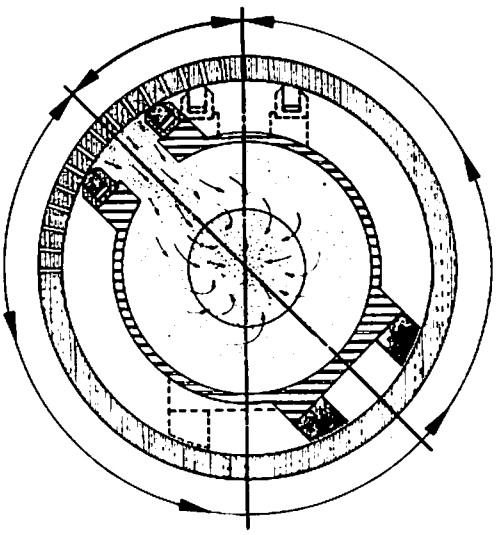
SUCTION BOX

Most frequently, there is only one suction box with one opening. Some applications, however, require a box which is partitioned, providing two or more openings and connections for maintaining different levels of vacuum in each one.

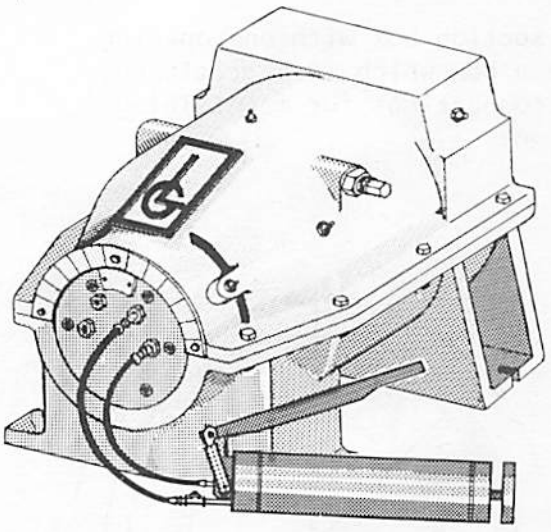
The box in an LG Industries suction roll can be rotated a full 360 degrees, which not only allows its position to be optimized during operation, but allows it to be operated in any position. Also, the roll can be moved to another machine where it would perform under the same conditions for which is was designed at an entirely different angle.



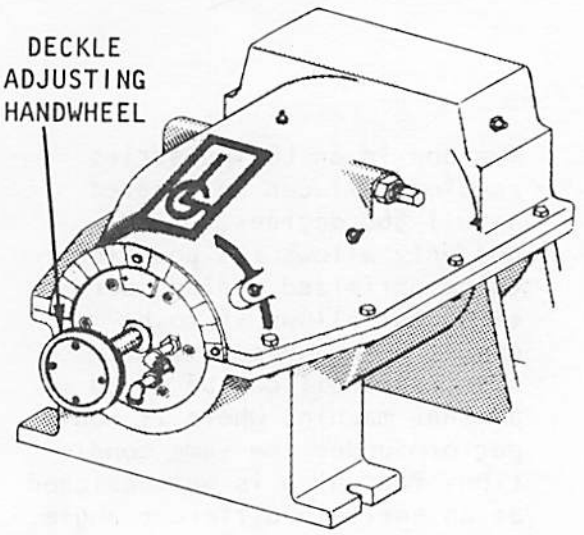
DECKLES

The deckles, which are fixed in some cases, but usually movable, form the ends of the suction box opening. They are moved to where the suction acts over the full width of the sheet.

The standard deckles are moved by hydraulic cylinders using grease as the actuating medium. The grease is pumped by means of a portable manual pump. By option, however, they are moved with a mechanical screw arrangement operated by a handwheel protruding through the front of the suction elbow.



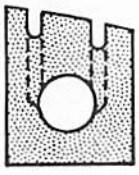
STANDARD DECKLE
ADJUSTMENT



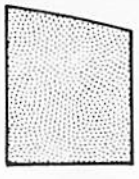
OPTIONAL HYDRAULIC
DECKLE ADJUSTMENT

SEAL STRIPS

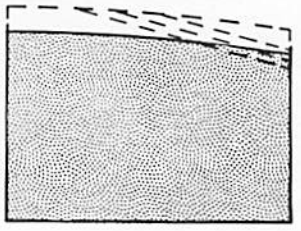
Seal strips are mounted in the top edges of the suction box and are held in contact with the inside surface of the roll to keep air from leaking in and short circuiting the flow through the sheet. They are of three types: water lubricated, plain, and silencing.



WATER LUBRICATED
SEAL STRIP



PLAIN
SEAL STRIP



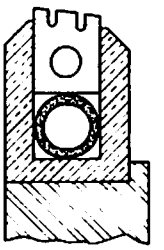
SILENCING
SEAL STRIP

On water lubricated seal strips, water introduced through the central hole flows upward through a series of holes and fills the grooves cut in the surface. Water flow is adjusted to the amount that just keeps the grooves filled, providing a thin water film between the seal and the shell. This film lubricates and seals with minimal water consumption. Water lubricated seal strips are normally on both the leading and trailing edges of the suction box.

When silencing strips are used, they replace the strip installed on the trailing edge to reduce the sound of air popping into the holes as the shell rotates from the suction area to normal atmospheric pressure. A series of slots introduce some air into the seal area, reducing the sudden pressure change which causes the noise.

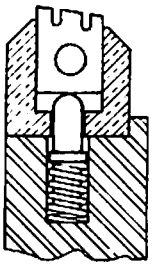
Plain seal strips are solid and can be used on either a leading or a trailing edge.

Regardless of the type of strip, pressure is applied under it to maintain good contact with the shell as the seal wears from the constant rubbing.



AIR-LOADED

Air loading is normally used to maintain proper seal-to-shell contact in which an expandable tube under the strip is pressurized by regulated air to schieve optimum sealing. Optional spring loading is available to maintain a light loading pressure.



SPRING-LOADED

The packing on deckles are almost always spring-loaded, regardless of what is used on the box sides.

INTERNAL SHOWERS

Internal showers are of four general types:

Cleaning

A simple shower for washing the roll's interior

surface. It uses no nozzles, no specific spray pattern, and does not necessarily provide an even distribution across the roll.

- Low pressure

  A cleaning shower with no nozzles but with reasonably uniform distribution and impingement force across the roll.

- Needle shower

  A cleaning shower using nozzles to control the shower pattern and providing a high impingement force across the roll.

- Fog shower

  A mist shower used to lubricate the leading seal strip in a roll not equipped with a water lubricated seal strip.

Fog showers are used continuously during operation, particularly at high speeds. The others are used intermittently, usually immediately prior to a stop or a shutdown, but they can be used at other times, if desired.

AIR PASS FEATURE

The air pass feature is usually installed on suction couch rolls. It permits the operator to blow air through the shell from the inside to raise the sheet from the roll's surface when he wants to pass the tail.

The air pass header inside the shell may be fixed or linked to the deckle mechanism to keep it in the same position relative to the deckle.

PULL BLOCK

When one is needed, a pull block is provided to aid in putting the felt or wire around the roll.

SAVEALL PAN

The saveall pan is an option in which a trough-shaped pan is mounted under the suction roll to accumulate all fluids which may drip from it. A drain then carries them away from the machine.

RECEIVING AND STORING

Each suction roll is shipped preassembled in its own specially prepared shipping container. All auxiliary items such as regulators, gauges, hydraulic power units, and spare parts are shipped in the container with the roll.

Check the shipment immediately upon receipt. Contact the factory promptly if there are discrepancies.

Preparations for shipment anticipate installation upon receipt. If the roll will not be installed and operating within a few weeks after shipment, contact LG Industries for instructions pertinent to both the storage period and conditions to which it will be subjected.

During the brief delay that even prompt installation may entail, keep the roll in a clean, covered area where it will not encounter freezing temperatures. If it has a rubber cover, protect it further by keeping it in its shipping container supported by its bearings. Also, avoid placing it close to a heat source or where sunlight, oil, grease, or ozone can reach the rubber.

INSTALLATION

The physical outline, dimensions, and basic reference data needed for installation are provided by the Suction Roll Specifications, the Installation Drawing, and the associated arrangement drawings. The instructions which follow present additional detail essential to proper installation and are used in conjunction with the drawings and specifications.

These installation instructions apply not only to new suction rolls, but also to those which are being reinstalled and those which have been disassembled.

NOTE ON LEVELING

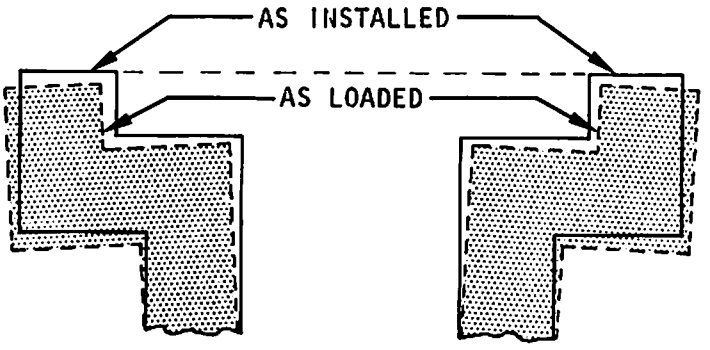
The instructions which follow call for leveling the mountings and achieving a state of levelness for the installed suction roll. The important aspect of leveling is to get the suction roll parallel to the other related rolls in the machine. Usually this is accomplished by leveling each component to the same standard as it is installed. On some older machines, however, the components may not be level. In such cases it is important to interpret "level" as mounting the suction roll parallel to the related rolls regardless of how they deviate from a true state of levelness.

MOUNTINGS

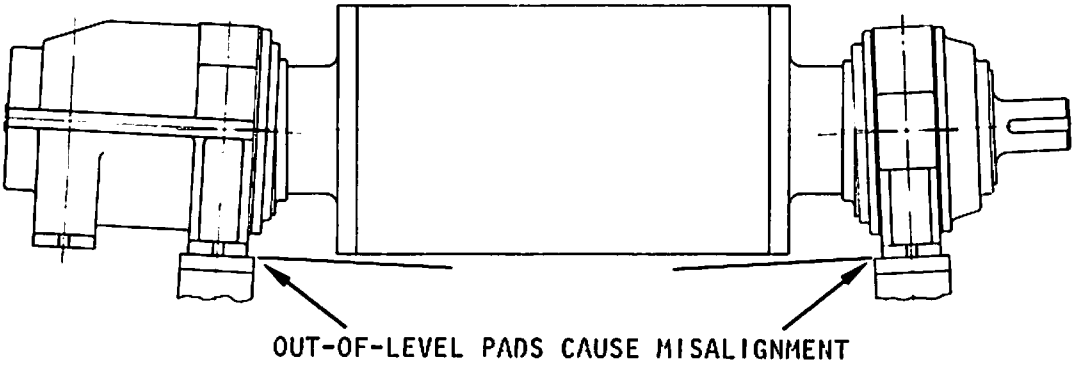
The mountings which are to support the roll must be strong, rigid, level, and properly positioned.

Inadequately designed mountings can deflect when the roll is installed or operating under load and cause enough misalignment to impair performance and promote rapid wear. Off-center supports are particularly susceptible to deflection.

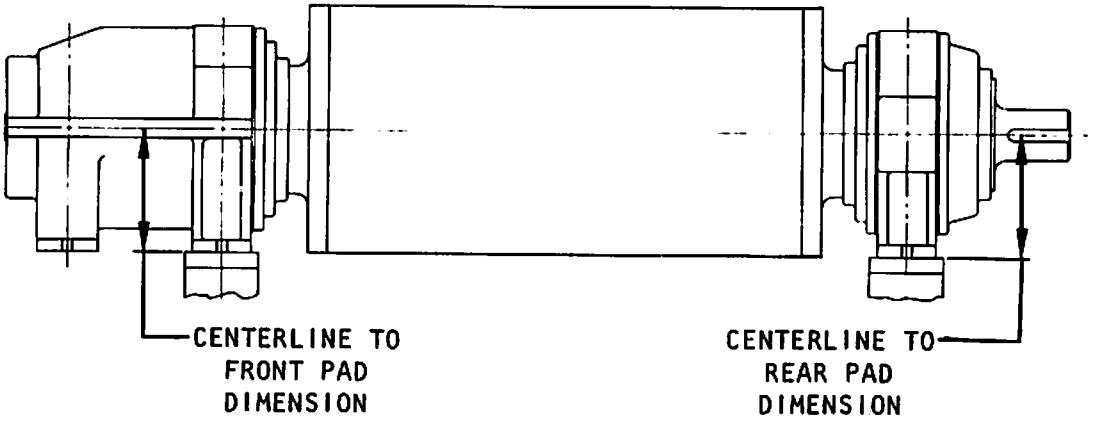
DEFLECTION IN OFF-CENTER MOUNTINGS



The mounting pads must be level to the degree attainable with a good-quality machinist's level. Pads which are not level can cause misalignment with adverse effects on performance and wear.

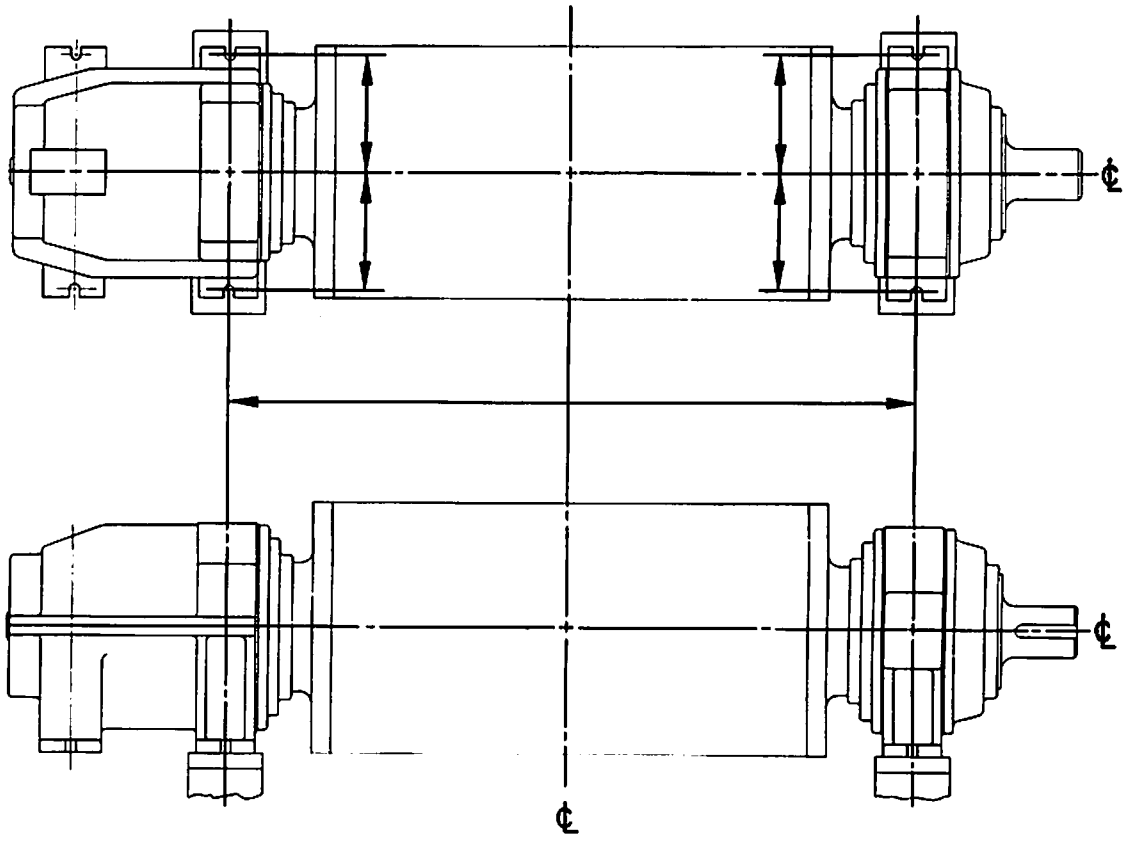


The roll centerline-to-base dimensions for the front and rear bearing housings must be as specified on the Installation Drawing. Usually they are different from each other, but in all cases they must be within the tolerance specified on the drawing.



Mountings must be positioned to allow the roll and both bearings to have a common centerline which is properly aligned with and square to the machine's centerline. The mounting keys -- between the pads and the housings -- must be in line with each other and located in accordance with the Installation Drawing.

The accurate location of mounting bolts is vital to proper alignment. They must be placed to conform to the dimensions and tolerances of the Installation Drawing.



If existing mountings are to be used, do not assume that they are adequate. Make appropriate measurements, verify that they are level, and rework them, if necessary.

LIFTING THE ROLL

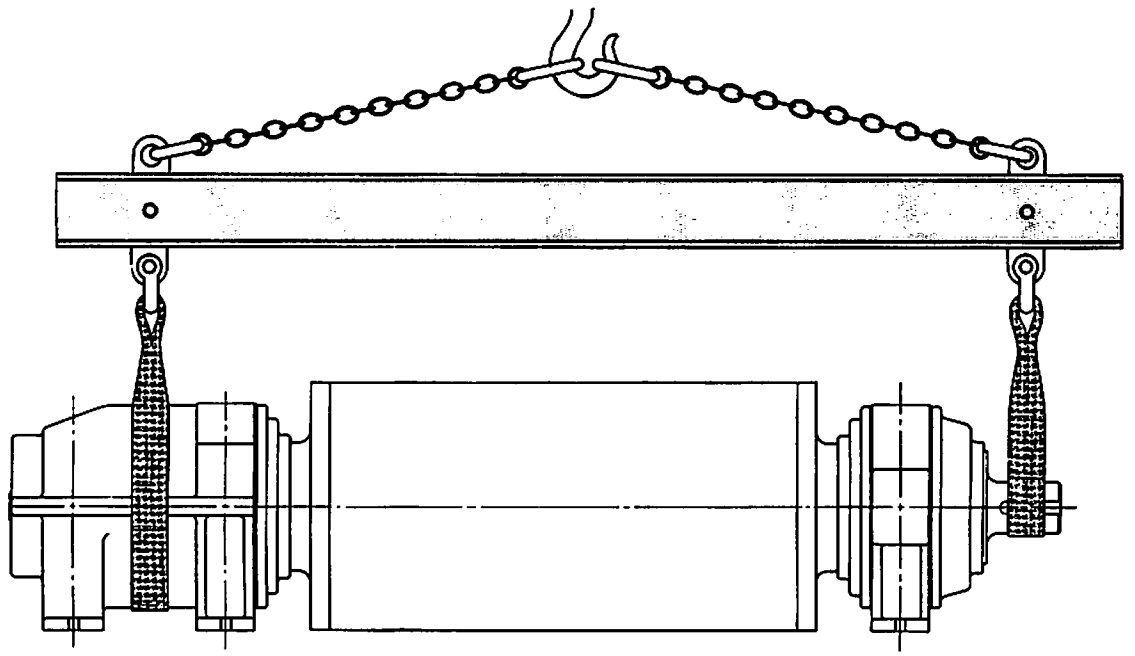
Lift and handle the roll with great care. Avoid using devices which can mark or mar the roll's surface or rubber cover.

CAUTION

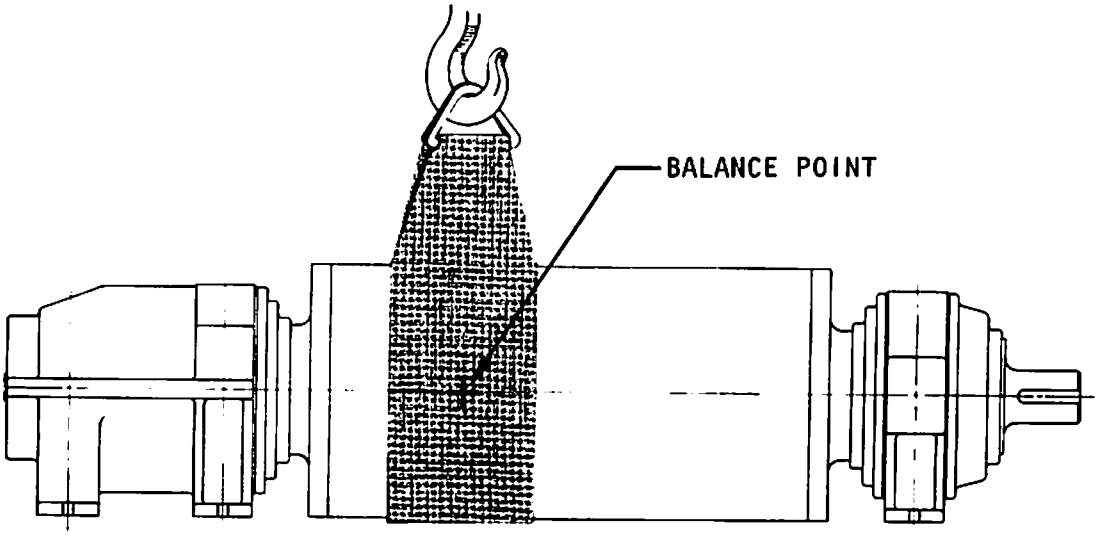
THE TAPPED HOLES IN THE BEARING HOUSING ARE NOT TO BE USED FOR LIFTING THE SUCTION ROLL.

USE SLINGS.

Use a sling around the front bearing housing and another around the journal extension behind the rear bearing housing. Use a spreader between them.



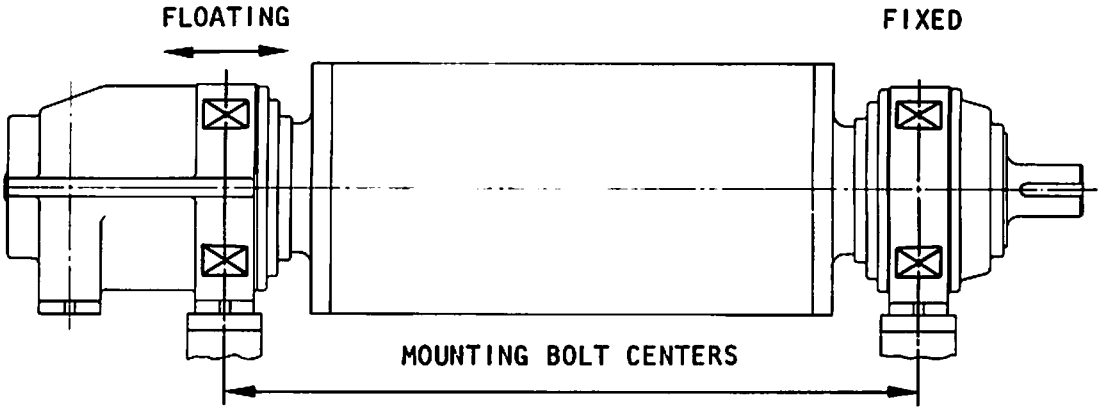
If a single sling is used, it must be very wide and free of hems and bands which could mar the roll's surface or cover. Locate the roll's balance point and position the sling over it to keep the roll level while lifting. Usually the balance point is a little to the front bearing side of the centerline.



SETTING AND ALIGNING

Move the suction roll into position on its mountings and align it in accordance with the Installation Drawing and the criteria discussed previously.

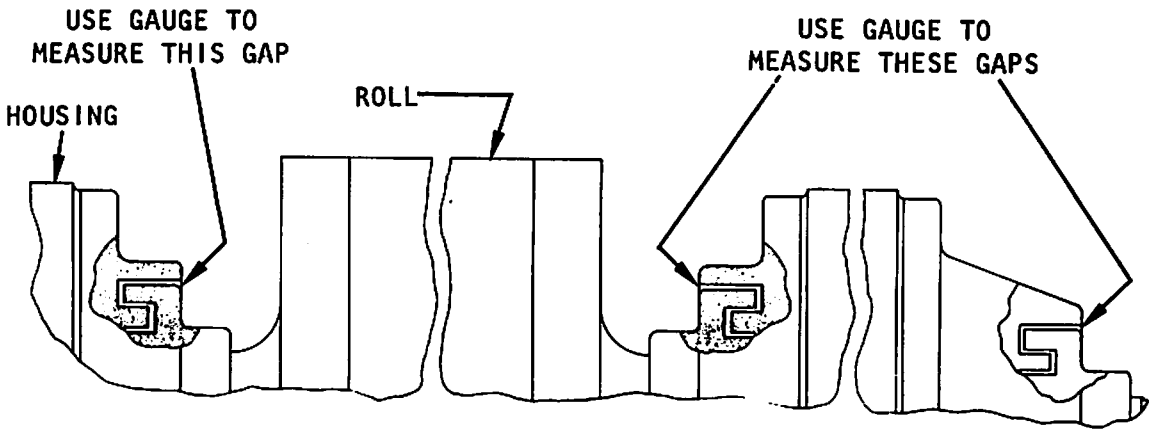
The rear bearing is fixed; the front bearing is floating to permit expansion and small inaccuracies in mounting. There is more clearance for expansion than there is for contraction. Accurate positioning of mounting bolts will assure adequate space for expansion.



Violation of clearances can cause excessive bearing thrust loads and result in premature failure.

With the roll initially set and aligned and with mounting bolts tight enough to prevent inadvertent movement, perform the checks and measurements which follow. *If discrepancies or problems are encountered, do not operate the roll until they are corrected and a complete set of satisfactory checks and measurements are made.*

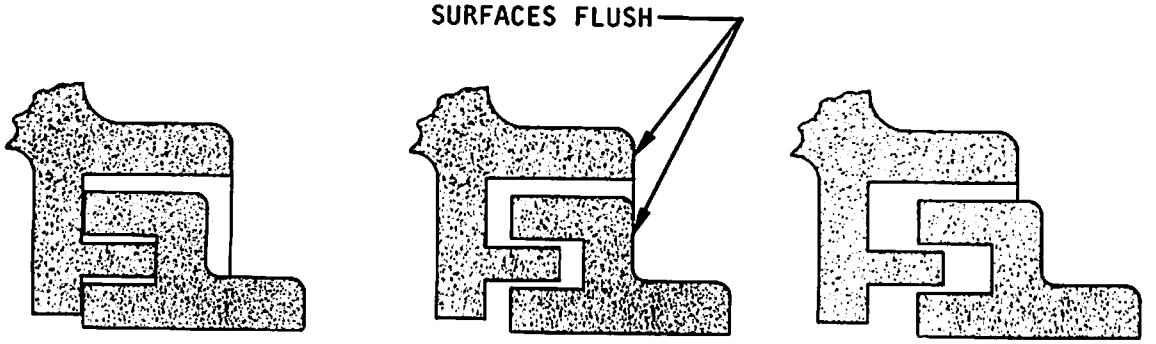
Use feeler gauges to check the radial clearance of the labyrinth seals on both bearings.



LABYRINTH CLEARANCE, FRONT BEARING

LABYRINTH CLEARANCE, REAR BEARING

- Make measurements all the way around each seal. On any given seal, all measurements must be essentially the same.
- Inspect all three labyrinth seals to verify that the rotating parts are neither jammed in against the stationary parts nor backed away from them an excessive amount.



LABYRINTH JAMMED. LITTLE OR NO GAP

PROPERLY ALIGNED LABYRINTH

LABYRINTH EXTENDED. EXCESSIVE GAP

- Rotate the roll by hand. It must turn freely.
- Using the procedure in the OPERATING INSTRUCTIONS, turn the suction box through a full rotation in both direc-

tions. It should require the same amount of effort to turn it to any position in either direction.

If the roll has mechanically operated deckles, use the appropriate procedure in the OPERATING INSTRUCTIONS to move them a full stroke in both directions. Verify that they move freely over the entire distance. Hydraulic deckles are checked later.

Tighten the mounting bolts fully, then check to see that the preceding items did not change.

VACUUM CONNECTION

The vacuum connection is almost always a rectangular opening in the bottom of the suction elbow. Refer to the Installation Drawing for dimensions and provisions for mating with the vacuum piping.

Vacuum piping, including the transition section between it and the suction elbow, must be independently supported so that no strain or load is placed on the suction elbow or other roll components.

> **CAUTION**
>
> VACUUM PIPING SUPPORTED BY OR APPLYING A STRAIN AT THE SUCTION CONNECTION CAN CAUSE ROLL MISALIGNMENT WHICH IMPAIRS PERFORMANCE AND INCREASES WEAR.

Select a vacuum pipe size which will assure adequate flow for proper aspiration of the roll. Consult your vacuum pump supplier for technical assistance with the piping.

SERVICE CONNECTIONS

Depending upon the purpose it is to serve and the options it includes, a suction roll can require a varied combination of air, water, and hydraulic connections. Refer to the drawings and

specifications to determine the services required, the features requiring them, the location and identification of connections, the related components supplied with the roll, and the essential details of the installation.

All such services are connected to the roll through LG-supplied flexible hoses fitted with quick disconnect couplings to permit suction box rotation and provide clearance for maintenance tasks such as roll removal and wire or felt changes. These factors must also be considered when installing permanent piping and terminations near the roll.

The following table identifies the features and options which require services. Subsequent paragraphs provide additional detail on the installation of each of them.

SERVICE	FEATURE/OPTION
Air	Seal strip loading. Air pass.
Water	Seal strip lubrication. Shower.
Hydraulic	Hydraulically operated deckles

CAUTION

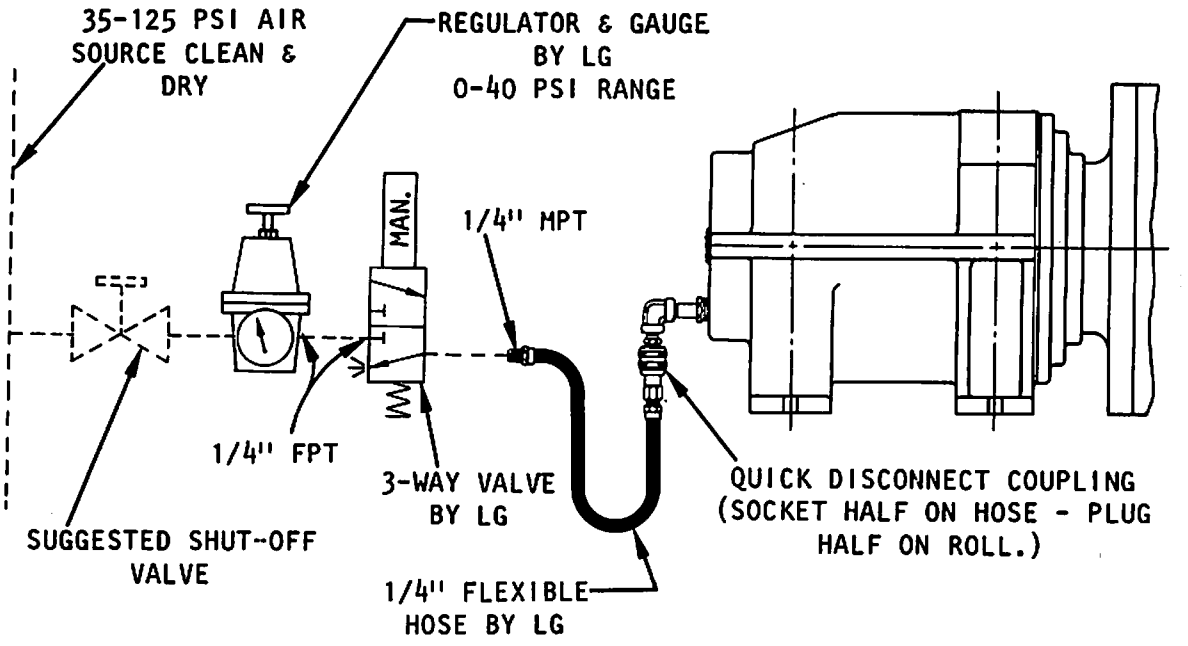
BE CAREFUL TO AVOID MISCONNECTING SERVICE LINES. CONNECTING TO THE WRONG SERVICE CAN RESULT IN DAMAGE TO THE ROLL.

AIR LOADED SEAL STRIPS

Seal strips, both the standard and silencing types, may be air loaded. There will be a separate service connection marked "AIR LOAD" on the front of the roll for each such strip.

A three-way valve and a pressure regulator are supplied for each connection. Mount them in your permanent piping at a convenient

location. The following figure illustrates a typical arrangement for one air loaded seal strip.

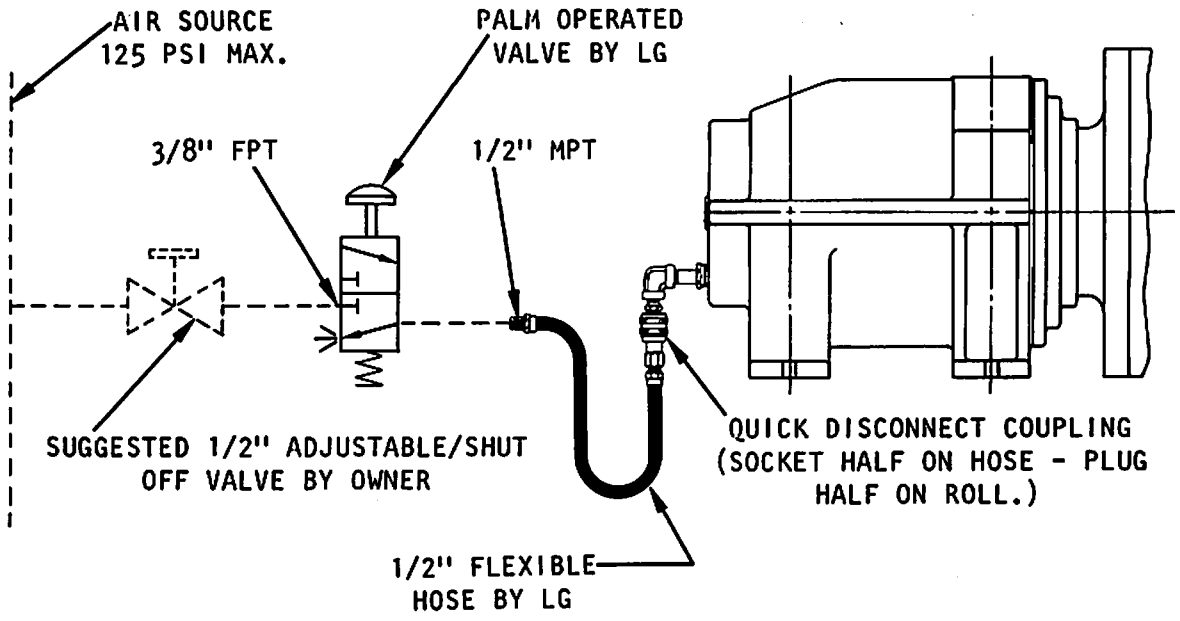


TYPICAL AIR LOADED SEAL ARRANGEMENT

Settings and adjustments are made when the roll is operating and are covered in the OPERATING INSTRUCTIONS.

AIR PASS CONNECTION

Rolls having the air pass feature will have a single service connection marked "AIR PASS" on the front of the roll. The following figure illustrates a typical installation. Install the valve supplied at a convenient location in the permanent piping.



TYPICAL AIR PASS ARRANGEMENT

Settings and adjustments are made when the roll is operating and are covered in the OPERATING INSTRUCTIONS.

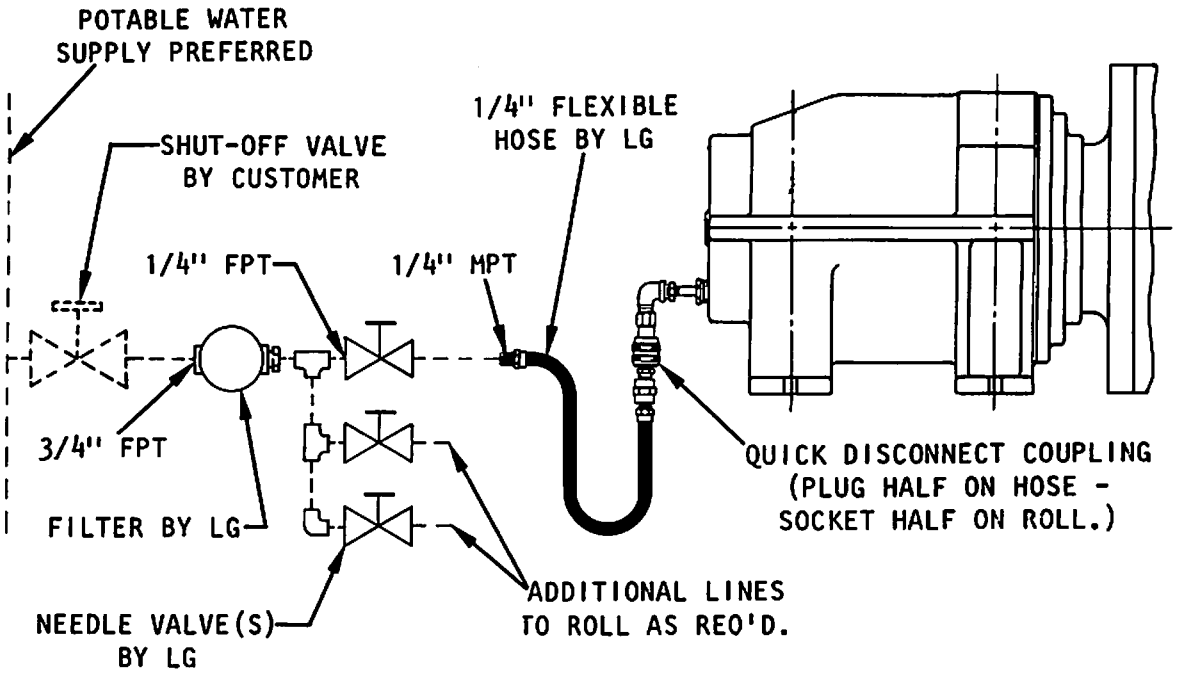
SEAL STRIP WATER CONNECTIONS

There will be a separate water connection marked "SEAL WATER" for each water lubricated seal strip in the roll. Most rolls have at least one. Silencing seal strips never have a water connection.

Because the water is both the lubricating and sealing medium between a stationary seal strip on the suction box and the rotating shell, it must be filtered to remove foreign particles. A single filter is frequently supplied to handle several seal strips, but a needle valve is provided for each strip to permit individual flow adjustment.

Install the filter and needle valves at a convenient location in the permanent piping. Remember that filters require periodic servicing and must be accessible.

The following figure illustrates a typical installation.



TYPICAL SEAL WATER ARRANGEMENT

Settings and adjustments are made when the roll is operating and are covered in the OPERATING INSTRUCTIONS.

SHOWER WATER CONNECTIONS

If the roll contains one or more internal showers, there will be a connection marked "SHOWER" on the front end for each one. Only the flexible hose and its fittings are supplied. For connection to plant piping it has a male pipe thread for sizes up to 2½ inches; a flange for larger sizes.

Filters and valves are not supplied, but a valve must be installed for each shower and the water should be filtered to remove foreign particles. Some showers include nozzles with internal screens which will clog on water-borne solids.

CAUTION

THE USE OF WHITE WATER WITHOUT ADEQUATE FILTERING WILL RESULT IN CLOGGED SHOWER HEADS.

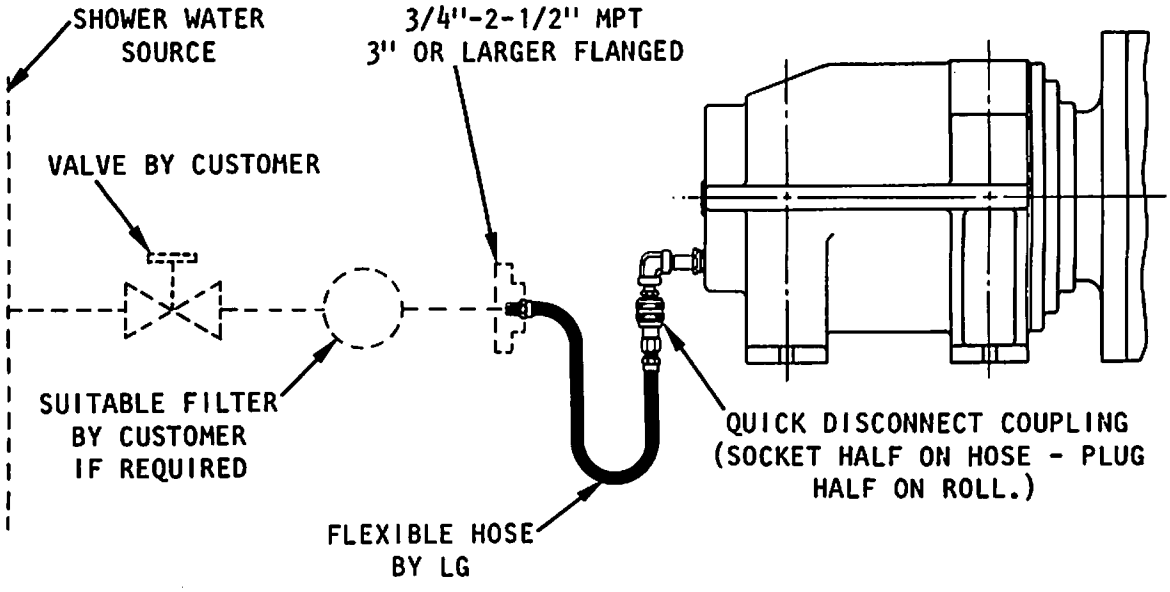
CAUTION

THE TEMPERATURE OF SHOWER WATER MUST APPROXIMATE THE ROLL'S OPERATING TEMPERATURE.

Extreme temperature variations between the shower water and the roll or its covering can cause damaging thermal stresses.

The water volume and pressure required are dependent upon the size of the roll and the intent of the shower, but the pressure at each nozzle must be at least 40 psi to develop the appropriate water pattern.

The following figure illustrates a typical installation.



TYPICAL SHOWER ARRANGEMENT

DRIVE MECHANISM

Most suction rolls are driven and a stub shaft extends from the rear bearing housing for attaching the drive mechanism. The drive can be attached any time after the suction roll has been aligned and bolted down. It should not be started, however, until specified by the initial Startup Procedure.

PREOPERATIONAL CHECKOUT

After all installation tasks have been completed, perform the following before beginning the initial startup sequence:

1. Verify that all checks, measurements, and observations made under SETTING AND ALIGNING are still valid.

2. Reinspect all hoses and piping to be sure they are properly routed, correctly connected, and that all connections are tight.

3. Check all nuts, bolts, and other fasteners for tightness.

4. Lubricate the roll.

5. If the unit has hydraulic deckles, use the procedure in the OPERATING INSTRUCTIONS to move them through a full stroke in both directions.

6. Inspect the roll's surface; clean it if needed.

7. Remove all dirt, debris, tools, and other items which shouldn't be present during operation.

OPERATING INSTRUCTIONS

The information and instructions which follow are needed to run and adjust the suction roll while it is running. Information needed to keep the roll in condition to run properly is covered under MACHINE CARE.

CAUTION

BEFORE STARTING, VERIFY THAT ALL TOOLS AND OTHER OBJECTS WHICH COULD FALL INTO OR BE DRAWN INTO THE MACHINERY HAVE BEEN REMOVED.

WARNING

DO NOT START THE SUCTION ROLL UNTIL ALL PERSONNEL ARE CLEAR OF THE MACHINE.

WARN ALL PERSONNEL IN THE AREA THAT OPERATION IS ABOUT TO BEGIN.

CHECK VISUALLY TO BE SURE EVERYONE IS CLEAR.

INITIAL STARTUP

The initial startup procedure is used only on newly installed, re-installed, or reassembled suction rolls and is preceded by the Pre-operational Checkout procedure of the INSTALLATION Section. Proceed as follows to start the suction roll for the first time and make the initial adjustments needed in bringing it to a normal operating status:

1. Loosen the locknut on the suction box worm shaft at the front of the roll.

2. Use the ratchet wrench supplied to turn the worm shaft and rotate the suction box to the approximate operating position.

3. For each air-loaded seal strip, adjust its regulator to apply 25 psi to make sure a seal is formed, then immediately reduce its air pressure to 8 to 10 psi.

4. With the water control valve in the line to each water-lubricated seal strip closed, open the seal water shut-off valve fully.

5. Crack the control valve in the water line to one seal strip and adjust it until there is just enough flow to keep the grooves in the strip flooded. Very little water is required; it is not to flood the holes in the shell.

6. Repeat step 5 for each water-lubricated seal strip on the roll.

7. Recheck water flow at all water-lubricated seal strips, verifying that there is flow. Readjust as needed to maintain the conditions specific in step 5.

8. Engage the drive to start the roll. Observe the roll while it is rotating, looking for abnormal conditions and listening for unusual noises.

9. Operate the deckles a full stroke to verify freedom of movement, then position them for the width of sheet to be run.

10. Turn on the vacuum.

11. Continue with the following steps only when a sheet is running over the suction roll.

12. Read the vacuum gauge.

13. For each air-loaded seal strip, reduce the air pressure at its regulator until the vacuum begins to drop, then increase the pressure just enough to return the vacuum to its original level.

14. Loosen the locknut on the suction box worm shaft at the front of the roll again.

15. Use the ratchet wrench supplied to turn the worm shaft and rotate the suction box to the optimum operating position.

16. Retighten the worm shaft locknut to prevent box rotation.

17. Recheck all settings and adjustments and optimize them.

NORMAL STARTUP

Use the following sequence to start a suction roll which is in a normal operational status:

1. At the shutoff valve, turn on seal water or, if one is included, the lubricating fog shower.

2. Engage the drive.

3. Position the deckles according to sheet width.

4. Turn on the air for loading seal strips; adjust as required.

5. Turn on the vacuum.

6. Optimize the suction box angle, if needed.

WARNING

DO NOT TOUCH OR GET NEAR THE SUCTION ROLL WHILE IT IS TURNING. SEVERE PERSONAL INJURY CAN RESULT.

WARNING

DO NOT ATTEMPT TO RETRIEVE ANY OBJECT MOVING THROUGH THE MACHINE. SEVERE PERSONAL INJURY CAN RESULT.

ADJUSTING SEAL STRIP WATER

The valves regulating flow to the water lubricated seal strips are adjusted during initial startup and do not require continuous adjustment. They should be tamper-proofed to avoid inadvertent adjustment. Initially, they are adjusted to keep the seal strip grooves filled and a thin film between the seal and shell. Little water is required. It should not fill holes in the shell.

Adjustments may be needed to compensate for seal strip wear or a sustained change in running speed.

Only the shutoff valve is used to start and stop water flow.

ADJUSTING SEAL STRIP LOADING

Spring-loaded seal strips require no operator attention; but the air loaded type are adjustable. The air pressure should be the minimum which maintains the maximum vacuum in the suction box. Higher pressures cause rapid wear, increase power consumption, but do not increase performance.

The initial setting and all adjustments to it are made while the roll is in operation, a sheet is running, and if so equipped, the seal water is on. If the roll has only one air-loaded seal strip, attain the basic setting by adjusting its regulator to apply 25 psi to obtain an initial seal. Immediately, begin to reduce pressure while observing the vacuum gauge. Continue to reduce pressure until the vacuum begins to decrease, then increase pressure enough to return the vacuum to the original level.

If there is more than one air-loaded seal strip, make an initial adjustment on each one by raising its air pressure to 25 psi to assure a seal, then reducing it immediately to 8-10 psi. Make a second adjustment on each one by reducing its pressure from the 8-10 psi setting until the vacuum begins to decrease, then increasing it just enough to return the vacuum to the original level.

Make additional adjustments to suit running conditions. Check regularly during the run-in period for a newly installed or reworked suction roll.

Once each week vary the pressure over its full range to keep the seal strips free to move up and down in their channels.

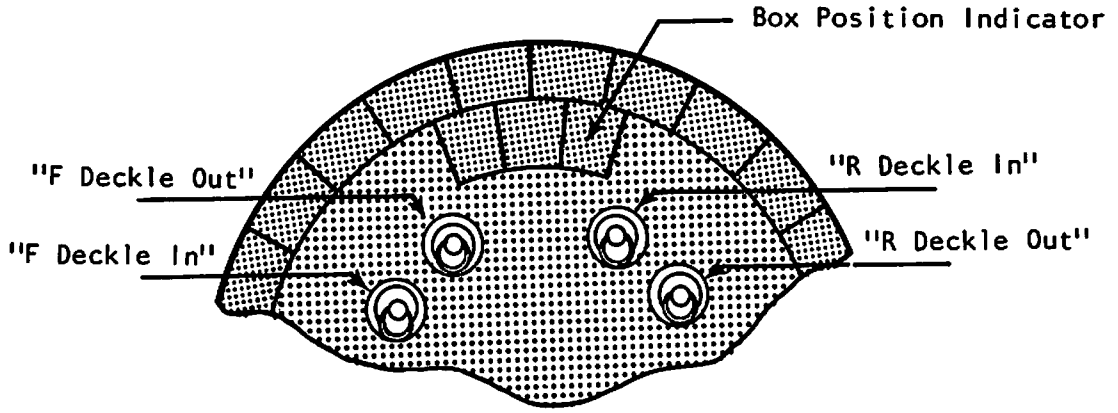
GREASE DECKLE OPERATION (Manual Portable Pump)

IMPORTANT: Read these instructions completely before attempting to move the deckles.

Orientation

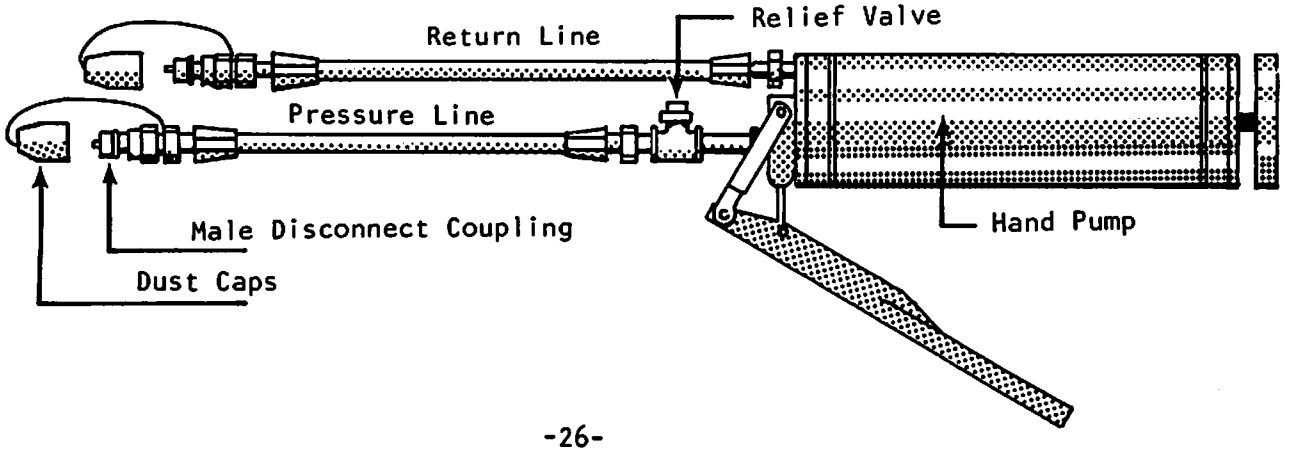
1. Roll and Connections

When facing the roll, there are four (4) female quick disconnect couplings projecting straight towards the observer. The couplings are plugged to keep dirt out of the coupling. See sketch below.



2. Pump and Connections

A portable manual pump is provided which is equipped with two hoses. One of the hoses is the pressure line. It is connected to the pump on the centerline just below the pump handle. The other line is the return line. It is connected at a slight angle and is off to the side. The pressure and return lines have male disconnect couplings which are "capped". See sketch below.



INSTRUCTIONS

1. To move front deckle in (towards centerline of roll)

   a. Remove protective plugs from couplings marked "F Deckle In" and "F Deckle Out".

   b. Remove protective caps from manual pump assembly pressure and return lines.

   c. Connect the pressure line to the coupling marked "F Deckle In" and the return line to the coupling marked "F Deckle Out".

   d. Slowly stroke pump handle to move the front deckle in (towards the centerline of the roll). Twenty (20) full strokes will move the deckle "in" approximately one inch.

> **CAUTION**
>
> Rapid stroking of the pump handle may cause a sudden rise in pressure at the relief fitting, forcing grease to spurt from it. Do not be alarmed. Use Slower Strokes. Grease is very viscous fluid and must be given time to flow as pressure builds on each stroke of the pump.

   e. Should the deckle reach its minimum in-most position, there will be a marked increase in the amount of force required to stroke the pump. A light amount of grease may spurt from the relief. Stop Cap and plug the disconnect couplings.

2. To Move the Front Deckle Out (Away from the centerline of the roll)

   a. Connect the pressure line to the coupling marked "F Deckle Out" and the return line to the coupling marked "F Deckle In".

   b. Slowly stroke pump handle. Eighteen (18) full strokes will move the deckle "out" approximately one inch.

3. To Move the Rear Deckle In or Out.

   Use a procedure similar to that outlined above. Remember to connect the pressure line to the coupling which is appropriate to the direction wanted.

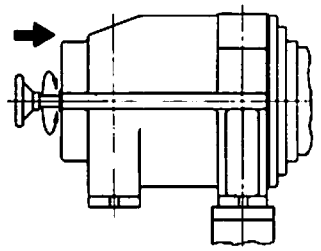
FILLING THE PUMP

Occasionally it will be necessary to fill the pump. Use a soft grease - NLGI Grade 2 or softer. Fill the pump 3/4 full. This will allow for the different volumes of grease expelled from the cylinders when moving in or out. The pump may be filled by removing the return line, installing a grease fitting in its place and filling from a grease gun.

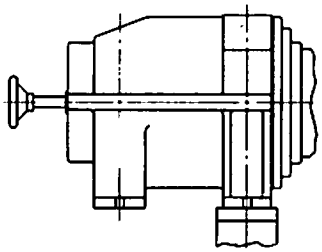
> **CAUTION:** Do Not Introduce Air Into The Grease Gun During The Filling Operation.

OPERATING MECHANICAL DECKLES

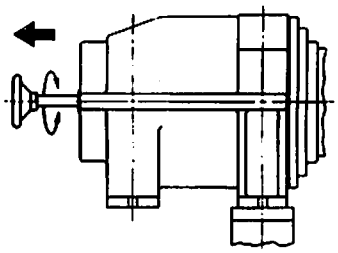
The handwheel on the suction elbow is pushed from its neutral position to engage one deckle; pulled from neutral and turned slowly to engage the other.



PUSH AND TURN SLOWLY TO ENGAGE ONE DECKLE



NEUTRAL



PULL AND TURN SLOWLY TO ENGAGE THE OTHER DECKLE

Once engaged, turning the handwheel moves the deckle.

A legend plate identifies which deckle is engaged when the handwheel is pushed or pulled and which direction to turn the wheel to move a deckle in a desired direction. Follow the instructions on the plate.

If deckle movement is difficult, turn off the vacuum until they are positioned.

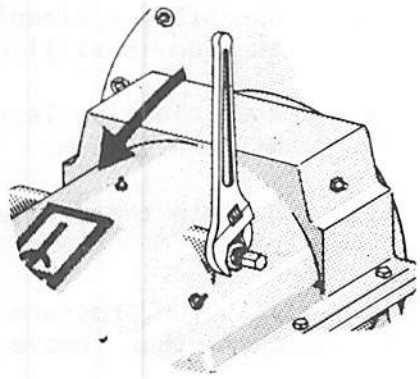
After deckles are positioned, put the handwheel in its neutral position to avoid inadvertent deckle movement.

Whenever operations permit, move the deckles several full strokes in both directions to clear the mechanism of deposits which could impair movement.

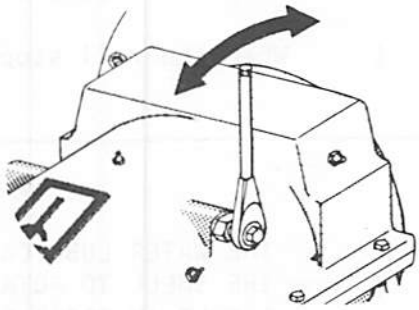
CHANGING SUCTION BOX POSITION

The suction box can be rotated a full 360 degrees. Further rotation is limited only by service connections to it. Proceed as follows to change its position:

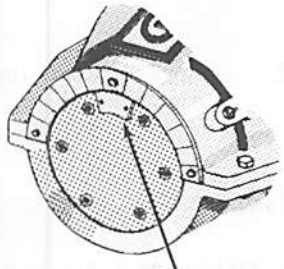
1. Loosen the wormshaft locknut on the suction elbow.



2. Put the ratchet wrench on the end of the shaft and turn it to rotate the suction box.

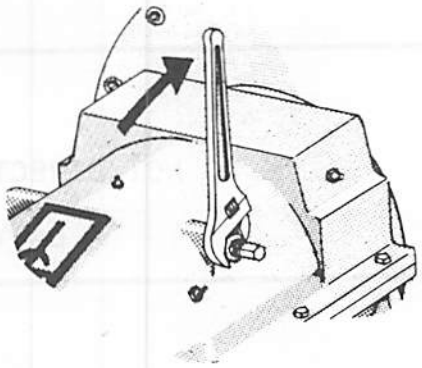


3. Observe the position indicator on the end of the suction box. Position the box carefully. A few degrees off the optimum position can seriously affect sheet dryness, press action, felt dryness, and other factors.



POSITION INDICATOR

4. When the box is in the optimum position for the prevailing conditions, retighten the locknut and remove the ratchet.



SHUTDOWN

Use the following sequence to effect a roll shutdown. Even a brief stop is to be treated as a shutdown.

1. Operate the cleaning shower, if one is included, while suction is still on.

2. When cleaning is completed and the shower stopped, turn off the vacuum.

3. Operate the deckles several full strokes in both directions.

4. Vary the pressure on air-loaded seal strips to free them, then remove air pressure.

5. Stop roll rotation.

6. When the roll stops shut off seal water.

> NOTE
>
> THE WATER LUBRICATES THE SEAL STRIPS. ALLOWING THE SHELL TO ROTATE WITHOUT THIS LUBRICANT CAN RESULT IN RAPID SEAL WEAR, PARTICULARLY IN HIGH SPEED MACHINES

7. Wash down immediately, if desired or appropriate.

WASHDOWN

Suction rolls not equipped with internal showers should be washed with water to thoroughly flush the holes and remove foreign materials. Turn the vacuum on during washdown to remove the wastewater.

> CAUTION
>
> DO NOT DIRECT WASHDOWN SPRAYS INTO
>
> LABYRINTH SEALS.

CHEMICAL CLEANERS

The use of chemical cleaners in showers or during washdown is discouraged. However, in some situations they present the only practical solution to a cleaning problem. In such cases, carefully consider the effects the cleaner will have on the roll's various components, materials, and lubricants.

PROBLEMS AND CAUSES

The following table lists symptoms of some problems which can arise at the suction roll and shows the probable causes which should be investigated in correcting them. Other more obscure problems are possible. Do not hesitate to contact the factory if a situation arises in which it appears that the suction roll is involved.

SYMPTOMS	PROBABLE CAUSES
Low vacuum, lack of water removal. (See Note 1, next page)	Deckles set beyond the sheet Seal strips worn or seized. Suction elbow seals or seal strips leaking Leak in vacuum hoses, fittings, or piping Insufficient seal water in the vacuum pump Vacuum pump worn internally.
Low vacuum, good water removal	Faulty vacuum gauge Suction box positioned beyond the roll nip and pulling a large volume of air. (This may be desirable if water removal remains good.)
High vacuum, lack of water removal	Blockage in the vacuum system Dirty or plugged felt Holes in shell plugged Blockage in the trunnion
High pump horsepower, high vacuum, lack of water removal	Too much water reaching the pump from the roll Too much seal water being supplied to the vacuum pump.

SYMPTOMS	PROBABLE CAUSES
Lack of water removal, high vacuum at the pump, low vacuum at the roll	Blockage between the pump and the roll

Note 1:

When the seal strips are replaced, there may be a period of low vacuum operation until the new strips wear in and adjust to the shell.

MACHINE CARE

Taking proper care of the suction roll is vital to insuring its long life and to maintaining a high level of performance. Schedules for routine maintenance which include lubrication, cleaning, and inspection must be established for each suction roll in its own operating environment. The schedules suggested in the following paragraphs are typical and may be modified. The maintenance actions covered, however, are basic and must be included in the schedules and routines developed for each suction roll. Consult the factory if maintenance beyond the scope of this manual is anticipated.

LUBRICATION

The suction roll is usually grease lubricated. It operates in a wet environment where the air is usually laden with contaminants. The lubricant selected must be suited to such conditions, and the roll must be lubricated heavily to exclude the water and other contaminants. If the roll is oil-lubricated, separate instructions applicable to oil lubrication are provided.

LUBRICANTS

The suction roll was lubricated with LE-1275 supplied by customer prior to shipment and a tag attached which identified the lubricant used. Use the same lubricant or one that you have verified to be compatible with it.

CAUTION

DO NOT MIX LUBRICANTS

All greases are not compatible with each other and cannot be mixed together without adverse effects. If a change of lubricant is desirable, either verify that the new type can be used with the old, or remove all of the old type before using the new.

LUBRICATING INFORMATION

The figure on the opposing page shows the points of lubrication; the following table identifies them and indicates the typical frequency. The quantity is discussed below.

. LUBRICATION TABLE

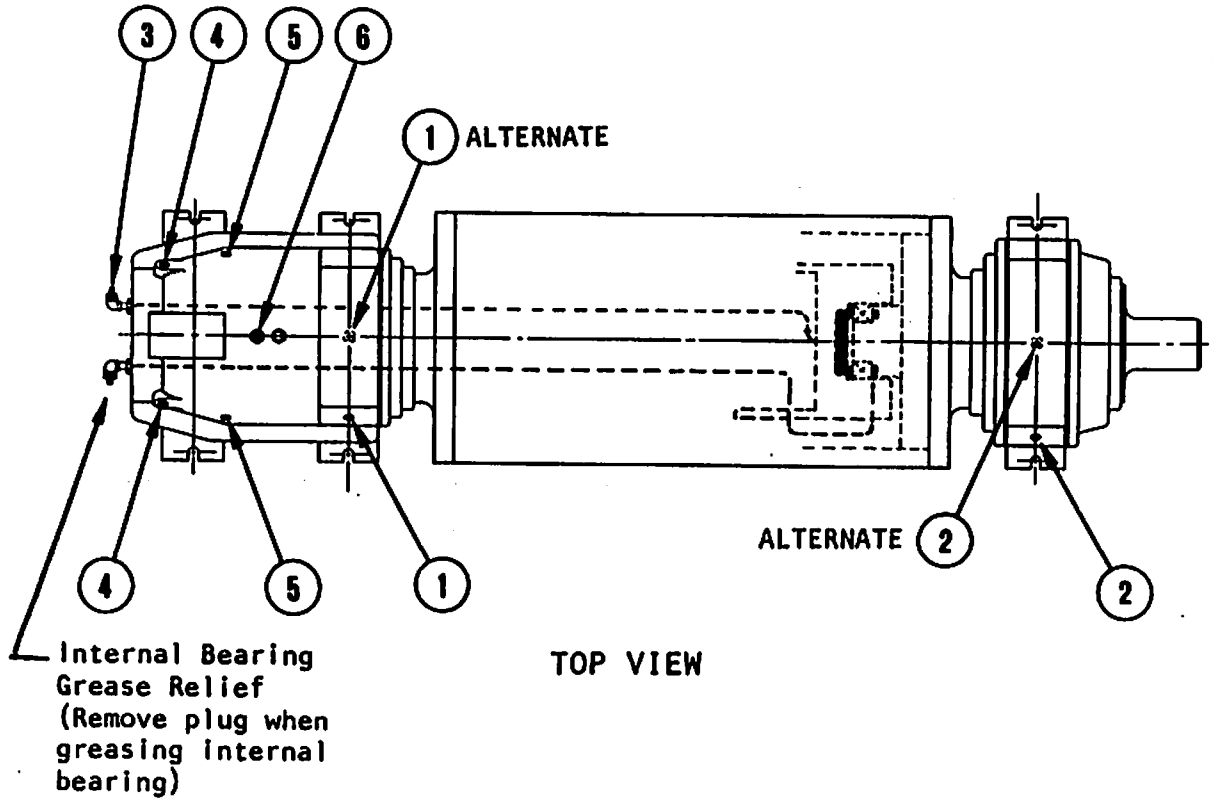
Item No.	Component	No. of Fittings	Lube Note	Frequency
1	Front main bearings (anti-friction type)	1	1	Every 170 operating hours.
2	Rear main bearing (anti-friction type)	1		
3	Internal bearing (anti-friction type)	1	2	
4	First trunnion bearing (plain type)	2	3	Every 680 operating hours and immediately prior to changing suction box position.
5	Second trunnion bearing (plain type)	2		
6	Suction box worm and gear	3		

LUBE NOTES

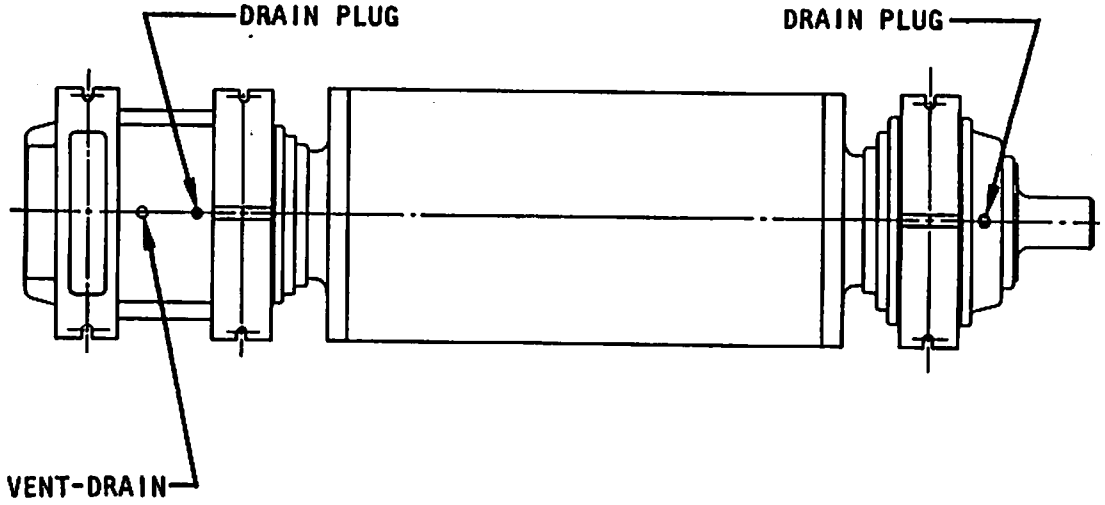
1. Inject fresh lubricant to force emulsified or soapy grease out through the labyrinth seals. When fresh grease appears, continue injecting until about 1/2-cup has been pumped through.

2. Inject fresh lubricant until about 1 ounce of noncontaminated grease appears at the grease relief hole on the rear head flange.

3. Inject 1 or 2 ounces from the hand gun.



TOP VIEW



BOTTOM VIEW

LUBRICATION DIAGRAM

4. VENT-DRAIN HOLE

The vent-drain hole, illustrated on the lubrication diagram, must be kept open. Check it each time the roll is lubricated. While not necessarily in the same place on all units, it will always be at one of the lowest places.

Suction roll lubrication can be generalized as follows:

- New grease must be used to purge the old from bearings.
- The labyrinths must be full of lubricant to seal effectively.
- During operation, there should always be some seepage of grease from the seals and reliefs.
- Underlubrication will lead to bearing failure.
- The suction roll must be lubricated heavily. However, watch for symptoms of the antifriction bearings being overlubricated.
- Overlubrication -- too much, too often, for too long a period -- will result in overheating and failure in antifriction bearings.

EXTERNAL INSPECTION

Inspect the suction roll regularly both while it is operating and while it is shut down. While it is not rotating --

- Inspect the surface for damage or excessive wear.
- Verify that the holes are not becoming plugged.
- Check the tightness of mounting hardware and service connections.
- Remove dirt and excess lubricant seepage.
- Make sure the vent-drain hole is open.

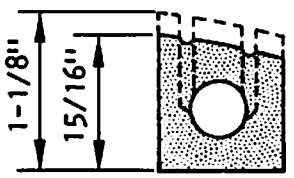
While it is rotating --

- Feel the external bearings for abnormal temperatures or vibration

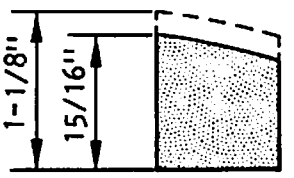
- Listen for new sounds or changes in the usual sounds.
- Feel the piping for abnormal temperature, vibration, or flow conditions.

SEAL STRIPS

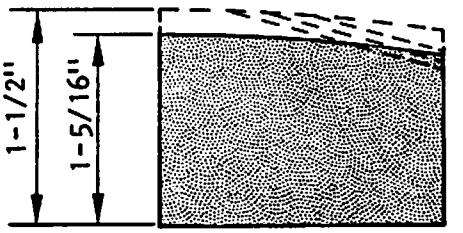
Clean seal strips as often as necessary to maintain good operating conditions; replace them when they have worn as shown below.



WATER LUBRICATED SEAL STRIP



PLAIN SEAL STRIP



SILENCING SEAL STRIP

The larger dimension is the height of a new strip; the smaller is the amount remaining when replacement is needed.

The Seal Strips can only be measured and cleaned or replaced when the suction box is removed from the shell. Refer to the Suction Roll Specifications to see which type has been selected.

To approximate the rate of wear and to predict when seal strip replacement must be scheduled, observe the depth of groove remaining on a water-lubricated seal strip. The depth on a new strip is 3/16". Replacement is required when the grooves are worn but still visible.

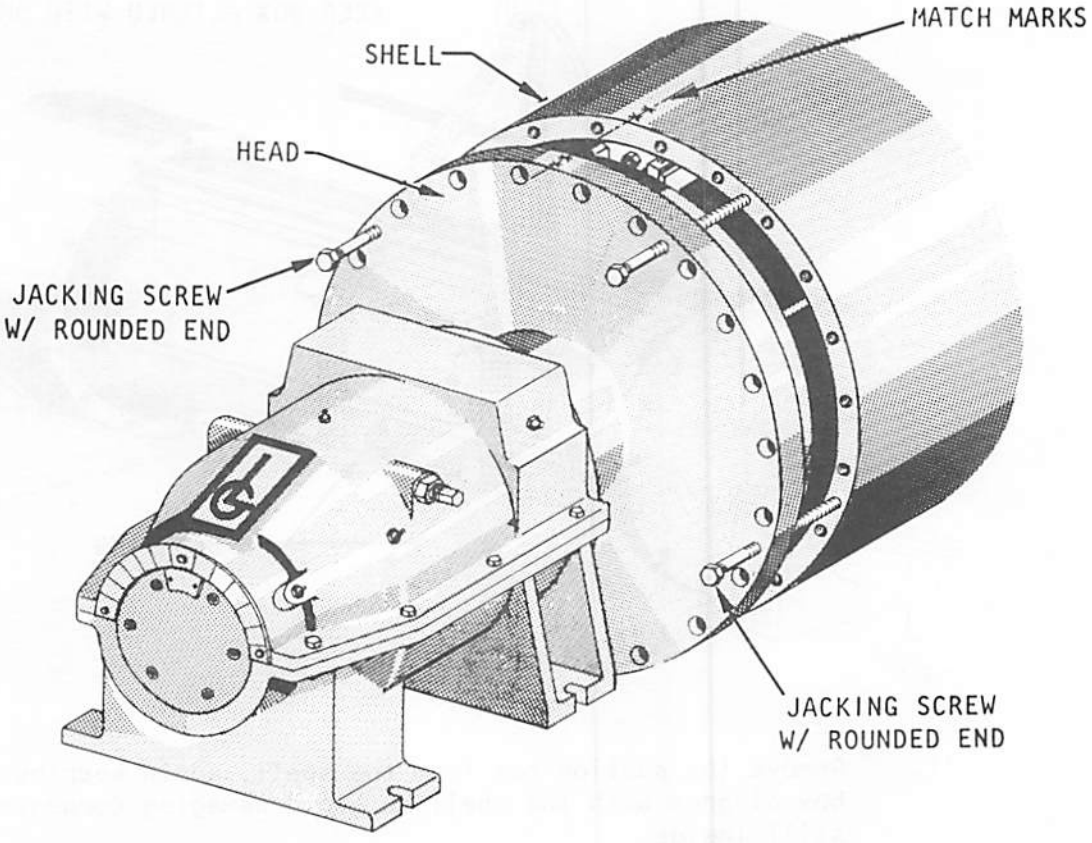
INTERNAL INSPECTION

Every 6 months, particularly when the suction roll is new, disassemble it to inspect and clean the interior. During the warranty period, disassembly and inspection must be performed under the supervision of a factory representative. Subsequently, arrange to have these services performed at the factory if at all practical. In all cases, be sure the factory is advised of all unexpected or unusual conditions detected during internal inspections.

The paragraphs which follow give procedures for disassembling the suction roll after it has been removed from its mountings, for servicing various internal components, and for reassembling the roll after internal maintenance has been completed.

7. Turn these screws in to jack the front head out of the shell until the suction box pulls free of the internal bearing and rests on its feet.

   Jack the screws evenly, to avoid cocking and binding the head. There is an interference fit between the head and shell.



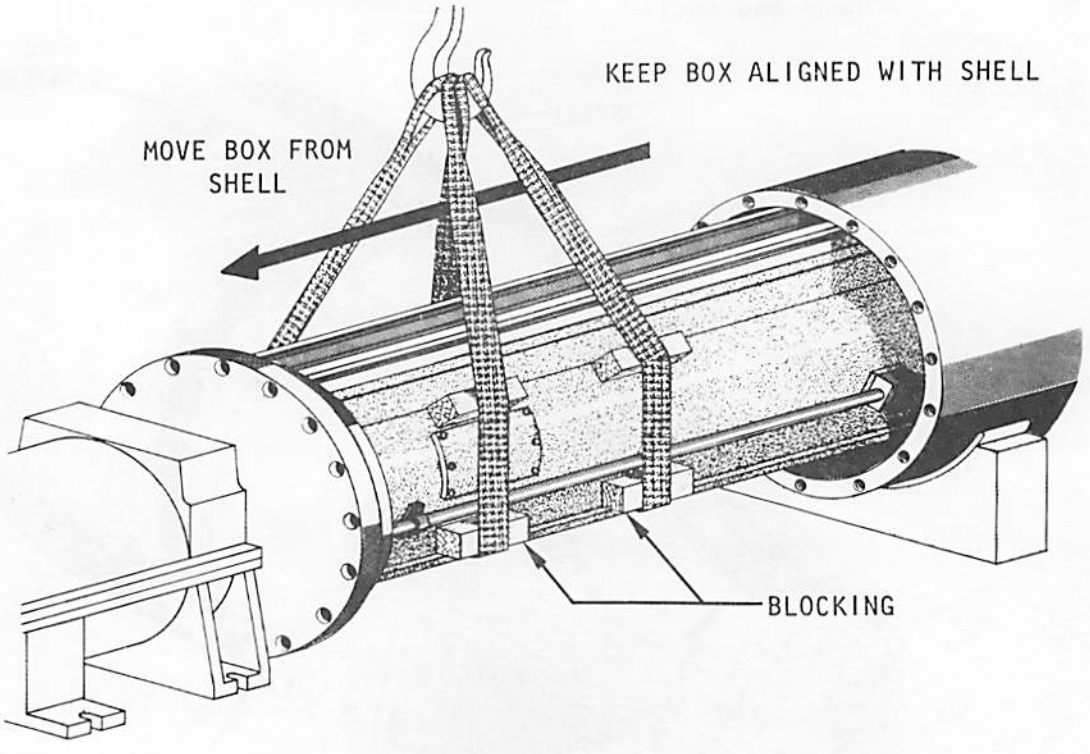
8. Using the sling around the suction elbow, pull the suction box approximately halfway out of the shell.

CAUTION

KEEP THE SUCTION BOX IN LINE WITH THE SHELL WHILE EXTRACTING IT TO PREVENT SEAL STRIP CHANNELS OR THE SUCTION BOX COUNTERWEIGHT FROM DRAGGING ACROSS THE SHELL.

9. With the box half pulled, support the suction elbow and remove the sling.

10. Resling around the balance point. Use blocks to protect any piping on the outside of the suction box.



11. Remove the suction box from the shell, again keeping the box aligned with the shell to avoid damaging components still inside.

Although it is possible to remove the suction box while the roll is in the machine, it is not recommended that this be attempted. It can be a hazardous operation.

SERVICING SEAL STRIPS WITH ROLL DISASSEMBLED

Every time the roll is disassembled, service all seal strips and related components as follows:

- Remove all seal strips, measure wear, look for scoring and other abnormalities.
- Clean the strips if they are serviceable, prepare new ones if they are not.
- Clean the retaining channels.

DEMOUNTING THE SUCTION ROLL

To remove the suction roll from the machine, proceed as follows:

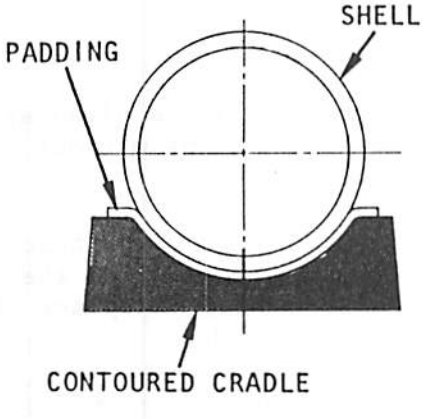
1. Effect a shutdown.
2. Disconnect all service hoses from the roll, using the quick disconnect couplings. Install protective caps on both ends of the couplings.
3. Loosen or remove all mounting bolts.
4. Before moving the roll, refer to the paragraph in the INSTALLATION Section entitled LIFTING THE ROLL.
5. Using a method appropriate for its location, remove the roll from the machine.
6. Set the bearing housings on blocks so that the roll is supported by the bearings and the shell is clear of the floor.

SUCTION BOX REMOVAL

During the warranty period, consult the factory before removing the suction box.

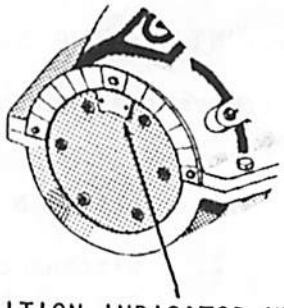
With the roll out of the machine, use the following procedure to remove the suction box.

1. Use contoured cradles to support the roll by its shell. Pad the cradles heavily to protect the roll's surface or cover.



2. If necessary, rotate the suction box until the position indicator is up.

There are feet on the bottom of the suction box which serve as slides while the box is being removed. The feet are down when the indicator is up.

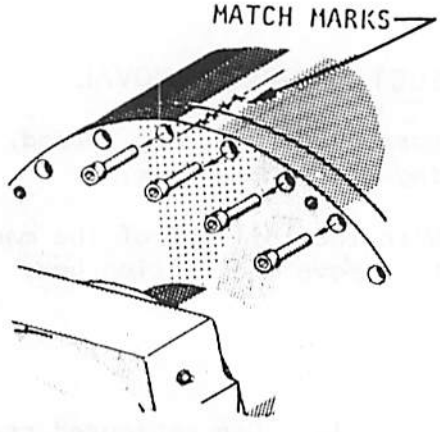


POSITION INDICATOR UP

WARNING

REMOVING A SUCTION BOX WHEN ITS FEET ARE NOT DOWNWARD CAN RESULT IN PERSONAL INJURY AND SERIOUS DAMAGE.

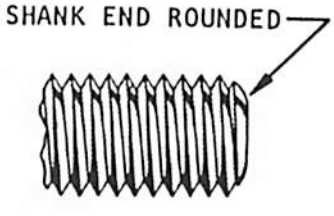
3. Matchmark the front head and shell for assembly.



4. Remove all head-to-shell bolts from the front head only.

5. Place a sling around the suction elbow to support its weight without lifting it.

6. Remove the headless set-screws from the front head. Replace them with hexhead jacking screws of a suitable length which have been rounded.



- On spring-loaded strips, remove the seal strip channels from the suction box, clean the springs, replace any that are corroded or broken. Clean the spring pockets under the channel. Fill the spring pockets with waterpump grease just before inserting the springs, then remount the channel.

- On air-loaded strips, inspect the air tubing for wear; apply air pressure very slowly and check for leaks.

- When inserting strips, be sure the top surface curves in the proper direction, that a 1/4-inch gap is left for longitudinal expansion during operation, that the fit is loose for vertical motion.

SUCTION BOX MAINTENANCE

Clean the suction box thoroughly and check for corrosion while it is out of the roll. Consult the factory if any corrosion is detected.

MECHANICAL DECKLES

Clean the mechanism thoroughly. The adjusting screws are subject to encrustation; coat them with waterpump grease after cleaning.

Replace bent or broken screw drive pins.

Clean or replace the end deckle packings, using the same criteria applied to seal strips. Merely lift them out of the deckles to remove them. Clean packing springs; replace any that are corroded or broken. Pack the springs with waterpump grease.

HYDRAULIC DECKLES

Clean all components of the hydraulic deckle system, particularly the cylinder rods. Clean or replace the end deckle packings, using the same criteria applied to seal strips. Merely lift them out of the deckles to remove them.

Look for hydraulic leaks. Pressurize the system and check for visible leaks and those which are within components. Creeping deckles indicate the presence of air or a leak.

Do not disturb the lines, fittings, or components unless necessary

to making a repair. Avoid scratching or otherwise marring the cylinder rods.

Keep disconnect couplings in good repair. While disconnected, use dust capt to keep dirt from entering the mating area.

If any air could have entered in the internal hydraulic circuit, do not reassemble the suction roll until all of it has been bled out.

Refer to the manufacturer's literature in Appendix A for additional information.

BLEEDING THE INTERNAL HYDRAULIC CIRCUIT

If air has entered the internal hydraulic circuit, it must be bled to avoid erratic deckle operation and drifting. Ports for bleeding are on top of the cylinders, at the highest points in the circuit. The air will collect at these places. While the suction box is out of the shell and with all hydraulic lines connected, proceed as follows:

1. Attach the portable hand pump pressure fitting to the "front deckle in" connection and the return lines to the "front deckle out" connection. Move the front deckle all the way "IN" by pumping hand pump (cyl. retracted).

2. Reverse hand pump connections, pressure to "front deckle out" and return to "front deckle in". Open bleed port and pump until all air is expelled and clean air-free grease appears. Close bleed port.

3. Move deckle to the extreme "out" position. (cyl extended).

4. Reverse hand pump connections, pressure to "front deckle in" and return to "front deckle out". Open bleed port and pump until all air is expelled and clean air-free grease appears. Close bleed port.

DEPOSITS IN SHELL PERFORATIONS

In some applications, deposits build up in and plus the shell perforations despite the use of showers and regular washdown. When the deposits impair performance, use a drill to clear the holes. Place leather washers or other protective devices on the drill shank to protect the roll's surface from damage by the chuck. Do not enlarge the holes beyond their original size.

Drill while the suction box is out of the roll so that all residue from drilling can be removed from the interior and all burrs and rough edges left by the drill can be removed to avoid scoring or abrasion of seal strips.

CAUTION

IF A DRILL BIT BREAKS AND REMAINS IN A HOLE, REMOVE IT BEFORE CONTINUING. THEY ARE DIFFICULT TO FIND LATER AND CAN DAMAGE THE ROLL DURING OPERATION IF NOT REMOVED.

SUCTION BOX REINSERTION

Use the following procedure to reinsert the suction box. It is assumed that the shell is still supported in a position to receive the box.

1. Verify that the shell's interior is clean.

2. Measure the inside diameter of the shell fit and the outside diameter of the head to verify that there will be a slight interference fit.

3. With the suction box oriented so that its feet are downward, sling around its balance point. Use blocks to protect any piping on the outside of the box.

4. Lift the box and while keeping it in line, insert it as far into the shell as the sling will permit.

5. Coat the head-to-shell fits with an anti-seizing compound.

6. Resling at the suction elbow and push the box into the shell until the internal bearing is about to enter its seat.

7. Align the matchmarks between the head and shell.

8. Insert a number of 5/8-11NC threaded rods with nuts through the head and into the shell, then tighten them to jack the box into the shell until the head fit seats. Tighten in a pattern and evenly to avoid cocking and jamming the head in the shell.

   It may be necessary to cut the threaded rods as they extend into the space between the housing and head when the head moves into the shell.

REINSTALLING A SUCTION ROLL

Handle the reinstallation of a suction roll as if it were a new roll. Follow the instructions of the INSTALLATION Section; also use the INITIAL STARTUP procedure of the OPERATING INSTRUCTIONS when returning it to service.

CAUTION

IF A DRILL BIT BREAKS AND REMAINS IN A HOLE, REMOVE IT BEFORE CONTINUING. THEY ARE DIFFICULT TO FIND LATER AND CAN DAMAGE THE ROLL DURING OPERATION IF NOT REMOVED.

SUCTION BOX REINSERTION

Use the following procedure to reinsert the suction box. It is assumed that the shell is still supported in a position to receive the box.

1. Verify that the shell's interior is clean.

2. Measure the inside diameter of the shell fit and the outside diameter of the head to verify that there will be a slight interference fit.

3. With the suction box oriented so that its feet are downward, sling around its balance point. Use blocks to protect any piping on the outside of the box.

4. Lift the box and while keeping it in line, insert it as far into the shell as the sling will permit.

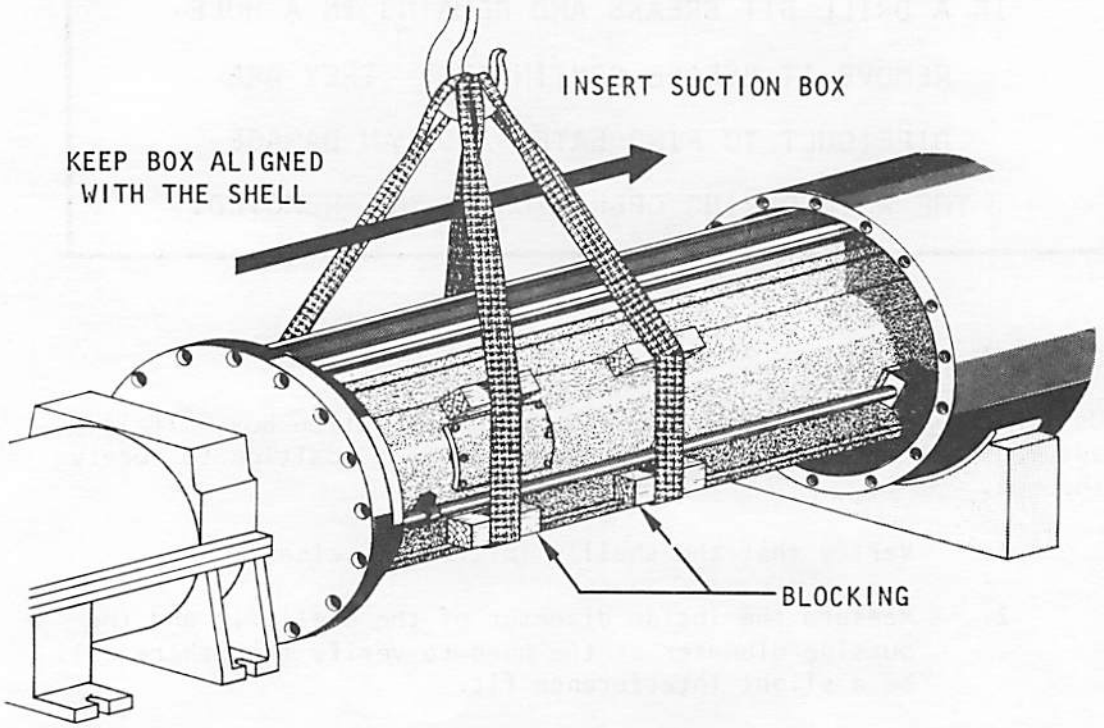
5. Coat the head-to-shell fits with an anti-seizing compound.

6. Resling at the suction elbow and push the box into the shell until the internal bearing is about to enter its seat.

7. Align the matchmarks between the head and shell.

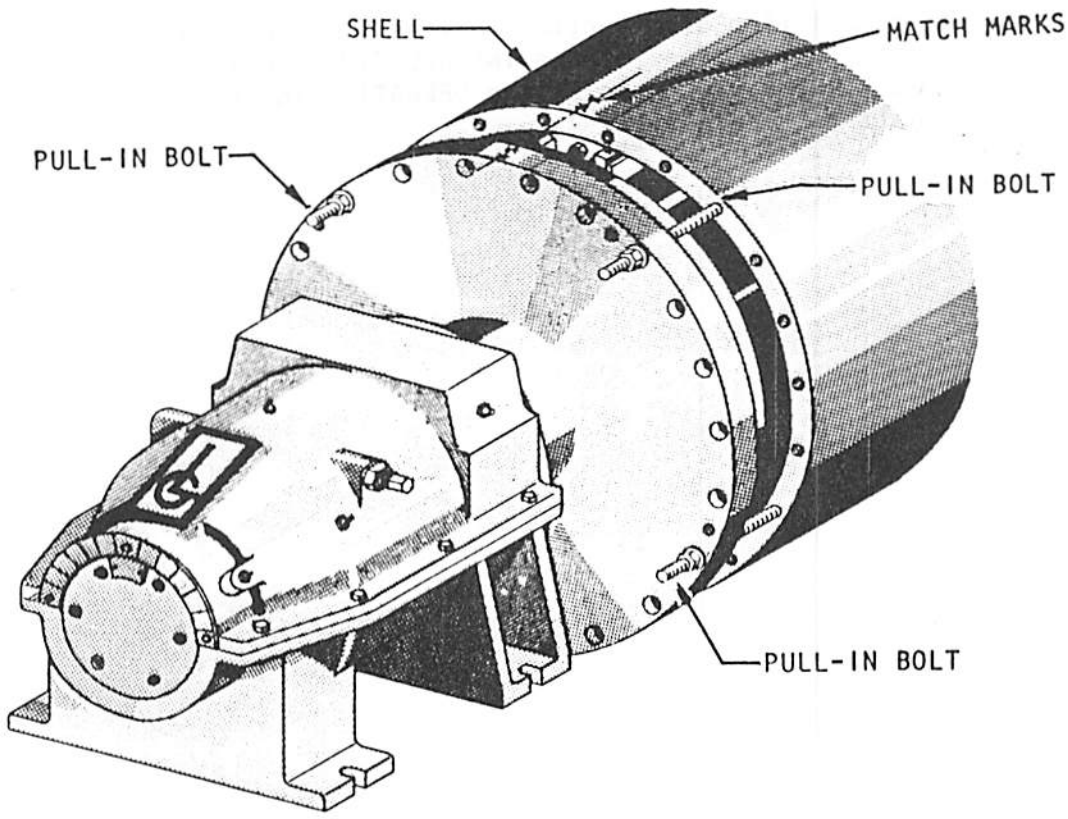
8. Insert a number of 5/8-11NC threaded rods with nuts through the head and into the shell, then tighten them to jack the box into the shell until the head fit seats. Tighten in a pattern and evenly to avoid cocking and jamming the head in the shell.

   It may be necessary to cut the threaded rods as they extend into the space between the housing and head when the head moves into the shell.



CAUTION

KEEP THE SUCTION BOX ALIGNED WITH THE SHELL WHILE INSERTING IT TO PREVENT SEAL STRIP CHANNELS OR THE SUCTION BOX COUNTERWEIGHT FROM DRAGGING ACROSS THE SHELL.



9. Coat all head-to-shell bolts with anti-seizing compound and install them in the empty holes. Do not apply excessive torque. (The length of head-to-shell bolts must not exceed 2¼ inches.)

10. Remove the jacking bolts and replace them with normal head-to-shell bolts. Do not apply excessive torque.

11. Install the headless setscrews in the backoff holes and tighten them.

12. Remove all temporary supports.

13. Continue with the paragraph entitled REINSTALLING A SUCTION ROLL.

REINSTALLING A SUCTION ROLL

Handle the reinstallation of a suction roll as if it were a new roll. Follow the instructions of the INSTALLATION Section; also use the INITIAL STARTUP procedure of the OPERATING INSTRUCTIONS when returning it to service.

ORDERING PARTS

Parts which should be kept on hand as spares for immediate use are listed in Appendix B. A complete bill of materials identifying all suction roll components is also provided.

When ordering any part from the factory, be sure to include the following information:

- The suction roll serial number.
- The name, description, part/drawing number, and item number as listed in the Bill of Materials.
- The quantity desired.
- Your purchase order number.
- Shipping address for the parts.
- Preferred method of shipment.

If the order is placed by telephone, please mark the written order "Confirmation" to avoid duplication.

Mail the order to the address on the cover page.

APPENDIX A

This appendix contains literature from manufacturers whose components are included in the suction roll. Information from all manufacturers is not always available.

APPENDIX B

This appendix contains information applicable to the suction roll having the specific serial number identified on the following pages. It includes:

- A list of the arrangement drawings.
- A list of recommended spare parts.
- The Suction Roll Specifications.
- Special instructions, if applicable.

SUCTION ROLL SPECIFICATIONS

Customer CRANE & COMPANY
Location DALTON, MA
Roll O.D. 23" Drilled Face 96 5/8"
Roll Type: Press ☐ Drum ☐ Couch ☒
Pickup ☐ Felt ☐ Other ____

LG Serial SR- 302
LG S. O. # 49943
Cust. P.O. # 9545P

Shell O.D. 22" I.D. 19 1/4" Length 104 5/8" Thk. 1 3/8"
Material: 1-N Bronze ☒ Other ____

Rubber Cover Thk. 1/2" O.D. 23" I.D. 22" Length 104 5/8"
P&J 15 Ends Dubbed? YES Rubber Type ____

Trunnion I.D. 5 7/8" Capacity Range 700 to 1400 CFM
Vacuum 20 In. Hg Connection at: Front ☒ Rear ☐

Bearings Front 23048K Stand off 8 1/2" | Rear 23048K Stand off 8 1/2" | Internal 22217K CL Main Brgs. 121 5/8"

Suction Box Material: C.S. Welded ☒ S.S. Welded ☐ C.I. ☐
No. Openings: Single ☒ Dual ☐ Other ____
1st Box Width 6 1/2" Other ____
2nd Box Width ____ Other ____

Deckles Actuation: Grease ☒ Mechanical ☐
Max. Deckled Face 96 5/8" Min. Deckled Face 72 5/8"

Seal Strips Matl: Polyethylene ☒ Lam. Phenolic ☐ Other ____
Std.(Water Lube) ☒ Plain(No Water Lube) ☐ Other ____
Can be pulled ☐ from ____ Cannot be pulled ☒
Load: Air ☒ Spring ☐

Silencing Strips Yes ☐ No ☒ Load: Air ☐ Spring ☐
Can be pulled ☐ from ____ Cannot be pulled ☐

Showers Cleaning ☒ uses 97 GPM@ 40 psi Fog ☐ uses ___ GPM@ ___ psi
Lo Press ☐ uses ___ GPM@ ___ psi Needle ☐ uses ___ GPM@ ___ psi

Air Pass Yes ☐ No ☒ Following ☐ Stationary ☐

Pull Block Yes ☒ No ☐ Matl: Al ☒ S.S. ☐ Other ____

Saveall Pan Yes ☐ No ☒ Matl: S.S. ☐ Other ____

Rotation (As viewed from front) Clockwise ☐ Counterclockwise ☒

Roll Weight Total Wt. ____ Front Wt. ____ Rear Wt. ____

Nip Load: ____ pli | **Grind:** Straight ☐ Crown ____ in @ ____

BM # 4589-128 Assy. Dwg. # D-4589-128 Installation Dwg. # D-4587-41

Other Data: The suction roll was lubricated with LE-1275 supplied by customer prior to shipment and a tag attached which identified the lubricant used. Use the same lubricant or one that you have verified to be compatible with it.

specif

THIS MANUAL HAS BEEN PREPARED FOR ROLL, SERIAL No. 302, IN ACCORDANCE WITH THE SUCTION ROLL SPECIFICATIONS ON THE NEXT PAGE.

THE FOLLOWING IS A LIST OF THE ARRANGEMENT DRAWINGS, BILLS OF MATERIAL, AND RECOMMENDED SPARES.

ARRANGEMENT DRAWINGS

DWG. No.		TITLE
D-4587-41	IN-3-349	SUCTION COUCH ROLL INSTALLATION
D-4589-128	350	SUCTION COUCH ROLL ASSEMBLY
B-5890-58	353	SHOWER PIPING ASSEMBLY
B-5888-10	354	INTERNAL BEARING PIPING ASSEMBLY
B-5887-15	355	SEAL WATER PIPING ASSEMBLY
B-5889-24	356	AIR LOAD PIPING ASSEMBLY
B-5893-15	357	GREASE DECKLE PIPING ASSEMBLY
B-6767-11	358	INTERNAL BEARING GREASE RELIEF ASSY.

BILLS OF MATERIAL

BM No. 4589-128 SHEETS 1 THROUGH 16 INCLUSIVE.

RECOMMENDED SPARE PARTS

REQUIRED	DESCRIPTION	BM ITEM No.
36	SHELL STUD	5 & 9
36	SHELL NUT	6 & 10
1	FRONT BEARING #23048K	39
1	REAR BEARING #23048K	86
2	LEFT & RIGHT SEAL STRIP	112 & 122
2	DECKLE PACKING	221
4	DECKLE PACKING SPRING	222
2	AIR LOAD ASSEMBLY	113 & 123
2	DECKLE CYLINDER	245
1	INTERNAL BEARING #22217K	501
2	SEAL RING INTERNAL BEARING	502
12	CARTRIDGES	410
1	VAC. GUAGE	66

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC-1013-10

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	1 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY Shell and Heads	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR # 302 DESCRIPTION	STK #	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR	
1	1	Shell 22" O.D. x 19 1/4" Nom. I.D. x 96 5/8" D.F. x			C-894-126					
		104 5/8" OAL Drill Pattern			B-4313-17					
2		Cover 23" O.D. x 1/2" THK. x 104 5/8" Lg. P&J=15			C-894-126					
3	1	Shim pack		Glass Epoxy	A-4497-107					
4	1	Front Head (Forging)		A-181 CL-60	D-1219-305					
	3	Copies of certified Test Report Required								
5	18	Studs - 3/4"-10 NC x 4 5/8" Lg.		A-193 GR-B7						
6	18	Heavy Hex Nuts - 3/4"-10NC		A-194 GR-2H						
7	1	Weight Record			PROCESS					
8	1	Rear Head (Forgin)		A-181 CL-60	D-1219-306					
	3	Copies Certified Test Report Required								
9	18	Studs - 3/4"-10 NC x 4 5/8" Lg.		A-193 GR-B7						
10	18	Heavy Hex Nuts - 3/4"-10NC		A-194 GR-2H						
11	2	Pipe Plug: 1/8" I.P.S. C'Sunk		Brass or S/S						
12	2	BOLT GUARD ASSEMBLY			D-10843-12		X			
	2	STRIP, .109" THK x 1 3/4" x 71" LG		STL.						
	2	STRIP, .109" THK x 1 1/4" x 61" LG		STL.						
	2	SK-PL 11 GA x 22 3/4" SQ		STL.						
	12	3/4-10NC x 2 1/4" LG HHCS (MUST HAVE		S/S						
		1/4"-20 NC TAP x 1" DP IN CENTER OF HEAD					X			
	12	1/4"-20NC x 1" LG BUTTONHEAD SCREW		S/S						
	12	1/4"-EXTERNAL TOOTH LOCKWASH		S/S						
	4	SHEET, 11GA. x 1 1/4" x 2"		STL.						
	8	#10-24 x 3/8" LG. T.Y 1B SLOTTED PANHEAD SELF-TAPPING SCREW		S/S						
13	18	3/4"-10NC x 2 1/2" LG. FLMS.		BRASS		A				

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41	BM-4589-128	1 OF 16
	A 1-2-92 T-KHA ADDED ITEM #13	ASSY DWG D-4589-128		

PROD.	INV.	PROC.	ACCT.	PURC.	ENG.	PROD.	REC.	S.O.F.

LC-1013-10-1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	2 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY 48 FRONT BRG ASSY SH 1 OF 2	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR# 302 DESCRIPTION	STK#	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
31	1	END PLATE ~ 1 1/4" x 7 1/4" ϕ DIA.		STL.	B-4617-10				
32	1	SUCTION ELBOW ~		C.I.	D-4615 5	4615-A & 4615-B			
	2	BUSHING ~ 1 3/8" OD x 1 1/8" ID x 2 1/2" LG BOSTON B-1822-20	S-70	BRONZE					
	8	Hx HD BOLT (FLANGE) 5/8-11 NC x 2 1/4" LG		S/S					
	8	Hx NUT (FLANGE) 5/8-11 NC		S/S					
	2	DOWEL (FLANGE) 3/8" DIA x 1 1/2" LG		STEEL					
37	1	INSIDE BRG COVER		C.I.	C-1108-7	415A			
38	1	INSIDE LABYRINTH SEAL		C.I.	B-1110-140	1110-F			
39	1	BRG ~ TORR# 240SD30K-W33 OR 23048K	B-5						
40	1	LOCK NUT ~ N048	B-102	STEEL					
41	1	LOCK PLATE ~ P48	B-112	STEEL					
42	1	OUTSIDE BRG SEAL	S-35	BRASS	B-1799-1	1799A			
43	1	WORM GEAR	S-95A	DUCTILE IRON	C-4616-1	4616			
44	1	KEY (WORM GEAR) 1/2" x 1/2" x 1 27/32 +0 -1/32 R.B.E.		STEEL	PROCESS				
45	1	WORM	S-96A	1045 STEEL	B-671				
46	2	SPRING PIN ~ 1/4" SIZE x 1 3/4 LG	S-66	S/S					
47	1	WORM SHAFT ~ 1 1/8" DIA x 13 1/4" LG		1040 TGP	B-673-9				
48	2	COLLAR (WORM SHAFT)	S-97	BRASS	A-672				
49	1	JAM NUT (WORM SHAFT) ~ 1"-8NC (1 5/8" ACROSS FLAT)		BRASS					
50	1	FLUSH PIPE BUSHING 1/2" MPT TO 1/4 FPT		STEEL					
51	2	RETAINER (O-RING)	S-33	BRASS	A 424-2	424-B			
52	2	"O" RING	S-24	BUNA "N"	A-425-2				
53	2	BUSHING (TRUNNION SUPPORT)	S-31	BRASS	A-423-8				
54	4	SK SET SCREW (END ADJUST) 5/16"-18NC x 1" LG		S/S					
55	6	SK HD CP SCREW ~ 3/8-16NC x 1 1/2" LG		S/S					

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41	BM-4589-128	2 OF 16
	△	ASSY DWG D-4589-128		

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC	S.O.F.

LC-1013-10

SHOP ORDER	SHEET	CUSTOMER	JOB	
49943	3 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	LG INDUSTRIES, INC
		PO OR ASSY 48 FRONT BRG ASSY SH 2 OF 2	DATE 10/22/91 BY T-KHA	BILL OF MATERIAL

ITEM	QUAN	SR# 302 DESCRIPTION	STK #	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
56	1	PIPE PLUG (GREASE DRAIN) 1/8" IPS C'SUNK		BRASS OR S/S					
57	6	GREASE FITTING ~ 1/8" NPT ~ ALEMITE #1610BL		STEEL					
58	2	GREASE FITTING ~ 1/4" NPT ~ ALEMITE #1627B		STEEL					
59	1	HX HD CP SCREW (LIFT HOLE) 3/4"-10NC x 1" LG		S/S					
60	8	SK HD CP SCREW (BRG COVER) 1/2"-13NC x 1 1/4" LG		S/S					
61	2	SK SET SCREW (LABY SEAL) 3/8"-16NC x 1/2" LG		S/S					
62	1	SERIAL PLATE	S-61						
63	4	RD HD DRIVE SCREW (SERIAL PLATE) #4 x 3/8" LG		S/S					
64	1	MONOGRAM	S-60						
65	4	HX HD CP SCREW (M'GM) #10-24NC x 3/8" LG		S/S					
66	1	VAC. GAGE ~ 1/4" MPT ~ BOTTOM CONN ~ 3 1/2" DIAL	S-59A						
67	1	ELBOW ~ 90° (VAC GAGE) 1/4" IPS		BRASS					
68	1	NIPPLE ~ 1/4" IPS x 2" LG		BRASS					
69	1	WORM WRENCH ~ LOWELL #22 ~ 3/4" HX x 10"	S-52						
70	1	KEY ~ (BRG FOOT) ~ 1" x 1" x 4 3/4" LG		STEEL	A-3138-3				
71	2	SK HD CP SCREW (KEY) ~ 1/4"-20NC x 1 1/4" LG		S/S					
72	1	LOCATING RING	S-107	BRASS	A-4595-3				
73	3	HX HD CP SCREW #10-24NC x 3/8" LG		S/S					
74	1	TRUNNION BUSHING 8 3/8" ϕO.D. x 7 5/8" ϕI.D. x 2" ϕ THK		BRASS	A-4554-20				
75	1	END COVER 1/8" THK x 8 11/32" DIA. WHITE W/BLACK LETTER		PHENOLIC LAMINETE	C-10645-16				
76	7	BUTTOM HEAD CAP SCREW #10-24 x 1/2" LG		S/S					
77	1	END RE. RING 8 3/4" ϕO.D. x 5 5/8" ϕI.D. x 1" ϕ THK		STL.	A-8557-5				
78	1	PIPE PLUG (BRG GREASE) 1/4 IPS C'SUNK		BRASS OR S/S					

REV		INST DWG	BILL OF MATERIAL	SHEET
△		D-4587-41	BM-4587-128	3 OF 16
△		ASSY DWG D-4589-128		

PROD.	INV.	PROC.	ACCT.	PUR.	ENG.	PROD.	REC.	S.O.F.

LC-1013-10-1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	4 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY 48 REAR BRG ASSY	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR# 302 DESCRIPTION	STK#	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
81	1	BRG HOUSING		C.I.	C-1809-21	1808A			
82	1	OUTSIDE BRG COVER		C.I.	C-1109-2	417A			
83	1	OUTSIDE LABYRINTH SEAL		C.I.	B-1110-7	1110-G			
84	1	INSIDE BRG COVER		C.I.	C-1108-3	415A			
85	1	INSIDE LABYRINTH SEAL		C.I.	B-1110-6	1110-F			
86	1	BRG-TORR #240SD30K-W33 OR 23048K	B-5						
87	1	LOCK NUT - N048	B-102	STEEL					
88	1	LOCK PLATE - P48	B-112	STEEL					
89	1	GREASE FITTING - 1/4" NPT - ALEMITE #1627B		STEEL					
90	1	PIPE PLUG (GREASE DRAIN) - 1/8" NPT C'SUNK		BRASS OR S/S					
91	1	KEY (HSG FOOT) 1" x 1" x 4 3/4" LG		STEEL	A-3135-3				
92	2	SK HD CP SCREW - (KEY) 1/4"-20NC x 1 1/4" LG		S/S					
93	4	SK SET SCREW (LABY SEAL) - 3/8"-16NC x 1/2" LG		S/S					
94	16	SK HD CP SCREW (BRG COVER) - 1/2"-13NC x 1 1/4" LG		S/S					
95	1	FAST'S #3 COUPLING HALF TYPE FS							
		RIGID HUB FOR SHROUDED BOLTS					X		
		BORE 4.747/4.748 W/ 1 1/4" W x 5/8" DP.					X		
		KEY WAY					X		

REV		INST DWG	BILL OF MATERIAL	SHEET
△		D-4587-41	BM-4589-128	4 OF 16
△		ASSY DWG D-4589-128		

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC#1013-10

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	5 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY: LH Seal Strip - Air Loaded	DATE: 10/22/91 BY: T-KHA	

ITEM	QUAN	SR#302 DESCRIPTION	STK#	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
111	1	Left Channel - Extrusion (Dwg. A-889-1) LG	S-2	Brass	C-960-270				
	1	Plate 1/8" x 1 1/4" x 19/16"		Brass					
	1	Sk. Plate 1/8" x 1 1/4" x 19/16"		Brass					
112	1	Left Side Seal Strip Assembly Consists of:		Poly	B-437-237				
	1	Extrusion - .860 x 1 1/8" x 97 3/8" (Ref A-4634)	S-16	UHMW Poly					
	1	Pipe Plug - 1/4" NPT C'Sunk Type		Brass or S/S					
113	1	Air Load Assembly - Consists of:			B-4253-233				
	1	Hose Adapter	S-81B	Brass	A-4252-5				
	2	Ferrule, Scovill #7331	S-42	Brass					
	1	Air Hose Plug	S-93	Brass	A-4398-1				
	1	Hose x 96 3/8 Lg.	S-41	Neoprene					
115	9	Flat Hd. Mach. Screw 3/8"-16 NC x 1" Lg.		Brass					

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41		
	△	ASSY DWG D-4589-128	BM-4589-128	5 OF 16

PROD.	INV.	PROC.	ACCT.	PU	ENG.	PROD.	REC.	S.O.F.

LC# 1013-12-1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	6 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY: RH Seal Strip - Air Loaded	DATE: 10/22/91 BY: T-KHA	

ITEM	QUAN	SR#302 DESCRIPTION	STK#	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
121	1	Right Channel - Extrusion (Dwg. A-889-1) LG	S-2	Brass	C-960-271				
	1	Plate 1/8" x 1 1/4" x 1 9/16"		Brass					
	1	Sk. Plate 1/8" x 1 1/4" x 1 9/16"		Brass					
122	1	Right Side Seal Strip Assembly Consists of:		Poly	B-437-238				
	1	Extrusion .860 x 1 1/8" x 97 3/8" (Ref A-4634)	S-16	UHMW Poly					
	1	Pipe Plug 1/4" NPT C'Sunk Type		Brass or S/S					
123	1	Air Load Assembly Consists of:			B-4253-233				
	1	Hose Adapter	S-81B	Brass	A-4252-5				
	2	Ferrule, Scovill #7331	S-42	Brass					
	1	Air Hose Plug	S-93	Brass	A-4398-1				
	1	Hose x 96 3/8" Lg.	S-41	Neoprene					
125	9	Flat Hd Mach. Screw - 3/8"-16 NC x 1" Lg.		Brass					

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41		
	△	ASSY DWG D-4589-128	BM-4589-128	6 OF 16

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC-1013-10-

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	7 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY SUCTION BOX ASSY. SHEET 1 OF 2	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR #302 DESCRIPTION	STK #	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR	
171	1	SUCTION BOX-WELDMENT-CONSIST OF:			D-5526-112		X			
	1	13" O.D. x 12" I.D. x 98 5/8"ff LG. TUBING		STL.						
	2	BAR 1 1/8" x 2" x 98 5/8"ff LG.		STL.						
	2	1/2" x 1 1/8" x 97 5/8" LG.		STL.						
	1	1" x 8 1/2" x 97 5/8" LG.		STL.						
	2	3/4" x 3 11/16" x 13 1/2"f LG.		S/S						
	2	SK-PL 7/8" x 3" x 3 15/16" LG.		STL.						
	2	SK-PL 7/8" x 2 1/4" x 3 15/16" LG.		STL.						
	1	7" XXH(.875" WALL) PIPE x 41 5/16"f LG.		STL.						..
	1	12" DIA.$^{+0\ -1/8}$ x 2" THK.		STL.						
	2	12" O.D.$^{+0\ -1/8}$ x 7 5/8" I.D.$^{-0\ +1/8}$ x 1/2" THK.		STL.						
	2	SK-PL 1/2" x 1 1/8" x 6 1/2" LG.		STL.						
	2	SK-PL 1/2" x 11/16" x 3 11/16" LG.		STL.						
	1	1"-3000# FULL COUPLING		S/S						
	4	1/8"-3000# FULL COUPLING	S-193	S/S						
	1	1/2"-3000# HALF COUPLING		S/S						

REV		INST DWG	BILL OF MATERIAL	SHEET
		D-4587-41		
		ASSY DWG D-4589-128	BM-4589-128	7 OF 16

BOXBM

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC#1015-10-1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	8 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY: Suction Box Assembly, Sheet 2 of 2	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR#302 DESCRIPTION	STK#	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
180	6	Cover Plates (Hand Hole) Formed Plate 1/4" x 7 1/2"		HRS	B-9818-20				
		x 13 1/2" LG.							
182	12	1/2"-13NC x 1" Lg. HHCS (Cover Plate)		S/S					
183	4	Slide Block	S-15A	Poly	A-961-124				
184	8	3/8"-16NC x 1" Lg. Socket Head Cap Screw		S/S					
188	1	Balance Point Label, 11 GA (120) x 2" x 3" Lg.	S-61A	S/S	B-10557				
	4	#10-24 Button Head Hex Soc x 1/2" Lg.		S/S					

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41	BM-4589-128	8 OF 16
	△	ASSY DWG D-4589-128		

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC #1013-1 -1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	9 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY Hydraulic Deckle Assembly	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR # 302 DESCRIPTION	STK #	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
208	2	Deckle Head			B-5158-32				
	2	1 1/2" x 2" ff x 6 27/64" ff Lg.		Brass					
221	2	Deckle Packing			B-5168-76				
	4	27/32" x 15/16" ff x 3 5/8" ff LG.		POLY					
	4	PACKING SPRING, LEE LC-038C-13		S/S					
	2	1/8" DIA. x 1 1/2" LG. ROD		POLY					
222	4	PACKING SPRING	S-53	BRONZE	A-434				
245	2	Hydraulic Cylinders, NFPA Style MS-2, 1 1/2" Bore x 12" stroke, 5/8" Dia. Rod, Style 5 Rod End, 7/16"-20NF Thread, Non-cushioned, ports at position #3, air bleeds at position #1, S/S 316 rod chrome plated, epoxy painted exterior, T-J Model LS-1 with metalic rod scraper.	R112						
246	2	Socket Set Screw (Cyl Rod Jam) 7/16-20NF x 1/2" Lg.	S-67	S/S	A-6504				
247	8	SHCS (Cyl Hold Down) 3/8-16NC x 1" Lg.		S/S					

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41	BM-4589-128	9 OF 16
	△	ASSY DWG D-4589-128		

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC # 1013-10-

SHOP ORDER	SHEET	CUSTOMER	JOB	
49943	10 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	LG INDUSTRIES, INC
		PO OR ASSY 1 1/4" SHOWER & SHOWER PIPING	DATE 10/22/91 BY T-KHA	BILL OF MATERIAL

ITEM	QUAN	DESCRIPTION	STK #	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR	
301	1	FRONT SHOWER PIPE ASSEMBLY-CONSISTS OF:			B-2630-102					
	1	PIPE-1" I.P.S.-STD. WEIGHT x 48" LG. (T.B.E.)		S/S						
	1	1" PIPE CAP		S/S						
302	1	REAR SHOWER PIPE ASSEMBLY-CONSISTS OF:			B-2630-102					
	1	PIPE-1" I.P.S.-STD. WEIGHT x 48" LG. (T.B.E.)		S/S						
	1	1" PIPE CAP		S/S						
304	4	SHOWER SUPPORT ASS'Y-CUT STUD TO LENGTH AT ASS'Y.		S/S	B-4323-13					
	4	BAR 1/16" x 3/4" x 5 3/16" LG.		S/S						
	4	BAR 3/8" x 3/4" x 3 1/4" LG.		S/S						
	8	3/8"-16 N.C. x 1/2" LG. H.H.C.S.		S/S						
	4	3/8"-16 N.C. x 3 1/4" LG. STUD		S/S						
305	4	HEX NUT - 3/8" - 16 N.C.		S/S						
306	1	TEE - 1" x 1" x 1" I.P.S.		S/S	A-4322-10					
310	1	1 1/4" SHOWER PIPING ASS'Y. - CONSISTS OF:			B-5890-58					
	1	1 1/4" I.P.S. 90° FEM. ELBOW		S/S						
	1	1 1/4" SCH. 40 PIPE x 77" LG. (T.B.E.)		S/S						
	1	SPECIAL PIPE BUSHING 2" x 1 1/4" STD.		S/S	A-3257-6					
	1	1" SCH. 40 PIPE x 6 3/8" LG. (T.B.E.)		S/S						
	1	BOSTON HOSE ASS'Y W/DIXON								
		FITTING # P980-1 1/4-RST-15-RST-15-24								
	1	1 1/4" I.P.S. UNION		S/S						
	1	1" PIPE NIPLE x 3" LG. (T.B.E.)		S/S						
	1	1 1/4" x 1" N.P.T. REDUCER		S/S						
	1	SEPCIAL PIPE BUSHING 1 1/4" x 1" STD.		S/S	A-3257-17					
	1	1" I.P.S. 90° FEM. ELBOW		S/S						

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41		
	△	ASSY DWG D-4589-128	BM-4589-128	10 OF 16

PROD.	INV.	PROC.	ACCT.	PUR	ENG.	PROD.	REC.	S.O.F.

LC # 1013-1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	11 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY: Internal Bearing Grease Feed (THRU SIDE OF BOX)	DATE: 10/22/91 BY: T-KHA	

ITEM	QUAN	SR # 302 DESCRIPTION	STK#	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
340	1	Internal Bearing Piping Assy - Consists of:			B-5888-10				
	1	1/4" I.P.S. 90° Elbow	S-192	S/S					
	1	1/4" N.P.T. Grease Fitting							
	1	1/4" IPS x 6" Lg. Pipe Nipple							
	2	Special Pipe Bushing	S-100	Brass	A-3257				
	1	1/4" F.P.T. to 3/8" O.D. Tube - Female Connector	S-116	S/S					
		Tube Fitting							
	1	1/4" Pipe Nipple 4" Lg.		S/S					
	3	1/4" F.P.T. to 3/8" O.D. Tube 90° Elbow Tube							
		Fitting							
	A/R	Tube Clip - 3/8" Size		S/S					
	A/R	Drive Screw - #10 x 1/2" Lg.		S/S					
	1	1/4" Pipe Nipple x 4 1/4" LG.		S/S					
	A/R	Tube 3/8" O.D. x .035 Wall	S-148A	S/S					

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41	BM-4589-128	11 OF 16
	△	ASSY DWG D-4589-128		

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC #1013-D-1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	12 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY SEAL WATER PIPING - (2 STRIPS)	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR # 302 DESCRIPTION (NYLON)	STK #	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
410	1	Seal Water Piping Assembly - Consists Of:			B-5887-15				
	2	1/4" I.P.S. Street Elbow	S-174	Brass					
	2	1/4" I.P.S. x 6" Lg. Pipe Nipple		316 S/S					
	2	Special Pipe Bushing	S-100	Brass	A-3257				
	2	1/4" F.P.T. to 1/4" O.D. Tube - Female Connector,							
		Parker #4-4GUBSS		316 S/S					
	4	1/8" M.P.T. to 1/4" O.D. Tube - 90° Male Elbow,							
		Parker #4CBUSS		316 S/S					
	A/R	Tubing - 1/4" O.D. x .035" Wall		Nylon					
	2	1/4" Hose Assembly, 24" OAL - 1/4" M.P.T. Brass	S-143						
		Hose Fitting with Flexible Hose, 350 PSI Max. W.P.							
	2	Socket to 1/4" F.P.T. - One Way Shut Off Quick	S-145	Brass					
		Connective Coupling							
	2	Plug to 1/4" F.P.T. - One Way Shut Off Quick							
		Connective Coupling, Hansen #11B, 1/4" F.P.T.		Brass					
	2	Needle Valve 1/4" F.P.T.	S-56	Brass					
	1	Micro Klean Filter - 3/4" F.P.T. - Cuno #1B1	S-57						
	12	Cartridges - Cuno #G78-C1	S-58						
	A/R	Moody Price 1/4" Tube Clip #40125-W-SS		316 S/S					
	A/R	1/4"-20 NC x 1/2" Lg. Rd. Hd. Mach. Scr.		S/S					
		[illegible]							
	2	1/4" M.P.T. to 1/4" O.D. Tube 90° Male Elbow		316 S/S					
		Parker #4-4CUBSS							

REV		INST DWG D-4587-41	BILL OF MATERIAL	SHEET
	△			
	△	ASSY DWG D-4589-128	BM-4589-128	12 OF 16

PROD.	INV.	PROC.	ACCT.	PI[illegible]H.	ENG.	PROD.	REC.	S.O.F.

LC#1013-.[illegible]-1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	13 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY: PIPING SCHEMATIC - AIR LOAD	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR#302 DESCRIPTION	STK#	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
420	2	Air Load Piping Assembly - Consists of:			B-5889-24				
	2	1/4" I.P.S. 90° Fem. Elbow		316 S/S					
	2	1/4" I.P.S. x 6" Lg. Pipe Nipple		316 S/S					
	2	Special Pipe Bushing	S-100	Brass	A-3257				
	2	1/4" F.P.T. to 1/4" O.D. Tube Connector							
		Parker #4-4GBUSS		316 S/S			X		
	A/R	Tubing - 1/4" O.D. x .035" Wall		316 S/S					
	2	1/4" Hose Assembly 24" OAL - 1/4" M.P.T. Brass	S-143						
		Hose Fittings with Flexible Hose, 350 PSI Max W.P.					X		
	2	Plug to 1/4" M.P.T. - One Way Shut Off Quick	S-144	Brass					
		Connective Coupling					X		
	2	Socket to 1/4" F.P.T. One Way Shut Off Quick	S-145	Brass					
		Connective Coupling					X		
	2	3 Way Air Valve 1/4" F.P.T.	S-151						
	2	Air Regulator with Gauge, 1/4" Pipe Size	S-151A						
		Low Press. 1 to 60 PSI Secondary Range					X		
	4	1/8" M.P.T. to 1/4" OD Tube - 90° Male Elbow							
		Parker #4CBUSS		316 S/S			X		
	A/R	Tube Clip - 1/4" Size, Moody Price #40125W-SS		316 S/S					
	A/R	Rd. Hd. Mach. Scr. - 1/4"-20NC x 1/2" Lg.		S/S					
	2	1/8" I.P.S. x 1 1/2" Pipe Nipple		316 S/S					
	2	1/8" F.P.T. to 1/4" O.D. Tube 90° Female Elbow							
		Parker #4DBUSS		316 S/S			X		

REV		INST DWG	BILL OF MATERIAL	SHEET
△		D-4589-41	BM-4589-128	13 OF 16
△		ASSY DWG D-4589-128		

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC # 1013-1-1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	14 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY: Grease Deckle Piping 1 1/2 Cyl.	DATE: 10/22/91 BY: T-KHA	

ITEM	QUAN	SR # 302 DESCRIPTION (For 2 Cyls) (S/S)	STK#	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
430	1	Grease Deckle Piping - Consists of:			B-5893-15				
	4	Socket to 1/8" F.P.T. - Two Way Shut-Off Quick							
		Conn. Coupling Hanson #B1-H11		Brass					
	4	Special Pipe Bushing	S-101	Brass	B-3257-1				
	4	1/8" Pipe Nipple x 6" Lg.		S/S					
	4	1/4" F.P.T. to 3/8" OD Tube Fitting Female							
		Connector		S/S					
	4	3/8" Pipe Nipple x 3" Lg.		S/S					
	4	3/8" F.P.T. to 3/8" O.D. Tube 90° Elbow		S/S					
	A/R	Tubing - 3/8" O.D. x .035" Wall		S/S					
	A/R	Tube Clip - 3/8" Moody-Price #6012SW-SS		S/S					
	A/R	Drive Screw #10 x 1/2" Lg.		S/S					
	2	Plug to 1/8" F.P.T. Two Way Shut-Off Quick							
		Conn. Coupling Hanson #B1-K11		Brass					
	4	Metal Plug and Chain, Hanson #SCD-1-HK							
	2	Metal Cap and Chain, Hanson #PDC-1-HK							
	1	1/8" Tee F.P.T.		Brass					
	1	Hand Grease Gun, Alemite #500							
	2	Alemite #317850-1, 1/8" MPT x 12" Lg. Hose							
	1	Alemite #305100 Relief Fitting 700-1000 PSI							
	1	1/8" Close Pipe Nipple		Brass					
	4	1/4" x 1/8" Hex Bushing		S/S					

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41	BM-4589-128	14 OF 16
	△	ASSY DWG D-4589-126		

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC# 1013-1(illegible)

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	15 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY Internal Bearing Grease Relief (S/S)	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR# 302 DESCRIPTION	STK#	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR
440	1	Internal Bearing Grease Relief Assy, Consists of:			B-6767-11				
	1	1/2" I.P.S. 90° Elbow		S/S					
	1	1/2" Pipe Nipple 6" Lg.		S/S					
	2	Special Pipe Bushing	S-101A	Brass	A-3257-2				
	1	1/2" F.P.T. to 3/4" O.D. Tube Fitting		S/S					
	1	1/2" Pipe Plug Sq. Head		S/S					
	A/R	Tubing - 3/4" O.D. x .049" Wall		S/S					
	A/R	Tube Clip 3/4" Pipe		S/S					
	A/R	Drive Screw #10 x 1/2" Lg.		S/S					
	1	1/2" M.P.T. to 3/4" O.D. Tube Fitting		S/S					

REV		INST DWG	BILL OF MATERIAL	SHEET
	△	D-4587-41	BM-4589-12B	15 OF 16
	△	ASSY DWG D-4589-12B		

PROD.	INV.	PROC.	ACCT.	PURCH.	ENG.	PROD.	REC.	S.O.F.

LC-1013-10-1

SHOP ORDER	SHEET	CUSTOMER	JOB	LG INDUSTRIES, INC
49943	16 OF 16	CRANE & COMPANY	SUCTION COUCH ROLL	BILL OF MATERIAL
		PO OR ASSY 217K INTERNAL BEARING ASSY. (TAPER)	DATE 10/22/91 BY T-KHA	

ITEM	QUAN	SR #302 DESCRIPTION	STK #	MATERIAL	DRAWING	PATTERN	S	PO #	VENDOR	
500	1	217K INTERNAL BEARING ASSEMBLY			C-10392-7		X			
501	1	BEARING - SKF #22217K								
502	2	OUTSIDE SEAL RING 5 15/16"f O.D. x		BRASS	B-1228-16					
		4 31/32"f I.D. x 1/2"ff THK.					X			
503	1	SEAL RING RETAINER 5 25/32"f O.D. x		STL.	C-10496					
		4 1/4"f I.D. x 7/8"f THK.					X			
504	1	BEARING CAP 5 25/32"f DIA. x 1/2" THK.		STL.	B-10467					
505	4	HHCS 3/8 -16 NC x 2" LG. (BRG. CAP)		STL.	DRILL HEAD FOR WIRE					
506	1	WIRE (FOR 505 & 514)		SOFT IRON						
507	1	JOURNAL 5 25/32"f DIA. x 6 1/4"ff LG.		1045 STL.	C-10508-1					
508	6	SHCS 1/2"-13NC x 3" LG. (JOURNAL)		GRADE #8 OR "UNBRAKO"						
509	1	SEAL RING SPACER 5 25/32"f O.D. x		STL.	C-10509					
..		4 1/4"f I.D. x 3/4"ff THK.					X			
510	2	SHSS 1/4"-20NC x 1/4" LG.		STL.						
511	1	217K INTERNAL BRG. LABYRINTH FLINGER		C.I.	C-6639-9	6639				
512	6	SHCS 3/8"-16NC x 1 1/4" LG.		S/S						
513	1	BEARING HOUSING FOR 217K BRG.		C.I.	C-6640-4	6640-A				
514	6	HHCS 1/2"-13NC x 2 1/4" LG.		STL.	DRILL HEAD FOR WIRE					
515	1	1/4" SQ. KEY x 1 1/2" LG. R.B.E.		STL.						
516	4	SHSS HALF-DOG PT. 3/8"-16NC x 5/8" LG.		STL.						

REV		INST DWG	BILL OF MATERIAL	SHEET
		D-4587-41	BM-4589-128	16 OF 16
		ASSY DWG D-4589-128		

217KBM7