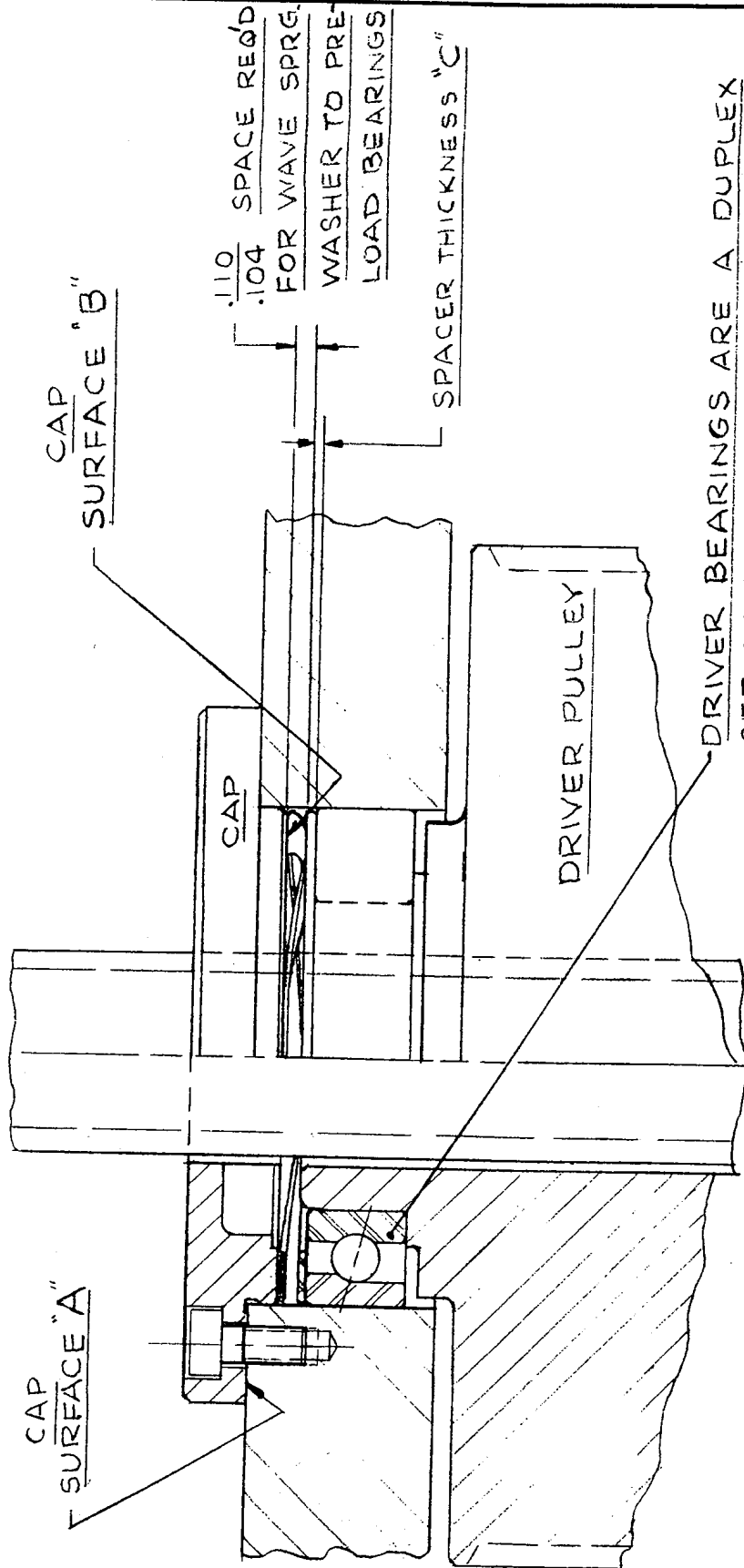


- Remove top cover from head casting.
- c. Check spindle belt tension in order to determine how tight it should be after re-assembly.
 - d. Loosen six bolts holding spindle motor bracket. Slide motor forward to relax belt, remove spindle belt.
 - e. Remove bearing retaining cap, remove wavy washer and fitting spacer (which may or may not be used dependent upon fitting requirements for preload).
 - f. Remove top bearing plate, use metric pin puller to remove two taper dowel pins. **DO NOT USE PRY BAR.**
NOTE: Some machines may have lower grease shield between top bearing and spindle drive dependent upon design of driver. Top spindle driver bearing may come off with plate or may stay on spindle driver. Use care to make sure bearing does not come apart (inner/outer race).
 - g. Remove spindle driver, lower bearing will stay in housing. It may be necessary to use pry bar.
CAUTION: Do not damage spindle drive with excessive force.
 - h. Remove lower bearing retaining cap. Lower bearing should slide out; if not, perform step i.
 - i. Remove housing.
NOTE: Use metric pin puller, **NOT** pry bar. Turn over, using pins in holes in bottom, press out bearing.

2. Installation

- a. Clean and stone all mounting surfaces and bearing shoulders to make sure there are no nicks and/or contaminants caused during the disassembly process.
- b. Open new bearings, make sure they are kept in clean environment until they are assembled. The bearing may have been pregreased at Tree, if not, consult this manual, Section IV. A., for type and amount of grease.
NOTE: Driver bearings are a duplex set of angular contact bearings which must be mounted face to face. Open side of bearings towards each other.
- c. Install one bearing into housing, making sure the outer race is seated against shoulder. Mount bearing retainer cap, again making sure lip in cap is securely against outer race. Tighten socket head cap screws in sequence, taking precaution not to cock bearing retaining cap. **Open side of bearing should be up.**
- d. Re-assemble housing onto head casting making sure dowel pins are aligned properly before securing socket head cap screws.
NOTE: This is only required if removed (as in K. Spindle Motor Belt, step i. above).
- e. Assemble grease shield (if part of original assembly) and top bearing onto spindle driver.



DRIVER BEARINGS ARE A DUPLEX SET OF ANGULAR-CONTACT TYPE

MOUNTED FACE-TO-FACE

PRELOAD DATA FOR DRIVER BEARINGS
FIGURE #10

SYN		DATE		CHANGE		ECN		DRAWN BY		CHK'D BY		MATERIAL		MACHINE	
									J. TREE						J325
									DATE	REPLACES					PART NAME
									2-26-87						PRELOAD DATA
									TOLERANCE UNLESS SPECIFIED						FOR DRIVER BRGS
									METRIC		INCH				SCALE
									X.	± 1.5	X	± .060			FULL
									X.X	± 0.8	XX	± .030			UNIT
									X.XX	± 0.25	XXX	± .010			PART NUMBER
									X.XXX	± 0.025	XXXX	± .0010			CC20300
									ANGLES ± 0.30'						
 TREE MACHINE TOOL CO., INC. RACINE, WISC.															

sequence:

- 1) Lower grease shield
- 2) Bearing, open side down
- 3) Inner and outer spacer
- 4) Bearing, open side up

NOTE: The new bearings should be pregreased by Tree or bearing manufacturer. If not, consult the maintenance manual for type and amount of grease.

- c. Re-assemble the wave spring assembly and retighten two SHSS.

NOTE: There should be a brass pad between the SHSS and thread on the spindle.

- d. Replace lower ball retaining ring (item #467) and cam ring (item #475). Compress cam ring and wave spring assembly far enough to re-insert the 30 steel balls. Replace top ball retaining ring (item #473) along with cross pin and collet tube assembly. Carefully release compression pressure used to compress wave spring assembly.
- e. Replace and secure top retaining plate.

4. Re-installation of Spindle into Quill

- a. Clean the bearing bore inside the quill and coat with a light oil film.
- b. Grease spindle splines (see manual for type of grease), position spindle into quill and line up splines with spindle driver.
- c. Insert the spindle into the quill until the lower spindle bearings have been seated against the shoulder inside the quill. Retighten the lower spindle bearing nut and re-assemble the drive key and spindle key guard.

NOTE: A light press fit may be required to seat bearing. Misalignment of bearings to bearing bore may damage the bearings so extreme care should be taken.

- d. Replace all covers and guards, bring machine under power using recommended procedure in manual. Lower quill 4-5 inches, run spindle in both directions 5-10 minutes each way, starting with a low RPM (250), gradually increasing to maximum RPM.

NOTE: Quill may show sign of excessive heat; if so, allow quill to cool to room temperature. Repeat warm-up cycle. It is not abnormal for the spindle bearings to heat up one time. However, if the quill continues to heat up, consult factory.

N. Spindle/Quill, Ballscrew Assembly - Removal and Installation

1. Removal

- a. Perform disassembly procedure for z-axis ballscrew