TROYKE MODEL NC-10-B-180 OR 360 ROTARY TABLE

THE NC-10-B IS A 10" DIAMETER VERTICAL MOUNT ONLY 4TH AXIS. ROTARY TABLE. THE TOTAL REDUCTION BETWEEN THE SERVOMOTOR AND THE TABLE IS 180:1 OR 360. THIS IS ACCOMPLISHED BY HAVING A 90:1 WORM TO WORMWHEEL DRIVE AND A 2:1 (20T/40T 180:1) OR 4:1 (10T/40T 360:1) 3/8 PITCH TIMING BELT DRIVE BETWEEN THE SERVOMOTOR AND THE WORMSHAFT ASSEMBLY. THE TABLE IS GRADUATED IN ONE DEGREE INCREMENTS AND AN ADJUSTABLE POINTER IS PROVIDED FOR THE STARTING POSITION.

LIFTING AND MOUNTING: TWO 1/2-13 TAPPED HOLES ARE PROVIDED IN THE TOP OF THE BASE NEAR THE POINTER. USE A 1/2-13 EYE BOLT FOR LIFTING THE TABLE. USE THE TAPPED HOLE CLOSEST TO THE TIMING BELT DRIVE SIDE TO LIFT THE TABLE LEVEL. ALWAYS MOUNT THE TABLE ON A FLAT CLEAN SURFACE.

WIRING: THE WIRING CONFIGURATION OF THIS UNIT CONSISTS OF A CLAMPED OR UNCLAMPED SOLENOID VALVE (100V AC, 110V AC OR 24V DC COIL), PNEUMATIC PRESSURE SWITCH (TO VERIFY IF THE TABLE IS CLAMPED OR UNCLAMPED), A ZERO RETURN OR DECEL SWITCH AND DOG (FOR INITIAL HOMING OR ZERO RETURNING OF THE TABLE), AND A SERVOMOTOR. THE SERVOMOTOR AND ELECTRICS ARE ENCLOSED IN A SHEETMETAL ENCLOSURE. TO GAIN ACCESS TO THE INSIDE OF THE ENCLOSURE, REMOVE THE ACCESS COVER ON THE BACK OF THE ENCLOSURE. OPTIONAL CABLES MAY BE PROVIDED TO INTERFACE THE ROTARY TABLE TO THE MACHINE. ONE CABLE NORMALLY HAS THE ARMATURE, GROUND LEADS, SOLENOID VALVE, PRESSURE SWITCH AND ZERO RETURN SWITCH. THE OTHER CABLE NORMALLY HAS THE ENCODER LEADS. THERE ARE DIFFERENT LENGTH CABLES PROVIDED FOR THE VARIOUS MACHINES. REFER TO THE PROPER WIRING DIAGRAM FOR FURTHER SPECIFICATIONS.

WARNING: BEFORE SERVICING THE TABLE DISCONNECT IT FROM THE MACHINE.

LUBRICATION: THE CENTRIFUGAL CAST MANGANESE BRONZE WORMWHEEL AND, HARDENED AND GROUND WORMSHAFT RUN IN A BATH OF OIL AND THE BASE HAS BEEN FILLED WITH LUBRICATIONS ENGINEERS 605 ALMASOL 90 WT. GEAR LUBE OIL PRIOR TO SHIPMENT. A FILL PLUG IS PROVIDED ON THE TOP OF THE BASE NEAR THE POINTER. TO DRAIN THE UNIT REMOVE THE OUTBOARD SUPPORT BRACKET OPPOSITE THE DRIVE SYSTEM. PERIODICALLY, DEPENDING UPON USAGE, THE OIL SHOULD BE CHANGED USING 605 ALMASOL OR A GOOD GRADE OF 80 OR 90 WT. GEAR LUBE OIL. THE CENTER BEARINGS HAVE BEEN PACKED WITH GREASE AND NEED NO OIL. THE OIL LEVEL SHOULD BE CHECKED AT THE OIL SIGHT GAGE LOCATED ON THE SUPPORT BRACKET OPPOSITE THE DRIVE SYSTEM. REFER TO THE MSDS REPORT FOR FURTHER INFORMATION ON THE OIL IN THE UNIT. SOME OIL MAY SEEP OUT BETWEEN THE TURNTABLE AND THE BASE. THE OIL WILL SPLASH UP ON THE TURCITE SURFACE BETWEEN THE TURNTABLE AND BASE TO LUBRICATE IT. THIS OIL SEEPAGE IS NORMAL.

LOCKING: THE LOCKING MECHANISM ON THIS UNIT IS A SOLENOID ACTUATED INTERNAL PNEUMATIC TABLE CLAMP. THE SOLENOID VALVE MAY BE ENERGIZED TO CLAMP OR ENERGIZED TO UNCLAMP THE ROTARY TABLE. THE CLAMP AND UNCLAMP IS VERIFIED BY A SWITCH LOCATED IN THE MOTOR ENCLOSURE. THIS LOCKING DEVISE REQUIRES 80 TO 100 PSI NORMAL DRY SHOP AIR. WHEN AIR PRESSURE IS PRESENT AT THE BASE THE TABLE IS IN THE CLAMPED STATE. THIS CAN BE VERIFIED BY LOOSENING THE FLARED FITTING NUT ON THE AIRLINE FROM THE MOTOR/ENCLOSURE TO THE ROTARY TABLE.

GENERAL: ALWAYS PROGRAM THE TABLE TO ROTATE IN THE SAME DIRECTION IF POSSIBLE. IF IT IS NOT POSSIBLE TO ROTATE IN THE SAME DIRECTION GO BEYOND THE POSITION BY ABOUT 5 DEGREES AND THEN APPROACH IN THE PROPER DIRECTION. THIS IS DUE TO BACKLASH ERROR IN THE TABLE. IT IS BEST IF THE TABLE IS USED IN A FULL 360 DEGREE ROTATION. ROTATING IN A SMALL ARC WILL CAUSE WEAR ON THE WORMWHEEL ONLY IN THIS AREA AND WHEN THE BACKLASH IS ADJUSTED, THIS MAY CAUSE HIGH CURRENT IN THE LEAST USED WORMWHEEL AREA'S. ALWAYS TRY TO KEEP THE BACKLASH ADJUSTED OR THIS WILL CAUSE PREMATURE WEAR. THE FACEPLATE IS NOT REMOVABLE ON THIS UNIT AND THE (4) SOCKET HEAD CAP SCREWS ON THE FACEPLATE SHOULD NOT EVER BE REMOVED.

ADJUSTMENTS

(REFER TO ASSEMBLY DRAWING NO. 3788-2)

A) CENTER BEARING ADJUSTMENT:

TABLE THRUST: (SECTION A-A/B-B AND TOP VIEW)

TO CHECK TO SEE IF THIS ADJUSTMENT IS NECESSARY ATTEMPT TO PASS A .001" FEELER GAGE BETWEEN THE TABLE AND BASE TRACK. THE FEELER GAGE SHOULD NOT PASS BETWEEN THE TWO MEMBERS. IF IT DOES PROCEED WITH THE FOLLOWING STEPS.

- 1. REMOVE THE ROTARY TABLE FROM THE MACHINE.
- 2. REMOVE LIMIT SWITCH NO. 41 FROM THE TABLE BY REMOVING THE (2) SOC. HD. CAP SCREWS NO. 70. LEAVE THE SWITCH ATTACHED TO THE MOTOR ENCLOSURE LID.
- 3. REMOVE BUTTON HEAD SCREWS NO. 74 IN COVER NO. 12.
- 4. REMOVE COVER NO. 12. (THIS MAY BE DIFFICULT DUE TO THE SILICONE SEALANT).
- 5. REMOVE (4) FLANGE HEX NUTS NO. 58.
- 6. REMOVE TIMING BELT NO. 46 BY MOVING THE MOTOR ASSEMBLY IN TOWARD THE TABLE TO ALLOW ENOUGH SLACK IN THE TIMING BELT TO REMOVE IT.
- 7. REMOVE MOTOR AND COVER ASSEMBLY NO. 10 & 31.
- 8. REMOVE (8) SOCKET HEAD CAP SCREWS NO. 65 AND REMOVE CLAMP CAP NO. 17 FROM THE TABLE AFTER MARKING IT'S POSITION. (BECAUSE OF THE QUAD RINGS IT MAYBE DIFFICULT TO REMOVE). ROCK THE CLAMP CAP BACK AND FOURTH TO REMOVE IT.
- 9. REMOVE CLAMP DISC NO. 16. ROCK THE CLAMP DISK BACK AND FOURTH TO REMOVE IT.
- 10. LOOSEN (2) SOCKET SET SCREWS NO. 67. IN NUT NO. 15 AND SNUG UP NUT NO. 15 BY TURNING IT SLIGHTLY CLOCKWISE. THERE SHOULD BE NO CLEARANCE BETWEEN THE TURNTABLE AND THE BASE. THIS CAN BE CHECKED BY ATTEMPTING TO PUT A .001" FEELER GAGE BETWEEN THE TURNTABLE NO. 1 AND TURCITE NO. 52. THE FEELER GAGE SHOULD NOT PENETRATE BETWEEN THE THE TWO MEMBERS.
- 11. AFTER THE NUT NO. 15 HAS BEEN ADJUSTED, SECURELY TIGHTEN THE (2) SOCKET SET SCREWS NO. 67. CLEAN CLAMP DISK NO. 16 AND CLAMP CAP NO. 17 AND INSPECT QUAD RINGS NO. 39 AND 40 LUBRICATE THE QUAD RINGS BEFORE REASSEMBLING THE UNIT. USE AN ANTI-RUST LUBRICANT ON CLAMP PINS NO. 18. REPLACE THE SCOCKET HEAD CAP SCREWS NO. 65. (USE LOCKTITE TO KEEP THE SCREWS FROM BACKING OUT).
- 12. REPLACE MOTOR AND COVER ASSEMBLY NO'S. 10 AND 31.
- 13. REPLACE TIMING BELT NO. 35 AND FLANGE HEX NUT NO. 58. THE TIMING BELT SHOULD HAVE A SLIGHT AMOUNT OF FLEXIBILITY.
- 14. REPLACE COVER NO. 12 AND BUTTON HEAD CAP SCREWS NO. 74. A LIGHT COATING OF SILICONE SEAL ON THE EDGE OF THE MOTOR PLATE NO. 8 AND COVER NO. 12 WILL HELP TO EXCLUDE COOLANT.

B) WORM TO WORMWHEEL (BACKLASH):

THESE INSTRUCTIONS SHOULD BE FOLLOWED CAREFULLY AS IMPROPER MESHING BETWEEN THE WORM AND WORMWHEEL MAY CAUSE DAMAGE.

REDUCE BACKLASH: (REFER TO SECTION B-B/SECTION C-C)

TO DETERMINE IF THIS ADJUSTMENT IS NEEDED POSITION THE STYLUS OF AN INDICATOR ON THE SIDE OF ONE OF THE T-SLOTS, NEAR THE TABLE O.D. PLACE A ROD IN ANOTHER OF THE T-SLOTS AND PUSH AND PULL THE ROD MOVING THE TABLE C.W. AND C.C.W. RELAX THE PRESSURE ON THE ROD IN EACH DIRECTION TO CHECK TABLE MOVEMENT. THE INDICATOR SHOULD READ NO MORE THAN .001-.002 DEGREE OF MOVEMENT. IF THE BACKLASH EXCEEDS .001-.002 AT TURNTABLE O.D. PERFORM THE FOLLOWING STEPS.

- 1. REMOVE THE BUTTON HEAD CAP SCREWS NO. 74 HOLDING COVER NO. 12 TO MOTOR PLATE NO. 8 AND REMOVE COVER NO. 12.
- 2. LOOSEN THE (4) HEX HEAD BOLTS NO. 73 IN BRACKET NO. 5 AND THE (4) HEX HEAD BOLTS NO. 56 IN OUTBOARD SUPPORT BRACKET NO. 6. THIS WILL ALLOW BOTH BRACKETS NO. 5 & 6 TO MOVE FREELY.
- 3. LOOSEN (2) SOCKET SET SCREWS NO. 62 IN THE TOP SHELF OF THE BASE NEAR BRACKETS NO. 5 & 6, 1/4 OF A TURN.
- 4. TIGHTEN SOCKET HEAD CAP SCREW NO. 4. THIS WILL REDUCE THE CENTER DISTANCE BETWEEN WORMSHAFT NO. 3 AND THE WORMWHEEL NO. 4 (DO NOT OVERTIGHTEN THE SOCKET HEAD CAP SCREW NO. 64 OR IT MAY STRIP THE THREADS IN BRACKET NO. 5).
- 5. TIGHTEN THE (4) HEX HEAD BOLTS NO. 73 IN BRACKET NO. 5.
- 6. RECHECK THE BACKLASH PER THE INSTRUCTIONS ABOVE AND IF IT EXCEEDS .001-.002 RETURN TO STEP 2.
- 7. JOG THE TABLE TO SELF ALIGN THE OUTBOARD SUPPORT BRACKET NO. 6 TIGHTEN THE (4) HEX HEAD BOLTS NO. 56 WHILE THE TABLE IS ROTATING. REFER TO YOUR 850SX OR CURRENT CONTROL MANUAL FOR THE BACKLASH COMPENSATION INSTRUCTIONS.
- 8. REPLACE COVER NO. 12 AND BUTTON HEAD CAP SCREWS NO. 74. A LIGHT COATING OF SILICONE SEAL ON THE EDGE OF THE MOTOR PLATE NO. 8 AND COVER NO. 12 WILL HELP TO EXCLUDE COOLANT.

NOTE: DO NOT ADJUST THE BACKLASH TO TIGHT AS THE TORQUE REQUIRED TO ROTATE THE TABLE WILL GREATLY INCREASE.

C) END PLAY IN THE WORMSHAFT ASSEMBLY:

(REFER TO SECTION B-B AND C-C)

THIS IS NOT AN ADJUSTMENT THAT SHOULD BE PERFORMED OFTEN. ONCE EVERY 500 HOURS OF OPERATION IS RECOMMENDED OR IF THE BACKLASH ADJUSTMENTS DO NOT ELIMINATE THE BACKLASH PROBLEM.

- 1. REMOVE BUTTON HEAD SCREWS NO. 74 AND REMOVE COVER NO. 12.
- 2. TO DETERMINE IF THIS ADJUSTMENT IS NEEDED PLACE THE STYLUS OF AN INDICATOR ON THE END OF WORMSHAFT NO. 3. PLACE A ROD IN ONE OF THE T-SLOTS AND PUSH AND PULL THE ROD MOVING THE TABLE C.W. AND C.C.W. AND ALSO FORCING THE WORMSHAFT IN AND OUT. THERE SHOULD BE NO MORE THAN .0002" END PLAY IN THE WORMSHAFT ASSEMBLY. IF THE END PLAY OF WORMSHAFT NO. 3 EXCEEDS .0002 THEN CONTINUE.
- 3. LOOSEN (2) SOCKET SET SCREWS NO. 75 IN NUT NO. 13.
- 4. SNUG UP NUT NO. 13 BY TURNING IT SLIGHTLY CLOCKWISE FOR TAKEUP. PREVENT WORMSHAFT NO. 3 FROM ROTATING WHILE ADJUSTING NUT NO. 13 BY PLACING A ROD IN THE HOLE IN THE O.D. OF PULLEY BUSHING NO. 42.
- 5. SECURELY TIGHTEN (2) SOCKET SET SCREWS NO. 75 IN NUT NO. 13.
- 6. RECHECK THE END PLAY PER ABOVE INSTRUCTIONS STEP 2.
- 7. REPLACE COVER NO. 12 AND BUTTON HEAD SCREWS NO. 74. (A LIGHT COATING OF SILICONE SEAL ON THE EDGE OF MOTOR PLATE NO. 8 AND COVER NO. 12 WILL HELP TO EXCLUDE COOLANT).

NOTE:

DUE TO CONDENSATION IN THE AIR THE PULLEY'S MAYBE RUSTY IF EXCESSIVE RUST IS PRESENT THE PULLEYS MAYBE REMOVED AND SANDBLASTED OR CLEANED.

D) REPAIR PARTS:

REFER TO PRINT 3788-2 FOR ASSEMBLY AND PARTS INFORMATION. BEFORE CONTACTING THE FACTORY HAVE THE TABLE MODEL NUMBER AND LOT NUMBER FROM THE TAG LOCATED ON THE TABLE. SOME PARTS MAYBE PURCHASED FROM A LOCAL POWER TRANSMISSION COMPANY.

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E) ELECTRICAL: REFER TO VIEW D-D AND TOP VIEW/SECTION C-C. TO GAIN ACCESS TO THE ELECTRICAL ENCLOSURE REMOVE THE (7) PANHEAD PHILLIPS HEAD SCREWS IN ENCLOSURE NO. 10 LID. REMOVE THE LID AND THIS WILL ALLOW ACCESS TO THE MOTOR/SOLENOID VALVE/PRESSURE SWITCH/ZERO RETURN SWITCH AND THE TERMINAL STRIP.

E) TAILSTOCK:

THE OPTIONAL MANUAL TAILSTOCK IS SOMETIMES SUPPLIED WITH THE NC-10-B. THE TAILSTOCK IS GROUND TO THE SAME CENTER HEIGHT AS THE TABLE. THE TAILSTOCK HAS A REMOVABLE #3 MT DEAD CENTER. IT ALSO INCORPORATES A MANUAL QUILL LOCK. TO MOVE THE MANUAL QUILL LOCK FROM ONE SIDE TO THE OTHER SIDE, REMOVE THE QUILL LOCK HANDLE BY ROTATING IT C.C.W. UNTIL THE HANDLE IS FREE. DRIVE OUT THE THREADED STUD FROM THE TAILSTOCK BODY AND MOVE IT TO THE OTHER SIDE OF THE TAILSTOCK BODY. REPLACE THE QUILL LOCK HANDLE. THE TAILSTOCK SHOULD BE LUBRICATED THRU THE BALL OILER'S LOCATED ON THE TOP OF UNIT. SEE ASSEMBLY DRAWING 3144 FOR PARTS AND ASSEMBLY INFORMATION.

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