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AM-1965-700

Lightweight Breakdown Stand

For CF6-80C2 Series Engines

Used On B-747, B-767



LATEST MANUAL REVISION LEVEL..... 1/9/2024 (Rev A)

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Notice

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

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

These modifications include but are not limited to:

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

Requests for modifications should be submitted to AGSE for review – please send modification requests to **<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

SECTION	DESCRIPTION	PAGE(S)
1.0	Revisions	1.0
2.0	Layout Illustration	2.0
3.0	Specification	3.0
3.1	General	3.0
3.2	Mobility	3.0
3 3	Design	3.0
3.4.	Fabrication and Finish	3.0
3.5	Characteristics	3.1
4.0	Maintenance and Inspection	4.0
4.1	General	4.0
4.2	Cleaning and Painting	4.0
4.3	Scheduled Service.	4.0
4.4	Scheduled Inspection	4.1
5.0	Operation.	5.0
5.1	Stand Erection	5.0
5.2	Engine Installation into Stand Using Overhead Sling	5.6
5.3	Engine Bootstrapping	5.8
6.0	Safety	6.0
6.1	Stress	6.0
6.2	General	6.0
6.3	Prevention	6.0
7.0	Warranty	
7.1	Statement of Warranty	
8.0	Parts Breakdown	8.0
8.1	General	8.0
8.2	Illustrated Parts Breakdown	8.1
8.2	IPB Figure 1 - AM-1965-700 Lt. Wt. Breakdown Stand Ass	y 8.1
8.2	IPB Figure 2 - AM-1965-700 Light Weight Breakdown Star	nd 8.3
9.0	Stencils, Decals, and Placards	9.0
9.1	General	9.0
9.2	Stencils and Placards	9.0
10.0	Recommended Spare Parts List	10.0
10.1	Critical Items	10.0

1.0 – Revisions

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

PAGEREVDESCRIPTION OF CHANGEDATE

NC New

1/9/2024

2.0 – Illustration



Figure 2.0-1 - Lightweight Breakdown Stand

AM-1965-700 - Lightweight Breakdown Stand

Page 2.0 Jan 9, 2024 Rev. NC



Figure 2.0-2 - Lightweight Breakdown Stand

Page 2.1 Jan 9, 2024 Rev. NC



Figure 2.0-3 - Lightweight Breakdown Stand with Engine

Page 2.2 Jan 9, 2024 Rev. NC

3.0 – Specification

3.1 General

The AM-1965 Light Weight Breakdown Stand is designed to support the General Electric CF6-80C2 Engine in full QEC configuration. The stand is compliant with applicable GE Specifications as they relate to engine interface and strength. The stand is designed for site transportation only, not air or truck shipment. The stand un-pins and folds to minimize empty shipping volume and can be shipped in the lower cargo compartments of a B737. Bootstrap points are provided on the stand for engine hoisting onto B747 & B767.

3.2 Mobility

Four caster assemblies support the stand. Each caster assembly offers a 3.0 inch wide by 10.0 inch diameter wheel for easy mobility and a weight capacity of 2,520 pounds each. Polyurethane tread wheels, swivel locks, and brakes are standard. The stand is towable from the aft end only with a two piece, telescoping towbar. Maximum towing speed for entire stand (with engine) is 5 Km/h (3 MPH).

CAUTION

Failure to unlock the lead casters (towbar end) during towing of the stand will result in flat spots being worn into the caster tread.

3.3 Design

The AM-1965-700 Light Weight Breakdown Stand consists of a pinned and bolted assembly of welded steel frame components with removable engine ground handling mounts compatible with the CF6-80C2 Engine. The mounts attach to the fan case and low pressure turbine case. Tubular arms support the engine handling mounts. Bootstrap points for the B747 & B767 Aircraft are provided.

3.4 Fabrication and Finish

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

3.5 Characteristics

3.5.1 Dimensions

Dimensions and weight are provided in the figures below. All dimensions and weights are approximated and reference only.

Length (In.) - Without Engine	165 7/32
Width (In.) - Without Engine	104
Height (In.) - Without Engine	72 5/8
Length (In.)W/ Towbar - Without Engine	165 7/32
Ground Clearance (In.)	11 11/16
Total Stand Weight (Lbs)	1,228





Figure 3.5.1-1 - Lightweight Breakdown Stand

3.5.2 Dimensions

Dimensions and weight are provided in the figures below. All dimensions and weights are approximated and reference only.

Length (In.) - With Engine	186 13/16
Width (In.) - With Engine	104
Height (In.) - With Engine	119 1/8
Length (In.) - W/ Towbar	214 7/16
Ground Clearance (In.)	11 11/16





Figure 3.5.1-2 - Lightweight Breakdown Stand

4.0 – Maintenance and Inspection

4.1 General

Life expectancy of the stand can be extended indefinitely, 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 structural integrity is not compromised.

4.2 Cleaning and Painting

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

CAUTION

Re-lubricate bearings and screw shaft after cleaning stand.

Damaged paint should be touched-up with paint provided by AGSE or other Skydrol resistant highgrade enamel paint. Superficial scratches are expected during normal usage and will not affect function.

4.3 Scheduled Service

All zerk fittings on the casters 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

Visual inspection of the swivel locks and brakes 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

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 structural integrity is not compromised.

Annual inspections of machined surfaces, pins, fasteners, and structure are recommended. The machined surfaces (wheels, axles, pivots) 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.

5.0 – Operation

5.1 Stand Erection

- 1) Remove stand components from the shipping container or pallet and inspect for obvious damage.
- 2) Assemble the left and right frame halve pieces (FWD and AFT pieces) together with the hardware provided. Ensure casters are parallel to frame, and swivel locks and brakes are set. See Figure 5.1-1.



A hoist and straps may be used to prop left and right frames while attaching the forward and aft frame pieces.

- 3) Attach the AFT Center frame assembly to the left and right frame assemblies using safety pins provided. See Figure 5.1-2.
- 5) Attach the FWD Center frame with brace assembly to the left and right frame assemblies using the safety pins. Left and right frame halves may be swiveled to aid in hole alignment. See Figure 5.1-3.
- 6) Attach left and right AFT mount with braces using safety pin assemblies. See Figure 5.1-4.
- Rotate left and right side frame brace from its storage position to attach to AFT mount. See Figure 5.1-5
- 8) Attach FWD boot strap adapter to left and right frame assemblies utilissing safety pins. See Figure 5.1-6.
- 9) Attach FWD mount assemblies to left and right frame assemblies by installing safety pins. See Figure 5.1-7.
- Insert spreader bar into saddles on AFT side and pin into position with safety pins. See Figure 5.1-8
- 11) Attach towbars to aft end of stand, See Figure 5.1-9.
- 12) Stand is now erect and ready for use.



Figure 5.1-1 Left and Right Frame Halves.



Figure 5.1-2 AFT Center Frame



Figure 5.1-3 FWD Center Frame

Page 5.2 Jan 9, 2024 Rev. NC



Figure 5.1-4 AFT Mount With Brace



Figure 5.1-5 Side Brace & AFT Mount

Page 5.3 Jan 9, 2024 Rev. NC



Figure 5.1-6 AFT Mount With Brace



Figure 5.1-7 Side Brace & AFT Mount

Page 5.4 Jan 9, 2024 Rev. NC



Figure 5.1-8 Spreader Bar AFT Side



Figure 5.1-9 Towbars

Page 5.5 Jan 9, 2024 Rev. NC

5.2 Engine Installation into Stand Using Overhead Sling

- 1) Inspect stand for obvious damage.
- 2) Install forward ground handling mounts to the engine fan case using hardware provided. Install the safety clips on all pins after inserting them.
- 3) Position the stand beneath the engine and set the caster brakes.

CAUTION

Do Not exceed 10Ft.-Lbs. to torque on cap screws.

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.

WARNING

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

- 4) Open the saddles on the AFT ground handling mounts and remove the trunnions. Insert the trunnions into the receptacles on the case and support by hand.
- 5) Adjust spanner nut on AFT mount (as shown in Figure 5.2-2) to ensure trunnion is fully engaged into bearing cup.
- 6) Lower the engine until the AFT mount trunnions are fully seated. Install both pins on each saddle and install the safety clips on the pins. See Figure 5.2-2.
- 7) Continue to lower the engine until the FWD mount assembly is pinned to the FWD spud weldment. See Figure 5.2-3.
- 8) Lower the engine until the stand supports the full weight of the engine.
- 9) Remove the engine sling.





Page 5.7 Jan 9, 2024 Rev. NC



Figure 5.2-2 AFT Engine Mount Installation.



Figure 5.2-3 FWD Engine Mount Installation.

Page 5.8 Jan 9, 2024 Rev. NC

5.3 Engine Bootstrapping

CAUTION

This procedure is not intended to replace the Boing Bootstrap Procedure. It identifies the required steps to configure and use the equipment during engine bootstrapping. It shall not be used as a replacement for engine installation or removal.

WARNING

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

- 1) Inspect stand for obvious damage.
- 2) Approaching from the front of the engine (on wing) move the empty stand aftward until the stand is beneath the engine.
- 3) Hook the hoists to the bootstrap adapters.
- 4) Raise the stand and engine in accordance with the Boing engine installation procedure, until the engine is secured to the aircraft pylon.
- 5) Release the engine handling mounts and lower the empty stand using the bootstrap system.
- 6) Remove the engine ground handling mounts from the engine and install them on the stand.
- 7) Remove the bootstrap system from the aircraft and cradle.



Figure 5.3-1 Bootstrapping Location

Page 5.8 Jan 9, 2024 Rev. NC

6.0 – SAFETY

6.1 Stress

Design stress safety factors are compliant with applicable GE Specifications.

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.

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 Parts List only. Do not order replacement parts by "ITEM" number. Order parts by "PART NUMBER" only.

8.2 Illustrated Parts Breakdown

IPB Figure 1 - AM-1965-700 Light Weight Breakdown Stand

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AM-1965-700	-	Lt. Wt. Breakdown Stand Assy (Figure 8.1-1)
1	AM-1965-700-101	1	AFT Center Frame With Bootstrap Beam Supp
2	AM-1965-700-102	1	L.H. FWD Side Frame
3	AM-1965-700-103	1	R.H. FWD Side Frame
4	AM-1965-700-104	1	FWD Center Frame With Braces
5	AM-1965-700-105	1	L.H. AFT Side Frame With Caster & Brace
6	AM-1965-700-106	1	R.H. AFT Side Frame With Caster & Brace
7	AM-1965-700-107	1	L.H. AFT Mount With Brace
8	AM-1965-700-108	1	R.H. AFT Mount With Brace
9	AM-1965-700-109	1	AFT Bootstrap Beam
10	AM-1965-700-110	2	FWD Mount
11	AM-1965-700-111	1	L.H. FWD Bootstrap Adapter
12	AM-1965-700-112	1	R.H. FWD Bootstrap Adapte
13	AM-1965-700-113	2	Towbar



Figure 8.1-1 Light Weight Breakdown Stand Assembly

Page 8.2 Jan 9, 2024 Rev. NC

IPB Figure 2 - AM-1965-700 Light Weight Breakdown Stand

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AM-1965-700	-	Lt. Wt. Breakdown Stand Assy (Figure 8.2-1)
1	AGSE-S00310-P53	4	Caster Assy
2	AGSE-S00104-08C020A01	1 16	Screw, Hex Head
3	AGSE-S00135-08A17	24	Washer, Locking
4	AGSE-S00104-08C040A03	1 8	Screw, Hex Head
5	AGSE-S00131-08A17	8	Washer
6	AGSE-S00150-08CA01	8	Nut
7	AM-9001	2	Safety Pin Assy
8	AM-1965-409	2	Spud Weldment
12	AM-1965-210	1	L.H. AFT Mount Support
13	AM-1965-218	1	R.H. AFT Mount Support
14	AM-1965-231	4	Brace
15	AM-1965-303	1	FWD Center Frame
16	AM-90750-48T	16	Safety Pin Assy
17	AGSE-S00104-12F064A01	14	Screw, Hex Head
18	AGSE-S00153-12FA01	14	Nut, Locking
19	AM-1965-304	1	AFT Center Frame
20	AM-1965-227	2	Brace
21	AM-1504-40	2	Tow Bar Assy
22	AM-91000-64T	2	Safety Pin Assy
23	AM-1965-230	2	Brace
26	AM-1965-500	1	L.H. AFT Bootstrap Support
27	AM-1965-501	1	R.H. AFT Bootstrap Support
28	AM-1965-510	2	AFT Bootstrap Bracket
29	AM-90750-68LNC	4	Safety Pin Assy
30	AM-1965-240	4	Brace

IPB Figure 2 - AM-1965-700 Light Weight Breakdown Stand (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
31	AM-1965-514	1	L.H. FWD Bootstrap Adapter
32	AM-1965-515	1	R.H. FWD Bootstrap Adapter
36	AM-1965-136	4	Pipe
37	AM-2245-200	2	FWD Mount Assy
41	AM-1928-K10	1	L.H. Mount Block
42	AM-90500-41T	2	Safety Pin
43	AGSE-S00170-375D032A0	5 1	Slotted Spring Pin
44	AM-1965-239	1	L.H. Adjustable Spindle
45	AM-1928-D10	2	AFT Mount Hold Down
46	AM-1928-G10	2	Hold Down Pin
47	AGSE-S00166-094D012A1	74	Cotter Pin
48	AM-1928-L10	1	R.H. Mount Block
49	AM-1965-238	1	R.H. Fixed Spindle
50	AM-1965-219	2	FWD Mount Assy
51	AM-1901-405	1	Sway Brace Assy
52	AGSE-S00193-P09	2	Threaded Shaft Collar
53	AM-90562-30T	1	Safety Pin
54	AGSE-S00104-12C052A0	1 1	Screw, Hex Head
55	AGSE-S00153-12CA01	1	Nut, Locking
56	AM-1965-801	1	L.H. FWD Side Frame
57	AM-1965-803	1	L.H. AFT Side Frame
58	AM-1965-802	1	R.H. FWD Side Frame
59	AM-1965-804	1	R.H. AFT Side Frame
60	AM-90750-50T	4	Safety Pin
61	AM-1127A-404	1	Spreader Bar
62	AM-90750-56T	4	Safety Pin





DETAIL B



Figure 8.2-1 Light Weight Breakdown Stand, Top Assembly

Page 8.5 Jan 9, 2024 Rev. NC



DETAIL C



Figure 8.2-2 Light Weight Breakdown Stand, Top Assembly

AM-1965-700 - Lightweight Breakdown Stand

Page 8.6 Jan 9, 2024 Rev. NC

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

ITEM	PART NUMBER	QTY	PART DESCRIPTION
1	AM-1965-1000	1	Stencil kit package for AM-1965-700

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	RECOMMENDED STOCK QTY	DESCRIPTION
AM-90750-48T	8	Safety Pin Assy
AM-91000-64T	2	Safety Pin Assy
AM-90750-68LNC	2	Safety Pin Assy
AM-90500-41T	2	Safety Pin
AM-1928-G10	2	Hold Down Pin
AM-90562-30T	1	Safety Pin
AM-90750-50T	2	Safety Pin
AM-90750-56T	2	Safety Pin