



ADDENDUM #1

July 8, 2025

BRIGHAM CITY – WWTP SECONDARY CLARIFIER REHABILITATION PROJECT

The following changes are hereby made to the Contract Documents for the above referenced Project:

BID OPENING DATE EXTENDED

Brigham City will now accept bids until **Thursday, July 17, 2025 @ 3:00pm**, at which time all received bids will be publicly opened and read. The bid opening will still occur at the same location as original advertised.

QUESTIONS FROM BIDDER

- 1. Need detailed drawings showing materials specifications and sizing to replace fiberglass panels, sludge rake blades and hardware, skimmer arms, supports, scum beach, and beach piping.***

Additional information for the existing structure and mechanism has been compiled and attached to this addendum. For additional information, we recommend scheduling a site visit with the Plant Manager, Bryce Lofthouse, (435) 723-3146.

- 2. Need specifications for clarifier drive, motor and gearbox in order to estimate rebuild.***

Additional information for the existing structure and mechanism has been compiled and attached to this addendum. For additional information, we recommend scheduling a site visit with the Plant Manager, Bryce Lofthouse, (435) 723-3146.

- 3. Does Brigham City WWTP have a crane on site to assist in lowering equipment into the clarifier?***

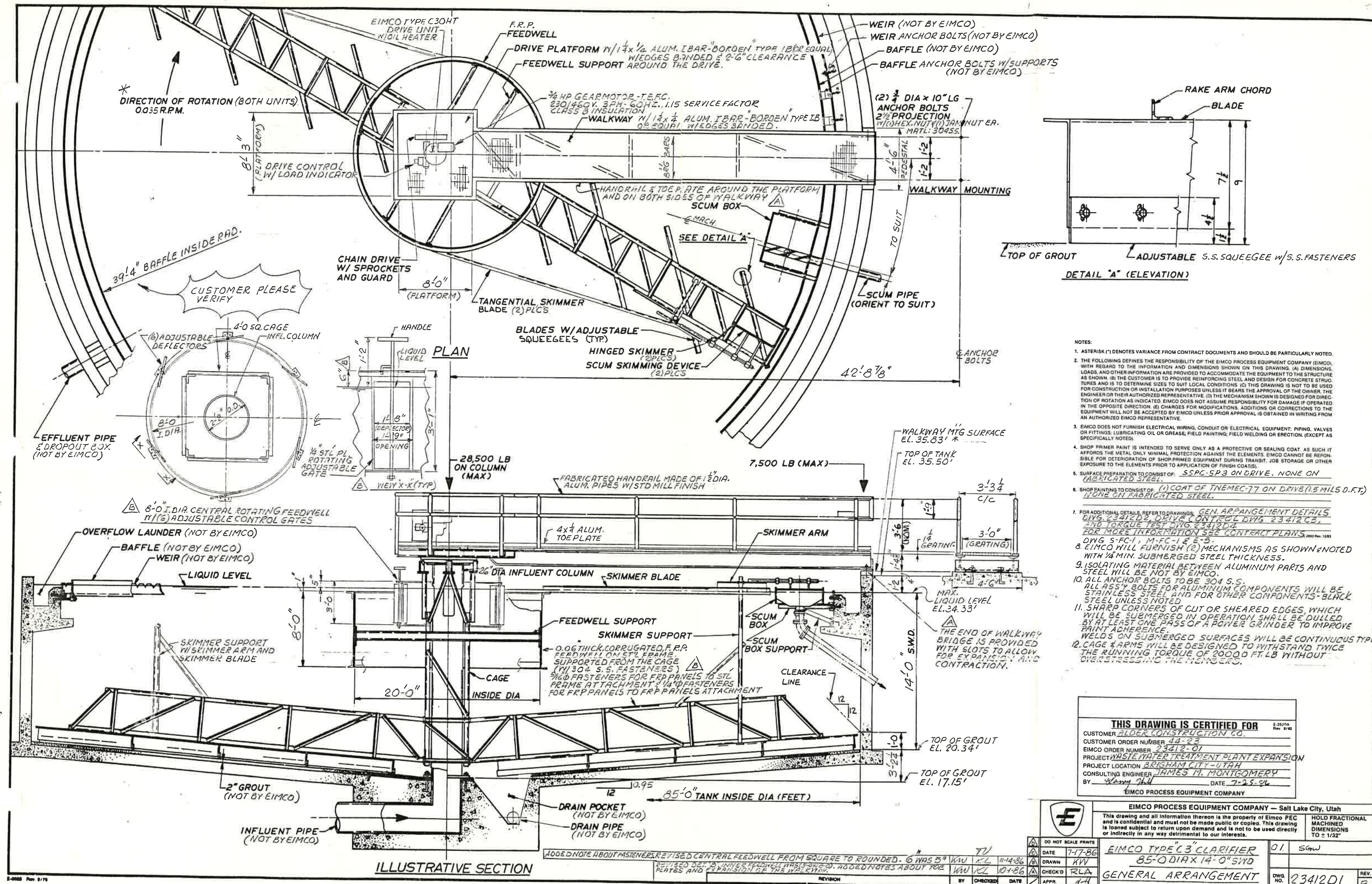
Brigham City WWTP does not have an available crane for the Contractor's use.

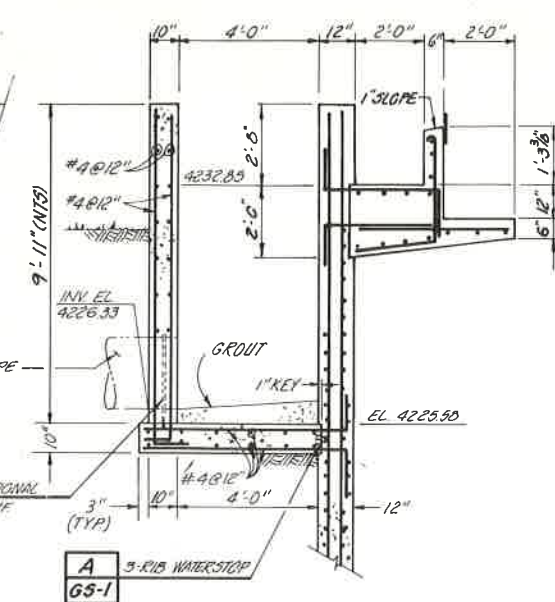
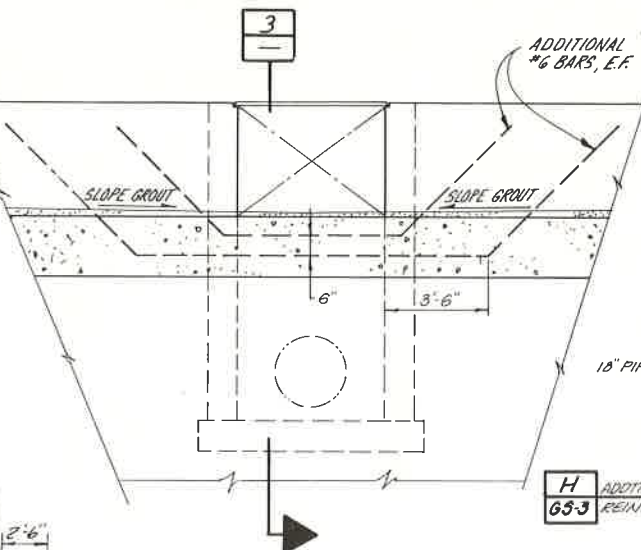


ATTACHMENTS: Eimco – General Arrangement Drawing
 Eimco Clarifier – O&M Manual
 Final Clarifier – Plan and Section

This Addendum is hereby attached to and made part of the Bidding Documents and each Bidder shall acknowledge receipt of this Addendum on the Bid Form.

Project Engineer: Steven Brady
 Jones & Associates
 6080 Fashion Point Drive
 South Ogden, UT 84405
 www.jonescivil.com





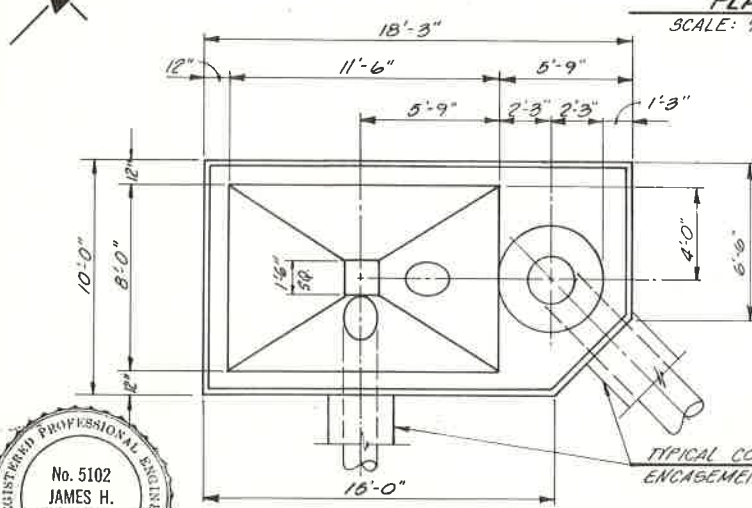
- NOTES:
1. SEE YARD PIPING PLAN FOR LOCATION OF PIPING, BOXES, & ACCESS BRIDGE ON EACH CLARIFIER.
 2. PROVIDE 24" OF GRANULAR STRUCTURAL FILL BENEATH STRUCTURE.
 3. PROVIDE CONCRETE STAIRS AT ACCESS BRIDGE. REINFORCE SIMILAR TO SECTION 4/3-CC-1.

SECTION 2

SECTION 3
SCALE: $\frac{3}{8}" = 1'-0"$

WARNING
THIS DRAWING
APPROXIMATELY ONE-HALF
ORIGINAL SCALE

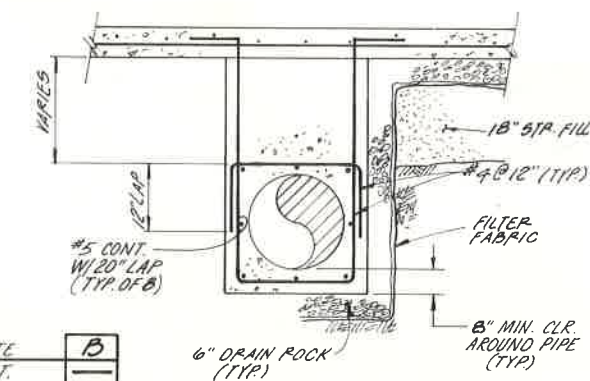
PLAN - FINAL CLARIFIER NO. 2
SCALE: $\frac{1}{8}" = 1'-0"$ (FINAL CLARIFIER NO. 1 SIMILAR)
(SEE INT. C-B FOR LAYOUT)



SLUDGE COLLECTOR PLAN

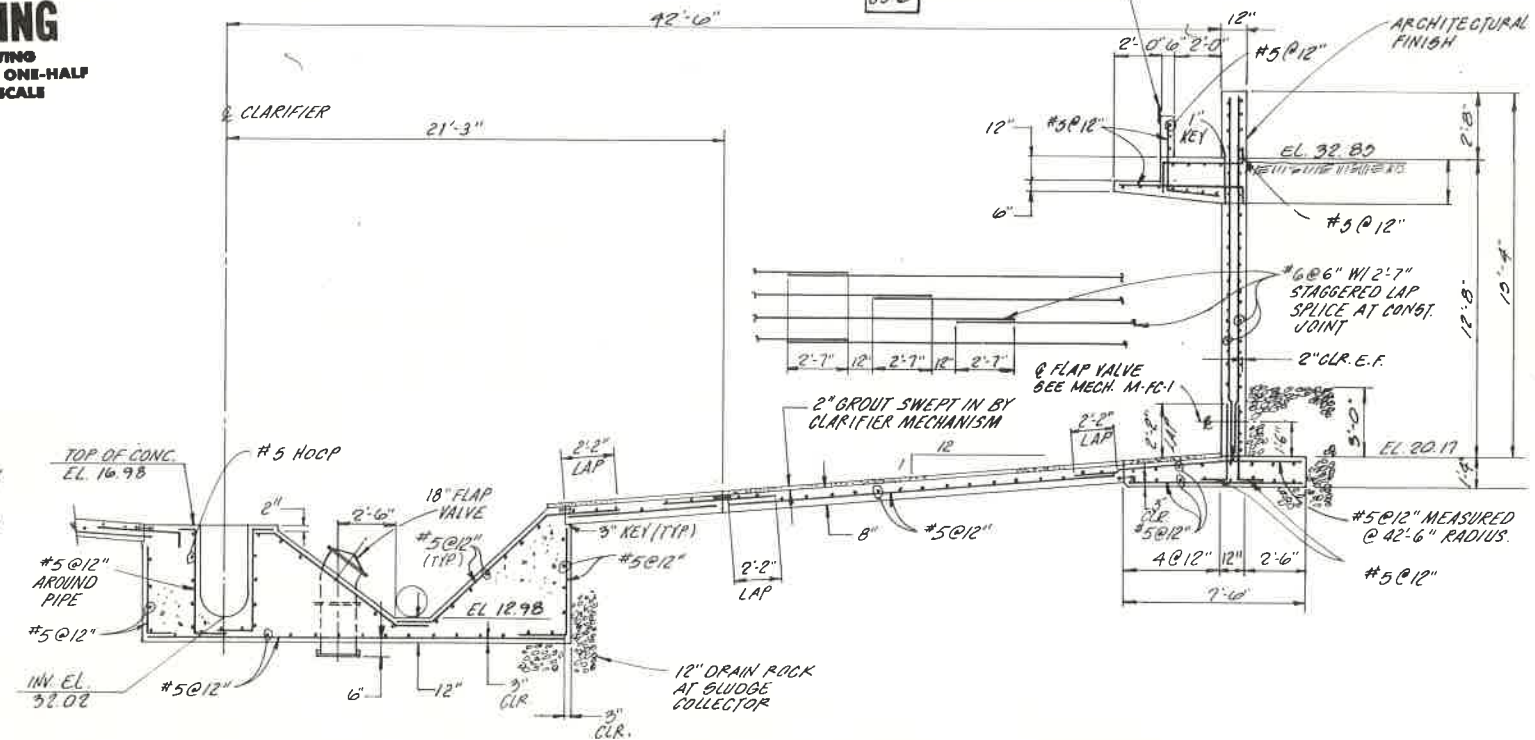
SCALE: 1/4" = 1'-0"

A
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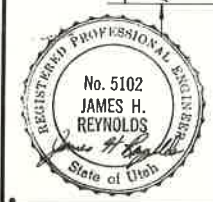


**TYPICAL CONCRETE
ENCASEMENT DETAIL**

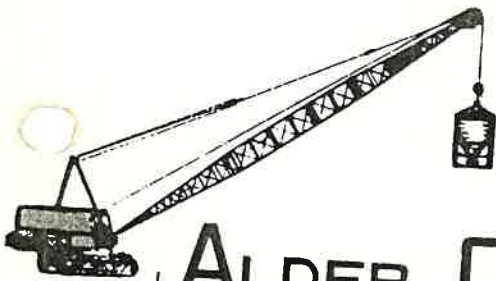
SCALE: $\frac{1}{2}" = 1'-0"$



SECTION 1
SCALE: 1/4" = 1'-0"



				SCALE: AS SHOWN		DESIGNED <i>B.A. McField</i> DRAWN <i>Mike Coker</i> CHECKED <i>D.W. Hooley</i>		SUBMITTED <i>James M. Montgomery</i> ID 3704 3-13-81 PROJECT ENGINEER R.C.E. NO. DATE RECOMMENDED <i>James M. Montgomery</i> ID 9639 3-14-86 JAMES M. MONTGOMERY CONSULTING ENGINEERS, INC. R.C.E. NO. DATE		JAMES M. MONTGOMERY CONSULTING ENGINEERS, INC. 624 NORTH 300 WEST, SALT LAKE CITY, UTAH 84103				BRIGHAM CITY, UTAH WASTEWATER TREATMENT PLANT EXPANSION FINAL CLARIFIER - PLAN & SECTIONS		SHEET S-FC-1 OF SHEETS	
REV	DATE	BY	DESCRIPTION														



ALDER CONSTRUCTION COMPANY

GENERAL CONTRACTORS 3939 South 500 West Suite # 1 Salt Lake City, Utah 84123 Phone 266-8856



WASTEWATER TREATMENT PLANT EXPANSION
BRIGHAM CITY, UTAH

SPECIFICATION SECTION 307

TITLE CLARIFIERS

Local - Parts & Services:

Name: Coombs-Hopkins

Address: 3760 Highland Dr. #404, Salt Lake City UT 84106

Telephone Number: (801) 272 9897

Factory - Parts & Services:

Name: EIMCO

Address: Box 300, Salt Lake City UT 84110 0300

Telephone Number: (801) 526 2000

REFERENCE:

SEE SEPARATE BIDDERS

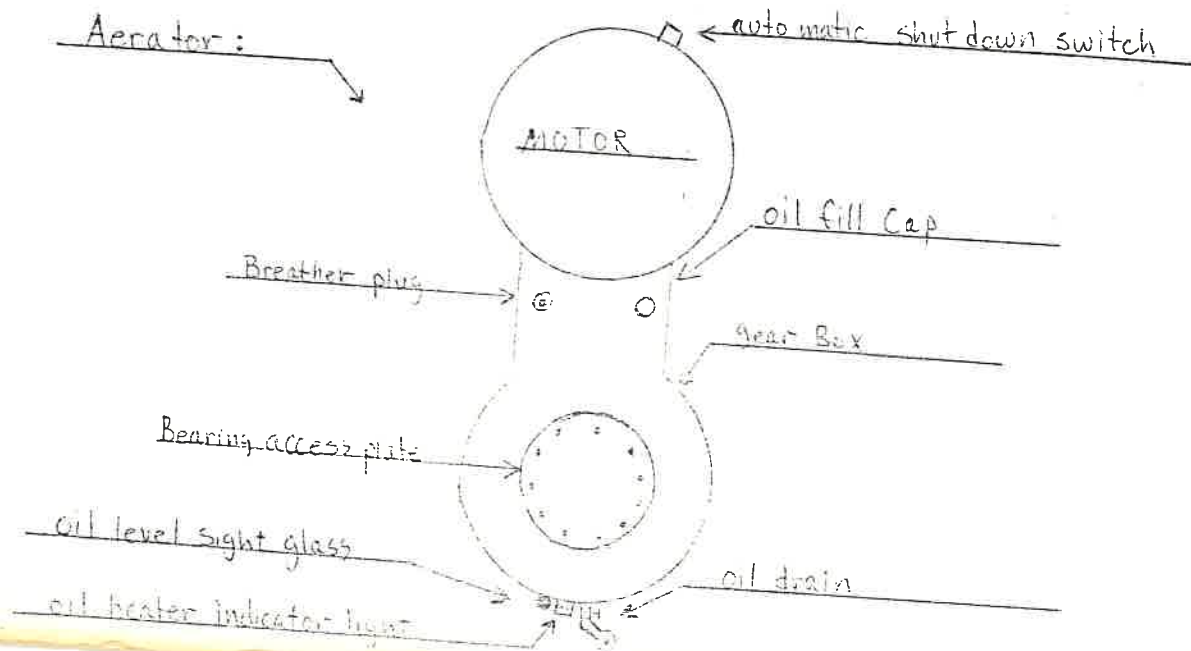
9-3-87

ORIENTATION
EIMCO CLARIFIERS AND AERATOR MOTORS

CLARIFIERS: Have double skimmer arms with spring loaded blades made of neoprene and small vertical blades that scrape the side of the scum baffle. Sludge rake blades are stainless steel with expected life of 7 to 10 years. Flow dispersion baffles located on the drive cage at the top of the influent column direct inflow in desired direction and velocity; 6 baffles.

Drive train- motor - chain drive - wormgear - cage. Wormgear has double gear reduction and spring compression mechanism indicator, meter in sight glass. It has automatic shutdown system at 85% or 5500 lbs. torque. Each gear box has it's own oil reservoir and double oil seals. Main gear box has an automatic temperature sensor, oil heater and oil sight glass.

AERATORS: 75 h.p. motors; have automatic temperature sensors and space heaters, automatic shut down (low oil pressure) and shut down testing capabilities. Motors run at constant 1800 r.p.m., at full loading draw 83 amp's. Gear boxes; have temperature sensors and oil heaters with on - off indicator lights, low oil pressure automatic shut down switch, oil level sight glass, remote oil drain system. Gear boxes reduce rotor blade speed to 28.2 r.p.m. First oil change at 600 - 1500 hrs. Cold weather - use winter grade oil.





EIMCO

Process
Equipment
Company

Installation, Operation and Maintenance
Instructions

EIMCO CLARIFIER, TYPE C3
85' Dia. With a C30HT Drive Unit

Serial No. 23412-01-A & B

For

BRIGHAM CITY, UTAH
W.W.T.P.

Alder Construction

Purchase Order No. 44-23

Eimco Order No. 23412-01

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EIMCO PARTS LIST52-RM104816/JKB-86
23412-01Recommended Spare Parts List
Complete Parts List



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EIMCO CERTIFIED DRAWINGS

23412D1	General Arrangement
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23412D51	General Erection
23412D52	Rake Arm Erection
23412D53	Skimming Mechanism Assembly
23412B79	Skimming Device Size 5'-0
23412C54	Walkway, Platform & Handrail Assembly
115342	Drive & Motor Package Assembly
23412D33	C30HT Basic Drive Assembly
115423	R.H. Drive Control w/p Potentiometer (Explosion-Proof)
48923	4 SPDT Rotary Switch

ACCESSORY EQUIPMENTGearmotor: U.S. Electrical Motors

(Eimco Part No. 23412A32A)

USEM Dimensions	- Section 415, Page 3
USEM Parts List	- Recommended Spare Parts List
USEM Renewal Parts	- Section 722, Page 8 & 8.1
USEM Renewal Parts	- Section 742, Page 45 & 46
USEM Instruction 419-32	- Right Angle Syncrogear Instruction
USEM Instruction 109-34A	- General Installation Instruction

Oil Heater: Chromalox

(Eimco Part No. 22989A432A)

Chromalox Data Sheet	- IMMERSON ELEMENTS - Screw-Plug Type
----------------------	---------------------------------------

Thermostat: Chromalox

(Eimco Part No. 75353A33A)

Chromalox Installation Instrs.	- Chromalox General Purpose Industrial Thermostat
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INTRODUCTION

1-AA7
(1/85)a

1

To ensure complete warranty coverage of the equipment, thoroughly read and familiarize yourself with the instructions in this manual.

The manual is separated into four basic parts: (1) mechanism erection and installation, (2) equipment operation and maintenance, (3) Eimco parts lists and drawings and (4) accessory equipment instructions, parts lists and drawings. Refer to the index at the front of the manual for the page listings.

The equipment, including the accessory equipment furnished but not built by Eimco, must be stored, installed, operated and maintained according to these instructions to ensure the warranty coverage.

Since the instructions are based on information available at the time of issue of this manual, the right is reserved to make subsequent changes to the instructions without obligation to replace existing copies.

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PRE-ERECTION ASSISTANCE

2-AX6
(3/84)

2

BEFORE YOU ERECT IT YOUR WAY

LET US SHOW YOU OUR WAY-

READ THE INSTRUCTIONS

These instructions are based on years of field experience. We selected the best procedures from that experience and put them together to give you our best method of erection. Consider them. They will save you time and money.

But -

- If you believe you have a better way, call us first anyway.
- If you want assistance or a pre-erection conference before you start, call us.
- If problems should occur, call us at once.

CALL your Eimco Representative. Look for his address at the back of this manual.



**SPECIAL INSTRUCTIONS TO
EQUIPMENT ERECTORS
FIELD CHARGES, MODIFICATION
STORAGE AND SHORTAGES**

1AA1
(3/84)

3

Eimco does not anticipate problems with the erection of this equipment. However, due to the nature of fabricated steel equipment, a certain amount of fit-up and adapting work may be required by the erector which is considered to be a normal part of erection, as well as the use of such tools as come-alongs, welding and cutting torches, and drift pins. But in case of problems, the following will apply:

- A. The AISC "Code of Standard Practice" Section 5-180 specifically states that cutting, reaming and use of drift pins are a part of standard erection practice:

"Corrections of minor misfits by the moderate use of drift pins, and a moderate amount of reaming, chipping or cutting are considered a part of erection. Any errors which prevent the proper assembly of parts by these measures, or which require correction or adjustment, must be immediately reported to the fabricator and erector to enable whoever is responsible either to correct the error or to approve the most efficient and economic method of correction to be used by others."

- B. Should a problem develop because of fabrication or engineering errors, Eimco will not accept back charges unless they are authorized in advance and in writing by the Eimco Sedimentation Warranty Department. Before work is started the erector must obtain an Eimco Field Work Order which must include a cost limitation. Payment may be refused for corrective work that is done without the above authorization.

Authorized charges will be paid only on the basis of standard direct field labor hours, material, and variable overhead. Other charges will not be allowed.

- C. Drawings and erection or installation instructions must be followed. The drawings will govern in case of minor discrepancies. In the event of major discrepancies, notify your Eimco Representative immediately, referring to the addresses at the back of this manual.



RECEIVING, INSPECTION,
SHIPPING BARS & ERECTION BOLTS

1-AA2
(5/75)-----

4

RECEIVING, INSPECTION

Although all possible precautions are taken to protect the equipment against damage or loss during shipment, before accepting the shipment check for shortages and for evidence of physical damage. Notify the carrier, if necessary. Keep a record of all claims and correspondence. Photographs are recommended.

PACKING BOXES AND COVERS

Do not remove protective covers unless there are indications of damage. Boxes opened for inspection should be carefully repacked to ensure protection of the contents or else the parts should be packaged and stored in a safe place. Examine all packing boxes, wrappings and covers for items attached to them, especially if they are to be discarded. Refer to the Storage Instructions.

SHIPPING BRACES AND BARS

All braces, bars, etc., that are required for shipment, but are not a part of the fabrication, are painted purple. These should not be removed until prior to installation, or during the erection as specifically noted.

STORAGE

When the equipment is not to be installed immediately, refer to the storage instructions. These are important to ensure warranty protection.

ERECTION BOLTS

Make sure the bolt lists are followed to ensure the correct lengths and sizes and to avoid shortages later in assembly.



STORAGE PRECAUTIONS

2-AX1
(10/86)

5

Equipment stored or out of use more than 30 days must be protected against corrosion and damage.

ACCESSORY EQUIPMENT

For storage and maintenance of equipment furnished but not built by Eimco, refer to the manufacturer's instructions at the back of this manual.

EIMCO DRIVE EQUIPMENT

FAILURE TO COMPLY WITH THESE STORAGE INSTRUCTIONS WILL VOID EIMCO'S WARRANTY.

DRIVE SHIPPED FROM THE FACTORY

Eimco drives received in shipment can be stored as long as 24 months, taking into account the intransit time. No special precautions are required other than those listed below.

Note: All drive unit machined surfaces are coated with LPS #3 which is a rust inhibitive agent good for approximately 24 months storage. No storage oil is required and, in fact, must not be used since LPS #3 will dissolve in oil or most other petroleum based products. Therefore, do not add oil etc. to the drive unit until it will be operated. If storage time is to exceed 24 months, contact Eimco PEC for long term storage information.

1. Store the drive(s) in normal operating position. If possible, store the drive(s) indoors in a dry, well ventilated place with a relatively constant temperature. Do not add oil. See note above.
2. When drive equipment is not installed, but must be stored outdoors:
 - a. Use wooden blocks to elevate above ground, arranged for even and firm support. Shipping crates or skids will often do. Make certain storage area is not where water can collect.
 - b. If protective covers have been removed or damaged, cover with canvas or protective tarpaulin, but allow adequate ventilation. Do not use space heaters.
 - c. Whenever possible, store in a shaded area protected against the sun and wind. This should also be an area away from moving equipment.

DRIVE INSTALLED-LONG TERM STORAGE

FAILURE TO COMPLY WITH THESE STORAGE INSTRUCTIONS WILL VOID EIMCO'S WARRANTY.



STORAGE PRECAUTIONS

2-AX1
2

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The following precautions cover non-operation or shutdown periods that exceed two months. They apply to the Eimco or accessory mechanical drive equipment that has been installed and operated. Keep records and schedules to ensure compliance with instructions.

Note: As LPS #3 will dissolve in and is compatible with oil, it is not necessary to remove it using solvents before adding oil.

Plan #1 - Power Available

When power is available, lubricate and operate the equipment about five minutes, or run it through a complete cycle once each week. Remove accumulated water from drives each month at drain plugs. (Some lift devices have dehumidifiers which should be operated continuously.) Refer to the accessory equipment manufacturer's instructions for additional information.

WARNING: In climates where snow and ice might accumulate in the tank, do not operate the drive. Follow Plan #2.

Plan #2 - No Power Available

Fill housing and gear cases with clean oil to maximum level. A rust inhibitive agent is recommended for adding to the oil. On certain type Eimco drives, make sure the primary, as well as the secondary drives, are lubricated. Check that all greased bearings are well lubricated. Cover seals, screws, chains and guides with heavy grease and cover breather caps with tape. Cover with tarpaulins, but allow ventilation. Release tension on all drive belts. Space heaters or dehumidifiers should operate continuously.

Once each month open drain plugs to remove accumulated water and return oil to maximum level. Check all greased items monthly for adequate covering. On variable speed drives, make certain condensate plugs are removed from the speed housing.

When the storage period extends into seasonable warm or cold weather, drain all gear housings and flush them with oil to remove residual water. Do not flush with solvents.

WARNING: Before the drive equipment is put into operation after storage, drain all oil and lubricate according to instructions. Relubricate all greased bearings and pump out old grease. Check motor windings. Refer to accessory equipment manufacturer's instructions.

STORAGE PRECAUTIONS - STRUCTURAL

1. Inspect painted surfaces for deterioration of paint. Apply finish coats as soon as possible. When this is not possible, remove rust or corrosion and paint, as necessary.



STORAGE PRECAUTIONS

2-AX1
3

7

For shop primed steel equipment, refer to the special "Paint Durability" precautions below.

2. Rubber coated equipment should be protected against the sun, extremes in temperatures, and mechanical damage. Refer to the Special Storage Instructions for Rubber Covered Equipment.

NOTE: **SHOP PRIMER PAINT DURABILITY**

Shop primer paints are intended to serve only as a bonding coat between metal surface and protective finish or sealing coats and act as a minimal protective finish. Eimco will not be responsible for condition of primed or finish painted surfaces after equipment leaves its shops. Purchasers are invited to inspect painting in shops for proper preparation and application prior to shipment. Eimco assumes no responsibility for field surface preparation or touch up of shipping damage to paint. Painting of fasteners and other touch up to painted surfaces will be by Purchaser's painting contractor after mechanism erection.

Shop primed steel surfaces should be finish coated within the time specified by the paint manufacturer. Eimco cannot accept responsibility for shop prime coats that have deteriorated due to exposure and time.



WARNING

2-AX4
(5/75)a -

8

Failure to heed these warnings will void the drive warranty!

LUBRICATION WARNING

The drive unit is shipped from the factory without operating lubricant.

SANDBLASTING WARNING

The Eimco main drive unit and motor drive must be fully covered or sealed off to protect against sand and dust when sandblasting in their vicinity. All external openings, including vents and oil fill plugs and the space between the rotating main gears and stationary bases on the main drive, should be taped closed, covered with polyethelene film, or stuffed with oakum or rag waste. After sandblasting and before start-up, drain a portion of oil from the drive through nylon stocking to be sure grit has not penetrated the drive. Remove all covers.

WELDING WARNING

Use the piece being welded as the ground to prevent electrical damage to the drive bearings.

DRIVE DIRECTION OF ROTATION

The drive must rotate the direction specified on the drawings, unless a reverse rotation is specifically allowed.

WARNING

DO NOT PULL, DRAG, PUSH OR DUMP THE STRUCTURAL COMPONENTS OFF THE CARRIER.

All structural components should be lifted and handled as covered below. Proper handling is necessary to protect special coatings or coverings and to ensure ease of assembly during equipment installation.

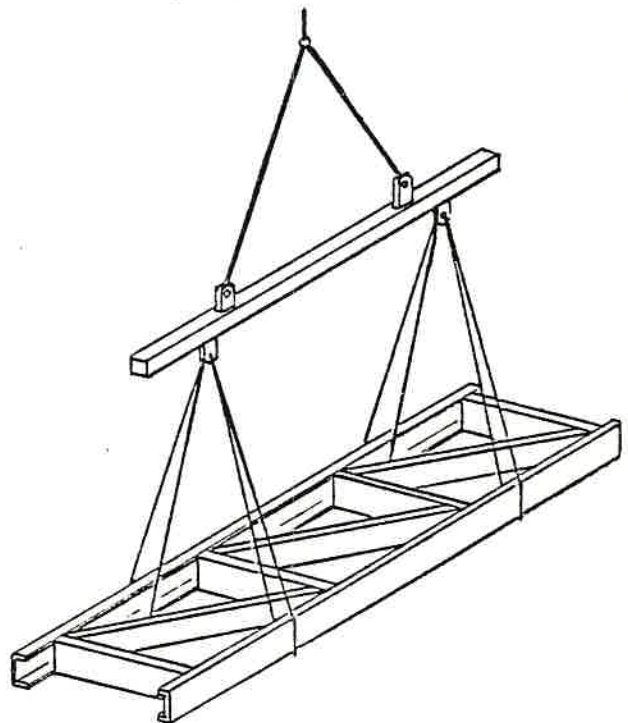
Eimco will not accept charges for repair or replacement of equipment or materials damaged due to improper handling.

LIFTING RECOMMENDATIONS AND CAUTIONS

Observe these precautions when lifting or handling structural components furnished by Eimco:

WARNING: STAND CLEAR AS THE EQUIPMENT IS LIFTED.

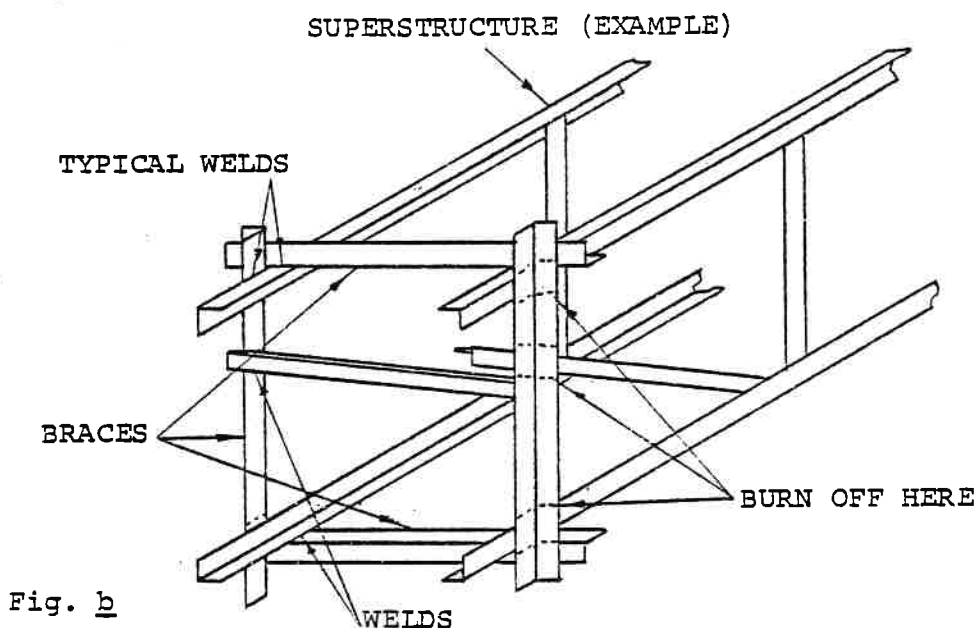
1. Make sure the equipment being lifted or the lifting equipment cannot come into contact with overhead electrical cables, etc.
2. Make sure the rigging and hoist equipment are adequate capacity.
3. All rigging and lifting should be done by experienced personnel.
4. Before the equipment is removed from the carrier, check to be sure the blocking, bracing and banding securing it to the carrier have been removed and it is ready for moving.
5. Use multiple point lifting whenever possible.
6. When lifting structural members of this equipment, such as rake arms, cages, superstructures, etc., avoid twisting or bending the members, especially components that are galvanized. Use spreader beams, as necessary, to fully support the pieces as they are lifted.
7. Make sure shop provided camber is maintained when lifting rake arms and superstructures.



8. Lift the equipment an inch or two off the carrier to be sure it is free to be moved and balanced correctly. Adjust as necessary.
9. Never move the equipment suddenly or in jerks and never allow it to strike the ground, tank or other equipment.
10. When lifting components that are rubber or neoprene covered or special painted, use rubber belting, burlap or other padding between the lifting cables and the equipment to prevent damage to the protective covering.

SHIPPING BRACES

Shipping braces are used to protect, segmented superstructures, rake arms and cages, from damage during shipping. This bracing must be removed. Burn the braces from the chords, angle braces or structural members, as shown in Figure b. DO NOT attempt to scarf braces as this may cause weakening of structural members.





INSTALLATION SEQUENCE OUTLINE

3-CL12
(7/83)

11

23412-01 /275

Sequence

Page Nos.

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2. Start the installation of the weirs, baffles and
scum box 13
3. Install and plumb the influent column. Do not grout 14
4. Place the cage and inner well (central rotating
feedwell) over the column 15-16
5. Install the drive unit. 17-18
6. Connect the cage to the drive unit 19
7. Install the rake arms (and, if furnished, the trough
scraper). DO NOT install the squeegees 20
8. Lubricate the drive and connect temporary wiring 21
9. Check and final level the drive unit 22-24
10. Final plumb the cage 25
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14. Install the inner well seal 32-33
15. Check the arms for equal clearance with the tank bottom . . . 34
16. Mechanical check by an Eimco serviceman may be adviseable . 35
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18. Grout the bottom of the tank 37-41
19. Install the skimming device. 42-43
20. Check the arms for final level 44
21. Install the squeegees 45
22. A final mechanical check of equipment by an Eimco
Serviceman may be required 46

Reference Drawings: General Arrangement and General Arrangement Details

TANK

The tank must conform to specifications in order to accommodate the mechanism. If the tank fails to meet these specifications, requiring any modifications of the equipment, Eimco will not accept charges. Check the tank as follows:

CHECK the elevation at the walkway mounting surfaces at (A) only.

CHECK the elevation at the influent column base at (B).

CHECK for true center at (C) in order to check the anchor bolts at the (D) locations and the wall circumference at (E).

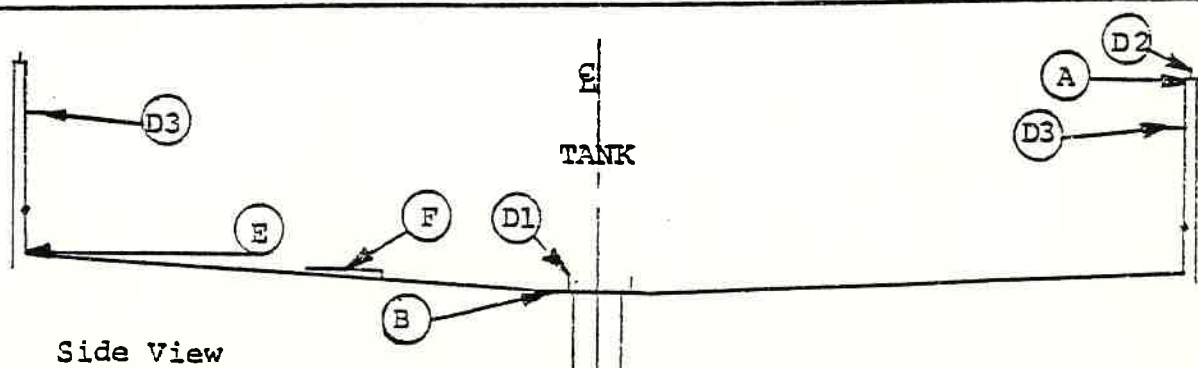
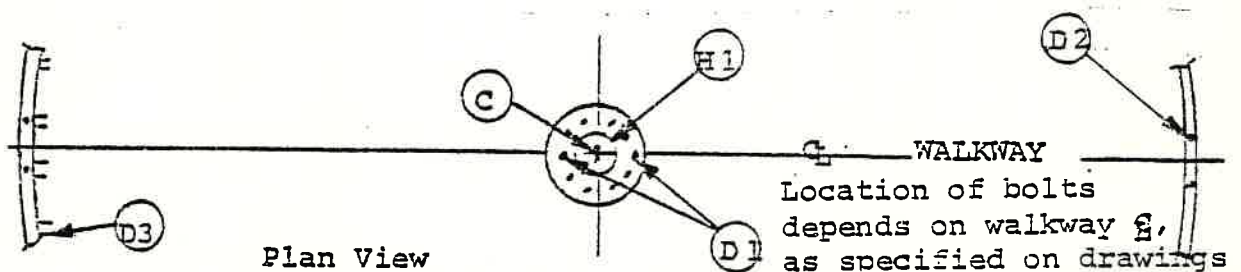
CHECK that the anchor bolts at (D1) are concentric with true center of the tank and that the bolts are located with respect to the walkway centerline, as shown on the drawings.

NOTE: If an anchor bolt template is furnished by Eimco, it must be used to locate the anchor bolts.

CHECK all anchor bolts at (D) locations for proper size, projection, elevation and orientation. Wall bolts at (D3), if furnished, should be on a radial line with true center.

CHECK the tank bottom for specified diameter all around at (E) and for specified slope (F) at approximate 90° locations around the tank.

CHECK the influent opening (H1) for proper diameter.





INSTALLATION OF WEIRS, BAFFLES AND SCUM BOX

4-BC6
(2/86)

13

Reference Drawings: General Arrangement, Skimming Mechanism Erection,
General Erection and General Arrangement Details

Start the installation of the weirs, scum baffle and scum box, completing the installations during the erection of the mechanism.

WEIRS (not by Eimco)

Apply a mastic sealer between the weirs and mounting surface, during or after installation. This is to prevent leakage and improper flow. Weirs must be level.

BAFFLES (not by Eimco)

Make sure the inside face of the baffle is free of projections, such as welds, offset, etc.

When the skimming device is installed, revolve the scum skimmer to the position where it is over the scum box. Measure the horizontal distance from the end of the support pipe to the scum baffle. Then revolve the skimmer and adjust the baffle assemblies for this same horizontal measurement. Adjust the baffles as necessary.

NOTE: Eimco cannot be responsible for the fitting of those pieces furnished by others.

SCUM BOX (by Eimco)

In most cases the baffles should be installed ahead of the scum box, but the adjustments should be made at the same time.

Mount the scum box supports to the anchor bolts, then mount the scum box to the supports.

Adjust the scum box for elevation and level referring to the drawings. When the skimming device is installed, adjust the box for concentricity with the device and recheck elevation and level. Adjust the scum box as follows:

Radial Adjustment:	Slots in scum box
Vertical Adjustment:	Slots in supports
Level Adjustment:	Shim between scum box supports and wall

If the mounting holes in the baffles were not precut, field drill them using the scum box as a template. Then, connect the scum box to the baffle using the bolts, nuts and washers specified.

Secure all fasteners. Then connect scum box nozzle, with flexible coupling, clamps, or welding, to the discharge piping, as specified.

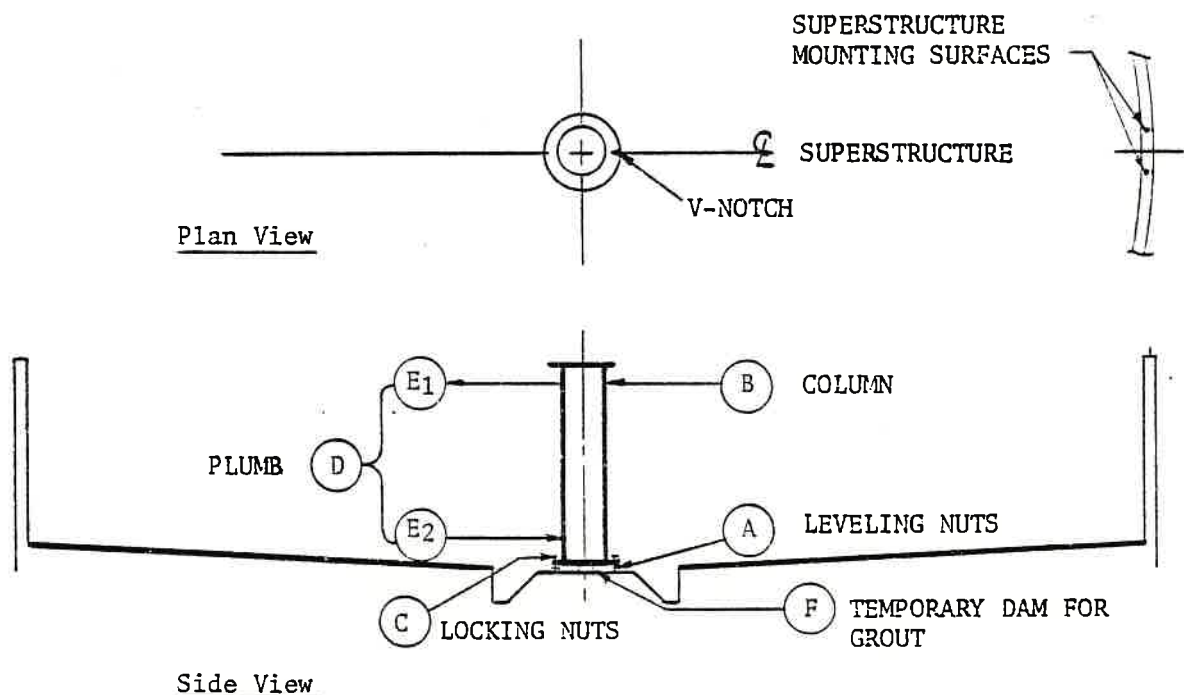
Reference Drawings: General Erection, General Arrangement and General Arrangement Details

1. Install the column leveling nuts (A) with top faces of the nuts set for the specified top of grout elevation.
2. Check all nuts for level with a combination straight edge and machinist's level. Check for specified top of grout elevation.
3. Construct a temporary dam for the grout (F) around the influent opening to hold back the grout during the grouting of the column.
4. Set the column on the leveling nuts with the "V" notch in the column flange in line with the center line for the superstructure (walkway). Then, snug the leveling nuts (A) against the flange. Install the upper locking nuts (C) and tighten by slugging with a slug wrench.
5. Check the column for plumb (D). Reasonable allowance is 1/8 inch in 10'-0" overall, that is (E1) minus (E2).

NOTE: Checking and adjustment must be done when the center column is a uniform temperature, such as the early morning or an overcast day.

6. Adjust for plumb with the leveling nuts (A). Make sure the upper nuts (C) are slugged after each adjustment.

NOTE: Do not grout under the column. This will be done following final leveling of the drive.

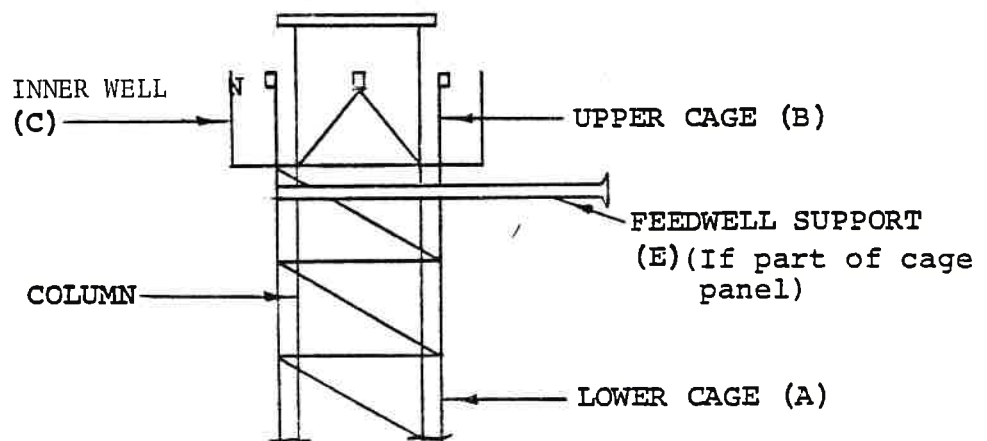


Reference Drawings: General Erection, General Arrangement and Illustration below

The innerwell (C) (central rotating feedwell) fits between and is assembled with the upper cage (B) and lower cage (A) sections. Since the cage sections are furnished in single pieces, they must be in place around the column before the drive is installed.

A. Follow one of the two methods of assembly:

- (1) If the cage and innerwell are to be assembled around the column, start with the bottom cage section and work upwards:
 - a. Set the lower cage (A) over the column, allowing it to sit on the column base.
 - b. Assemble the innerwell sections (C).
 - c. Connect the upper cage (B) temporarily to the innerwell (C). Then set the assembly in place on the lower cage (A).
 - d. The cage sections can be (a) joined and mounted as a unit to the drive, after the drive is installed, or (b) installed one at a time, starting with the upper cage.
 - e. If the feedwell supports (E) also serve as the cage panel members, install the supports either before or after the cage has been placed around the column, but install them before the rake arms are installed. Do not weld (if specified) the supports to the cage at this time.



----- OR -----



CAGE AND
INNER WELL ASSEMBLY

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----- OR -----

- (2) If the cage and innerwell are to be assembled separately from the column, assemble the cage sections with the innerwell sandwiched between.
- a. Assemble the cage sections with the innerwell.
 - b. Install the assembly over the column, allowing it to sit on the column base.
 - c. If the feedwell supports (E) also serve as the cage panel members, install the supports either before or after the cage has been placed around the column, but install them before the rake arms are installed. Do not weld (if specified) the supports to the cage at this time.

Use High Strength Bolts as specified, but do not tighten them as specified in the instructions for the Turn-of-Nut-Method until all adjustments for cage alignment are completed. Note that all connecting structural surfaces (torqued surfaces) should be clean and unpainted where High Strength Bolts are used.

B. Check the Cage for Alignment

Check for alignment of the cage, preferably using a transit.

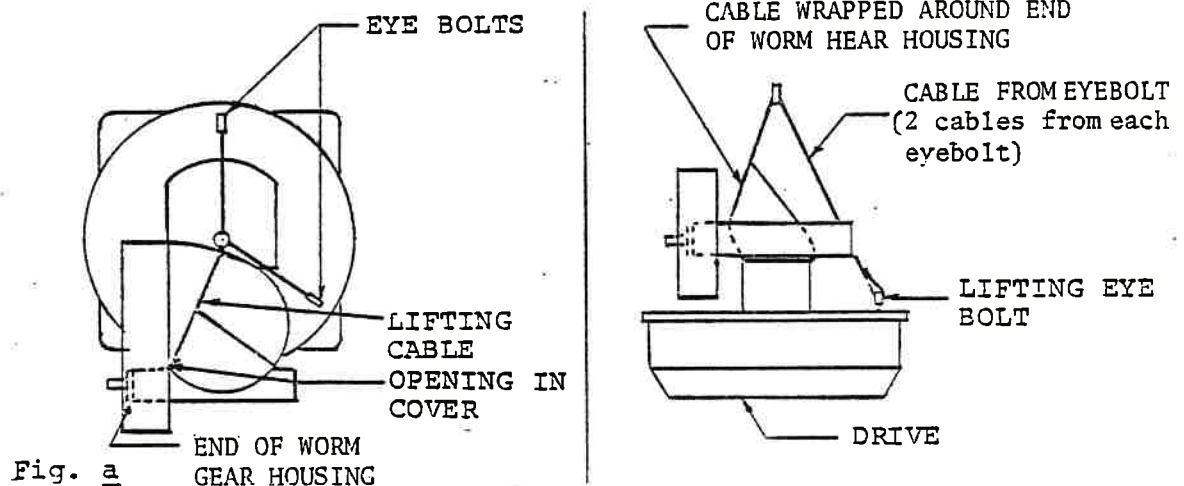
Adjust the cage sections and innerwell, if necessary, by shimming between the innerwell and the flanges of the cage sections.

Reference Drawings: General Arrangement, Drive Unit Package, and General Erection

The drive unit is shipped fully assembled, including the drive control (overload cutout device). The main drive housing, to which the cage attaches, is on the bottom and the worm drive assembly is on top.

1. LIFT THE DRIVE UNIT

Lift and install the drive as a complete assembly, using the two eye bolts and wrapping a 3rd lifting cable around the worm gear housing, through the opening in the drive cover, as shown in Fig. a. Do not allow the cable to contact the drive control.



2. INSTALL THE DRIVE

CHECK The mounting surface of the drive housing for foreign matter and the column mounting flange for spatter or other foreign matter. Remove as necessary for a clean flat surface.

Place the drive unit on the column, orienting as shown on the General Arrangement drawing.

3. MOUNTING BOLTS

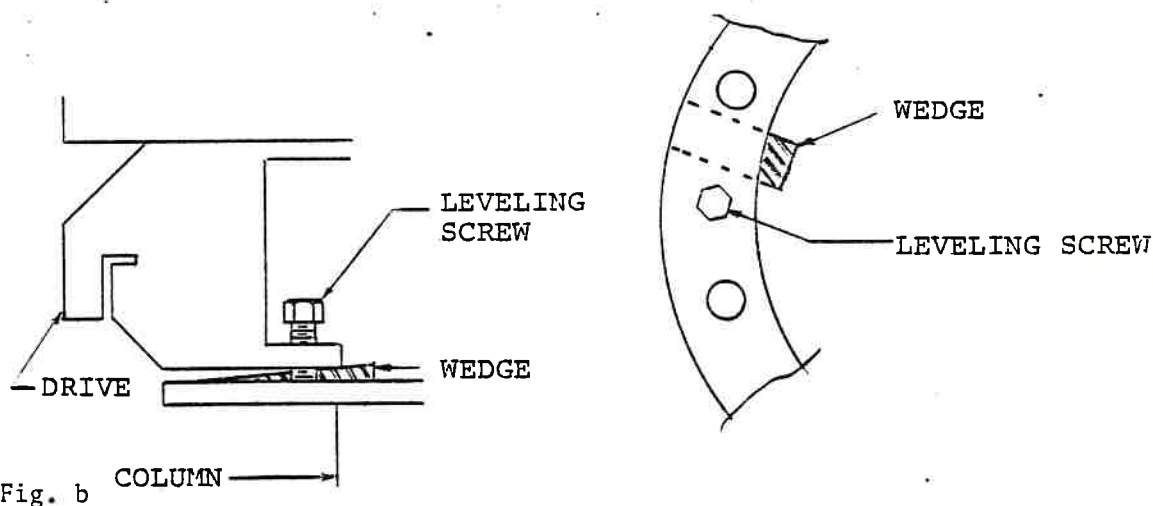
Insert but do not tighten the drive mounting bolts. Note that some drives have (2) tapped mounting holes, one on each side of the pinion pocket, due to inaccessibility of the bolts and nuts for installation. If the holes are tapped, install the mounting bolts by running them up through the flange of the column, then into the threaded holes in the drive base. Only these 2 holes are tapped. The other mounting holes use nuts and bolts, which are installed by running them down through the drive base and through the column flange. (Nuts are not required at tapped holes.)

4. LEVEL THE DRIVE

At this point in the erection the drive will be adjusted for near level, using a carpenter's level and the leveling jack screws. After installation of the arms and cage, the drive will be adjusted for final level by shimming.

CHECK the drive for level, using a 4' carpenter's level placed on the leveling surface of the main drive cover. Check in two directions (90°).

- Remove, clean and lubricate the jack screws in the drive base, then reinstall the jack screws.
- Adjust for level using the jack screws.
- After leveling, support the drive using wedges at the jack screws.
- Install the drive hold-down bolts and snug tighten only. Do not torque.
- Final leveling of the drive will follow installation of the rake arms.



LUBRICATION WARNING: The drive is shipped from the factory without operating lubricant.

SANDBLASTING WARNING:

The Eimco main drive unit and motor drives must be fully covered or sealed off to protect against sand and dust when sandblasting in their vicinity. All external openings, including vents and oil fill plugs and the space between the rotating main gears and stationary bases on the main drive, should be taped closed, covered with polyethelene film, or stuffed with oakum or rag waste. After sandblasting and before start-up, drain a portion of oil from the drive through nylon stocking to be sure grit has not penetrated the drive. Remove all covers.

Failure to observe this warning will void the drive warranty.

Reference Drawings: General Erection and Illustration Below

1. Referring to Figure a, attach the cage to the drive unit, using the vertical adjusting bolts (A) and nuts (D).
2. Loosely install the bolts and nuts (B). Shim between the drive and cage for a snug fit and alignment. (Shims not by Eimco.)

Note: Final check for plumb and shimming will follow drive leveling.

3. Using the adjusting bolts (A) and take-up nuts (D), raise the cage to its highest position.
4. Using a carpenter's level, check the cage for plumb.
5. Adjust the cage for plumb using the adjusting bolt (A) and take-up nuts (D), then secure the bolts (B). Do not torque the bolts (B). Secure the lock nuts (E).

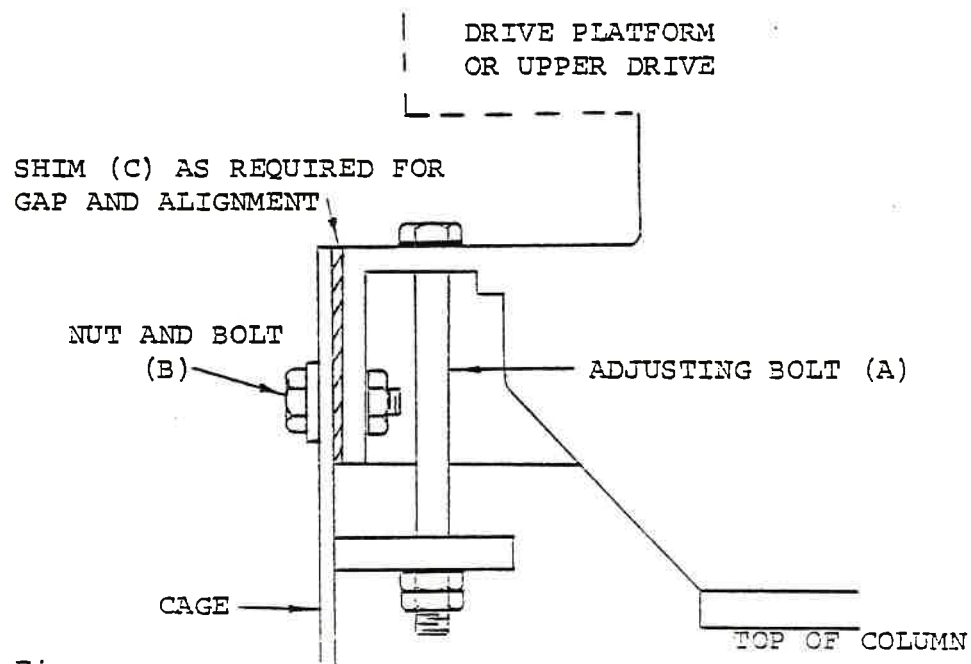


Fig. a

Reference Drawings: General Erection and Rake Arm Erection

To prevent misalignment or damage to the cage, install the arms as a pair and support the arms with blocking arranged so that the connection to the cage will not be forced.

1. Set the arms (A) in position at the cage, supported by blocking (B) for the specified clearance with the tank bottom plus the amount specified for camber (C). Refer to the camber diagram on the General Erection drawing. Pull the arms up square with the cage and with the arm connections adjacent their matching fittings at the cage.

Make sure the arms are straight and square with the center line of the arm. If necessary, pull them into square alignment while they are held secure.

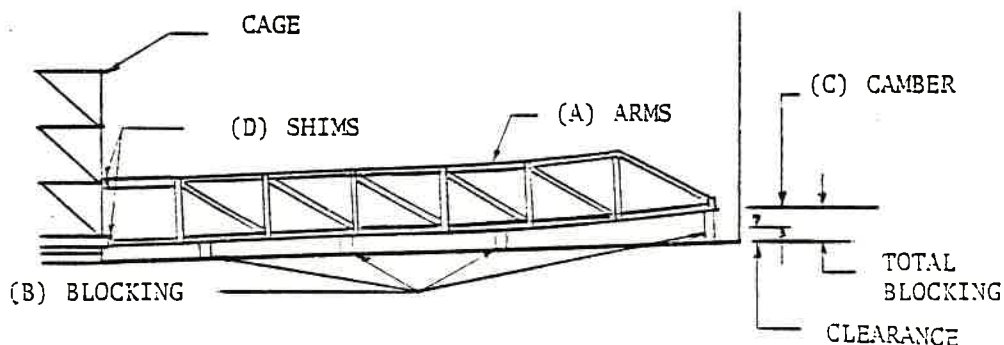
2. Install the blades according to the part numbers; use the High Strength Bolts if specified. Make sure the arms remain square during the installation.
3. Shim (D) at the two lower connections as necessary for arm alignment. Install the bolts and draw them up snug. If there is a gap at one of the two upper connections, shim (D) as necessary for a tight fit (shim only one). Tighten all bolts, but do not force a connection in order to close a gap since this will put a twist in the arm. Close the gap by shimming at the cage to arm connections.

NOTE: Do not weld at this time. Welding will be done after final adjustment.

4. Remove the blocking (B) equally from each arm, beginning at the cage and working outward. Check the arm blades for clearance with the tank bottom to be sure they do not touch. (Final arm level will be checked later.)
5. If arm adjustment is necessary, use jacks placed near the outer ends of the arms for lifting. Shim equally at either the bottom or top connections to adjust for elevation.
6. The squeegees will be installed after tank grouting.

Leveling Adjustment

If it is necessary to level the arms, adjust them as a pair, or adjust one arm while supporting the opposite arm with blocking. This is to maintain equal weight on the cage.





LUBRICATE THE DRIVE
DRIVE ROTATION WARNING

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(4/86)a

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1. LUBRICATE THE DRIVE

Reference drawings: Drive Assembly and Drive Unit Package

Center Drive Unit - Refer to the Eimco Drive Lubrication Instructions in this manual and the lubrication instructions plate on the drive unit.

Motors and Reducers - Refer to the respective manufacturer's instructions in this manual.

2. WARNING ON DRIVE ROTATION

If power is not available for the drive, an air ratchet, hand crank, or electrical drill can be used to rotate the rake arms for final leveling, but the following warnings must be observed:

- a. Direction of rotation - Make sure the drive is turned the direction of the "rotational arrow" on the drive cover or chain guard. (It is necessary to ensure full warranty coverage on the drive unit too.)
- b. Torque build up - Watch the drive control arrow, during the rotation, to make sure it does not go above zero "0". If it should, immediately stop the rotation. Refer to the "Drive Maintenance Warning" instruction in the maintenance section.
- c. If the drive's electrical motor drive is used for drive rotation, refer to the electrical wiring instructions on a following page.

CHECK FOR LEVEL

The main bearing of the rake drive must be level for proper operation of the mechanism and maximum bearing life.

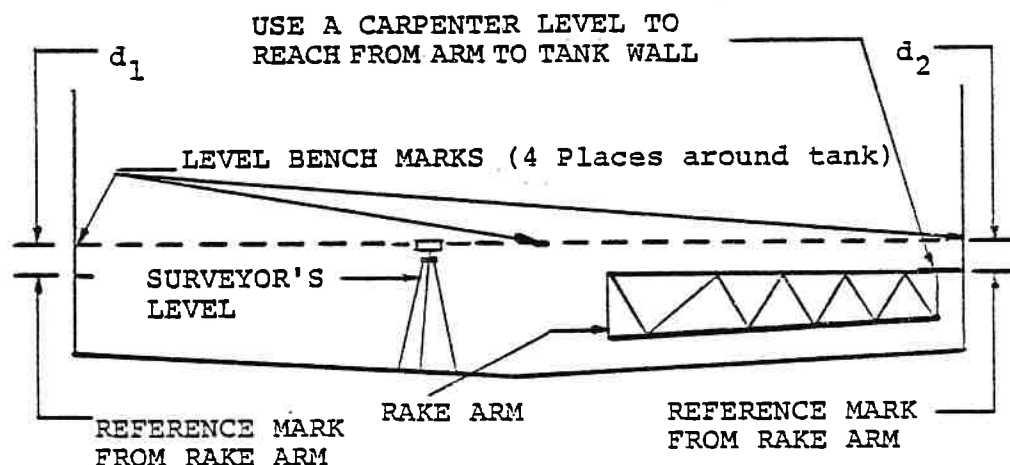
The drive will be checked for level by measuring the level of the drive at the end of a rake arm, at various points around the tank. It will then be shimmed for level.

The drive must be leveled within a maximum out-of-level tolerance of .005 inch (.0127 CM) in 12 inches (30.48 CM) distance. This tolerance will be measured on a large scale using the rake arm, rather than the relatively small area of the drive cover.

1. Set up a surveyor's level near the center of the tank. Using the instrument, mark four level bench marks on the tank wall at the same height and spaced approximately 90° apart. Refer to the illustration below.
2. Rotate the drive and stop one (and the same) long arm at each of the four level points marked around the tank, and using a carpenter's level as an extension from that arm to the tank wall, make the second marks. These are shown as the "Reference Marks" in the illustration.

NOTE: Checking and leveling must be done when the center column is a uniform temperature, such as the early morning or an overcast day.

WARNING: The drive is shipped from the factory without lubricant.



Note: d_1 and d_2 are 180° opposite

3. Referring to the illustration, compare the difference in dimensions between the level marks and the rake arm reference marks at diametrically opposite sides of the tank.
4. The difference between the two observed dimensions (d_1 minus d_2) must not exceed the maximum out-of-level dimension below:

<u>Mechanism Diameter</u>	<u>Maximum Out-of-Level Tolerance (d_1 minus d_2)</u>
50' or less	1/4"
→ 100' or less	1/2"
150' or less	3/4"
200' or less	1"
250' or less	1-1/4"
300' or less	1-1/2"
350' or less	1-3/4"
400' or less	2"

A proportional allowance should be made for intermediate diameters, except for mechanisms 50' or less which would be 1/4 inch.

SHIM FOR LEVEL

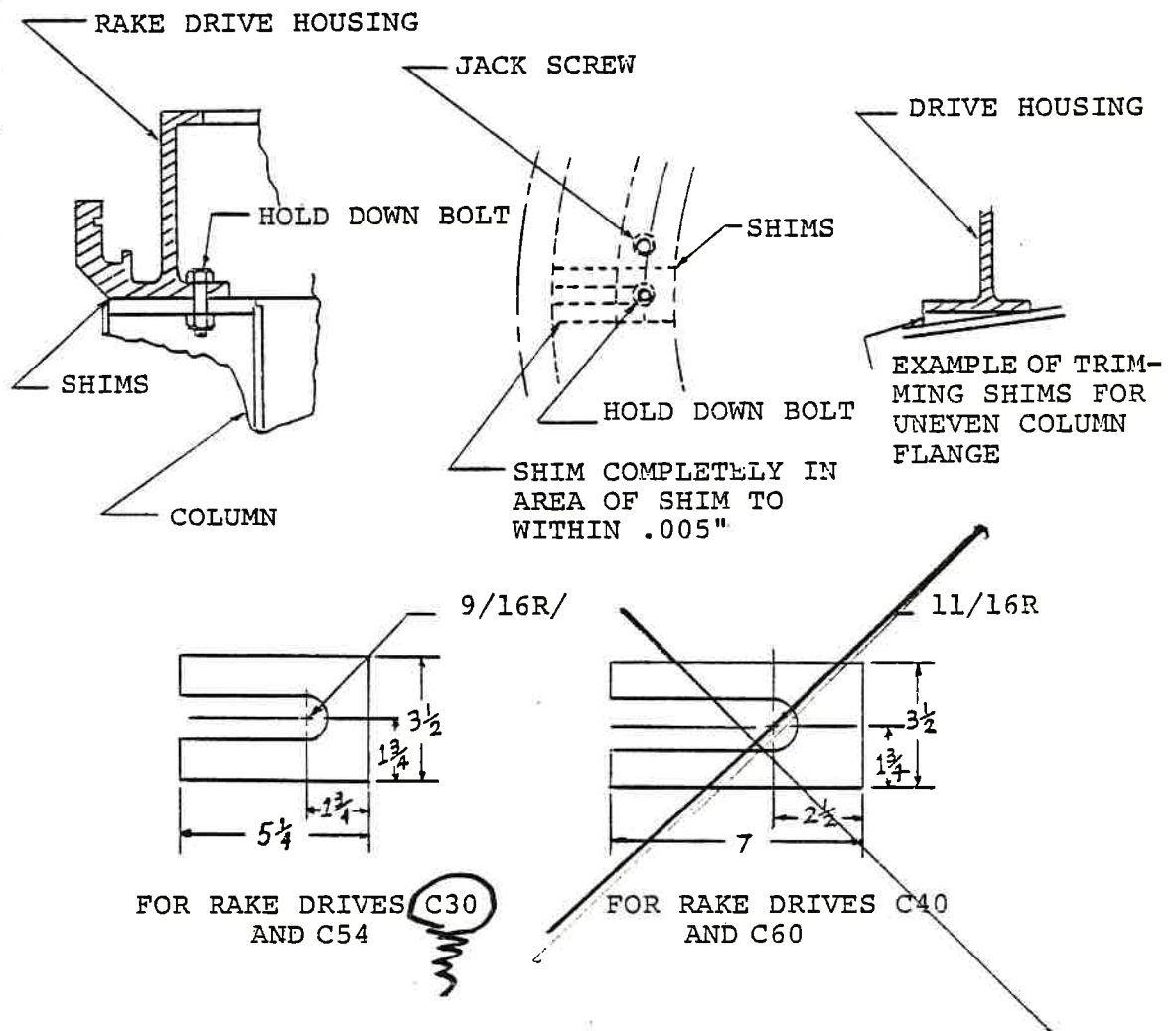
Shimming may be necessary to level the drive. Maximum bearing life of the drive unit main bearing is dependent on proper leveling and shimming. Perfect final leveling is not practical; however, it should be as accurate as possible. As the diameter of the mechanism increases, it becomes increasingly difficult to obtain an accurate adjustment.

In making a final shimming adjustment, care should be taken to tighten the drive mounting bolts equally and to support each drive mounting bolt, as necessary, with the proper thickness of shim material. Uneven tightening and shimming may cause deformation of the bearing race, causing shortened bearing life.

Shimming

1. Use the jack screws provided in the base casting to level the drive. BE SURE to release the hold down bolts.
2. Check clearances between the drive base and column with a feeler gauge at each of the hold down bolts. Mark clearances on the drive base for ready reference.
3. Shim at the mounting bolts, covering as much contact area as possible. Refer to the illustrations and note on the next page.
4. Tighten the bolts equally and make sure all jack screws are loose. Recheck the level of the drive by rotating the arm to the level marks. Adjust as necessary until the drive is within specified level tolerance.
5. Tighten the bolts and make sure all jack screws are loose.

NOTE: Shimming materials should be, as much as possible, of the same material as the surfaces that will be contacted, such as, steel on steel, stainless on steel, etc. Corrosive vapors will require stainless. And brass on steel or on galvanized makes a poor combination when the surfaces will be wet.

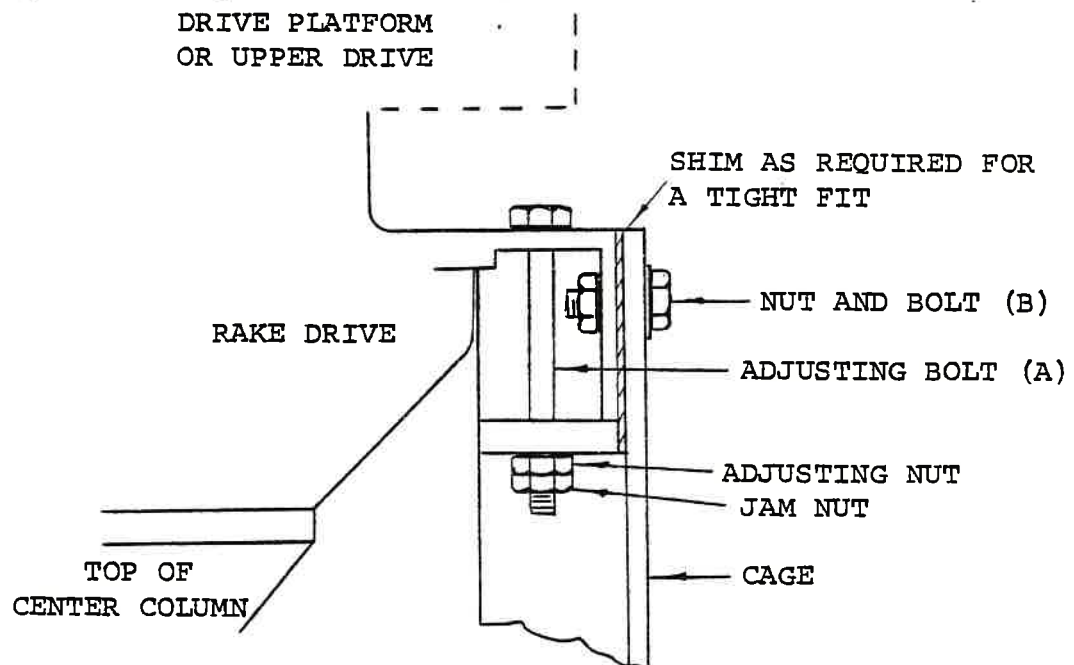


Reference Drawings: General Erection and Illustration Below

1. CHECK the cage for plumb with a surveyor's instrument.

NOTE: Checking and adjustment must be done when the steel is a uniform temperature, such as the early morning or an overcast day.

2. Use the adjusting bolts (A) to correct for plumb.
3. Secure all bolts (B), shimming as necessary between the drive and cage for a tight fit and centering of cage around the drive (shims not by Eimco).
4. CHECK to be sure the cage is centered around the drive.
5. Secure the jam nuts on the take-up bolts when the cage is plumb. Do not torque the bolts at (B).





INSTALL THE FEEDWELL

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Reference Drawing: General Erection

1. Level the feedwell supports within the same plane.

NOTE: The feedwell supports were installed when the cage was set in place.

2. Assemble the feedwell frame sections on a level surface, orienting the sections as shown on the drawing.
3. Adjust for alignment of the sections and upper rim and secure all bolts.
4. Lift the feedwell frame, lower it into place over the drive unit and mount it to the feedwell supports.
5. Check the feedwell frame for elevation and all around level. Adjust, if necessary. Weld the feedwell supports to the cage, as specified. Complete all welding.

WELDING WARNING: When welding on the feedwell, do not use the superstructure platform or column as a ground and vice versa. This will damage the drive unit bearings due to electrical circuit contact.

6. Install the FRP feedwell panels, mounting them to the frame using the self-tapping screws. Note that the mounting holes for the screws must be field drilled.

Note: Field cut the FRP panels, as necessary, to clear the bolt heads at the frame splices.

7. Secure all unsupported FRP seams using the specified capscrews with nuts field drilling the holes, as required.

Reference Drawings: General Erection, Walkway, Platform and Handrail Assembly, General Arrangement and Grating Clip Assembly Erection, if furnished

1. If mounting plates are required, set them in place as called for in the drawings.
2. CHECK the walkway for camber, if specified in the General Erection drawing. If the walkway is not cambered, as specified, notify your Eimco representative immediately.
3. Mount the walkway in place on the tank and drive. Do not force the connection. If necessary, elongate the mounting holes on the tank end of the walkway section. Secure the anchor fasteners at the drive end and tighten the nuts together on the tank end, leaving a gap, as shown in Fig. a.

The 1/16" (approximately) clearance between the walkway and nuts, shown in Fig. a, allows for contraction and expansion of the walkway during temperature changes.
4. Mount the platform in place on the drive, bolting it to the drive and walkway, as specified. Install the braces and spacer bars.
5. Remove the drive oil fill pipe plug from the drive cover and install the pipe nipple and coupling specified. Reinstall the pipe plug in the top of this assembly.
6. Install the floor plates or grating.
7. Install handrails, kick plates, and nameplate. Refer to the handrail splice instructions on the following page, if furnished by Eimco.

Note: If specified, use Bi-Metallic adhesive backed neoprene tape at all aluminum to steel connections to protect components from galvanic action. Install any support brackets for piping, etc., that attach to the walkway.

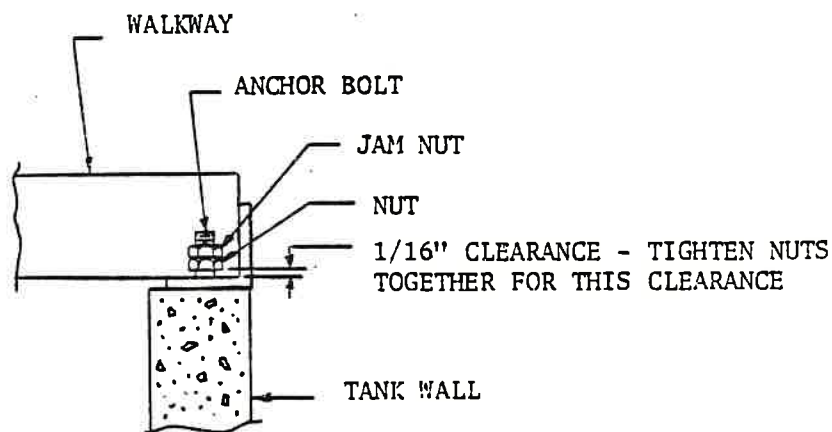


Fig. a



Reference Drawings: General Arrangement and Superstructure Erection

FLOOR PLATES

Install the floor plates and toe plates, if furnished, for the walkway, referring to the part numbers and match marks.

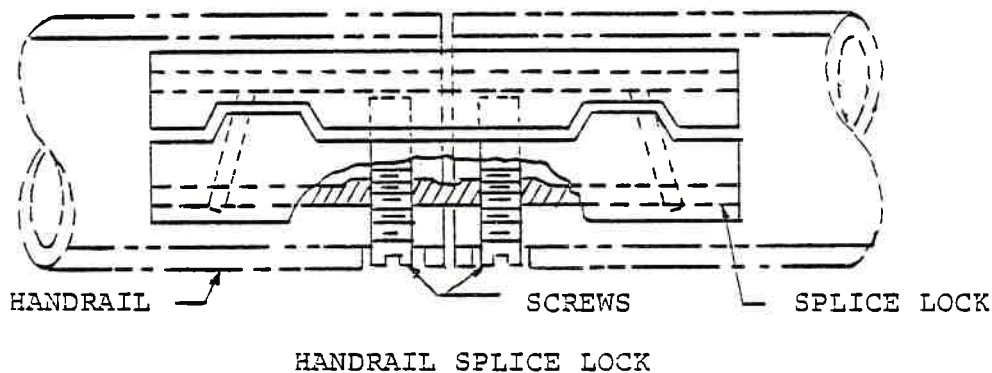
CHECK the floor plates to ensure clearance with all drive unit components.

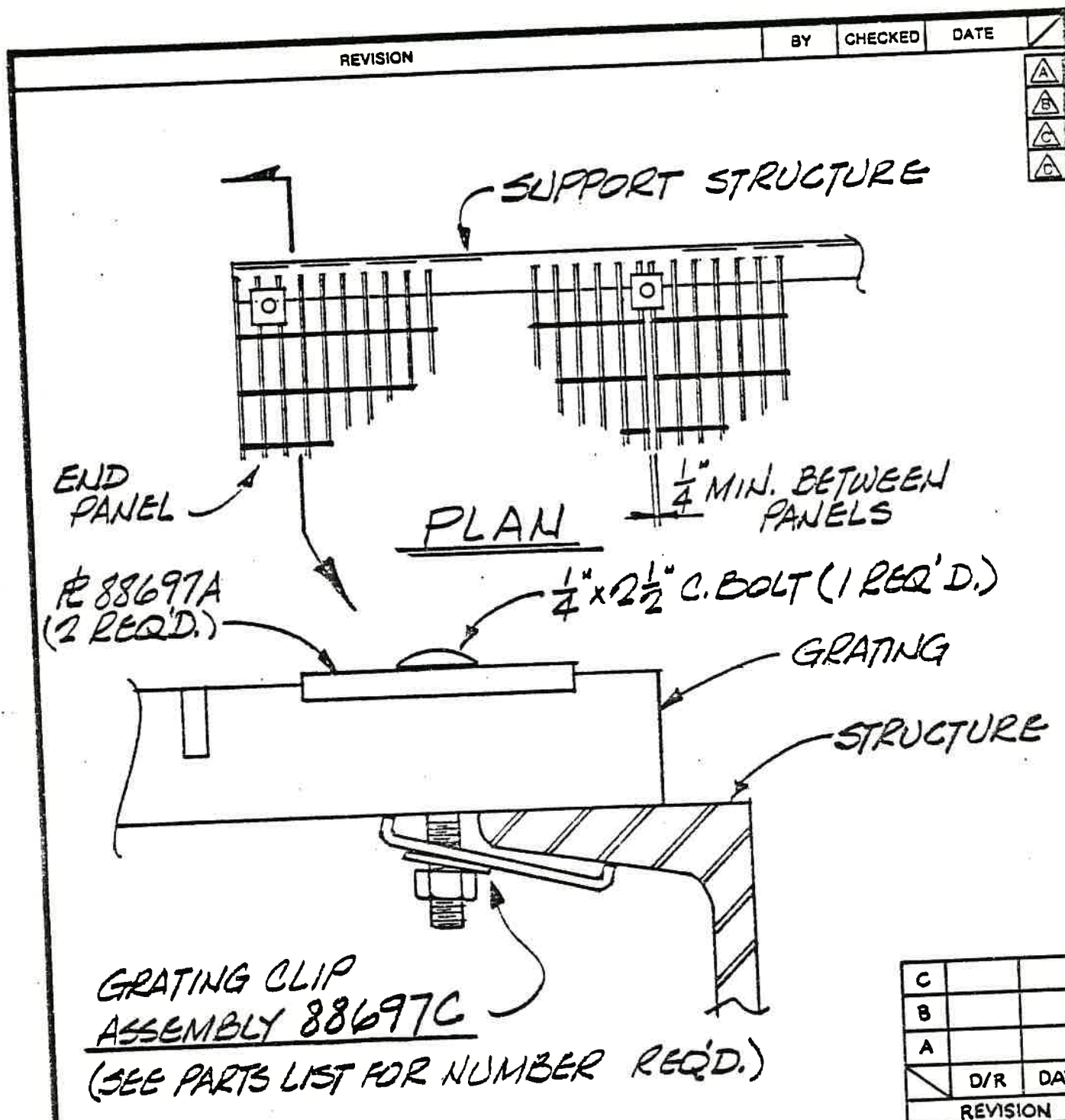
HANDRAIL

1. Install the walkway handrail as shown. If handrail "splice locks" are used, install as follows, referring to the illustration below.
 - a. Remove the screws from the splice lock fitting, then insert the splice lock into one end of the handrail and line up the tapped hole with the matching hole in the handrail. Replace the screw for that side, but do not tighten.
 - b. Slide the mating handrail over the projecting end of the splice lock and replace the second screw.
 - c. Tighten both screws. This causes the lock to expand and grip the inside of the handrail. The screws are always on the underside of the handrail.

NAMEPLATE

Install the Eimco nameplate as shown.





ENVIROTECH 		EIMCO PMD — ENVIROTECH CORPORATION — Salt Lake City, Utah	
DO NOT SCALE PRINTS		This drawing and all information thereon is the property of Eimco PMD and is confidential and must not be made public or copied. This drawing is loaned subject to return upon demand and is not to be used directly or indirectly in any way detrimental to our interests.	
DATE 4-3-84 DRAWN RLA CHECK'D KW APPR. GEN		HOLD FRACTIONAL MACHINED DIMENSIONS TO $\pm 1/64$ "	
GRATING CLIP ASSEMBLY ERECTION		DWG. NO. 88820	REV.



CONNECT THE ELECTRICAL WIRING,
CHECK DRIVE ROTATION AND
THE DRIVE CONTROL

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1. CONNECT ELECTRICAL WIRING

Reference Drawing: Motor Drive Wiring, Drive Control Assembly, Drive Control Wiring and Alarm Wiring, if furnished

Refer to the drawings for connection of the wiring to the gear motor, drive control, and, as furnished, alarm, control panels, torque recorders, etc. Eimco does not furnish, locate or install the interconnecting wiring, control panels, etc. Note that all interconnecting wiring must meet local electrical codes.

2. CHECK DRIVE ROTATION

Reference Drawings: Drive Unit Package

Make sure the gear motor is connected for proper direction of rotation. If it is not, the drive unit warranty will be void and any costs for drive damage will not be accepted by Eimco.

CHECK the gear motor for direction of rotation before it is connected to the drive unit. Refer to the directional "arrows" on the drive cover, chain guards or reference drawing for direction of rotation.

If the gear motor was not shipped installed, the drive sprockets must be aligned as follows, when the gear motor is installed:

Set the driven sprocket on the worm shaft outward 5/16 inch from true alignment. This is necessary since the worm shaft will be displaced inward 5/8 inch under maximum running load. This initial setting, then, will allow for near true alignment with the displacement that occurs under normal running load. Adjust the chain for tension as recommended by the manufacturer.

3. CHECK the drive control for operation.

- a. Start the motor drive.
- b. Remove the cylindrical switch housing, unscrewing it from the base. Then manually actuate the cam switches by turning the cam shaft (and pointer) with the set collar. Slowly turn the pointer through a complete range to 100. This will simulate a mechanism load condition. At the set points the alarm should sound and the drive should stop.
- c. If the drive control does not react correctly, check each switch individually.
- d. If none of the cam switches actuate, as stated above, recheck the wiring to the drive control (not by Eimco). Refer to the wiring diagrams.
- e. If the wiring is correct, check the cams for proper setting and check the cam actuation pin to be sure it is in position and not bent. Contact your Eimco Representative if the problem cannot be determined.



CONNECT THE ELECTRICAL WIRING,
CHECK DRIVE ROTATION AND
THE DRIVE CONTROL

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- f. Replace the switch housing cover, being sure it goes on straight to ensure a tight seal.

Drive Control Caution: The drive control is the overload cut-out device for the drive. Since it is installed and adjusted at the factory for proper operation, do not tamper with it. If the original cam settings are not considered satisfactory for the operating conditions, contact your Eimco Representative before attempting any adjustment.

WARNING: IF THE DRIVE UNIT STOPS DUE TO AN OVERLOAD, DO NOT ATTEMPT TO RESTART THE UNIT UNTIL THE CAUSE OF THE OVERLOAD HAS BEEN LOCATED AND CORRECTED. REFER TO THE "DRIVE MAINTENANCE WARNING" INSTRUCTION IN THIS MANUAL.

Reference Drawing: General Erection

Install the Innerwell Seal

1. Mount the seal ring section (A) in place around the column by clamping it with the take-up brackets and bolts (B). See Figure a.

Do not weld at this time.

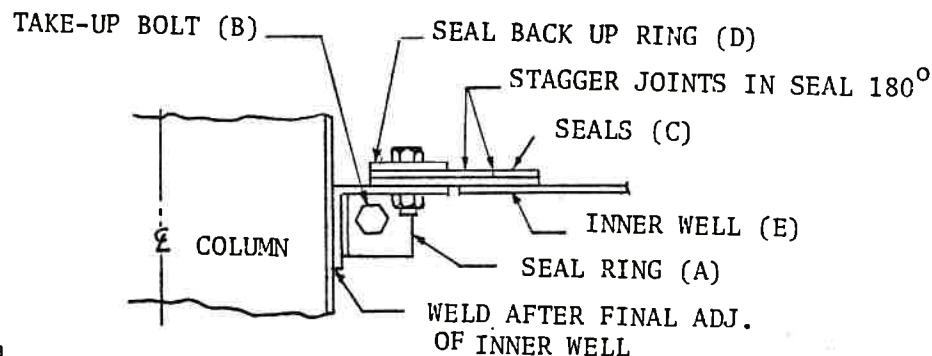


Fig. a

2. CHECK the innerwell (E) for concentricity with the seal ring (A) by rotating the cage. A minimum 1/4" clearance is required all around between the innerwell and seal ring. Note that a gap that rotates as the cage rotates indicates the cage is not plumb.

NOTE: Checking and adjustment must be done when the steel is a uniform temperature, such as the early morning or an overcast day.

3. Adjust the innerwell for concentricity by shimming between the cage connections and the drive on the side with the least clearance and removing shims, if any, on the opposite sides (no shims). See Fig. b. For example, shim at drive corners "W" and remove shims from drive corners "X". Note: Maximum adjustment is 3/8" by shimming.

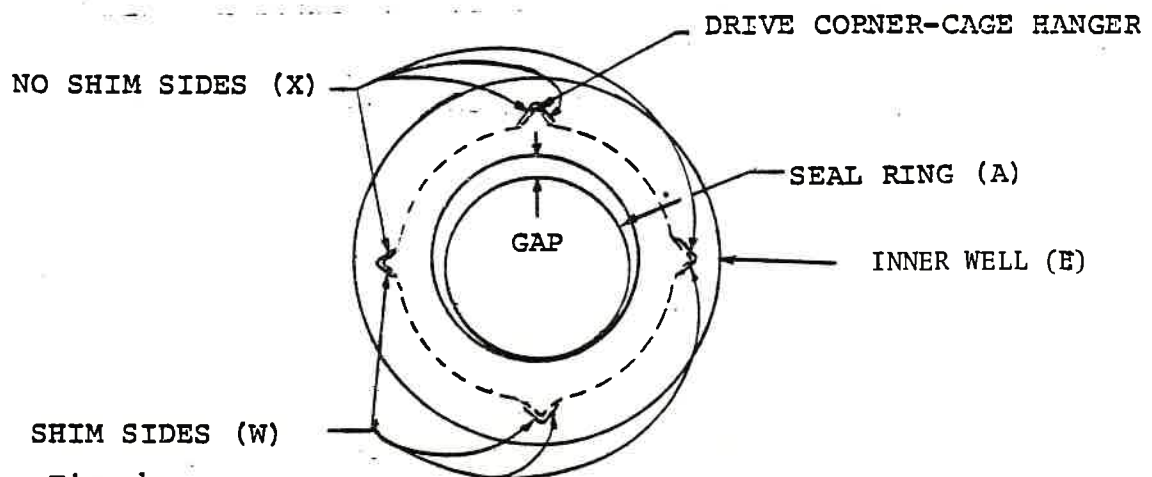
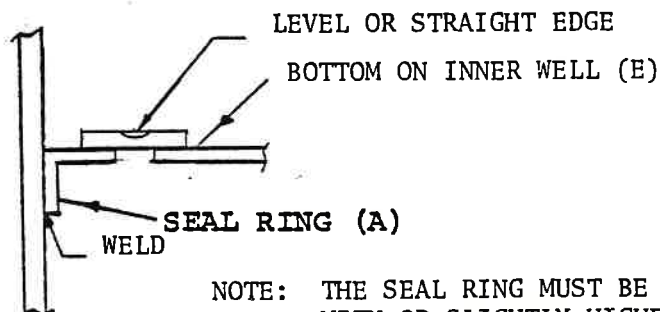


Fig. b

4. CHECK the seal ring (A) for alignment with the bottom of the innerwell (E) using a level or straight edge, as shown in Figure c. The top of the seal ring must be level or slightly higher than the bottom of the innerwell, all around.



NOTE: THE SEAL RING MUST BE LEVEL WITH OR SLIGHTLY HIGHER THAN THE BOTTOM OF THE INNER WELL

Fig. c

5. Adjust the ring (A) for alignment with the bottom of the innerwell, then secure the take-up bolts (B).
6. Seal weld the seal ring (A) to the column as specified on the drawing. Tack and skip weld to prevent warpage. Refer to Figure c. See the Welding Warning.

WELDING WARNING: Do not use the cage, innerwell, or any attachments to them as a ground. This will damage the drive bearing through electrical circuit contact.

7. Assemble the seals (C) with the seal back-up ring (D), being sure to orient the seal with the cuts 180° apart, as shown in Figure d. Mount the seals (C) and back-up ring sections (D) to the seal ring (A). Refer to Figure a.

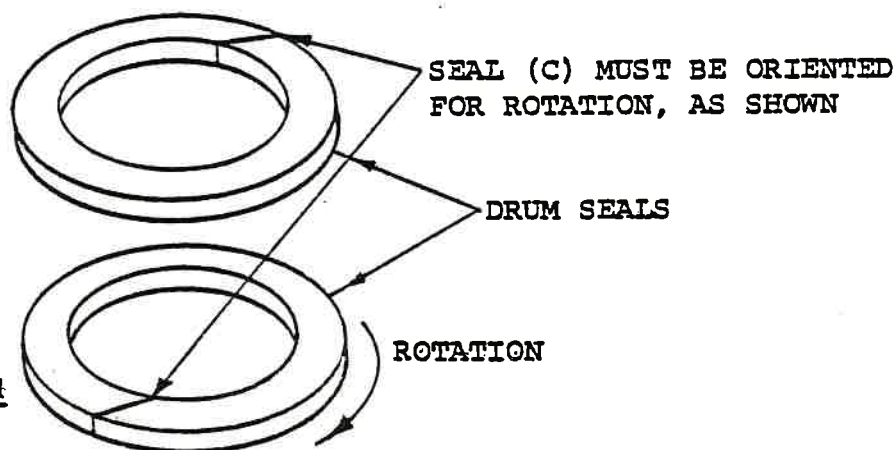


Fig. d



CHECK THE ARMS FOR EQUAL
CLEARANCE WITH THE TANK
BOTTOM

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The arms will be checked at this time for equal clearance with the tank bottom. It is not necessary, at this time, that the arms be set at the specified elevation, but both arms must sweep in the same plane.

1. CHECK the arms for equal setting or clearance with the tank bottom, using a reference device on the tank bottom, such as piles of sand.
2. Adjust the arms for equal sweep by rotating the arms over the reference device and adjusting them as necessary for the same alignment.

When adjusting one arm, always support the opposite arm with blocking. And use jacks to lift the arms. Do not attempt to lift them any other way.



MECHANICAL CHECK

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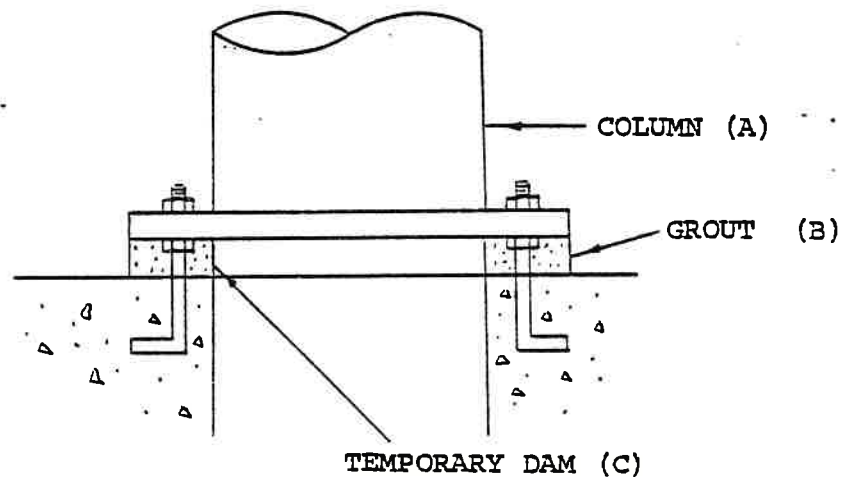
A field mechanical check of the equipment by an Eimco PEC Service Representative may be advisable at this stage in the installation before the tank bottom is grouted.

However, this should be discussed with your Eimco Representative, who will decide if the mechanical check should be made now or at a later date. Refer to the addresses page to contact him.

Arrangements for this service should be made at least two weeks in advance.

Reference Drawings: General Erection, General Arrangement and General Arrangement Details

1. A temporary dam (C) should be constructed around the influent opening to hold back the grout during the grouting of the column, if not already constructed.
2. Grout under the column (A) using a non-shrinking type grout (B). Pack the grout by tamping. (Grout not by Eimco.)



Reference Drawings: General Arrangement and General Arrangement Details (if furnished)

GROUTING RESPONSIBILITY

Eimco is not responsible for grouting the tank, grouting specifications of material, depth or accuracy of placement. Grouting specifications and final approval of the grouted tank are solely the responsibility of the user, or his agent.

This suggested procedure is offered only as a guide to assist those responsible for grouting.

PURPOSE OF GROUTING

Grout is added to a tank bottom to provide a bottom surface with controlled contour variation. Such variation, if not specified on contract documents, is usually intended to be $\pm 1/4"$, and allows setting rake arm blades, via adjustable squeegees, 0 to $1/2"$. Clearance of the adjusted squeegee to local low spots may be allowed up to $3/4"$. The clearances provided herein do not supersede contract documents governing equipment installation.

DETERMINE GROUT ELEVATION

Refer to the reference drawing for the specified elevation of grout. Then, using a surveyor's instrument, mark the elevation on bolts or posts secured to the tank bottom, referring to Fig. a. String a reference line or wire between the posts or bolts, set for the surveyed elevation. This line will be used to set the screed boards for correct grout elevation and slope.

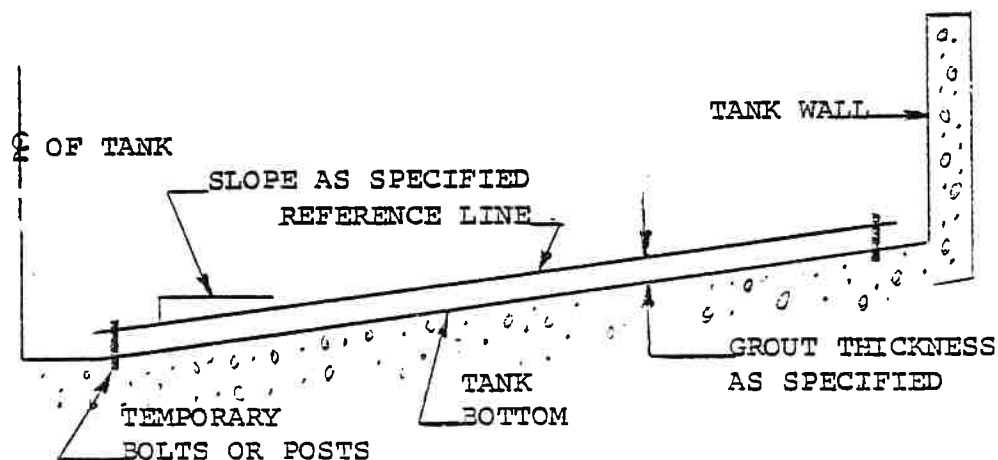


Fig. a

HEAT DISTORTION

Heat distortion, by the sun, can cause the column and arms to distort unevenly during screed board construction or grouting, which will cause an unevenly grouted tank bottom.

Heat distortion of the column can be controlled by mounting sheets of cardboard, styrofoam, etc. to the sides of the cage, or by grouting in the early morning or on an overcast day.

On mechanisms over 50' dia., heat distortion of the arms can also be a problem. It can be controlled by grouting in the late afternoon or on an overcast day, or by covering the arms. But, if the tank must be grouted during the hot part of the day and the arms are not covered, the amount of distortion should be considered.

1. During the early morning hours measure the distance from the bottom of the arm to the tank bottom at the outer end of the arm.
2. Next, during the hottest part of the day, again measure the clearance between the arm and tank bottom at the same point measured in early morning.
3. The difference between these two measurements (1 and 2 above) is the amount of heat distortion that must be considered during grouting. Remember that the arms will distort downward at the tips; so, for example, if grouting is started in early morning and it runs into noon, the outer tips of the arms will sag and cut into the outer circle of grout. For that reason it would be better to start in the afternoon.

Note: During operation, heat distortion is not a problem as both the arms and column are under water and equal temperature.

SCREED BOARD CONSTRUCTION

1. Bolt 2 x 4 boards to each steel blade on one of the arms or both long arms (see note below) with the boards extending about 2 inches in front of the blades, as shown in Fig. b. At the leading edges of the boards, cut the ends parallel with the arm so that the screed board will run parallel to the arm when it is nailed to the boards. Round off the lower edges of the screed board.

Note: Make up a screed board for one arm only when the tank is less than 50 feet diameter and two screed boards for two arms when the tank is 50 feet diameter or larger.

2. Nail a strip of bent sheet metal across the bottom of the 2 x 6 board that will be used for the screed, as shown in Fig. b. Note that the sheet metal for the screeding surface on the bottom must be straight and smooth. Nail only to the sides of the boards.
3. Nail the 2 x 6 screed board to the ends of the 2 x 4 boards. The bottom of the screed board must just touch and run parallel with the reference line. At no point should the grout thickness be less than 1 inch to avoid cracking. (Take note of "Heat Distortion" above.)

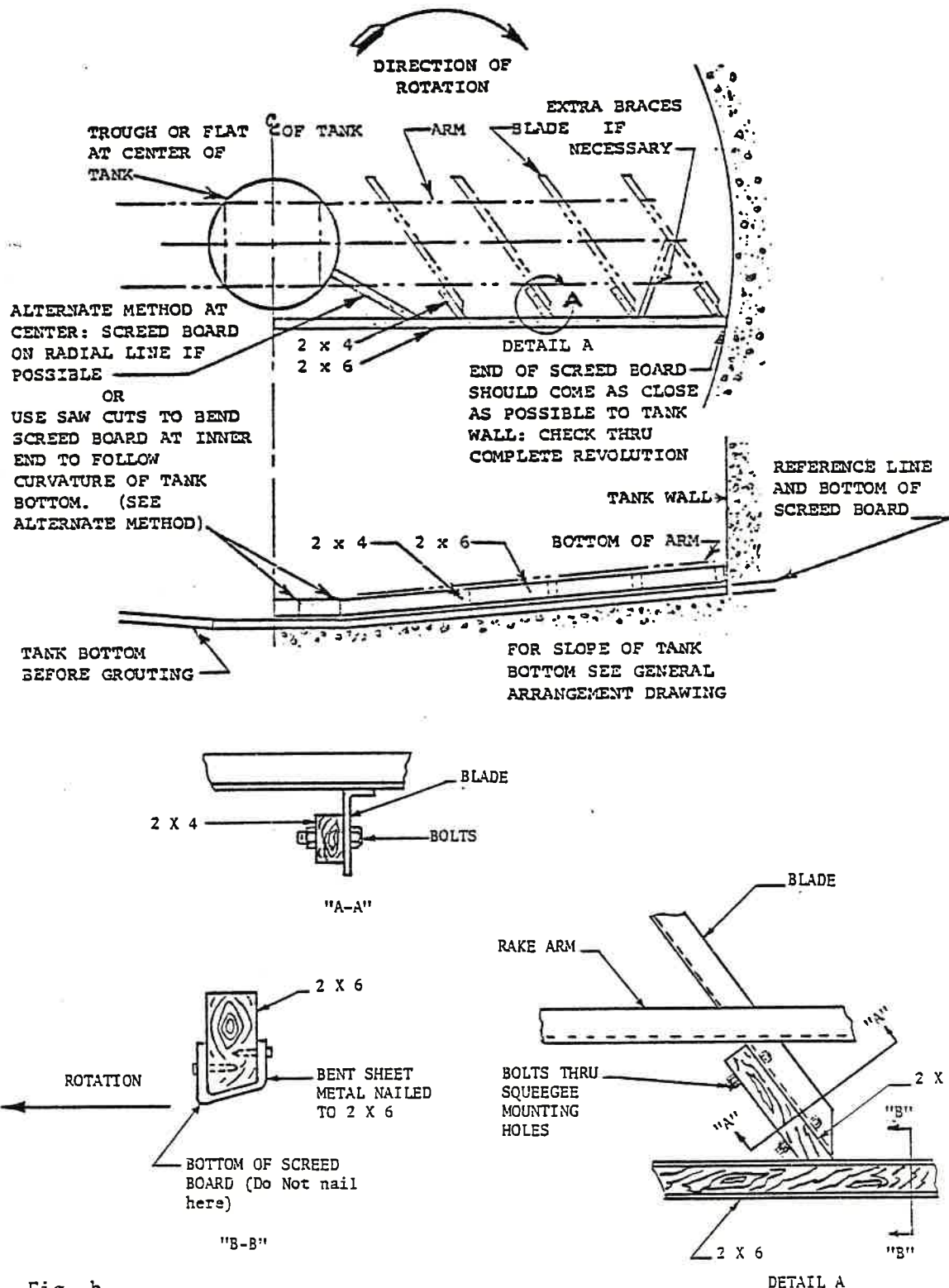


Fig. b

- Note:**
- (a) On tie rod supported arms, place about 50 to 100 lbs. of temporary ballast on the end of each arm to prevent the grouting arm from rising in case of accumulations of grout in front of the screed board.
 - (b) When two rake arms are used for grouting, place piles of sand under the screeds of the first arm, then level the screeds on the second arm according to the heights of the sand piles. This is to ensure that all corresponding screeds are of equal height.

- 4. Since the center of the tank may be flat, sloped or cone shaped, a diagonal or bent inner screed board may be required or it may be grouted by hand. Whether it is grouted flat or sloped, be sure a constant depth of grout not less than 1 inch is maintained.

Prepare a form around the trough or cone, as required, to keep out the grout.

SUGGESTED GROUTING PROCEDURE

WARNING: The drive control (torque indicator) must be connected before starting the grouting. This is a protective device for the drive unit and mechanism. Bypassing it will void the warranty.

- 1. Usually, grout of the following proportions will be satisfactory: 3 parts sand by weight, 1 part cement by weight and clear water, enough to permit reasonable slump for ease of equipment distribution (about the consistency of mortar). Do not use gravel.
- 2. Start a ring of grout which can be worked by a crew, usually 2' wide, (2 rings, one for each arm on units over 50 feet diameter) at the outer edge of the tank. This ring can be gradually widened as it approaches the center of the tank. The grout should not be allowed to build up in front of the screed.

Continue the outer ring in a spiraling pattern, working towards the center of the tank. Cement finishers should work just ahead of the screed arm(s) to be certain the grout is proper thickness to cover the area and to prevent excessive loads accumulating in front of the screed board. Also wet down the concrete floor ahead of the grout to ensure a good bond.

When a load of grout is placed in front of a moving arm, it should be wide enough for the cement finishers to work it at the rate of arm travel. Never stand or put weight on an arm during grouting.

Do not stop the mechanism once grouting has started. Restarting will result in screed jerking and digging in the grout. If an area to be grouted must be missed, return to it later. **DO NOT WAIT.**



SUGGESTED TANK GROUTING PROCEDURE

10-CA1
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3. When grouting is complete, rotate the mechanism 2 to 3 times to pick up any grout that may have sloughed toward the center. If sloughing occurs, it will be necessary to remove the excess and fill in the low areas with fresh grout. Watch for rocks or dried pieces of grout during this procedure, which may catch under the screeds and gouge the surface. The ungrouted area at the center of the tank can be filled in by the cement finishers working from the arms.

Careful grouting should produce a finished bottom that is uniform within a $\pm 1/4$ inch of the specified depth.

4. Remove the screeds after the grout has dried.

Reference Drawings: Skimming Device Assembly, Skimming Mechanism General Erection, General Arrangement and General Erection

1. Place temporary blocking under the rake arms for support.
2. Mount the vertical skimmer support(s) to the rake arm(s), as shown on the drawings, using the clamps. Do not weld at this time.
3. Adjust the skimmer support(s) for position on the rake arm(s) referring to the skimming mechanism erection drawing for dimensions. Adjust the skimmer support for plumb, shimming as required (shims not by Eimco). Then secure the clamps.

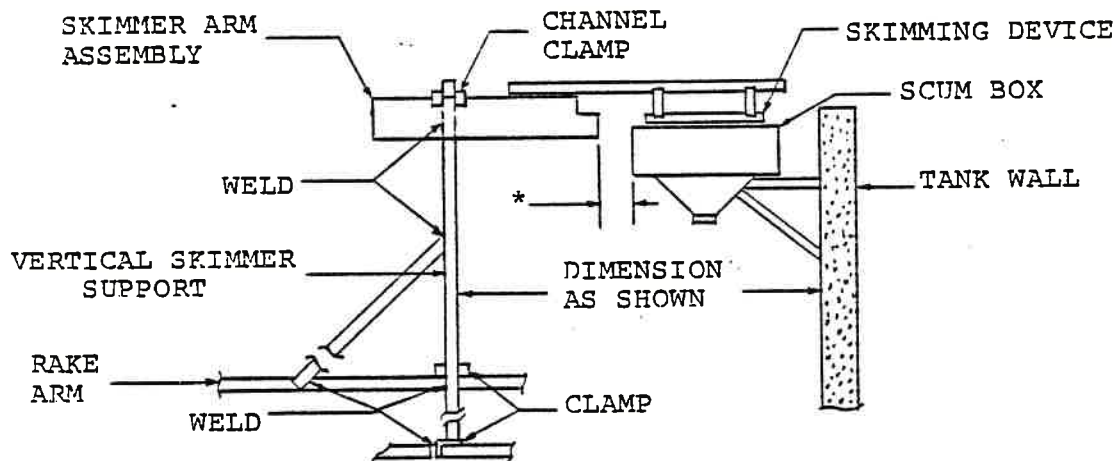


Fig. a

The distance from the scum box to the skimmer (dimension) is approximately 4" $\pm \frac{1}{2}$ ".

4. Mount the skimming device parts to the skimmer arm referring to the assembly drawings.
5. Mount the skimmer arm assembly (with skimmer device) to the vertical skimmer support using the channel clamps. Position the skimming device on the arm so the end wiper is just touching the baffle and so that the bottom wiper is approximately 3" below water level.
6. Weld the skimmer support and clamps to the rake arm, as specified on the drawings. Observe the welding warning.

WELDING WARNING: Do not use the walkway or column as a ground, for this will damage the drive unit bearings due to electrical circuit contact.

7. Then weld the skimmer arm to the vertical support.
8. Install and tension the springs as specified on the skimming device assembly.
9. Install the skimmer blade, positioning it at the outer end of the skimmer arm blade and at the feedwell, as shown in Figure b.
10. Referring to the erection drawings, adjust the skimmer blade for level at the elevation specified and for allowable contact at the feedwell. Weld, as specified, referring to the welding warning.
11. Refer to the Skimmer Arm Assembly Maintenance and Adjustment instructions for complete adjustment and maintenance procedures.

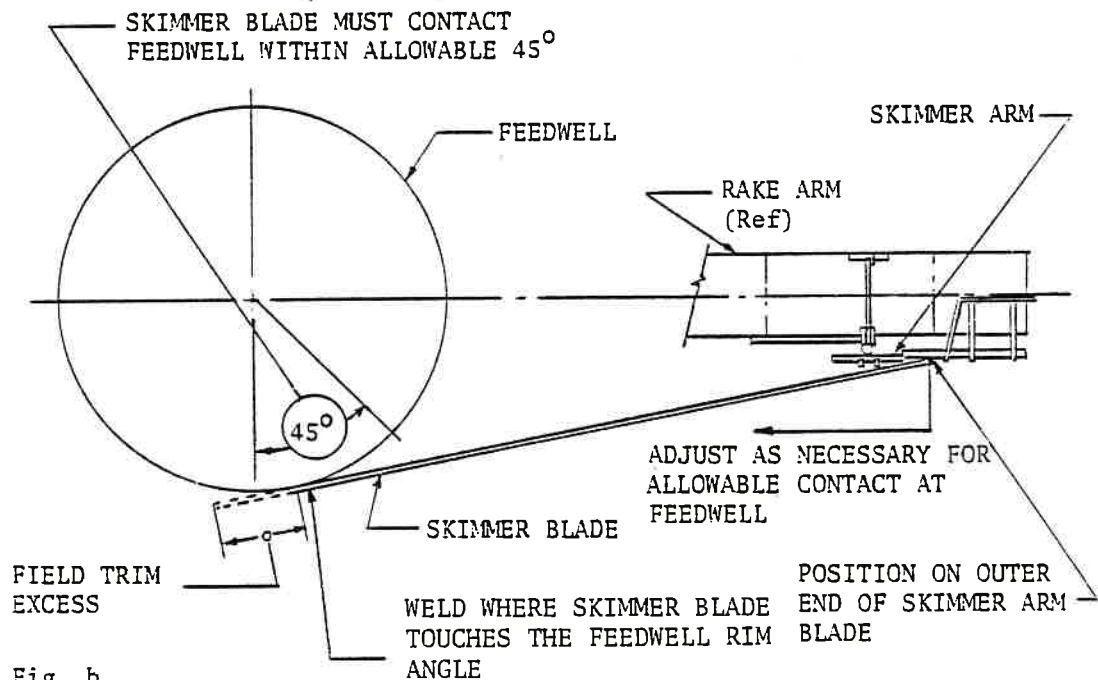


Fig. b



ADJUST THE ARMS

9-CL3
(2/86)a

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Reference Drawings: General Arrangement, General Erection and Rake Arm Erection, if Furnished.

The purpose of this adjustment is to ensure that all arms have proper and equal clearance with the tank bottom so that each arm shares its load, preventing unbalanced loading on the mechanism.

This adjustment must follow the final check for level of the drive unit.

NOTE: Checking and leveling must be done when the steel is a uniform temperature, such as the early morning or an overcast day.

1. CHECK the arm blades for specified clearance with the tank bottom around the center of the mechanism, referring to the General Arrangement drawing. Vertical adjustments are made by raising or lowering the cage by means of the take-up studs and slotted connections between the drive and cage. Use of jacks under the cage for this adjustment is recommended. In this case, recheck the cage for plumb.
2. CHECK that the arm blades sweep at specified clearance with the tank bottom and in the same plane. The checking is done by means of reference devices on the tank floor, such as a pile(s) of sand. Adjust or mark the devices for the required clearance of the arms from the tank floor. (Do this at each "break" in long arms that are supplied in multiple sections and at tips of short arms, if used).
3. Rotate each arm to the place of the checking device and adjust the arm for the required clearance. Use a jack to lift the arms to assist in this adjustment. Add or remove shims equally at both connections as necessary to achieve equal arm level. Block under the opposite arm before the arm is raised or lowered.
4. Secure all arm connections. Install the cage corner braces, if required. Recheck alignment.
5. Weld splices and connections, if specified.

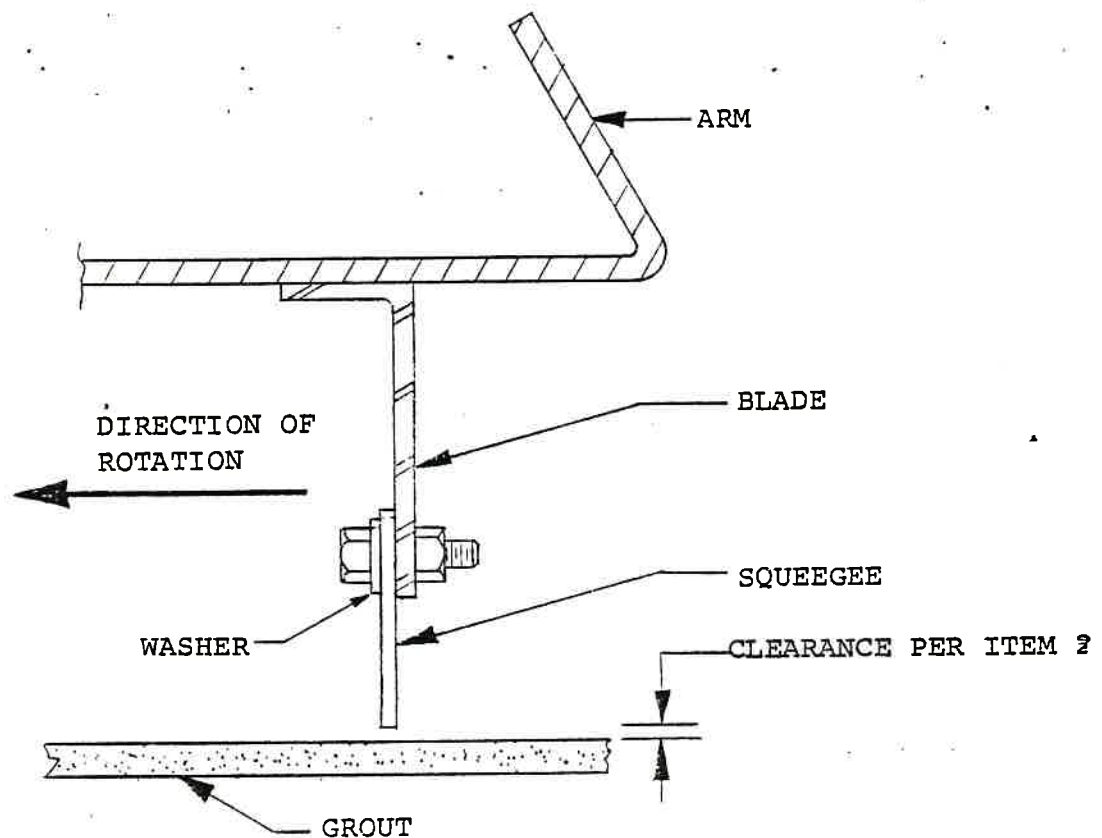
WELDING WARNING: When welding on a rake arm, never use the superstructure or platform as a ground and vice versa. This will damage the drive unit bearings due to electrical circuit contact.

6. Install the pickets (if furnished) referring to the part numbers on the drawings. Refer to the above welding warning.



Reference Drawing: General Erection

1. After the tank has been grouted, install the squeegees, referring to the part numbers in the drawing. The squeegees must be installed on the side of the blade facing the direction of arm rotation, as shown in the illustration below.
2. Adjust each squeegee for minimum clearance with the bottom of the tank: Clearance of the squeegee from the grouted bottom will be from 0 (touching at the highest point in the sweep of the arm) to $\frac{1}{2}$ inch, with possible $\frac{3}{4}$ inch clearance at local low spots. This will be possible if grouting was done properly.
3. Rotate the arms and check clearances.
4. CHECK squeegee clearance around the tank by rotating the arms.





MECHANICAL CHECK

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FINAL MECHANICAL CHECK

A final, field mechanical check of the equipment is required by an Eimco PEC Service Representative at the completion of erection or installation of the equipment. Unless accepted and signed-off by the Service Representative at the completion, the warranty will not be in effect.

Previous inspections will not count towards final acceptance unless a sign-off is obtained in writing from the Service Representative. Also depending on any previous inspections, this final check may be an additional paid service call.

ARRANGEMENTS FOR SERVICE

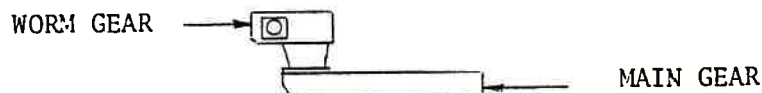
Arrangements for field mechanical check should be made at least two weeks in advance with your Eimco Representative. Refer to the address page to contact him.

DO NOT FILL THE TANK WITH WATER

The mechanical check cannot be done if the tank is filled with water. In this case if the check cannot be performed, an additional paid service day will be charged.

LUBRICATION

The drive is a combination of Eimco manufactured parts and gear motors purchased from others. The lubrication instructions apply only to the Eimco manufactured main drive unit. Refer to Item #5 for new drives only.



PART	METHOD	MINERAL LUBRICANT*	AGMA NO.	SYNTHETIC LUBRICANT*
Worm Gear	Oil Bath	Mobilgear 632	6EP	Mobil SHC630
Main Gear	Oil Bath	Mobilgear 632	6EP	Mobil SHC 630

1. Oil must be kept clean and free of water. Change oil as required. An Eimco oilpac cleaner/conditioner is available for lubricant cleaning during drive operation. See Lubrication Schedule on the next page.

2. Drain condensate from housings once each week and refill with fresh oil to operating level.

Note: The vent opening located in the top screw plug of the sight glass (if used) must be kept clean. If the vent opening is clogged or dirty, the glass will not show the oil level correctly and may not show an oil level at all.

3. CHECK the oil levels weekly, when the drive is stopped, to ensure the oil is maintained at proper levels. Do not overfill with oil, since it will simply overflow the drive. The gears are only partly submerged with oil. Lubrication of the full contact surface of the teeth is accomplished by the pumping action of the meshing teeth. See "Note" above.

4. For lubrication of the gear motor, or other drive equipment, refer to the manufacturer's instruction at the end of this manual if furnished by Eimco.

5. New drives only - After the drive has been installed and leveled, the sight glass casings on both the worm and gear housings must be notched to show proper oil level. Proper oil level is shown on the Drive Assembly drawing.

Note: The Drive Assembly drawing may show sight glass notching as a shop procedure, but since it cannot be done accurately until the drive is level, the notching should be done in the field. If the sight glasses were notched in the shop, the notch marks should be rechecked and, if necessary, remarked after the drive has been final leveled.

*Although Mobil products are specified, any equivalent product can be used. Refer to the equivalent list in this manual.

LUBRICATION SCHEDULE

<u>Item</u>	<u>Manufacturer's Recommendations</u>	<u>Type Lubricant</u>	<u>Frequency</u>
Drive Unit Worm & Main Gear	Check oil level and add oil as necessary	Mobilgear 632	Weekly
	Change oil as necessary	Mobilgear 632	Oil must be kept clean. Replace as required
Drive chain	Lubricate	Mobilplex #47	Monthly
Gearmotor	"Check oil level and add oil as necessary	AGMA 5EP Oil	As required. Refill often enough to maintain proper level

DRIVE OIL QUANTITIES IN U.S. GALLONS

<u>MODEL</u>	<u>WORM GEAR</u>	<u>MAIN GEAR</u>
B33	1 $\frac{1}{4}$	1 $\frac{3}{4}$
B-40	3	2 $\frac{1}{2}$
B-50	3	3 $\frac{1}{2}$
C-30	1 $\frac{1}{4}$	1 $\frac{1}{4}$
C-30LT	$\frac{1}{2}$	4 $\frac{1}{4}$
→ C-30HT	$\frac{1}{2}$	4 $\frac{1}{4}$
C-40	3	2 $\frac{1}{2}$
C-40LT	3	7
C-40HT	3	7
C-54	3	3 $\frac{1}{4}$
C-54B2	3 (has 2 worm gears)	3 $\frac{1}{4}$
C-54HT	3	11 $\frac{1}{2}$
C60HT	3	17
C-60R	3	18
C-72	3	6
C-80	3 $\frac{1}{2}$	10 $\frac{1}{2}$

LUBRICANT EQUIVALENTS LIST

MANUFACTURER	GREASE	OIL							
		AGMA EQUIVALENT NUMBER/VISCOSITY CST AT 40°C							
		2EP/ISO 68	4EP/ISO 150	5EP/ISO 220	6EP/ISO 320	7EP/ISO 460	8EP/ISO 680		
PETROLEUM BASED	NLGI No. 1	COMPOUND AA #	COMPOUND BB #	COMPOUND CC #	COMPOUND DD #	COMPOUND FF #	COMPOUND GG #		
	MOBIL EP	MOBILPLEX #10 MOBILPLEX 47 MOBILUX EP1							
	MOBIL	MOBILUX 1 or MOBILITH 21	MOBILGEAR 629	MOBILGEAR 630	MOBILGEAR 632	MOBILGEAR 634	MOBILGEAR 636		
	AMOCO	RYKON #1 AMDEX #1	PERMAGEAR EP #150	PERMAGEAR EP #220	PERMAGEAR EP #320	PERMAGEAR EP #460	PERMAGEAR EP #680		
	EXXON	NEBURA EP-1	SPARTAN EP 150	SPARTAN EP 220	SPARTAN EP 320	SPARTAN EP 460	SPARTAN EP 680		
	GULF OIL	HIGH TEMPERATURE GREASE	EP LUBRICANT H.D. 150	EP LUBRICANT H.D. 220	EP LUBRICANT H.D. 320	EP LUBRICANT H.D. 460	EP LUBRICANT H.D. 680		
	IMPERIAL OIL & GREASE	MOLUB-ALLOY NLGI EP #1 or 777-1	MOLUB-ALLOY #814 EP	MOLUB-ALLOY #90 EP	MOLUB-ALLOY #690 EP	MOLUB-ALLOY #140 EP	MOLUB-ALLOY #910		
	TEXACO	MULTIPAK EP1	MEROPA 150	MEROPA 220	MEROPA 320	MEROPA 460	MEROPA 680		
	PHILLIPS PET	Philube 1EP	Philube APGO 8QW	Philube APGO 85W-90	-----	Philube ARGO 140	-----		
	SHELL	DARINA EP #1	OMALA 150	OMALA 220	OMALA 320	OMALA 460	OMALA 680		
SYNTHETIC	STANDARD OF CALIFORNIA CHEVRON USA	RPM MULTIMOTIVE #1	CHEVRON GEAR COMPOUND NL150	CHEVRON GEAR COMPOUND NL220	CHEVRON GEAR COMPOUND NL320	CHEVRON GEAR COMPOUND NL460	CHEVRON GEAR COMPOUND NL690		
	SUN OIL	SUNAPLEX 1 EP	-----	SUNEP 1070	SUNEP 1090	SUNEP 1130	SUNEP 1150		
	KEYSTONE	81 EP X LT	WG-3	WG-2	WG-1	WG-A	None		
	MOBIL	None	SHC 630 (Synthesized (Hydrocarbon))			None	None		
	KEYSTONE	None	KSL 366 (Diester)			None	None		

(1) Mobilplex No. 47 is an NLGI No. 2 grease, but can be used in Einco equipment as a NLGI 1 substitute

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MAINTENANCE AND OPERATION WARNING

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(6/86)

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WARNING:

USE EXTREME CARE WHEN WORKING AROUND ROTATING OR OTHER MOVING PARTS, TO PREVENT INJURIES TO YOURSELF OR OTHERS. ALSO, ANYONE ENTERING THE AREA OF THIS EQUIPMENT MUST BE WEARING ADEQUATE SAFETY EQUIPMENT SUCH AS SAFETY GLASSES, SAFETY SHOES, HARD HAT, ETC.

WARNING:

Keep foreign objects, hands, etc. away from moving parts (belts, sheaves). Never operate equipment if guards have been removed.

WARNING:

Lock out power from electrical equipment using a manual breaker or disconnect switch before starting any work or maintenance on the equipment. Lock and tag disconnect switch so it cannot be closed.

Warnings and Cautions are included throughout this manual. These warnings and cautions must be read and understood by those installing, maintaining or operating this equipment.



PRE-START-UP CHECK
AND
MAINTENANCE OUTLINE

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CHECK POINTS BEFORE START-UP

NOTE: The drive and mechanism must be level and checked by an authorized Eimco Representative before start-up.

1. Remove any foreign matter from inside the tank.
2. CHECK the oil levels in the main drive. Refer to Lubrication Instructions.
3. Make sure the drive control was checked for proper operation referring to "The Drive Control" instructions under drive maintenance.
4. Rotate the arms for at least 4 or 5 revolutions. Watch for clearance of the arms with the tank bottom and for proper operation of the skimmer (if furnished) at the scum box. Check for loose parts, bolts and nuts. Observe from outside the tank.

MAINTENANCE CHECK LIST

Weekly:

1. CHECK oil levels at each main drive housing. Refer to the Lubrication Instructions. Check the motor drives referring to the manufacturer's instructions.
2. Watch the scum skimmer, if furnished, to be sure it is working efficiently and adjusted for smooth operation over the scum box. Check wipers and hinges for proper operation. Refer to the Skimmer Maintenance Instructions.
3. Keep the drive platform and walkway clean and free of oil, debris and tools. Make sure all cover guards are in place.

Monthly:

1. Check the drive control referring to the Drive Maintenance Instructions following this maintenance outline.
2. Drain condensate from each housing once a month to prevent water accumulation in the lower bearings. Check all vent holes to be sure they are clean.
3. Change oil in the main drive every 6 months, if specified. Refer to the Lubrication Instructions.
4. Replace leaking worm shaft oil seals when the oil is changed.
5. CHECK for movement at the connection between the cage and main gear on column mounted drives only.
6. CHECK for loose bolts and nuts.



PRE-START-UP CHECK
AND
MAINTENANCE OUTLINE

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Yearly:

If possible, shutdown the mechanism at least once a year and thoroughly inspect and maintain it, as necessary.

1. Clean the tank and mechanism for a thorough inspection. Remove grease, algae and other matter at water level.
2. Remove rust spots and paint or cover as required. In some cases badly corroded steel should be replaced. (Be sure to support members before removal of any structural member.)
3. CHECK the flexible connectors on the scum box discharge pipe, if furnished.
4. CHECK connections between the cage and main gear and between the arms and cage on column mounted drives only.
5. CHECK for loose bolts and nuts and broken welds.
6. CHECK the squeegees, if furnished, for damage and wear and replace them as necessary.
7. Refer to the manufacturer's instructions for maintenance of motor drives and gear reducers.
8. Remove the worm gear cover and inspect the worm and gear for wear. In case of oil loss from an upper drive housing to a lower drive housing, internal seals may need replacement. This should be done and the other gears and bearings inspected during a shutdown period.

CHECK DRIVE ROTATION

Reference Drawing: Drive Unit Package (Drive and Motor Package)

CHECK a new gear motor for direction of rotation before the drive chain is installed. Refer to the directional "arrow" on the drive cover, chain guard or reference drawing for direction of rotation.

If the drive unit is not turning proper direction of rotation, the drive unit warranty will be void and Eimco will not accept costs for drive damage.

ADJUST THE CHAINS

Since the worm shaft will be displaced inward under load, the drive sprocket on the worm shaft should be offset $5/16$ " from true alignment, as shown in Fig. a. This initial setting, then, will allow for near true alignment with the displacement that occurs under normal running load. Adjust the chain for tension as recommended by the manufacturer. Refer to the reference drawing for correct setting of the driven sprocket.

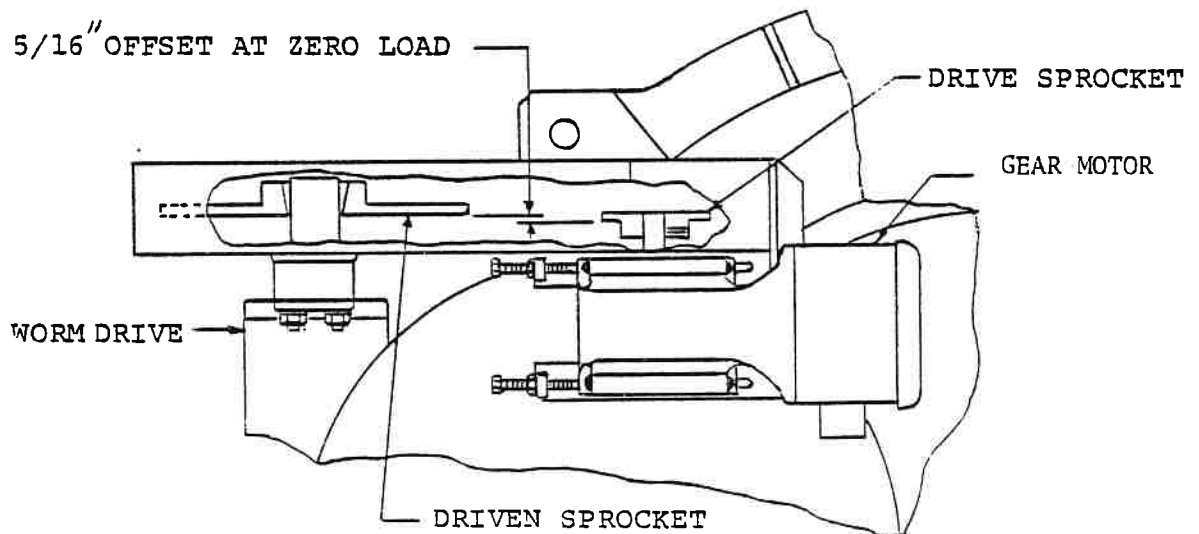


Fig. a

THE DRIVE UNIT

These drive units consist of a main gear on the bottom which is the main driving unit for the rake arms and a worm assembly on top that drives the main gear with a pinion.

The worm gear drive is designed with a worm shaft that moves axially under loaded conditions of the drive unit. This movement is made possible by a thrust bearing with a sliding bearing seat arrangement on the loaded side of the worm.

The sliding bearing seat is held in place by a spring, and the compression of that spring, when the drive is under load, indicates the torque on the drive unit. When the spring compresses, its movement is transmitted by the movement of the bearing seat against an actuating pin screwed into the drive control actuator pointer. (The spring is calibrated for load at the factory.)

THE DRIVE CONTROL

The drive control, which mounts to the worm housing, protects the drive unit and mechanism in case of overload, such as an excessive solids load on the rake arms.

Basically the drive control consists of the actuating pin in the actuator pointer, the scale, a cam shaft and cams and switches. The actuating pin, which connects to the sliding bearing seat in the worm drive assembly, rotates the actuator pointer which rotates the cam shaft, as the sliding seat moves when load is applied to the mechanism.

The cams rotate with the cam shaft and they actuate the switches at various load settings as they rotate. At the same time, the amount of torque on the drive is shown by the pointer on the scale which is graduated into percents from 0 to 100.

CHECK THE DRIVE CONTROL once a year for condition and operation, as follows below:

- Note:** In areas with wide variations in temperature, at first check the drive control once a month for condensation and for operation until a reasonable inspection frequency can be determined.
- a. Start the gear motor drive.
 - b. Remove the cylindrical switch housing, unscrewing it from the base. Then manually actuate the cam switches by turning the cam shaft (and pointer) with the set collar. Slowly turn the pointer through a complete range to 100. This will simulate a mechanism load condition. At the set points the alarm should sound and the drive should stop.
 - c. If the drive control does not react correctly, check each switch individually.



- d. If none of the cam switches actuate, as stated above, recheck the wiring to the drive control (not by Eimco). Refer to the wiring diagrams.
- e. If the wiring is correct, check the cams for proper setting and check the actuation pin to be sure it is in position and not bent. Contact your Eimco Representative if the problem cannot be determined.
- f. Replace the switch housing cover, being sure it goes on straight to ensure a tight seal.

Drive Control Caution: The drive control is the overload cut-out device for the drive. Since it is installed and adjusted at the factory for proper operation, do not tamper with it. If the original cam settings are not considered satisfactory for the operating conditions, contact your Eimco Representative before attempting any adjustment.

WARNING: IF THE DRIVE UNIT STOPS DUE TO AN OVERLOAD DO NOT ATTEMPT TO RESTART THE UNIT UNTIL THE CAUSE OF THE OVERLOAD HAS BEEN LOCATED AND CORRECTED. REFER TO THE "DRIVE MAINTENANCE WARNING" INSTRUCTION IN THIS MANUAL.

ELECTRICAL EQUIPMENT AND ENCLOSURES

Electrical enclosures for the motor, control panels, etc. are listed on the drawings and Eimco Parts List, if those items are furnished by Eimco.

If any electrical equipment, including motors, is to be replaced, it must be of equal or better rating. Refer to the latest edition of the NEMA ICS (National Electrical Manufacturer's Association Industrial Control Standards) and NEMA MG 1 (N.E.M.A. Motors and Generators) for a description of those enclosure designations.



This warning plate on the drive unit has an important purpose!
It is there to warn you of possible danger before you service the drive.
This is the. . .

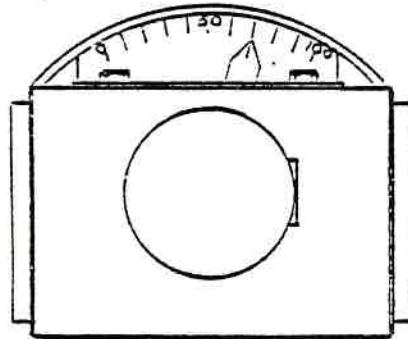
... DRIVE HIGH TORQUE SHUTDOWN WARNING

When a raking mechanism drive shuts down due to high torque load, it may likely have stored spring force energy. This energy can be dangerous to those who service the drive unit in returning it to operation, if the energy is not relieved in a safe way.

The stored energy is most likely in two areas: (1) the torque control spring which is located in the worm drive housing and (2) the elastic deformation of the rake arms and rake cage, which is caused by the torsional load.

How to check for stored energy:

Check the drive control. If the arrow indicates any torque above zero "0" as illustrated in Figure a, next page, it has stored energy. That is dangerous and must be relieved as covered on the next page.



DRIVE CONTROL (right hand shown)
This illustrates stored energy in the amount of 70%.

Fig. a

How to relieve stored energy:

The only safe way to relieve stored energy is to use the motor to reverse the drive unit. Other methods are hazardous.

Reversing the motor will require temporary alteration of the wiring so the motor can be jogged in reverse:

1. Exchange two of the motor leads.

Note: The customer is responsible for altering his own plant wiring.

2. Close the torque control circuit.
3. Disconnect the "hold-in" circuit in the motor starter so that only jogging can be done.
4. The push button used for jogging should be located where the operator can watch the drive control.
5. Actual reversing of the motor should be done in jogs of only 1 second duration, to avoid drive damage. Watch the drive control indicator movement and progress towards relaxing the stored energy. Discontinue reverse jogging immediately when the Drive Control indicates zero torque, since a drive can damage itself and other components when it is running in reverse without torque control protection.
6. Restore wiring to its previous condition after energy release.

DANGEROUS METHODS to relieve stored energy

DO NOT attempt to reverse the drive unit to relieve stored energy by pulling the chain backwards, or, disconnecting the roller chain, as shown in Fig. b. The worm shaft may spin suddenly, pulling in fingers and hands, or if a wrench or pry bar is used, it may be ejected violently.

DO NOT disassemble a drive unit while there is stored energy, as shown in Fig. c. Parts of it may release suddenly, when some of the fasteners are loosened, causing serious injuries and machine damage. This danger is greatest at the worm drive end cap where the spring is housed, which can burst away from the worm housing if the fasteners are unscrewed.

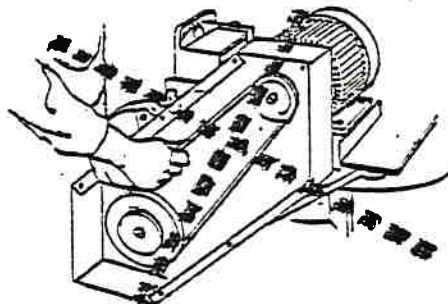


Fig. b - DO NOT

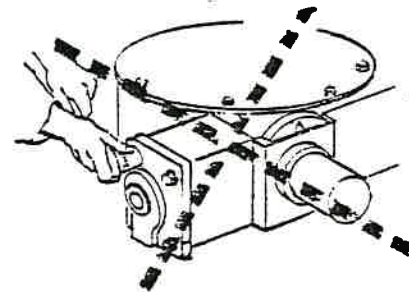
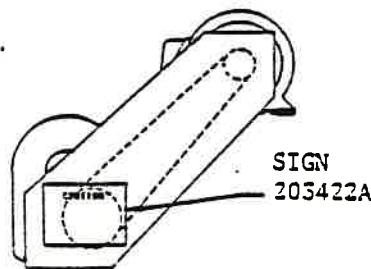


Fig. c - DO NOT

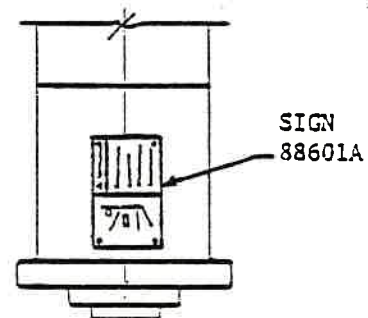
SAFETY SIGNS

Two signs are installed on the drive unit to warn personnel in safe practices: (1) "Caution" sign 203422A on chain guards cautions the personnel to follow the manufacturer's instructions. And, the (2) "Warning" sign 88601A on the torque control spring end cap (shown previously) warns about relieving the spring energy before attempting to remove the end cap.



CAUTION SIGN INSTALLATION

Typical for chain guard



WARNING SIGN INSTALLATION

Most common end cap style shown



DRIVE UNIT AND MAIN GEAR
DISASSEMBLY AND REASSEMBLY

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No special tools are required for maintenance or repair of this equipment.

Reference Drawing: Drive Assembly Drawing

WARNING: CHECK THE DRIVE FOR TORQUE, REFERRING TO THE PRECEDING "DRIVE MAINTENANCE WARNING" BEFORE STARTING DISASSEMBLY. ALSO MAKE SURE THE POWER TO THE DRIVE HAS BEEN DISCONNECTED OR BLOCKED OUT TO PREVENT THE DRIVE FROM BEING ACCIDENTALLY STARTED.

1. Disconnect or block out all electrical power to the drive.
2. Support the rake arms in position on blocking. If the unit has a scum skimmer, additional support must be used to keep it upright. Disconnect the arms from the cage.

SUCTION CLARIFIERS ONLY: Disconnect all suction piping at the elbows prior to lowering the cage.

3. Disconnect the cage from the drive unit and lower the cage to the tank bottom.
4. Remove the walkway. Retain the slide plates and mounting plates, if furnished, and match mark for return to original positions.

A. DISASSEMBLY OF THE MAIN GEAR

The drive base must not be removed from the column during the disassembly of the drive.

1. Remove the worm gear assembly, referring to the worm gear disassembly and reassembly instructions.
2. Remove the main gear cover.

NOTE: Some drive units use a seal that is held around the main gear cover with a clamp. If used, remove the seal and clamp. Reinstall the seal after the drive has been reassembled.

3. Remove the main gear from the drive base, using lifting bolts (not by Eimco) at each of the four (4) cage take-up stud mounting holes on the gear.

NOTE: Do not remove the drive base from the column.

4. Place the main gear on blocking, upside down, allowing adequate room for inspection of the main gear teeth and bearing strips.



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B. INSPECTION

1. Inspect the teeth of the main gear for the following:
 - a. **ABRASIVE WEAR:** The wear on the teeth will show at random spacing across the teeth. This is normally caused by dirt or other foreign material in the lube oil.
 - b. **SCORING:** This is shown by vertical scratches and/or grooves running from the pitch line (approx. center of tooth) to the top of the tooth. It can result from improper lubrication or abrasive materials in the lubricant.
 - c. **PITTING:** It is evident in large or numerous pits in the gear teeth. Note that small pits may occur during run-in of a new gear, but these will smooth out as the gear wears in. It is caused by overload on gear, poor lubrication or improper lubricant.
 - d. **GALLING:** This condition appears on the gear teeth as numerous deep grooves or gouges and it is caused by overload of the gear for the lubricant used.
 - e. **NORMAL WEAR:** Eventually all gears wear out due to long use and/or prolonged overload. Replacement should be considered based on the condition of the gearing and extent of the wear.
2. Replace the gear, as necessary, depending on the severity and extent of these conditions.
3. Clean the bearing balls and strips with solvent or kerosene and coat them with light oil.
4. Carefully inspect all bearing balls for pitting or scoring. Check the balls for uneven wear, using a micrometer. Refer to the Parts List for specified ball diameter.
5. Inspect the bearing strips on the main gear and drive base for wear and pitting and replace, if necessary. Refer to the bearing strip replacement instructions on a following page.

C. BEARING STRIP REPLACEMENT

NOTE: All bearing strips on the main gear and the drive base should be replaced at the same time. The following procedure covers installation of a bearing strip on the main gear, but is typical for all four (4) bearing strips on the drive unit.

1. Place the main gear upside down on blocking for access to the bearing strips. See Figure a.
2. Using the strip removal slot, carefully pry one end of the bearing strip out of the mounting groove. Then, starting at the free end of the strip, pull the rest of the bearing strip out of the mounting groove.

CAUTION: CARE MUST BE TAKEN TO AVOID DAMAGING THE MOUNTING GROOVE.

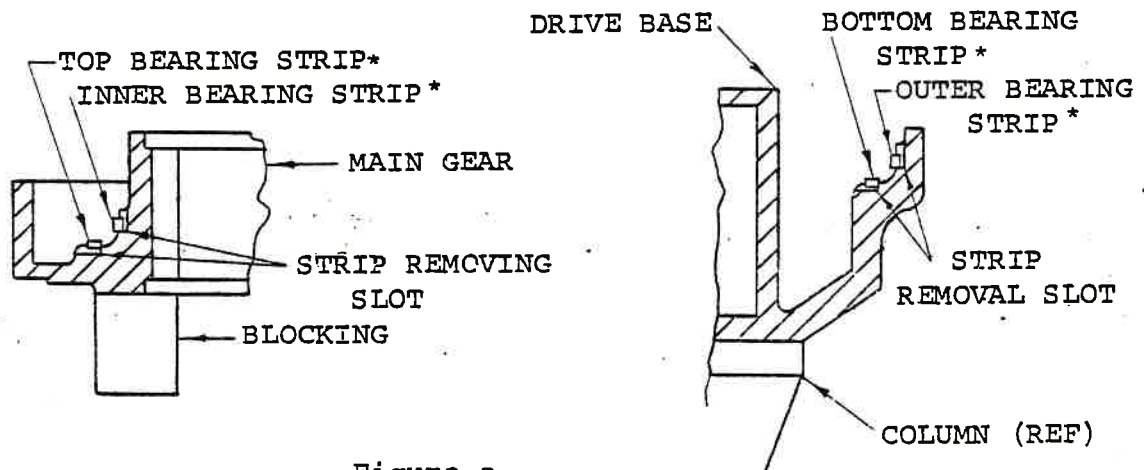
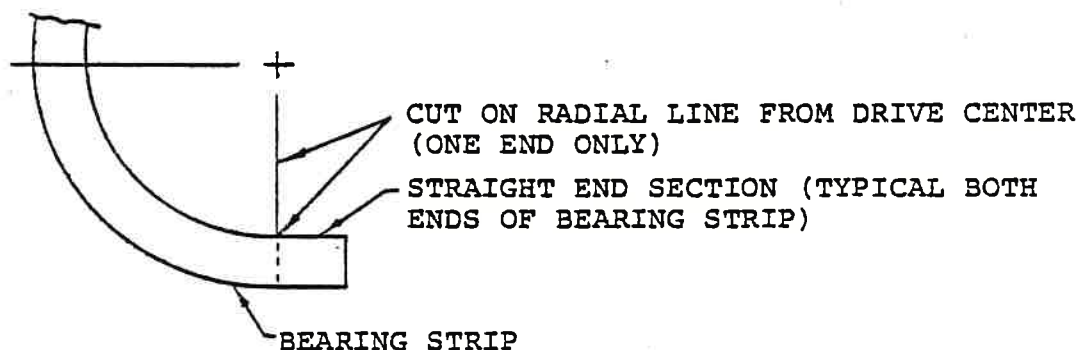


Figure a

* Polished surface faces out

3. Clean the mounting groove with solvent and blow dry.
4. Trim off one straight end section of bearing strip only, as shown in Figure b. The cut should be made on a radial line from the drive center to provide the proper angle at the joint. Note that the polished surface of the new strip will be facing out.

CAUTION: DO NOT USE A CUTTING TORCH TO TRIM THE BEARING STRIP.

Figure b

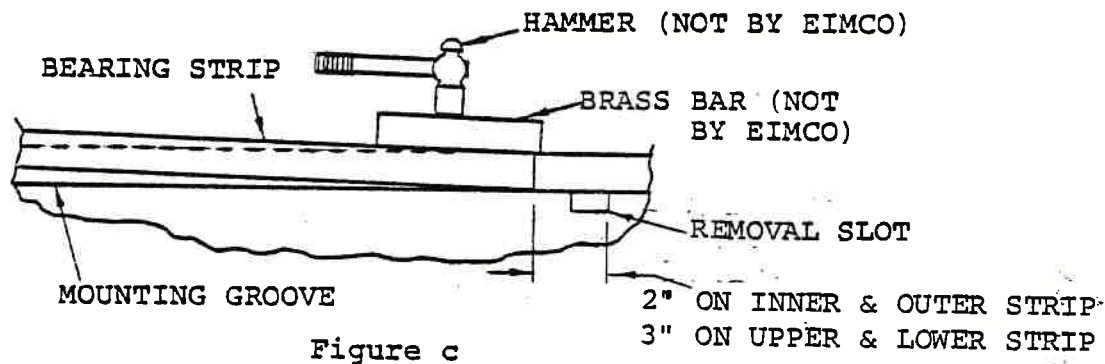
Note: Polished surface of the bearing strip must face out.

5. Start the trimmed end of the bearing strip (polished surface facing out) into the mounting groove approximately 2" away from the removal slot on the inner and outer strips and 3" away from the removal slot on the upper and lower strips. Use a brass bar (not by Eimco) and hammer, as shown in Figure c.

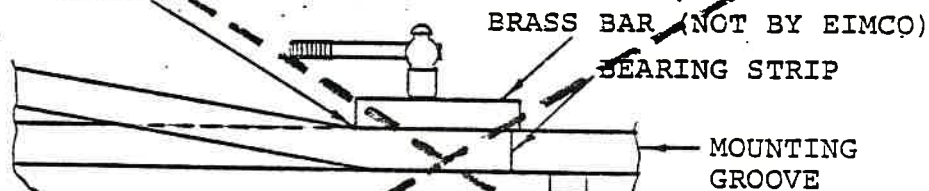
CAUTION: DO NOT HAMMER DIRECTLY ON THE BEARING STRIP;
AS THIS WILL DAMAGE THE SURFACE OF THE STRIP.

6. Work the bearing strip gradually down into the groove, while working around the strip. Take care to avoid gouging metal off the drive base or main gear into the mounting groove, as this will prevent the bearing strip from seating in the groove.

NOTE: The bearing strip must be worked gradually into the groove all around the circumference of the strip. Force seating the bearing strip, as shown in Figure d, will bend or deform the strip, making it impossible to properly seat the bearing strip in the mounting groove.



FORCE SEATING WILL BEND OR
DEFORM BEARING STRIP



INCORRECT
WORK BEARING STRIP IN GRADUALLY.
DO NOT FORCE SEATING OF BEARING STRIP.

Figure d

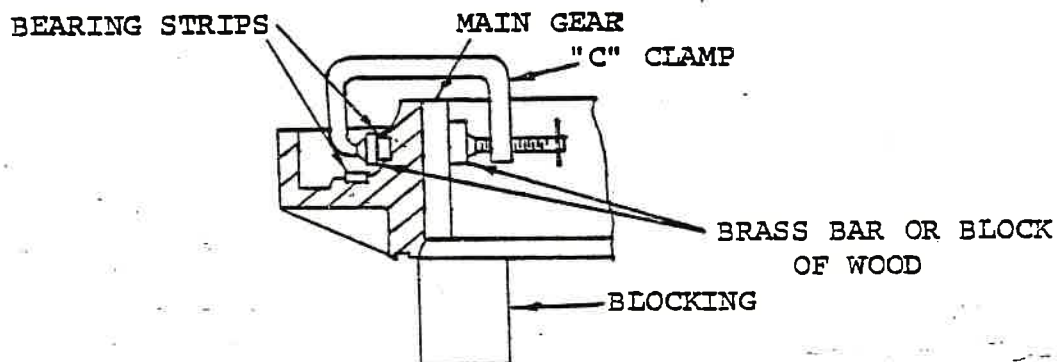


Figure e



7. Referring to Figure f, mark and field trim the trailing end of the bearing strip where it overlaps the leading end.

CAUTION: DO NOT USE A CUTTING TORCH TO TRIM THE BEARING STRIP.

8. Check to be sure the mounting groove is free of all metal particles and debris, then finish seating the bearing strip in the mounting groove. Care must be taken to obtain a clean, tight joint. The ends of the bearing strip must butt together with a maximum $1/32$ " gap between the ends. See Figure g.

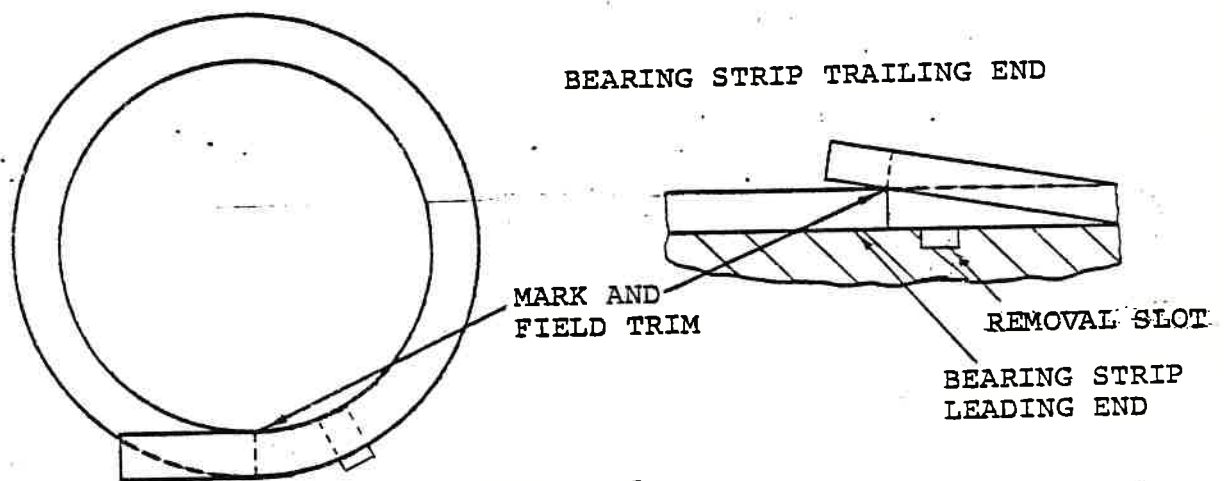


Figure f

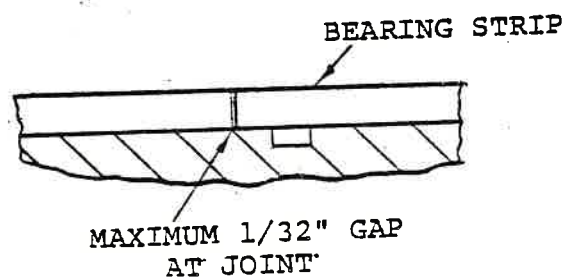


Figure g



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DISASSEMBLY AND REASSEMBLY

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9. Check to be sure the bearing strip is completely seated all around.
10. After the strips are installed, polish the bearing surfaces on the strips to 32 RMS finish. Use a 120 Emery cloth for polishing.

D. REASSEMBLY OF THE MAIN GEAR

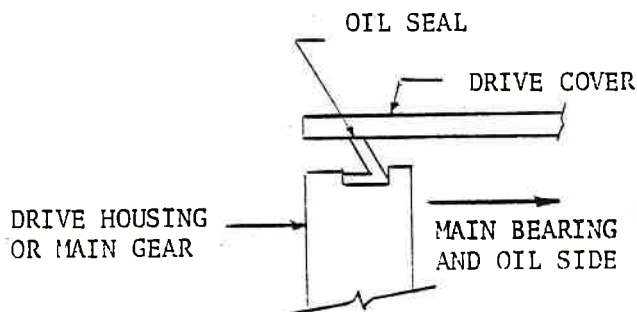
1. Thoroughly clean all parts, including housing, before reassembly. Remove all gasket and packing material.

NOTES:

- a. Take care to prevent dirt or foreign matter from getting into the drive assembly. All parts must be cleaned with a solvent before reassembly and blown dry.
 - b. Seals, packing and gaskets should be replaced whenever the unit is disassembled.
 - c. Inspect all parts for damage or wear and replace as necessary. Refer to the "Inspection".
2. Coat bearing balls with grease, then set the balls in place in the drive base. Refer to the parts list for the specified number of bearing balls required.
 3. If the lip seal between the drive base housing and the main gear is being replaced, refer below to item "E. Replacement of the Lip Seals".
 4. Referring to the main gear disassembly instructions for lifting, set the main gear in place, resting on the bearing balls.
 5. If the lip seal between the main gear and the cover is being replaced, refer to the instructions below for the lip seals.
 6. Install the main gear cover, using Permatex #2 at the joints, as specified on the Drive Assembly drawing.
 7. Install the worm gear assembly, referring to the worm gear disassembly and reassembly instructions.
 8. Lubricate the drive referring to the lubrication instructions.
 9. Install the motor, guards, etc.
 10. Connect the electrical wiring and check for proper drive rotation.

E. REPLACEMENT OF THE LIP SEALS

1. Thoroughly clean the seal mounting surfaces. These surfaces must be free of dirt, grease, or any foreign matter.
2. Measure a seal for cutting by laying it in position on the housing or gear mounting surface, where it will be located. The sealing surface must be facing out, away from the center of the drive. Make a square cut on the end of the seal, leaving a slight overlap. Refer to the Assembly drawing and Fig. h.
3. Apply contact cement (Eimco Part No. 88666C) over the mounting surfaces where the seals will be installed.
4. Apply the same contact cement to the bottom of the seal except the last 12 inches of one end of the seal. Allow sufficient time for the cement to become tacky.
5. Referring to Figure h, set the lip seal in place, making sure the seal lip is facing out, away from the oil. Since contact cement will bond on contact, take care in setting the seal in place.
6. Bring the uncemented end together with the opposite end. Mark and cut the end of the seal for a square, butt fit against the opposite end.
7. Apply the cement to the unbonded end of the seal and to both square ends and set the seal in place when the cement is tacky. Press the ends together until a firm bond is made.

Fig. h



WARNING: CHECK THE DRIVE FOR TORQUE, REFERRING TO THE PRECEDING "DRIVE MAINTENANCE WARNING" BEFORE STARTING DISASSEMBLY. ALSO MAKE SURE THE POWER TO THE DRIVES HAS BEEN DISCONNECTED OR BLOCKED OUT, TO PREVENT THE DRIVES FROM BEING ACCIDENTALLY STARTED.

A. REMOVAL OF THE WORM DRIVE

1. Remove the guards, disconnect all belts, chains or sheaves and motors. If furnished with shaft mounted reducers, remove the reducers and torque arms.
2. Drain the oil from the worm housing.
3. Remove the capscrews (A), connecting the worm housing (B) to the main drive (refer to Fig. 3).
4. Lift the worm gear assembly from the drive, referring to the lifting illustration. See Fig. 1. Place four (4) eye bolts symmetrically through the upper cover screw holes into the housing and lift with cables. If shims are in place between the worm housing and lower drive, match mark them so they can be returned to their original positions.

CAUTION: Use care when removing the unit from the main gear to prevent damage to the drive control, pinion, main gear and bearings.

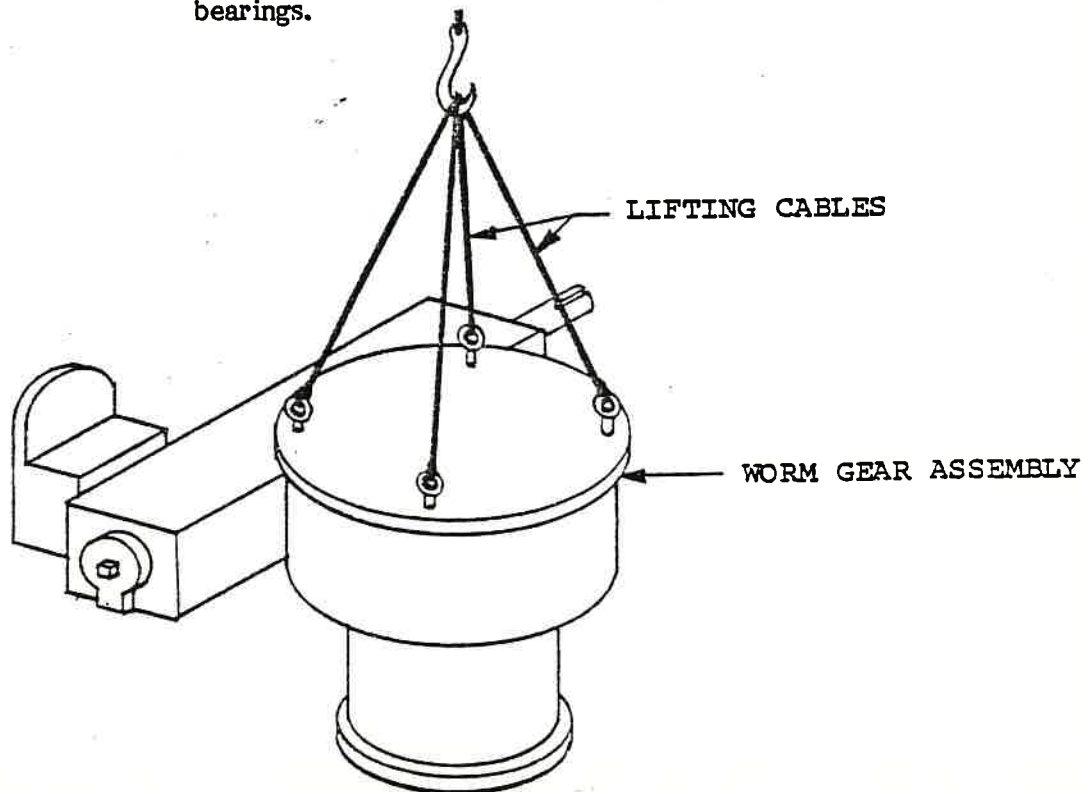


Fig. 1

5. Place the worm gear unit on saw-horse type supports as shown in Fig. 2. Make sure this device will support the weight of the worm gear unit.

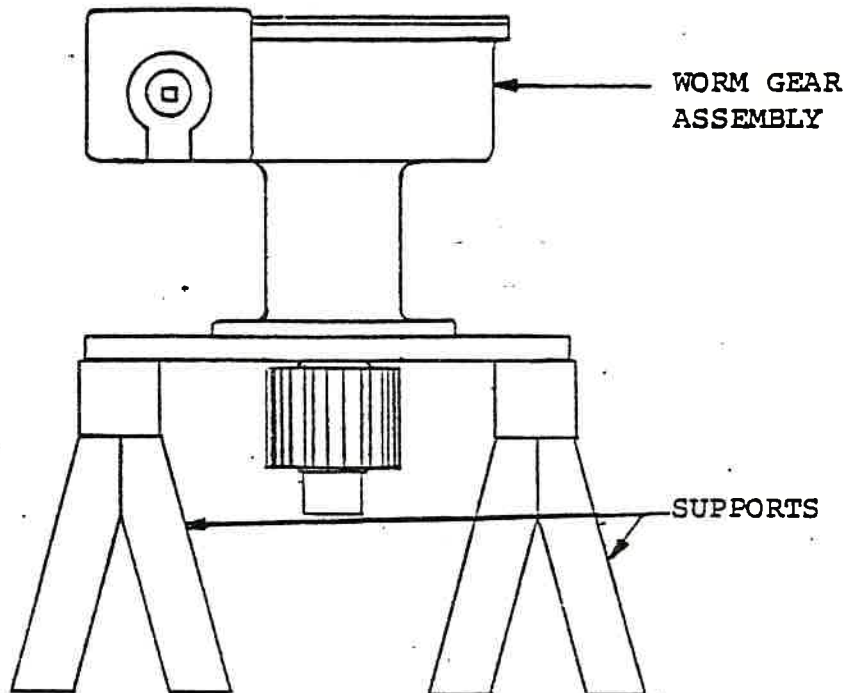


Fig. 2

B. DISASSEMBLY OF THE WORM DRIVE

1. Remove the drive control and drive control pin (G).
2. Remove the capscrews and end cap (C). Remove the spring seat (D) and the spring (E).
3. Remove the capscrews and bushing housing assembly (F).
4. Remove the anti-rotation pin (H). Refer to note below. Then remove the worm shaft (I) and bearing(s) (J) with the sliding bearing seat (K) by turning the worm shaft so that the worm moves to the non drive end (spring end).

Note: Some units do not use an anti-rotation pin (H). If the pin is not used, the pin mounting hole in the worm gear housing will be sealed with a pipe plug.

5. Remove the housing capscrews and cover (L).



WORM GEAR DISASSEMBLY AND REASSEMBLY INSTRUCTIONS

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6. Place blocking under the pinion (M) to prevent it from falling out of the drive when the retaining ring (N) is removed from the gear. Then remove the retaining ring (N), and the key (O). Remove the worm gear (P).
7. Support the pinion (M) (using an eyebolt in the top of the pinion) and lower it down through the housing as the blocking is removed.
8. Remove the pinion upper bearing retaining ring (Q). Then remove the bearing (R) using a puller. Remove the oil seals (S).
9. Remove the pinion lower bearing retaining ring (T) and the bearing inner race (U) from the end of the pinion. Then remove the outer bearing race (V) from the bottom of the main gear housing.
10. Remove the sliding bearing seat (K), and bearing(s) (J) from the worm shaft (I). Use a bearing puller if necessary.

C. INSPECTION

1. Inspect the teeth of the worm gear and pinion and the worm for the following:
 - a. **ABRASIVE WEAR:** Wear will show at random spacing across the gear teeth and worm. This is normally caused by dirt or other foreign material in the lube oil.
 - b. **SCORING:** This appears as vertical scratches and/or grooves running from the pitch line (approx. center of tooth or worm) to the top of the tooth or worm. It can result from improper lubrication or abrasive materials in the lubricant.
 - c. **PITTING:** It is evident in large or numerous pits in the gear teeth and worm. Note that small pits may occur during run-in of a new gear, but these will smooth out as the gearing wears in. It is caused by overload, poor lubrication or improper lubricant.
 - d. **GALLING:** This condition appears as numerous deep grooves or gouges and it is caused by overload of the gearing for the lubricant used.
 - e. **NORMAL WEAR:** Eventually all gears and worms wear out due to long use and/or prolonged overload. Replacement should be considered based on the condition of the gearing and extent of the wear.
2. Depending on the condition of the worm and gear, replacement may be required depending on the severity of the condition and the affect that a breakdown would have on the operation. Small scratches can be removed by repolishing the surface but if the scratches are large or deep, such as galling, replacement of the worm may be necessary, since the operating life would be limited. Would failure cause damage to the components? Cause production stoppage?
3. Inspect the bearing balls for pitting or scoring. If there is any quesiton about the condition of a bearing, it should be replaced.

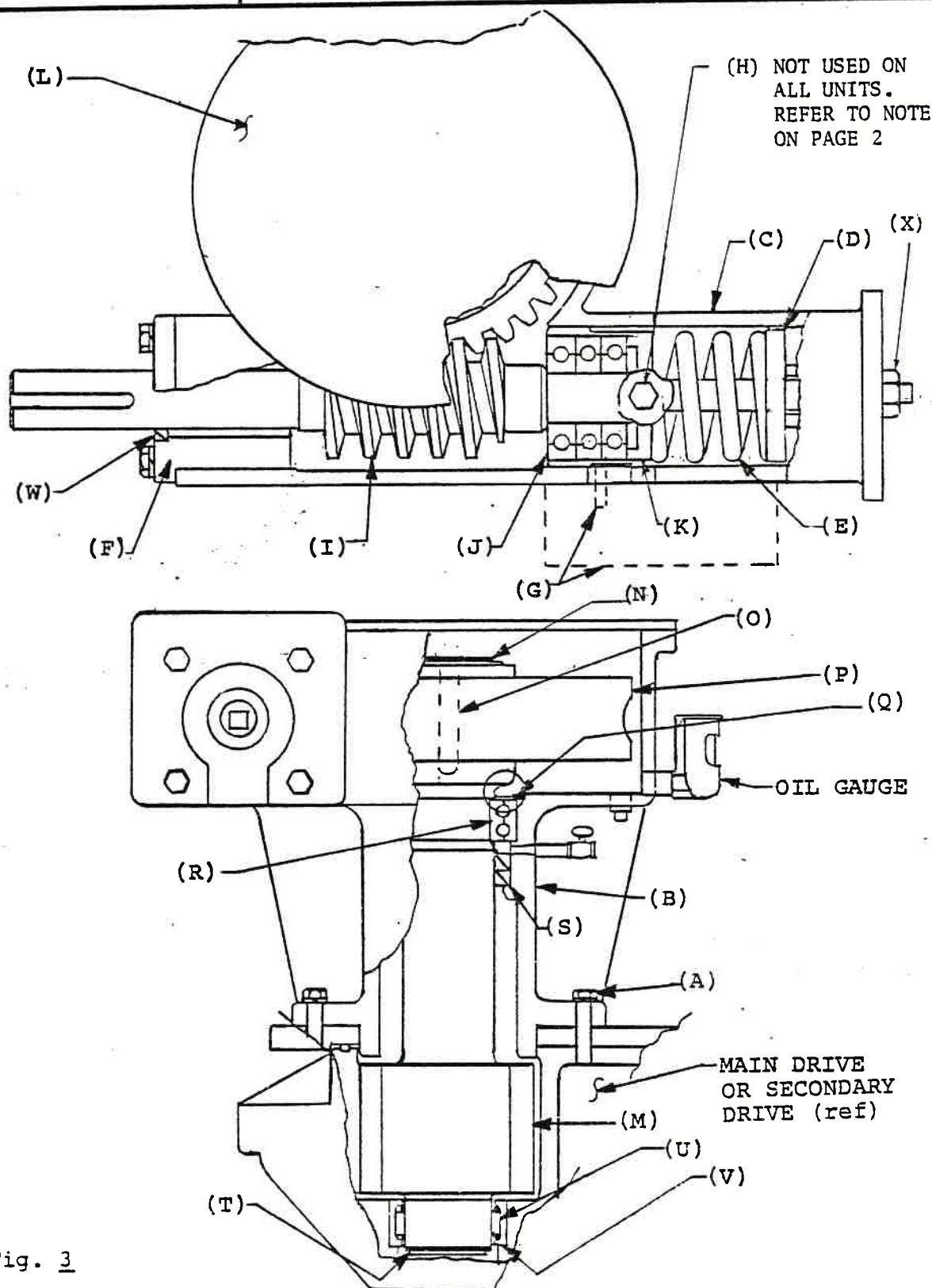


Fig. 3

4. All parts should be cleaned with a solvent, then coated with a light oil for inspection. Never rotate a dry bearing.

D. REASSEMBLY OF THE WORM DRIVE

NOTES:

- (a) Take care to prevent dirt or foreign matter from getting into the worm assembly. All parts must be cleaned with a solvent before assembly and blown dry. Coat the bearings and seals with a film of oil.
 - (b) Inspect all parts for damage or wear and replace as necessary.
 - (c) Check all bearings for pitting, roughness of rotation or scoring. Replace all bearings on a shaft if one is defective.
 - (d) Coat all bearings and bushings liberally with grease or oil before they are installed.
 - (e) Oil seals are subject to deterioration and should be replaced with new seals when the unit is reassembled, even though the deterioration may not show.
1. Mount the pinion bearing inner race (U) on the pinion shaft (M) and install the retaining ring (T). Install the outer race (V) inside the main drive housing bearing packet.
 2. Install the oil seals (S) inside the worm housing (B), referring to Fig. 4. The oil seals must be installed as shown with the lips facing upwards.

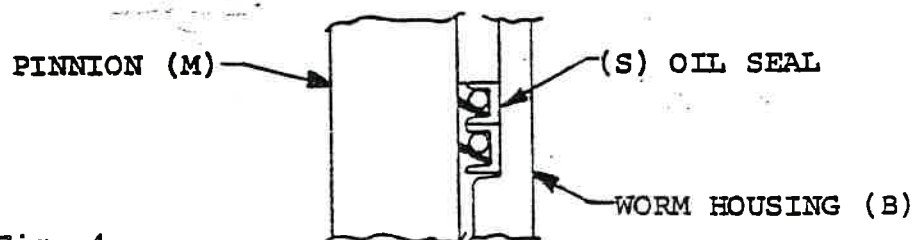


Fig. 4.

3. Pull the pinion (M) up through the worm housing (B) with an eye bolt and cable and support the pinion from below with blocking. (First, cover the keyway with tape to prevent it from cutting the seals.)
4. Install the bearing (R) over the shaft. Tap the bearing (R) in as necessary to seat, using a tubular driver. Then install the retaining ring (Q).
5. Mount the worm gear (P) on the pinion shaft and install the keys (O). Using a hammer and block of wood, drive the worm gear down until the retaining ring groove is exposed. Then install the retaining ring (N).

NOTE: DO NOT drive directly on the worm gear, use a block of wood.

6. Place the bearings (J) in the sliding bearing seat (K), as shown in Fig. 5. NOTE: Worm Drives can have either 1, 2 or 3 thrust bearings. Refer to the Drive Assembly drawing for the number of bearings provided.

CAUTION: The bearings must be installed as shown to take the thrust towards the spring. Improper assembly will cause bearing failure.

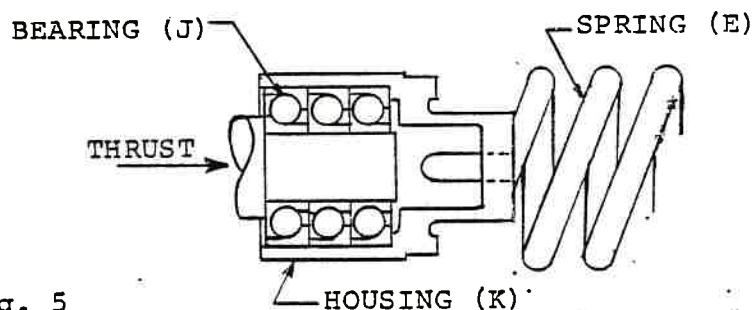
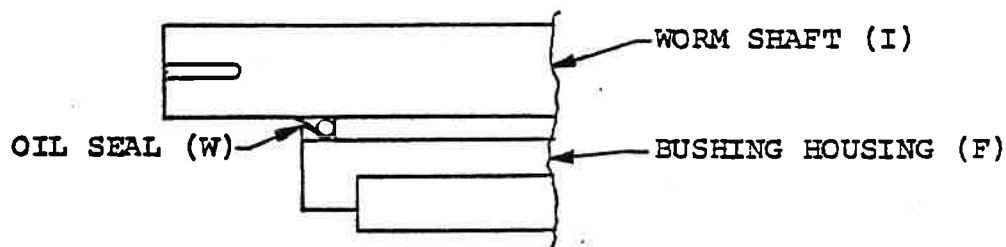


Fig. 5

7. Mount the sliding bearing seat (K) and bearings (J) on the worm shaft (I). The bearing must seat against the worm shoulder. Use a tubular driver or place the end of the worm on a block of wood and drive on the bearing housing, using a block of wood and hammer.
 8. Insert the worm into the gear housing (from the non-drive end) turning it as necessary to mesh with the worm gear threads. (Coat the worm with oil.)
 9. Coat both ends of the worm housing with non-hardening Permatex No. 2. Then place the spring (E) over the shaft and install the spring seat (D) and end cap (C). Secure the bolts. DO NOT turn the spring adjusting screw plug or nut (X).
 10. Place the bushing housing (F) over the shaft and install the capscrews. Turn the bolts equally when tightening.
- NOTE: If the bushing was replaced, make sure it is flush with the inside face of the housing.
11. Install the oil seal (W) as shown in Fig. 6. First, cover the keyway with tape to prevent the seal being cut.
 12. Install the anti-rotation pin (G), if used..
 13. Place the drive control pin (G) in the seat of the sliding bearing seat (K). Then install the drive control box with gasket. Adjust the control box as necessary so the pointer is on "0".

**Fig. 6**

14. Turn the worm by hand to be sure all parts are properly installed and rotate freely.
15. Apply Permatex No. 2 to the worm gear housing lower mounting face. Lift the worm gear assembly, referring to the lifting instructions, and set it in position on the drive. Align the gear housing with the bottom drive referring to the Drive Assembly drawing for orientation.

NOTE: If shims were used between the worm housing and the drive, return them to their original positions.
16. Install the cover (L) and secure the capscrews.
17. Lubricate the drive referring to the Lubrication Instructions.
18. Install motors, etc. and guards.
19. Reconnect the electrical wiring and check for proper drive rotation.



SKIMMING DEVICE MAINTENANCE AND ADJUSTMENT

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Reference Drawing: Skimmer Assembly

The skimming device is designed to skim the surface of the tank and push the floating scum towards the periphery where the skimmer blade will collect it and dump it into the scum box. To operate correctly the blade and scraper must be proper submergence, the scraper must pivot and rotate correctly and the wipers must be able to wipe most solids from their contact surfaces.

CHECK POINTS BEFORE START-UP

Observe skimmer rotation for several complete revolutions. The skimmer blade must be level and proper elevation. The scum scraper should be submerged about 3" and all wipers, or scrapers, must contact their wiping surfaces on the baffles and scum box. The baffles must provide a smooth and uninterrupted surface for the scraper. Any deviation should be adjusted as specified below.

SKIMMER ADJUSTMENT

1. Adjust the scum scraper for specified skimming depth (normally 3" submergence) using the stop screws (collars and eye bolts). Note that the arm clevis should allow the skimmer to rise up and over the scum box ramp for discharge, but the collars should stop the scraper from dropping below the adjusted submergence level (about 3" submergence).
2. Adjust the hinged skimmer (vertical hinged deflector) radially and longitudinally on the skimmer arm to maintain contact with the inner vertical skirt of the scum box. This is to minimize the loss of scum when the scraper goes up the scum box ramp.
3. Adjust the spring tension on the hinged skimmer as specified. This tension should force the scum scraper to pivot horizontally so it will contact the inner surface of the scum baffle (normal spring tension is about 8 lbs. against the wiper).

UPKEEP AND MAINTENANCE

Once a week, check that the scum skimmer assembly is collecting the scum from the baffle and carrying it to and into the scum box. This includes the neoprene wipers and hinged skimmer. It is particularly important when the skimmer passes over the scum box that scum does not run back and down the ramp.



MAINTENANCE AND
START-UP SERVICES
PARTS AND REPAIR ORDERS

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MAINTENANCE AND START-UP SERVICES

Experienced Eimco engineers and service personnel are available to assist in the maintenance and start-up of your Eimco equipment. They offer you the benefits of their technical know-how and firsthand knowledge of the equipment, plus the backing of Eimco's entire engineering and research facilities.

They can instruct on proper operating and maintenance procedures, advise on trouble shooting and, if necessary, supervise the entire start-up, depending on your requirements.

If you should want such assistance, arrangements should be made at the earliest possible date, outlining the services required, giving the approximate duration of such services. Charges for the services will be arranged at that time.

Write to your Eimco PEC Representative; referring to the addresses page.

PARTS AND REPAIR ORDERS

To make sure you receive the right replacement parts for your equipment and avoid delay, it is important to give the following information with each order.

1. SIZE AND TYPE OF UNIT: These are found on the cover page of the manual and on the Material List pages.
2. SERIAL NUMBER: This is found on the unit nameplate and the Material List. In case the S/N is omitted on the Material List, use the Order number since it and the S/N are similar
3. PART NUMBER AND DESCRIPTIONS: Listed on Material List.
4. SPECIAL FIELD MODIFICATIONS: This is important if the original material or design has been changed. Include drawings or other descriptive information.

Please contact the sales/service office closest to you for parts, repair orders and equipment service. Additional assistance may be obtained from the Eimco PEC Parts Department, P.O. Box 300, Salt Lake City, Utah 84110.



CLARIFIER OPERATING INSTRUCTIONS

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PURPOSE

The Clarifier is installed for the purpose of continuously removing substantially all settleable solids from a flow of water, sewage, or trade waste.

For water treatment, the mechanism is installed in clarification and softening plants to remove precipitates after chemical treatment and before sand filtration. It is also used for presedimentation of turbid or muddy water.

In sewage treatment, the uses for the mechanism vary considerably, depending upon the type of plant and its location in the plant's flowsheet. It may be used for sedimentation of raw sewage after coarse or fine screening, shredding or grit removal, for sedimentation of activated sludge after aeration, or for settling out the humus in the effluent of trickling filters.

In trade waste treatment so much variation is found that specific use cannot be tabulated. However, in every case, operation will be sufficiently similar to that of clarifiers on sewage or water to enable general usage of these instructions.

DESIGN FEATURES

Influent and Effluent

The feed enters the innerwell through the ports in the center influent column and is discharged through adjustable energy dispersion gates into the feedwell. As the feed discharges from the center column, its entering velocity is dissipated by means of the innerwell, gates and the feedwell.

The flow is directed downward from the feedwell and then outward, and the solids settle out on the tank bottom along the flow path from the center column to the outer tank wall. The clarified effluent, following this radial pattern, flows upward and outward into an overflow collection launder around the tank.

The effluent flows over a weir, which ordinarily extends around the entire periphery of the clarifier. Flow through the clarifier is of sufficient detention time to allow the solids in the feed to settle during the time of passage from the influent to the effluent weir.

The effluent weir must, therefore, be level in order to discharge a steady and uniform amount of liquid. Any irregularity in weir level will cause a convergence of flow at low points and the velocity at the low points will be enough to carry fine solids over the weir at that point. Most clarifiers, and especially the large-diameter clarifiers, use saw-toothed weirs in order to overcome the effect of wind, which would cause flow to the downwind side of the tank if the weir were flat.

The effluent channel may sometimes slope toward the outlet or outlets, but in any case is of sufficient capacity to enable flow to the point of outlet from the channel without flooding or submerging the weirs.



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Scum Baffles

Primary clarifiers are provided with scum baffles that are located parallel to and about 6" away from the weirs to prevent scum from overflowing the weirs into the effluent channel. Secondary clarifiers may have scum baffles if required; however, they are generally not necessary because scum is not normally present in effluent from trickling filters or activated sludge tanks.

Integral with the scum baffle is a scum box that receives and discharges accumulated scum as it is moved from the center of the tank to the periphery by means of a scum skimmer and scum scraper. This scum box must be level and adjusted in height in accordance with the erection instructions.

The scum skimming device is designed for long service life with a minimum of maintenance. No lubrication is required. Periodically the condition of the wipers on the skimming device should be checked to make certain they are effectively contacting the scum box and baffle surfaces in order to properly contain the scum material for discharge into the scum box. The scum skimming device must also be leveled in accordance with the erection instructions.

Raking Mechanism

The raking mechanism at the tank bottom collects the solids as they settle. The rake blades with replaceable squeegees roll and concentrate the solids during their travel to the center of the clarifier. The speed of the raking mechanism has been set for the indicated purpose of the particular machine and should not be changed without consulting Eimco.

The rake arms are supported and driven by a center drive unit by way of a cage or a shaft that connects to the drive main gear. Refer to the instructions on General Drive Maintenance instructions for further details.

STARTING OPERATION

It is assumed that the mechanism has been lubricated, all parts are in alignment, and proper clearance exists between the rake arm squeegees and the tank bottom throughout a complete revolution of the mechanism. The squeegees are furnished for scraping the tank bottom to prevent septic action of sludge and so a minimum clearance is required during a complete revolution of the arms, as specified in the erection instructions.

The mechanism should be rotated in the empty tank at least 4 or 5 times before any feed is allowed to enter the tank. Any discrepancies or problems should be noted and corrected before start up, referring to the General Maintenance instructions.

After operating the mechanism in the empty tank, start the feed into the tank while the mechanism continues to operate. Allow the tank to fill.

At first, withdraw the sludge at frequent intervals until a definite schedule for removal can be made. The sludge removal schedule should call for withdrawal at least twice every twenty-four (24) hours. Do not try to discharge the sludge too



CLARIFIER OPERATING INSTRUCTIONS

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thick, as this may overload the mechanism, cause septic action, or result in clogged piping or pumps.

A depth of sludge of 12" to 24" over the point of discharge in the sludge pocket should be kept at all times, depending upon the size of the clarifier. This sludge will form a seal over the discharge and sludge outlet pipe and ensure removal of uniform sludge with as high a solids concentration as possible.

NORMAL OPERATION

The clarifier mechanism should operate continuously to keep the sludge in constant motion towards the sludge pocket.

The sludge should be removed from the clarifier several times daily, as stated above, to prevent the accumulation of heavy rake loads and the flotation of sludge (sometimes septic sludge).

A regular schedule of pumping should be determined by experience and strictly followed. The quantity of grit in the incoming flow is very important; if it is present in appreciable quantities, more frequent intervals of pumping will be necessary. If grit is present in large quantities, some provision for its removal should be made prior to its entering the clarifier. Its removal from the clarifier with sludge will cause inevitable deposits in digesters, if used, necessitating their shutdown and cleaning.

OPERATING PROBLEMS AND CORRECTIONS

1. Foreign Objects in Tank

To minimize damage resulting from objects such as tools, rocks, rags and other foreign bodies being dropped into the tank, it is imperative that the feed and mechanism be stopped and these objects removed immediately before continuing operation.

2. Discharge Line Becomes Plugged

If sludge is allowed to become too thick, it may plug the discharge line. Sometimes foreign material may get into the line to cause the plugging. To correct this, turn high pressure water back through the underflow line until the line is cleared.

3. Higher Than Normal Torque on the Drive Control

Sludge may gradually accumulate in the tank over a period of time due to the sludge being discharged at a rate less than the rate of solids entering with the feed. This will be noticed by a higher than normal operating torque. It will be necessary to increase the rate or frequency of withdrawal in order to bring the sludge down to appropriate operating level.

If a very gradual increase in the torque load is noted, it is possible that grit or silt is being introduced with the influent. If this material cannot be removed normally through the tank drain it will gradually overload the mechanism. In



CLARIFIER OPERATING INSTRUCTIONS

15-LA1
(1/86)b
4

79

any case, the drive should not be allowed to operate continuously for days at a high torque (over 20%), even though the alarm does not sound. It will be necessary to remove the silt. This may be done by shutting off the feed and withdrawing the silt by rotating the arms and intermittent withdrawals. Usually, however, grit and silt are removed from the influent before it can reach the Clarifier and this kind of problem is unlikely to occur.

4. Overload Alarm Sounds or Motor Stops

If the sludge load becomes so heavy that torque build-up occurs in the machine and the drive control indicates a load sufficient to actuate the alarm, the operator will then be alerted that something is causing an overload on the mechanism. The feed should be stopped immediately and the solids withdrawn to normal level. (The operator should not allow the torque to reach this point before taking corrective action, however.)

If the overload is allowed to increase, the drive control will cut electrical power and stop the mechanism. When this occurs, it will be necessary to drain the tank and physically remove the sludge from the tank. This must be done by draining the tank and sluicing out or digging out the sludge.

If a foreign object has been dropped into the tank accidentally, the mechanism may suddenly overload, sound the alarm and then stop. In this case, the object must be removed. It will be necessary to bypass the feed until the obstruction can be located, and it might be necessary to drain the tank.

5. Solids in the Effluent and Overloading

If the solids rise to the surface and overflow with the effluent, any number of problems may be at fault and each should be investigated individually.

The clarifier may be overloaded either by too great a volume of water or by too many solids in the feed, or by a combination of both.

Too much volume, due to storm water for example, may increase the flow above design capacity of the clarifier causing sludge particles to wash over with the effluent rather than settle out. This also reduces the sludge level in the tank adversely affecting the solids concentration. When there is excessive flow some of the flow should be by-passed if possible. Too many solids in the overflow may be caused simply by an overload of the treatment plant and too many solids for the clarifier to handle. This and too much water, over a period of time, can be corrected only by additional treatment units.

But too many solids in the effluent may be caused simply by inadequate solids withdrawal due to amount or frequency. This in turn could be caused by the sludge pump, timing mechanisms or a plugged sludge pipe. Temporary shutdown will be necessary.

An overload may also be the result of a single unusually large discharge of solids into the plant, but this must be corrected at the source. Temporary relief may be obtained by storage, if possible, or by-passing to other units or areas.



CLARIFIER OPERATING INSTRUCTIONS

15-LA1
(1/86)b
5

80

6. Poorly Settling Sludge

Solids in the effluent may also be the result of a poorly settling sludge or other sludge problems.

In a low solids condition, inadequate flocculation may occur somewhere in the system and so the solids will be dispersed and fail to settle. This can be controlled by temporarily reducing the sludge withdrawal or additional flocculation upstream. In some cases, flocculants may be added to develop the bulk and weight for the solids to settle.

Growths of certain organisms may also cause the sludge to swell, but they themselves do not flocculate. Since there are various conditions and solutions involving pH, temperature, low oxygen, etc., consult your Eimco Representative.

When pieces of sludge float to the tank surface accompanied by objectionable odor, this is caused by septic sludge on the tank bottom due to a lack of oxygen (anaerobic decomposition occurs). This may be due to worn squeegees that are not sufficiently close to the tank bottom to scrape up the sludge, inadequate withdrawal of sludge, or retention time too long. Locate and correct the problem before the condition gets worse.

SHUTDOWN OF THE CLARIFIER

Before a tank is drained or dewatered to correct any operating problem, every effort should be made to correct the problem first. The sludge pipe should be cleared if possible with a plumber's snake or by applying high pressure water. Foreign objects should be fished out, if possible, with hooks. And, causes of operating problems should be determined and corrected if possible.

Draining the tank to correct problems or to recondition the mechanism should be done preferably in the winter when biological growth would be the least, rather than in the warm weather of summer. It should also be planned so that down time is at a minimum and the flow into the plant is at its lowest point.

Refer to the Mechanism General Maintenance instructions.

OPERATING WARNINGS:

DO NOT ATTEMPT TO KEEP THE CLARIFIER RUNNING WHEN AN OVERLOAD IS INDICATED! FIND THE TROUBLE AND CORRECT IT! DO NOT TAMPER WITH THE OVERLOAD ALARM SWITCH ADJUSTMENTS IN AN EFFORT TO KEEP THE MECHANISM RUNNING.

DO NOT START UP WITH A LOAD OF SLUDGE IN THE TANK!

MAINTENANCE

Refer to the Maintenance instructions in a previous section.



PROCESS PERFORMANCE CONDITIONS

1-AA5
(12/83)

81

The process performance of the equipment referred to in these instructions is dependent upon many factors, including influent or feed quality and quantity, additives required, time, temperature, rates of change, sizing criteria used, operating conditions, etc. Therefore, unless a written Process Performance Warranty has been included, Eimco P.E.C. cannot assume any liability or responsibility for performance results that the user of the equipment is expecting or has predicted.

Should assistance be required in the operation of the equipment, due to unexpected conditions, or should accessory or add on components or changes be required to meet your performance needs, Eimco P.E.C. can, at additional cost, provide the service of experts to assist you in determining what actions must be taken.

Parts Service Department
P.O. Box 300
Salt Lake City, Utah 84110-0300
Telephone 801/526-2000
Telex 38-8331



PAGE: 1 OF

DATE: 12/16/

PARTS SERVICE PROPOSAL

NUMBER: 52-RM104816/JKB-86

CUSTOMER INFORMATION

PREPARED FOR: BRIGHAM CITY WWTP

600 NORTH 1450 WEST
BRIGHAM CITY UT

EQUIPMENT DATA

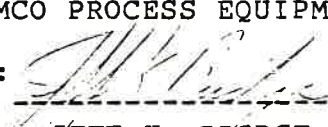
SERIAL NUMBERS: 23412-01
MODEL : C30HT DRIVE UNIT
85' C3
EQUIPMENT: CLARIFIER

SERVICE OFFICE

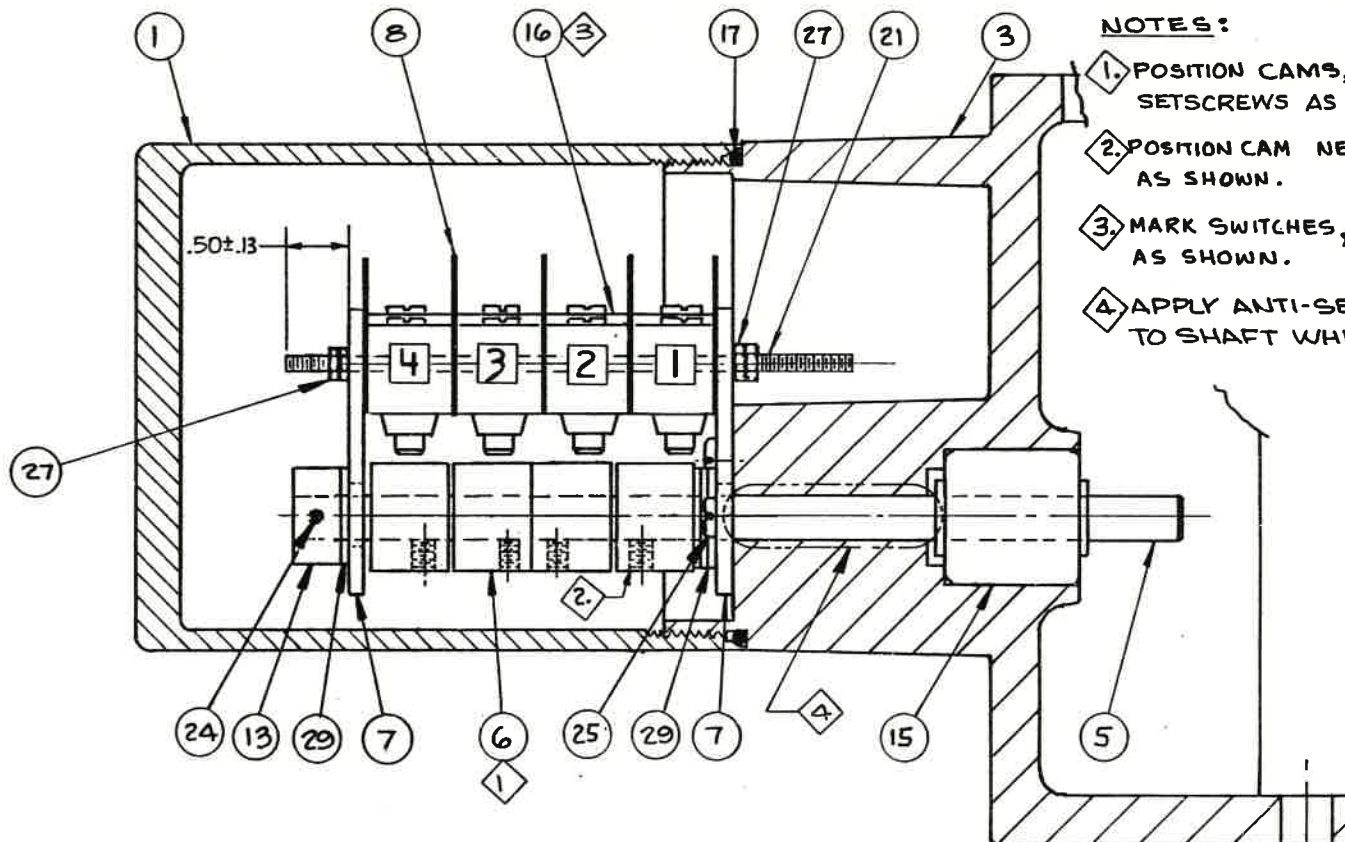
TO RECEIVE ASSISTANCE BY OUR REPRESENTATIVES IN YOUR AREA,
PLEASE CONTACT THEM AT THE FOLLOWING LOCATION:

COOMBS-HOPKINS COMPANY
3760 HIGHLAND DRIVE
SUITE 404
SALT LAKE CITY UT 84106
801/272-9898

EIMCO PROCESS EQUIPMENT COMPANY

BY: 

JEFF K. BRIDGE



NOTES:

1. POSITION CAMS, ITEM (6) & SECURE SETSCREWS AS SHOWN.
2. POSITION CAM NEXT TO WASHERS AS SHOWN.
3. MARK SWITCHES, ITEM (16), AS SHOWN.
4. APPLY ANTI-SEIZE COMPOUND TO SHAFT WHERE INDICATED.

PARTS LIST: L48923-1

NET WT:

C	6/80	8-12-85
B	6/62	6-18-85
A	6050	9-13-84
	D/R	DATE
REVISION		



EIMCO Process Equipment Company - Salt Lake City, Utah

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HOLD FRACTIONAL MACHINED DIMENSIONS TO $\pm 1/64"$

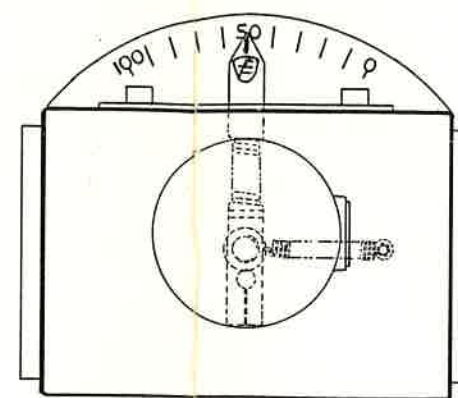
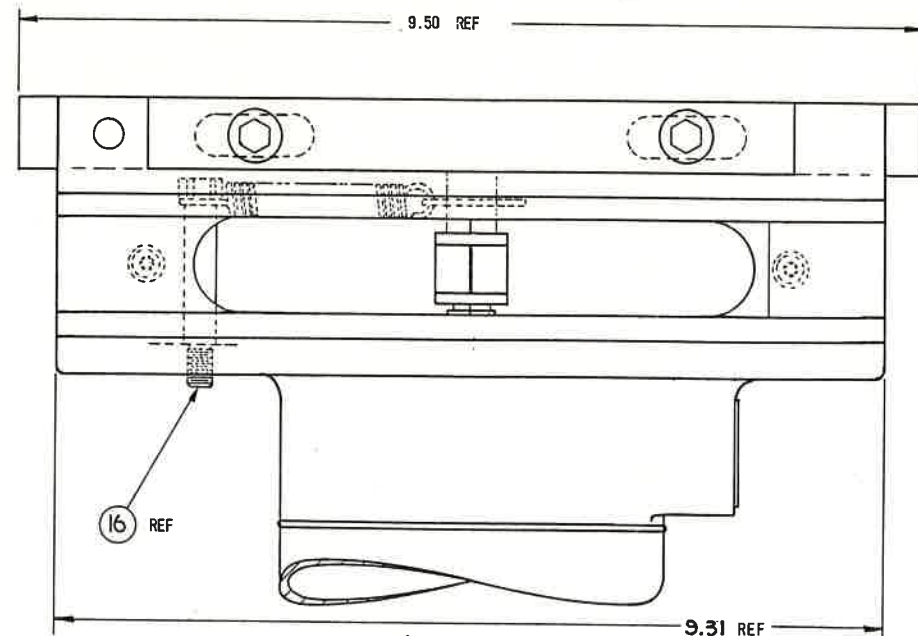
DO NOT SCALE PRINTS
DATE 4-9-84
DRAWN CWJ
CHECK'D JKM
APPR. GEN

SWITCH-ROTARY 4SPDT
RIGHT HAND OR LEFT HAND
EXPLOSION PROOF

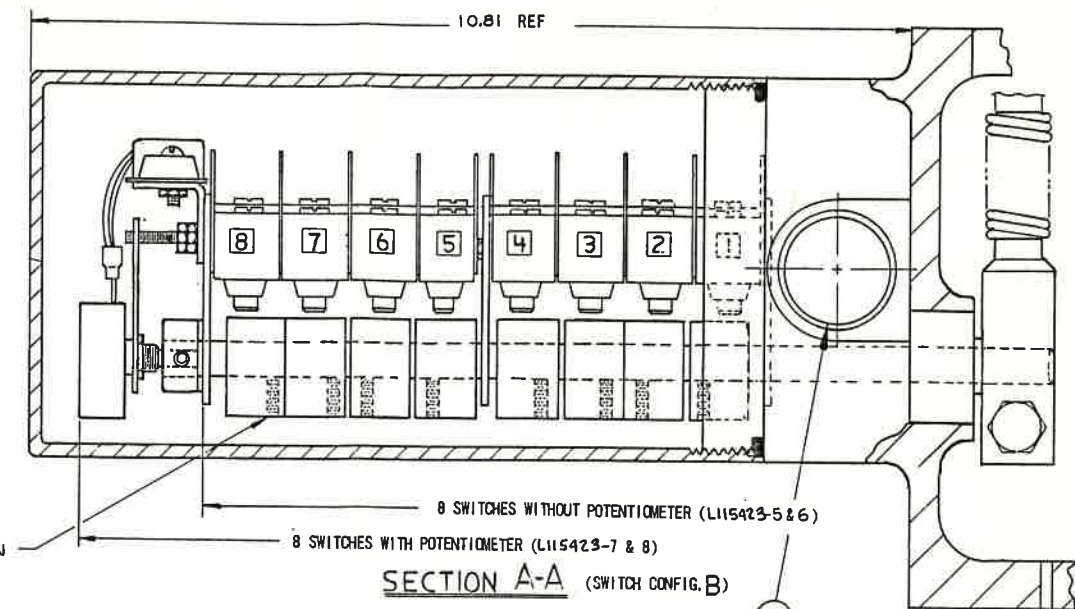
DWG. NO. 48923	REV. C
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REVISION

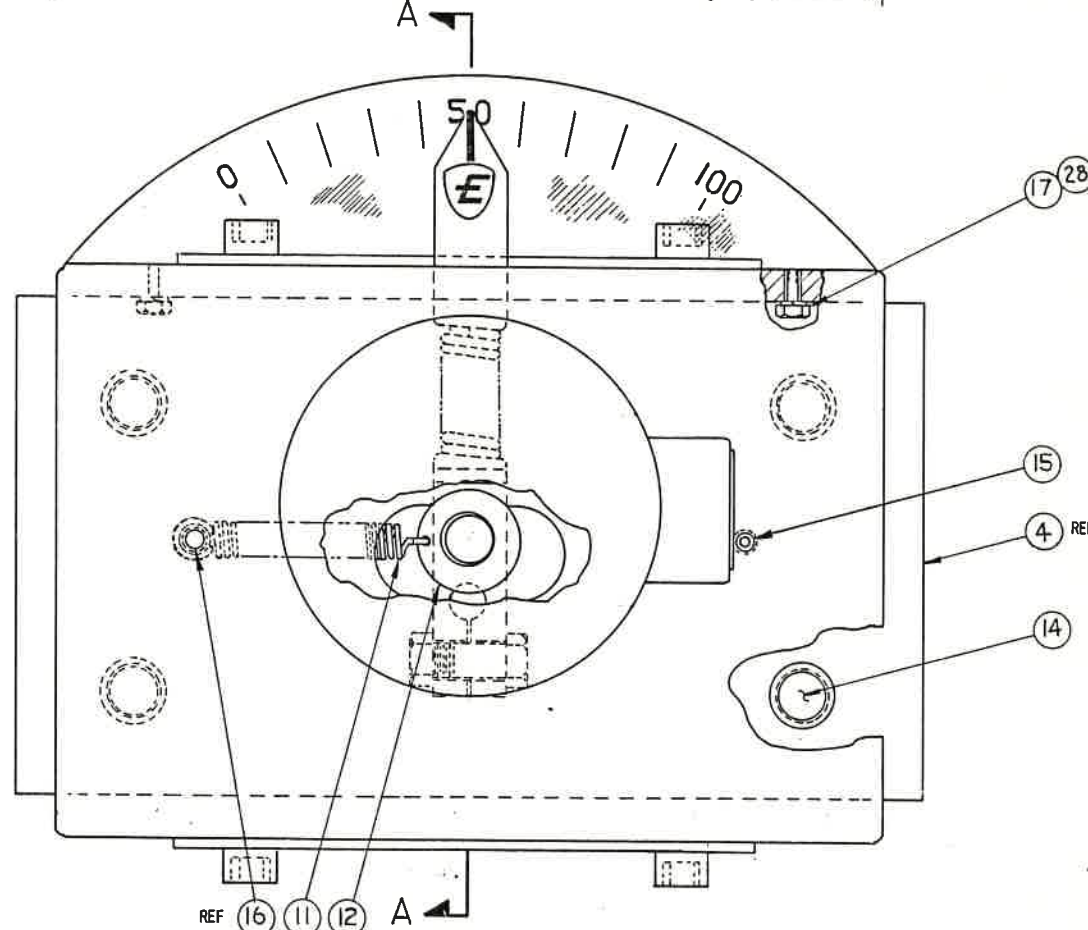
BY CHECKED DATE



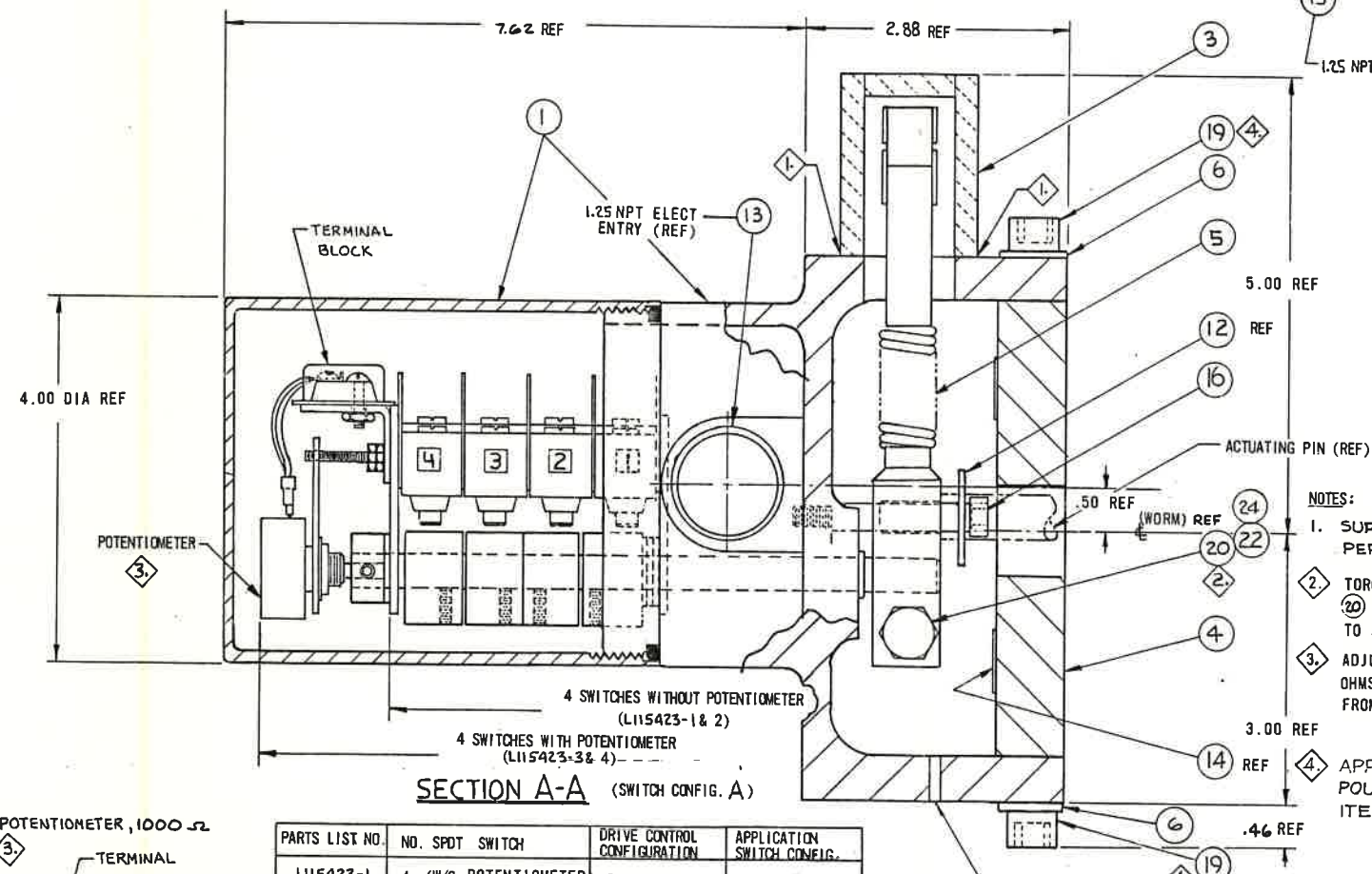
LEFT HAND DRIVE CONTROL CONFIGURATION



SECTION A-A (SWITCH CONFIG. B)



RIGHT HAND DRIVE CONTROL CONFIGURATION



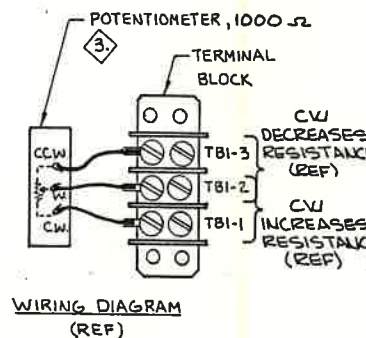
SECTION A-A (SWITCH CONFIG. A)

- NOTES:
1. SURFACE PREPARATION & PAINT PER DWG NO 88747.
 2. TORQUE TIGHTEN CAPSCREW, ITEM 20 TO SECURE POINTER ITEM 5 TO SHAFT OF ROTARY SWITCH, ITEM 1.
 3. ADJUST POTENTIOMETER FOR 500 OHMS AT ZERO PERCENT INDICATION FROM POINTER.
 4. APPLY ANTI-SEIZE COMPOUND TO THREADS OF ITEM 19 WHERE SPECIFIED.



BAGGED ITEMS
BAGGED ITEMS ARE TO BE USED WHEN UNIT IS ATTACHED TO DRIVE UNIT.

TIE BAG & CONTENTS TO DRIVE CONTROL



WIRING DIAGRAM (REF)

PARTS LIST NO.	NO. SPOT SWITCH	DRIVE CONTROL CONFIGURATION	APPLICATION SWITCH CONFIG.
L115423-1	4 (W/O POTENTIOMETER)	RIGHT HAND	A
L115423-2	4 (W/O POTENTIOMETER)	LEFT HAND	A
L115423-3	4 (W/ POTENTIOMETER)	RIGHT HAND	A
L115423-4	4 (W/ POTENTIOMETER)	LEFT HAND	A
L115423-5	8 (W/O POTENTIOMETER)	RIGHT HAND	B
L115423-6	8 (W/O POTENTIOMETER)	LEFT HAND	B
L115423-7	8 (W/ POTENTIOMETER)	RIGHT HAND	B
L115423-8	8 (W/ POTENTIOMETER)	LEFT HAND	B

PARTS LIST: SEE SELECTION TABLE

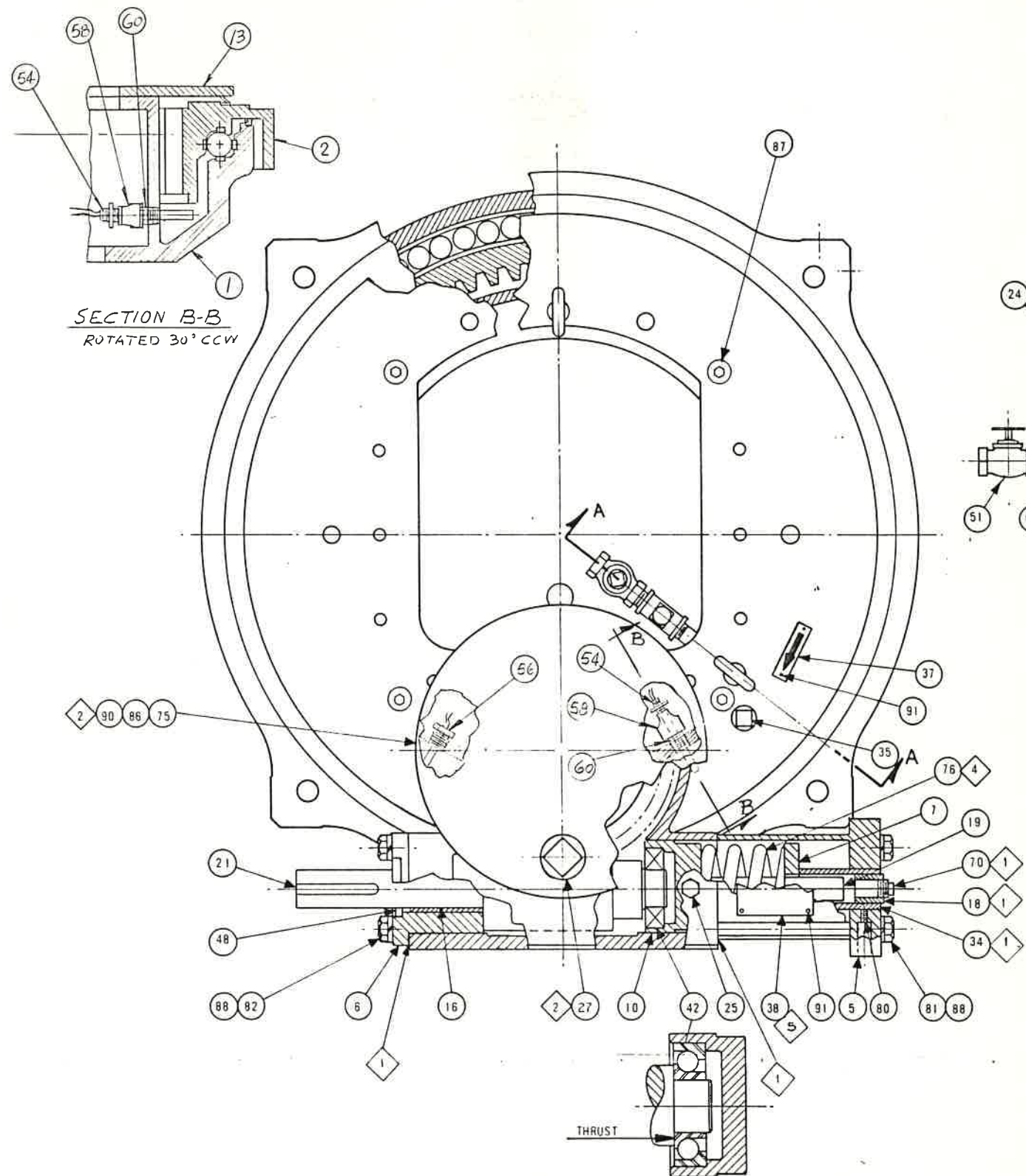


EIMCO PMD — ENVIROTECH CORPORATION — Salt Lake City, Utah
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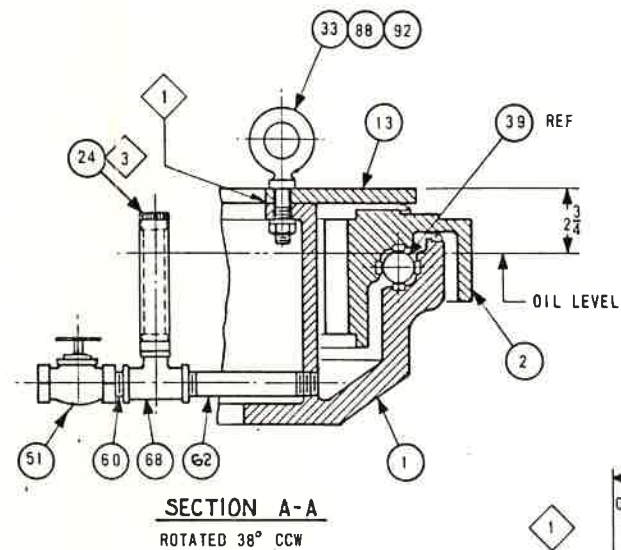
DO NOT SCALE PRINTS
DATE 4-11-84
DRAWN CWJ
CHECK'D JKM
APPR. GEN

DRIVE CONTROL, ELECTRICAL ENCLOSURE IS WEATHER PROOF & EXPLOSION PROOF (NEMA4e7)

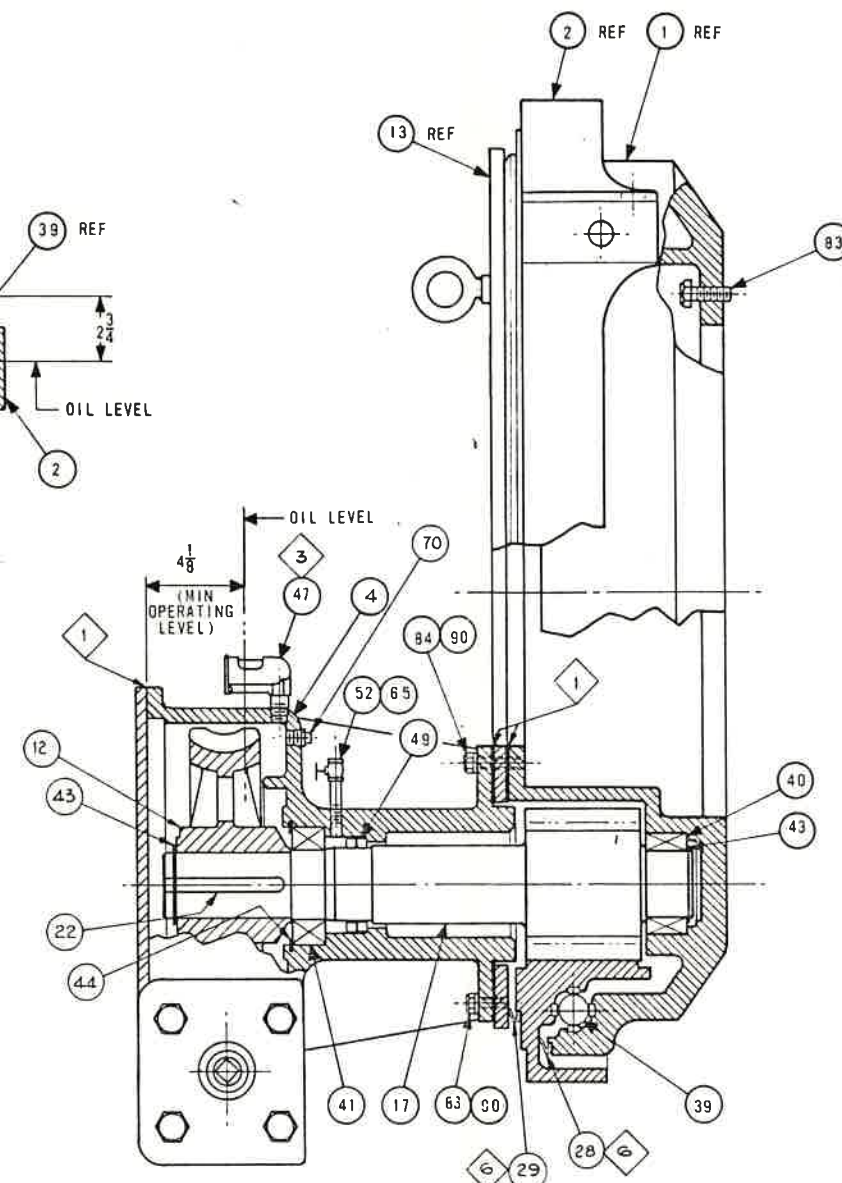
HOLD FRACTIONAL MACHINED DIMENSIONS TO ± 1/64"
DWG. NO. **115423** REV. **C**



SECTION B-B
ROTATED 30° CCW



SECTION A-A
ROTATED 38° CCW



ILLUSTRATIVE SECTION

- 5 TO ELIMINATE BURRS & CHIPS FROM ENTERING WORM GEAR HOUSING, DRILL (4) #37 (.104 DIA) HOLES IN END CAP, ATTACH ITEM (38) USING ITEM (91) AND CLEAN UP BEFORE INSTALLING END CAP TO WORM GEAR HOUSING.
- 6 INSTALL SEAL ITEM (28) AND ITEM (29) PER INSTALLATION INSTRUCTIONS DRAWING NUMBER 48643

NOTES:

- 1 APPLY SEALANT TO ALL JOINTS INDICATED FOR LIQUID TIGHT SEAL.
- 2 DESIGN OF WORM GEAR COVER TO BE DETERMINED AS REQUIRED FOR MOTOR DRIVE COMPONENTS. ITEM (27) TO BE BAGGED AND TIED TO DRIVE UNIT. USE TEMPORARY COVER, ITEM (75), FOR STOCK UNIT.
- 3 ASSEMBLY SHOP TO NOTCH SIGHT GLASS CASING AT OIL LEVEL.
- 4 SPRING IS CALLED OUT WITH MOTOR DRIVE COMPONENTS. BASIC DRIVE IS STOCKED WITH SPACER, ITEM (76).

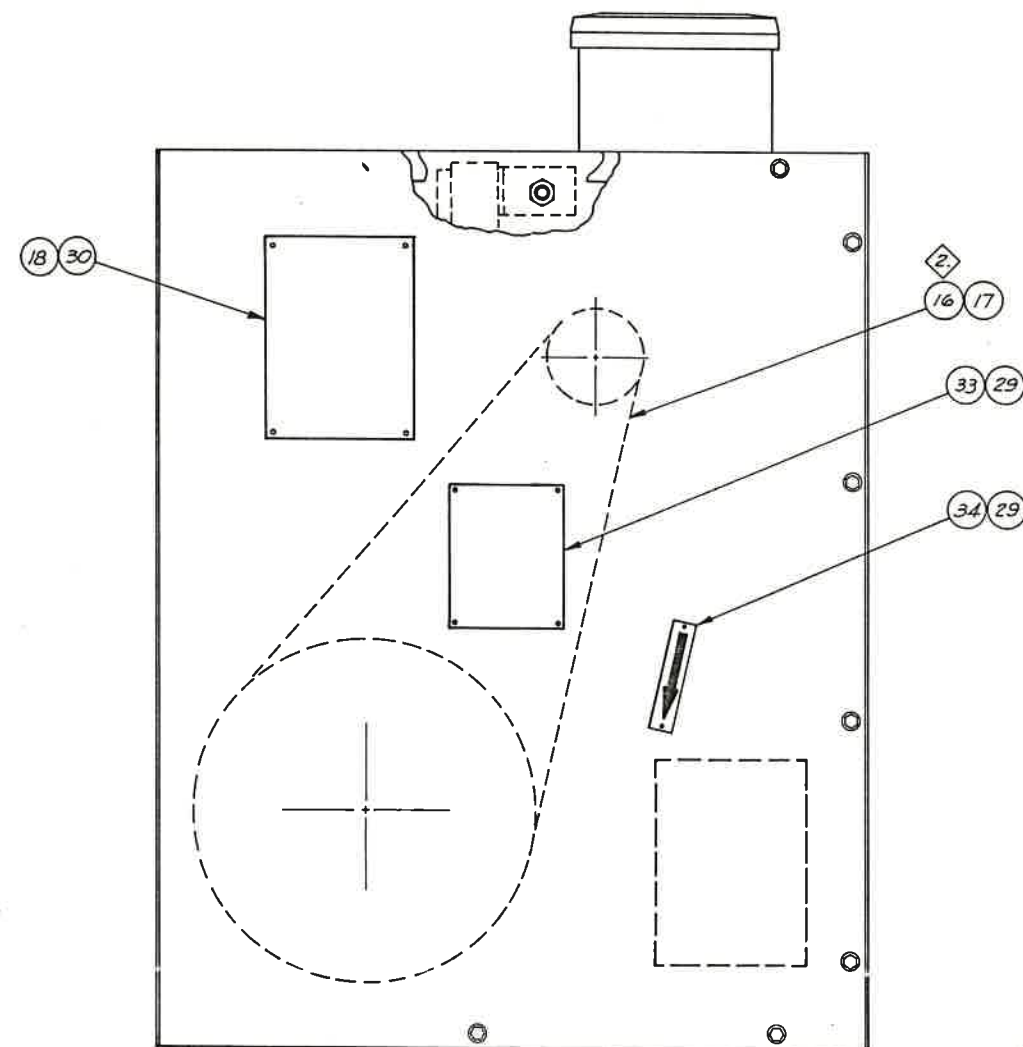
PARTS LIST: L 23412 D33

CAUTION
NOTE CAREFULLY HOW BEARING, ITEM (42) IS ASSEMBLED IN HOUSING TO TAKE THRUST TOWARD SPRING
IMPROPER ASSEMBLY WILL CAUSE BEARING FAILURE

SEPIA FROM: 22989D434

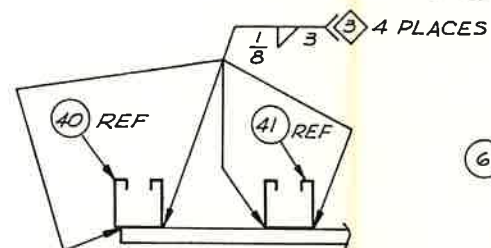
		ENVIROTECH EIMCO PMD - ENVIROTECH CORPORATION - Salt Lake City, Utah This drawing and all information thereon is the property of Eimco PMD and is confidential and must not be made public or copied. This drawing is loaned subject to return upon demand and is not to be used directly or indirectly in any way detrimental to our interests.		HOLD FRACTIONAL MACHINED DIMENSIONS TO ± 1/64"	
DO NOT SCALE PRINTS DATE 7-21-86 DRAWN W.D. CHECK'D B.H. APPR B.H.		DRIVE ASSEMBLY C30HT (BASIC)		DWG. NO. 23412 D33 REV	

PIECE MARK	NO. REQ'D	MATERIAL	DESCRIPTION/REMARKS	TOTAL WEIGHT
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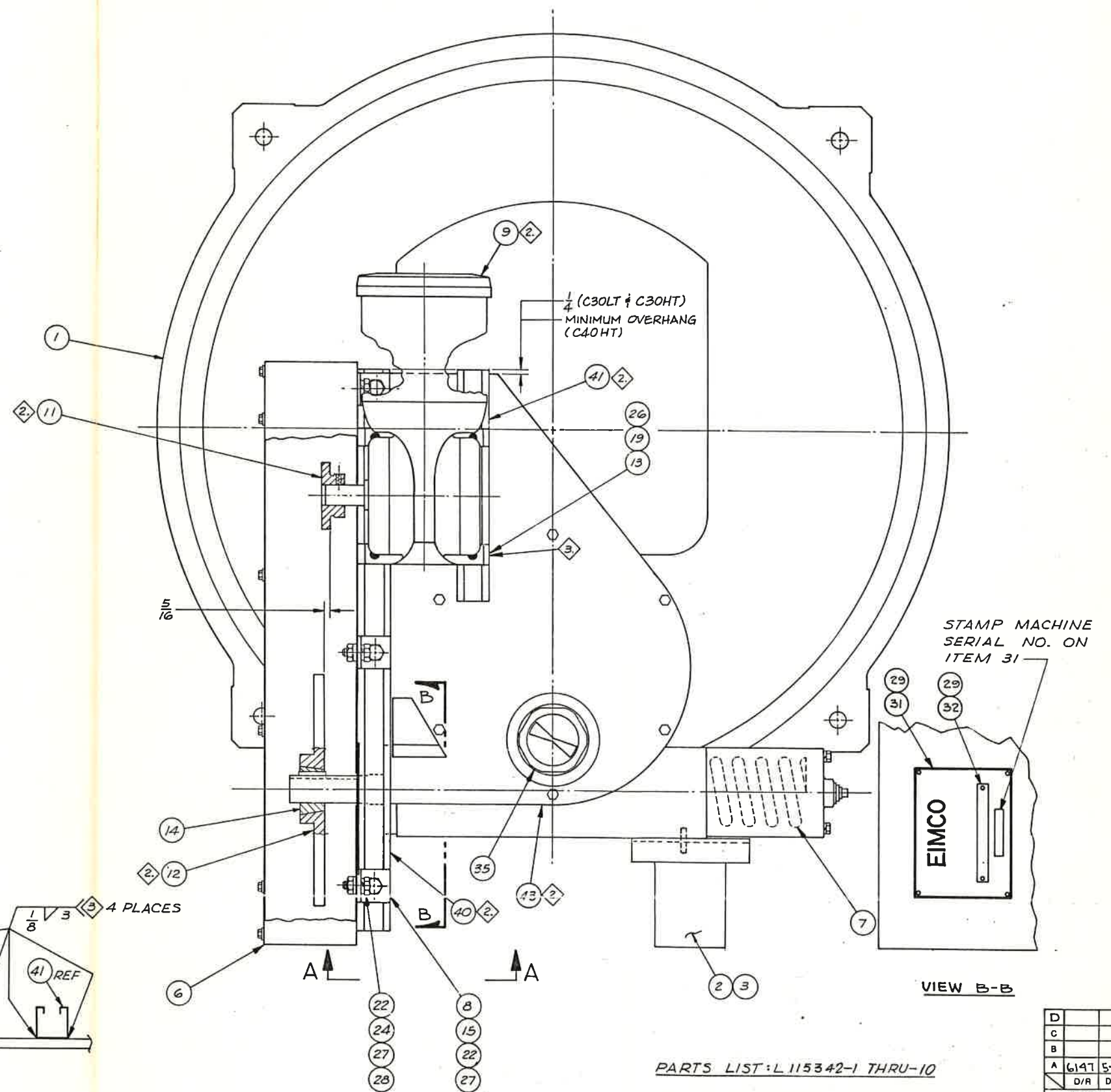


NOTES:

1. BASIC DRIVE CONFIGURATION AS SHOWN FOR ILLUSTRATION ONLY.
2. BOLT GEAR MOTOR (9) TO MOUNTING CHANNELS, (40) AND (41), POSITION ON COVER (43). INSTALL SPROCKETS (11), (12), AND CHAIN (16). ALIGN AS SHOWN AND WELD MOUNTING CHANNELS TO COVER PER VIEW A-A AND PLAN VIEW.
3. THREE INCH LONG WELDS, CENTERED AT A POINT WHERE REDUCER FEET BOLT TO MOUNTING CHANNEL.
4. SEE DRAWING 203520 FOR CHAIN GUARD ASSEMBLY.



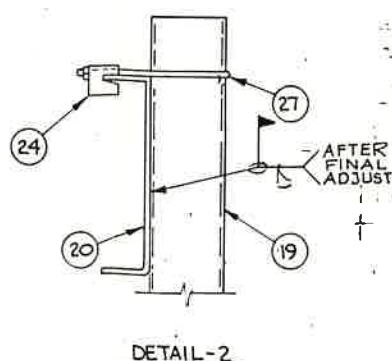
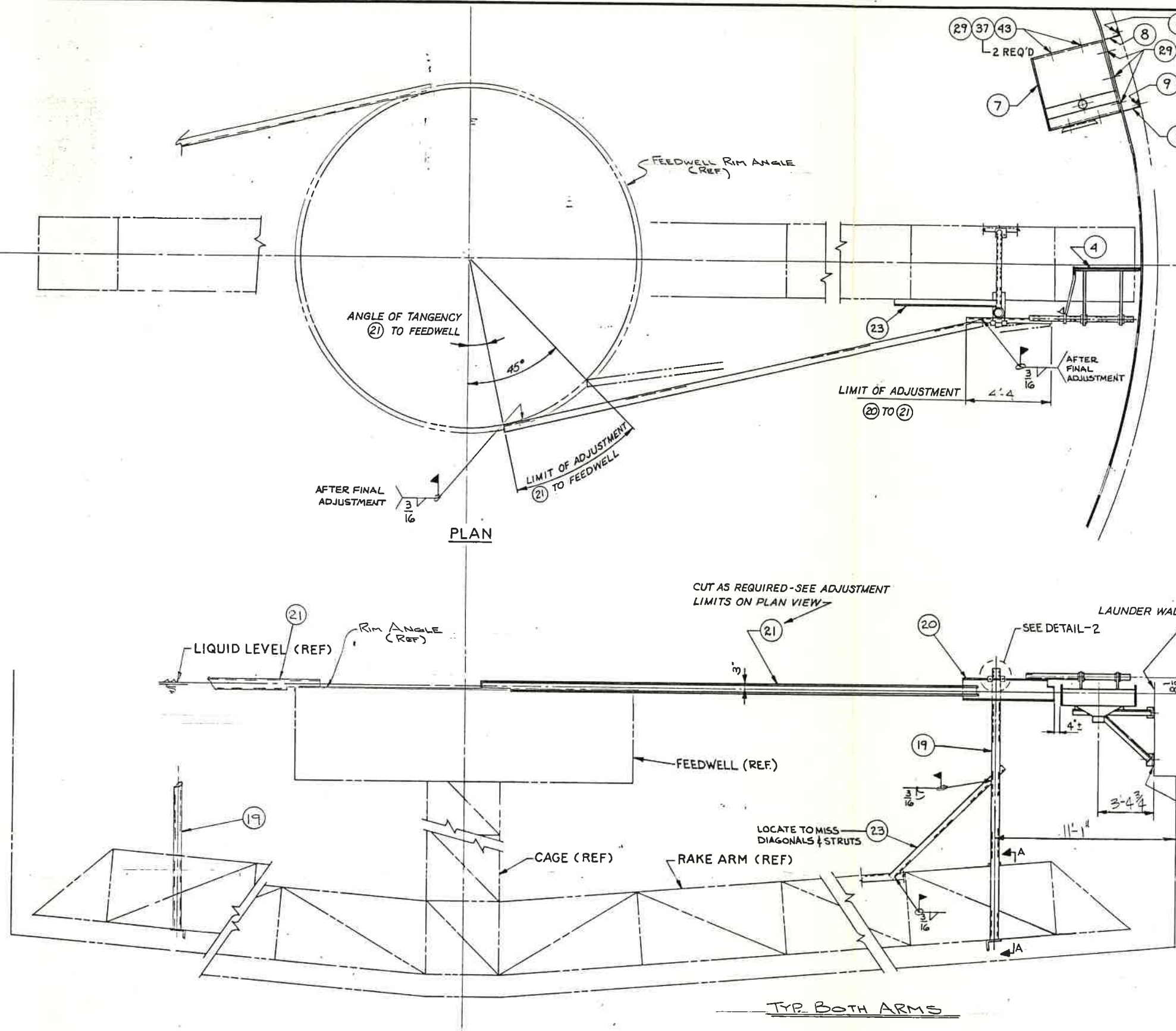
VIEW A-A



VIEW B-B

PARTS LIST: L 115342-1 THRU-10

ENVIROTECH 		EIMCO PMD — ENVIROTECH CORPORATION — Salt Lake City, Utah		REVISION
		This drawing and all information thereon is the property of Eimco PMD and is confidential and must not be made public or copied. This drawing is loaned subject to return upon demand and is not to be used directly or indirectly in any way detrimental to our interests.		HOLD FRACTIONAL MACHINED DIMENSIONS TO ± 1/64"
DO NOT SCALE PRINTS		DRIVE UNIT PACKAGE <i>CLARIFIERS & CLARITHICKENERS</i> W/C 30LT, C30HT, C40LT OR C40HT DRIVES		
 DATE	1-3-84			
 DRAWN	LHS			
 CHECKED	JKM			
 APPR	GEN	DWG. NO.	115342	REV. A

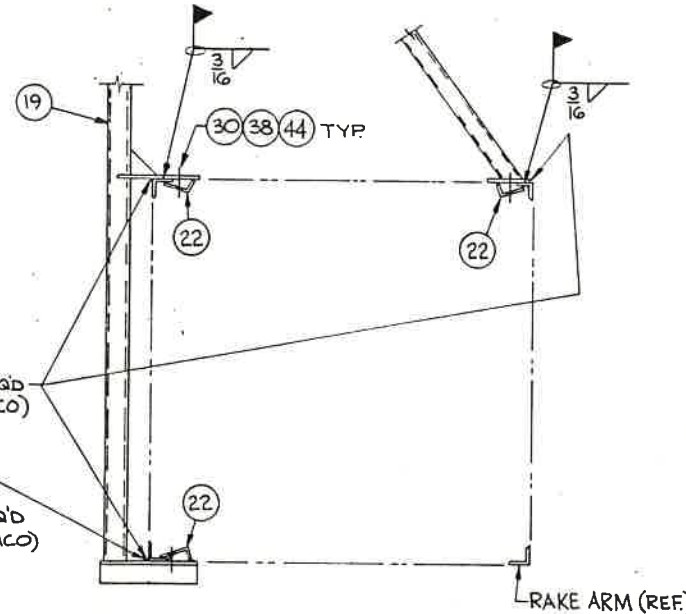


HIGH STRENGTH (H.S.) BOLTS (ASTM A325)
 MUST BE USED WHERE SHOWN AND SPECIFIED.
ASSEMBLY INSTRUCTIONS. TURN-OF-NUT METHOD.
 ALL JOINT SURFACES SHALL BE FREE OF LOOSE MILL SCALE, BURRS, AND FOREIGN MATERIAL.
 ENOUGH BOLTS SHALL BE BROUGHT TO A "SNUG TIGHT" CONDITION TO INSURE THAT THE PARTS OF THE JOINT ARE PROPERLY COMPACTED, I.E. BROUGHT INTO FULL CONTACT WITH EACH OTHER. "SNUG TIGHT" SHALL BE DEFINED AS THE TIGHTNESS ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A MAN USING AN ORDINARY SPUD WRENCH. FOLLOWING THE INITIAL TIGHTENING, BOLTS SHALL BE PLACED IN ANY REMAINING HOLES IN THE CONNECTION AND BROUGHT TO SNUG TIGHTNESS.
 ALL BOLTS IN THE JOINT SHALL BE TIGHTENED ADDITIONALLY BY THE APPLICABLE AMOUNT OF NUT ROTATION SPECIFIED BELOW, WITH TIGHTENING PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT TO ITS FREE EDGES.

Disposition of Outer Faces of Bolted Parts

Bolt Length (as measured from underside of head to extreme end of point)	One face normal to bolt axis and other face sloped not more than 1:20 (bevel washers not used)		Both faces sloped not more than 1:20 from normal to bolt axis (bevel washers not used)	
	Both faces normal to bolt axis	One face normal to bolt axis and other face sloped not more than 1:20 (bevel washers not used)	Both faces sloped not more than 1:20 from normal to bolt axis (bevel washers not used)	Both faces sloped not more than 1:20 from normal to bolt axis (bevel washers not used)
Up to and including 4 diameters	1/3 turn	1/2 turn	2/3 turn	
Over 4 diameters but not exceeding 8 diameters	1/2 turn	2/3 turn	5/6 turn	

NUT ROTATION IS ROTATION RELATIVE TO BOLT, REGARDLESS OF THE ELEMENT (NUT OR BOLT) BEING TURNED.
 TOLERANCE ON ROTATION 30° OVER OR UNDER.
 FOR OTHER THAN TURN-OF-NUT METHOD, FOLLOW PROCEDURES OUTLINED IN LATEST EDITION OF THE AISC STEEL CONSTRUCTION MANUAL.
 E-2299 Rev 5-81



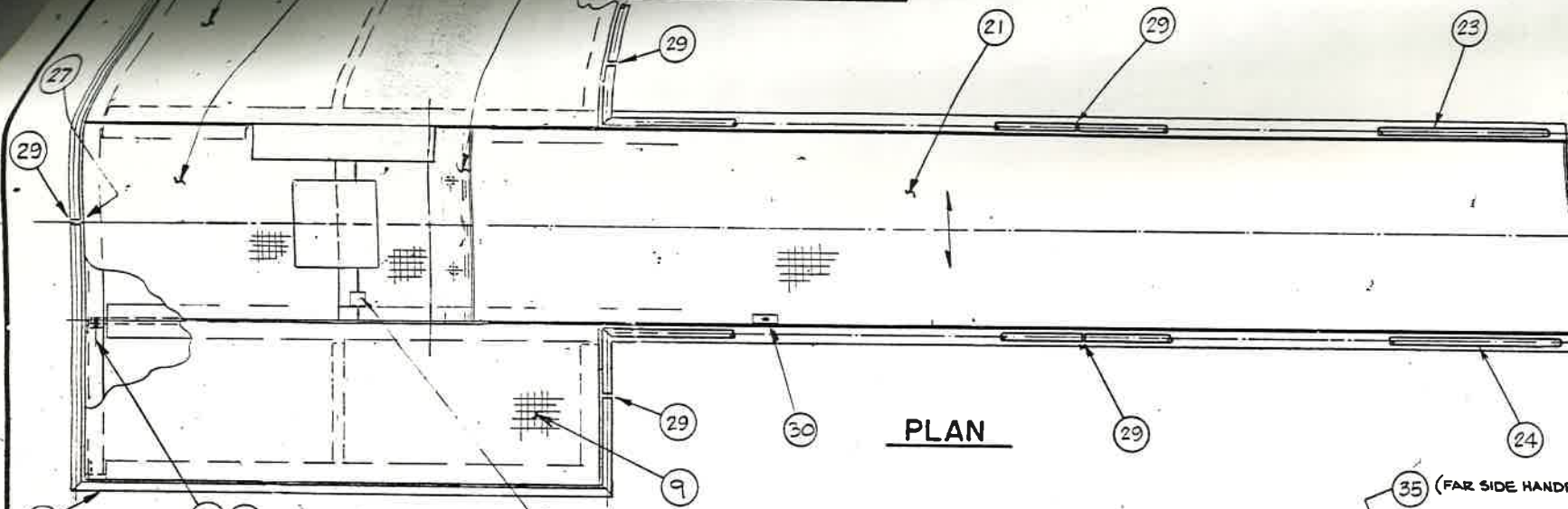
NOTE:
 ALL ITEMS SHOWN IN BUBBLES ARE IDENTIFIED ON PARTS LIST L23412053

SEPIA FROM 115020

ENVIROTECH		EIMCO BSP DIVISION - ENVIROTECH CORPORATION - Salt Lake City, Utah	
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DO NOT SCALE PRINTS DATE 8-14-86 DRAWN Tom S CHECK'D HCN APPR. MW		SKIMMING MECHANISM ERECTION DWG. NO. 23412053 REV.	

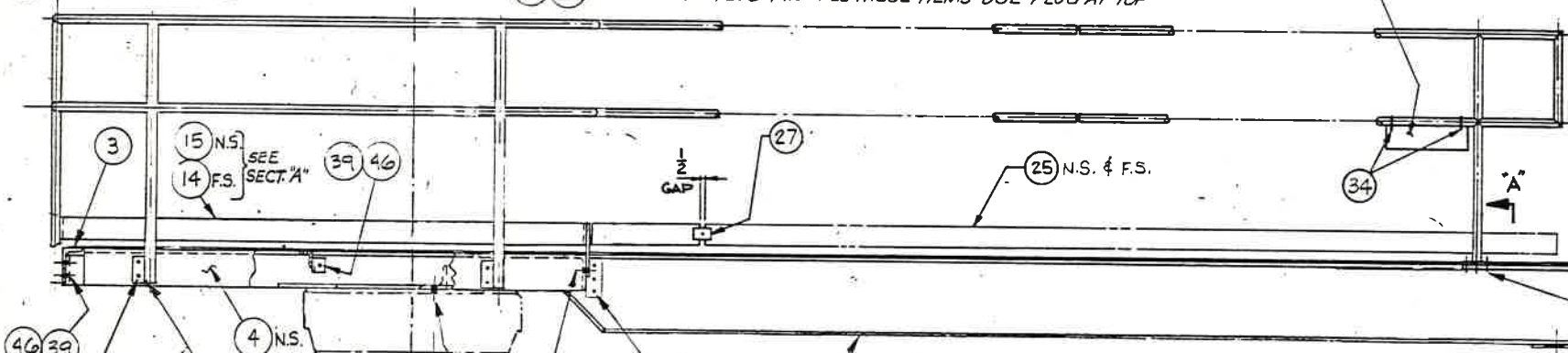
PIECE MARK	NO. REQ'D	MATERIAL	DESCRIPTION	MARKS	TOTAL WEIGHT
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NOTE
THE INSTALLATION, OPERATION AND
MAINTENANCE INSTRUCTIONS
MANUAL MUST BE REFERRED TO
PRIOR TO STARTING ERECTION OF
THIS EQUIPMENT



PLAN

REMOVE PIPE PLUG & INSTALL THESE ITEMS-USE PLUG AT TOP



ELEVATION

SECT. "A"

NOTES:

1. ALL ITEMS CALLED OUT ON THIS DWG. ARE
IDENTIFIED ON PARTS LIST L23412C54.

ISOLATION MATL REQ'D
BETWEEN ALUM. & STL.
(NOT BY EIMCO)

SEPIA FROM 203712/23281C54



ERMCO PROCESSING MACHINERY DIVISION-ENVIROTECH CORPORATION-Salt Lake City, Utah

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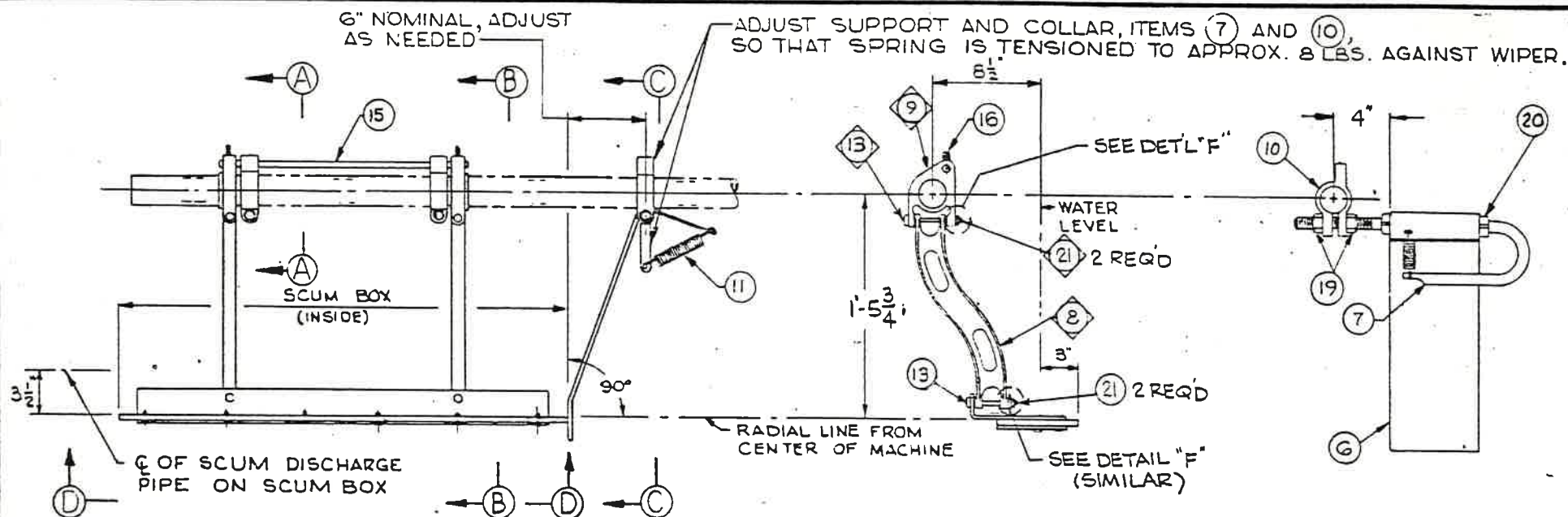
HOLD FRACTIONAL MACHINED
DIMENSIONS TO $\pm 1/64"$

DO NOT SCALE PRINTS
DATE 8-19-86
DRAWN JON S
CHECKED HCN
APPR. WU

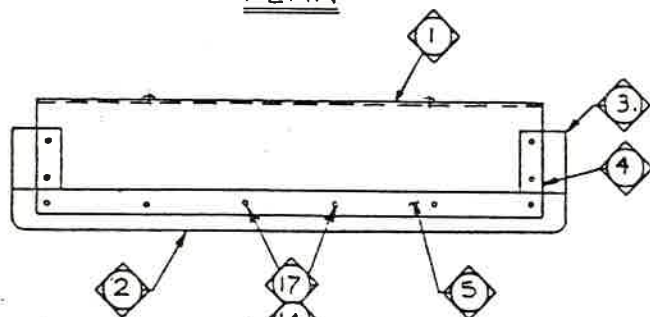
WALKWAY, PLATFORM & HANDRAIL
ASSEMBLY
85" DIA. CLARIFIER

REVISION	DWG. NO.	REV
	23412C54	

C	D/R	DATE
B		
A		



PLAN

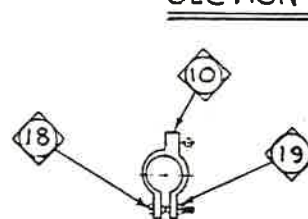


VIEW D-D

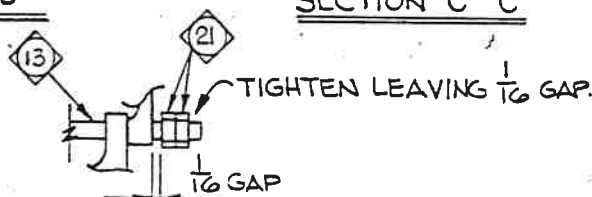
NOTE:

1. ALL ITEMS CALLED OUT ON THIS DWG. ARE IDENTIFIED ON PARTS LIST L23412B79 REFER TO JOB G.A. DRAWING
2. DENOTES SHOP ASSEMBLED

SECTION B-B



SECTION A-A



DETAIL "F"

SEPIA FROM 42700 & 23046B253 & 23077B254

THE EIMCO CORPORATION

Salt Lake City, Utah

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DATE	11-18-86	SKIMMING DEVICE ASSEMBLY FOR SQUARE SCUM BOXES		ORDER NO.	
BY	MDA			DATE ISSUED	
CHKD	WVW			DRAWING NO.	23412B79
APPR	WVW			REV	

2286 AUG 21 1984

HIGH STRENGTH (H.S.) BOLTS (ASTM A325)

MUST BE USED WHERE SHOWN AND SPECIFIED.

ASSEMBLY INSTRUCTIONS. TURN-OF-NUT METHOD.

ALL JOINT SURFACES SHALL BE FREE OF LOOSE MILL SCALE, BURRS, AND FOREIGN MATERIAL.

ENOUGH BOLTS SHALL BE BROUGHT TO A "SNUG TIGHT" CONDITION TO INSURE THAT THE PARTS OF THE JOINT ARE PROPERLY COMPACTED, I.E., BROUGHT INTO FULL CONTACT WITH EACH OTHER. SNUG TIGHT SHALL BE DEFINED AS THE TIGHTNESS ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A MAN USING AN ORDINARY SPUD WRENCH. FOLLOWING THE INITIAL TIGHTENING, BOLTS SHALL BE PLACED IN ANY REMAINING HOLES IN THE CONNECTION AND BROUGHT TO SNUG TIGHTNESS.

ALL BOLTS IN THE JOINT SHALL BE TIGHTENED ADDITIONALLY BY THE APPLICABLE AMOUNT OF NUT ROTATION SPECIFIED BELOW, WITH TIGHTENING PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT TO ITS FREE EDGES.

Bolt Length (as measured from underside of head to extreme end of point)	Disposition of Outer Faces of Bolted Parts		
	Both faces normal to bolt axis	One face normal to bolt axis and other face sloped not more than 1:20 (bevel wash- er not used)	Both faces sloped not more than 1:20 from normal to bolt axis (bevel wash- ers not used)
Up to and including 4 diameters	1/3 turn	1/2 turn	2/3 turn
Over 4 diameters but not exceeding 8 diameters	1/2 turn	2/3 turn	5/8 turn

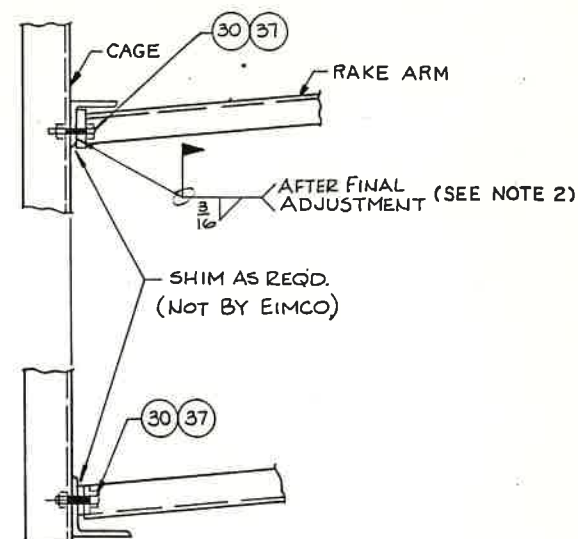
NUT ROTATION IS ROTATION RELATIVE TO BOLT, REGARDLESS OF THE ELEMENT (NUT OR BOLT) BEING TURNED.
TOLERANCE ON ROTATION: 30° OVER OR UNDER.
FOR OTHER THAN TURN-OF-NUT METHOD, FOLLOW PROCEDURES OUTLINED IN LATEST EDITION OF THE AISC STEEL CONSTRUCTION MANUAL.

E-2299 Rev. 5-81

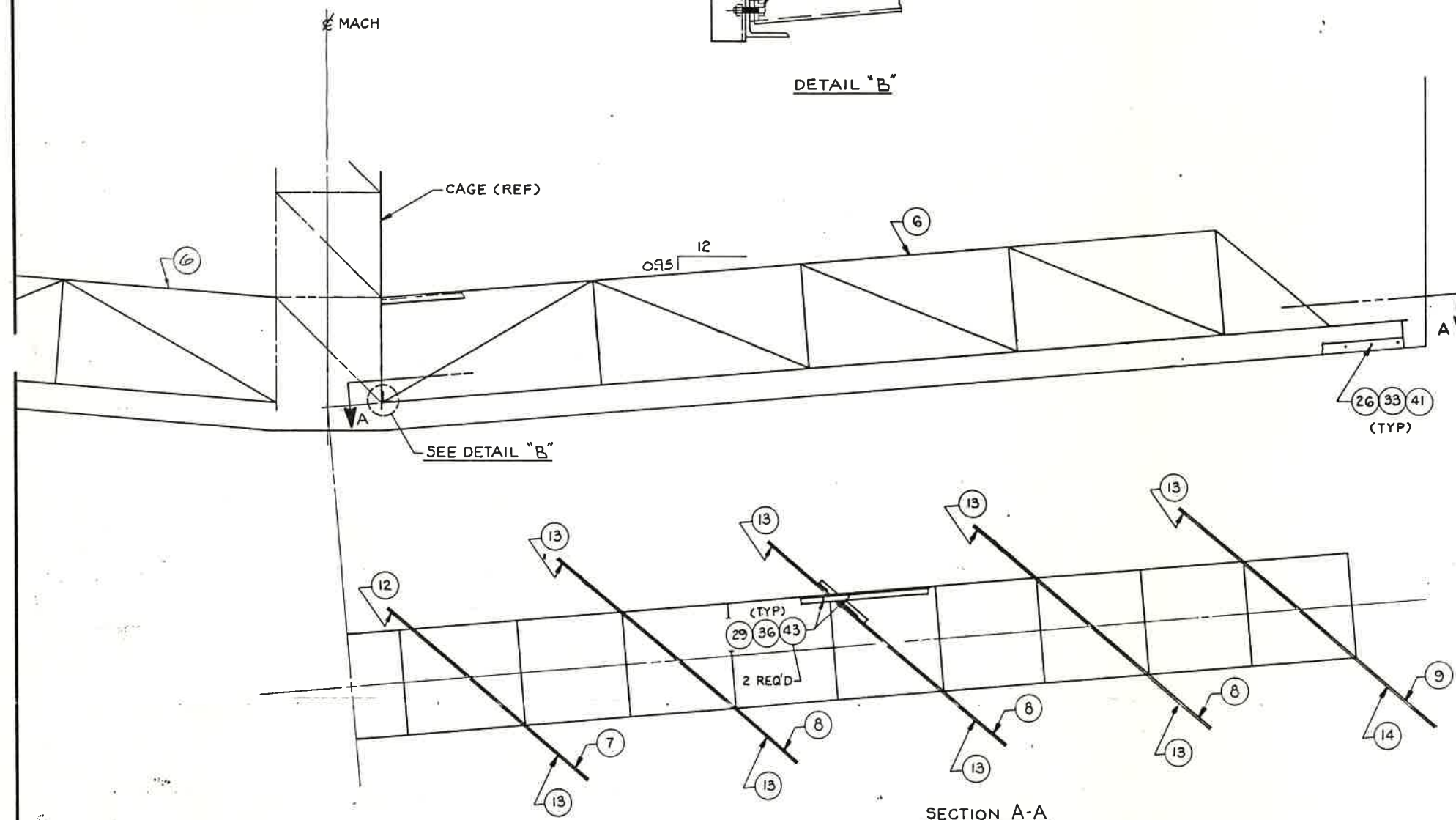
NOTES:

1. WORK THIS DRAWING WITH GENERAL ERECTION DRAWING N° 23412D51.
2. IF SHIMS ARE USED, WELD MUST BE ENLARGED SO THAT THE LOAD WILL BE TRANSFERRED FROM THE ARMS TO THE CAGE, NOT FROM ARMS TO SHIMS.

FOR ITEMS IDENTIFIED BY BUBBLES SEE PARTS LIST L23412D52.



DETAIL "B"

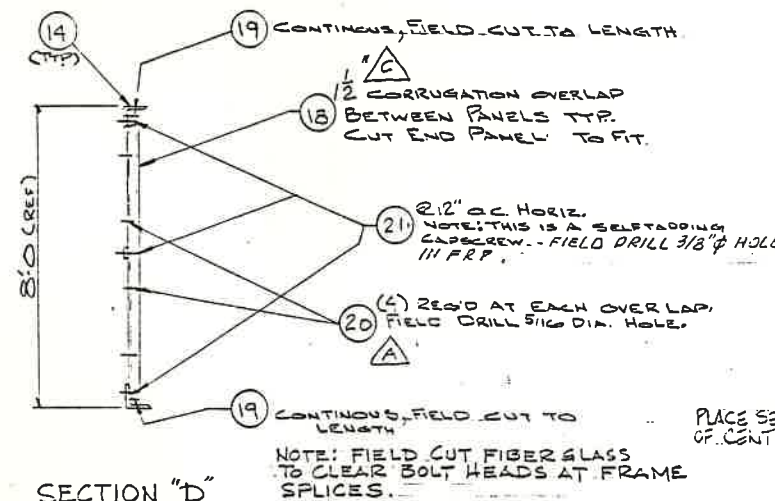
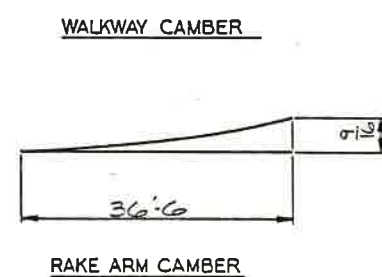
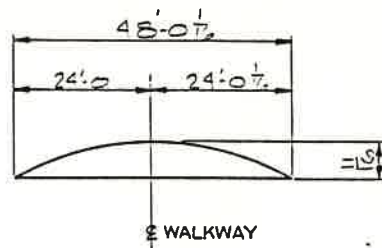
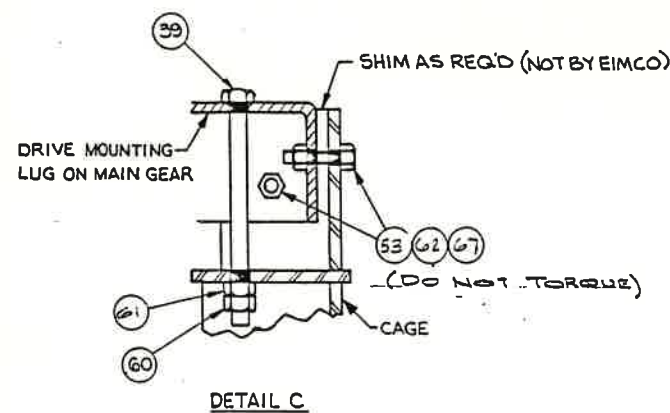


SECTION A-A

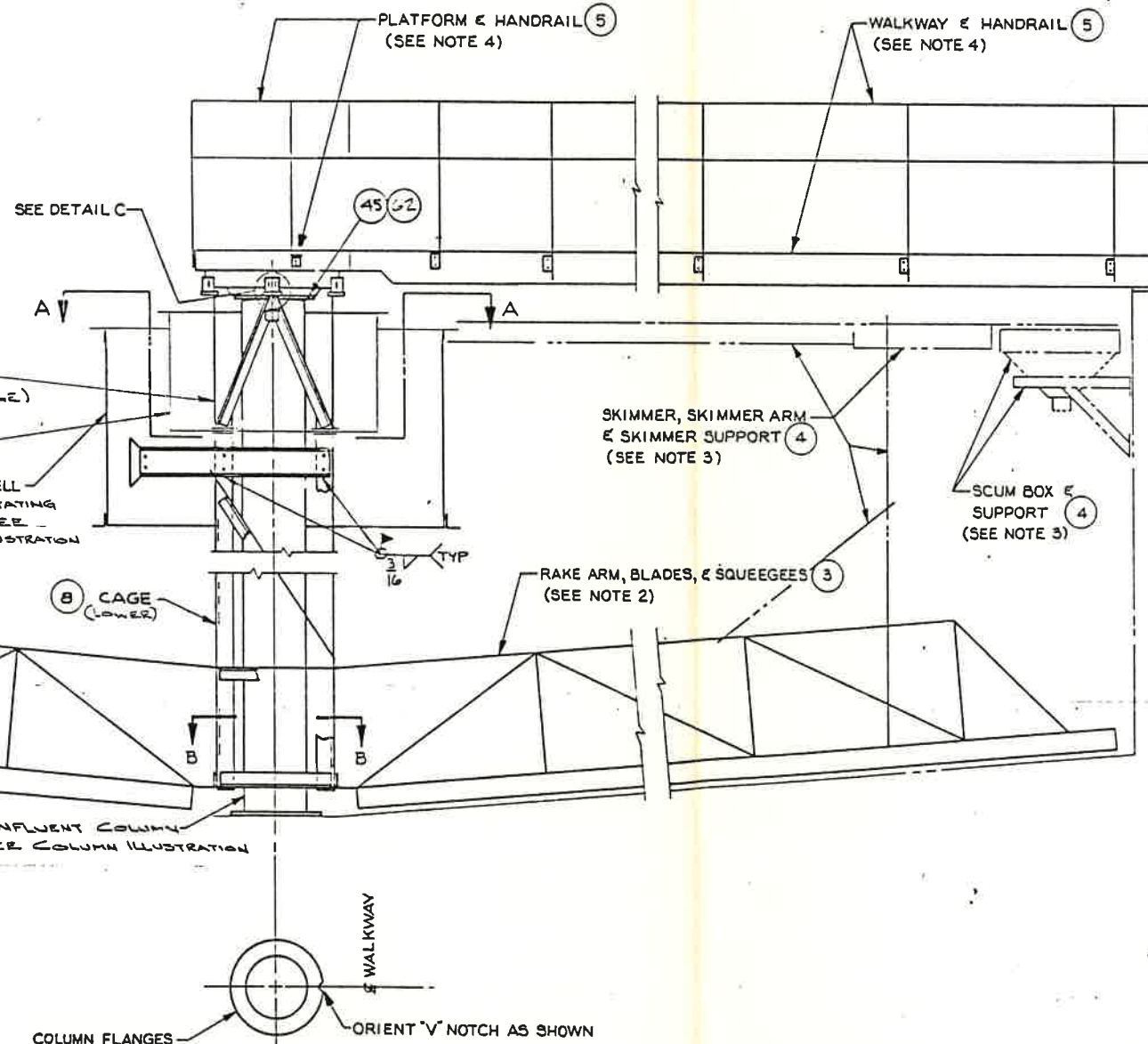
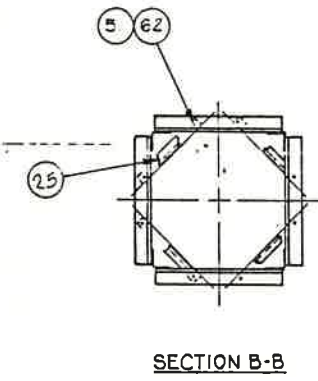
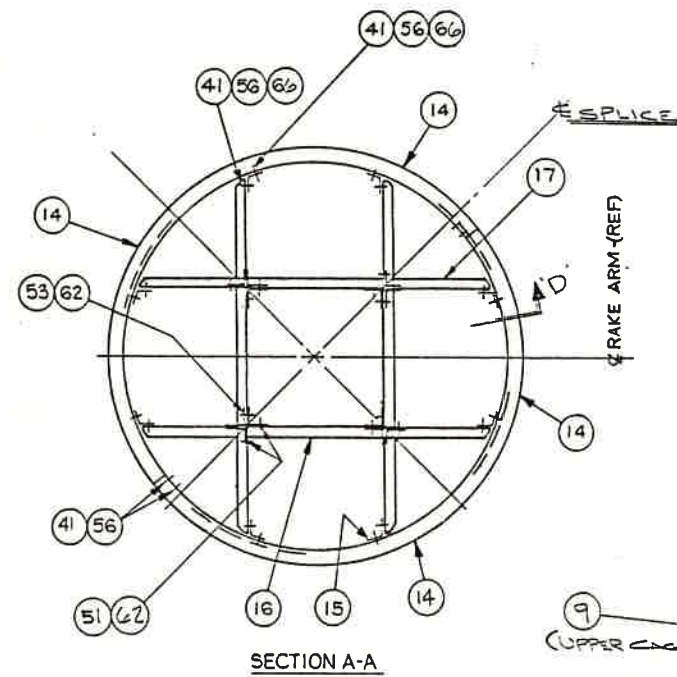
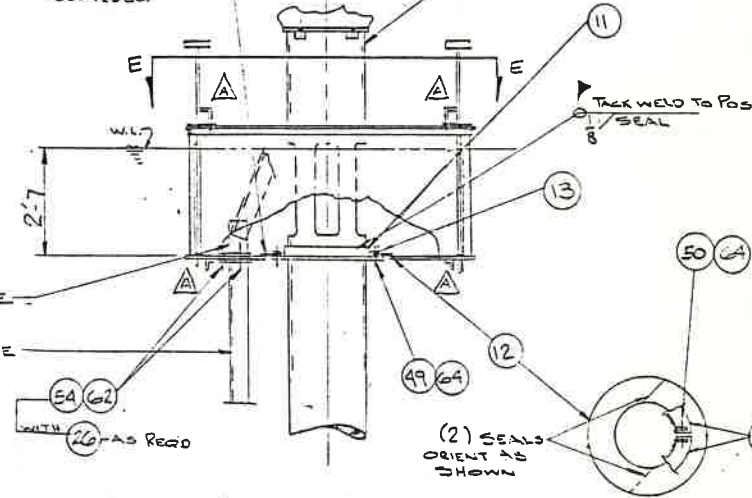
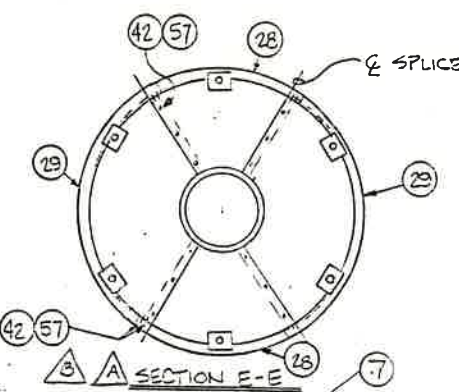
D	
C	
B	
A	
D/R	DATE

SEPIA FROM 114239

ENVIROTECH		EIMCO BSP DIVISION - ENVIROTECH CORPORATION - Salt Lake City, Utah	
DO NOT SCALE PRINTS		This drawing and all information thereon is the property of Eimco BSP and is confidential and must not be made public or copied. This drawing is loaned subject to return upon demand and is not to be used directly or indirectly in any way detrimental to our interests.	
DATE	8/14/86	HOLD FRACTIONAL MACHINED DIMENSIONS TO ± 1/64"	REV.
DRAWN	Tom S		
CHECK'D	HON		
APPR	WJ		
RAKE ARM ERECTION		DWG. NO.	23412D52
C3 CLARIFIER			
85" O DIA			



PLACE SEALS ON TOP OF CENTRAL FEEDWELL.



HIGH STRENGTH (H.S.) BOLTS (ASTM A325)

MUST BE USED WHERE SHOWN AND SPECIFIED. ASSEMBLY INSTRUCTIONS. TURN-OF-NUT METHOD. ALL JOINT SURFACES SHALL BE FREE OF LOOSE MILL SCALE, BURRS, AND FOREIGN MATERIAL. ENOUGH BOLTS SHALL BE BROUGHT TO A "SNUG TIGHT" CONDITION TO INSURE THAT THE PARTS OF THE JOINT ARE PROPERLY COMPACTED, I.E., BROUGHT INTO FULL CONTACT WITH EACH OTHER. SNUG TIGHT SHALL BE DEFINED AS THE TIGHTNESS ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A MAN USING AN ORDINARY SPUD WRENCH. FOLLOWING THE INITIAL TIGHTENING BOLTS SHALL BE PLACED IN ANY REMAINING HOLES IN THE CONNECTION AND BROUGHT TO SNUG TIGHTNESS. ALL BOLTS IN THE JOINT SHALL BE TIGHTENED ADDITIONALLY BY THE APPLICABLE AMOUNT OF NUT ROTATION SPECIFIED BELOW, WITH TIGHTENING PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT TO ITS FREE EDGES.

Disposition of Outer Faces of Bolted Parts			
Bolt Length (as measured from threaded end of nut to extreme end of point)	Both faces normal to bolt axis	One face normal to bolt axis and other face sloped not more than 1:20 from normal to bolt axis	Both faces sloped not more than 1:20 from normal to bolt axis
Up to and including 4 diameters	1/3 turn	1/2 turn	2/3 turn
Over 4 diameters but not exceeding 8 diameters	1/2 turn	2/3 turn	5/6 turn

NUT ROTATION IS ROTATION RELATIVE TO BOLT. REGARDLESS OF THE ELEMENT (NUT OR BOLT) BEING TURNED. TOLERANCE ON ROTATION: 30 OVER OR UNDER. FOR OTHER THAN TURN-OF-NUT METHOD, FOLLOW PROCEDURES OUTLINED IN LATEST EDITION OF THE AISC STEEL CONSTRUCTION MANUAL. E-2299 Rev 5-81

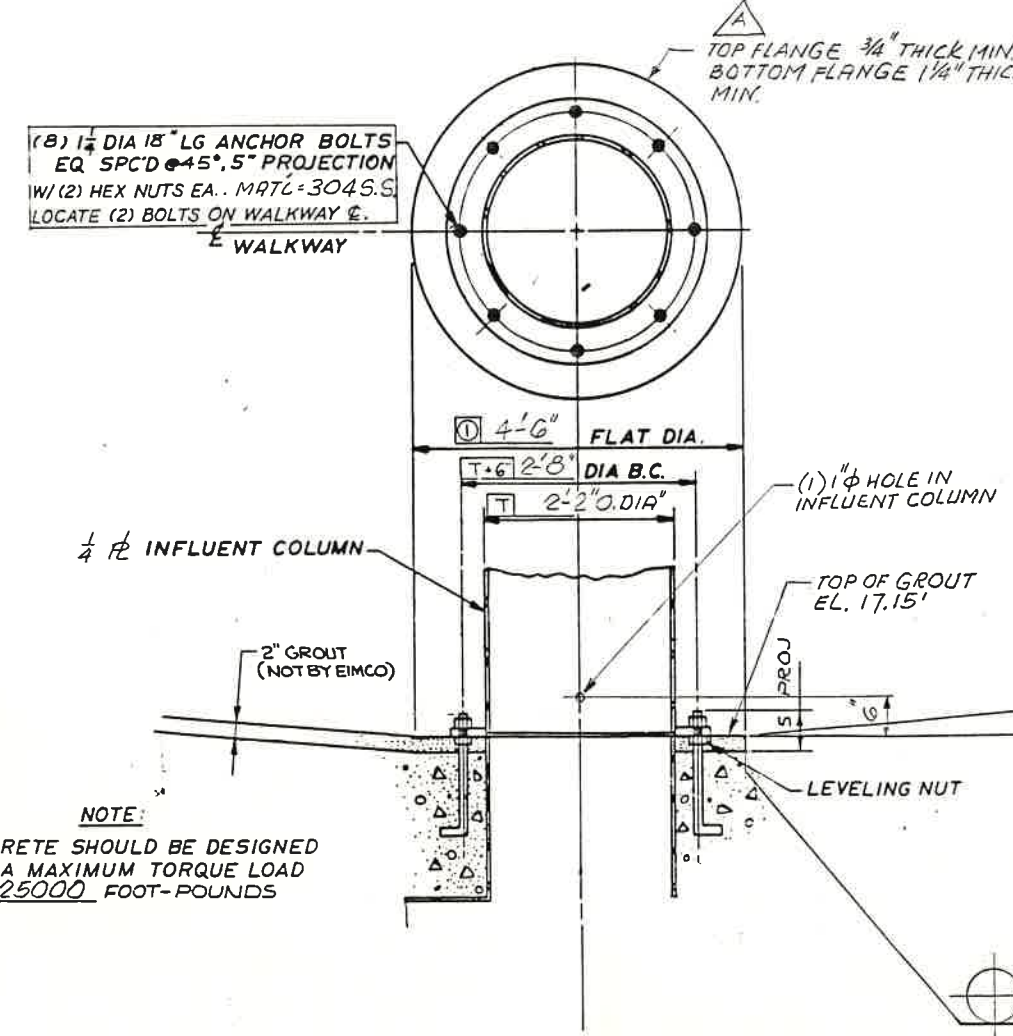
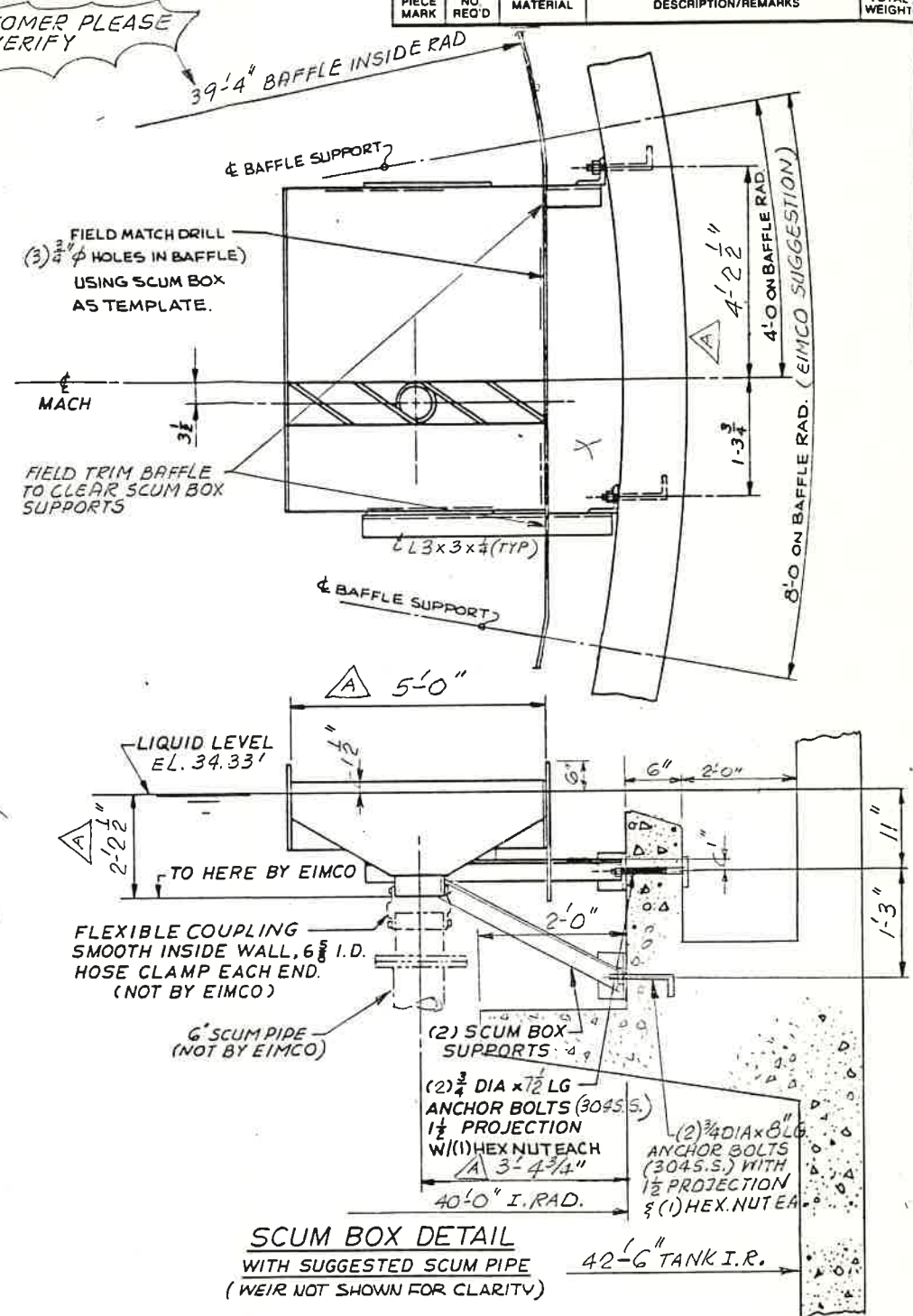
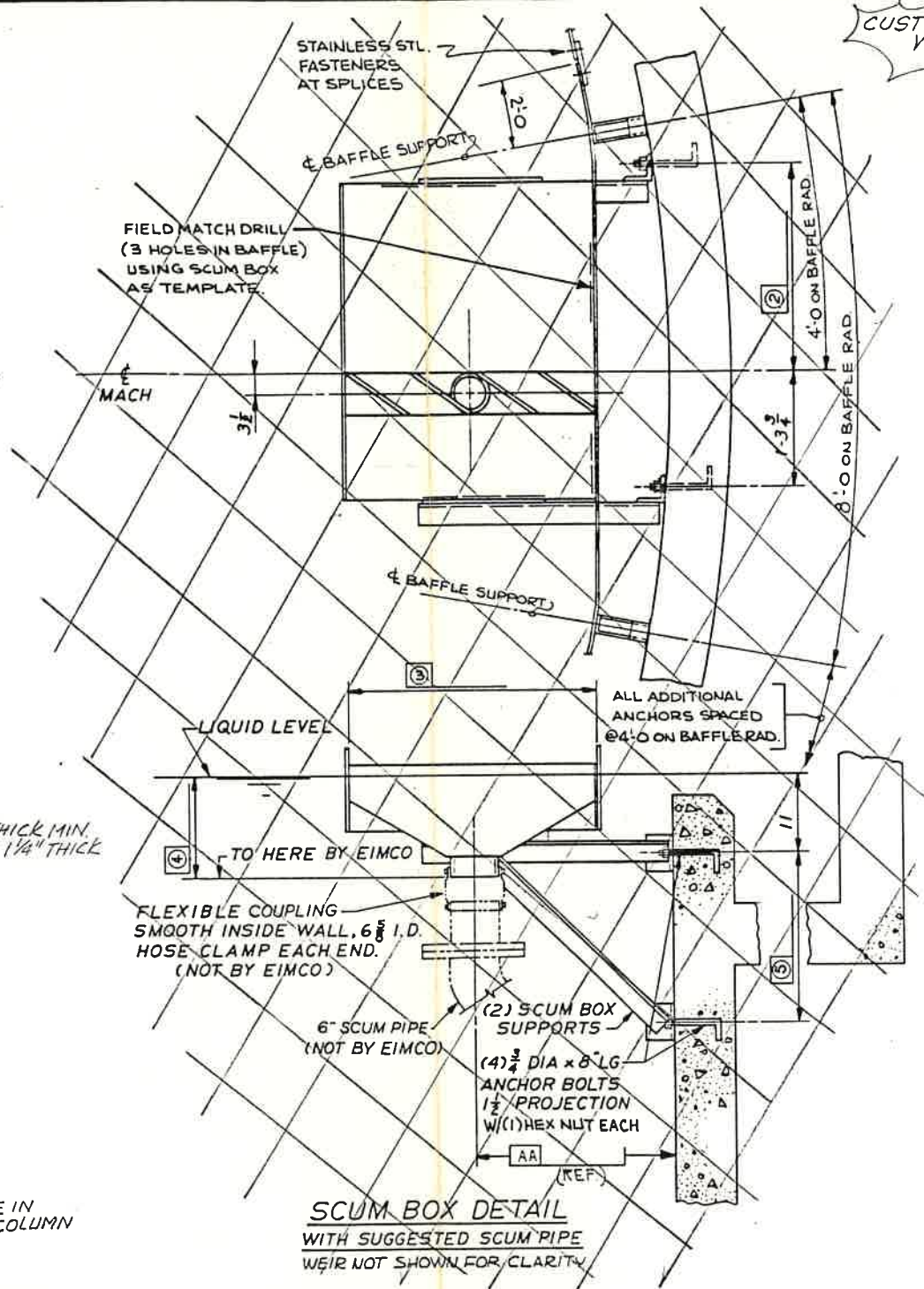
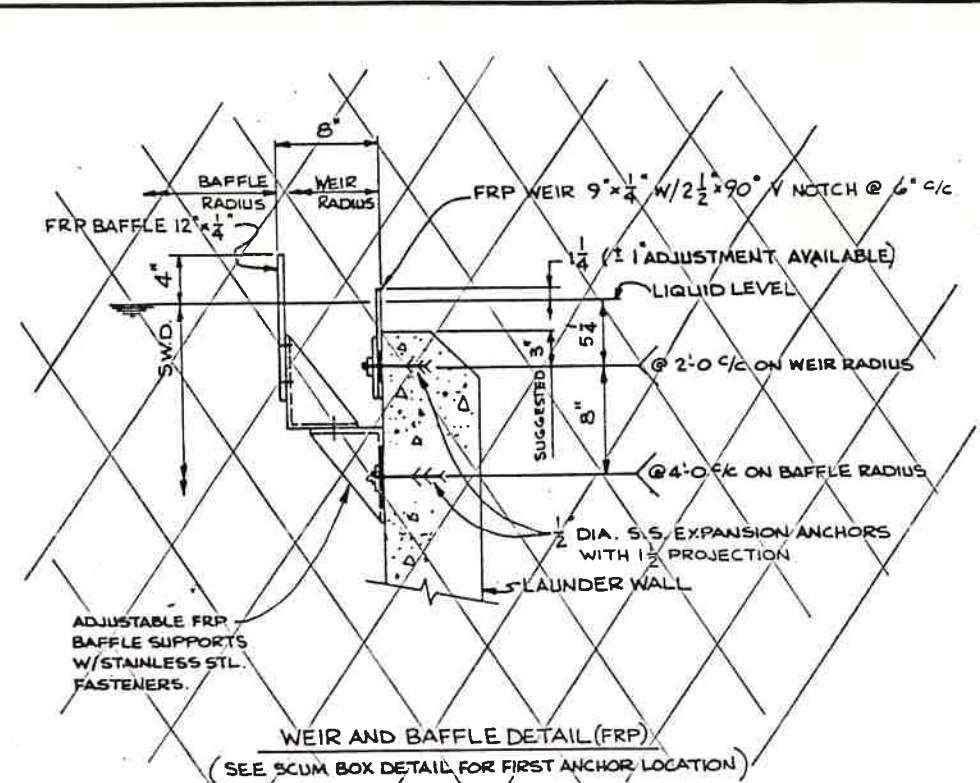
NOTES:

- ALL ITEMS CALLED OUT ON THIS DRAWING ARE IDENTIFIED ON PARTS LIST [23412051].
- FOR ERECTION OF RAKE ARMS, BLADES, SQUEEGEES, AND ARM TO CAGE CONNECTION, SEE DRAWING [23412052].
- FOR SKIMMING MECHANISM ERECTION, SEE DRAWING [23412053].
- FOR ERECTION OF PLATFORM, WALKWAY, RELATED HANDRAIL AND FLOOR PLATE, SEE DWG [23412054].
- THE INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS MANUAL MUST BE STUDIED PRIOR TO STARTING ERECTION OF THIS EQUIPMENT.

SEPIA FROM 114998

ENVIROTECH		EIMCO BSP DIVISION - ENVIROTECH CORPORATION - Salt Lake City, Utah	
DATE: 8-18-86		HOLD FRACTIONAL MACHINED DIMENSIONS TO ± 1/64"	
DRAWN: Tan S.		GENERAL ERECTION	
CHECKED: ILCN		85" DIA C3 CLARIFIER	
APPR: [signature]		DWG NO. 23412051	
BY: [signature]		REV: C	

WAS 2" OVERLAP MODIFIED SECTION "E-E" ROUND FEEDWELL WAS RECTANGULAR.



THIS DRAWING IS CERTIFIED FOR
CUSTOMER ALDER CONSTRUCTION CO
CUSTOMER ORDER NUMBER 44-23
EIMCO ORDER NUMBER 23412-01
PROJECT WASTE WATER TREATMENT PLANT EXPANSION
PROJECT LOCATION BEIGHAM CITY - UTAH
CONSULTING ENGINEER JAMES M. MONTGOMERY
BY James Hill DATE 7-25-86
EIMCO PROCESS EQUIPMENT COMPANY

SEPIA FROM 115457

EIMCO PROCESS EQUIPMENT COMPANY — Salt Lake City, Utah

This drawing and all information thereon is the property of Eimco PEC and is confidential and must not be made public or copied. This drawing is loaned subject to return upon demand and is not to be used directly or indirectly in any way detrimental to our interests.

HOLD FRACTIONAL MACHINED DIMENSIONS TO ± 1/32"

DO NOT SCALE PRINTS

DATE 7-17-86

DRAWN KVV

CHECKED RLA

APPR JMH

REVISION

BY

CHECKED

DATE

101-86

CLARIFIER

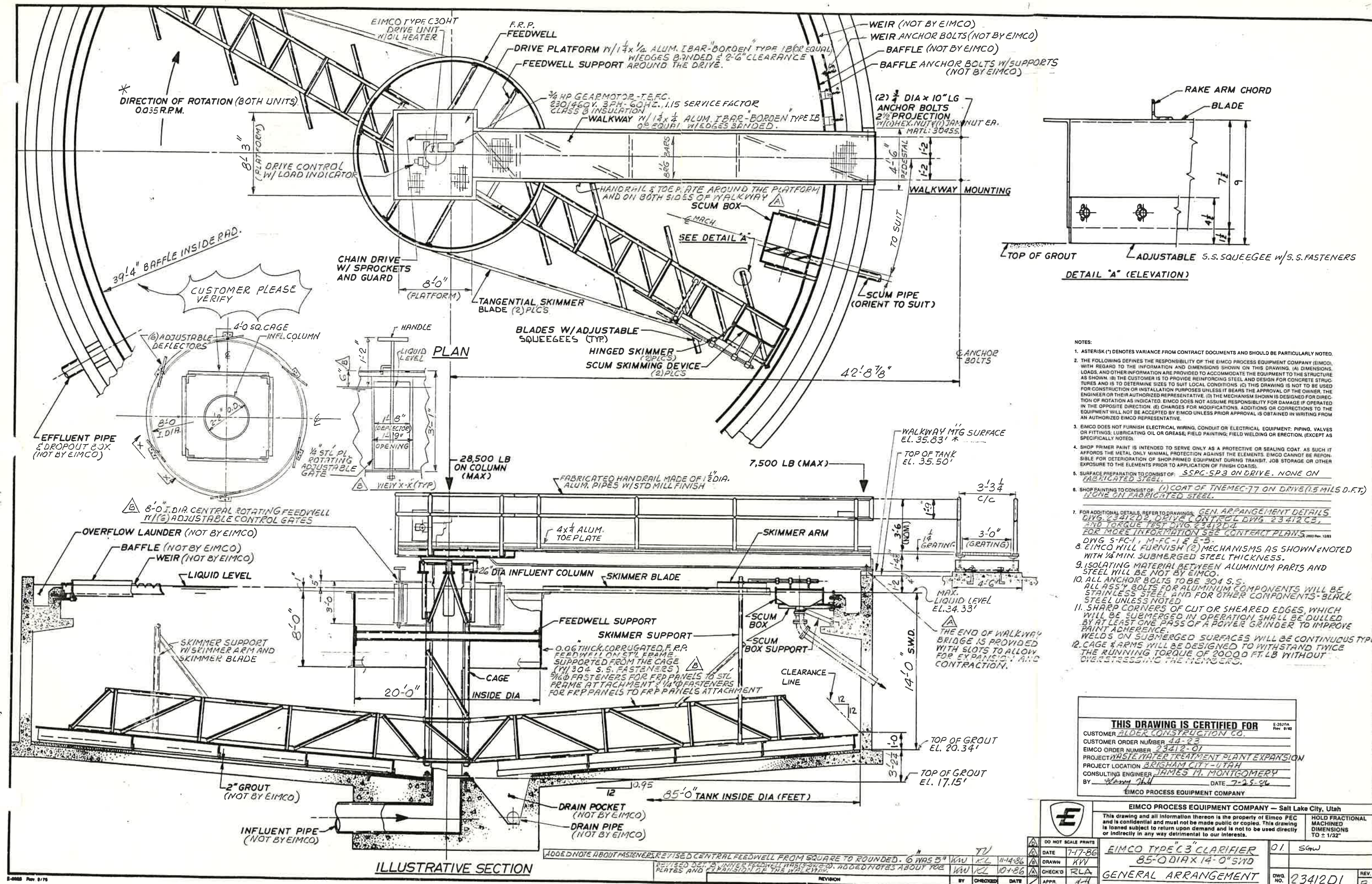
TYPE "C3" 85'-0" DIA.

GENERAL ARRANGEMENT DETAILS

01 S4W

DWG NO 23412D2

REV A



Parts Service Department
P.O. Box 300
Salt Lake City, Utah 84110-0300
Telephone 801/526-2000
Telex 38-8331



PAGE: 2 OF

NUMBER: 52-RM104816/JKB-86

DATE: 12/16/

PARTS SERVICE PROPOSAL

QTY	PART NUMBER	DESCRIPTION	RSPL CODE	UNIT KILO	ITM NO.	UNIT PRICE
		DRIVE & MOTOR PACKAGE L23412A31 -----				
1	L115423-1	DRIVE CONTROL ASSEMBLY	A		2	
1	48806A	ACTUATING PIN	A		3	
1	21092CC	SPRING	C		7	
1	86067K	SPROCKET	C		11	
1	86143AF	SPROCKET	C		12	
1	85853S	BUSHING	A		14	
1	86603H	ROLLER CHAIN (10' LENGTHS) INCLUDES: (1) 86605H LINK	A		16	
1	86605H	CONNECTING LINK	A		17	
		C30HT DRIVE ASSEMBLY L23412D33 -----				
1	20766CS	BEARING STRIP, BOTTOM LOCATED IN BASE	A		1	
1	20766CR	BEARING STRIP, OUTER LOCATED IN BASE	A		1	
1	114442A1A	MAIN GEAR INCLUDES BEARING STRIPS	B		2	
1	20766CS	BEARING STRIP, TOP LOCATED IN MAIN GEAR	A		2	
1	20766CP	BEARING STRIP, INNER LOCATED IN MAIN GEAR	A		2	
1	L202316	BUSHING HOUSING ASSEMBLY	B		6	
1	86196A	SPRING SEAT	C		7	
1	201735A3A	SLIDING BEARING SEAT	B		10	

This proposal and any order based hereon is subject only to all the Terms and Conditions and Warranty set forth on the reverse side and made a part hereof. EIMCO reserves the right to partial ship unless notified in writing.

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Salt Lake City, Utah 84110-0300
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Telex 38-8331



PAGE: 3 OF 5

NUMBER: 52-RM104816/JKB-86

DATE: 12/16/71

PARTS SERVICE PROPOSAL

QTY	PART NUMBER	DESCRIPTION	RSPL CODE	UNIT KILO	ITM NO.	UNIT PRICE
1	204158A1A	WORM GEAR	B		12	
1	203604A	WORM & SHAFT	B		16	
1	203791A	MAIN PINION	B		17	
1	86213A	STOP SCREW	C		18	
1	48686A	STOP ROD	B		19	
1	86762F	OIL GAUGE	C		24	
1	86215A	ANTI ROTATION PIN	B		25	
10	88607C	LIP SEAL (PER FOOT)	A		28	
10	88683C	LIP SEAL (PER FOOT)	A		29	
1	86201A	SPRING ADJUSTING SCREW	B		34	
87	85321R	BEARING BALL	A		39	
		BEARING SET CONSISTING OF:				
1	46783H	INNER RACE	A		40	
1	46783K	OUTER RACE	A		40	
1	46807F	BEARING	A		41	
1	46789Y	BEARING	A		42	
2	46767BC	RETAINING RING	C		43	
1	46766AZ	RETAINING RING	C		44	
1	85628D	OIL GAUGE	C		47	
1	46761AD	OIL SEAL	A		48	
2	46762AC	OIL SEAL	A		49	

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PAGE: 4 OF 5

NUMBER: 52-RM104816/JKB-86

DATE: 12/16/8

PARTS SERVICE PROPOSAL

QTY	PART NUMBER	DESCRIPTION	RSPL CODE	UNIT KILO	ITM NO.	UNIT PRICE
		SKIMMING DEVICE L23412B79 -----				
1	84032A	BOTTOM WIPER	A		2	
2	81602A	SIDE WIPER	A		3	
2	81598A	SIDE WIPER CLAMP	C		4	
1	84030A	BOTTOM WIPER CLAMP	C		5	
2	48080A1A	SCRAPER ARM	C		8	
1	85606A	EXTENSION SPRING	A		11	
		SYMBOL NOTATION -----				
		* PRICE AVAILABLE UPON REQUEST				
		RSPL CODES -----				
		A-WEAR ITEM				
		B-LONG LEADTIME				
		C-CONVENIENCE ITEM				
		REFERENCE 52-RM1048116/JKB-86 (EIMCO'S PROPOSAL NUMBER) WHEN ORDERING FROM THIS PROPOSAL TO ENSURE CORRECT PRICING AND TO HELP EXPEDITE YOUR ORDER.				

Parts Service Department
P.O. Box 300
Salt Lake City, Utah 84110-0300
Telephone 801/526-2000
Telex 38-8331



PAGE: 5 OF

NUMBER: 52-RM104816/JKB-86

DATE: 12/16/

PARTS SERVICE PROPOSAL

PART QTY NUMBER	DESCRIPTION	RSPL UNIT ITM CODE KILO NO.	UNIT PRICE
--------------------	-------------	--------------------------------	---------------

TERMS AND CONDITIONS

PRICES ARE FIRM FOR 90 DAYS
TERMS OF PAYMENT ARE NET 30
PRICES ARE F.O.B. SHIPPING POINT FREIGHT ALLOWED
MINIMUM ORDER IS \$ 50.00
NORMAL SHIPMENT IS 8-10 WEEKS AFTER
RECEIPT OF YOUR PURCHASE ORDER
IN SALT LAKE CITY, UTAH.

Parts Service Department
P.O. Box 300
Salt Lake City, Utah 84110-0300
Telephone 801/526-2000
Telex 38-8331



EIMCO

Process
Equipment
Company

PAGE: 1 OF 5

DATE: 12/16/86

PARTS SERVICE PROPOSAL

NUMBER: 52-RM104816/JKB-86

CUSTOMER INFORMATION

PREPARED FOR: BRIGHAM CITY WWTP

600 NORTH 1450 WEST
BRIGHAM CITY UT

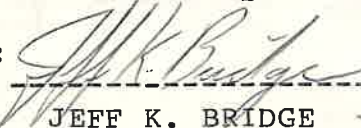
EQUIPMENT DATA

SERIAL NUMBERS: 23412-01
MODEL : C30HT DRIVE UNIT
85' C3
EQUIPMENT: CLARIFIER

SERVICE OFFICE

TO RECEIVE ASSISTANCE BY OUR REPRESENTATIVES IN YOUR AREA,
PLEASE CONTACT THEM AT THE FOLLOWING LOCATION:
COOMBS-HOPKINS COMPANY
3760 HIGHLAND DRIVE
SUITE 404
SALT LAKE CITY UT 84106
801/272-9898

EIMCO PROCESS EQUIPMENT COMPANY

BY: 

JEFF K. BRIDGE

Parts Service Department
P.O. Box 300
Salt Lake City, Utah 84110-0300
Telephone 801/526-2000
Telex 38-8331



PAGE: 2 OF 5

NUMBER: 52-RM104816/JKB-86

DATE: 12/16/86

PARTS SERVICE PROPOSAL

QTY	PART NUMBER	DESCRIPTION	RSPL CODE	UNIT KILO	ITM NO.	UNIT PRICE	TOTAL PRICE
		DRIVE & MOTOR PACKAGE L23412A31 -----					
1	L115423-1	DRIVE CONTROL ASSEMBLY	A		2	1448.00	1448.00
1	48806A	ACTUATING PIN	A		3	20.90	20.90
1	21092CC	SPRING	C		7	568.00	568.00
1	86067K	SPROCKET	C		11	20.50	20.50
1	86143AF	SPROCKET	C		12	113.00	113.00
1	85853S	BUSHING	A		14	23.00	23.00
1	86603H	ROLLER CHAIN (10' LENGTHS) INCLUDES: (1) 86605H LINK	A		16	52.00	52.00
1	86605H	CONNECTING LINK	A		17	.85	.85
		C30HT DRIVE ASSEMBLY L23412D33 -----					
1	20766CS	BEARING STRIP, BOTTOM LOCATED IN BASE	A		1	142.00	142.00
1	20766CR	BEARING STRIP, OUTER LOCATED IN BASE	A		1	142.00	142.00
1	114442A1A	MAIN GEAR INCLUDES BEARING STRIPS	B		2	*	*
1	20766CS	BEARING STRIP, TOP LOCATED IN MAIN GEAR	A		2	142.00	142.00
1	20766CP	BEARING STRIP, INNER LOCATED IN MAIN GEAR	A		2	138.00	138.00
1	L202316	BUSHING HOUSING ASSEMBLY	B		6	684.00	684.00
	86196A	SPRING SEAT	C		7	28.50	28.50
1	201735A3A	SLIDING BEARING SEAT	B		10	664.00	664.00

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Parts Service Department
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Telephone 801/526-2000
Telex 38-8331



EIMCO Process
Equipment
Company

PAGE: 3 OF 5

NUMBER: 52-RM104816/JKB-86

DATE: 12/16/86

PARTS SERVICE PROPOSAL

QTY	PART NUMBER	DESCRIPTION	RSPL CODE	UNIT KILO	ITM NO.	UNIT PRICE	TOTAL PRICE
1	204158A1A	WORM GEAR	B		12	2372.00	2372.00
1	203604A	WORM & SHAFT	B		16	2910.00	2910.00
1	203791A	MAIN PINION	B		17	5501.00	5501.00
1	86213A	STOP SCREW	C		18	92.00	92.00
1	48686A	STOP ROD	B		19	59.00	59.00
1	86762F	OIL GAUGE	C		24	44.50	44.50
1	86215A	ANTI ROTATION PIN	B		25	73.00	73.00
10	88607C	LIP SEAL (PER FOOT)	A		28	2.05	20.50
	88683C	LIP SEAL (PER FOOT)	A		29	2.65	26.50
1	86201A	SPRING ADJUSTING SCREW	B		34	140.00	140.00
87	85321R	BEARING BALL	A		39	3.85	334.95
		BEARING SET CONSISTING OF:					
1	46783H	INNER RACE	A		40	36.05	36.05
1	46783K	OUTER RACE	A		40	51.00	51.00
1	46807F	BEARING	A		41	133.00	133.00
1	46789Y	BEARING	A		42	100.00	100.00
2	46767BC	RETAINING RING	C		43	1.55	3.10
1	46766AZ	RETAINING RING	C		44	6.30	6.30
1	85628D	OIL GAUGE	C		47	68.00	68.00
1	46761AD	OIL SEAL	A		48	10.60	10.60
2	46762AC	OIL SEAL	A		49	15.40	30.80

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Parts Service Department
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EIMCO Process
Equipment
Company

PAGE: 4 OF 5

NUMBER: 52-RM104816/JKB-86

DATE: 12/16/86

PARTS SERVICE PROPOSAL

QTY	PART NUMBER	DESCRIPTION	RSPL CODE	UNIT KILO	ITM NO.	UNIT PRICE	TOTAL PRICE
		SKIMMING DEVICE L23412B79 -----					
1	84032A	BOTTOM WIPER	A		2	20.40	20.40
2	81602A	SIDE WIPER	A		3	5.60	11.20
2	81598A	SIDE WIPER CLAMP	C		4	24.10	48.20
1	84030A	BOTTOM WIPER CLAMP	C		5	94.00	94.00
2	48080A1A	SCRAPER ARM	C		8	108.00	216.00
1	85606A	EXTENSION SPRING	A		11	5.75	5.75

SYMBOL NOTATION

* PRICE AVAILABLE UPON REQUEST

RSPL CODES

A-WEAR ITEM
B-LONG LEADTIME
C-CONVENIENCE ITEM

REFERENCE 52-RM1048116/JKB-86
(EIMCO'S PROPOSAL NUMBER)
WHEN ORDERING FROM THIS
PROPOSAL TO ENSURE CORRECT
PRICING AND TO HELP EXPEDITE
YOUR ORDER.

Parts Service Department

Parts Service Department
P.O. Box 300
Salt Lake City, Utah 84110-0300
Telephone 801/526-2000
Telex 38-8331



EIMCO

Process
Equipment
Company

PAGE: 1 OF 2

DATE: 01/23/87

PARTS SERVICE PROPOSAL

NUMBER: 52-RM100291/JKB-87

CUSTOMER INFORMATION

PREPARED FOR: BRIGHAM CITY WWTP

BRIGHAM CITY

UT

EQUIPMENT DATA

SERIAL NUMBERS: 23411#02
MODEL : 10' MOTORIZED WIERS

EQUIPMENT: AERATION

SERVICE OFFICE

TO RECEIVE ASSISTANCE BY OUR REPRESENTATIVES IN YOUR AREA,
PLEASE CONTACT THEM AT THE FOLLOWING LOCATION:
COOMBS-HOPKINS COMPANY
3760 HIGHLAND DRIVE
SUITE 404
SALT LAKE CITY UT 84106
801/272-9898

EIMCO PROCESS EQUIPMENT COMPANY

BY:

JEFF K. BRIDGE

Parts Department
P.O. Box 100
Salt Lake City, Utah 84110-0300
Telephone 801/526-2000
Telex 38-8331



EIMCO

Process
Equipment
Company

PAGE: 2 OF 2

DATE: 01/23/87

NUMBER: 52-RM100291/JKB-87

PARTS SERVICE PROPOSAL

QTY	PART NUMBER	DESCRIPTION	RSPL CODE	UNIT KIT	ITM NO.	UNIT PRICE	TOTAL PRICE
		GENERAL ERECTION #23411C251 *****					
6	22682A567A	FLEXIBLE COUPLING	C		26	35.20	211.20
2	22682A574A	LIMIT SWITCH	C		30	127.00	254.00
1	23193A71A	SCALE GAUGE	C		32	36.65	36.65

REFERENCE 52-RM100291/JKB-87
(EIMCO'S PROPOSAL NUMBER)
WHEN ORDERING FROM THIS
PROPOSAL TO ENSURE CORRECT
PRICING AND TO HELP EXPEDITE
YOUR ORDER.

RSPL CODES

A - WEAR ITEMS

B - LONG LEADTIME

C - CONVENIENCE ITEM

TERMS AND CONDITIONS

PRICES ARE FIRM FOR 90 DAYS
TERMS OF PAYMENT ARE NET 30
PRICES ARE F.O.B. SHIPPING POINT FREIGHT ALLOWED
MINIMUM ORDER IS \$ 50.00
NORMAL SHIPMENT IS 8-10 WEEKS AFTER
RECEIPT OF YOUR PURCHASE ORDER
IN SALT LAKE CITY, UTAH.

Part _____ e Department
P.C. _____ 00
Salt Lake City, Utah 84110-0300
Telephone 801/526-2000
Telex 38-8331



EIMCO

Process
Equipment
Company

PAGE: 1 OF 2

DATE: 01/23/87

PARTS SERVICE PROPOSAL

NUMBER: 52-RM100291/JKB-87

CUSTOMER INFORMATION

PREPARED FOR: BRIGHAM CITY WWTP

BRIGHAM CITY

UT

EQUIPMENT DATA

SERIAL NUMBERS: 23411-02
MODEL : 10' MOTORIZED WIERS

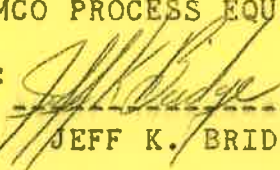
EQUIPMENT: AERATION

SERVICE OFFICE

TO RECEIVE ASSISTANCE BY OUR REPRESENTATIVES IN YOUR AREA,
PLEASE CONTACT THEM AT THE FOLLOWING LOCATION:

COOMBS-HOPKINS COMPANY
3760 HIGHLAND DRIVE
SUITE 404
SALT LAKE CITY UT 84106
801/272-9898

EIMCO PROCESS EQUIPMENT COMPANY

BY: 

JEFF K. BRIDGE

Process Department
P.O. Box 3100
Salt Lake City, Utah 84110-0300
Telephone 801/526-2000
Telex 38-8331



EIMCO

Process
Equipment
Company

PAGE: 2 OF 2

NUMBER: 52-RM100291/JKB-87

DATE: 01/23/87

PARTS SERVICE PROPOSAL

QTY	PART NUMBER	DESCRIPTION	RSPL CODE	UNIT KILO	ITM NO.	UNIT PRICE	TOTAL PRICE
		GENERAL ERECTION L23411C251 -----					
6	22682A567A	FLEXIBLE COUPLING	C		26	35.20	211.20
2	22682A574A	LIMIT SWITCH	C		30	127.00	254.00
1	23193A71A	SCALE GAUGE	C		32	36.65	36.65

REFERENCE 52-RM100291/JKB-87
(EIMCO'S PROPOSAL NUMBER)
WHEN ORDERING FROM THIS
PROPOSAL TO ENSURE CORRECT
PRICING AND TO HELP EXPEDITE
YOUR ORDER.

RSPL CODES

- A - WEAR ITEMS
- B - LONG LEADTIME
- C - CONVENIENCE ITEM

TERMS AND CONDITIONS

PRICES ARE FIRM FOR 90 DAYS
TERMS OF PAYMENT ARE NET 30
PRICES ARE F.O.B. SHIPPING POINT FREIGHT ALLOWED
MINIMUM ORDER IS \$ 50.00
NORMAL SHIPMENT IS 8-10 WEEKS AFTER
RECEIPT OF YOUR PURCHASE ORDER
IN SALT LAKE CITY, UTAH.

CUSTOMER ALDER CONSTRUCTION
COMPANY

ORDER No.: 44-03

PARTS LIST INSTRUCTION

THIS PARTS LIST IS MADE UP OF
"MASTER PARTS LISTS" AND
POSSIBLY, "SUB-PARTS LISTS".

THE "MASTER PARTS LIST" LISTS EACH
PIECE OR PART AND ASSEMBLY REQUIRE-
D FOR AN ORDER. IT IS IDENTIFIED BY
THE ORDER AND PAGE NUMBER, LOCAT-
ED IN THE LOWER RIGHT HAND CORNER.

EXAMPLE: (PAGE M1, ORDER XXXXX-00)

THE "SUB-PARTS LIST" IS A LISTING OF
COMMON PARTS OR ASSEMBLIES. IT IS
LISTED IN EITHER THE "MASTER PARTS
LIST" OR IN ANOTHER "SUB-PARTS LIST"
UNDER THE PART NUMBER COLUMN AND
IS A NUMBER PREFIXED BY THE LETTER
"L". (THIS NUMBER, LOCATED IN THE
LOWER LEFT HAND CORNER, IDENTIFIES
THE PARTS LIST AND IS ALSO THE PART
NUMBER FOR THAT GROUP OF PARTS.)
THE ORDER AND PAGE NUMBERS AP-
PEAR IN THE LOWER RIGHT HAND COR-
NER.

EXAMPLE: (PAGE S1, ORDER XXXXX-00)

*THE SUB-PARTS LISTS WHICH ARE IN-
DENTED ARE LISTED ON THE PREVIOUS
SUB-PARTS LIST.

FILTER

ACCS

DRIVE

STEEL

ANCHOR

OTHER

PLI

7-30-86

12-1-86

7-08-86

HILL

ORDER

Not Complete ☐

Complete ☒



EIMCO PEC PARTS LIST

PAGE
NUMBER

INDEX

M / THRU
M.3.

MASTER PARTS LIST NUMBER
2.3412-01

DESCRIPTION 85' Ø C3 CLARIFIERS
WITH C30HT

PAGE
NUMBER

SUB PARTS LIST NUMBERS

(1) LOT OF 2

S-1	S-2	L23412	A31			C30 HT DRIVE UNIT
S-3 THRU	S-6	L23412	D33			C30 HT DRIVE ASSEMBLY
S-7		L202316				BUSHING HOUSING ASSEMBLY
S-8		L115423-1				DRIVE CONTROL ASSEMBLY
S-9		L48923-1				SWITCH - ROTARY 4 SPDT
S-10		L48929-2				COVER - WELDMENT & MACHINING
S-11		L203520-1				CHAIN GUARD ASSEMBLY
S-12, S-13		L23412	D51			GENERAL ERECTION
S-14		L23412	D52			RAKE ARM ERECTION
S-15		L23412	D53			SKIMMING MECHANISM ERECTION
S-16		L23412	D79			SKIMMING DEVICE
S-17, S-18		L23412	C57			WALKWAY, PLATFORM & HANDRAIL ASSY



LINE No.	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
1	16	85979KK	85979	1 1/4" x 18 LG ANCHOR BOLTS - 304 S.S.			
2	32			1 1/4" 7NC HEX NUTS - 1"			
3				(C.C. COLUMN)			
4							
5	4	85979R	85979	3/4" x 10 LG ANCHOR BOLTS 304 S.S.			
6	4			3/4" - 10NC HEX. NUTS - 1"			
7	4			3/4" - 10NC JAM NUTS (WALKWAY)			
8							
9							
10	4	85979P	85979	3/4" x 8 LG ANCHOR BOLTS 304 S.S.			
11	4			3/4" - 10NC HEX. NUTS - 1"			
12	4			3/4" - FLAT WASHERS (SCUM BOX)			
13							
14							
15	4	23412AGA	23412AG	3/4" x 7 1/2 LG ANCHOR BOLTS 304 S.S.			
16	4			3/4" - 10NC HEX NUTS - 1"			
17	4			3/4" - 10NC FLAT WASHERS (SCUM BOX)			
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							

ONE LOT OF (2) MECHANISM(S)

ORDER COMPLETE ☐ NOT COMPLETE ☒

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED.

* WEIGHT SHOWN IS TOTAL FOR ORDER. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES.

TITLE: 85-0 DIA. C3 CLARIFIERS

REVISIONS:

BY	CK'D BY	DATE

MASTER PARTS LIST

When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.

PREPARED BY	DATE	CK'D BY	DATE	PAGE	OF
KW	7-23-86	LH	7-25-86	M-1	

SERIAL NUMBER

ORDER NUMBER

23412-01



LINE No.	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
1	2	L23412 A31		C30 HT DRIVE UNIT			
2							
3							
4							
5				NAMEPLATE SERIAL NUMBER: 23412-01A5-01B			
6							
7			46551	TOLERANCE AND RULES			
8							
9			86858	FABRICATION AREA CLEANING GRADE D			
10							
11							
12			.85472	SURFACE PREPARATION:			
13							
14							
15			85474	PAINT SPECIFICATIONS: (1 GAL/COAT/MACHINE)			
16							
17							
18							
19				NOTES:			
20				1. ASSEMBLE AND TEST RUN PRIOR TO SHIPMENT.			
21				2. GREASE ALL MACHINED SURFACES.			
22				3. TAPE SHUT ALL GAPS WHERE DUST CAN ENTER.			
23				4. PACKAGE AS REQUIRED FOR SAFE SHIPMENT.			
24							
25							
26				ENGINEERING REFERENCE:			
27				DRIVE MOUNTING / INTERFACE EDM			
28							
29							
30				DRIVE DATA: .035 RPM, 3/4 HP, 25K TORQUE			
31							
32				(DRIVE COMPLETE)			
ONE LOT OF (2) MECHANISM(S)				ORDER COMPLETE ☐ NOT COMPLETE ☒			
ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED.				* WEIGHT SHOWN IS TOTAL FOR ORDER. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES.			
TITLE: C30 HT DRIVE UNIT C3 CLARIFIER 85'-0 DIA x 14'-0 SWD				REVISIONS:		BY	CK'D BY
MASTER PARTS LIST				When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.		SERIAL NUMBER	
PREPARED BY		DATE		CK'D BY		DATE	
WD		7-21-86		BA		7-23-86	
				PAGE		17-2 OF	
						ORDER NUMBER	
						23412-01	



LINE No.	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
1	2	L23412D51		GENERAL FRECTION	33	076	
2							
3			86858	FAB. AREA CLEANING GRADE "D"			
4							
5			46551	TOLERANCE & RULES			
6							
7			23412A78	SHOP ASSEMBLY INST.			
8							
9				SURFACE PREP (SUBMERGED & NON-SUB.			
10				ST'L) BARE METAL			
11							
12				PAINT SPEC. (SUB. & NON-SUBMERGED ST'L)			
13				BARE METAL			
14				THE FOLLOWING DWG'S. TO RECEIVE CONTINUOUS WELDS			
15				23412D66, 23412D63, 23412D80, 23412B73, 23412D69, 23412C65,			
16				23412C64, 204104, 114642, 203673, 203675, 203479, 110332, 48718.			
17				NOTE: ALL WELDING SHALL BE PERFORMED			
18				IN ACCORDANCE WITH THE LATEST EDITION			
19				OF AWS. WELDING PROCEDURES WITH			
20				QUALIFICATION RECORDS PER AWS D1.1			
21							
22				SUBMERGED ST'L WITH SHARP CORNERS TO			
23				RECEIVE ONE PASS OF A POWER GRINDER			
24				REFERENCE DWGS			
25			23412D1	GENERAL ARRANGEMENT			
26			23412D2	" " " " DETAILS			
27							
28							
29							
30							
31							
32							
ONE LOT OF (2) MECHANISM(S)				ORDER COMPLETE ☒ NOT COMPLETE ☐			
ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED.				* WEIGHT SHOWN IS TOTAL FOR ORDER. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES.			
TITLE: C3 CLARIFIER 85" O DIA. X 14" O SWD				REVISIONS: TOTAL WT. WAS 33816		BY: KWW CK'D BY: HCN DATE: 12-6-86	
MASTER PARTS LIST				When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.		SERIAL NUMBER	
				PREPARED BY: Tom S. DATE: 8-19-86 CK'D BY: HCN DATE: 9-4-86		ORDER NUMBER: 23412-01	
				PAGE: M-3 OF 7			

PARTS LIST No. L23412 A 31

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
				115342	ASSEMBLY			
1	1	2	L23412 D 33		C30HT DRIVE ASSEMBLY			
2	1	2	L115423-1		DRIVE CONTROL ASSEMBLY RH	(B)		
					(SET SWITCHES #1-80, #2-67, #3 & #4-OVER 100)			
3	1	2	48806A	48806	ACTUATING PIN			
6	1	2	L203520-1		CHAIN GUARD ASSEMBLY			
7	1	2	21092CC	21092	SPRING	(B)		
8	3	6	88557A	88557	MOUNTING ANGLE			
9	1	2	23412 A 32 A	23412 A 32	GEARMOTOR 25 RPM 230/460-3-60 115423	(B)		
					SL-7 (13) SL-16 (13) SL-24			
11	1	2	86067K	86067	SPROCKET-13T 1 1/2 BORE			
12	1	2	86143AF	86143	SPROCKET-54T			
13	4	8	88558D	88558	NUT W/SPRING			
14	1	2	85853S	85853	BUSHING-TAPER-LOCK #2517 2 3/16 DIA. BORE			
15	3	6	88558D	88558	NUT W/SPRING			
16	75	150	86603H	86603	CHAIN-ROLLER ASA 60			
17	1	2	86605H	86605	CONNECTING LINK ASA 60			
18	4	8	88441D	88441	SCREW-SELF DRILLING & TAPPING			
19	4	8			CAPSCREW-HEX HD 1/2-13NC x 1 3/4	(STL)		
22	6	12			CAPSCREW-HEX HD 1/2-13NC x 1"	(STL)		
24	3	6			NUT-HEX 1/2-13NC	(STL)		
26	4	8			WASHER-LOCK 1/2 STD	(STL)		
27	6	12			WASHER-LOCK 1/2 STD	(STL)		
28	3	6			WASHER-FLAT 1/2 STD	(STL)		
29	12	24			SCREW-DRIVE RD HD #6 x 1/2 TYPE U	(SS)		
30	1	2	203422A	203422	NAMEPLATE (CAUTION)			
31	1	2	21066A	21066	NAMEPLATE			
32	1	2	21066H	21066	LEGEND PLATE (CLARIFIER)			

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES.

SEPIA FROM L115342-3

TITLE DRIVE & MOTOR PACKAGE: FOR
CLARIFIER, C30HT DRIVE, WITH 3/4 HP
.035 RPM, 25,000 FT LB TORQUE

REVISIONS.

BY CK'D BY DATE

SUB-PARTS LIST

PREPARED BY

WD

DATE

7-21-86

When ordering parts specify Type of Equipment, Order No, Serial No., Part No., and Description, per this parts list

UNITS REQ'D FOR ORDER

2

CHECKED BY

B.H.

DATE

7-23-86

PREPARED BY

DATE

CK'D BY

DATE

ORDER PAGE NO.

5-1

ORDER NUMBER

23412-01

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
33	1	2	48743A	48743	INSTRUCTION PLATE			
34	1	2	84640A	84640	INSTRUCTION PLATE (ARROW)			
35	1	2	88551A	88551	PLUG 2" NPT			
40	29	58	88549C	88549	MOUNTING CHANNEL			
41	16	32	88549C	88549	MOUNTING CHANNEL			
43	1	2	203792A	203792	COVER-WORM GEAR			
/	1	2	88550A	88550	FLANGE			
NOTE: SHOP ASSEMBLE ALL ITEMS								
TITLE DRIVE & MOTOR PACKAGE: FOR CLARIFIER, C30HT DRIVE, WITH 3/4 HP .035 RPM, 25,000 FT LB TORQUE						REVISIONS:		BY CK'D BY DATE
SUB-PARTS LIST				PREPARED BY WD	DATE 7-21-86	UNITS REQ'D FOR ORDER 2		ORDER NUMBER 23412-01
PARTS LIST No L23412A31				CHECKED BY BH	DATE 7-23-86	ORDER PAGE NO. 5-2		

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'D. NUMBER	REL. No.
				23412D33	ASSEMBLY			
1	1	2	23412C34A	23412C34	BASE MODIFICATION			
/	1	2	115623A1A	115623-1	BASE	(B)		
/	1	2	115623A	115623	BASE (RAW CASTING)			
/	1	2	20766CS	20766	BEARING STRIP-BOTTOM	(A)		
/	1	2	20766CR	20766	BEARING STRIP-OUTER	(A)		
					SEE NOTE PAGE 3			
2	1	2	114442A1A	114442-1	MAIN GEAR	(B)		
/	1	2	114442A	114442	MAIN GEAR (RAW CASTING)			
/	1	2	20766CS	20766	BEARING STRIP-TOP	(A)		
/	1	2	20766CP	20766	BEARING STRIP-INNER	(A)		
					SEE NOTE PAGE 3			
4	1	2	112837A2A	112837-2	WORM GEAR HOUSING			
/	1	2	112837A	112837	WORM GEAR HOUSING (RAW CASTING)			
5	1	2	203608A	203608	END CAP			
6	1	2	L202316		BUSHING HOUSING ASSEMBLY			
7	1	2	86196A	86196	SPRING SEAT	(A)		
10	1	2	201735A3A	201735-3	SLIDING BEARING SEAT			
/	1	2	201735A	201735	SLIDING BEARING SEAT (RAW CASTING)			
12	1	2	204158A1A	204158-1	WORM GEAR	(B)		
/	1	2	204158A	204158	WORM GEAR (RAW CASTING)			
13	1	2	203790A	203790	MAIN GEAR COVER	(B)		
16	1	2	203604A	203604	WORM AND SHAFT	(B)		
17	1	2	203791A	203791	MAIN PINION	(B)		
18	1	2	86213A	86213	STOP SCREW	(A)		
19	1	2	48686A	48686	STOP ROD	(A)		
20								
21	1	2	40442J	40442	KEY	(B)		

ALL CAPSCREWS A11F SAE GRADE 5 UNLESS OTHERWISE SPECIFIED * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES. SEPIA FROM: L115100-2

TITLE: DRIVE ASSEMBLY C30HT (BASIC)		REVISIONS:		BY	CK'D BY	DATE

SUB-PARTS LIST		PREPARED BY W.D.	DATE 7-21-86	When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.		UNITS REQ'D FOR ORDER 2
PAGE 1 OF 4	PARTS LIST No. L23412D33	CHECKED BY BH	DATE 7-23-86	PREPARED BY	DATE	ORDER PAGE NO. 5-3
				CK'D BY	DATE	ORDER NUMBER 23412-01

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'D. NUMBER	REL. No.	
22	1	2	40447A	40447	KEY	(B)			
24	1	2	86762F	86762	GAUGE-OIL STRAIGHT	(C)			
25	1	2	86215A	86215	ANTI-ROTATION PIN	(B)			
26					NOT REQD.				
27	1	2			PLUG-PIPE 2" SQ HD SCRD 2" STD	(MI)			
28	10	20	89607C	88607	SEAL, LIP	(A)			
29	10	20	88683C	88683	SEAL LIP	(A)			
33	2	4	87548F	87548	LIFTING BOLTS				
34	1	2	86201A	86201	SPRING ADJUSTING SCREW	(C)			
35	1	2			PLUG-PIPE 1" SQ HD SCRD 1" STD	(MI)			
37	1	2	84640A	84640	INSTRUCTION PLATE (ARROW)				
38	1	2	88601A	88601	NAMEPLATE-END CAP WARNING SIGN				
39	87	174	85321R	85321	BEARING BALL 1 1/4 DIA.	(A)			
40	1	2			BEARING CONSISTING OF:				
/	1	2	46783H	46783	INNER RACE	(A)			
/	1	2	46783K	46783	OUTER RACE	(A)			
41	1	2	46807F	46807	BEARING	(A)			
42	1	2	46789Y	46789	BEARING	(A)			
43	2	4	46767BC	46767	RETAINING RING	(A)			
44	1	2	46766AZ	46766	RETAINING RING	(A)			
47	1	2	85628D	85628	GAUGE-OIL 1/2"	(B)			
48	1	2	46761AD	46761	SEAL-OIL	(A)			
49	2	4	46762AC	46762	SEAL-OIL	(A)			
51	1	2	85773 F	85773	VALVE-GLOBE 3/4"	(C)			
All CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES. SEPIA FROM: L115100-2									
TITLE: DRIVE ASSEMBLY C30HT (BASIC)					REVISIONS:		BY	CK'D BY	DATE
SUB-PARTS LIST					PREPARED BY W.D.	DATE 7-21-86	UNITS REQ'D. FOR ORDER 2		
					When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.				
					PREPARED BY	DATE	CK'D BY	DATE	ORDER NUMBER
PAGE 2 OF 4 PARTS LIST No. L23412D33					CHECKED BY B.H.	DATE 7-23-86	ORDER PAGE NO. 5-4	23412-01	

PARTS LIST No. L23412 D 33

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
52	1	2	85773 B	85773	VALVE - GLOBE 1/4"	(C)		
54	1	2	22980A432A	22980A432	OIL HEATER			
56	1	2	75353A33A	75353A33	THERMOSTAT			
58	1	2			REDUCER 3/4 x 1/2 NPT	(MAL. IRON)		
60	2	4	MO 10815		NIPPLE-PIPE 3/4 CLOSE TBE	(STL BLK)		
62	1	2	MO14193		NIPPLE-PIPE 3/4 x 4 STD TBE	(STL BLK)		
65	1	2	MO 10798		NIPPLE-PIPE 1/4 x 2 STD TBE	(STL BLK)		
68	1	2	MO 11153		TEE-RED-PIPE 3/4 x 3/4 x 3/8 STD	(STL BLK)(MI)		
70	2	4	MO 10943		PLUG-SO HD PIPE 1/2 STD	(MI)		
75					NOT REQUIRED			
76					NOT REQUIRED			
80	1	2	MO 11055		SETSCREW-SOC HD CUP PT 1/2-13NC x 3/4	(STL)		
81	4	8	MO 10082		CAPSCREW-HEX HD 3/4-10NC x 10 1/2	(STL)		
82	4	8	MO 10225		CAPSCREW-HEX HD 3/4-10NC x 2	(STL)		
83	8	16	MO 10253		CAPSCREW-HEX HD 1/2-13NC x 1 1/2	(STL)		
84	4	8	MO 10273		CAPSCREW-HEX HD 1/2-13NC x 2 1/2	(STL)		
86	4	8	MO 10256		CAPSCREW-HEX HD 1/2-13NC x 1"	(STL)		
87	4	8			CAPSCREW-FLAT HD, HEX SOC 5/8-11 NC x 1 1/4	(STL)		

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED.

* WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES.

SEPIA FROM:

L115100-2

TITLE:

DRIVE ASSEMBLY
C30HT (BASIC)

REVISIONS:

BY CK'D BY DATE

SUB-PARTS LIST

PREPARED BY
W.D.DATE
7-21-86When ordering parts specify Type of Equipment, Order No.,
Serial No., Part No., and Description, per this parts listUNITS REQ'D.
FOR ORDER

2

PAGE 3 OF 4

PARTS LIST No.
L23412 D 33

CHECKED BY

BH.

DATE
7-23-86

PREPARED BY DATE

CK'D BY

DATE

ORDER
PAGE
NO.

5-5

ORDER NUMBER

23412-01

X

[illegible]

[illegible]

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED.	* WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES.	SEPIA FROM:
---	---	-------------

TITLE:

BUSHING HOUSING ASSEMBLY

REVISIONS: D/R 3800, 5569, 5646, 5700,
5745,

BY	CK'D BY	DATE
----	---------	------

SUB-PARTS LIST

PREPARED BY
CBR

DATE
1-19-73

When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.

UNITS REQ'D FOR ORDER	2
--------------------------	---

PAGE 1 OF 1

PARTS LIST No.
L202316

CHECKED BY
AG

DATE 1-31-73

PREPARED BY	DATE	CK'D BY	DATE
W.D.	7-7-86	B.H.	7-23-86

ORDER
PAGE
NO. 5-7

ORDER NUMBER
23412-01

PARTS LIST No. L115423-1

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
				115423	DRIVE CONTROL			
1	1	2	L48923-1		SWITCH-ROTARY 4 SPDT			
3	1	2	204163A	204163	INDICATOR HOUSING			
7	2	4	88749A	88749	INSERT			
4	1	2	48993A1A	48993-1	MOUNTING PLATE (MACHINING)			
7	1	2	48993A	48993	MOUNTING PLATE (PATTERN)			
5	1	2	48983A1A	48983-1	ACTUATOR POINTER (MACHINING)			
7	1	2	48983A	48983	ACTUATOR POINTER (PATTERN)			
7	1	2	88854A	88854	SPRING			
6	2	4	88753A	88753	WASHER-PLATE			
11	1	2	85692A	85692	SPRING			
12	1	2	88754A	88754	WASHER-SPRING RETAINER			
13	1	2	~~86665~~	~~86665~~	PLUG			
14	4	8	82045R	82045	PLUG			
15	1	2	M011054		SETSCREW-SOC HD CUP PT. 1/4-20UNC x 3/8 (STL)			
16	1	2	M014596		SHOULDER SCREW-SOC HD 5/16 SHOULDER DIA x 1-1/4 (STL)			
17	2	4	M013867		CAPSCREW-HEX HD #10-24NC x 1" (STL)			
19	4	8	M011133		CAPSCREW-SOC HD 3/8-16UNC x 1" (STL)			
20	1	2	M010245		CAPSCREW-HEX HD 3/8-16UNC x 1-1/4 (STL)			
21	2	4	M014984		CAPSCREW-BUTTON SOC HD 1/2-13NC x 1-1/4 (STL)			
22	1	2	M010876		NUT-HEX 3/8-16UNC (STL)			
24	1	2	M011231		WASHER-LOCK 3/8 STD (STL)			
28	2	4	M011228		WASHER-LOCK #10 STD (STL)			

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED. * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES. SEPIA FROM:

TITLE: DRIVE CONTROL, R.H. W/O POTENTIOMETER
(EXPLOSION PROOF)

REVISIONS: D/R 6050, 6071, 6095, 6148, 6162, 6249

BY CK'D BY DATE

SUB-PARTS LIST

PREPARED BY
CWJ

DATE
4-11-84

When ordering parts specify Type of Equipment, Order No.,
Serial No., Part No., and Description, per this parts list.

UNITS REQ'D.
FOR ORDER 2

PAGE 1 OF 1

PARTS LIST No.
L115423-1

CHECKED BY
JKM

DATE
4-17-84

PREPARED BY
WD

DATE
7-21-86

CK'D BY
B.H.

DATE
7-23-86

ORDER
PAGE NO. 5-8

ORDER NUMBER
23412-01

PARTS LIST No. L48923-1

E-3599A

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	#	REQ'N. NUMBER	REL. No.
				48923	SWITCH-ROTARY			
1	1	2	L48929-2		COVER-WELDMENT & MACHINING			
3	1	2	115595A1A	115595-1	DRIVE CONTROL HOUSING (MACHINING)			
1	1	2	115595A	115595	DRIVE CONTROL HOUSING (PATTERN)			
5	1	2	48931C	48931	SHAFT			
6	4	8	88821A	88821	CAM			
7	4	8	MO14987		SETSCREW-SOC HD CUP PT NO. 8-32 UNC x 3/16 (STL)			
7	2	4	88817A	88817	PLATE-SWITCH MOUNTING			
8	5	10	88825A	88825	SEPARATOR-INSULATING			
13	1	2	88845A	88845	COLLAR-SET			
15	1	2	86439T	86439	BEARING			
16	4	8	88819A	88819	SWITCH			
17	1	2	88859A	88859	"O" RING			
21	2	4	MO16037		THREADED ROD NO. 6-32UNC x 4-3/4 (STL)			
24	1	2	MO14988		SETSCREW-SOC HD CUP PT. NO. 10-24UNC x 3/16 (STL)			
25	2	4	MO14989		SCREW-MACHINE, SLTD PAN HD NO. 10-24UNC x 3/8 (STL)			
27	8	16	MO12843		NUT-HEX MACH NO. 6-32UNC (STL)			
29	4	8	MO11178		WASHER-FLAT 3/8 STD (NYLON)			

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED. * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES. SEPIA FROM:

TITLE:

SWITCH-ROTARY 4 SPDT
RIGHT HAND OR LEFT HAND
EXPLOSION PROOF

REVISIONS: D/R 6050, 6162, 6167, 6180.

BY CK'D BY DATE

SUB-PARTS LIST

PREPARED BY
CWJDATE
4-9-84When ordering parts specify Type of Equipment, Order No.,
Serial No., Part No., and Description, per this parts list.UNITS REQ'D.
FOR ORDER

2

CHECKED BY
JKMDATE
4-17-84PREPARED BY DATE CK'D BY DATE
WD 7-21-86 B.A. 7-23-86ORDER
PAGE NO. 5-9ORDER NUMBER
23412-01

PAGE 1 OF 1

PARTS LIST No.
L48923-1

[illegible]

[illegible]

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED.	* WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES.	SEPIA FROM:
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ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED. * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LEVERS (A), (B), OR (C) ARE RECOMMENDED.										BY	CK'D BY	DATE
TITLE: CHAIN GUARD ASSEMBLY					REVISONS: D/R 5641, 5925							
SUB-PARTS LIST			PREPARED BY DRYSDALE	DATE 8-27-79	When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.				UNITS REQ'D. FOR ORDER 2			
PAGE 1 OF 1	PARTS LIST No. L203520-1		CHECKED BY JKM	DATE 10-18-79	PREPARED BY WD	DATE 7-21-86	CK'D BY B.H.	DATE 7-23-86	ORDER PAGE NO. 5-11	ORDER NUMBER 23412-01		

PARTS LIST No. L23412D51

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
				23412D51	GENERAL ERECTION	16538	A	
3	1	2	L23412D52		RAKE ARM ERECTION	21294		
4	1	2	L23412D53		SKIMMING MECHANISM ERECTION	1745		
5	1	2	L23412C54		WALKWAY, PLATFORM & HANDRAIL ASS.	3057		
7	1	2	23412D66A	23412D66	INFLUENT COLUMN	STL 1541		
8	1	2	23412D63B	23412D63	LOWER CAGE	" 1382		
9	1	2	" A	"	UPPER "	" 525		
11	2	4	23412B73A	23412B73	SEAL RING	STL 128		
12	2	4	88269A	88269	SEAL	NEOPRENE -		
13	2	4	88267A	88267	SEAL BACK-UP RING	STL 26		
14	4	8	23412D69A	23412D69	FEEDWELL FRAME SECTION	STL 1892		
15	8	16	88842A	88842	FEEDWELL SUPPORT BRACKET	" 64		
16	4	8	204104A	204104	" "	708		
17	4	8	204104B	"	" "	536		
18	17	34	23412A67A	23412A67	FIBERGLASS PANEL	FDP -		
19	1	2	23412A68A	23412A68	MOLDING CLOSURE	NEOP. -		
20	74	148	23412A82A	23412A82	FASTENERS	304SS. -		
21	200	400			SCREW, SELF TAPPING, HEX WASHER HEAD " "	-		
					(5/16" - 18 NC X 1/4" LG W/ FIBER WASHER			
25	4	8	88326A	88326	CAGE BRACE	STL 48		
26	1	2	88354A	88354	SHIM PACK	-		
28	2	4	23412D83A A	23412D83	INNER WELL W/ ONE DISPERSION GATE	STL 500	A	
29	2	4	23412D80A A	23412D80	INNER WELL W/ TWO DISPERSION GATES	" 798	A	
				23412D81	DISPERSION GATE DETAILS			
39	4	8			BOLT-HEX HD 1"-8 NC X 9" (9" THRD)	STL -		

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED. * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES. SEPIA FROM:

TITLE:

GENERAL ERECTION

REVISIONS:

16538 WAS 16903, 500 WAS 764, 798 WAS 804,
 23412D83 WAS 23412D80, 23412D80A WAS
 23412D80B.

BY	CK'D BY	DATE
KW	HCN	12-6-86

SUB-PARTS LIST

PREPARED BY
Tom S.DATE
8-18-86

When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.

UNITS REQ'D.
FOR ORDER (2)

PAGE 1 OF 2 PARTS LIST No. L23412D51

CHECKED BY
HCNDATE
9-4-86

PREPARED BY DATE CK'D BY DATE

ORDER
PAGE NO. 5-12ORDER NUMBER
23412-01

PARTS LIST No. 1 23412D51

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
41	79	158			BOLT-HEX HD 5/8-11NC X 1 1/2	A325	-	
42	44	88			CAPSCREW-HEX HD 5/8-11NC X 1 1/2	STL	-	
45	10	20			BOLT-HEX HD 3/4-10NC X 2 3/4	A325	-	
49	17	34			CAPSCREW-HEX HD 1/2-13NC X 1 3/4	BLACK STL	-	
50	4	8			CAPSCREW-HEX HD 1/2-13NC X 2	" "	-	
51	26	52			BOLT-HEX HD 3/4-10NC X 1 3/4	A325	-	
53	17	34			BOLT-HEX HD 3/4-10NC X 2	A325	-	
54	9	18			BOLT-HEX HD 3/4-10NC X 2 1/4	"	-	
56	79	158			NUT-HEX 5/8-11NC	A325	-	
57	44	88			NUT-HEX 5/8-11NC	STL	-	
60	4	8			NUT-JAM 1-8NC	STL	-	
61	4	8			NUT-HEX 1-8NC	"	-	
62	61	122			NUT-HEX 3/4-10NC	A325	-	
64	22	44			NUT-HEX 1/2-13NC	STL	-	
66	35	70			WASHER-FLAT 5/8 STD	HARD STL	-	
67	17	34			" " " 3/4 STD	" "	-	
					10% EXTRA FASTENERS ADDED			

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED. * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES. SEPIA FROM:

TITLE:

GENERAL EJECTION
CONT.

REVISIONS:

BY CK'D BY DATE

SUB-PARTS LIST

PREPARED BY

Tom S

DATE

8-15-86

When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.

UNITS REQ'D FOR ORDER (2)

CHECKED BY

HCN

DATE

9-4-86

PREPARED BY

DATE

CK'D BY

DATE

ORDER PAGE NO.

S-13

ORDER NUMBER

23412-01


PARTS LIST No. L23412D52

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
				23412D52	RAKE ARM ERECTION	3688		
6	2	4	114642A	114642	RAKE ARM	ST'L 2688		
7	2	4	203673A	203673	INNER BLADE	ST'L 158		
8	6	12	203675A	203675	MIDDLE BLADE	ST'L 558		
(9)	2	4	203479A	203479	OUTER BLADE	ST'L 208		
12	2	4	88327A	88327	SQUEEGEE	304 SS 4		
13	16	32	88306A	88306	SQUEEGEE	304 SS 64		
(14)	2	4	88328A	88328	SQUEEGEE	304 SS 8		
26	141	282			CAPSCREW-HEX HD 3/8-16NC x 1 1/4	304(SS)		
29	48	96			BOLT-HEX HD 5/8-11NC x 1 1/2	(A325)		
30	13	26			BOLT-HEX HD 3/4-10NC x 2 1/2	(A325)		
33	141	282			NUT-HEX 3/8-16NC	304(SS)		
36	48	96			NUT-HEX 5/8-11NC	(A325)		
37	13	26			NUT-HEX 3/4-10NC	(A325)		
41	141	282			WASHER-FLAT 3/8 STD	304 (SS)		
43	96	192			WASHER-FLAT 5/8 STD	(A325)		

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SEPIA FROM:

L114239

TITLE:

RAKE ARM ERECTION C3 CLARIFIER,
85'-0" DIA.

REVISIONS: D/R 5100, 5301, 5420, 5704.

BY CK'D BY DATE

SUB-PARTS LIST

PREPARED BY

Tom S.

DATE

8-14-86

When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list

UNITS REQ'D FOR ORDER (2)

CHECKED BY

HCN

DATE

9-4-86

PREPARED BY

DATE

CK'D BY

DATE

ORDER PAGE NO.

S-14

ORDER NUMBER

23412-01

PARTS LIST No. 123412D53

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
				23412D53	SKIMMING MECHANISM ERECTION.	1745		
4	2	4	L23412B79		SKIMMING DEVICE	-		
7	1	2	105667A	105667	SCUM BOX	ST'L	519	
8	2	4	23412C65A	23412C65	" " SUPPORT	"	98	
9	4	8	88313A	88313	WASHER - SCUM BOX SUPPORT	"	-	
19	2	4	23412C64A	23412C64	SKIMMER SUPPORT	ST'L	332	
20	2	4	48718A	48718	SKIMMER ARM	"	168	
21	2	4	23412B76A	23412B76	SKIMMER BLADE	"	566	
22	6	12	88263A	88263	CLAMP	SALV. "	4	
23	2	4	48634A	48634	SKIMMER SUPPORT BRACE	"	50	
24	4	8	86751A	86751	CHANNEL CLAMP	"	-	
27	2	4	88616B	88616	U-BOLT	CAD. P. ST'L	-	
29	8	16			BOLT-HEX HD 5/8-11NC x 1 3/4	A325	-	
30	6	12			BOLT-HEX HD 1/2-13NC x 2	ST'L	-	
37	16	32			WASHER-FLAT 5/8	HARD ST'L	-	
38	6	12			WASHER-FLAT 1/2	"	-	
43	8	16			NUT-HEX 5/8-11NC	A325	-	
44	6	12			NUT-HEX 1/2-13NC	ST'L	-	
10% EXTRA FASTENERS ADDED								

ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED. * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES. SEPIA FROM:

TITLE: SKIMMING MECHANISM ERECTION		REVISIONS:		BY	CK'D BY	DATE
SUB-PARTS LIST		PREPARED BY Tom S	DATE 8-14-86	When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.		UNITS REQ'D. FOR ORDER (2)
		CHECKED BY HCN	DATE 9-4-86	PREPARED BY	DATE	CK'D BY
PAGE 1 OF 1	PARTS LIST No. L23412D53			ORDER PAGE NO. 5-15	ORDER NUMBER 23412-01	

PARTS LIST No. L23412B79

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
				23412B79	ASSEMBLY			
1	1	4	44774A	44774	SCUM SKIMMER			
2	1	4	84032A	84032	BOTTOM WIPER	(A)		
3	2	8	81602A	81602	SIDE WIPER	(A)		
4	2	8	81598A	81598	CLAMP-SIDE WIPER			
5	1	4	84030A	84030	CLAMP-BOTTOM WIPER			
6	1	4	88188A	88188	HINGED SKIMMER			
7	1	4	23017A275A	23017A275	HINGED SKIMMER SUPPORT	SS		
8	2	8	48080A1A	48080-1	SCRAPER ARM			
/	2	8	48080A	48080	SCRAPER ARM (RAW CASTING)			
9	2	8	88010A1A	88010-1	ARM CLEVIS			
/	2	8	88010A	88010	ARM CLEVIS (RAW CASTING)			
10	3	12	88011A1A	88011-1	COLLAR			
/	3	12	88011A	88011	COLLAR (RAW CASTING)			
11	1	4	85606A	85606	SPRING-EXTENSION	(A)		
13	4	16			CAPSCREW-HEX HD 1/2-13NC x 4 3/4"	304SS		
14	13	52			NUT-HEX 3/8-16NC	304SS		
15	1	4	85607F	85607	STOP ROD			
16	2	8			SETSCREW SQ HD 3/8-16NC x 3/4	304SS		
17	13	52			CAPSCREW-RD HD 3/8-16NC x 1	304SS		
18	2	8			CAPSCREW-HEX HD 3/4-10NC x 3	304SS		
19	4	16			NUT-HEX 3/4-10NC	304SS		
20	2	8	85609A	85609	COLLAR-SET	304SS		
21	8	32			NUT-HEX 1/2-13NC			
NOTE: SHOP ASSEMBLY ITEMS 1, 2, 3, 4, & 5 USING ITEMS 14 & 17 AS REQUIRED SHOP ASSEMBLY ITEMS 8 & 9 USING 2 EACH OF ITEMS 13 & 21 SHOP ASSEMBLY 2 EACH OF ITEM 10 USING ITEMS 18 & 19.								
ALL CAPSCREWS ARE SAE GRADE 5 UNLESS OTHERWISE SPECIFIED. * WEIGHT SHOWN IS TOTAL FOR ONE UNIT. LETTERS (A), (B) OR (C) ARE RECOMMENDED SPARE PART CODES.								
TITLE: SKIMMING DEVICE SIZE 5'-0					REVISIONS:		BY CK'D BY DATE	
SUB-PARTS LIST					PREPARED BY MDA DATE 11-17-86		UNITS REQ'D FOR ORDER (4)	
PAGE 1 OF 1 PARTS LIST No. L23412B79					CHECKED BY Kiv DATE 11-25-86		ORDER PAGE NO. 5-16 ORDER NUMBER 23412-01	

PARTS LIST No. L23412C54

ITEM No.	QTY. PER UNIT	TOTAL FOR ORDER	PART NUMBER	DRAWING NUMBER	DESCRIPTION	*	REQ'N. NUMBER	REL. No.
				23412C54	WALKWAY, PLATFORM & HANDRAIL ASS.	3057		
3	1	2	23281C72A	23281C72	CLOSURE ANGLE	3180		
4	1	2	" B	"	FRAME	" 115		
5	1	2	" C	"	"	" 115		
7	1	2	23412C71A28	23412C71	PLATFORM HANDRAIL	ALUM -		
8	1	2	" B28	"	"	" -		
9	1	2	23412C72A	23412C72	PLATFORM GRATING	" -		
14	1	2	23412C77A	23412C77	PLATFORM TOE PLATE	ALUM -		
15	1	2	" B	"	"	" -		
20	1	2	23412D75A	23412D75	WALKWAY	ST'L 2747		
21	1	2	23412B70A	23412B70	GRATING	ALUM -		
23	1	2	23412D74E28	23412D74	WALKWAY HANDRAIL	ALUM -		
24	1	2	" H28	"	"	" -		
25	2	4	" TE20	"	" TOE PLATE	" -		
27	3	6	23412D74BD	23412D74	TOE PLATE SPLICE CLAMP	ALUM -		
29	10	20	85729A	85729	SPLICE LOCK	ALUM -		
30	3	6	88697A	88697	GRATING ANCHOR PART	30455 -		
31	1	2		88820	" CLIP ASSEMBLY	ST'L -		
32	1	2			NIPPLE, PIPE 1/2 STD T.B.F.	" -		
34	2	4	88696B	88696	COUPLING, PIPE 1" STD NPT	" -		
35	1	2	20799A	20799	TENSION BAND	GALV. ST'L -		
					NAME PLATE	ZINC -		

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TITLE:

WALKWAY, PLATFORM & HANDRAIL
ASSEMBLY

REVISIONS:

BY CK'D BY DATE

SUB-PARTS LIST

PREPARED BY

T.M.S.

DATE

8-19-86

When ordering parts specify Type of Equipment, Order No., Serial No., Part No., and Description, per this parts list.

UNITS REQ'D.
FOR ORDER

(2)

PAGE

1 OF 2

PARTS LIST No.

L23412C54

CHECKED BY

HCN

DATE

9-4-86

PREPARED BY

DATE

CK'D BY

DATE

ORDER
PAGE
NO.

S-17

ORDER NUMBER

23412-01

10% EXTRA FASTENERS ADDED

SEPIA FROM:

WALKWAY, PLATFORM & HANDRAIL
ASSEMBLY CONT.

BY	CK'D BY	DATE
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219.86

UNITS REQ'D.
FOR ORDER (2)

9-4-86

DATE _____

ORDER
PAGE
NO. 5-18

ORDER NUMBER
23412-01