DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E4WE
Revision 34

HONEYWELL
(AlliedSignal,
Garrett, AiResearch)

TPE331-3	TPE331-8	TPE331-10N	TPE331-11U
TPE331-3U	TPE331-8A	TPE331-10P	TPE331-11UA
TPE331-3UW	TPE331-9	TPE331-10R	TPE331-12
TPE331-3W	TPE331-9U	TPE331-10T	TPE331-12B
TPE331-5	TPE331-10	TPE331-10U	TPE331-12JR
TPE331-5A	TPE331-10A	TPE331-10UA	TPE331-12UA
TPE331-5AB	TPE331-10AV	TPE331-10UF	TPE331-12UAN
TPE331-5B	TPE331-10B	TPE331-10UG	TPE331-12UAR
TPE331-5U	TPE331-10G	TPE331-10UGR	TPE331-12UER
TPE331-6	TPE331-10GP	TPE331-10UJ	TPE331-12UHR
TPE331-6A	TPE331-10GR	TPE331-10UK	TSE331-3U
TPE331-6U	TPE331-10GT	TPE331-10UR	
	TPE331-10J		

May 22, 2014

TYPE CERTIFICATE DATA SHEET E4WE

Engine models described herein conforming with this data sheet (which is part of Type Certificate No. E4WE) and other approved data on file with the Federal Aviation Administration meet the minimum standards for use in certified aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

TYPE CERTIFICATE (TC) HOLDER: Honeywell International Inc.
111 South 34th Street
Phoenix, AZ 85034

TYPE: Single-shaft engine with two-stage centrifugal compressor, three-stage axial turbine, and singular annular combustion chamber

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Ratings (see NOTES 3, 4, and 5)

	Maximum Continuous			Takeoff (5 Minutes)				
	SHP	ESHP	Output Shaft RPM	SHP (Dry)	SHP (Wet)*	ESHP (Dry)	ESHP (Wet)*	Output Shaft RPM
Model TPE331								
-3	840	904	2000	840	940	904	1010	2000
-3U	"	"	"	"	"	"	"	"
-3UW	"	"	"	"	"	"	"	"
-3W	"	"	"	"	"	"	"	"
-10UA	"	"	"	"	"	"	"	"
-5	776	834	1591	776	776	834	834	1591
-5B	"	"	"	"	"	"	"	"
-5U	"	"	"	"	"	"	"	"
-10P	"	"	"	"	"	"	"	"
-10T	"	"	"	"	"	"	"	"
-5A	"	"	"	"	840	"	904	"
-5AB	"	"	"	"	"	"	"	"
-10GP	"	"	"	"	"	"	"	"
-10GT	"	"	"	"	"	"	"	"
-6	715	776	2000	750	N/A	808	N/A	2000
-6A	"	"	"	"	"	"	"	"
-6U	"	"	"	"	"	"	"	"
-10AV	"	756	"	"	"	792	"	"
-8	715	755	2000	715	N/A	755	N/A	2000
-8A	"	"	1591	"	"	"	"	1591
-10N	"	"	2000	"	"	"	"	2000
-9	865	907	2000	865	N/A	907	N/A	2000
-9U	"	"	"	"	"	"	"	"
-10	900	944	1591	940	940	984	989	1591
-10G	"	"	"	"	"	"	"	"
-10GR	"	"	"	"	"	"	"	"
-10R	"	"	"	"	"	"	"	"
-10U	"	"	"	"	"	"	"	"
-10UF	"	"	"	"	"	"	"	"
-10UG	"	"	"	"	"	"	"	"
-10UGR	"	"	"	"	"	"	"	"
-10UR	"	"	"	"	"	"	"	"
-12	"	"	"	"	N/A	"	N/A	"

Ratings (see NOTES 3, 4, and 5) Continued

	Maximum Continuous			Takeoff (5 Minutes)				
	SHP	ESHP	Output Shaft RPM	SHP (Dry)	SHP (Wet)*	ESHP (Dry)	ESHP (Wet)*	Output Shaft RPM
Model TPE331								
-10A	900	944	2000	940	940	984	989	2000
-10B	"	"	"	"	"	"	"	"
-10J	970	1015	1591	1000	1000	1045	1045	1591
-10UJ	"	"	"	"	"	"	"	"
-12JR	"	1020	"	"	"	1050	1050	"
-10UK	"	"	2000	"	"	"	"	2000
-11U	1000	1045	1591	1000	1100	1045	1152	1591
-11UA	"	"	"	"	"	"	"	"
-12B	1100	1151	2000	1100	N/A	1151	N/A	2000
-12UA	1050	1100	1591	1100	1100	1151	1156	1591
-12UAR	"	"	"	"	"	"	"	"
-12UER	"	"	"	"	"	"	"	"
-12UHR	"	"	"	"	"	"	"	"
-12UAN	"	"	"	"	"	"	"	"
Model TSE331								
-3U	700	756	2482	800	N/A	858	N/A	2482

*Augmented with water-alcohol per NOTE 5

	Weight, Dry **(Pounds)	Propeller-Shaft to engine rotor ratio
Model TPE331		
-3, -3U, -3UW, -3W	353	1:20.865
-5, -5U	360	1:26.229
-5A	370	"
-5B	375	"
-5AB	385	"
-6, -6U	360	1:20.865
-6A	375	"
-8	370	1:20.865
-8A	370	1:26.229
-9, -9U	375	1:20.865
-10, -10G, -10GR, -10R, -10T, -10U, -10UF, -10UG, -10UGR, -10GT, -10UR, -12	385	1:26.229
-10P, -10GP	400	1:26.229
-10A, -10AV	385	1:20.865
-10B, -10UK	387	"
-10N	385	"
-10UA	377	"
-10J, -10UJ	393	1:26.229
-11U, -11UA	405	"
-12B	429	1:20.865
-12JR	415	1:26.229
-12UA, -12UAR, -12UER, -12UHR	405	1:26.229
-12UAN	433	1:26.229
Model TSE331		
-3U	350	1:16.813

**The engine weight shown herein consists of hardware as shown on the engine parts list including nose cone assembly, intermediate housing and gear assembly, torque sensor assembly, power group (compressor and turbine), fuel delivery system (including low and high pressure pumps and fuel filter with integral bypass and thermostatically controlled valve for filter and anti-icing, fuel control unit, fuel-shutoff valve), ignition system, and propeller oil flow tube, but does not include: (a) hardware shown on the engine equipment list with the exception of fuel control unit, or (b) items coded "A" or “N” on the engine parts list.

FUEL TYPES AND ADDITIVES

Refer to the FAA approved Section of the Installation Manual (IM-5117).

Controls (See Note 13)

Principal dimension of basic engine

Refer to the Installation Drawing for each specific engine model configuration for dimensions and center of gravity location.

Oil

Oil conforming to Honeywell International Inc. Specification EMS53110 (Type I and Type II) is approved.

Certification Basis

14 CFR part 33 dated February 1, 1965 and Amendments 33-1, 33-2, and 33-3
Type Certificate No. E4WE issued March 28, 1969, Model
TPE331-3, -3U, -3W, and -3UW;
Model TSE331-3U added April 30, 1970;
Model TPE331-5, -5U, -6, and -6U added May 15, 1970;
Model TPE331-8, -9, and -9U added November 19, 1976;
Model TPE331-10, -10U, and -6A added January 20, 1978;
Model TPE331-11U added September 28, 1979;
Model TPE331-10A and -10B added December 12, 1980;
Model TPE331-8A added December 24, 1981;
Model TPE331-10R, -10UF, and -11UA added June 25, 1982;
Model TPE331-10UA added July 29, 1982;
Model TPE331-10UR added November 14, 1983;
Model TPE331-10UG, -10UGR, -10GR, and -10G added
August 14, 1984;
Model TPE331-12 added December 19, 1984;
Model TPE331-12B added December 10, 1986;
Model TPE331-12UAR added December 18, 1987;
Model TPE331-5A, -12UA, -10J, and -10UJ added May 4, 1988;
Model TPE331-10UK added November 4, 1988;
Model TPE331-12UER added July 22, 1991;
Model TPE331-10N added February 6, 1992
Model TPE331-5B and -5AB added July 21, 1992;
Model TPE331-12UHR added January 7, 1993;
Model TPE331-10T added April 14, 1994;
Model TPE331-10GT, -10P, -10GP added December 14, 1994;
Model TPE331-10AV added July 19, 1996;
Model TPE331-12JR added October 31, 1997
Model TPE331-12UAN added May 9, 2014

Production Basis

Production Certificate No. 413 issued March 4, 1965. Reissued Production Certificate No. 413NM to Honeywell International Inc. on January 25, 2000

NOTE 1: Maximum Permissible Temperatures - $^{o}F(^{o}C)$

	Exhaust Gas Temperature			Interstage Turbine Temperature			
	Maximum Continuous	Takeoff (5 min.) (Dry)	Takeoff (5 min.) (Wet)*	Maximum Continuous	Takeoff (5 min.) (Dry)	Takeoff (5 min.) (Wet)*	See Note Below
Model TPE331							
-3	1002(539)	1002(539)	1012(544)	1693(923)	1693(923)	1732(944)	
-3U	"	"	"	"	"	"	
-3UW	"	"	"	"	"	"	
-3W	"	"	"	"	"	"	
-5, -5A	1002(539)	1002(539)	1002(539)	1693(923)	1693(923)	1693(923)	
-5AB, -5B	"	"	"	"	"	"	
-5U	"	"	"	"	"	"	
-6	1002(539)	1002(539)	N/A	1693(923)	1693(923)	N/A	
-6A	"	"	"	"	"	"	
-6U	"	"	"	"	"	"	
-8	842(450)	842(450)	N/A	N/A	N/A	N/A	17
-8A	"	"	"	"	"	"	"
-10N	"	"	"	"	"	"	20
-9	842(450)	842(450)	N/A	N/A	N/A	N/A	20
-9U	"	"	"	"	"	"	"
-10, -10A	1202(650)	1202(650)	1202(650)	N/A	N/A	N/A	20
-10B, -10G	"	"	"	"	"	"	"
-10GR	"	"	"	"	"	"	"
-10J, -10R	"	"	"	"	"	"	"
-10U	"	"	"	"	"	"	"
-10UF	"	"	"	"	"	"	"
-10UG	"	"	"	"	"	"	"
-10UGR	"	"	"	"	"	"	"
-10UJ	"	"	"	"	"	"	"
-10UR	"	"	"	"	"	"	"
-11U	"	"	"	"	"	"	"
-11UA	"	"	"	"	"	"	"
-12	"	"	"	"	"	"	"
-12B	"	"	"	"	"	"	"
-12JR, -12UA	"	"	"	"	"	"	"
-12UAN	"	"	"	"	"	"	"
-12UAR	"	"	"	"	"	"	"
-12UER	"	"	"	"	"	"	"
-12UHR	"	"	"	"	"	"	"

NOTE 1: Maximum Permissible Temperatures - $^{O}F(^{O}C)$ (Continued)

	Exhaust Gas Temperature			Interstage Turbine Temperature			
	Maximum Continuous	Takeoff (5 min.) (Dry)	Takeoff (5 min.) (Wet)*	Maximum Continuous	Takeoff (5 min.) (Dry)	Takeoff (5 min.) (Wet)*	See Note Below
Model TPE331							
-10UA	1049(565)	1049(565)	1049(565)	N/A	N/A	N/A	
-10AV	"	"	"	"	"	"	
-10GP	"	"	"	"	"	"	
-10GT	"	"	"	"	"	"	
-10P	"	"	"	"	"	"	
-10T	"	"	"	"	"	"	
-10UK	"	"	"	"	"	"	
Model TSE331							
-3U	N/A	N/A	N/A	1693(923)	1693(923)	N/A	

***** Augmented with water-alcohol per NOTE 5.

For engines equipped with Interstage Turbine Temperature (ITT) measurement systems the maximum permissible temperatures do not vary with ambient or operating conditions.

For engines with Exhaust Gas Temperature (EGT) measurement systems, and not operating with a Single Red-Line (SRL) computer or Electronic Engine Control (EEC), the maximum permissible temperatures vary as a function of ambient temperature, altitude, and other operating conditions. Takeoff and maximum continuous EGT temperatures are for International Standard Atmosphere (ISA) sea-level, static un-installed conditions. Consult IM-5117 for other conditions. The maximum EGT for operation between 65 percent and 79 percent engine speed is $760^{O}C$ for the TPE331-3 through -6 series engines and is $770^{O}C$ for the TPE331-8 through -12 series engines.

For engines equipped with EGT measurement systems, and operating with a SRL computer or EEC, the maximum permissible temperature does not vary under any condition except engine speed. The maximum EGT for operation between 65 percent and 79 percent engine speed is $770^{O}C$ for the TPE331-8 through -12 series engines. For engine speeds above 80 percent the maximum indicated EGT is $450^{o}C$ for TPE331-8 series, and -10N model engines, or $650^{O}C$ for TPE331-12B model engine and engines equipped with a SRL computer, except when APR/RPR is activated. (See NOTE 20).

NOTE 1: Maximum Permissible Temperatures - $^{O}F(^{O}C)$ (Continued)

	Maximum Exhaust Gas Temperature During Starting (1 sec. Limit): $^{O}F(^{O}C)$	Maximum Interstage Temperature During Starting (1 sec. Limit): $^{O}F(^{O}C)$
Model TPE331		
-3, -3U, -3W, -3UW,	1500 (815)	2100 (1149)
-5, -5A, -5U, -5AB,	"	"
-5B, -6, -6A, -6U	"	"
-8, -8A	1418 (770)	N/A
-9, -9U	"	"
-10, -10A, -10AV, -10B	"	"
-10G, -10GR	"	"
-10J, -10R, -10T, -10GT	"	"
-10P, -10GP	"	"
-10U, -10UA	"	"
-10UF, -10UG	"	"
-10UGR, -10UJ	"	"
-10UK, -10UR, -10N	"	"
-11U, -11UA	"	"
-12, -12JR, -12UA	"	"
-12UAR, -12UER, -12UHR, -12UAN	"	"
-12B	1500 (815)	"
Model TSE331		
-3U	1500 (815)	2100 (1149)

Oil Temperature and Specifications:

Honeywell Specification	Type of Lubricant Equivalent Military Specification	Minimum of Starting ^{O}F (^{O}C)
EMS 53110 TYPE I	MIL-PRF-7808	-40 (-40)
EMS53110 TYPE II	MIL-PRF-23699	-40 (-40)

Note: Refer to IM-5117, FAA Approved Section, Lubrication System, for oil pressure and temperature limits.

NOTE 1: Maximum Permissible Temperatures - $^{O}F(^{O}C)$ (Continued)

Ambient Air Temperature, $^{O}F(^{O}C)$

	Starting	Operation
Minimum	-40 (-40)**	--
Maximum	130 (55)	130 (55)

**Starting in ambient air temperatures below -40^{o}F(-40^{o}C) is acceptable provided the engine oil and electrical components' steady state temperatures are not less than -40 ^{o}F(-40^{o}C).

Engine External Components Surface Temperature Limits (See Installation Manual IM-5117, Section A).

NOTE 2: Pressure Limits

Fuel pump inlet pressure, minimum normal operation, refer to IM-5117 for operational limitations	5 psig plus true vapor pressure of fuel
Minimum oil pressure at inlet connection to the engine	2.45 psig
Oil operating pressure ground idle (minimum at 65% speed)	40 psig
Normal operating range	70 to 120 psig
Normal operating range (above 23,000 ft. altitude)	50 to 120 psig
Minimum water-alcohol augmentation manifold inlet pressure	(see NOTE 5)

NOTE 3: The Engine Ratings are based on:

Dynamometer operation at International Standard Atmosphere (ISA), Sea Level Static Conditions, see NOTE 1.

MIL-DTL-5624, Grade JP-4 fuel with lower heating value of 18,400 BTU per pound.

MIL-PRF-23699 type oil, Mobil Oil Jet II, or Exxon 2380.

No bleed-air extraction.

No anti-icing airflow.

No external accessory loads.

Zero inlet loss.

NOTE 3: The Engine Ratings are based on: (Continued)

Exhaust gas discharging to ambient-static pressure through the turbine exhaust diffuser furnished with the engine.

Turbine gas temperature (ITT or EGT) limits not exceeded.

NOTE 4: Equivalent Shaft Horsepower (ESHP) for Static Conditions is based on:

$$ESHP = \frac{\text{Net thrust, pounds}}{2.5} + SHP$$

NOTE 5: Augmented Performance

A. Augmented engine ratings are listed on Page 2.

B. Augmented interstage turbine temperature or exhaust gas temperature limits are stated in NOTE 1.

C. Engine propeller shaft torque limits per NOTE 7 shall remain the same.

D. Water-alcohol mixture must conform to that shown in FAA approved Installation Manual IM-5117.

E. Minimum water-alcohol flow rate is dependent on engine power requirements and is determined through coordination of the aircraft manufacturer and Honeywell International Inc.

F. Water-alcohol manifold pressure required to obtain specified flow is stamped on each manifold.

Engine Model	Water-Alcohol Flow Rate – lb/hr (NOTE 5D)		Water Alcohol Manifold Pressure (psig) (NOTE 5F)
	Minimum	Maximum	
-3, -3UW, -3W	780	950	10-14
-10UA, -10UK	528	600	6-8
-5, -5A, -5AB, -5B, -5U, -10T	NOTE 5E	950	N/A
-10GT, -10P, -10GP	"	"	"
-10, -10A, -10B, -10G, -10AV	"	"	"
-10J, -10R, -10U, -10UF	"	"	"
-10UG, -10UGR, -10UJ, -10UR	"	"	"
-11U, -11UA	NOTE 5E	1250	"
-12JR, -12UA, -12UAR, -12UER, -12UHR	"	1300	"
-12UAN	“	“	“

NOTE 6: Accessory Provisions

A. Aircraft Accessory

	All Models
Type of drive: (one each)	AND20001 Type X1-B (Modified)
AND drive modifications	Rotation and RPM
Rotation facing drive pad	CCW
RPM at 100 percent engine speed	3959
Maximum torque (lb-in.) T_C, continuous torque	250
T_O, torque overload	375
T_S, static torque	1650
Overhung moment (lb-in.)	125
Speed ratio, drive to engine rotor	0.09487

B. Starter, Starter-generator or Alternator

Type of drive: (one each)	AND20002 Type XII-D (Modified)
AND drive modifications	RPM, T_C, T_O and stud pattern rotated 30 degrees

NOTE 6: Accessory Provisions: (Continued)

	All Models Except: TPE331-5, -5A, -5AB, -5B, -5U, -6, -6A, -6U, -10AV, -10GT, -10P, -10GP, -8, -9, -9U, -10N, -10T	TPE331-5, -5A, -5AB, -5B, -5U, -6, -6A, -6U, -8, -9, -9U, -10AV, -10N, -10T, -10GT, -10P, -10GP
Rotation facing drive pad	CW	CW
RPM at 100 percent engine speed	12,175	10,887
Maximum torque (lb-in.) T_C, continuous torque	300	300
T_O, torque overload	600	600
T_S, static torque	2,200	2,200
Overhung moment (lb-in.)	500	500
Speed ratio, drive to engine rotor	0.29175	0.26089
C. Tachometer Generator	All Models	
Type of drive: (one each)	AND20005 Type XV-B (Modified)	
AND drive modifications	Shorter studs and thread lengths	
Rotation facing drive pad	CW	
RPM at 100 percent engine speed	4,187	
Maximum torque (lb-in.) T_C, continuous torque	7	
T_S, static torque	50	
Overhung moment (lb-in.)	25	
Speed ratio, drive to engine rotor	0.10033	

NOTE 6: Accessory Provisions: (Continued)

D. Propeller Governor	All Models
Type of drive: (one each)	AND20010 Type XX-A (Modified)
AND drive modifications	RPM
Rotation facing drive pad	CW
RPM at 100 percent engine speed	3,754
Maximum torque (lb-in.) T_C, continuous torque	125
T_O, torque overload	188
T_S, static torque	N/A
Overhung moment (lb-in.)	125
E. Propeller Pitch Control	
Type of drive: (one each)	Mounting pad provided
Overhung moment (lb-in.)	30

NOTE 7: Maximum Allowable Propeller Shaft Torque as Sensed by the Torque Sensor, in Pound Feet

Model TPE331	5 Minute Torque Limit	Maximum Continuous
-3	2470	2206
-3U	"	"
-3UW	"	"
-3W	"	"
-10UA	"	"
-5, -5B	2564	2564
-5U	"	"
-8A, -10T, -10P	"	"
-5A, -5AB, -10GT,	2773	2564
-10GP	"	"
-6	2040	1878
-6A	"	"
-6U	"	"
-8	"	"
-10AV	"	"
-10N	"	"
-9	2363	2271
-9U	"	"
-10J	3301	3202
-10UJ	"	"
-12JR	"	"
-10A	2470	2363
-10B	"	"
-10	3105	2972
-10G	"	"
-10GR	"	"
-10R	"	"
-10U	"	"
-10UF	"	"
-10UG	"	"
-10UR	"	"
-10UGR	"	"
-12	"	"
-11U	3631	3466
-11UA	"	"
-12UA	"	"
-12UAR	"	"
-12UER	"	"
-12UHR, -12UAN	"	"
-12B	2889	2889
-10UK	2626	2547

NOTE 7: Maximum Allowable Propeller Shaft Torque as Sensed by the Torque Sensor, in Pound Feet (Continued)

Model TSE331	5 Min. Torque Limit	Maximum Continuous
-3U	1777	1481

NOTE 8: Propeller Output Shaft (Bolted Flange) Maximum Speed, Percent (RPM) and Direction of Rotation

	TPE331 -3, -3U, -3UW, -3W, -6, -6A, -6U, -8, -9, -9U, -10A, -10B, -10N, -10UA, -10AV, -10UK, -12B	TPE331 -5, -5A, -5AB, -5B, -5U, -8A, -10, -10G, -10GR, -10J, -10R, -10U, -10UF, -10T, -10GT, -10UG, -10UGR, -10P, -10GP, -10UJ, -10UR, -11U, -11UA, -12, -12JR, -12UA, -12UAR, -12UER, -12UHR, -12UAN	TSE331 -3U
Normal Operation	100.0 (2000)	100.0 (1591)	100.0 (2482)
Continuous Operation	101.0 (2020)	101.0 (1607)	101.0 (2507) see NOTE 14
Transient Limit	104.0 (2080) NOTE 22	104.0 (1655) NOTE 22	104.0 (2581)
Rotation, aft looking forward	CW (CCW FOR -10B)	CCW	CW

NOTE 9: Incorporated into NOTE 8.

NOTE 10: Up to 10 percent of the engine airflow is available for bleed air purposes (except during starting). Of this 10 percent total, 1.2 percent is utilized by the engine mounted anti-icing system.

NOTE 11: These engines meet FAA requirements for adequate turbine disk integrity and rotor blade containment, and do not require external armoring.

NOTE 12: These engines meet FAA requirements for operation in icing conditions within the envelope defined in 14 CFR part 25 Appendix C, original issue.

NOTE 13: Variations in engine configuration and installation components are identified on the engine nameplate by a suffix to the basic model number; i.e., TPE331-3-XY (“X” denotes Honeywell installed configuration rating code number(s) and “Y” denotes Honeywell equipment code letter(s) of aircraft manufacturer or supplemental type certificate holder), and by an engine part number. The engine part number shown on the engine nameplate identifies the specific parts list and/or equipment list which have been demonstrated as compatible with the basic engine during engine certification; however, the operation, functioning, and rigging of these in a specific aircraft must be demonstrated during aircraft certification. Subsequent design change control associated with these factors is the responsibility of the aircraft manufacturer.

NOTE 14: The maximum allowable continuous operating output shaft speed for the TSE331-3U is 2556 rpm (103 percent speed) for 1100^{O}F ITT and below, varying linearly to 2507 rpm (101 percent speed) at 1693^{O}F (ITT).

NOTE 15: Certain engine parts are life limited. These limits are listed in the FAA-Approved Honeywell International Inc. Service Bulletins as follows:

Engine Series	Honeywell Service Bulletins
TPE331-3, -5, -6, TSE331-3	TPE33/TSE1-72-0019 Revision 23, or later FAA approved revisions
TPE331-8, -9	TPE331-72-0117 Revision 12, or later FAA approved revisions
TPE331-10, -11	TPE331-72-0180 Revision 35, or later FAA approved revisions
TPE331-12	TPE331-72-0476 Revision 32, or later FAA approved revisions

NOTE 16: The following information should be included, as appropriate, in a suitable aircraft placard or FAA approved flight manual - "Avoid operation between 18 and 28 percent rpm, except for transient occurring during start and shut-down."

NOTE 17: The TPE331-8 series engines are equipped with an integrated fuel control system consisting of an engine driven hydromechanical control and an aircraft mounted EEC that is energized by the aircraft electrical system. This system may be operated in either an Automatic Mode in which both control components are active or in a Manual Mode with the EEC de-activated. De-activation of the EEC is accomplished automatically should certain faults develop in the electronic component. The operating limits shown in NOTE 1 are for Automatic Mode operation. When operating in the Manual Mode, the rated EGT shown in NOTE 1 will be 937^{O}F (503^{O}C) for the TPE331-8 series engines and will vary as a function of ambient conditions. Consult IM-5117 for other than standard day sea level EGT limits.

NOTE 18: Deleted with Revision 26.

NOTE 19: Deleted with Revision 25.

NOTE 20: Certain TPE331-9 series, TPE331-10 series and TPE331-11 and -12 series engine power management systems may include a SRL temperature indicating system and an automatic torque and temperature limiting system. At the SRL limit value of 1202^{O}F (650^{O}C) [except for -9 series and -10N engines is 842^{o}F (450^{o}C)] these engines will provide a minimum of rated thermodynamic performance. The TPE331-10R, -10GR, -10UR, -10UGR, -12JR, -12UAR, -12UER, -12UHR, and -12UAN engines have the capability of Automatic Performance Reserve (APR) or Restricted Power Reserve (RPR) to provide a thermodynamic power increase in some multi-engine aircraft installations if significant power loss occurs on another engine. The engines are approved for operation up to an SRL value of 676^{O}C for -10R, 669^{O}C for -10UG/-10UR/ -10UGR, and 675^{O}C for -12JR, -12UAR, -12UER, -12UHR, and -12UAN when the APR/RPR EGT compensator is not powered and APR/RPR is activated with temperature limiting disabled. The aircraft may incorporate EGT compensation that will reduce the indicated EGT to preclude exceeding the EGT limiting set point (650^{O}C or 660^{O}C depending on the installation), when APR/RPR is activated.

With the SRL computer inoperative, the EGT limit for the TPE331-9 and -9U engines is 937^{O}F (503^{O}C), for TPE331-10, -10G, -10R, -10GR, -10U, and -11UA engines is 1049^{O}F (565^{O}C), and for TPE331-10UF, -10J, -10UJ, -10UG, -10UGR, -10UR and -11U engines is 1079^{O}F (582^{O}C), and 1085^{O}F (585^{O}C) for -12 series engines [except for -12JR , -12UHR, and -12UAN engines is 1116^{O}F (602^{O}C)] at ISA/sea level and will vary as a function of ambient conditions. Consult IM-5117 for off-standard day EGT limits.

The -10A, -10B, -10N, and -12B engines are equipped with an integrated fuel control system consisting of an engine driven hydromechanical control and an aircraft mounted EEC which is energized by the aircraft electrical system. This system may be operated in either an Automatic Mode in which both control components are active, or in a Manual Mode with the EEC de-activated. De-activation of the EEC is accomplished automatically should certain faults develop in the electronic component. The operating limits shown in NOTE 1 are for Automatic Mode operation. When operating in the Manual Mode, the rated EGT shown in NOTE 1 will be 1049^{O}F (565^{O}C) for the -10A and -10B engines, 946^{O}F (508^{O}C) for the -10N engine, and 1085^{O}F (585^{O}C) for the -12B engine at ISA/sea level and will vary as a function of ambient conditions. Consult IM-5117 for off-standard day EGT limits.

Component interface and installation requirements of the aircraft-installed components are also prescribed in IM-5117.

NOTE 21: Deleted with Revision 26.

NOTE 22: Transient operation of propeller output shaft speed above 104 percent, to a maximum of 106 percent is allowable for fuel control overspeed governor test when the propeller is on the start locks (not applicable to TSE331-3U). Refer to engine maintenance manual for proper procedures and limitations for this test.

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