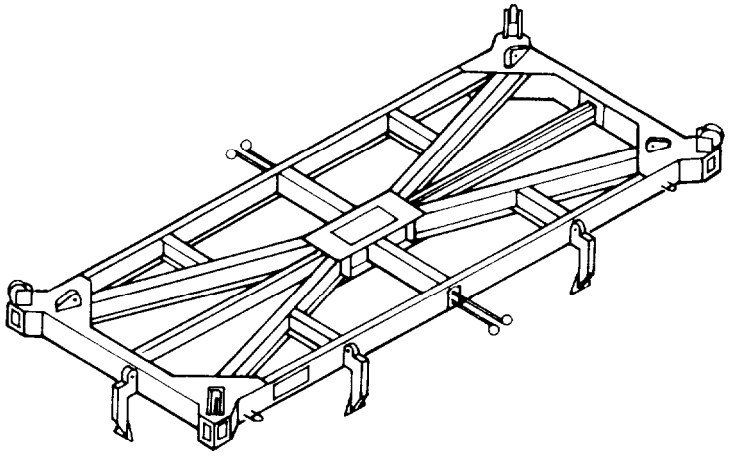
TM 10-3990-204-12&P

TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS)
TOGETHER WITH SUPPLEMENTAL OPERATING MAINTENANCE
AND REPAIR PARTS INSTRUCTIONS (SOMARPI)

FOR

SPREADER, LIFTING FRAMES
NSN 3990-01-128-0089
(LINEFAST MODEL NO. 7127-51A-20L)
NSN 3990-01-128-0090
(LINEFAST MODEL NO. 7127-51A-35L)
NSN 3990-01-128-0091
(LINEFAST MODEL NO. 7127-51A-40L)
AND -
SPACER/STABILIZER BAR
FSCM 58400, PN 7127-SB



HEADQUARTERS, DEPARTMENT OF THE ARMY

25 SEPTEMBER 1984

WARNING

Spreaders are heavy lifting equipment and could cause personnel injury if the following operating safety precautions are not strictly adhered to.

After operating the Control Cables, Ground Crew Personnel must position themselves well clear of the Spreader involved in Container handling operations.

Never crawl, stand, or walk beneath the Spreader during operation, maintenance, or repair procedures.

Before lifting a freight container, check that all four Bayonets are operational. See page 5.

Never attempt to lift a freight container which is loaded to a gross weight (container plus payload) which exceeds the safe working load of the spreaders.

The Tie-Down "D" Rings are intended for Tie-Down only! Never use "D" Rings for lifting.

The Spreader Frames have been designed and constructed for use with Lifting Sling Assemblies that have a 45° minimum angle of lift, see page 1. Never substitute Sling Assemblies not specifically designed for the specific size spreader.

Compressed air used for cleaning purposes will not exceed 30 PSI. Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

NBC contaminated filters must be handled using adequate precautions (FM 21-40) and must be disposed of by trained personnel.

Dry cleaning solvent P-D-680 (SD 2) is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes and clothes and don't breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with skin or clothing is made, flush with water. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

Refer to FM 21-11 for instructions covering first aid for soldiers.

TM 10-3990-204-12&P

TECHNICAL MANUAL

No. 10-3990-204-12&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 25 September 1984

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS) TOGETHER WITH SUPPLEMENTAL OPERATING MAINTENANCE AND REPAIR PARTS INSTRUCTIONS (SOMARPI)

FOR

SPREADER, LIFTING FRAMES
NSN 3990-01-128-0089 (LINEFAST MODEL 20 FT. ISO)
NSN 3990-01-128-0090 (LINEFAST MODEL 35 FT. SEALAND)
NSN 3990-01-128-0091 (LINEFAST MODEL 40 FT. ISO)
AND
SPACER/STABILIZER BAR
FSCM 58400, PN 7127-SB

PART I. OPERATING INSTRUCTIONS, SERVICE AND PARTS MANUAL

PART II. SUPPLEMENTAL MAINTENANCE AND REPAIR PARTS INSTRUCTIONS

REPORTING **OF ERRORS**

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Tank-Automotive Command, ATTN: DRSTA-MBS, Warren, MI 48090. A reply will be furnished direct to you.

NOTE

This manual is published for the purpose of identifying an authorized commercial manual for the use of the personnel to whom this equipment is issued.

Manufactured by: Linefast Corporation
805 Grundy Avenue
Holbrook Avenue
New York, N.Y. 11741

Procured under Contract No. DAAE07-82-C-5337

AUTHENTICATION STATEMENT

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 310-3. Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

TABLE OF CONTENTS

TABLE OF CONTENTS

PART I

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE
OPERATING INSTRUCTIONS AND SERVICE MANUAL

FOR

SPREADER, LIFTING FRAMES

20 FT
35 FT
40 FT

AND

SPACER/STABILIZER BAR

1.1 This manual includes operating, maintenance, and repair instructions for 20 ft., 35 ft., and 40 ft., fixed length, manually operated, x-frame type, intermodal freight container lifting spreaders with, four corner Cell Guide Wheel Assemblies, four side and two end Alignment Flipper Assemblies, a 45° single pick Lifting Sling Assembly and United States Department of Labor Form 3 Certification. National Stock Numbers are as shown on the front cover. All information is applicable to 20 ft., 35 ft., and 40 ft. Spreaders unless otherwise noted.

A Container Lifting Spreader is required for handling freight containers to prevent possible container or cargo damage which can result from using only Lifting Sling Assemblies as well as for convenience and speed.

1.2 A 20 ft. Spreader has a safe working load of 44,800 lbs. and shall be used for handling I.S.O. (International Standards Organization), "Designation 1C", 20 ft. freight containers. 35 ft. Spreaders have a safe working load of 61,600 lbs. and shall be used for handling "Sealand" 35 ft. Freight Containers. 40 ft. Spreaders have a safe working load of 67,200 lbs. and shall be used for handling I.S.O. "Designation 1A" 40 ft. Freight Containers.

1.3 Because the Spreaders are of a fixed length they may not be used interchangebly to handle alternate size freight containers and the Lifting Sling Assemblies must be kept at a 45° minimum angle of lift, see page 1, and are non-interchangeable. Consult the Repair and Replacement Component Parts List on pages 31 to 35 for reference to common parts. No special tools are required during normal operation, maintenance and repair of the spreaders, with the exception of a special Alignment Flipper Operating tool to be used whenever manual Alignment Flipper Operation is not possible. Certain hand tools listed in the Repair and Replacement Component Parts List may facilitate ease in installation of special component parts but are not requirements since standard hand tools can be used.

1.4 The following are basic areas of the spreader and their purpose. Refer to the Component Part Identification section on pages 1 to 4.

Bayonet and Bayonet Body: The Bayonet is the link between the spreaders and the Freight Containers. It enters then locks in the Containers Corner Fittings for Lifting. The Bayonet Body serves as a housing for the Bayonet.

Striker Blocks: Limits Bayonet penetration and prevents Container Corner Fitting damage.

Spreader Control Cables: Operate the Spreader Linkage Assemblies to lock and unlock the Bayonets.

Centerbox: Serves as a housing for the Centerbox Linkage Assembly and is an integral part of the Spreader frame.

Centerbox Cover Plate: Removable for access to the Centerbox Linkage Assembly.

Driveshaft: Connects the End and Centerbox Linkage Assemblies.

Driveshaft Guard: Protects the Driveshafts

Lifting Lugs: Are the Spreader Frame attachment points for the Lifting Sling Assemblies.

Lifting Sling Assembly and Lifting Ring: Connects the Spreader Frame to the crane or other Lifting equipment being used.

Linkage Access Holes: Provide maintenance access to Spreader Linkage Assemblies.

Tie Down "D" Rings: Securing points for Spreader while in transport mode.

Alignment Flipper: Aids crane operator to align Spreader for Container engagement.

Flipper Lock Pin: Locks the Alignment Flipper in both the raised, (position no. 3), and lowered, (position no. 1) positions.

Dovetail Receptacle: Provides horizontal restraint for the Alignment Flipper in the lowered position.

Cell Guide Wheel: Guide and prevent jamming of the Spreader when operating in Cell Guides, below decks on a vessel.

Wheel Keeper Plates: Retain the Cell Guide Wheel in the Wheel Mounts.

Identification and Specification Plate: Contains Spreader Model No. , Proof Test Safe working load, and serial no. information.

Alignment Flipper Operating Tool: Use to operate Alignment Flipper when manual operation is not possible.

January 6, 1982

(Line Fast Ref.: P-4852, W.O.-4920)

U.S. Army Tank Automotive Command
Procurement and Production Directorate
Warren, Michigan 48090

WARRANTY

Subject: Contract No. DAAE07-82-C-5337
20 FT., 35 FT., and 40 FT. Spreader Lifting Frames

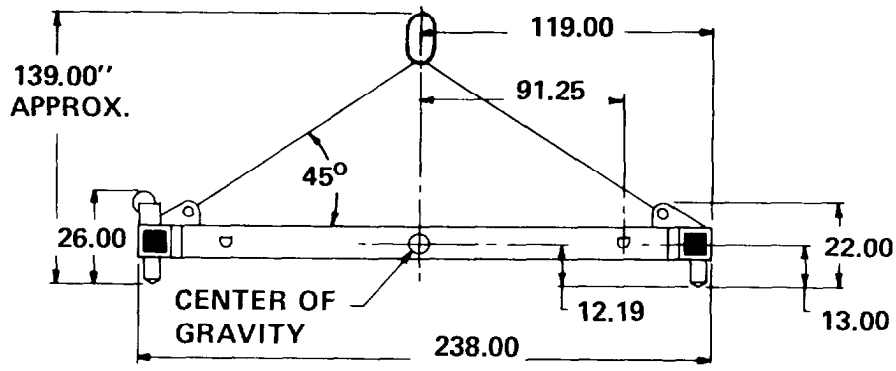
This is to certify that the Line Items 1001, 1002, 1003, 2001AA, 2002AA, and 2003AA, 20 ft., 35 ft., and 40 ft. Spreader Lifting Frames, from the above contract are guaranteed against flaws due to workmanship for a period of fifteen (15) months from date of acceptance and testing of the above referenced Line Items.

This guarantee is based upon material and workmanship alone and does not include damages incurred during shipment, misuse, operational neglect, basic preventitive maintenance and normal usage and wear.

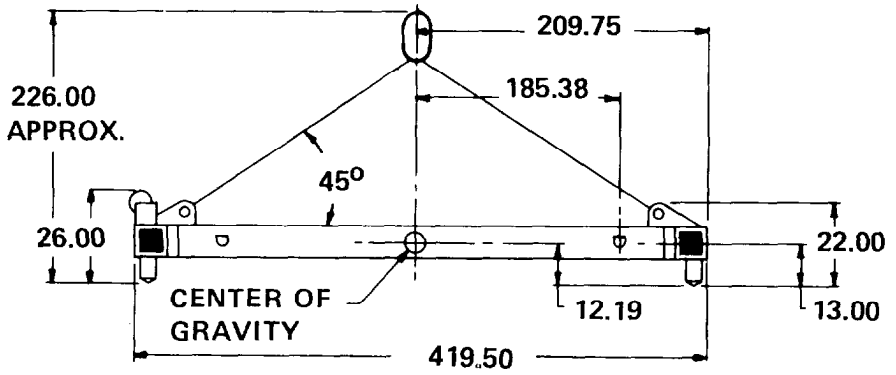
The above warranty is extended to all commercial and military uses.

LINE FAST CORPORATION

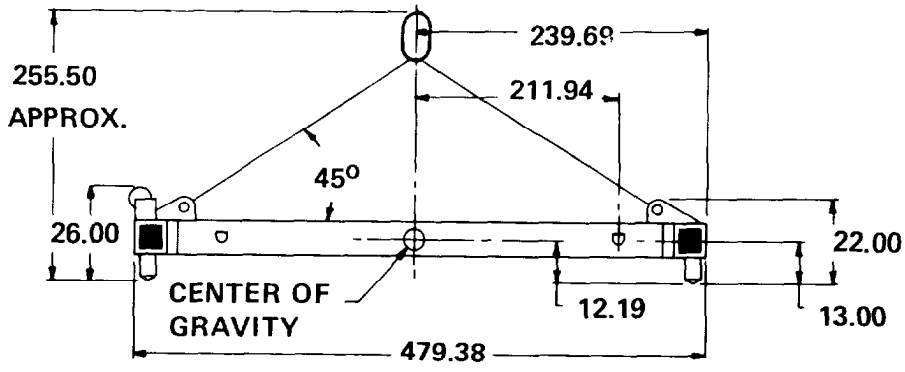
Harry A. Rausch
Executive Vice President



20 FT. SPREADER SIDE VIEW



35 FT. SPREADER SIDE VIEW

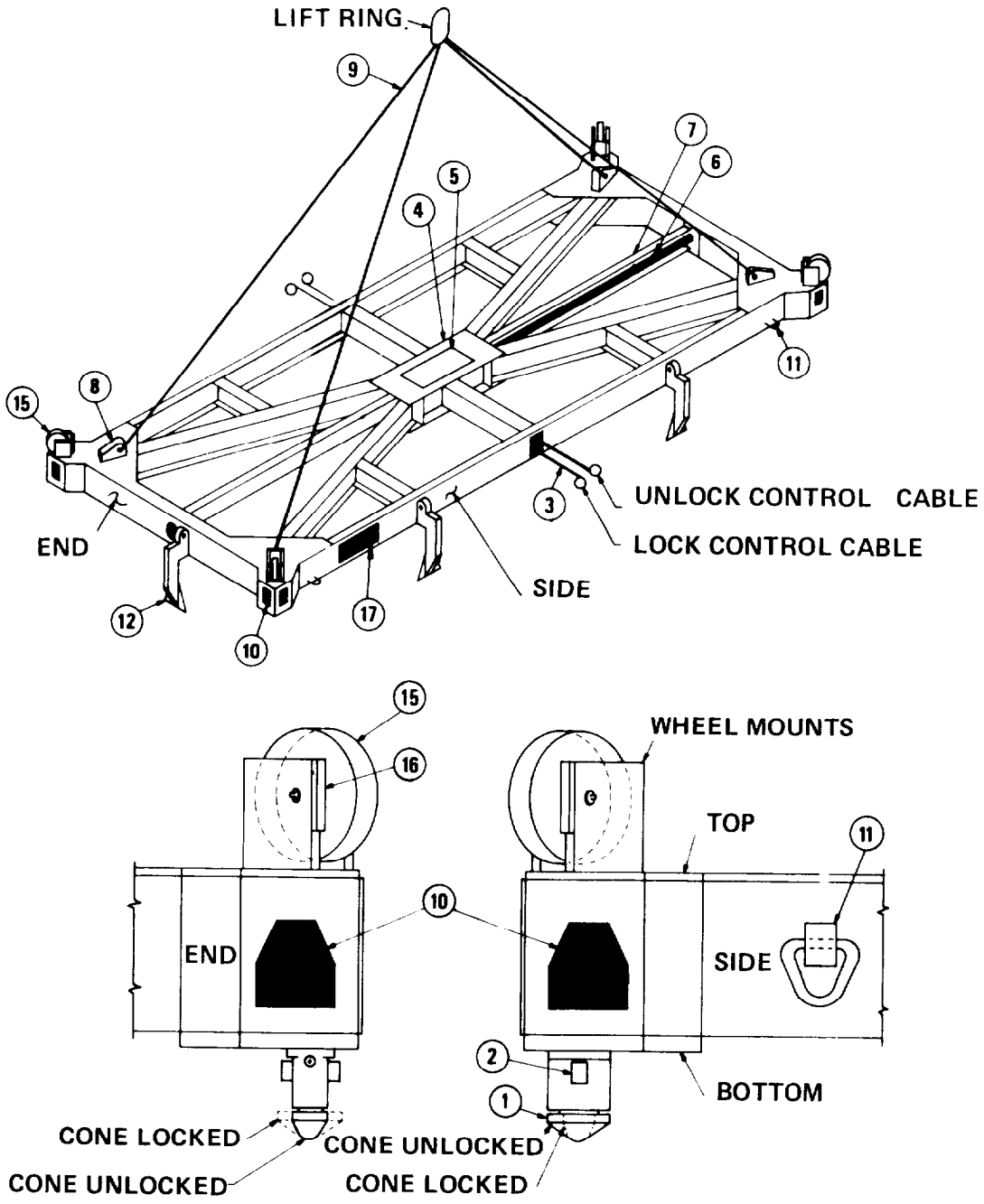


40 FT. SPREADER SIDE VIEW

COMPONENT PART IDENTIFICATION

1. BAYONET AND BAYONET BODY (CONE SHOWN IN LOCKED AND UNLOCKED POSITIONS)
2. STRIKER BLOCKS
3. SPREADER CONTROL CABLES (BOTH SIDES)
4. CENTERBOX
5. CENTERBOX COVER PLATE
6. DRIVESHAFT
7. DRIVESHAFT GUARD
8. LIFTING LUGS
9. LIFTING SLING ASSEMBLY (INCLUDES LIFTING RING), 45° TYPE
10. LINKAGE ACCESS HOLES (REF.)
11. TIE DOWN "D" RINGS (FOR TIE DOWN ONLY!)
12. ALIGNMENT FLIPPER (SIX PER SPREADER)
13. FLIPPER LOCK PIN
14. DOVETAIL RECEPTACLE
15. CELL GUIDE WHEEL
16. WHEEL KEEPER PLATES
17. IDENTIFICATION AND SPECIFICATION PLATE
18. ALIGNMENT FLIPPER OPERATING TOOL

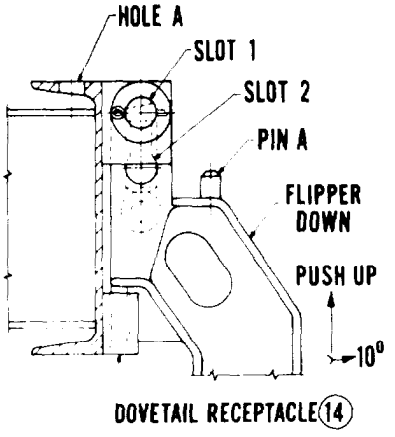
See Component Part Illustrations on pages 3 & 4.



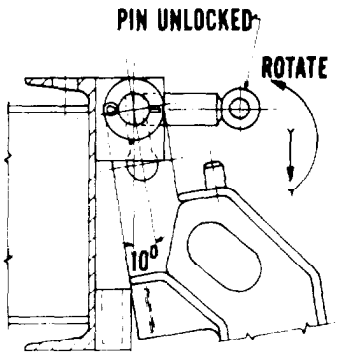
CORNER DETAIL

See Component Part Identification List On Page 2.

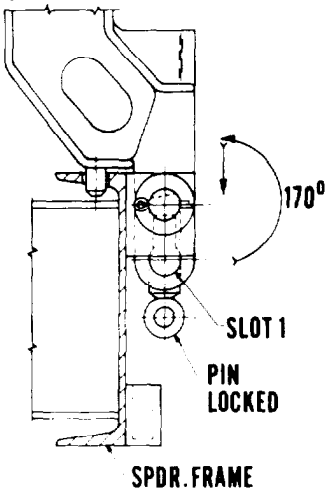
COMPONENT PART IDENTIFICATION



POSITION NO. 1

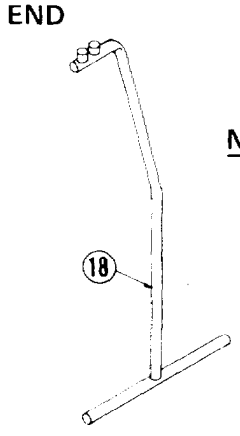


POSITION NO. 2

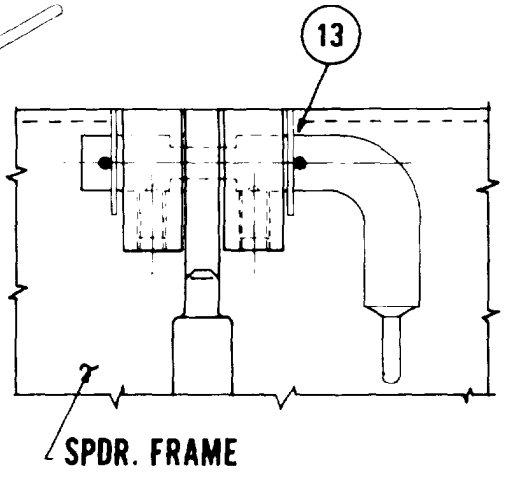


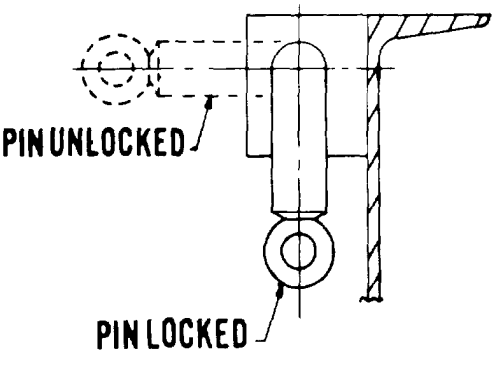
POSITION NO. 3

OPERATIONAL PHASES OF ALIGNMENT FLIPPER



NOTE: For use in operating Alignment Flipper WHEN MANUAL OPERATION is not possible. Engage "End" of tool in holes of Alignment Flipper and Flipper Lock Pin.





See Component Part Identification List On Page 2.

PRE - OPERATION INSPECTION OF THE SPREADER

1.1 Before attempting to operate, members of the operating crew should familiarize themselves with the component parts and operating procedures of the spreader through a careful inspection of this manual.

1.2 Check that the four wire rope legs of the lifting sling assembly are securely attached to the lifting ring at one end and the lifting lugs at the other end.

1.3 Check that the capscrews, (item (JJ) on page 34), which restrain the cell guide wheels, are properly torqued, (tightened), per table 1-2 on page 20.

1.4 Check that the lifting ring is securely attached to the crane or other lifting equipment being used.

WARNING:

1.5 Check that when "lock" control cables are pulled, the four bayonet cones rotate from "unlocked" to "locked" positions as shown on the component part identification sheet on page 3. If any cone fails to rotate or fails to rotate a full ¼ turn, the spreader is not safe to operate and the end linkage assembly must be readjusted. See pages 14 to 15 for adjustment procedures. (To perform this check, the spreader must not be resting on the bayonet cones.)

OPERATING SAFETY PRECAUTIONS

WARNING: 2.1 Before lifting any container be sure that all ground crew members are positioned well clear of the container in operation.

2.2 After the alignment flipper is put in either the down, (position no. 1) or up, (position no. 3) position make sure that the flipper lock pin is then "locked" to prevent the alignment flipper from swinging freely and damaging nearby objects or personnel.

2.3 The safe working loads of the spreaders are 44,800 lbs. for a 20ft., 61,600 lbs. for a 35ft. and 67,200 lbs. for a 40ft. spreader. Never lift a container that is loaded to a gross weight (container plus pay load) which exceeds these limits.

CAUTIONS: 2.4 Never drop the spreader, it should be lowered gently to avoid damaging the bayonet corner assemblies and other linkage components.

2.5 When not in use, the spreader should always be supported by its structural framework. The spreader should never be supported by the bayonets. See page 10 of this manual for suggested supporting points.

2.6 MODEL NO. 7127-51A-20L SPREADER

Spreader frame gross weight	2,625 lbs.
7127-45-20 Lifting sling assembly gross weight	275 lbs.
Safe working load	44,800 lbs.
Spreader proof test load	55,800 lbs. *

2.7 MODEL NO. 7127-51A-35L SPREADER

Spreader frame gross weight	4,175 lbs.
7127-45-35 Lifting sling assembly gross weight	415 lbs.
Safe working load	61,600 lbs.
Spreader proof test load	72,600 lbs.*

2.8 MODEL NO. 7127-51A-40L SPREADER

Spreader frame gross weight	4,580 lbs.
7127-45-40 Lifting sling assembly gross weight	525 lbs.
Safe working load	67,200 lbs.
Spreader proof test load	78,200 lbs *

* CONFORMS TO U.S. DEPT. OF LABOR FORM NO. 3 CERTIFICATION

OPERATION OF THE SPREADER

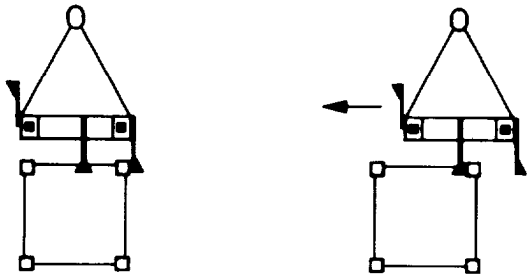
3.1 CAUTION! Only I.S.O. freight containers with nominal 20ft. or 40ft. lengths and Sea-Land type freight containers with nominal 35 ft. lengths may be handled with the spreaders.

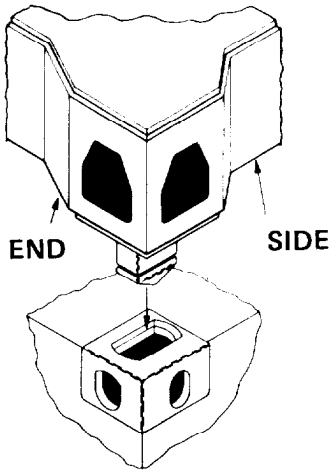
3.2 WARNING! The container weight to be lifted, including payload, must not exceed the safe working loads of the spreaders, which are 44,800 lbs. for a 20ft., 61,600 lbs. for a 35ft., and 67,200 lbs. for a 40ft. spreader.

3.3 CAUTION! Inspect to make sure that the bayonet cones are in the "unlocked" position and that appropriate alignment flippers are locked in the down position as dictated by the current operating conditions. All other flippers should be locked in the raised position.

3.4 Position the spreader above and to the side of the freight container to be lifted.

3.5 CAUTION! SLOWLY ! Move the spreader horizontally until the alignment flippers make contact with the sides and ends of the container.





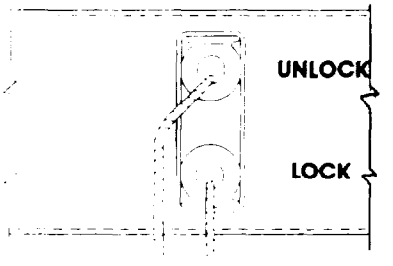
3.6 CAUTION! When aligned, lower the spreader gently onto the container, making sure that all four bayonet cones enter the top openings of the corner fittings.

3.7 CAUTION! When lifting a freight container from a ship's below deck cell, make sure that all alignment flippers are raised and locked, then lower the spreader into the cell on top of the container. The cell guide wheels will work automatically to guide and help prevent jamming of the spreader while in the cell.

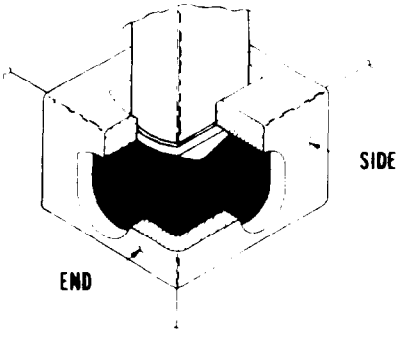
3.8 CAUTION ! The bayonet cones must now be "locked" before the container can be lifted. Spreaders may be "locked" or "unlocked" by pulling the control cables located on both sides of the spreader.

3.9 CAUTION! To lock the bayonet cones, the ground crew member will pull the control cable marked "lock" The cable will travel approximately one foot before it stops and cannot be pulled any further, which signals that the bayonet cones are locked, and the container may be lifted.

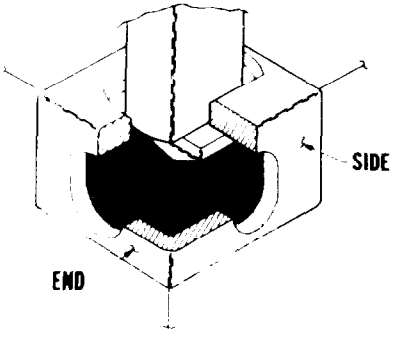
NOTE: Control cables may be pulled from any convenient angle



3.10 "Locking" rotates the bayonet cones 90°, ¼ turn, from "unlocked" to "locked" positions as shown below and on the component part identification sheets



Bayonet cone inside corner fitting "unlocked" position



Bayonet cone inside corner fitting "locked" position

3.11 After loading the bayonet cones may be "unlocked" by pulling the control cable marked "unlock" and the spreader may be lifted clear of the container.

ALIGNMENT FLIPPER OPERATION

(SEE ILLUSTRATIONS ON PAGE 4)

HOW TO RAISE THE ALIGNMENT FLIPPER

3.12.1 Start with the alignment flipper down and "locked" (Position no. 1).

3.12.2 Rotate the flipper lock pin from "locked" to "unlocked" position.

3.12.3 Push up on the alignment flipper until it travels 2" and the flipper lock pin is now in slot no. 2. Angle the alignment flipper 10° away from the spreader and lower it back down 2" so that the flipper lock pin is back in slot no. 1 and the alignment flipper is resting on the outside of the dovetail receptacle. This is position no. 2.

3.12.4 Rotate the alignment flipper 170° to the raised position and then lower it 2" so that the flipper lock pin is in slot no. 2 and pin "A" has entered hole "A" in the top of the spreader's side channel. This is position no. 3. Now make sure that the flipper lock pin is rotated back to the "lock" position.

HOW TO LOWER THE ALIGNMENT FLIPPER

3.13.1 Start with the alignment flipper raised and locked. (Position no. 3)

3.13.2 Rotate the flipper lock pin from "locked" to "unlocked" positions.

3.13.3 Push up on the alignment flipper until it travels 2" and the flipper lock pin is in slot no. 1 then rotate the alignment flipper down 170° to position no. 2.

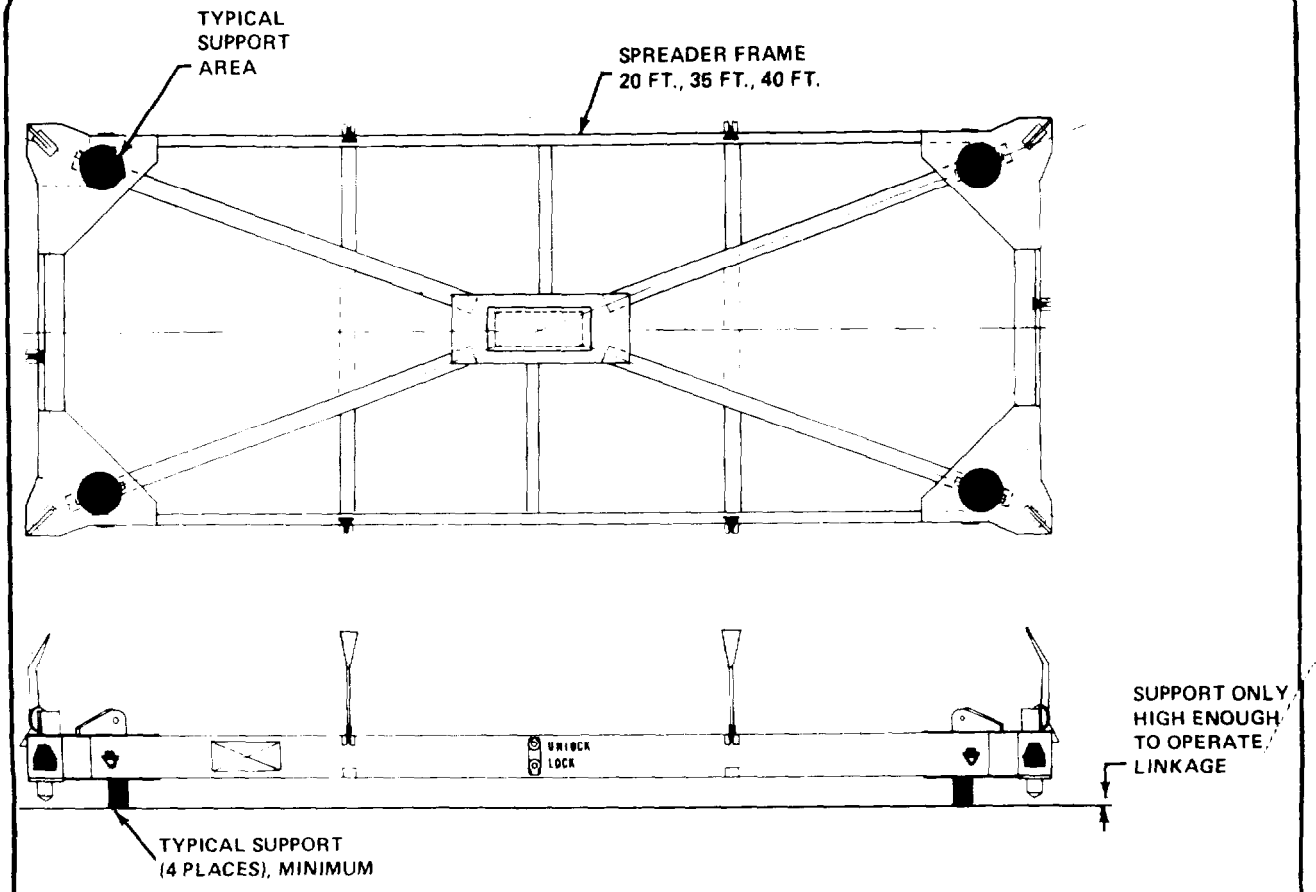
3.13.4 Push up on the alignment flipper until it travels 2" and the flipper lock pin is in slot no. 2 then swing the alignment flipper flush against the side of the spreader.

3.13.5 Now lower the alignment flipper into the dovetail receptacle. The flipper lock pin should be in slot no. 1. "Lock" the flipper lock pin

NOTES:

1. The alignment flipper operating tool component (QQ) may be used to assist operating personnel with alignment flipper operation.

2. The flipper lock pin is designed to prevent upward alignment flipper motion when it is "locked". To check if pin has been properly locked, push up on the alignment flipper.



NOTES:

1. Support the spreaders with at least four level and stable supports underneath the shaded areas shown.
2. The spreader need only be supported high enough so that the four bayonet cones are off the ground and the linkage may be operated.
3. WARNING! Never attempt to crawl beneath the spreader to gain access to the linkage, instead step over and in between the structural framework members.
4. Dashed lines indicate 35 ft. and 40 ft. framework members.
5. CAUTION! For a 20 ft. spreader, each support should be capable of supporting a minimum of 750 lbs. A minimum of 1,200 lbs. is required for a 35 ft. spreader, and 1,300 lbs. for a 40 ft. spreader.

HOW TO BLOCK-UP A SPREADER

PREPARATIONS FOR TRANSPORTATION AND LONG TERM STORAGE

LONG TERM STORAGE

4.1 The spreader should be blocked up as per page 10 of this manual for the duration of the storage. If necessary, the Alignment Flippers may be removed to reduce spreader volume.

4.2 Clean and grease the End Linkage Assembly, Centerbox Linkage Assembly and the Cell Guide Wheel Assemblies. See page 12 - Cleaning and Greasing Procedures.

4.3 If the spreader is to be stored outdoors, it should be covered with a waterproof tarp to prevent excessive weather damage.

4.4 After removing the spreader from storage, examine it as per the Pre-Operation Inspection section of this manual, on page 5.

4.5 Clean and re-grease if necessary.

TRANSPORTATION

4.6 When transporting by flat bed truck, the spreader should be lashed to the truck at each corner using the Tie-Down "D" Rings.

4.7 When transporting aboard ship, the spreader may be left "locked" to a freight container or lashed to deck equal to the flat bed truck method. If the spreader is to be left "locked" to a container, be absolutely sure that the additional spreader gross weight added to the existing container gross weight does not exceed the maximum allowable weight for the container as established by I.S.O. standards, Sea-Land standards, or the ship's container securing system's container weight restriction.

CHECK LIST OF PERIODIC MAINTENANCE PROCEDURES

5.1 To aid locating and identifying component parts which require servicing, refer to the Repair and Replacement Component Parts List on pages 31 to 35. Also see the plan, elevation, pictorial, or exploded views of these parts on pages 16 - 19 and 36 to 40 .

5.2 The End Linkage, Centerbox Linkage, Cell Guide Wheels, and Alignment Flipper components require only simple regular servicing. Al least once a month, (or sooner if operation is not smooth), they should be cleaned and greased. At least every six months, check that the End Linkage Assemblies are correctly adjusted. See pages 14 and 15 for linkage adjustment procedures.

5.3 Each time the End Linkage Assemblies are checked for adjustment, all hardware listed in the Repair and Replacement Component Parts List on pages 31 to 35 , should be checked for proper tightness. See torque table 1-2 on page 20.

CLEANING AND GREASING PROCEDURES

6.1 Refer to the views on page 13 which show the locations of component part (KK) (GG) and (W) grease fittings, as well as other surfaces of friction which should be greased. These locations are marked with an (X) .

6.2 Block up the spreader so that the linkages may be operated. Refer to blocking instructions on page 10.

6.3 To eliminate the need for End Linkage re-adjustment, do not disassemble any End Linkage components while cleaning and greasing.

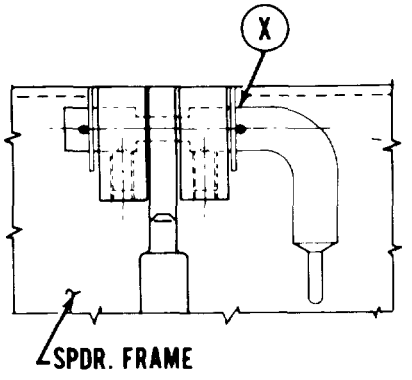
6.4 Grease fittings, component parts (KK) , (GG) and (W) should be wiped with a clean rag and filled with component part (XX) , grease. Grease fittings are located in sixteen places per spreader, eight at the ends of the Cell Guide Wheels, four on the Bayonet bodies, two on the end driveshaft bushings, and two on the centerbox driveshaft bushings.

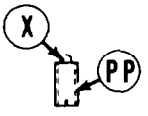
Note: The centerbox cover plate must be removed for access to the centerbox driveshaft bushings.

6.5 Place the End Linkage in an "Unlocked" position. All other surfaces to be greased shall first be scraped free of dirt and dried up grease. A household paint scraper may be used for this purpose Next, wipe these surfaces with a clean rag. Repeat with End Linkage in a "Locked" position.

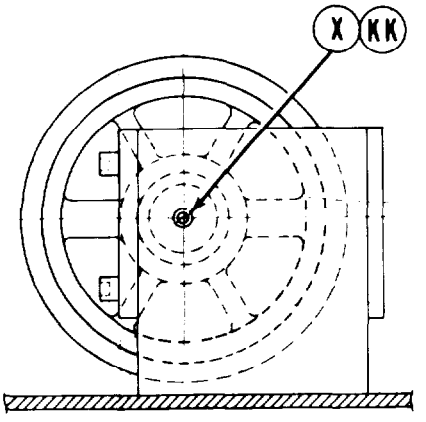
6.6 Cover all accessable surfaces, as marked with an (X) , with a thin film, not to exceed 1/16", of component part (XX) , grease. Operate the End Linkage through a few Lock-Unlock cycles and repeat.

6.7 The Flipper Lock Pin component (NN) and Stubby Spring Plungers component part (PP) should be dissassembled and their frictional surfaces cleaned and greased

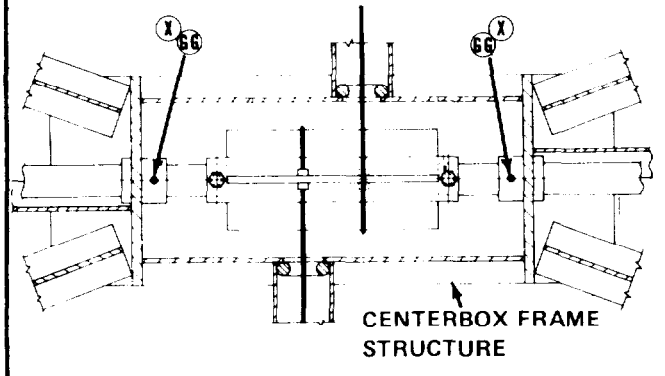




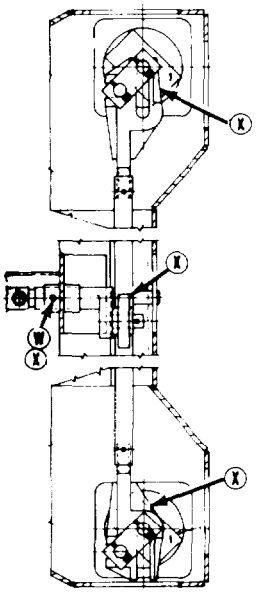
FLIPPER LOCK PIN



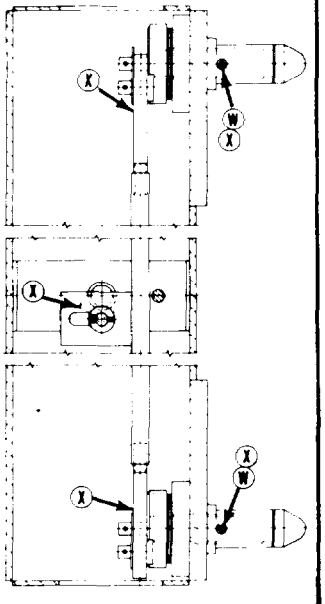
CELL GUIDE WHEEL



CENTERBOX LINKAGE ASSEMBLY
PLAN VIEW



END NO. 1
END LINKAGE ASSEMBLY
PLAN VIEW



END NO. 1
END LINKAGE ASSEMBLY
ELEVATION VIEW

NOTES:

1. All areas marked with an (X) are to be cleaned and greased at least once a month to maintain smooth operation and help prevent corrosion.
2. Greasing locations for End No. 1 and End No. 2, as well as for 20 ft., 35 ft., and 40 ft. spreaders are the same.
3. Flipper Lock Pins are located six places per spreader and component (KK). Grease Fittings for the Cell Guide Wheels Assemblies are located eight places per spreader.

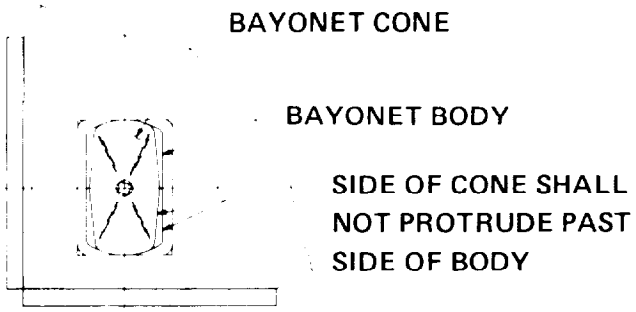
20 FT., 35 FT., and 40 FT.
LINKAGE GREASING LOCATIONS

ADJUSTMENT OF THE END LINKAGE ASSEMBLY

7.1 WHEN TO ADJUST THE LINKAGE

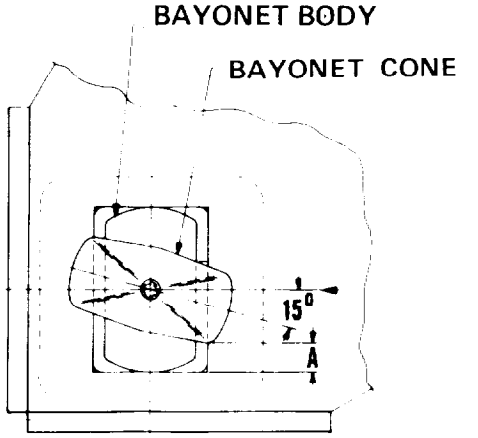
CAUTION! **Adjustment is required if either one or both of the following conditions is violated. Each Bayonet must be checked separately.**

7.2 Condition No. 1: **With the spreader End Linkage fully Unlocked, any side edge of the Bayonet Cone shall not protrude past the Bayonet Body, but may be flush.**



VIEW FROM BENFATH CORNER OF SPREADER

7.3 Condition No. 2: With the spreader End Linkage fully Locked, the Bayonet Cone shall not be more than 15^{0} out of alignment. The cone is within this limit if Dimension "A" is not less than 5/8, .63 inches for 20 ft. and 40 ft. spreaders and 1-1/8, 1.125 inches for a 35 ft. spreader.



VIEW FROM BENEATH CORNER OF SPREADER

CAUTION! Whenever Condition No. 1 or No. 2 is not satisfied, the End Linkage should be re-adjusted using the following procedure until both conditions are satisfied.

HOW TO ADJUST THE LINKAGE

8.1 Place the End Linkage in an Unlocked position. Any Bayonet Cone which operates to satisfy Condition No. 1 and No. 2 need not be re-adjusted. Clamp these Bayonets to the Bayonet Body to prevent them from rotating while adjusting other cones.

8.2 Refer to Page 16 and 17 End Linkage Plan and Elevation Views.

8.3 Remove component part (ZZ) Cotter Pins and lift off component part (S) Keeper Plate.

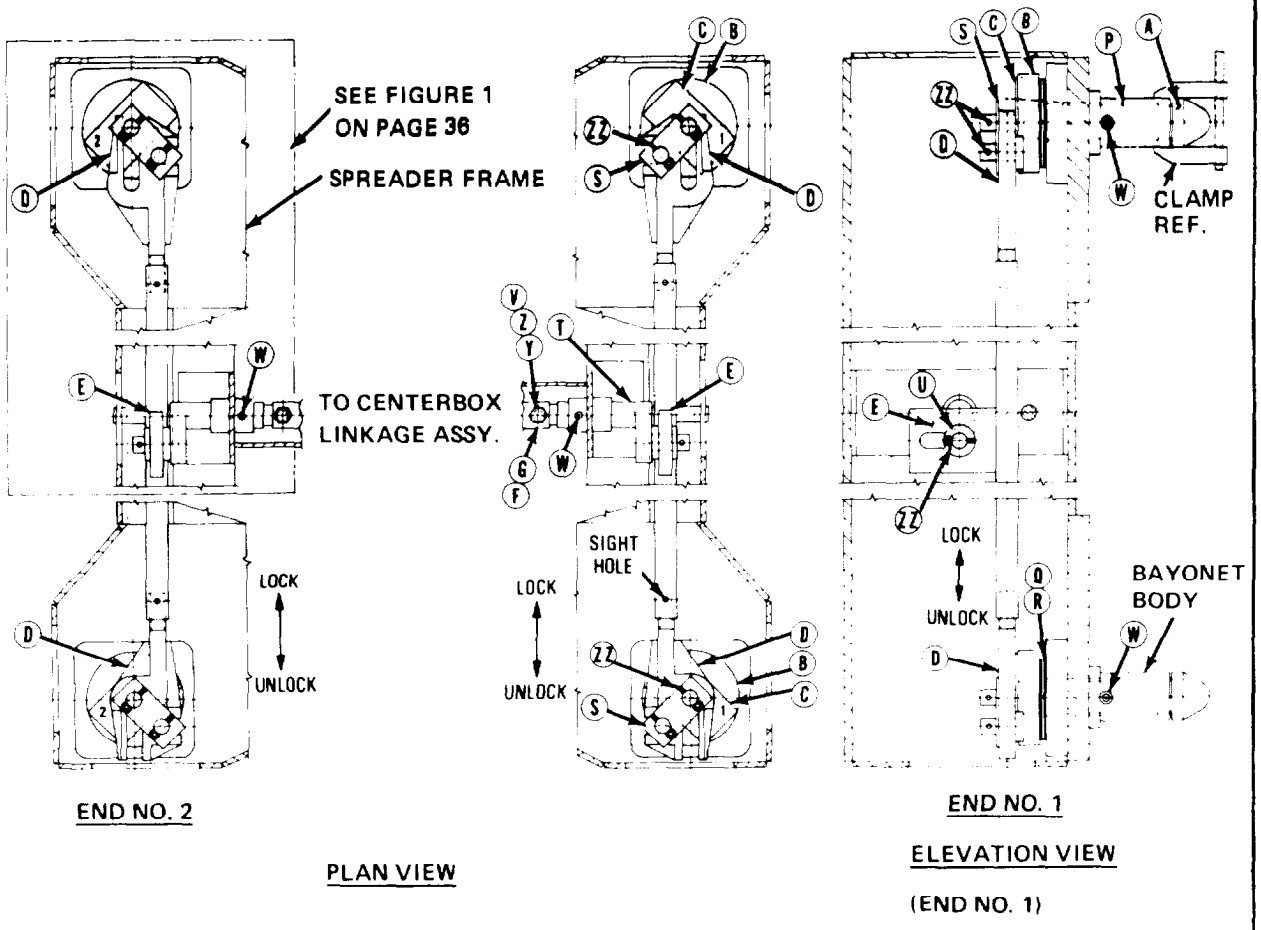
8.4 Grasp (E) or (N) End Tie Rod Assemblies and lift off the Bayonet Cam Plates (D), (L) and (M) as required, from the Stress Collars (B) or (I). Adjust by rotating the Cam Plates at 1 turn intervals until Condition No. 1 is satisfied. Clamp the Bayonet Cone to the Bayonet Body and re-assemble component parts (S) and (ZZ)

CAUTION! There is a minimum adjustment sight hole in the End Tie Rods. Some portion of the Cam Plates threaded studs should always be visible thru this hole.

8.5 Repeat steps 3 and 4 for each Bayonet Cone which requires adjustment.

8.6 The End Linkage should now be properly adjusted. Unclamp the Bayonet Cones and operate the spreader through several Lock-Unlock cycles. With the spreader in Lock position, check Dimension "A".

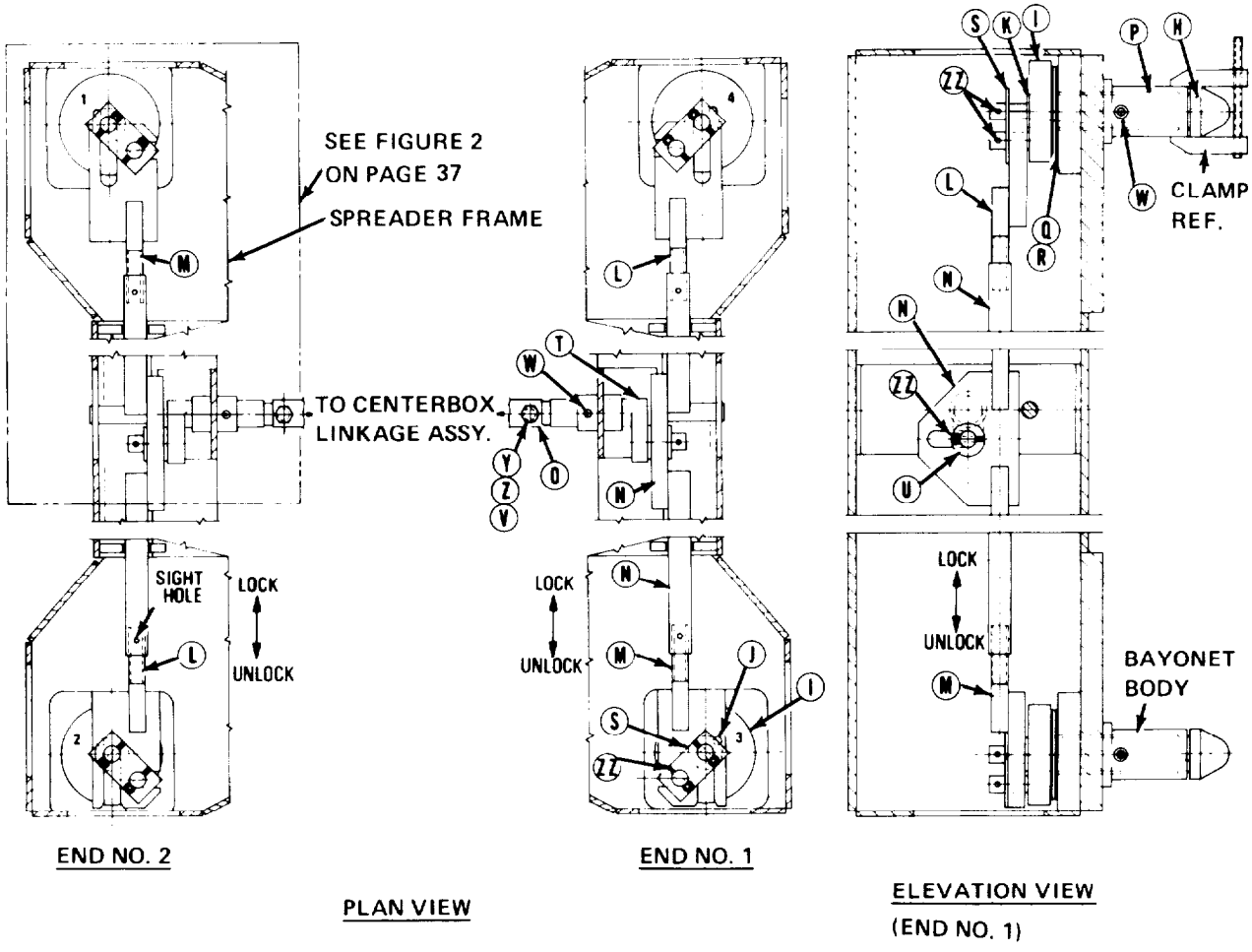
8.7 CAUTION! No End Linkage component part should ever wear to a point to prevent proper End Linkage adjustment as described in steps 8.1 - 8.5. If the End Linkage cannot be properly adjusted, structural damage to the linkage or spreader framework may have occured. The spreader must not be operated until it has been inspected by Line Fast personnel and the problems corrected.



NOTES:

1. Views show opposite ends of a 20 ft. or 40 ft. spreader linkage in a fully "unlocked" position.
2. Ends labeled No. 1 and No. 2 for identification purposes.

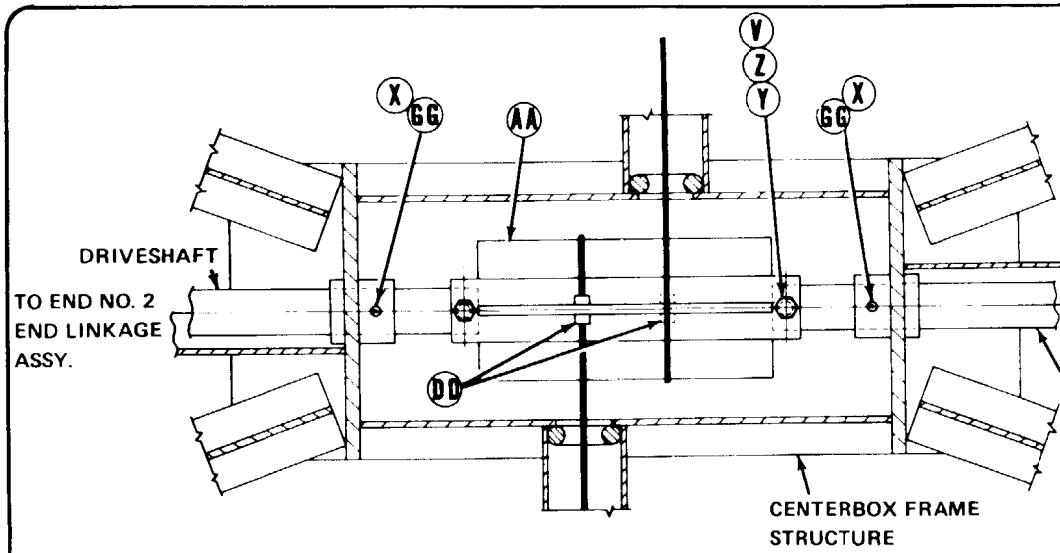
20 FT. AND 40 FT. END LINKAGE ASSEMBLY
(PLAN AND ELEVATION VIEWS)



NOTES:

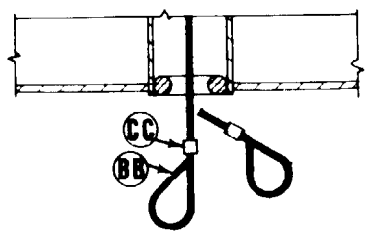
1. Views show opposite ends of a 35 ft. spreader linkage in a fully "unlocked" position.
2. Ends labeled No. 1 and No. 2 for identification purposes.

35 FT. END LINKAGE ASSEMBLY
(PLAN AND ELEVATION VIEWS)

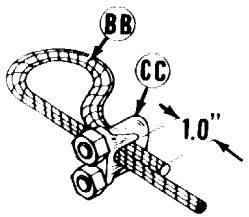


NOTES:

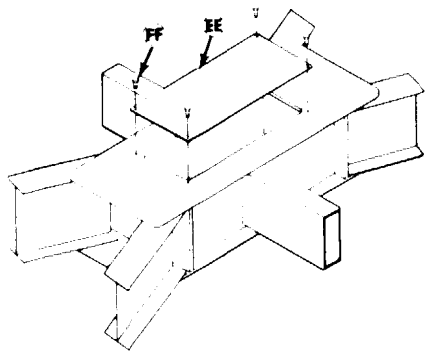
1. Plan view shows a Centerbox Linkage Assembly for 20 ft., 35 ft., and 40 ft spreaders as it would appear in a fully "unlocked" position.
2. Ends labeled No. 1 and No. 2 for identification purposes.



PLAN VIEW



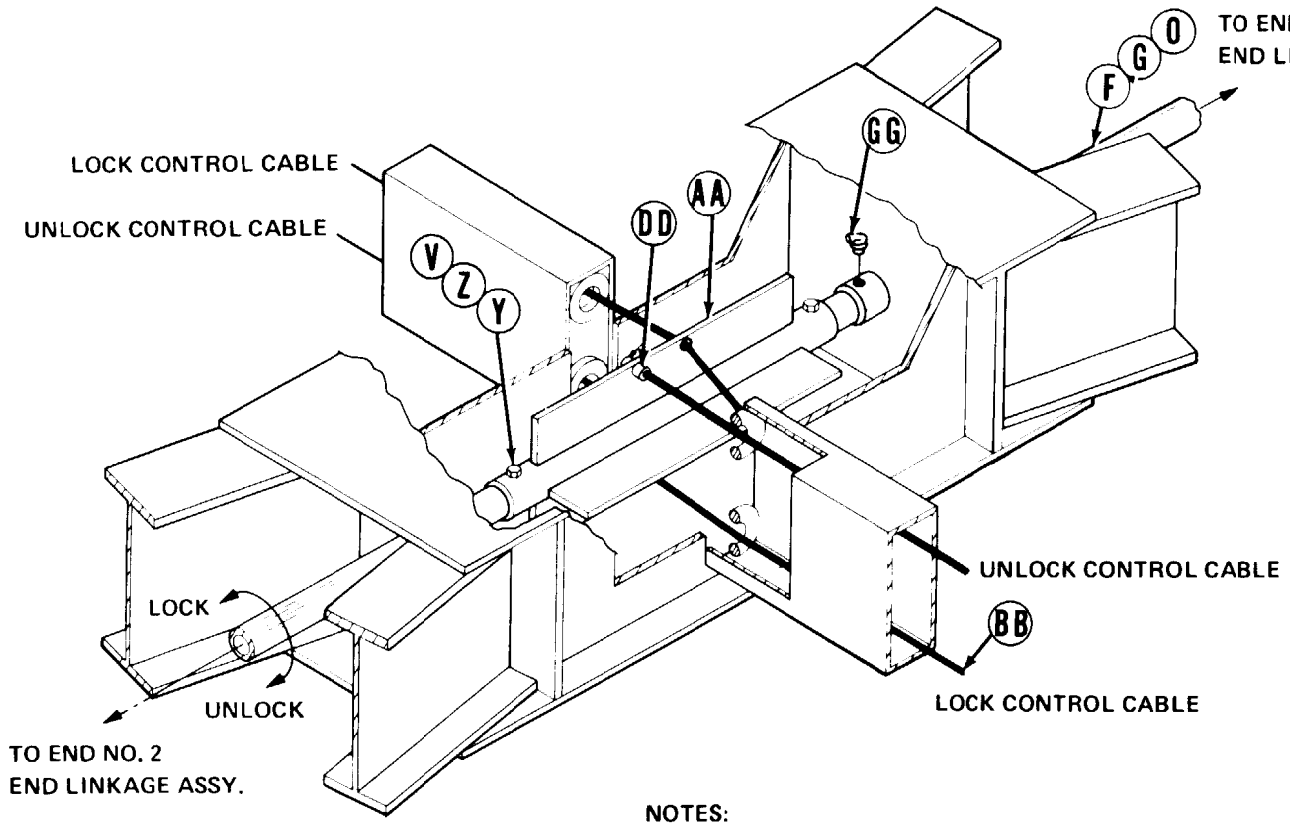
TYPICAL CABLE LOOP
PICTORIAL VIEW



CENTERBOX FRAME STRUCTURE
PICTORIAL VIEW

SEE ALSO PICTORIAL VIEW ON PAGE 19

20 FT., 35 FT., AND 40 FT.
CENTERBOX LINKAGE ASSEMBLY
(PLAN VIEW AND PICTORIAL VIEWS)



NOTES:

1. Lock-unlock arrows refer to the direction of the Driveshaft rotation.
2. This Pictorial View shows the correct way the Control Cables should be wrapped about the Paddle Wheel Blade Assembly.
3. Centerbox Linkage Assembly shown in a fully "unlocked" position.
4. Ends labeled No. 1 and No.2 for identification purposes.

20 FT., 35 FT., AND 40 FT.
CENTERBOX LINKAGE ASSEMBLY
(PICTORIAL VIEW)

TABLE 1 - 2 Calculated Tightening-Torque Values for SAE Grade 2 Bolts used on Spreader Frames.

	DESCRIPTION	TIGHTENING TORQUE
(FF)	3/8-16 UNC-2A HEXAGON HEAD, SELF TAPPING SCREW	15 LB. - FT.
(Z)	1/2-13 UNC-2A HEXAGON HEAD BOLT	36.5 LB.- FT.
(JJ)	1/2-13 UNC-2A HEXAGON SOCKET HEAD CAP SCREW	36.5 LB.- FT.

NOTES:

9.1 Use this table to achieve proper torque values for all hardware when reassembling component parts.

ASSEMBLY OF REPAIR AND REPLACEMENT COMPONENTS

10.1 For reference, refer to the plan and elevation views of the End and Centerbox Linkage Assemblies on pages 16 - 19 as well as the repair part illustrations on pages 38 to 40.

10.2 Before any disassembly, it is strongly recommended that the spreader be placed in a fully "Unlocked" position and that each Bayonet Cone be clamped in this position. This will help insure that the End Linkage is not assembled with the Bayonet Pins in the wrong positions, and that the Bayonet Cones will rotate in sequence when locking and unlocking the spreader. Remove clamps only after the End Linkage has been reassembled.

10.3 (A) Replacing a 20 Ft. and 40 Ft. Bayonet

10 3.1 Working through the Access Holes, remove Cotter Pins (ZZ), 2 places, and lift off the Keeper Plate (S). Grasp the End Tie Rod (E), and lift the Cam Plate (D), off the Central Shaft and Bayonet Pin, then unthread it from the End Tie Rod. Lift off the Key Plate (C). Note that the Key Plate has a numeral 1 or 2 stamped on it These numbers correspond to End No. 1 and 2 of the spreader for ease of reassembly. Unthread the Stress Collar (B), from the Bayonet, then unclamp and remove the damaged part.

10.3.2 Reassemble the parts as above in reverse order. Hand tighten the Stress Collar on the new Bayonet as far as possible, then back off until the Bayonet Pin is in the proper position and the Bayonet rotates freely. The Key Plate should be assembled with the numbered side face up. The shallow slot of the Cam Plate goes over the Bayonet Pin and the deep slot over the Central Shaft. Grease new parts.

10.4 (B) Replacing a 20 Ft. and 40 Ft. Stress Collar

10 4.1 Unlike a 35 Ft. spreader, the Stress Collars and Bayonets for a 20 ft. or 40 ft. spreader may be replaced separately. Line Fast strongly recommends, however, that if at all possible they also be replaced in pairs. If either one is damaged, there could be unseen damage in the other part.

10.4.2 Follow the procedures outlined for replacing component part (A). After unthreading the old Stress Collar, install the new part and grease.

10.5 (C) Replacing a 20 Ft. and 40 Ft. Key Plate

10.5.1 Follow the procedure outlined for replacing component part (A). Lift off the old Key Plate and install the new part with the proper numeral surface No. 1 or 2 face up. When ordering a new Key Plate, specify part number and which numeral should be stamped on it. Grease new part.

10.6 (D) Replacing a 20 Ft. and 40 Ft. Bayonet Cam Plate

10.6.1 Follow the procedure outlined for replacing component part (A). Thread the new Cam Plate into the End Tie Rod until the shallow and deep slots drop into position over the Bayonet Pin and Central Shaft. Grease new Part.

10.7 (E) Replacing a 20 Ft. and 40 Ft. End Tie Rod Assembly

10.7.1 Follow the procedure outlined for replacing component part (A) to detach each end of the End Tie Rod from the Cam Plates. Remove Cotter Pin (ZZ) from the Center Cam Drive (T). Lift off Washer (U), remove End Tie Rod from Pin on Center Cam Drive and slip it out from the spreader frame through the Access Holes. Reassemble the new End Tie Rod in reverse order.

10.7.2 The Cam Plates should be threaded equally into the ends of the End Tie Rods until they drop into position over the Central Shaft and Bayonet Pins. Grease new part.

10.8 (F) & (G) & (O) Replacing 20 Ft., 35 Ft., and 40 Ft. Drive Shafts

10.8.1 Remove component parts (Y) Nut, (Z) Bolt and (V) Cotter Pin at both ends of the Driveshafts To remove these parts at the Centerbox End, the Centerbox Cover Plates must be removed. Now remove parts (E) End Tie Rod, (N) End Tie Rod and (T) Center Cam Drive as required. Slide the Driveshaft out through the End Access Hole of the spreader. Slide in the new Driveshaft, reinstall parts (Y), (Z), (V), (E), (N) and (T). Grease the Driveshaft Bushings at both ends of the Driveshafts.

10.9 (H) & (I) Replacing a 35 Ft. Bayonet and Stress Collar

10.9.1 The 35 ft. Bayonet and Stress Collar are manufactured in matched pairs, and must be replaced together. Matched Bayonets and Stress Collars are stamped with the numbers 1 - 4 on each spreader. When ordering a replacement pair, specify part numbers and which numeral should be stamped on the new pair.

10.9.2 Working thru the Access Holes, remove Cotter Pins (ZZ), 2 places, and lift off the Keeper Plate (S). Grasp the End Tie Rod (N), and lift the Cam Plate (L), or (M), from the Central Shaft and Bayonet Pin. Unthread the Cam Plate from the End Tie Rod. Lift off Spacer Washer (K) and remove Setscrew (J). Unthread the Stress Collar (I) from the Bayonet (H) and remove the damaged parts.

10.9.3 Reassemble the parts as above in reverse order. Hand tighten the new Stress Collar onto the new Bayonet as far as possible, then back off until the Bayonet Pin is in the proper position and the Setscrew threads are aligned, the Bayonet should rotate freely. Assemble the Setscrew flush with the Stress Collar. The shallow slot of the Cam Plate goes over the Bayonet Pin and the deep slot over the Central Shaft. Grease new parts.

10.10 (J) Replacing a 35 Ft. Setscrew

10.10.1 Follow the procedures outlined for replacing component parts (H) and (I) After lifting off the Spacer Washer, remove the old and install the new setscrew.

10.11 (K) Replacing a 35 Ft. Spacer Washer

10.11.1 Follow the procedure outlined for replacing component parts (H) and (I) After lifting off the Cam Plate, lift off the damaged and install the new Spacer Washer over the Central Shaft.

10.12 (L) & (M) Replacing a 35 Ft. Bayonet Cam Plate

10.12.1 Procedures for replacing a right hand or left hand Cam Plate are the same. Follow the procedure outlined for replacing component parts (H) and (I). Thread the new Cam Plate into the End Tie Rod until the shallow and deep slots drop into position over the Bayonet Pin and Central Shaft. Grease new parts.

10.13 (N) Replacing a 35 Ft. End Tie Rod Assembly

10.13.1 Follow the procedures outlined for replacing component parts (H) and (I), to detach each end of the End Tie Rod from the Cam Plates. Now follow the procedure outlined for replacing component part (E) to remove damaged End Tie Rod. Install new parts in reverse order and grease .

10.14 (P) Replacing a 20 Ft., 35 Ft., and 40 Ft. Spacer Bushing

10.14.1 Follow the procedures outlined for replacing component parts (A), (H) and (I). After removing the Bayonet, lift out the old and insert the new Spacer Bushing . Line Fast recommends that the Spacer Bushing be replaced each time a Bayonet is replaced. Grease new part.

10.15 (Q) & (R) Replacing 20 Ft., 35 Ft., and 40 Ft. Washers

10.15.1 Follow the procedures outlined for replacing component parts (A), (H) and (I). After unthreading the Stress Collars, lift off the old and install the new Washers. After reassembly beneath each Stress Collar there should be one Washer (R), Sandwiched between two Washers (Q).

10.16 (S) Replacing a 20 Ft., 35 Ft., and 40 Ft. Keeper Plate

10.16.1 Remove Cotter Pins (ZZ), 2 places. Lift off damaged Keeper Plate and install the new one. Replace the Cotter Pins.

10.17 (T) Replacing a 20 Ft., 35 Ft., and 40 Ft. Center Cam Drive

10.17.1 Follow the procedure outlined for replacing components (E) and (N) End Tie Rod Assemblies, to remove them for access to the Center Cam Drive. Detach the damaged Center Cam Drive from the Driveshaft by removing component parts (V) Cotter Pin, (Y) Nut and (Z) Bolt. Install the new Center Cam Drive, making sure that it's Pin is in the proper position, reattach to Driveshaft. Reassemble the End Tie Rod and grease new part.

10.18 (U) Replacing a 20 Ft., 35 Ft., and 40 Ft. Washer

10 18.1 Follow the procedures outlined for replacing component parts (E), and (N) End Tie Rods. Slide old Washers off the Center Cam Drive and install new Washers one on each side of the End Tie Rod.

10.19 (V) & (Y) & (Z) Replacing 20 Ft., 35 Ft., and 40 Ft. Bolt, Nut and Cotter Pin

10.19.1 Remove the Cotter Pin from the Nut, disassemble Nut and Bolt, then install new parts.

10.20 (W) & (GG) & (KK) Replacing 20 Ft., 35 Ft., and 40 Ft. Grease Fittings

10.20.1 All three Grease Fittings are the force fit type and are replaced in the same way. Pull to remove the old fitting then tap in the new fitting.

10.21 (AA) & (BB) & (CC) & (DD) Replacing 20 Ft., 35 Ft., and 40 Ft., Paddle Wheel Blade Assemblies, Control Cables, Single U-Bolt Clamps and Copper Stop Sleeves

10.21.1 The Control Cables are permanently attached to the Paddle Wheel Blade by the stop sleeves, and must be cut in order to be replaced themselves or to replace the PaddleWheel Blade. The Control Cables and Stop Sleeves must be scraped but the U-Bolt Clamps may be removed and re-used.

10.21.2 Remove the Centerbox Cover Plate and cut the Control Cables. Follow the procedures outlined for replacing (F), (G) and (O) Driveshafts so that they can be moved far enough to lift out the Paddle Wheel Blade.

10.21.3 Install the new Paddle Wheel Blade and Control Cables. Be sure that the Control Cables are threaded thru the holes in the Paddle Wheel Blade and that the Stop Sleeves are pressed onto the Control Cable, (use Nicopress, Inc. Tool No. 51-MJ or equivalent), on both sides of the Paddle Wheel Blade Hole. Loop the exterior ends of the Control Cables to suit hand grasp and install U-Bolt Clamps.

10.22 (EE) & (FF) Replacing 20 Ft., 35 Ft., and 40 Ft. Centerbox Cover Plates and Self-Tapping Screws

10.22.1 Remove the four component (FF) Self-Tapping Screws, lift off the Cover Plate, and replace.

10.23 (HH) & (II) & (JJ) & (LL) Replacing 20 Ft., 35 Ft., and 40 Ft. Cell Guide Wheel Component Parts

10.23.1 Remove the four capscrews and two Keeper Plates. Grasp the Cell Guide Wheel and pull it out of the Wheel Mounts and remove the Bearings from the axle projections on the wheel. Line Fast recommends that the bearings be replaced each time the Cell Guide Wheels are replaced. Install new components in reverse order and grease.

10.24 (MM) (NN) (OO) (PP) Replacing 20 Ft., 35 Ft., and 40 Ft., Alignment Flipper Component Parts

10.24.1 Remove the two component part (ZZ) Cotter Pins from the Flipper Lock Pin. Grasp Pin and pull to remove it and component part (OO) Washers, from the Mounting Blocks. Removing the pin also detaches the Alignment Flipper from the spreader, although it may have to be lifted out of the Dovetail Receptacle. Install the new Flipper Lock Pin (or other damaged part) from the right hand side of the Mounting Blocks only, through one Washer, the Mounting Blocks and the Alignment Flipper. Install second Washer and Cotter Pins. In order to remove the Flipper Lock Pin it may be necessary to release spring tension on the Spring Plungers. Insert a standard screw driver or, (Vlier Inc. Wrench No. VW-62), in from the underside of the Mounting Blocks to loosen or remove the Spring Plungers. After installing a new Flipper Lock Pin readjust the Spring Plungers to obtain maximum spring tension but maintain free movement of Flipper Lock Pin between lock and unlock positions. Grease new parts.

10.25 (RR) & (TT) & (VV) Replacing 20 Ft., 35 Ft. and 40 Ft. Lifting Sling Assemblies

10.25.1 CAUTION! Note that the Lifting Slings are all of the 45 degree type. NEVER! attach a Lifting Sling to these spreaders, (such as Line Fast's low profile type which has a 30 degree sling angle), which has a sling angle of less than 45 degrees. The spreader frames have not been designed to withstand the larger compression loads that lifting slings less than 45 degrees would apply to the frame.

10.25.2 Use Safety Shackles, (SS) for 20 Ft , (UU) for a 35 Ft.. and (WW) for a 40 Ft., to attach the four legs of the Lifting Slings to the Lift Lugs of the spreader. Use ONLY! (YY) Safety Shackles to attach the opposite end of the sling legs to the Lifting Ring.

10.26 (SS) & (UU) & (WW) & (YY) Replacing 20 Ft., 35 Ft., and 40 Ft. Safety Shackles

10.26.1 See replacement of Lifting Slings.

10.27 (ZZ) Replacing 20 Ft., 35 Ft., and 40 ft. Cotter Pins

10.27.1 Remove damaged Cotter Pin and install new part.

11.1 (A) & (H) 20 Ft., 35 Ft., and 40 Ft. Bayonets

CAUTION! Replace if the Bayonets become bent, cracked, or broken or if after greasing they no longer freely rotate. Do not attempt to straighten a bent Bayonet.

11.2 (B) & (I) 20 Ft., 35 Ft., and 40 Ft. Stress Collar

Replace if the Stess Collar becomes cracked, broken, or if the threads strip. If the Bayonet Pin bends, it may be straightened, but exercise care not to crack it.

11.3 (C) 20 Ft. and 40 Ft. Key Plates

Replace if the Key Plate becomes cracked, bent, broken or excessively worn allowing a sloppy fit over the Bayonet and in the Stress Collar slot. When the Key Plate is assembled there should be a minimum amount of play when the Bayonets are rotated.

11.4 (D) & (L) & (M) 20 Ft., 35 Ft., and 40Ft. Bayonet Cam Plates

Replace if the threaded shafts become bent and cannot be straightened, or if threads are damaged. Also replace if either slot wears to more than 15/16", (.937") wide.

11.5 (E) & (N) 20 Ft., 35 Ft., and 40 Ft. End Tie Rod Assemblies

Replace if threads become damaged or if Tie Rods become bent and cannot be straightened. Also replace if the slot for the Center Cam Drive wears to more than 15/16", (.937") wide.

11.6 (F) & (G) & (O) 20 Ft., 35 Ft., and 40 Ft. Driveshafts

Replace if Driveshafts are broken, bent, and cannot be straightened or no longer rotate freely.

11.7 (J) 35 Ft. Setscrews

Replace if the Setscrew is cracked, broken, or has a stripped socket or threads.

11.8 (K) 35 Ft. Spacer Washers

Replace if Washer cracks or becomes worn to less than 1/16", (.063") thick.

11.9 (P) 20 Ft., 35 Ft., and 40 Ft. Spacer Bushings

Replace if the bushing wears excessively thin or becomes cracked or broken. The bushing may have a cut along one side to facilitate flexibility and ease of assembly.

11.10 (Q) 20 Ft., 35 Ft., and 40 Ft. Washers

Replace if Washer becomes cracked or broken.

11.11 (R) 20 Ft., 35 Ft., and 40 Ft. Washers
Replace if the Washer becomes cracked, broken, or if it wears to less than 1/32", (.031") thick.

11.12 (S) 20 Ft., 35 Ft., and 40 Ft. Keeper Plates
Replace if the plate becomes cracked, bent, broken and cannot be straightened.

11.13 (T) 20 Ft., 35 Ft., and 40 Ft. Center Cam Drives
Replace if Drive becomes cracked, bent, broken or if the Pin which projects into the End Tie Rods wears to less than 5/8", (.625") in diameter.

11.14 (U) 20 Ft., 35 Ft., and 40 Ft. Washers
Replace if Washer is cracked, broken or worn to less than 3/32", (.094") thick.

11.15 (V) & (ZZ) 20 Ft., 35 Ft., and 40 Ft. Cotter Pins
Replace if Cotter Pin is cracked or broken.

11.16 (W) & (GG) & (KK) 20 Ft., 35 Ft., and 40 Ft. Grease Fittings
Replace if Grease can no longer be injected thru fittings.

11.17 (Y) 20 Ft., 35 Ft., and 40 Ft. Nuts
Replace if nut breaks or if the threads are damaged.

11.18 (Z) 20 Ft., 35 Ft., and 40 Ft. Bolts
Replace if Bolt breaks, if threads become damaged, or is bent and cannot be straightened.

11.19 (AA) 20 Ft., 35 Ft., and 40 Ft. Paddle Wheel Blade Assemblies
Replace if it becomes cracked, broken, or bent and cannot be straightened to operate smoothly in Centerbox.

11.20 (BB) 20 Ft., 35 Ft., and 40 Ft. Control Cables
Replace if cables are frayed or broken.

11.21 (CC) 20 Ft., 35 Ft., and 40 Ft. Single U Bolt Clamps
Replace if clamp breaks or if threads are damaged.

11.22 (DD) 20 Ft., 35 Ft., and 40 Ft. Stop Sleeves
Replace if stop sleeve is cracked, broken, or if the control cable begins to slip thru the sleeve as the control cables are operated.

11.23 (EE) 20 Ft., 35 Ft., and 40 Ft. Centerbox Cover Plates
Replace if plate is cracked or broken.

11.24 (FF) 20 Ft., 35 Ft., and 40 Ft. Self Tapping Screws
Replace if it breaks or bends and cannot be straightened, or if the threads are damaged.

11.25 (HH) 20 Ft., 35 Ft., and 40 Ft. Cell Guide Wheels
Replace if the wheel breaks, cracks, or if after greasing it , it no longer rotates freely. The wheel should also be replaced if there is excessive play between the wheel and bushings.

11.26 (II) 20 Ft., 35 Ft., and 40 Ft. Keeper Plates
Replace if plate is cracked, broken or bent and cannot be straightened.

11.27 (JJ) 20 Ft., 35 Ft., and 40 Ft. Capscrews
Replace if Capscrew is cracked, broken or bent and cannot be straightened.

11.28 (LL) 20 Ft., 35 Ft., and 40 Ft. Bearings
Replace if it becomes cracked, broken, or if the inside diameter wears to more than 1-13/16", (1.813") in diameter.

11.29 (MM) 20 Ft., 35 Ft., and 40 Ft. Alignment Flippers
Replace if flipper is cracked, broken, or bent and cannot be straightened.

11.30 (NN) 20 Ft., 35 Ft., and 40 Ft. Flipper Lock Pins
CAUTION! Replace if pin breaks or bends. A bent lock pin should not be straightened.

11.31 (OO) 20 Ft., 35 Ft., and 40 Ft. Washers
Replace if Washer is cracked, broken or worn to less than 3/32", (.094") thick.

11.32 (PP) 20 Ft. 35 Ft., and 40 Ft. Spring Plungers
Replace if threads are damaged, or if spring tension weakens so that the Flipper Lock Pin is no longer held firmly in lock position.

11.33 (QQ) 20 Ft., 35 Ft., and 40 Ft. Alignment Flipper Operating Tools
Replace if tool is broken, cracked, or bent and cannot be straightened.

11.34 (RR) & (TT) & (VV) 20 Ft., 35 Ft., and 40 Ft. Lifting Sling Assemblies
Replace if any part of the slings become cracked, broken, or if the cable begins to fray.

11.35 (SS) & (UU) & (WW) & (YY) 20 Ft., 35 Ft., and 40 Ft. Safety Shackles
CAUTION! Replace if shackles are bent or broken, do not attempt to straighten a bent shackle

Description	Qty. Per Spdr.	See Page	FSCM No
20Ft., 35Ft. And 40Ft. End Linkage Assemblies, Parts Used On 20Ft. And 40Ft. Spreaders			
(A) 7127-50-14P, Bayonet	4	16 & 36	58400
(B) 7127-50-12P, Stress Collar	4	"	58400
(C) 7127-51-74P, Key Plate	4	"	58400
(D) 7127-51-72-P, Bayonet Cam Plate	4	"	58400
(E) 7127-51-5-P, End Tie Rod Assembly	2	"	58400
(F) 7127-51-18-20P, 20Ft. Spreader Driveshaft Overall Length Is 99.75"	2	"	58400
(G) 7127-51-18-40P, 40Ft. Spreader Driveshaft Overall Length Is 220.50"	2	"	58400
Parts Used On 35Ft. Spreaders			
(H) 7127-50-16P, Bayonet	4	17 & 37	58400
(I) 7127-50R-3, Stress Collar	4	"	58400
(J) 3/8" 16UNC-2A, Hexagon Socket Head Setscrew Grade 8 Steel, .63" Long, With Nylok, Zinc Plated	4	"	08928
(K) 7127-17-3/4, Spacer Washer Nylon, (Reference 1.25" Outside Diameter, .765" Inside Diameter, .125" Thick).	4	"	58400
(L) 7127-51R-5 R/H, Right Hand Bayonet Cam Plate Assembly Mirror Image Of Component (M)	2	"	58400

	Description	Qty. Per Spdr.	See Page	FSCM No.
M.	7127-51R-5 L/H, Left Hand Bayonet Cam Plate Assembly Mirror Image of Component (L)	2	17 & 37	58400
N.	7127-51-5A-P, End Tie Rod Assembly	2	"	58400
O.	7127-51-18-35P, 35Ft. Spreader Driveshaft Overall Length Is 189.38"	2	"	58400
	Parts Used On 20Ft., 35Ft. And 40Ft. Spreaders			
P.	7127-50-6, Spacer Bushing	4	36 & 37	58400
Q.	7127-50-F, Washer Ryertex Fiber Material, (Reference 4.00" Outside Diameter 1.56" Inside Diameter, .125" Thick).	8	"	58400
R.	7127-50-S, Washer Steel, (Reference 4.00" Outside Diameter, 1.56" Inside Diameter, 0.63" Thick)	4	"	58400
S.	7127-51-CW-P, Keeper Plate	4	"	58400
T.	7127-51-9-P, Center Cam Drive	2	"	58400
U.	3/4" Ansi Standard Washer Type A, Series N, (Reference 1.469" Outside Diameter .812" Inside Diameter, .134" Thick, Zinc Plated).	4	"	08928
V.	3/32" Ansi Standard Cotter Pin 1.25" Minimum Length, Zinc Plated	4	"	08928
W.	Grease Fitting Alemite Part Number 1608-B, 5/16" Force Fit, Zinc Plated	6	"	57733
X.	This Letter Has Been Reserved To Mark Greasing Locations Elsewhere In This Manual.			

	Description	Qty. Per Spdr.	See Page	FSCM No.
Y.	1/2"-13UNC-2B, Hexagon Head Slotted Nut Grade 2 Steel, Zinc Plated	4	36 & 37	08928
Z	1/2"-13UNC-2A, Hexagon Head Bolt Grade 2 Steel, 2.25" Long, Shank Drilled, Zinc Plated	4	"	08928
	20Ft., 35Ft. And 40Ft. Centerbox Linkage Assembly			
AA.	7127-51-21-P, Paddle Wheel Blade Assembly	1	18 & 19	58400
BB.	7x19-GAC, 3/16" Diameter Control Cable Steel 15Ft. Long	2	"	77141
CC.	3/16" Single U-Bolt Cable Clamp Superior Wire Co. Part Number 10-10 033	4	18	77141
DD.	3/16" Copper Stop Sleeve Nicopress Inc Part Number 871 20-M 1,600 lb. Strength. Reference Nicopress Installation Tool Part Number 51-MJ	4	18 & 19	76691
EE.	7127 52-6P, Centerbox Cover Plate	1	18	58400
FF.	3/8" 16UNC-2A, Hexagon Head Self Tapping Screw Grade 2 Steel, .75" Long, Zinc Plated	4	18	08928
GG.	Grease Fitting Alemite Part Number 1630 B, 5/16" Force Fit, Offset Type , Zinc Plated	2	18 & 19	57733
	20Ft , 35Ft. And 40Ft. Cell Guide Wheel Assembly			
HH.	7127 2, Cell Guide Wheel	4	39	58400
II.	7127-52-68P, Keeper Plate	8	"	58400

	Description	Qty. Per Spdr.	See Page	FSCM No
(JJ.)	1/2" 13UNC-2A, Hexagon Socket Head Capscrew Grade 2 Steel, 1" Long, Zinc Plated	16	39	08928
(KK.)	Grease Fitting Alemite Part Number 1952, 1/4" Force Fit, Zinc Plated	8	"	57733
(LL.)	Bearing Rexnord Inc , Duralon, 2.251" Outside Diameter, 1.760" Inside Diameter Cut.563" ± .030" Long	8	"	77896
	20Ft., 35Ft. And 40Ft Alignment Flipper Assembly			
(MM.)	7127-51-76P Alignment Flipper	6	38	58400
(NN.)	7127-51-19P Flipper Lock Pin	6	"	58400
(OO.)	1-1/8" Ansi Standard Washer Type A, Series N, (Reference 2.25" Outside Diameter, 1.25" Inside Diameter, 134" Thick, Zinc Plated).	12	"	08928
(PP.)	Stubby Spring Plunger Vlier Inc., Part Number SSM 62N Reference Vlier Wrench Part Number VW-62	12	"	01226
(QQ.)	7127 51 21, Alignment Flipper Operating Tool	1	4	58400
	20Ft. Lifting Sling Assembly			
(RR.)	7127 45-20, 20Ft Spreader Lifting Sling Assembly For A 20Ft. Spreader ONLY! Can Be Ordered As An Assembled Unit Only And Will Include 4 Item (SS) Safety Shackles And 4 Item (YY) Shackles	1	40	77141
(SS)	1-1/8" Safety Shackle For A 20Ft Spreader ONLY!, Carbon Steel, Midland Industries Part Number 855. Shackle Is A Component Of Item (RR) Sling Assembly But May Be Ordered Separately.	4	"	90202

	Description	Qty. Per Spdr.	See Page	FSCM No.
	35Ft. Lifting Sling Assembly			
(TT.)	7127-45-35, 35Ft. Spreader Lifting Sling Assembly For A 35Ft. Spreader ONLY! Can Be Ordered As An Assembled Unit Only And Will Include 4 Item (UU) Safety Shackles and 4 Item (YY) Shackles	1	40	77141
(UU.)	1-1/8" Safety Shackle For A 35Ft Spreader ONLY!, Alloy Steel, Midland Industries Part Number 855A. Shackle Is A Component Of Item (TT) Sling Assembly But May Be Ordered Separately.	4	"	90202
	40Ft. Lifting Sling Assembly			
(VV.)	7127-45-40, 40Ft. Spreader Lifting Sling Assembly For A 40Ft. Spreader ONLY! Can Be Ordered As An Assembled Unit Only And Will Include 4 Item (WW) Safety Shackles And 4 Item (YY) Shackles	1	40	77141
(WW.)	1-1/4" Safety Shackle For A 40Ft Spreader ONLY!, Alloy Steel, Midland Industries Part Number 856A. Shackle Is A Component Of Item (VV) Sling Assembly But May Be Ordered Separately.	4	"	90202
	Miscellaneous Parts (Used On More Than One Assembly)			
(XX.)	Alvania Grease Used On All Areas Of The Spreaders Which Require Lubrication Shell Oil Co. Code Number 71011	As Req'd	13	54527
(YY.)	1-3/8" Safety Shackle Used to Attach Lifting Sling To Lifting Ring On All Spreaders Carbon Steel, Midland Industries Part Number 866. Shackle Is A Component Of Items (RR) (TT) (VV) Sling Assemblies But May Be Ordered Separately.	4	40	90202
(ZZ.)	1/4" Ansi Standard Cotter Pin 1.50" 2.00" Long, Zinc Plated. Used On End Linkage And Alignment Flipper Assemblies All Spreaders	22	36,37 & 38	08928

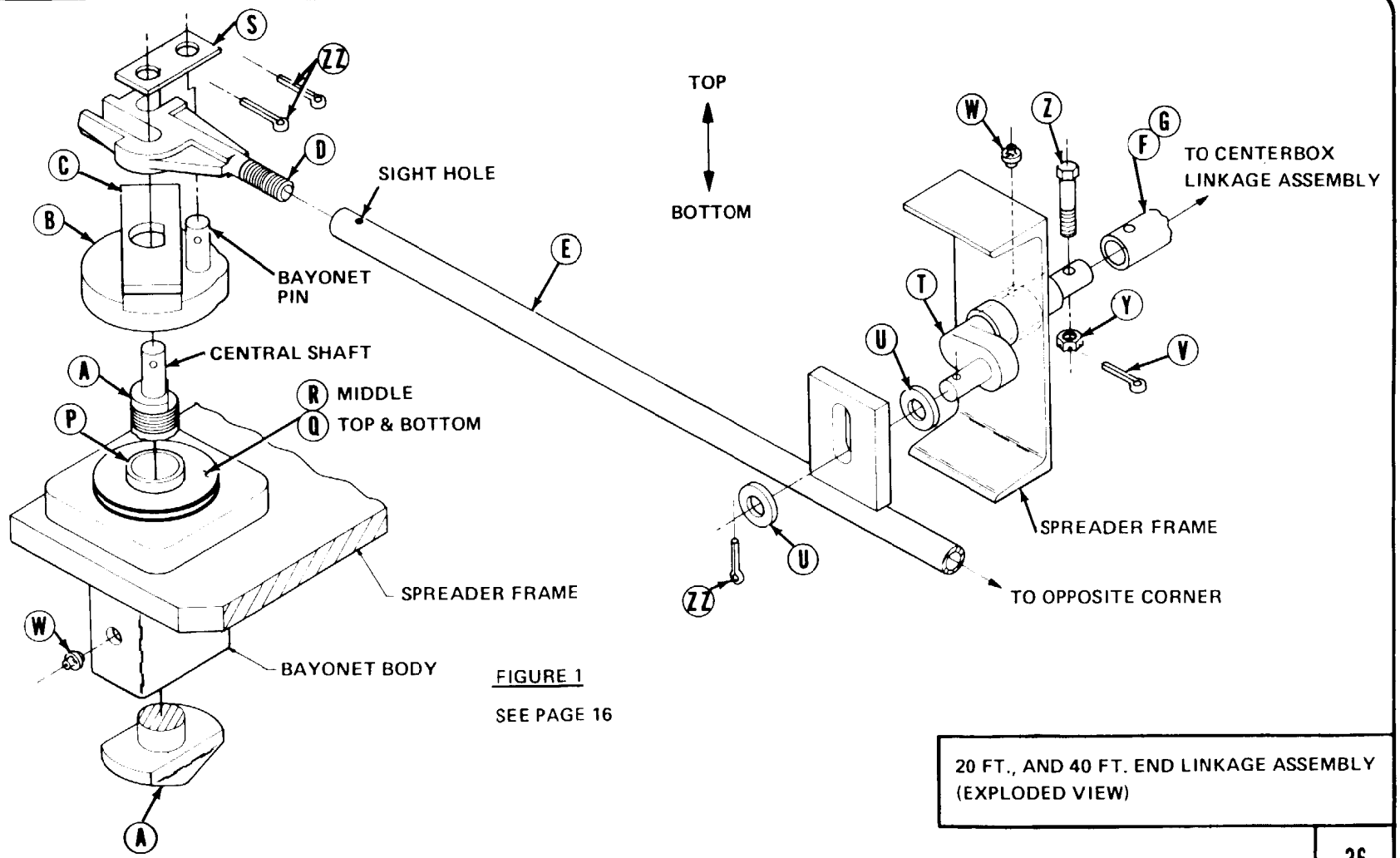


FIGURE 1

SEE PAGE 16

20 FT., AND 40 FT. END LINKAGE ASSEMBLY (EXPLODED VIEW)

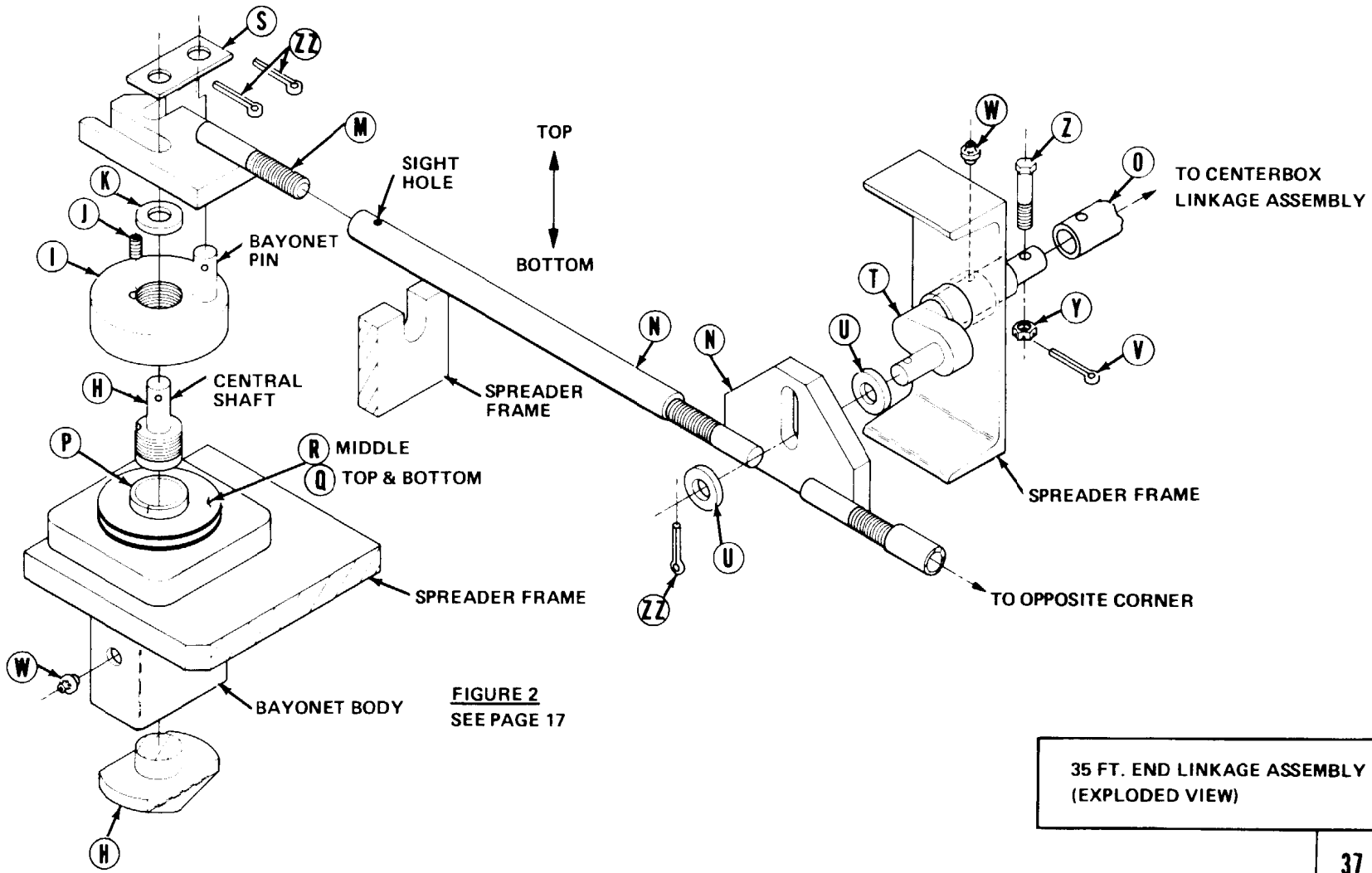
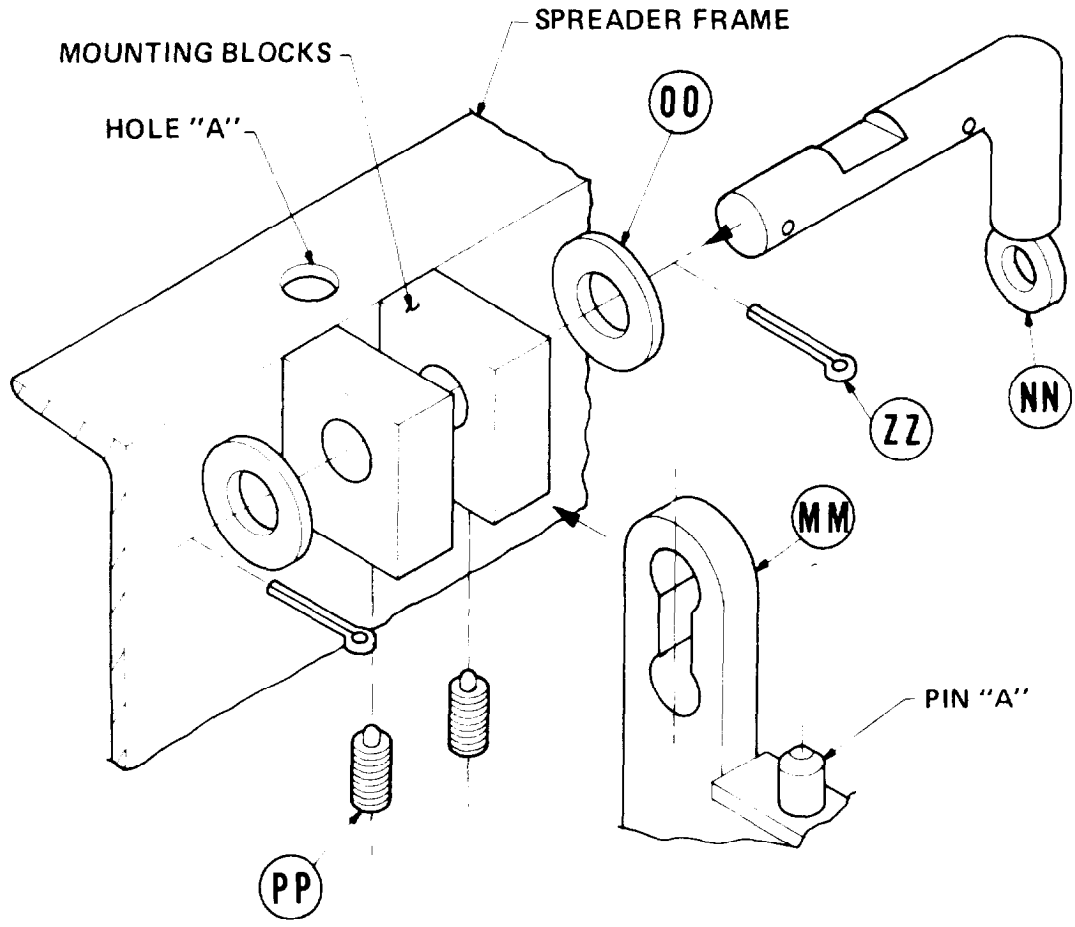


FIGURE 2

SEE PAGE 17

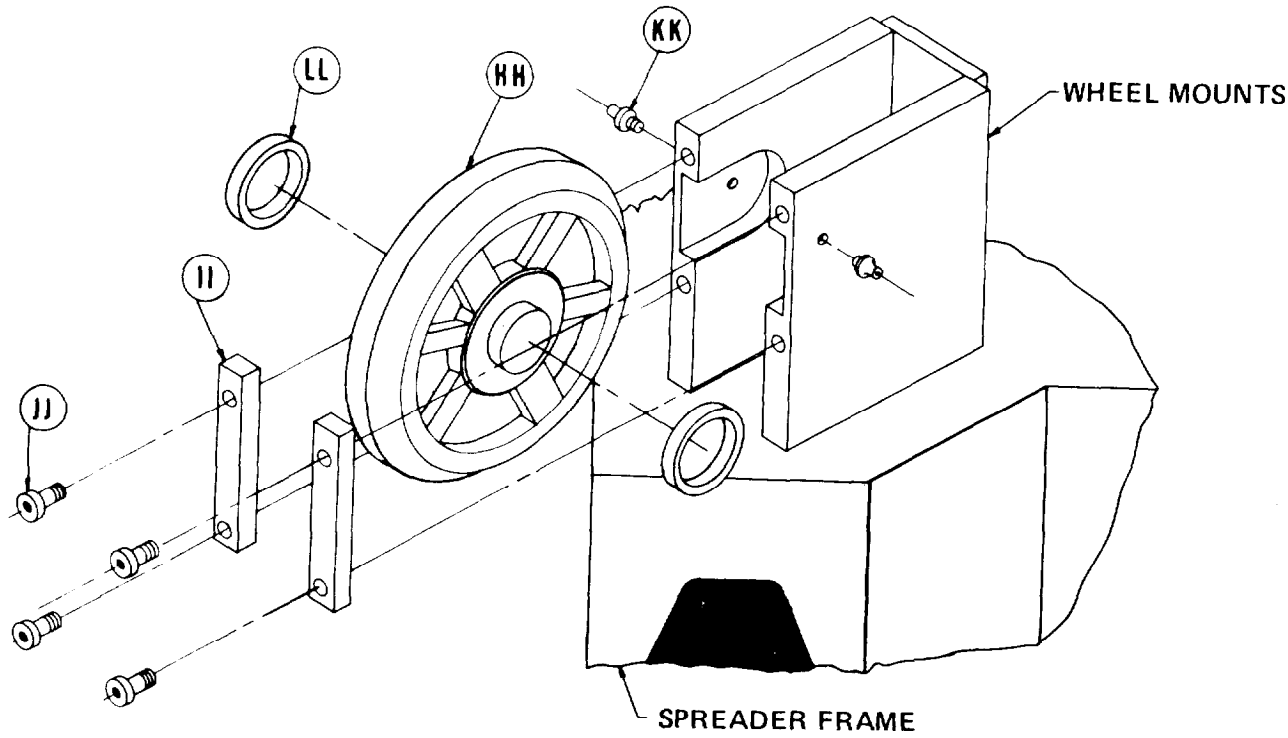
35 FT. END LINKAGE ASSEMBLY (EXPLODED VIEW)



NOTES:

1. Upper portion of Alignment Flipper shown.
2. CAUTION! Flipper Lock Pin must! be assembled from the right hand side of the mounting blocks as shown above.
3. When putting the Alignment Flipper in the raised position, make sure that Pin "A" drops into Hole "A".
4. Adjust component (PP) "stubby" Spring Plungers for maximum restraint of Flipper Lock Pin in lock and unlock positions, without binding.

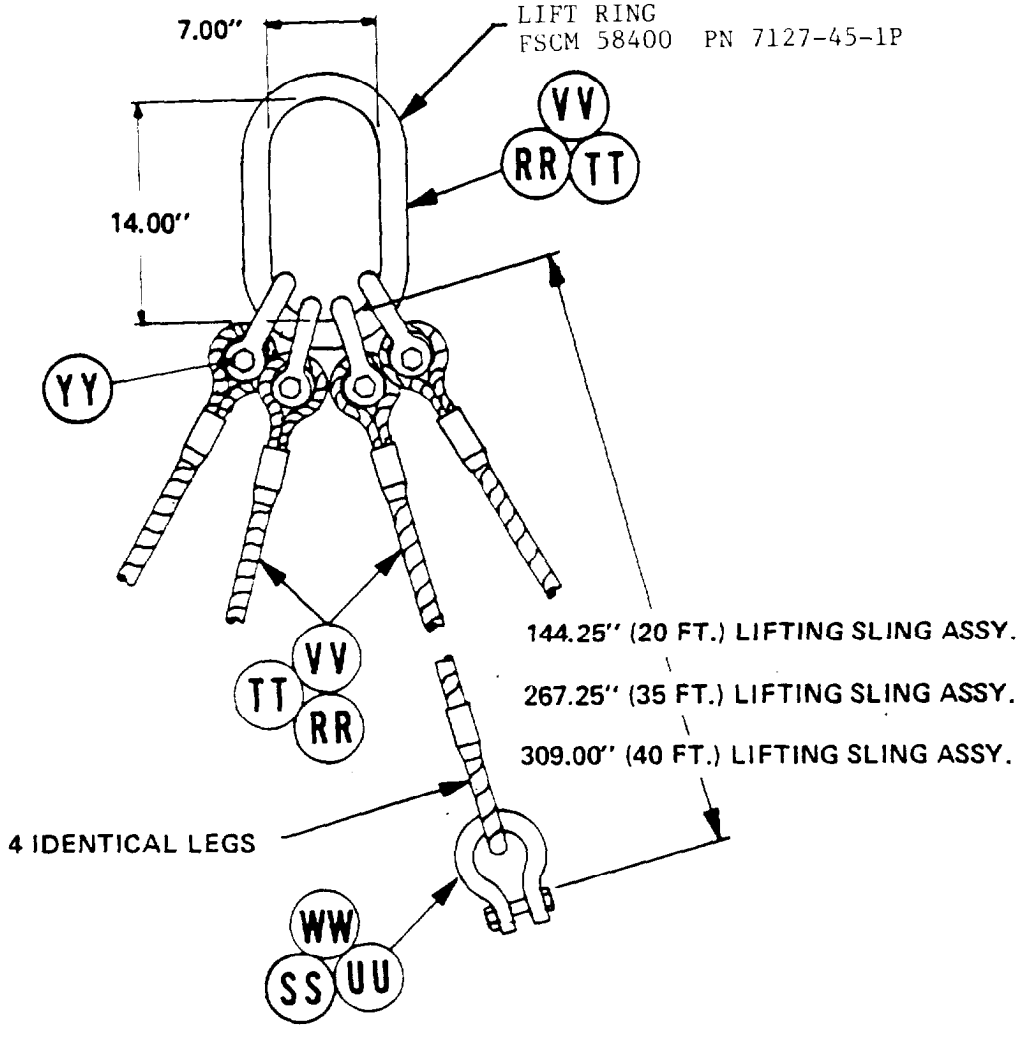
20 FT., 35 FT., AND 40 FT.
ALIGNMENT FLIPPER ASSEMBLY
(EXPLODED VIEW)



20 FT., 35 FT., AND 40 FT.

CELL GUIDE WHEEL ASSEMBLY

(EXPLODED VIEW)



NOTE: Components (UU), (WW), (YY), and (SS) Safety Shackles, will be re-supplied automatically as required if a new Lifting Sling Assembly is ordered, but they may be ordered seperately in case of loss or breakage.

20 FT., 35 FT., AND 40 FT.
LIFTING SLING ASSEMBLIES

FSCM NO.:	NAME AND ADDRESS
08928	Abbot Screw and Mfg. Co. 6525 North Clark Street Chicago, ILL. 60626
58400	Line Fast Corporation 805 Grundy Avenue Holbrook, N.Y. 11741
90202	Midland Forge, Inc. P.O. Box 1627 Cedar Rapids, Iowa 52406
76691	Nicopress 5100 Superior Avenue Cleveland, Ohio 44103
77141	Paulsen Wire Rope Corp. 84 Williams Street New York, N.Y. 10038
77896	Rexnord Inc. Bearing Division 2400 Curtiss Street Downers Grove, ILL. 60515
54527	Shell Oil 1 Shell Plaza P.O. Box 2463 Houston, Tx 77001
57733	Stewart Warner 1826 Diversy Pky. Chicago, ILL. 60614
01226	Vlier Engineering 2333 Valley Street Burbank, Ca. 91505

PART II

SUPPLEMENTAL OPERATING, MAINTENANCE AND
REPAIR PARTS INSTRUCTIONS (SOMARPI)

FOR

SPREADER, LIFTING FRAMES

20 FT
35 FT
40 FT

AND

SPACER/STABILIZER BAR

INDEX

SUPPLEMENTAL OPERATING, MAINTENANCE
AND REPAIR PARTS INSTRUCTIONS
FOR
SPREADER, LIFTING FRAMES
20 FT. ISO, NSN 3990-01-128-0089
35 FT. SEALAND, NSN 3990-01-128-0090
40 FT. ISO, NSN 3990-01-128-0091
AND
SPACER/STABILIZER BAR
FSCM 58400, PN 7127-SB
AS
ASSOCIATED SUPPORT ITEMS OF EQUIPMENT
(ASIOE) TO THE 140 AND 250 TON CAPACITY,
CRANES, MOBILE, CONTAINER HANDLING, TRUCK MOUNTED

TABLE OF CONTENTS

SECTION I

GENERAL

1.1 Purpose. This publication is a supplement to LineFast Corporation Manual Number 1A 7127-L. Additional information is provided to make the Commercial Manual with this supplement suitable for military use.

1.2 Scope. This publication applies to the Department of the Army Units, Organizations and Activities that use and/or support the 20 ft I.S.O., 35 ft Sealand and 40 ft I.S.O. Spreader, Lifting Frames.

1.3 Description. The spreaders are manufactured by LineFast Corporation, Holbrook, N.Y. The basic spreader is the latest standard product used by the civilian handling industry. To meet the requirements of MIL-S-52173A(ME) four cell guide wheels and six alignment flippers were added to make these spreaders adaptable in Logistic Over The Shore (LOTS) operations.

1.4 Operational Concept. The spreaders are authorized and intended for use as associated support items to the 140 and 250 ton Mobile Cranes. They will be used primarily for loading/off-loading of shipping containers.

1.5 Personnel & Training.

MOS Requirements.

(1) Operator: 57H Lifting and Loading Equipment Operator.

(2) Organizational Maintenance: 62B System Operator/Mechanic, 63S Construction Equipment Repairer.

(3) Direct and General Support Maintenance: There are no planned requirements for DS/GS maintenance support for these Spreaders.

b. New Equipment Training: There is no planned NET for the Spreader, Lifting Frames specifically. These spreaders are simplistic in design and operation, which should not pose any unique training requirements. As these assemblies are support items of the 140 and 250 ton Cranes, their use/operation will be contained within the training provided for the Cranes.

1.6 Logistics Assistance (AR 700-4). US Army Tank-Automotive Command's field maintenance technicians stationed at CONUS installations are available to furnish on-site training and/or technical assistance. When training or technical assistance is required, contact the appropriate Logistics Assistance Office (LAO) listed in Appendix B of AR 700-4.

1.7 Warranty. LineFast Corporation warrants the Spreader Lifting Frame furnished under Contract Number DAAE07-82-C-5337 for a period of 15 months from the date of acceptance as stated in the Commercial Manual. The terms and conditions of the warranty and instructions for submitting warranty claims are contained in Appendix B.

1.8 Equipment Publications Improvements. You can improve this publication by recommending improvements using DA Form 2028 (Recommended Changes to Publications and Blank Forms). Completed form can be mailed direct to: Commander, US Army Tank-Automotive Command, Attn: DRSTA-MB, Warren, MI 48090.

SECTION II

MAINTENANCE

2.1 Maintenance Concept. The Spreader, Lifting Frames will not require any new or special maintenance considerations. All maintenance functions can be accomplished within the current maintenance concepts established for Construction and material Handling Equipment.

a. Operator/Crew Maintenance: Operator and crew maintenance is limited to daily preventive maintenance checks and routine services.

b. Organizational Maintenance: Organizational maintenance consists of scheduled preventive maintenance services, repairs and adjustments. Diagnosis, isolation and replacement of easily accessible unserviceable piece parts and components as authorized by the MAC do not require special tools or test equipment.

2.2 Maintenance Allocation Chart. Maintenance will be performed as necessary by the category indicated in the Maintenance Allocation Chart (MAC) to retain or restore serviceability. (See MAC, Appendix C.)

2.3 Modifications. Modifications will be accomplished by the end item manufacturer after MERADCOM acceptance and TACOM approval.

2.4 Reliability and Maintainability. Reliability and maintainability will be assessed through field evaluations.

2.5 Equipment Improvement Recommendations (EIR). EIRs will be submitted in accordance with TM 38-750.

2.6 Shipment and Storage.

a. Shipment and Storage: Refer to TB 740-97-2 for procedures covering preservation of equipment for shipment and storage. General procedures for shipment are found in FM 55-15.

b. Administrative Storage: Refer to TM 740-90-1 for instructions covering administrative storage of equipment.

2.7 Maintenance Expenditure Limits (MEL). The average life expectancy for the Spreader, Lifting Frames is 15 years.

Year	Percent of Repair
1992	50%
1997	30%

2.8 Maintenance Forms and Records. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750.

2.9 Maintenance and Operating Supply List (MAOSL) . It has been determined that Grease. Automotive & Artillery (GAA), MIL-L-10924 is suitable for all greasing operations on the spreaders.

MAOSL:

Grease, Automotive & Artillery MIL-L-10924	1 lb 5 lb	NSN 9150-00-190-0904 NSN 9150-00-190-0905
Dry Cleaning Solvent, SD-2 P-D-680	1 gal	NSN 6850-00-281-1985

2.10 Preventive Maintenance Checks and Services (PMCS). Perform PMCS in accordance with Appendix D.

2.11 Spacer/Stabilizer Bar. This item is manufactured by LineFast Corporation and distributed as a support item for the 140 and 250 ton Cranes. One Stabilizer Bar will be issued for each Crane that units are authorized. The stabilizer bar is intended for use on cranes in the “dual lift line” configuration. It provides the necessary connection to change from a single point pickup to a dual, to facilitate spreader bar use. See Appendix G for additional data and operating instructions.

2.12 Destruction To Prevent Enemy Use. Refer to TM 750-244-3 for procedures covering destruction of equipment to prevent enemy use.

SECTION III

REPAIR PARTS SUPPLY

3.1 General

a. The basic policies and procedures in AR 710-2 and AR 725-50 are generally applicable to repair parts management for Material Handling Equipment (MHE) items.

b. Manufacturer's (LineFast Corp) parts manuals are furnished with this crane instead of Department of the Army Repair Parts and Special Tool List (RPSTL).

c. National Stock Numbers (NSNS) are initially assigned to ASL/PLL items only. Additional NSNs are assigned as demand data indicates.

d. Automatic Processing (AUTODIN) of Federal Supply Code Manufacturer (FSCM) part number requisitions, without edit for matching NSNs and exception data is authorized.

e. Non-NSN repair parts are available from commercial sources and may be purchased locally IAW AR 710-2 and DA Circular 700-81-1.

3.2 Prescribed Load List (PLL). The PLL, distributed by TACOM, is an estimated 15 days supply recommended for initial stockage at Organizational Maintenance. Management of PLL items will be governed by the provisions of AR 710-2 and local command procedures. Selection of PLL parts is based upon the receiving command's recommendations after their review of the TACOM prepared list. Organizations and activities will establish PLL stocks through normal requisitioning process (Appendix F). Note: The PLL in Appendix E is divided into a separate PLL for the 20 ft, 35 ft, and 40 ft Spreader Lifting Frames.

3.3 Authorized Stockage List (ASL). The ASL, distributed by TACOM, is an estimated 45 days supply of repair parts for support activities. Selection of ASL is based upon receiving command's recommendations after their review of the TACOM prepared list. Support units and activities will establish ASL stocks through the normal requisitioning process. Note: The ASL in Appendix E is divided into a separate ASL for the 20 ft, 35 ft, and 40 ft Spreader Lifting Frames.

3.4 Requisitioning Repair Parts (MILSTRIP). Requisitions (DD Form 1348 Series) will be prepared in accordance with the MILSTRIP format (AR 725-50). Project Codes for MHE are "BGX" for Conus and, "JZM" for 0-Conus.

APPENDIX A

REFERENCES

This appendix lists all forms, technical bulletins field manuals and technical manuals covered in this publication.

A-1. FORMS

Equipment Inspection and Maintenance Work Sheet	DA Form 2404
Maintenance Request	DA Form 2407
Recommended Changes to DA Publications	DA Form 2028

A-2. TECHNICAL BULLETIN

Safety Inspection and Testing of Lifting Devices	TB 43-0142
Safe Use of Cranes Near Electric Power Lines	TB 385-101

A-3. FIELD MANUAL

First Aid for Soldiers	FM 21-11

A-4. TECHNICAL MANUALS

Administrative Storage of Equipment	MIL-M-63042B
Commercial Equipment	MIL-M-7298C
General Style and Format Requirements	MIL-M-38784A
Organization or Aviation Unit, Direct Support or Aviation Intermediate, and General Support Maintenance	MIL-M-63038B
Procedure for Destruction of Equipment to Prevent Enemy Use	MIL-M-63042B
Shipment for Limited Storage	MIL-V-62028
The Army Maintenance Management System (TAMMS)	DA PAM 738-750

APPENDIX B

WARRANTY INFORMATION

1. The LineFast Corporation Government Service Representative listed below must be contacted before any warranty repair is started:

LineFast Corp.
805 Grundy Avenue
ATTN: Government Sales Rep
Holbrook, NY 11741

(516) 472-4428

2. All warranties, settled or unsettled, will be reported to the National Maintenance Point (NMP) at TACOM on a DA Form 2407. The instructions for submitting the DA Form 2407 are outlined in paragraph 12-2 of TM 38-750, The Army Maintenance Management System. For warranties settled locally, the DA Form 2407 will contain a statement "For Information Only" in block 16A. This information is required by the NMP for determing warranty utilization, warranty cost avoidance to the Government, and analyzing failure trends on newly fielded equipment. Be certain to include the vehicle serial number on the DA Form 2407.

3. During the Warranty Period: Quality Deficiency Report (EIR/QDR) SF 368, will be limited to the reporting of "equipment failure in design" which pose a threat to operator safety or which detract from the operational capability, and For the reporting of "delays exceeding 20 days" (from contractor notification) in completing requested warranty services, or "unsatisfactory workmanship resulting in user dissatisfaction with such services."

4. TERMS AND CONDITIONS:

a. Acceptance. The word "acceptance" as used herein means the execution of the Acceptance Block and signing of a DD Form 250 by the authorized Government representative.

b. Supplies. The word "supplies" as used herein means the end items and all parts and accessories thereof, furnished by the contractor, and any related services required under this contract. The word does not include technical data.

C. Warranty. Notwithstanding inspection and acceptance by the Government of the supplies furnished under the contract or any provision of this contract concerning the conclusiveness thereof, the contractor hereby warrants that the supplies are free from defects in material and workmanship and will conform with the specifications and all other requirements of this contract for a period of 15 months from date of acceptance, as shown on the Material Inspection and Receiving Report (DD Form 250).

Further, if the Government, prior to placing end item in service, elects to place quantities of such newly delivered end items in Government depot storage, the contractor agrees that the time period of the warranty will not begin to run for such stored end items until each end item is withdrawn from Government storage or until six months from date of acceptance, whichever occurs first. The Government, prior to placing each new end item in storage and again at time of its withdrawal, shall notify the contractor thereof and identify each end item at its time in and out of storage. End items designated as Production Samples shall be treated as end item placed in storage for warranty purposes.

d. Safety Recall. If a Safety Recall defect occurs during end item warranty period, the contractor agrees to extend the term of the warranty by a period of time equal to the time period required to make necessary safety defect corrections. Additionally, to the extend the contractor or his supplier(s) provide to commercial customers a greater warranty for the supplies furnished therein, the contractor hereby likewise provides such greater warranty to the Government. To the extent the terms of such greater warranty are inconsistent with or conflict with this warranty, the provisions of such greater warranty shall govern.

e. Remedies.

(1) New Replacement Supplies. With respect to defective supplies, wherever located, the warranty shall include the furnishing, without cost to the Government, F.O.B. contractor's plant, branch or dealer facility, or F.O.B. original CONUS destination, or F.O.B. US Port of Embarkation, at the Government's option, new supplies to replace any that prove to be defective within the warranty period.

(2) Corrective Action Option. In addition, the Government shall have the option (1) to return the end items or parts thereof to the contractor's plant, branch or dealer facility for correction, or (2) to correct the supplies itself. When the Government elects to return the vehicles or parts to the contractor's plant, branch or dealer facility, the cost of labor involved in the correction of the defective supplies shall be borne by the contractor. When the end item or parts thereof are returned to the contractor for correction, the contractor shall bear all transportation costs to the contractor's plant and return. With respect to defective supplies located within the 50 states, when the Government elects to correct them itself, the cost of labor involved in the correction of defects shall be borne by the contractor and shall be computed at the contractor's then prevailing hourly rate for such services in that geographical area, based upon the number of labor hours appearing in the contractor's flat rate time schedule manual, or the Government's actual cost, whichever is less. With respect to defective supplies located outside the 50 states, when the Government elects to correct them itself, the cost of labor involved shall be borne by the contractor at the then prevailing hourly rate in the geographical area for such services based upon the number of labor hours appearing in the contractor's flat rate time schedule manual or the Government's actual cost, whichever is less. Additionally, the contractor shall be responsible for reasonable costs of disassembly/reassembly of items necessarily removed in connection with repair or replacement on vehicles wherever located.

f. Notification. If the Government elects to have warranty repair or replacement performed by the contractor, the Government shall deliver the end item to contractor's local facility or dealership for warranty corrective repair or replacement. Receipt for such end item by the contractor's local facility or dealership will be deemed proper notification by the Government of any breach of the warranty provided by this provision. If the Government elects to effect warranty repairs or replacement itself, the contractor shall be notified in writing of any breach in the warranty within 30 days after discovery of the defect. Within 10 days after receipt of such notice, the contractor shall submit to the Contracting Officer a written recommendation as to the corrective action required to remedy the breach. In any event, the Contracting Officer may, upon the expiration of the 10-day period set forth above, proceed with correction or replacement as set forth in paragraph, Remedies, above and the contractor shall, notwithstanding any disagreement regarding the existence of a breach of warranty, comply with any Contracting Officer directions related to such correction or replacement. After the notice of breach, but not later than 30 days after receipt of the contractor's recommendation for corrective action, the Contracting Officer will, in writing, notify the contractor of the parts used by the Government in repair or replacement and all other costs or expenses required for Government correction of warranty defect as set forth in the paragraph, Remedies, above. The contractor shall respond within 30 days after receipt of this notice, of his intention to furnish identified replacement parts and/or cost reimbursements to the Government. In the event it is later determined that the contractor did not breach the warranty in paragraph, Warranties, above, the contract price will be equitably adjusted pursuant to the terms of the "Changes" clause of the contract. Failure to agree to such an equitable adjustment or upon any determination to be made under this clause shall be a dispute concerning a question of fact within the meaning of the "Disputes" clause of Contract No. DAAE07-82-C-5387.

g. Corrected or Replaced Supplies. Any supplies or parts thereof corrected or furnished in replacement pursuant to this clause shall also be subject to all provisions of this clause to the same extent as supplies initially delivered.

h. Decalcomania. A synopsis or simplified summary of the warranty coverage and its implementation will be imprinted on a decalcomania approximately 3" x 4" and shall be mounted in view of the operator as near as possible to the center of the instrument panel of each vehicle. On those vehicles requiring concealed markings and registration numbers, said decalcomania shall be placed in a readable position on the engine side of the firewall. (Contractor shall forward proposed decalcomania to Contracting Officer for approval.)

APPENDIX C
MAINTENANCE ALLOCATION CHART FOR
SPREADER, LIFTING FRAMES, 20, 35 & 40 FT

Section I - Introduction

1. GENERAL

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in Section II designated overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

2. MAINTENANCE FUNCTIONS

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint or to replenish fuel, lubricants, hydraulic fluids or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating or fixing into position an item, part or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace.

(1) The act of substituting a serviceable like type part, subassembly or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

(2) The act of substituting a serviceable-like type part, subassembly or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services or other maintenance actions to repair serviceability to an item by correcting specific damage, fault, malfunction or failure in a part, subassembly, module (component or assembly), end item or system.

j. Overhaul. The maintenance effort (service/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards in appropriate technical publications. Overhaul does not normally return an item to like new conditions.

k. Rebuild. Consists of those services/actions necessary to the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hour/miles, etc.) considered in classifying Army equipment/components.

3. COLUMN ENTRIES USED IN THE (MAC)

a. Column 1, Group Number. Column 1 lists group number, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. Column 2, Components/Assembly. Column 2 contains the name of components, assemblies, subassemblies and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in Column 2 (for detailed explanation of these functions, see Paragraph 2).

(1) Services - inspect, test, service, adjust, align, calibrate, replace.

(2) Action - weld, grind, rivet, straighten, face, remachine, resurface.

d. Column 4, Maintenance Level. Column 4 specifies, by listing of a “work time" figure in the appropriate subcolumn(s) the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform the maintenance function at the indicated level of maintenance. If the number or complexity of the task within the listed maintenance function vary at different maintenance levels, appropriate “work time” figures will be shown for each level. The number of manhours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time and quality assurance/quality control time, in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C - Operator or crew

O - Organization maintenance

F - Direct support maintenance

H - General support maintenance

D - Depot maintenance

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall contain a letter code in alphabetical order which shall be keyed to the remarks contained in Section IV.

4. COLUMN ENTRIES USED ON TOOL AND TEST EQUIPMENT REQUIREMENTS:

a. Column 1, Tool or Test Equipment Reference Code. The tool and test equipment reference code correlates with a maintenance function on the identified end item or component.

b. Column 2, Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

5. EXPLANATION OF COLUMNS IN SECTION IV:

a. Reference Code. The code scheme recorded in Column 6, Section II.

b. Remarks. This column lists information pertinent to the maintenance function being performed as indicated on the MAC, Section II.

MAINTENANCE ALLOCATION CHART FOR

Spreader Lifting Frames, LineFast Corp.

20 ft – NSN 3990-01-128-0089, 35 ft – NSN 3990-01-128-0090, 40 ft – NSN 3990-01-128-0091,

SECTION II – ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)					(5)	(6)
GROUP NUMBER	**COMPONENT/ASSEMBLY**	**MAINTENANCE FUNCTION**	**MAINTENANCE CATEGORY**					**TOOLS AND EQUIP**	**REMARKS**
			C	**O**	**F**	**H**	**D**		
7411	Spreader Frame	Inspect	0.1					1-6	A
		Replace		8.0					
	Control Cables	Inspect	0.1					1-6	
		Replace		1.0					
	Centerbox	Inspect	0.1					1-5	
		Service		0.2					
		Replace		2.0					
		Repair		1.0					
	Driveshaft	Inspect	0.1					1-5	
		Replace		1.0					
		Repair		1.0					
	End Tie Rod Assy	Inspect	0.1					1-5	
		Service		0.2					
		Adjust		1.0					
		Replace		3.0					
		Repair		1.0					
	Bayonet Assy	Inspect	0.1					1-5	
		Service		0.2					
		Adjust		1.0					
		Replace		3.0					
		Repair		1.0					
	Alignment Flipper		0.1					1-5	
		Inspect		0.5					
		Service		1.5					
		Replace		0.5					
		Repair							
	45° Sling Assy		0.1					1-5	B
		Inspect		0.5					
		Replace							
	Cell Guide Wheel		0.1					1-5	
		Inspect		0.2					
		Service		0.5					
		Replace		0.5					
		Repair							
	Spacer/Stabilizer Bar		0.1					1-5	
		Inspect		0.1					
		Replace							

MAINTENANCE ALLOCATION CHART FOR

Spreader, Lifting Frames, 20, 35, and 40 ft

SECTION III — TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O, F, H	Shop Equip Contact Maint: Truck Mounted (SC 4940-95-CL-B04)	4040-00-294-9518	T10138
2	O, F, H	Shop Equip Auto Maint: Org Maint, Common No. 1 (SC 4910-95-CL-A74)	4910-00-754-0654	W32593
3	O, F, H	Shop Equip Auto Maint: Org Maint, Common No. 2 (SC 4910-95-CL-A72)	4910-00-754-0650	W32730
4	O, F, H	Shop Equip, Auto Maint: Org Maint, Supp No. 1 (SC 4910 95 CL-A73)	4910-00-754-0653	W32867
5	O, F, H	Tool Kit, General Mechanics: Auto (SC 5810-90-CL-N26)	5180-00-177-7033	W33004
6	O, F, H	Tool Kit, Rigging, Wire Rope (SC-5180-90-CL-N17)	5180-00-596-1513	W50266

MAINTENANCE ALLOCATION CHART FOR

Spreader, Lifting Frames, 20, 35, and 40 ft

SECTION IV — REMARKS

REFERENCE CODES	REMARKS
A	No repair is authorized, i.e., welding.
B	Shackles are to be replaced in sets of four, unless the replacement Shackle is identical to the original in specification and dimension.

APPENDIX D

OPERATOR/CREW
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

1. Do your before (B) PREVENTIVE MAINTENANCE just before you operate the Spreader. Pay attention to the CAUTIONS and WARNINGS.

2. DURING checks and services (D) of PREVENTIVE MAINTENANCE will be performed while the equipment and/or its component systems are in operation.

3. Do your monthly (M) PREVENTIVE MAINTENANCE once a month.

4. If something doesn't work, troubleshoot it with the instructions in your commercial manual, or notify your supervisor.

5. Always do your PREVENTIVE MAINTENANCE in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

6. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to Organizational Maintenance RIGHT NOW.

7. When you do your PREVENTIVE MAINTENANCE, take along a rag - you'll always need at least one.

WARNING

Dry cleaning solvent P-D-680 (SD 2) is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes and clothes and don't breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with skin or clothing is made, flush with water. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

a. Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (SD 2) on all metal surfaces. Use soap and water when you clean rubber or plastic material.

b. Bolts, nuts, and screws: Clean them all for obvious looseness, missing, bent or broken condition. You can't try them all with a tool, of course, but look for chipped paint, bare metal, or rust around bolt heads. If you find one you think is loose, tighten it. Report it to Organizational Maintenance if you can't tighten it.

c. Welds: Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to Organizational Maintenance.

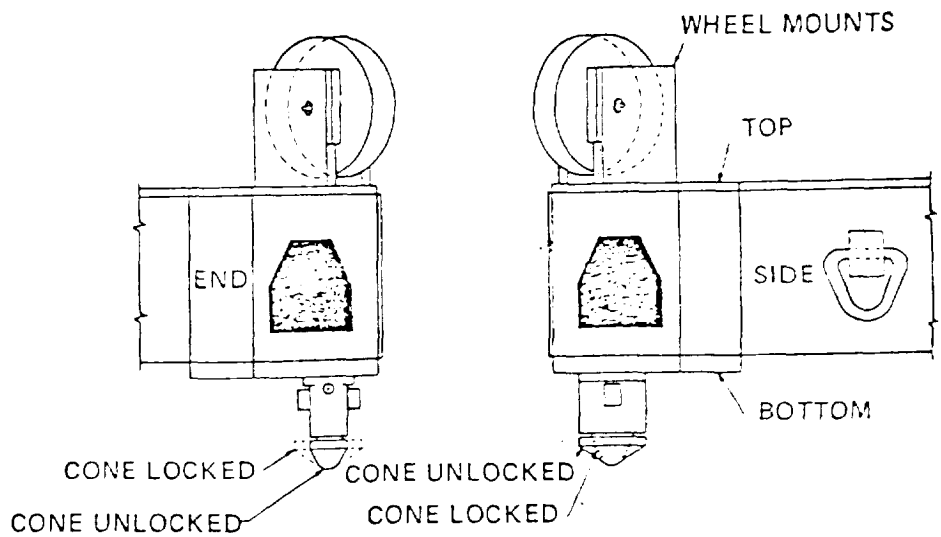
Operator/Crew Preventive Maintenance Checks and Services

B - Before D - During M - Monthly

Item NO.	Interval				Item To Be Inspected Procedure: Check for and have repaired, filled or adjusted as needed.	Equipment is not ready/ Available If:
		B	D	M		
1					SPREADER FRAME	
		●			Check for obvious bends, cracks, broken welds, loose or missing hardware.	Frame is bent, cracked, loose or missing hardware.
2					LIFTING SLING ASSEMBLY	
		●			a. Check the wire rope, rope sockets and fittings for damage, wear, corrosion, fatigue.	a. In standing ropes, more than two broken wires in one lay between end connections. b. More than one broken wire at an end connection. c. Wear of more than one-third of the original diameter of outside individual wires. d. Evidence of heat damage of any cause. e. Evidence of kinking, “bird-caging”, crushing, cuts, abrasions, sharp bends, rust, corrosion or any other damage that results in distortion of rope structure. f. Obvious reduction if wire rope diameter.
		●			b. Check lifting ring and shackles for cracks, bends, breaks and that they are securely attached.	Cracked, bent, broken, not securely attached.
3					ALIGNMENT FLIPPERS	
		●			a. Check for cracks, bends or breaks.	Cracked, bent or broken.
			●		Check that flippers lock in raised and lowered positions. (Ref. LineFast Manual 1A-7127-L, pages 4, 9.)	Flippers do not lock in one or both positions.

Operator/Crew Preventive Maintenance Checks and Services

B - Before D - During M - Monthly

Item No.	Interval B	Interval D	Interval M	Item To Be Inspected Procedure: Check for and have repaired, filled or adjusted as needed.	Equipment is not ready/ Available If:
4				CELL GUIDE WHEELS	
		●		Check that guide wheels are securely attached and rotates freely. WARNING Personal injury may result if bayonet fails to lock.	Wheels not securely attached. If wheels do not rotate, equipment is not ready for ship cell operations.
5				CONTROL ROPES AND BAYONET ASSEMBLY	
		●		Check that when the LOCK control rope is pulled, the four bayonet CONES rotate from UNLOCKED to the LOCKED positions. CONES must rotate a full 1/4 turn.	If any cone fails to rotate a full 1/4 turn.
					
6					
	●			a. Check for cracks, bends, or obvious distortion.	Cracked, bent or distorted.
	●			b. Check for loose or missing hardware.	Loose or missing hardware.

APPENDIX D

ORGANIZATIONAL
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

1. Do your (S) PREVENTIVE MAINTENANCE once each 6 months.

2. If something doesn't work, troubleshoot it with the instructions in your commercial manual or notify your supervisor.

3. Always do your PREVENTIVE MAINTENANCE in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

4. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to Direct Support Maintenance RIGHT NOW.

5. When you do your PREVENTIVE MAINTENANCE, take along the tools you will need to make all the checks. Take along a rag; you'll always need at least one.

WARNING

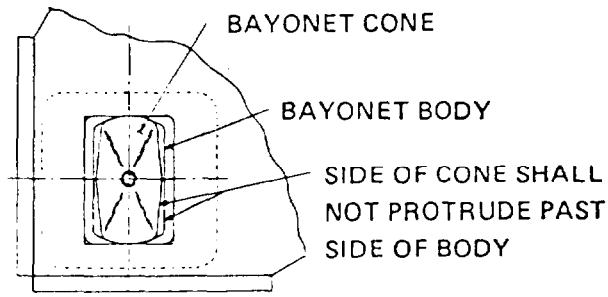
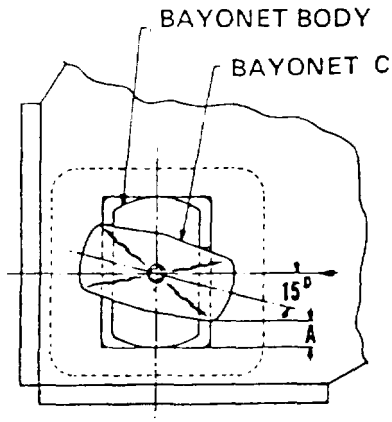
- Dry cleaning solvent P-D-680 (SD 2) is toxic and flammable. Wear protective goggles and gloves and use only in well ventilated area. Avoid contact with skin, eyes and clothes and don't breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with skin or clothing is made, flush with water. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

a. Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (SD-2) on all metal surfaces. Use soap and water when you clean rubber or plastic material.

b. Bolts, nuts, and screws: Check them all for obvious looseness, missing, bent or broken condition. You can't try them all with a tool, of course, but look for chipped paint, bare metal, or rust around bolt heads. If you fine one you think is loose, tighten it.

c. Welds: Look for loose or chipped paint, rust or gaps where parts are welded together. If you find a bad weld, report it to Direct Support Maintenance.

S - Semiannually

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED Procedure: Check for and repair, fill or adjust as needed.
		S	
1		●	END LINKAGE ASSEMBLY Check that linkage is correctly adjusted. Adjustment is required if either one or both of the following conditions are violated. Each bayonet must be checked separately. (Ref. Linefast Manual 1A 7127-L, page 15.) Condition No. 1: With the spreader End Linkage fully Unlocked, any side edge of the Bayonet Cone shall not protrude past the Bayonet Body. but may be flush.  VIEW FROM BENEATH CORNER OF SPREADER Condition No. 2: With the spreader End Linkage fully Locked, the Bayonet Cone shall not be more than 150 out of alignment. The cone is within this limit if Dimension “A” is not less than 5/8, .63 inches for 20 ft. end 40 ft. spreaders and 1-1/8, 1.125 inches for a 35 ft. spreader.  VIEW FROM BENEATH CORNER OF SPREADER

APPENDIX E

Initial Recommendation Prescribed Load List (PLL)/Authorized Stockage List (ASL)

END ITEM: Spreader, Lifting Frame Assy. (40 Foot)		MAKE: LineFast Corp. (58400)		MODEL: 7127-51A-40L (S/N 152 thru 176)					
NSN: 3990-01-128-0089		CONTRACT NO.: DAAE07-82-C-5337					DATE: Sep 82		
SMR CODE	NSN	PRIME P/N	FSCM	PART DESCRIPTION	UNIT PRICE	U/M	QTY OF PARTS REQ'D FOR NO. OF END ITEMS		
							PLL	ASL	
							1-5	1-5	6-20 21-50
PAOZZ	5315-01-158-2143	7127-50-14P	58400	Bayonet, Twist-Lock	38.60	EA	4	8	
PAOZZ	5365-01-154-0423	7127-50-6	58400	Spacer Bushing, Bayonet, Nylon	30.44	EA	4	8	
PAOZZ	5310-01-152-5916	7127-50-F	58400	Washer, Bayonet; Ryertex Material	3.80	EA	8	16	
PAOZZ	3930-01-155-5783	7127-50-12P	58400	Stress Collar	44.13	EA	4	8	
PAOZZ		7127-51-74P	58400	Kay Plate	23.43	EA	4	8	
PAOZZ	5310-00-209-7273	MS24665-625	96906	1/4 Std. ANSI Cotter Pin, 1-1/2" - 2" long	.43	EA	12	24	
PAOZZ	5310-00-841-2041	MS35692-33	96906	1/2 - 13 UNC - 2B Hex Hd Slot Nut, Grade 2, Zinc Pltd.	.49	EA	4	8	
PAOZZ	5315-00-011-9120	MS24665-287	96906	3/32" ANSI Std. Cotter Pin, 1-1/4" Lg, Zinc Plated	.10	EA	4	8	
PAOZZ	4030-01-154-0763	10-10-033	77141	3/16" Single U-Bolt Cable Clamp Superior Wire Co. or equal	.96	EA	4	8	

Initial Recommendation Prescribed Load List (PLL)/Authorized Stockage List (ASL)

END ITEM: Spreader, Lifting Frame Assy. (20 Foot)		MAKE: LineFast Corp. (58400)		MODEL: 7127-51A-20L (S/N 100 thru 151)					
NSN: 3990-01-128-0089		CONTRACT NO. DAAE07-82-C-5337					DATE: Sep 82		
SMR CODE	NSN	PRIME P/N	FSCM	PART DESCRIPTION	UNIT PRICE	U/M	QTY OF PARTS REQ'D FOR NO. OF END ITEMS		
							PLL	ASL	
							1-5	1-5	6-20 21-50
PAOZZ	3990-01-151-9140	871-20-M	76691	Copper Stop Sleeve. 1600 lbs Strength, NICO Press Inc. or Equal	.86	EA	4	8	
PAOZZ	3990-01-151-5829	7127-2-P	58400	Cell Guide Wheel	82.25	EA	4	8	
PAOZZ	5340-01-156-5077	7127-52-68P	58400	Keeper Plate, Cell Guide Wheel	13.38	EA	4	8	
PAOZZ	4730-00-279-0354	1608-B	95879	Grease Fitting, 5/16" Force Fit, Zinc Plated	.18	EA	6	12	
PAOZZ	4730-00-218-5825	1630-B	95879	Grease Fitting, 5/16" Force Fit, Offset Type, Zinc Plated	.72	EA	2	4	
PAOZZ		1952	57733	Grease Fitting, 1/4" Force Fit, Zinc Plated	.72	EA	8	16	
PAOZZ	4030-01-154-0704	855	90202	1 - 1/8" Safety Shackle	51.38	EA	4	8	
PAOZZ		866	90202	1 - 3/8" Safety Shackle	120.12	EA	4	8	
PAOZZ	4010-01-159-3859	7127-45-1P	58400	Ring, Lifting; Sling	80.00	EA	1	2	
PAOZZ		7127-51-76P	58400	Alignment Flipper	216.00	EA	3	6	
PAOZZ		7127-51-19P	58400	Flipper Lock Pin	45.51	EA	3	6	

Initial Recommendation Prescribed Load List (PLL)/Authorized Stockage List (ASL)

END ITEM: Spreader Lifting Frame Assy. (35 Foot)		MAKE: LineFast Corp. (58400)		MODEL: 7127-51A-35L (S/N 152 thru 176)					
NSN: 3990-01-128-0090	CONTRACT NO. DAAE07-82-C-5337					DATE: Sep 82			
SMR CODE	NSN	PRIME P/N	FSCM	PART DESCRIPTION	UNIT PRICE	U/M	QTY OF PARTS REQ'D FOR NO. OF END ITEMS		
							PLL	ASL	
							1-5	1-5	6-20	21-5
PAOZZ		7127-50-16P	58400	Bayonet Twist Lock	58.75	EA	4	8		
PAOZZ	5365-01-154-0423	7127-50-6	58400	Spacer Bush., Bayonet Twist Lock	30.44	EA	4	8		
PAOZZ	5310-01-152-5916	7127-50-F	58400	Washer, Bayonet, Ryertex Material	3.80	EA	8	16		
PAOZZ		7127-50R-3	58400	Stress Collar	44.13	EA	4	8		
PAOZZ	5310-01-155-1837	7127-17-3/4	58400	Spacer Washer, Nylon, 1.25 0.D. x .765 I.D. x 1.25	2.46	EA	4	8		
PAOZZ	5310-00-209-7273	MS24665-625	96906	1/4" Std, ANSI Cotter Pin 1 - 1/2" - 2" Long	.43	EA	12	24		
PAOZZ	5310-00-841-2041	MS35692-33	96906	1/2" - 13 UNC - 2B, Hex Hd. Slotted Nut, Grade 2, Zinc Plated	.72	EA	4	8		
PAOZZ	5315-00-011-9120	MS24665-287	96906	3/32" ANSI Std. Cotter Pin, 1 - 1/4" Long, Zinc Plated	.10	EA	4	8		
PAOZZ	4030-01-151-9140	10-10-033	77141	3/16" U-Bolt Cable Clamp; Superior Wire Co. or Equal	.96	EA	4	8		
PAOZZ	3990-01-151-9140	871-20-M	76691	Copper Stop Sleeve, 1600 lbs Strength, NICOPRESS Inc. or Equal	.86	EA	4	8		

END ITEM: Spreader Lifting Frame Assy. (35 Foot)				MAKE: LineFast Corp. (58400)		MODEL: 7127-51A-35L (S/N 152 thru 176)			
NSN: 3990-01-128-0090		CONTRACT NO. DAAE07-82-C-5337				DATE: Sep 82			
SMR CODE	NSN	PRIME P/N	FSCM	PART DESCRIPTION	UNIT PRICE	U/M	QTY OF PARTS REQ'D FOR NO. OF END ITEMS		
							PLL	ASL	
							1-5	1-5	6-20	21-50
PAOZZ	3990-01-151-5829	7127-2-P	58400	Cell Guide Wheel	82.25	EA	4	8		
PAOZZ	5340-01-156-5077	7127-52-68P	58400	Keeper Plate, Cell Guide Wheel	13.38	EA	8	16		
PAOZZ	4730-00-279-0354	1608-B	95879	Grease Fitting, 5/16" Force Fit, Zinc Plated	.18	EA	6	12		
PAOZZ	4730-00-218-5825	1630-B	95879	Grease Fitting, 5/16" Force Fit, Offset Type, Zinc Plated	.72	EA	2	4		
PAOZZ		1952	57733	Grease Fitting, 1/4" Force Fit, Zinc Plated	.72	EA	8	16		
PAOZZ		7127-51-76P	58400	Alignment Flipper	216.00	EA	3	6		
PAOZZ	3040-01-154-6453	7127-51-19P	58400	Flipper Lock Pin	45.51	EA	3	6		
PAOZZ	4030-01-156-5223	855A	90202	1 - 1/8 in. Safety Shackle	65.03	EA	4	8		
PAOZZ		866	90202	1 - 3/8 in. Safety Shackle	120.12	EA	4	8		
PAOZZ	4010-01-156-3859	7127-45-1P	58400	Ring, Lifting Sling	80.00	EA	1	2		

Initial Recommendation Prescribed Load List (PLL)/Authorized Stockage List (ASL)

END ITEM: Spreader, Lifting Frame Assy. (20 Foot)		MAKE: LineFast Corp. (58400)		MODEL: 7127-51A-20L (S/N 100 thru 151)					
NSN: 3990-01-128-0089		CONTRACT NO. DAAE07-82-C-5337				DATE: Sep 82			
SMR CODE	NSN	PRIME P/N	FSCM	PART DESCRIPTION	UNIT PRICE	U/M	QTY OF PARTS REQ'D FOR NO. OF END ITEMS		
							PLL	ASL	
							1-5	1-5	6-20 21-50
PAOZZ	5315-01-158-2143	7127-50-14P	58400	Bayonet, Twist-Lock	38.60	EA	4	8	
PAOZZ	5365-01-154-0423	7127-50-6	58400	Spacer Bushing, Bayonet, Nylon	30.44	EA	4	8	
PAOZZ	5310-01-152-5916	7127-50-F	58400	Washer, Bayonet; Ryertex Material	3.80	EA	8	16	
PAOZZ	3930-01-155-5783	7127-50-12P	58400	Stress Collar	44.13	EA	4	8	
PAOZZ		7127-51-74P	58400	Key Plate	23.43	EA	4	8	
PAOZZ	5310-00-209-7273	MS24665-625	96906	1/4" Std. ANSI Cotter Pin, 1 - 1/2" - 2" Long	.43	EA	12	24	
PAOZZ	5310-00-841-2041	MS35692-33	96906	1/2 - 13" UNC - 2B Hex Hd Slot Nut, Grade 2, Zinc Plated	.49	EA	4	8	
PAOZZ	5315-00-011-9120	MS24665-287	96906	3/32" ANSI Std. Cotter Pin, 1 - 1/4" Long, Zinc Plated	.10	EA	4	8	
PAOZZ	4030-01-154-0763	10-10-033	77141	3/16" Single U-Bolt Cable Clamp Superior Wire Co. or equal	.96	EA	4	8	

Initial Recommendation Prescribed Load List (PLL)/Authorized Stockage List (ASL)

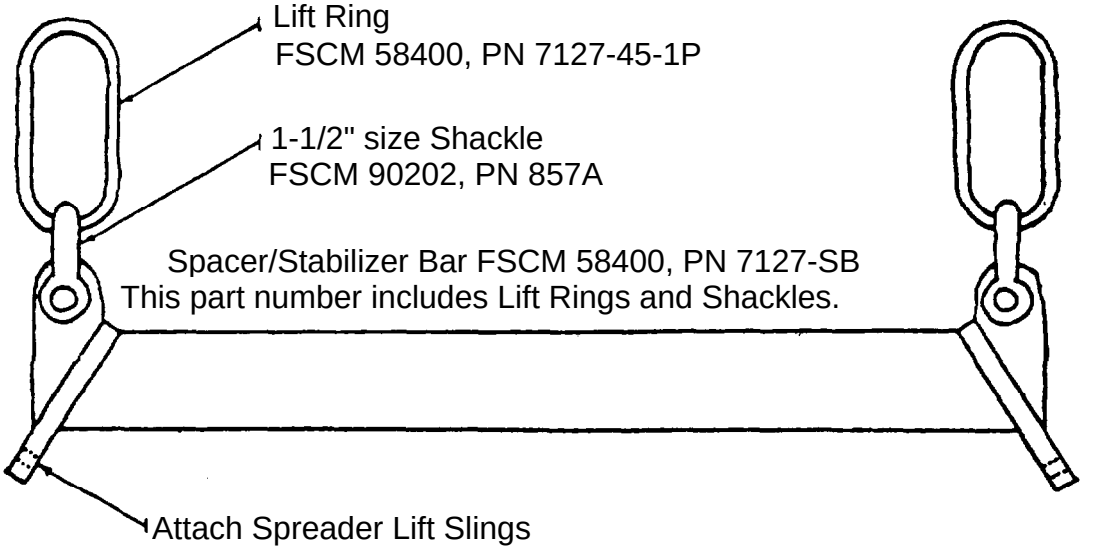
END ITEM: Spreader, Lifting Frame Assy. (40 Foot)		MAKE: LineFast Corp. (58400)		MODEL: 7127-51A-40L (S/N 152 thru 176)					
NSN: 3990-01-128-0089	CONTRACT NO. DAAE07-82-C-5337					DATE: Sep 82			
SMR CODE	NSN	PRIME P/N	FSCM	PART DESCRIPTION	UNIT PRICE	U/M	QTY OF PARTS REQ'D FOR NO. OF END ITEMS		
							PLL	ASL	
							1-5	1-5	6-20	21-50
PAOZZ	3990-01-151-9140	871-20-M	76691	Copper Stop Sleeve, 1600 lbs. Strength, NICO Press Inc. or equal	.86	EA	4	8		
PAOZZ	3990-01-151-5829	7127-2-P	58400	Cell Guide Wheel	82.25	EA	4	8		
PAOZZ	5340-01-156-5077	7127-52-68P	58400	Keeper Plate, Cell Guide Wheel	13.38	EA	4	8		
PAOZZ	4730-00-279-0354	1608-B	95879	Grease Fitting, 4/16" Force Fit, Zinc Plated	.18	EA	6	12		
PAOZZ	4730-00-218-5825	1630-B	95879	Grease Fitting, 5/16" Force Fit, Offset Type, Zinc Plated	.72	EA	2	4		
PAOZZ		1952	57733	Grease Fitting, 1/4" Force Fit, Zinc Plated	.72	EA	8	16		
PAOZZ		856A	90202	1 - 1/4" Safety Shackle	84.44	EA	4	8		
PAOZZ		866	90202	1 - 3/8 Safety Shackle	120.12	EA	4	8		
PAOZZ	4010-01-156-3859	7127-45-1P	58400	Ring, Lifting; Sling	80.00	EA	1	2		
PAOZZ		7127-51-76P	58400	Alignment Flipper	216.00	EA	3	6		
PAOZZ		7127-51-19P	58400	Flipper Lock Pin	45.51	EA	3	6		

APPENDIX F

OPERATING, MAINTENANCE AND REPAIR PARTS INSTRUCTIONS FOR SPACER/STABILIZER BAR FSCM 58400, PN 7127-9

1. Instructions for Use with Spreader, Lifting Frames. Disconnect the four 1-3/8” shackles from the lift ring of the desired Spreader, Lifting Frame so that each leg of the lift sling is free to be connected to the Spacer/ Stabilizer Bar. Leave all sling legs attached to the Spreader lift lugs. Position the Spacer/Stabilizer bar longitudinally with Spreader. Attach 1-3/8” shackle at end of each sling leg to the approximate eye of the Spacer/ Stabilizer bar, making certain that sling legs are not tangled or crossed.

2. Maintenance. Other than the replacement of shackles and lift rings, there is no repair authorized for the Spacer/Stabilizer Bar.



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General, United States Army
Chief of Staff

Official:

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Major General, United States Army
The Adjutant General

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

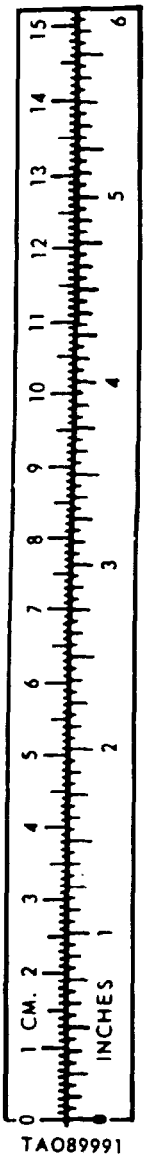
TEMPERATURE

$5/9\ (^{0}F - 32) = {}^{0}C$
212^{0} Fahrenheit is equivalent to 100^{0} Celsius
90^{0} Fahrenheit is equivalent to 32.2^{0} Celsius
32^{0} Fahrenheit is equivalent to 0^{0} Celsius
$9/5\ C^{0} + 32 = F^{0}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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