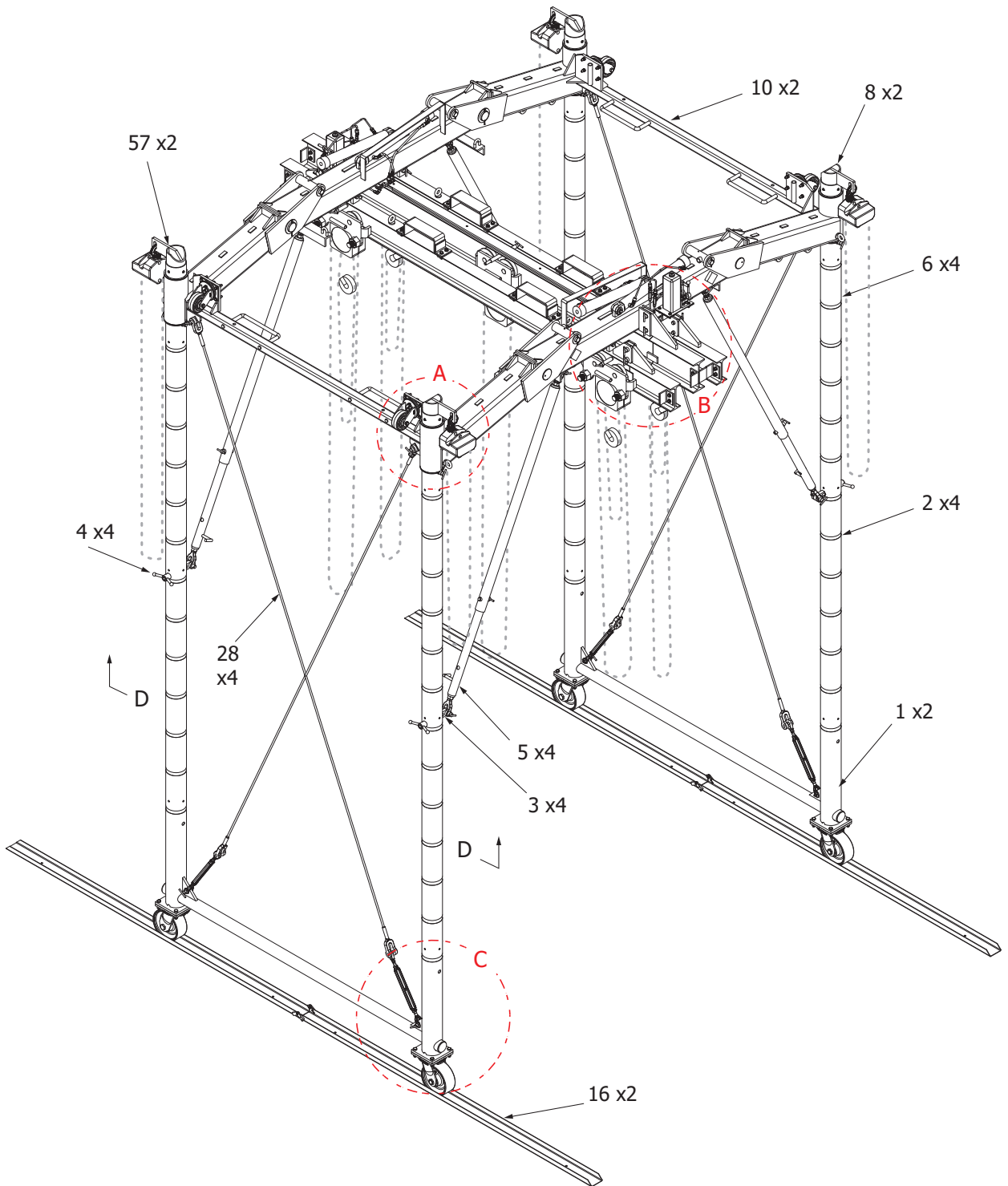
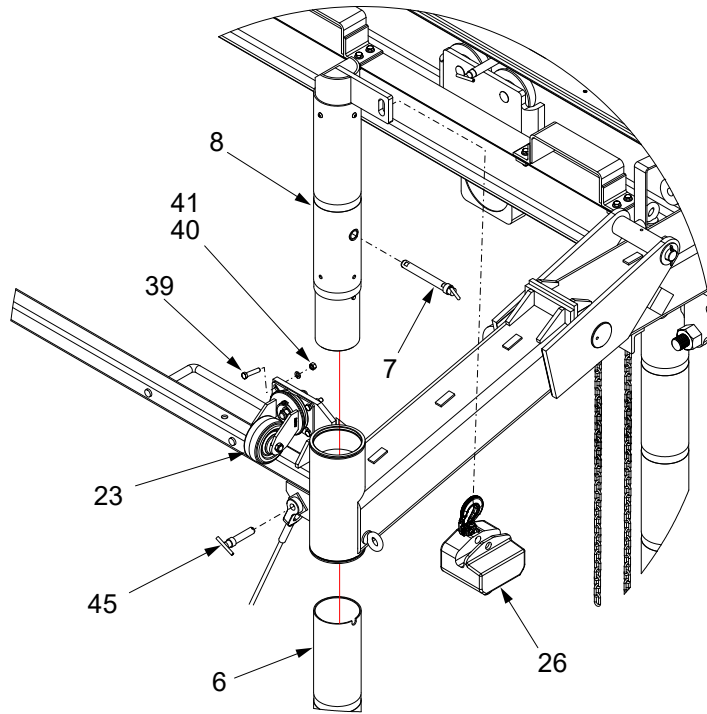
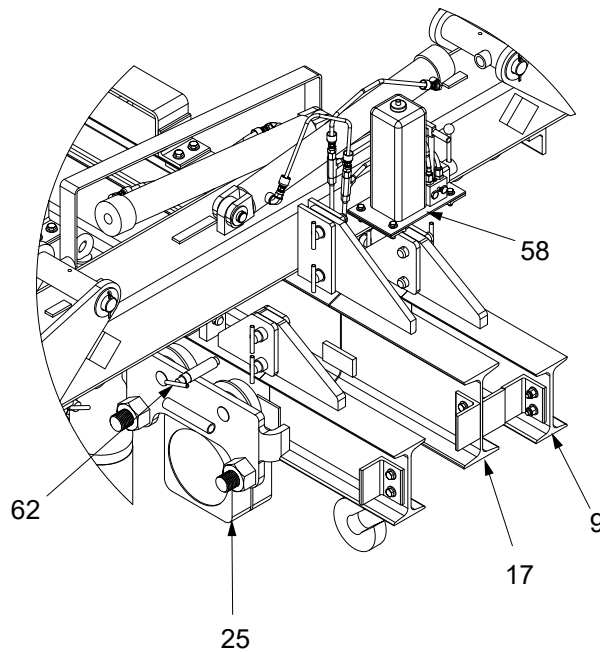


Figure 8.1-1 - AGSE-Y002-G01

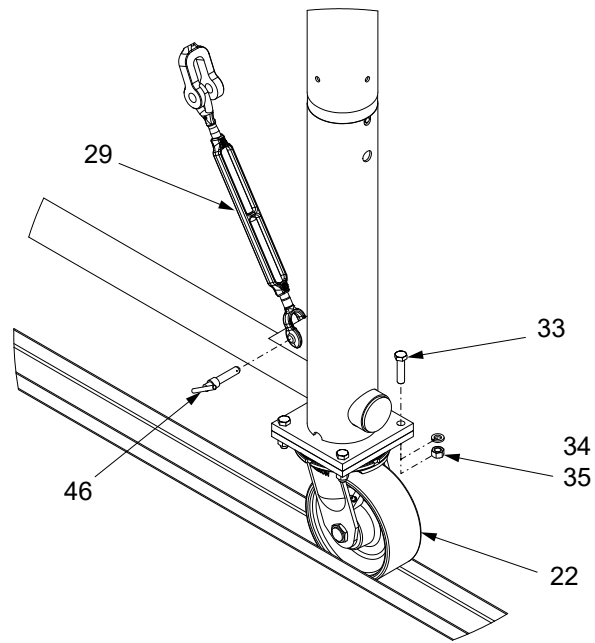


DETAIL A

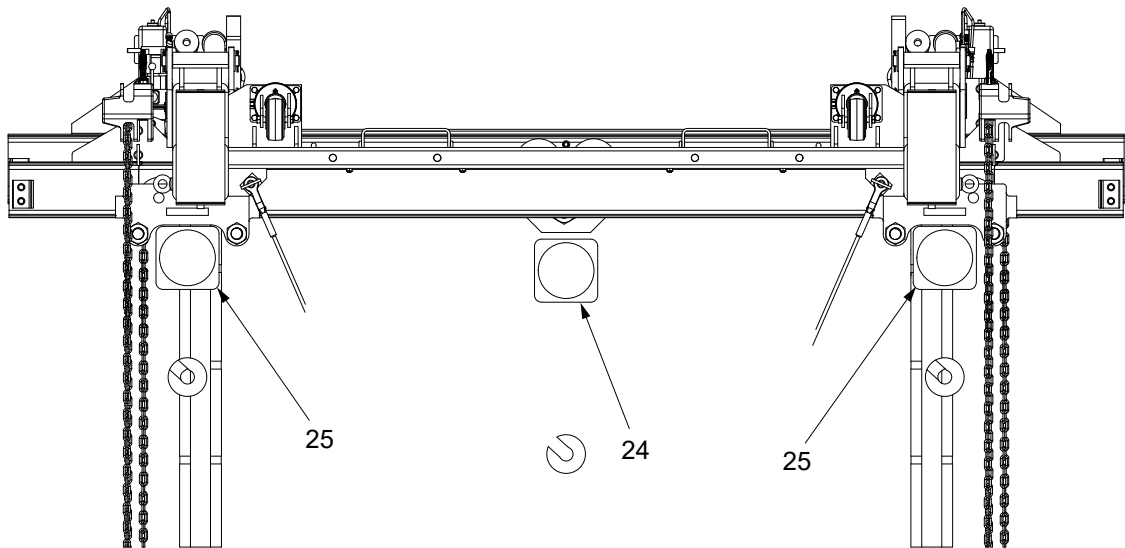


DETAIL B

Figure 8.1-2 - AGSE-Y002-G01



DETAIL C



DETAIL D

Figure 8.1-3 - AGSE-Y002-G01

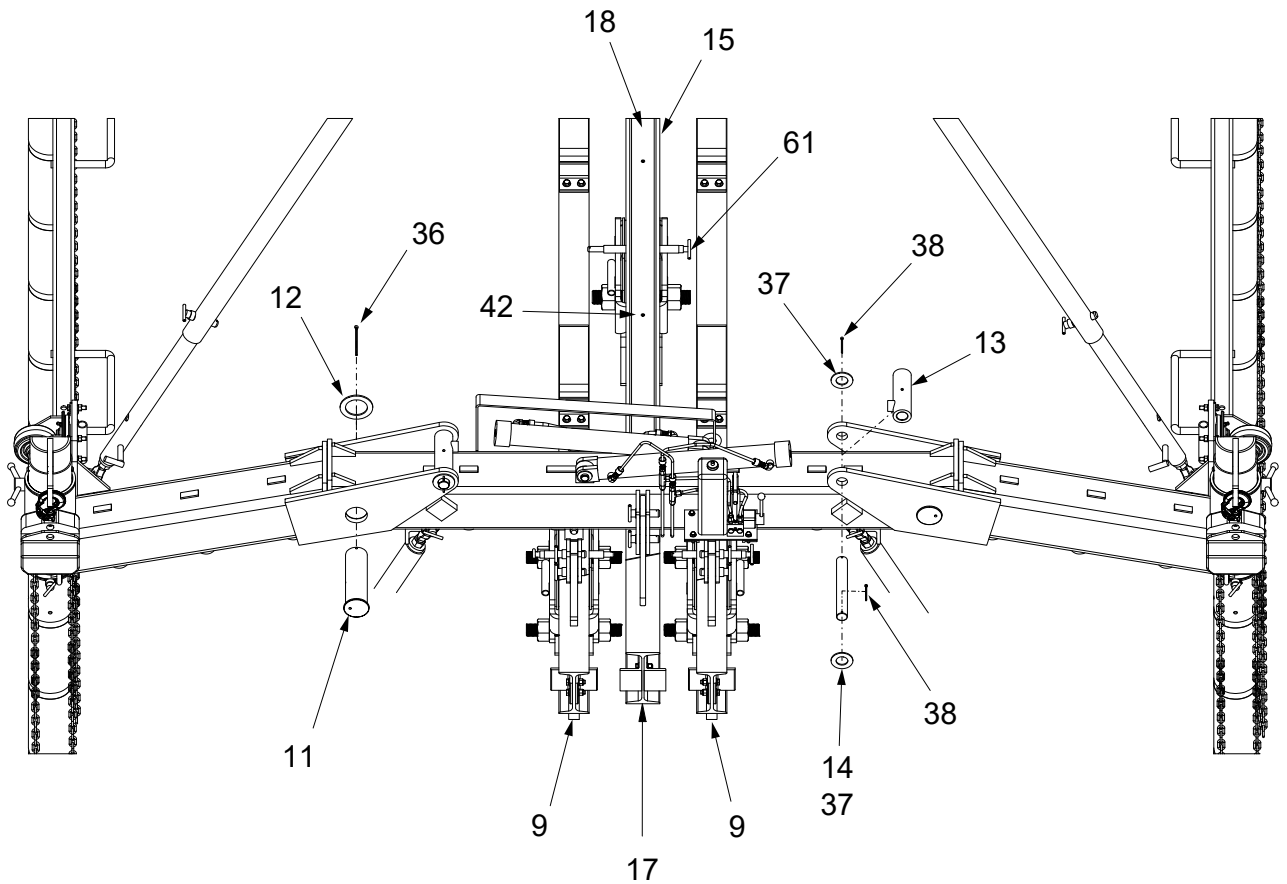


Figure 8.1-4 - AGSE-Y002-G01

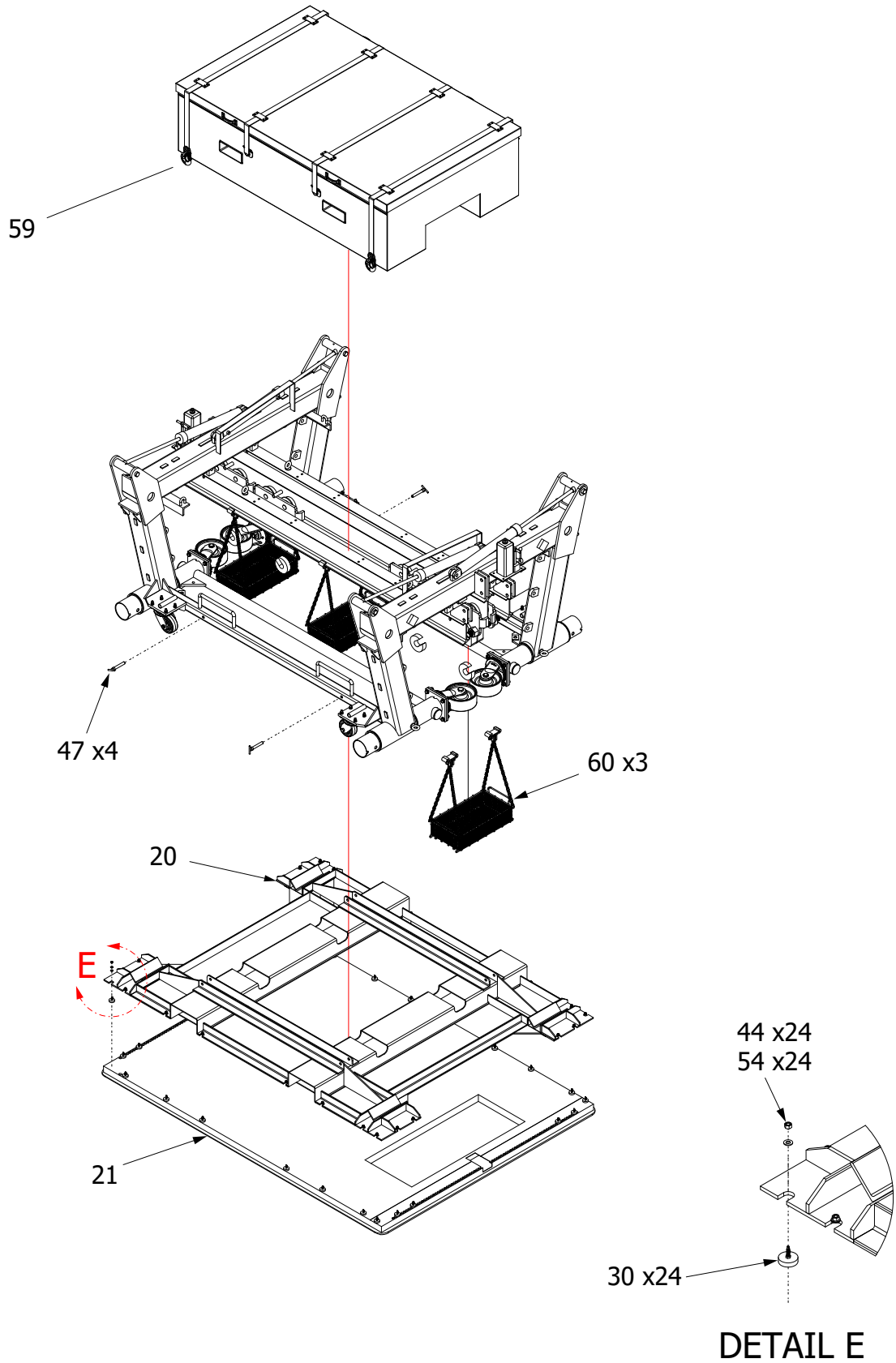


Figure 8.1-5 - AGSE-Y002-G01

IPB Figure 2 - AGSE-Y00209-S01 Hydraulic System Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-Y00209	-	Hydraulic System Assembly (Figure 8.2-1 - 8.2-?)
1	TR 100-6-150S	2	Pump & Reservoir
2	TC25X24HC-AGSE	4	Cylinder Assembly
3	6-8CBTX-S	12	JIC Male Elbow
5	6FBTX-S	4	Male Connector - 1/4-NPT X 3/8" Tube
6	6JBTX-S	4	Union Tee - 3/8" Tube
7	6EBTX-S	4	Union Elbow - 3/8" Tube
8	6BTX-S	4	Nut - 3/8" Tube
9	6TX-S	8	Sleeve - 3/8" Tube
10	E076A	4	Hose Assembly - 18" Lg
11	E076A	4	Hose Assembly - 24" Lg
13	AGSE-S00104-06C024A01	8	Hex Head Cap Screw - 3/8"-16 UNC x 1-1/2 Lg GR. 5 - Zinc Plt
14	AGSE-S00135-06A17	8	Lock Washer - 3/8" - Stl - Zinc Plt
15	AGSE-S00150-06CA01	8	Hex Nut - 3/8"-16 UNC - Gr. 5 - Zinc Plt
17	3/8HP-S	4	Plug - 3/8" NPT
18	AGSE-S00121-06CE08A05	4	Set Screw - 3/8"-16 UNC x 1/2" Lg
19	AGSE-S00131-06A17	16	Flat Washer - 3/8" SAE - Stl - Zinc Plt
20	68370	4	Pivot Pin - 1" DIA
21	AGSE-S00131-16A17	8	Flat Washer - 1" SAE - Stl - Zinc Plt
22	AGSE-Y00209-P01	2	Tube Assy
23	AGSE-Y00209-P02	2	Tube Assy
24	AGSE-Y00209-P03	2	Tube Assy
25	AGSE-Y00209-P04	2	Tube Assy
26	AGSE-Y00209-P05	2	Tube Assy
27	AGSE-Y00209-P06	2	Tube Assy

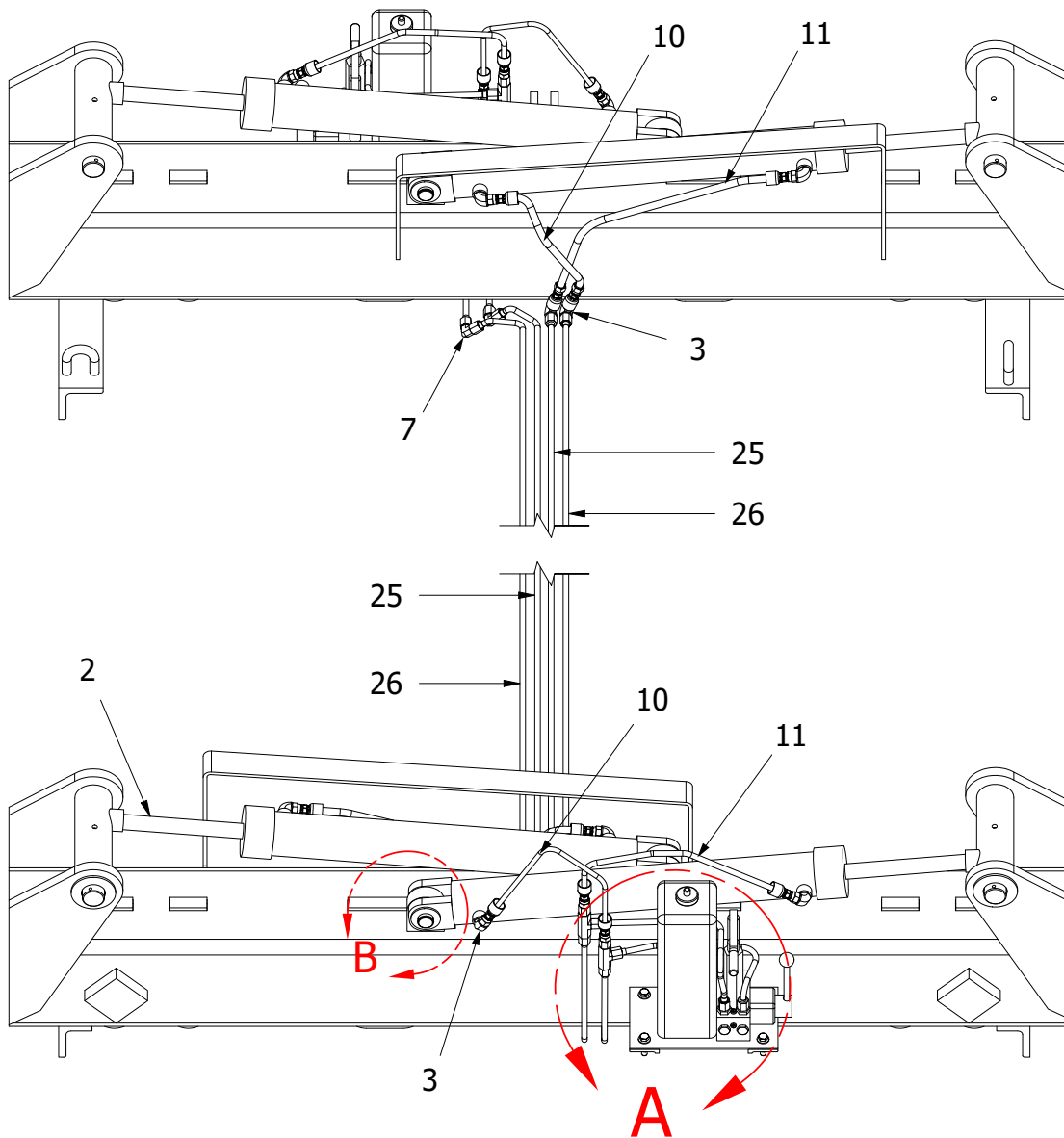
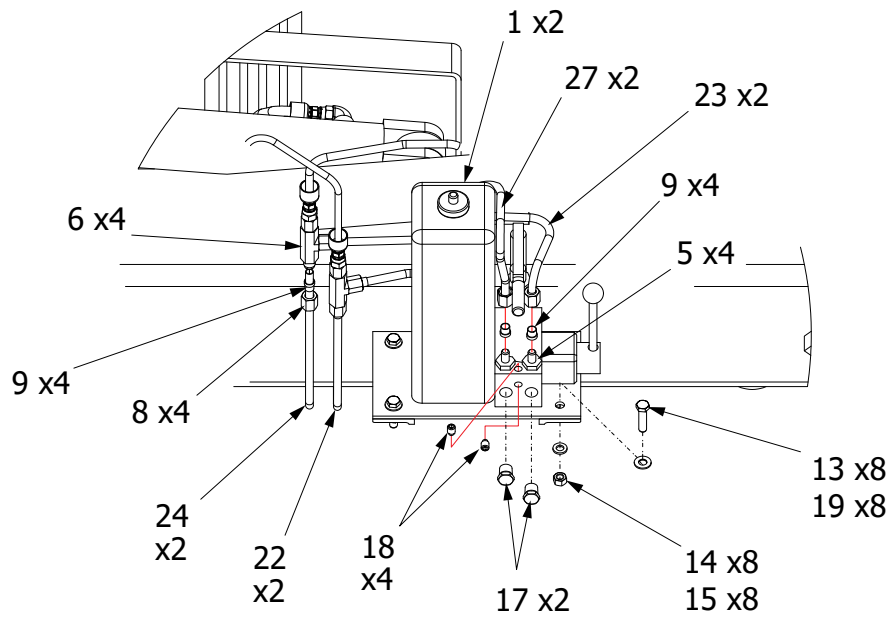
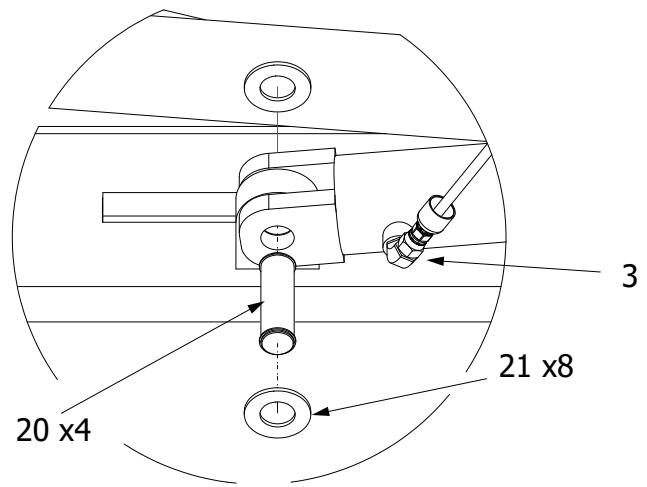


Figure 8.2-1. Hydraulic System



DETAIL A



DETAIL B

Figure 8.2-2. Hydraulic System

9.0 – Stencils, Decals, and Placards

9.1 General

On this unit, standard identification, safety & operation markings are permanently incorporated directly into the structure to assist in the safest and easiest operation possible. Many markings are standard for units of this nature but there are a few which warrant special attention and these are depicted below. All of these markings are to be read and understood completely prior to operating this unit.

9.2 Stencils and Placards

Stencil	Description
CAUTION OPEN VENT BEFORE OPERATING PUMP	Denotes procedural step for using hydraulic pump.
HYDRAULIC OIL	Denotes contents of fluid reservoir.
THIS PUMP CONTROLS THIS SIDE	Denotes informational message.
IN OUT	Denotes cylinder valve position.
CAUTION INSTALL EXTENSIONS BEFORE REMOVING TROLLEY STOW PINS	Safety related stencil noting important procedural step.
CAUTION PIN TROLLEYS BEFORE OPERATING PUMPS	Safety related stencil noting important procedural step.
BRACE	Denotes location of brace attachment to Gantry bribe.
STOW PIN	Denotes location of pin storage.
FORK LIFT	Denotes forklift location container or entire Gantry.
FORK LIFT EMPTY ONLY	Denotes forklift location for lifting Gantry pallet frame only.

10.0 – Recommended Spares

10.1 Critical Items

AGSE defines “critical” items as those items, if broken or missing, that would render the equipment inoperable or severely impair equipment operation. Since most of these items are also long leads, it is AGSE’s recommendation that such items be identified, purchased, and stocked by the customer. In the remote event of “critical” item failure, the equipment can be quickly repaired and placed back in service with minimal down time.

AGSE does not typically stock all components used with the equipment, so immediate shipment of “critical” items may not always be possible. AGSE will respond to customer requests for quotation on any spare parts, and expedite orders for spare parts as required. The customer should never assume immediate delivery is always possible.

It is the responsibility of the operator of the equipment to review the recommended spares list and balance costs against equipment down-time. The list can be adjusted by the operator based on the actual service life of components experienced during equipment usage.

PART NUMBER	QTY	PART DESCRIPTION
TR100-6-150S	1	Hand Pump Assembly
500022	2	Pump Seal Kit
TC25x24HC-AGSE	1	Cylinder Assembly
KPTC25	4	Cylinder Seal Kit
AGSE-Y00202-P06	1	Special Safety Pin
AM-90875-48T	1	Safety Pin
AM-90625-34T	1	Safety Pin
CM2233A	1	Chain Hoist 2 Tons
95-FS-10709-S-TRL-SL95 -PCB-95	1	Swivel Caster with Lock Brake
HG227-3/4”x12	1	Turnbuckle Assembly