CARDINAL

MODEL 1500 SERIES
BUCKET ELEVATOR

MODEL & HEIGHT:_____
SERIAL NUMBER:_____
DATE PURCHASED:_____

MANUAL

CARDINAL GRAIN SYSTEMS, INC.—COLUMBIA CITY, INDIANA 46725—PHONE: 260-244-4654 3/04

Cardinal$_{TM}$ Brand Grain Handling Equipment One Year Limited Warranty

Novae Corp. warrants to the original owner that your Cardinal equipment will be free from defects in material and workmanship for the one (1) year period commencing with the date of purchase, except as herein limited. The obligation of this warranty is limited to repairing or replacing any part or parts which, in the opinion of Novae Corp. is/are defective in material or workmanship under normal use and service.

90 Day Limited Warranty

Excluded from this One Year Limited Warranty are driveline components such as gearboxes, PTO drive shafts, chain and belt drives, and universal joints, which are warranted for a 90 day period commencing with the date of purchase.

Warranty Validation

Your new equipment should be registered with Novae Corp within ten (10) days of the original purchase. Warranty registration forms are available on the web at www.cardinalgrain.com or by calling customer service at 888-400-3545 to have one mailed to you.

How to Obtain Service

1. All warranty claims must be presented to Novae Corp. and proper arrangements must be made and approved by Novae Corp. prior to any work being done.
2. All warranty repairs must be performed at Novae Corp. unless prior approval is obtained from Novae Corp. In certain cases, Novae Corp may, at its sole discretion, elect to have warranty work performed by a qualified repair facility.
3. Novae Corp. will not be obligated in any way to pay for: repairs made without specific advance approval, labor charges in excess of those deemed reasonable by Novae Corp., or for any part costs in excess of the cost if Novae Corp. had supplied the parts. The cost of any replacement items will be limited to the amount of the original cost of that item as installed and sold by Novae Corp.
4. Any charges for: overtime labor, service calls, towing charges, expediting, freight or transportation costs are the sole responsibility of the consumer and will not be paid by Novae Corp.

Items Not Covered In This Warranty

1. Wheels and Tires. Contact the tire manufacturer for warranty information
2. Running Gear including axle and suspension assemblies. Present all claims directly to the axle manufacturer or their authorized dealers.
3. Paint finish and durability are not covered under this warranty.
4. Damage or defects resulting from misuse (including, but not limited to, improper operation, negligence, alteration, accident or lack of maintenance.)
5. Maintenance items that are worn through normal use.
6. Damage caused by loose nuts, bolts or screws including improperly torqued wheel lug nuts.
7. Damage caused by improper hitching or improper installation of drive motors.
8. Loss of time, inconvenience, loss of equipment use, rental or substitute equipment, loss of revenues, or any other losses.
9. Damage or loss resulting from towing equipment that exceeds the tow vehicle manufacturer's specific towing limitations.
10. Any travel time or expenses, such as food, fuel, lodging, etc., incurred to obtain service.

Any express warranty not provided herein, and any remedy for breach of contract which, but for this provision, might arise by implication or operation of law, is hereby excluded and disclaimed. The implied warranties for merchantability and of fitness for a particular purpose are expressly limited to a term of one (1) year. Under no circumstances will Novae Corp. be liable to purchaser or any other person for any special, incidental, or consequential damages, whether arising out of a breach of warranty, breach of contract or otherwise. This warranty gives you specific legal rights and you may have other rights which vary from state to state.

Novae Corp. neither assumes nor authorizes any other person to give any other warranty on its behalf. This warranty is not transferable from the original owner.

Cardinal $_{TM}$ Equipment Warranty Registration Form

Model: _____ Date: _____

Serial Number: _____

Owners Name: _____ Phone Number: _____

Street: _____

City, State Zip: _____

Primary Use: _____

Store and Location where purchased: _____ Delivery Date: _____

Store Representative: _____ Owner Signature: _____

(Fold to conceal information, tape closed, affix postage and mail)

Name: _____

Address: _____

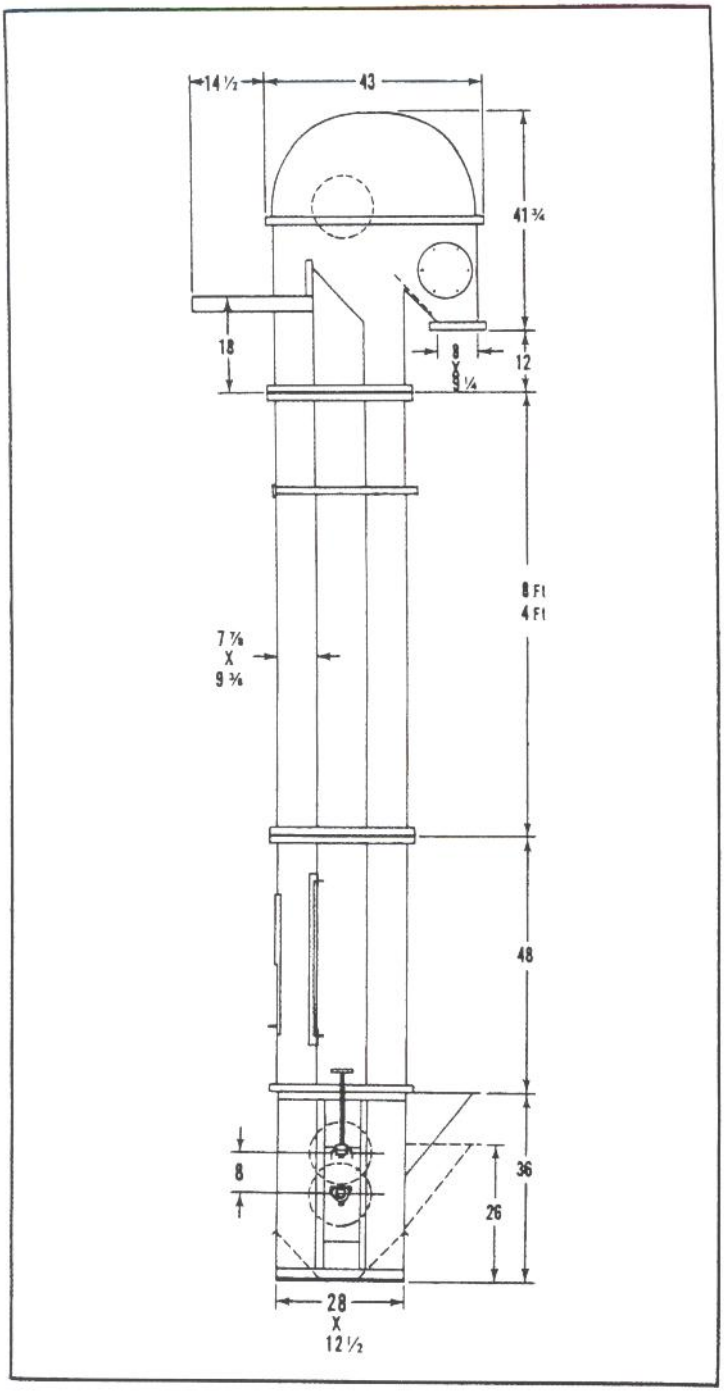
City, State Zip: _____

PLACE POSTAGE HERE

NOVAE CORP. / CARDINAL GRAIN
607 S CHAUNCEY ST
COLUMBIA CITY, IN 46725

CARDINAL

Engineering Specifications



Model 1500

Maximum height ---------- 76 ft.
Capacities* ---------- 550, 825, 1100, 1500 bph
Bucket spacing ---------- 12" on 550 bph, 8" on 825 bph, 6" on 1100 bph, 6" on 1500 bph
Bucket size ---- 6" x 4" on 550, 825 and 1100 bph, 6" x 4½" on 1500 bph
Belt speed ----- 350 ft/min for 550, 825, 1100 and 1500 bph
Belt width ---------- 7"
Belt thickness ---------- ¼" PVC belting standard
Belt adjustment ---------- 8"
Belt splice ---------- lap type
Head pulley ---- 12" dia. rubber lagged
Boot pulley ------ 12" dia. crown faced
Head material ---------- 14 ga.
Boot material ---------- 12 ga.
Legging material ---------- 16 ga.
Head shaft ---------- 1 7/16"
Jack shaft ---------- 1¼"
Boot shaft ---------- 1 7/16"

Installation dimensions...

Space required for boot --- 12½" x 28"
Space required for head ---- 20" x 58"
Space required for legging - 12½" x 29"
Standard boot hopper --- 13" projection x 9¼" wide
Hopper height on "Up" leg ------- 36"
Hopper height on "Down" leg ---- 36" or 26"

*Important

Capacity ratings shown are based on handling dry grain (14% moisture maximum) and with feed-in equipment installed so that belt cups are at least 90% filled. Right angle feed-in and high moisture content lowers the capacity of this elevator.

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- SAFETY -

1. LADDERS AND CAGES MUST BE INSTALLED CORRECTLY AND SECURELY.

2. PERSONS OF POOR HEALTH OR IRRESPONSIBLE PERSONNEL SHOULD NOT ASCEND THE LADDER.

3. BE SURE GUARDS ARE INTACT AT ALL TIMES DURING OPERATIONS.

4. DO NOT REMOVE OR OPEN ANY INSPECTION DOORS OR COVERS WHILE THE ELEVATOR IS IN OPERATION. FLYING GRAIN MAY INJURE YOUR EYES.

5. ENCLOSED AREAS AROUND THE ELEVATOR MUST BE VENTILATED TO PREVENT DUST EXPLOSIONS.

6. DO NOT WELD ON ANY PART OF THE UNIT AFTER THE ELEVATOR HAS BEEN USED TO MOVE GRAIN, AS THIS MAY CAUSE A DUST EXPLOSION.

7. ONLY PERSONAL CARE AND COMMON SENSE CAN PREVENT FALLS.

8. DO NOT CLIMB ON ANY PART OF THE UNIT EXCEPT THOSE PLACES MEANT FOR CLIMBING, I.E. LADDERS AND PLATFORM AREAS.

9. STAY CLEAR OF THE ELEVATOR AND IT'S APPURTENANCES WHEN WEATHER CONDITIONS ARE SUSCEPTIBLE TO LIGHTNING OR HIGH WINDS.

- SYSTEM PLANNING -

A GRAIN SYSTEM BUILT AROUND A CARDINAL BUCKET ELEVATOR AFFORDS THE MOST VERSATILE SYSTEM TO OPERATE, MAINTAIN, AND EXPAND THAN ANY OTHER TYPE OF SYSTEM.

WHEN PLANNING YOUR SYSTEM TAKE WHAT YOU NEED TODAY AND DOUBLE YOUR PLAN. YOU MIGHT NOT INSTALL THIS PLAN TODAY, BUT YOU MUST ALLOW FOR IT TODAY TO ASSURE YOURSELF OF A COMPLETE WORKABLE SYSTEM WHEN THE TIME ARISES.

USE THIS FUTURE PLAN AND LEAVE ROOM FOR IT WHEN YOU PICK THE SITE. ALSO, LOOK FOR A PLACE WHICH WILL BE FREE FROM SURFACE WATER DRAINING INTO OR STANDING AROUND THE COMPLETED SYSTEM. THE SITE MUST ALSO OFFER A GOOD WORKABLE TRAFFIC PATTERN TO ASSURE A MORE EFFICIENT LOADING AND UNLOADING OPERATION.

WHEN THE SITE AND THE SYSTEM IS ESTABLISHED, THE DISCHARGE HEIGHT CAN BE DETERMINED. ALWAYS HAVE EACH SPOUT RUN FALLING AT LEAST AT A 37° ANGLE FOR DRY GRAIN AND AT LEAST 45° FOR WET GRAIN. THESE ANGLES ARE ABSOLUTE MINUMUMS WHICH MAY NOT WORK PROPERLY WITH LESS THAN TOP QUALITY GRAIN. THE 37° FALL ANGLES ARE MEANT FOR NO MORE THAN 15% MOISTURE CONTENT WITH MINIMAL FOREIGN MATERIAL, AND FINE CONTENT. THE 45° FALL ANGLES ARE MEANT FOR GOOD QUALITY GRAIN AND A MAXIMUM OF 28% MOISTURE CONTENT. AS THE MOISTURE CONTENT RISES AND/OR THE QUALITY DROPS, STEEPER FALL ANGLES ARE REQUIRED. IN GENERAL, IF ALL DRY GRAIN SPOUTS ARE 45° AND ALL WET GRAIN SPOUTS ARE 60°, THESE STEEPER FALLS WILL ALLOW FOR ERRORS AND THE FUTURE ADDITIONS OF BINS AND ACCESSORIES. (ALL FALL ANGLES ARE STATED IN DEGREES FROM HORIZONTAL.)

PROPER SIZING OF SPOUTING DIAMETER WILL INCREASE THE FLOW CHARACTERISTICS OF A GIVEN SPOUT. IF THE MINIMAL FALL ANGLES ARE USED, ALWAYS USE SPOUT DIAMETERS AS SHOWN IN THE FOLLOWING TABLE:

THROUGHPUT CAPACITY (BU/HR) DRY GRAIN 15% MC

SPOUTING DIAMETER	37° FALL	45° FALL
6"	0-1500	0-2000
8"	2000-3500	2500-4000
10"	3500-7000	4500-8000

THROUGHPUT CAPACITY (BU/HR) 28% MC MAXIMUM

SPOUTING DIAMETER	45° FALL	60° FALL
6"	0-1500	0-2000
8"	2000-3500	2500-4000
10"	3500-7000	4500-8000

(THESE CAPACITIES RELATE TO GOOD QUALITY #2 GRADE SHELLED CORN)

EACH SPOUT SHOULD BE TERMINATED WITH A SELF-CLEANING BIN ENTRANCE CUSHION BOX. THIS UNIT HAS A REMOVEABLE END PLATE WHICH ALLOWS THE OPERATOR TO CHECK FOR PLUGGING OR EXCESSIVE WEAR. IT ALSO AFFORDS A CUSHION OF GRAIN TO BUILD UP IN THE BIN ENTRANCE SO THE INCOMING GRAIN IMPACTS AGAINST GRAIN INSTEAD OF METAL.

WHEN THE SYSTEM IS PLANNED, A DISTRIBUTOR HEAD WHICH ALLOWS FOR THE FUTURE ADDITIONS OF SPOUT RUNS SHOULD BE INCORPORATED.

FOR EACH RUN OF SPOUT WHICH IS LONGER THAN 30' LONG AND IS AT LEAST 45° NEEDS TO BE TRUSSED WITH CARDINAL TRUSS SUPPORTS. IF YOUR SPOUT RUNS ARE AT A STEEPER 60° ANGLE, BEGIN TRUSSING AT 50' OF SPOUT RUN. SEE THE FOLLOWING TABLE FOR FIGURING YOUR TRUSS REQUIREMENT. THE CHART SHOWS THE NUMBER OF TRUSS SUPPORTS NEEDED AND THE SPAN OF EACH TRUSS SUPPORT.

LENGTH OF SPOUT

SPOUT DIA.	30'-50'	50'-70'	70'-90'	90'-110'	110'-130'
6"	1-3'	2-4'	2-3';1-6'	2-4';1-8'	N/R
8"	1-4'	2-6'	2-4';1-6'	2-4';1-8'	2-6';1-8'
10"	1-6'	2-6'	2-6';1-8'	2-6';1-8'	2-6';1-8'

EACH TRUSS SUPPORT MUST BE ORDERED SEPARATELY AND ONE HOOK-UP KIT FOR EACH RUN OF SPOUT MUST BE ORDERED. THE HOOK-UP KIT INCLUDES THE TURNBUCKLES AND THE THIMBLES LESS THE CABLE REQUIRED. ORDER CABLE 5 TIMES THE SPOUT RUN FOR EACH SPOUT.

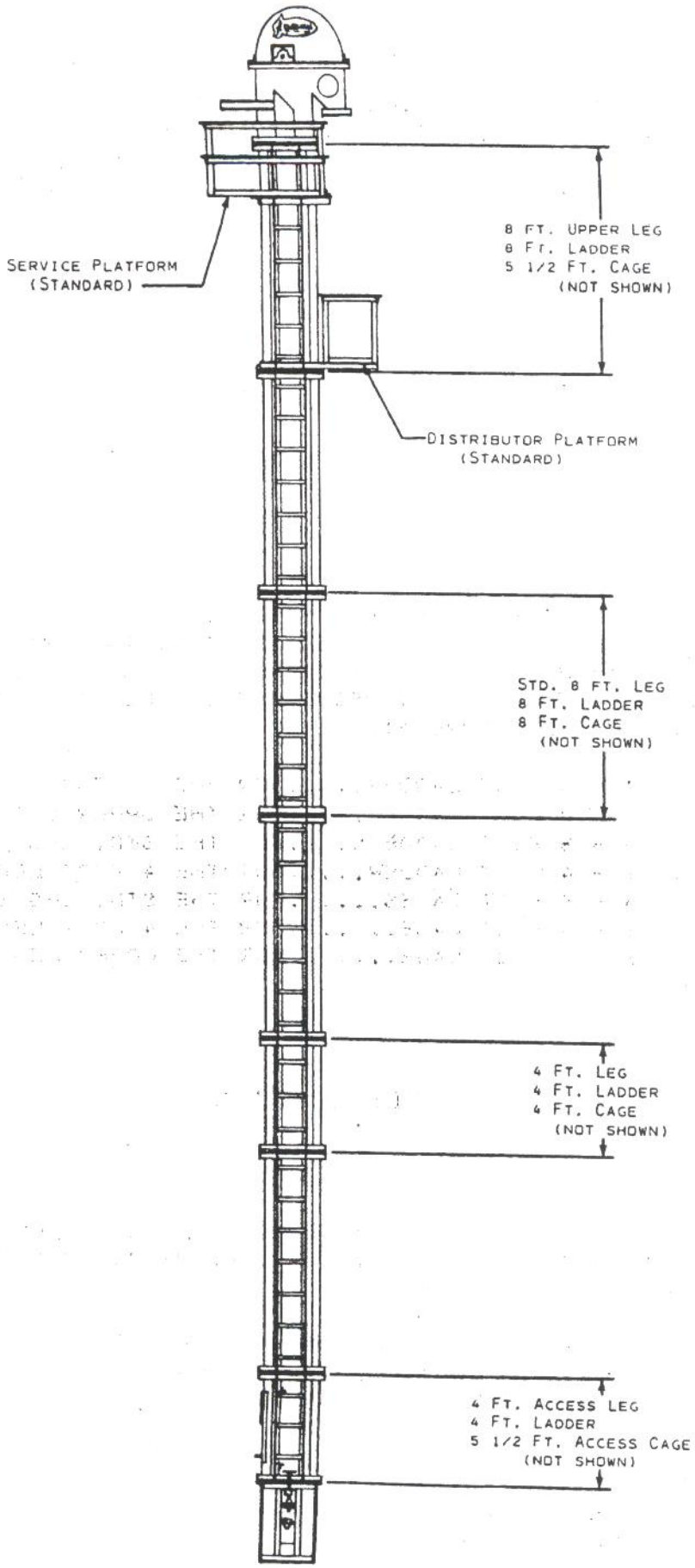
FOR ALL PRACTICAL PURPOSES, THE DISTRIBUTOR HEAD DOES NOT REQUIRE ANY ADDITIONAL HEIGHT TO BE ADDED TO THE BUCKET ELEVATOR. HOWEVER, THE HEAD DISCHARGE ADAPTOR, WHICH ATTACHES DIRECTLY ABOVE THE DISTRIBUTOR, REQUIRES AN ADDITIONAL ONE FOOT TO THE DISCHARGE HEIGHT OF THE BUCKET ELEVATOR. ALWAYS USE THE HEAD DISCHARGE ADAPTOR, EXCEPT WHEN THE GRAIN CLEANER IS ATTACHED TO THE DISCHARGE OF THE ELEVATOR. THE HEAD DISCHARGE ADAPTOR CREATES A GOOD FLOW PATTERN WITHIN THE GRAIN FLOW BEFORE THE GRAIN ENTERS ANY SORT OF DISCHARGE ACCESSORIES.

WITH ALL OF THE DISCHARGE EQUIPMENT REQUIREMENTS DECIDED, A SCHEMATIC DRAWING (SEE FIGURE #1) OF THE ELEVATOR SHOULD BE DONE. THIS DRAWING WILL HELP YOU DECIDE WHAT SUPPORT EQUIPMENT IS REQUIRED AND WHAT SERVICE EQUIPMENT WILL BE NEEDED.

WHEN THE MODEL NUMBER IS USED FOR ORDERING, IT WILL GIVE YOU THE REQUIRED LEG SECTIONS, BOOT SECTION AND HEAD SECTION TO PRODUCE YOUR REQUIRED HEIGHT. THE DISCHARGE HEIGHT ADDED BY THE HEAD IS FIGURED IN THE MODEL NUMBER FOR THE BASIC ELEVATOR. THE EQUIPMENT THAT COMES WITH THE BASIC ELEVATOR IS CHARTED BELOW WITH IT'S DISTANCE TAKEN UP IN THE FINAL STRUCTURE.

	HEIGHT
BOOT SECTION	3 FT.
ACCESS LEG. SECTION	4 FT.
STD. LEG SECTION	8 FT.
UPPER LEG SECTION	8 FT.
ALL HEAD SECTIONS	1 FT.
4 FT. LEG SECTIONS (IF REQUIRED)	4 FT.

SEE FIGURE #1



SCHEMATIC
FIGURE #1

IF A 68 FT. LEG WAS THE REQUIRED HEIGHT YOU WOULD GET 1-BOOT SECTION, 1-ACCESS SECTION, 1-UPPER LEG SECTION, 1-HEAD SECTION, WHICH WOULD EQUAL 16 FEET OF DISCHARGE HEIGHT. THE REMAINING 52 FEET WOULD BE STANDARD LEG SECTIONS, 6 PCS. OF 8 FOOT LEG SECTIONS AND 1 PIECE OF A FOUR FOOT LEG SECTION.

WITH THE SCHEMATIC DRAWING DONE YOU CAN FIGURE THE SERVICE EQUIPMENT NEEDED.

- SERVICE EQUIPMENT -

THE SERVICE EQUIPMENT REQUIRED FOR YOUR ELEVATOR WILL BE DETERMINED BY THE AMOUNT OF BUCKET ELEVATOR LEG SECTIONS THAT WILL NEED A LADDER AND/OR A CAGE. EACH LADDER END ATTACHES TO EACH LEG SECTION. FOR EXAMPLE, THE 68 FOOT LEG WOULD REQUIRE THE FOLLOWING, IF THE BOOT IS AT GROUND LEVEL: SEE FIGURE #1.

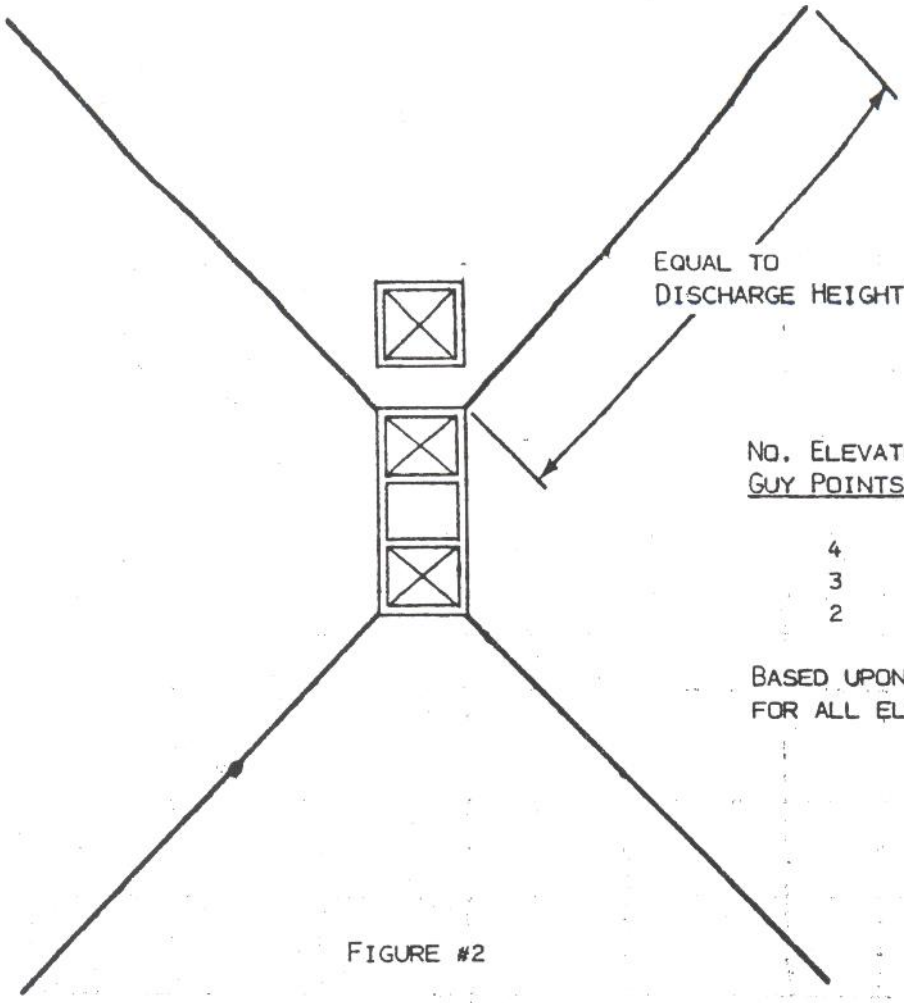
1 - 4 FOOT LADDER.....FOR THE ACCESS SECTION
1 - 8 FOOT LADDER.....FOR THE UPPER LEG SECTION
6 - 8 FOOT LADDERS....FOR THE STD. LEG SECTION
1 - 4 FOOT LADDER.....FOR THE 4 FOOT LEG SECTION
6 - 8 FOOT CAGES.....FOR THE STD. LEG SECTIONS
1 - 4 FOOT CAGE.....FOR THE 4 FOOT LEG SECTION
1 - 5 1/2' CAGE.....FOR THE UPPER LEG SECTION

- GUYING EQUIPMENT -

THE RECOMMENDED POINTS FOR ATTACHING GUY CABLES TO THE BUCKET ELEVATOR IS AT THE FIRST 40 FEET OF TRUNKING AND EVERY 32 FEET THEREAFTER. PLOT THIS ON THE SCHEMATIC DRAWING.

THE GROUND POINT ATTACHMENT SHOULD BE AS FAR FROM THE BASE OF THE BUCKET ELEVATOR AS THE ELEVATOR IS TALL. THE GROUND ATTACHMENT SHOULD BE ON A DIAGONAL WITH THE ELEVATOR. SEE FIGURE #2.

YOU SHOULD ALSO ORDER ONE DISTRIBUTOR ROD CONTROL GUIDE WITH EACH GUY CABLE BRACKET THAT IS NEEDED.



No. Elevator Guy Points	Total Approximate Cable Required
4	21 x Elev. Height
3	16 x Elev. Height
2	11 x Elev. Height

Based upon one ground attachment for all elevator guy points.

FIGURE #2

- FEED IN-EQUIPMENT -

THIS BUCKET ELEVATOR IS VERY VERSATILE IN THE MANY WAYS IT CAN BE FED. PROPER FEEDING IS THE ONE MAIN CONCERN IN MAKING SURE THE ELEVATOR OPERATES AT FULL CAPACITY. IT CAN BE FED ON EITHER THE UP OR DOWN LEG SIDE. (UP LEG OR DOWN LEG REFERS TO THE DIRECTION OF CUP TRAVEL) WITH THE STANDARD HOPPER, WHICH COMES WITH THE BOOT SECTION, THERE ARE TWO MOUNTINGS, HIGH AND LOW, ON EITHER SIDE OF THE BOOT. FOR UP LEG FEEDING, THE HOPPER SHOULD BE IN THE HIGH POSITION; AND FOR DOWN LEG FEEDING, THE HOPPER SHOULD BE IN THE LOW POSITION. THE LARGE DUMP HOPPER SHOULD BE USED FOR DOWN LEG FEEDING ONLY.

THE FEEDING OF THE ELEVATOR WITH AN AUGER DOES NOT PRESENT ANY PARTICULAR PROBLEMS AS FAR AS PLACEMENT ON THE BOOT.

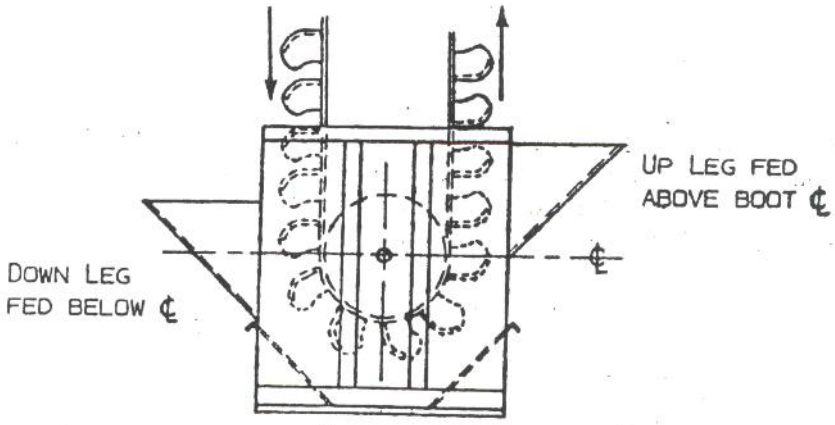


FIGURE #3

CHECK YOUR ORDER:

CHECK YOUR ORDER FOR ALL THE PIECES. BE SURE THEY ARE THERE AND IN THE RIGHT QUANTITY. A MISSING LEG SECTION WILL LOWER THE DISCHARGE HEIGHT AND WILL ADVERSLY AFFECT THE ANGLE OF THE SPOUTING. AN EXCESSIVE AMOUNT OF LEG SECTIONS WILL RAISE THE DISCHARGE HEIGHT AND CAUSE A SHORTAGE IN BELT LENGTH, CUPS, ETC. REFER TO THE SHIPPING BUNDLE CHECK LIST FOR CORRECT QUANTATIES.

BASIC SHIPPING BUNDLE CHECK LIST

HEIGHT	ACCESS LEG 292-96	UPPER LEG 292-97	8' LEGS 292-98	4' LEGS 292-99	CUPS* 550	825	1100	1500+
24	1	1	1	-	52	78	104	104
28	1	1	1	1	60	90	120	120
32	1	1	2	-	68	102	136	136
36	1	1	2	1	76	114	152	152
40	1	1	3	-	84	126	168	168
44	1	1	3	1	92	138	184	184
48	1	1	4	-	100	150	200	200
52	1	1	4	1	108	162	216	216
56	1	1	5	-	116	174	232	232
60	1	1	5	1	124	186	248	248
64	1	1	6	-	132	198	264	264
68	1	1	6	1	140	210	280	280
72	1	1	7	-	148	222	296	296
76	1	1	7	1	156	234	312	312

HEAD SECTION W/JACKSHAFT CHAIN DRIVE.....1; 293-2

BOOT SECTION.....1; 292-95

OPTIONAL BOOT SECTION W/SLATTED PULLEY.....1; 294-4

* CUPS - EACH CUP USES 2 ELEVATOR BOLTS. ALL OF THESE BOLTS, EXCEPT FOR THE BELT SPLICE BOLTS, ARE 1/4-20NC X 3/4 FLAT HEAD ELEVATOR BOLTS. THE SPLICE BOLTS ARE 1/4-20NC X 1-1/4 FLAT HEAD ELEVATOR BOLTS. THE SPLICE REQUIREMENT IS AS FOLLOWS:

500 BU/HR	6 BOLTS
825 BU/HR	8 BOLTS
1100-1500 BU/HR	10 BOLTS

* THE 1500 BU/HR MODEL USES A 6 X 4 1/2 CUP WHEREAS THE OTHER MODELS USE A 6 X 4 CUP.

HEAD DISCHARGE ADAPTER 6" 1; 293-93

TWO SECTION ADJUSTABLE ELBOW.....1; 294-18

SERVICE PLATFORM (STANDARD).....1; 293-90

DISTRIBUTOR SERVICE PLATFORM (STANDARD).....1; 293-94

CONTROL ROD GUIDE.....1; 293-91

GUY CABLE BRACKET.....1; 293-92

3 FT. SPIDER TRUSS 6" .....1; 295-70 3' TRUSS
1; 294-39 6" HOOK-UP KIT

4 FT. SPIDER TRUSS 6" .....1; 295-72 4' TRUSS
1; 295-39 HOOK-UP KIT

6 FT. SPIDER TRUSS 6" .....1; 295-73 6' TRUSS
1; 295-39 HOOK-UP KIT

8 FT. SPIDER TRUSS 6" .....1; 295-74 8' TRUSS
1; 294-39 HOOK-UP KIT

6" TRUSS ACCESSORIES.....1; 294-40

- PLANNING THE ERECTION AND ASSEMBLY -

THE BOOT AND AT LEAST ONE LEG SECTION SHOULD BE PLACED IN IT'S PROPER POSITION ON A CONCRETE PAD. THE FIRST LEG SECTION ABOVE THE BOOT CAN BE ANY OF THE REGULAR 4' OR 8' LEG SECTIONS OR THE ACCESS LEG SECTION DEPENDING ON THE DESIRES OF THE CUSTOMER.

PLACE THE BOOT AND LEG SECTION, WITH IT'S LADDER AND CAGE ATTACHED (SEE FIGURE #4 AND #5).

THE ACCESS SECTION OPENINGS ARE USED TO INSTALL THE BELT AND BUCKETS AFTER THE ELEVATOR IS STANDING. THEREFORE, THE OPENINGS SHOULD BE PLACED PROPERLY TO EASE THE INSTALLATION OF THE BELT. DO NOT REMOVE ANY OF THE DOORS BEFORE ERECTION BECAUSE THIS LEG SECTION IS PUT UNDER GREAT STRAIN DURING THE ERECTION PROCEDURE. NO PROBLEMS WILL BE ENCOUNTERED IN REMOVING THE DOOR AFTER THE ELEVATOR IS SET. SEE FIGURE #6

ASSEMBLE THE LEG SECTIONS ON A LEVEL SURFACE WITH ONE TRUNK UP AND ONE TRUNK DOWN. DO NOT ASSEMBLE MORE THAN 40 FEET OF LEG SECTIONS AS THIS IS THE MAXIMUM RECOMMENDED LIFT AT ONE TIME. BE SURE THAT A GUY POINT IS AVAILABLE ON EACH LIFT AND THAT THE GUY BRACKET DOES NOT COME AT A JOINT OF ONE LIFT TO THE NEXT LIFT. SEE FIGURE #7.

ASSEMBLE THE DISTRIBUTOR PLATFORM IN IT'S POSITION. SEE FIGURE #8.

ATTACH THE ASSEMBLED HEAD SECTION TO THE LAST LIFT. PLAN TO LEAVE AT LEAST TWO 8 FOOT LEG SECTIONS AND NO MORE THAN THREE SECTIONS TO BE ERECTED WITH THE HEAD. THE HEAD SECTION IS SOMEWHAT TOP HEAVY AND THE ADDITIONAL LEG SECTIONS WILL STABILIZE THE HEAD CONSIDERABLY. (SEE FIGURE #9.) ALWAYS PUT THE UPPER LEG SECTION DIRECTLY UNDER THE HEAD. STENCILED ON THE UPPER LEG ARE INSTRUCTIONS PERTAINING TO THE PROPER PLACEMENT IN RELATION TO THE HEAD.

ASSEMBLE THE SERVICE PLATFORM TO THE UPPER LEG SECTION. SEE FIGURE #10.

ASSEMBLE THE DISTRIBUTOR HEAD AND HEAD DISCHARGE ADAPTOR TO THE HEAD, SEE FIGURE #11.

ASSEMBLE THE SPOUTS ON A LEVEL SURFACE AND ASSEMBLE THE TRUSS SUPPORTS SEE FIGURE #12 OR #13.

- ERECTION -

TO PREPARE THE ASSEMBLED ELEVATOR FOR ERECTION FOLLOW THE FOLLOWING CHECK LIST:

1. ATTACH ALL GUY CABLES TO THE LEG SECTIONS AND CUT TO THE LENGTH.

2. CHECK ALL GROUND GUY POINTS TO BE SURE THEY ARE FIRMLY PLANTED AND ALL CONCRETE IS CURED AND HARD.

3. CHECK THAT ALL BOLTS AND NUTS ARE SECURELY TIGHTENED.

4. REMOVE THE HEAD CAP AND SECURELY FASTEN TO THE PLATFORM FLOOR.

5. CHECK THE UP LEG AND DOWN LEG RELATIONSHIPS TO THE HEAD. WILL THE LADDER BE ON THE CORRECT SIDE OF THE ELEVATOR?

6. CHECK AGAIN THE DISCHARGE HEIGHT. IS THE PROPER NUMBER OF LEG SECTIONS ASSEMBLED?

7. CHECK ALL LADDERS, CAGES, PLATFORMS, ETC. TO BE SURE THAT NONE ARE MISSING.

8. CHECK THAT ALL UNASSEMBLED LEG JOINTS ARE CAULKED.

9. CHECK THE TOTAL WEIGHT OF THE LIFTS AGAINST THE CRANE CAPACITIES.

THE MOST EFFECTIVE WAY TO LIFT THE ELEVATOR SECTIONS IS BY USING A CRANE WITH AT LEAST 12 FEET MORE REACH THAN THE DISCHARGE HEIGHT OF THE ERECTED ELEVATOR. A SNATCH BLOCK ARRANGEMENT USING THREE CHOKER CABLES AND TWO SHACKLES SHOULD BE USED. SEE FIGURES 14A AND 14B ON ATTACHING THE CRANE TO THE LEG SECTIONS AND THE HEAD.

THIS SNATCH BLOCK WILL KEEP ALL THE CABLES TIGHT AT ALL TIMES AND ALLOW FOR THE LIFTED UNIT TO "HANG" STRAIGHT UP AND DOWN WHEN IT CLEARS THE GROUND.

AS EACH SECTION IS "STACKED" ON THE PREVIOUS SECTION BE SURE THE GUY CABLES ARE ALL SECURED TO THE GROUND GUY POINTS BEFORE THE CRANE HOOK IS RELEASED.

EACH LIFT SHOULD BE PLUMBED AFTER THE CRANE IS RELEASED. GOOD PLUMBING PRACTICES DICTATE THAT A TRANSIT SHOULD BE USED TO PLUMB THE ELEVATOR. THE ELEVATOR CONVEYOR BELT IS 7" WIDE RUNNING IN A 9" WIDE TRUNK. IF THE ELEVATOR IS OUT OF PLUMB MORE THAN ONE INCH IN ANY SPOT, THE BELT WILL RUB ON TRUNK. SINCE THE BELT MIGHT TRACK TO ONE SIDE OR THE OTHER ONCE IN A WHILE, THE OVERALL PLUMBNESS SHOULD BE WITHIN 1/2" AND NOT BE OUT OF PLUMB AT ANY ONE SPOT MORE THAN 1/2". IT IS NOT OUT OF THE QUESTION TO HAVE THE UNIT STAND PERFECT. SEE FIGURE # 15

AFTER THE ELEVATOR IS STANDING AND PLUMBED, THE SPOUTING CAN BE ASSEMBLED TO THE UNIT. AS THE SPOUTING IS BEING ATTACHED WATCH THE PLUMBNESS OF THE ELEVATOR. THE PLUMBNESS OF THE UNIT CAN BE MAINTAINED BY BEING SURE THAT THE SPOUTS ARE CUT TO THE PROPER LENGTH AND ATTACHED WITHOUT PULLING THE ELEVATOR ONE WAY OR ANOTHER.

- BELT INSTALLATION -

AFTER THE ELEVATOR AND IT'S SPOUTING IS COMPLETED, THE BELT CAN BE INSTALLED. REMOVE THE INSPECTION DOOR FROM THE ACCESS LEG. STRING A ROPE OR CABLE OVER THE HEAD PULLEY. ATTACH ONE END OF THE ROPE OR CABLE TO THE END OF THE BELT. RUN THE OPPOSITE END OF THE ROPE OR CABLE UNDER THE BOOT PULLEY. PULL ON THIS END OF THE ROPE OR CABLE PULLING THE BELT THROUGH ONE OF THE INSPECTION DOORS. BE SURE THE CUPS, IF THEY ARE ASSEMBLED TO THE BELT, ARE ORIENTED CORRECTLY.

LET THE BELT HANG OVER THE HEAD PULLEY OVER NIGHT BEFORE SPLICING. SEE FIGURE #16 FOR SPLICING INSTRUCTIONS.

- OPERATIONAL CHECK -

WITH ALL OF THE DRIVE COMPONENTS INSTALLED AND THE UNIT CHECKED OUT, THE ELEVATOR IS READY FOR AN OPERATIONAL CHECK. REMOVE THE HEAD CAP AND REPLACE ALL DRIVE COVERS BEFORE STARTING THE ELEVATOR. START THE ELEVATOR AND CHECK THE BELT FOR TRACKING ON THE HEAD PULLEY. SHIM THE BEARINGS AS NEEDED TO CENTER THE BELT. REINSTALL THE HEAD CAP.

STAND CLEAR OF THE HEAD SECTION TO PREVENT CONTACT WITH THE ROTATING HEAD PULLEY, CUPS, BELT, ETC.

BE <u>CAREFUL</u> OF FLYING MATERIAL WHEN THE HEAD CAP IS OFF. EYE PROTECTION SHOULD BE WORN.

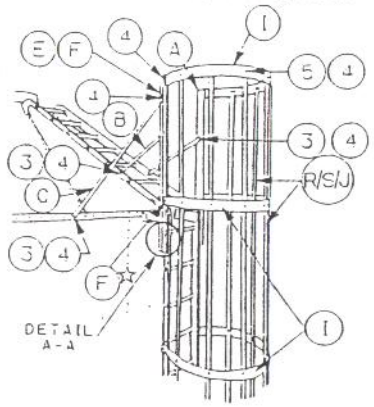
1. CENTER THE BELT IN THE BOOT WITH THE ADJUSTMENT SCREW.
2. RECHECK ALL COMPONENTS FOR LUBRICATION.
3. ADJUST THE DISCHARGE FLAP TO WITHIN 1/8" OF A CUP at BELT SPLICE SEE FIGURE #9. FOR NOTE.

LET THE UNIT RUN WITHOUT GRAIN FOR A PERIOD OF TIME AND LISTEN FOR CUPS OR THE BELT HITTING THE TRUNKS. IF THIS OCCURS, RECHECK THE PLUMBNESS AND/OR TIGHTEN THE BELT.

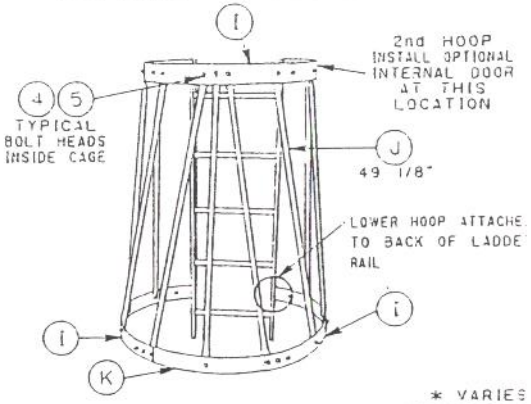
RUN SMALL AMOUNTS OF GRAIN THROUGH ALL PARTS OF THE SYSTEM TO CHECK FOR OBSTRUCTIONS AND ALIGNMENTS OF SPOUTS.

CAGE INSTRUCTIONS

HOPPER BIN CAGE ATTACHMENT



CAGE BOTTOM FLARE DETAIL



* VARIES

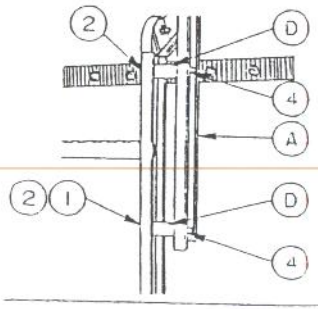
☆HOOP HALF ATTACHES TO LADDER RAIL WITH LOCKING CLIP

KEY	PART NO.	DESCRIPTION	QTY
1	39-20245	WASHER,FLAT 11/32 I.D. X 1 1/2 O.D.	2
2	39-20246	BOLT,H.H. 5/16 X 2 1/2 •5	4
3	39-20072	BOLT,BIN SEAL 5/16 X 3/4 •8.2	6
4	39-20152	NUT,FLANGE 5/16	*
5	39-20145	BOLT,TR. HD. BIN SEAL 5/16 X 3/4 •8.2	*
6	39-20116	COTTER,HAIR PIN	2

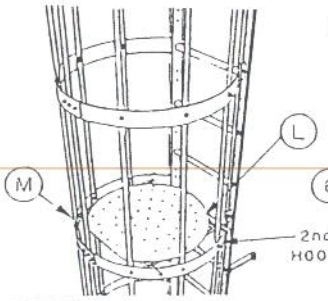
KEY	PART NO.	DESCRIPTION	QTY
A	9-24142	RAIL,EXTENSION 54" O.A.	2
B	9-24318	BRACE,EXT. RAIL FRONT 25 1/2" O.A.	2
C	9-24317	BRACE,EXT.RAIL SIDE 46" O.A.	2
D	9-24339	SPACER TUBE,EXT. RAIL	4
E	9-24316	BRACKET,EXT. RAIL BRACE	2
F	9-23779	CLIP ASSEMBLY,LOCKING	4
I	9-23777	HOOP HALF,CAGE	*
R	9-24070	TUBE,CAGE 25 1/8" O.A.	*
S	9-24071	TUBE,CAGE 37 1/8" O.A.	*
J	9-24072	TUBE,CAGE 49 1/8" O.A.	*
K	9-24021	EXPANDER,CAGE HOOP	1
L	9-24065	DOOR ASSEMBLY,INTERNAL	1
M	9-24075	ROD,INTERNAL DOOR HINGE	1

NOTE: IF LADDER STANDOFF BRACKETS INTERFERE WITH THE CAGE FLARE HOOP. MOVE THEM UP OR DOWN ONE CORRUGATION. FIELD DRILL AND ATTACH.

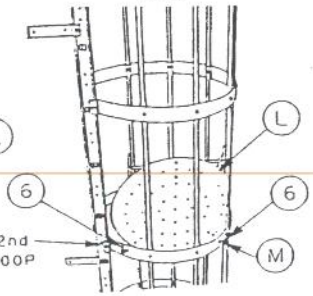
LADDER EXTENSION DETAIL DETAIL A-A

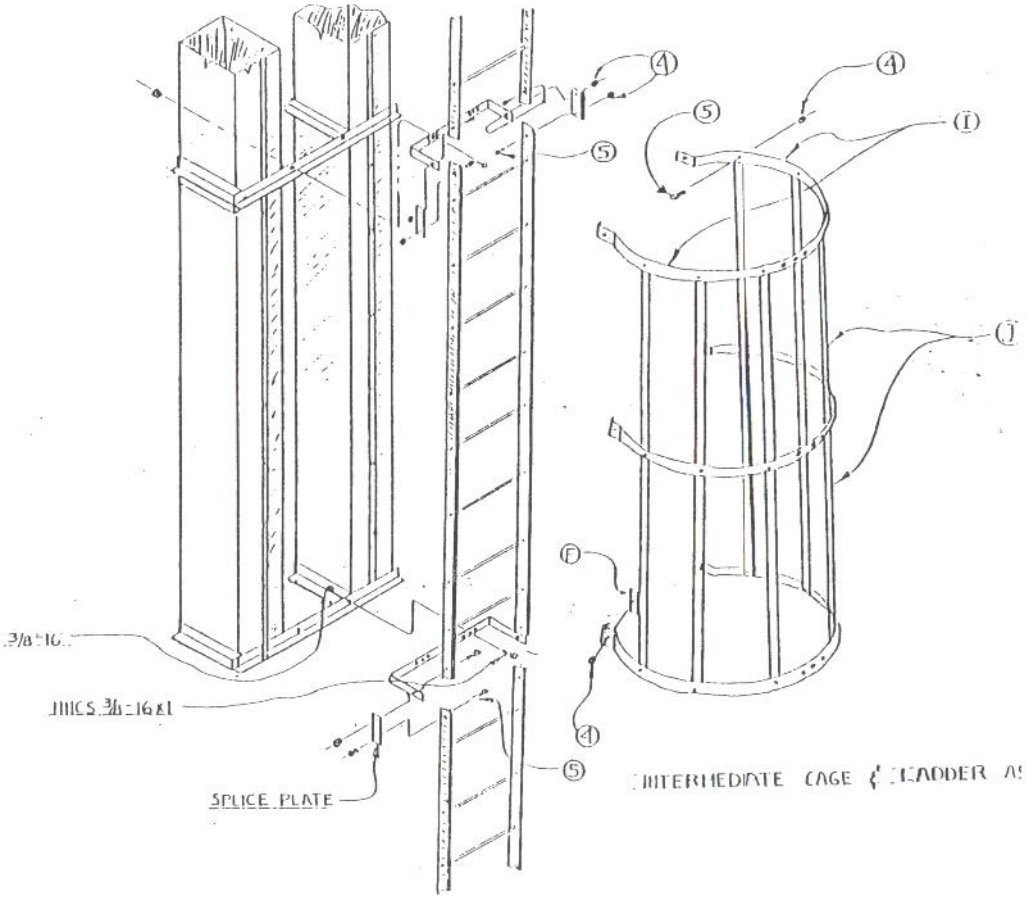


OPTIONAL INTERNAL DOOR CLOSED



OPTIONAL INTERNAL DOOR OPEN





INTERMEDIATE CAGE & LADDER AS

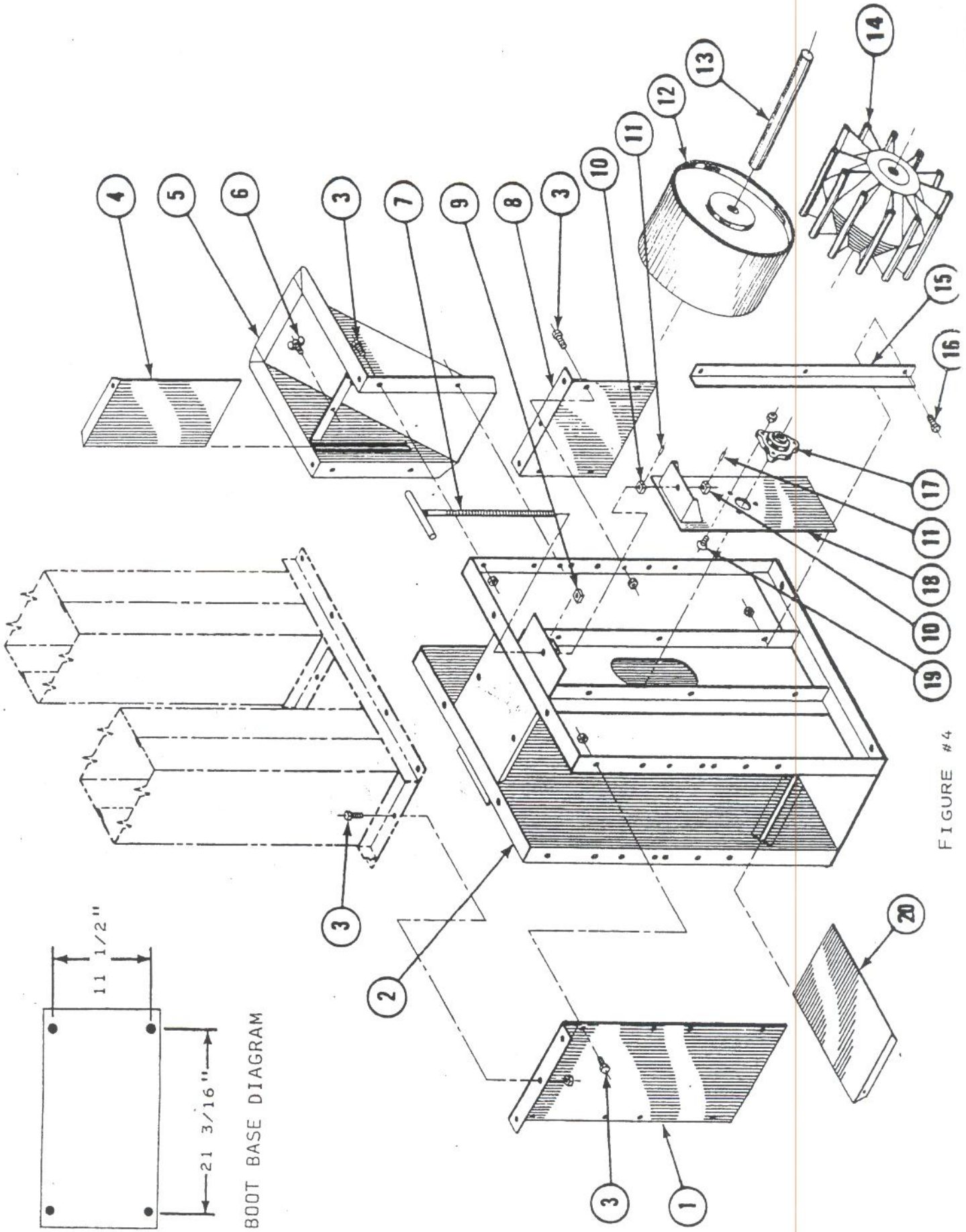
REPAIR PARTS

AND

ASSEMBLY INSTRUCTIONS

BOOT ASSEMBLY
PARTS LIST FIGURE #4

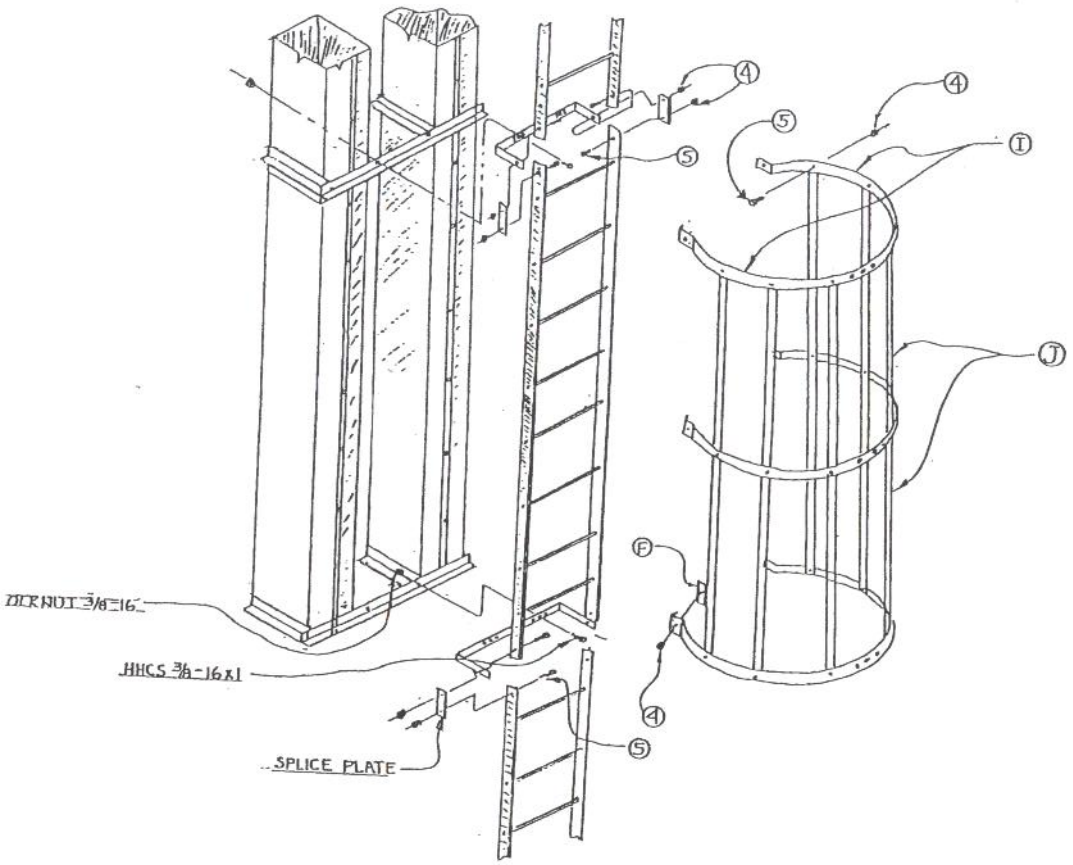
KEY NO.	PART NO.	DESCRIPTION
1	A21994	END PLATE, LONG
2	A21986	BOOT SECTION
3	1174	3/8-16NC X 3/4 CAP SCREW
4	22003	SLIDE GATE
5	A22000	HOPPER
6	10137	THUMB SCREW
7	A21126	ADJUSTING BOLT
8	A21997	END PLATE, SHORT
9	1263	3/4-10NC REG. SQ. NUT
10	21372	SQUARE NUT W/HOLE
11	15389	SPRING PIN
12	A22005	BOOT PULLEY W/BUSHING
13	22004	BOOT SHAFT
14	A22274	BOOT PULLEY SLATTED (OPTIONAL)
15	21141	SLIDE ANGLE
16	1195	5/16-18NC X 3/4 CAP SCREW
17	A20004	BALL BEARING 1 1/16" (COMPLETE)
18	A21992	BEARING PLATE
19	1230	3/8-16NC X 1 1/4 FL. HD. MACH. SCREW
20	22003	SLIDE GATE



BOOT BASE DIAGRAM

FIGURE #4

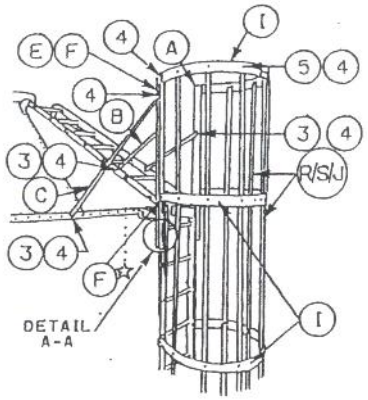
BOOT ASSEMBLY



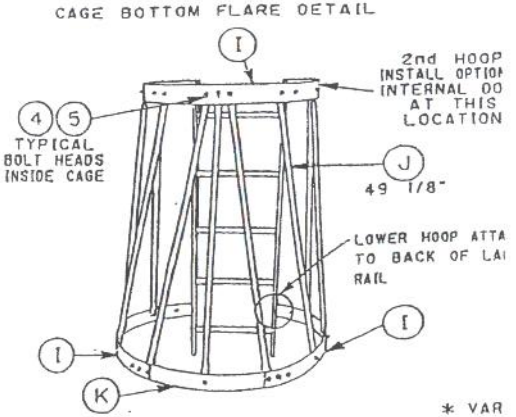
INTERMEDIATE CAGE & LADDER ASS'Y.....

CAGE INSTRUCTIONS

HOPPER BIN CAGE ATTACHMENT



CAGE BOTTOM FLARE DETAIL



* VAR

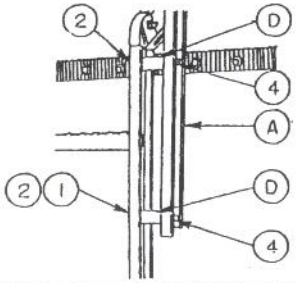
☆HOOP HALF ATTACHES TO LADDER RAIL WITH LOCKING CLIP

KEY	PART NO.	DESCRIPTION	QTY
1	39-20245	WASHER.FLAT 11/32 I.D. X 1 1/2 O.D.	2
2	39-20246	BOLT.H.H. 5/16 X 2 1/2 #5	4
3	39-20072	BOLT.BIN SEAL 5/16 X 3/4 #8.2	6
4	39-20152	NUT.FLANGE 5/16	*
5	39-20145	BOLT.TR. HD. BIN SEAL 5/16 X 3/4 #8.2	*
6	39-20116	COTTER.HAIR PIN	2

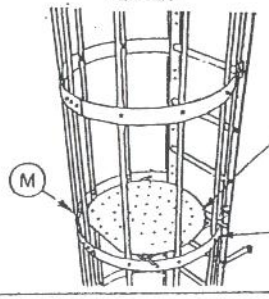
KEY	PART NO.	DESCRIPTION	Q
A	9-24142	RAIL.EXTENSION 54" O.A.	
B	3-24318	BRACE.EXT. RAIL FRONT 25 1/2" O.A.	
C	9-24317	BRACE.EXT.RAIL SIDE 46" O.A.	
D	9-24339	SPACER TUBE.EXT. RAIL	
E	9-24316	BRACKET.EXT. RAIL BRACE	
F	9-23779	CLIP ASSEMBLY.LOCKING	
I	9-23777	HOOP HALF.CAGE	
R.	9-24070	TUBE.CAGE 25 1/8" O.A.	
S	9-24071	TUBE.CAGE 37 1/8" O.A.	
J	9-24072	TUBE.CAGE 49 1/8" O.A.	
K	9-24021	EXPANDER.CAGE HOOP	
L	9-24065	DOOR ASSEMBLY.INTERNAL	
M	9-24075	ROD.INTERNAL DOOR HINGE	

NOTE: IF LADDER STANDOFF BRACKETS INTERFERE WITH THE CAGE FLARE HOOP, MOVE THEM UP OR DOWN ONE CORRUGATION. FIELD DRILL AND ATTACH.

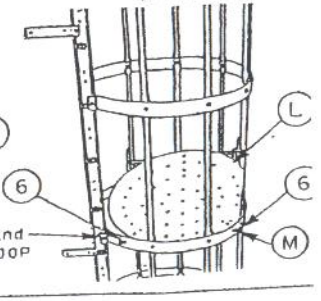
LADDER EXTENSION DETAIL
DETAIL A-A



OPTIONAL INTERNAL DOOR CLOSED



OPTIONAL INTERNAL DOOR OPEN



1.	26990	Inspection panel
2.	A26989	Slide plate
3.	26991	Shim
4.	A26994	Inspection Panel w/A
5.	A26986	Access Leg w/A
6.	26993	Access Panel
7.	1175	HHCS 3/8-16x1
8.	1174	HHCS 3/8-16x3/4

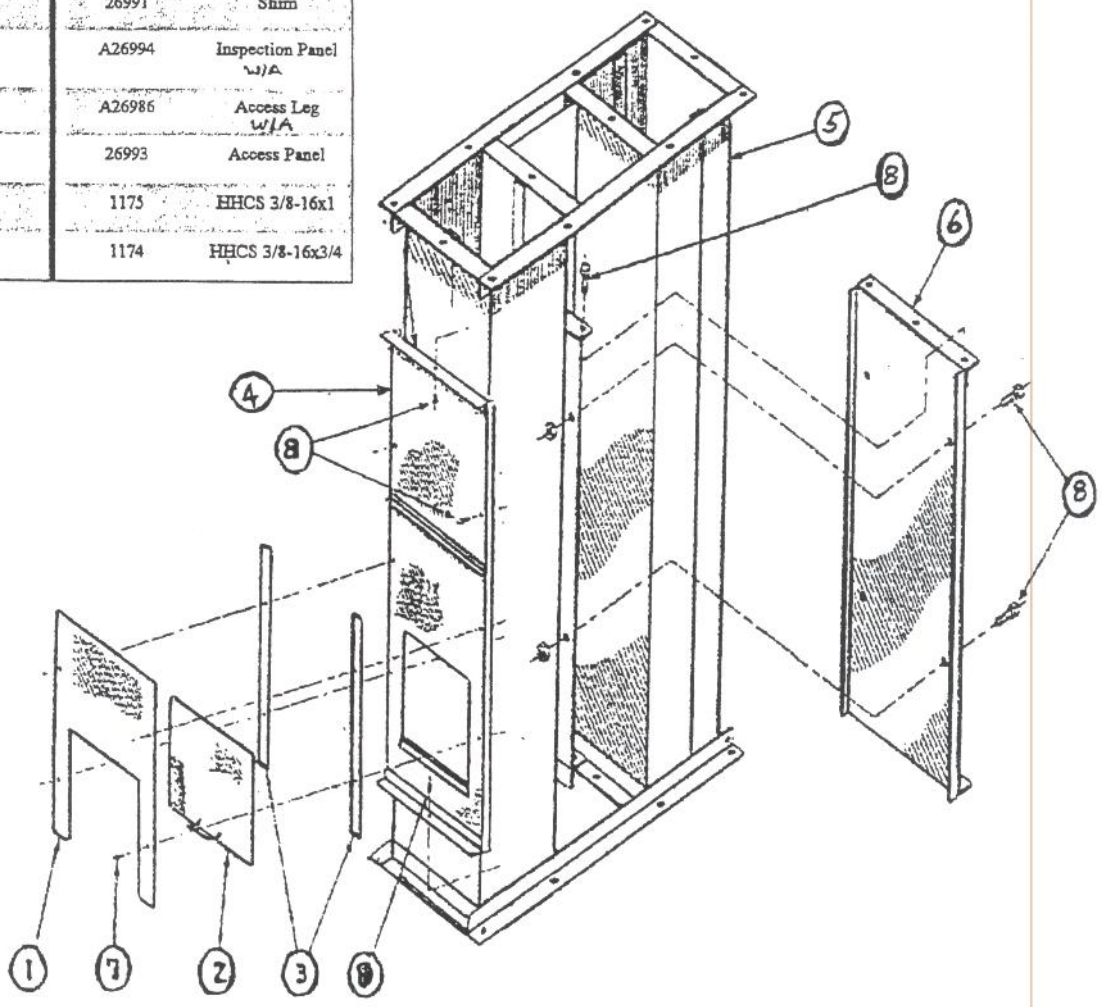
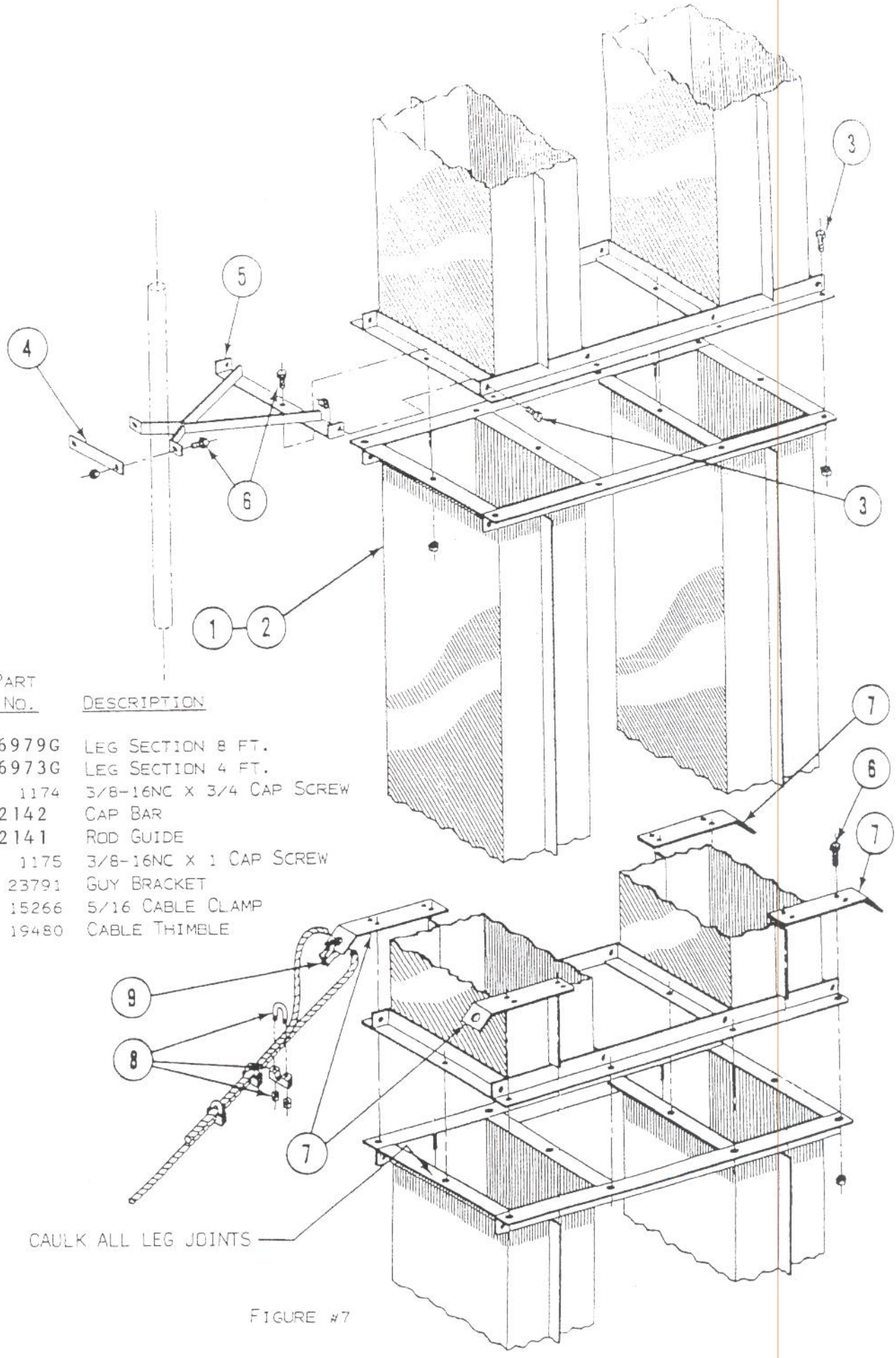


FIGURE #6

4' 1500 ACCESS SECTION ASSEMBLY



KEY NO.	PART NO.	DESCRIPTION
1	A26979G	LEG SECTION 8 FT.
2	A26973G	LEG SECTION 4 FT.
3	1174	3/8-16NC X 3/4 CAP SCREW
4	22142	CAP BAR
5	A22141	ROD GUIDE
6	1175	3/8-16NC X 1 CAP SCREW
7	23791	GUY BRACKET
8	15266	5/16 CABLE CLAMP
9	19480	CABLE THIMBLE

FIGURE #7

LEG SECTION - GUY BRACKET - ROD CONTROL ASSEMBLY

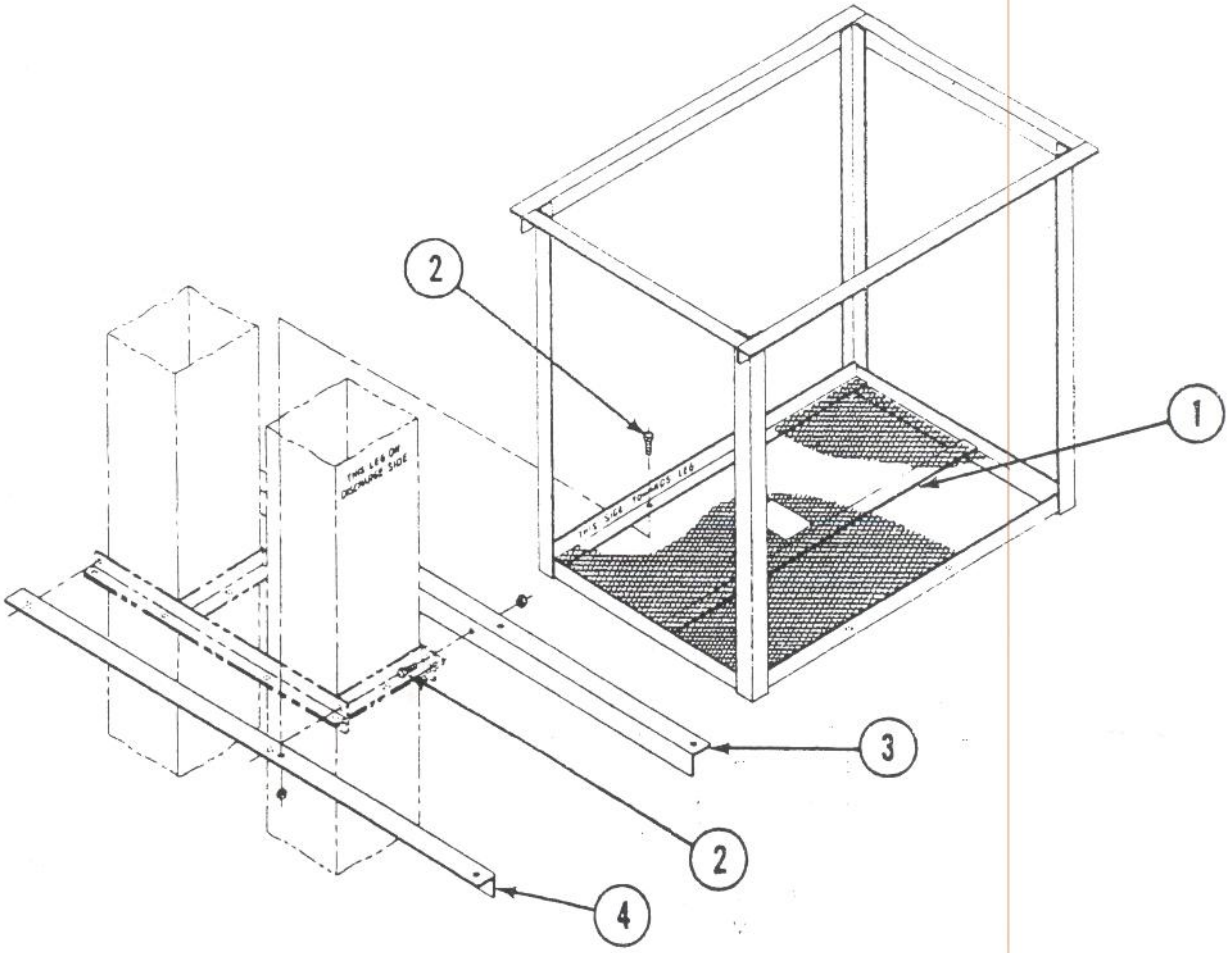
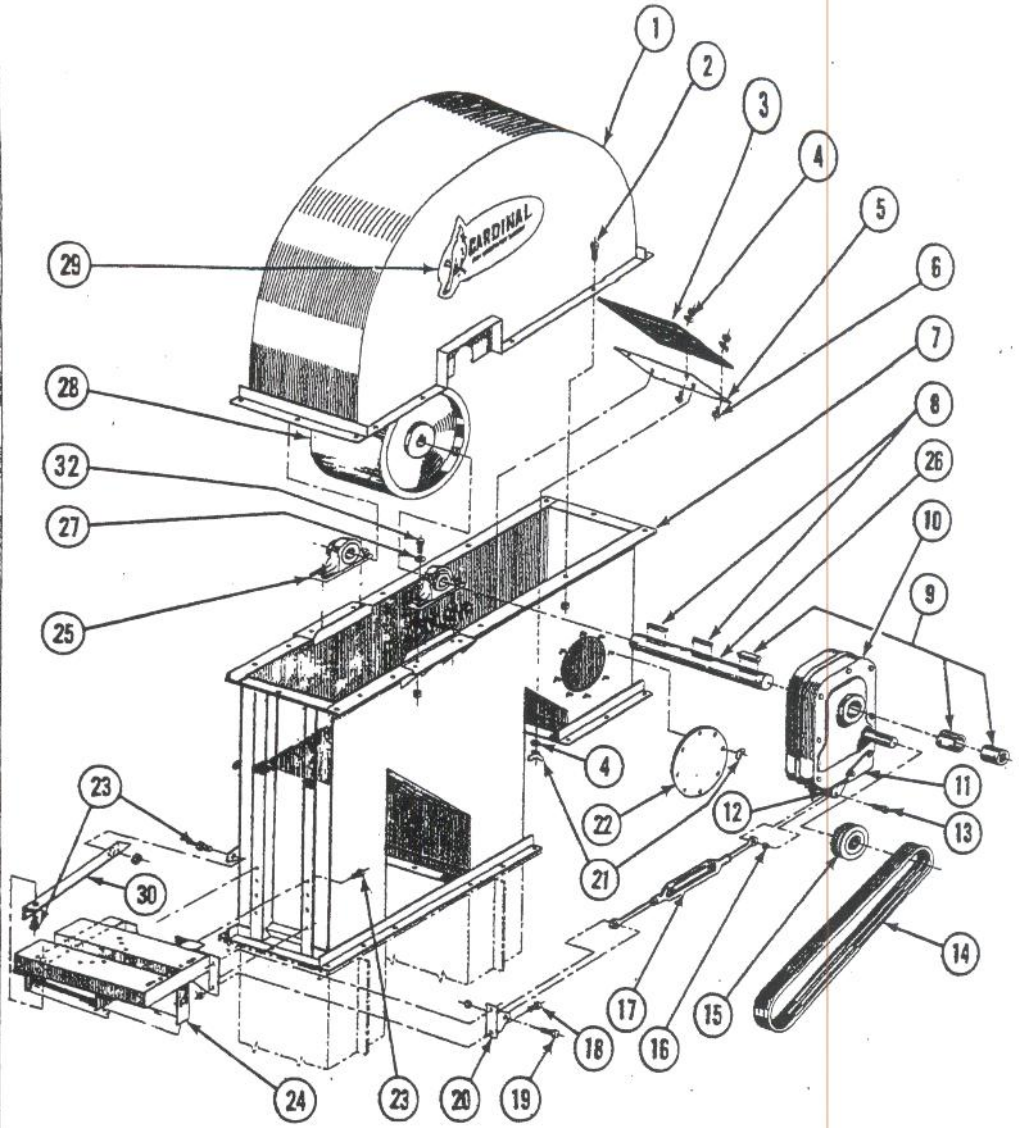


FIGURE #8

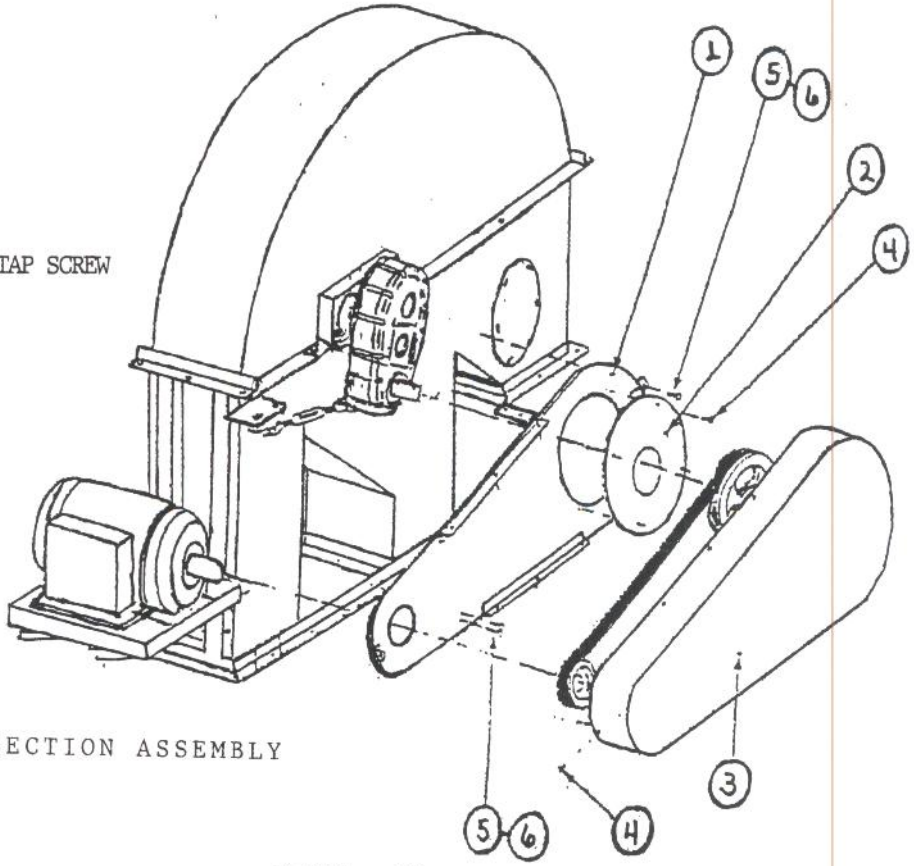
KEY NO.	PART NO.	DESCRIPTION
1	A22202	PLATFORM
2	1175	3/8-16NC x 1 CAP SCREW
3	22204	PLATFORM SUPPORT LEFT
4	22203	PLATFORM SUPPORT RIGHT

STANDARD DISTRIBUTOR SERVICE PLATFORM

1.	A22153	CAP
2.	1174	HHCS 3/8-16X3/4
3.	A22162	DIE PLATE ASSY
4.	1224	ELEV BOLT 1/4X3/4
5.	1291	1/4 FLAT WASHER
6.	1271	LOCKNUT 1/4-20
7.	A22152	HEAD SECTION
8.	21361	SQ KEY 3/8X2 1/4
9.	19179	SQ KEY 1/4X1 1/2
10.	A26852	REDUCER
11.	N/A	
12.	N/A	
13.	N/A	
14.		BELT (NOT INCLUDED)
15.	27595	PULLEY 2GB 4.35 OD
16.		PART OF A26852
17.		PART OF A26852
18.	N/A	
19.	N/A	
20.	N/A	
21.	21177	WINGNUT 1/4-20
22.	22172	COVER PLATE
23.	1174	HHCS 3/8-16X3/4
24.	A26839	MOTOR MT
25.	A21352	BEARING 1 7/16
26.	26844	HEAD SHAFT
27.	1190	HHCS 1/2X1 1/2
28.	A22156	PULLEY
29.	26320	CARDINAL DECAL



1. 26851 BACKPLATE
2. 21172 COVERPLATE
3. A26846 BELT GUARD
4. 1319 1/4x1/2 SELFTAP SCREW
5. 1274 3/8 LOCKNUT
6. 1175 3/8x1 HHCS



GEAR REDUCER HEAD SECTION ASSEMBLY

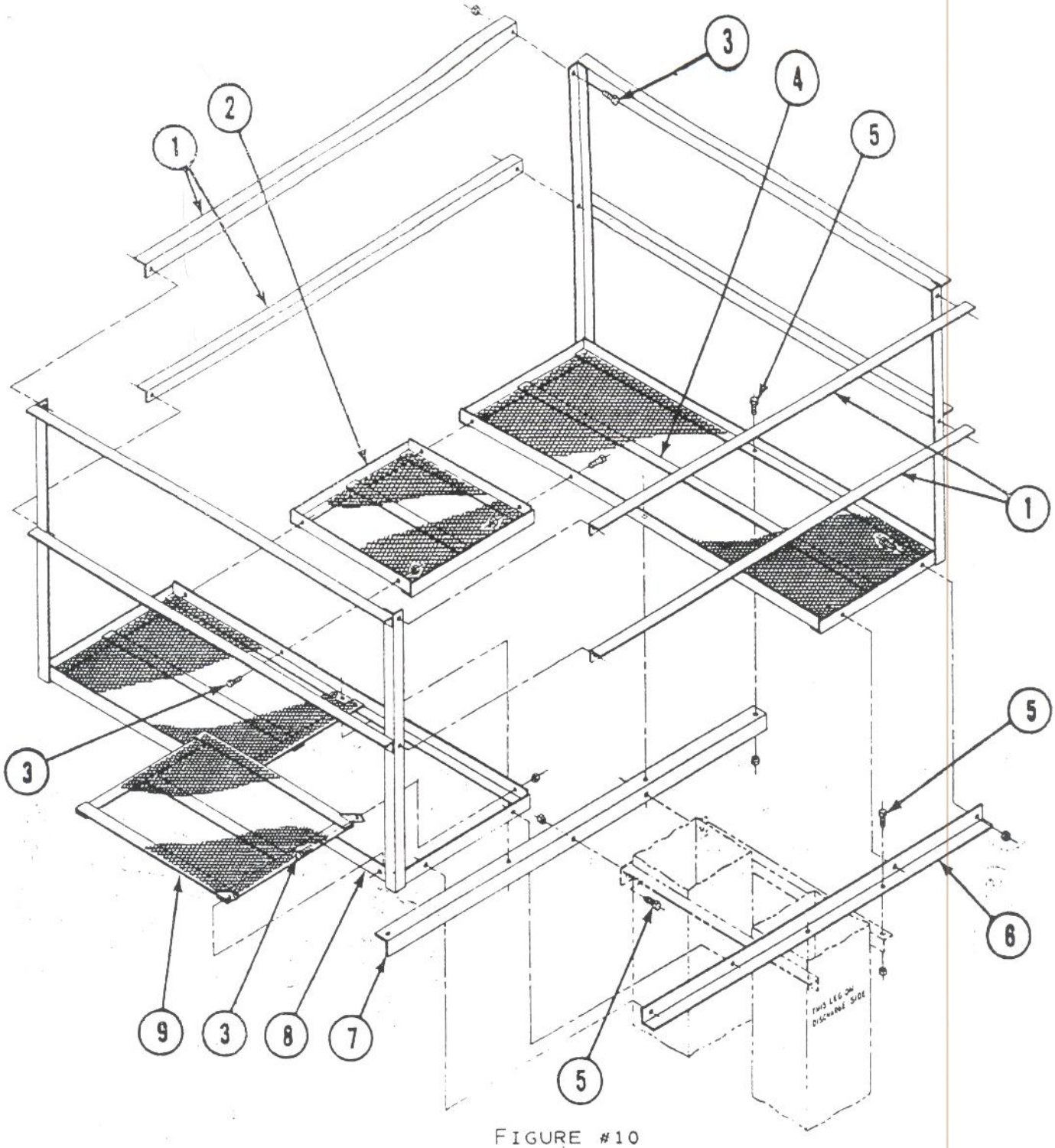


FIGURE #10

KEY NO.	PART NO.	DESCRIPTION
1	22120	RAIL
2	A22117	PLATFORM CENTER
3	1174	3/8-16NC X 3/4 CAP SCREW
4	A22115	PLATFORM, LEFT
5	1175	3/8-16NC X 1 CAP SCREW
6	22118	PLATFORM SUPPORT 50"
7	22119	PLATFORM SUPPORT 55 1/2"
8	A22116	PLATFORM, RIGHT
9	A21532	DOOR

STANDARD SERVICE PLATFORM

KEY NO.	PART NO.	DESCRIPTION
1	1174	3/8-16NC x 3/4 CAP SCREW
2	A22147	6" HEAD DISCHARGE ADAPTER
3	1195	5/16-18NC x 3/4 CAP SCREW GRADE 5
4	A25175	DISTRIBUTOR 8 WAY 6"
5	1213	1/4-20NC x 3/4 CARRIAGE BOLT
6	25418	6" RISER LINER
7	25391	ACCESS DOOR
8	1256	1/4 X 3/4 SELF-DRILLING SCREWS
9	A25040	HANDLE
10	1179	3/8-16NC x 2 CAP SCREW
11	1194	1/4-20NC x 1-1/2 CAP SCREW
12	1342	FLAT WASHER 5/8"
13	25401	ROLLER
14	A25039	AXLE
15	1159	5/16-18NC x 1 CAP SCREW
16	25403	CLAMP
17	25404	DIRECTIONAL GUIDE CLAMP
18	A25043	CONTROL STAND
19	1159	5/16-18NC x 1 CAP SCREW
20	A25423	CLAMP HALF

CONTROL PIPE BY CUSTOMER 1" STD. PIPE

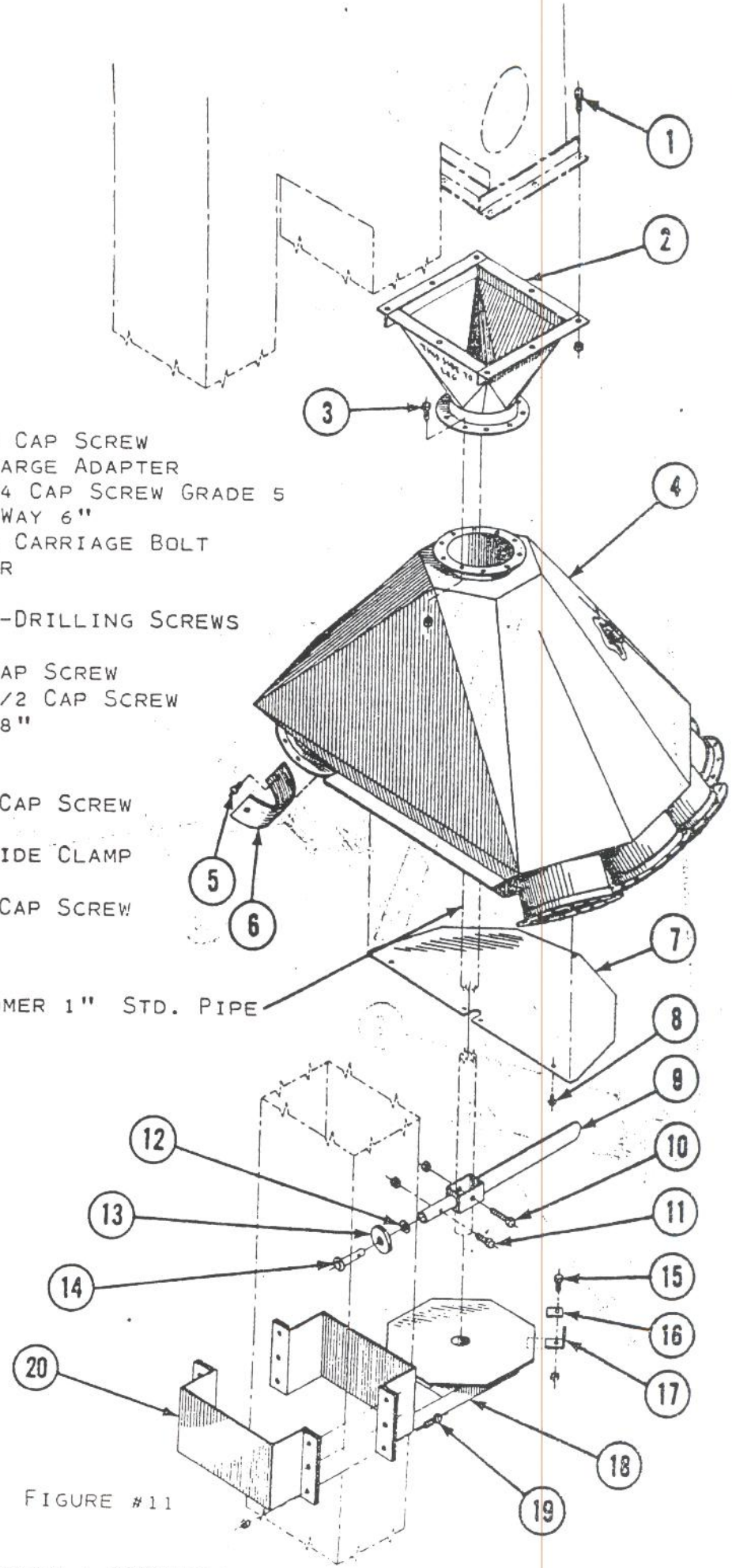
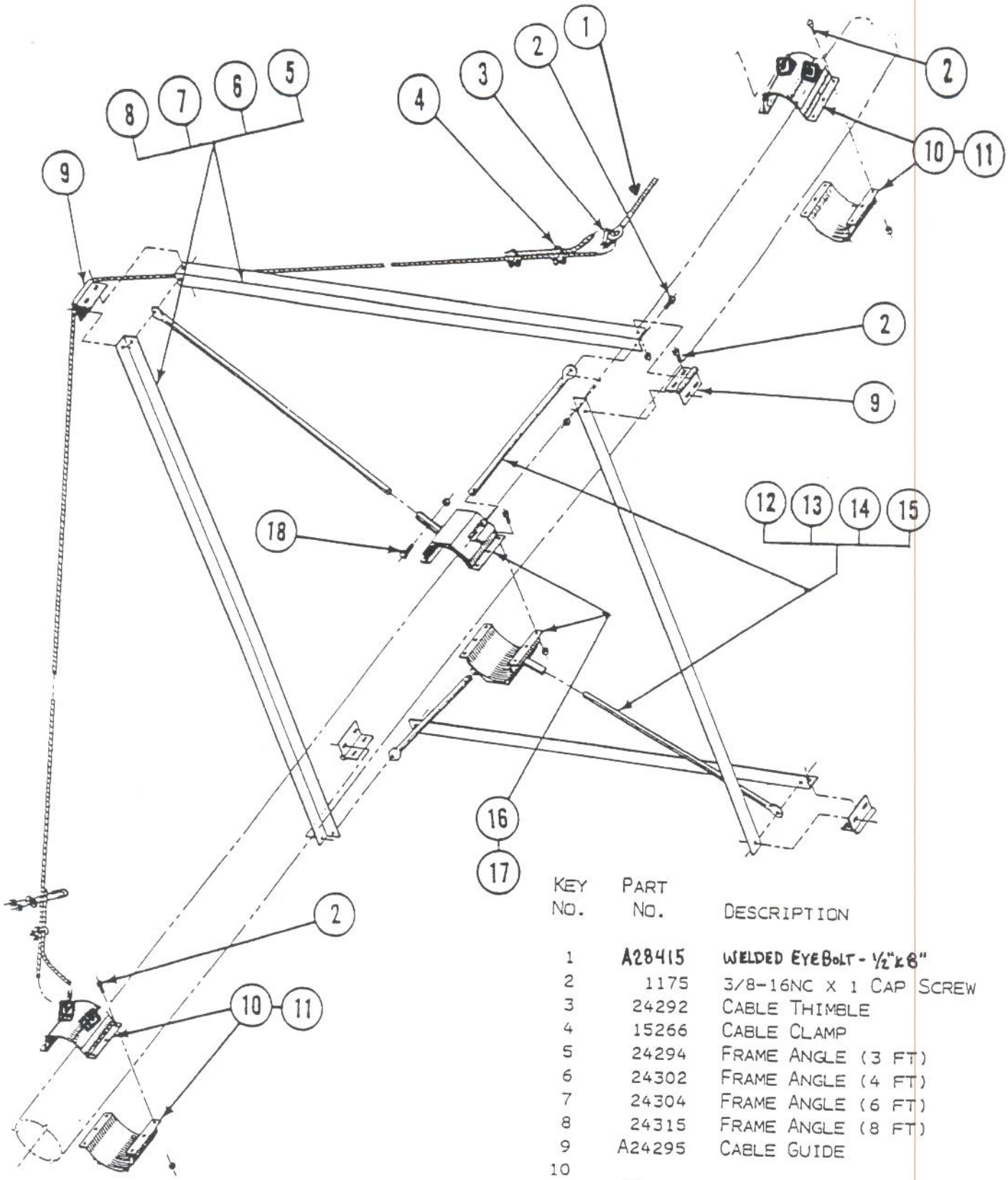


FIGURE #11

8 WAY DISTRIBUTOR HEAD & DISCHARGE ADAPTER ASSEMBLY



KEY NO.	PART NO.	DESCRIPTION
1	A28415	WELDED EYEBOLT - ½"x8"
2	1175	3/8-16NC x 1 CAP SCREW
3	24292	CABLE THIMBLE
4	15266	CABLE CLAMP
5	24294	FRAME ANGLE (3 FT)
6	24302	FRAME ANGLE (4 FT)
7	24304	FRAME ANGLE (6 FT)
8	24315	FRAME ANGLE (8 FT)
9	A24295	CABLE GUIDE
10		
11	A30026	CABLE HOOK-UP 6"
12	24293	TRUSS SUPPORT (3 FT)
13	24301	TRUSS SUPPORT (4 FT)
14	24303	TRUSS SUPPORT (6 FT)
15	24311	TRUSS SUPPORT (8 FT)
16	A25021	SPIDER HOOK-UP 8"
17	A25017	SPIDER HOOK-UP 6"
18	1196	5/16-18NC x 1-1/2 CAP SCREW

WELD ALL JOINTS AFTER ASSEMBLY

PAINT ALL WELDS

FIGURE #16

6" SPOUTING TRUSS ASSEMBLY

TOUCH-UP WELDED AREA WITH PART NO.
23485 RED AEROSOL PAINT

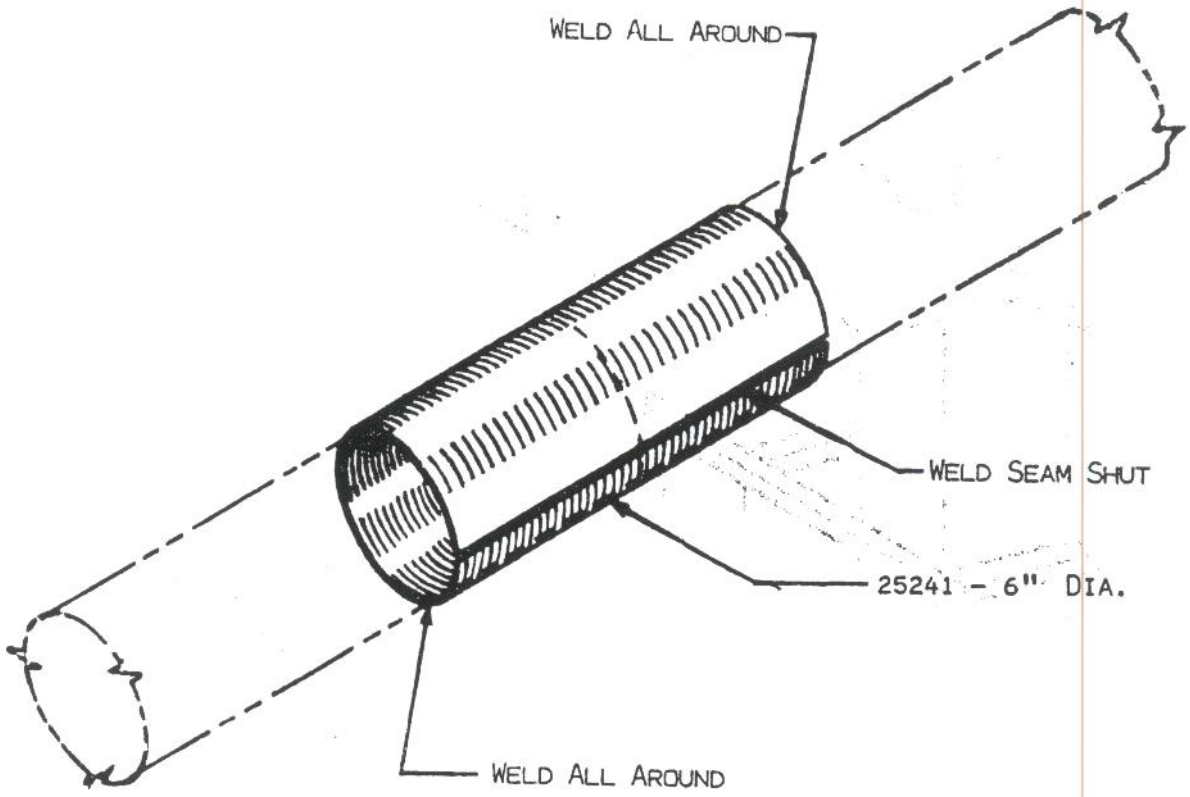


FIGURE #13

SPOUTING JOINER DETAILS

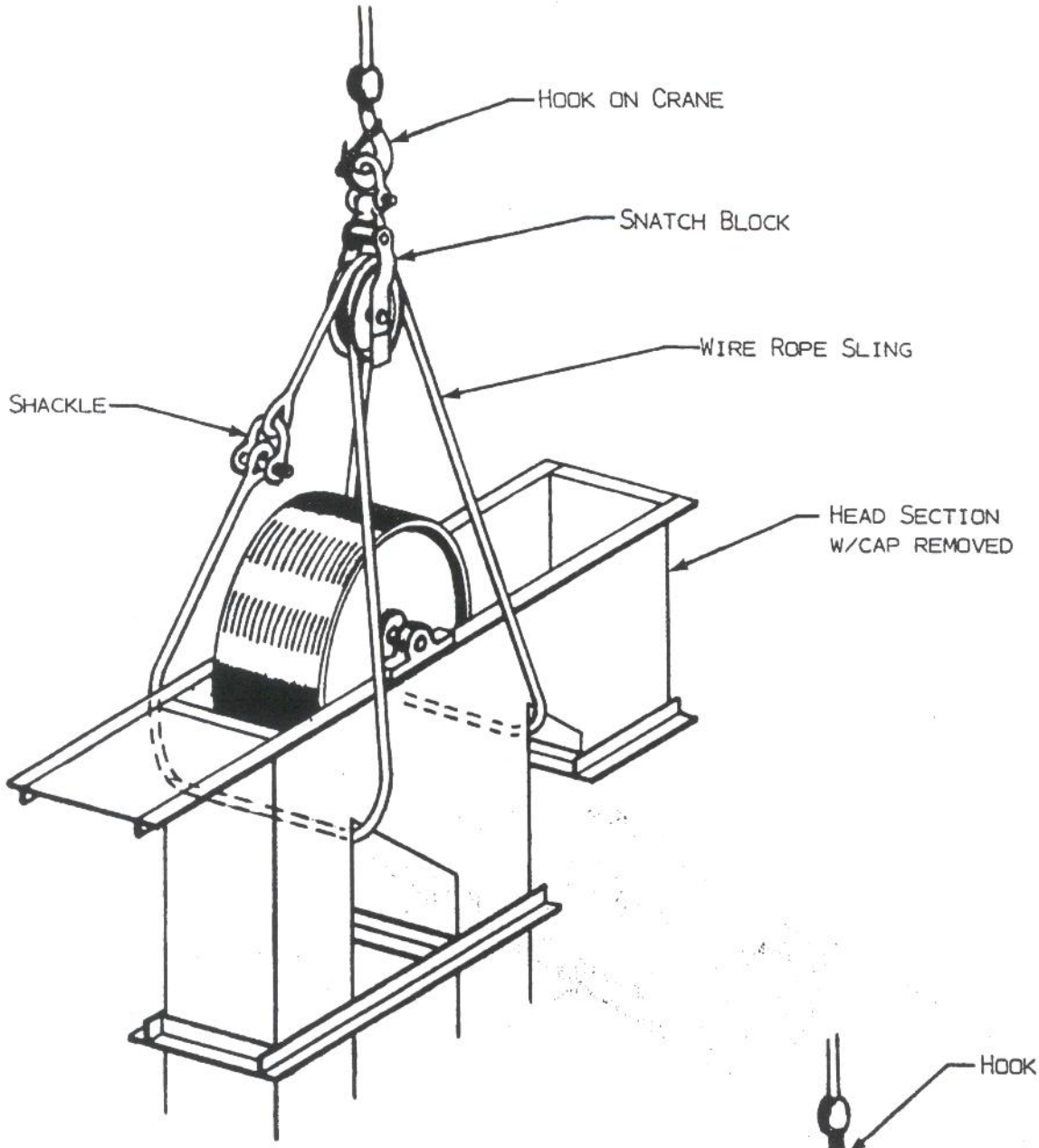


FIGURE #14B

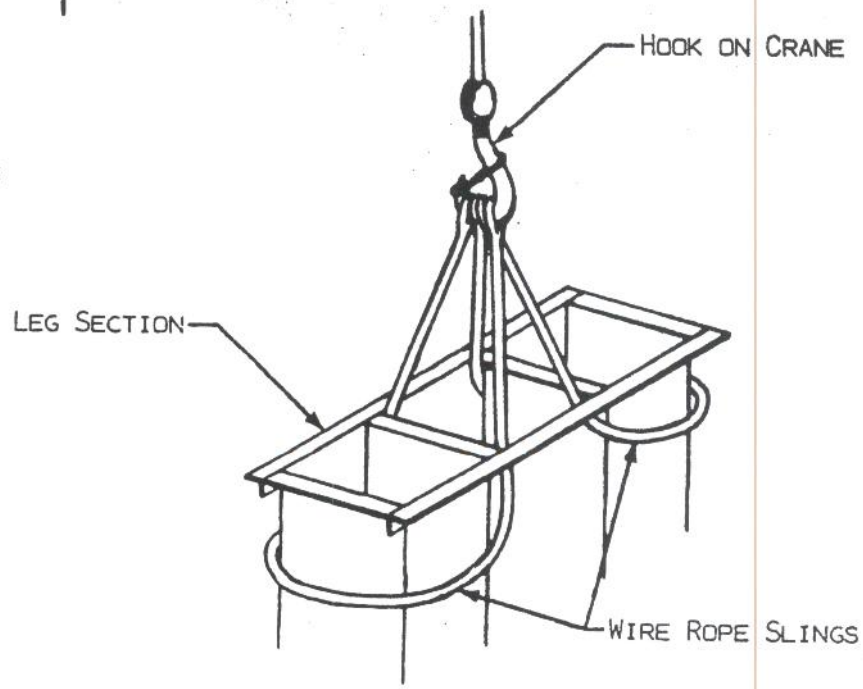


FIGURE #14A

LIFTING INSTRUCTION DIAGRAM

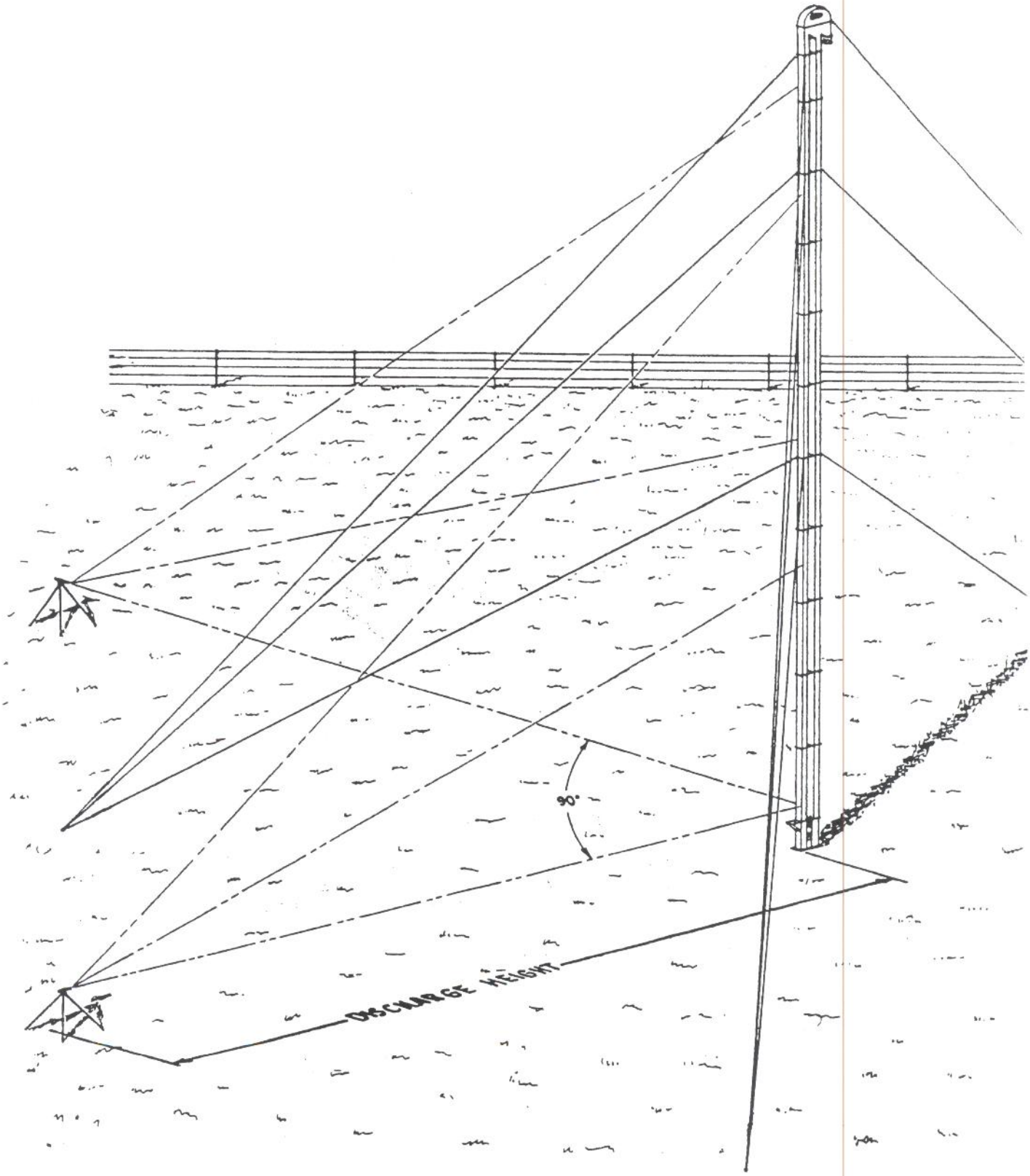


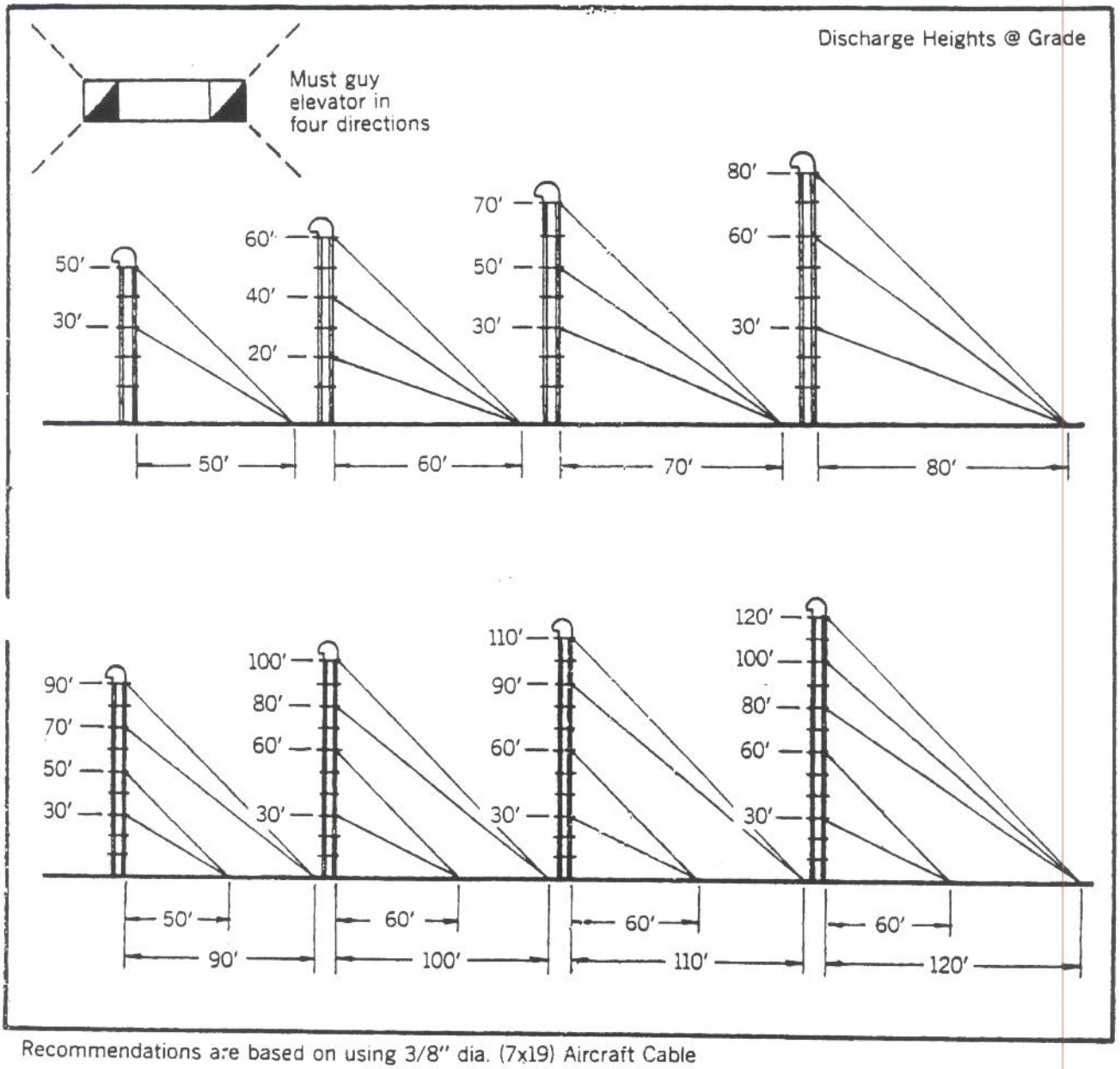
FIGURE # 15

TRANSIT PLUMBING

MANUFACTURER'S

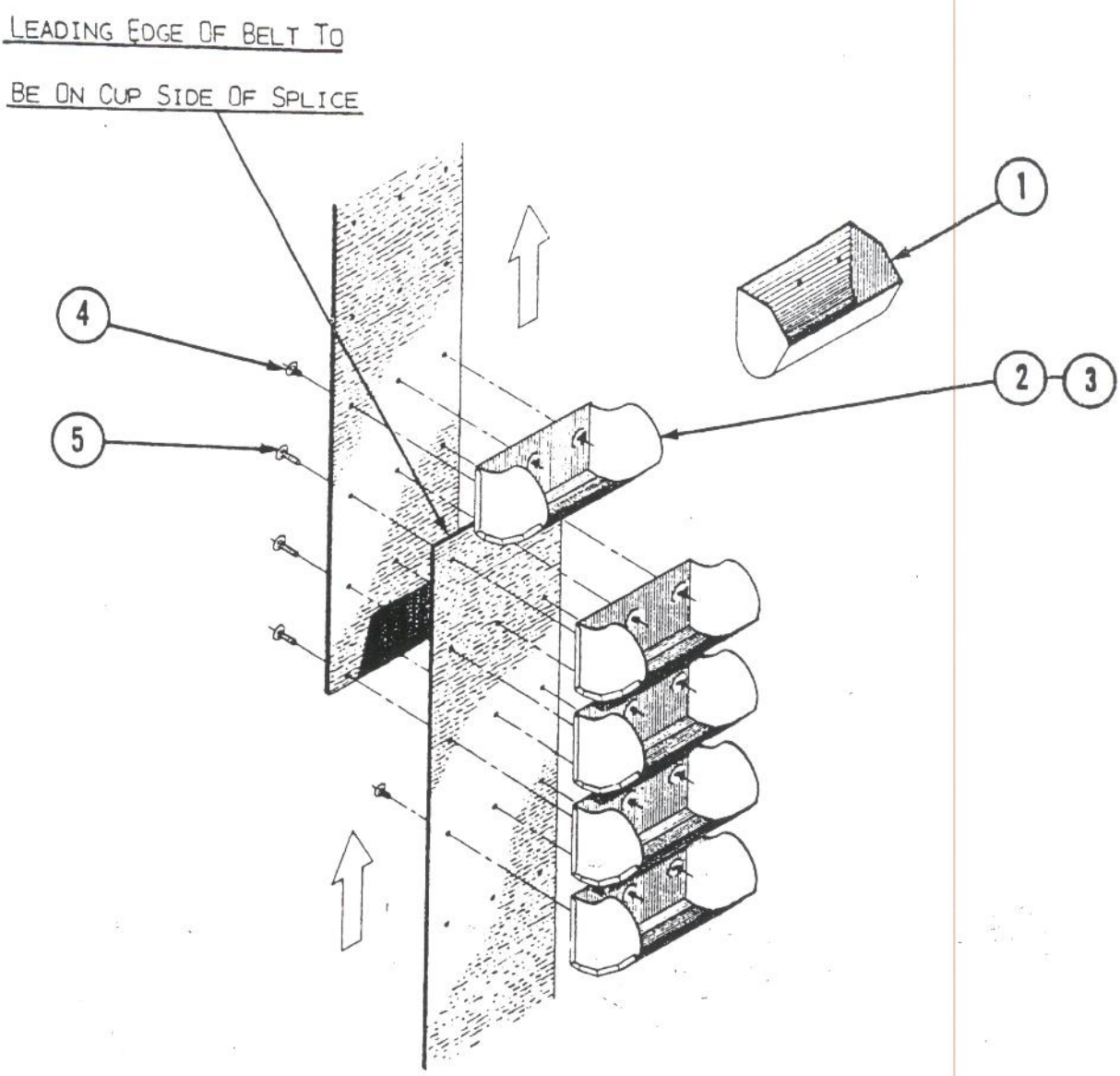
DATE	
2-28-86	

SUGGESTIONS FOR GUYING BUCKET ELEVATORS



Recommendations are based on using 3/8" dia. (7x19) Aircraft Cable

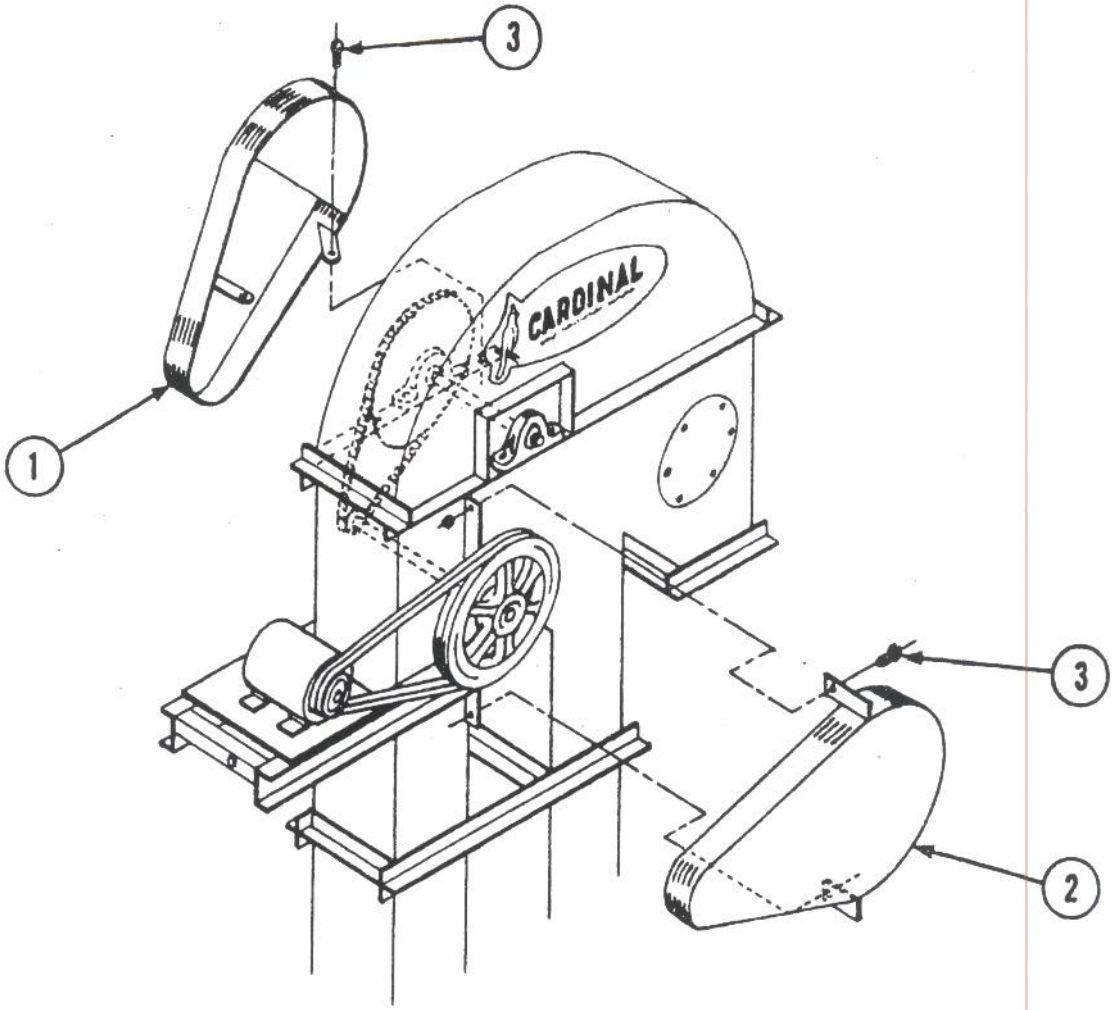
CABLE AND FITTING REQUIREMENTS								
Discharge Height	50′	60′	70′	80′	90′	100′	110′	120′
Approx. Cable	520′	885′	1050′	1200′	1485′	1690′	1800′	2490′
3/8" Cable Clamp	48	72	72	72	96	96	96	120
1/2"x6" Turnbuckle	8	12	12	12	16	16	16	20



KEY NO.	PART NO.	DESCRIPTION
1	23587	6 X 4 PLASTIC CUP
2		
3	27865	6 X 5 PLASTIC CUP (1500 BPH ONLY)
4	1461	1/4-20NC X 1" ELEVATOR BOLT
5	1462	1/4-20NC X 1½" ELEVATOR BOLT (SPLICE)
6	1394	1/4-20 WHIZ NUT

FIGURE # 16

BELT SPLICE ASSEMBLY



KEY NO.	PART NO.	DESCRIPTION
1	A22196	CHAIN GUARD
2	A22191	BELT GUARD
3	1175	3/8-16NC X 1 CAP SCREW

FIGURE # 17

CHAIN AND V-BELT WEATHERGUARDS