Parts Catalog

MAINTENANCE TIPS

Just as the operator acquires a "feel" for the machine, the entire crew should try to sense failure before it strikes. Take that extra step to examine anything that appears out of place. How about a bubble or discolored crack in the paint? It is an early warning for metal stress or breakage. Could that slight hiss indicate a growing air leak? After all, it is easier to tighten a packing nut than shut down for packing repairs. An alert crew will:

Check operating air pressure.

Wipe away excess lube around bearings and gears.

Maintain correct supply lubricants.

Lube regularly.

Never lubricate parts in motion, gears, shafts, clutches, etc.

Look for and secure any loose bolts or locking devices.

Check all wire ropes for early signs of wear or failure.

Promptly replace all guards, inspection plates, access covers or other safety devices after inspection/repair.

USE EXTREME CAUTION around ANY electrical lines and equipment. This pertains to low as well as high voltage.

Never attempt electrical repairs, unless qualified.

Assure power source is properly grounded.

Check limit switches for proper operation.

Check overloads and thermal breakers.

14. No. 1 M-G Set "On" Light – Indicates that the M-G set starting vacuum breaker has closed, connecting the synchronous motor to the power line.

15. No. 1 M-G Set "Start" Pushbutton.

16. No. 1 M-G Set "Start" Light – Indicates when DC power has been applied for "soft starting".

17. No. 1 Field "On" Light – Indicates that voltage is applied to No. 1 synchronous motor field.

18. No. 1 M-G Set "Stop" Pushbutton.

19. No. 2 M-G Set "Ready" Light – Indicates that the "soft start" circuitry is energized and No. 2 M-G set may be started.

20. No. 2 M-G Set "On" Light – Indicates that the M-G set starting vacuum circuit breaker has closed, connecting the synchronous motor to the power line.

21. No. 2 M-G Set "Start" Pushbutton.

22. No. 2 M-G Set "Start" Light – Indicates when DC power has been applied for "soft starting".

23. No. 2 Field "On" Light – Indicates that voltage is applied to No. 2 synchronous motor field.

24. No. 2 M-G Set "Stop" Pushbutton.

25. Watthour Meter – Records total power used.

26. Overtemperature Indicator Light – When lit, indicates operation of the overtemperature relay in the auxiliary transformer.

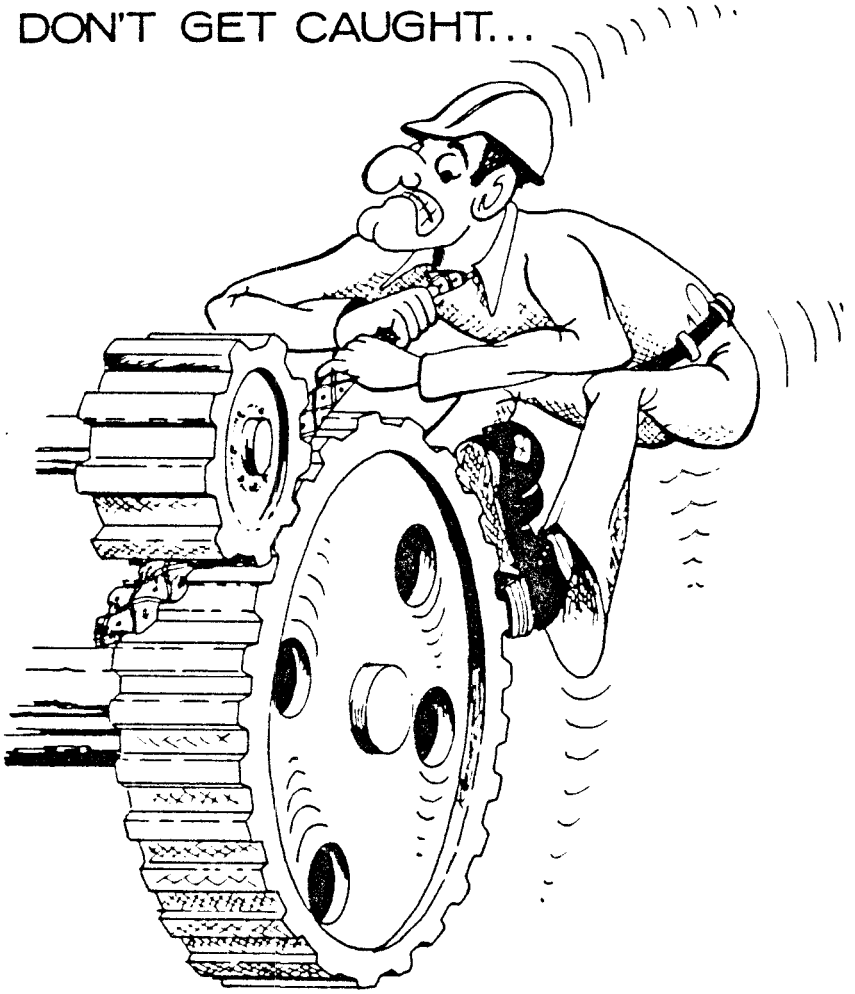
VISUAL INSPECTION of the machine should be performed, by operator and oiler, at the beginning of each shift. A potential problem may be prevented if discovered early. The following check list helps with the inspection.

GENERAL CHECK LIST for all areas of the machine.

Is power source properly grounded?

Fully depress and release the M.G. stop push button. Depress the blowers, filter fan and exciter set stop push button. Turn air compressor switch to off.

The machine is now shutdown to a point where inspection, maintenance, etc. can be performed on rotating machinery. Keep in mind, incoming electrical power is on to transformers, cabinets, collectors rings, etc.



CODE	NAME	DESCRIPTION
GL	Enclosed Gear Case	3. Inside machinery house, where oil is not pumped, use GL-200 except where freezing temperatures rarely or never occur, use GL-250. For large shovels and walking draglines: 1. For crawlers, use GL-140. 2. For gear cases inside machinery house: a. Use GL-200 where there are no pumps or where V-belt drive pumps are used. b. Use GL-250 instead of GL-200 where temperatures rarely go below freezing. c. Use GL-140 with older type pumps. On new machines, oil should be drained after first 60 days of operation and replaced with new oil. Thereafter, change oil once a year, or when determined necessary by oil supplier. Oil should be checked for contamination every 30 days.
PO	Pneumatic Oil	Petroleum oil especially compounded for use in air line oilers or built in lubricators having the correct viscosity, low pour point, emulsifying ability, film strength and free of deposit forming tendencies. It should not cause swelling or deterioration of rubber or leather seals and gaskets.
EMG	Electric Motor Grease	Electric motor bearing grease meeting the requirements of G.E. Specification D6A2C5 or Westinghouse equivalent.

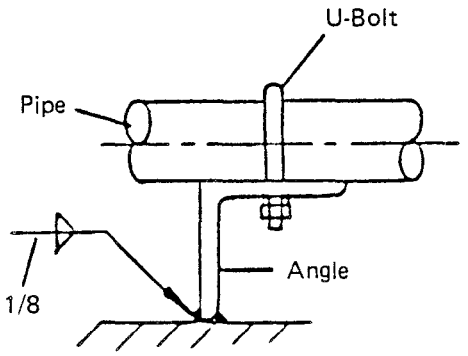
In addition to the aforementioned products the following lubricants may also be required. No specification or standard for these products have as yet been prepared.

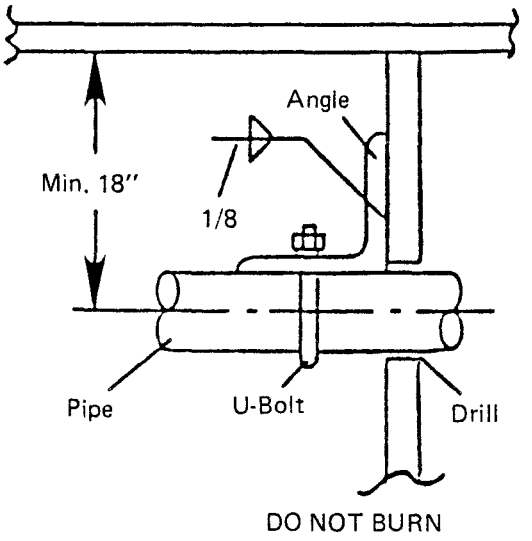
NAME OF PART	TYPE	NO. OF POINTS	LOCATION	LUB. SYM.	METHOD & FREQUENCY
Boom Foot Pins	Plain	2	End of Pin	MPG	Hand, 6 Mo. & Before Use
Mast Foot Pins	Plain	2	End of Pin	MPG	Hand, 12 Mo. & Before Use
Gantry Foot Pins	Plain	2	End of Pin	MPG	Hand, 12 Mo.
Operator's Seat	Jack Screw Shaft	1	Under Seat	Light Oil	Hand, As Required
Operator's Seat	Swivel Joint	1	Base	Light Oil	Hand, As Required
Swing Pedals	Needle Bearings	2	Under Floor	MPG	Hand, 500 Hrs.
Front Window Opening Mechanism	Pins	12	Hinge Points	General Purpose Oil	Hand, 500 Hrs.
Main Traveling Crane	Anti-Friction	8	End of Axle Pins	MPG	Hand, As Required
Jib Crane	Bushing	4	End of Shaft	MPG	Before Use

NOTES:

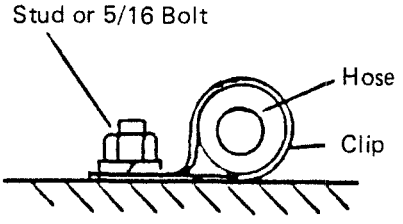
STANDARD LUBRICATION INSTALLATION

TYPICAL PIPE MOUNTING

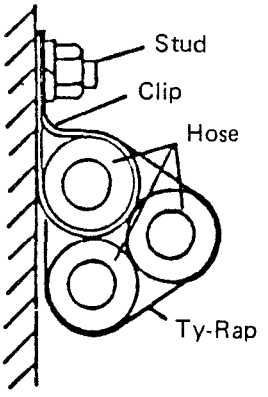




TYPICAL HOSE MOUNTING

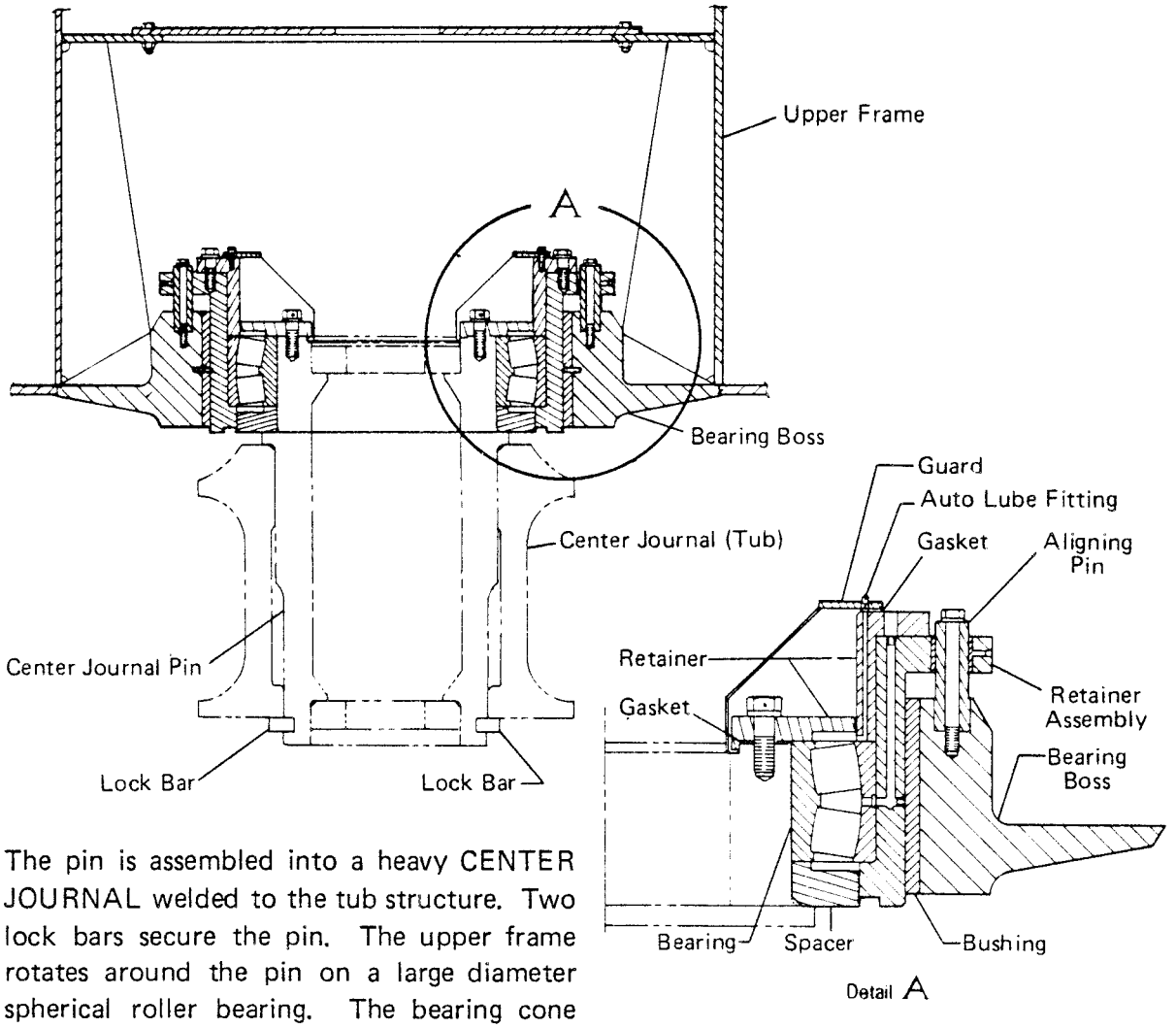


Every 3 Feet or as Required



For more than one Hose, clip one, secure others to it with Ty-Rap.

CENTER JOURNAL pin holds the rotating frame and the tub in concentric alignment at the center of rotation.

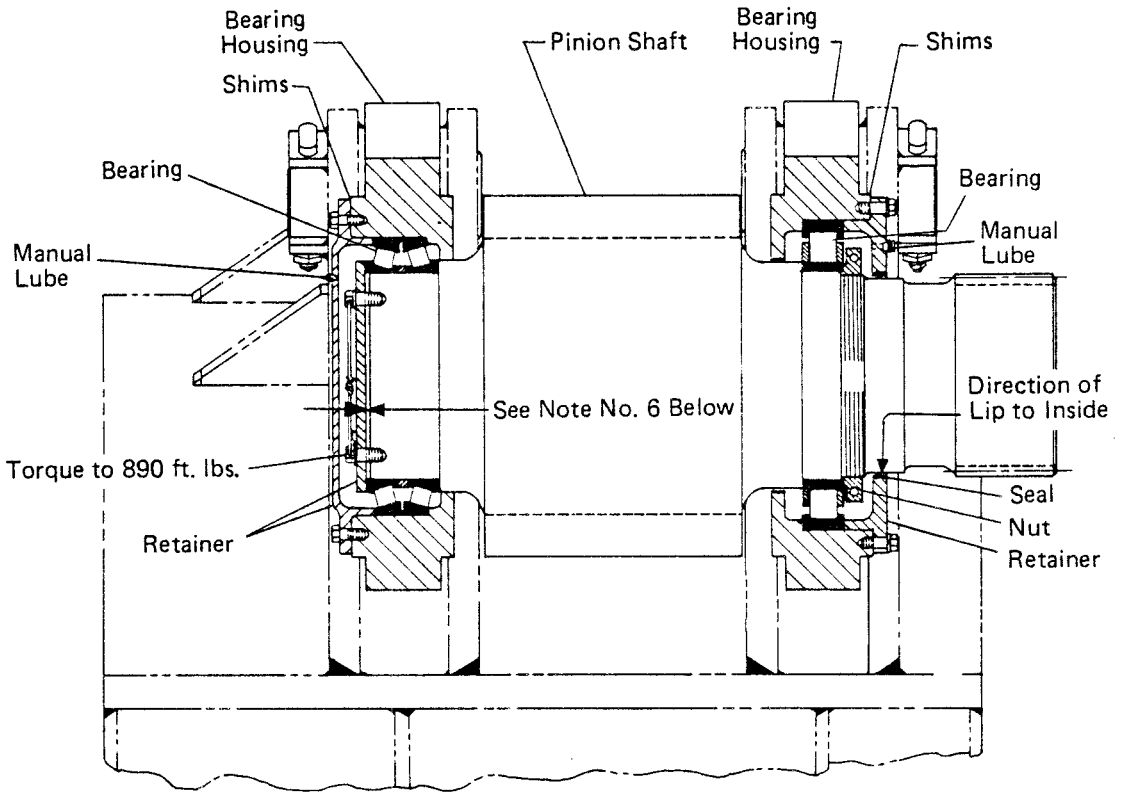


The pin is assembled into a heavy CENTER JOURNAL welded to the tub structure. Two lock bars secure the pin. The upper frame rotates around the pin on a large diameter spherical roller bearing. The bearing cone (inner race) is clamped between a spacer and a bearing retainer which is bolted to the top of the center journal pin. The bearing cup (outer race) is mounted in a retainer assembly which moves vertically on four aligning pins. These pins also prevent rotation of the retainer assembly.

When machine weight is resting evenly on all rollers, maintain a clearance between the bearing boss and the retainer assembly. This clearance should allow a complete revolution of the rotating frame without binding, and also allow vertical movement of the rotating frame during the walking cycle. Inspect each periodic maintenance day.

It is not necessary to disconnect incoming electrical power to service or inspect the center journal bearing because the collector rings are isolated. It will be necessary to disconnect and remove the collector rings if bearing replacement is required.

MAIN PROPEL DRIVE PINION SHAFT is coupled to second intermediate propel shaft and drives main propel shaft.



Assembly notes:

1. Coat coupling splines with type "B" OGL at assembly.

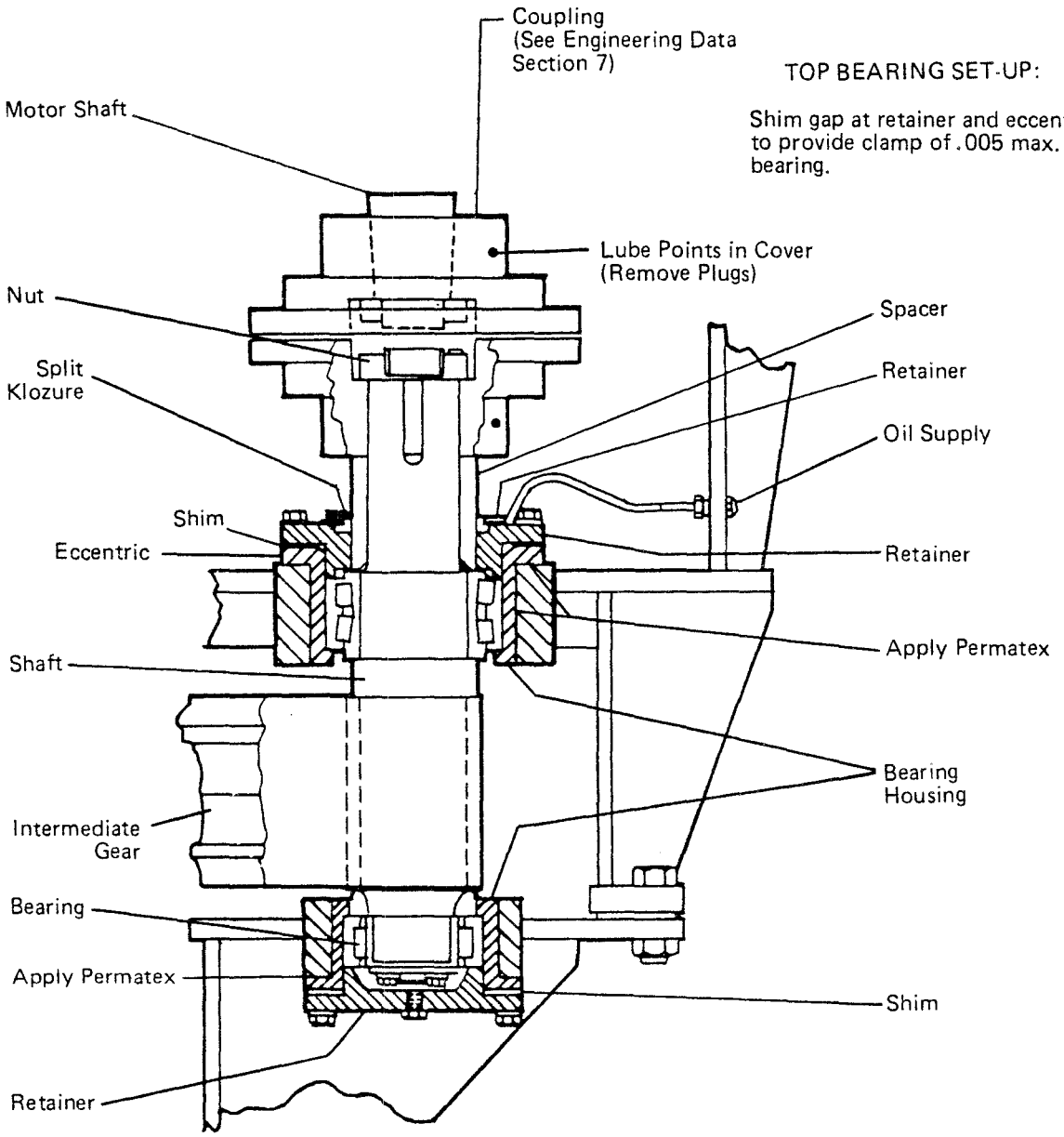
2. Bearing adjustment – tighten caps (retainers) and measure gap between cap and housing. Shim caps to this measurement. Rotate bearing while clamping up tightly thru cones to assure proper seating of rollers.

3. Grease bearings with multi-purpose grease at assembly.

4. Single-row bearing must be assembled on shaft with bearing housing in place at coupling end of shaft.

5. Spray coat shaft in lip seal area with Molycote M-3402 (MPSD No. 170025-1).

6. After assembling bearings, measure gap under retainer and add shims, leaving .010 for clamping.



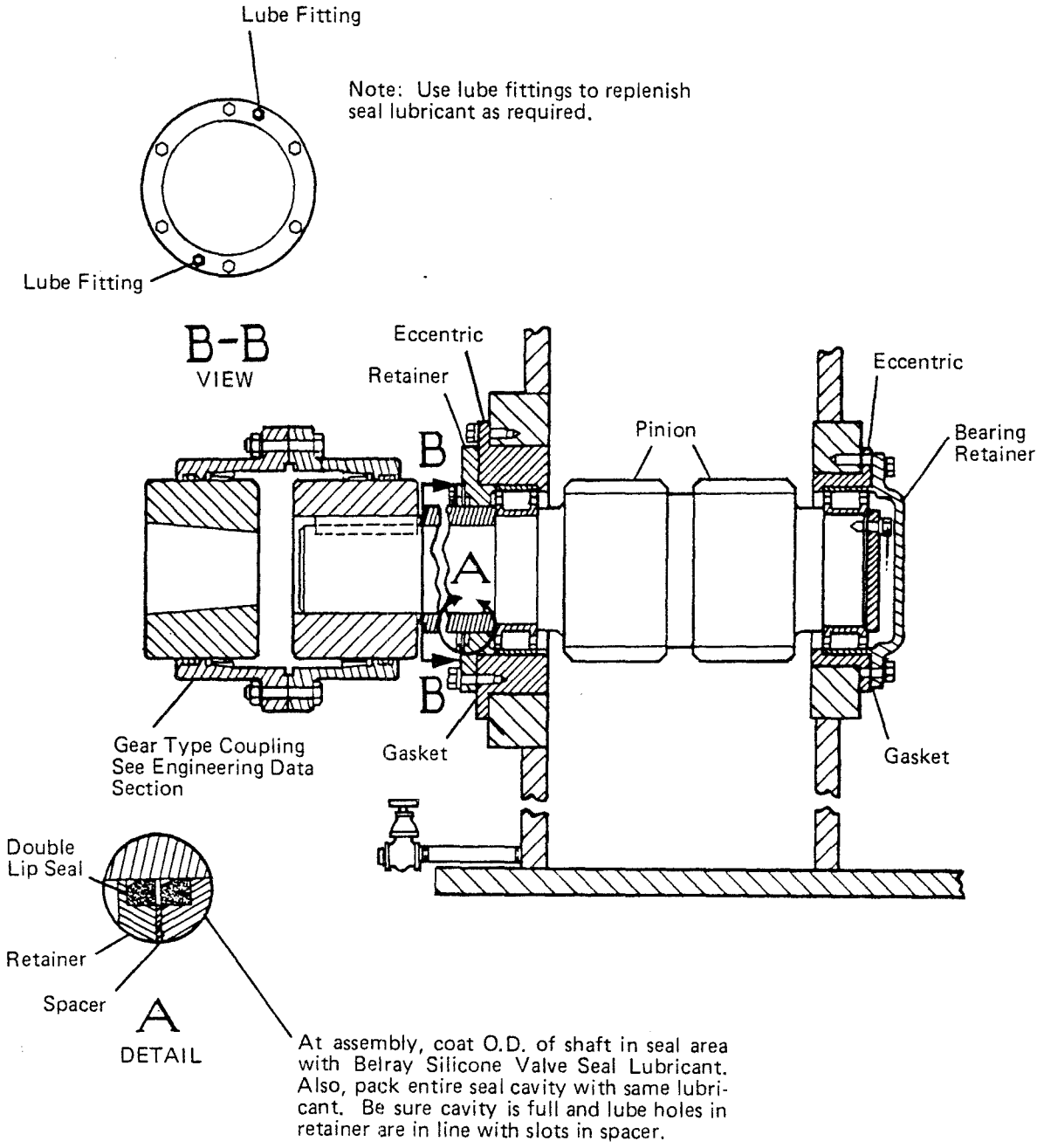
TOP BEARING SET-UP:

Shim gap at retainer and eccentric to provide clamp of .005 max. on bearing.

BOTTOM BEARING SET-UP:

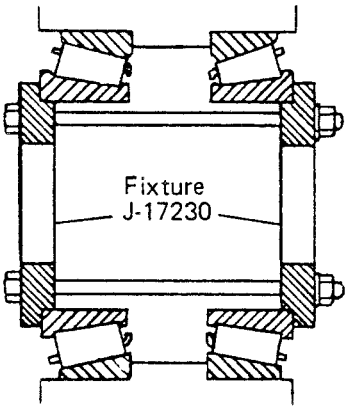
Draw up retainer. Measure gap at eccentric, then add shims to give .002 to .004 clearance between retainer and bearing.

MOTOR EXTENSION SHAFT ASSEMBLY



HOIST/DRAG MOTOR EXTENSION SHAFT

INSTALL ANTI-FRICTION BEARING cups first. The cups should be well sealed against inside flange of sheave bore. Assemble roller and bearing cone, without spacer, using fixture as shown in sketch. Draw bearing cones together until bearing binds slightly when turned by hand. Measure space between bearing cones at three places, 120 degrees apart, with an inside micrometer. Average the three measurements and grind new spacer to this dimension minus 0.004 to 0.007.



To REASSEMBLE BOOM POINT SHEAVE make sure ball joint surface is clean, smooth and free of burrs. Fit spherical bushing to ball using band jig to hold it to shaft. Make sure mating parts align with at least 70% surface contact with ball. Before spherical bushing is assembled on ball, the inside bearing retainer must be placed at center of shaft. Assemble spherical bushing (pre-lube) and install aligning pin.

Slide bearing carrier over spherical bushing, removing band jig in the process, and attach inside bearing retainer ring. Align witness holes in bearing carrier and retainer ring with split on boom foot side of spherical bushing. Measure gap between ring and carrier. Install shims to gap measurement minus 0.010 inch. Install sheave with bearings and bearing spacer. At this time, hand pack bearings with MPG.

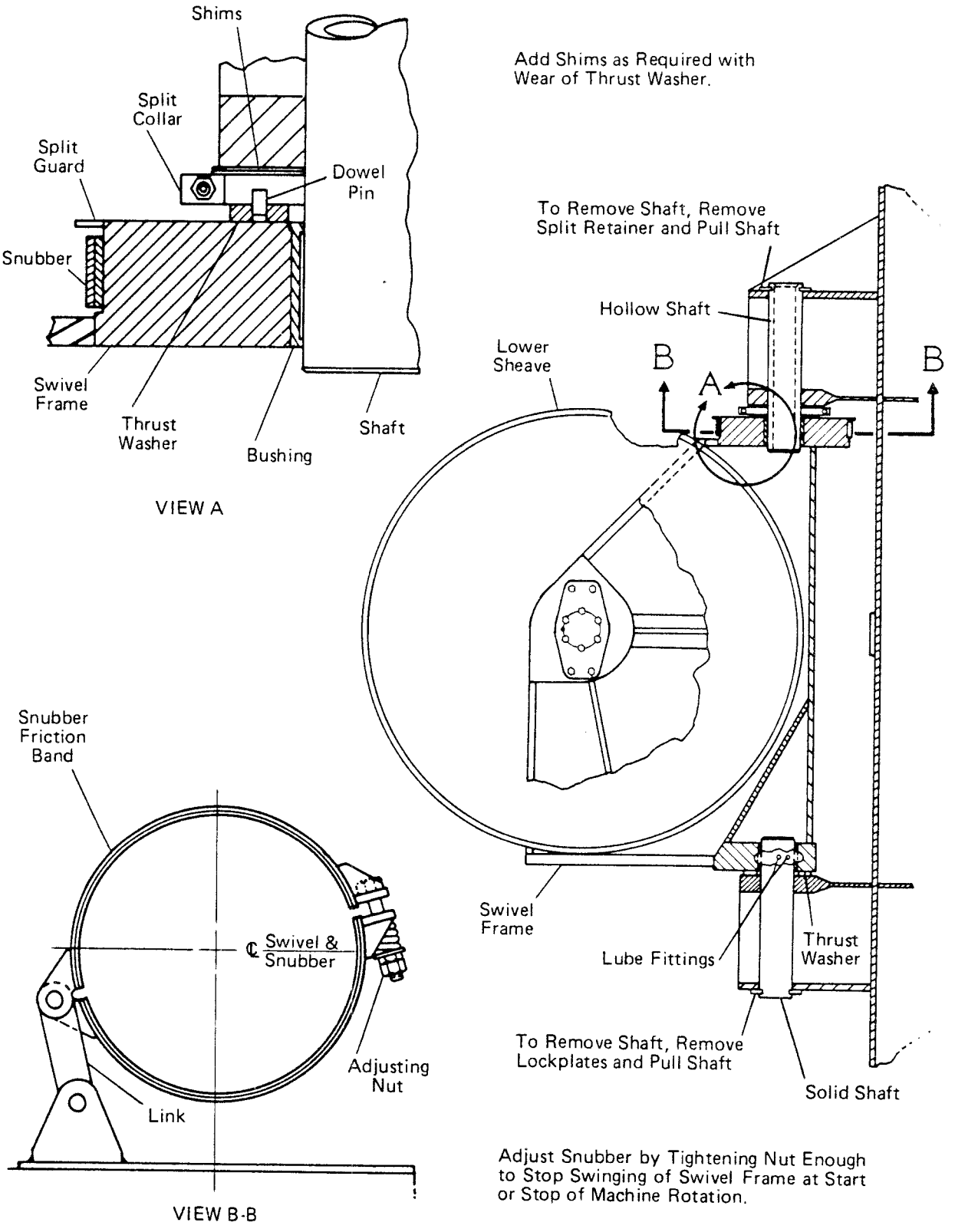
Assemble outside bearing retainer ring, aligning its' witness hole with split on boom foot side of spherical bushing. Measure gap between ring and carrier. Install shims to gap measurement minus 0.010 inch. Make sure that lube access to bearings and bushing is open-purge with MPG.

Complete assembly with inside split retainer ring and dust boots. Reinstall point sheave assembly in point structure.

Before torsion bar is attached, loosen or remove all bolts in anchor plate and center bearing flange plate.

Block or secure point sheaves. The sheaves MUST BE PERPENDICULAR to center line of shaft when torsion bar is installed. Attach top of torsion bar to retainer rings.

Measure space between bottom flange of torsion bar and bulkhead anchor plate. This space must be completely filled with shims. One of the three shims provided is laminated, peel laminations with sharp knife to obtain proper thickness. Attach flange to bulkhead anchor plate. If holes in the bar flange and holes in bulkhead anchor plate do not align radially, the holes in the anchor plate should be filled with weld and ground smooth, then lay out and redrill new holes.



FAIRLEAD ASSEMBLY

full spring pressure on brush. Hold sandpaper close to commutator and draw it in direction of rotation. Then lift brush, push sandpaper back and repeat. Continue this operation until brush shapes to an even contact with commutator. Be sure to raise the brush before moving sandpaper back for the next stroke. DO NOT raise sandpaper when removing from commutator. This act generally ruins the fit on the brush. DO NOT install brushes and allow to fit by wear. This method usually causes arcing and scoring before brush wears in. After sanding brushes in, thoroughly clean aramture, commutator, risers and brush assembly with dry compressed air. Remove ALL carbon and copper cuttings. This prevents possible grounding or short circuiting. Failure to follow this proper cleaning procedure has resulted in costly shutdowns due to damaged armatures. After grinding brush, run in under light loads for a short period. This allows the surface to set or wear in before applying heavier loads. Install a complete set of brushes rather than replacing them one by one.

COMMUTATORS frequently inspected by an electrician assures detection of surface faults in the early stages. This is important. Faults corrected early cost little in time loss or expense. Bar burning, high and low bars, high mica or flat spots become serious at an accelerating rate over time. When not seen and corrected early they often require a long shutdown. A good commutator surface is highly polished. It shows a chocolate brown color. If the commutator is only slightly blackened due to arcing, the best cleaning procedure is the use of a piece of canvas wrapped around a wooden block. The canvas cleans the surface and does not scratch the copper. When excessive arcing takes place over a long time, a burned and blackened commutator results. In these severe cases, use a very fine sandpaper (2/0 or 3/0).

NEVER USE EMERY CLOTH OR EMERY PAPER. Emery conducts electricity. Serious injury to personnel and equipment results.

Shape a wooden block to commutator contour. Fold sandpaper around block and hold against commutator while motor or generator runs at no-load. Use a slow lateral movement of the block to avoid diagonal scratches. Undue amounts of sandpapering destroys the needed polished surface and results in increased brush wear. Use sandpaper as little as possible. In most cases, polishing with canvas (see above) removes the blackening. One main objection to using sandpaper is that it rarely leaves bars properly grounded. On an unslotted commutator particularly with high mica, sandpaper tends to flatten the center of the bars.

Should the commutator become rough or pitted to a point where canvas and sandpaper cleaning does not remove bad spots, use a hand stone as needed. Sandpapering removes some slight spots, but not large flat ones. The effect merely broadens out the spots so they no longer show due to the flexibility of sandpaper. The stone smooths much better here. The stone presents a rigid contact surface and may be held firmly in place while grinding. Sanding or stoning destroys perfect brush contact. After polishing using either method, bring the unit to rest and remove carbon and copper dust with dry compressed air.

reducing stall current reduces motor torque so an equally heavy load cannot be lifted as before. A reduction in no-load voltage causes decreased speeds.

A change in motor field strength offers various effects. A lower field voltage provides higher speed for light loads, but lower speed for heavy loads. Complete field loss gives very high speeds for light loads. Although this is uncommon, too strong a field creates low speed with light loads and probably high speed with heavy loads.

Many failures effect BOTH stall current and no-load voltage. A master switch failure generally effects BOTH.

Fortunate and rare is the case of an intermittent problem occurring with the electrician aboard, so finding these requires a combination of skill and luck.

The starting procedure is the same. Gather needed info regarding effect on speeds and pulls. Determine what the operator did just before the failure. Ask yourself, if any special weather or temperature conditions existed; how long did failure last in time and what was done to restart, etc. Study the system with this info and estimate the circuit(s) at fault. Look for the obvious first. Loose connections are commonplace.

As a last resort; simulate the fault. In other words, open the circuit felt to cause the trouble and see if it occurs again. CAUTION is the byword here since opening the wrong circuit could cause more damage than the failure. NEVER OPEN a critical circuit such as; current-limit or voltage feedback unless it is positive the results will not prove damaging. Again, know your system.

As an example of simulated troubleshooting.

The complaint is of a sluggish swing motor. Although the troubleshooter rode the machine for several days, the trouble never re-occured. The operator remembered that the trouble occured only on hot days and he felt he'd know it if duplicated. The machine used three-field control. A weak motor field or weak generator field could cause sluggishness.

Simulating the trouble required first opening the motor field contactor, but to no avail. Next, the self field contactor was opened and produced the same intermittent result. Investigation proved the contactor did not close in hot weather since coil resistance increased not allowing sufficient coil current to flow. Weakening spring tension solved the problem.

Unfortunately, some circuits do not check with the common instruments. These include anti-hunting or stabilizing circuits, plugging control circuits, rate circuits, etc. The use of these circuits is minimized, but often unavoidable on newer, sophisticated, fast response control systems. Failure of a plugging control circuit causes higher plugging currents and possibly bad commutation; but the operator generally notices a harder plug. Failure of sta-

Section 7 — Engineering Data (cont.) Page

5. Place seal on the shaft with lip turned toward the pressure and install garter spring in the slot with the hook and eye, 90 degrees from split. Butt seal ends together. If desired, apply to the split a small amount of Loctite #404 or Eastman #910 adhesive; but be very careful to keep adhesive AWAY from shaft, bore and seal edge. START seal into bore with the split at top of shaft. Tap seal into bore with hammer and wood block. Alternate from side to side until seal firmly seats in the bore. (Might be an idea to read the solid seal installation).

INSTALL OIL AND GREASE SEALS with the following procedure:

1. Carefully inspect seal for cuts, nicks or breaks. Rub a finger over lip and edges to feel roughness or pits that might cause a leak. A damaged seal is not worth installing. A properly sized seal is.

2. Check shaft for scratches, burrs or roughness that may cut or score the lip of seal. Look closely at area over which seal installs. Keyway and splines need a thimble or protective tape to safeguard seal.

3. Inspect bore for roughness or burrs that might cut or scrape seal when pressed into place. The bore and shaft need 1/16" chamfer. If not, carefully break the corner of seal.

4. Determine proper position of lip. (Ask the question: Is seal used to retain fluid or grease IN or rather to keep other material OUT). Position seal with lip turned to INSIDE when retaining oil or grease. Place seal with lip to OUTSIDE when other material OUT of bearing or case.

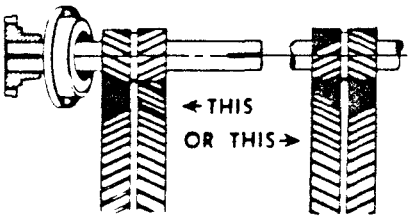
5. Lube the seal with light coat of oil or grease on ALL surfaces, particularly the lip and O.D. Lube shaft and bore also.

6. CAUTIOUSLY install seal on shaft. Be sure garter spring is IN SLOT and lip is TURNED correctly. Move seal from the shaft end to bore with a spiral motion.

7. Align seal in bore and tap LIGHTLY with hammer on wood block. Change from side to side around the seal until firmly seated in bore. No retainer plate is needed.

TWO SEALS INSTALLED back to back retain grease or oil and keep out other material at the same time. Where this practice exists, fill the space between the two with MPG.

GEAR CASE SEAL used for ALL oil tight gear cases requires a coat on one surface of the gear case cover with aviation Form-a-Gasket #3 (Permatex Co.). Apply 1/64" thick. If using a paper gasket at cover, ALWAYS replace with a NEW manila paper gasket .010" thick. Apply aviation Form-a-Gasket #3 to BOTH sides of the gasket. Tighten the gear case cover bolts until the seal material extrudes from the joint.



Herringbone Gears

on the correct extension with relation to hand helix. See sketch.

The **MOUNTING SURFACE** on which gear halves install MUST BE inspected for face runout. This surface MUST BE in a plane perpendicular to the axis of rotation. Mounting a gear to a surface that is NOT prevents satisfactory tooth contact between gear and pinion.

SPLIT RING GEAR INSTALLATION INSTRUCTIONS

MOUNT ONE GEAR HALF, but first recheck mounting flanges. Remove any burrs incurred in handling. Secure gear half to mounting flange with every fourth bolt. Rotate equipment so this gear half is positioned on bottom with the splits in a horizontal position.

BOLT ASSEMBLY CLEARANCE CHECK: Insert a clearance bolt from top of split into one of the clearance holes. These are located nearest the outside diameter of the gear half. If the bolt passes completely thru hole, proceed with mounting the other gear half. If bolt DOES NOT pass completely thru hole, due to interference at the inside rim diameter of gear, insert ALL clearance bolts into this half (as far as they will go) BEFORE assembling the other gear half.

CAUTION: DO NOT DAMAGE THREADS DURING ASSEMBLY.

MOUNTING SECOND GEAR HALF requires making a final check for burrs and bumps on mounting flanges and mating surfaces of BOTH gear halves. Bring the second gear half into position. Assemble with stamped match marks ALL appearing at the SAME split. Secure gear half against the mounting flange with three bolts, (one near each split and one 90 degrees from split). Snug these bolts enough to insure metal-to-metal contact, but not tight enough that this gear half cannot be shifted slightly. Align reamed alignment holes in the splits accurately as possible by shifting top half of the gear. Use jackscrews or hydraulic jacks.

ALIGNMENT BOLT INSTALLATION

AN ALIGNMENT BOLT ASSEMBLY consists of: Tapered alignment bolt, split sleeve, two washers, two standard nuts, two lock nuts.

Four of these assemblies are furnished with EACH gear.

COAT the split sleeve (inside and outside) with white lead.

GEAR MAINTENANCE PROCEDURES

OPERATION OF GEARS: After full load is applied, it is important to RECHECK tooth contact periodically during the first few hours of the running-in period. This determines the effect of any settling of foundations, initial bearing wear and assures proper lubrication. If minor adjustments are needed, follow procedures outlined on these pages for checking tooth contact during installation for final inspection and readjustments.

If conditions are satisfactory after the first operating week, make general inspections and observations every week to assure an adequate film of lube on pinion and gear teeth. Since some lube squeezes or wipes off contact areas, CHECK working areas of the teeth for adequate lube, not just general appearance of pinion and gear.

INSPECTION OF GEAR SPLITS: Check split ring gears after ONE month of operation. Make certain the two halves HOLD TIGHTLY TOGETHER AT THE SPLITS.

HANDLING: If it becomes necessary to dismantle the drive for any reason, USE GREAT CARE in handling the pinion and gear. Prevent damage to teeth. Protect teeth by placing wooden planks between chain and cable and ends of gear teeth when lifting with a crane. When placing the gear or pinion on the floor, use wooden planks or blocks to avoid tooth damage.

PINION REPLACEMENT: Installing a NEW pinion to mesh with a USED gear is difficult. Aligning pinion to suit the wear or contact pattern on the working face of the gear teeth is the problem. Therefore, the alignment of a NEW pinion is usually a CUT and TRY procedure.

The important steps in the installation and alignment of a replacement are: CAREFULLY inspect ALL teeth on the gear for possible burrs, ridges or high spots. File or grind these below the normal tooth curvatures to eliminate high load concentration. This only causes tooth surface distress or noisy operation.

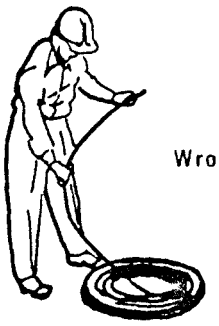
ALIGN the pinion to the gear following the procedures outlined in these pages to obtain the BEST possible contact pattern on the loaded side of the gear teeth.

The **RIGHT WAY TO RECOIL**, after wire rope has been used, is in the direction of its lay. A Good Rule Here requires looking down at the rope on the floor, then coil right-lay rope clockwise and coil left-lay rope counterclockwise. It is not difficult to determine when wire rope is being coiled in the WRONG direction; it soon becomes lively and hard to handle.

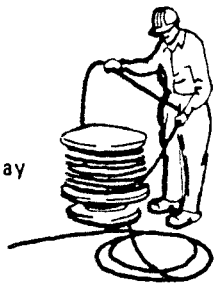
The **WRONG WAY TO UNCOIL WIRE ROPE** is when coil is placed on floor and uncoiled by pulling it straight off. Spirals and kinks occur. Torsions put into rope at every loop pulled off cause rope twists and makes hard to handle. Also wire rope cannot be uncoiled like hemp rope. Pulling one end thru the middle only results in severe kinking.

Once wire rope is improperly uncoiled, it is a waste of time to try to run out the kinks by twisting with one end loose on the floor. Once kinked, the rope is ruined in the area of the kink.

KINKS are places where the rope has been bent to a permanent set. Great stress has been placed on the care to take and avoid these kinks in wire rope. Loops of small diameter where rope is pulled, bending a rope around a sheave where radius is wrong and sharp objects are the general causes. No amount of restraightening will restore the wire where the kink has occurred. Normal service of this kinked wire cannot be expected, it has been permanently damaged thru lack of caution.

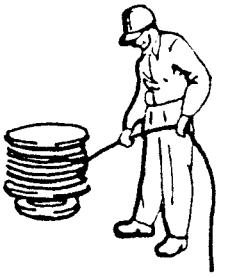


Wrong Way



Wrong Way

Right Way



Right Way

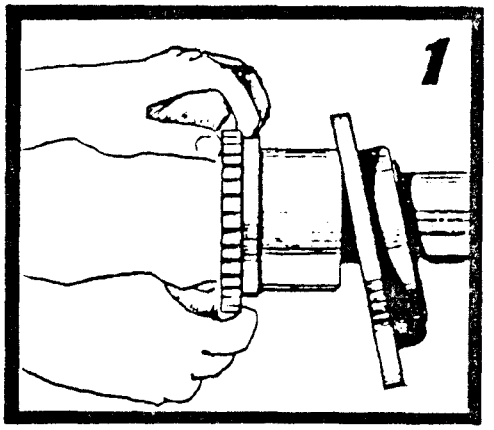
MPSD Symbol	Chemical Description	Electrode		Preheat Degrees F.			
		Standard	Alternate	.75 & Under	.88 - 1.50	1.62 - 2.50	2.50 & Over
CB	1025	E7018		70	70	100	150
CC2A, Q	MN-MO	*4130	E9018	250	300	325	350
CFE, S	4330	*4130	E9018	400	450	475	500
CH**	AUST-MN	E309		70	70	100	150
CK, Q, QS	8630	4130	E9018	450	475	500	550
CL4B	4320	*4130	E9018	400	425	450	475
CL5	4815	E8018C1	E7018	100	150	200	250
CN	NI-V	E8018C1	E7018	200	250	275	300
CO	4322	*4130	E9018	250	275	300	325
"D" Materials Contact Welding Engineering for Procedure							
F	1020	E70XX		70	70	70	70
F1	1020	E7018		70	70	70	70
F2	A36	E7018		70	70	70	100
FB	1055-80	Consult Welding Engineering					
FCHN**	AUST MN	E309		70	70	100	150
FHL		E9018	E8018C1	70	70	100	150
FHU	A543-65	E11018	E9018	300	375	450	500
FK	A572 GR 42-50	E7018		70	70	150	225
FK2	A572-72 GR 50	E8018C1	E7018	70	150	225	300
FR4	ABRA. RESIS.	E11018	E9018	150	200	250	300
FT1	A514-69	E11018	E9018	70	125	175	225
FT2	A514-69	E11018	E9018	70	125	175	225
FT3		E11018	E9018	100	150	200	250
KA, 1, 2	8630	*4130	E9018	300	325	350	400
KB, 1, 2	8625	*4130	E8018C1	300	325	350	400
KC, 1	4340	*4130	E11018	475	500	525	550
KL, 1	43L40	*4130	E11018	475	500	525	550
KM, 1, 2, 3	4140	*4130	E11018	350	400	450	500
KO, 1, 2	4150	Consult Welding Engineering					
KO, 3, 4	4150	Consult Welding Engineering					
KP, 1, 2	4150	Consult Welding Engineering					
KP, 3, 4	4150	Consult Welding Engineering					
P1, P2	A53	E70XX		70	70	70	70
S	1018	E70XX		70	70	70	70
SE, 1, 2, 3	1045	E8018C1	E7018	300	325	350	375
SE, 4, 5, 6	1045	E8018C1	E7018	300	325	350	375
SH, 1, 2, 3	1095	Consult Welding Engineering					
SL, 1	1035	E7018		100	175	225	250
SP	A 311-64 GR(1144)	Consult Welding Engineering					
SS	A108-73 (1117)	E7018		70	100	150	200
ST	1045	E8018C1	E7018	300	325	350	375
SX1, 2	4140	*E4130	E11018	350	400	450	500
TS-1	A519-72 (1015)	E7018		70	70	70	70
TS-2	A333-76 (1026)	E7018		70	70	70	70
TS-4	A519-72	Consult Welding Engineering					

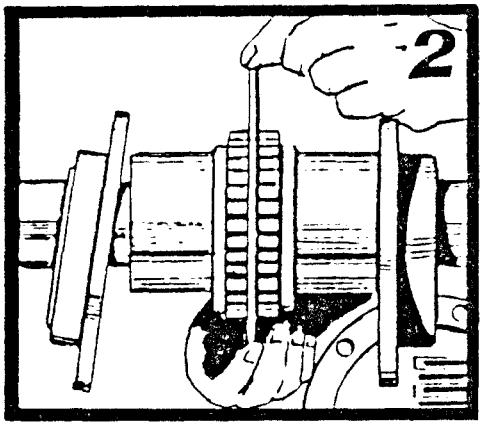
* 4130 to be used when a hardness is required either as welded or flame hardened. Alternate electrode should be used when hardness is not required.

** Do not allow preheat or interpass temperature to go over 400 degrees F.

FALK COUPLINGS

1. Mount cover with seal ring and hub on shaft. Press or shrink hubs on respective shafts so hub face is flush with shaft end. Tighten set screws on BOTH hubs on sizes 3 thru 11.

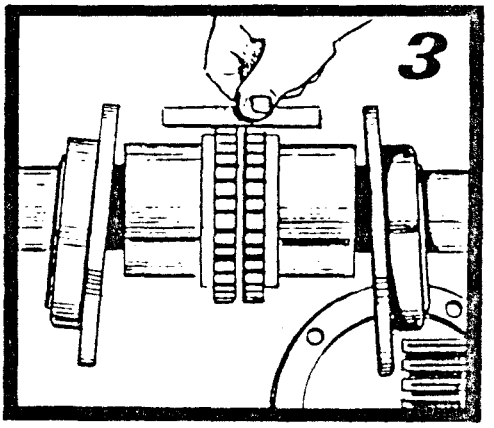


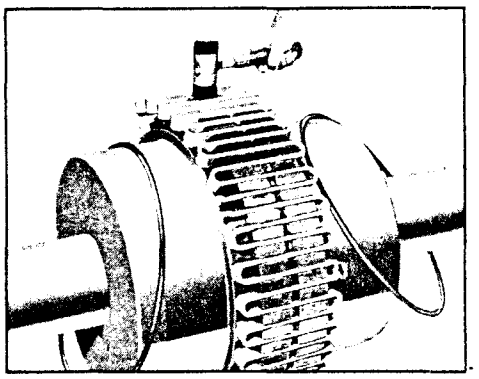


2. Check gap and angular alignment. Set coupling for normal gap. Align shafts by placing spacer block equaling gap between hub faces, and at right angles to it. Check using feelers.

   Maintain normal coupling gap where possible. To insure best performance, DO NOT EXCEED minimum and maximum gaps. Consult company if limited axial float is needed. Provide for shaft end play in coupling gap when using sleeve bearing units. Once mounted, position free unit so coupling gap is between minimum and maximum limits with BOTH shafts in extended or retracted position. With gap set and shafts aligned, tighten unit foundation bolts and RECHECK alignment.

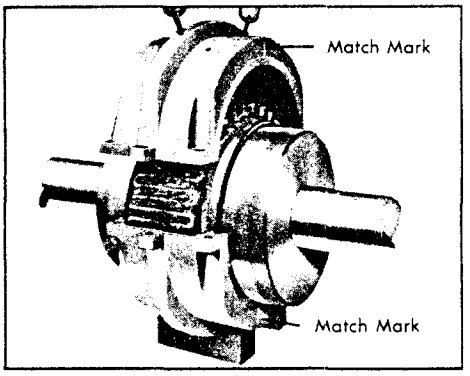
3. Check parallel alignment so a straight edge rests squarely on BOTH hubs at right angles. Fasten foundation bolts and RECHECK alignment and gap.

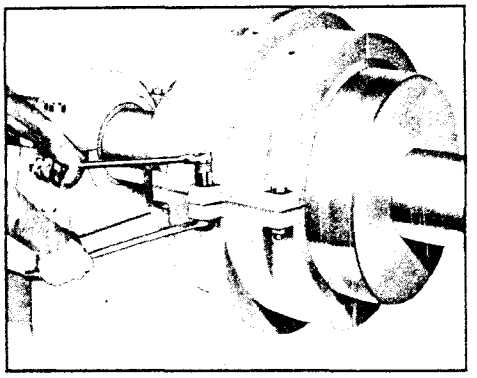




4 INSERT GRID

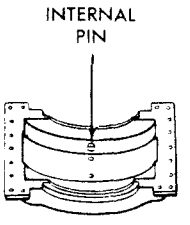
Pack gap and grooves with specified lubricant before inserting grid. Install grid segments so that all cut ends extend in the same direction, this will assure correct grid contact with non-rotating pin in cover halves. Spread grid segments slightly to pass over the coupling teeth and seat with a soft mallet.





5 PACK WITH GREASE AND ASSEMBLE COVERS

Pack the spaces between and around the grid with as much lubricant as possible and wipe off excess flush with top of grid. Position seals on hubs to line up with grooves in cover. Move lower cover half into position and block-up in place.



Sizes 150 thru 230 – Position gaskets on flange split and assemble upper cover half with the match mark on the same side as the lower half (see above). Secure cover with fasteners and tighten to torque specified in Table. CAUTION: Make certain all lube plugs are installed before operating.

Sizes 240 thru 260 – Check all flange faces for burrs and coat either half with Permatex No. 2 or equivalent. Assemble upper cover half with the internal pin (see drawing at right above) on same side as the lower half. Secure cover with fasteners and tighten to torque specified in Table. Assemble split seal retainers so the split is 90 degrees from the cover split. Secure with fasteners. CAUTION: Make certain all lube plugs are installed before operating.

Elements of a Maintenance Program

- Preventive maintenance program
- Well-trained and motivated workforce
- Effective communications
- Proper equipment selection and procurement
- Meaningful paperwork
- Operations-maintenance department cooperation
- Warehouse support
- Good shop facilities

PROPEL MACHINERY (continued)

5. Check propel brake assemblies

   a. Do Propel Brakes Operate OK?

   b. Are Brake Band Linings Worn?

6. Check propel clutch assembly
   (If this is applicable. This could be part of Drag Machinery.)

   a. Do the Clutches Operate Properly?

   b. Do the Air Cylinders Operate?

   c. Are the Bands OK?

   d. Are the Band Linings Worn?

   e. Is the Band Adjustments OK?

   f. Does the Limit Switch Work?

7. Visually examine propel shafting

   a. What is Spline to Gear Condition?

   b. Any Cracks in Shafting?

TUB (continued)

7. Normal wear of teeth in gear segments?

8. Normal wear of rails, top and bottom?

9. Normal wear of rollers in circle?

10. Normal wear of roller cage?

11. Center journal casting?

    a. Any Visual Cracks in Casting?

    b. Any Cracks in Weld?