DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E-259
Revision 6
WRIGHT
Cyclone 955C9HE1 & 2
959C9HE1 & 2
960C9HE1 & 2
961C9HE1 & 2
962C9HE1 & 2
963C9HE1 & 2
967C9HE2
968C9HE1 & 2
(Military R-1820-80)
969C9HE1 & 2
982C9HE1, 2, & 3
989C9HE1 & 2
(Military R-1820-82, 82B)

December 28, 1983

TYPE CERTIFICATE DATA SHEET NO. E-259

Engines of models described herein conforming with this specification and approved data on file with the Federal Aviation Administration are rated as airworthy for use in certificated aircraft in accordance with pertinent aircraft specifications and applicable portions of the Civil Air Regulations and Federal Aviation Regulations provided they are installed, operated and maintained as prescribed by the manufacturer.

Type Certificate Holder — Curtiss-Wright/Marquette, Inc.
Fountain Inn, South Carolina

Model	Cyclone	955C9, 959C9, 961C9 & 969C9HE1 & 2	960C9, 962C9, 963C9, 968C9HE1 & 2, 967C9HE2	982C9HE1
Type	9RA	.4375 reduction gear except .5625 model 969C9	.4375 reduction gear except .5625 on models 967C9 & 968C9	.5625:1
Rating (with low imp. gear ratio)				
Max. cont., hp, rpm, in. Hg., at:		7.21:1	- -	- -
Rated pressure alt., ft.		1275-2500-45.5-3700	- -	1275-2500-46.0-3400
Sea level pressure alt.		1275-2500-46.5-S.L.		1275-2500-47.0-S.L.
Takeoff (Five min.) (See NOTE 5), hp, rpm, in.Hg., at:				
Rated pressure alt., ft.		1475-2800-54.0-1700	- -	1525-2800-55.5-700
Sea level pressure alt.		1475-2800-54.5-S.L.	- -	1525-2800-56.5-S.L.
Rating (with high imp. gear ratio)		8.69:1	—	—
Max. cont., hp, rpm, in. Hg., at:				
Rated pressure altitude, ft.		1125-2500-44.0-10700	—	—
Low critical pressure alt. ft.		1125-2500-44.5-8400	—	—
Takeoff (Five min.), hp, rpm, in. Hg., at:				
Rated pressure alt., ft.		1250-2800-48.0-10900	—	—
Low critical pressure alt. ft.		1250-2800-49.0-6500	—	—

"- -" indicates "same as preceding model"
"—" indicates "does not apply"

Model Cyclone (cont'd)	955C9, 959C9, 961C9 & 969C9HE1 & 2	960C9, 962C9, 963C9, 968C9HE1 & 2, 967C9HE2	982C9HE1
Type 9RA	.4375 reduction gear except .5625 model 969C9	.4375 reduction gear except .5625 on models 967C9 & 968C9	.5625:1
Fuel (Min. grade aviation gas.)	100/130 except 115/145 model 959C9 only	100/130 except 115/145 model 963C9 only	— 115/145
Lubricating oil	MIL-L-6802 WAD Spec 5815 or 5818	- -	- -
Bore and stroke, inches	6.125 x 6.875	- -	- -
Displacement, cu. in.	1823	- -	- -
Compression ratio	6.8:1	- -	- -
Weight (dry), lbs. (See NOTE 4)	1398 (except 955C9) 1406 (Model 955C9)	1390 (except 960C9 & 967C9) 1398 (models 960C9 & 967C9)	1469
C.G. location (dry)			
Fwd. of mounting face, in.	7.4	- -	7.53
Above prop. shaft, in.	.2	- -	- -
Propeller shaft, SAE No.	50	- -	51
Carburetion	Stromberg PD12K18 except PD12K14 on model 955C9 only	Stromberg PD12K18 except PD12K14 on models 960C9 & 967C9	Stromberg PD12K14
Ignition, Dual	Bosch SF9LU-2 magnetos	- -	Bendix Scintilla D9LN-2
Timing, °BTC	20	- -	25
Spark Plugs	AC 171, 181, 271, 281, 285; BG RB19R-2, RB27B-1; Champion B-111, B-115, RC-37S, RC-37S-1, REA37N, RHA32N, RHA37N	- -	AC 271, RHB-37N
NOTES	1,2,3,4,5	1,2,3,4,5,6	1,2,3,4,9

Model Cyclone	98C9HE2	982C9HE3	989C9HE1 & 2
Type 9RA	.5625:1	- -	Direct Drive
Rating (with low imp. gear ratio)			
Max. cont., hp, rps, in. Hg., at:			
Rated pressure alt., ft.	1275-2500-45.5-3000	- -	1275-2500-46.0-3500
Sea level pressure alt.	1275-2500-46.5-S.L.	- -	1275-2500-47.0-S.L.
Takeoff (Five min.) (See NOTE 5), hp, rpm, in.Hg., at:			
Rated pressure alt., ft.	1475-2800-54.0-1500	- -	1525-2800-55.5-700
Sea level pressure alt.	1475-2800-54.5-S.L.	- -	1525-2800-56.5-S.L.
Rating (with high imp. gear ratio)	—	—	—
Max. cont., hp, rpm, in. Hg., at:			
Rated pressure altitude, ft.	—	—	—
Low critical pressure alt. ft.	—	—	—
Takeoff (Five min.), hp, rpm, in. Hg., at:			
Rated pressure alt., ft.	—	—	—
Low critical pressure alt. ft.	—	—	—

"- -" indicates "same as preceding model"
"—" indicates "does not apply"

Model Cyclone (cont'd)	98C9HE2	982C9HE3	989C9HE1 & 2
Type 9RA	.5625:1	- -	Direct Drive
Fuel (Min. grade aviation gas.)	—	—	—
	100/130	—	115/145
Lubricating oil	MIL-L-6802		
	WAD Spec 5815 or 5818	- -	- -
Bore and stroke, inches	6.125 x 6.875	- -	- -
Displacement, cu. in.	1823	- -	- -
Compression ratio	6.8:1	- -	- -
Weight (dry), lbs. (See NOTE 4)	1469	- - + 10 lbs.	1446
C.G. location (dry)			
Fwd. of mounting face, in.	7.53	- -	7.2
Above prop. shaft, in.	.2	- -	- -
Propeller shaft, SAE No.	51	- -	- -
Carburetion	Stromberg PD12K14	- -	Stromberg PD-12K1
Ignition, Dual	Bendix Scintilla D9LN-2	- -	- -
Timing, °BTC	20	- -	25
Spark Plugs	AC 271, RHB-37N		AC 273, RHB-32N
NOTES	1,2,3,4,9		1,2,3,4,7,8,9

"- -" indicates "same as preceding model"
"—" indicates "does not apply"

Certification basis Type Certificate No. 259
Production basis Production Certificate No. 8

NOTE 1. Maximum permissible temperature limits:

	989C9HE1 & 2	All others
Cylinder head (well type thermocouple)	450°F (500°F for T.O.)	475° (500°F for T.O.)
Cylinder base	320°F (350°F for T.O.)	335°F (350°F for T.O.)
Oil inlet	220°F	220°F

NOTE 2. Fuel and oil pressure limits:

Oil pressure (psi)	
Normal Continuous operation	70 ± 5
Minimum (Idle)	15
Maximum (Takeoff)	90

Fuel pressure (psi) 22±3

NOTE 3. The following accessory drives are provided:

	967C9HE2	968C9IHE1 & 2	969C9HE1 & 2	982C9HE1, 2 & 3	989C9HE1	989C9HE2	All Others
Starter	X	X	X	X	X	X	X
Generator				X			
Generator	X	X	X				X
Generator						X	
Fuel Pump	X	X	X	X	X	X	X
Tachometer	X	X	X	X	X	X	X
Vacuum pump	X		X				X
Vacuum pump		X					
Hydraulic pump	X		X				X
Hydraulic pump		X					
Fluid power pump				X	X	X	
Propeller governor		X	X	X			X
Propeller governor	X						

	Rotation*	Speed*	Max. Torque (in. lbs.) Continuous	Static	Max. Overhang Moment (in. lbs.)
Starter	C	1.00	—	25,800	300
Generator	C	3.135	1000	4,400	400
Generator	C	3.31	500	2,200	350
Generator	C	3.135	1000	4,000	400
Fuel Pump	CC	1.0	25	450	—
Tachometer	C	0.5	7	50	—
Vacuum pump	CC	1.5	50	1,200	25
Vacuum pump	CC	1.5	100	800	25
Hydraulic pump	CC	1.5	150	2,250	50
Hydraulic pump	CC	1.5	250	1,650	50
Fluid power pump	C	1.4	250	1,650	125
Propeller governor	C	0.883	125	825	—
Propeller governor	C	1.0	125	825	—

* "C" - Clockwise viewing pad, "CC" = counter clockwise.
Speed * X crankshaft

NOTE 4. All C9HE2 except the 982C9HE2 and 989C9HE2 models are similar to the corresponding C9HE1 models except for the incorporation of a built-in torquemeter at an additional weight of 10 lbs. The 989C9HE2 engine is similar to the 989C9HE1 model except for the incorporation of a generator drive. The 982C9HE2 engine is similar to the 98C9HE1 model except for ignition timing, ratings and fuel grade. The 982C9HE-315 is similar to 982C9HE2 except for the incorporation of a built-in torquementer at an additional weight of approximately 10 lbs.

NOTE 5. Special takeoff ratings are eligible on the following models as specified:

Models	T.O. RATINGS (hp, rpm, in. Hg., ft.)	
955C9HE1 & 2		
960C9HE1 & 2	1525-2800-51.5-2500)	With anti-detonant injection
967C9HE1 & 2	1525-2800-52.0-S.L.)	fluid consumption 5#/min.
959C9HE1 & 2	1525-2800-56.0-700 (dry)	
963C9HE1 & 2	1525-2800-56.0-S.L. (dry)	

Engines with wet (AD1) ratings incorporate a water injection regulator and utilize AMS-3006 or equivalent fluid which is composed of 25% Methyl alcohol, 25% Ethyl alcohol in accordance with AM-A-24 requirements and 50% water.

NOTE 6. The Military R-1820-80 is identical to the 968C9HE1 model and is eligible for use in certificated aircraft and when so used, the engine nameplate should be revised to include the corresponding civil model designation and Type Certificate No. Magneto model designation is Bosch S9LU.

NOTE 7. The 989C9HE1 & 2 engines are approved for helicopter application and operation in a 34° nose up and 8° clockwise roll attitude.

NOTE 8. The 989C9HE1 & 2 engines are eligible for operation with grade 100/130 fuel at the following ratings:

Maximum continuous hp, rpm, in. Hg. at:	
Critical pressure altitude (ft.)	1275-2500-46.0-3500
Sea level pressure altitude	1275-2500-47.5-S.L.
Takeoff (Five min.) hp, rpm, in. Hg. at:	
Critical pressure altitude (ft.)	1425-2800-52.0-2900
Sea level pressure altitude	1425-2800-53.0-S.L.

NOTE 9. The ratings of 982 and 989C9HE1 & 2 engines are based on standard conditions of temperatures and barometric pressure (60°F and 29.92 in. Hg. at sea level) and 0% humidity. A correction equal to twice the actual vapor pressure may be added to the allowable take-off MAP. When setting take-off power for torquementer equipped 982C9HE3 engine, observe maximum limits of 340 psi torque/229BMEA or 54.5 in. MAP plus vapor correction, whichever occurs first.

NOTE 10. The Military R-1820-82 and -82B may be identified as Model 982C9HE2 when inspected and overhauled according to Wright Service Bulletin No. C9-473 dated December 14, 1979, and the 982C9HE2/NAVAIR instruction and parts manuals listed therein. Upon completion the engine nameplate is to be modified to specify 982C9HE2 and T.C. E-259.

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