AM-2228-A1 Engine Cradle
AM-2228-B1 Base

Ref. IAE6R18897
Ref. IAE6F10000

Engine Handling System
For V2500-A1/A5 Engines
Used On A319/A320/A321 Aircraft

ORIGINAL MANUAL DATED 02/21/1991
LATEST MANUAL REVISION DATE (LEVEL) ..... 07/13/2023 (Rev W)

ADVANCED GROUND SYSTEMS ENGINEERING LLC
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NOTICE

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

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

These modifications include but are not limited to:

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

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

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

NOTE

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

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

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1.0 - Revisions

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

PAGE	REV	DESCRIPTION OF CHANGE	DATE
8.2	W	Deleted Item 12	07/13/2023
8.2	W	Updated Part Number Item 15, 17, 18, 19 & 20	07/13/2023
8.3	W	Updated Part Number Item 25, 27, 55, 67, 68 & 69	07/13/2023
8.4	W	Updated Figure 8.2-1	07/13/2023
8.5	W	Updated Figure 8.2-2	07/13/2023
8.6	W	Updated Figure 8.2-3	07/13/2023
8.7	W	Updated Part Number Item 41, 42, 44, 45 & 46	07/13/2023
8.7	W	Deleted Item 47	07/13/2023
8.8	W	Updated Part Number Item 57	07/13/2023
8.8	W	Added Item 59- 66	07/13/2023
8.9	W	Updated Figure 8.3-1	07/13/2023
8.10	W	Updated Figure 8.3-2	07/13/2023

2.0 - Illustrations

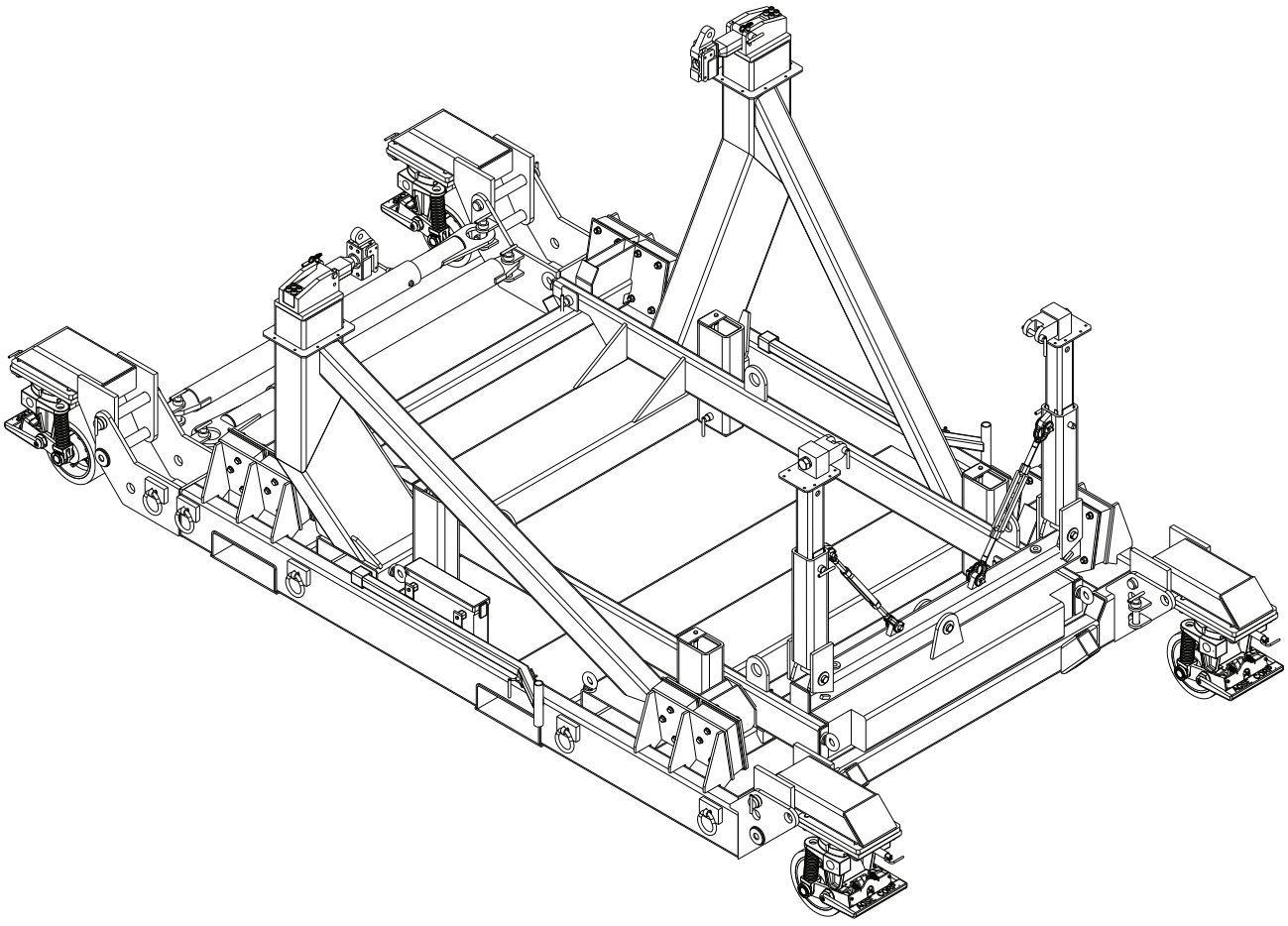


Figure 2.0-1 AM-2228-A1/B1 Transportation Stand

3.0 - Specification

3.1 General

The AM-2228-A1/B1 Engine Shipping Stand.(Cradle /Base Assembly) is designed to accommodate V2500-A1/A5 engines used on A319, A320, and A321 aircraft, with or without selected Engine Build Unit (EBU) hardware and components. The stand is compliant with IAE Specification IAE6F10000. Unit may also be incorporated for transport during development and/or production of engines. Cradle is counter-weighted for proper balance requirements. Engine Shipping Stand, with engine, will fit up to the wing position.

3.2 Design

The design, construction, and the integrity of this unit are in accordance with, and representative of acceptable commercial manufacturing practices. All test of unit's design and structural integrity (proof load, fit & function, drop tests, hoist tests, etc.) are completed on the first issue and accordingly documented.

3.2-1 Attach Points

Unit attaches to engine at STA.95.1 (forward) and STA.174.2 (aft). Forward mount is a "slip-pin' with anchor block and rotating bearing type attachment. Aft mount is a direct "pin-thru" type attachment.

3.2-2 Tie-Down

Unit is designed with tie-down rings around base frame to secure fixture during any transport motions. Each tie-down rings offers a minimum of 11,023 Lbs. (5000Kg) rated tensile load capacity.

3.2-3 Shock System

Unit is designed with a shock attenuation arrangement which will provide a suspended system natural frequency of 7-10HZ for both engine configurations. This system reduces transportation shock and vibrations to values which do not exceed the calculated load limits to the selected attachment points.

3.2-4 Sway Space

Design allows sufficient sway space (no less than 1.57 inches) to permit proper functioning of the shock attenuation arrangement during air or truck transport.

3.2-5 Fork Lift Capability

Forklift tubes are positioned within the base and located to best center the stands CG with and without the engine in place. Any fork truck transfer or movement requirements are now possible from either side of the stand**.**

3.3 Mobility

The transport base consists of a frame weldment supported by four shock absorbing caster assemblies. Each caster assembly offers a 5 inch wide by 10 inch diameter wheel for easy mobility and a weight capacity of 5,000 pounds each. Polyurethane tread wheels, position locks, and face brakes are standard. All four caster assemblies are designed to pin in an elevated position for air/truck transport of the entire unit, with engine. The tow bar stows on the base frame when not in use. Maximum towing speed of the unit is 5 km/hr (3 MPH). Built-in shock absorbing mounts cushion all transport shocks and vibrations. A series of tie-down rings offer secure retainment during transportation of unit.

CAUTION

Failure to release the parking brakes will result in flat spots being worn into the caster tread.

CAUTION

Failure to unlock the lead casters (tow bar end) during towing of the unit will damage the casters.

3.4 Fabrication And Finish

Fabricated from structural steel shapes conforming to ASTM A500, A513, and A36 materials. All bolted connections use A325 structural bolts or grade 5 commercial hardware. Unit is primed and painted with high grade, Skydrol resistant, air dry enamel. Color is optional. Pins and miscellaneous hardware are CRES or plated as required.

3.5 Characteristics

Cradle
Length: 108”
Height: 57” Legs Up
Height: 65” Legs Down
Width: 96”
Weight: 2047 Lbs

Base
Length: 152” (C/U)
Length: 170” (C/D)
Width: 86”
Height: 17” (C/U)
Height: 23” (C/D)
Weight: 2800 Lbs

Combined Cradle /Base
Length 152” (C/U)
Length 170” (C/D)
Width 96”
Height 61.5 (C/U)
Height: 67.5” (C/D)
Height (Shipping W/O Pallet & Inlet Cowl): 93”
Weight: 4847 Lbs (2199 Kg)
Weight (Engine & Cradle): 11,216 Lbs (5089 Kg)

3.6 Basic Station Point and C.G

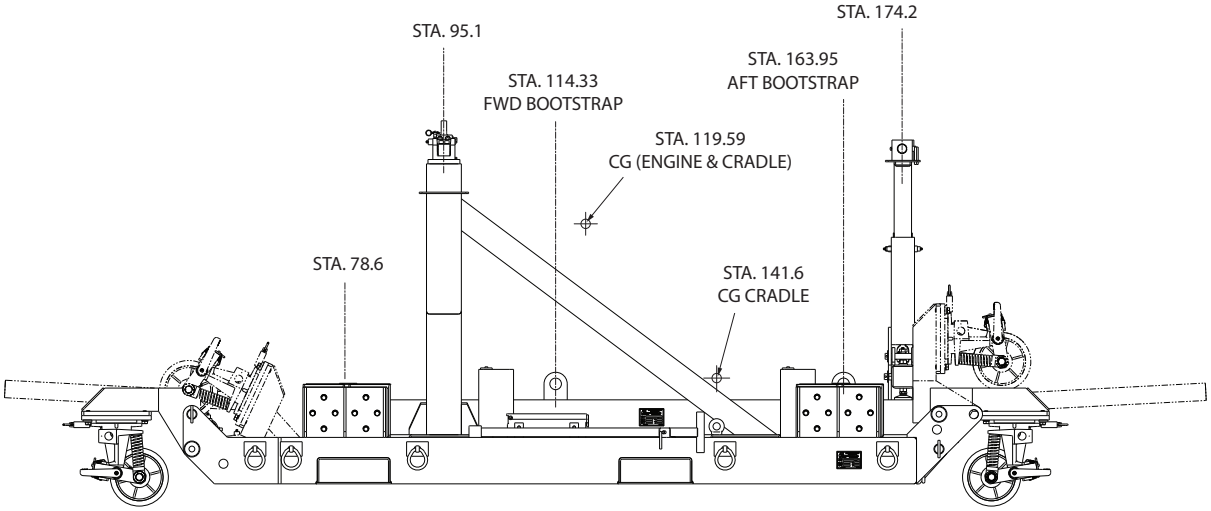


Figure 3.0-1 Basic Station Point and CG

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 cleaned with a soap and water solution and rinsed thoroughly.

WARNING

Re-lubricate all grease zerk fittings after cleaning stand.

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 casters should be lubricated every 90 days with the following extreme pressure grease or equivalent grease:

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 aerosol lubrication WD-40 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 (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 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 rior 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 General Maintenance Schedule (Where Applicable)

NOTE:

This Maintenance Schedule does not supersede the maintenance described by Customers' Company Maintenance Policy. Intervals indicated are recommendations only and should be altered to take into consideration usage factors and environmental conditions.

Component	Task to be Performed	Maintenance Intervals			
		Monthly	3 Months	6 Months	Yearly
General	Inspect for missing parts	1*			
	Inspect paint/plating finish			I	
	Inspect exposed/bare metal for rust		H		
	Function check equipment				2*
	Inspect all stencils/placards/stamps			I	
Casters	Check wheel condition			I	
	Tighten mounting bolts			T	
	Check swivel lock/brake			I	
	Lubricate bearings			L	
Structure	Inspect frame for damage/cracked welds			I	
	Tighten all bolts		T		
	Lubricate/protect moving joints		H	L	
Pins	Inspect for damaged/bent/worn pins			I	
	Inspect for broken/cracked pin handles			I	
	Inspect for broken/cut lanyards			I	
Shock Mounts	Check date				3*
	Inspect rubber for cracking/deformation			I	
	Inspect for permanent set/deformation			I	
Manual	Check manual is present/readable			4*	
	Check manual revision is current				5*

1* - Inspection for missing parts before every use.

2* - Carry out function test if equipment has not been used for extended period of time.

3* - AGSE recommends that shock mounts be replaced within five (5) years.

4* - Check that manual is present before every use.

5* - Latest manuals are available from *www.agsecorp.com* or call (562) 906-9300.

Legend

I - Inspect/Check

T - Tighten

L - Lubricate

H - Spray with rust inhibitor

R - Replace

Recommended Lubricant: Chevron Dura-Lith Grease EP, NLGI2 or equivalent.

5.0 - Operations

5.1 Engine Installation

1) Inspect stand for obvious damage.
2) Install the forward engine mounts to the engine using the hardware provided.
3) Position the stand beneath the engine and set the caster brakes.

CAUTION

Minimal clearance exist 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) Retract the stabilizing jacks on the aft mount beam and loosen or disconnect the turn buckles until the aft mount support arms rest on the travel limiting stops.
5) Lower engine into stand until the trunnions slide into the saddles located on the forward arms. Align the aft mounts to mate with the aft engine ground handling points. This may require the stabilizing jacks located beneath the rocker arm to be extended. Continue to lower the engine until the forward trunnions rest fully in the saddles and the inboard saddle pins can be installed. Adjust the aft mounts as required to mate with the aft engine ground handling points. Install clevis pin and safety clip.
6) Retract the stabilizing jacks on the aft rocker beam.
7) Lower engine completely so that the stand supports the full weight of the engine.
8) Reinstall turnbuckles and adjust by hand ensuring that they remain loose enough that they do not impart any load into the engine.
9) Tighten locking nuts on turnbuckles.
10) Extend the the stabilizing jacks until they just touch the base, ensuring that they are not imparting any load into the engine.
11) Tighten the locking nuts on the stabilizing jacks to prevent their position does not alter.
12) Remove engine sling.
13) Engine is now ready for transportation or storage

5.2 Engine Bootstrapping

CAUTION

This procedure is intended to supplement the engine installation procedure provided by the air frame manufacturer.

1) Inspect stand for obvious damage.
2) Telescope the aft arms downward.
3) Disconnect the aft arm turnbuckles and rotate the aft arms outward.
4) Position the stand beneath the engine by starting forward of the engine moving aft.
5) Once beneath the engine rotate the aft arms inward, and pin the aft upper arms in a raised position.
6) Connect the engine hoists to the bootstrap points on the stand.
7) Remove the ground handling mounts from the container attached to the stand.
8) Install the forward engine mounts to the engine using the hardware provided.
9) Raise the empty cradle.

WARNING

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

10) Raise the empty cradle until the trunnions slide into the saddles located on the forward arms. Align the aft mounts to mate with the aft engine ground handling points. This may require the stabilizing jacks located beneath the rocker arm to be extended. Continue to raise the cradle until the forward trunnions rest fully in the saddles and the inboard saddle pins can be installed. Adjust the aft mounts as required to mate with the aft engine ground handling points. Install clevis pin and safety clip.
11) Retract the stabilizing jacks on the aft rocker beam.
12) Lower engine cradle onto the base and install locking pins.
13) Lower engine completely so that the stand supports the full weight of the engine.
14) Reinstall turnbuckles and adjust by hand ensuring that they remain loose enough that they do not impart any load into the engine.
15) Tighten locking nuts on turnbuckles.
16) Extend the the stabilizing jacks until they just touch the base, ensuring that they are not imparting any load into the engine.
17) Tighten the locking nuts on the stabilizing jacks to prevent their position does not alter.
18) Remove bootstrap equipment.
19) Engine is ready for transportation or storage.

5.3 Tow Bar Deployment and Stowage

The empty stand or stand with a full QEC configured engine may be towed from either the FORWARD or AFT end. Maximum towing speed is 3 MPH (5 KM/H).

CAUTION

The tow bar assemblies are heavy and MUST BE HANDLED BY AT LEAST TWO PERSONS. Dropping the tow bars can cause injury and damage the tow bars.

NOTICE

Failure to unlock swivel lock on lead casters and/or foot brakes on all casters during towing of the stand will result in flat spots damage to the tread surface of the caster.

NOTICE

Do not attach tow bars to a forklift. Otherwise tow bars and casters will be damage.

5.3.1 Deploying Tow Bars for Towing from the Forward End of the Stand and Stowage

1). Ensure casters are deployed.

2). Locate two removable telescoping tow bar assemblies that are attached to the Forward base cross member. Remove the safety pin and retainer pin to free one end of the tow bars.

3). Rotate each tow bar assembly outward as shown in Figure 5.3-1.

4). To extend the tow bars, remove the safety pin closest to the towing end and pull the inner section outward.

5). Align the pin holes between the outer and inner sections and insert the pin. (Figure 5.3-2)

6). Bring the two tow bars together to attach to a tow vehicle.

7). Reverse these steps for stowing the tow bars.

NOTICE

Do not tow the engine stand with retracted tow bars. Tow bars must be extended to avoid damaging the tow bars or the engine. This is most likely to occur when towing around a corner with a tow vehicle.

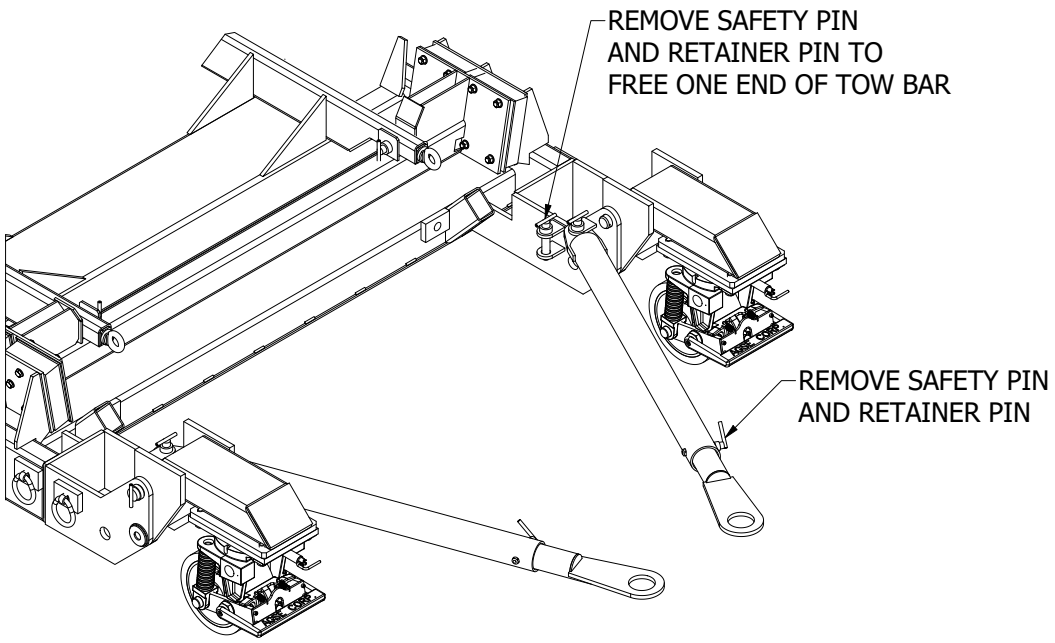


Figure 5.3-1

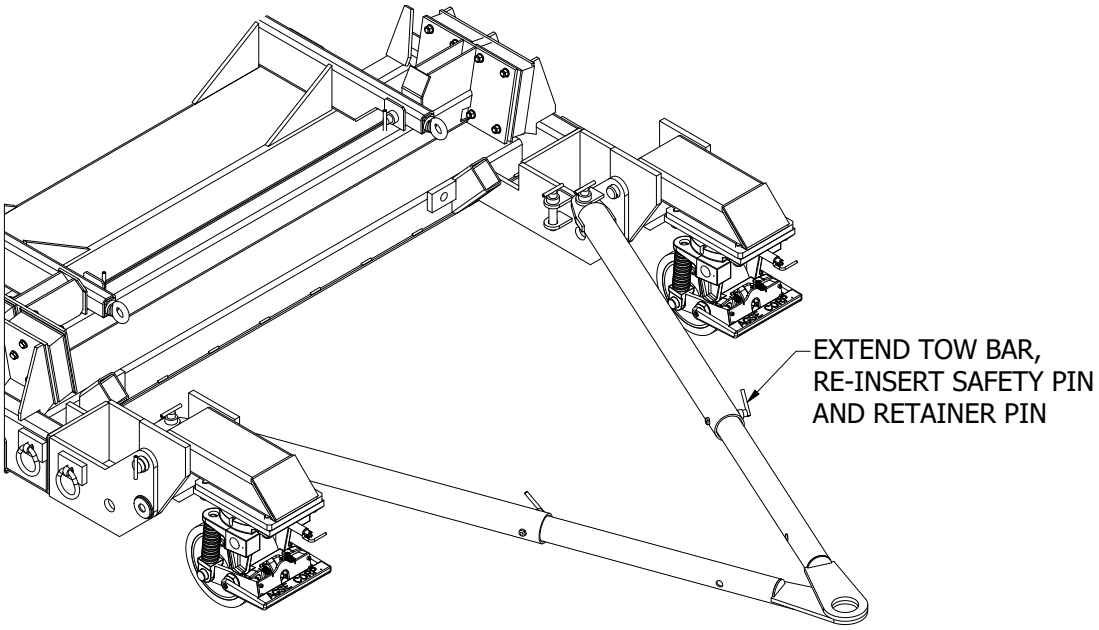


Figure 5.3-2

5.3.2 Deploying Tow Bar for Towing from the AFT End of the Stand

1). Ensure casters are deployed.

2). Locate two removable telescoping tow bar assemblies that are attached to the Forward base cross member. Remove the safety pins and retainer pins to remove the tow bars.

3). Move two (2) tow bars to the AFT end of the stand.

4). Attach the tow bars to the AFT end of the base (Figure 5.3-3).

5). To extend the tow bars, remove the safety pin closest to the towing end and pull the inner section outward.

6). Align the pin holes between the outer and inner sections and insert the pin.

7). Bring the two tow bars together to attach to a tow vehicle. (Figure 5.3-4).

NOTICE

Do not tow the engine stand with retracted tow bars. Tow bars must be extended to avoid damaging the tow bars or the engine. This is most likely to occur when towing around a corner with a tow vehicle.

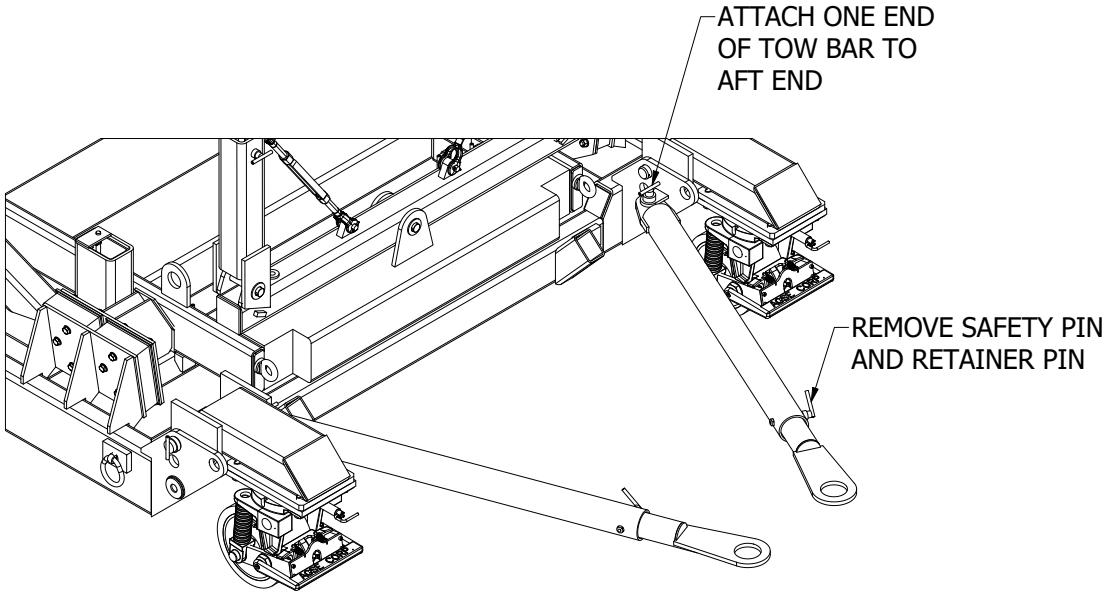


Figure 5.3-3

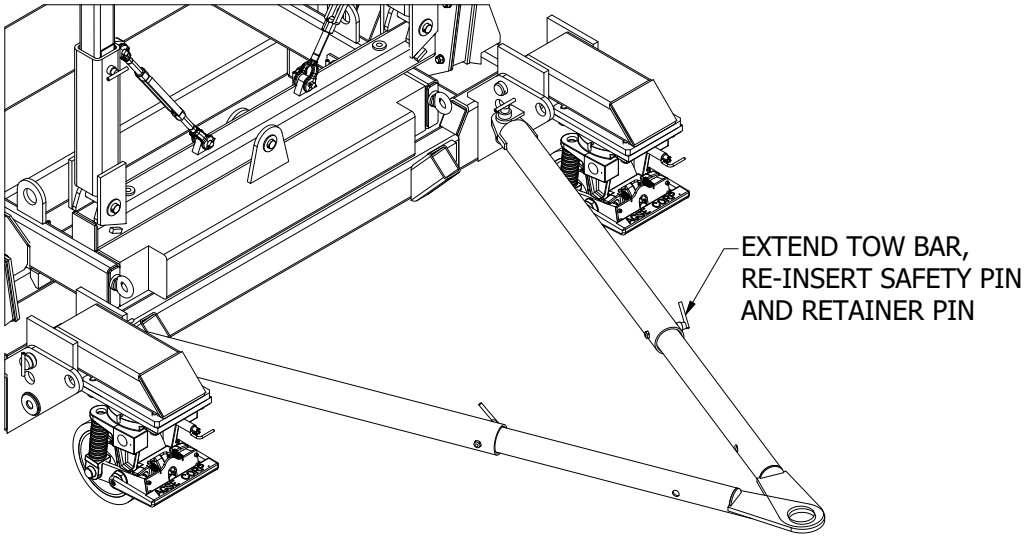


Figure 5.3-4

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.

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 AM-2228-A1/C1 Engine Shipping Stand (AM-2228-A1 Cradle/AM-2228-B1 Base) is a commercial product designed to transport and/or store the IAE V2500-A1/A5 engines. It is not anticipated that the equipment will be used or misused for other purposes. The equipment is to be used by trained mechanics free from physical impairment and who are familiar with this or similar engine cradles. The equipment is not to be used or made available to the general public.

6.4.2 Risk Assessment and Residual Risk

The risk assessment 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 Engine 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 Engine Shipping Stand is considered safe to use when all instructions are followed and cautions/warnings are heeded. Low residual risks include potential pinch points during operation of the equipment.

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

ADVANCED GROUND SYSTEMS ENGINEERING LLC

EC DECLARATION OF CONFORMITY

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

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

Machinery covered by this Declaration:

Description:	Engine Handling System, V2500-A1/A5
Model:	AM-2228
Part Number:	AM-2228-A1
	AM-2228-B1
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:

- IAE6R18897, Stand Without Roll Transfer, 1993/10/20 REV NC
- IAE6F10000, V2500 A1/A5 Stand, Engine Transportation for A320 Aircraft, 1987/07/29 Rev E
- AGSE Quality System Procedure Number QSP-006
- Aerospace Recommended Practice Standard, SAE ARP 1840, 2007/02 Rev B

Place: Santa Fe Springs, California, USA

Date: _____

Signed: _____

Quality Representative

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

7.0 - 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 – AM-2228-A1/B1
Transportation Stand Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AM-2228-A1/B1	-	Transportation Stand Assy (Illustration Figure 8.1-1)
1	AM-2228-A1	1	Cradle Assy (See IPB Figure 2 for Details)
2	AM-2228-B1	1	Base Assy (See IPB Figure 3 for Details)

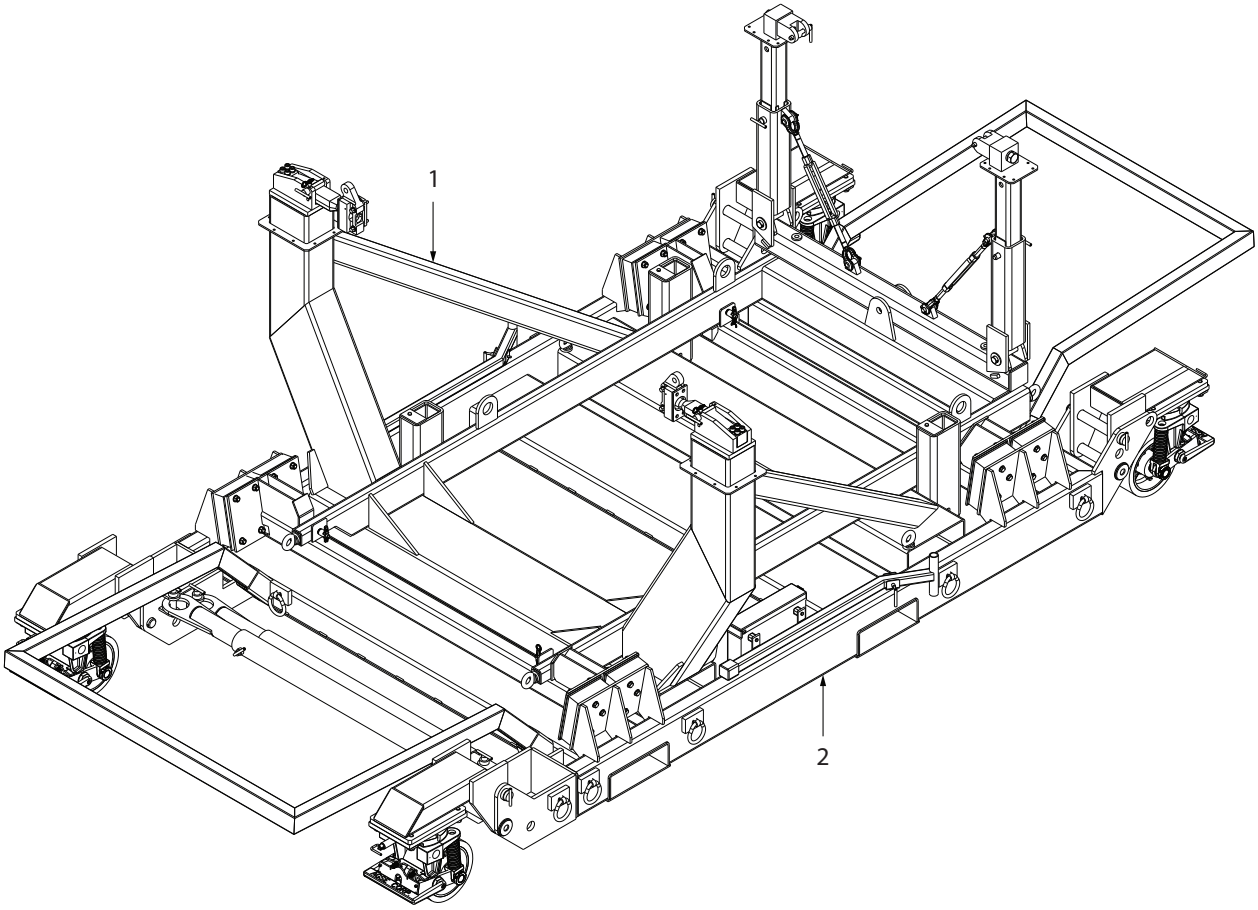


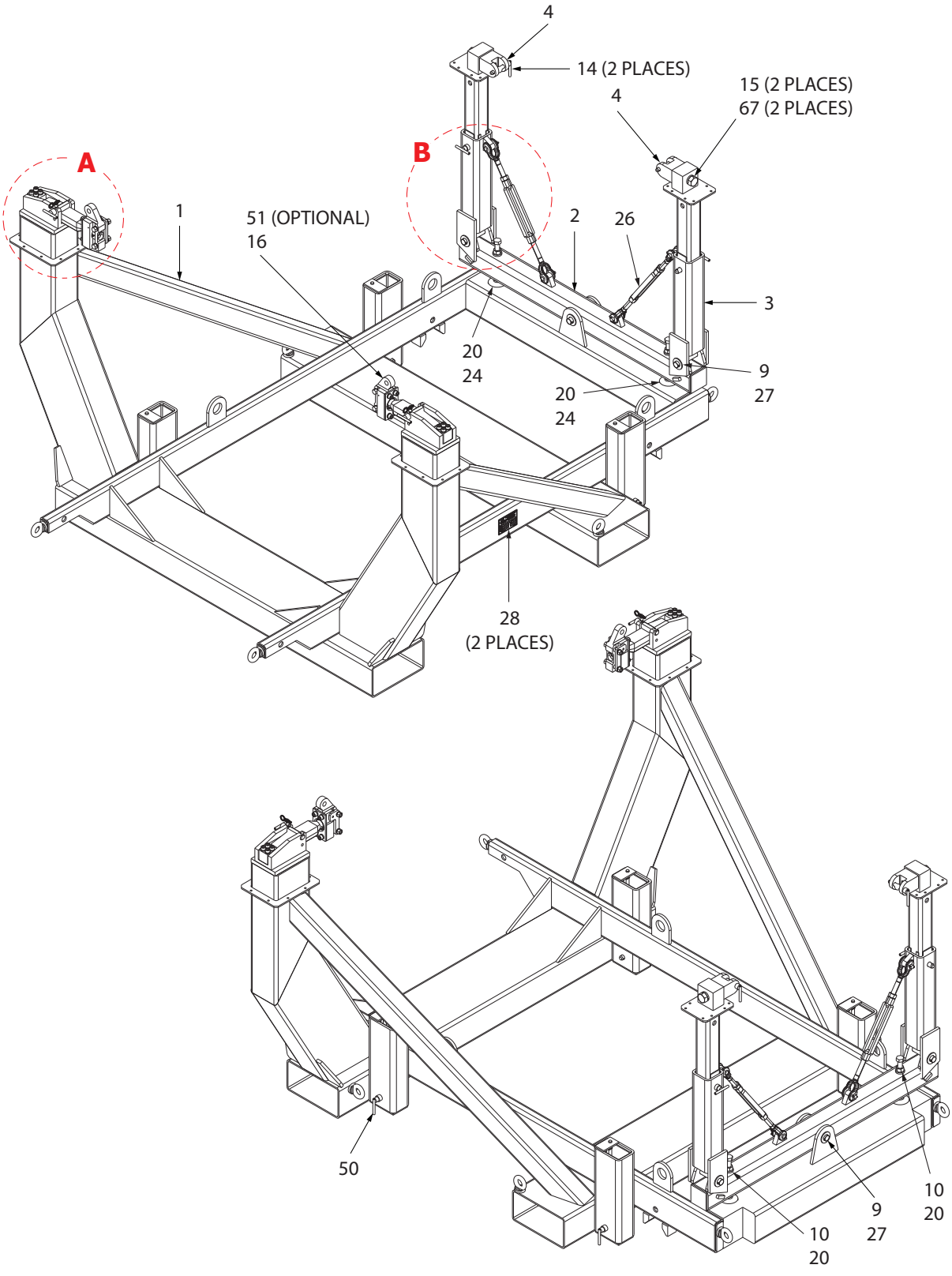
Figure 8.1-1

IPB Figure 2 – AM-2228-A1
Cradle Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AM-2228-A1	-	Cradle Assy (Illustration Figure 8.2-1)
1	AM-2228-A3	1	Cradle Weldment
2	AM-2228-A6	1	Tube Weldment
3	AM-2228-B6	2	AFT Mount Bracket
4	AM-2228-C6	2	AFT Mount
6	AM-2228-E6	2	Retainer Plate
7	AM-2228-F6	2	Retainer Pin
8	AM-2228-C8	2	FWD Mount Shaft
9	AM-2228-D8	3	Round Bar
10	AM-2228-E8	2	Rod Thread
11	AM-2228-F8	2	Hold Down Bar
14	AM-2228-K8	2	Safety Pin
15	AGSE-S00104-16C072A01	2	Screw, Hex Head
16	AM-2228-A10	1	Mount Assy
17	AGSE-S00118-12C032A07	2	Screw, Socket Head
18	AGSE-S00118-08C016A07	8	Screw, Socket Head
19	AGSE-S00118-08F044A07	8	Screw, Socket Head
20	AGSE-S00150-12CA05	6	Nut
21	13SF22	2	Spherical Bearing
22	AM-2228-M8	2	Washer - Steel Finished - 25/32” ID 1-1/2” OD x 1/4” Thk

IPB Figure 2 – AM-2228-A1
Cradle Assembly (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
23	CL-4-BLPT-2.00-S	2	Ball Lock Pin
24	L-3	2	Leveling Pad -3/4”-10UNC
25	AGSE-S00170-125D024A05	2	Slotted Spring Pin
26	HG-2510/4037	2	Take-up Jaw & Jaw (5,200)
27	AGSE-S00131-16A17	6	Washer
28	AM-2207	2	AGSE Name Plate
50	AM-90750-64L	4	Safety Pin
51	AM-2228-G6	2	Spindle Adapter (Optional)
55	AM-90625-33L	2	Safety Pin Assy
67	AGSE-S00135-16A17	2	Washer, Locking
68	AGSE-S00135-08A17	16	Washer, Locking
69	AGSE-S00166-250D024A17	6	Cotter Pin
70	AM-90750-64T	2	Safety Pin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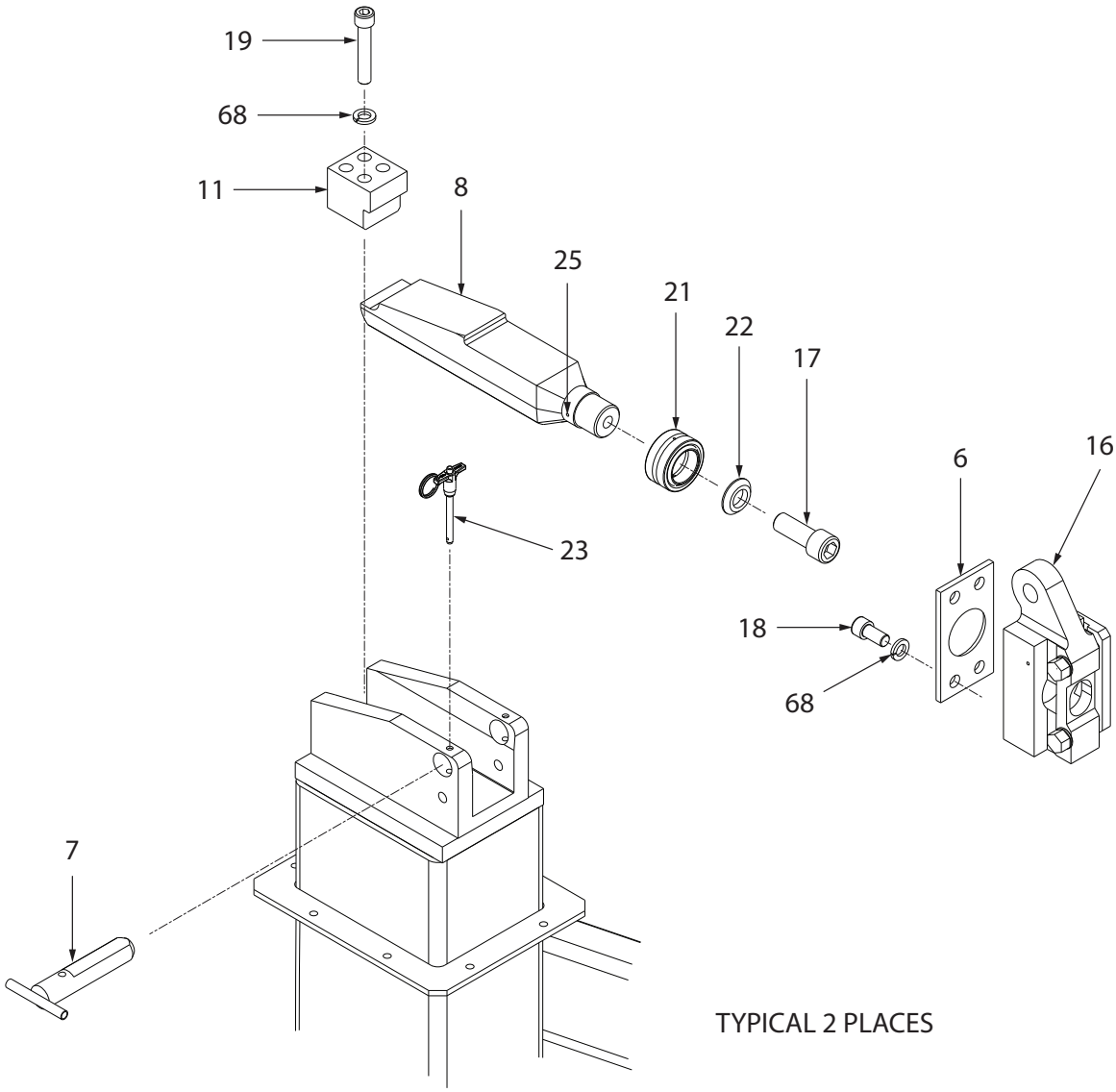
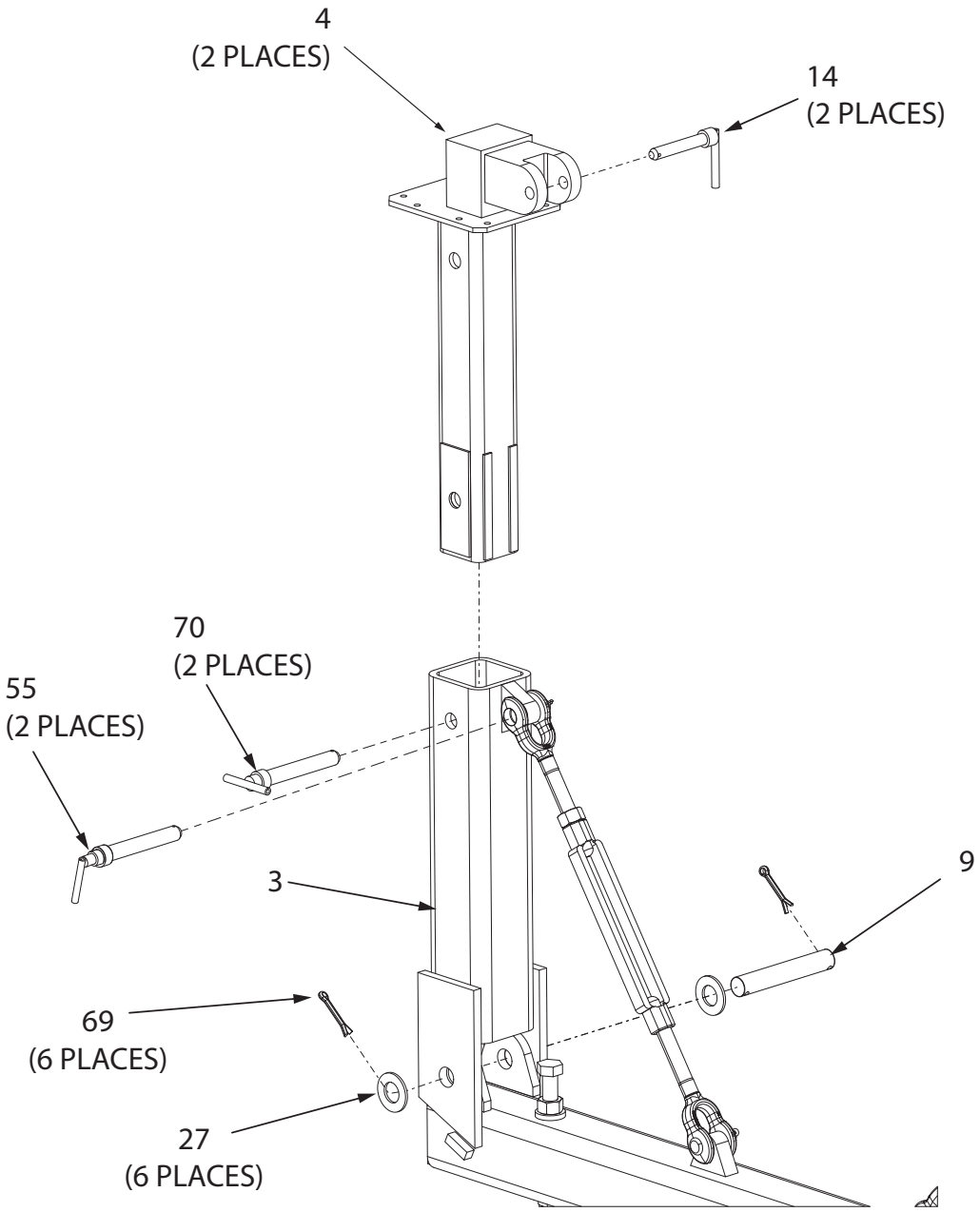
14 (2 PLACES)
15 (2 PLACES)
67 (2 PLACES)
4
A
B
1
51 (OPTIONAL)
16
2
26
3
20
24
9
27
20
24
28
(2 PLACES)
50
10
20
9
27
10
20

Figure 8.2-1



DETAIL A

Figure 8.2-2



DETAIL B

Figure 8.2-3

IPB Figure 3 – AM-2228-B1
Base Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AM-2228-B1	-	Base Assy (Illustration Figure 8.3-1)
29	AM-2228-A5	1	Base Weldment
30	AM-2228-A7	1	FWD Cross Member
31	AM-2228-B7	1	AFT Cross Member
32	AM-2228-C7	4	Caster Bracket
33	AM-2228-L8	2	Tow Bar Assy
34	AM-1803-732	4	Pin
35	AGSE-S00304-P04	8	Shock Mount
37	S00105-08F016A01	64	Screw, Hex Head
38	CL-12-BLPT-3.50	4	Ball Lock Pin
39	AM-91500-160T	4	Safety Pin
40	AM-2079-2	4	Caster Assy - 5,000 Lb Cap
41	AGSE-S00104-10C028A01	8	Screw, Hex Head
42	AGSE-S00104-10C032A01	8	Screw, Hex Head
43	PMP-10111	16	Tie-down Ring - 10,000 Lb Cap
44	AGSE-S00131-24A17	4	Washer
45	V164-S01	1	Document Box
46	AGSE-S00175-08A17	64	Flat Washer
48	AM-91000-52T	4	Safety Pin
49	AM-2207	2	AGSE Name Plate
53	AM-2228-A9	1	Bumper Assy (Optional)
54	AM-2228-B9	1	Bumper Assy (Optional)
56	AGSE-16911-P01	2	Steering Bar

IPB Figure 3 – AM-2228-B1
Base Assembly (Continued)

ITEM	PART NUMBER	QTY	PART DESCRIPTION
57	AGSE-S00166-188D032A17	4	Cotter Pin
59	AM-90250-32L	2	Safety Pin Assy
60	AGSE-S00104-04F014A01	4	Screw, Hex Head
61	AGSE-S00135-04A17	4	Washer, Locking
62	AGSE-S00131-04A17	8	Washer
63	AGSE-S00114-04C016A27	4	Screw, Flat Head
64	AGSE-V16402-P01	1	Bracket Adapter
65	AGSE-S00153-04CA01	4	Nut
66	AGSE-S00135-10A17	16	Washer, Locking

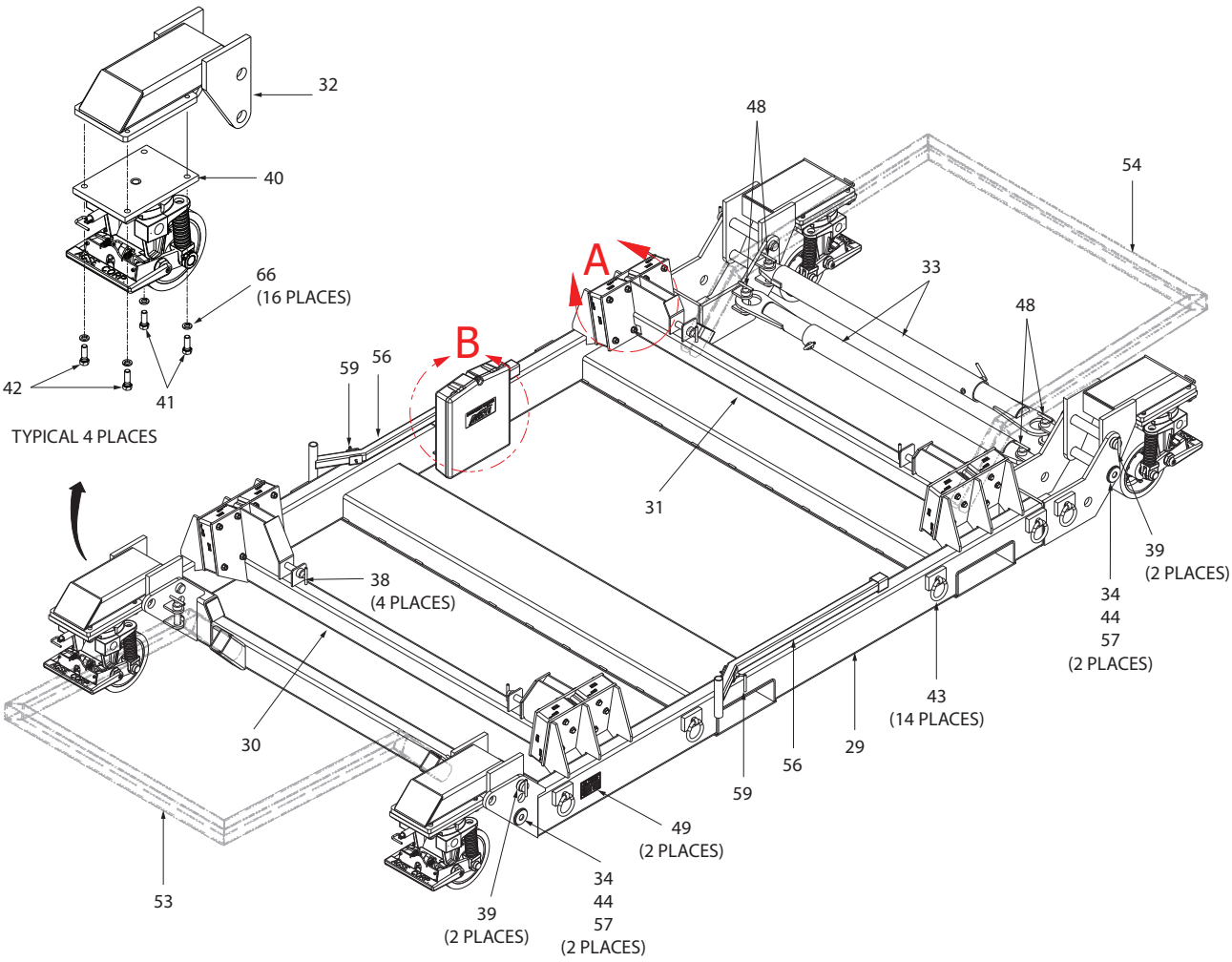
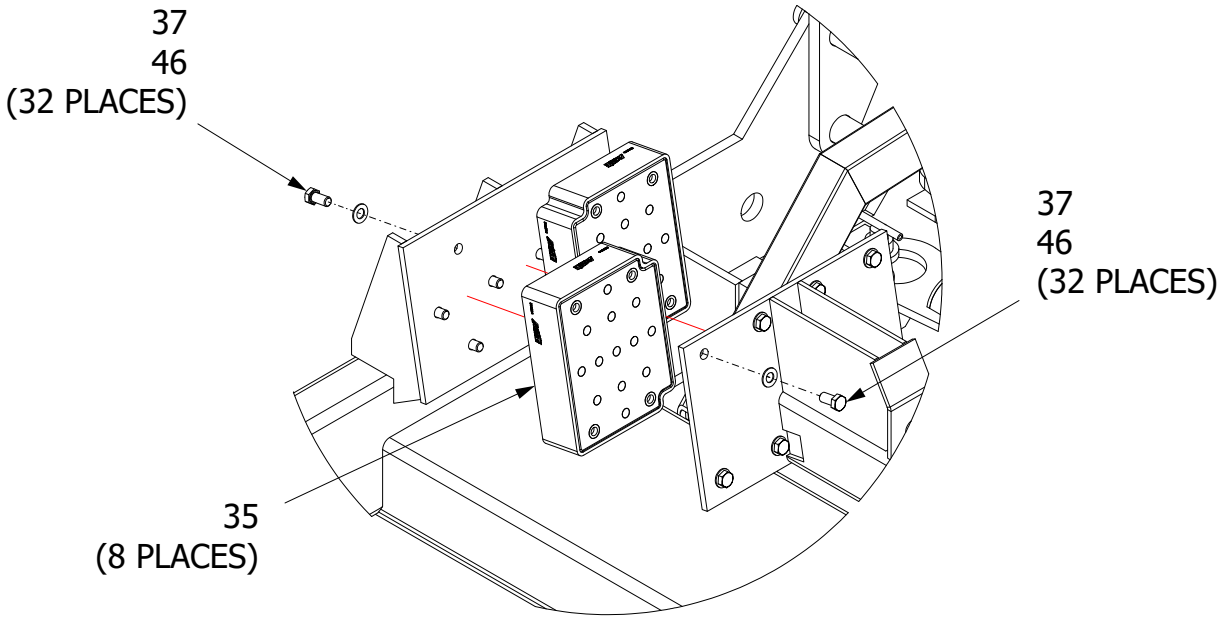
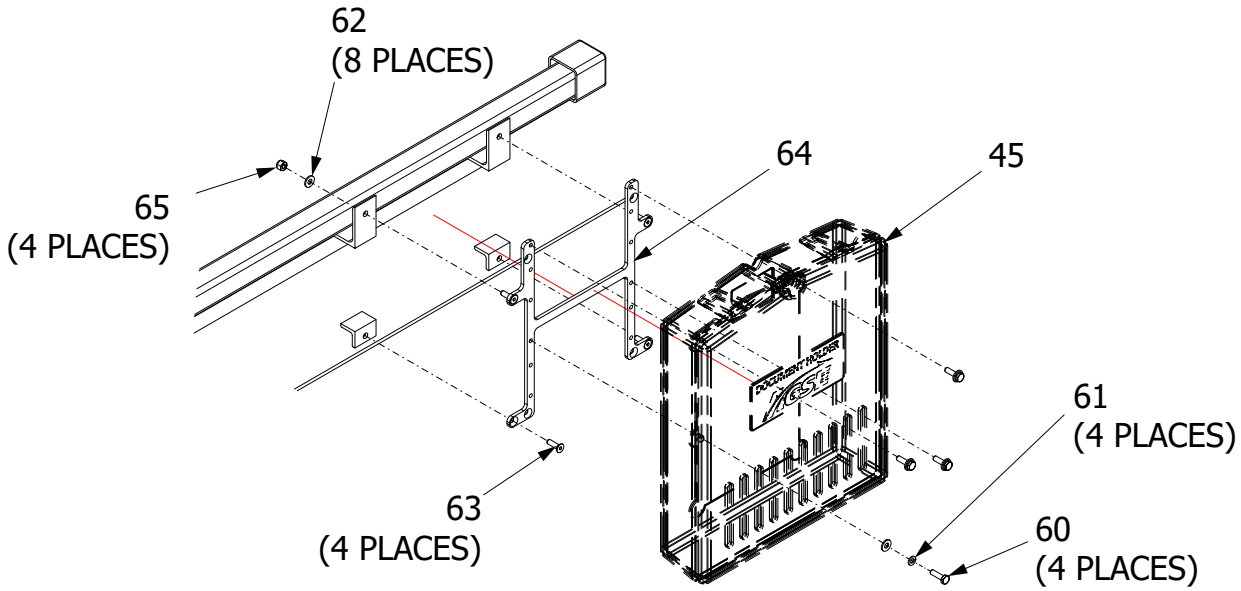


Figure 8.3-1 - AM-2228-B1 Base Assembtly



DETAIL A



DETAIL B

Figure 8.3-2 - AM-2228-B1 Base Assembtly

IPB Figure 4 – AM-2228-A10
FWD Mount Assembly

ITEM	PART NUMBER	QTY	PART DESCRIPTION
	AM-2228-A10	-	FWD Mount Assy (Illustration Figure 8.4-1)
1	AM-2228-D10	1	Mount Bracket
2	AM-2228-E10	1	Mount Bracket - Opposite
3	97345A531	2	Shoulder Screw -1/4”-24UNC x 3/8” Lg 18-8 SS
4	AM-2228-F10	4	Hex Head Bolt
5	AM-2228-B10	1	Slide Plate
6	AM-2228-C10	1	Slide Plate - Opposite

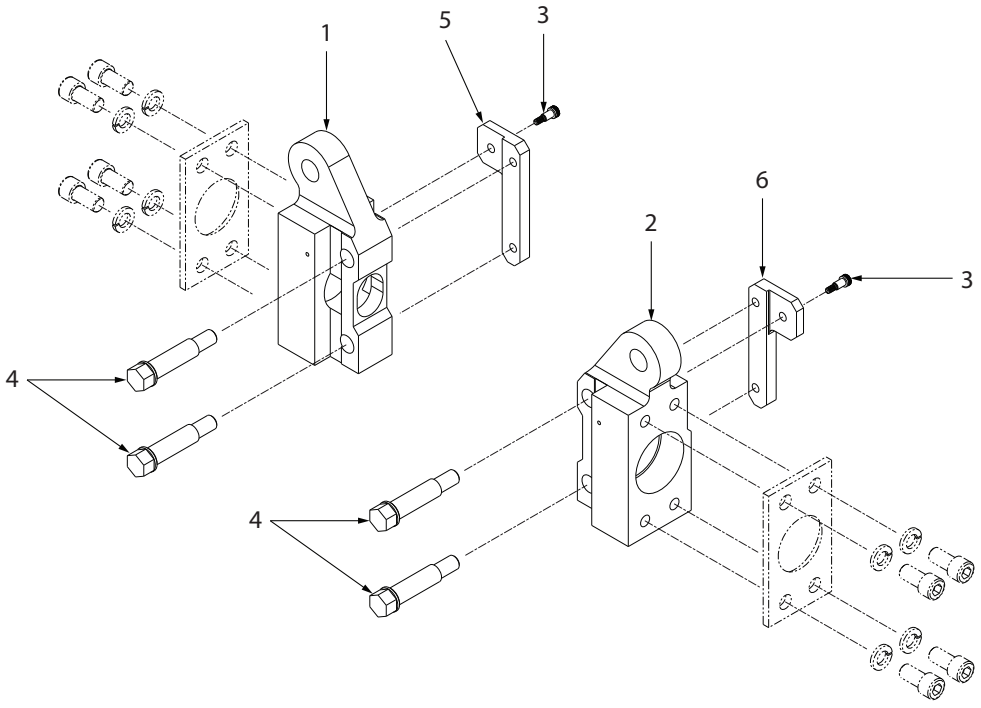


Figure 8.4-1

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. The assembly drawings in section 8.0 should identify and define all stencils, decals, and placards.

9.2 Stencils and Placards

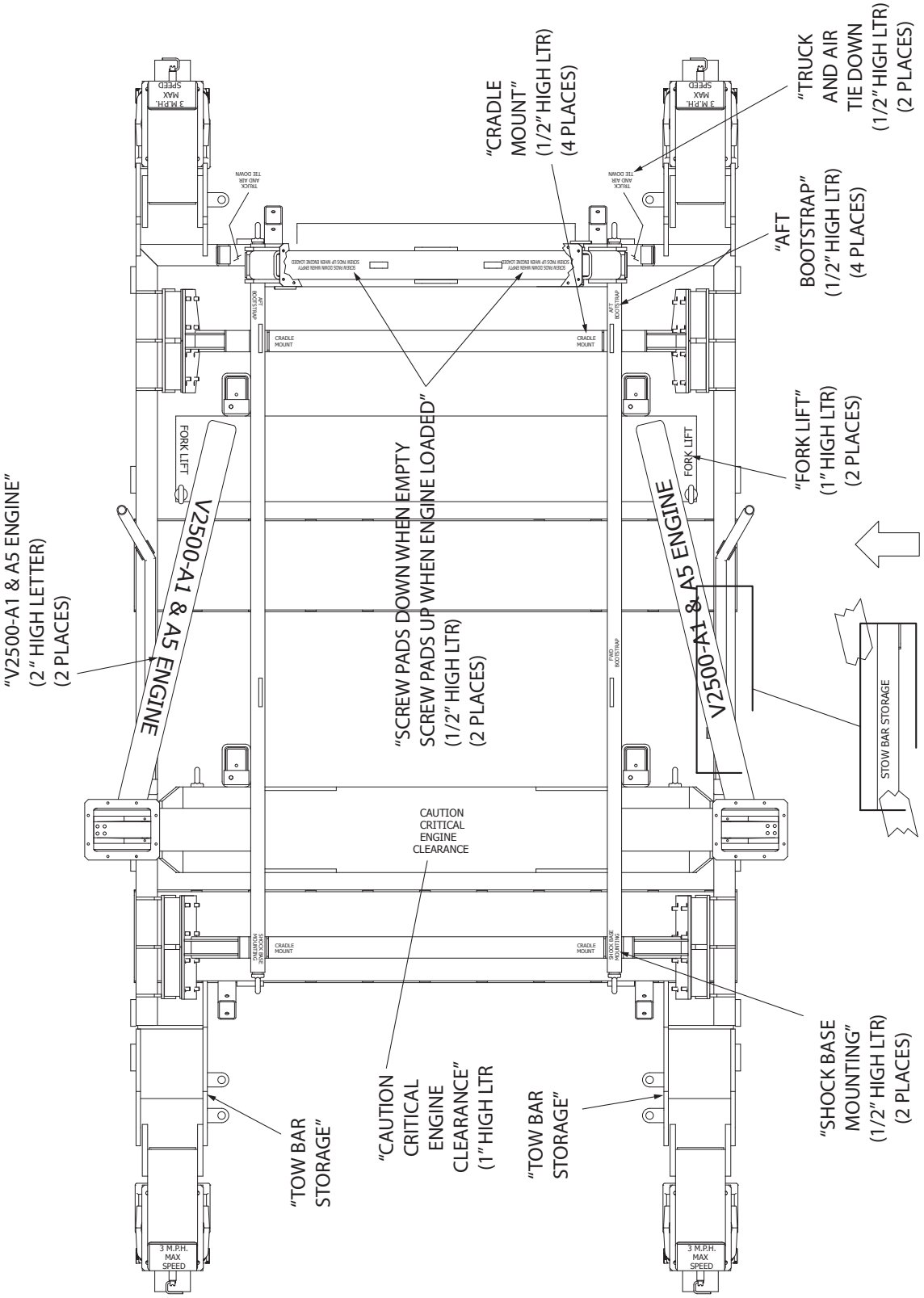

"V2500-A1 & A5 ENGINE"
(2" HIGH LETTER)
(2 PLACES)
"SCREW PADS DOWN WHEN EMPTY
SCREW PADS UP WHEN ENGINE LOADED"
(1/2" HIGH LTR)
(2 PLACES)
"CRADLE
MOUNT"
(1/2" HIGH LTR)
(4 PLACES)
"TRUCK
AND AIR
TIE DOWN
(1/2" HIGH LTR)
(2 PLACES)
"AFT
BOOTSTRAP"
(1/2" HIGH LTR)
(4 PLACES)
"FORK LIFT"
(1" HIGH LTR)
(2 PLACES)
VIEW A
"TOW BAR
STORAGE"
"CAUTION
CRITICAL
ENGINE
CLEARANCE"
(1" HIGH LTR
"TOW BAR
STORAGE"
"SHOCK BASE
MOUNTING"
(1/2" HIGH LTR)
(2 PLACES)
V2500-A1 & A5 ENGINE
V2500-A1 & A5 ENGINE
FORK LIFT
FORK LIFT
CAUTION
CRITICAL
ENGINE
CLEARANCE
STOW BAR STORAGE
CRADLE
MOUNT
CRADLE
MOUNT
CRADLE
MOUNT
CRADLE
MOUNT
3 M.P.H.
MAX
SPEED
3 M.P.H.
MAX
SPEED
3 M.P.H.
MAX
SPEED
3 M.P.H.
MAX
SPEED

Figure 9.2-1

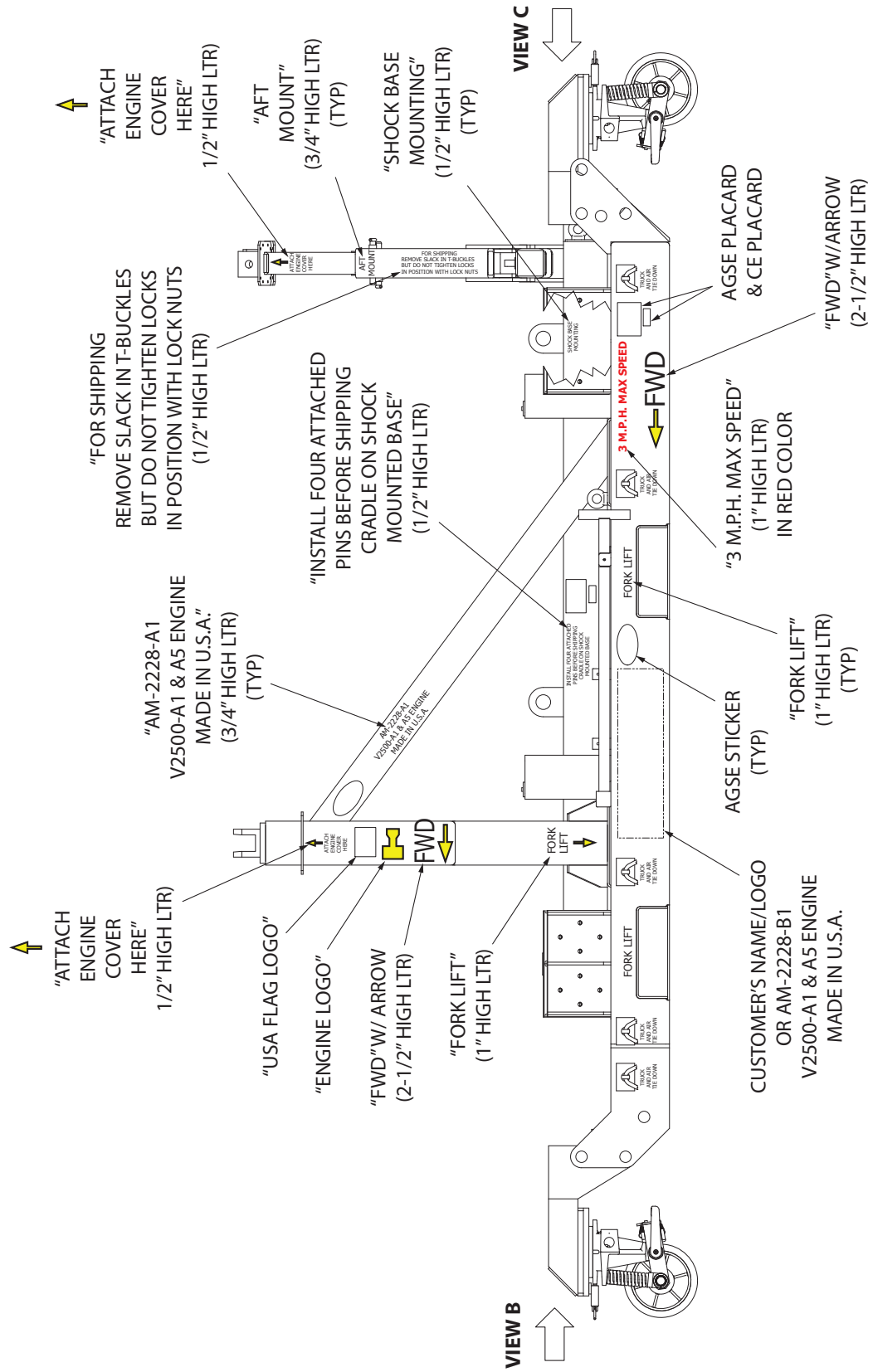
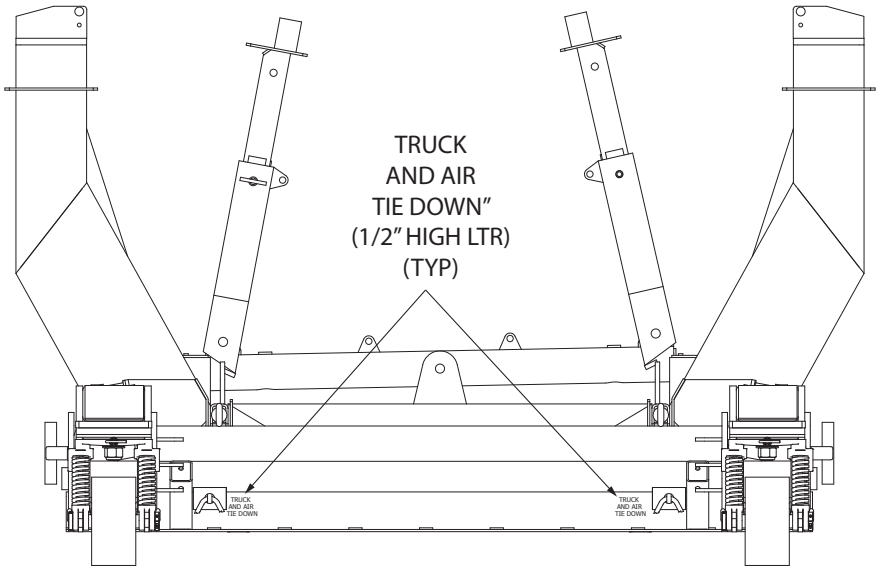
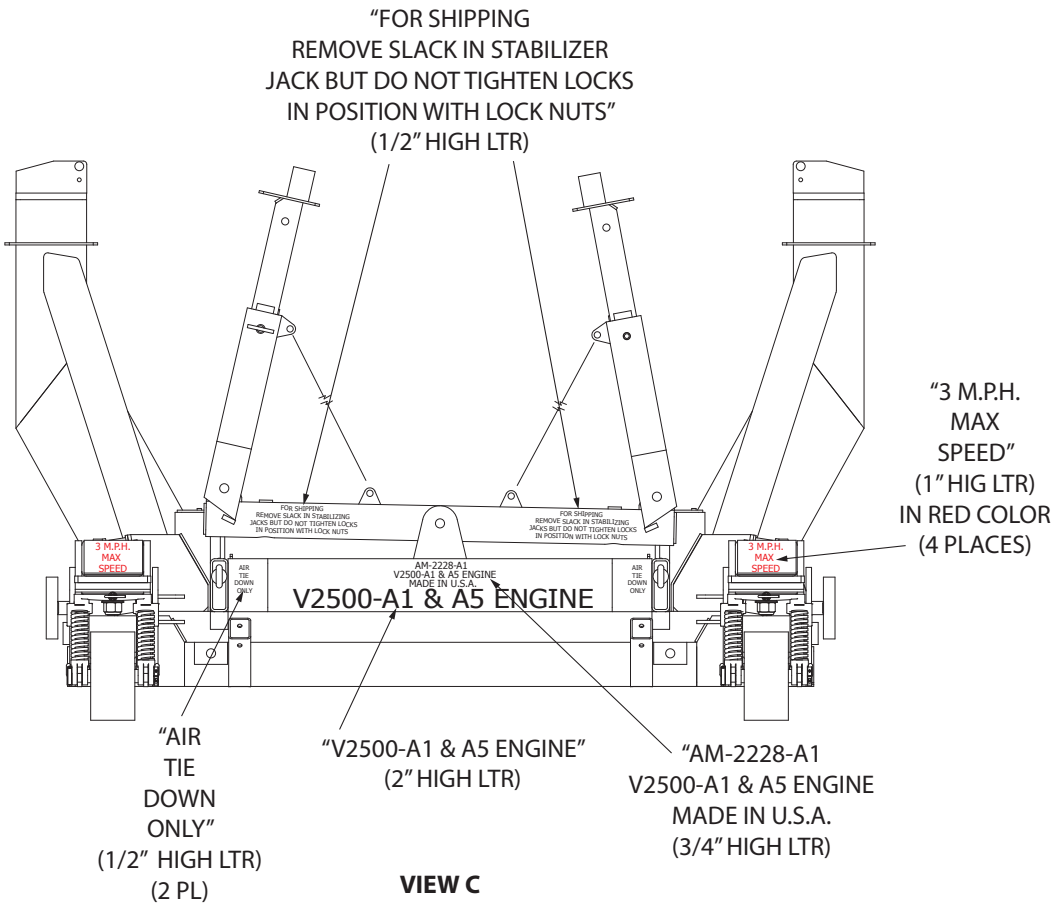

"ATTACH ENGINE COVER HERE" 1/2" HIGH LTR)
"USA FLAG LOGO"
"ENGINE LOGO"
"FWD"W/ ARROW (2-1/2" HIGH LTR)
"FORK LIFT" (1" HIGH LTR)
"AM-2228-A1 V2500-A1 & A5 ENGINE MADE IN U.S.A." (3/4" HIGH LTR) (TYP)
"FOR SHIPPING REMOVE SLACK IN T-BUCKLES BUT DO NOT TIGHTEN LOCKS IN POSITION WITH LOCK NUTS (1/2" HIGH LTR)
"ATTACH ENGINE COVER HERE" 1/2" HIGH LTR)
"AFT MOUNT" (3/4" HIGH LTR) (TYP)
"SHOCK BASE MOUNTING" (1/2" HIGH LTR) (TYP)
"INSTALL FOUR ATTACHED PINS BEFORE SHIPPING CRADLE ON SHOCK MOUNTED BASE" (1/2" HIGH LTR)
"3 M.P.H. MAX SPEED" (1" HIGH LTR) IN RED COLOR
AGSE STICKER (TYP)
CUSTOMER'S NAME/LOGO OR AM-2228-B1 V2500-A1 & A5 ENGINE MADE IN U.S.A.
AGSE PLACARD & CE PLACARD
"FWD"W/ARROW (2-1/2" HIGH LTR)
"FORK LIFT" (1" HIGH LTR) (TYP)
VIEW B
VIEW C
FWD
FORK LIFT
3 M.P.H. MAX SPEED

Figure 9.2-2



VIEW B



VIEW C

Figure 9.2-3

10.0 - Recommended Spares

10.1 Critical Items

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

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

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

PART NUMBER	QTY	PART DESCRIPTION
AM-2228-C6	1	Aft Mount
AM-2228-F6	1	Retainer Pin
AM-2228-G8	1	Hex Head Bolt
AM-2228-K8	1	Safety Pin
CL-4-BLPT-2.00-S	1	Ball Lock Pin
CL-12-BLPT-3.50	1	Ball Lock Pin
AM-91500-160T	1	Safety Pin
AM-91000-52T	1	Safety Pin