AGSE-C069-G02
(11C3004P02)

Fan Stator Module Shipping Fixture

GEnx -1B/-2B

ORIGINAL MANUAL DATED 03/28/2011
LATEST MANUAL REVISION LEVEL .....2/1/2024 (REV H)

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NOTICE

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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 revisions.

PAGE(S)	REV	DESCRIPTION OF CHANGE	DATE
3.10	H	Revised Section 3.4	02/01/2024
3.12	H	Updated Figure 3.2.2-2	02/01/2024
4.0	H	Revised Section 4.2	02/01/2024
4.0	H	Revised Section 4.3	02/01/2024
4.1	H	Revised Section 4.4	02/01/2024
5.0	H	Revised Section 5.0	02/01/2024
5.3-5.4	H	Revised Emergency Stop	02/01/2024
5.5	H	Revised Section 5.2	02/01/2024
5.6	H	Revised Caution	02/01/2024
5.8	H	Revised Section 5.2-12	02/01/2024
5.9	H	Revised Section 5.3	02/01/2024
5.10	H	Updated Figure 5.14-1 & 5.14-2	02/01/2024
5.11	H	Updated Figure 5.14-3 & 5.14-4	02/01/2024
5.11	H	Revised Section 5.3-4 & 5.3-5	02/01/2024
5.12	H	Revised Section 5.3-6	02/01/2024
5.12	H	Updated Figure 5.15-1, 5.15-2 & 5.16	02/01/2024
5.13	H	Revised Section 5.3-10	02/01/2024
5.13	H	Updated Figure 5.18	02/01/2024
5.14	H	Revised Section 5.3-11	02/01/2024
5.15	H	Updated Figure 5.21, 5.22, & 5.23	02/01/2024
5.15	H	Revised Section 5.3-17 & 5.3-18	02/01/2024
5.16	H	Revised Note	02/01/2024
5.22	H	Revised Caution	02/01/2024
5.22	H	Updated Figure 5.34	02/01/2024
5.25	H	Updated Figure 5.37	02/01/2024

2.0 – Illustrations

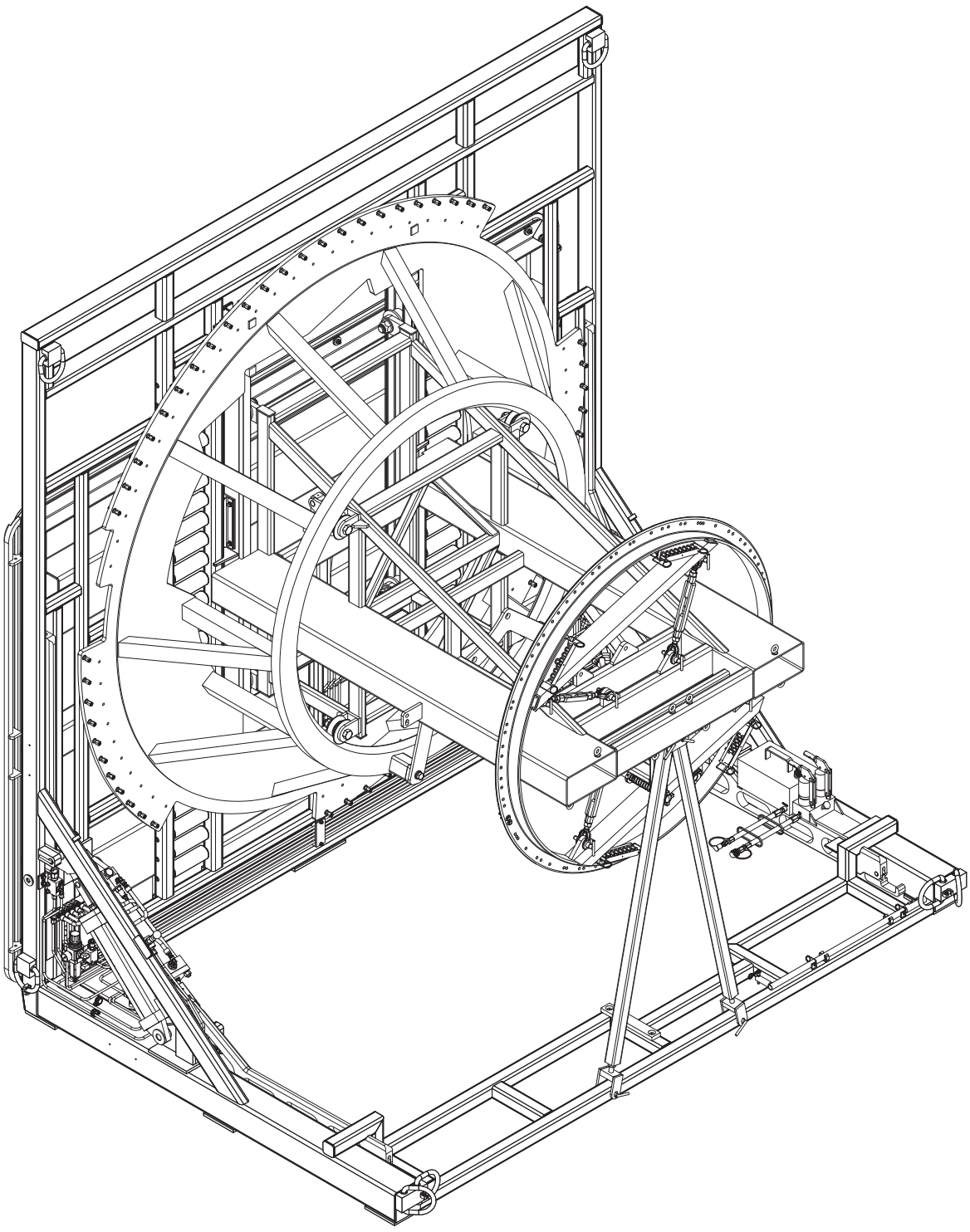


Figure 2.0-1 Stand with Hydraulic Rotation

2.0 – Illustrations (Continued)

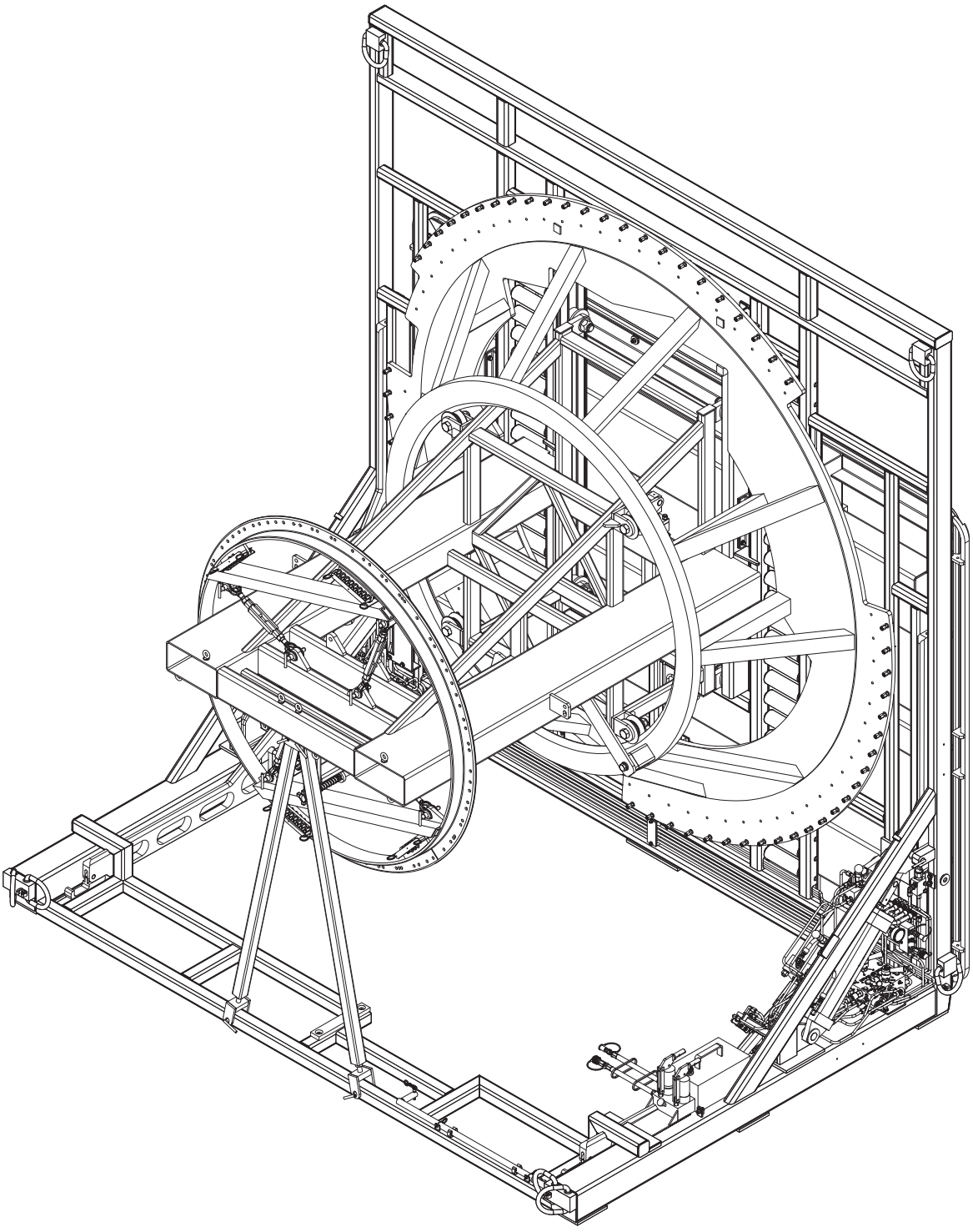


Figure 2.0-2 Stand with Hydraulic Rotation

3.0 – Specification

3.1 General

Designed to GE SOW 11C3004P01, P02, Stand, Air Shipping - Fan Module, Rev B dated April 22, 2009. The stand is designed to store or truck transport of the GEnx-1B or -2B Fan Stator Module on drop deck truck trailers or air transport on the main deck of B747 and DC-10/MD-11 freighters. The 11C3004P02 is compatible with the 11C4490 and 11C4348 Fan Transfer Dollies.

3.2 Design

The stand consists of 4 main connected components:

3.2.1 Palletized Base Frame (See Figure 3.2.2-1)

The Palletized Base Frame consists of welded steel tube frame bolted to a standard 96” x 125” “cookie sheet” type pallet. The frame contains fork tubes for lifting from one side only when in the horizontal position and folding side guide bars for centering the stand in the B747 side cargo door.

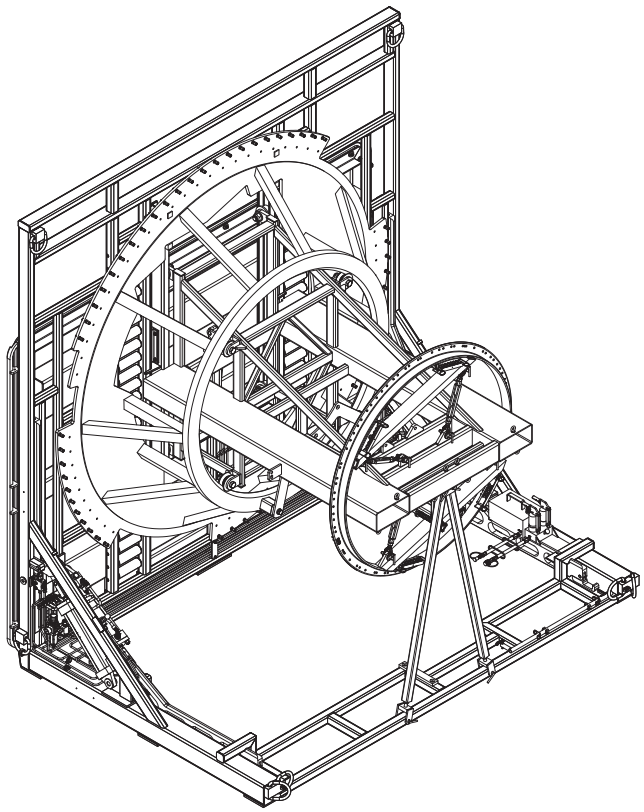


Figure 3.2-1 Normal orientation

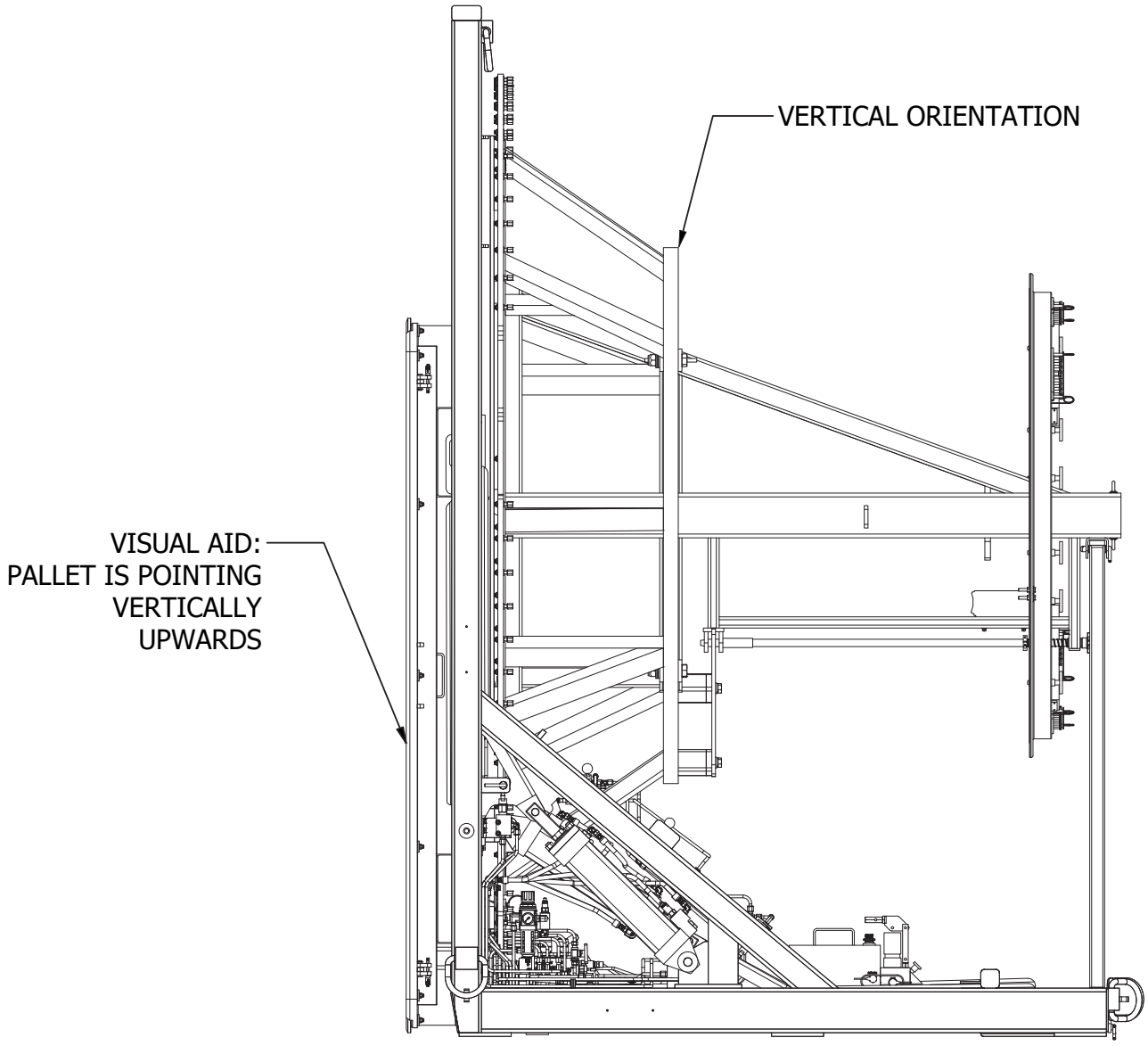


Figure 3.2-2 Vertical orientation (the pallet is vertically up right)

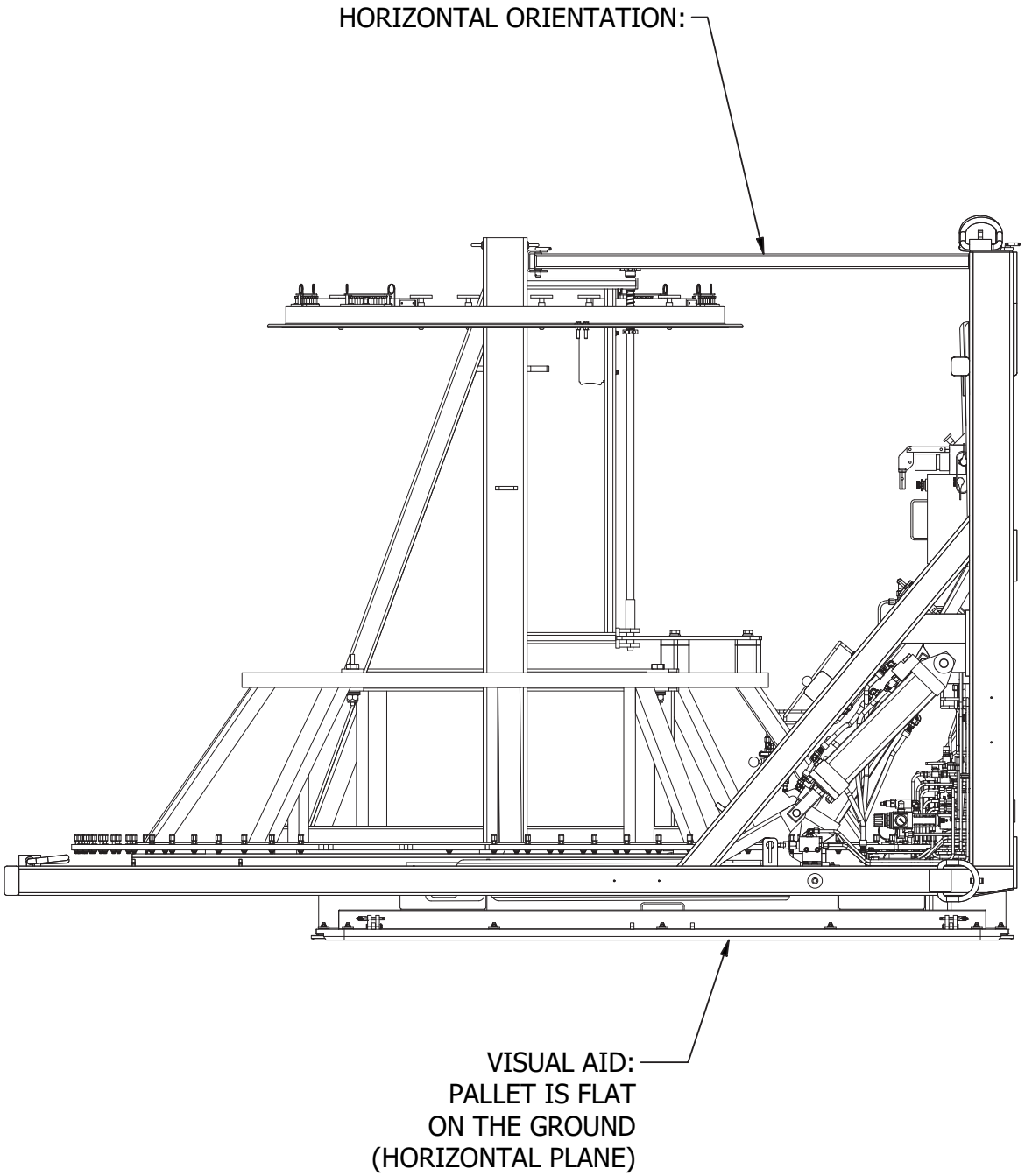


Figure 3.2-3 Horizontal orientation (the pallet is horizontal to the ground)

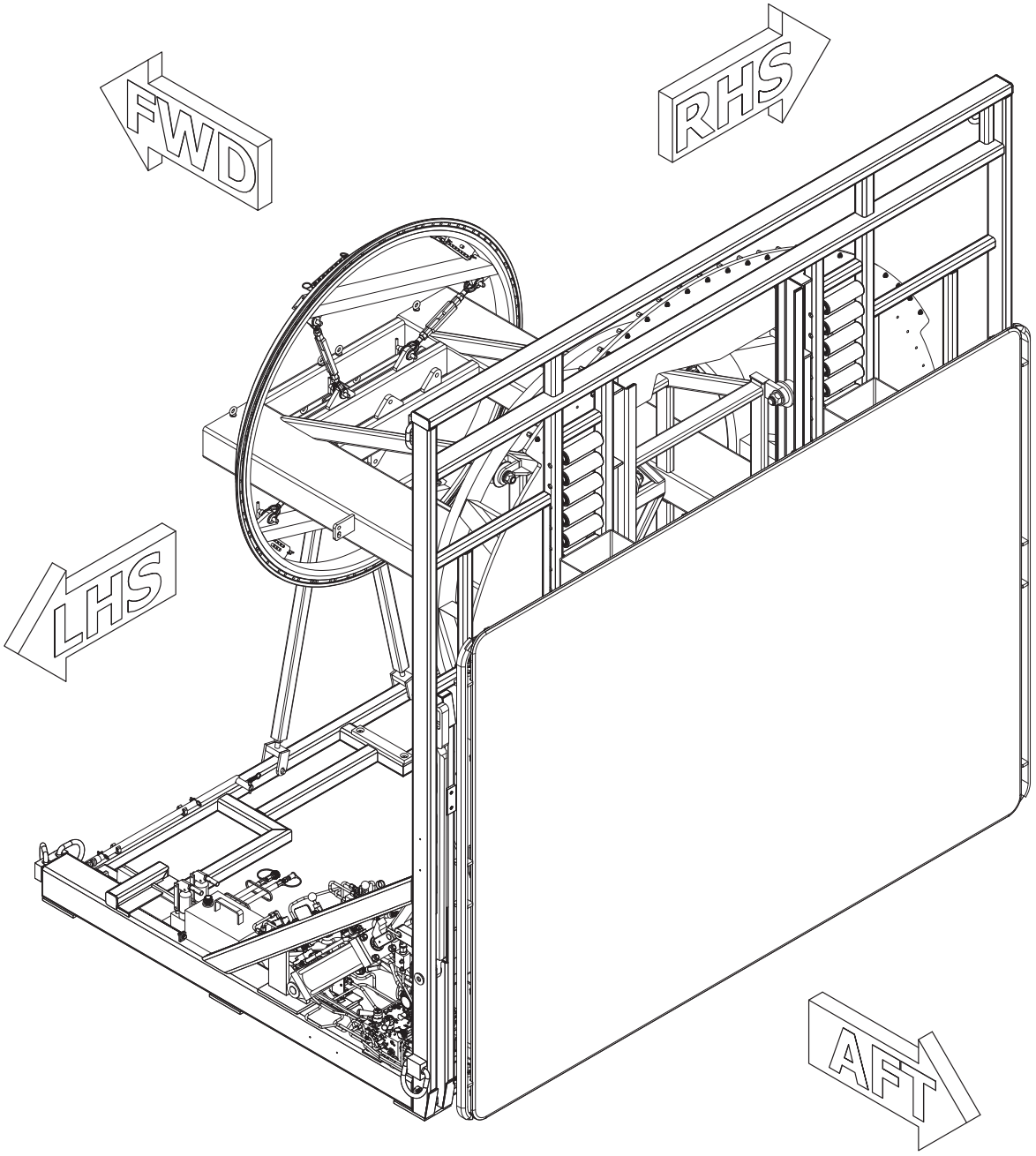


Figure 3.2-4 AFT looking FWD in vertical orientation

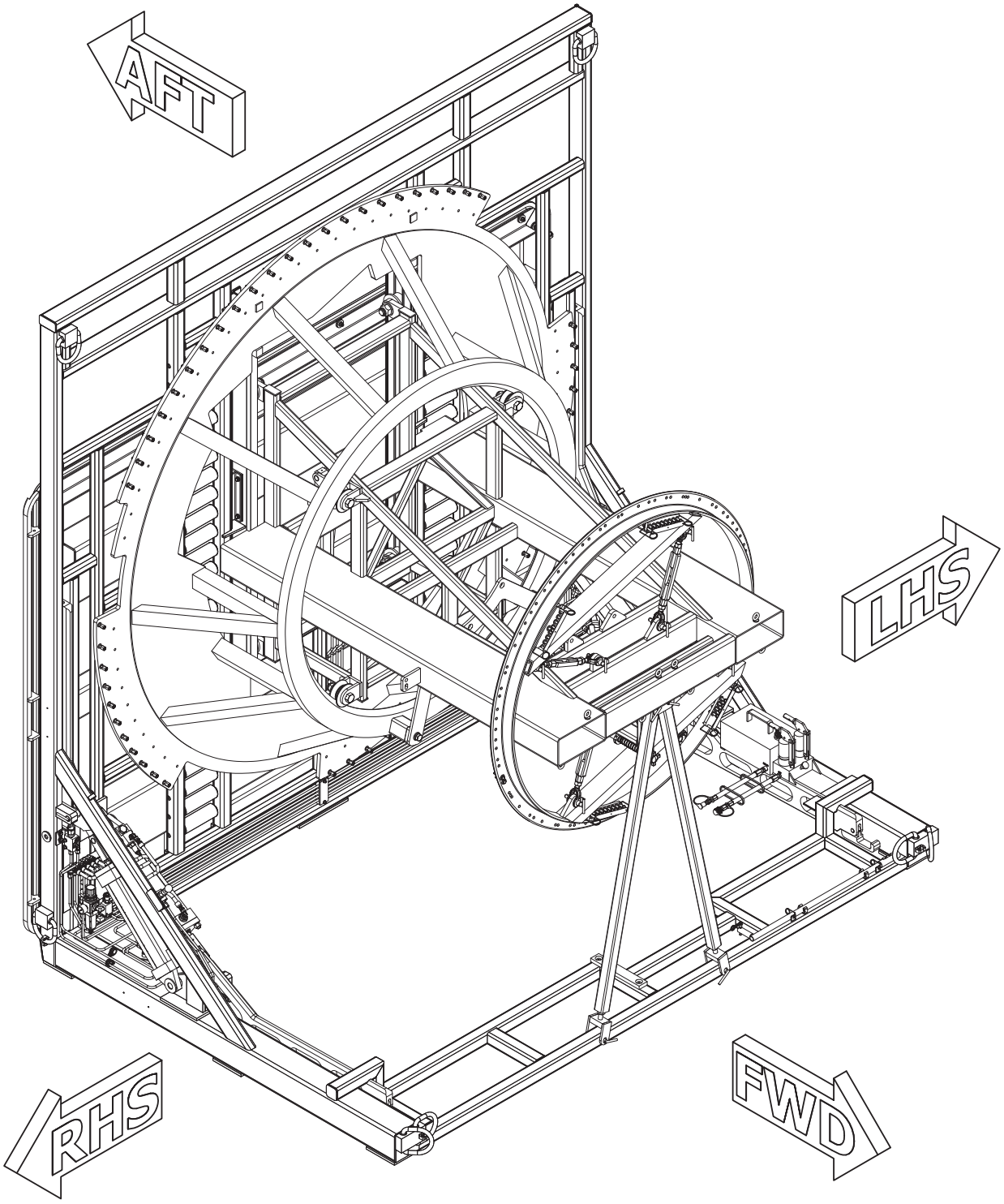


Figure 3.2-5 FWD looking AFT in vertical orientation

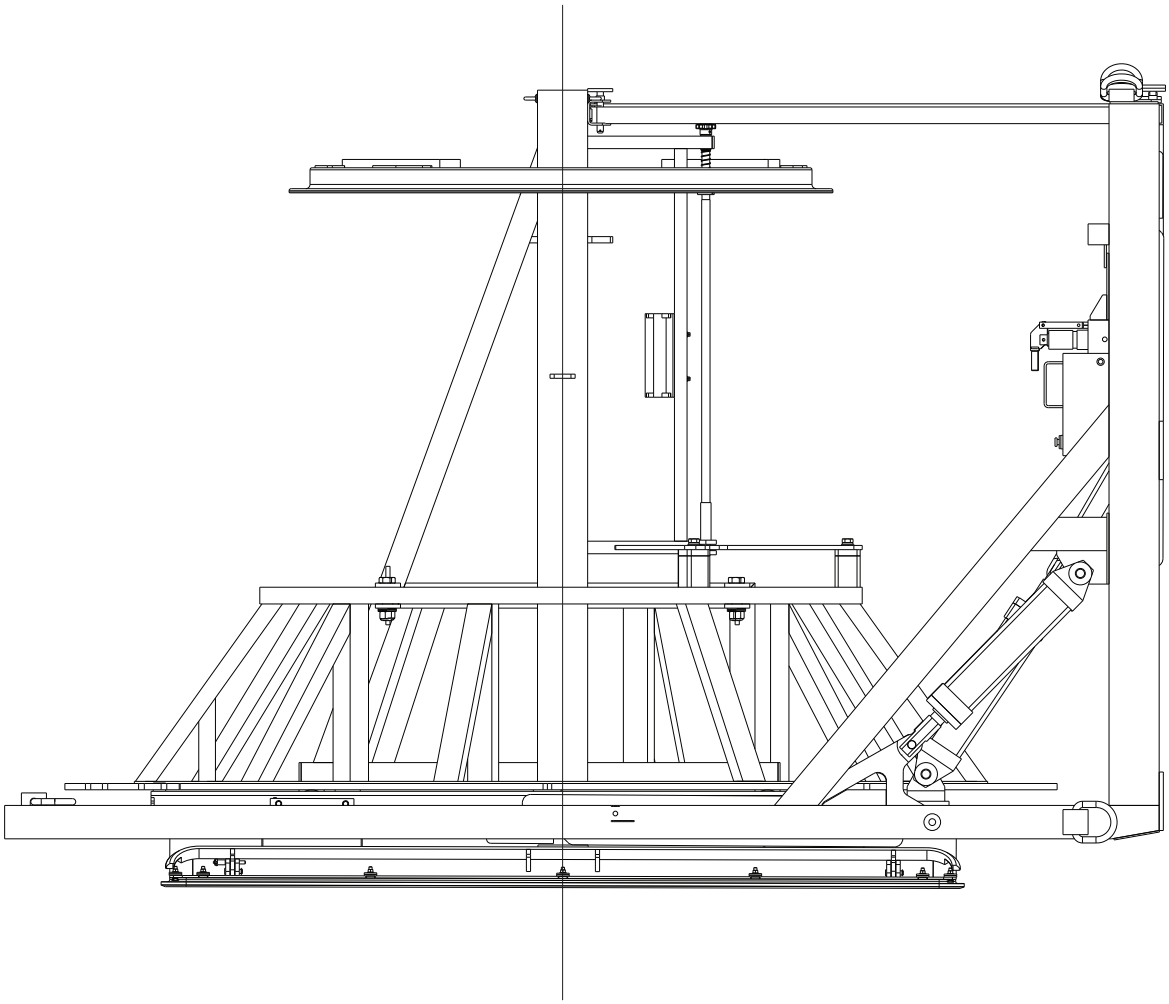


Figure 3.2-6 Centered cargo loading configuration

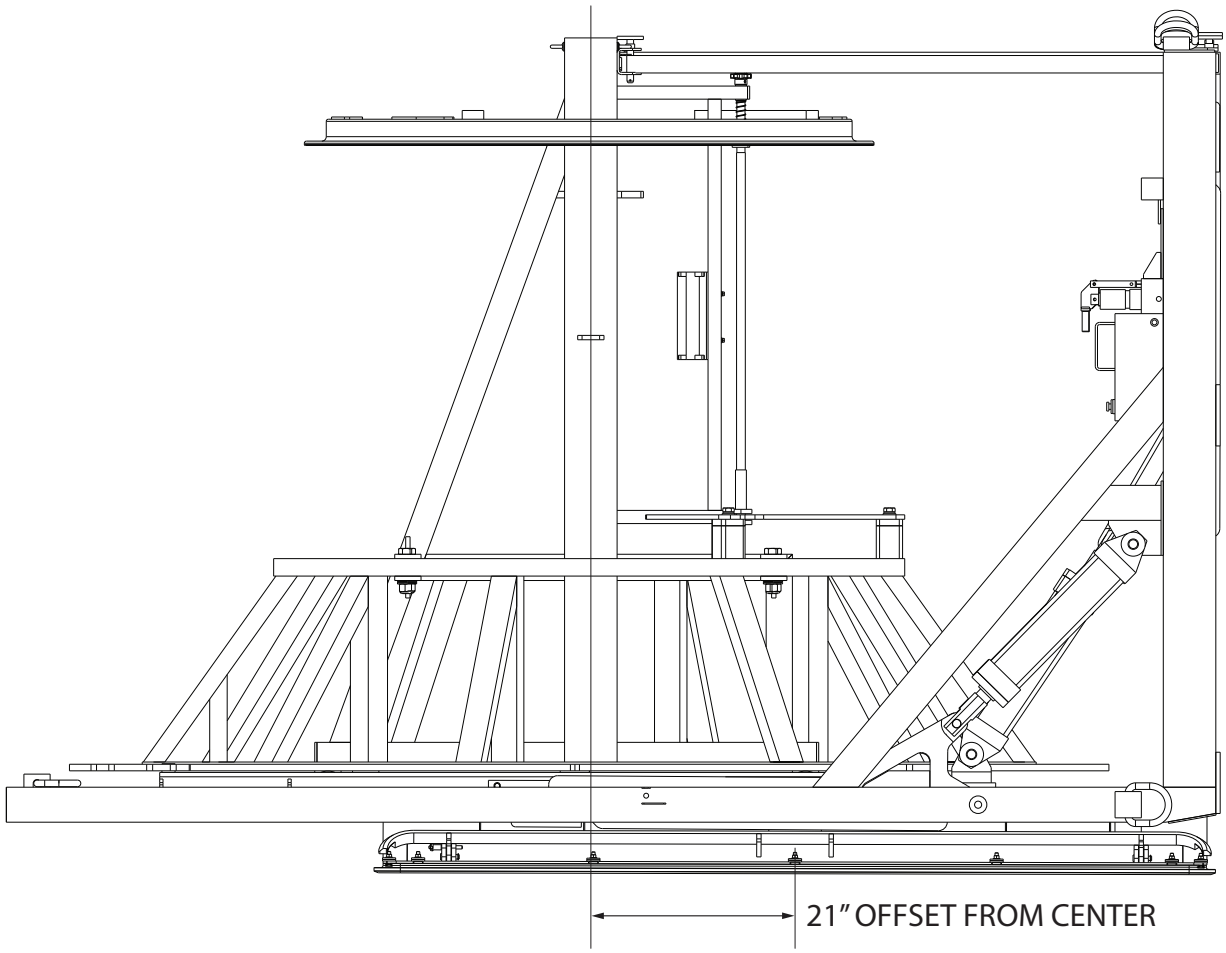
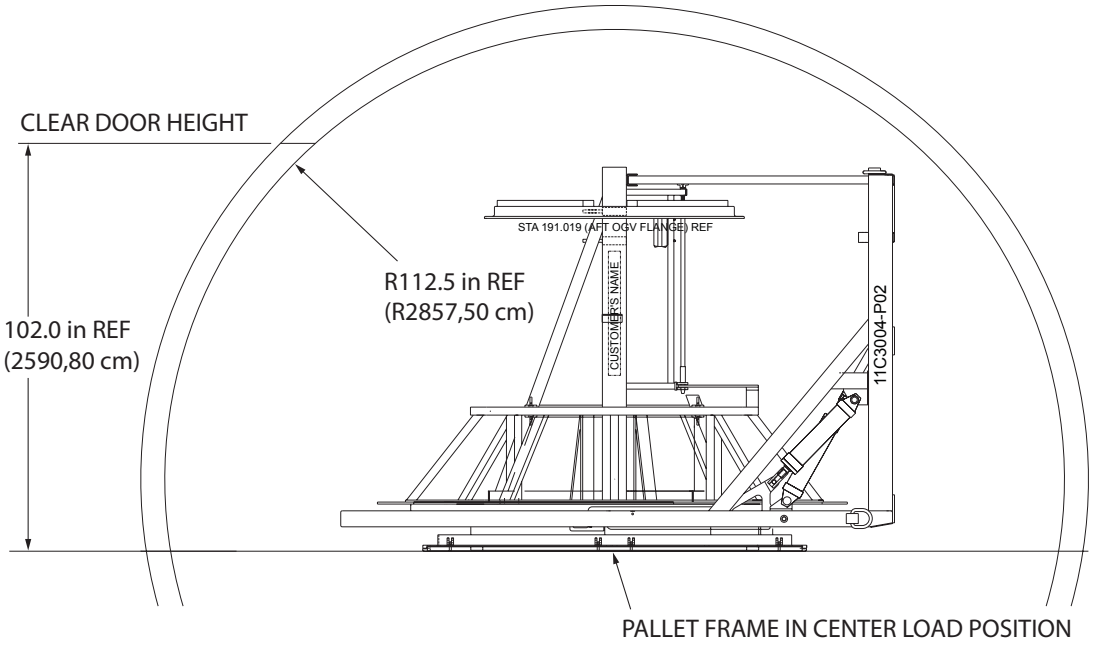
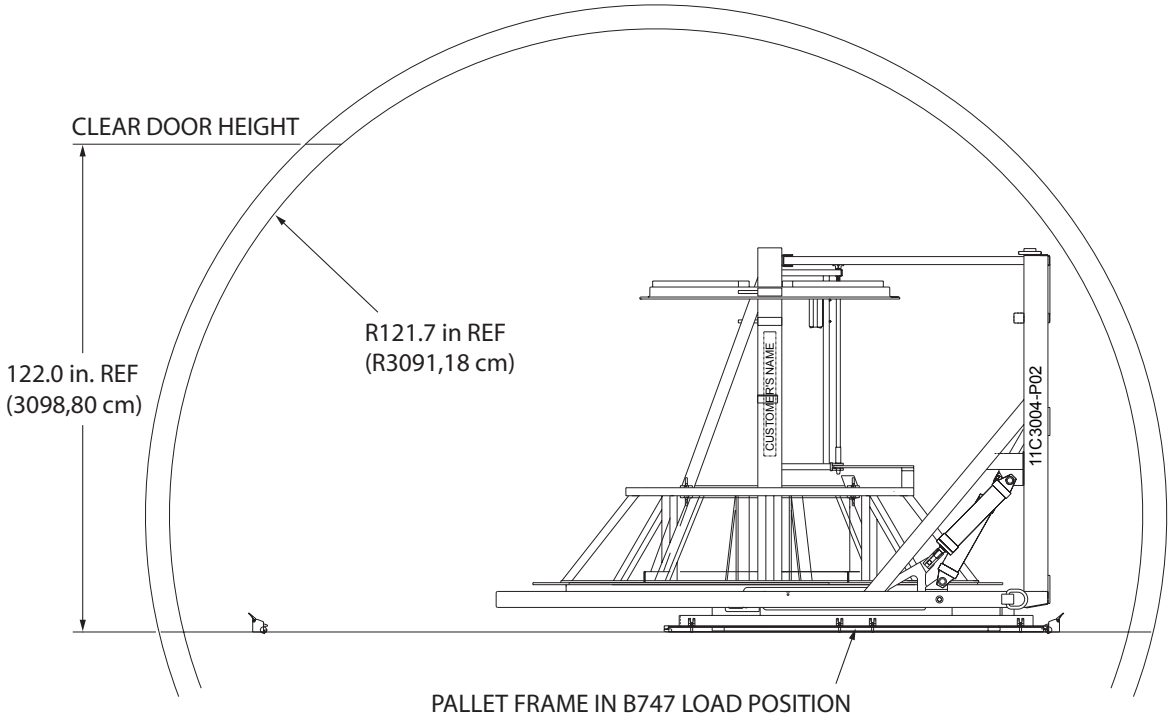


Figure 3.2-7 Offset cargo loading configuration

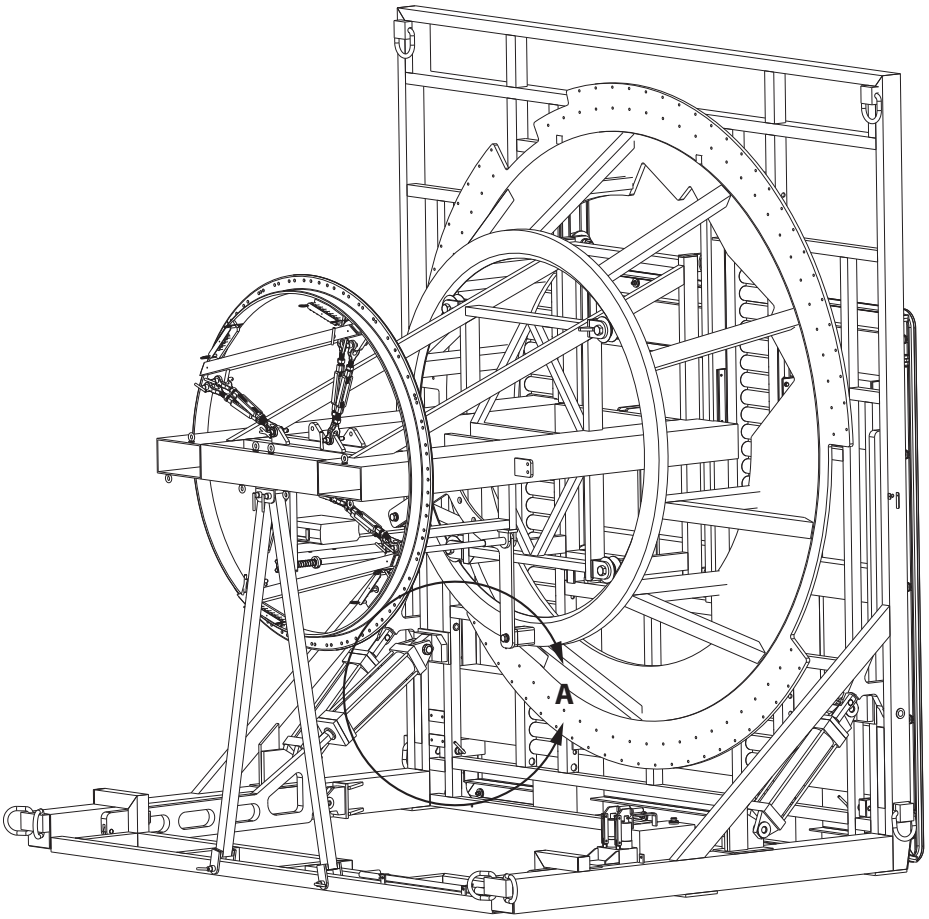


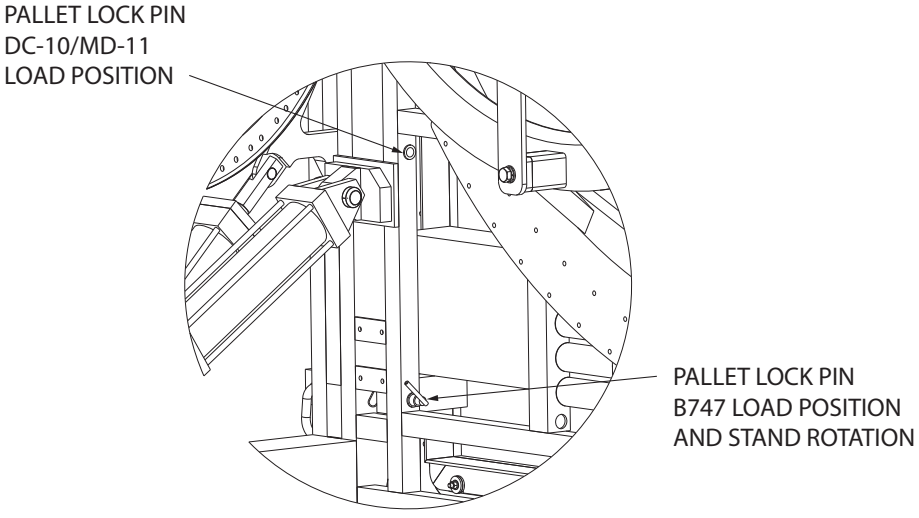
MD-11/DC-10/B777



B747

Figure 3.2-8





DETAIL A

Figure 3.2-9

3.2.2 Main Support Frame (See *Figure 3.2.2-1*)

Main Support Frame consists of welded steel tube frame that contains two rows of rollers that sit on the Palletized Base Frame and sockets for pins securing the frame to the base in either the B747 or DC-10/MD-11 position. Movement is by manually pushing the frame to one position or the other. This frame also contains the hydraulic system and legs for rotating stand assembly from pallet vertical to pallet horizontal and back. Frame also contains hydraulic cylinder for moving the Center Support Frame. Main Support Frame has large "D" type rings for securing stand assembly to truck trailers. Main Support Frame has channel-shaped rails for the Center Support Frame to travel in. This base holds to the Main Support Frame (See Section 3.2.2) in two positions to allow for side loading on B747 or center loading on DC-10/ MD-11.

3.2.3 Center Support Frame (See *Figure 3.2.2-1*)

Center Support Frame consists of welded steel tube frame that contains two (2) fork tubes for lifting stand from one side only when in vertical position. The frame has four (4) flanged rollers that ride in the channel rails of the Main Support Frame. The frame has four (4) "V" groove rollers that support the Fan Case Mounting Plate. The frame contains the locking mechanism for holding the Fan Case Mounting Plate in the fan install/remove position and ship positions. The mounting hardware storage container is mounted on this frame. Movement is controlled by the "C" valve and held in position by the manifold mounted pilot operated check valve.

3.2.4 Fan Case Mounting Plate (See *Figure 3.2.2-1*)

The Fan Case Mounting Plate consists of welded steel plate and tube frame that contains a "V" ring that rides in the "V" groove rollers on the Center Support Frame. The mounting plate has two (2) hole patterns for attaching either a -1B or -2B fan stator module at the forward flange. The mounting plate has a contoured hole cut out of the center that fits over the Center Support Frame and the channel rails of the Main Support Frame. This cutout allows the mounting plate to be rotated only in the raised position and prevents the accidental lowering of the plate if it has not been rotated. Movement is by manually rotating the mounting plate to one position or the other. A locking pin holds the plate in position. The mounting plate also includes clearance notches for fan module mounted Anti-Ice Ducts and for forward flange support plates of the fan transfer dollies.

3.2.5 Outer Guide Vane (OGV) Support Ring (See *Figure 3.2.2-1*)

This ring bolts to the aft OGV QEC mating flange. Four (4) turnbuckle braces connect the support ring to the Center Support Frame. The ring has two (2) bolt patterns for the -1B and -2B.

3.2.6 Main Shipping Braces (See *Figure 3.2.2-1*)

Shipping braces secure the Center Support Frame to the Main Base Frame during transport.

3.3 Mobility (See *Figure 3.2.2-1*)

The stand may be moved by fork lift in either the vertical or horizontal position. The stand may be rotated from vertical to horizontal or reverse by using the hydraulic system or two (2) overhead hoists. The stand is transportable by B747 (side load) and/or DC-10/MD-11 (center load).

NOTE

AGSE does not assume responsibility for transportation on any other than noted aircrafts.

3.4 Hydraulic System

3.4.1 Hydraulic Operating System (See *Figure 3.2.2-1*)

The Operating System consists of three main circuits, the 'A/B' circuit for rotating the entire stand from pallet horizontal to pallet vertical and back, the 'C' circuit for raising/lowering the center support structure for installing or removing the fan stator module when the stand is in the pallet vertical/horizontal position, stow/deploy circuit used to start and end the rotation cycle. The system is controlled by manually operated valve handles.

3.4.2 System Safety Controls (See *Figure 3.2.2-1*)

The System External Safety Controls include (2) emergency stop valves, (2) A/B support leg valves, (1) Center valve interlock, (4) Support leg stow pin interlocks (See Figure 3.2.2-2).

3.4.3 Hydraulic Pressure

The operating system requires hydraulic pressure either from a manually operated hand pump which can be removed from main base frame and placed next to Stand or air pressure driven pump mounted on the base frame on the opposite side from the main control valve manifold block. The manual pump is connected to the system through hoses and quick disconnect couplings. The manual pump has two pumps, low pressure/high flow for quick movement of unloaded components and high pressure/low flow for rotation of the entire stand and/or loaded center support structure. The air driven pump provides a flow at the required pressure by an air pressure regulator.

Section 5.0 - Operation will include pictures and schematics as required to show location of emergency stop valves, manual and air (optional) pump connection and operating valve locations and explain/illustrate operating procedures.

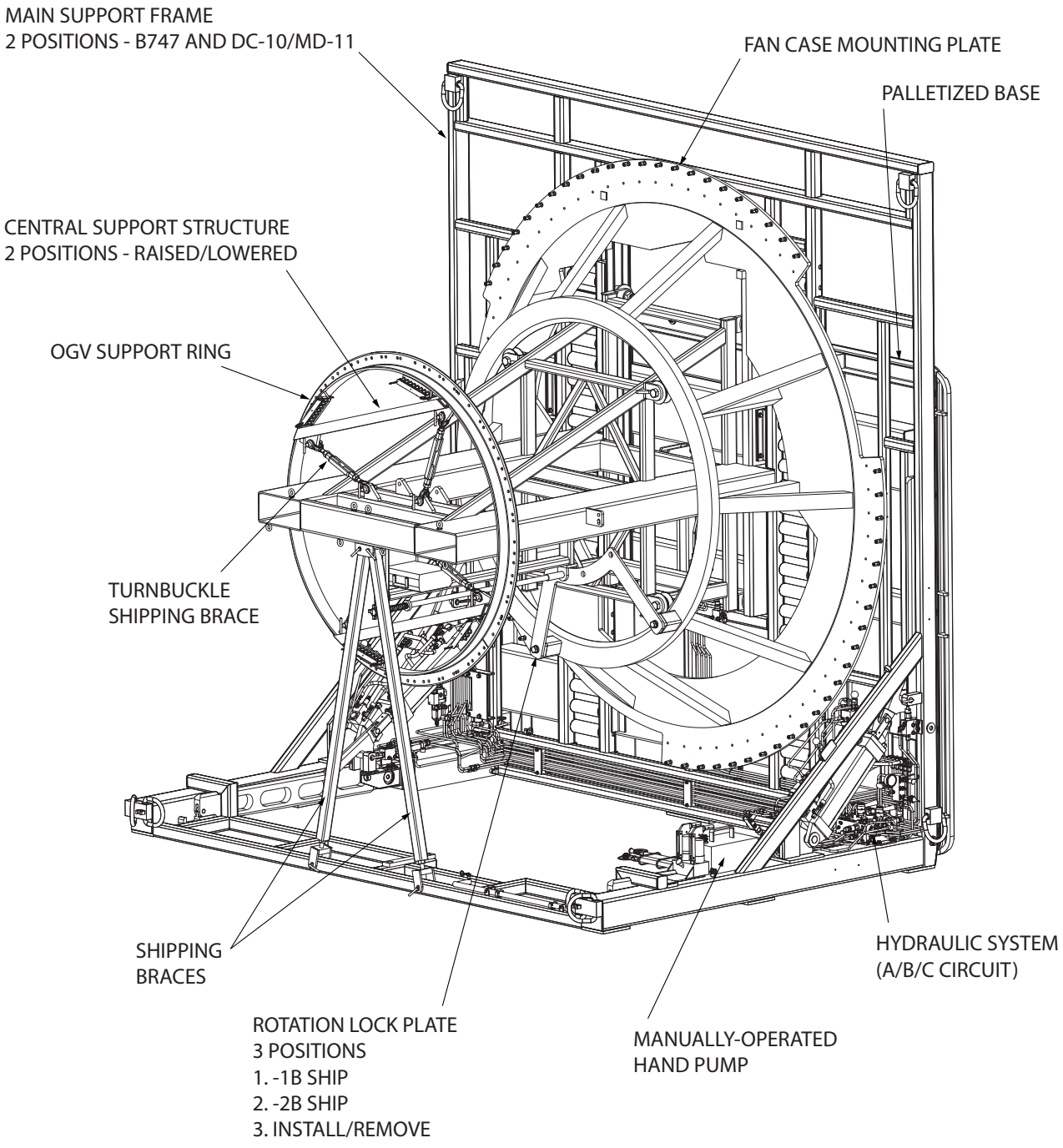


Figure 3.2.2-1

See Page 3.7 for Dimensions for Truck Transport

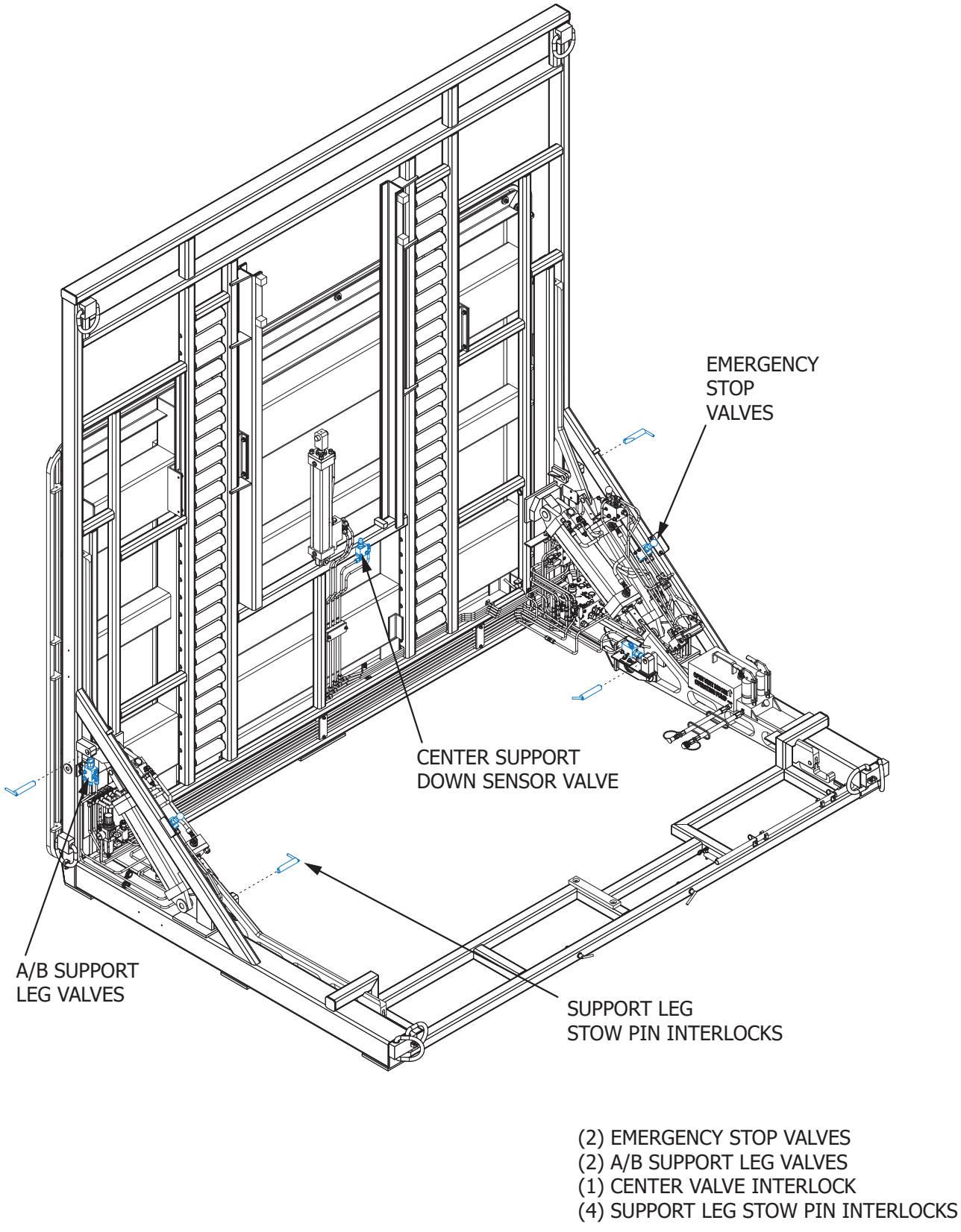


Figure 3.2.2-2 - System Safety Controls

3.5 Characteristics

NOTE

The weight of the GEnx-1B Fan Case is 1,931 Lbs. and the weight of the GEnx-2B Fan Case is 1,838 Lbs.

	With Fan Case (Air Ship Configuration)		With Fan Case (Truck Ship Configuration)		Without Fan Case
	-1B	**-2B**	**-1B**	**-2B**	
Height	98”	98”	139”	139”	98”/139”
Width	136”	136”	96”	96”	136”/96”
Length	139”	139”	133”	133”	136”/96”
Fan CL Height	N/A	N/A	72”	72”	N/A
Weight	9,131 Lbs.	9,038 Lbs.	9,131 Lbs.	9,038 Lbs.	7,200 Lbs.

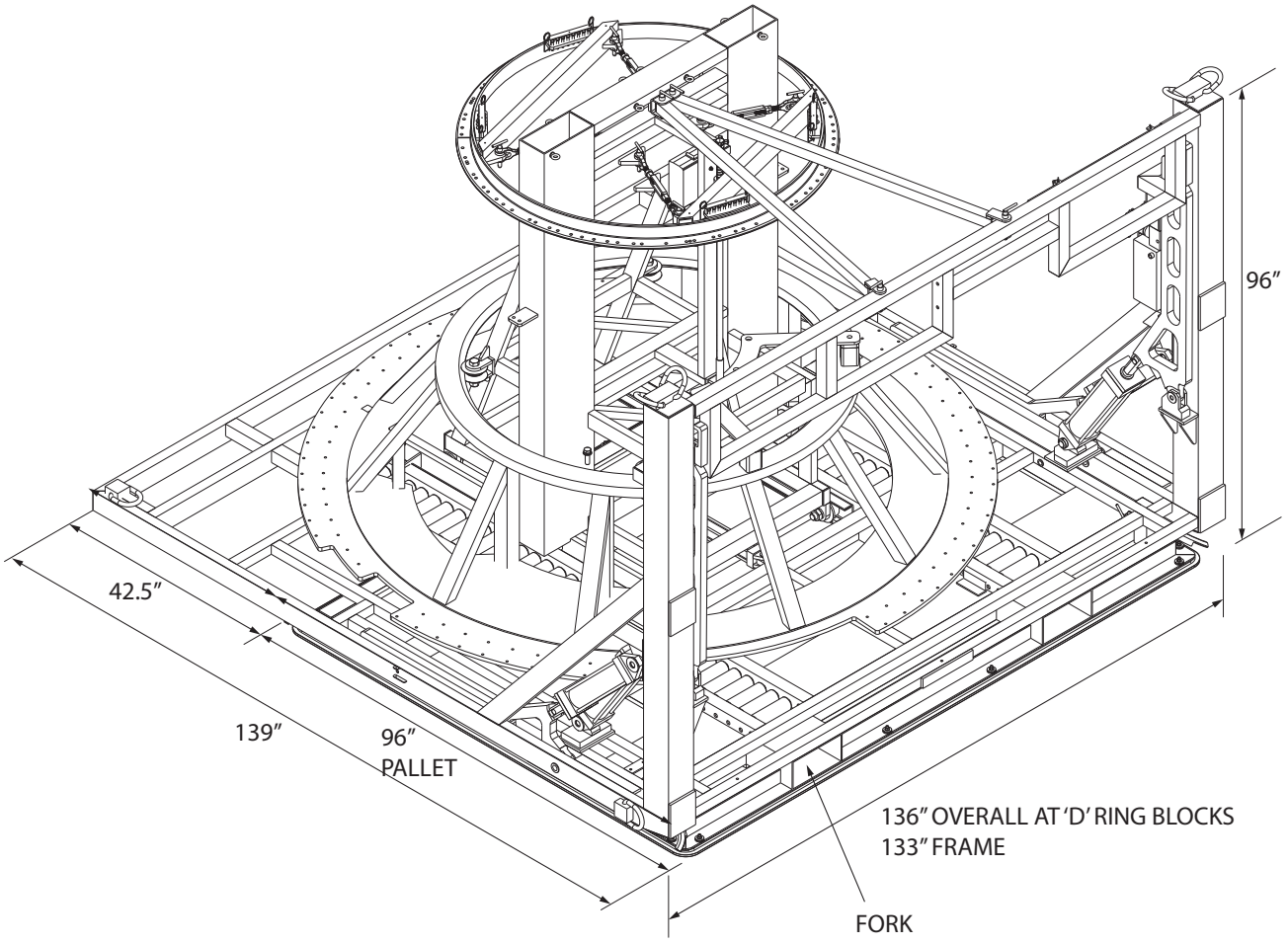


Figure 3.4-1 FAV - Flight Axis Vertical

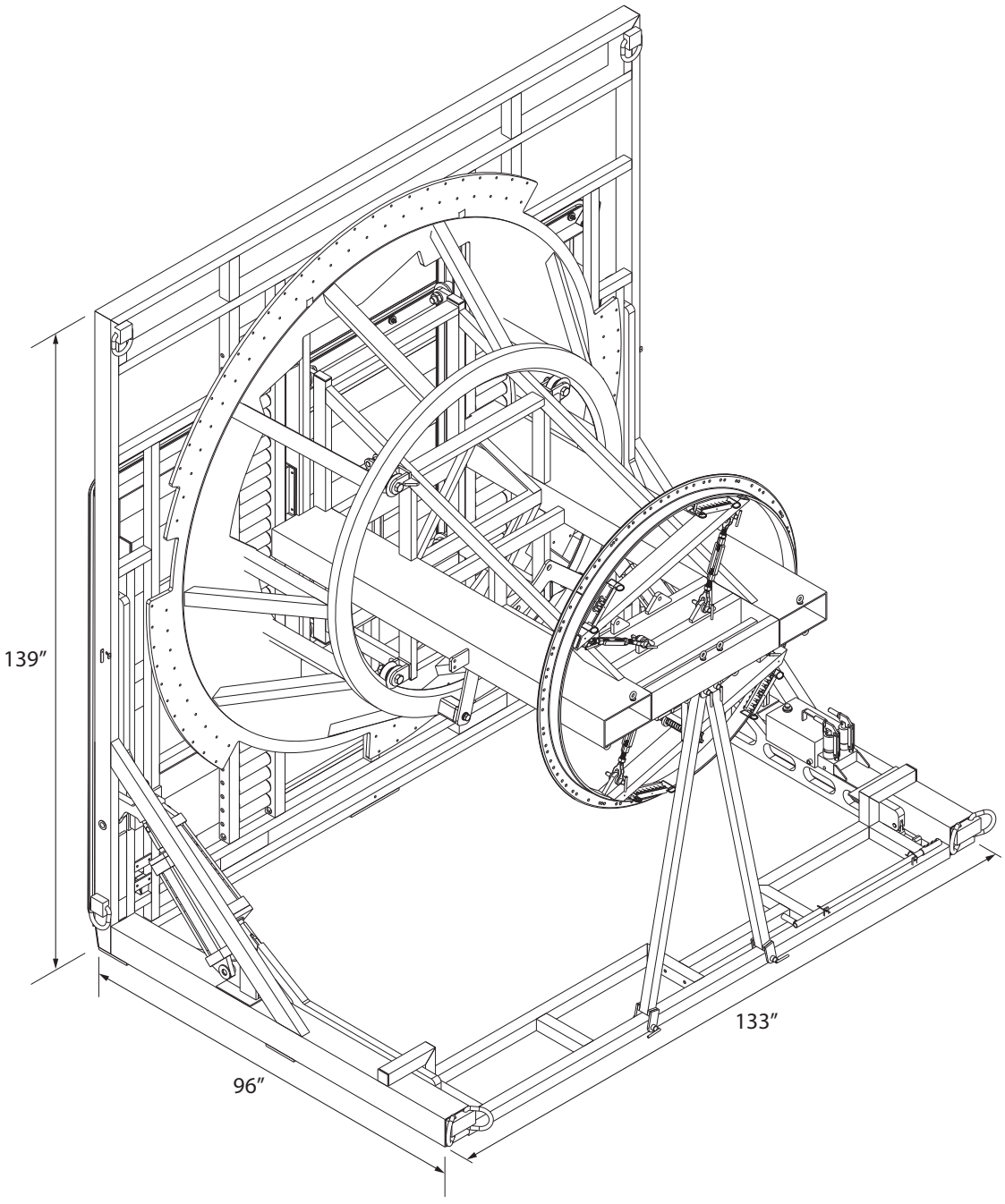
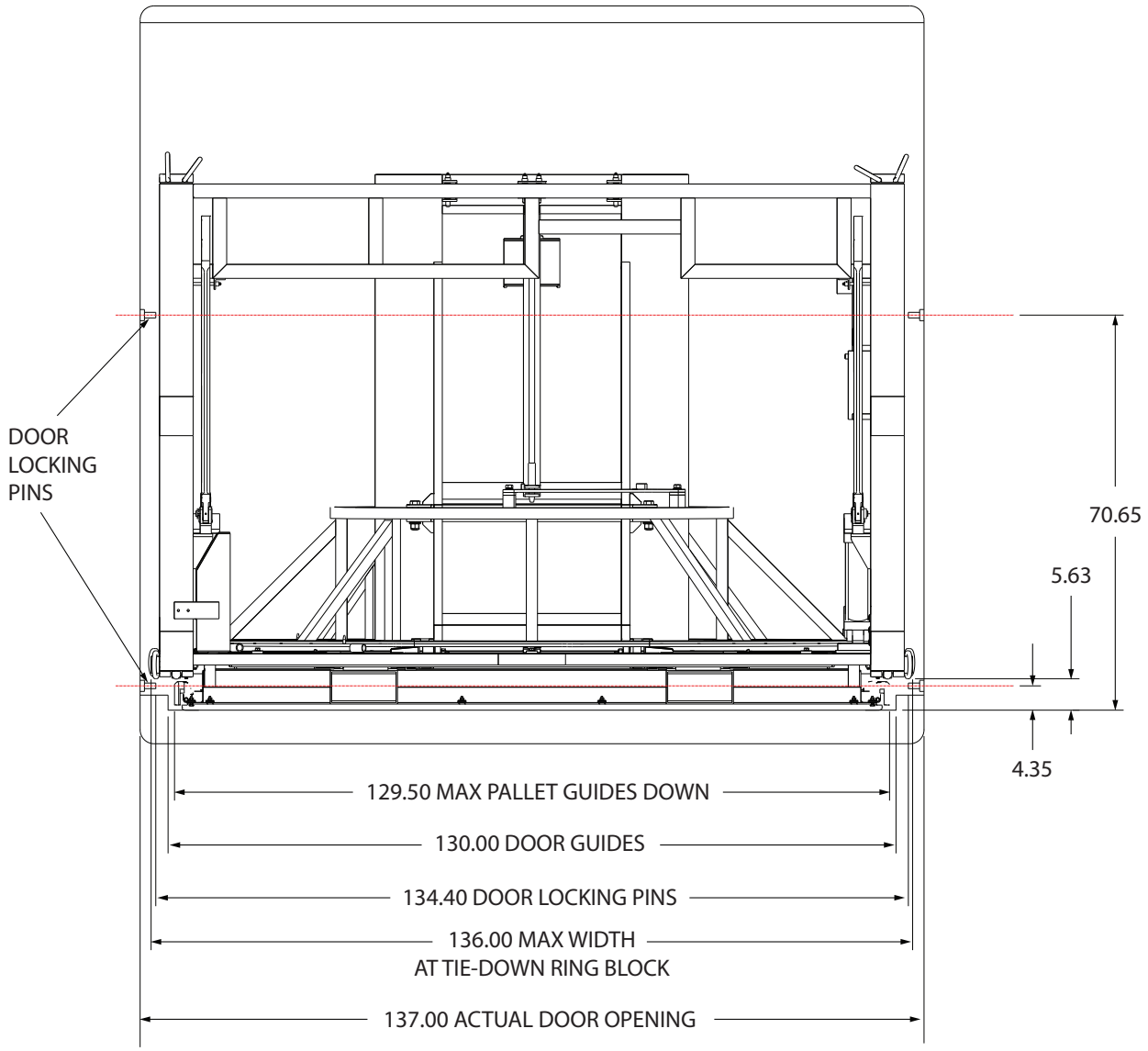


Figure 3.4-2 FAH - Flight Axis Horizontal



B747 CARGO DOOR

Figure 3.4-3 - B747

4.0 – Maintenance and Inspection

4.1 General

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

4.2 Cleaning and Painting

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

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.

All non-painted machined surfaces should be coated with a light grade oil spray every 90 days. Spray with rust inhibitor LPS-3 (MIL-C-16173D, Gr. 2) or WD-40 equivalent.

4.3 Scheduled Service

The hydraulic reservoir level should be checked every 90 days and refilled as necessary with the following hydraulic oil:

Manufacturer	Product
Commercial	MIL-5606 SAE 5W
Commercial	(Mobil DTE 24) or Equivalent

4.4 Scheduled Inspection

CAUTION

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

Annual inspections of machined surfaces, pins, fasteners, and structure are recommended. All machined surfaces 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 or fan module. Pins and fasteners are to be visually inspected for cracks, damage, or corrosion. Loose fasteners should be tightened. The stand structure is to be visually inspected for damage, weld cracks, or corrosion any and all deficiencies should be corrected prior to use.

The hydraulic system is to be inspected for loose and leaking fittings and/or hoses. Loose fittings should be tightened any and all deficiencies should be corrected prior to use. The hydraulic fluid should be visually inspected for proper level and water contamination in the reservoir, contaminated hydraulic system needs to be flushed and filled with recommended hydraulic oil.

CHECK LIST	
PPK	Leaks, blockages, vent reservoir, air filter, drain filter regulator, dents, deformation.
Manual Pump	Leaks, blockages, dents, deformation, Pump lever, oil level check.
Reservoir	Leaks, blockages, vent reservoir, oil level check.
Base Rollers	Cracks, missing, damage, wear, corrosion.
Fan Case Rollers	Cracks, missing, damage, wear, corrosion.
Hinge Points	Cracks, missing, damage, wear, corrosion.

5.0 - Operation

WARNING

Operators should review the following safety and cautionary notes prior to operation.

It is recommended that these operations be performed in a safe area by a minimum of two persons : the pump operator and a spotter watching for unexpected movements, interferences and to prevent other nearby personnel from approaching thus being exposed to any potential danger. The fan shipping fixture is a very large tool and one operator cannot observe all areas while operating the movements. Operators are responsible to follow all procedures and in a safe manner. It is recommended that communication is constant- informing each other of their movements and actions before doing them as well as knowing clear signals to be used for "ALL CLEAR" or "EMERGENCY STOP" situations. Before each use it is recommended to complete a full rotation of the stand without fan case.

Pre-Operation Check List:

Insure hydraulic reservoir is FULL, inspect ALL hydraulic lines, hoses, tubes and fittings for leaks or damage. Tighten or repair as required. Inspect ALL support leg pivot pins and hydraulic cylinder connection pins for any loose or missing hardware. Make sure ALL stow pins are pulled and stowed. Tighten or replace as required. *Figure 5.1 (1,2,3,4)*

Figure 5.1- 1 Pivot Pins, Hydraulic Lines and Fittings

Figure 5.1- 2 Pivot Pins, Hydraulic Lines and Fittings

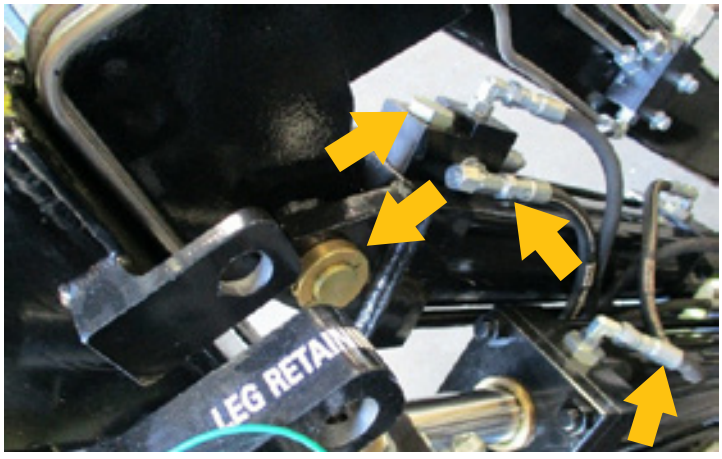


Figure 5.1- 3 Pivot Pins, Hydraulic Lines and Fittings

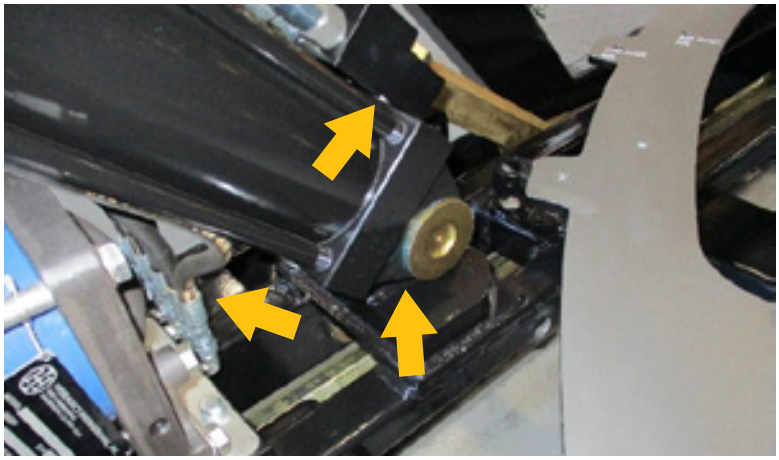


Figure 5.1- 4 Pivot Pins, Hydraulic Lines and Fittings

1. Check all leg and hydraulic cylinder structural connections for cracks or signs of fatigue. Do not operate equipment if defects are visible.
2. Inspect center support guide rollers and hydraulic cylinder connection pins for loose or missing parts. Tighten or replace as required.
3. Make sure the side guides are stowed and secured (both sides) and that the ball lock pin is secured in place. (See *Figure 5.2* and paragraph 3.2.6 for hydraulic system safety features.)

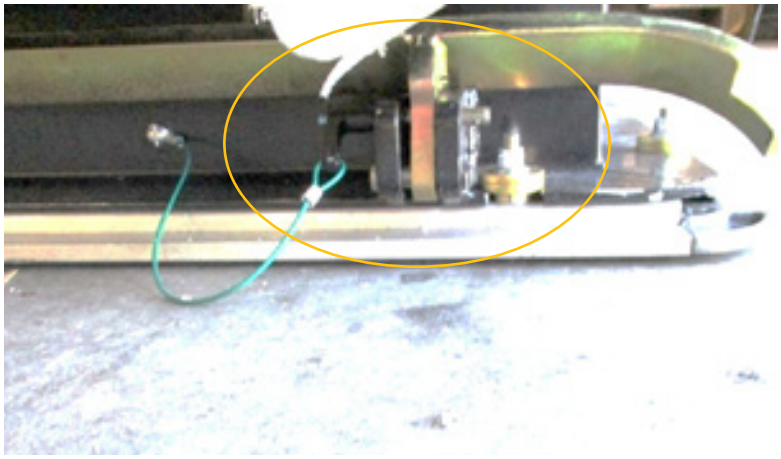


Figure 5.2 Side Guides are Stowed

Determine the current position of the fan case;

1. Figure 5.3 shows the Carriage and Mounting Ring are in the (LOWER) position; in this position the stand can be flipped between “A” and “B” positions.
2. Figure 5.4 shows the Carriage and Mounting Ring in the (RAISED) position; in this position you can load and unload the fan stator. NOTE: The unit CANNOT flip in this position

Figure 5.3 Fan Carriage and Mounting Ring is in Lower position

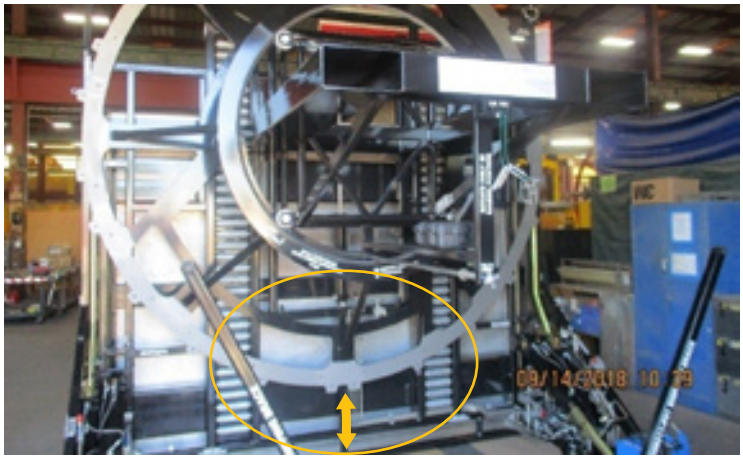


Figure 5.4 Fan Carriage and Mounting Ring in the Higher Position

Emergency Stop

1. Two red button-operated valves ("EMERGENCY STOP") are located on either side of the stand to facilitate an emergency stop (*Figure 5.5*)

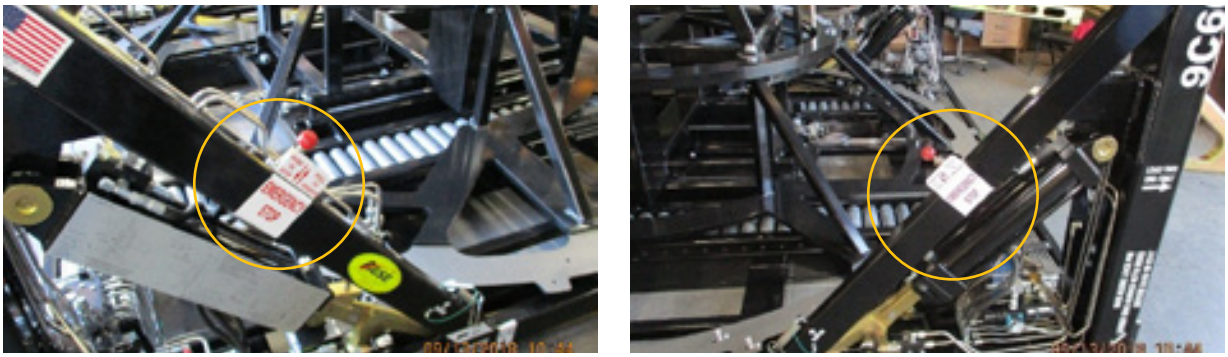


Figure 5.5 - Emergency Stop Valves Located on Both Sides of Equipment

1. Push down either of red button-operated valves "EMERGENCY STOP" to stop all functions and hold stand in position until ready to Restart
2. Ensure both red button-operated valves “EMERGENCY STOP” are pulled up to enable operation.

NOTE

The system will not operate unless both “EMERGENCY STOP” have been pulled out.

NOTE

Establish Safety Zone for Operation

Suitable space must be planed around the equipment operational area to facilitate a safe operating environment.

1. Minimum clearance of 14 feet behind the pallet.

2. Minimum vertical clearance (above equipment) of 15 feet for fan and fixture rotation.

3.Minimum clearance of 2 feet on each side.

5.1 Establish Starting Orientation

Before installing the fan stator, operators must determine in what positions the equipment is resting. This will establish the operating sequence. Options are -

1. **Vertical Orientation (A)** (Ref Fig 3.2-2)

2. **Horizontal Orientation (B)** (Ref Fig 3.2-3)

VERTICAL Orientation (A) - Start Orientation:

In the VERTICAL Orientation (A), the fan case stator can be loaded onto the fixture or removed from the fixture. This is also (**A position)** the recommended position for **STORAGE** and **TRUCK TRANSPORT**.

To rotate the stand to the **Horizontal Orientation (B)**, follow the sequence of operations beginning in Section 5.3.

HORIZONTAL Orientation (B) - Start Orientation:

In the Horizontal Orientation (B), the fan case stator can be loaded onto the fixture or removed from the fixture. This is also (B position) the recommended position for **STORAGE** , **TRUCK TRANSPORT** and **AIR TRANSPORT**.

To move the stand to the **VERTICAL Orientation (A)**, follow the sequence of operations beginning in Section 5.4.

5.2 Fan Stator Installation/Removal Using Either Overhead Hoist or 11C4490 (-1B) or 11C4348 (-2B) Fan Transfer Dolly, Beginning in VERTICAL Orientation (A)

When starting in the VERTICAL Orientation (A) make sure the following guidelines are met.

5.2-1 The two (2) shipping braces removed and put aside. Figure 5.6

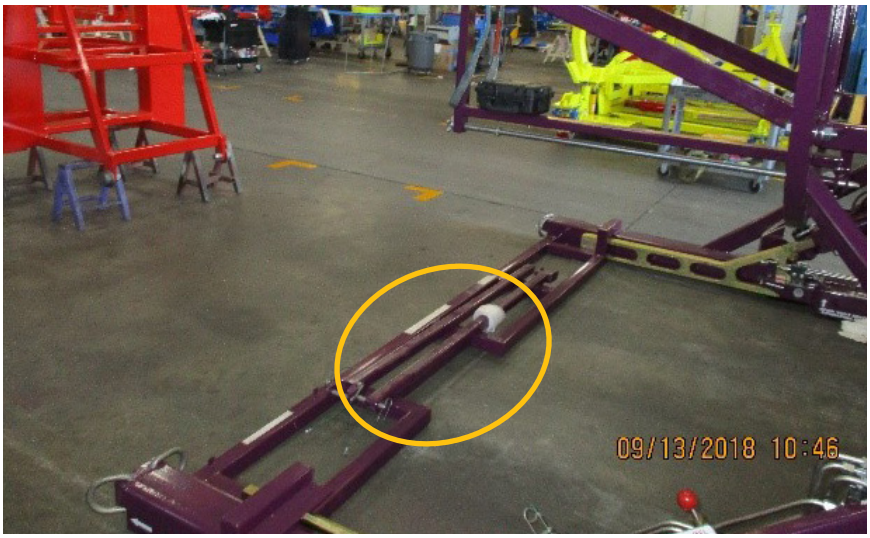


Figure 5.6 - Shipping Braces

5.2-2 The center support is in the raised position, as in *Figure 5.7*.

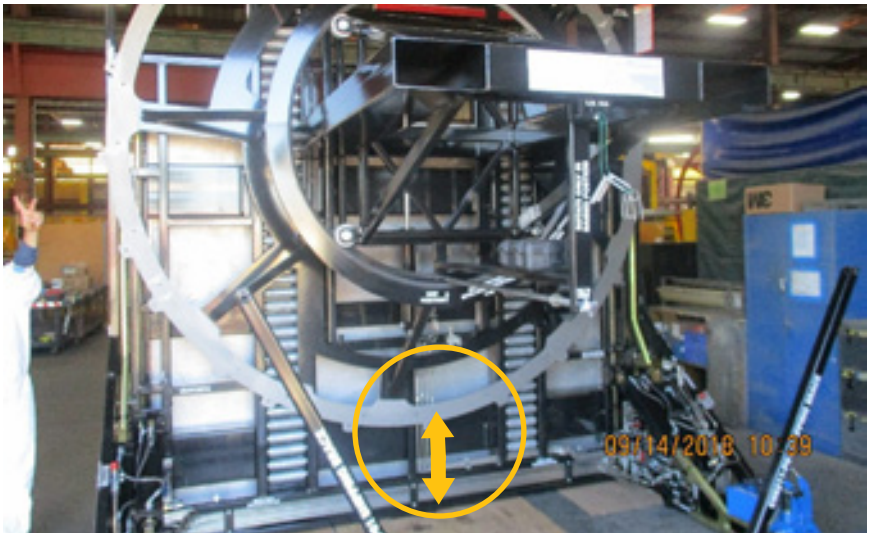


Figure 5.7 - Center Support is in Raised Position

5.2-3 The mounting plate rotated 40 degree counterclockwise to Remove/Install position and secured by the rotation lock pin (*Figure 5.8*).

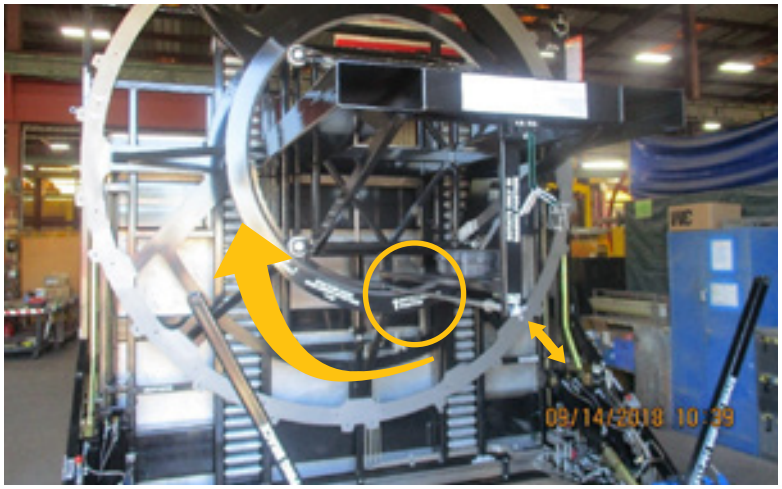


Figure 5.8 - Rotate Mounting Plate 40 degrees

5.2-4 Bring the fan stator to the stand with the FWD flange facing the stand. If the fan stator is supported by an overhead hoist, pull the rotation lock pin out of the mounting plate lock plate to allow rotation of the plate to align mounting holes to the fan stator. If the fan stator is supported by a fan transfer dolly, use the dolly's jacking legs to align the fan stator to the mounting-plate holes.

5.2-5 Secure the fan stator with the mounting hardware in as many places as possible. If all the available bolts cannot be installed because of structure, wait until the mounting plate is rotated (See section 5.2.4).

CAUTION

All Mounting bolts MUST be installed from the mounting plate side.

5.2-6 Remove the fan transfer dolly or overhead hoist and move away from equipment.

5.2-7 Pull rotation lock pin clear of mounting plate and manually rotate plate to designated "**SHIP**" position, as in *Figure 5.8-1*. Install all the remaining hardware.

Figure 5.8-1 Rotate Locking Pin to SHIP Position

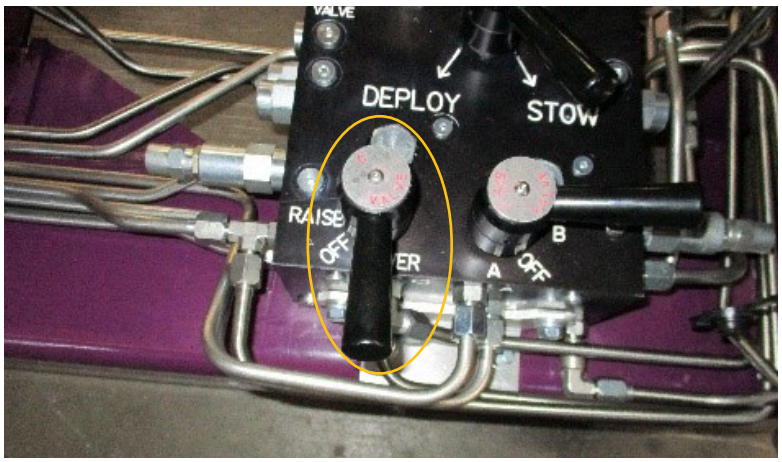
5.2-8 Attach the two (2) shipping braces to the upper bracket. (Note: You will secure the lower connections later in the process – Section 5.2.10.)

5.2-9 Lower the center support to the fully "LOWER" position by turning the "C" valve handle to the "LOWER" position (Figure 5.11- 1)

5.2-10 To complete the installation of the shipping braces, slowly raise the center support by turning the "C" valve handle to the "RAISE" position (Figure 5.11-2). When the shipping brace aligns with the pin holes turn the "C" valve handle to "OFF" to stop raising the center support and install hardware to complete installation of the shipping braces (Figure 5.11-3).

5.2-11 Turn the "C" valve handle to "LOWER" to continue to lower the support until it is resting on the "down stop" blocks on the main base frame (Figure 5.11-1).

5.2-12 Shift "C" valve handle to "OFF" (Figure 5.11-3).



5.11-1 C-Valve in LOWER Position

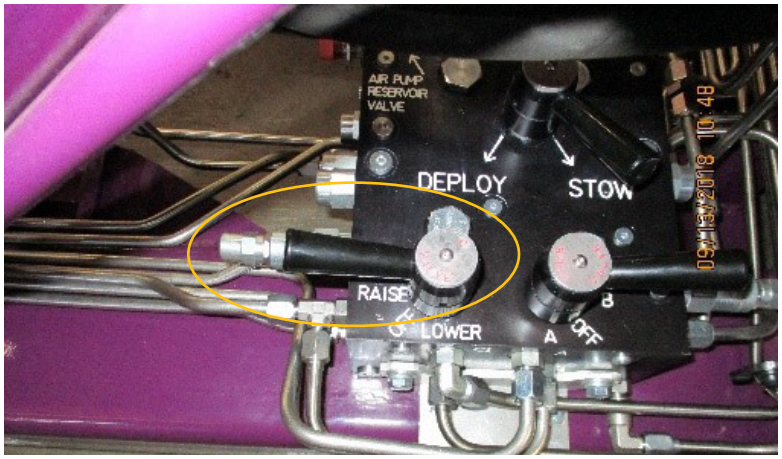


Figure 5.11-2 C-Valve in RAISED Position

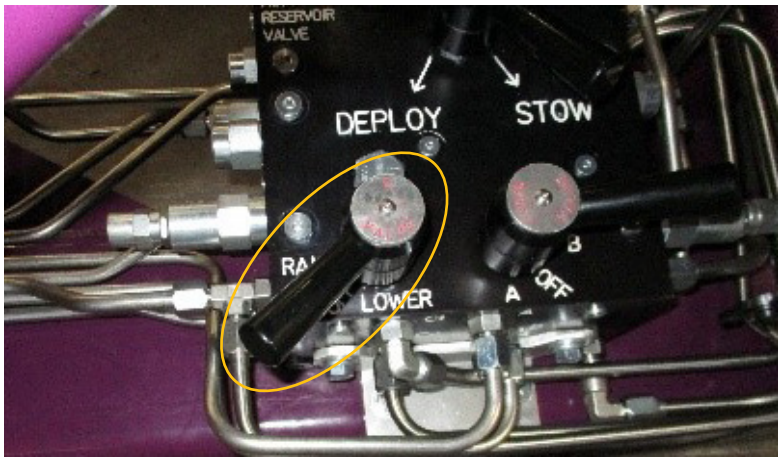


Figure 5.11-3 C-Valve in OFF Position

The stand with shipping brace installed is in the VERTICAL Orientation (A position), is now ready for truck transportation. To rotate to the HORIZONTAL orientation where the tool is suitable for AIR TRANSPORT, follow the procedures starting in section 5.3.

NOTE

In the event that the stand is unresponsive or stops in the middle of operation apply Emergency Stop then swiftly toggle STOW/DEPLOY DCV handle one full cycle ending on the desired position, repeat the same action with A/B DCV handle, disengage Emergency stops and continue operation.

NOTE

The air operated pneumatic hydraulic pump (PPK) operation is strongly recommended as it allows for an easier equipment rotation without physical exertion.

5.3 VERTICAL (A Position) to HORIZONTAL (B Position) Rotation

The recommended operation mode is the use of the hydraulic/pneumatic pump. The system can also be driven using a manual pump; manual pump operation is described in the Section 5.5.

5.3-1 Remove air pump reservoir fill cap to check the oil level (Figure 5.13). Oil level should be within 1" from the top of the reservoir when parallel or perpendicular to the ground.

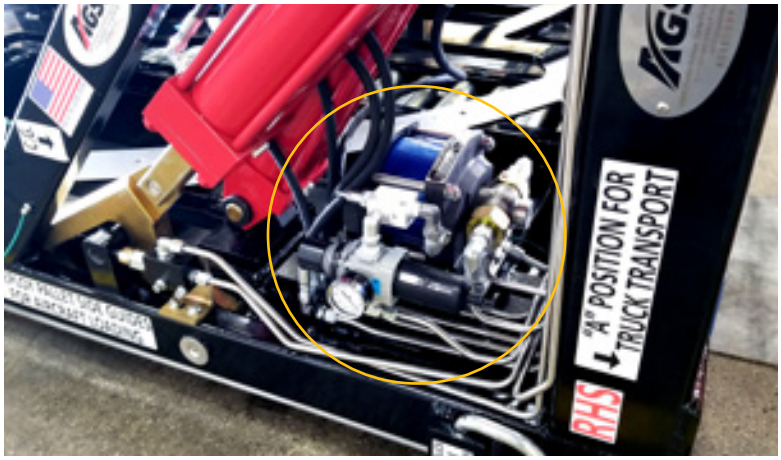


Figure 5.12 - Air Hydraulic Pump

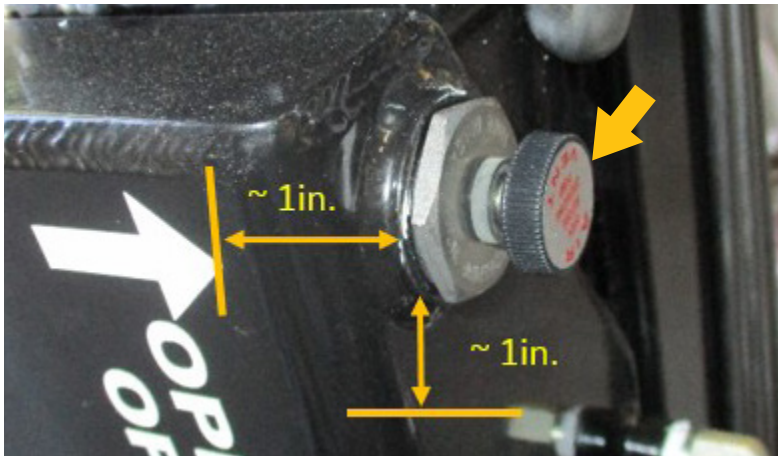


Figure 5.13 - Reservoir Assembly - Showing Reservoir Cap (Closed for Shipping, Open for Operation)

NOTE

If stow pins cannot be removed by hand, move DCV handle to stow position and the A position, push pressure release valve actuator and operate pump until pins can be removed.

5.3-2 Remove all **STOW** pins. There are four (4) pins that must be removed (*Figures 5.14-1,2,3,4*)

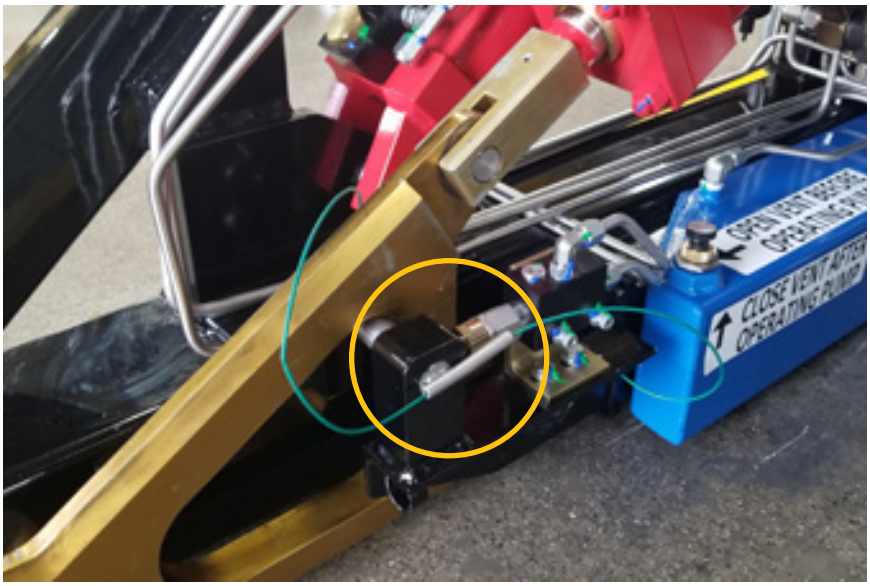


Figure 5.14-1 STOW pins

Figure 5.14-2 STOW Pins

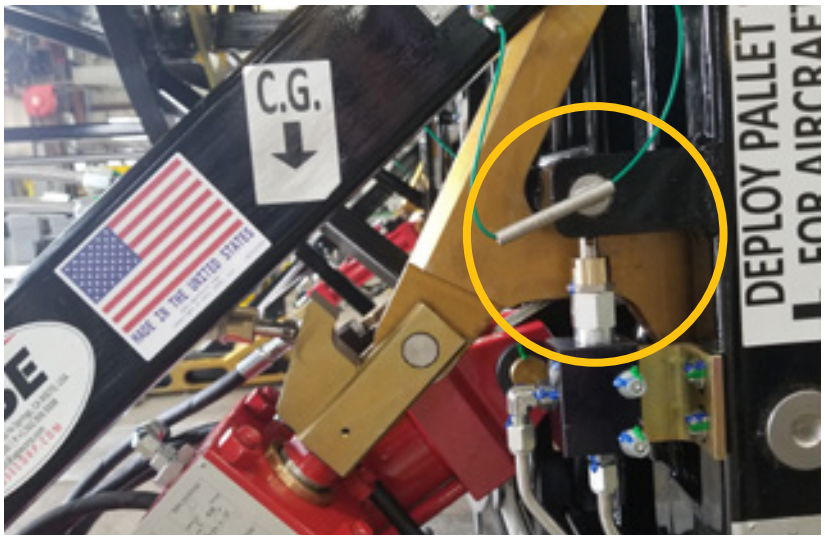


Figure 5.14-3 STOW Pins

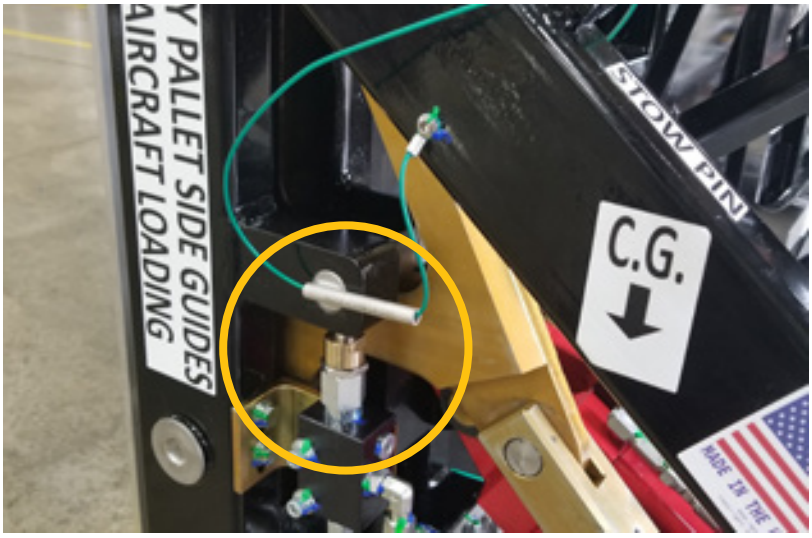


Figure 5.14-4 STOW Pins

5.3-4 Ensure both Emergency STOPS are pulled out to enable equipment operation *(see Figure 5.5)*.

5.3-5 Connect air supply to fitting on Air Manifold Assembly (*Figure 5.15-1*). Open the air supply shut off valve as in *Figure 5.17*. Air pump should start to pump and will stop when pressure reaches maximum.

Air supply should be a minimum of 75 PSI. Air pump has a 30:1 air pressure to oil pressure ratio. Air pressure regulator should NEVER be set above 75 PSI, see *Figure 5.15-2*

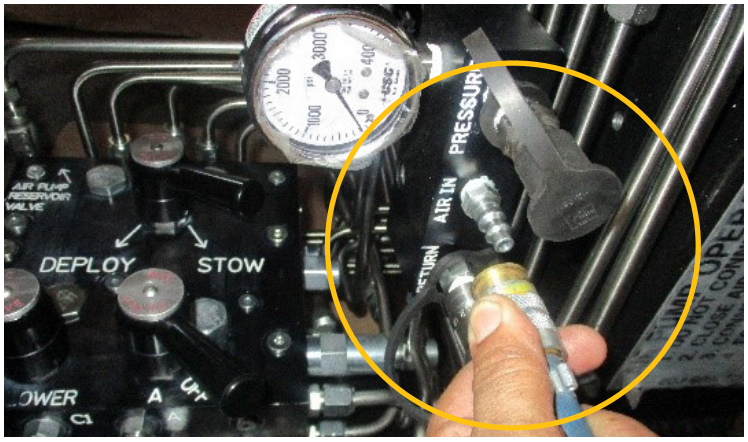


Figure 5.15-1 - Air Manifold Assembly

CAUTION

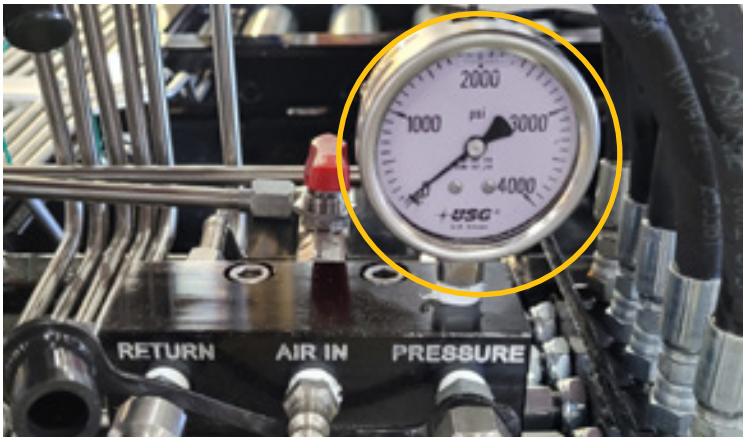


Figure 5.15-2 - Air Supply Pressure Not to Exceed 75 PSI.

5.3-6 Open air pump reservoir valve (also called an isolator valve *Figure 5-16*) . Open air supply shut-off valve (*Figure 5.17)*.

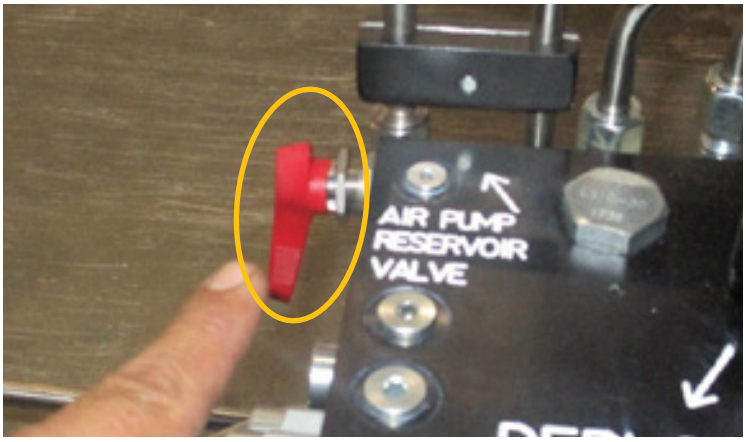


Figure 5.16 - Air Pump Reservoir Valve (Isolator Valve) - Shown in Open Position

Figure 5.17 - Air Supply Shut-Off Valve (Open Position)

NOTE

If the center support is not in the lowered position, follow the steps beginning at 5.2-9.

5.3-8 Ensure compliance of the Establish Safety Zone for Operation

5.3-9 To Rotate fan stator to the HORIZONTAL ORIENTATION (B Position n) (*see Figure 5.7*), select the **DEPLOY/STOW** valve (also called the **D/S** valve) and turn handle to **DEPLOY**. (*See Figure 5.18*)

5.3-10 Select **A/B** valve and move to the **B** position. This will begin transition to the Horizontal Orientation (B position) *Figure 5.18*.

NOTE

There may be a slight delay in movement as hydraulic pressure builds within the system.

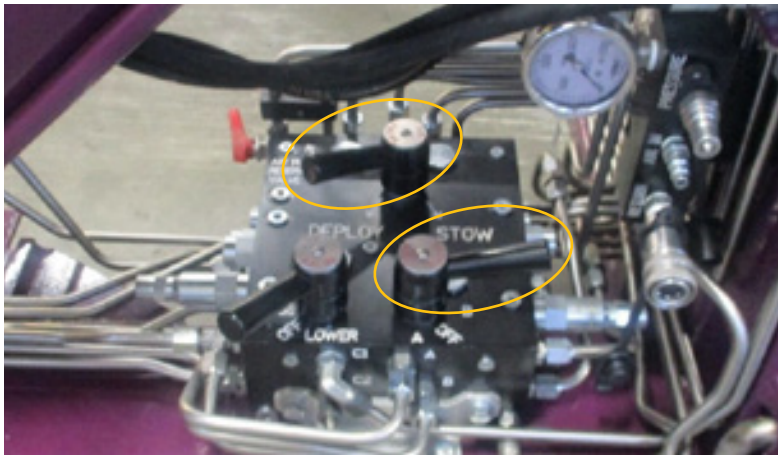


Figure 5.18 - D/S set to "Deploy", AB valve set to "B"

5.3-11 Once the transition from VERTICAL ORIENTATION (A) to HORIZONTAL (B) is complete (i.e. pallet is now on ground) rotate **D/S** valve to the **STOW** position, as in *Figure 5.19*

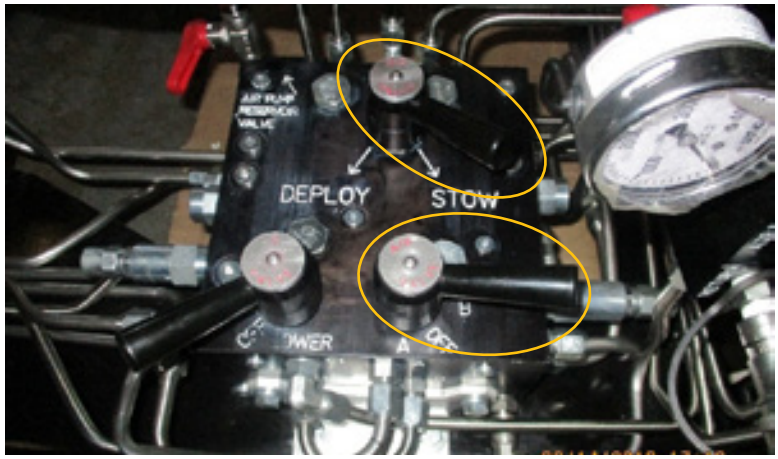


Figure 5.19 - D/S Valve in STOW Position

5.3-12 All legs will move to the stow position. When legs are in the stow position (all cylinders fully retracted), the operation is complete.

5.3-13 Rotate the A/B valve to the "**OFF**" position.

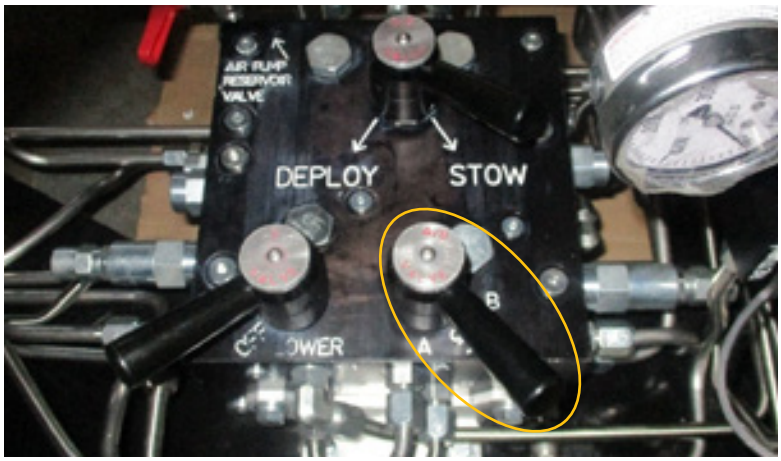


Figure 5.20 - A\B Valve in OFF Position

5.3-14 Install all four (4) stow pins, reference 5.3.2.

5.3-15 Disconnect air hose and allow air pressure within the system to bleed air. This may take more than 4 minutes.

5.3-16 Close the air pump reservoir valve (Isolator Valve) (*Figure 5.21*).

Figure 5.21 - Air Pump Reservoir Valve - Closed

5.3-17 Close the air supply shut-off valve (*Figure 5.22*).

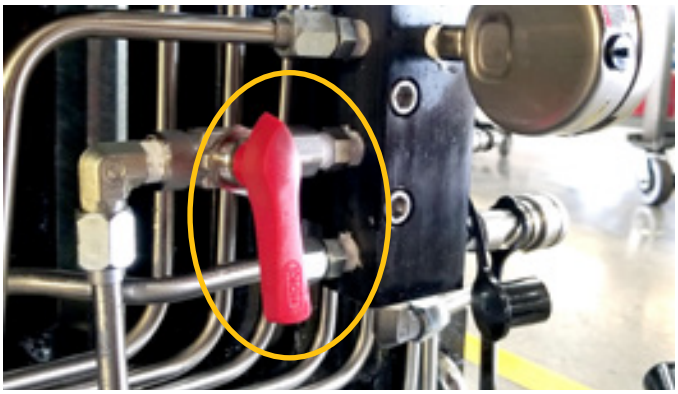


Figure 5.22 - Air Supply Shut-Off Valve - Closed

5.3-18 Ensure that all the manifold handles are in the "OFF" and "STOW" positions as in *Figure 5.23*

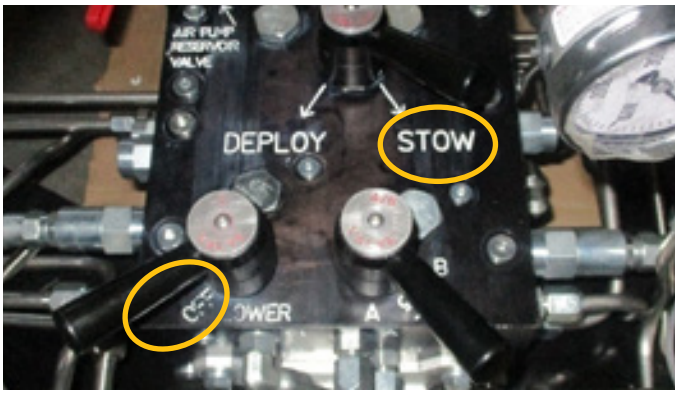


Figure 5.23 Valves in OFF and in STOW Position

The transition from VERTICAL orientation to HORIZONTAL orientation is complete. The equipment is now ready for AIR SHIPMENT.

NOTE

The hydraulic air pump operation is strongly recommended as it allows for an easier equipment rotation without physical exertion.

5.4 Horizontal (B Position) to Vertical (A Position) Rotation

The recommended operation is the use of the hydraulic/pneumatic pump. The system is also capable of using a manual pump; manual pump operation is described in the Section 5.5.

5.4.1 Remove air pump reservoir fill cap to check the oil level (*Figure 5.13*). Oil level should be within 1" below fill port when perpendicular (Horizontal) to the ground orientation.

5.4.2 Remove all STOW pins. There are four (4) pins that must be removed. (*Figure 5.14-1, 2, 3, 4*).

5.4.3 Pull "OUT" both Emergency STOPS to enable equipment operation.

5.4.4 Connect air supply to air manifold assembly (*Figure 5.15-1*) . Open the air supply shut off valve (*Figure 5.17*). Air pump should start to pump and will stop when pressure reaches maximum. Air supply should be a minimum of 75 PSI. Air pump has a 30:1 air pressure to oil pressure ratio. Air pressure regulator should NEVER be set above 75 PSI.

5.4.5 Open air pump reservoir valve (*isolator valve Figure 5.16*). Open air supply shut-off valve. (*Figure 5.17*).

5.4.6 Ensure that the center section is in the lowered position. In this position the "C" valve is in contact with the adjustment valve per *Figure 5.3*.

NOTE

If the center section is not in the lowered position, then follow the steps beginning at 5.2-5.

5.4.7 Select DEPLOY / STOW valve (also called the D/S valve) and turn handle to DEPLOY (*Figure 5.24*).

5.4.8 Rotate A/B selector valve to the A position (*Figure 5.24*). This will begin transition from Horizontal to Vertical orientation.

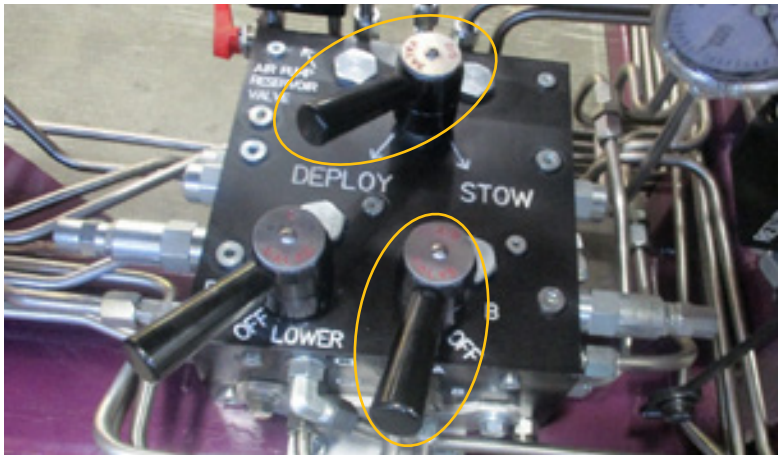


Figure 5.24 D/S set to "Deploy"; A/B valve set to "A"

NOTE

There may be a slight delay in movement of legs as hydraulic pressure builds within the system.

5.4.9 Once the transition from Horizontal to Vertical is complete (i.e. pallet and leg are vertical) rotate D/S valve to the STOW position as shown in *Figure 5.25*

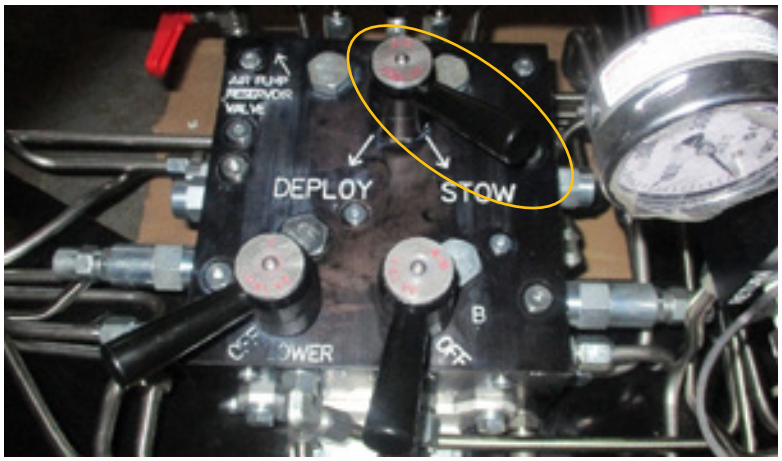


Figure 5.25 D\S Valve is in Stow Position

5.4.10 All legs will move to the stow position. When legs are in the stow position (all cylinders fully retracted), the operation is complete.

5.4.11 Rotate the **A/B** valve to the "**OFF**" position. *Figure 5.26*

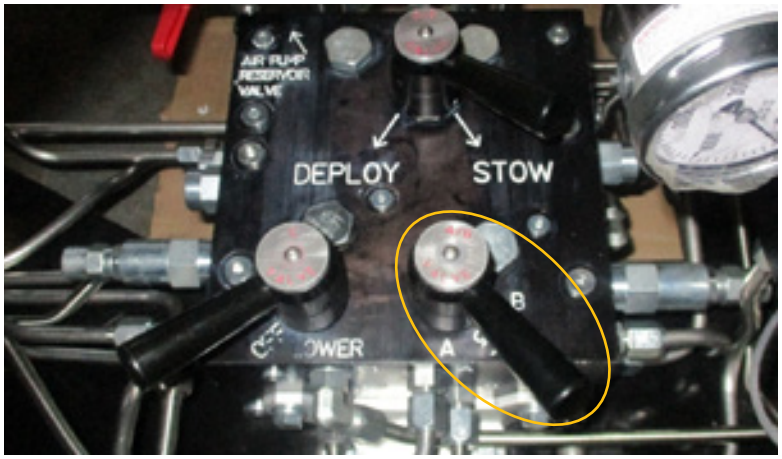


Figure 5.26 A\B Valve is in OFF Position

5.4.12 Install all four (4) stow pins, reference 5.3-2.

5.4.13 Disconnect air hose and allow air pressure within the system to bleed air. This may take more than 4 minutes.

5.4.14 Close the air pump reservoir valve. (Isolator valve), as in *Figure 5.27*.

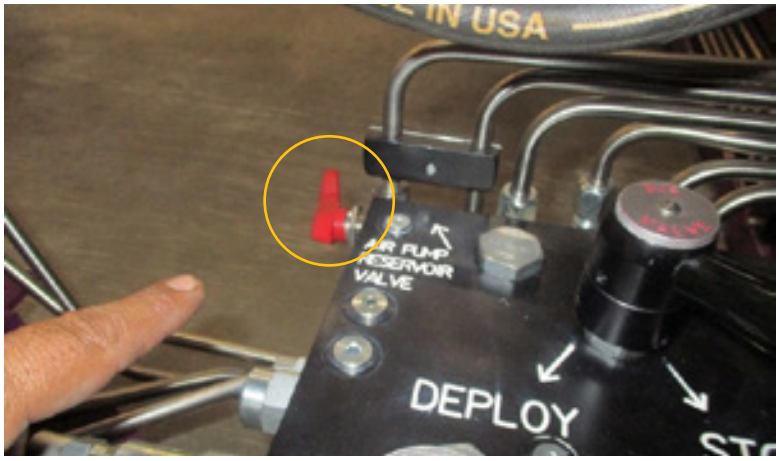


Figure 5.27 Reservoir Valve in OFF Position

5.4.15 Close the air pump inlet, as in *Figure 5.28.*

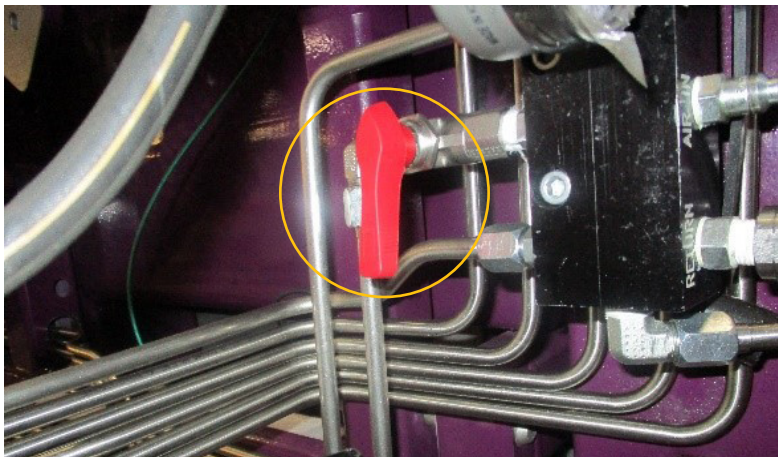


Figure 5.28 Air Supply Shut-Off Valve in Closed Position

5.4-16 Move the **Raise/Lower** and **A/B** selector valve handles to the "**OFF**" position, as in *Figure 5.29*.

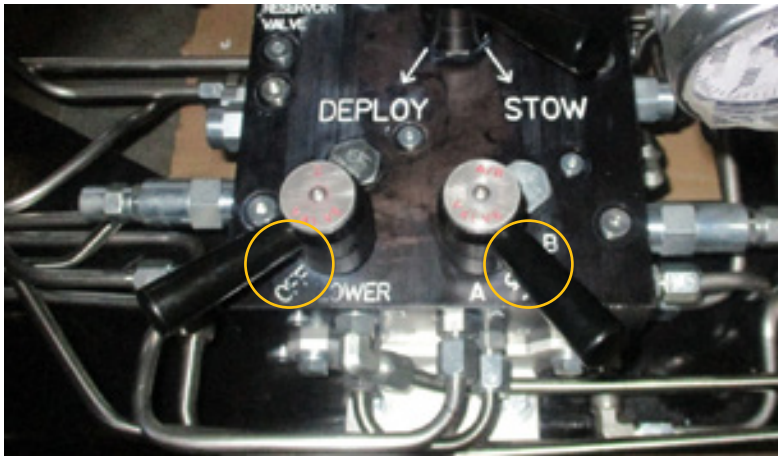


Figure 5.29 Manifold Handles in OFF Position

The transition from **HORIZONTAL** (B position) to **VERTICAL** (A position) is complete. The equipment is now ready for **TRUCK SHIPMENT**.

5.5 Manual Pump Operation

CAUTION

Follow all Warnings, Cautions and Setup Notes as described in Sections 5.1, 5.2, 5.3 and 5.4.

CAUTION

Make sure the Air Pump Reservoir Valve is closed as in *Figure 5.30*. If left open, the oil in the pneumatic pump hydraulic reservoir will transfer to the manual pump reservoir located within the fan stator and will over flow.

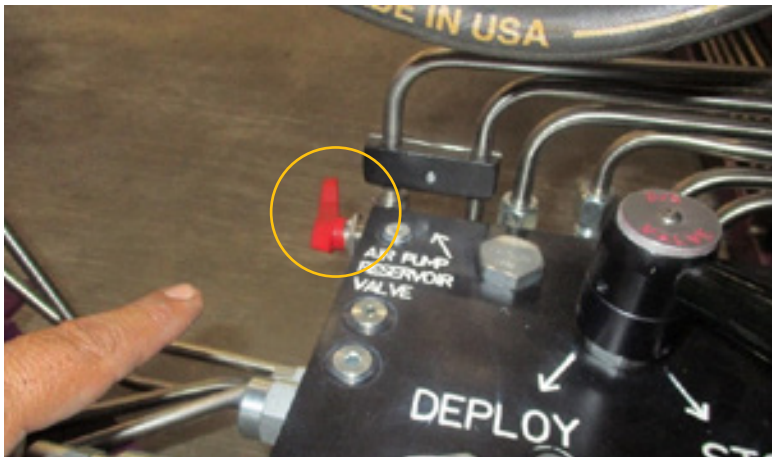


Figure 5.30 - Air Pump Reservoir Valve in CLOSED Position

5.5.1 Remove manual pump from stand. Hoses are pre-connected and ready for hook up. Remove protective covers from hoses.

5.5.2 Connect pressure hose to inlet "**PRESSURE**" connection and connect the return line to "**RETURN**" connection (*Figure 5.31*).

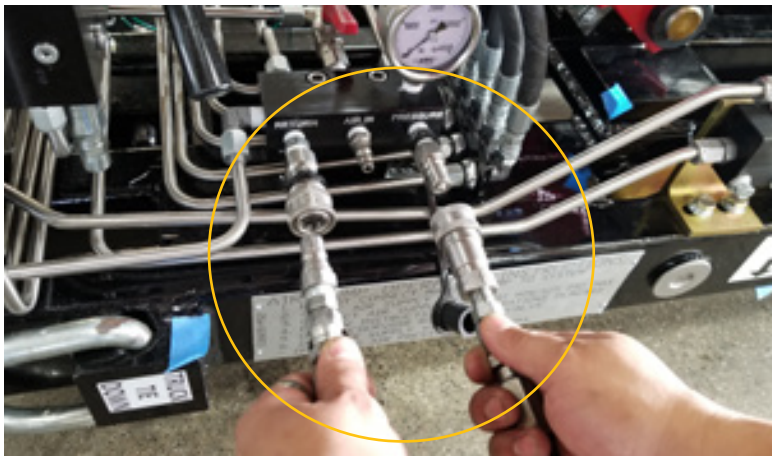


Figure 5.31 - Manual Hose Connections

5.5.3 The manual pump is configured as in *Figure 5.32*. The pump has two handle lever options for pumping.

1.The lever with the black cylinder (larger diameter) is hi-flow/low pressure and is used for deploying the legs when the legs are not holding the weight of the stand.

2. The lever that is painted blue (smaller diameter) is low flow/high pressure and is used for the transition (rotation) of the stand and is engaged when the legs assume the weight of the stand.

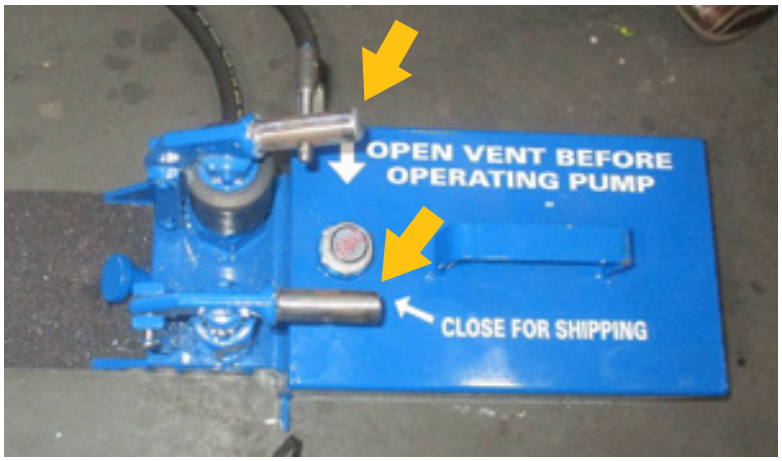


Figure 5.32 - Manual (Hand) Pump

5.5.4 Open vent on the manual hydraulic reservoir (*Figure 5.33*).

Figure 5.33 - Open Vent on Pump

5.5.5 To Pump, close the pressure release valve (*Figure 5.34*) by tightening clockwise (hand tightness is acceptable). (Counterclockwise will release the pressure, should be no more than one full turn from the tight position.)

CAUTION

Do not unscrew the pressure release valve completely, as damage to the pump may result.

Figure 5.34 - Close the Pressure Release Valve

5.5.6 Connect the pump arm to the appropriate lever and begin pumping to actuate the tool, as in *Figure 5.35*.

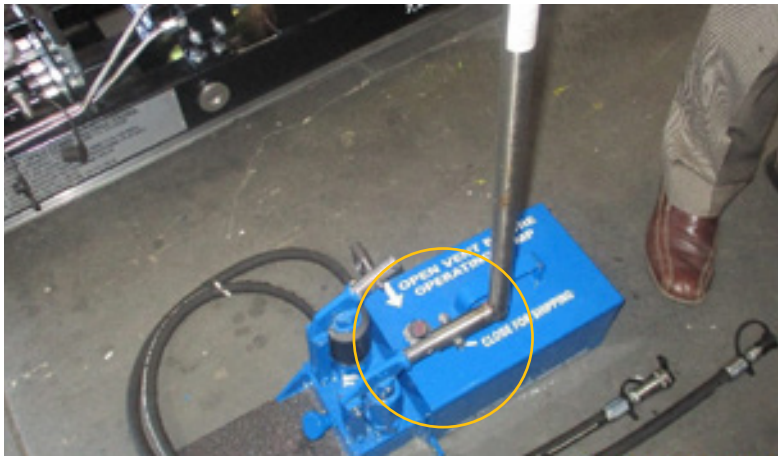


Figure 5.35 Attach the Lever to the Pump Arm

We are now ready to activate the system. Go to section 5.3 for Vertical to Horizontal or to section 5.4 for Horizontal to Vertical transition.

5.6 Rotation with the Two Crane Method.

The Two Crane Rotation method can be used to rotate back and forth between the Vertical Orientation and Horizontal Orientation configurations. Rotation is permissible with a laden (installed Fan Stator module) and unladed (empty) shipping fixture.

The method involves the simultaneous use of one crane to Raise and the other to Lower at the same rate, this applies a couple or a moment to rotate the shipping fixture.

Lifting Sling and Shackle Specification:

- A pair of 10 ft long slings with a minimum capacity of 5,000 Lb each.
- Shackles with a minimum capacity of 5,000 Lb, to be attached to the shipping fixture D rings.
- Shackles with a minimum capacity of 25,000 Lb, to be attached to the crane hoist/ hook.

WARNING

Prior to operating the equipment, a safety zone must be established with a minimum measurement of 14 square feet all around the equipment.

WARNING

A minimum hook height of 20 feet is required for rotating the equipment with overhead or mobile cranes.

1. Using shackles, attach each sling to the D-rings across the width of the shipping fixture.
2. For the double D-ring attachment points, only use the D-rings inboard of the shipping fixture.
3. Connect each sling to a crane hoists/hook using a 25,000 Lb rated capacity shackle.
4. Using the two cranes, lift vertically upwards a minimum height of 12 in. from the floor.
5. Raise with the crane attached to lower D-rings, and lower with the crane attached to the upper D-rings as shown in the hoist points for rotation illustration (*Fig. 5.36* and *Fig. 5.37*) and the rotation sequence illustration (*Fig. 5.38*)
6. Operate the cranes at a very slow speed to ensure a smooth operation and to avoid any sudden movement of the shipping fixture.
7. The use of multiple spotters all around the shipping fixture is recommended throughout the operation.

WARNING

Ensure to select the correct hoist rings for the rotation using the Two Crane Method. The use of the incorrect hoist rings could lead to an unbalanced load, which could create a dangerous working environment.

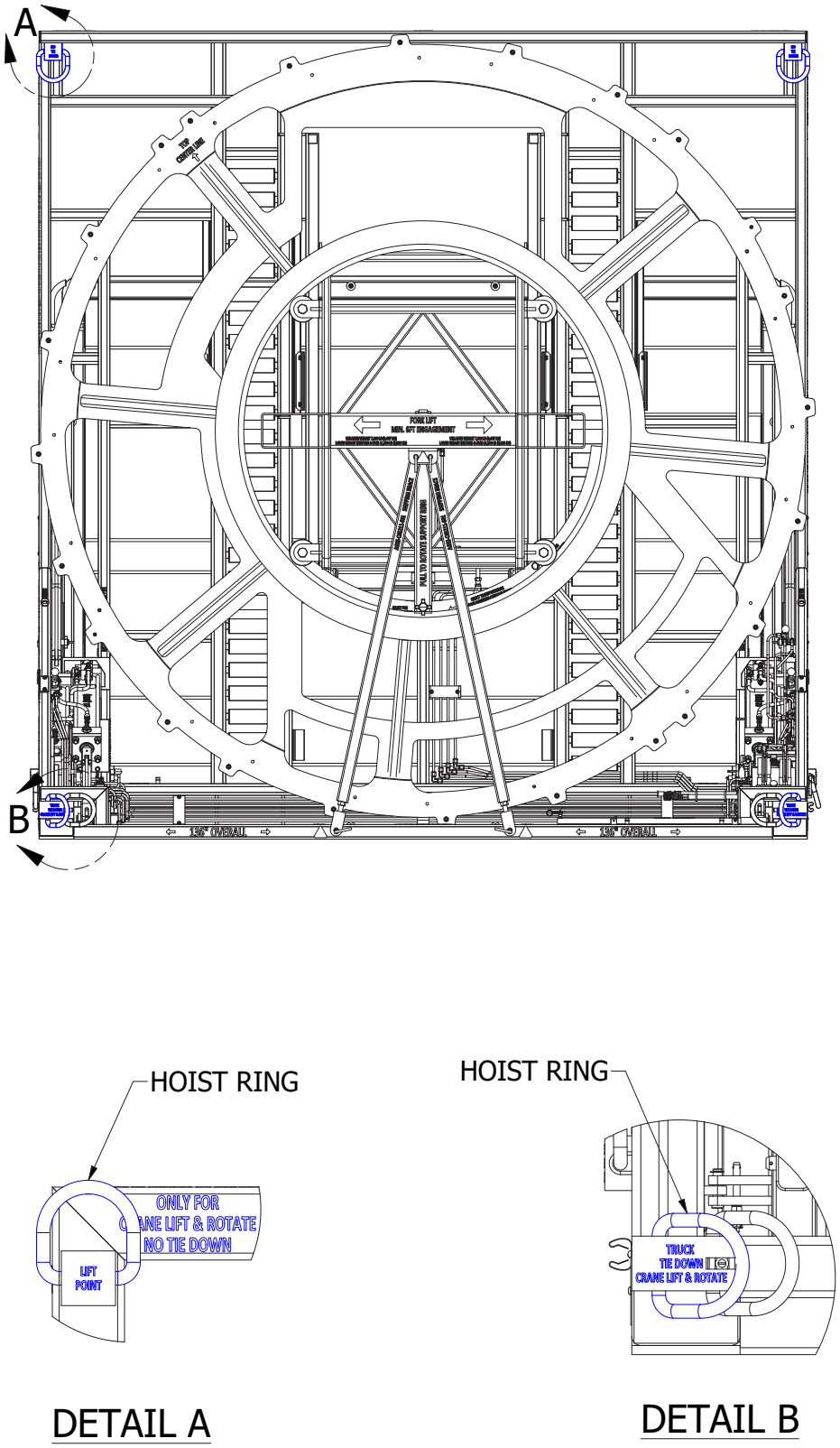


Figure 5.36 - Hoist points for rotation

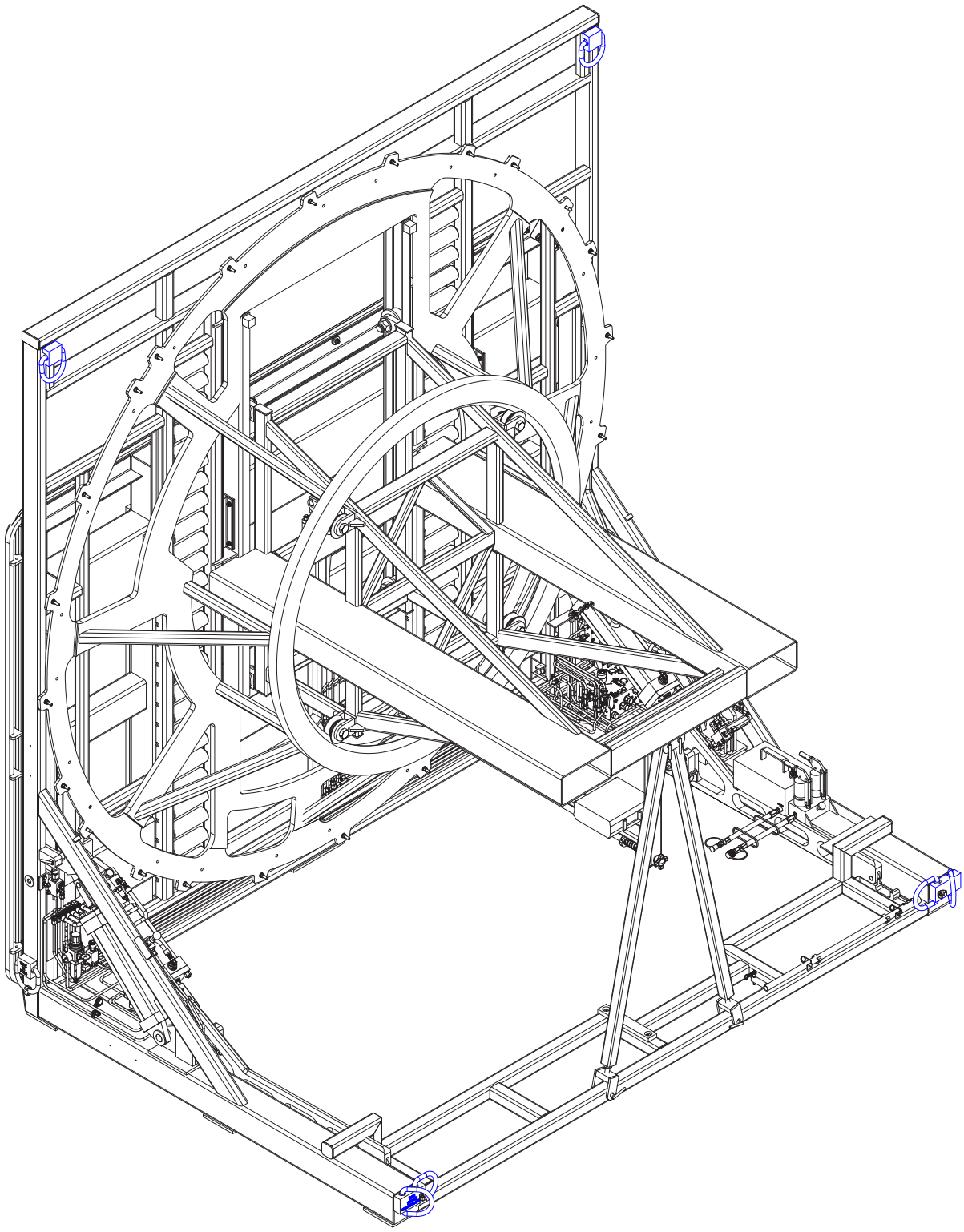


Figure 5.37 - Hoist points for rotation

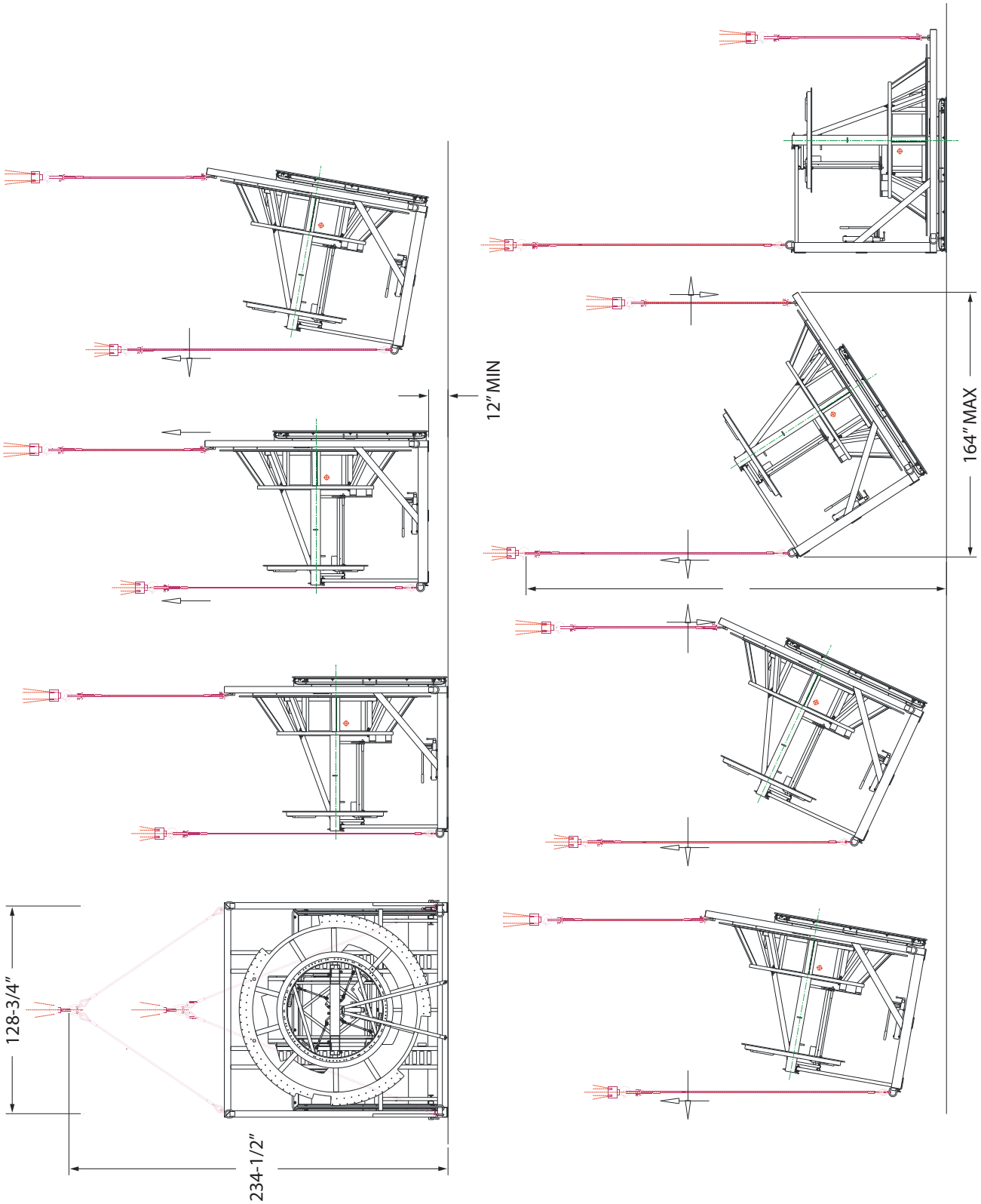


Figure 5.38 - Rotation Using Two-Crane Method

5.7 Side Guide Operation

Release the drop down guide rails by releasing the safety pins. Swing the guide rails down into place and re-secure. The guide rails will guide and center the stand as it is moved into the aircraft and also prevent damage to the fan case.

5.8 Converting Stand/Base Configuration from B747, Side-Aisle Loading, to DC-10/MD-11

NOTE

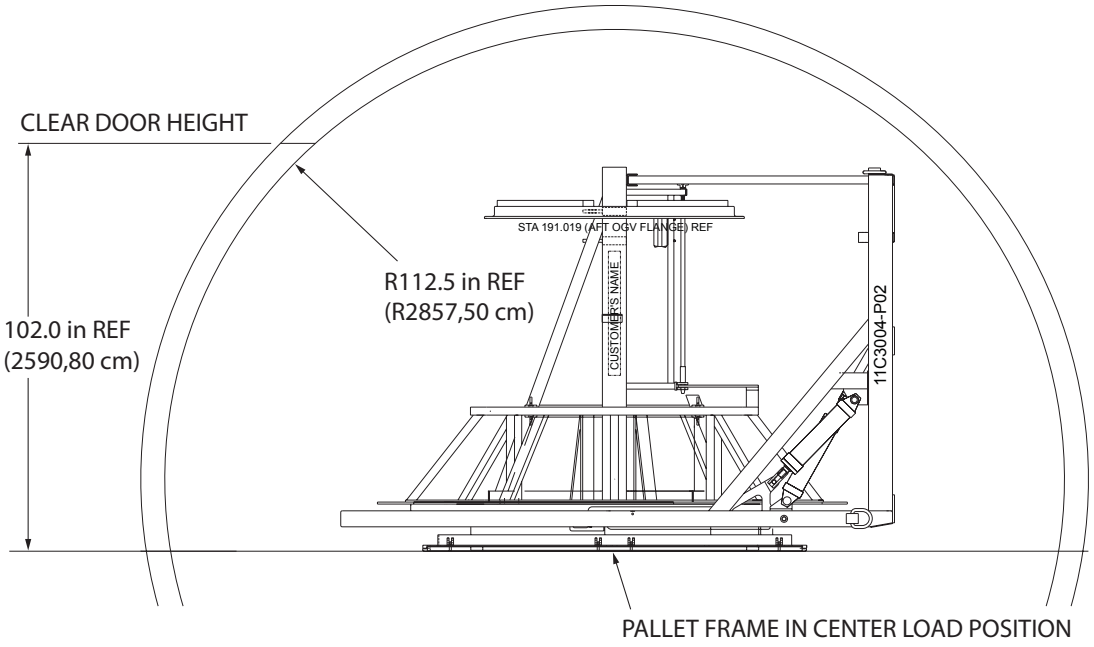
Because of aircraft size and pallet position differences, the base must be shifted to fit the noted aircrafts (Figure 5.10-1)

Pull the base-to-pallet lock pin, then manually push the base to the required position and repin (Illustration Figure 5.10-2, Page 5.29).

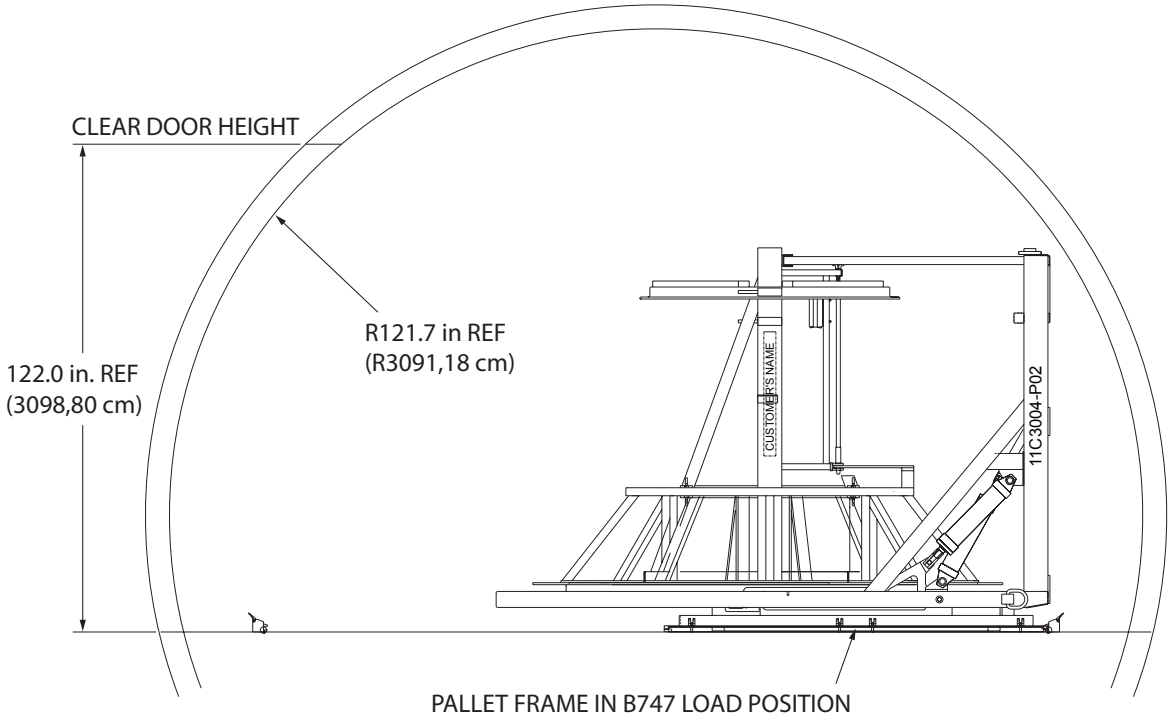
If the stand is to be center-aisle loaded, the main base must be shifted to the center of the pallet frame. The main frame is secured to the pallet base by two pins. Pull these pins and push the main frame towards the middle of the pallet frame. Re-install the pallet frame pins.

CAUTION

In this position, longer forklift tines are required to lift the stand.



MD-11/DC-10/B777



B747

Figure 5.10-1 Pallet Shipping Positions

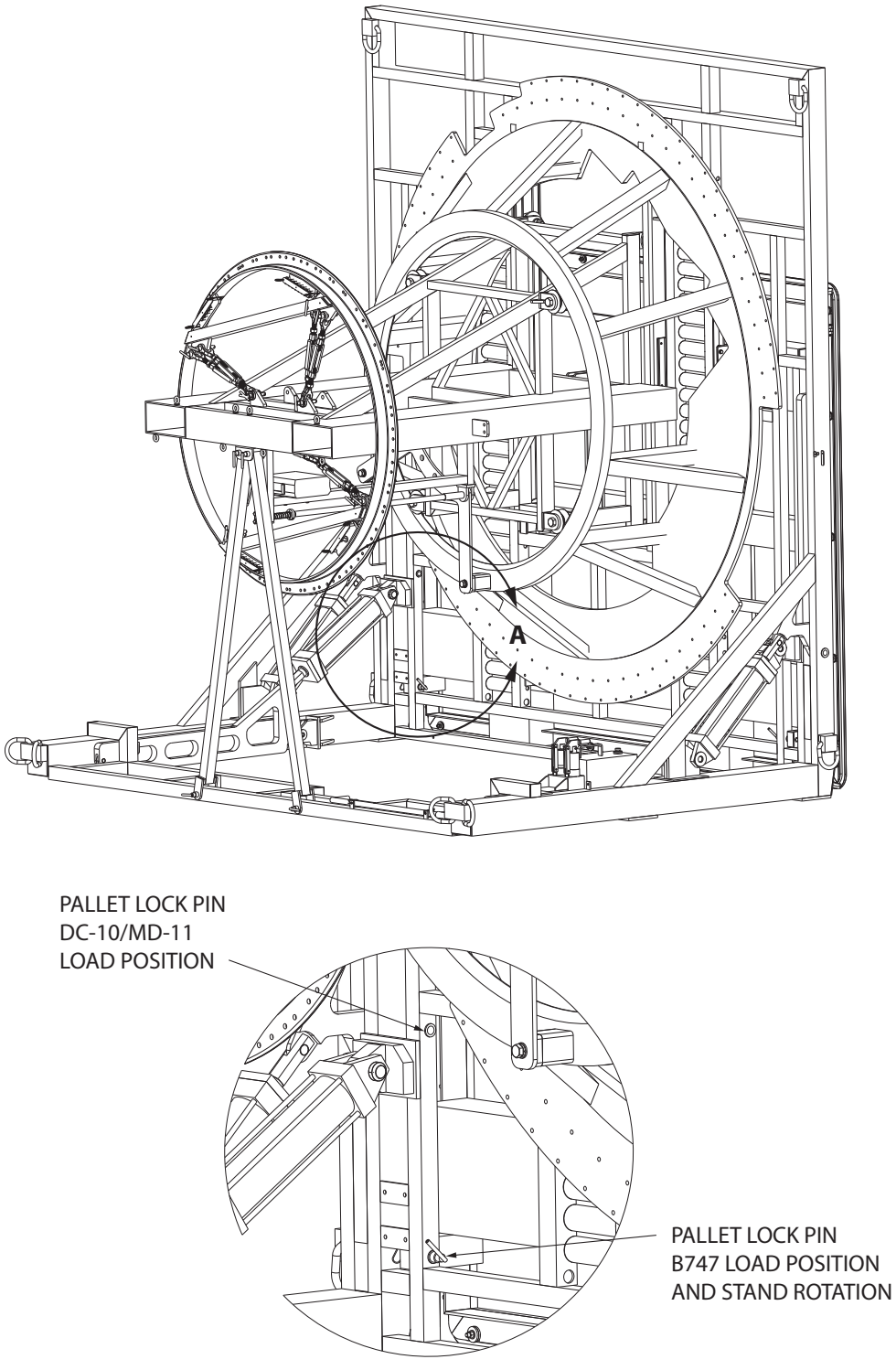

A
PALLET LOCK PIN
DC-10/MD-11
LOAD POSITION
PALLET LOCK PIN
B747 LOAD POSITION
AND STAND ROTATION
DETAIL A

Figure 5.10-2

6.0 – Safety

6.1 Stress

Design stress safety factors are compliant with applicable GE Specifications. The equipment is provided with 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 equipment.

Many safety features have been incorporated into the design 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.

CAUTION

Any deficiency revealed through inspection must be reported to supervisory personnel. A determination must be made prior to resuming operation, as to whether the deficiency constitutes a safety hazard to personnel or equipment.

It is the operator's responsibility to report any deficiencies, unusual noises, or operating conditions to supervisory personnel. It is also the responsibility of the user of this equipment to discontinue use until they are assured that the deficiency has been corrected.

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, but will also extend useful service life as well.

6.4 Risk Assessment

6.4.1 Limits of the Machinery

The 11C3004P02 (AGSE-C069-G02) Fan Stator Module Shipping Fixture is a commercial product designed specifically only to store and/or transport the GEnx-1B and -2B Fan Stator Modules. The equipment is to be used by trained mechanics free from physical impairment and who are familiar with this or similar transfer fixture. The equipment will not be used or available to the general public.

6.4.2 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 Fan Case Shipping Fixture Operation manual along with instructions. Stencils also have been put on the equipment to identify hazardous and/or potential risk areas.

The operation of the Fan Stator Module Shipping Fixture 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 within 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.

ADVANCED GROUND SYSTEMS ENGINEERING LLC

EC DECLARATION OF CONFORMITY

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

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

Machinery covered by this Declaration:

Description:	GEnx-1B Fan Module Rotation/Air Shipping Stand
Model:	AGSE-C069
Part Numbers:	AGSE-C069-G02 (11C3004-P02)

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:

- General Electric Aircraft Engines, Ground Support Equipment Statement of Work, 11C3004-P02, GEnx-1B Production Fan Module Rotation/Air Shipping Stand, dated 04/27/07 Rev “A”.
- AGSE Quality System Procedure Number QSP-006
- Aerospace Recommended Practice Standard, SAE ARP 1840, Revision B, 02/2007.

Place: Santa Fe Springs, California, USA
Date: June 26, 2019

Signed:
Stevan Case
Engineering Manager

Technical File: Jean-Marc Neveu
Techman-Head
10 Ave Loeonce Duteil
ZI du Sanital – 86100
Chatelleraut, France
+33(0)5 49 02 53 40

7.0 – Warranty

7.1 Statement of Warranty

Advanced Ground Systems Engineering LLC (AGSE) warrants to original purchasers that it's 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 manufacturers 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

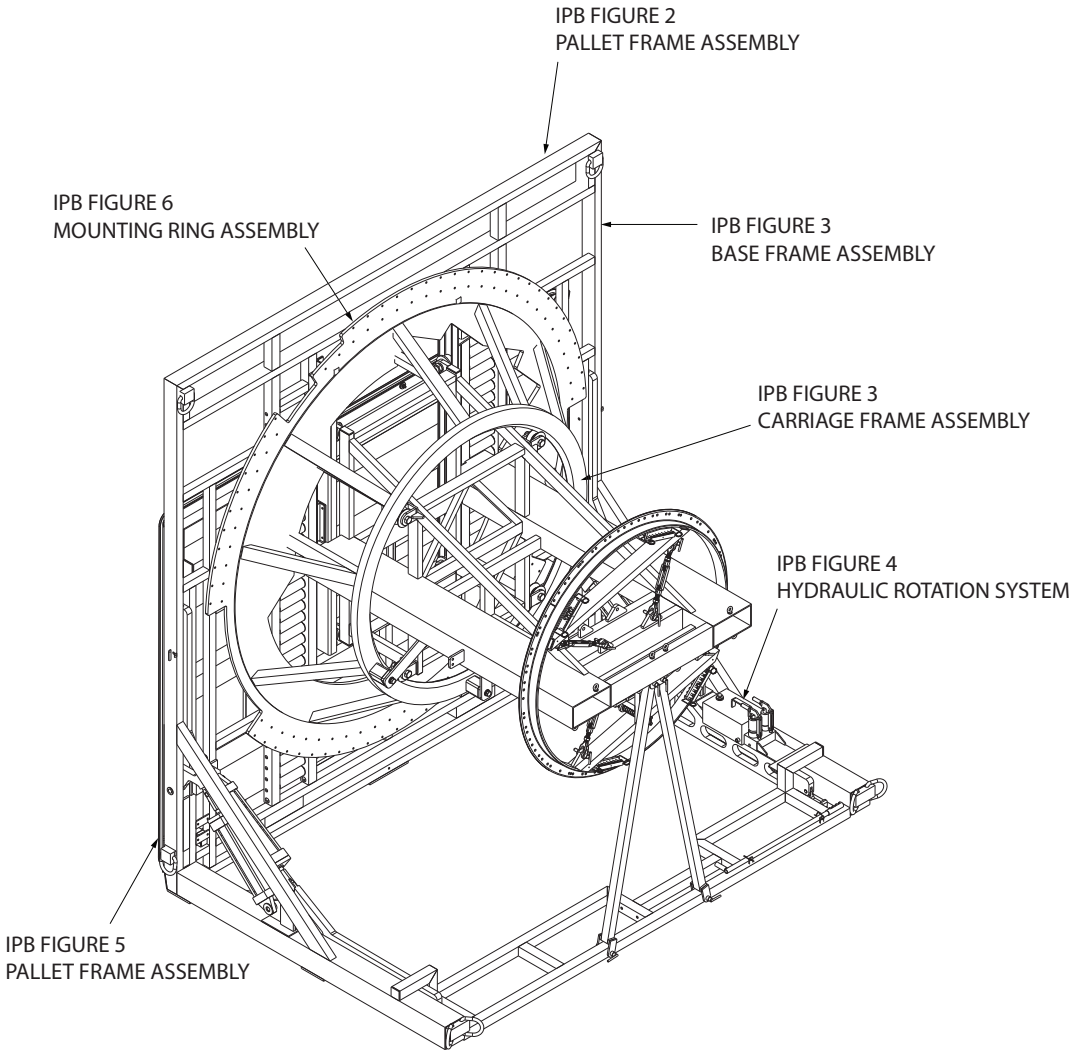
The following pages can be used in the identification of components used in the product described in this manual. Parts List are broken down by "ITEM," "PART NUMBER," "QTY," and " DESCRIPTION."

NOTICE

"ITEM" numbers are for reference to the parts list only. Do not order replacement parts by "ITEM" number. Order parts by "PART NUMBER" only.

Purchased parts will reflect a valid part number and source from which the product may be purchased. AGSE does not guarantee availability of purchased parts indefinitely.

8.2 Illustrated Parts Breakdown



IPB Figure 1 – AGSE-C069-G02
Fan Stator Module Shipping Fixture Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-C069-G02	-	Fan Stator Module Shipping Fixture Assy (Fig. 8.1-1)
1	AGSE-C06923-S01	1	Base Frame Assy (See IPB Figure 2 for Details)
2	AGSE-C06902-S01	1	Carriage Frame Assy (See IPB Figure 3 for Details)
3	AGSE-C10616-S01	1	Hydraulic Rotation System (See IPB Figure 4 for Details)
4	AGSE-C10627-S01	1	Pallet Assembly (See IPB Figure 5 for Details)
5	AGSE-C06904-S01	1	Mounting Ring Assy
6	AGSE-C06922-S01	1	OGV Support Ring Assy
7	AGSE-C10618-P01	4	Lock Pin Stow Valves
8	AGSE-C10618-P02	2	Lock Pin - Pallet
9	AGSE-C10620-P01	1	Bumper Rubber
10	AGSE-C05209-P05	1	Knuckle Pin C Cylinder
11	AGSE-C05209-P07	1	Pump Handle
12	AGSE-C05211-S01	2	Shipping Brace
13	AGSE-C06924-S01	1	Stencil Kit - AGSE-C069-G02 *(NOT SHOWN)*
14	AM-9000B	2	Safety Pin Retainer
15	AM-90750-50LNC	2	Safety Pin
16	AM-90750-62LNC	2	Safety Pin
17	CL-5-BLPL-1.25	1	Ball Lock Pin
18	1723A24	8	Tool Holder
19	90251A533	1	Set Screw Cup Point
20	Commercial	8	SBHCS - 1/4”-20 UNC x 1/2” Alloy Stl - Zinc Plt
21	Commercial	2	HSFCCS - 3/8”-16 UNC x 1-1/2” Alloy Stl - Zinc Plt

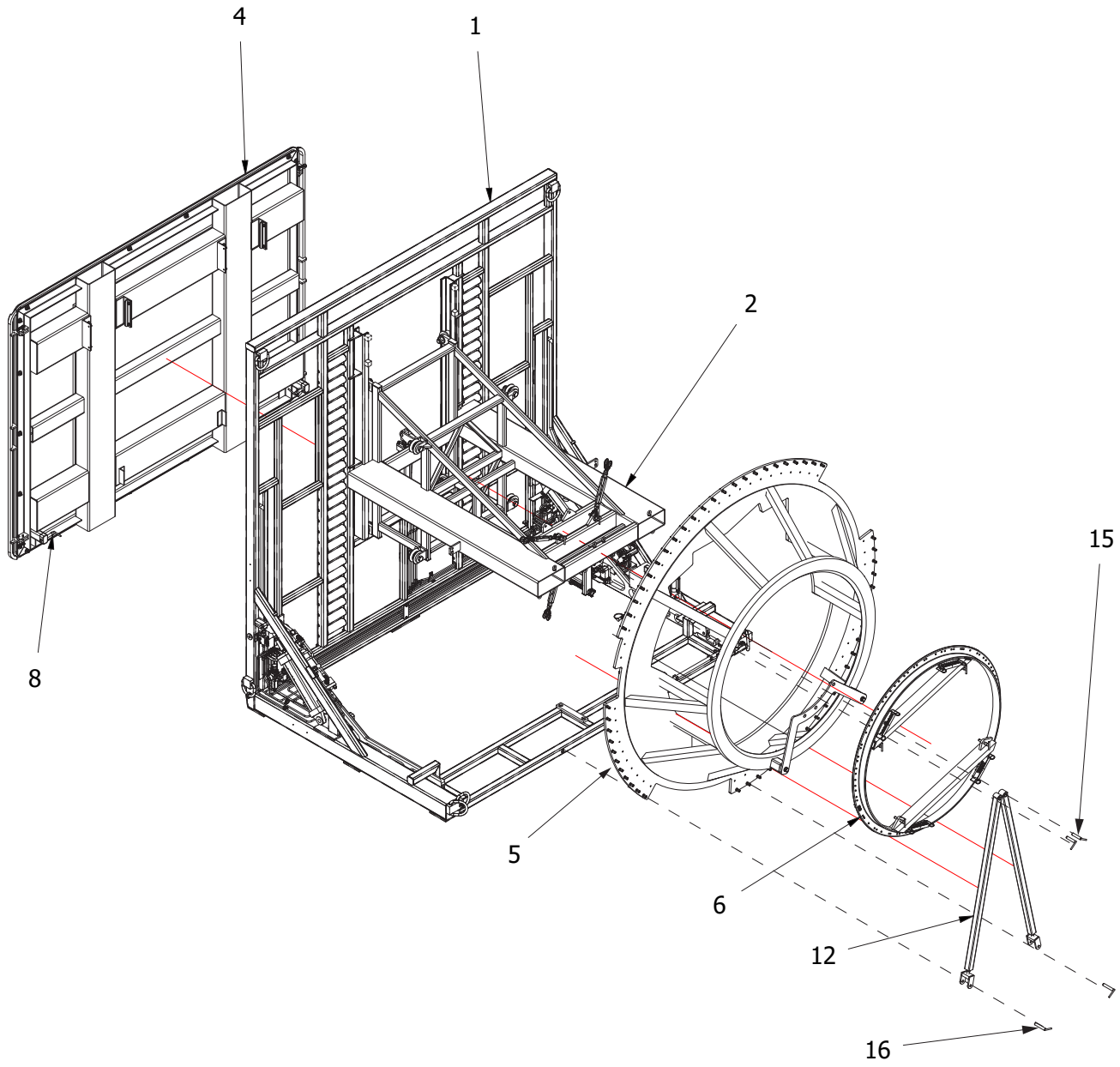
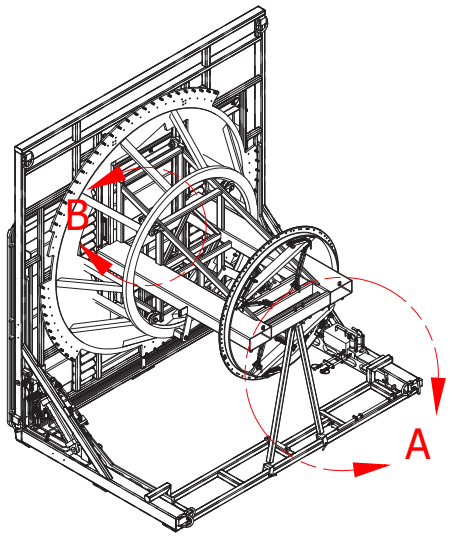
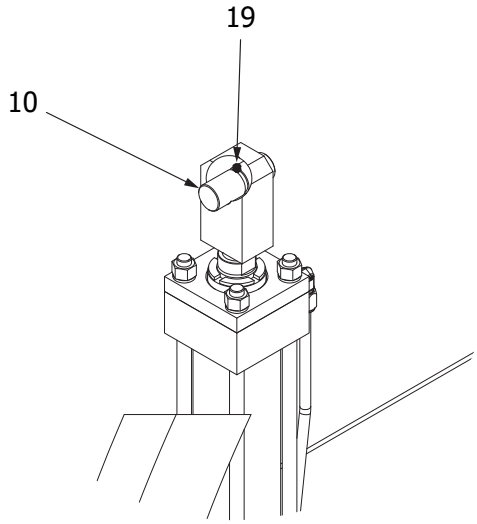
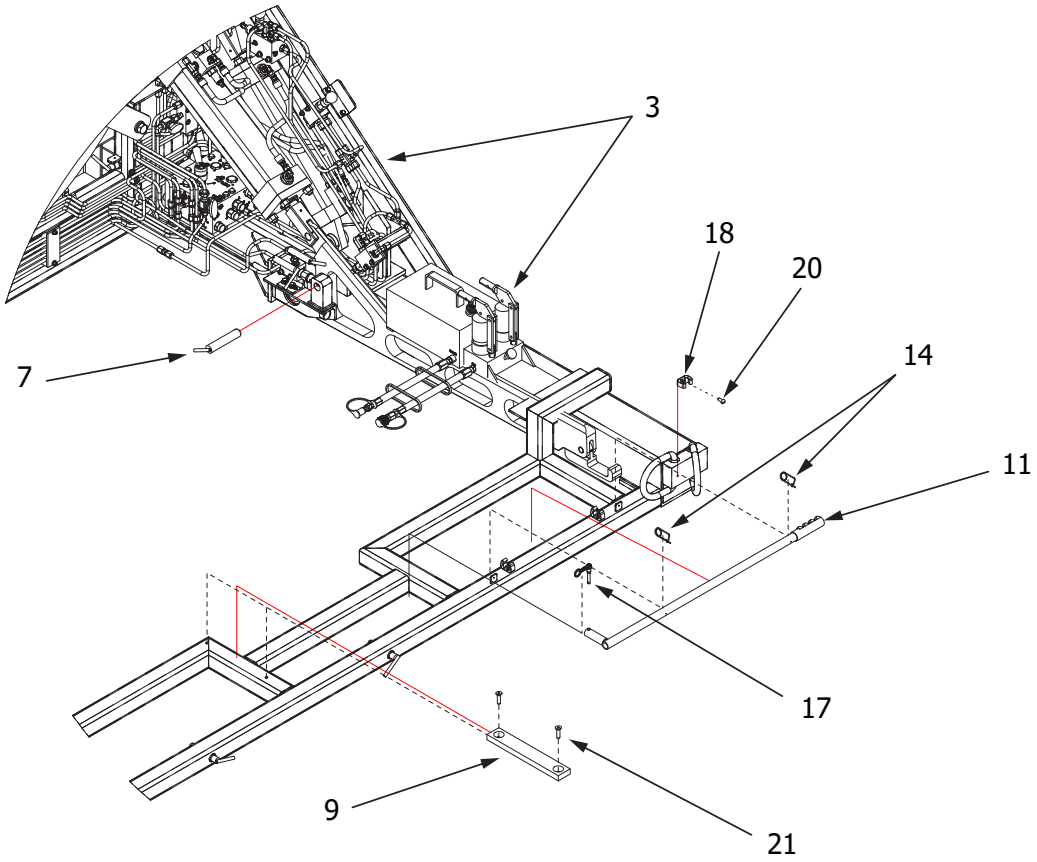


Fig. *8.1-1*





DETAIL B



DETAIL A

Fig. *8.1-2*

IPB Figure 2 – AGSE-C06923-S01
BASE FRAME ASSEMBLY FAN STATOR MODULE

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-C06923-S01	-	Fan Stator Base Frame Assy (Fig. 8.2-1)
1	AGSE-C10607-P02	1	Base Frame Weldment
2	AGSE-C10610-P01	4	Valve Mounting Bracket
3	AGSE-C10610-P02	1	Tube Mounting Bracket
4	AGSE-C10610-P03	1	Main Manifold Block MTG Bracket-2
5	AGSE-C10610-P04	1	Main Manifold Block MTG Bracket-1
6	AGSE-C10610-P05	2	Emergency Stop Bracket
7	AGSE-C05207-P03	2	Pivot Leg Guide
8	33827	52	SG09 Roller Assy
9	Commercial	5	Flat Washer - 1/4” Dia. - Stl - Zinc Plt
10	Commercial	5	Lock Washer - 1/4” Dia. - Stl - Zinc Plt
11	Commercial	4	Hex Head Cap Screw - 1/4”-20 UNC x 1/16” Gr. 5 - Zinc Plt
12	Commercial	1	Socket Head Cap Screw - 1/4”-20 UNC x 3/4” Alloy Stl - Zinc Plt
13	Commercial	5	Hex Socket FHCS - 1/4”-20 UNC x 1” Alloy Stl - Zinc Plt
14	Commercial	16	Flat Washer - 3/8” Dia. - Stl - Zinc Plt
15	Commercial	16	Lock Washer - 3/8” Dia. - Stl - Zinc Plt
16	Commercial	16	Hex Head Cap Screw - 3/8”-16 UNC x 7/8” Gr. 5 - Zinc Plt

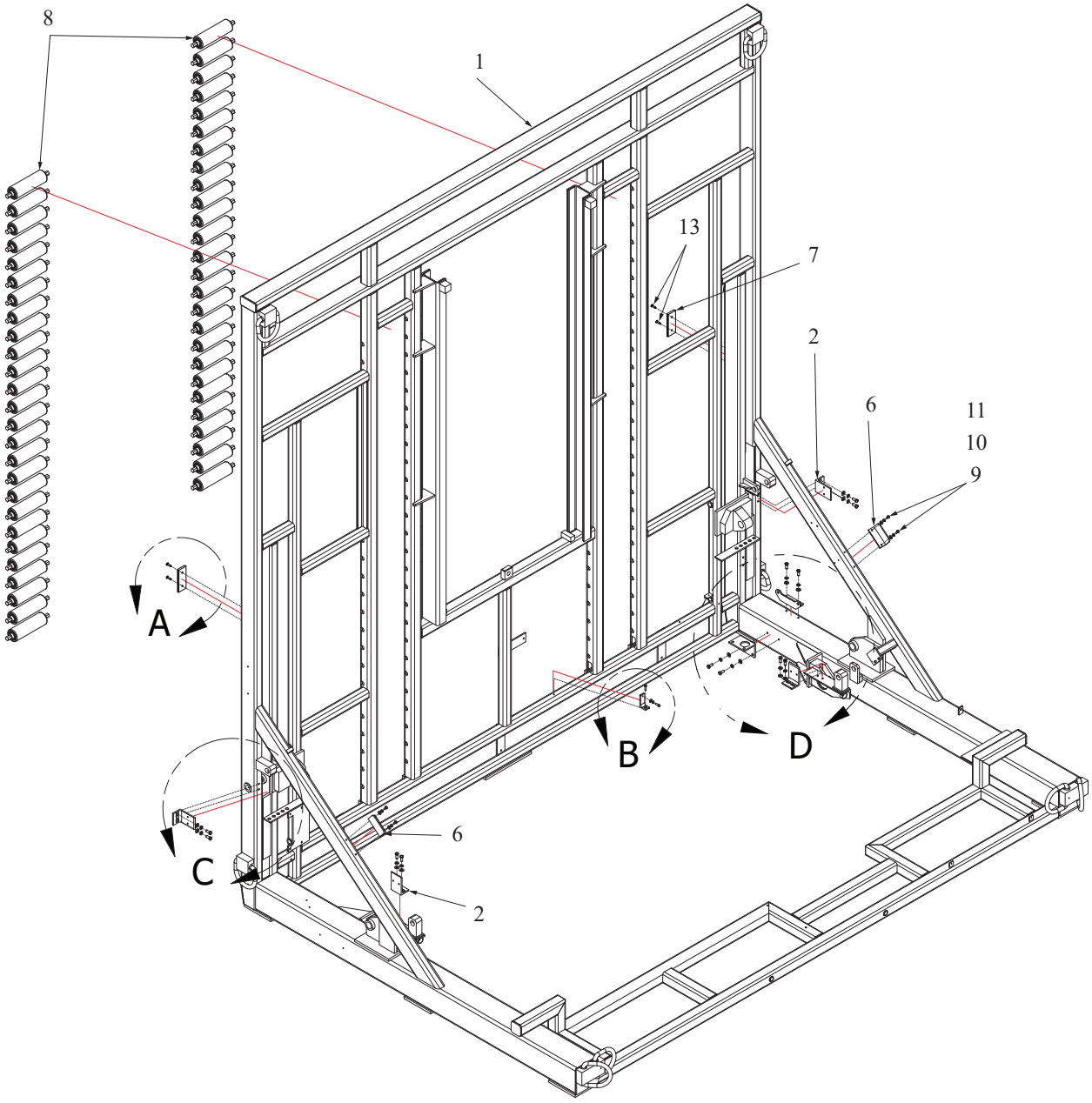
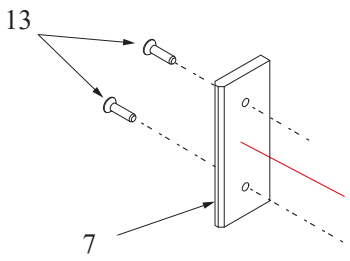
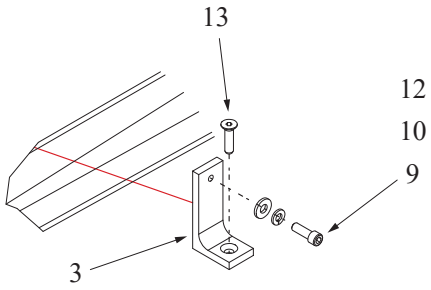


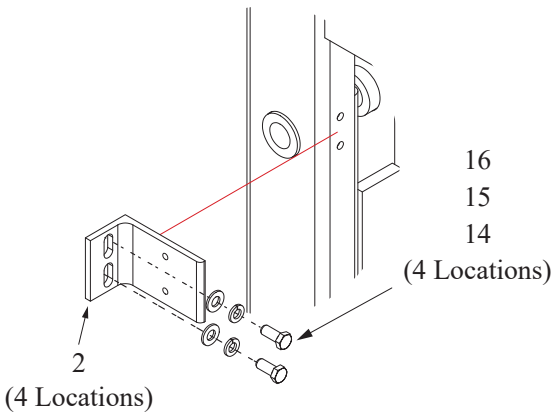
Fig. *8.2-1 Base Frame Assembly*



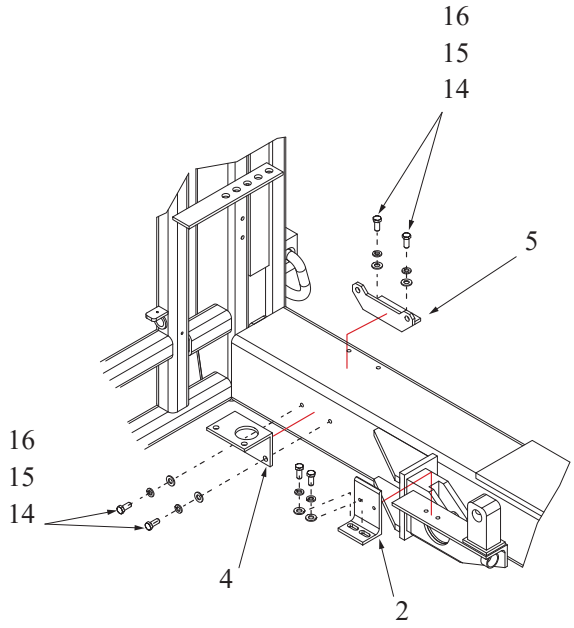
DETAIL A



DETAIL B



DETAIL C



DETAIL D

Fig. *8.2-2 Base Frame Assembly*

IPB Figure 3 – AGSE-C06902-S01
Carriage Frame Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-C06902-S01	-	Carriage Frame Assy (Fig. 8.3-1)
1	AGSE-C10611-P02	1	Carriage Frame Weldment
2	AGSE-C05205-P03	1	Hand Knob
3	AGSE-C05205-P04	4	Bolt Modified
4	AGSE-C06913-P01	1	Rotation Lock Pin
5	AM-90625-40T	8	Safety Pin
6	VLRY-4.5	4	V'Grove Roller
7	FLR3.5	4	Flanged Roller
8	CSSC100	1	Threaded Type Clamping Collar
9	BMB 107-4	1	Container
10	S-3256	2	Compression Spring
11	3001T62	2	9" Turnbuckle
12	3001T61	2	6" Turnbuckle
13	1075614	4	Lock Nut - Left Handed - 3/4"-10 UNC
14	1075231	4	Lock Nut - Right Handed - 3/4"-10 UNC
15	Commercial	2	Hex Head Cap Screw - 1/4"-20 UNC x 2" Gr. 5 - Zinc Plt
16	Commercial	2	Hex Nut - 1/4"-20 UNC - Gr. 5 - Zinc Plt
17	Commercial	4	Flat Washer - 1/4" Dia. - Stl - Zinc Plt
18	Commercial	2	Lock Washer - 1/4" Dia. - Stl - Zinc Plt
19	Commercial	1	Hex Head Cap Screw - 5/8"-11 UNC x 2-3/4" Gr. 5 - Zinc Plt
20	Commercial	1	Hex Nut - 5/8"-11 UNC - Gr. 5 - Zinc Plt
21	Commercial	1	Flat Washer - 5/8" Dia. - Stl - Zinc Plt
22	Commercial	4	Lock Nut - 1"-8 Metal Type - Gr. 5 - Zinc Plt
23	Commercial	12	Flat Washer - 1" Dia. - Stl - Zinc Plt
24	Commercial	4	Lock Nut - 1-1/4"-12 Metal Type Gr. 5 - Zinc Plt
25	Commercial	4	Flat Washer - 1-1/4" Dia. - Stl - Zinc Plt
26	Commercial	1	1/4" x 1-1/4" - Slotted Spring Pin

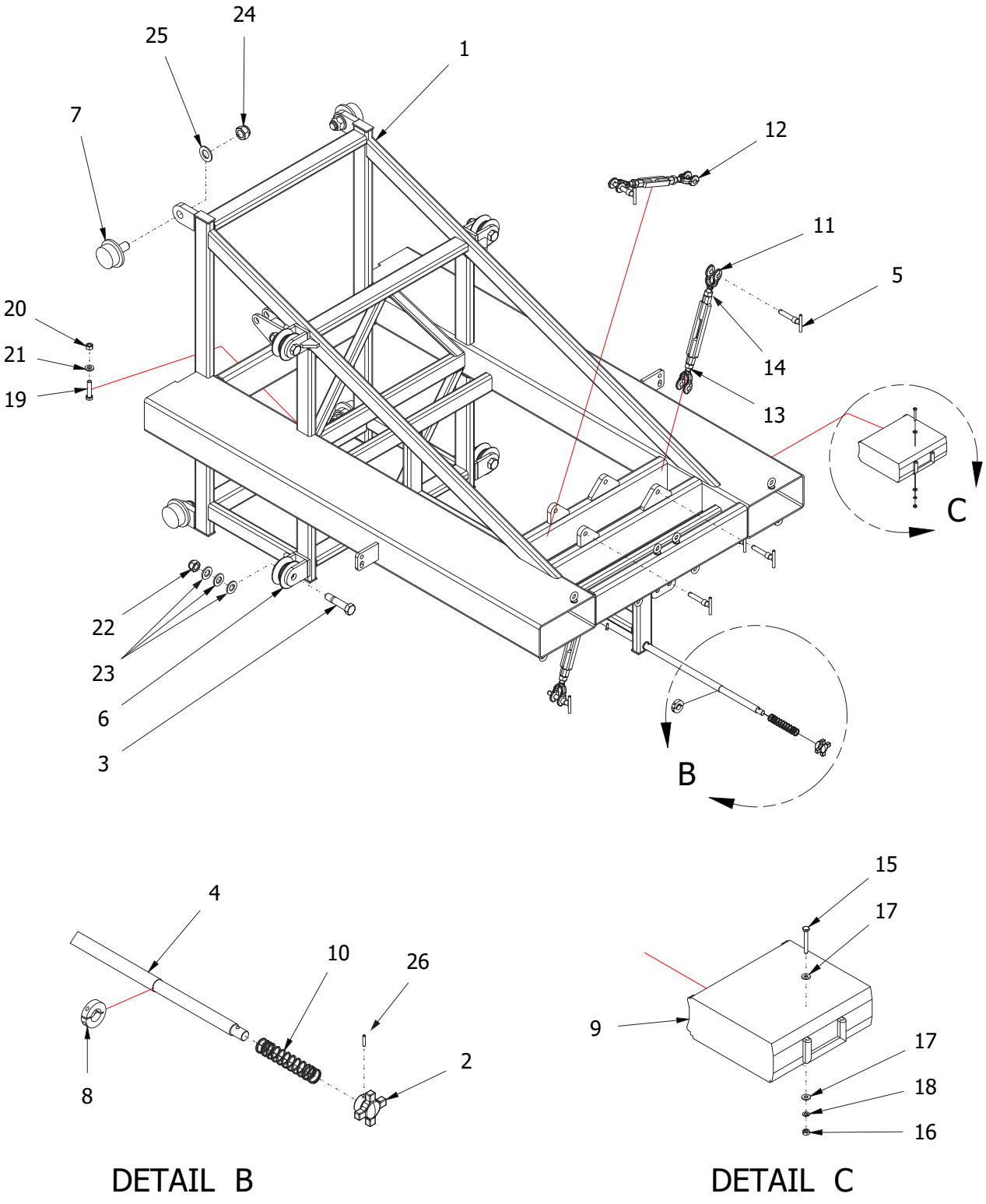


Fig. 8.3-1 Carriage Frame Assembly

IPB Figure 4 – AGSE-C10616-S01
Hydraulic Rotation System

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-C10616-S01	-	Hydraulic Rotation System (Fig. 8.4-1 to 8.4-5)
1	AGSE-C10613-S01	1	Master Control Manifold W/ Fittings
2	AGSE-C10613-S02	1	A Leg Retract Valve Assy W/ Fitting
3	AGSE-C10613-S03	4	Stow Lock Valve Assy W/ Fitting
4	AGSE-C10613-S04	2	Emergency Stop Valve Assy W/ Fitting
5	AGSE-C10613-S07	1	B Leg Retract Valve Assy W/ Fitting
6	AGSE-C10613-S08	1	C Interlock Valve W/ Fitting
7	AGSE-C10614-S01	1	Air Manifold Assy
8	AGSE-C10614-S02	1	Reservoir Assy
9	AGSE-C10614-S03	1	Pneumatic Pump Assy W/ Flow Control Valve
10	AGSE-C10614-S04	1	Manual Hydraulic Pump Assy W/ Hoses
11	AGSE-C10615-S01	2	A Cylinder Assy
12	AGSE-C10615-S02	2	B Cylinder Assy
13	AGSE-C10615-S03	1	C Cylinder Assy
	ITEM 14 - 65 Tubing and Hoses Omitted - Available Upon Request		
66	7115G6Y	1	Ball Valve
67	AGSE-C10622-P01	3	Type 1 Tube Clamping Block
68	AGSE-C10622-P02	5	Type 2 Tube Clamping Block
69	AGSE-C10622-P03	4	Cap Tube Clamping Block
70	AGSE-C05208-P01	4	Pivot Leg
71	AGSE-C05208-P02	4	Pivot Foot
72	AGSE-C05208-P03	3	Cylinder Clevis
73	AGSE-C05208-P06	1	Cylinder Clevis W/ Cam Activation
74	AGSE-C05209-P02	4	Pivot Foot Clevis Pin, ‘A’ & ‘B’ Leg
75	AGSE-C05209-P03	4	Clevis Pin, ‘A’ & ‘B’ Cyl to Leg

IPB Figure 4 – AGSE-C10616-S01
Hydraulic Rotation System (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
76	AGSE-C05209-P04	2	Pivot Pin, ‘A’ Leg
77	AGSE-C05209-P06	2	Pivot Pin, ‘B’ Leg
78	AGSE-C05209-P09	1	Clevis Pin ‘C’ Cyl
79	AGSE-C05209-P10	4	‘A’ & ‘B’ Cyl Clevis Pin
80	3225T270	3	Cushion Clamp
81	6438K25	1	Thrd’d Lock Collar - 3/4”-10 UNC
82	6438K29	4	Thrd’d Lock Collar - 1”-8 UNC
83	6438K34	4	Thrd’d Lock Collar - 1-1/4”-12 UNF
84	92373A189	8	Slotted Spring Pin - 1/8 DIA x 1-3/4” - Lg
85	90251A533	4	Set Screw, Cup Point
86	90669A535	8	Set Screw, Brass Tip
87	Commercial	3	Socket Head Cap Screw - 1/4”-20 UNC x 5/8” Stl - Zinc Plt
88	Commercial	4	Socket Head Cap Screw - 1/4”-20 UNC x 2” Stl - Zinc Plt
89	Commercial	2	Hex Head Cap Screw - 1/4”-20 UNC x 2-1/4” Gr. 5 - Zinc Plt
90	Commercial	8	Socket Head Cap Screw - 1/4”-20 UNC x 2-3/4” Stl - Zinc Plt
92	Commercial	27	Flat Washer - 1/4” - Stl - Zinc Plt
93	Commercial	19	Lock Washer - 1/4” - Stl - Zinc Plt
94	Commercial	2	Hex Nut - 1/4”-20 UNC - Gr. 5 - Zinc Plt
95	Commercial	8	Jam Nut - 1/4”-20 UNC - Gr. 5 - Zinc Plt
96	Commercial	2	Socket Head Cap Screw - 5/16”-18 UNC x 1-3/4” Stl - Zinc Plt
97	Commercial	12	Flat Washer - 5/16” - Stl - Zinc Plt
98	Commercial	12	Lock Washer - 5/16” - Stl - Zinc Plt

IPB Figure 4 – AGSE-C10616-S01
Hydraulic Rotation System (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
99	Commercial	4	Hex Head Cap Screw - 3/8"-16 UNC x 5/8" Gr. 5 - Zinc Plt
100	Commercial	3	Hex Soc. FHCS - 3/8"-16 UNC x 1" Stl - Zinc Plt
101	Commercial	1	Hex Head Cap Screw - 3/8"-16 UNC x 1-1/4" Gr. 5 - Zinc Plt
102	Commercial	6	Flat Washer - 3/8" - Stl - Zinc Plt
103	Commercial	5	Lock Washer - 3/8" - Stl - Zinc Plt
104	Commercial	1	Hex Nut - 3/8"-16 UNC - Gr. 8 - Zinc Plt
105	AGSE-S00118-05C032A07	8	Socket Head Cap Screw - 5/16"-18 UNC x 2" - Lg Stl - Zinc Plt
106	AGSE-S00118-05C048A07	2	Socket Head Cap Screw - 5/16"-18 UNC x 3" - Lg Stl - Zinc Plt

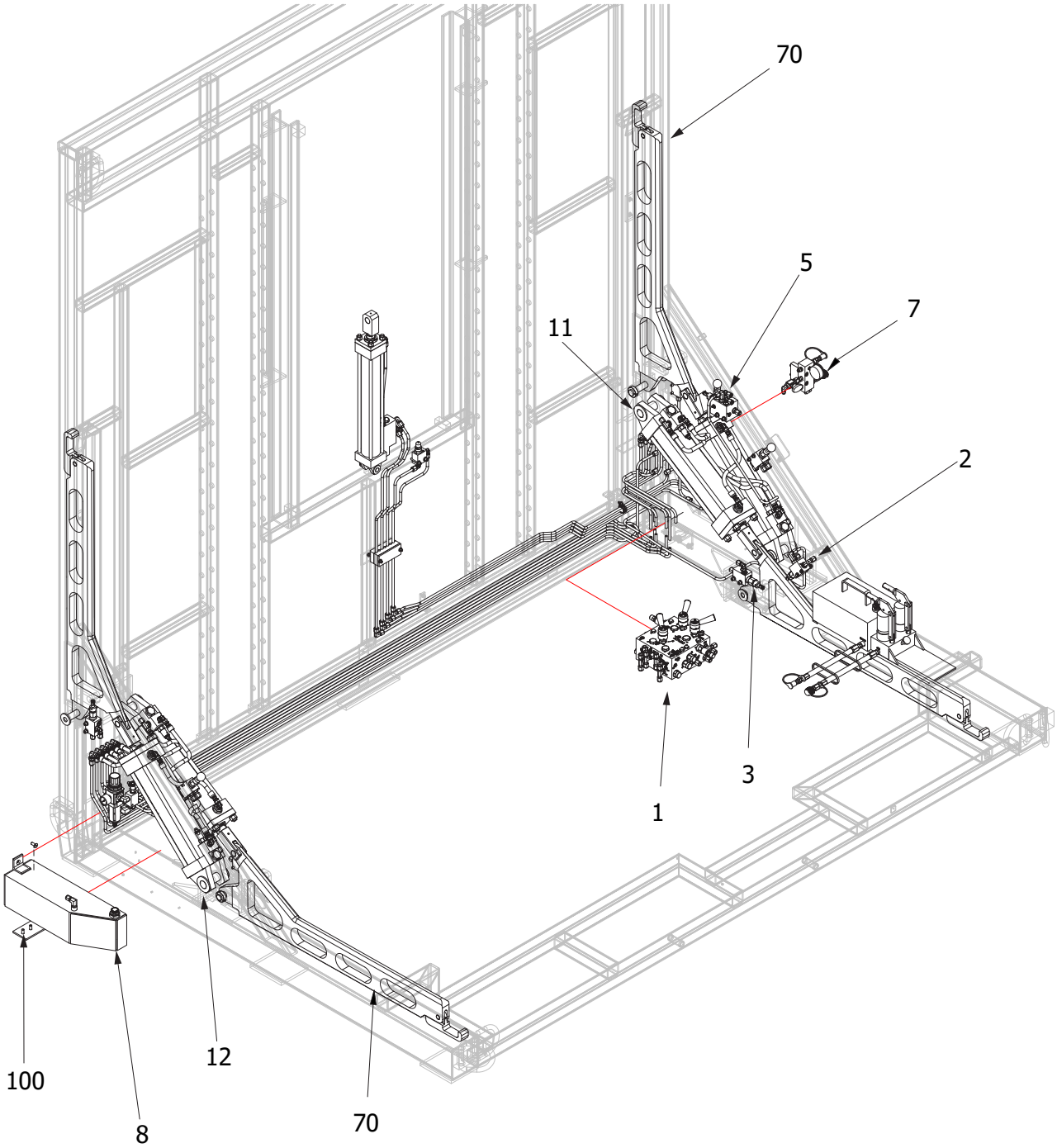


Fig. 8.4-1 Hydraulic Rotation System
(Tube Routing are for Illustration Purposes only)

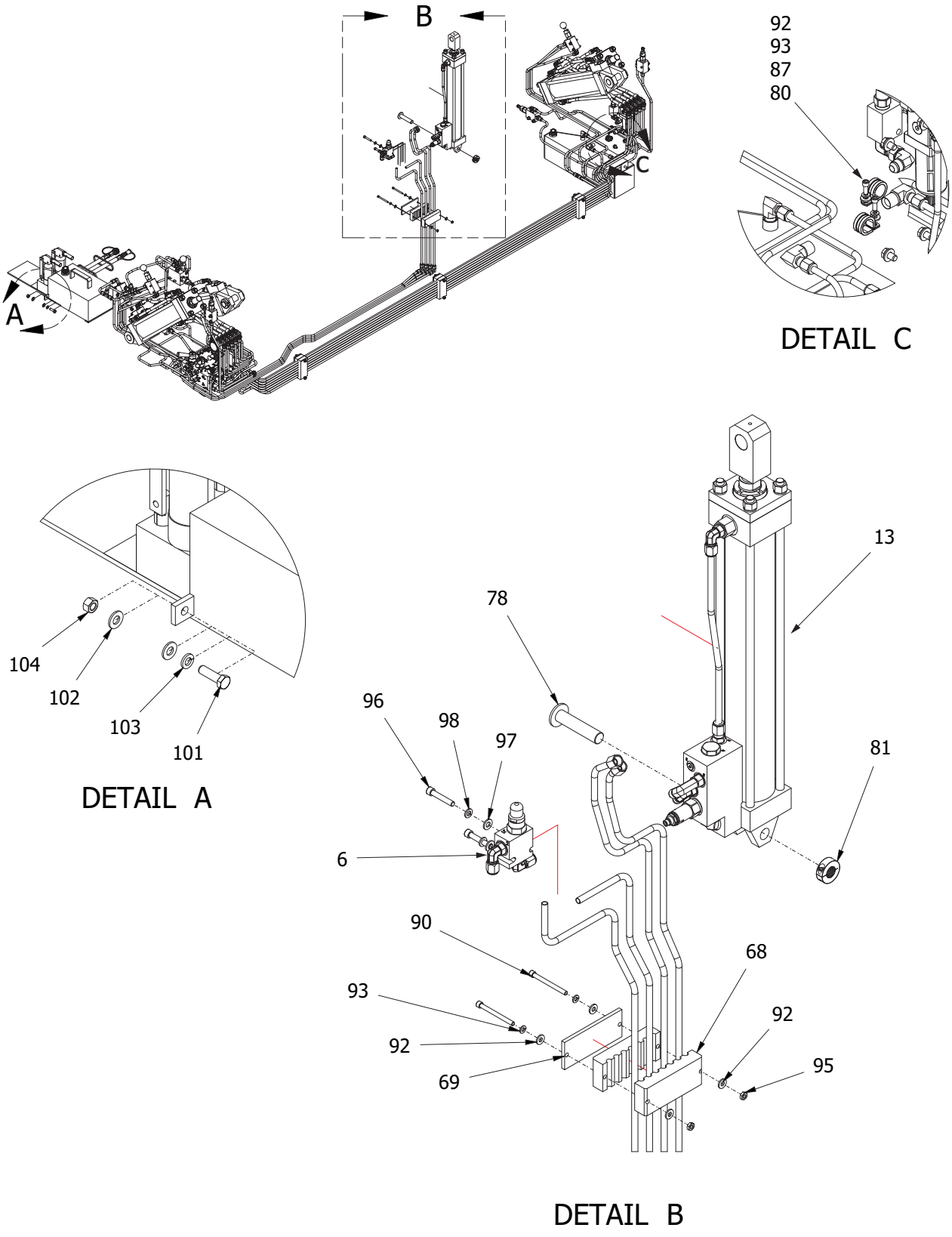


Fig. 8.4-2 Hydraulic Rotation System
(Tube Routing are for Illustration Purposes only)

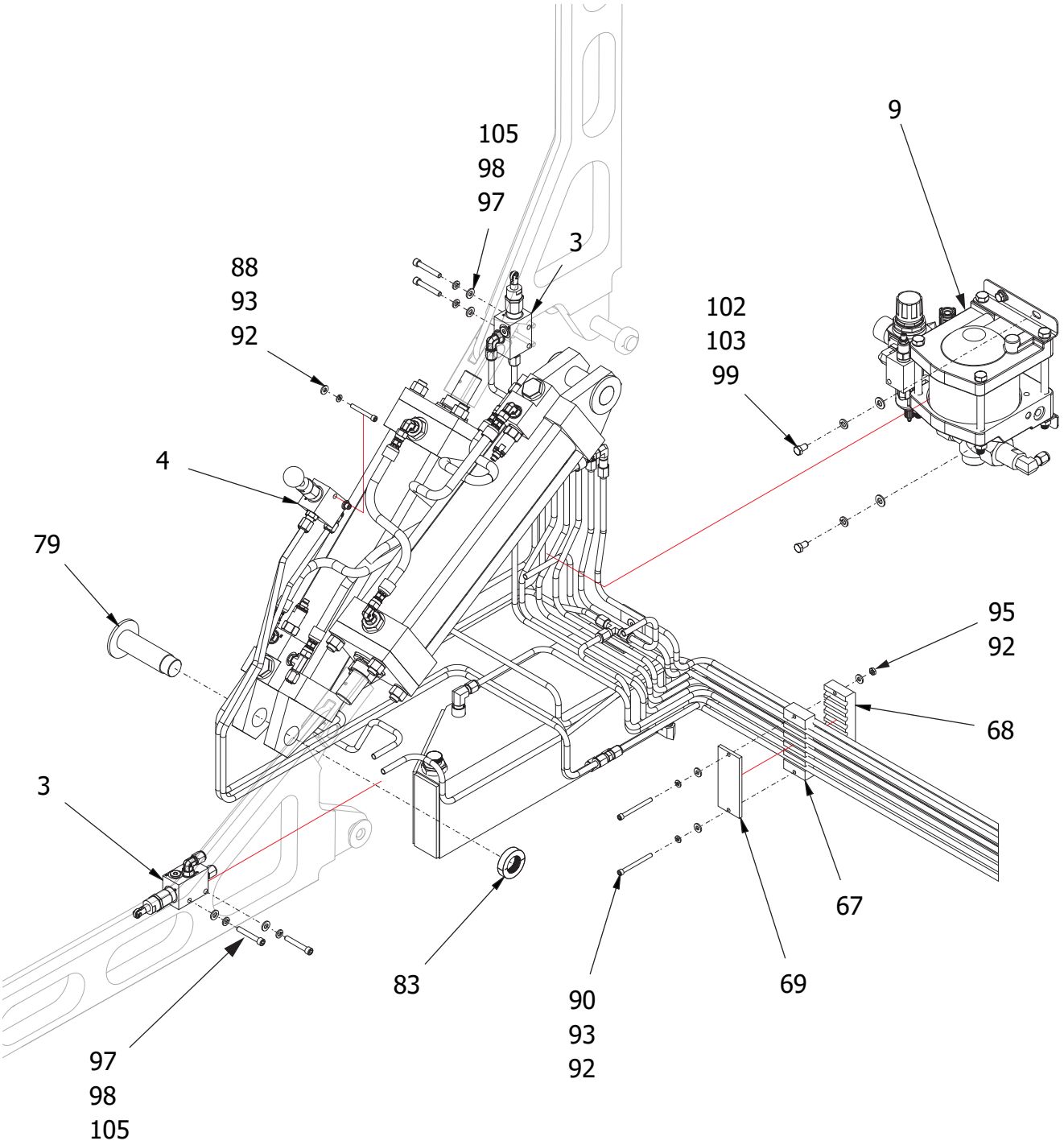


Fig. 8.4-3 Hydraulic Rotation System
(Tube Routing are for Illustration Purposes only)

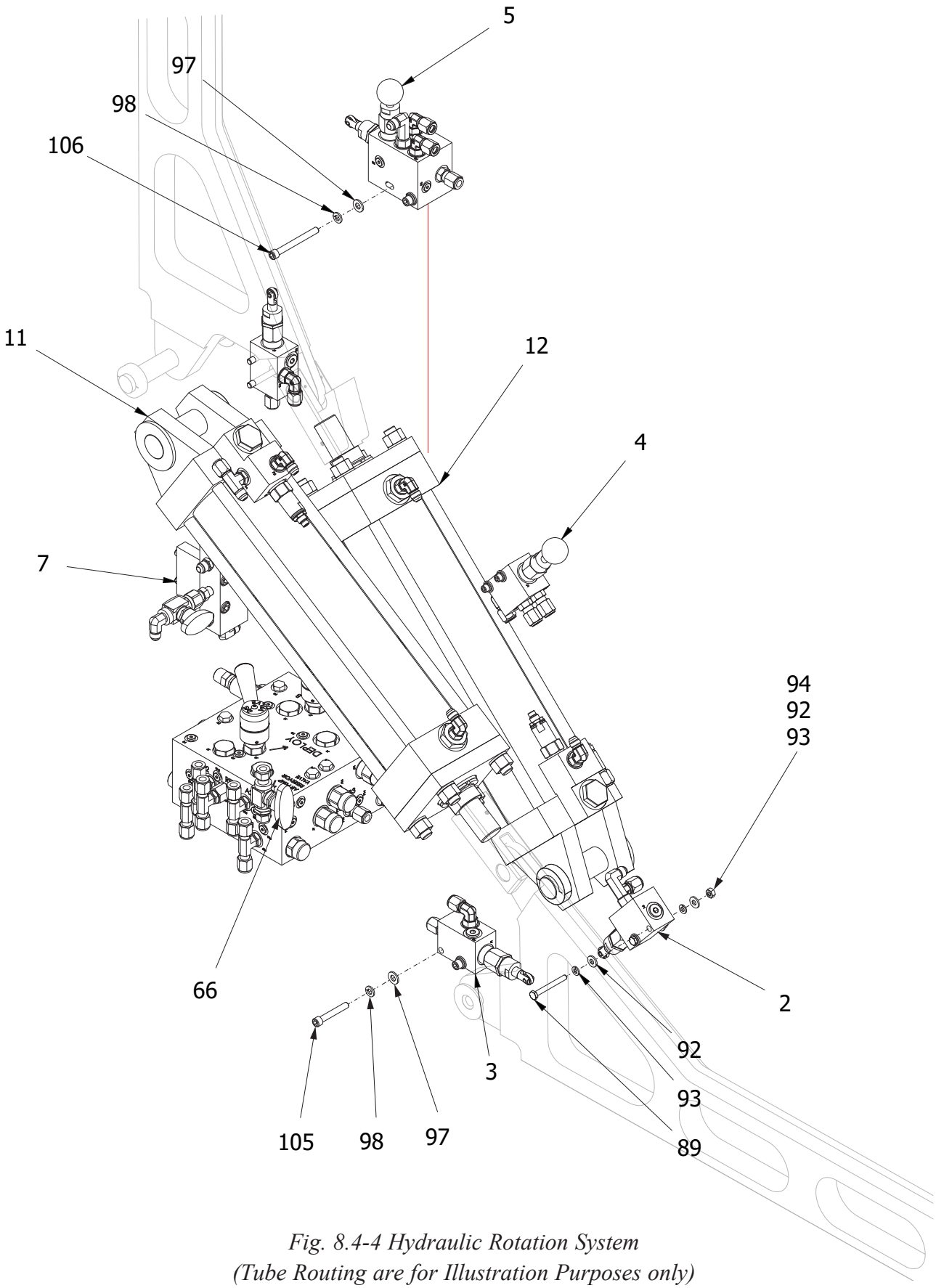


Fig. 8.4-4 Hydraulic Rotation System
(Tube Routing are for Illustration Purposes only)

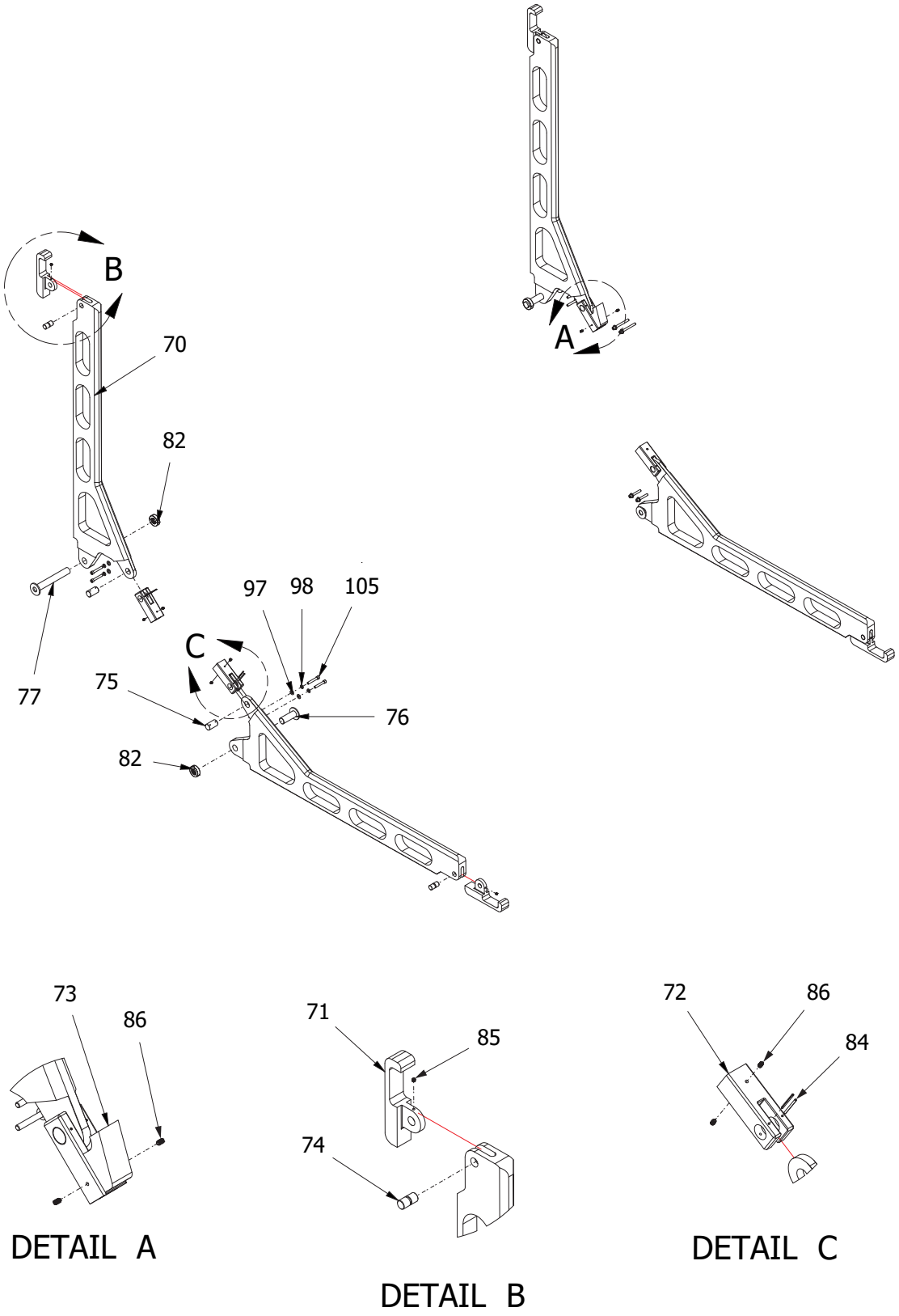


Figure 8.4-5 Hydraulic Rotation System

IPB Figure 5 – AGSE-C10627-S01
Pallet Frame Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-C10627-S01	-	Pallet Frame Assy (Fig. 8.5-1)
1	AGSE-C10623-P01	1	Base Weldment
2	AGSE-C10624-P01	2	Side Guide
3	AGSE-C10625-P01	4	Keeper
4	AGSE-C10626-P01	36	Washer
5	31086-595	1	Pallet
6	40191-12	18	Pallet Fitting Assy
7	CL-6-BLPL-2_00-S	4	Ball Lock Pin
8	92735A515	4	Clevis Pin
9	Commercial	8	Hex Head Cap Screw - 3/8”-16 UNC x 3/4” Gr. 8 - Zinc Plt
10	Commercial	8	Lock Washer - 3/8” - Stl - Zinc Plt
11	Commercial	34	Flat Washer - 3/8” - Stl - Zinc Plt
12	Commercial	18	Lock Nut - 3/8” - 24 Metal Type - Zinc Plt

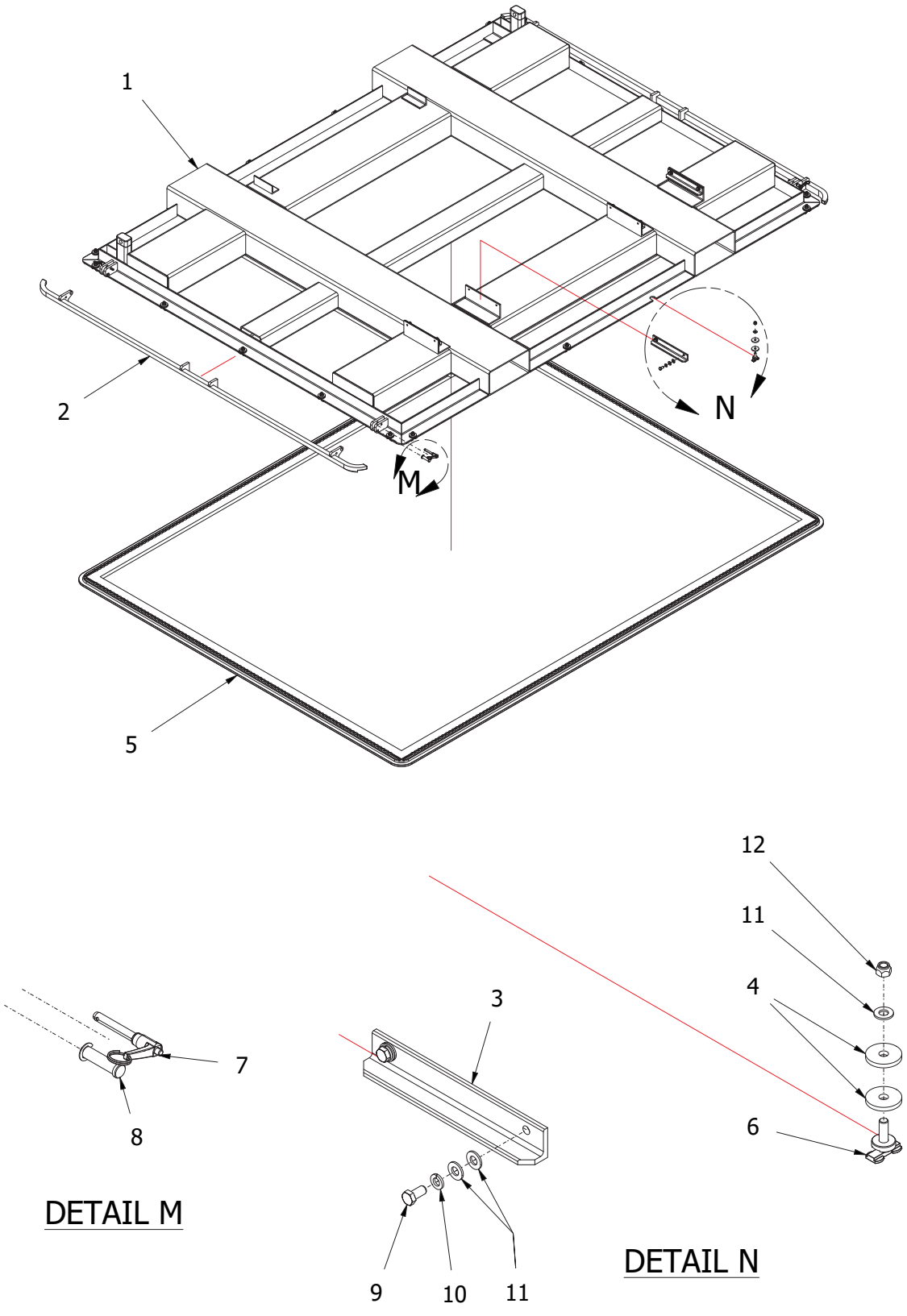


Fig. 8.5-1 Pallet Frame Assembly

IPB Figure 6 – AGSE-C06904-S01 Mounting Ring Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-C06904-S01	-	Mounting Ring Assy (Fig. 8.6-1)
1	AGSE-C06904-P01	1	Mounting Ring Weldment
2	AGSE-C06904-P02	1	Rotation Lock Plate
3	AGSE-C06920-P01	57	Standoff Nut - 3/8”-16 UNC - Zinc Plt
4	AGSE-C06920-P02	57	12-Point Bolt - 3/8”-16 UNC x 2-3/16” - S.S.
5	Commercial	114	Flat Washer - 3/8” Nom ID - Zinc Plt
6	Commercial	57	Lock Washer - 3/8” Nom ID - Zinc Plt
7	Commercial	2	Hex Head Cap Screw - 3/4”-10 UNC x 1-3/4” Gr. 5 - Zinc Plated
8	Commercial	2	Flat Washer - 3/4” Nom ID - Stl - Zinc Plt
9	Commercial	2	Lock Washer - 3/4” Nom ID - Stl - Zinc Plt

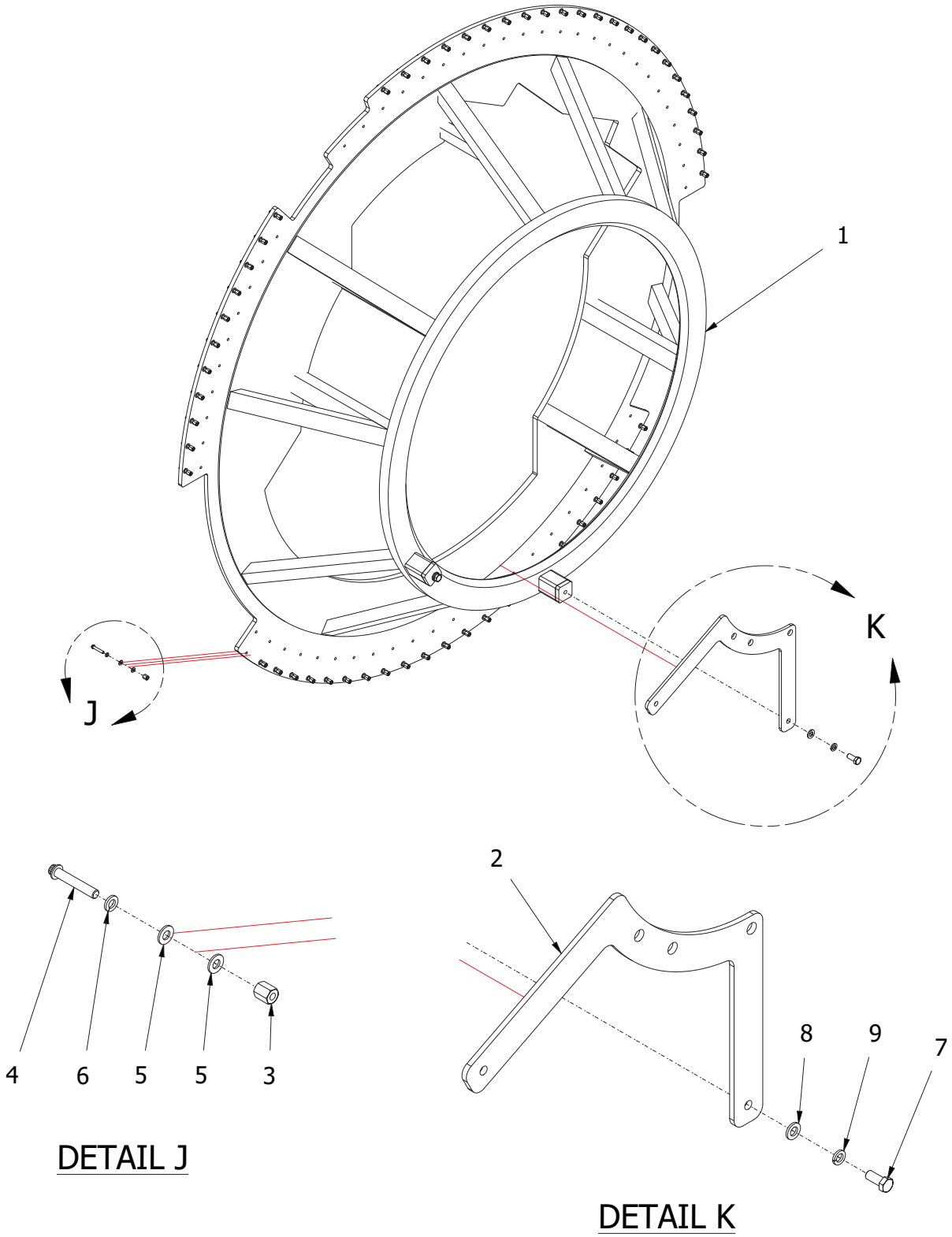


Fig. 8.6-1 Mounting ring assembly

IPB Figure 7 – AGSE-C06922-S01
OGV Support Ring Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-C06922-S01	-	OGV Support Ring Assy (Fig. 8.7-1)
1	AGSE-C06908-P01	1	OGV Support Ring
2	AGSE-C06921-P01	4	Bolt Keeper
3	AM-900A	8	Retainer Pin
4	Commercial	44	Hex Head Cap Screw 3/8”-24 UNF x 1-3/4” - SST 18-8
5	Commercial	44	Flat Washer - 3/8” Nom ID - SST
6	Commercial	4	Hex Head Cap Screw 3/8”-24 UNF x 1-3/4” - SST 18-8
7	Commercial	4	Flat Washer - 7/16” - SST

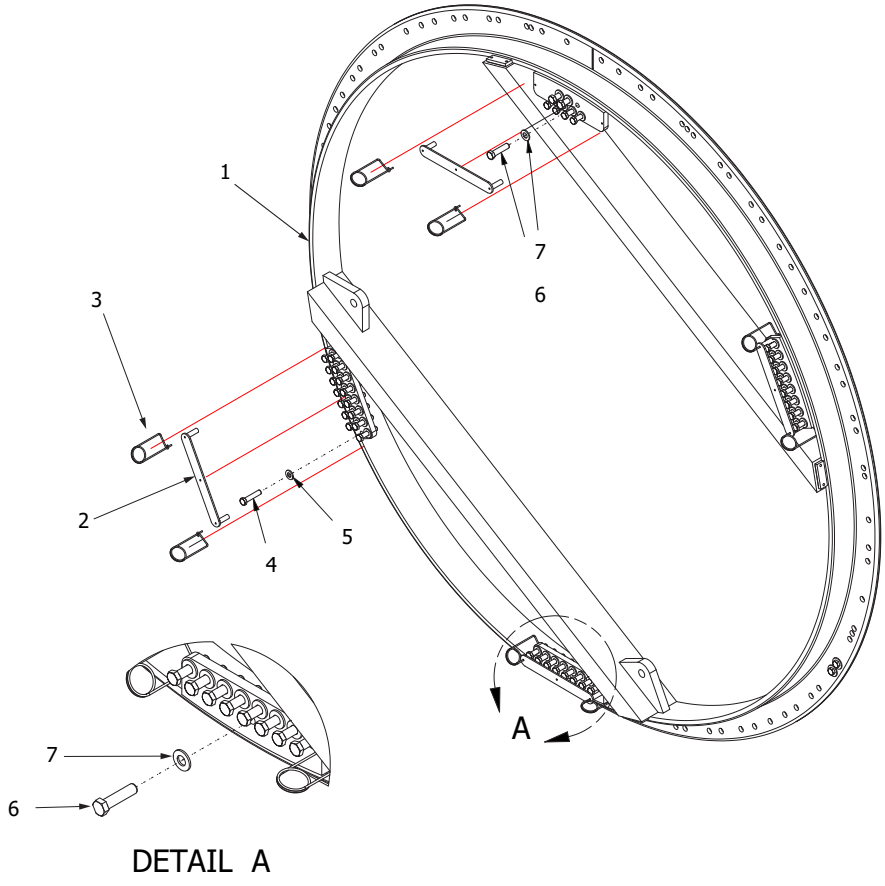


Fig. 8.7-1 OGV Support ring assembly

IPB Figure 8 - AGSE-C05211-S01
Shipping Brace

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-C05211-S01	-	Shipping Brace (Fig. 8.8-1)
1	AGSE-C05211-P05	1	Brace Weldment
2	AGSE-C05211-P06	1	Brace Weldment
4	Commercial	1	Hex Nut - 3/4”-10 UNC Gr. 5 - Zinc Plt

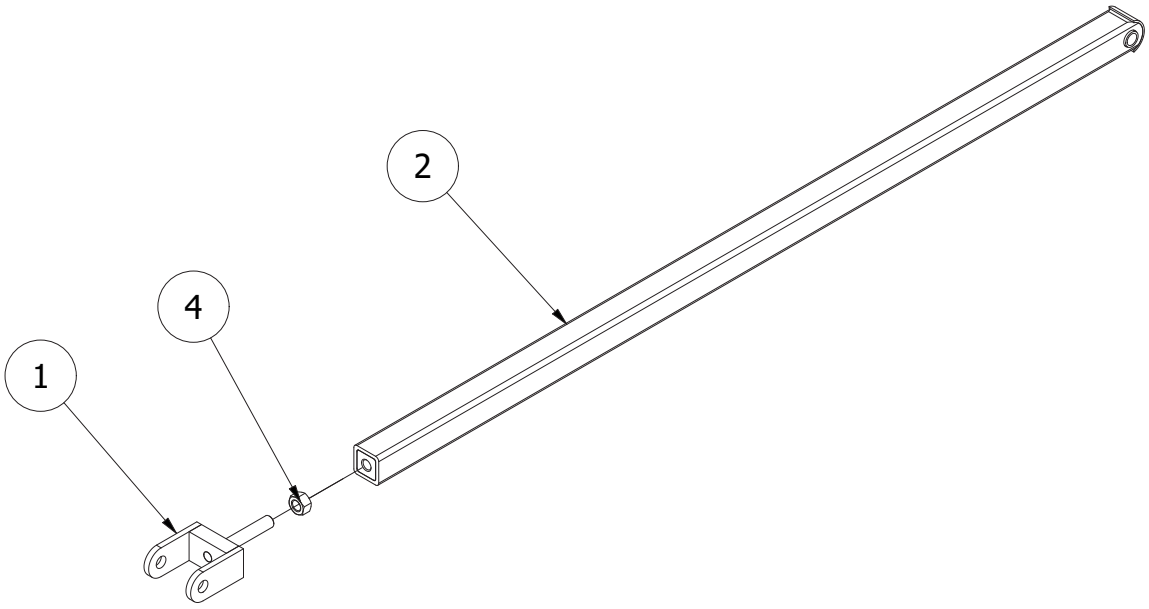


Fig. 8.8-1 AGSE-C05211-S01 Brace assembly

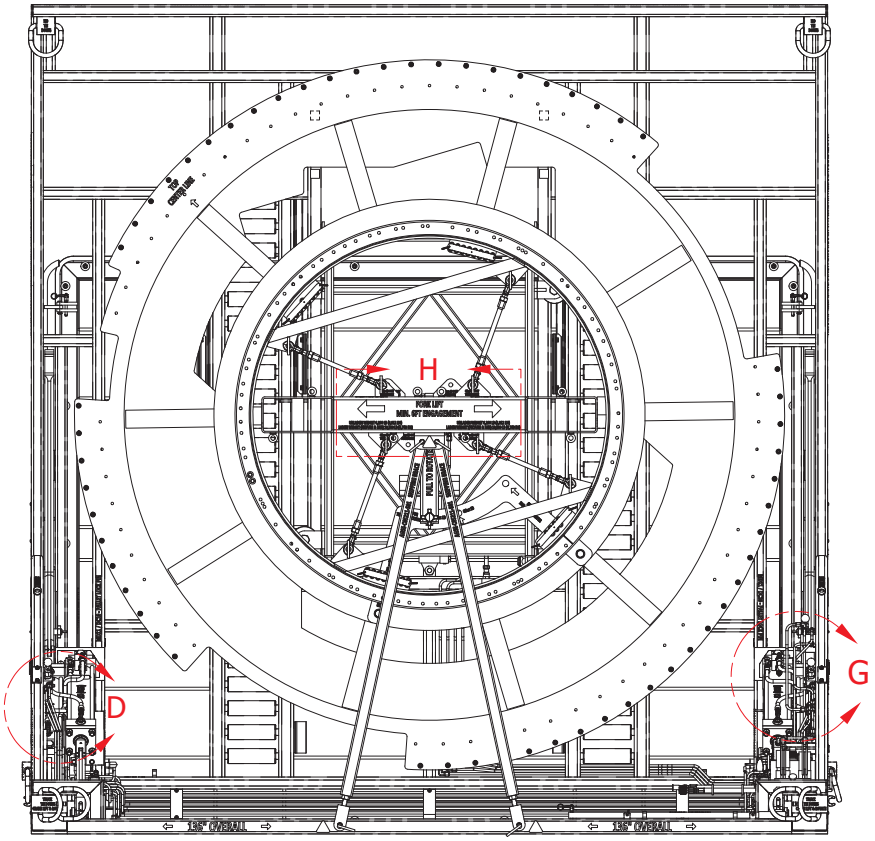
9.0 – Stencils, Decals, and Placards

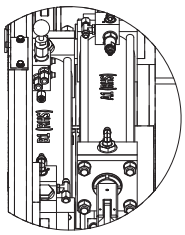
9.1 General

Various stencils, decals, and placards are added to the equipment to provide warnings, cautions, and general information. These items should be reviewed and understood by maintenance and user personnel.

9.2 Stencils and Placards

AGSE-C06924-S01 Stencil Kit (Supplied as a complete kit)





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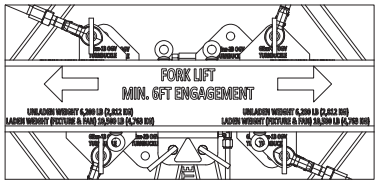

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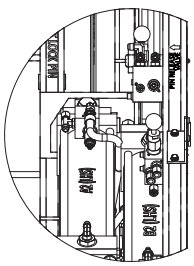
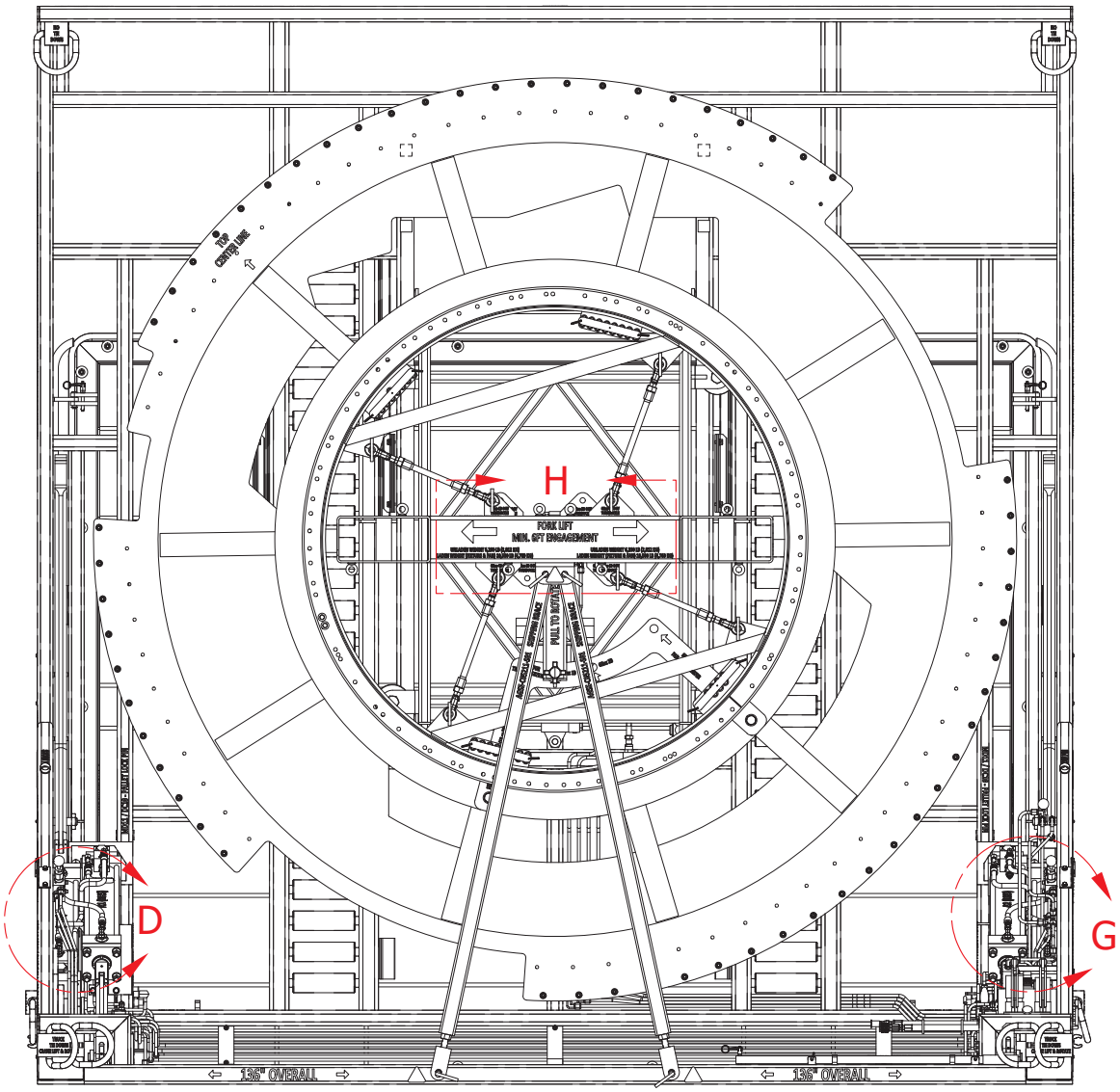
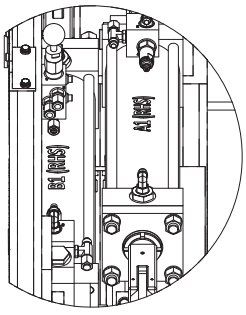


DETAIL G

Fig. 9.2-1





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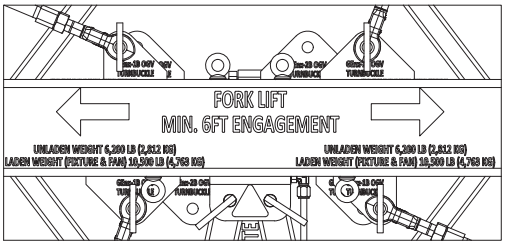

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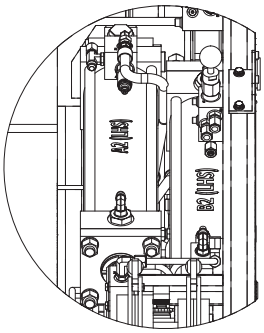

DETAIL G

Fig. 9.2-2

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
No Recommended Spare Parts at this time		