# BURGMASTER

# SERVICE MANUAL

## Model OB

**BENCH MODEL DRILLING AND TAPPING MACHINE**

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MANUFACTURED BY

BURGMASTER HOUDAILLE
13900 S. Broadway—Los Angeles, California 90061

1981

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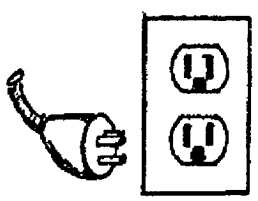
This manual is your introduction to the BURGMASTER Bench Model Drilling and Tapping Machine and, if thoroughly read, will give you valuable information in the installation, operation, and servicing of the BURGMASTER.

The manual should be available to operators, foremen, maintenance men and any other personnel that have dealings with the BURGMASTER, so that should it be necessary to make minor adjustments, it can be used for reference.

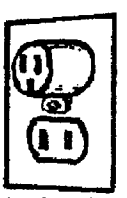
Quality materials and the finest engineering skill have been built into the BURGMASTER Bench Model Machine and, with the proper care and use, you are assured trouble-free, accurate, and economical operations for the life of the machine tool.

## SAFETY INSTRUCTIONS

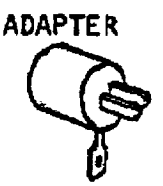
This tool should be grounded while in use to protect the operator from electric shock. The tool is equipped with an approved three-conductor cord and three-prong grounding type plug to fit the proper grounding type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. Never connect the green (or green and yellow) wire to a live terminal. Your unit has a plug that looks like that shown in sketch (A). An adapter, see sketches (B) and (C), is available for connecting sketch (A) type plugs to two-prong receptacles. The green colored rigid ear, lug etc., extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box.



GROUNDING BLADE (A) COVER OF GROUNDED OUTLET BOX



(B) COVER OF GROUNDED OUTLET BOX




(C) GROUNDING MEANS

BURGMASTER HOUDAILLE

## SAFETY INSTRUCTIONS

1. KEEP WORK AREA CLEAN
   Cluttered areas and benches invite accidents

2. AVOID DANGEROUS ENVIRONMENT
   Don't expose power tools to rain. Don't use power tools in damp or wet locations. Keep work area well lit.

3. KEEP CHILDREN AWAY
   All visitors should be kept safe distance from work area.

4. STORE IDLE TOOLS
   When not in use, tools should be stored in dry, high, or locked-up place - Out of Reach of Children.

5. DON'T FORCE TOOL
   It will do the job better and safer at the rate for which it was designed.

6. USE RIGHT TOOL
   Don't force small tool or attachment to do the job of a heavy-duty tool.

7. WEAR PROPER APPAREL
   No loose clothing or jewelry to get caught in moving parts.

8. USE SAFEY GLASSES
   Use safety glasses with most tools. Also face or dust mask if cutting operation is dusty.

9. DONT ABUSE CORD
   Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil, and sharp edges.

10. SECURE WORK
    Use clamps or a vise to hold work. It's safer than using your hand and it frees both hands to operate tool.

11. DON'T OVERREACH
    Keep proper footing and balance at all times.

12. MAINTAIN TOOLS WITH CARE
    Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

13. DISCONNECT TOOLS
    When not in use; before servicing; when changing accessories such as blades, bits, cutters, etc

14. REMOVE ADJUSTING KEYS AND WRENCHES
    Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.

15. AVOID ACCIDENTAL STARTING
    Be sure switch is off when plugging in.

INSTALLATION:

A. After removing from packing, remove all grease and mount feed handle, elevating screw and cotterpin and spindle guard, per drawing.

It is possible that part no. B01307 -- Follower Bracket, has been jarred loose in transit. Make certain that it is adjusted per paragraph C.

LUBRICATION:

A. Before operating machine the slide gear case and turret must be lubricated.

Proceed as follows:

1. Turret head and slide gear case should be filled with spindle #4 in operating position. Pipe plug will be found between spindles #1 and #6. Oil sight gage in face of turret should show full. Use only Mobil Gear #632 or equivalent.

2. Put a few drops of light machine oil daily on the slide portion of the gear box casting -- part #D05031-5.

3. No other lubrication is needed.

4. Gear box should be drained, flushed and refilled after first 50 hours of use.

NOTE: FOR BEST RESULTS CHANGE OIL IN GEAR BOX EVERY 300 HOURS OF OPERATION.

OPERATION:

A. A high and low speed range is provided by a two-step timing belt drive. To change speed range, remove belt cover at rear of machine and change belt to second range of pulleys.

B. Mount chucks and tapping heads to suit the sequence of operations for any particular job. Select sequence of speeds that will best suit the operations. (See speed chart on spindle guard).

Chuck mounting face and spindle shoulder should be free of dirt in order to insure accuracy.

1. A special bracket is provided for holding tapper body in position. Mount bracket to turret before mounting tapper

2. Using proper spindle extensions set all remaining chucks and tools so that the tools are all at approximately the same length from face of turret.

NOTE: FOR MOST ACCURATE RESULTS USE 5/32 CHUCKS AT THE HIGH SPEED STATIONS -- 6200 & 5400 rpm. On Standard Sequence Machines, these will be stations #1 and #4

C. Set head assembly to convenient working clearance over the work by raising or lowering body on columns. Loosen locking knob and raise or lower by turning elevating knob at top of columns. When proper height is reached re-lock in position.

D. Index machine through working cycle, setting depth stop screw and locking nut at each position to suit the work. The turret will index automatically when slide is raised to the top position, actuating the index mechanism. To repeat operations at one spindle without indexing, simply avoid raising the slide to the extreme top.

E. To skip a station or stations, first adjust depth-stop screw down to shortest stroke to prevent feeding an unused station.

A short downward and upward stroke of feed handle will allow turret to index to next station.

NOTE: DO NOT DOWN FEED UNTIL INDEX IS COMPLETED.

ADJUSTMENTS:

A. DEPTH STOP ASSEMBLY

1. If depth stop screws do not index to match the hardened stop pad on body casting, turn depth stop by hand until spring loaded ball is felt to drop into detent and alignment is correct. The depth stop casting incorporates a slip clutch that requires no adjustment -- part #B05821 -- depth stop plate, is driven by part #05832 -- detent drum, using a spring loaded ball driven by a detent.

2. To remove depth stop mechanism, remove 3 cap screws -- part A800804, and acorn nut -- part #05807.

3. To remove depth stop shaft -- part #05822, remove turret head, loosen set-screw -- part A05831, and remove depth stop shaft gear -- part B05823 from shaft and raise depth stop shaft from gear case stem.

NOTE: DEPTH STOP PLATE MUST BE REMOVED WHEN ANY COMPLETE DIS-ASSEMBLY OF SLIDE GEAR CASE IS REQUIRED. CRANK-SHAFT AND CAM-SHAFT CANNOT BE REMOVED OR REPLACED WHILE SHAFT GEAR IS IN POSITION.

B. COUNTER WEIGHT SPRING AND FEED HANDLE

1. The counter weight spring case -- part #01773-3 is also the means of increasing or decreasing the spring tension which counter-balances the feed mechanism. Depending on the weight of tooling being used, increase or decrease the tension by removing the thumb-screw at the back of the spring case from engagement and turning clockwise to increase, and counter-clockwise to decrease.

2. To change position of feed handle part #01771 remove all tension on counter weight spring part #01773 and remove set screw part A813006. Holding slide part #D05031 in it's upper position pull entire feed handle assembly outward until pinion is disengaged from rack, it is not necessary to remove completely. With feed handle in desired position carefully reinstall feed handle assembly. Replace set screw part A813006 and readjust counter weight spring.

3.** CAUTION: Replacement of the counter weight spring should be done with care as the spring could unwind and cause possible injury. It is suggested that a burlap bag be placed over the housing as the broken spring is pulled from the housing and while the new spring is being inserted.

4. Procedure for replacing the counter balance spring:

   a. Place blocking material beneath turret head and slide to prevent movement.

   b. Remove all tension on counter weight spring by loosening thumb screw part #01777 on spring housting part #01773 and carefully unwind tension.

   c. Loosen or remove set screw part #A813006. (Front side of casting near spring housing). Entire assembly can now be removed from body of machine.

   d. Mount assembly upright in a bench vise equipped with brass or aluminum jaws. Cover the spring housing with a burlap bag and remove feed handle part #01771. Carefully remove cover part #01774. Spring can now be viewed and the method of how to remove can be determined by the nature of its failure.

**CAUTION: The replacement spring is supplied with a "keeper".

Do not remove until the following steps are taken.

e. Place spring on shaft part #01775 centering the spring tail to set screw #A802902.

f. Insert the spring cut-out hole into the spring housing lug.

g. Using the handle assembly, turn the shaft part #01775 counter clockwise. This will position the spring tail onto the holding screw #A802902. As the spring is wound the keeper can be removed and the spring placed into the housing cavity.

h. Remove the handle assembly and replace the housing cover part #01774. Replace the handle assembly. The entire unit can now be installed in the machine body.

**CAUTION: The counter weight spring should not be adjusted so tightly that the slide will retract and index automatically.

C. FOLLOWER BRACKET

At the rear of the slide gear case is a bracket with 2 roller followers -- part #B01307. This bracket keeps the slide gear case free of side play. If radial side movement develops the slide, lightly tap bracket into a positive contact against both roller followers and tighten securely with Allen wrench.

D. TURRET HEAD

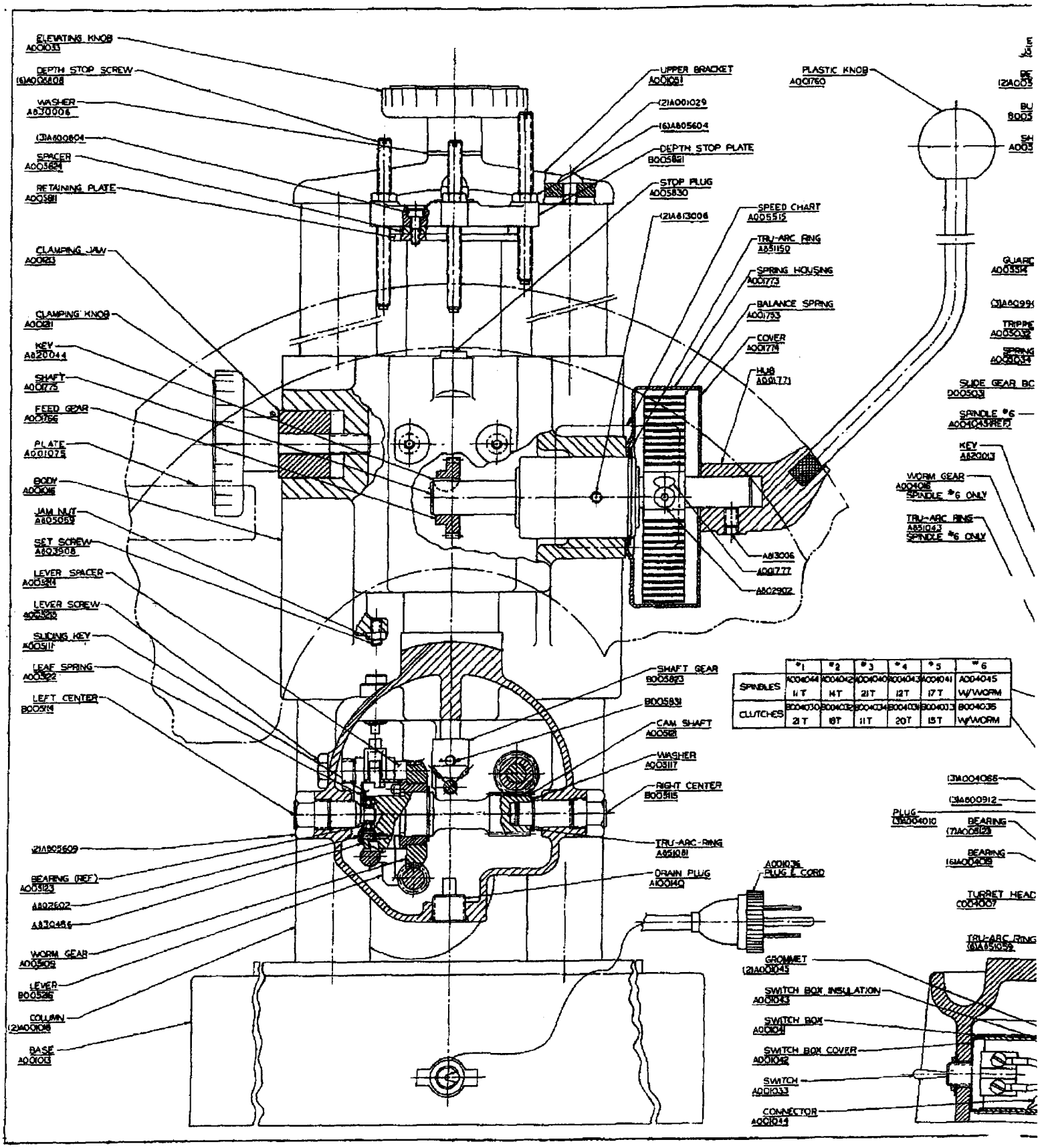
1. If turret head gives indications of being loose against the slide face, or an oil leak develops at bottom of turret between slide and turret, it indicates a loosening of the turret stud -- part A815028. To adjust, remove hex plug -- part #04018 on face of turret and using 7/16 socket wrench, tighten slightly.

2. To remove turret, loosen set screw -- part A05831, remove stud completely and pull turret head straight out.

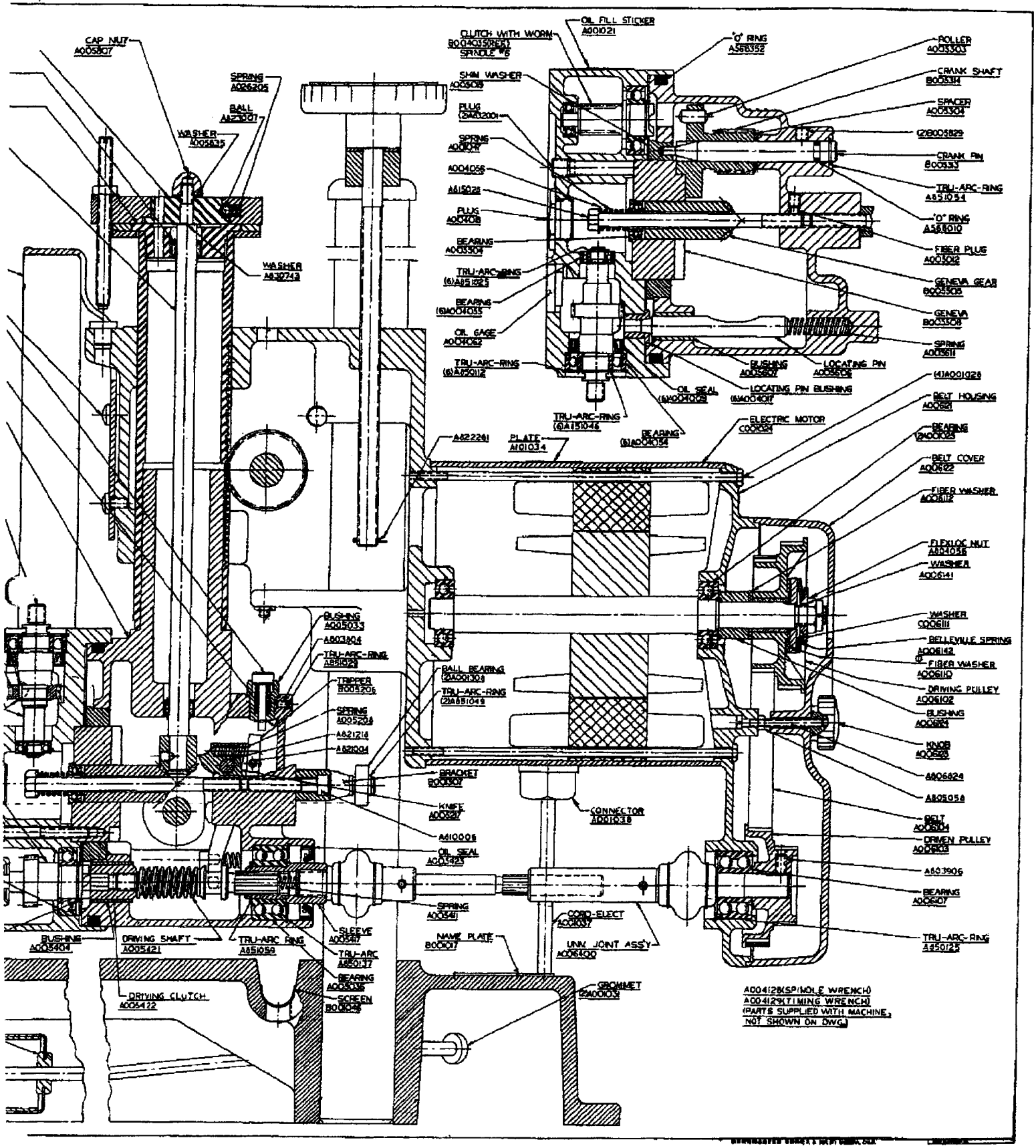
E. DRIVING CLUTCH

To replace Driving Clutch (05421), proceed as follows:

1. Remove Turret Head, following instructions for Turret Head Removal, page 8.




| | #1 | #2 | #3 | #4 | #5 | #6 |
|---|---|---|---|---|---|---|
| SPINDLES | A004044 11T | A004042 14T | A004040 21T | A004043 12T | A004041 17T | A004045 W/WORM |
| CLUTCHES | B004030 21T | B004032 18T | B004034 11T | B004031 20T | B004033 15T | B004035 W/WORM |


CAP NUT A005807
SPRING A006205
BALL A4230017
WASHER A005835
WASHER A4130743
CLUTCH WITH WORM B004035(REF) SPINDLE #6
OIL FILL STICKER A001021
"O" RING A568352
SHIM WASHER A005408
PLUG (2)A6A1001
SPRING A001017
A004056
A815028
PLUG A004008
BEARING A003304
TRU-ARC-RING (6)A851025
BEARING (6)A004035
OIL GAGE A001062
TRU-ARC-RING (6)A850112
TRU-ARC-RING (6)A151046
BEARING (6)A001054
OIL SEAL (6)A001008
BUSHING A005807
LOCATING PIN A005806
LOCATING PIN BUSHING (6)A004017
ROLLER A003303
CRANK SHAFT B005314
SPACER A005304
(2)B003829
CRANK PIN B005313
TRU-ARC-RING A851034
"O" RING A568010
FIBER PLUG A003012
GENEVA GEAR B005305
GENEVA B003308
SPRING A005611
(4)A001028
BELT HOUSING A00562
BEARING (2)A00028
ELECTRIC MOTOR COVER
BELT COVER A006022
FIBER WASHER A006112
FLEXLOC NUT A804036
WASHER A006141
WASHER A006111
BELLEVILLE SPRING A006142
FIBER WASHER A006110
DRIVING PULLEY A006102
BUSHING A006814
KNOB A006826
A806824
A805056
BELT A006004
DRIVEN PULLEY A006103
A803906
BEARING A006107
TRU-ARC-RING A850125
A822241
PLATE A101034
BUSHING A005033
A803804
TRU-ARC-RING A851023
TRIPPER B005206
SPRING A005208
A821214
A821004
BRACKET B00507
KNIFE A00507
A810006
OIL SEAL A001425
BALL BEARING (2)A001308
TRU-ARC-RING (2)A851049
CONNECTOR A001038
SPRING A005411
SLEEVE A005417
TRU-ARC-RING A851037
BEARING A005015
SCREEN B00504
CORD-ELECT A00507
NAME PLATE B00507
UNIV JOINT ASSY A006400
GROMMET (2)A00009
BUSHING A005404
DRIVING SHAFT A005421
TRU-ARC RING A851058
DRIVING CLUTCH A005422
A004128(SPINDLE WRENCH)
A004129(TIMING WRENCH)
(PARTS SUPPLIED WITH MACHINE, NOT SHOWN ON DWG.)

2. Insert Allen Wrench into front face of Driving Shaft #05421 and hold #05417 with open and wrench. This will allow the Driving Jaw to be unthreaded from Driving Clutch #05422.

3. Replace with new driving clutch and reinstall turret head.

F. RESETTING OF TURRET HEAD TO CORRECT "OVER" OR "UNDER" INDEXING

This machine has been properly set at the factory so that the indexing mechanism carries turret to the next position without over or under travel from final index position.

The mechanism indexes the turret head to an approximate position and a taper pin locates the turret head to a final accurate position. The Geneva Star Wheel is fastened to the turret head with three screws. Should these screws become loose during operation, it will result in over or under indexing. To reset, proceed as follows:

1. Loosen the three locking screws in face of turret.

2. Remove 1/16 pipe plug on face of turret, insert timing wrench part #04129.

3. Turn slightly to the right or left depending on whether the turret was over or under traveling at the end of the index cycle.

4. Re-tighten locking screws and test indexing.

IMPORTANT: WHEN TURRET IS PROPERLY SET, IT WILL HAVE A VERY SLIGHTLY CLOCKWISE MOVEMENT AT THE END OF THE INDEX CYCLE DUE TO THE LOCATING PIN ACTION IN THE TAPERED BUSHING.

5. Replace 1/16 pipe plug.

CAUTION: IF TURRET STUD IS TOO TIGHT TURRET WILL FAIL TO COMPLETE INDEX. CHECK ADJUSTMENT CAREFULLY.

G. SLIDE GEAR BOX

1. CRANK SHAFT TIMING --

The crankshaft -- part #A05424 must be set with the crank throw -- part #05303 at approximately two o'clock when the cam shaft is in normal disengagement from worm gear.

2. CAM SHAFT ADJUSTMENT

The cam shaft -- part #A05425 is held in position by the left and right centers, part nos. B05114 and B05115.

To adjust cam shaft, loosen jam nuts at both centers and by turning centers locate cam shaft in the position that will allow knife -- part #05217 to drop into groove without interference.

Check adjustment by raising slide to actuate thr tigger pin and raising and lowering knife to assure an exact setting. Retighten jam nuts and check setting by rotating brass washer -- part #05117.

Washer must be free to turn.

NOTE: IF EITHER CAM SHAFT CENTERS OR CRANKSHAFT PIN ARE TOO TIGHT, IT WILL RESULT IN A BINDING ACTION THAT CAUSES A DOUBLE ACTION OF THE DRIVING SHAFT AND LOCATING PIN DURING THE INDEX CYCLE.

H. ADJUSTMENT OF MACHINE CLEARANCE

In order to increase or decrease clearance spindle to base, first loosen clamp knob #A001211, then turn elevating knob #A001053 clockwise to increase clearance and counter clockwise to decrease clearance.

Tighten Clamp Knob #A001211.

CAUTION: COTTER PIN A822261 SHOULD ALWAYS BE IN PLACE AND NOT REMOVED FROM ELEVATING SCREW. REMOVAL OF COTTER PIN COULD ALLOW THE BODY CASTING TO DROP, IF THE ELEVATING ASSEMBLY WAS TURNED TOO FAR.

ELECTRIC MOTOR

1. The 110-V, single phase motor is manufactured by the General Electric Company and carries Manufacturer's Warranties. It is provided with an overload safety mechanism which will automatically break contact if the motor overheats dangerously. To reset, wait a few moments for motor to cool then press reset button at side of motor shell.

   This motor is rated at $50^{\circ}$ Centigrade rise and will operate at temperatures as high as $190^{\circ}$ without injury to the motor and without thermo reset 'kicking' out.

2. Other Motor repairs can be obtained at any authorized G.E. service station.

FACTORY SERVICE

1. For major repairs or adjustments contact your local distributor.

2. For information on special length of columns, or special sequence of speeds at spindles, contact your local distributor.

SEQUENCE CHANGE OF TURRET SPINDLE SPEEDS

1. In order to disassemble or attempt a change of sequence of turret spindle speeds, it is necessary that you have available BURGMASTER Spindle and Clutch Puller -- part #B01501 and a minimum of two -- part #04009 oil seals, in the event that any seals are damaged in disassembly.

2. DISSASSEMBLY OF TURRET HEAD

   A. Remove plug -- part #04018 at turret face.

   B. With 7/16 socket wrench, remove turret stud -- part #04051, first loosening set screw part #05829.

   C. Remove Turret from slide.

   D. With spindle and clutch puller -- part #B01501, remove clutch assembly.

   E. Remove Truarc Ring -- part #04067.

   F. With puller, tap out spindle assembly.

   G. Press in new spindle assembly and replace Truarc Ring.

   H. Tap in mating clutch, being careful that gears mesh properly while pressing.

   I. Remount turret and stud.

   J. Reset turret head per paragraph F.

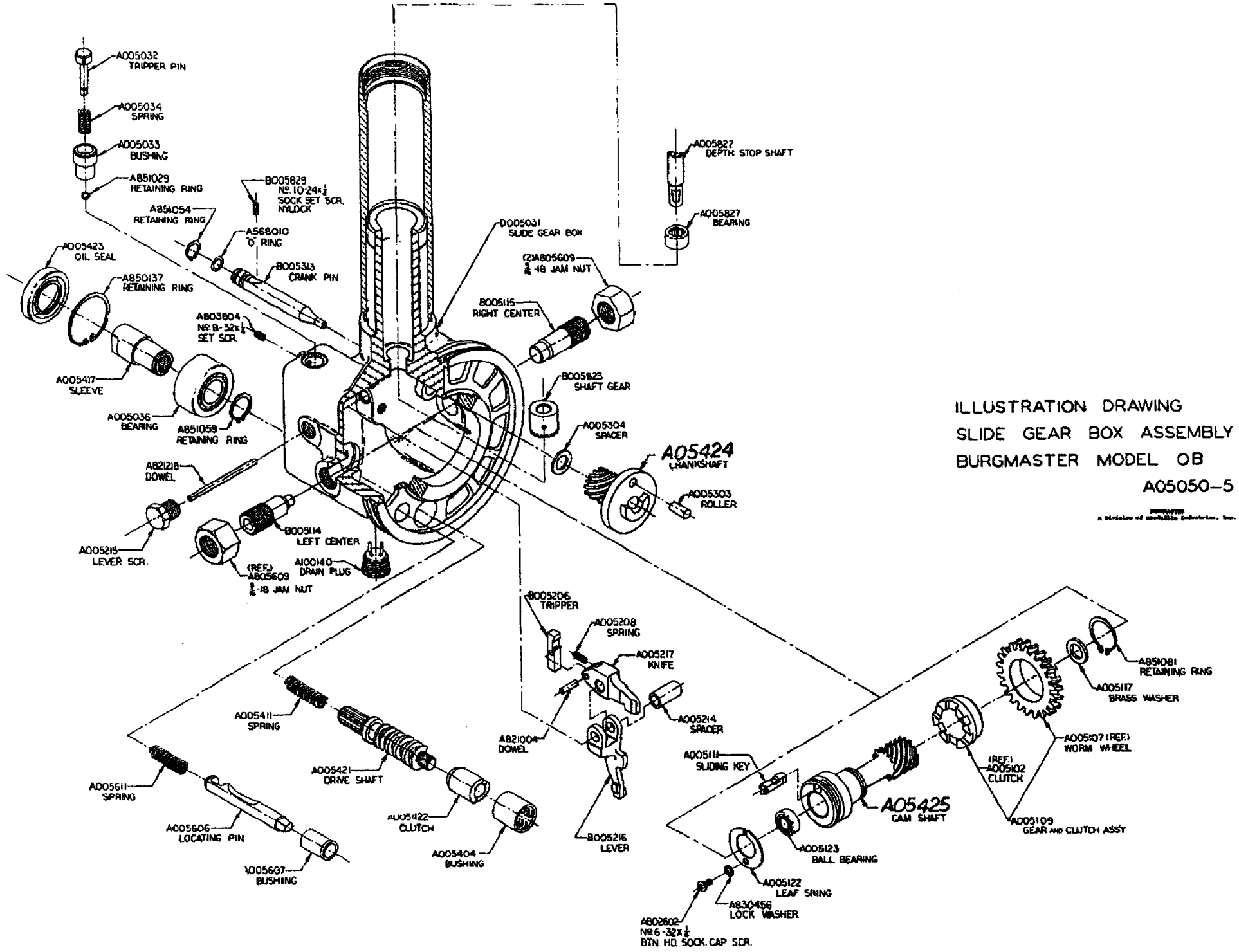
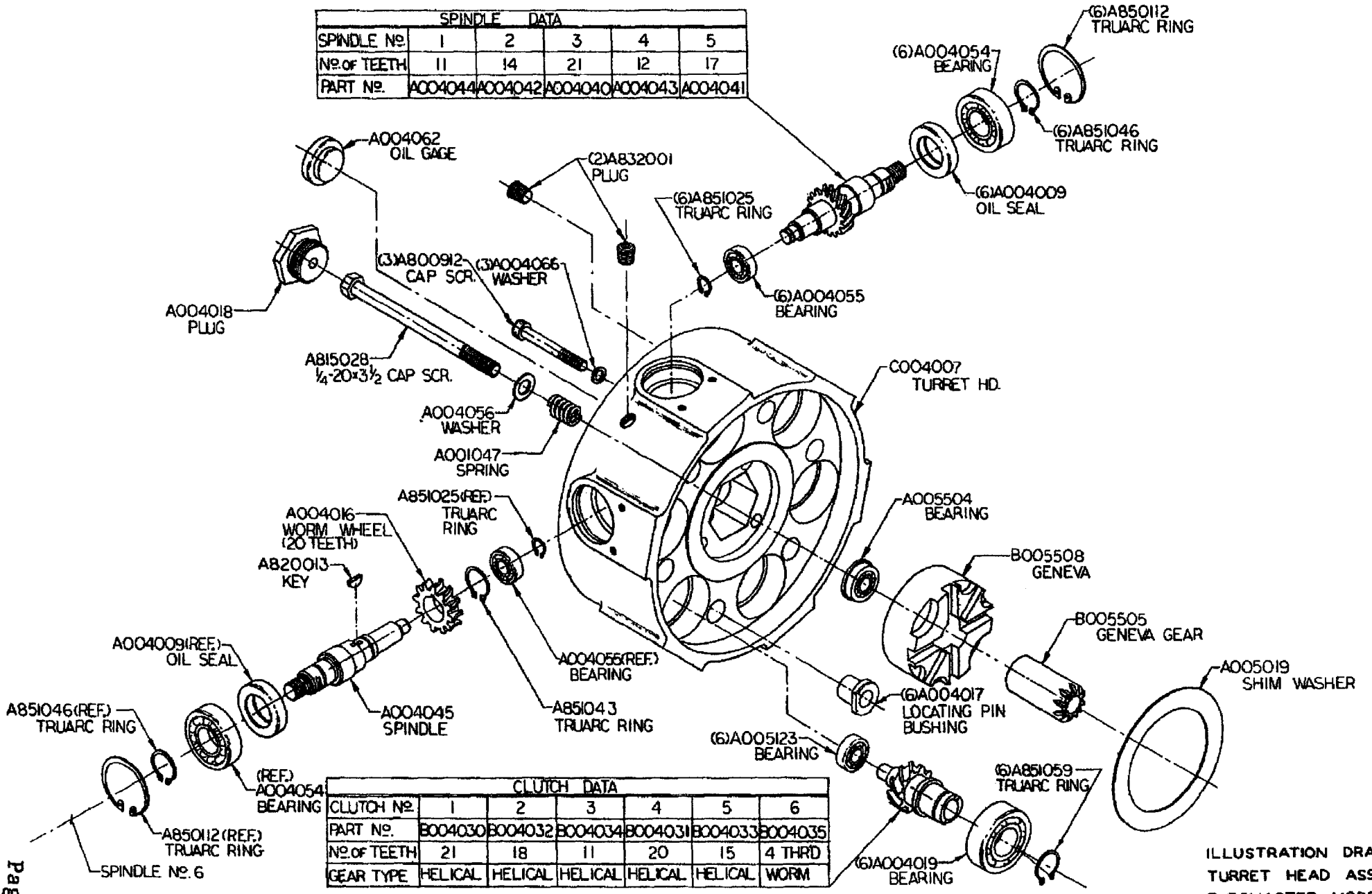


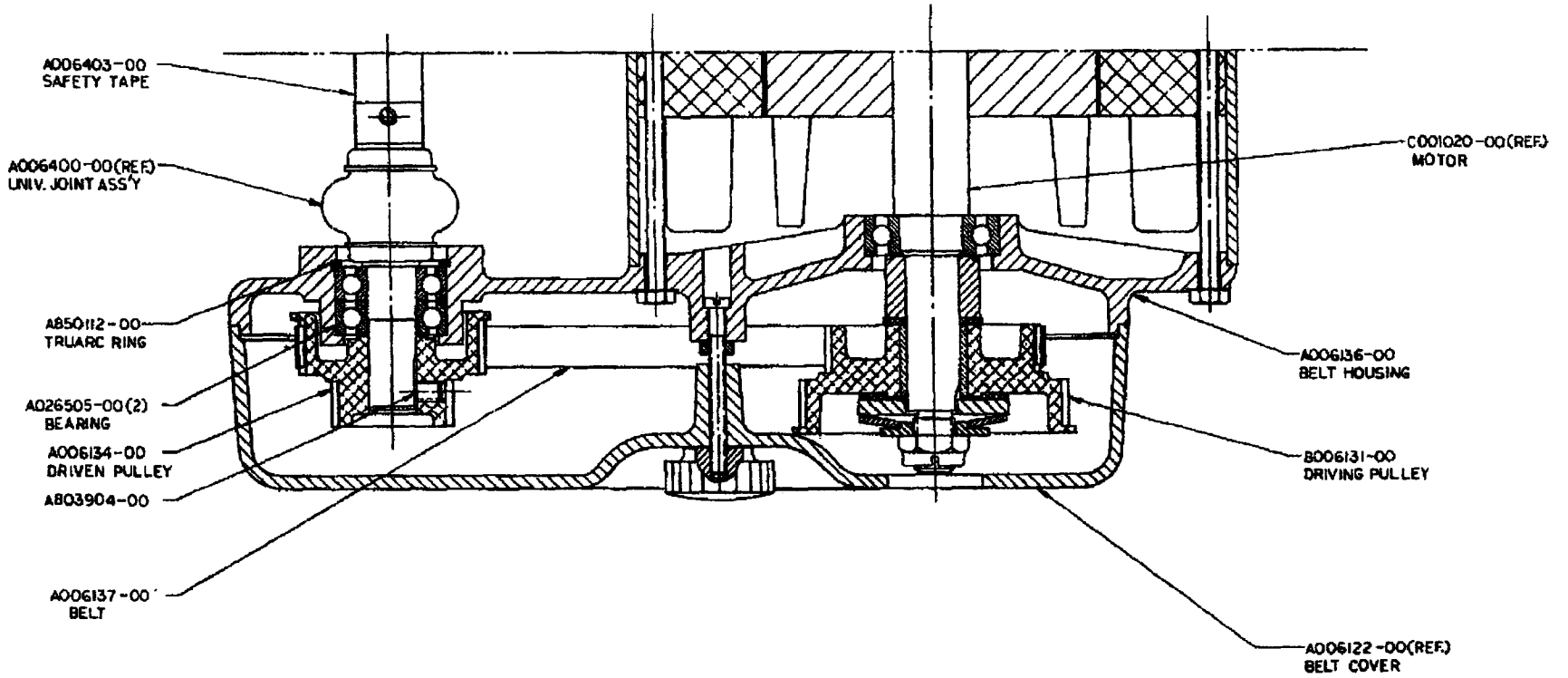

ILLUSTRATION DRAWING
SLIDE GEAR BOX ASSEMBLY
BURGMASTER MODEL OB
A05050-5




| SPINDLE DATA | | | | | |
|---|---|---|---|---|---|
| SPINDLE Nº. | 1 | 2 | 3 | 4 | 5 |
| Nº. OF TEETH | 11 | 14 | 21 | 12 | 17 |
| PART Nº. | A004044 | A004042 | A004040 | A004043 | A004041 |

| CLUTCH DATA | | | | | | |
|---|---|---|---|---|---|---|
| CLUTCH Nº. | 1 | 2 | 3 | 4 | 5 | 6 |
| PART Nº. | B004030 | B004032 | B004034 | B004031 | B004033 | B004035 |
| Nº. OF TEETH | 21 | 18 | 11 | 20 | 15 | 4 THRD |
| GEAR TYPE | HELICAL | HELICAL | HELICAL | HELICAL | HELICAL | WORM |

ILLUSTRATION DRAWING
TURRET HEAD ASSEMBL
BURGMASTER MODEL O
A04100-




NOTE:
1. FOR PARTS NOT CALLED OUT SEE ASSY DWG. [illegible]

**50HZ DRIVE ASSEMBLY**

**B006130-00**