IMPORTANT: READ THE FOLLOWING INFORMATION BEFORE STORING PARTS OR STARTING INSTALLATION

Please check the enclosed goods for damage or error in shipment.

If the contents are damaged, file a claim with the freight company immediately.

If there is a discrepancy in the goods received, contact Columbia Machine immediately. To save time and effort, contact the depot that shipped the goods. It would hasten a solution if you had the packing slip, invoice or sales order number available when you called.

In the event goods have to be returned to Columbia, it is mandatory you get a "Return Goods Authorization" (RGA) issued by any of our Parts Depots.

Vibrator shafts and control units out of warranty will be eligible for a core refund if returned to one of our Parts Depots. Goods sent in for core refund must also be accompanied by an RGA.

Full warranty conditions may be found on the next page.

Please fill in warranty information on the attached sheet and return to Columbia Machine to protect your warranty.

Publication No. 200-12

Warranty

Columbia Machine, Inc., warrants that each new product of their manufacture is free from defect in material and workmanship under normal use and service for a period of ninety (90) days from date of delivery.

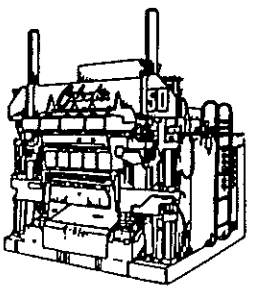
If such defect occurs during the warranty period, the foresaid purchaser should immediately contact Columbia Machine, Inc., or its authorized dealer. Columbia will furnish or arrange for repair or replacement of the defective parts within the terms of this warranty. The defective part should be returned promptly to Columbia or the authorized dealer (transportation prepaid). Upon examination by them to determine if the part is defective through no neglect on the customer's part, Columbia will repair or replace said part. All freight charges on said parts are to be paid by the customer.

Columbia Machine, Inc., shall not be obligated to furnish labor required or be responsible for labor charges incurred in installing or servicing of their equipment, including the removal or installation of the defective part. Nor shall Columbia be liable for delay on freight, or failure to furnish a replacement part resulting from government restriction, priority or other allocation, or otherwise.

The following are not warranted by Columbia: pumps, motors, starters, switches, relays, or other equipment purchased by Columbia as an assembly. (The majority of these items are warranted by the company manufacturing said items).

This warranty shall not apply to Columbia products which have been repaired or altered in any way, so as, in Columbia's judgment, to have affected its stability or reliability, nor which has been subject to misuse, negligence or accident, nor which has had the serial number altered or removed. Neither shall this warranty apply to Columbia products which have been corrected other than in accordance with instructions furnished by Columbia.

This warranty is expressly in lieu of all other warranties expressed or implied, and of all other obligations or liabilities on Columbia parts. Columbia neither assumes or authorizes any representative or person to assume for it any liability in connection with the sale of Columbia products.



VIBRATOR SHAFT WARRANTY INSTRUCTIONS

In order to validate the warranty on this shaft, the following information must be sent in to Columbia Machine, Inc.:

CUSTOMER NAME: _____

ADDRESS: _____

CITY: _____

STATE: _____ ZIP _____

Vibrator Shaft Serial No. _____

Block Machine Model No. _____

Vibrator Shaft Model No. (Circle One)

901A	483.3.51	483.1.472
1345	C2184.13	482.800.20
C1016.26	C2845.34	483.16.139
C1016.28	C2185.45	484.2.412
C1201.7	483.16.73	483.1.367

Other _____

Date Installed _____

Return warranty information to: Columbia Machine, Inc.
ATTN: Warranty Control Dept.
107 Grand Boulevard
Vancouver, WA 98661

NOTES:

SPLIT GREASE VIBRATOR SHAFTS
(All Models)

Field repair of the vibrator shaft is not recommended. If repair is required, the entire assembly should be removed from the machine and returned to the factory for repair or exchange. The following defines removal and installation procedures. (See Drawing 382.660.12)

Vibrator shafts are of the split design allowing a half shaft to be replaced separately. Belt replacement also can be done by removing the center shaft section and couplings.

REPAIR

Cleanliness is of utmost importance when removing or replacing vibrator shafts. Vibrator bearings are highly precision components and require extreme caution to keep clean and free from grit.

Bearing cap and base surfaces must be kept clean and free of any nicks or burrs as this will effect bearing bore tolerances in housing. Care must be taken when reinstalling center shaft and couplings so be careful that no dirt or paint gets between mating surfaces of shafts and coupling halves.

INSTALLATION - SPLIT GREASE VIBRATOR SHAFT WITH BASE

The new shaft assembly can be installed as a unit.

1. Thoroughly clean area.
2. Remove vibrator shaft cover.
3. Remove bolts that retain shaker shafts to eccentric housings
4. Place a small screw jack 3" between parallel bars and top of main box (See Drawing 382.660.13) and lift mold support and shaker shaft up approximately 1/4" or until top of shaker shaft touches feed drawer track bar.
5. Loosen vibrator motor mount bolts and slide motor forward to loosen belt; remove belt from motor pulley.
6. Remove vibrator bearing caps, being sure to support vibrator shaft as it may fall from base - remove shaft from base.
7. Remove base from front of machine box.

8. Thoroughly clean front of machine and mounting surface of vibrator base, also bottom ends of shaker shafts and clamps.

INSTALLATION OF NEW SHAFT ASSEMBLY

1. Before installing new vibrator shaft, loosen the shaker shaft clamp plates from the shaker shafts. Do this by using a suitable spacer, pipe, etc., that will fit over the end of the shaker shaft and tap with hammer. Loosening the clamp plates will prevent misalignment and binding upon reassembly. (See Figure 1.)

2. Clean back of new base, removing any nicks or burrs with a file.

3. With eccentric housings pointing up, lift unit into place and line up with bolt holes in main box, re-install bolts and torque evenly, 3/4" bolts to 225 ft. lbs., 1" bolts to 540 ft. lbs.

4. Let shaker shaft down to engage recess in eccentric housing and re-install clamps. Torque all 3- and 4-block machines to 90 ft. lbs. All 2-block machines should be torqued to 70 ft. lbs.

5. Install pulley on vibrator motor if clutch/brake is used.

6. Slide belt on motor and set to correct tension, (See Drawing 382.640.5)

7. Check shaft for free rotation.

8. Install shaft cover.

9. Shafts are grease packed at factory. Replenish grease after four (4) hours running according to greasing recommendations.

GREASING RECOMMENDATIONS

10. Grease ONLY with Columbia Machine vibrator grease (P/N-400622).

Main Bearings	Four (4) total, one (1) fitting each bearing. Four (4) pumps from a hand grease gun every four (4) hours of operation.
Eccentric Bearings	Two (2) fittings each housing - Four (4) total NOTE: Each fitting provides grease for each bearing! Six (6) pumps from a hand grease gun every four (4) hours of operation.

BE SURE TO GREASE "ALL" GREASE FITTINGS. Four (4) for main bearings and four (4) for eccentric bearings! See note on next page.

NOTE

WE DO NOT RECOMMEND EXCEEDING THIS RECOMMENDATION IN FREQUENCY OR VOLUME. OVER GREASING CAN CAUSE EXCESSIVE HEAT BUILD UP.

REMOVAL & REPLACEMENT OF GREASE SHAFTS (See Drawing 382.660.12)

HALF SHAFTS

1. Thoroughly clean area.
2. Remove vibrator shaft cover.
3. Remove one (1) or both shaft couplings, depending on whether one half shaft is to be removed or if both half shafts are to be removed.
4. Remove bolts that retain shaker shafts to eccentric housings.
5. Place small screw jack (3") between parallel bars and top of main box (see Drawing 382.660.13) and lift mold support and shaker shaft up approximately 1/4" or until top of shaker shaft touches feed drawer track bar.
6. Remove vibrator bearing caps being sure to support vibrator shaft as it may fall from the base.
7. Remove shaft and end seal plate as a unit.

TO RE-ASSEMBLE

1. Thoroughly clean bearing base and caps.
2. Inspect bearing seat areas for pitting, corrosion or a bearing that may have spun in the housing. If these areas are damaged, a new base is required.
3. Before installing new vibrator shaft, loosen the shaker shaft clamp plates from the shaker shafts. Do this by using a suitable spacer, pipe, etc., that will fit over the end of the shaker shaft and tap with hammer. Loosening the clamp plates will prevent misalignment and binding upon reassembly. (See Figure 1.)

4. If base is good, install new half shaft into base

CAUTION Be careful that end roller bearing does not slide off shaft.

NOTE Place counterweight on shaft before installing.

5. With eccentric housing pointed up, carefully slide shaft into place being sure all bearing seal plates are in their proper grooves.

6. Seal plates have a notch in their outer flanges and it must be oriented to be located pointing out horizontally to center of bearing cap. (See Drawing 382.660.14)

7. A pin is located in the center of each groove in the cap and it must match the notch in the seal plate. When notch is in correct position, slide cap into place. Cap should go down to its mating surface of the base with only slight pressure or tap of a rubber hammer. DO NOT FORCE. Locating pin may not be lined up correctly and it may damage. (See Drawing 382.660.4)

8. Install cap bolts and tighten loosely, install second cap and bolts.

9. Loctite main bearing caps to main bearings. Remove all bearing caps individually and thoroughly clean incide of bearing cap and exposed outer face of main bearing with Loctite Safety Solvent #755.

10. Apply a very thin coating of Loctite RC/609 to exposed outer bearing race only.

11. Re-install bearing caps and torque bolts as follows: Tighten all 5/8" bolts evenly to 180 ft.lbs. and 1/2" bolts evenly to 90 ft.lbs., rotate shaft by hand. It should rotate freely.

12. Reattach shaker shaft to eccentric housing, tighten bolts evenly and torque all 3- and 4-block machines to 90 ft.lbs. All 2-block machines should be torqued to 70 ft.lbs.

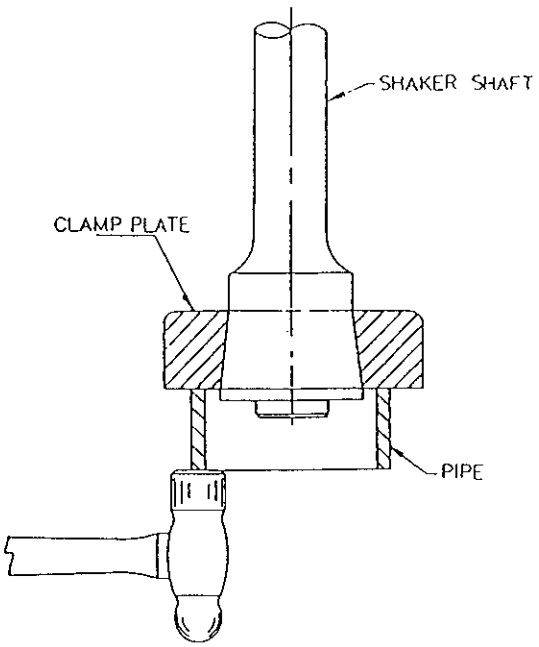


Figure 1

13. Secure counterweight to shaft keeping 3/16 gap at end seal plate.

14. Replace coupling, be sure parts are clean with no dirt and paint under coupling halves (keep coupling halves together as they were removed).

15. Tighten all bolts evenly.

COLUMBIA MACHINE, INC.
BLOCK DIVISION
SERVICE ALERT BULLETIN

SUBJECT: Columbia Block Machine Maintenance Tips

DATE: 3-15-89

ORIGINATOR: Gordon Eigsti

MAINTENANCE TIPS ON REMOVAL AND ADJUSTMENT OF MOLD SHAKER SHAFTS (See Drawing on Page 7)

The proper installation, adjustment, or removal of shaker shafts have a great effect on the proper operation and longevity of your vibrator shaft.

If the shaker shaft is misaligned it will cause premature failure of the bearings in the eccentric housings of your vibrator shaft. The following are things to remember when performing maintenance on your Columbia Block Machine:

a) Never tighten or adjust the upper shaker shaft nuts (1) without loosening the tapered hold down collar (4) on the bottom of the shaker shaft (2) because turning the nuts (1) on top will slightly turn the bottom of the shaker shaft (2) which puts the eccentric housing (5) in a bind. The taper of the collar (4) must be broken loose from the taper on the shaker shaft (2) and re-tightened to make sure the alignment has not been affected.

Number in parenthesis () refer to bubbles on attached sketch (see page 7).

b) When installing the shaker shaft tapered hold down collar (4) to vibrator shaft eccentric housing (5) make sure the base of the shaker shaft sits down flat and tight against the top of eccentric housing flange (5) and there is at least 1/16" clearance between shaker shaft hold down collar (4) and eccentric housing mounting surface (5) when the shaker shaft (2) is clamped solidly to the eccentric housing (5). If the hold down collar bolts down tight to the eccentric housing (5) without maintaining the 1/16" gap, the shaker shaft 92) may be loose or become loose from the eccentric house (5) causing premature failure of the vibrator shaft.

c) Make sure that the mold mounting surface of the die support (3) and mold mounting bracket mounting surfaces are smooth and perpendicular to center line of shaker shafts (2). If the above two surfaces are worn causing the shaker shafts (2) to be out of line or in a bind, it will cause premature failure of the vibrator bearings.

Never pry a shaker shaft in any direction to get it to line up with die support (3) or vibrator shaft eccentric housing (5). If the shaker shaft (2) has to be pried to get it to line up, there is something out of line and running the machine with misaligned shaker shafts (2) will cause vibrator shaft failure. Check for the following when misalignment occurs:

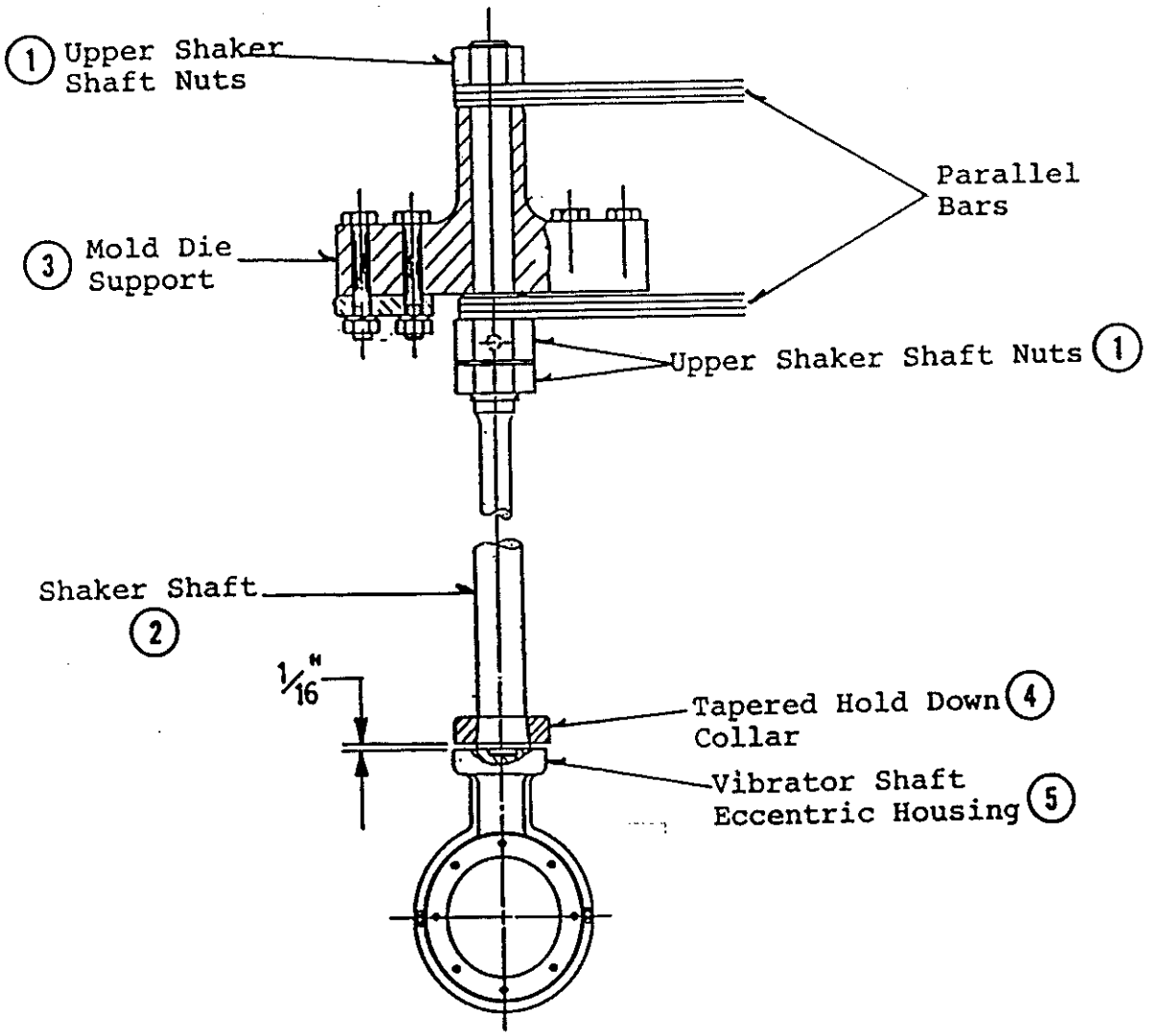
a) Bent Shaker Shafts (2)

b) Worn Die Supports (3)

c) Worn Mold Mounting Brackets

d) Incorrect fit between Shaker Shafts

(2) Tapered hold down collar (4)


1 Upper Shaker Shaft Nuts
Parallel Bars
3 Mold Die Support
Upper Shaker Shaft Nuts 1
Shaker Shaft 2
1/16"
Tapered Hold Down 4 Collar
Vibrator Shaft Eccentric Housing 5

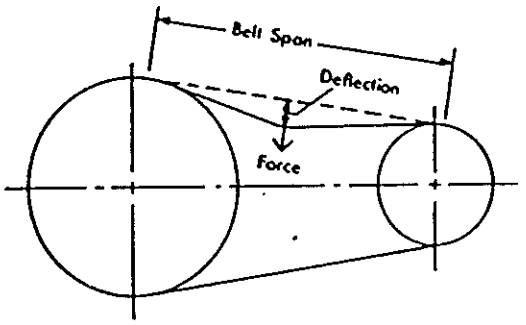
HTD DRIVE INSTALLATION

The HTD belt drive will perform successfully when proper installation procedures are followed.

BELT INSTALLATION

Do not pry or otherwise force the belt onto the sprockets,. as this can result in permanent damage to the belt. Either remove the sprocket's outside flange or reduce the center distance between the pulleys so that the belt can be easily installed.

HTD belts are not to be tensioned as you would a V-Belt or any other belt that depends on friction to transmit the load. They should be installed with a snug fit, neither too taut nor too loose.



An alternate method can be used to properly tension the belt on an HTD drive. After the drive has been installed and tension applied, the deflection force can be measured to verify the proper tension. Stop the drive and measure the belt span (see sketch). Using a spring scale, apply a perpendicular force to the exact center of the belt width and near the center of the belt span. Measure the force required to deflect the belt 1/64 inch for every inch of span length. For example, the deflection for a 32-inch span would be 1/64 inch multiplied by 32, or 1/2 inch.

The HTD Belt Deflection Force table lists the range of forces normally sufficient for drive installation. Actual installation tension required depends on peak loads, system rigidity, number of teeth in mesh, etc. For drives with shock loading or other unusual conditions, the force may have to be increased for proper operation of the drive.

Note: For belts wider than 2 inches, it is suggested that a rigid strip of keystock or something similar be placed across the belt between the point of force and the belt to prevent belt distortion.

HTD BELT DEFLECTION FORCE

Pitch	Width	Force lbs.
5mm	15mm	1 to 2
	25mm	1½ to 3
8mm	20mm	2 to 4
	30mm	3 to 6
	50mm	6 to 11
	85mm	10 to 19
14mm	40mm	5 to 11
	55mm	8 to 16
	85mm	13 to 26
	115mm	19 to 37
	170mm	29 to 58
20mm	115mm	28 to 56
	170mm	43 to 86
	230mm	60 to 120
	290mm	76 to 150
	340mm	90 to 180

SPROCKET ALIGNMENT

HTD sprocket alignment and parallelism of the shafts is very important. Proper alignment helps to equalize the load across the entire belt width, thereby reducing wear and extending belt life.

PLACE A STRAIGHTEDGE against the outside edge of the sprockets and move sprockets until the straightedge touches the two outside and two inside edges of the sprockets. The straightedge should cross the sprockets as near the shafts as possible. A string can be used if a straightedge is not available. Remember the string should contact at four points as explained above.

After aligning the sprockets, check the rigidity of the supporting framework. Shafts should be well supported to prevent distortion and a resulting change in the center distance under load. *Do not* use spring-loaded or weighted idlers. Idler sprockets or pulleys must be locked into position after adjusting belt tension.

Please note: At least one sprocket must have a flange.

Columbia MACHINE, INC.
VANCOUVER WASHINGTON

BELT TENSION SPEC

Drawn By	R.S.	Date	3-15-89
Approved By		Scale	
A-382.640.5		sht	of

Rev	Change/DCN	Date	By	M/F

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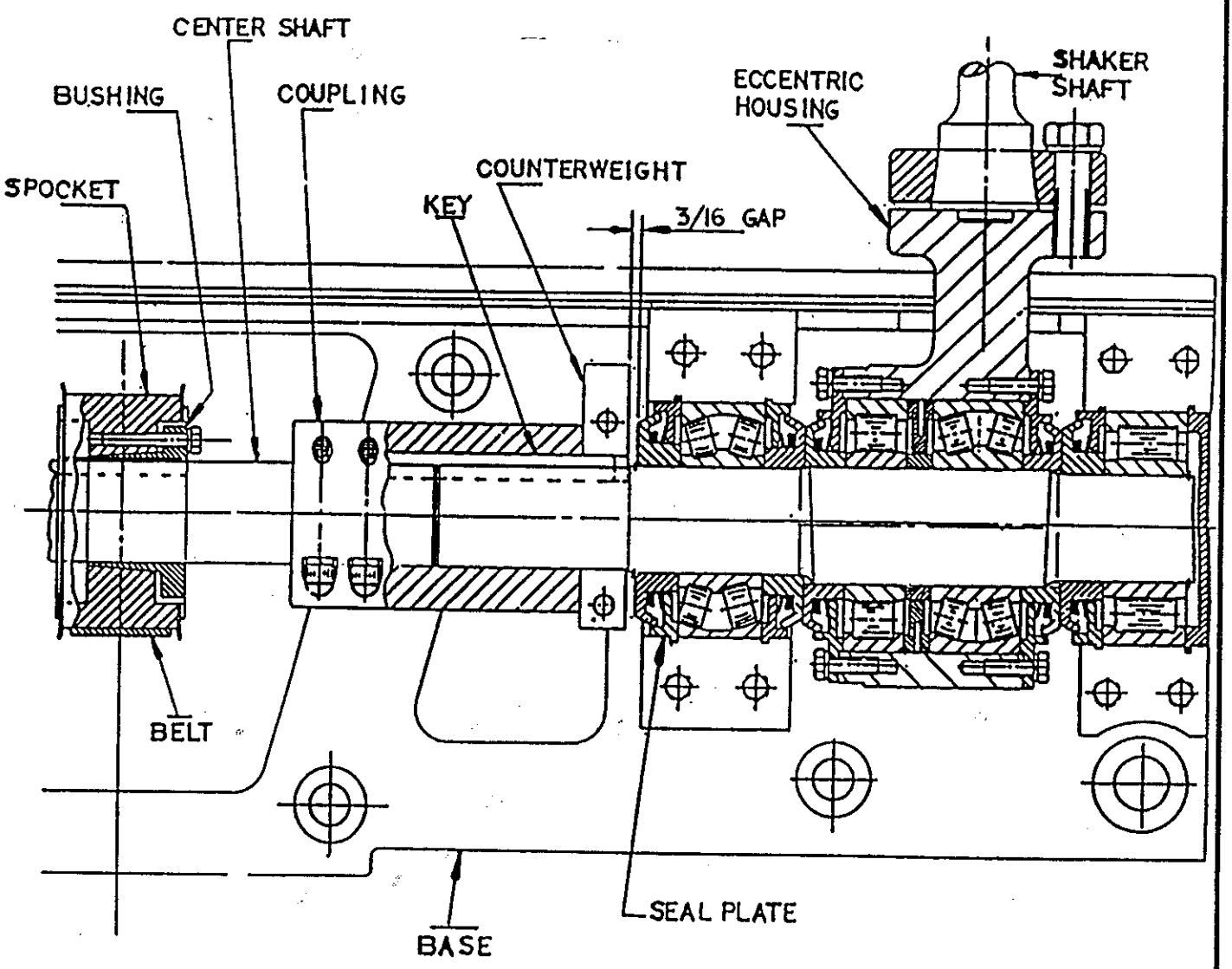
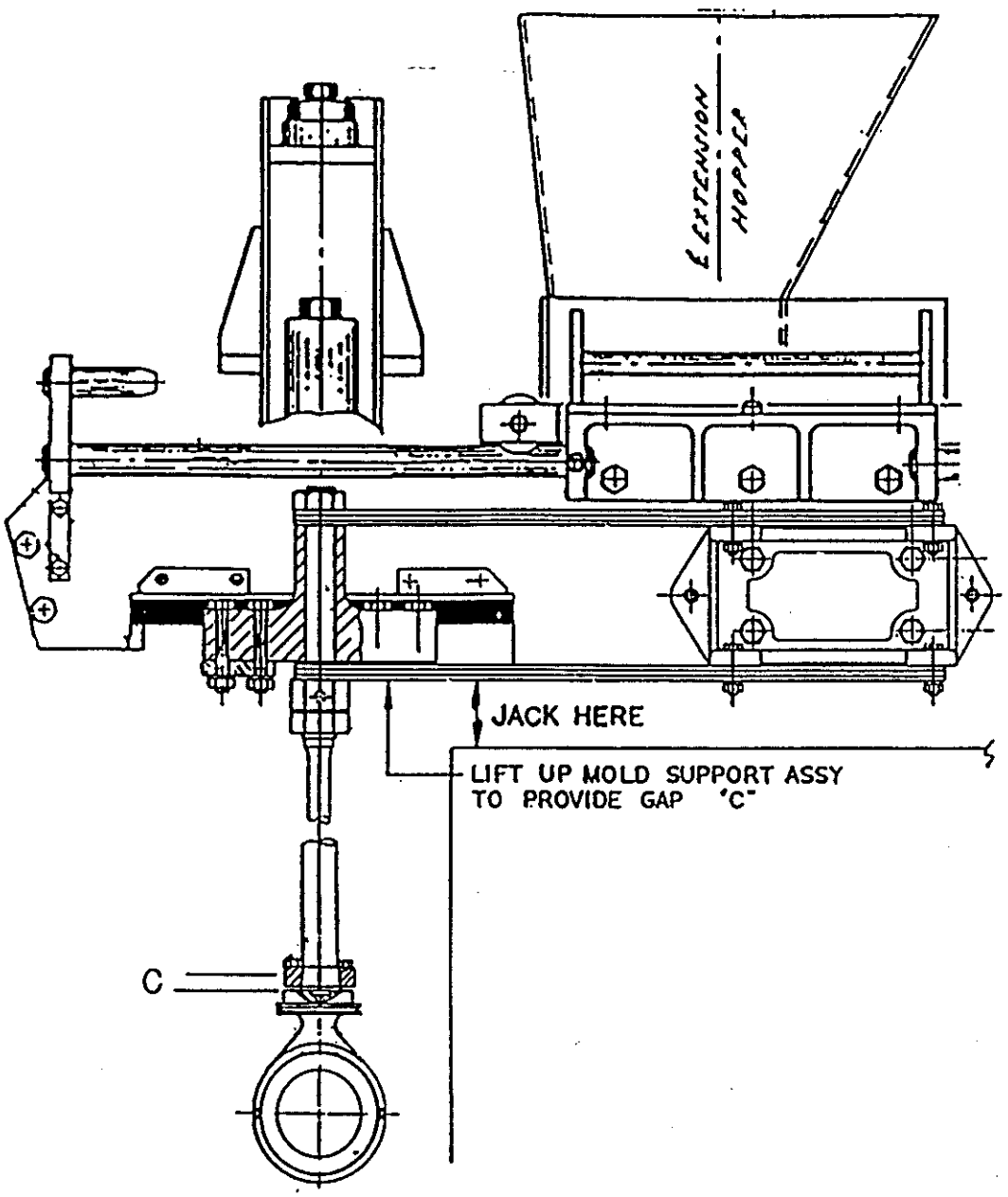


GREASE LUBED VIBRATOR SHAFT
FIG.-1

UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS AND SHARP CORNERS DO NOT SCALE THIS DRAWING					Columbia MACHINE, INC. VANCOUVER WASHINGTON	
TOLERANCE FOR MACHINE DIMENSIONS UNLESS OTHERWISE SPECIFIED					GREASE LUBED VIBRATOR SHAFT	
ANGULAR ±1/2	DECIMAL ±010	FRACTIONAL ±1/32			Drawn By R S	Date 4-17-91
					Approved By	Scale
Rev	Change/DCN	Date	By	M/F	A-382,660.12	sht 1 of 1

142643



UNLESS OTHERWISE SPECIFIED
REMOVE ALL BURRS AND SHARP CORNERS
DO NOT SCALE THIS DRAWING

TOLERANCE FOR MACHINE DIMENSIONS
UNLESS OTHERWISE SPECIFIED

ANGULAR ±1/2	DECIMAL ±010	FRACTIONAL ±1/32

Rev	Change/DCN	Date	By	M/F

Columbia MACHINE, INC.
VANCOUVER WASHINGTON

MAINT. REF. DRAWING
VIB. SHAFT

Drawn By	R S	Date	4 –17–91
Approved By		Scale	

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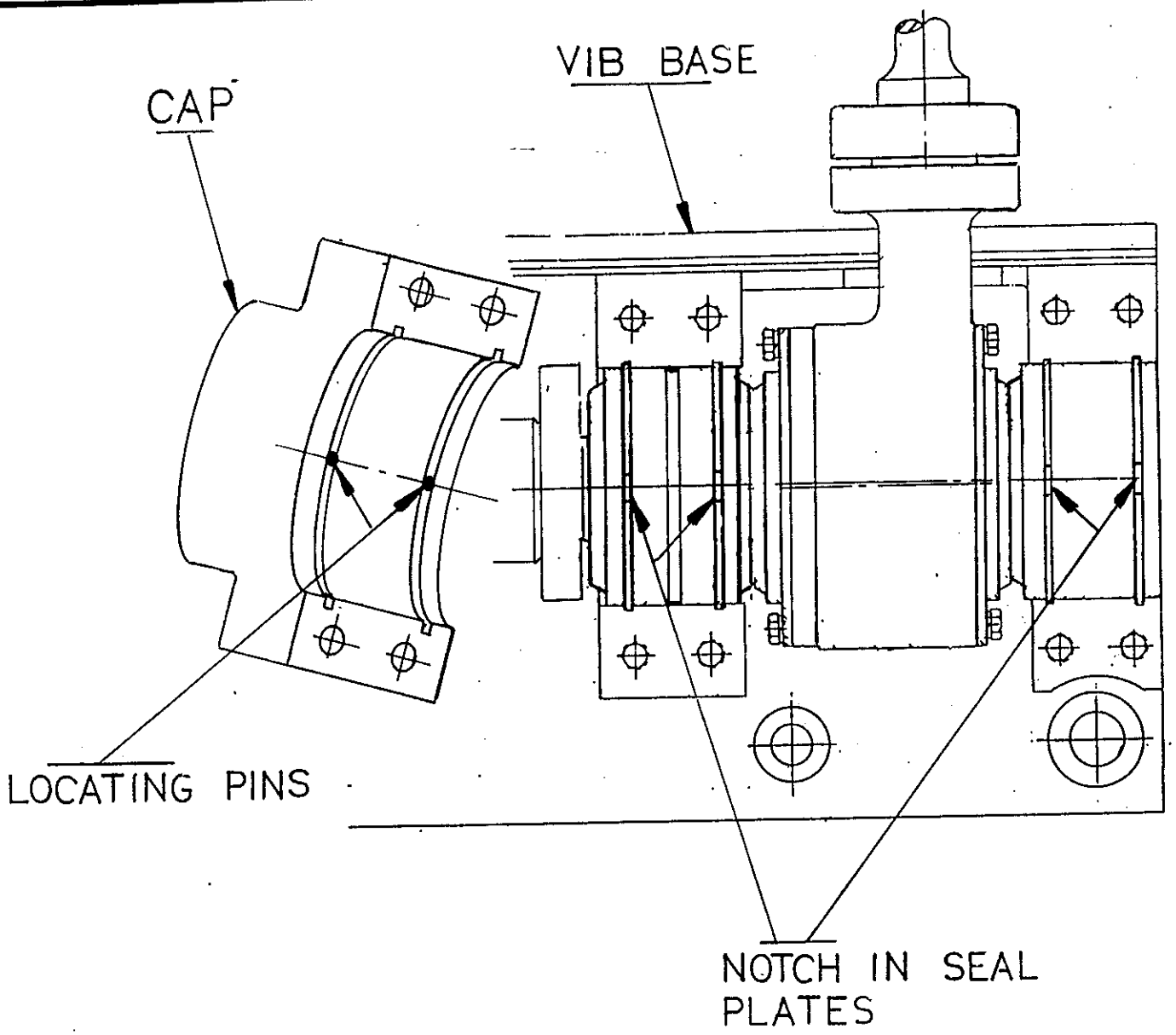


ORIENT SEAL PLATE WITH NOTCH CENTERED FACING OUT

PINS IN CAP MUST FIT INTO NOTCHES IN SEAL PLATES

UNLESS OTHERWISE SPECIFIED
REMOVE ALL BURRS AND SHARP CORNERS
DO NOT SCALE THIS DRAWING

TOLERANCE FOR MACHINE DIMENSIONS
UNLESS OTHERWISE SPECIFIED

ANGULAR ±1/2	DECIMAL ±010	FRACTIONAL ±1/32

Rev	Change/DCN	Date	By	M/F
A	REV - REDRAWN	5-15-91	RS	

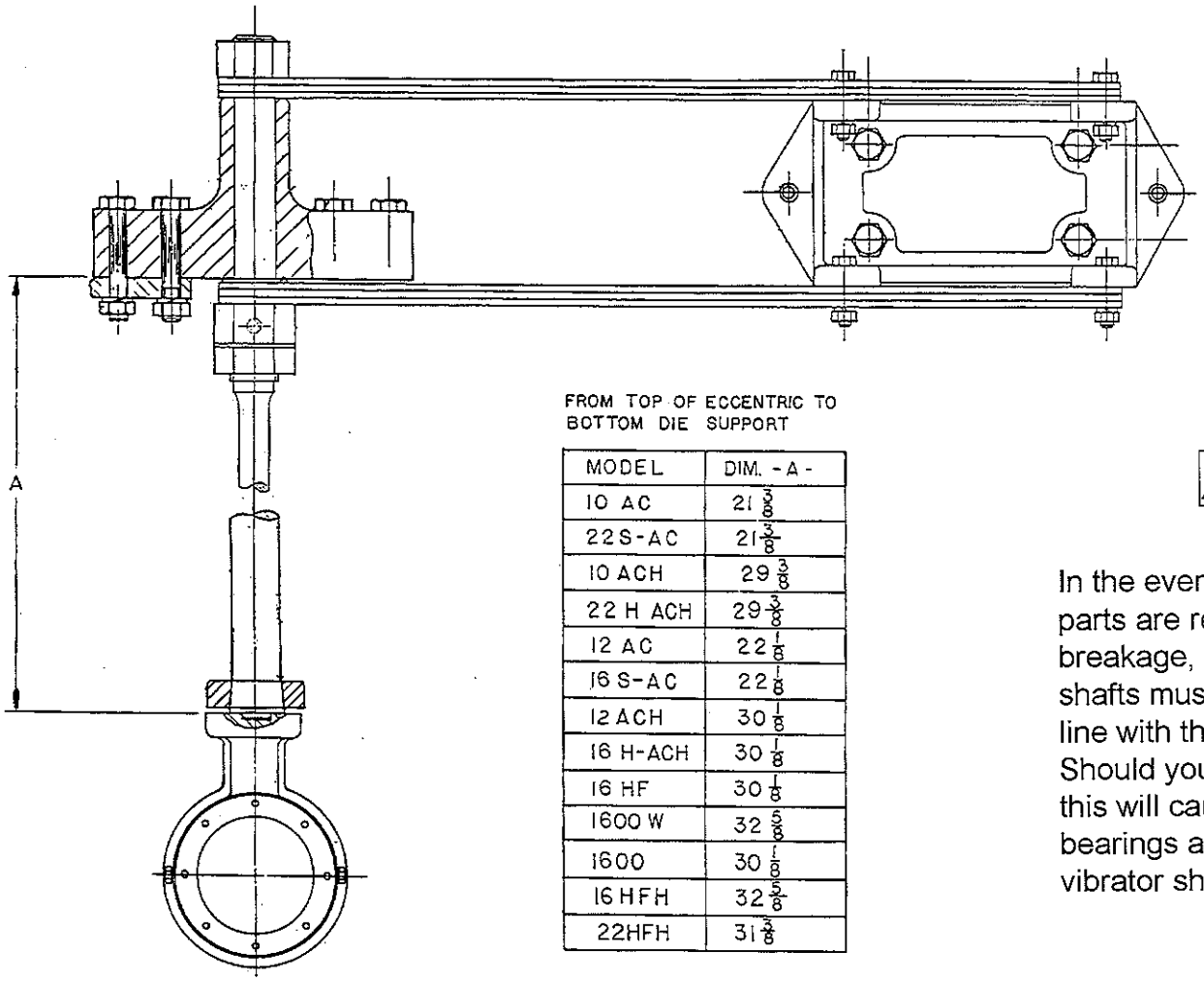
Columbia MACHINE, INC.
VANCOUVER WASHINGTON

MAINT REF DRAWING VIB SHAFT

Drawn By	R S	Date	4 - 17 - 90
Approved By		Scale	

A- 382.660.14

sht 1 of 1



FROM TOP OF ECCENTRIC TO BOTTOM DIE SUPPORT

MODEL	DIM. -A-
10 AC	21 3/8
22S-AC	21 3/8
10 ACH	29 3/8
22 H ACH	29 3/8
12 AC	22 1/8
16 S-AC	22 1/8
12 ACH	30 1/8
16 H-ACH	30 1/8
16 HF	30 1/8
1600 W	32 5/8
1600	30 1/8
16 HFH	32 5/8
22HFH	31 3/8

⚠ WARNING

In the event that the upper vibration parts are replaced because of wear or breakage, the centerline of the shaker shafts must be parallel or straight in line with the vibrator shaft eccentrics. Should you fail to align shaker shaft, this will cause side load on eccentric bearings and **reduce** the life of the vibrator shaft.

HEIGHT DIMENSIONS FOR SHAKER SHAFT
No. 483.1.530
Rev. D