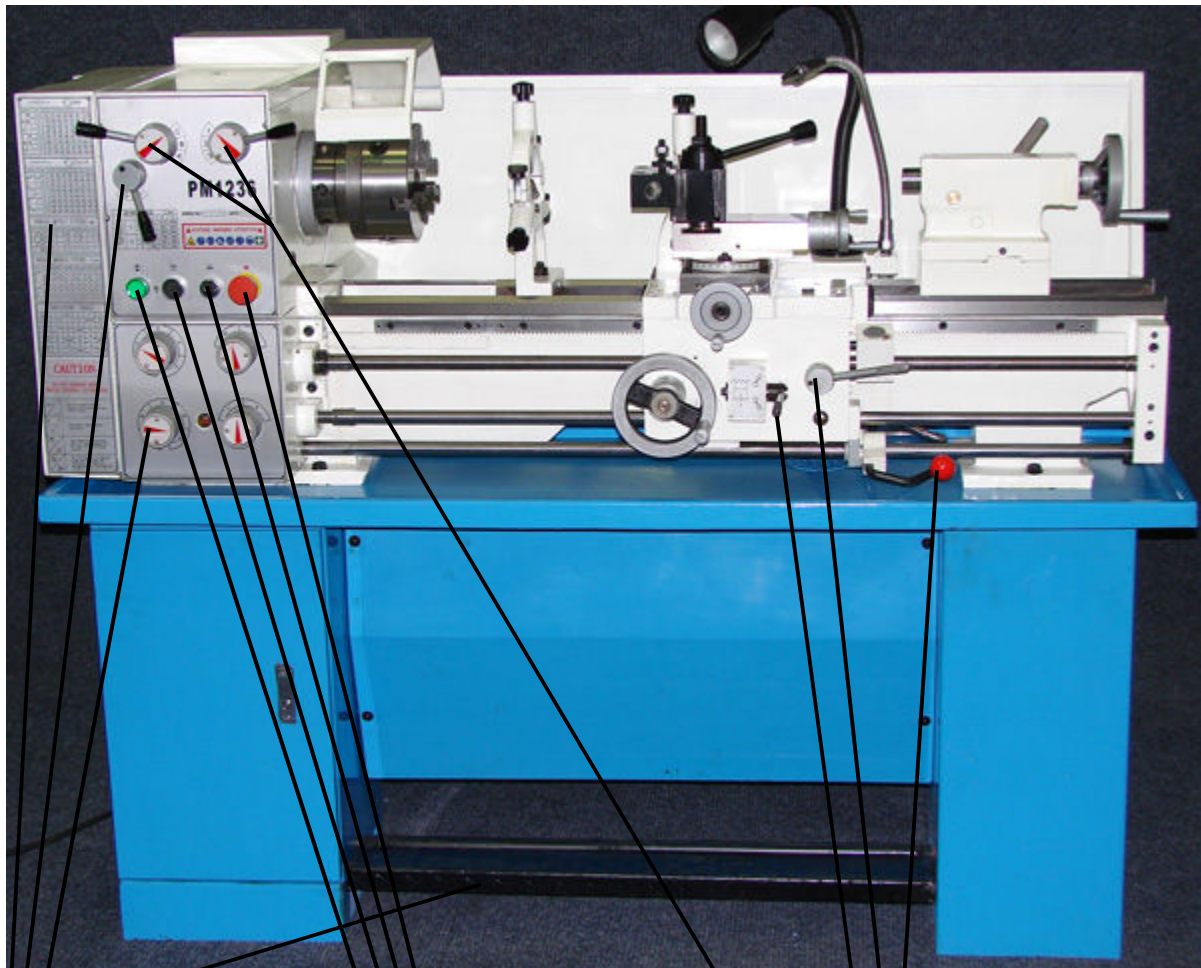


Thread and Feed Selection on a PM-1236 Lathe

Section 1: Control Locations



• Thread / Feed Chart
• Thread / Feed Direction
• Thread / Feed Knobs
• Foot Brake

• Emergency Stop
• Coolant Pump Switch
• Jog Button
• Power Indicator Light

• Half Nut Lever (Thread)
• Spindle For/Stop/Rev
• Feed Engagement Lever
• Speed Selection Levers

Section 2: Inch (Standard) Pitch Threading

Selecting the proper thread pitch for Inch threads:

- To select the proper thread pitch, first find the pitch that you would like to cut on the lathe's thread chart. The thread pitches are shown in the boxes outlined in **RED**. Only the numbers inside of these boxes are the thread pitches. For this example, we will choose **26 Threads Per Inch** in the green box.
- First, if you look directly above your selection of 26 TPI, in the yellow box, you will see the number 52, and at the top above that, you will see C3. Then, directly to the left, outside of the red box, you will see MII. You will need these settings.
- The "Z" Row numbers in yellow represent the number of teeth for the gear you need for this thread in the Z Position. In this case, you will need a 52 tooth gear in the change gear selection. So for this thread, you will have a 24 tooth gear on top:

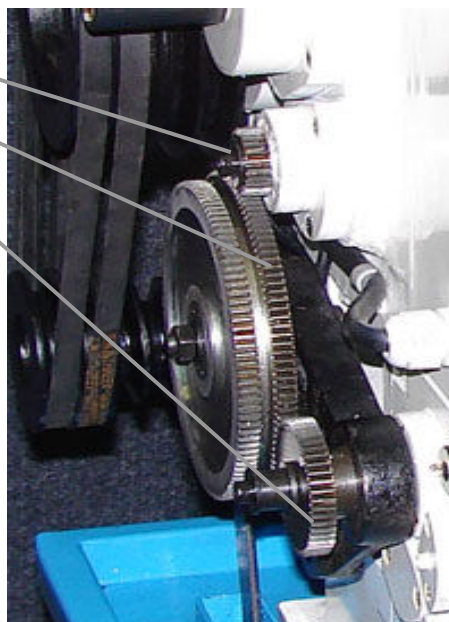
mated with the 127 tooth large gear:

and a 52 tooth gear on the bottom:

which is also mated with the 127 tooth gear. Remember though, these gear positions can vary, always look at the layout of the change gears, sometimes Z is on top, and sometimes the gears mate with the other side of the large double gear, so always pay close attention to the chart.

- Next, you will set the (4) knob positions on the front of the threading/feed gearbox, you will place them so the arrows line up with the M, II, C, and 3 in this example. This completes the set up for the 13 Thread Per Inch Setting. *Tip, select these (4) knob positions with the machine running at a slow speed (Under 100 RPM), it makes it much easier to engage these while the machine is running. DO NOT move any other knobs/levers with the machine running, damage may result.

		A2	A3	C3	A4	C3	C3	C3	A5	B4
48 ^T	Z	24	24	38	24	22	24	26	24	24
127 ^T	MII	4	4½	9½	5	5½	6	6½	7	7½
24 ^T	MI	8	9	19	10	11	12	13	14	15
48 ^T	Z	48	48	38	48	44	48	52	48	48
127 ^T	MII	16	18	19	20	22	24	26	28	30
24 ^T	MI	32	36	38	40	44	48	52	56	60



Thread Indicator Table:

- The thread indicator table and thread dial is useful when doing Inch (Standard) thread pitches only. This method can not be used for Metric threads on any lathe with an Inch Pitch lead screw.
- To figure which threads and dial positions you can use this chart for, first find your thread you want to cut. In this example, we will use the same 26 TPI from above. In the chart, you will see it has 2.4.6.8. This means you can engage any time the thread dial is at the numbers 2, 4, 6, or 8.
- If the thread pitch has a / beside it, you can engage at any position, no need to use the dial. If it has a dash between it like 1-8, you can engage on any number between 1 and 8.
- The 16 under the T is the number of teeth for the thread dial gear that meshes with the lead screw.

INDICATOR TABLE					
T	T·P·I	SCALE	T	T·P·I	SCALE
0	4	—	0	8	—
	16	—		24	—
	32	—		40	—
	48	—		56	—
16	4½	8	16	14	2·4·6·8
	5	4·8		15	4·8
	5½	8		18	2·4·6·8
	6	4·8		19	8
	6½	8		20	1-8
	7	4·8		22	2·4·6·8
	7½	8		26	2·4·6·8
	9	4·8		28	1-8
	9½	8		30	2·4·6·8
	10	2·4·6·8		36	1-8
	11	4·8		38	2·4·6·8
	12	1-8		44	1-8
	13	4·8		52	1-8

Section 2: Metric Threading

Selecting the proper thread pitch for Metric threads:













- Metric threading is similar to the process above, except that there is not a change gear listed in the chart, you only use the change gears set up as shown in the change gear diagram to the left of the thread pitches, shown here.
- For this example, we will use a 1.5 MM Thread Pitch. Find the 1.5 pitch in the chart, shown in green.
- All the way to the left, you see that there is correlating change gear diagram, which shows a 24 tooth gear on top, mated with the large 127 tooth gear. And then the 48 tooth gear on the bottom, mated with the 120 tooth gear. (you will need a spacer behind the bottom gear to achieve this set up)
- Once the gears are set up, find the knob position above which is A2, and to the left which is M2. Go to the gearbox, set your knobs on M, II, A, and 2, and you are ready to cut threads.
- *Remember, you can not disengage the half nut while doing metric threads on ANY machine with an inch pitch lead screw. (Which is almost all lathes in the USA)
- To cut the threads in metric, engage the half nut lever (threading lever), make the first pass, shut the spindle off while backing the tool out with the cross slide. Reverse the spindle, let the carriage go back to where you started, and repeat.

METRIC THREAD PITCH LIST									
	B4	C4	C3	C2	A4	D2	E4	A2	E2
MI	0.4	0.45	0.5		0.5		0.7	0.75	
MII	0.8	0.9	1		1.2	1.25	1.4	1.5	1.75
MI	1.6	1.8	2	2.25	2.4	2.5	2.8	3	3.5
MII	3.2	3.6	4	4.5	4.8	5	5.6	6	7

Section 3: Feed Rate Selection

Selecting the proper feed rate for cutting:

- Feed rates are set the same way that Metric threading is accomplished, and using the same change gear set ups. The only difference will be, that you will use different knob positions.
- Feeds are calculated in INCHES PER REVOLUTION, so this means that for every turn of the spindle, the carriage or cross slide will move this much. For example, .001 Inch per Revolution, means that the carriage will travel .001 inches every time the spindle makes one complete turn, when the feed is engaged.
- Gears do not always have to be changed to set up feeds, generally, use this chart with the feed rates shown with whatever gears you have installed, and it should be close enough.
- The metric feed rate chart (not shown) works the same way, just shown in mm per revolution instead.

										 / inch									
Position			E2	E3	A2	E4	E1	C3	C4	A5	D5	P							
	SI		0.006	0.005	0.005	0.005	0.004	0.004	0.003	0.003	0.002	0.002							
			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001						
	SII		0.012	0.011	0.010	0.009	0.008	0.007	0.006	0.006	0.005	0.004	0.003						
			0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001						
	SI		0.024	0.021	0.02	0.019	0.016	0.0154	0.012	0.012	0.009	0.008							
			0.005	0.004	0.004	0.004	0.003	0.003	0.002	0.002	0.002	0.001	0.001						
	SII		0.048	0.043	0.041	0.038	0.032	0.031	0.025	0.024	0.019	0.016	0.016						
			0.009	0.008	0.008	0.007	0.006	0.005	0.005	0.005	0.004	0.003	0.003						

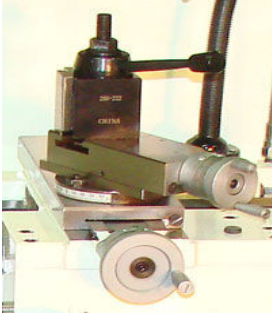


Cross Feed



Longitudinal Feed

Section 3: Thread Troubleshooting

Problem	Cause	Solution
<ul style="list-style-type: none"> Thread pitch not correct 	<ul style="list-style-type: none"> Improper change gear set up Improper knob selection 	<ul style="list-style-type: none"> Study chart, and correct gear set up Verify knob position with chart
<ul style="list-style-type: none"> Thread not an even V shape, one side is a different angle than the other 	<ul style="list-style-type: none"> Improperly ground tool Tool nose not square with work piece Compound not set on correct angle, BE SURE that it is set 29-1/2 degrees from cross slide movement direction, not 29-1/2 degrees from parallel with work piece. (should look like picture to the right) Compound is graduated in degrees from work piece, not for threading. You would need to be at 60-1/2 degrees from workpiece to get 29-1/2 degree threading mark. 	<ul style="list-style-type: none"> Grind tool and check carefully Use a thread gauge, and make sure to adjust tool square with work Correct angle 
<ul style="list-style-type: none"> Rough/Torn Finish on threads 	<ul style="list-style-type: none"> Improperly ground tool Dull cutting tool Lack of lubrication Speed Selection not correct Poor Material Choice 	<ul style="list-style-type: none"> Grind tool properly Sharpen Tool Use cutting oil or similar compound Calculate speeds and correct Choose better material
<ul style="list-style-type: none"> Chatter or vibration 	<ul style="list-style-type: none"> Loose compound hold down bolts Loose tool or tool post, or tool post not locked down Dull cutting tool Too heavy of a cut Tool not centered with work 	<ul style="list-style-type: none"> Tighten Tighten or lock tool post Sharpen tool Take lighter cuts Properly center tool
<ul style="list-style-type: none"> Lead screw turns under no load, but stops when engaging half nut lever 	<ul style="list-style-type: none"> Gear box knobs not seated in proper position Shear pin sheared at lead screw to gear box connection 	<ul style="list-style-type: none"> Check knobs for position Replace shear pin