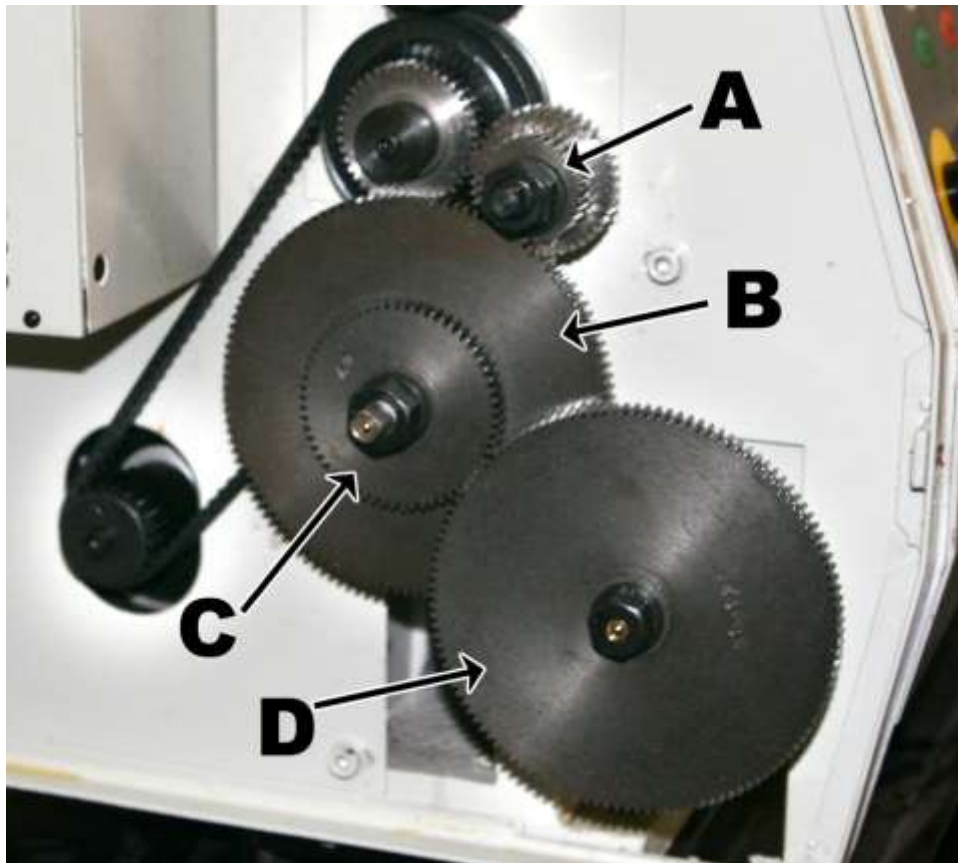


## Threading with the HiTorque 8.5x16 Bench Lathe



There are 4 positions for the change gears, commonly called A, B, C, and D.

<b>A</b>	This is the top change gear position. It is forward of, and slightly below the spindle.
<b>B</b>	Gear positions B and C are on the same shaft, between positions A and D. Position B is the inside gear on this shaft.
<b>C</b>	Gear positions B and C are on the same shaft; between positions A and D. Position C is the outside gear on this shaft.
<b>D</b>	Position D is the end of the lead screw.

The change gears are commonly tight on the shaft when new. You might need to use a screwdriver behind them to pry them off.

To change a gear in position A, use an 8 mm end wrench on the square end of the shaft to keep it from turning. Loosen the nut with a 19 mm end wrench and remove the notched washer from behind the nut. Remove the nut so you can slide the gear off the shaft.



To change a gear in positions B or C, use an 8 mm end wrench on the square end of the shaft to keep it from turning. Loosen the nut with a 19 mm end wrench and remove the notched washer from behind the nut. Remove the nut so you can slide the gear off the shaft.

The B and C gears ride on a sleeve that is free to turn on the shaft. It has a keyway and key that keep the B and C gears turning together. Lubricate this sleeve every time you change a B or C gear. Bad things happen when these sleeves seize on the shaft.

To change the gear in position D, use a 17 mm end wrench to remove the shoulder bolt that retains the gear. Gear position D has a spacer behind the gear. When you only use three gears, put the spacer outside the gear so the gear will align with the gear in position B.

In the change gear results, many of the combinations have “Any gear” in columns B and C. This means that you can use a gear with any number of teeth in position B. It is an idler and does not affect the overall gear ratio. Use a gear that makes it easy to properly engage the gears. For these combinations, you can use any gear for position C; this gear acts only as a spacer and does not engage the other gears.

The B-C Gear shaft is mounted on an arm that pivots around the lead screw. You can move the B-C shaft location to engage different gear combinations. To engage a new set of gears, use a 5 mm hex wrench to loosen the socket head cap screw that locks the B-C arm around the lead screw. Use an 8 mm end wrench on the square end of the B-C shaft to loosen it in the slot in the arm. Move the gears so they are all in engagement. Tighten the arm around the lead screw and tighten the B-C shaft.



## Change Gear Tables

### Inch Threads

Desired Pitch	A	B	C	D
4	90	80	127	45
4.5	80	40	127	90
5	80	100	127	40
6	60	90	127	40
7	50	100	127	35
8	50	100	127	40
9	50	100	127	45
10	127	Any gear		100
11	50	100	127	55
11.5	87	70	80	90
12	50	100	127	60
13	50	94	90	49
14	30	120	127	35
16	40	120	127	50
18	30	120	127	45
20	30	120	127	50

Desired Pitch	A	B	C	D
24	30	120	127	60
27	40	120	127	90
28	30	120	127	70
32	30	120	127	80
36	30	120	127	90
40	30	120	127	100
44	55	60	40	127
48	30	120	90	85
56	50	120	49	90
64	45	80	30	85
72	30	120	60	85
80	35	120	49	90
100	40	87	35	127

### Metric Threads

Desired Pitch	A	B	C	D
0.2	30	120	40	100
0.25	30	120	60	120
0.3	30	100	60	120
0.35	35	100	60	120
0.4	40	100	60	120
0.45	30	100	60	80
0.5	30	Any gear		120
0.6	30	Any gear		100
0.7	50	100	70	100
0.75	45	Any gear		120
0.8	50	100	80	100
1	50	Any gear		100
1.25	50	Any gear		80

Desired Pitch	A	B	C	D
1.5	45	Any gear		60
1.75	70	Any gear		80
2	50	Any gear		50
2.5	50	Any gear		40
3	60	Any gear		40
3.5	70	Any gear		40
4	100	Any gear		50
4.5	90	Any gear		40
5	100	Any gear		40
5.5	100	50	55	40
6	120	Any gear		40
8	100	50	100	50