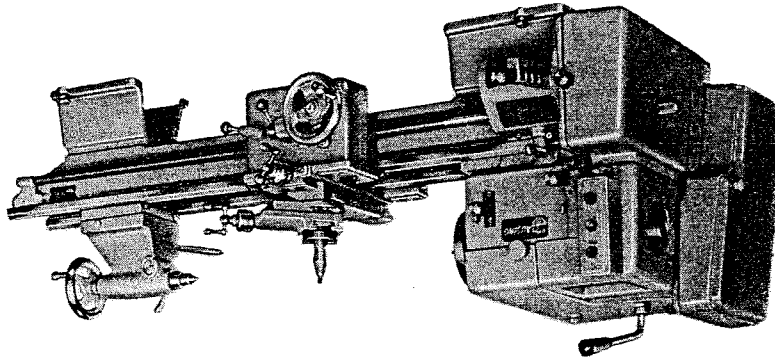




**12-inch LATHES  
No. 5300 SERIES  
CLAUSING**



**OPERATING MANUAL  
and  
PARTS LIST**

**LATHE BULLETIN  
5300 - X**

11111111

For SWS up to 001077

# Instructions for Mounting and Leveling the Lathe

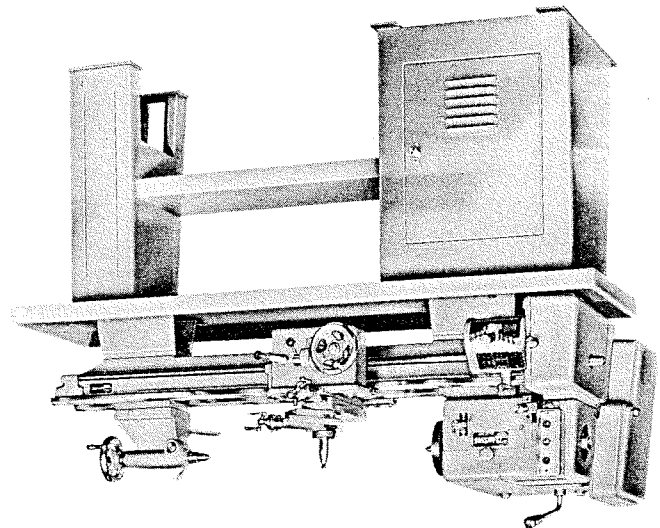
**IT IS YOUR RESPONSIBILITY** to properly level the lathe — it is the first essential for accurate work and long service life. Satisfactory performance is impossible if the lathe bed is out of level as little as one thousandth of an inch.

## To Do It Right -

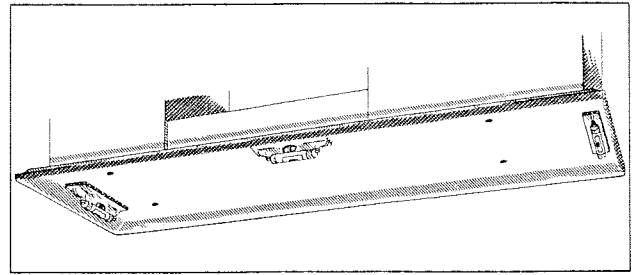
- First install pedestal cabinet or bench before mounting the lathe
- Next level the pedestal cabinet or bench
- Then mount and level the lathe

### PEDESTAL CABINET INSTALLATION

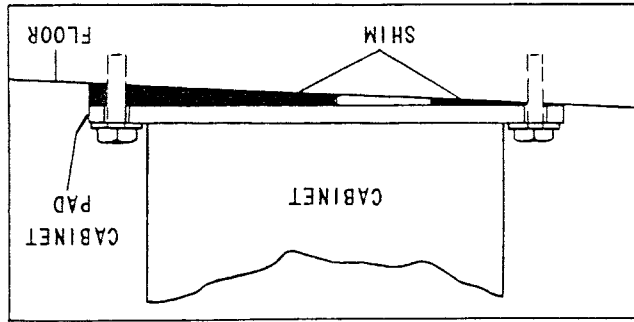
1. Mount cabinet on a concrete floor or base whenever possible — if a wood floor is used, it should be well braced, capable of absorbing vibration and withstanding the load. Make sure cabinet rests solidly on the floor.
2. Fasten cabinet to concrete by marking location of mounting holes and drilling holes large enough to receive expansion bolts, or set studs or bolts in melted lead. Use lag screws or bolts to fasten cabinet to a wood floor.
3. Cabinet must be bolted to floor, otherwise vibration will result.
4. Level the cabinet — use a precision machinist level. Place shims as required between pads and floor, to accurately level the top. Shims should be of hardwood or metal and bear under at least 75% of the cabinet pads as shown in Figure 3.
5. Mount the lathe. Two mounting holes are in the cabinet top to fasten the headstock end of the lathe. Position lathe over the holes. Mark and drill two 1/2" dia. holes to fasten the lathe leg at the tailstock end. Bolt lathe to cabinet using bolts furnished. Do not tighten bolts securely. Lathe may now be leveled — see instructions LEVELING THE LATHE, page 5.



1. Lathe mounted on metal cabinet.



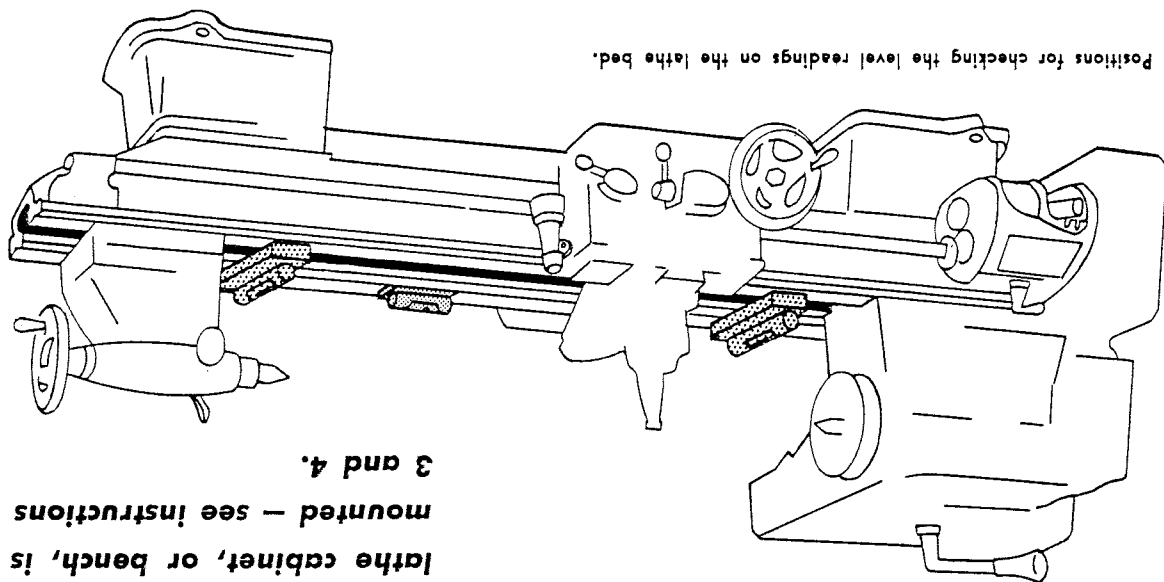
2. Positions to check level readings on cabinet or bench top.



3. Use shims made of hardwood or metal to level the cabinet. Shims should bear under at least 75% of the cabinet pads as shown above.

**BE SURE YOU HAVE FOLLOWED THESE INSTRUCTIONS COMPLETELY BEFORE LEVELING THE LATHE.**

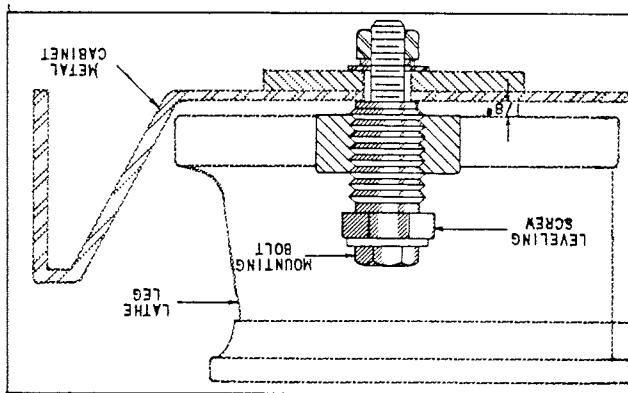
Before leveling the lathe be sure the lathe cabinet, or bench, is properly mounted — see instructions on pages 3 and 4.



6. Positions for checking the level readings on the lathe bed.

## Leveling the Lathe

1. Screw down the four leveling screws, raising the lathe so that lathe legs at no point touch cabinet top — approximately  $\frac{1}{8}$ " clearance is sufficient — see fig. 7.
2. Use a precision machinist's spirit level to level the lathe. A VERY SENSITIVE LEVEL SHOULD BE USED. Level should be at least 6" long and should show a distinct bubble movement when a .003" shim is placed under one end of the level.
3. Lathe bed must be leveled longitudinally to within .002" per foot before leveling the ends.
4. Both ends of the lathe bed — the headstock end and the tailstock end — must be checked with the level



7. The four leveling screws furnished with lathe will quickly and accurately level the lathe.

5. Level reading in both positions must be identical. Compensate variations of bubble readings by turning the leveling screws until lathe is level — see fig. 7.
6. Now tighten the four mounting bolts securely.
7. Again check the level of the lathe with the level. Tightening the bolts may have pulled lathe bed out of level. If further adjustment is necessary, hold bolt head with wrench while adjusting leveling screws.

**CHECK THE LEVEL OF THE LATHE AT FREQUENT INTERVALS** to assure accurate turning. If the lathe is not properly leveled, it will twist the bed resulting in misalignment of the headstock and tailstock with the ways, causing lathe to chatter - turn taper - uneven wear - bore taper - face convex or concave - ruin spindle bearings and make carriage bind.

# Maintenance and Controls

**DO NOT OPERATE THE LATHE** — until you are thoroughly familiar with all the controls and their functions (read carefully the instructions **MAINTENANCE AND CONTROLS**). Then operate the lathe in back gear — get the "feel" of the controls — set up different threads and feeds — engage the power feeds — get acquainted with the lathe before you start a job — it will save time and produce better work.

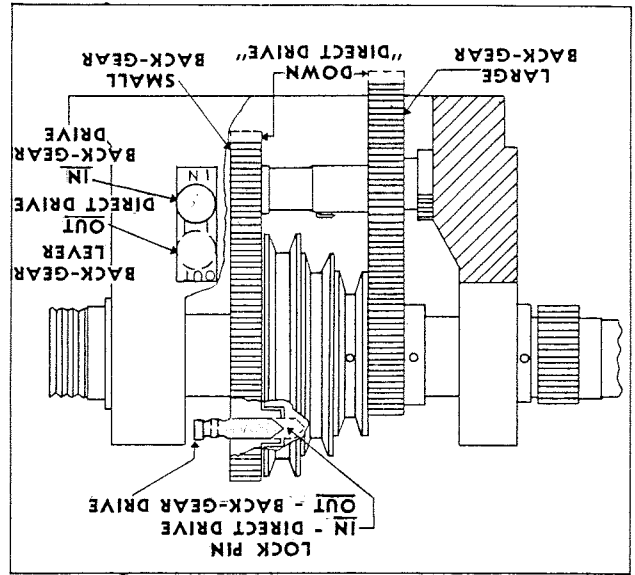
## SPINDLE DRIVE

(See Figure 9)

**FOR DIRECT DRIVE** — turn pulley until lock pin can be reached and engage lock pin with the pulley, locking pulley to the bull gear and spindle. Raise back gear lever to the disengaged, or out, position. Lathe is now in direct drive.

**FOR BACK GEAR DRIVE** — pull out lock pin, disengaging bull gear from pulley. Lower back-gear lever to the "IN" position, meshing back gears with spindle gears — it may be necessary to rotate spindle pulley to mesh gears.

**CAUTION** — Always stop motor before changing from one drive to another.

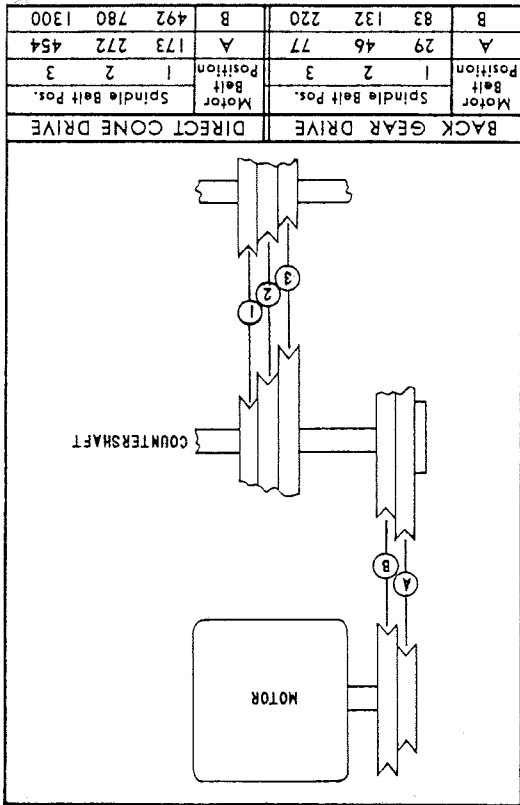


9. Position of back gears, lever and lock pin to drive spindle in back-gear (shaded) and in direct drive (broken line).

## LATHE COUNTERSHAFT

Countershaft has friction clutch and brake for instant starting and stopping of the spindle without stopping the motor. Moving clutch lever to left engages spindle drive — to the right disengages it. Moving lever to extreme right tightens the brake shoe stopping the spindle.

Speed changes are made by raising the spindle-countershaft guard which slackens the drive belt for easy belt changes. Raise guard by pushing in and upward on the guard lock knob. The chart, Figure 10, lists the speeds available and shows how they are obtained.



10. Spindle speed chart, listing speeds available, and diagram showing how they can be obtained.

When one of these levers is engaged, the other is locked and cannot be moved — DO NOT FORCE. The positions of the levers to obtain a thread or feed are illustrated in Figures 13, 14 and 15. The direction of feed is controlled by the reverse lever on front of headstock.

## SELECTION OF THREADS AND FEEDS

Study the chart on the gear box — it lists the threads and feeds available and indicates the position of the controls for thread or feed desired. Figure 16 illustrates and names these controls.

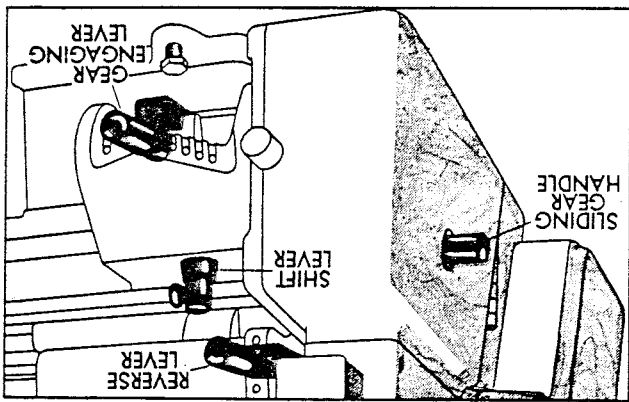
NOTE: The gear chart shows only the carriage longitudinal feeds that are commonly used. Many other feeds can be obtained — these are shown in the table, Figure 17, along with the cross feeds available. To obtain one of these longitudinal or cross feeds, set up the lathe gear box for the equivalent thread as shown in the table. FOR EXAMPLE — To obtain a carriage longitudinal feed of .0033", set up the controls to cut 44 threads.

## SEQUENCE OF ENGAGING CONTROLS FOR THREADS OR FEEDS ARE OUTLINED BELOW:

1. Disengage the carriage feed controls.
2. Move sliding gear handle "In" or "Out" as indicated on chart for thread or feed desired.
3. Release and lower gear engaging lever.
4. To make sure gears in the quick-change gear box will engage, first start motor. Now move gear engaging lever to the slot directly below thread or feed desired. Raise lever and snap plunger into position.

5. Next, check the chart for position of the shift lever. There are three positions — center, left and right. Shift the lever to position indicated on chart. (It may take a few seconds for the dog gears to engage if the lathe is in back gear or turning slowly.) Lathe is now ready to cut thread or feed.

The threading dial is used in thread cutting and indicates the proper time to engage the half-nut lever so that the cutting tool will enter the same groove of the thread for each cut. When cutting even numbered threads engage the half-nut lever at any one of the markings on the



16. Controls used to obtain a thread or feed.

threading dial for each cut of the thread. When cutting odd numbered threads, engage the half-nut lever for the first cut and all successive cuts at either the 1 or 2 positions on the dial. When cutting half-nut threads, engage the half-nut lever at the same mark on the threading dial for each cut of the thread.

Thds. Per Inch	Carriage Long Feed	Cross Feed	Thds. Per Inch	Carriage Long Feed	Cross Feed
4	.0367	.00917	32	.0046	.0011
4.5	.0326	.0081	36	.0041	.0010
5	.0293	.0073	40	.0036	.0009
5.5	.0267	.0066	44	.0033	.0008
5.75	.0255	.0063	46	.0031	.00079
6	.0244	.0061	48	.0030	.00076
6.5	.0226	.0056	52	.0028	.00070
7	.0209	.0052	56	.0026	.00065
7.75	.0218	.0054	54	.0027	.00068
8	.0183	.0045	64	.0022	.00057
9	.0163	.0040	72	.0020	.00052
10	.0147	.0036	80	.0018	.00045
11	.0134	.0033	88	.0017	.00041
11.5	.0127	.0032	92	.0016	.00039
12	.0122	.0030	96	.0015	.00038
13	.0113	.0028	104	.0014	.00035
13.5	.0109	.0027	108	.00136	.00034
14	.0105	.0026	112	.0013	.000325
16	.0092	.0023	128	.0011	.00027
18	.0081	.0020	144	.00094	.000235
20	.0073	.0018	160	.00092	.000225
22	.0066	.00166	176	.00083	.00020
23	.0063	.00159	184	.00079	.000197
24	.0061	.00152	192	.00076	.000190
26	.0056	.0014	208	.00070	.000175
27	.0054	.00136	216	.00068	.00017
28	.0052	.0013	224	.00065	.00016

17. Chart listing available threads per inch with equivalent carriage longitudinal and power cross feeds.

## BELT ADJUSTMENT ON HORIZONTAL COUNTERSHAFT LATHES

SPINDLE BELT — This belt can be easily adjusted with the four countershaft adjusting screws, see Figure 22. Belt should be just tight enough to prevent slipping when hood is lowered.

**IMPORTANT — Do not tighten the four countershaft adjusting screws too tightly — it may compress the outer bearing sleeve and distort the bearing, causing permanent damage. Turn screws up until they are finger tight, then about 1/8" turn more, and lock.**

**MOTOR BELT —** Correct motor belt tension is obtained by adjusting the spring tension nut located on underneath side of motor base — see Figure 8. Belt should be just tight enough to prevent slipping.

## HOW TO REMOVE HEADSTOCK SPINDLE

(See Figure 19)

1. Remove guard that covers top left side of headstock.

2. Remove screw that holds top of quadrant to headstock. At the same time loosen nut that's on the screw.

3. Loosen lock screw at bottom of quadrant and lower quadrant assembly.

4. Pull out the feed reverse lever and remove the feed reverse gear assembly from headstock.

5. Loosen lock screw in collar "A" and remove collar — make sure not to lose brass plug beneath screw.

6. Slide spindle gear "B" off spindle. If gear sticks, tap it lightly with a piece of wood. Remove key from spindle with pliers.

7. Next, remove the grooved collar "C."

8. Loosen lock screw in collar "D."

9. Wedge two pieces of wood between headstock and large spindle gear "E" on both sides of spindle. Then, with a soft hammer drive spindle out the front of headstock until key that drives the spindle gear "E" is exposed. Remove key with pliers.

10. Now continue to drive out the spindle — BE SURE to catch it as it is released from the headstock. If spindle belt is being replaced, first remove the countershaft — see REMOVING COUNTERSHAFT SPINDLE ASSEMBLY, page 12, then continue as follows.

12. Remove the two screws and sleeves that hold the hood to countershaft support bracket and remove hood.

13. Remove countershaft support bracket from rear of headstock. Bracket is held with three screws and two dowel pins. After screws are removed, pry bracket off headstock.

## RE-ASSEMBLING THE HEADSTOCK SPINDLE

1. Clean all parts thoroughly, including the bearings, and lightly file off all burrs from the spindle.

2. Place new belt, or bearings in position — make sure front spindle bearing and washer are tight against spindle shoulder.

3. Place spindle through front of headstock and then slide on the large spindle gear, pulley, collar "D" and belt. Replace key. Position gear tight against spindle shoulder and spindle pulley against the gear. Then lock collar "D" against spindle pulley. **IMPORTANT —** Use palm of your hand or a soft hammer when replacing the spindle — it will avoid damaging the precision surfaces of the spindle nose.

4. Place rear spindle bearing cone on spindle and carefully tap it on to spindle just far enough to mount spindle gear "B", and start collar "A" on the spindle threads.

5. Tighten collar "A", moving bearing farther on spindle — tighten until collar stops at end of threads.

6. Remove collar "A" and gear "B" and place spacer "C" on spindle. Replace gear, collar and tighten collar until no lateral play in spindle can be felt when tapping spindle back and forth with the hand.

7. Again remove collar and gear and replace bearing dust cover and key in spindle.

8. Replace gear "B" and take-up collar "A". Tighten collar until all lateral (end) and radial (side) play has been removed from the spindle. Check by tapping back and forth with a soft hammer. **DO NOT** tighten collar too tightly — spindle should rotate freely.

9. To determine correct bearing preload, give spindle pulley a sharp spin with your hand — pulley should rotate about one turn. If it doesn't, adjust collar "A", then recheck. When properly adjusted, tighten lock screw in collar "A" — make sure brass plug is beneath screw.

10. Replace front dust cover.

11. Replace tumbler assembly.

12. Raise quadrant so gears are in mesh and lock in position with screw and nut that holds upper end of quadrant to headstock clamp. Tighten screw until screw head is against quadrant, then tighten nut against back of quadrant.

13. Tighten lock screw on lower part of quadrant. Replace headstock guard.

15. If spindle belt is being replaced, install countershaft as follows.

16. Fasten countershaft support bracket to rear of headstock — make sure bracket is between the belt.

17. Replace hood — adjust so it's flush with front of headstock.

18. Mount countershaft spindle assembly — see page 13, RE-ASSEMBLING COUNTERSHAFT SPINDLE ASSEMBLY.

## RE-ASSEMBLING COUNTERSHAFT SPINDLE ASSEMBLY

1. Place countershaft spindle assembly in bearing hangers. Tighten just enough to hold spindle in bearings and tighten the two rear countershaft adjusting screws. Tighten just enough to hold spindle in bearing hangers. Lock in place with the lock nuts.

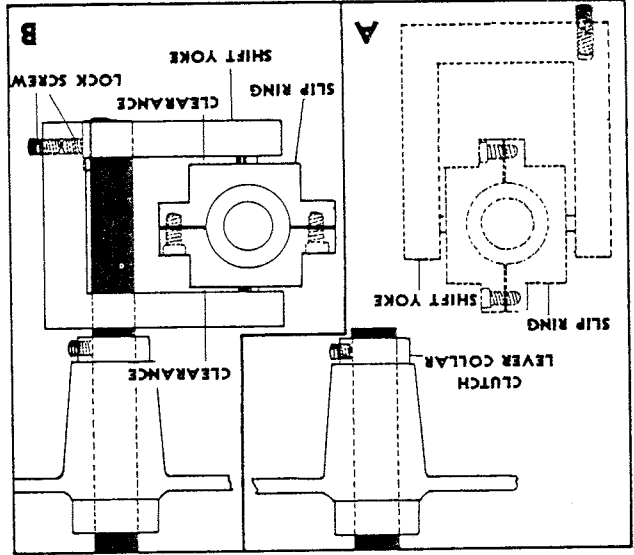
2. Slide clutch lever through hole in top of hood. Replace clutch lever collar and temporarily position about  $1/2$ " above end of lever — tighten screw in collar just enough to hold collar in place.

3. Turn slip ring (see Figure 23A) so pins are in a horizontal position and the cap screw heads face headstock.

4. Now slide shift yoke over the slip ring pins and swing yoke up so it's in line with clutch lever — see Figure 23B. Push lever through shift yoke. Line up keys and replace key. Lock yoke to lever with the two socket set screws.

5. Make sure shift yoke isn't touching upper or lower slip ring. If it is loosen collars on lever above and below hood and adjust lever. Lock in this position by locking collars against hood.

6. Replace countershaft spindle pulley, grease cap and belt. Large step of pulley should be toward outside.



23. Installing the shift yoke.

## CLUTCH COUNTERSHAFT ADJUSTMENT

If the countershaft clutch slips when the spindle drive is engaged, adjust as follows:

First remove the lock screw that's just ahead of the clutch adjusting screw—see Figure 24. Then tighten

13

clutch adjusting screw just enough to prevent slippage. DO NOT tighten screw too tight — spindle drive will not disengage when clutch lever is moved to the right if screw is too tight.

If clutch still slips, it's an indication grease has worked into clutch mechanism and the clutch assembly must be removed from the spindle and cleaned thoroughly with kerosene or gasoline. To remove:—

1. First remove countershaft spindle assembly — see "REMOVING COUNTERSHAFT SPINDLE ASSEMBLY", page 12.

2. Next, remove the 3-step countershaft pulley by taking off the grease cup, collars, and bearing race from right end of spindle (end opposite the large two-step pulley).

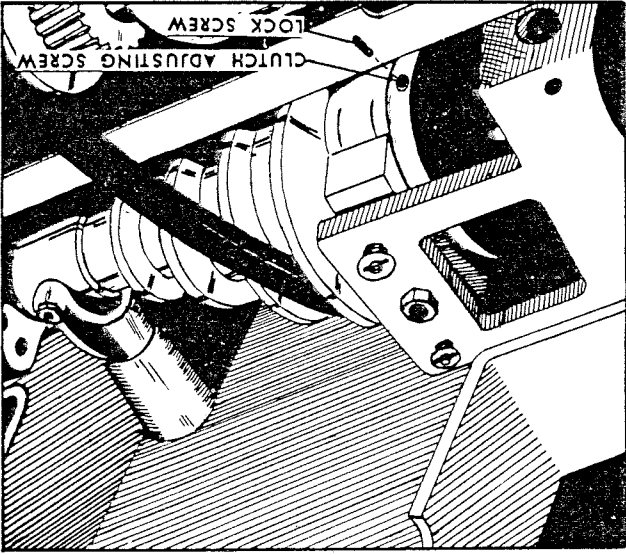
**IMPORTANT** — Make sure parts are kept in the order they are removed, especially the fibre washers — they must be replaced in their original positions.

3. Clean bore of pulley hub and clutch ring with kerosene or gasoline.

4. Re-assemble parts. Make sure that lock screws in collar next to pulley seat into holes in spindle.

5. Mount countershaft spindle assembly in hangers and replace 2-step pulley and belt — see "RE-ASSEMBLING COUNTERSHAFT SPINDLE, this page.

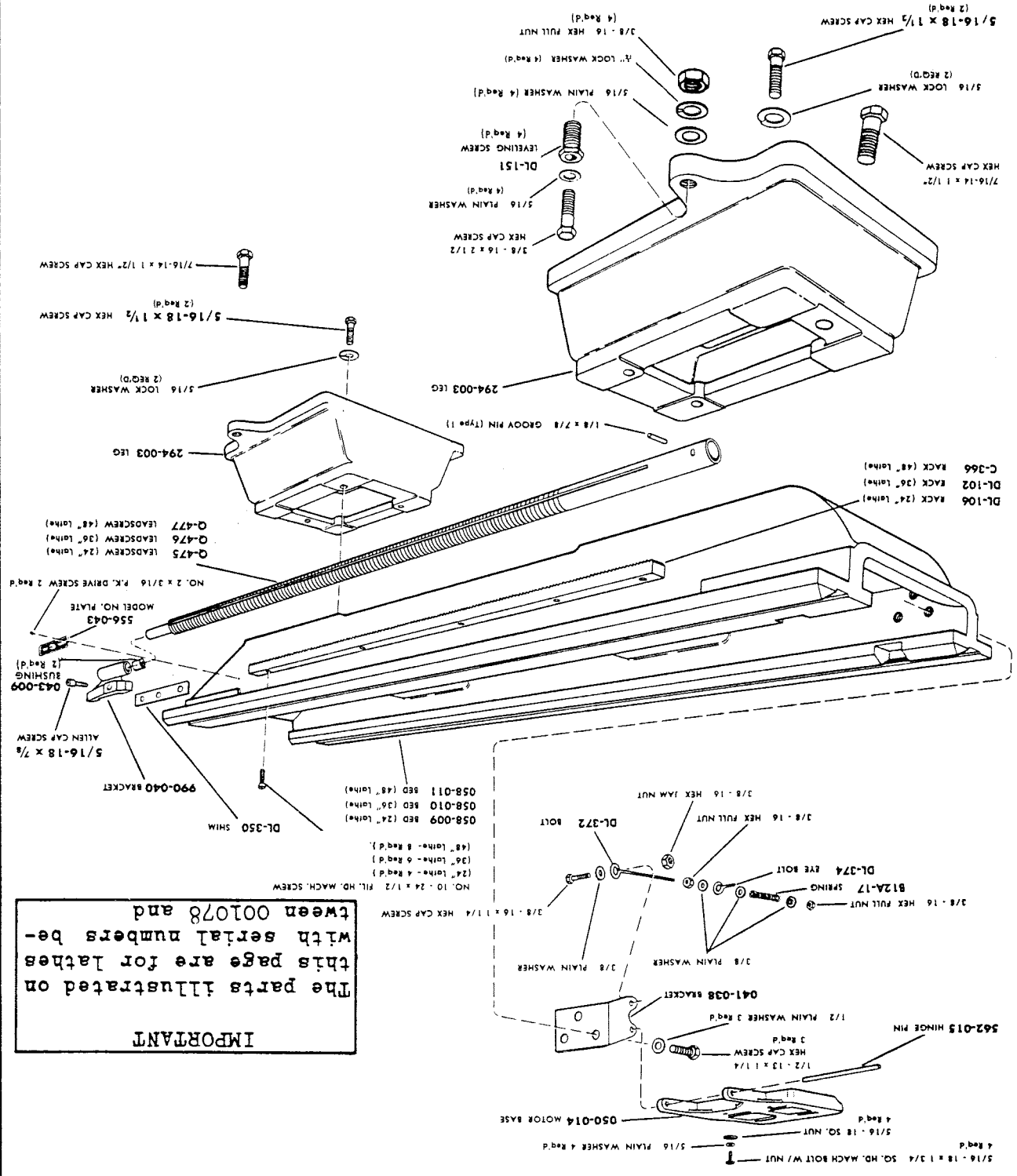
6. Adjust clutch with the clutch adjusting screw — see Figure 24.



24. Tighten clutch adjusting screw if countershaft clutch slips when spindle drive is engaged.

# BED AND LEADSCREW ASSEMBLY

**IMPORTANT**  
 The parts illustrated on  
 this page are for lathes  
 with serial numbers be-  
 tween 001078 and





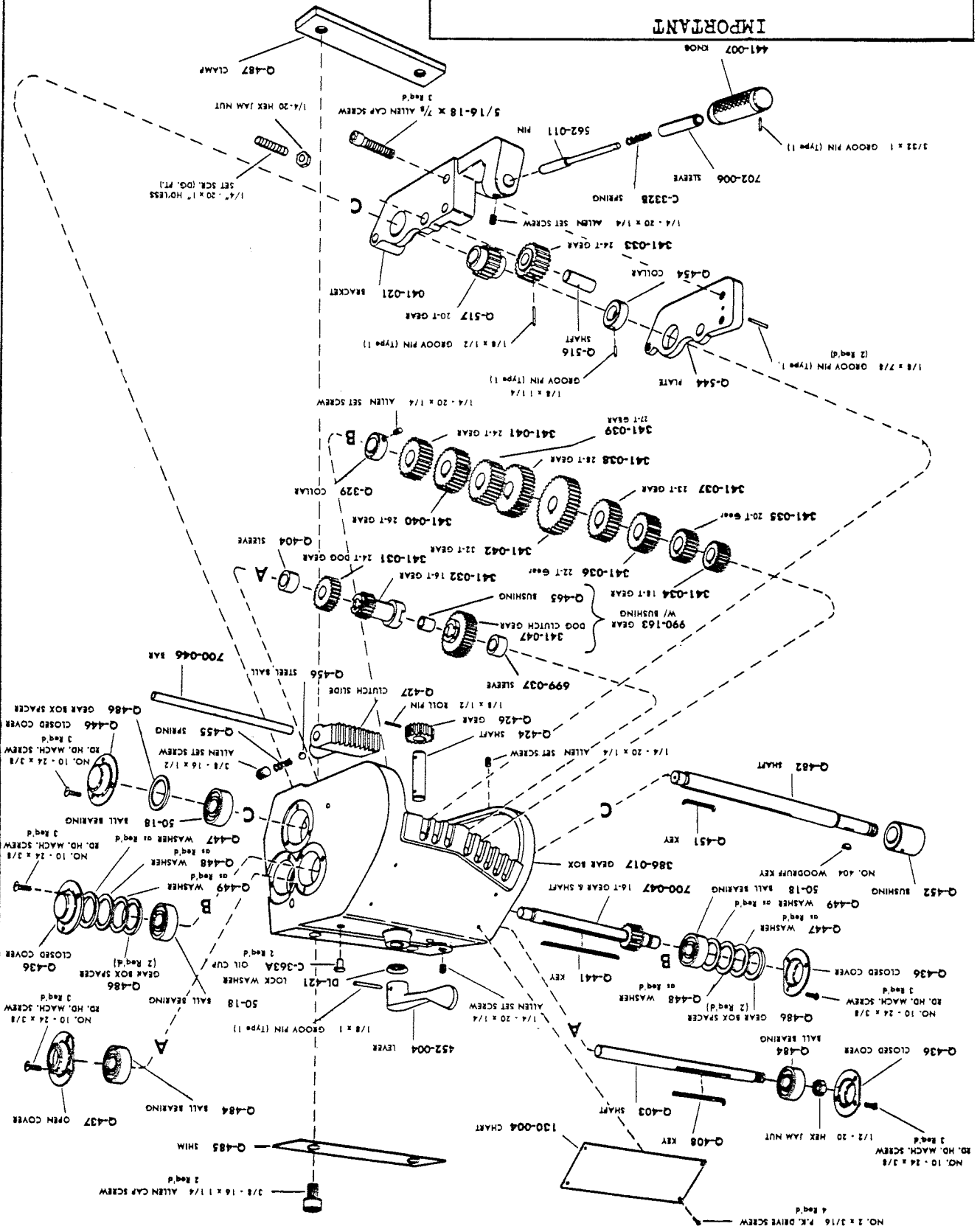






The parts illustrated on this page are for  
lathes with serial numbers between 001057  
and

IMPORTANT

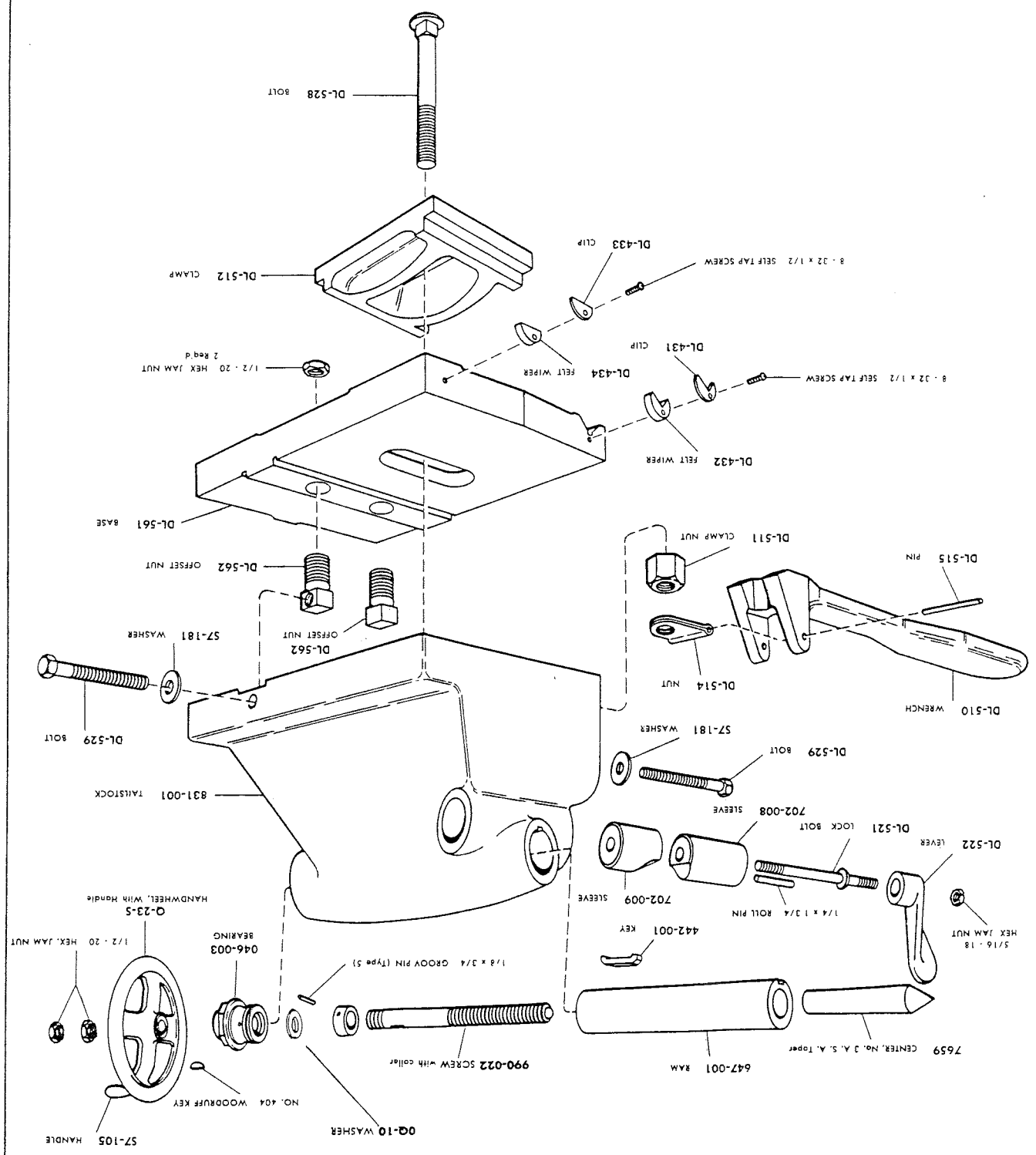


QUICK-CHANGE GEAR BOX ASSEMBLY





# TAILSTOCK ASSEMBLY 990-039



# LUBRICATION CHART

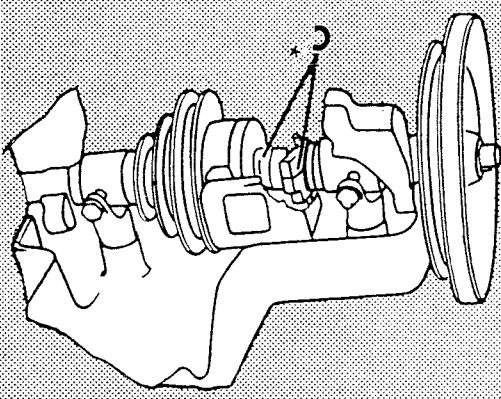
## CLAUSING 5300 SERIES 12-INCH LATHES

IMPORTANT — LUBRICATE LATHE BEFORE OPERATING

### CODE

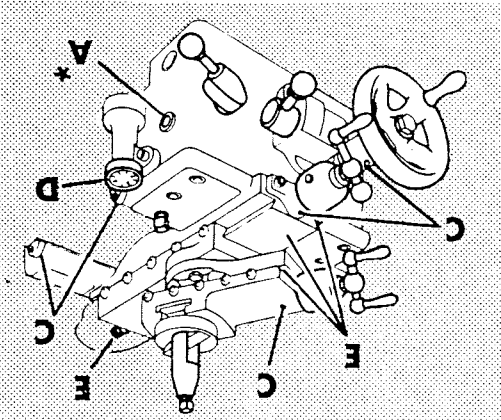
D — OIL MONTHLY with S.A.E. No. 20 oil  
 E — KEEP CLEAN and well oiled at all times  
 F — LUBRICATE with a medium grade automotive cup grease

A — FILL TO oil level window with S.A.E. No. 20 oil  
 B — OIL DAILY with S.A.E. No. 20 oil  
 C — OIL WEEKLY with S.A.E. No. 20 oil



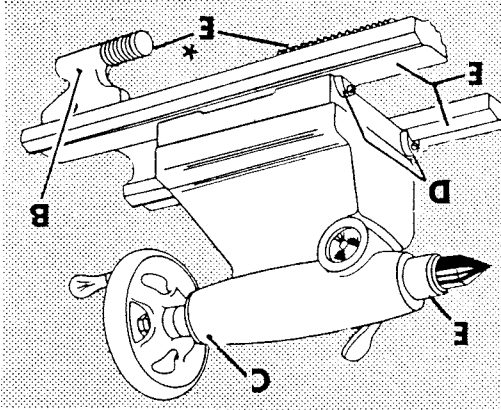
**HEADSTOCK AND BACK GEARS**  
 \*Remove set screw to oil bearings.

**COUNTERSHAFT**  
 \*Once a week place a drop or two of oil on clutch pusher and expander pin.



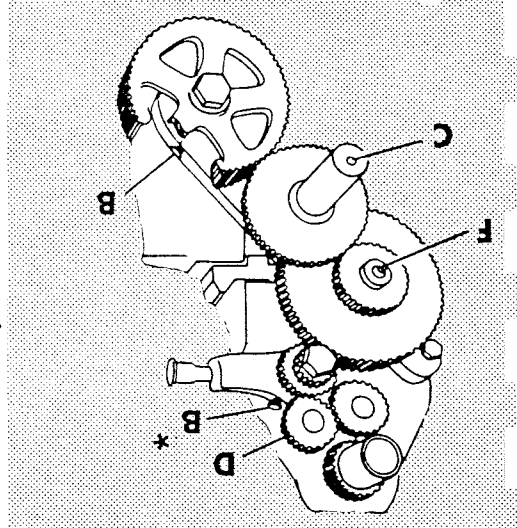
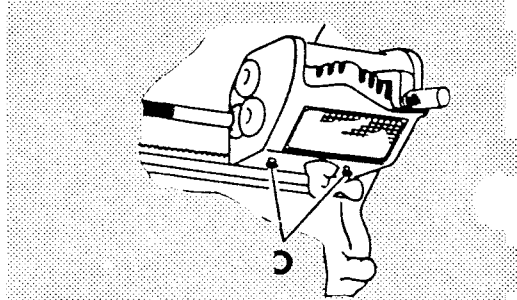
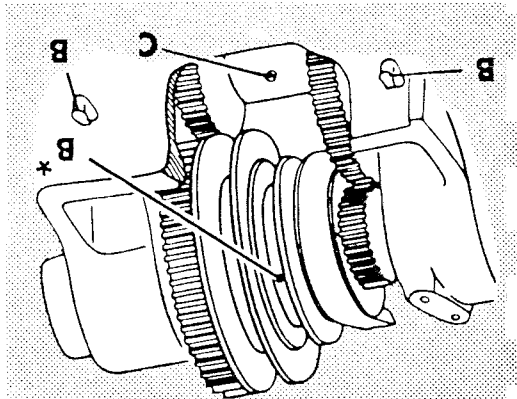
**GEAR BOX**  
**QUICK-CHANGE**

**CARRIAGE**  
 \*Remove pipe plug and fill apron to oil level window. Maintain this level at all times.



**QUICK-CHANGE GEAR TRAIN**  
 \*Oil through hole in guard.

**TAILSTOCK — LEADSCREW — LEADSCREW BEARING — RACK**  
 \*About once a month clean with kerosene and a brush, then cover with oil.



Oil and dirt form an abrasive compound which can easily damage carefully fitted bearing surfaces. Wipe the bed and all polished parts with a clean oily rag at frequent intervals. Use a brush to clean spindle threads, gear teeth, lead screw threads, etc.

## KEEP YOUR LATHE CLEAN