

**MODELS: Pratt & Whitney Military R-2800 Series**

**T.C. NUMBER: 5E-8**

Model	R-2800-27,-27M1,-31,-31M1, -43,-51,-51M1,-71,-75, -75M1,-79	R-2800-21,-21M1,-51M3,-51M4 -59,-59M1,-63,-75M2,-75M3	R-2800-31M2,-51M2
Type 18RA			
- reduction gearing	2:1 except 16:9 on -31,-31M1	2:1	2:1 except 16:9 on -31M2
Similar civil model series	B	--	--
Rating (with low impeller gear ratio):	7.6:1	--	7.29:1
Maximum continuous, hp, rpm, in.Hg., at:			
Rated pressure altitude (ft.)	1700-2550-43.0-5500	--	1700-2550-43.5-4800
Sea level pressure altitude (ft.)	1700-2550-44.0-S.L. or 1600-2400-41.5-5300 1600-2400-43.2-S.L.	--	1700-2550-45.0-S.L. or 1600-2400-41.5-4800 1600-2400-43.0-S.L.
Take-off (5 minutes), hp, rpm, in.Hg., at:	(Dry)		
Rated pressure altitude (ft.)	2000-2700-51.0-1500	--	--
Sea level pressure altitude (ft.)	2000-2700-52.0-S.L.	--	--
Rating (with high impeller gear ratio):	9.89:1	--	--
Maximum continuous, hp, rpm, in.Hg., at:			
Rated pressure altitude (ft.)	1450-2400-43.0-13300	--	--
Low critical pressure altitude (ft.)	1450-2400-43.5-9000	--	--
Fuel (minimum grade aviation gasoline)	100/130	--	--
Bore and stroke, in.	5.75 x 6.000	--	--
Displacement, cu. in.	2804	--	--
Compression ratio	6.65:1	--	--
Weight (dry), lbs.	See NCTE 3	--	--
C.G. location (dry)			
Forward of mounting pad C.L., in.	14.1	--	--
Forward of mounting lug rear edge, in.	--	--	--
Above propeller shaft C.I., in.	.2	--	--
Propeller shaft, SAE No.	50	--	--
Carburetion	Stromberg PT-13G1 or G5	--	PR-58E2 or PR-58E5
Ignition, dual	Scintilla DF-18RN on models -27,-27M1,-31,-31M1,-43,-51,-51M1; G.E. S18-LG-P on models -71,-75,-75M1,-79	Scintilla DF-18RN on models -21,-21M1,-51M3,-51M4,-63; G.E. S18-LG-P on models -59,-59M1,-75M2,-75M3	Scintilla DF-18RN
Ignition timing, degrees ETC	20	--	--
NOTES	1,2,3,4,5,7,9,10,11	1,2,3,4,5,7,9,10,11	1,2,3,4,5,7,9,10,11
Model	R-2800-34, --34M1, -34W, -83, -83A, -83AM3, -83AM4, -83AM4A, -85, -85M1, -85A, -85AM1, -85AM2, -85XA, -101M1	R-2800-57, -57M2, -73, -77, -83AM2, -83AM2A, -83AM12, -83AM12A, -101	
Type 18RA			
- reduction gearing	20:9	--	--
Similar civil model series	C & CA	--	--
Rating (with low impeller gear ratio);	7.29:1	--	--
Maximum continuous, hp, rpm, in.Hg., at:			
Rated pressure altitude (ft.)	1800-2600-44.0-6500	--	--
Sea level pressure altitude (ft.)	1800-2600-45.0-S.L. (or for -83AM4A only) 1900-2600-46.5-4900 1900-2600-47.5-S.L.	-- (or for -83AM12A only) -- (or for -83AM2A only) 1800-2600-46.5-S.L. 1800-2600-45.2-5300	--
Take-off (5 minutes), hp, rpm, in.Hg., at:	(Dry)		
Rated pressure altitude (ft.)	2100-2800-52.5-3400	--	--
Sea level pressure altitude (ft.)	2100-2800-54.0-S.L. (With ADI for models -34M1, -83AM3, -83AM4, -83AM4A, -85M1, -85AM1, -85AM2 only)	-- (or for -83AM2A only) 2100-2800-54.0-S.L. 2100-2800-53.0-3000 (With ADI)	--

	2400-2800-56.0-1000	--
	2400-2800-56.5-S.L.	--
Rating (with high impeller gear ratio):	9.45:1	--
Maximum continuous, hp, rpm, in.Hg., at:		
Rated pressure altitude (ft.)	1600-2600-45.0-16200	--
Low critical pressure altitude (ft.)	1600-2600-46.5-10000 or 1500-2500-42.0-16000 1500-2500-43.0-10000	--
Fuel (minimum grade aviation gasoline)	100/130	--
Bore and stroke, in.	5.75 x 6.00	--
Displacement, cu.in.	2804	--
Compression ratio	6.75:1	--
Weight (dry), lbs.	See NCIE 3	--
C.G. location (dry)		
Forward of mounting pad C.L., in.	--	--
Forward of mounting lug rear edge, in.	11.8	--
Alcove propeller shaft C.L., in.	.2	--
Propeller shaft, SAE No.	60-A	--
Carburetor	PK-58E2 or PK-58E5	--
Ignitor, dual	DF-18-LN (high tension) or DLN-10 (low tension); G.E. S18LG for models -83,-85,-10M only, -34 eligible with either.	DF-18-LN (high tension) or DLN-10 (low tension); G.E. S18LG for models -57,-73 only
Ignition timing, degrees BTC	20	--
NCIES	1,2,3,4,5,6,8,9,10,11,12	1,2,3,4,5,6,8,9,10,11,12

MODELS: Pratt & Whitney Military R-2800 Series (Continued)

I.C. NUMBER: 5E-8 (Continued)

Model	R-2800-57M1, -83AM10	R-2800-83AM6, -83AM9	R-2800-52WM1, -83AM5, -83AM16
Type 18RA			
- reduction gearing	16:9 (2:1 on -57M1 only)	20:9	--
Similar civil model series	E and C	C and CA	CB16
Rating (with impeller gear ratio):	7.29:1	--	--
Maximum continuous, hp, rpm, in.Hg., at:			
Rated pressure altitude (ft.)	1700-2600-41.5-8000	1800-2600-44.0-6500	1800-2600-46.5-9200
Sea level pressure altitude (ft.)	1700-2600-44.0-S.L.	1800-2600-45.0-S.L.	1800-2600-48.5-S.L.
Take-off (5 minutes), hp, rpm, in.Hg., at:			
	(Dry)	(Dry)	(Dry)
Rated pressure altitude (ft.)	2000-2700-50.5-4800	2100-2800-52.5-3400	2050-2700-53.0-6900
Sea level pressure altitude (ft.)	2000-2700-52.0-S.L.	2100-2800-54.0-S.L.	2050-2700-55.0-S.L. 1950-2800-51.0-9800 1950-2800-53.0-S.L.
	(-83AM10 only)	(With ADI) (-82AM9 only)	(With ADI)
Rated pressure altitude (ft.)	2100-2800-53.5-3400	2400-2800-56.0-1000	2400-2800-59.0-5000
Sea level pressure altitude (ft.)	2100-2800-53.5-S.L.	2400-2800-56.5-S.L.	2400-2800-59.5-S.L.
Rating (with high impeller gear ratio):	9.45:1 (-83AM10 only)	9.1:1	8.58:1 (except -83AM16)
Maximum continuous, hp, rpm, in.Hg., at:			
Rated pressure altitude (ft.)	1600-2600-45.0-16200	1675-2600-47.0-13500	1700-2600-47.5-16800
Low critical pressure altitude (ft.)	1600-2600-46.5-10000	1675-2600-49.0-8000	1700-2600-48.5-10000
Take-off (5 minutes), hp, rpm, in.Hg., at:	--	(With ADI) (-83AM9 only)	--
Rated pressure altitude (ft.)		1900-2600-49.0-10900	
Low critical pressure altitude (ft.)		1900-2600-49.5-8000	
Fuel (minimum grade aviation gasoline)	100/130	--	--
Bore and stroke, in.	5.75 x 6.00	--	--
Displacement, cu. in.	2804	--	--
Compression ratio	6.75:1	--	--
Weight (dry), lb.	(See NOTE 3)	--	--
C.G. location (dry)			
Forward of mounting pad C.L., in.	--	--	--
Forward of mounting lug rear edge, in.	11.8	--	11.6

Above propeller shaft C.L., in.	.2	--	--
Propeller shaft, SAE No.	50	60-A	--
Carburetion	PR-58E2 or PR-58E5	--	--
Ignition, dual	DF-18LN (high tension) or DLN-10 (low tension)	--	--
Ignition timing, degrees BTC	20	--	--
NOTES	1,2,3,4,5,6,9,10,11,12	1,2,3,4,5,6,8,9,10,11,12	1,2,3,4,5,8,9,10,11,12
Model	R-2800-52W, -52WM2, -83AM7, -83AM15, -99W, -103W	R-2800-83AM8, -83AM11	R-2800-83AM13, -83AM14
Type 18RA - reduction gearing	20:9	--	16:9
Similar civil model series	CE17	C and CE	B, C and CB
Rating (with low impeller gear ratio); Maximum continuous, $n_f$ , rpm, in.Hg., at:	7.29:1	--	--
Rated pressure altitude (ft.)	1900-2600-50.0-7100	1675-2600-42.0-12000	1700-2600-43.0-11500
Sea level pressure altitude (ft.)	1900-2600-51.5-S.L.	1675-2600-45.0-S.L.	1700-2600-46.0-S.L.
Take-off (5 minutes), $n_f$ , rpm, in.Hg., at:	(Dry)	(Dry)	(Dry)
Rated pressure altitude (ft.)	2200-2800-59.0-5200	1950-2800-51.0-9800	2000-2700-52.0-7700
Sea level pressure altitude (ft.)	2200-2800-60.0-S.L. (With ADI)	1950-2800-53.0-S.L. (With ADI)	2000-2700-53.5-S.L. --
Rated pressure altitude (ft.)	2500-2800-61.5-3700	2250-2800-55.0-7000	
Sea level pressure altitude (ft.)	2500-2800-62.0-S.L.	2250-2800-56.5-S.L.	
Rating (with high impeller gear ratio):	8.58:1 (except -52WM2 & -83AM15)	-- (-83AM11 only)	-- (-83AM13 only)
Maximum continuous, $n_f$ , rpm, in.Hg., at:			
Rated pressure altitude (ft.)	1750-2600-49.5-15000	1600-2600-44.0-18000	--
Low critical pressure altitude (ft.)	1750-2600-51.5-10000	1600-2600-46.5-10000	--
Take-off (5 minutes), $n_f$ , rpm, in.Hg., at:	(With ADI)	--	--
Rated pressure altitude (ft.)	1900-2600-49.0-15700		
Low critical pressure altitude (ft.)	1900-2600-50.5-10000		
Fuel (minimum grade aviation gasoline)	108/135	100/130	--
Bore and stroke, in.	5.75 x 6.00	--	--
Displacement, cu. in.	2804	--	--
Compression ratio	6.75:1	--	--
Weight (dry), lb.	See NCTE 3	--	--
C.G. location (dry)			
Forward of mounting pad C.L., in.	--	--	--
Forward of mounting lug rear edge, in.	11.6	--	--
Above propeller shaft C.L., in.	.2	--	--
Propeller shaft, SAE No.	50	--	--
Carburetor	PR-58E5	--	--
Ignition, dual	DF-18-LN (high tension) or DLN-10 (low tension)	--	--
Ignition timing, degrees BTC	20	--	--
NOTES	1,2,3,4,5,8,9,10,11,12	1,2,3,4,5,6,8,9,10,11,12	1,2,3,4,5,6,9,10,11,12

NOTE 1. Maximum permissible temperatures are as follows:

Model	Cylinder Head, Degrees F.	Cylinder Barrel, Degrees F.	Oil Inlet, Degrees F.
R 2800 B Series	500 (Spark plug gasket)	340	200 (205 with P/N's 79150 and 75151 oil pump drive gears & AEF P/N 20-102 inter-cylinder oil drain)
R-2800 C & CA Series	500 Low blower (Well type) 450 High blower for 1600 BHP and 1675 BHP (Well type)	350	212
R-2800 CE Series	500 High blower for 1500 BHP (Well type) 500 (Well type)	350	212

NOTE 2.

Fuel pressure, psi	<u>Maximum</u> 17 25	<u>Minimum</u> 14 21	With 5 lb. discharge nozzle spring With 10 lb. discharge nozzle spring
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NOTE 3. The following accessory drives are provided:

R-2800-B series engines (basic drives - note exceptions below)

	Drive Ratio (Times Crankshaft)	Rotation (C = Clockwise; CC = Counter-Clockwise)	Maximum Torque (in. lb.)		Maximum Overhang (in. lb.)
			Continuous	Static	
Starter	1.0	C	--	30000	340
Generator (optional on right or left rear)	1.4	C	1300	12000	300
Vacuum pump (optional on right or left generator drive)	1.4	C	185	2250	--
Fuel pump	.864	CC	355	1380	10
1st Pump auxiliary (right side)	1.4	C	185	2250	40
2nd Pump auxiliary (left side)	1.4	CC	185	2250	40
Propeller governor	1.0	C	110	440	--

R-2800-C, CA and CB engines

Starter	1.0	C	--	30000	340
Generator (right rear)	3.033	C	500	3000	300
Fuel pump	.864	CC	355	1380	10
Pump drives (right and left sides)	1.4	C	250	2250	40
Power takeoff (left rear)	1.4	C	1300	12000	300
Propeller governor	.964	CC	125	825	--

R-2800-21, -59, -63 engines incorporate right and left generator drive pads on rear cover without pump drive adapters and side auxiliary drives.

R-2800-43, -51, -75 engines incorporate dual pump drive adapter (over left generator drive) providing 2 angular side drive pads similar to 2nd auxiliary and generator type drive at rear.

R-2800-27, -71, -79 engines incorporate a pump drive adapter (over left generator drive) similar to 1st auxiliary.

R-2800-43, -51 engines (early serial numbers only) incorporate 2 gun synchronizer drives (right and left side) in lieu of side auxiliary pump drives.

NOTE 4. The above engines incorporate the following additional characteristics:

R-2800 Models	Weight (dry) lb.	Characteristics
-21	2265	B Series, basic model
-21M1	2355	Same as -21 except has "C" type cylinder and associated changes.
-27	2300	Same as -21 except for two-speed supercharger and drive provisions above.
-27M1	2390	Same as -27 except has "C" type cylinder and associated changes.
-31	2280	Same as -51 except for different accessory drive provisions and reduction gear ratio.
-31M1	2370	Same as -31 except has "C" type cylinder and associated changes.
-31M2	2320	Same as -31M1 except has "C" type supercharger and associated changes.
-34	2360	C Series, basic model, grooved diffuser, short type rods, integral torqueometer. Also eligible with G.E. ignition system.
-34M1	2360	Same as -34, modified by American Airlines for water injection operation with water regulator, P&WA P/N 90573 with No. 27 water jet.
-34W	2360	Same as -34 with military war emergency water injection equipment which must be removed per NOTE 5 or engine modified to -34M1.
-43	2300	Same as -51, but incorporates different mounting brackets.
-51	2300	B Series, basic model, has dual vacuum pump drive adapter over left generator drive.
-51M1	2390	Same as -51 except has "C" type cylinders and associated changes.
-51M2	2340	Similar to -51M1 except has "C" type supercharger and associated changes.
-51M3	2365	Similar to -51M1 except has no high blower drive and clutches.
-51M4	2275	Same as -51 except has no high blower drive and clutches.
-52W	2400	Same as civil Double Wasp CB17, also eligible at ratings shown for -83AM5 (CB16) when using grade 100/130 fuel.
-52WM1	2400	Same as -52W except for fuel and ratings of -83AM5.
-52WM2	2367	Same as -52W except has no high blower ratio and clutches.
-57	2315	Same as -34 except has single-speed supercharger. ADI rating with -83AM3 water injection system optional.
-57M1	2310	Same as -57 except has -75 nose section. Associated changes are also necessary for retention and lubrication of the -75 nose section and for the drive arrangements to accommodate magnetos.
-57M2	2351	Same as -57 except has CB type cylinders, pistons, crankshaft, long rods and associated changes, low tension ignition system on ADI system.
-59	2290	Same as -21 except for carburetor, ignition system, and has water injection for military use.
-59M1	2380	Same as -59 except has "C" type cylinder and associated changes.
-63	2265	Same as -21 except has water injection for military use.
-71	2325	Same as -27 except has G.E. ignition system.
-73	2351	Same as -57 except has G.E. ignition system and double acting propeller provisions. ADI rating with -83AM3 water injection system optional.
-75	2325	Same as -51 except has G.E. ignition system.

-75M1	2415	Same as -75 except has "C" type cylinders and associated changes.
-75M2	2290	Same as -75 except has no high blower ratio or clutches.
-75M3	2390	Same as -75M1 except has no higher blower ratio or clutches.
-77	2321	Similar to -57 but has double acting propeller provisions. ADI rating with -83AM3 water injection system optional.
-79	2325	Same as -71 except has PT-13G5 carburetor and water injection for military use.
-83	2392	Same as -83A except has G.E. ignition system.
-83A	2367	Similar to -34, has double acting governor and water injection for military use.
-83AM2	2367	Same as -83A but has no high ratio blower gears. ADI rating with -83AM3 water injection system optional.
-83AM2A	2360	Same as -83AM2 except incorporates modifications as specified in Canadian Report CES1000 Issue 4 FAA approved 7/11/68.
-83AM3	2367	Same as -83A except modified by American Airlines for water injection operation at take-off with water regulator, P6WA P/N 90573 with No. 27 water jet or P6WA P/N 190255 regulator.
-83AM4	2367	Same as -83A except has the original Double Wasp CA Type crankshaft, having one heavy and one lightweight damper. When the crankshaft with the two lightweight dampers is installed per NOTE 12, this engine becomes an -83AD engine. When equipped with water regulator, is eligible for ADI take-off power.
-83AM4A	2367	Same as -83AM4 but modernized to include CA, CB long rod type cylinders, pistons, etc.
-83AM5	2400	Same as civil model Double Wasp CB16 except has -83A nose section, crankcase housing and accessory rear section. Water regulator, either constant flow or variable flow type, but only variable flow type can be mounted on engine case.
-83AM6	2367	Same as -83A except has civil Double Wasp CA18 high ratio gearing and carburetor setting.
-83AM7	2400	Same as -83AM5 with ratings of -52W (CB17) using 105/135 fuel.
-83AM8	2367	Same as -83AM3 except has CB3 supercharger, associated changes and reduced ratings.
-83AM9	2380	Same as -83AM6 except has CA18 rear cases which provides pad for mounting of variable flow water regulator.
-83AM10	2360	Same as -83A except has -31 nose section (16:9 reduction gear ratio). Associated changes are also necessary for retention and lubrication of the -31 nose section and for the drive arrangements to accommodate magnetos.
-83AM11	2400	Same as -83AM3 except has CB16 supercharger, reduced ratings and associated changes.
-83AM12 & -83AM12A	2342	Same as -83AM4 but has no high ratio blower gears.
-83AM13	2393	Same as -83AM10 except has CB16 supercharger, associated changes and ratings.
-83AM14	2360	Same as -83AM10 except has CB3 supercharger, associated changes and ratings.
-83AM15	2367	Same as -83AM7 except has no high blower ratio and clutches.
-83AM16	2400	Same as -83AM5 except modified to a single speed impeller drive per P6WA Service Bulletin 1760.
-85	2375	Same as -83A but has G.E. ignition and no water injection provision.
-85 MI	2367	Same as -83AM3 except has G.E. ignition and water injection provision.
-85A	2365	Same as -85 but has Scintilla ignition.
-85AM1	2365	Same as -85 except has American Airlines ADI torque nose for autofeathering, Scintilla ignition, and provisions for double acting governor.
-85AM2	2365	Same as -85AM1 except has no provisions for double acting governor.
-85XA	2365	Same as -85A plus a higher ratio generator drive.
-99W	2400	Same as -52W except has two high-speed (3.003:1) generator drives.
-101	2351	Same as -57 except has G.E. ignition system and two high-speed (3.003:1) generator drives. ADI rating with -83AM3 water injection system optional.
-101M1	2360	Same as -101 except has two-speed supercharger and low-speed generator drive on right side.
-103W	2400	Same as -52W except for carburetor setting.

NOTE 5. The R-2800-59, possibly some other "B" series engines, and all "C" series engines incorporate carburetors with a built-in derichment valve. Except for those engines with ADI civil ratings, the derichment valve diaphragm and valve should either be removed and replaced with a gasket, or merely punctured. The vented 1/8" pipe plug in the derichment valve cover should be replaced with a solid pipe plug. Remove all water injection equipment and plug the resulting openings. (Refer to P6WA F-2800 Bulletin No. 476 covering conversion to R-2800-34W engines to R-2800-34 engines.)

NOTE 6. The G.E. P-18HG-9 ignition harness and the G.E. S18PG-2 magneto are eligible on all "C" series engines.

NOTE 7. R-2800-B series engines are eligible for operation on Grade 91 fuel at the following maximum ratings:

	Low Ratio Blower	High Ratio Blower
Maximum continuous:	1380-2400-38.5-S.L.	1100-2400-33.5-10000
	1380-2400-34.5-10500	1100-2400-32.0-21000
Takeoff:	1650-2700-42.0-S.L.	--

NOTE 8. The take-off ratings using anti-detonant injection are permissible when the engine is equipped with a P6WA water regulator. ADI flow is 9.2 lbs./min. for 2400 bhp., 11.5 lbs./min. for 2500 bhp., and 7.8 lbs./min. at 1900 bhp. high ratio ratings. The ADI fluid may be composed of any of the following solutions by volume (per P6WA Specification 509): (1) Methyl alcohol 50 percent and water 50 percent; (2) Methyl alcohol 60 percent and water 40 percent; (3) Methyl alcohol 25 percent, Ethyl alcohol 25 percent and water 50 percent; (4) Methyl alcohol 60 parts, water 40 parts, anti-corrosion oil 1 part, per British Specifications D-Eng. R.D. 2470 dated January 8, 1946.

NOTE 9. When incorporated in certificated aircraft, the engine nameplate should be stamped "FAA Spec. No. 5E-8." If there is no room for this information on the existing nameplate, such information may be stamped on a plain thin metal plate attached beneath the existing plate by at least two of the mounting screws. When a new model designation is required because of changes to the engine, the new designation should be added to the nameplate.

NOTE 10. Scintilla low tension ignition system consists of one DLN-10 dual magneto, two low tension distributor units and 18 cylinder head mounted ignition coils. Scintilla high tension ignition system consists of one DF-18LN dual magneto and two high tension distributors.

NOTE 11. The following spark plugs are approved on these engines:

AC	161, 165, 171, 175*, 181, 261, 265, 271, 273, 275*, 281
Autolite	SL30, SL300, SL400**
BG	240, 245, 340, 341, 345, 346, RB19R-2, RB21R-1, RB27R, RB27R-1, RB39R
Champion	C34S, R33S*, R37S-1, R56S, R103*, R111, R115, R214D, RC34S, RC35S, REA29N*, REA32N, REA37N, REB29N*, REB32N, REB37N, RHA29E*, RHA29N*, RHA32E, RHA32N, RHA37E, RHA37N, RHB29E*, RHB29N*, RHE32E, RHB32N, RHB37E, RHB37N
Lodge	RS19-2R

\* May be used in rear position of both front and rear rows but not in front of either row.

\*\* Rear position of front row only.

NOTE 12. The suffix "D" is to be added to the engine model designation on the nameplate when the Double Wasp CB type crankshaft with two lightweight dampers is determined to be incorporated. The suffix "H" is to be added to the engine model designation on the nameplate when the original Double Wasp CA type crankshaft with the heavyweight front damper and lightweight rear damper is determined to be incorporated.