

This document contains information proprietary to ADVANCED GROUND SYSTEMS ENGINEERING LLC

and shall not be reproduced, transferred to other documents, disclosed to others, or used for any purpose other than that for which it is furnished without the prior written permission of Advanced Ground Systems Engineering LLC.

# AGSE-E102-G04/G05 (9C6025P04/P05)

## Up-Lift Propulsor Air/Truck Shipping Stand

For GE90-94B and -115B Series Engines

## Advanced Ground Systems Engineering LLC

10805 Painter Ave., Santa Fe Springs, CA, 90670 • PHONE: 562-906-9300 • FAX: 562-906-9308 • E-MAIL: agse@agsecorp.com

## 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 **<u>support@agsecorp.com</u>**.

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.

## INDEX

PAGE(S)

**SECTION** 

**DESCRIPTION** 

1.0	Revisions	1.0
2.0	Illustrations	2.0
3.0	Specification	3.0
3.0	3.1 General	3.0
3.0	3.2 Design	3.0
30	3.3 Transportability	3.0
3.0	3.4 Characteristics.	3.3
4.0	Maintenance and Inspection	4.0
4.0	4.1 General	4.0
4.0	4.2 Cleaning and Painting.	4.0
4.0	4.3 Scheduled Service.	4.0
4.0	4.4 Scheduled Inspection	4.1
4.0	4.5 Pump Maintenance-Base and Cradle.	4.1
4.0	4.6 Pump Maintenance-Cradle-Pressure Relief	4.2
4.0	4.7 Air Pump Maintenance.	
5.0	Operation.	5.0
5.0	5.1 Jacking Leg Operation	5.0
5.0	5.2 Caster Storage and Deployment	5.6
5.0	5.3 Towing	5.12
5.0	5.4 Fork Lifting	5.14
5.0	5.5 Transportation	5.19
5.0	5.6 Propulsor/Engine Handling.	5.19
5.0	5.7 Cradle Lift System	5.23
5.0	5.8 Engine Installation into Stand Using Overhead Sling	5.33
5.0	5.9 Engine Bootstrapping	5.34
5.0	5.10 Fan Separation	5.41
6.0	Safety	6.0
6.0	6.1 Stress	6.0
6.0	6.2 General	6.0
6.0	6.3 Prevention	6.0
6.0	6.4 Risk Assessment	6.0
6.0	6.4.1 Limits of the Machinery	6.0
6.0	6.4.2 Risk Assessment and Residual Risk	6.1
7.0	Warranty	7.0
7.0	7.1 Statement of Warranty	7.0
8.0	Parts Breakdown	8.0
8.1	8.1 General	8.0

## **INDEX (Continued)**

SECTION	DESCRIPTION PAGE(S)
8.0	8.2 Illustrated Parts Breakdown 8.0
8.0	IPB Figure 1 - AGSE-E102-G04 Air Truck
	Engine Stand Assembly
8.0	IPB Figure 2 - AGSE-E102-G05 Air Truck
	Engine Stand Assembly
8.0	IPB Figure 3 - AGSE-E107-G01 Base Assembly
8.0	IPB Figure 4 - AGSE-E108-G03 Cradle Assembly 8.10
8.0	IPB Figure 5 - AGSE-E108-G04 Cradle Assembly 8.15
8.0	IPB Figure 6 - AGSE-E10712-S01 Jack Leg Hydraulic System 8.20
8.0	IPB Figure 7 - AGSE-E10807-S01 FWD Lift Cable Installation 8.23
8.0	IPB Figure 8 - AGSE-E10807-S02 AFT Lift Cable Installation 8.25
8.0	IPB Figure 9 - AGSE-E10810-S01
	Lift System Hydraulic Installation
8.0	IPB Figure 10 - 9426M25-G01 AFT Mount Adapter Assembly 8.29
8.0	IBP Figure 11 - AGSE-E10812-S01 Hydraulic Installation 8.31
8.0	IPB Figure 12 - AGSE-E10709-S01 Jacking Leg Assembly 8.31
9.0	Stencils, Decals, and Placards 9.0
9.0	9.1 General
9.0	9.2 Stencils and Placards 9.0
9.0	9.2.1 Base Assembly
9.0	9.2.2 Cradle Assembly 9.3
10.0	Recommended Spares 10.0
10.0	10.1 Critical Items 10.0

## 1.0 – Revisions

		8	8 1	
PAGE	REV	<b>DESCRIPTION OF CHANGE</b>		DATE
5.8	С	Updated Figure 5.2-2		6/22/23
5.9	С	Updated Figure 5.2-3		6/22/23
5.10	С	Updated Figure 5.2-4		6/22/23
5.11	С	Updated Figure 5.2-5		6/22/23
9.4	С	Updated Figure 9.2-5		6/22/23

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

## 2.0 – Illustrations



Figure 2.0-1 AGSE-E102-G04 (9C6025P04) Shipping Stand -<br/>GE90-115B Configuration (AGSE-E108-G03 Cradle)Page 2.0AGSE-E102-G04/G05 (9C6025P04/P05) Up-Lift Propulsor Air/Truck Shipping StandJun. 22, 2023<br/>Rev. C



Figure 2.0-2 AGSE-E102-G04 (9C6025P04) Shipping Stand -GE90-94B Configuration (AGSE-E108-G03 Cradle)

AGSE-E102-G04/G05 (9C6025P04/P05) Up-Lift Propulsor Air/Truck Shipping Stand Jun. 22, 2023

Page 2.1 n. 22, 2023 Rev. C

## 2.0 – Illustrations (Continued)



Figure 2.0-3 AGSE-E102-G05 (9C6025P05) Shipping Stand -<br/>GE90-94B Configuration (AGSE-E108-G04 Cradle)Page 2.2AGSE-E102-G04/G05 (9C6025P04/P05) Up-Lift Propulsor Air/Truck Shipping StandJun. 22, 2023<br/>Rev. C

## 2.0 – Illustrations (Continued)



Figure 2.0-4 AGSE-E102-G05 (9C6025P05) Shipping Stand -<br/>GE90-115B Configuration (AGSE-E108-G04 Cradle)Page 2.3AGSE-E102-G04/G05 (9C6025P04/P05) Up-Lift Propulsor Air/Truck Shipping StandJun. 22, 2023<br/>Rev. C

## **3.0 – Specification**

#### 3.1 General

The AGSE-E102-G04/G05 (9C6025P04/P05) Shipping Stand is designed to transport the GE90-94B and GE90-115B series engines. (See Section 3.3 below for details). Air transport of the propulsor only is suitable on the main deck of the following freighter aircrafts: B747F, B767F, B777F, C-130, CL-44, AN-22, AN-124, AN-225, and IL-76. Air transport of full engine, -115B without inlet, is possible only on specialized large freighter aircrafts such as AN-124 and AN-225.

#### 3.2 Design

The AGSE-E102-G04 stand consists of a base (AGSE-E107-G01) and an engine support structure, cradle (AGSE-E108-G03). The AGSE-E102-G05 stand consists of the same base and an engine support structure, cradle (AGSE-E108-G04). Shock mounts are installed between the base and cradle to handle vibrations and shocks during transportation.

The cradle separates from base during bootstrapping for engine change. The cradle may be raised or lowered to accommodate transport and or fan separate/mate requirements. Integral to the base are four (4) jacks for leveling, stabilizing and raising the stand to retract casters. The jacks are operated by manual hydraulic pump. Integral to the cradle is a hydraulic cable lift system operated by manual pump and/or optional air-operated hydraulic pump. Forward mount adapters for both -94B and -115B engines are stored at the FWD RH corner on the base. The 9C6030 Fan Transfer Stand is required for fan stator separate/mate procedure.

The stand is permanently attached to a 96" x 196" NAS3610-2R1P pallet. The pallet has a special cutout for clearance with the fan case.

All production cradle bootstrap hoist brackets are proof loaded to a minimum of 2 times working load. The tie-down rings on the base may be used for lifting/maneuvering the stand with engine in place.

#### 3.3 Transportability

#### 3.3.1 Truck/Air Transportation

1. The Stand with GE90-94B can be truck or air shipped in propulsor only configuration. This stand cannot be used for truck or air ship the GE90-94B full engine.

### WARNING

TRANSPORTING A GE90-94B FULL ENGINE ON AGSE-E102-G04/G05 BY TRUCK OR AIR CAN CAUSE DAMAGE TO THE ENGINE. (*Ref: GE90 Transportation Manual GEK 105039 - 09/15/06*). 2. The Stand with GE90-115B series propulsor or full engine without inlet can be transported by truck or air shipment.

The Stand is supported by four shock absorbing caster assemblies with brakes and swivel locks. The casters must be retracted for truck or air transport.

### NOTICE

#### If unit is to be transported by truck and trailer, it is "MANDATORY" that both the truck and trailer be equipped with "air-ride" type suspension.

The Stand has provisions for securing to a trailer. There are tie down rings located on the base to secure the stand to a trailer for shipment. Refer to securing method diagram placards that are attached to the cradle frame or Figure 3.3-1 below.



#### The cradle must never be tied down to the trailer bed.

#### 3.3.2 Towing

The Stand may be towed from either end with the propulsor only or a full engine without the inlet attached. A full engine with the inlet attached may only be towed from the rear of the stand. Maximum towing speed is 3 MPH (5 KM/H).



#### Failure to unlock foot brakes on casters during towing of the stand will result in flat spots being worn into the caster tread.

#### 3.3.3 Forklifting

The stand may only be fork lifted when the cradle is in the lowered position. Fork stop plates block the forward fork tubes when the cradle is raised. Forklift tines must be a minimum of 8 feet long to completely pass through the stand base frame. The stand with a full engine may be fork lifted only under special conditions, see the operation section 5.4.3 of this manual.





Figure 3.3-1

#### 3.4 Characteristics

	With Propulsor		With Full Engine		With Full Engine		Empty (Cradle Raised)
	(+ Exhaust Nozzle)		(Without Inlet)		(With Inlet)		
	-94B	-115B	-94B	-115B	-94B**	-115B	(Casters Stowed)
Height*	99.7	99.7	160	160	164	174	70.7
Length	262.5	262.5	273	273	318	328	223.5
Width	102	102	154	156	154	164	102
Engine CL Height*	53	53	81.5	81.5	81.5	81.5	
Weight	22,200	23,300	26,200	28,200	28,000	30,100	8,800

Maximum envelope dimensions as noted

\* Add 7" for casters \*\* Towing only







*Figure 3.4-2* 

## 4.0 – Maintenance and Inspection

#### 4.1 General

Life expectancy of this unit can be extended if 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 periodically 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.

#### 4.3 Scheduled Service

All zerk fittings on the casters and sheave axles should be lubricated every 90 days with the following extreme pressure grease or equivalent grease:

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



Hydraulic reservoir levels should be checked every 90 days, and refill as necessary.



Hydraulic system should be flushed if different fluid is to be used.

To prevent the accumulation of water in the hydraulic fluid, it is recommended that the hydraulic fluid is replaced in both hydraulic systems annually.

Manufacturer	Product
Commercial	Dextron III (ATF)
Commercial	SAE 5W
Commercial	DTE25

The wire cables should be lubricated every 90 days with a Molybdenum Disulfide formula wire and cable lubricant as manufactured by ITW Fluid Co., or equivalent.

Visual inspection of the swivel locks and brakes on the casters should occur with the scheduled lubrication. All non-painted machined surfaces should have a light grade oil spray as required. Spray with rust inhibitor LPS-3 (MIL-C-16173D, Gr. 2) or equivalent.

#### 4.4 Scheduled Inspection

Annual inspections of machined surfaces, pins, fasteners, structure, and shock mounts are recommended. The machined surfaces (pivots, axles, mounts) 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 stand structure is to be visually inspected for damage, weld cracks, or corrosion.

### CAUTION

AGSE recommends that shock mounts be replaced every five (5) years. Additionally, periodic inspections should be performed and any of the following conditions are proper cause for replacement of the shock mounts prior to their expiration:

- 1. Visible evidence of cracks.
- 2. Discoloration: visible damage caused by solvents.
- 3. Permanent deformation.
- 4. Mount does not flex during engine loading/unloading.
- 5. Significant corrosion on shock attach-plate.

The following exposures can reduce the life of shock mounts and it is recommended to avoid them where possible.

- High humidity and/or salty air
- Direct sunlight
- Solvent, corrosive liquids, and fumes
- Oils, jet fuel, or Skydrol hydraulic fluid
- Extreme temperatures
- Ozone or engine exhaust

#### 4.5 Pump Maintenance - Base and Cradle

- 1. Oil level
- 2. Oil clean No water or other contaminants DO NOT MIX OIL TYPES OR VISCOSITY.
- 3. Leaks Holds pressure for minimum 3 minutes.

#### 4.6 Pump Maintenance - Cradle - Pressure Relief

Setting 2700 - 3000 PSI (See Illustration Figure 4.6-1)

Close pressure release valve - Plug outlet - Operate pump - Gauge should not go above 3000 PSI

- Adjust - Follow procedure as shown.



Figure 4.6-1

#### 4.7 Air Pump Maintenance

Filter - Drain, clean

Regulator setting minimum 90 PSI - maximum 100 PSI

## 5.0 – Operation

### CAUTION

Severe pinch may cause harm to personnel while operating the following procedures:

- 1. Hydraulic jacking leg
- 2. Caster rotation during caster stowage and deployment
- 3. Engine loading and unloading
- 4. Bootstrapping attachment
- 5. Pinning cradle to base
- 6. Installing tow bars
- 7. Attaching slings

#### 5.1 Jacking Leg Operation

There are four hydraulically operated jacking legs located approximately on the corners of the base. They are separated into two pairs, FWD and AFT, by a manual 3-way selector valve. A manually operated hydraulic pump is connected to the 3-way selector valve through a pressure compensated flow control valve. The jacking legs are used to raise the stand to deploy or retract the casters, level and stabilize the stand for raising/lowering the cradle and for fan separating/mating operations.

The jacking legs are stowed within the base outside dimensions. The legs may be deployed by removing the pin holding the leg in the stow position and rotating the leg outward and down. The pin is then re-inserted to secure the leg in place. (See illustration Figure 5.1-2).

To extend the jacking legs, remove the pump handle from the AFT base cross member and pin it to the pump linkage handle (See illustration Figure 5.1-3). Move the selector valve handle toward the direction indicated to extend either the FWD or AFT pair of jacking legs (Figure 5.1-5).

### NOTE

The pump reservoir has an automatic spring-loaded air vent. Always check function by pulling up on center part before operating the pump or lowering the stand.

Operate the pump handle to extend the legs. Follow the instructions on the base near the pump to extend the legs (alternating between forward and aft legs) in short (approximately 3" (76mm)) increments to prevent damage to the jacking legs and swivel foot pad. The legs will extend to lift the stand approximately 9.5" (241 mm), it takes only a minimum of 8.5" (216 mm) to be able to deploy/retract the casters.



## Operator must be aware of pumpage and safety precautions to prevent physical injury.

For stabilizing the stand, when the stand is supported by the casters, extend the legs as required to level the stand. It is not required to lift the casters completely off the ground/floor.

To retract the jacking legs, move the selector valve handle to either FWD or AFT pair of jacking legs. Rotate the pressure release handle either way to allow the legs to retract. The pressure release handle is self-centering and must be held in the rotated position until the legs are fully retracted. When the legs are fully retracted remove the leg pin and lift/rotate the leg back to the stow position. Re-insert the pin to secure the leg.

### CAUTION

The retract bypass valve is ONLY used to rapidly retract the jacking legs after the load is supported by the casters or base.

DO NOT USE THIS VALVE to lower the stand. The jacking legs, the stand and/or the engine could be damaged. Personnel could suffer serious foot injury.

RETRACT BYPASS VALVE



Figure 5.1-0 Retract Bypass Valve

### NOTE

The flow control valve is pre-set to prevent an uncontrolled drop of the stand. Follow the same procedure to raise the stand or to lower the stand in short increments, alternating between forward and AFT legs. When the legs are fully retracted remove the leg pin and lift/rotate the leg back to the stow position. Re-insert the pin to secure the leg.

### CAUTION

Each leg is heavy and MUST BE HELD tightly to prevent the leg from falling inward.



DO NOT tow the stand while the jacking legs are deployed or it will damage the equipment.



Figure 5.1-1

- 1. Pull stow pin
- 2. Rotate outward
- 3. See Illustration Figure 5.1-2



Figure 5.1-2

Unpin and rotate each hydraulic cylinder "out" and "down". Pin in place.

After making sure all four deployed hydraulic cylinders are securely pinned in place, you may now actuate the hydraulic hand



*Figure 5.1-3* 

AGSE-E102-G04/G05 (9C6025P04/P05) Up-Lift Propulsor Air/Truck Shipping Stand Rev. C

pump.







Figure 5.1-5

#### 5.2 Caster Storage and Deployment

Before deploying or storing the casters, the stand must be raised by the four (4) jacking legs (see Section 5.1).

The caster mounts assemblies are made up of two independently rotating parts.

### WARNING

The caster and caster mounts are very heavy and MUST NOT BE ROTATED WITHOUT USING THE PROVIDED CASTER BAR (Illustration Figure 5.2-1). Rotating the casters should always be done by two or more persons, one to pull and insert pins, the other to rotate the caster mount.

To stow the AFT casters, follow the sequence shown in illustration Figure 5.2-2.

To stow the FWD casters, follow the sequence shown in illustration Figure 5.2-3.

To stow the FWD casters for propulsor only, follow the sequence shown in illustration Figure 5.2-4.

To deploy the casters, reverse the sequence shown in illustration Figures 5.2-2, 5.2.3 and 5.2-4.





Figure 5.2-1 Deploying/Storing the Casters



Figure 5.2-2 AFT Casters Stow Sequence



Figure 5.2-3 FWD Casters Stow Sequence (for Full Engine With Fan)







Figure 5.2-5 FWD Casters 3 Positions

#### 5.3 Towing

Two removable, telescoping tow bar assemblies are attached to the AFT base cross member. (Illustration Figure 5.3-1).

To deploy the tow bars for towing from the AFT end of the stand, remove the pin from the storage clamp bracket and rotate the tow bars assemblies outward. To extend the tow bars, remove the pin closest to the towing end and pull the inner section outward until a red stripe becomes visible. Align the pin holes between the outer and inner sections and insert the pin. Bring the two tow bars together to attach to a tow vehicle. (Illustration Figure 5.3-1).



Stand clear from the stand while towing to avoid physical injury.





To deploy the tow bars for towing from the forward end, remove the pin from the storage clamp bracket and the pin that secures the tow bar assembly to the base aft cross member. Move the tow bars to the forward end of the stand.

### CAUTION

## The stand MUST NOT be towed from the FWD end if the engine has the inlet installed. Damage to the inlet can occur during towing.

#### WARNING

## The tow bar assemblies are heavy and MUST BE HANDLED BY AT LEAST TWO PERSONS.

Attach the tow bars to the brackets on the forward end of the base. Extend, pin and bring together to attach to a tow vehicle. See Illustration Figure 5.3-2.

For tight turns and maneuvering use the provided steering bar. See Illustration Figure 5.3-3. Release all caster brakes and engage the swivel locks of the trailing casters. Max towing speed is 3 MPH (5 KM/H). Do not engage the swivel locks of the casters closest to the tow vehicle as this will cause damage to the casters.







Figure 5.3-3 Steering Bar Usage

#### 5.4 Fork Lifting

5.4.1 Prior to Forklifting



# This procedure can be performed with an empty stand or with a propulsor installed. The cradle must be pinned in position. Do not forklift a ready for installation (RFI) engine with fan installed.

The base has fork pockets for fork lifting the stand. The aft fork pocket extends through both sides of the base structure. The forward fork pocket is in two sections, each extending through the sides of the base but is open in the middle to clear the full engine lower bifurcation and drains mast.

- 1) Ensure there are no physical obstructions within the fork tubes before the forklift tines are inserted.
- 2) Look through the forward fork tube to verify that it is clear the full length of the tube.
  - 2.1 Verify two (2) AGSE-E10803-P09 FWD Bootstrap Reaction Block are removed and properly stored and do not protrude into the fork tube internal area. Refer to Instruction 5.9.4.

- 2.2 Verify the fork tube blocker plates are raised and fully clear of the fork tube internal area. Manually raise the blocker plates if the cradle is in its raised position.
- 2.3 Verify that there are no engine components nor any portion of the propulsor bag hanging down into the fork tube internal area.
- 3) Look through the aft fork tube to verify it is clear of any debris.

#### 5.4.2 Fork Lifting An Empty Stand or Stand with Propulsor

Each section of the forward fork pocket has a hinged blocker plate to prevent fork lifting when a full engine is installed in the stand (illustration Figure 5.4-2). The blocker plates are automatically rotated open when the cradle is lowered. If the cradle is in the raised position, the blocker plates must be manually rotated open for fork lifting.

### CAUTION

Great care must be used to make sure the fork tine is inserted flat to avoid the fork tine from protruding through the open section of the forward fork tube. Spotters are highly recommended to assist the fork lift operator during inserting the fork tines. The fork tines must be of sufficient length (108" (2.7m) minimum - Longer 134" (3.4m) if full engine is installed) to protrude through the opposite end of the fork pocket.

### CAUTION

Stand clear from the stand while forklifting to avoid physical injury.

### NOTICE

AGSE assumes no responsibility or liability for personnel injury, engine damage, stand damage, fork lift damage or transport vehicle damage from forklifting a full or RFI engine in this stand.



Figure 5.4-1 Fork Tube Blocker Plate



Figure 5.4-2 Fork Tube Blocker Plate



*Figure 5.4-3* 

#### 5.4.3 Fork Lifting a Full Engine

#### THIS IS NOT RECOMMENDED - THE FOLLOWING REQUIREMENTS AND RISK FACTORS MUST BE CONSIDERED TO DETERMINE IF THE NEED TO FORK LIFT IS GREATER THAN THE REQUIREMENTS AND RISK FACTORS.

Fork lifting the stand when supporting a full engine is NOT recommended. The risk of damage to the engine is very high. If the need is great enough to override the risk, as assessed by the operators at the site, the lower bifurcation and drains mast must be removed. Both blocker plates must be manually rotated upward to clear the fork tube opening. Spotters must be used to ensure that the fork tine does not contact the engine. When lifting the stand it must be as level as possible without allowing the stand to slip off the tines. The stand should be secured to the fork lift mast to ensure safety. Move the forklift very slowly.

### CAUTION

#### The FWD Bootstrap Reaction Block must be in storage position before lowing the cradle.

#### A. Minimum Requirements

1) Larger capacity fork lift: minimum 20-Ton (40,000 lb or 20,000 kg) capacity at 67 inch (1.7 meters) from lift mast.
### NOTE

#### Approximately 70 - 80% of the 29,000 lb load is on the FWD fork.

- 2) Longer fork tines required: minimum 134 inch (3.4 meters) long to clear the fan case and attached components and pass through the opposite side for tube.
- 3) Remove lower bifurcation and drain mast parts to clear the passage for the fork tine.
- 4) Manually open both sides blocker plates to clear the passage for the fork tine.
- 5) After the fork tine has passed through the opposite side fork tube, secure stand to mast and insert blocks between the mast and stand to prevent the stand from slipping off the fork tine ends or slipping toward the mast.

#### **B. Risk Factors**

- 1) The fork tines must be inserted flat to avoid hitting the engine and going outside of the opposite side fork tubes.
- 2) Spotters must be used to guide the lift operator at all time.
- 3) Lift stand level to the minimum height required for the route.
- 4) Once the stand has been lifted, move VERY slowly. NO RAPID ACCELERATIONS, SHARP TURNS OR HARD STOPS.
- 5) Establish a "KEEP OUT ZONE" along the travel route. Clear any potential obstacle and alert unauthorized personnel to move away.

#### **5.5 Transportation**

**5.5.1** Truck transport of stand with propulsor or engine MUST be by air ride suspension equipped tractor/trailers. The securing straps and or chains must not be attached/ wrapped around any part of the cradle.

Loading the stand onto a truck may be by crane/sling (recommended) or fork lift (not recommended) (see paragraph 5.4.3).



The -94B series full engines CANNOT be transported by truck while supported by the FWD propulsor mounts.

# The -115B series full engines without inlet may be transported by truck while supported by the FWD propulsor mounts.

**5.5.2** Air Transport of stand with propulsor in the low position is possible on most wide body freighter main deck cargo doors. The base is a standard NAS-3610 96" wide x 196" long x 2 3/4" thick pallet that is secured to the stand using standard pallet fittings.

### CAUTION

The stand must be loaded axially. The stand is not certified as a ULD and MUST be lashed down to the aircraft floor according to the specific aircraft's Weights and Balance Manual. Do NOT rely solely on pallet locks.

#### 5.6 Propulsor/Engine Handling

This stand can perform several functions and is designed to support regular or AOG engine changes using the Boeing bootstrap system. See the B777 AMM for details.

#### 5.6.1 Installing a Propulsor Assembly into the Stand.



This procedure is for planning reference to be used with the GE EMM and/ or Transportation Manual for the correct procedures. For any differences, the GE documents are the final authority.

The propulsor is moved above the stand or the stand is moved under an already suspended propulsor. The cradle should be in the raised position. If the propulsor is to be bagged for shipment or storage, the bag lower half should be laid out on the cradle frame structure.

Attach the FWD propulsor mounts, see illustration Figure 5.6-1 for the correct configuration, see the EMM for the correct procedure. Lower the propulsor to within approximate 6" of the stand. Make any alignment adjustments before proceeding.



AGSE-E108-G03 CRADLE - GE90-94B PROPULSOR MOUNT CONFIGURATION



AGSE-E108-G03/-G04 CRADLE - GE90-115B PROPULSOR MOUNT CONFIGURATION



AGSE-E108-G04 CRADLE - GE90-94B PROPULSOR MOUNT CONFIGURATION

#### Figure 5.6-1 FWD Propulsor Mount Configurations

Remove the AFT mount shaft and 'V' block assemblies from either the storage container or the AFT mount support base. Insert the shaft adapter into the AFT GSE mount fitting on either side of the Turbine Rear Frame. Secure the shaft assemblies with the specified hardware. (Illustration Figure 5.6-2).

Continue to lower the propulsor down into the stand manually aligning the AFT shaft assemblies into the mount support bases first until seated into the bases. At the same time guide the forward mounts onto the FWD cradle support structure. Insert the large index pin through the mount blocks and insert the retaining ball lock pin.

Install the AFT mount retaining/clamp bars and secure with the pins and retaining clips. Continue to lower the propulsor until the weight of the propulsor is supported by the stand. Adjust the FWD mount shipping lock screw and secure with the lock nut. Remove the overhead support.

Finish the installation by installing the upper portion of the bag and preparing for shipping or storing.



Figure 5.6-2 Propulsor Installation



**VIEW AFT LOOKING FORWARD** 

Figure 5.6-3

#### 5.6.2 Removing a Propulsor Assembly from the Stand

To remove a propulsor from the stand, reverse procedure 5.6.1.

#### 5.6.3 Fan Module Split/Transfer/Mate

The fan module split/transfer/mate procedure usually occurs after an engine is removed from the pylon for an engine/propulsor change. The procedure requires the 9C6030 fan transfer dolly to support the fan module for removal/split, transferring to the replacement propulsor, supporting the fan module during the install/mate procedure. The dolly must be configured to support either the GE90-94B series or GE90-115B series fan modules. Refer to the 9C6030 manual for configuring and operating the stand. The GE EMM outlines the procedure for fan module split and mate.

#### 5.7 Cradle Lift System

A hydraulically operated cable system integral to the cradle is used to move the cradle from one position to the other. The cable system consists of one cable assembly for the forward end of the cradle and two cable assemblies for the rear end of the cradle. A two-stage telescoping hydraulic cylinder controls the system through a manual hydraulic pump. The cradle has two positions: a raised position for install/remove propulsor/ full engine support, for fan module separate/mate operations and engine install/remove onto/from aircraft wing pylon; and a lower position to support the propulsor only for air or truck transport.

### CAUTION

The stand must be level as possible before operating the cradle lift system. If the stand is on the casters, deploy the jacking legs to stabilize the stand.

#### 5.7.1 Raising the Cradle Using the Manual Pump

A manual hydraulic pump is used to extend a 2-stage hydraulic cylinder to raise the cradle from the lower position.

To operate the pump remove the pump handle from the stow position on the aft cross member of the base and pin it to the pump linkage handle. Open the reservoir vent valve. See Illustration Figure 5.7-1.

To operate the pump to pressurize the system to remove four (4) cradle lock pins. See Illustration Figure 5.7.2.

### NOTE

All pins may not come out at once, continue to slowly operate the pump until all the pins are removed.



Figure 5.7-1



CABLE SUPPORT BEAMS MUST BE PINNED TO BASE DORK PINS (NOT SHOWN)

Figure 5.7-2 Cradle in Lowered Position

Once all pins are removed, close the pressure valve. Use the pump handle provided to operate the pump mechanism. Continue to pump to raise the cradle to the upper pin position. Note that when the second stage of the cylinder begins to extend the handle effort will increase suddenly. A gauge is mounted on the pump to indicate the system pressure. If at any time the system pressure is 2700 PSI or more, stop pumping and check that the cradle is not bound up on the base or shock mount structure.

The normal operating pressure in the second stage extension is 2500 PSI. The hand pump has an internal relief valve set at 2700 PSI; if the pump does not reach 2500 PSI, the relief valve may be the cause. Refer to the maintenance section for adjusting the valve. When the cradle reaches the upper position, insert pins through the brackets on the cable beam structure. Some additional pumping may be required to insert all the pins.



# If all the pins cannot be installed, ensure the jacking legs are level and stabilize the stand.

After the pins have been installed, slowly release the system pressure. See Illustration Figure 5.7-3 and Figure 5.7-4.



Figure 5.7-3 Cradle in Raised Position



Figure 5.7-4 Cradle Lift System Hydraulic Pump with Self-Centering Pressure Release Valve Handle

5.7.2 Prior to Lowering the Cradle



# This procedure should be performed after the fan has been removed from the propulsor and must be done with the cradle frame raised and pinned in the "up" position.

Prior to lowering the cradle, ensure the AGSE-E10803-P09 Forward Bootstrap Reaction Block are removed from the bootstrapping position and stored on top of the cradle in the dedicated storage position. Refer to Instruction 5.9.4. Never lower the cradle while the Forward Bootstrap Adapter Bars are installed in the bootstrapping position.

Ensure the fork tube blockers are in the down position. Damage to the stand will occur if the cradle is lowered while the fork tube blockers are in their raised position. See Figure 5.4-2.

#### 5.7.3 Lowering the Cradle Using the Manual Pump

Close the pressure release screw. Operate the pump to pressurize the system. Pull the four cradle lock pins and place on the cradle. Release the hydraulic pressure by slowly rotating the pressure release valve handle. Hold handle in the rotated position until the cradle pins may be inserted into the lower position pin brackets. Rotate the handle. If the cradle stops before reaching the lower position, close the pressure release screw, check for binding of the cradle with the base.



If the cradle is lowered too fast, a flow fuse valve will close and stop the cradle. To reset, operate the pump to slightly raise the cradle. Rotate the pressure release valve handle on the pump to continue lowering.



Empty cradle may not completely lower to shipping position. The weight of the FWD end of the empty cradle is too light to sufficiently tension cables. Adding weight (~ 200 lbs.) usually will lower the FWD end to insert pins.

When the cradle reaches the low position insert the cradle pins through the base shock mount structure brackets. Leave the pressure release valve open.

### NOTE

If all the pins cannot be installed, ensure the jacking legs are level and stabilize the stand.

5.7.4 Using the Optional Air-Operated Hydraulic Pump

### CAUTION

### The manual pump reservoir has a manual air vent that must be opened before using the pump to raise and lower the cradle. Failure to do so will cause the pump to operate dry or pressurize the reservoir.

This optional pump is used to raise the cradle from the lower position. It is not required to lower the cradle. To lower the cradle follow the procedure using the manual pump and pressure release handle.

The pump uses air pressure to pump oil at a ratio of 30 psi oil pressure to 1 psi air pressure. The air supply must not be less than 90 PSI and not more than 120 PSI to the fitting located near the pressure regulator/filter housing above the manual pump.



The air supply pressure is regulated to 90 PSI maximum to the pump.

Connect fittings are to be supplied by the user. Air supply hose must be minimum 1/4" diameter, 3/8" to 1/2" diameter is recommended.

The pump cycles automatically until the cylinder reaches its maximum extension, then will stall and stop pumping. It is recommended that the air supply be shut off before the cradle pin holes align with the cable beam holes and use the manual pump to align the pin holes.

### CAUTION

Be sure the air inlet valve is closed before connecting the air supply or the pump will begin to cycle and pressurize the system. The air/oil pump cycles more quickly and circulates more oil than the manual pump so it is recommended that the manual pump be used to remove the pins before opening the air supply valve.

If at any time during the raising operation the hydraulic pressure goes above 2700 PSI (18,622 kPa) (the pump should "stall"), close the air supply valve and inspect around the cradle and cables for binding. After correcting the problem, open the air supply valve to continue raising the cradle. It is recommended that the cradle be stopped before the pin holes align and use the manual pump to align pin holes to insert the cradle pins.





Figure 5.7-5

#### 5.7.5 Raising Cradle to Fan Mate Position

1) Using the manual hydraulic powered system (see step 2 for using the optional air-powered system).

### CAUTION

The stand must be level on casters and/or jacking legs before raising or lowering the propulsor to minimize cradle rubbing/binding on base/ shock mounts. If the propulsor is to be raised or lowered on an inclined surface, the stand should be located such that the forward and aft ends are directly parallel with the incline slope. The leveling jacks should be used in all cases for leveling and stabilizing the stand.

- a) Level the stand using the hydraulic jacks described in section 5.1.
- b) Remove the four (4) lower position locking pins located near the base of the shock towers. This may require operating the hydraulic pump to raise the cradle to unload the locking pins.
- c) Turn the release screw to close pressure system before operating the pump (not required with spring-loaded release screw red lever) (See Illustration Figure 5.7-6).
- d) Use the provided handle to operate the pump (stowed on rear of the base frame) to raise the cradle.

### CAUTION

Minimal clearance exists between the propulsor and the stand. The operator is responsible to ensure the engine does not contact the stand. This may require the removal or adjustment of engine components.

### WARNING

Stand clear when the cradle is suspended by the cable and keep hands clear from cradle and sheaves.



Figure 5.7-6 Cradle Hand Pump

- 2) Using the optional air-powered system (see step 1 for using the hand pump system).
- a) Place the pump handle in the down position.
- b) Close the compressed air inlet handle located at the filter regulator by turning the handle up, clockwise (see figure 5.7-6).
- c) Connect a 100 psi compressed air supply hose to the quick disconnect fitting located on the inlet side of the filter regulator.
- d) Raise cradle by slowly turning the compressed air inlet handle down, counterclockwise. The air driven hydraulic pump will start and the cradle will begin to raise.
- e) Adjust the air flow at the filter regulator by lifting up on the outer cover on top, and turning to a maximum pressure of 85-90 psi. The gauge hand will fluctuate with the cycling of the air pump operation.
- f) Once the cradle has reached the raised position, close the air supply valve by turning the handle up, clockwise.

3) Replace the safety pins removed from the lower position to lock the propulsor and cradle into the shock system. Once one or two safety pins are installed additional adjustment maybe required to install the remaining pins. Use the hand pump and red lever to raise and lower the propulsor and cradle as required.

4) Release all hydraulic pressure from system by turning the red lever on the hand pump counter clockwise to allow locking pins to support entire weight of propulsor or complete engine.

#### 5.7.6 Lowering Cradle to Propulsor Shipping Position

### CAUTION

The stand must be level on casters before raising or lowering the propulsor to minimize cradle lifting. If the Propulsor is to be raised or lowered on an inclined surface, the stand should be located such that the forward and aft ends are directed parallel with the incline slope. The jacks should be used in all cases for straightening and stabilizing the stand.

1) Inspect stand for obvious damage.

2) Configure the propulsor for shipment in accordance with GE Engine Shipping Manual. This will require the fan case assembly to be removed.

3) Level the base and cradle system with the hydraulic jacking legs as described in Section 5.1.

4) Pressurize the hydraulic system by turning and holding the red lever controlling the valve at the hand pump clockwise.

5) Raise the cradle slightly to free the locking pins that support the cradle in the raised position.

6) Remove the four (4) safety pins holding the cradle in the up position.

7) Slowly turn the red lever on the pump and the propulsor and cradle will begin to descend. Continue to control the start, stop, and speed with the red lever.

### CAUTION

Open the release valve slowly. If opened quickly, the flow fuse on the cylinder may activate and stop the cradle from lowering. If this occurs, close the release valve and raise the cradle slightly using the hand pump. This will release the back pressure on the flow fuse and reset it.

### WARNING

Stand clear when the cradle is suspended by the cable and keep hands clear from cradle and sheaves.

8) Once the propulsor and cradle have indexed on the lower stops install the four (4) safety pins.

- 9) After the pressure gauge reads zero, release the red lever.
- 10) Close the reservoir vent.
- 11) The propulsor is now in position for air/truck shipment.

#### 5.8 Engine Installation into Stand (In Raised Position) Using Overhead Sling (9C6020, 9C6021 Ref)

- 1) Inspect dolly for obvious damage and/or missing parts.
- 2) Cradle must be secured in raised position
- 3) Configure engine for shipping in accordance with GE Engine Shipping Manual.
- 4) Remove AFT engine ground handling mounts from the engine stand and install on the engine LPT. Loosen lock collars to allow adjustment as required.

### NOTE

This attachment hardware is not provided with the engine stand. Recommended hardware is 1/4-20UNC-2B Hex Nut with 1/4-20UNC-2A x 3/4 Lg Hex Head Cap Screw, all to be commercial Grade 5 or 8 steel (or equivalent).

- 5a) (For use with -94B) Remove the FWD ground handling mounts from the engine stand and install on the engine using the pins provided. Install the safety pin clips after pins are inserted. Retract set screws on the FWD supports to maximum possible.
- 5b) (For use with -115B) Bolt FWD supports to propulsor using hardware provided. Pin support adapters to supports. Note the RH/LH markings.
- 6) Position the stand beneath the engine and set the caster brakes.

### CAUTION

Minimal clearance exists between the engine and stand. The operator is responsible to ensure the engine does not contact the stand. This may require the removal or adjustment of engine components.

### CAUTION

# Care must be taken when working near suspended loads. Personnel should never stand beneath the suspended load.

7a) (For use with -94B) Lower engine/propulsor into stand while holding the AFT mount V-blocks by hand. Guide the aft mounting blocks into the saddles on the stand as required (this may require the extension of the pins to be adjusted). To adjust the aft pins loosen the threaded collars and rotate the pins. Continue to lower the engine until the forward mount adapters are aligned with the index pins on the engine stand.

- 7b) (For use with -115B) Lower engine onto stand while supporting the AFT mount blocks by hand. Guide the AFT mounting blocks into the saddles on the stand as required (this may require extension of the pins to be adjusted). To adjust the AFT pins, loosen the threaded collars and rotate the pins. Continue to lower the engine until the FWD mount adapters are aligned with the index pins on the engine stand.
- 8) Lower the support until the pin hole aligns with the adapter pin hole. Insert the ball lock pin (LH) and safety pin (RH).
- 9) Install the forward index pins and ball lock pins. Continue to lower the engine until the AFT mounts are fully seated and the retainer on the AFT mounts can be pinned closed. Tighten threaded collars and lock with set screws. Install the safety clips.
- 10) Continue to lower the engine until the stand supports the full weight of the engine.
- 11) Remove engine sling.
- 12) Adjust set screws on forward mounts and tighten jam nuts.

**5.9 Engine Bootstrapping** 

### CAUTION

This procedure is intended to supplement the Boeing AMM and GE EMM for the correct bootstrap procedure and tooling to be used. It identifies the required steps to configure and use AGSE equipment during engine bootstrapping. It shall not be used as a replacement procedure for engine installation or removal.

5.9.1 Installation of Forward Bootstrap Reaction Block Prior to Bootstrapping

### NOTE

This procedure must be done with the cradle frame raised and pinned in the "up" position. Access to install the Forward Bootstrap Adapter Bar will be restricted if an engine with fan is installed on the stand.

1) Retrieve the AGSE-E10803-P09 Forward Bootstrap Reaction Block from storage position (See Illustration Figure 5.9-1)

2) Ensure the AGSE-E10803-P09 Forward Bootstrap Reaction Block is attached securely in the "bootstrapping position." (See Illustration Figure 5.9-2).

3) Install the hex nut through the pulley sheave window. (See Illustration Figure 5.9-2)

4) For the initial tightening, hand tighten the screws while holding the next nut stationary.

5) Use the drive ratchet wrenches to complete the installation of the reaction block assembly. (See Illustration Figure 5.9-3).

6) To access the hex nut, utilize a drive ratchet assembly with a swivel and deep socket.

7) Torque the screws to 40-50 ft-lb (50-68 Nm). Do not overtighten. (See Illustration Figure 5.9-4).



Figure 5.9-1 Forward Bootstrap Reaction Block in Storage Position



Figure 5.9-2 Forward Bootstrap Reaction Block Installation



Figure 5.9-3 Forward Bootstrap Reaction Block Installation



Figure 5.9-4 Forward Bootstrap Reaction Block Installation - Section View

#### 5.9.2 Bootstrapping

1) Install the Boeing Forward Inboard Bootstrap Adapter to cradle. (See Illustration Figure 5.9-5)

2) Install the Boeing Forward Outboard Bootstrap Adapter to cradle. (See Illustration Figure 5.9-5).

3) Install two (2) Boeing AFT Bootstrap to LH and RH sides of cradle. (See Illustration Figure 5.9-5).

4) Raise empty stand or stand with engine slighly using the Boeing bootstrap system to center the stand under the aircraft pylon per Boeing AMM.

5) Level stand roll before lowering stand.

6) Lower stand until all the casters support the full weight of the empty stand.

7) Remove two (2) AGSE-E10811-P01 beam-to-shock mount pins from each side to disconnect the base and cradle. (See Illustration Figure 5.9-6).

8) Unbolt the FWD and AFT cable beam plates from the base shock towers and store the hardware in storage position. (See Illustration Figure 5.9-6)

9) Check cable system so that hydraulic pressure is zero.

10) Raise cradle and engine, and secure engine to the aircraft pylon per Boeing AMM.

11) Release the FWD and AFT engine handling mounts and lower the empty cradle using Boeing bootstrap system.

12) Lower the cradle until the FWD and AFT cable beam plates can be bolted to the base shock towers. Install two (2) AGSE-E10811-P01 beam-to-shock mount pins on each side.

13) Retrieve hardware from stow position. Inspect and install hardware with 40 ft-lb (54.2 Nm) torque.

14) If engine -115B, remove AGSE-E10806-P01 and AGSE-E10806-P02 FWD engine support brackets from the engine and install the brackets on the cradle. (See Illustration Figure 5.9-7).

15) Remove engine ground handling mounts from the engine and store them in storage box or cradle.

16) Follow INSTRUCTION in Section 5.9-3 to remove and store the AGSE-E10803-P09 FWD Bootstrap Reaction Block in storage position.



Figure 5.9-5 Install Bootstrap Adapters



Figure 5.9-6



Figure 5.9-7

#### 5.9.4 Removing and Storing the Bootstrap Reaction Block



This procedure should be performed after the fan has been removed from the propulsor and must be done with the cradle frame raised and pinned in the "up" position.

1) Remove the attachment screws and the AGSE-E10803-P09 Forward Bootstrap Reaction Block. Use caution to support the Forward Bootstrap Reaction Block, which weights 12 lb (5.4 kg), from falling.

3) Install the Forward Bootstrap Reaction Block in the "storage position" as shown in Figure 5.9-8. Tighten the bolts such that they will not loosen during shipment. Recommended torque is 50 ft-lb (68 Nm).



Figure 5.9-8

#### 5.10 Fan Separation

 $\sim$  Refer to the GE Fan Separation Procedure  $\sim$   $\sim$  Refer to 9C6030 Manual  $\sim$ 

# 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.

#### 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 AGSE-E102-G04/G05 (9C6025P04/P05) Up-Lift Propulsor Air/Truck Shipping Stand is a commercial product designed specifically only to store and/or transport the General Electric GE90-94B and GE90-115B Propulsor. 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 is not to be used or made 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 GE90-94B/-115B Up-Lift Propulsor Air/Truck Shipping Stand 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 AGSE-E102-G04/G05 (9C6025P04/P05) Up-Lift Propulsor Air/Truck Shipping Stand 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.





### **EC D**ECLARATION OF **C**ONFORMITY

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:	9C6025 Up-Lift Propulsor Air/Truck Shipping Stand
Model:	AGSE-E102
Part Number:	AGSE-E102-G04 (9C6025P04)
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:

- GE Aviation Support Equipment SOW, 9C6025P04/P05, STAND, SHIPPING -PROPULSOR, Revision -, Last Modified: 8/26/2021
- 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

> 10805 Painter Avenue, Santa Fe Springs, CA 90670 United States T +1.562.906.9300 | F +1.562.906.9308 | AGSECORP.COM



### **EC D**ECLARATION OF **C**ONFORMITY

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:	9C6025 Up-Lift Propulsor Air/Truck Shipping Stand
Model:	AGSE-E102
Part Number:	AGSE-E102-G05 (9C6025P05)
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:

- GE Aviation Support Equipment SOW, 9C6025P04/P05, STAND, SHIPPING -PROPULSOR, Revision -, Last Modified: 8/26/2021
- 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

10805 Painter Avenue, Santa Fe Springs, CA 90670 United States T +1.562.906.9300 | F +1.562.906.9308 | AGSECORP.COM

# 7.0 – Statement of 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 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 Parts Breakdown

### IPB Figure 1 - AGSE-E102-G04 Air/Truck Engine Stand Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E102-G04	-	Air/Truck Engine Stand Assy (Illustration Figure 8.1-1)
1	AGSE-E107-G01	1	Base Assy (See IPB Figure 3 for Details)
2	AGSE-E108-G03	1	Cradle Assy (See IPB Figure 4 for Details)
3	Commercial	10	Lock Washer - 1/2" ID, ZP
4	Commercial	10	Hex Nut - 1/2"-13 UNC, ZP
5	Commercial	10	Hex Head Cap Screw - 1/2"-13 UNC x 2-1/4" Lg., ZP
6	Commercial	20	Flat Washer - 1/2" ID, ZP



Figure 8.1-1 AGSE-E102-G04 Air/Truck Engine Stand Assembly

### IPB Figure 2 - AGSE-E102-G05 Air/Truck Engine Stand Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E102-G05	-	Air/Truck Engine Stand Assy (Illustration Figure 8.2-1)
1	AGSE-E107-G01	1	Base Assy (See IPB Figure 3 for Details)
2	AGSE-E108-G04	1	Cradle Assy (See IPB Figure 5 for Details)
3	Commercial	10	Lock Washer - 1/2" ID, ZP
4	Commercial	10	Hex Nut - 1/2"-13 UNC, ZP
5	Commercial	10	Hex Head Cap Screw - 1/2"-13 UNC x 2-1/4" Lg., ZP
6	Commercial	20	Flat Washer - 1/2" ID, ZP



Figure 8.2-1 AGSE-E102-G05 Air/Truck Engine Stand Assembly

### IPB Figure 3 - AGSE-E107-G01 Base Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E107-G01		Base Assy (Illustration Figure 8.3-1 through Figure 8.3-3)
1	AGSE-E10701-P01	1	Base Weldment
2	AGSE-E10704-P02	1	Clamp Bar
3	AGSE-E10704-P05	1	Pin
4	AGSE-E10705-P01	1	FWD Shock Mount
5	AGSE-E10705-P02	1	FWD Shock Mount - Opposite
6	AGSE-E10706-P01	1	AFT Shock Mount
7	AGSE-E10706-P02	1	AFT Shock Mount
8	AGSE-E10707-P01	1	FWD Caster Mount Support Weldment
9	AGSE-E10707-P02	1	FWD Caster Mount Support Weldment
10	AGSE-E10707-P05	8	Cap
11	AGSE-E10707-P03	1	AFT Caster Mount Support Weldment
12	AGSE-E10707-P04	1	AFT Caster Mount Support Weldment - Opposite
13	AGSE-E10708-P01	2	Caster Mount Weldment
14	AGSE-E10708-P02	2	Caster Mount Weldment - Opposite
15	AGSE-E10712-S01	1	Jack Leg Hyd System (See IPB Figure 4 for Details)
18	Commercial	2	Spring Pin - 1/8" Dia. x 1" Lg.
19	AGSE-E10702-P06	1	Fork Stop Plate, LH
20	AGSE-E10702-P07	1	Fork Stop Plate, RH
21	AGSE-E10710-S01	2	Tow Bar Assy
22	AGSE-E10710-P03	1	Steering Bar
23	AGSE-E10711-S01	1	Pump Handle
24	AGSE-E10711-P03	18	Special Pallet Washer
25	33160-513	1	Pallet
26	40191-12	18	Pallet Attach Fitting (w/ Washer)
28	AM-2079-20	4	Caster
29	AGSE-S00304-P04	20	Shock Mount
30	Commercial	160	Flat Washer - 1/2" ID x .032" Thk.

### IPB Figure 3 - AGSE-E107-G01 Base Assembly (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
32	S00105-08F016A01	160	HHCS with Nylon Patch - 1/2"-20 UNF x 1" - Zinc Plt
34	Commercial	4	FSHCS - 3/8"-16 UNC x 4" Lg.
35	Commercial	4	FSHCS - 3/8"-16 UNC x 1-1/2" Lg.
36	Commercial	44	Flat Washer - 3/8" ID - Zinc Plt
37	Commercial	4	Flat Washer - Large OD - 1/4" Nom ID
38	Commercial	12	Hex Lock Nut - 3/8"-16 UNC
39	Commercial	1	Roll Pin - 1/8" Dia. x 3/4" Lg.
40	AM-90375-64LNC	1	Safety Pin - 3/8" Dia. x 4" Grip
41	Commercial	32	HHCS - 1/2"-13 UNC x 1-1/2" Lg.
42	Commercial	32	Lock Washer - 1/2" ID
43	Commercial	18	Lock Nut - 3/8"-24 UNF
44	AM-91000-74L	4	Safety Pin - 1" Dia. x 4-5/8" Grip
45	Commercial	8	HHCS - 5/8"-11 UNC x 2" - Zinc Plt
46	Commercial	16	Lock Washer - 5/8" ID - Zinc Plt
47	Commercial	16	Flat Washer - 5/8" ID - Zinc Plt
48	AM-91000-144T-H900	8	Safety Pin
49	Commercial	8	HHCS - 5/8"-11 UNC x 2-1/2" - Zinc Plt
50	AGSE-E10710-P04	1	Caster Bar
51	AGSE-E10711-P04	2	Safety Pin - 1/4" Dia.
52	Commercial	4	HHCS - 3/8"-16 UNC x 1-1/4" - Zinc Plt
53	AGSE-E10711-P05	1	Tool Box - Modified
54	Commercial	4	Lock Washer - 1/4" ID - Zinc Plt
55	Commercial	4	HHCS - 1/4"-20 UNC x 1" Lg Zinc Plt



### Figure 8.3-1 AGSE-E107-G01 Base Assembly



DETAIL B




#### Figure 8.3-3 AGSE-E107-G01 Base Assembly



Figure 8.3-4 AGSE-E107-G01 Tow Bar Sub-Assembly



DETAIL A (TYPICAL 4 PLACES)

#### Figure 8.3-5 AGSE-E107-G01 Base Assembly

## IPB Figure 4 - AGSE-E108-G03 Cradle Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E108-G03		Cradle Assy (Illustration Figure 8.4-1 through Figure 8.4-3)
4	AGSE-E10805-P01	1	FWD Mount - LH (Used on AGSE-E108-G03 - GE90-94B)
5	AGSE-E10805-P02	1	FWD Mount - RH (Used on AGSE-E108-G03 - GE90-94B)
6	AGSE-E10805-P03	2	Cap
7	AGSE-E10805-P04	2	Index Pin
8	AGSE-E10805-P05	4	Set Collar - Modified
9	AGSE-E10805-P06	2	Set Screw - Modified
10	AGSE-E10806-P01	1	FWD Engine Support Weldment
11	AGSE-E10806-P02	1	FWD Engine Support Weldment
12	AGSE-E10806-P03	1	FWD Mount - LH (Used on AGSE-E108-G03 - GE90-115B)
13	AGSE-E10806-P04	1	FWD Mount - RH (Used on AGSE-E108-G03 - GE90-115B)
14	AGSE-E10807-S01	1	FWD Lift Cable Installation (See IPB Figure 5 for Details)
15	AGSE-E10807-S02	1	AFT Lift Cable Installation (See IPB Figure 6 for Details)
16	AGSE-E10809-P02	2	UHMW Bar
17	9426M25G01	2	AFT Mount Assy (See IPB Figure 8 for Details)
18	AGSE-E10811-P01	4	Cable Beam to Shock Safety Pin
19	CL-8-BLPT-4.0	4	T-Handle Ball Lock Pin
20	CL-10-BLPT-1.50-S	1	T-Handle Ball Lock Pin
21	AGSE-E10811-P02	4	Cable Beam to Cradle Safety Pin
22	AM-2787-3	2	Tie-Down Placard
23	Commercial	8	HHCS - 5/8"-11 UNC x 1-3/4" Lg.
24	Commercial	8	Lock Washer - 5/8" Dia.
25	Commercial	2	Jam Nut - 1"-8 UNC
26	Commercial	2	Lock Washer - 1" Dia.

### IPB Figure 4 - AGSE-E108-G03 Cradle Assembly (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
27	Commercial	4	HHCS - 1/4"-20 UNC x 1" Lg Zinc Plt
28	Commercial	4	Lock Washer - 1/4" Dia.
29	Commercial	4	FHCS - #10"-24 UNC x 1/2" Lg.
30	Commercial	8	Drive Screw098" Dia. x 1/4" Lg.
31	Commercial	2	Spring Pin - 1/8" Dia. x 1" Lg.
32	AGSE-E10810-S01	1	Lift System Hyd Installation (See IPB Figure 7 for Details)
35	TA485-12	1	Document Holder
36	3AJ1.250-12CLF	16	Cap Screw - 12 Pt - 3/8"-24 UNF x 1-1/4" Lg SS
39	CL-12-BLPT-1.50-S	1	T-Handle Ball Lock Pin
40	AM-90750-24T-H900	1	Safety Pin - 3/4" Dia.
41	AM-90623-24T-H900	1	Safety Pin - 5/8" Dia
42	Commercial	6	HHCS - 1/2"-13 UNC x 2" Lg Zinc Plt
43	Commercial	4	HHCS - 1/2"-13 UNC x 2-1/4" Lg Zinc Plt
44	Commercial	14	Hex Nut - 1/2"-13 UNC - Zinc Plt
45	Commercial	14	Lock Washer - 1/2" ID - Zinc Plt
46	Commercial	24	Flat Washer - 1/2" ID - Zinc Plt
47	Commercial	8	Flat Washer Hardend - 5/8" ID - Zinc Plt
48	Commercial	4	Flat Washer - 1/4" ID - Zinc Plt
49	AGSE-E10801-P02	1	Cradle Weldment
50	AGSE-E10804-P04	1	Cable Support Beam
51	AGSE-E10804-P05	1	Cable Support Beam
52	AGSE-E10803-P09	2	FWD Bootstrap Reaction Block
53	AGSE-E10803-P10	2	Storage Bracket
54	Commercial	4	HHCS - 1/2"-13 UNC x 1-3/4" Lg Zinc Plt
55	Commercial	4	SHCS - 3/4"-10 UNC x 4-1/2" Lg Zinc Plt
56	Commercial	4	Hex Nut - 3/4"-10 UNC - Zinc Plt







**DETAIL A** 









### IPB Figure 5 - AGSE-E108-G04 Cradle Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E108-G04		Cradle Assy
			(Illustration Figure 8.5-1 through Figure 8.5-3)
6	AGSE-E10805-P03	2	Cap
7	AGSE-E10805-P04	2	Index Pin
8	AGSE-E10805-P05	4	Set Collar - Modified
9	AGSE-E10805-P06	2	Set Screw - Modified
10	AGSE-E10806-P01	1	FWD Engine Support Weldment
11	AGSE-E10806-P02	1	FWD Engine Support Weldment
12	AGSE-E10806-P03	1	FWD Mount - LH
			(Used on AGSE-E108-G04 - GE90-115B)
13	AGSE-E10806-P04	1	FWD Mount - RH
			(Used on AGSE-E108-G04 - GE90-115B)
14	AGSE-E10807-S01	1	FWD Lift Cable Installation (See IPR Figure 5 for Details)
15	AGSE E10807 S02	1	AET Lift Cable Installation
15	AGSE-E10007-502	1	(See IPB Figure 6 for Details)
16	AGSE-E10809-P02	2	UHMW Bar
17	9426M25G01	2	AFT Mount Assy
			(See IPB Figure 8 for Details)
18	AGSE-E10811-P01	4	Cable Beam to Shock Safety Pin
19	CL-8-BLPT-4.0	4	T-Handle Ball Lock Pin
20	CL-10-BLPT-1.50-S	1	T-Handle Ball Lock Pin
21	AGSE-E10811-P02	4	Cable Beam to Cradle Safety Pin
22	AM-2787-3	2	Tie-Down Placard
23	Commercial	8	HHCS - 5/8"-11 UNC x 1-3/4" Lg.
24	Commercial	8	Lock Washer - 5/8" Dia.
25	Commercial	2	Jam Nut - 1"-8 UNC
26	Commercial	2	Lock Washer - 1" Dia.
27	Commercial	4	HHCS - 1/4"-20 UNC x 1" Lg Zinc Plt
28	Commercial	4	Lock Washer - 1/4" Dia.
29	Commercial	4	FHCS - #10-24 UNC x 1/2" Lg.

### IPB Figure 5 - AGSE-E108-G04 Cradle Assembly (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
30	Commercial	8	Drive Screw098" Dia. x 1/4" Lg.
31	Commercial	2	Spring Pin - 1/8" Dia. x 1" Lg.
32	AGSE-E10810-S01	1	Lift System Hyd Installation (See IPB Figure 7 for Details)
35	TA485-12	1	Document Holder
36	3AJ1.250-12CLF	16	Cap Screw - 12 Pt 3/8-24 UNF x 1-1/4" Lg SS
37	AGSE-E10805-P07	1	FWD Mount - LH (Used on AGSE-E108-G04 - GE90-94B)
38	AGSE-E10805-P08	1	FWD Mount - RH (Used on AGSE-E108-G04 - GE90-94B)
39	CL-12-BLPT-1.50-S	1	T-Handle Ball Lock Pin
40	AM-90750-24T-H900	1	Safety Pin - 3/4" Dia.
41	AM-90623-24T-H900	1	Safety Pin - 5/8" Dia
42	Commercial	6	HHCS - 1/2"-13 UNC x 2" Lg Zinc Plt
43	Commercial	4	HHCS - 1/2"-13 UNC x 2-1/4" Lg Zinc Plt
44	Commercial	14	Hex Nut - 1/2"-13 UNC - Zinc Plt
45	Commercial	14	Lock Washer - 1/2" ID - Zinc Plt
46	Commercial	24	Flat Washer - 1/2" ID - Zinc Plt
47	Commercial	8	Flat Washer Hardended- 5/8" ID - Zinc Plt
48	Commercial	4	Flat Washer - 1/4" ID - Zinc Plt
49	AGSE-E10801-P02	1	Cradle Weldment
50	AGSE-E10804-P04	1	Cable Support Beam
51	AGSE-E10804-P05	1	Cable Support Beam
52	AGSE-E10803-P09	2	FWD Bootstrap Reaction Block
53	AGSE-E10803-P10	2	Storage Bracket
54	Commercial	4	HHCS - 1/2"-13 UNC x 1-3/4" Lg Zinc Plt
55	Commercial	4	SHCS - 3/4"-10 UNC x 4-1/2" Lg Zinc Plt
56	Commercial	4	Hex Nut - 3/4"-10 UNC - Zinc Plt







**DETAIL A** 









## IPB Figure 6 - AGSE-E10712-S01 Jack Leg Hydraulic System

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E10712-S01	-	Jack Leg Hydraulic System (Illustration Figure 8.6-1)
1	AGSE-S00312-P01	1	Hand Pump
2	Commercial	A/R	Tube - 3/8" OD x .035W
3	6-6FBTX-S	5	Male Conn. Fitting - 3/8T x 3/8P
4	6JBTX-S	2	Union Tee Fitting - 3/8T
8	6CBTX-S	1	Male Elbow
9	6FBTX-S	2	Male Connector
10	3/8-FF-S	1	Hex Pipe Nipple - 3/8" NPT
11	RC1010	4	Hydraulic Cylinder - 10" Stroke
12	3225T23	30	Cushioned Tube Clamp
13	Commercial	30	HHCS - 1/4"-20 UNC x 1" Lg
14	Commercial	4	HHCS - 3/8"-16 UNC x 1" Lg
15	Commercial	4	Lock Washer - 3/8" ID
17	AGSE-E10712-P02	2	Hose Assembly - LHS
18	AGSE-E10712-P03	2	Hose Assembly - RHS
19	FDBA-LAN-GAB	1	Flow Control Valve w/Body
20	700154	1	Directional Control Valve
21	AGSE-E21522-P01	1	Valve Mounting Bracket
22	Commercial	4	SHCS #10-24 UNC x 1" Lg
23	Commercial	4	Flat Washer - #10 ID
24	Commercial	4	Lock Washer - #10 ID
25	Commercial	3	FSHCS - 3/8"-16 UNC x 1" Lg

### IPB Figure 6 - AGSE-E10712-S01 Jack Leg Hydraulic System (Continue)

#### **ITEM PART NUMBER**

#### QTY PART DESCRIPTION

- 26 6-6CBTX-S
- 1 Elbow
- 27 AGSE-E17510-P02
- 28 Commercial
- 37 Commercial
- 38 Commercial
- 39 Commercial
- 40 991004
- 41 AGSE-E10709-S01

- 1 Valve Guard
- 2 Pan Head Screw 1/4"-20 UNC x 1" Lg
- 30 Flat Washer 1/4" ID
- 30 Lock Washer 1/4" ID
- 4 Flat Washer 3/8" ID
- 1 Tamper Resistant Cap
- 4 Jacking Leg Assembly (See IPB Figure 10 for Details)



Figure 8.6-1 AGSE-E10712-S01 Jacking Leg Hydraulic System

### IPB Figure 7 - AGSE-E10807-S01 FWD Lift Cable Installation

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E10807-S01	-	FWD Lift Cable Installation (Illustration Figure 8.7-1)
4	AGSE-E10807-P04	1	FWD Cable Assy
7	AGSE-E10808-P01	1	Threaded Shaft
9	AGSE-E10808-P03	2	Sheave Shaft
10	AGSE-E10808-P04	1	Sheave Shaft
11	AGSE-E10808-P05	2	Sheave Shaft
12	AGSE-E10809-P01	1	Cyl/Cable Adapter Plate Weldment
13	AGSE-E10811-P03	2	Spherical Washer
14	472697	4	Wire Rope Sheave 5-7/8" Dia x 1-1/2" Dia Bore
15	473268	5	Wire Rope Sheave 8" Dia x 1-1/2" Dia Bore
16	TCL-24-12-SS	2	Threaded Split Set Collar - 1-1/2"-12 UNF
17	TT-2008	6	Thrust Bearing - Bronze 1-1/2" ID x 2" OD x 1/8" Thick
18	Commercial	10	HHCS - 1/4"-20 UNC x 3/4" Lg
19	Commercial	10	Lock Washer - 1/4" ID
20	Commercial	2	Lock Nut - 1-1/4"-7 UNC
21	Commercial	4	Flat Washer - 1-1/4" - SAE
22	Commercial	4	HHCS - 5/8"-11 UNC x 3" Lg
23	Commercial	4	Flat Washer - 5/8" ID
24	Commercial	4	Lock Nut - 5/8"-11 UNC
25	3088K16	2	Grease Fitting - Brass - 1/8" NPT
27	Commercial	10	Flat Washer - 1/4" ID



Figure 8.7-1 AGSE-E10807-S01 FWD Lift Cable Installation

### IPB Figure 8 - AGSE-E10807-S02 AFT Lift Cable Installation

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E10807-S02	-	AFT Lift Cable Installation (Illustration Figure 8.8-1)
5	AGSE-E10807-P05	1	AFT Cable Assy
6	AGSE-E10807-P06	1	AFT Cable Assy
8	AGSE-E10808-P02	2	Sheave Shaft
13	AGSE-E10811-P03	2	Spherical Washer
14	472697	2	Wire Rope Sheave 5-7/8" Dia x 1-1/2" Dia Bore
18	Commercial	4	HHCS - 1/4"-20UNC x 3/4" Lg
19	Commercial	4	Lock Washer - 1/4" ID
20	Commercial	4	Lock Nut - 1-1/4"-7 UNC
21	Commercial	4	Flat Washer - 1-1/4" SAE
25	3088K16	6	Grease Fitting - Brass - 1/8" NPT
26	Commercial	2	Jam Nut - 1-1/4"-7 UNC - Zinc Plt
27	Commercial	4	Flat Washer - 1/4" ID



Figure 8.8-1 AGSE-E10807-S02 AFT Lift Cable Installation

## IPB Figure 9 - AGSE-E10810-S01 Lift System Hydraulic Installation

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E10810-S01	-	Lift System Hydraulic Installation (Illustration Figure 8.9-1)
1	AGSE-E10810-P01	1	Cable Cover Screen
3	SCD-1024	1	2-Stage Single Acting Hyd Cylinder 30" Stroke
4	FQEA-XAN-DAC 2.5 GPM	[ 1	Flow Fuse Valve w/ Body - 90° Aluminum (2) - 1/2 NPTF Port
5	1/2-FF-S	1	Nipple - 1/2P x 1/2P
6	1 x 1/2 PRT-S	1	Reducing Bushing - 1P x 1/2P
7	6-6CBTX-S	1	JIC Long Elbow - 3/8P x 1/2 - 37 <sup>o</sup>
8	3/8-FF-S	1	Nipple - 3/8P x 3/8P
9	3/8-MMO-S	1	Female Tee - 3/8 NPT
10	6-8FBTX-S	1	JIC Male Connector - 1/2P x 3/8P - 37°
11	Commercial	1	Tube - 3/8" OD x .035"W - SS
16	Commercial	4	HHCS - 1/2"-13 UNC x 1-1/2" Lg - Zinc Plt
17	Commercial	4	Flat Washer - 1/2" ID - Zinc Plt
18	Commercial	12	HHCS - 1/4"-20 UNC x 3/4" Lg
19	Commercial	4	HHCS - 3/8"-16UNC x 1-1/2" Lg
20	Commercial	4	Lock Washer - 3/8" ID - Zinc Plt
21	Commercial	4	Hex Nut - 3/8"-16 UNC
22	Commercial	1	Ang - 1-1/2" x 1-1/2" x 3/16" x 5"
23	Comemrcial	1	Ang - 1-1/2 x 1-1/2 x 3/16 x 3
24	Commercial	12	Flat Washer - 1/4" ID - Zinc Plt
26	SCD-1046-1	1	Liquid Filled Gauge 4,000 PSI
27	3/8x1/4PTR-S	1	Hyd Pipe Reducer
28	Commercial	12	Lock Washer - 1/4" ID - Zinc Plt
29	Commercial	4	Flat Washer - 3/8" ID - Zinc Plt
30	Commercial	4	Lock Washer - 1/2" ID - Zinc Plt
31	101097	1	Hand Pump - 3000 PSI



Figure 8.9-1 AGSE-E10810-S01 Lift System Hydraulic Installation

Page 8.28 AGSE-E102-G04/G05 (9C6025P04/P05) Up-Lift Propulsor Air/Truck Shipping Stand Rev. C

### IPB Figure 10 - 9426M25G01 AFT Mount Adapter Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	9426M25G01	-	AFT Mount Adapter Assy (Illustration Figure 8.10-1)
2	9426M25P02	1	Shaft
3	9426M25P03	1	Base
4	9426M25P04	1	Block - Indexing
5	9426M25P05	1	Bar - Retainer
6	9426M25P06	1	Retainer
7	9426M25P07	1	Locator
8	9426M25P08	1	Washer - Retaining
9	AM-90625-L-SPCL	2	Safety Pin Assy (Alt P/N 9426M39G44)
10	TCL24-12SS	2	Collar - Threaded - Clamp
11	10SF16	1	Bearing - Spherical - Plain - RDL
12	S00116-N10F06A05	3	Screw - Cap - Skt Flat Hd
13	MS16995-78	1	Screw - Cap - Skt Hd - SST - .375-16UNC x .5 Lg
14	MS35307-460	1	Screw - Mach - Pan Hd - SST - .190-24UNC x .5 Lg
15	AS3237-14	2	Hex Bolt, 1/4"-28UNJF x 1" Lg
16	J1092P04	2	Hex Nut, Self Locking, 1/4"-28UNJF



Figure 8.10-1 9426M25G01 Aft Mount Adapter Assembly

#### IPB Figure 11 - AGSE-E10812-S01 Hydraulic Installation (Air Pump Assist)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E10812-S01		Installation Pneumatic Pump (Air Assist) (Illustration Figure 8.11-1)
1	HIHP-S5L-30224	1	Air/Hyd Pump Kit Including Filter/Regulator Unit with Gage and Inlet Shutoff Valve
2	AGSE-E10812-P01	1	Pump Mounting Bracket
4	AGSE-S00131-06A17	4	Flat Washer - 3/8" ID - Zinc Plt
5	AGSE-S00135-06A17	4	Lock Washer - 3/8" ID - Zinc Plt
6	AGSE-S00104-06C016A01	4	HHCS - 3/8"-16 UNC x 1" Lg Gr. 5 - Zinc Plt
8	AGSE-E10812-P02	1	Filter-Regulator Mount Plate
9	AGSE-E10812-P03	1	Filter-Regulator Cover
10	AGSE-E10812-P04	1	Support Plate
11	AGSE-S00118-04C072A07	4	SHCS - 1/4"-20 UNC x 4-1/2" Lg
12	AGSE-S00153-04CA01	4	Lock Nut - 1/4"-20 UNC - Gr. 5 - Zinc Plt
13	AGSE-S00131-04A17	8	Flat Washer - 1/4" ID - Zinc Plt
15	6-8CBTX-S	2	Male Elbow - $1/2P \ge 3/8T$
16	6-8 FBTX-S	1	Male Connector - 3/8T x 1/2P
17	6-6 FBTX-S	2	Male Connector - 3/8T x 3/8P
18	1/2 x 3/8 CD-S	1	Street Elbow - 1/2P x 1/2P
19	6-6-6 SBTX-S	1	Male Branch Tee - 3/8T x 3/8P
21	6-6CBTX-S	1	Male Elbow - 3/8P x 3/8T
22	Commercial	10 FT	Tube - 3/8 OD x .035W - SS
26	8-3/8AOEG-S	1	Female Pipe Elbow
27	3225T23	1	Rubber-Cushioned Loop Clamp
30	1/2 FF-S	1	Pipe Nipple - 1/2"-14 x 1/2"-14 NPTF
31	3/8-FF-S	1	Pipe Nipple - 3/8" x 3/8" NPTF
32	3/8-MMO-S	1	Female Pipe Tee - 3/8" NPT
33	6-8GBTX-S	6	Female Connector - 3/8T x 1/2P
34	FQEA-XAN-DAC 2.5 GPM	1	Flow Fuse Valve with Body 90 Degree Aluminum and (2) 1/2" NPTF Ports
35	1/2-FF-S	1	Nipple - 1/2P x 1/2P
36	1 x 1/2 PTR -S	1	Reducing Bushing - 1P x 1/2P
37	101097	1	Hand Pump - 3000 PSI
38	B18-04-FKG0	1	Air Regulator

Page 8.31

### IPB Figure 11 - AGSE-E10812-S01 Hydraulic Installation (Air Pump Assist)



Figure 8.11-1 AGSE-E10812-S01 Lift System Hydraulic Installation (Air Assist)

## IPB Figure 12 - AGSE-E10709-S01 Jacking Leg Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-E10709-S01	-	Jacking Leg Assembly (Illustration Figure 8.12-1)
1	AGSE-E10709-P01	1	Jacking Leg Weldment
2	AGSE-E10709-P02	1	Pivot Block
3	AGSE-E10709-P03	2	Pivot Pin
4	AGSE-E10709-P04	1	Leveling Pad



Figure 8.12-1 AGSE-E10709-S01 Jacking Leg 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 (Illustration Figure 9.2-1 through Figure 9.2-3)

#### 9.2.1 Base Assembly







Figure 9.2-2





#### 9.2.2 Cradle Assembly (Illustration Figure 9.2-4 through Figure 9.2-7)

















DETAIL H

Figure 9.2-6





INSIDE VIEW FWD CASTERS DNLY

SIDE VIEW IN STOW POSITION





INSIDE VIEW AFT CASTER

SIDE VIEW AFT CASTER





# **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 Description

472697	2	Wire Rope Sheave 5-7/8" Dia. x 1-1/2" Dia Bore
473268	2	Wire Rope Sheave 5-7/8" Dia. x 1-1/2" Dia Bore
AGSE-E10807-P04	1	FWD Cable Assembly
AGSE-E10807-P05	1	AFT Cable Assembly
AGSE-E10807-P06	1	AFT Cable Assembly
FQEA-XAN-DAC		
2.5 GPM	1	Flow Fuse Valve w/ Body
TCL24-12SS	2	Lock Collar
10SF16	2	Spherical Bearing
AGSE-E10805-P06	2	Set Screw - Modified
Commercial	2	Jam Nut - 1-8UNC
Commercial	2	Lock Washer - 1" Dia.
Commercial	2	Spring Pin - 1/8" Dia. x 1" Lg.
101097	1	Hydraulic Hand Pump - 3000 PSI
CL-8-BLPT-4.0	1	"T" Handle Ball Lock Pin