

How to handle all those numbers for your LPC RPM's.

Okay folks, let's have a bit of fun here...

Two options, you book a ground course with us and you will get it instructed or you guys take your manuals (I am sure everybody got them) and you look inside Book 5 Part 2, Page 74 Chapter 5.4 and there are the instructions.

Or you are following that instruction below:

The LPC RPM must be checked at determined HPC RPM under standard INA conditions.

As you can imagine, there are only very few days per year which will exactly meet the INA conditions (Temp/Airfield Pressure) and perhaps on such a perfect day you are out fishing on your sail boat or you have an appointment with your dentist...

Therefore the smart guys in Ukraine came up with a solution for you:

The LPC RPM must be tested at determined HPC Power levels. Such are 97, 99, 101, 103, 105, 107 % HPC (valid for 15°C). Now, you go to the chart Table No 2 on page 77 of the manual. You take your surrounding temperature not earlier than 10 minutes before you start your engine. Let's take now the entries of 16. Sept 1986, from the sample which I had provided, for this little lesson. The engine had 171:01 hrs and the temperature was at 9°C (Bautzen "International" Airport).

After Capt. Hans "Hansi" Richter took a cup of coffee, he started with the calculation of the RPM's.

1.) Now Hansi (or you) take the 9°C to the columns of 97...107 (blue marked).

You will find for the Column with 97 % at the red marked line an HPC RPM of 96 % and for 99 % a RPM of 98 % and so on from the left to the right. I think you got that!

The 1 % lower RPM is related to the 9°C instead of 15°C. At 15°C you will find exact the numbers 97, 99, 101...

Here is the Table -2 (only the right side and upper part for our purposes here)

°C	TEMPER. OF SURROUND. MEDIUM t _H °C	HPC-120 HPC in % CONVERTED REVOLUTIONS OF					
		97	99	101	103	105	107
,3	0	94,4	96,4	98,3	100,3	102,2	104,2
,5	+ 1	94,6	96,6	98,5	100,5	102,4	104,4
,7	+ 2	94,8	96,7	98,7	100,7	102,6	104,6
,9	+ 3	95,0	96,9	98,9	100,8	102,8	104,8
,1	+ 4	95,1	97,1	99,1	101,0	103,0	104,9
,3	+ 5	95,3	97,3	99,2	101,2	103,2	105,1
,5	+ 6	95,5	97,4	99,4	101,4	103,4	105,3
,7	+ 7	95,7	97,6	99,6	101,6	103,5	105,5
,9	+ 8	95,8	97,8	99,8	101,7	103,7	105,7
,1	+ 9	96,0	98,0	100,0	101,9	103,9	105,9
,3	+ 10	96,2	98,1	100,1	102,1	104,1	106,1

2. Those numbers you got from Table-2 are the numbers to which you set your throttle lever during the run up, on the TP-2 chart it's named $\Pi_{KBД}$.
 - A) Prepare your airplane and have one Mech. outside to watch your airplane because you are very busy inside. Before increasing the RPM each time, make eye contact with the safety guard outside if everything is still okay and no Piper Cub is behind your tail pipe.
 - B) Start engine and warm up engine for 2 minutes.
 - C) Air Conditioning OFF, no load on Generator and Hydraulic pump !!!
 - D) Increase RPM until you reach 96 % HPC RPM N-1 (for 97%), let's stabilize engine there for 30 seconds and make necessary corrections until you really have 96,0 %.
 - E) After 30 sec you read the indicated LPC-N-2 RPM (Hansi got 77,2 %). Make a note in the prepared little chart on your knee board. Look at the guy outside, and
 - F) set throttle to 98 % (for 99%), wait again 30 sec and take indicated n-2 RPM and so on, until you reach the applicable max RPM for that day.
 - G) After you reached 105 %, it's the last one for which you can get the LPC numbers on that day at 9°C. (If one would see at +9°C an RPM of 107 % - his FCU is gone!) So therefore no LPC entries at 107 in the TP-2 Chart,
 - H) Cool engine down and get out of the plane. Have another cup of coffee. Bud Light is not an option if I am around there!

3. Take now your indicated LPC N-2 RPM $\Pi_{KHД}$ and enter them in Line 2 of the TP-2 Chart and the HPC RPM ($\Pi_{KBД}$) in Line 1.

4. Next you go to the Table-3 of your Engine manual (page 78...81). During the run up at 97 % (Throttle lever set to 96 %) you (Hansi) got a LPC N-2 indicated of 77,2 %. Go to the red marked column for 9 °C and on the left side down until you see the 77 % green marked , move to the right and you will find a value of 77,8 %. Now, since we got really 77,2% and not clean 77,00 %, we have to add the 0,2 % to the value of 77,8 % found on table 3. Its called linear interpolation. That would make a LPC N-2 ($\Pi_{KHД}$) of corrected 78,0 %, which you are entering now in your Line 3, same as Capt. Richter did (Brave Man!).

5. You repeat this for all power settings. 98 %, 100 %, 101, 9%, 103, 9 and 105, 9 %

6. As to the next, you compare on each line 3 the value of ($\Pi_{KHД}$) with the 1st entry in that line, measured on the day on that the engine was installed. This value should not differ more than +/2 % of the origin value, and that over the whole TBO of your engine, no matter if the engine has 171 hrs or 980 hrs since new or last overhaul.

7. Now back to Dave, if you look at the line for 101 % (Throttle to be set at 100 % N-1) the indicated N-2 should be around 84 % and not 90 % (again in flight are some differences).

And here is an excerpt of Table No 3 :

Nv	0	+ 1	+ 2	+ 3	+ 4	+ 5	+ 6	+ 7	+ 8	+ 9	+ 10	+ 11
50	51,4	51,3	51,2	51,1	51,0	50,9	50,8	50,7	50,6	50,5	50,4	50,4
51	52,4	52,3	52,2	52,1	52,0	51,9	51,8	51,7	51,6	51,5	51,4	51,4
52	53,4	53,3	53,2	53,1	53,0	52,9	52,8	52,7	52,6	52,5	52,5	52,4
53	54,4	54,3	54,2	54,1	54,0	53,9	53,8	53,7	53,6	53,5	53,5	53,4
54	55,4	55,3	55,2	55,1	55,0	54,9	54,8	54,7	54,6	54,5	54,5	54,4
55	56,4	56,3	56,2	56,1	56,0	55,9	55,8	55,7	55,6	55,5	55,5	55,4
56	57,4	57,3	57,2	57,1	57,0	56,9	56,8	56,7	56,6	56,5	56,5	56,4
57	58,4	58,3	58,2	58,1	58,0	57,9	57,8	57,7	57,6	57,5	57,5	57,4
58	59,4	59,3	59,2	59,1	59,0	58,9	58,8	58,7	58,6	58,5	58,5	58,4
59	60,4	60,3	60,2	60,1	60,0	59,9	59,8	59,7	59,6	59,5	59,5	59,4
60	61,4	61,3	61,2	61,1	61,0	60,9	60,8	60,7	60,6	60,5	60,5	60,4
61	62,4	62,3	62,2	62,1	62,0	61,9	61,8	61,7	61,6	61,5	61,5	61,4
62	63,4	63,3	63,2	63,1	63,0	62,9	62,8	62,7	62,6	62,5	62,5	62,4
63	64,4	64,3	64,2	64,1	64,0	63,9	63,8	63,7	63,6	63,5	63,5	63,4
64	65,4	65,3	65,2	65,1	65,0	64,9	64,8	64,7	64,6	64,5	64,5	64,4
65	66,4	66,3	66,2	66,1	66,0	65,9	65,8	65,7	65,6	65,5	65,5	65,4
66	67,4	67,3	67,2	67,1	67,0	66,9	66,8	66,7	66,6	66,5	66,5	66,4
67	68,4	68,3	68,2	68,1	68,0	67,9	67,8	67,7	67,6	67,5	67,5	67,4
68	69,4	69,3	69,2	69,1	69,0	68,9	68,8	68,7	68,6	68,5	68,5	68,4
69	70,4	70,3	70,2	70,1	70,0	69,9	69,8	69,7	69,6	69,5	69,5	69,4
70	71,4	71,3	71,2	71,1	71,0	70,9	70,8	70,7	70,6	70,5	70,5	70,4
71	72,4	72,3	72,2	72,1	72,0	71,9	71,8	71,7	71,6	71,5	71,5	71,4
72	73,4	73,3	73,2	73,1	73,0	72,9	72,8	72,7	72,6	72,5	72,5	72,4
73	74,4	74,3	74,2	74,1	74,0	73,9	73,8	73,7	73,6	73,5	73,5	73,4
74	75,4	75,3	75,2	75,1	75,0	74,9	74,8	74,7	74,6	74,5	74,5	74,4
75	76,4	76,3	76,2	76,1	76,0	75,9	75,8	75,7	75,6	75,5	75,5	75,4
76	77,4	77,3	77,2	77,1	77,0	76,9	76,8	76,7	76,6	76,5	76,5	76,4
77	78,4	78,3	78,2	78,1	78,0	77,9	77,8	77,7	77,6	77,5	77,5	77,4
78	79,4	79,3	79,2	79,1	79,0	78,9	78,8	78,7	78,6	78,5	78,5	78,4
79	80,4	80,3	80,2	80,1	80,0	79,9	79,8	79,7	79,6	79,5	79,5	79,4
80	81,4	81,3	81,2	81,1	81,0	80,9	80,8	80,7	80,6	80,5	80,5	80,4
81	82,4	82,3	82,2	82,1	82,0	81,9	81,8	81,7	81,6	81,5	81,5	81,4

Still questions? Book our Ground Course! You got already one and this was not included? You should try to get some money back... ;-) just kidding.

Fly safe

Bernd

PS: Yes, it works at - 28°C in Anoka/MN, 17°C at Sydney/Bankstown Airport and 26°C in Minden/NV exactly the same way...