

Engine Partial Cycle Comparison TPE331-12JR vs. PT6A-114A and PT6A-42A

Engine	Component	No. of Starts	No. of Flights	Damage Fraction/ Abbreviated Cycle Factor	Flight Count Factor	Damage Formula	Equivalent Cycles	Cycles over 3500 starts	Cycle Life	Cycles Remain
PT6A-114A	1st compressor	1	10	2	1	Total Cycles = $\left[\text{No. of Starts} + \left(\frac{\text{No. of Flts} - \text{No. of Starts}}{\text{Abbr. cycle factor}} \right) \right] \times \text{Flight count factor}$	5.5	19250	19000	-250
	2nd compressor			2	1		5.5	19250	24000	4750
	3rd compressor			2	1		5.5	19250	25000	5750
	Impeller			2	1		5.5	19250	19000	-250
	CT disk			5	1		2.8	9800	16000	6200
	PT disk			5	1		2.8	9800	20000	10200
PT6A-42A	1st compressor	1	10	3	1	Total Cycles = $\left[\text{No. of Starts} + \left(\frac{\text{No. of Flts} - \text{No. of Starts}}{\text{Abbr. cycle factor}} \right) \right] \times \text{Flight count factor}$	4	14000	20000	6000
	2nd compressor			3	1		4	14000	20000	6000
	3rd compressor			3	1		4	14000	20000	6000
	Impeller			3	1		4	14000	24000	10000
	CT disk			10	1		1.9	6650	10000	3350
	1st PT disk			10	1		1.9	6650	30000	23350
	2nd PT disk			10	1		1.9	6650	30000	23350
	TPE331-12JR			1st Impeller	1		10	0	N/A	Total Cycles = No. Starts + [Damage Fraction \times (No. of flts - 1)]
2nd Impeller		0	1	3500		30000		26500		
1st Seal Plate		0	1	3500		20000		16500		
2nd Seal Plate		0	1	3500		30000		26500		
1st Turbine		0	1	3500		20000		16500		
2nd Turbine		0.1	1.9	6650		15000		8350		
3rd Turbine		0.1	1.9	6650		12000		5350		