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The premier source of tooling, parts, and accessories for bench top machinists.

Using Dividing Plates with the Rotary Table

Dividing plates allow you to precisely divide a circle into a number of divisions or degrees. The indexing feature helps prevent errors during the repetitive adjustments required in indexing work.

Dividing plates can be used to create bolt circles, gears, polygons, and so on.

These instructions are for the LittleMachineShop.com 6" Precision Rotary Table part number 2326 and Dividing Plate Set part number 2328. (The photos in these instructions are of the 4" rotary table.)

Installing the Dividing Plate

The dividing plate mounts in place of the hand wheel on the rotary table. Follow these steps to mount the dividing plate.

Remove the Hand Wheel

1. Remove the nut and washer from the center of the hand wheel.
2. Slide the hand wheel and the center indexing ring off the shaft together. This is to prevent losing the small flat spring that is between these parts.
3. Slide the inner indexing ring off the shaft.
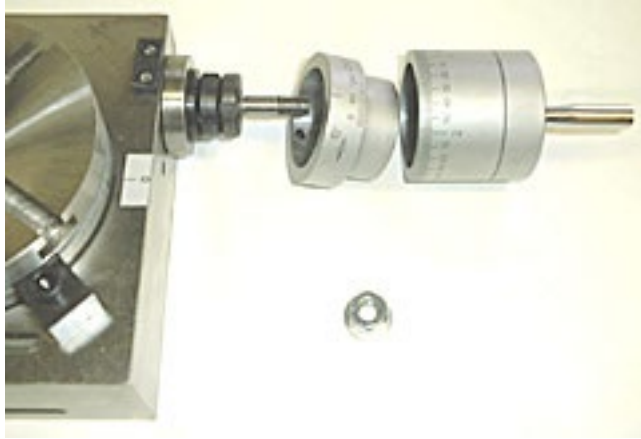
Disassemble the Dividing Plate

1. Remove the retaining nut from the dividing plate.
2. Remove the two sector arms together, being careful to not lose the small flat spring that falls out.
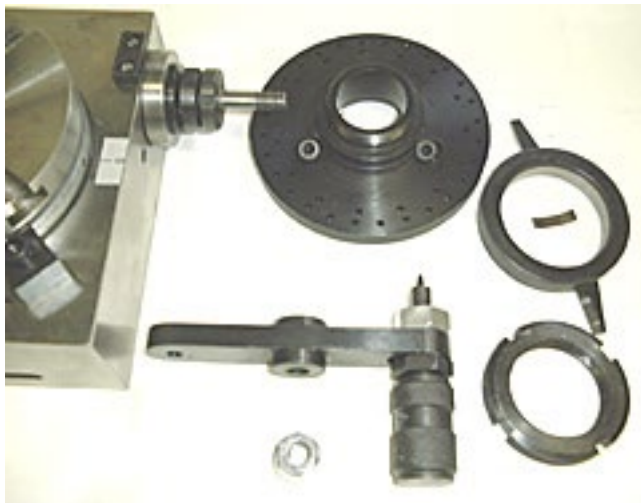
Install the Dividing Plate

1. Slide the dividing plate onto the shaft.
2. Secure it with two socket head cap screws.
3. Place the flat spring in the groove in the dividing plate hub.
4. Put the two sector arms on the dividing plate.
5. Install the retaining nut.
6. Install the crank handle.
7. Reinstall the washer and nut on the end of the shaft.

Using the Dividing Plate

Once the dividing plate is in place, the next step is to make the calculations for the job at hand.

Calculate for Degrees

If you want to advance a certain number of degrees between divisions, here is how to figure out how many turns of the crank handle are needed.

1. Look in the Degrees column in the Indexing Table on page 8 for the number of degrees you want to advance. If you find the value you want, read across the line to find the hole circle to use, the number of full turns, and the number of holes beyond the last full turn. Skip the rest of this procedure.

2. Divide the number of degrees per division by 5. Each full turn of the crank handle advances the rotary table 5 degrees.

3. The whole number is the number of full turns of the crank handle.

4. If there is a remainder in step 1, multiply the remainder by 15.

5. If the answer to step 3 is a whole number, it is the number of extra holes on the 15-hole circle to advance the crank handle.

6. If the result of step 3 is not a whole number, multiply the remainder from step 1 by 28.

7. If the answer to step 5 is a whole number, it is the number of extra holes on the 28-hole circle to advance the crank handle.

8. If neither step 3 nor step 5 resulted in a whole number, you can't advance that number of degrees with this dividing plate.

Here is an example. Suppose you want to create a disk with holes that are 7.5 degrees apart.

Divide the number of degrees per division (7.5) by 5	7.5/5 = 1.5
The whole number part of the answer is the number of full turns	1
Multiply the remainder (0.5) by 15.	0.5 x 15 = 7.5
The result is not a whole number, so the 15-hole circle does not work.	
Multiply the remainder (0.5) by 28	0.5 x 28 = 14
The result (14) gives you the number of extra holes	14

So to advance 7.5 degrees, you make 1 full turn and then advance an extra 14 holes in the 28-hole circle.

Calculate for Number of Divisions

If you know the number of divisions into which you want to divide a circle, follow these steps:

9. Find the number of divisions you want in the Divisions column in the table on page 8.

10. Read across the line to find the hole circle to use, the number of full turns, and the number of holes beyond the last full turn.

Here is an example. Suppose you want to create a circle with 48 holes. Look in the Divisions column in the Indexing Table for 48. Here is that row from the table.

Divisions	Degrees	Circle	Turns	Holes
48	7.500	28-Hole	1	14

So to create 48 divisions, you make 1 full turn and then advance an extra 14 holes in the 28-hole circle.

Setting up the Dividing Plate

Once the calculations are done, you are ready to adjust the crank handle and sector arms.

Set the Crank Handle

1. Make sure that the indexing pin assembly is on the correct side of the sector arms so it will contact a tapered edge of the sector arm.

2. Loosen the nut on the indexing pin assembly.

3. Move the indexing pin assembly in or out until the indexing pin fits in the holes in the appropriate hole circle.

4. Tighten the nut on the indexing pin assembly.
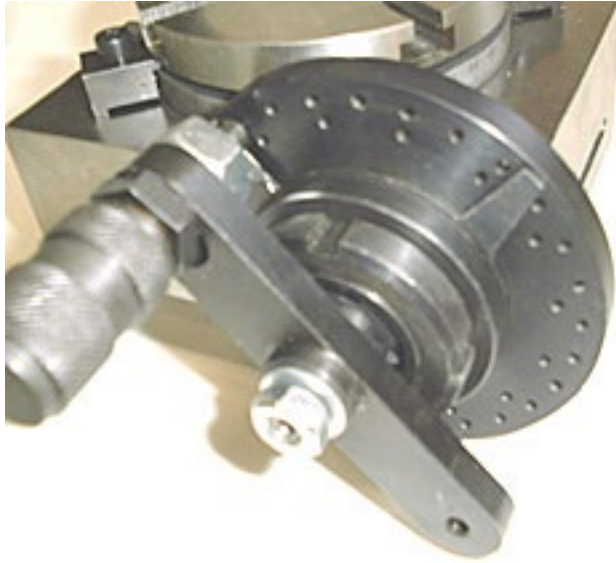
Crank handle set for the 28-hole circle with the indexing pin between the sector arms.

Set the Sector Arms

1. Loosen the small setscrew in the outer sector ring.

2. Adjust the sectors until there is the correct number of holes between them.

   - If you will be advancing 7 full turns, plus 4 holes, then there should be 5 holes between the sector arms. (The starting hole, plus the number of holes you are advancing.)
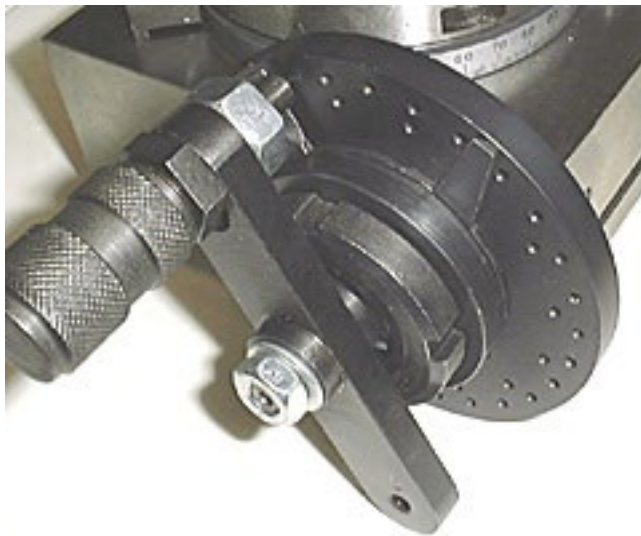
Sector arms set to advance 4 extra holes on the 28-hole circle.

   - If you will be advancing almost the full number of holes in the circle, then set the sector arms so they enclose the first hole you want and the last hole you want, but none of the intermediate holes.

Sector arms set to advance 27 extra holes on the 28-hole circle.

3. Tighten the small setscrew in the outer sector ring.
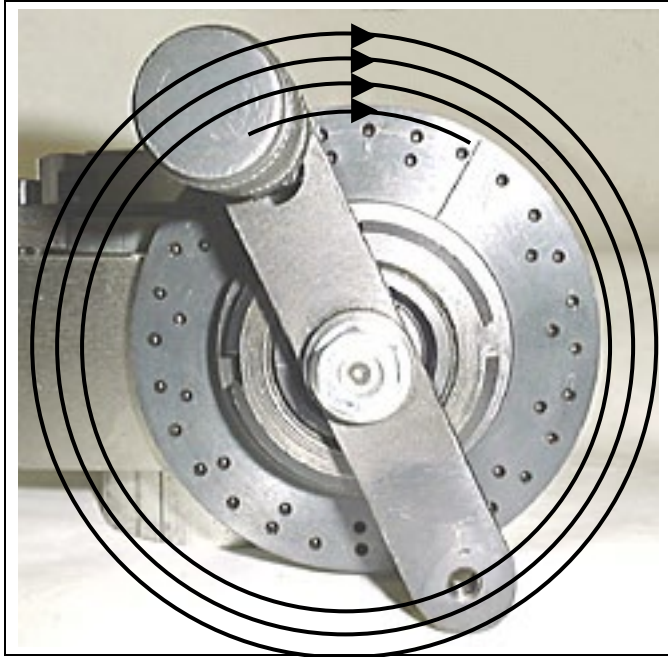
Operating the Rotary Table

With the dividing plate installed and set up, mount your work piece on the rotary table, and the rotary table on the mill.

The position of the crank handle when you start is not important as long as the indexing pin is in a hole. Make sure it is on the correct side of the sector arms, so it will contact a tapered edge of the sector arm.

Each time you make a cut, you advance the work piece to the next position.

Advance the Work Piece

1. Pull the handle on the indexing pin assembly to disengage the indexing pin. Pull it far enough so the indexing pin clears the sector arms.

2. Turn the crank handle the number of full turns required, stopping at the position from which you started.

3. Release the indexing pin partially so that the end is at the surface of the dividing plate.

4. Advance the crank handle to the next sector arm. (If you need to pass the sector arms, you will need to retract the pin more to clear the sector arms again.)

5. Release the indexing pin so that it engages the correct hole.

6. Rotate the two sector arms to the next starting position.

This shows rotating three complete turns, plus advancing 4 additional holes to the right sector arm.

You are now ready to make your next cut. Repeat this process for each division.

Indexing Table

This indexing table is for a rotary table with a 72-to-1 ratio and a dividing plate with 15-, 21-, 28-, and 34-hole circles.

Divisions	Degrees	Circle	Turns	Holes
2	180	Either	36	
3	120	Either	24	
4	90	Either	18	
5	72	15-Hole	14	6
6	60	Either	12	
7	51.429	28-Hole	10	8
8	45	Either	9	
9	40	Either	8	
10	36	15-Hole	7	3
12	30	Either	6	
14	25.714	28-Hole	5	4
14.4	25	Either	5	
15	24	15-Hole	4	12
16	22.500	28-Hole	4	14
18	20	Either	4	
20	18	15-Hole	3	9
21	17.143	28-Hole	3	12
22.5	16	15-Hole	3	3
24	15	Either	3	
27	13.333	15-Hole	2	10
28	12.857	28-Hole	2	16
30	12	15-Hole	2	6
32	11.250	28-Hole	2	7
36	10	Either	2	
40	9	15-Hole	1	12
42	8.571	28-Hole	1	20
45	8	15-Hole	1	9
48	7.500	28-Hole	1	14
54	6.667	15-Hole	1	5
56	6.429	28-Hole	1	8
60	6	15-Hole	1	3
72	5	Either	1	
84	4.286	28-		24

Divisions	Degrees	Circle	Turns	Holes
		Hole		
90	4	15-Hole		12
96	3.750	28-Hole		21
108	3.333	15-Hole		10
120	3	15-Hole		9
135	2.667	15-Hole		8
144	2.500	28-Hole		14
180	2	15-Hole		6
216	1.667	15-Hole		5
270	1.333	15-Hole		4
288	1.250	28-Hole		7
360	1	15-Hole		3
540	0.667	15-Hole		2
1080	0.333	15-Hole		1

Divisions	Degrees	Circle	Turns
2	180	Any	36
3	120	Any	24
4	90	Any	18
5	72	15-Hole	14
6	60	Any	
7	51.429	21-Hole	10
8	45	Any	9
9	40	Any	8
10	36	15-Hole	7
12	30	Any	6
14	25.714	21-Hole	5
14.4	25	Any	5
15	24	15-Hole	4
16	22.500	28-Hole	4
17	21.176	34-Hole	4
18	20	Any	4
20	18	15-Hole	3

Divisions	Degrees	Circle	Turns	Holes
21	17.143	21-Hole	3	9
22.5	16	15-Hole	3	3
24	15	Any	3	
27	13.333	15-Hole	2	10
28	12.857	21-Hole	2	12
30	12	15-Hole	2	6
32	11.250	28-Hole	2	7
34	10.588	34-Hole	2	4
36	10	Any	2	
40	9	15-Hole	1	12
42	8.571	21-Hole	1	15
45	8	15-Hole	1	9
48	7.500	28-Hole	1	14
51	7.059	34-Hole	1	14
54	6.667	15-Hole	1	5
56	6.429	21-Hole	1	6
60	6	15-Hole	1	3
63	5.714	21-Hole	1	3
68	5.294	34-Hole	1	2
72	5	Any	1	
84	4.286	21-Hole	0	18
90	4	15-Hole	0	12
96	3.750	28-Hole	0	21
102	3.529	34-Hole	0	24

Divisions	Degrees	Circle	Turns	Holes
108	3.333	15-Hole		0
120	3	15-Hole		0
126	2.857	21-Hole		0
135	2.667	15-Hole		0
136	2.647	34-Hole		0
144	2.500	28-Hole		0
153	2.353	34-Hole		0
180	2	15-Hole		0
189	1.905	21-Hole		0
204	1.765	34-Hole		0
216	1.667	15-Hole		0
224	1.607	28-Hole		0
252	1.429	21-Hole		0
270	1.333	15-Hole		0
272	1.324	34-Hole		0
288	1.250	28-Hole		0
306	1.176	34-Hole		0
336	1.071	34-Hole		0
360	1	15-Hole		0
540	0.667	15-Hole		0
1080	0.333	15-Hole		0