AGSE-C034

Core Engine Shipping Container

For CFM56-7 Engines
(856A1257G09)

ORIGINAL MANUAL DATED. 01/12/2000

LATEST MANUAL REVISION LEVEL. . . . . 9/14/2023 (REV A)

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Rev A

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1.0 – Revisions

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

PAGE	REV	DESCRIPTION OF CHANGE	DATE
2.0	A	Updated Figure 2.0-1	9/14/2023
4.0-4.1	A	Updated Section 4.4	9/14/2023
8.1	A	Updated Item 12-24 Part Numbers	9/14/2023
8.2	A	Updated Item 25-36 Part Numbers	9/14/2023
8.3	A	Updated Figure 8.1-1	9/14/2023
8.4	A	Updated Figure 8.1-2	9/14/2023
8.5	A	Added Figure 8.1-3	9/14/2023

2.0 – Illustration

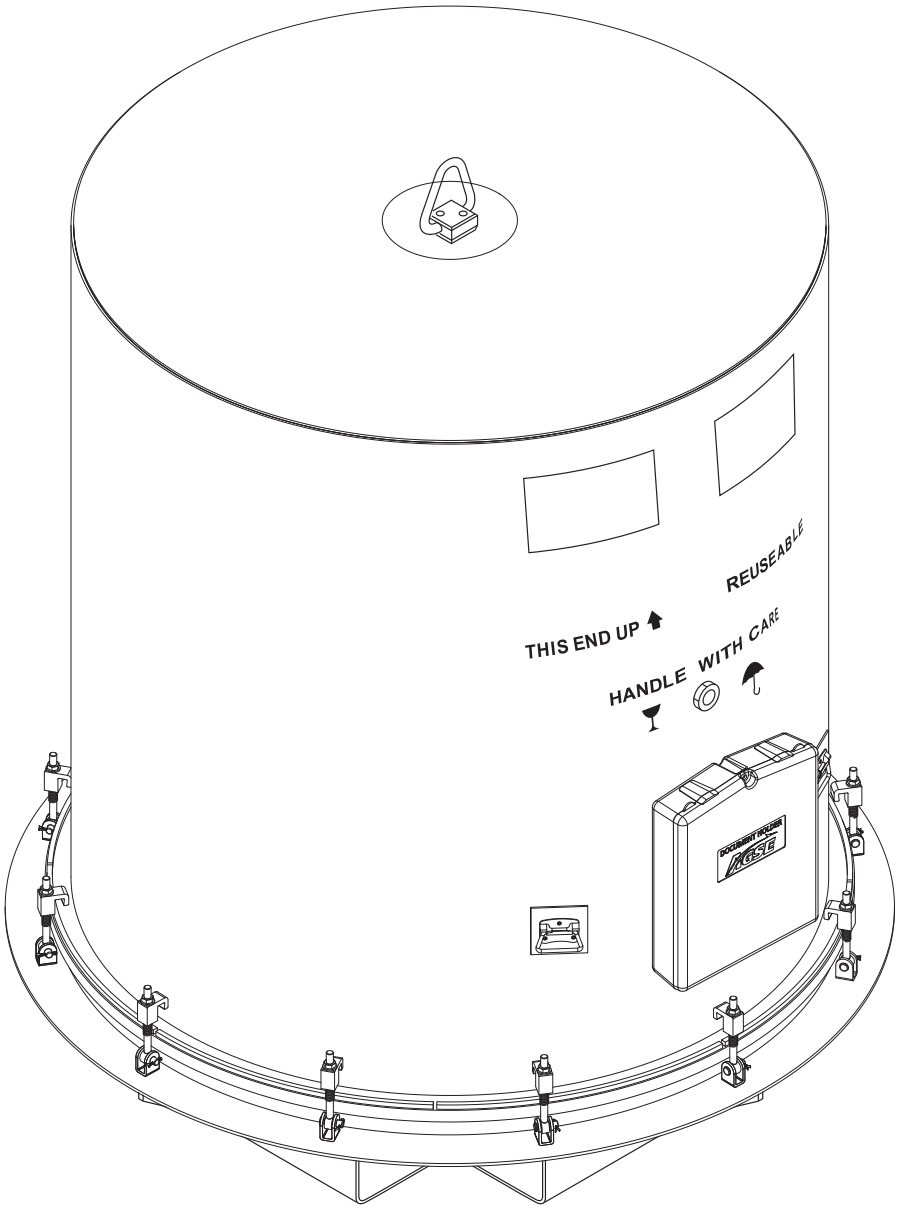


Figure 2.0-1. AGSE-C034 Core Engine Shipping Container

3.0 – Specification

3.1 General

The AGSE-C034 Core Engine Shipping Container is designed to transport and/or store the CFM International CFM56-7 Core Engine. The container is functionally equivalent to the GE designed 856A1257G09 (limited for use on CFM56-7 only). The cover is made of fiberglass and fastens to the welded steel base with standard clamp assemblies. The container has integral shock mounts to protect the core from shipping vibrations and rough handling. The core engine is shipped with the engine axis vertical and the forward end down. A container for loose bolts is included inside the base and a document container is provided on the outside of the cover.

3.2 Mobility

The shipping container is skid mounted and can be lifted by a forklift from all sides. The fork pockets are 4.5 x 9.5 (inside dimensions).

3.3 Design

The shipping container consists of a welded steel shock mounted support base with a mounting plate that centers the compressor case on a rabbet. The forward shaft of the rotor is supported and centered on a phenolic plug. The aft restraint bracket centers and axially restrains the core rotor. The cover is fiberglass. A rubber gasket on the base and rain lip on the cover protects the interior from moisture. A storage box is attached to the base and is used to store the various fasteners.

3.4 Fabrication and Finish

The system 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

Empty Container

Height (IN.)..... 60.0

Diameter (IN.)..... 62.5

Weight (Lbs.)..... 1,100

4.0 – Maintenance and Inspection

4.1 General

Life expectancy of this equipment 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, this equipment should be inspected for obvious signs of abuse or shipping damage. Observed damage should require complete inspection of the affected area to ensure structural integrity is not compromised.

4.2 Cleaning and Painting

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

4.4 Scheduled Inspection

CAUTION

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

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

5.0 – Operation

CAUTION

This procedure is intended to supplement the CFMI procedure for CFM56-7 Core Module shipping.

WARNING

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

5.1 Core Engine Installation

1) Position the container level on the floor (clear of obstructions) and remove the cover.

2) Remove four (4) hex head cap screws and washers from the aft bracket (in storage position). See Figure 5.1-1. Set hardware and aft bracket aside.

3) Re-install the four (4) hex head cap screws into the adapter storage brackets (see Figure 5.1-2). Remove the eight (8) hex head cap screws and lock nuts retaining the adapter storage brackets. Install the adapter storage brackets in their storage position with the eight (8) hex head cap screws and lock nuts. Torque fasteners to 10 ± 2 Ft-Lbs.

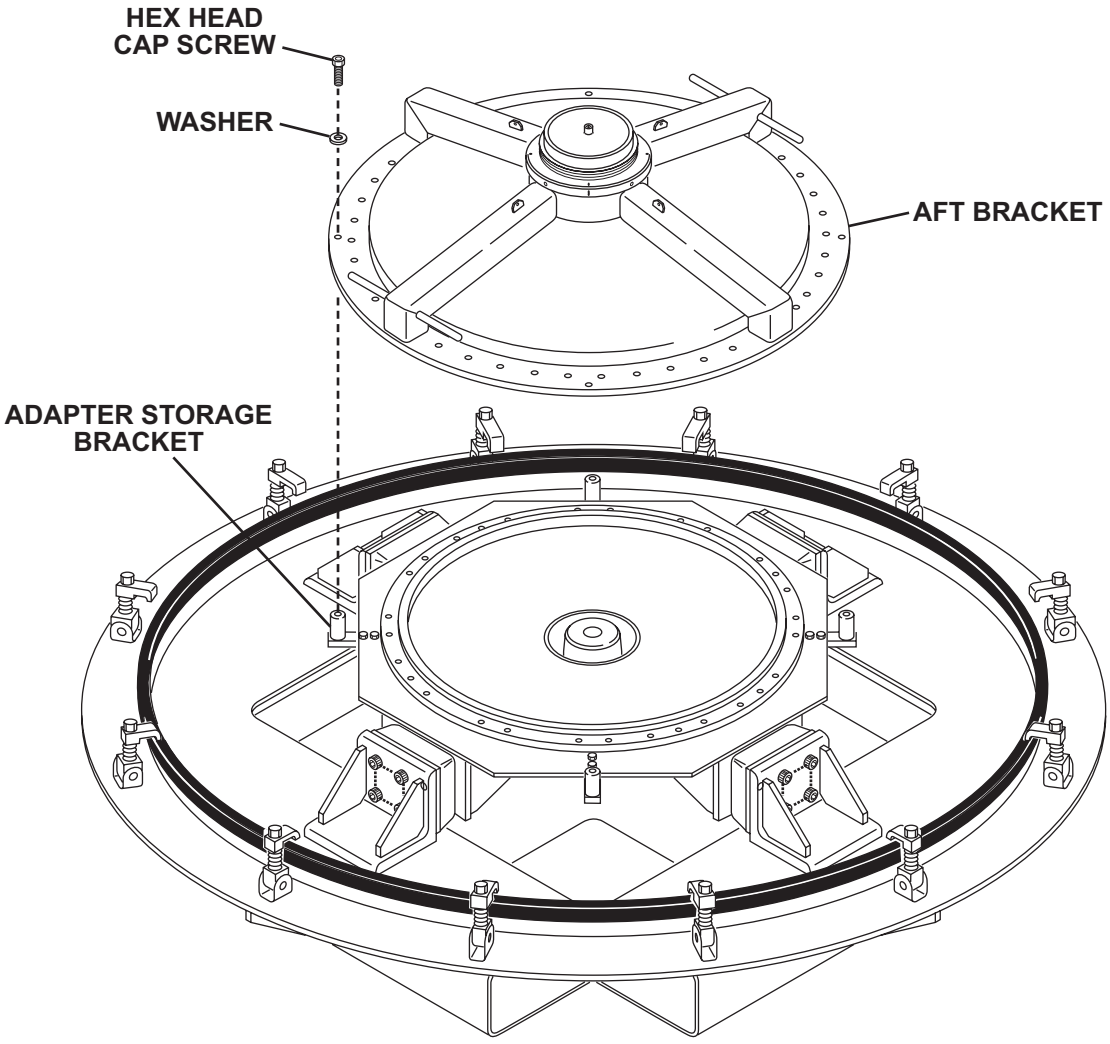


Figure 5.1-1. Aft Bracket Removal.

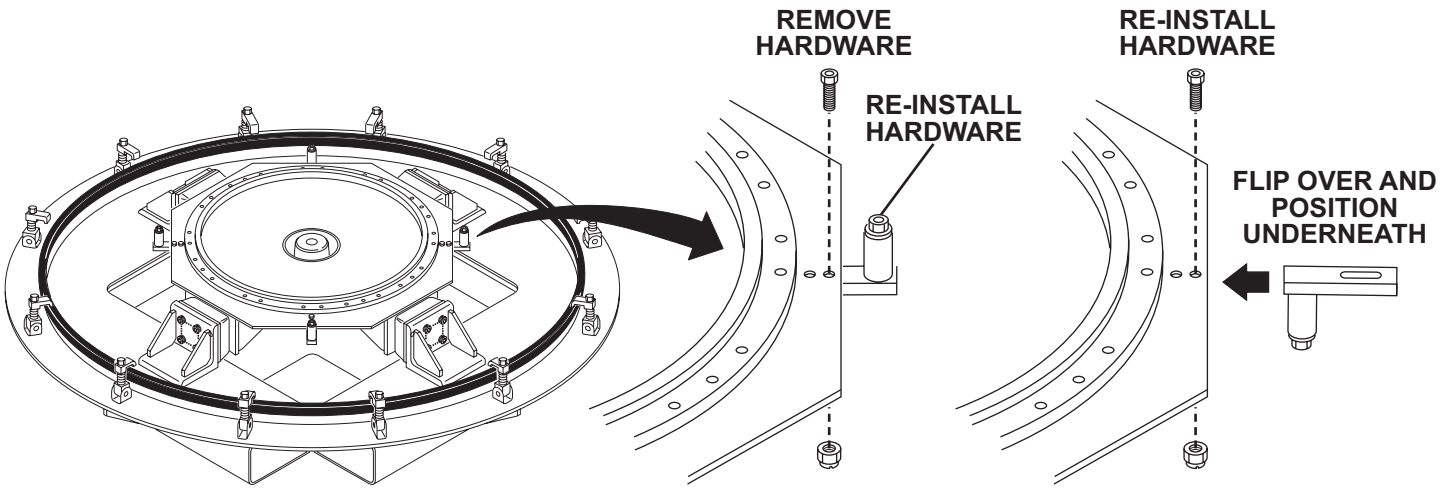


Figure 5.1-2. Adapter Storage Brackets (Storage Position).

4) Position the core engine adjacent to the container in a vertical build up stand, forward end down with the forward strong-back 856A1332 and the aft strong-back 856A1423 installed on the core.

5) Lift the core engine vertically using lift bar 856A1083 (or equivalent) and remove the forward strong-back.

6) Install the core engine on the container base with the shaft centered on the locator plug, and
engage the core engine forward flange to the rabbeted ring on the forward support. Secure with hardware Hex Head Screw (AGSE-S00104-04F012A05) provided. Torque fasteners to 10 ± 2 Ft-Lbs.

7) Remove the aft strong-back 856A1423 from the core engine.

8) Before installing the aft bracket, loosen the jam nut on the aft bracket and retract the threaded plug to provide sufficient axial clearance between the HPTR shaft and the threaded plug. See Figure 5.1-3.

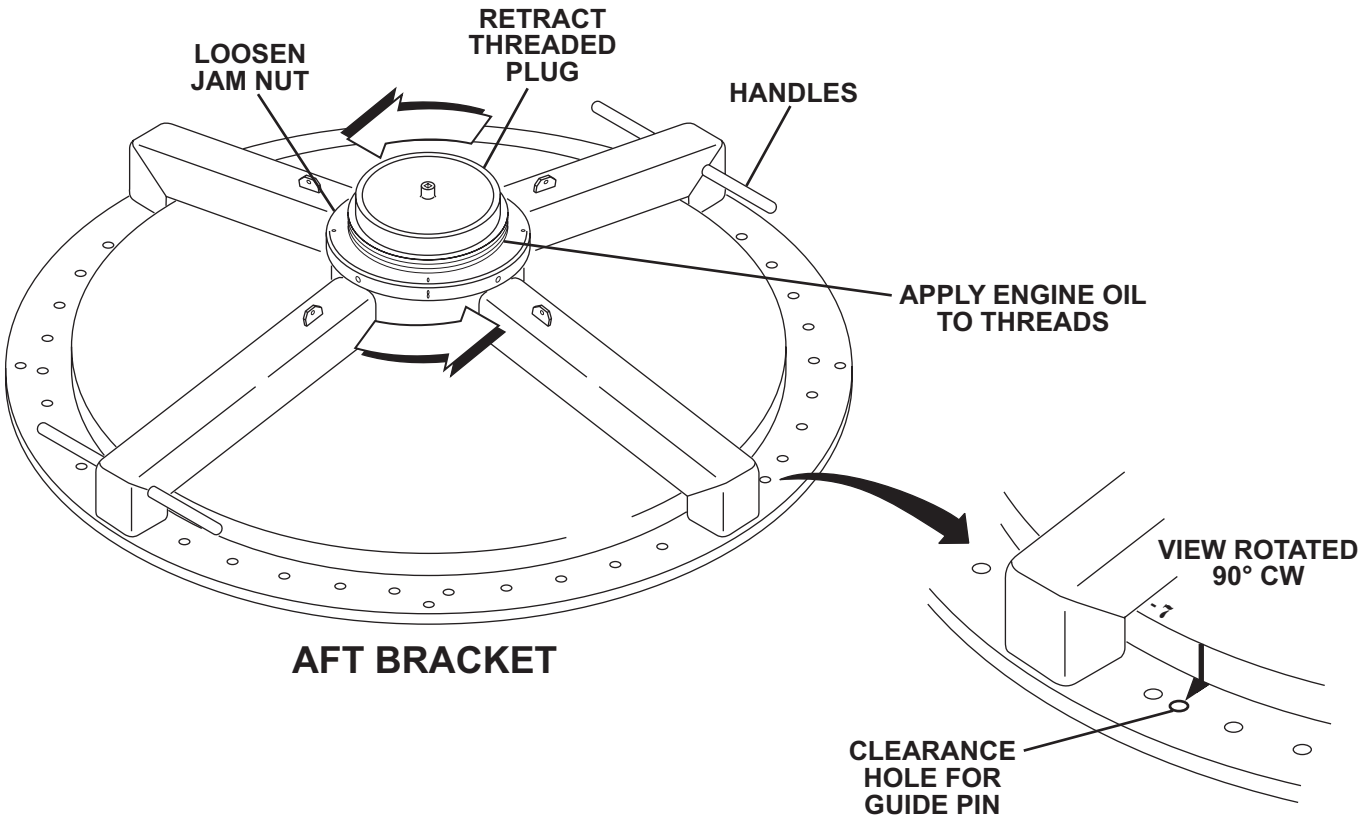


Figure 5.1-3. Aft Bracket Installation.

9) Install the aft bracket in the proper orientation for the engine model. The bracket can be lifted manually by two people using the handles on both sides of the bracket. The aft flange of the core has a guide pin protruding from the flange of Module 12. The bracket has a clearance hole clearly marked to be located on the guide pin to ensure the proper bolt circle will be aligned. Install Hex Head Screw (AGSE-S00104-04F024A05) with Locking Nut (AGSE-S00153-04FA05) provided.

10) Apply a light coating of engine oil to the threads of the jam nut and threaded plug. Turn the threaded plug clockwise until it contacts the HPTR aft shaft. Torque the plug to 5-10 Ft-Lbs.

11) Tighten the jam nut (AGSE-C03404-P03) hand tight and install lock wire.

12) Install cover and secure with the clamp assemblies.

5.2 Core Engine Removal

To remove the core engine, repeat the installation in reverse.

5.3 Empty Container Storage

1) Remove the core engine from the container.

2) Remove the adapter storage brackets (AGSE-C03404-P01) from their storage position under the forward support. Install brackets onto the forward support as shown in Figure 5.1-1. Do not fully tighten screws at this time. This will allow for alignment adjustment when installing the aft bracket.

3) Remove the four (4) socket head cap screws stored on top of the adapter storage brackets, and set aside. Place the aft bracket (AGSE-C03403-P01) on top of the adapter storage brackets. Adjust the adapter storage brackets as needed to align the holes in the aft bracket with the holes in the adapter storage brackets.

4) Install the four socket head cap screws through aft bracket. Tighten all screws at this time (see Figure 5.1-1).

5) Place all remaining hardware (bolts, nuts, etc.) in the storage box located in the base.

6) Install the cover and secure with the clamp assemblies around the perimeter of base. Torque nuts on clamp assemblies 5-10 Ft-Lbs.

6.0 – SAFETY

6.1 Stress

Design stress safety factors are compliant with industry standards.

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 – 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-C034-G01
Core Module Shipping Container

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AGSE-C034-G01	1	Core Module Shipping Container (Illustration Figure 8.1-1)
1	AGSE-C03401-P01	1	Base Assy
2	AGSE-C03402-P01	1	Forward Support Assy
3	AGSE-C03404-P04	1	Locator
4	AGSE-C03403-P01	1	Bracket Assy
5	AGSE-C03404-P03	1	Jam Nut
6	AGSE-C03404-P02	1	Threaded Plug
7	AGSE-C03404-P01	4	Storage Bracket
8	AM-2179-110	1	Fiberglass Cover
9	AGSE-V16401-P01	1	Document Container
10	TA456	2	Observation Window
11	AGSE-S00213-P04	1	Hoist Ring
12	AGSE-S00118-07F012A05	29	Screw, Socked Head
13	AGSE-S00104-04F012A05	8	Screw, Hex Head
14	AGSE-S00131-04A05	44	Washer
15	AGSE-S00104-04F020A05	8	Screw, Hex Head
16	AGSE-S00153-04FA05	48	Nut, Locking
17	AGSE-S00104-06C024A05	1	Screw, Hex Head
18	AGSE-S00131-06A05	3	Washer
19	AGSE-S00284-P03	1	Rubber Seal
20	AGSE-S00105-08F016A01	32	Screw, Hex Head
21	AGSE-S00131-08A17	4	Washer
22	AGSE-S00118-08C040A07	4	Screw, Socket Head
23	AGSE-S00153-08CA01	4	Nut, Locking
24	AGSE-S00104-03C016A01	4	Screw, Hex Head

IPB Figure 1 – AGSE-C034-G01
Core Module Shipping Container (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
25	AGSE-S00153-03CA01	4	Nut, Locking
26	AGSE-S00132-03A17	4	Washer
27	AGSE-S00104-04F024A05	36	Screw, Hex Head
28	AGSE-S00304-P07	4	Shock Mount
29	AGSE-S00211-P04	4	Chest Handle
30	AGSE-S00150-N6CA01	12	Nut
31	AGSE-S00135-N6A17	12	Washer, Locking
32	AGSE-S00131-N6A17	12	Washer
33	1/8x4x4	5	SHT STK A36 *Not Required if Aluminnum Cover Supplied*
34	AGSE-S00244-P04	1	Polyethylene Container
35	AGSE-S00115-N6C010A07	12	Screw, Button Head
36	AGSE-C03405-P01	1	Aluminum Cover *Alternate Aluminnum Cover*

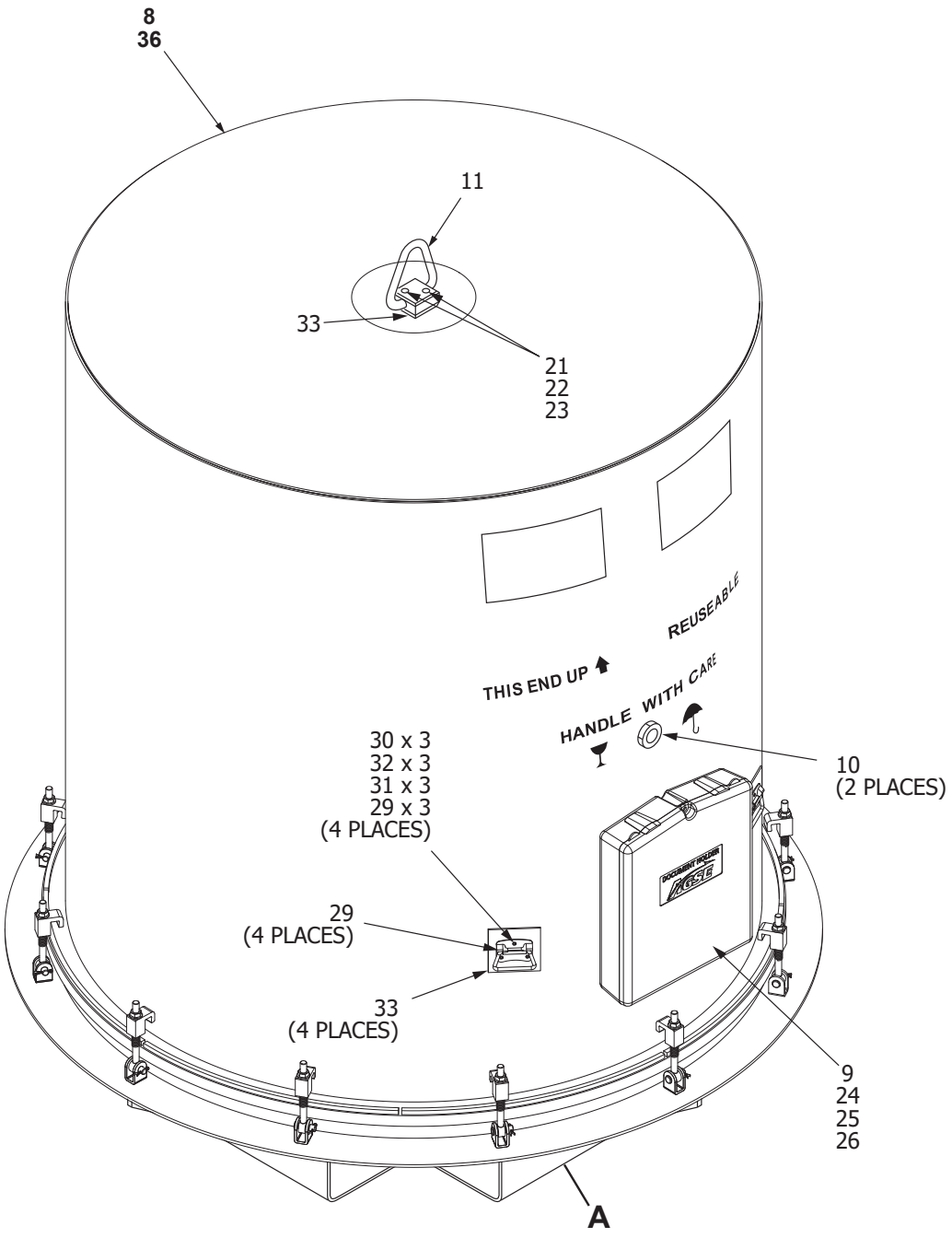


Figure 8.1-1 AGSE-C034 Core Engine Shipping Container

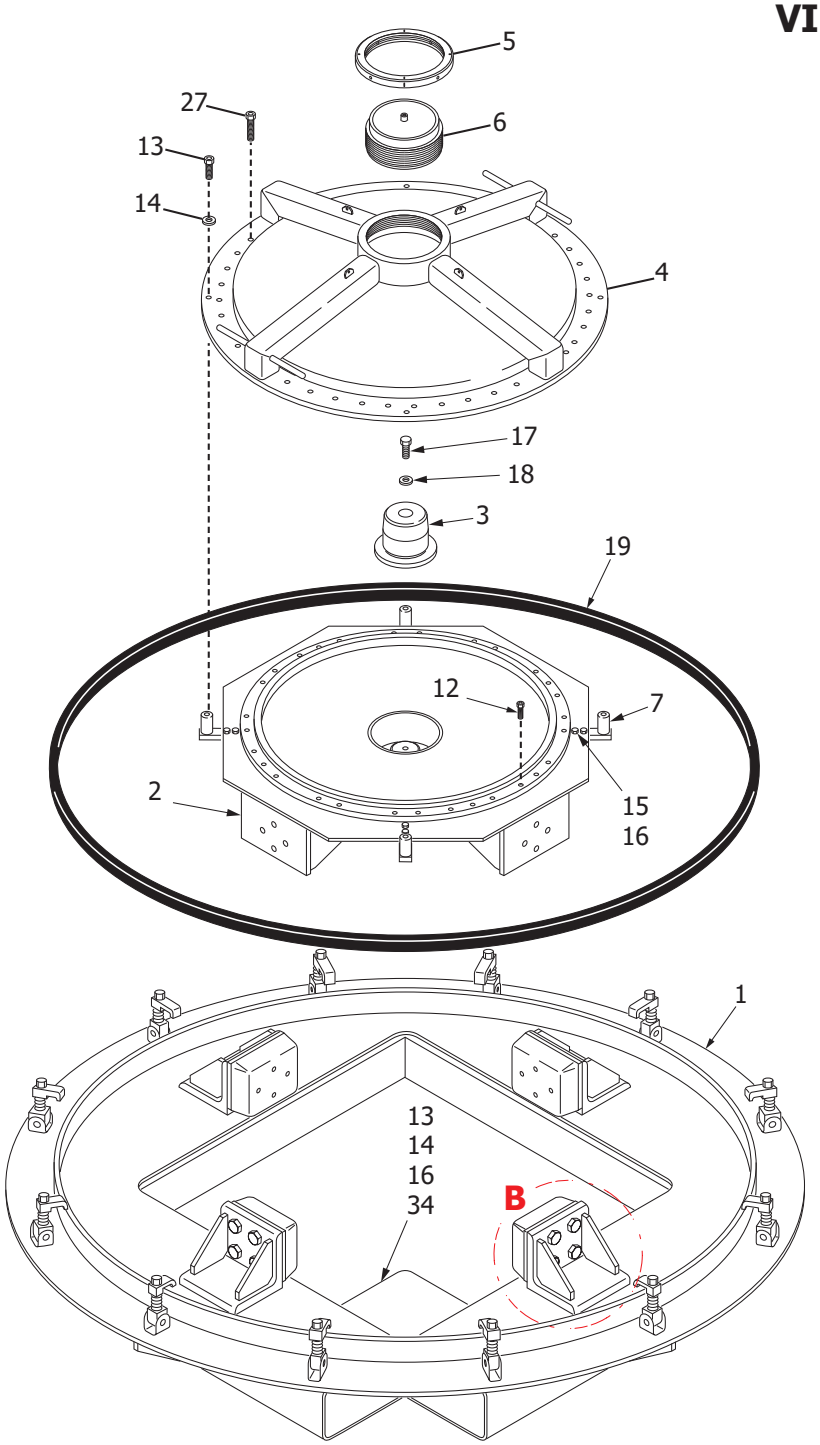


Figure 8.1-2 AGSE-C034 Core Engine Shipping Container

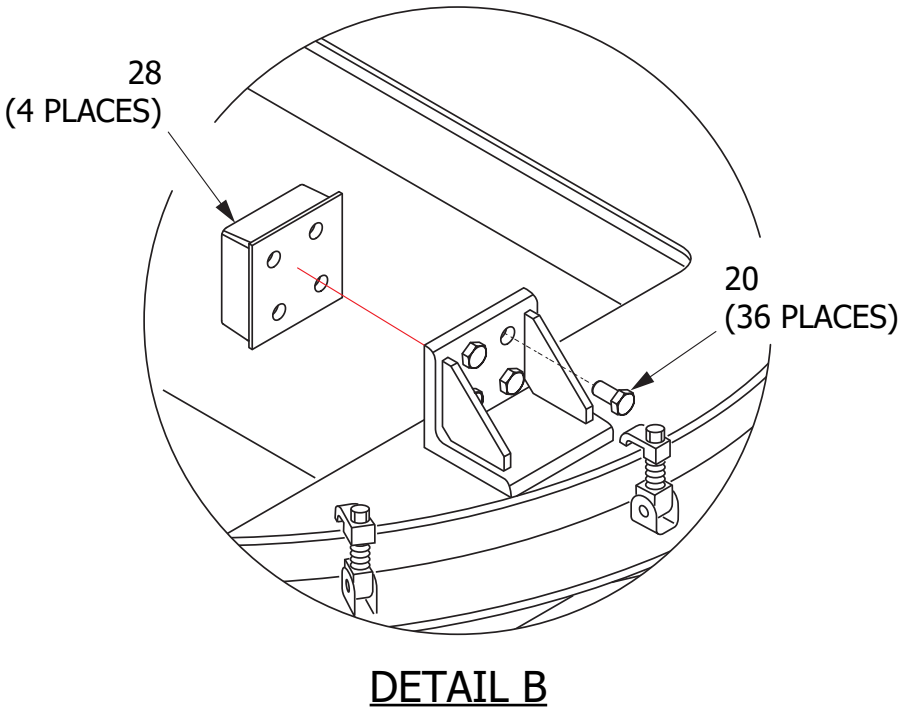


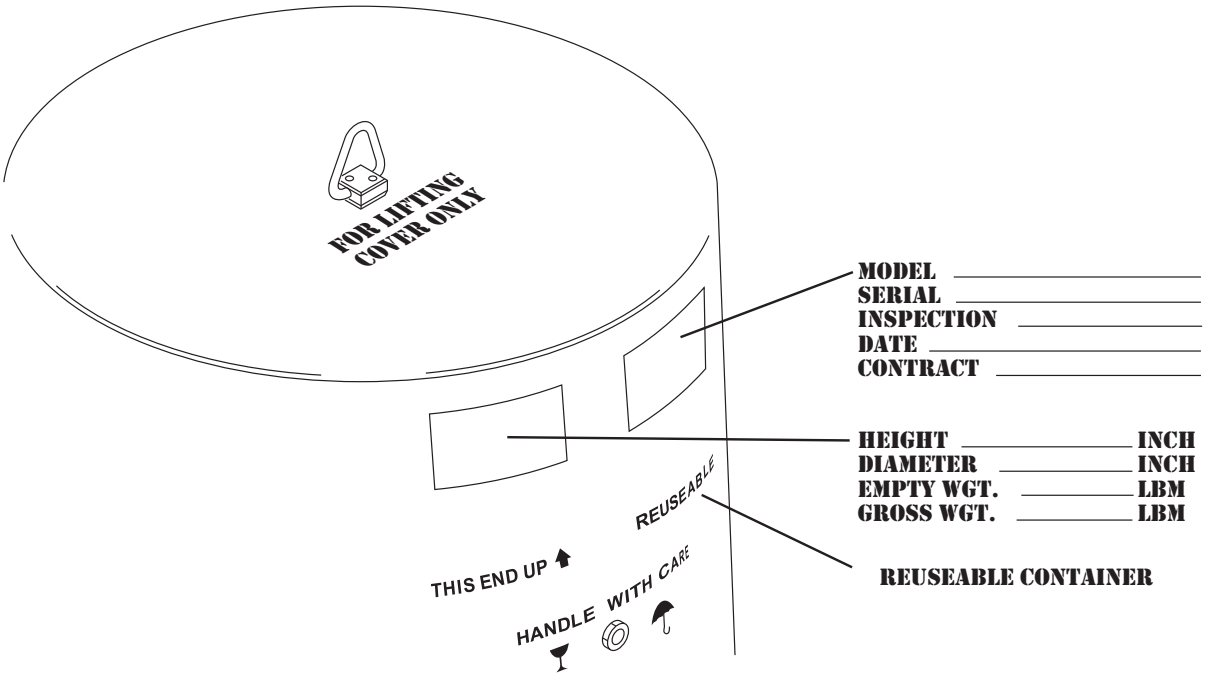
Figure 8.1-3 AGSE-C034 Core Engine Shipping Container

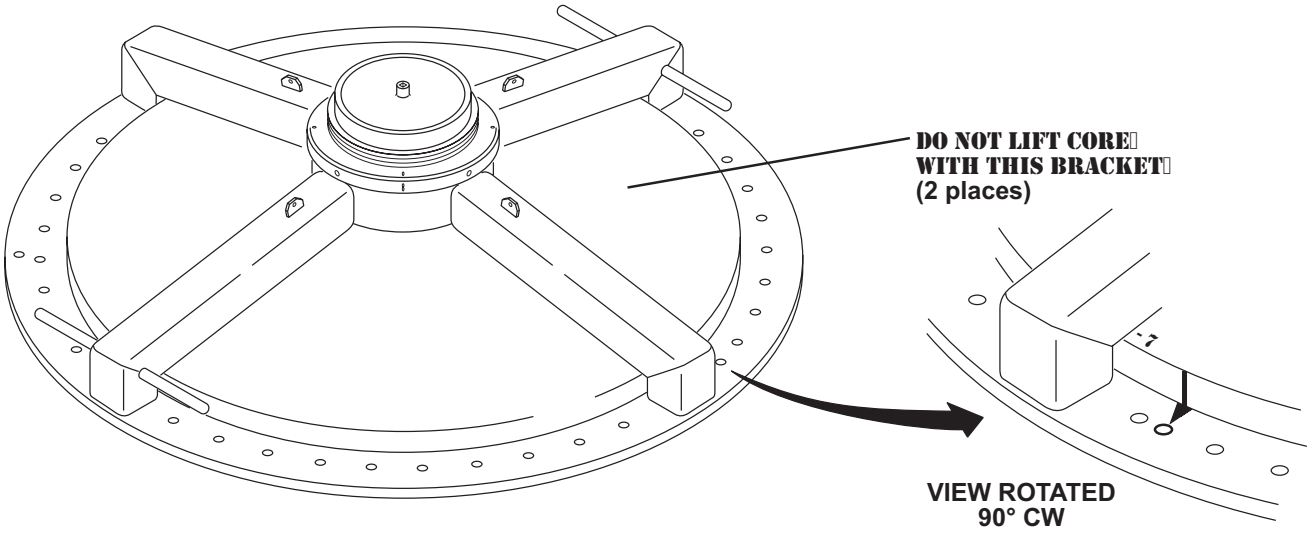
9.0 – Stencils, Decals, and Placards

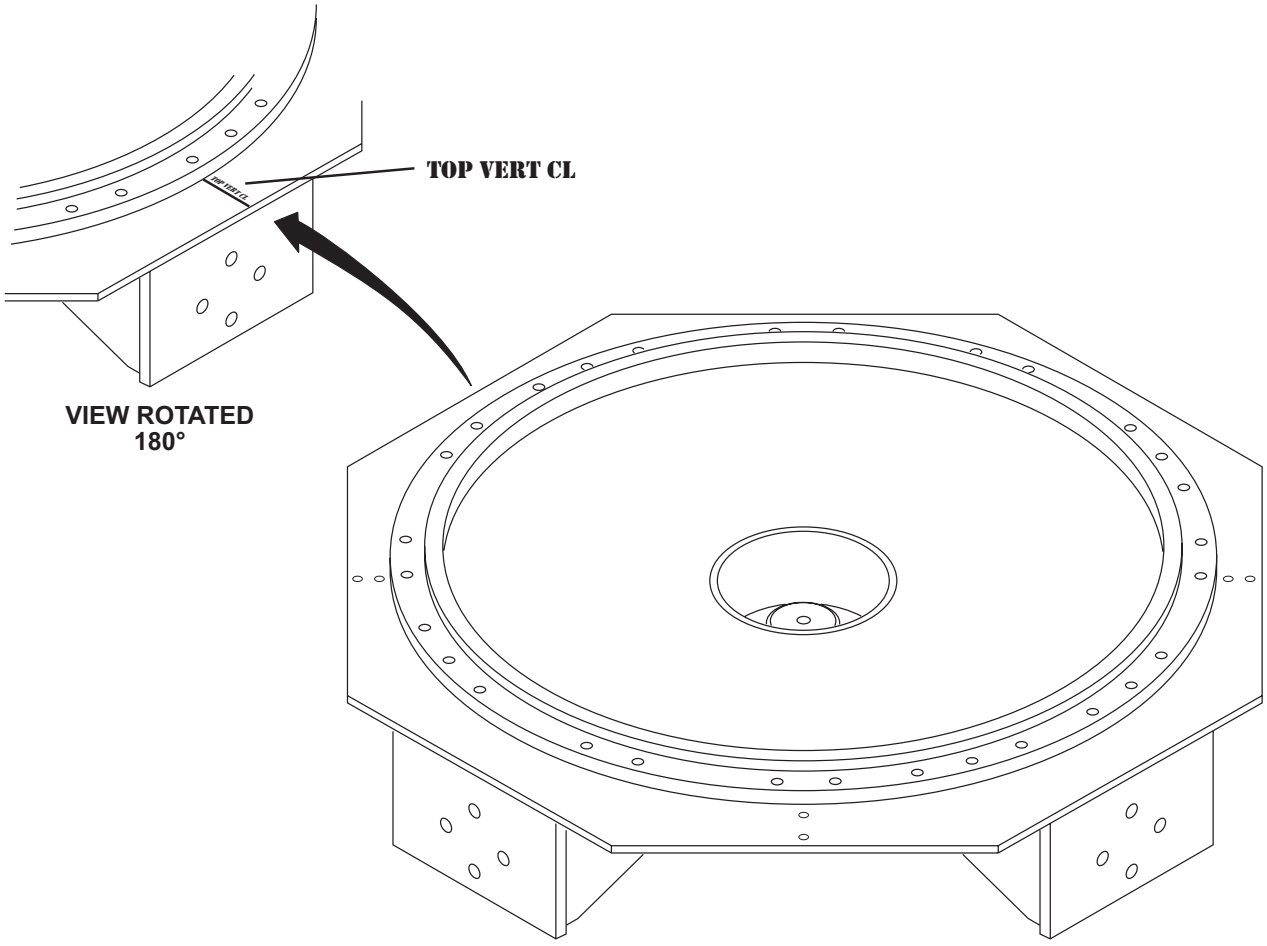
9.1 General

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




DO NOT LIFT CORE
WITH THIS BRACKET
(2 places)
VIEW ROTATED
90° CW


TOP VERT CL
VIEW ROTATED
180°