

MODELS: Wright Military Cyclone R-1820 Series

T.C. NUMBER: 5E-10

Model	R-1820-40,-60,-40C	R-1820-71,-97,-99	R-1820-45	R-1820-50
(See following listings for additional models.)				
Type - 9RA (reduction gearing)	3:2	-71 has 3:2, -97 has 16:9	16:1	Direct drive
Rating (with low impeller gear ratio) Maximum continuous, hp, rpm, in.Hg., at:	7.14:1	7:1	7.14:1	--
Critical altitude (ft.)	1100-2400-40.0-5500 or 1000-2300-37.2-6900	--	860-2100-34.5-3200	850-2100-34.0-6000
Sea level	1100-2400-43.0-S.L. or 1000-2300-39.5-S.L.	--	830-2100-34.5-S.L.	850-2100-35.7-S.L.
Take-off (5 minutes), hp, rpm, in.Hg., at:	1200-2500-45.5-S.L.	--	930-2200-37.5-S.L.	950-2200-38.0-S.L.
Rating (with high impeller gear ratio): Maximum continuous, hp, rpm, in.Hg., at:	10:1	--	10:1	--
Rated pressure altitude (ft.)	900-2300-40.0-15200	--	810-2100-35.0-10400	750-2100-33.0-15200
Low critical pressure altitude (ft.)	900-2300-42.5-9700	--	780-2100-35.0-6200	750-2100-34.5-9500
Take-off (5 minutes), hp, rpm, in.Hg., at:	1000-2500-44.5-14200	--	--	--
Critical altitude (ft.)	1000-2500-46.0-9200	--	--	--
Low critical pressure altitude (ft.)	--	--	--	--
Fuel (minimum grade aviation gasoline)	100/130	--	91/96	--
Displacement, cu. in.	1823	--	--	--
Compression ratio	6.7:1	--	6.45:1	--
Weight (dry), lb.	1315	--	1180	1115
C.G. location (dry)				
Forward of mounting face, in.	7.5	--	7.3	5.8
Above crankshaft C.L., in.	.4	--	.5	.6
Propeller shaft, SAE No.	50	--	--	40
Carburetor model	PD-12H3 for -40, PD-12K4 for -60	PD-12H2 or H3	NAF-7F	1375H or HA
Ignition, dual	SF9LN-4 for -40, SF9LU-3 for -60	Scintilla SF9LN-4 or Bosch SF9LU-3	SF9L-1	SF9LU-3
Ignition timing, degrees BTC	20	--	20R, 15L	--
NOTES	1, 2, 3, 4, 7, 8	--	--	--

MODELS: Wright Military Cyclone R-1820 Series (Continued)

T.C. NUMBER: T.C. 5E-10 (Continued)

Model	R-1820-52	R-1820-53	R-1820-56,-56A, -56M3,-56AM3,-66, -66M1,-72,-72A,	R-1820-56M2,-56AM2,-56M4, -56AM4,-66M3,-72M1, -72AM1,-72M3,-72AM3

	-72M4, -72AM4 (See following listings for additional models.)			
Type - 9RA (reduction gearing)	16:11	--	3:2	16:9
Rating (with low impeller gear ratio):	7.14:1	--	--	--
Maximum continuous, hp, rpm, in.Hg., at:				
Critical altitude (ft.)	950-2300-37.0-5000	860-2100-35-3800	1200-2500-43.5-2500	--
Sea level	950-2300-38.0-S.L.	830-2100-35-S.L.	1200-2500-44.0-S.L.	--
Take-off (5 minutes), hp, rpm, in.Hg., at:	1000-2350-39.5-S.L.	1000-2200-40-S.L.	1350-2700-48.0-S.L.	--
Rating (with high impeller gear ratio)	10:1	--	--	--
			(except -56M3, -56AM3, -66M1, -72M4, -72AM4)	(except -56M4, -56AM4, -72M3, -72AM3)
Maximum continuous, hp, rpm, in.Hg., at:				
Rated pressure altitude (ft.)	800-2300-35.5-16000	850-2100-38-9600	900-2500-40.0-17000	--
Low critical pressure altitude (ft.)	800-2300-37.0-10000	812-2100-38-5500	900-2500-42.0-11100	--
Fuel (minimum grade aviation gasoline)	100/130	--	--	--
Displacement, cu. in.	1823	--	--	--
Compression ratio	6.45:1	--	6.5:1	--
Weight (dry), lbs.	1255	1210	1338	--
C.G. location (dry)				
Forward of mounting face, in.	5.8	--	7.4	--
Above crankshaft C.L., in.	.6	--	.2	--
Propeller shaft, SAE No.	50	--	--	--
Carburetor model	1375H	NAF-7K	PD12K10 or 14	--
Ignition, dual	SF9LN-2	SF9L-1	SF9LD or SF9LN-4, SF9LD-1 (on -72's)	--
Ignition timing, degrees BIC	20R, 15L	--	20	--
NOTES	1,2,3,4,7,8	--	1,2,3,4,5,6,7,8,9	--

MODELS: Wright Military Cyclone R-1820 Series (Continued)

T.C. NUMBER: 5E-10 (Continued)

Model	R-1820-62,-62A,-62M2, -62AM2,-70,-70M1	R-1820-56M1,-56AM1,-56M5, -56AM5,-62M1,-62AM1,-66M2, -72M2,-72AM2	R-1820-72AM5,-72AM6
	(See following listings for additional models.)		
Type - 9RA (reduction gearing)	3:2 on -62,-62A; 16:9 on -62M2,-62AM2,-70,-70M1	3:2	--
Rating (with low impeller gear ratio)	7:1	7.14:1 (7.0:1 on -62M1,-62AM1 only)	--
Maximum continuous, hp, rpm, in.Hg., at:			
Critical altitude (ft.)	1200-2500-43.5-2500	1100-2500-40.0-5100	1260-2500-45.5-3000
Sea level	1200-2500-44.0-S.L.	1100-2500-40.5-S.L.	1260-2500-46.0-S.L.
Take-off (5 minutes), hp, rpm, in.Hg., at:	1350-2700-48.0-S.L.	1200-2700-43.0-S.L.	1410-2700-50.0-2600
Rating (with high impeller gear ratio)	(See NOTE 6)	1200-2500-44.0-S.L.	1410-2700-51.0-S.L.
Maximum continuous, hp, rpm, in.Hg., at:		10:1 (-56M1,-56AM1, -66M2,-72M1,-72AM1 only)	10.04:1
Rated pressure altitude (ft.)	--	900-2500-40.0-17000	960-2500-41.2-18000
Low critical pressure altitude (ft.)	--	900-2500-42.0-11100	960-2500-43.2-11500
Fuel (minimum grade aviation gasoline)	100/130	91/96	100/130
Displacement, cu. in.	1820	--	--
Compression ratio	6.5:1	--	6.8:1
Weight (dry), lbs.	1315	1330 (1315 -62M1,-62AM1 only)	1338
C.G. location (dry)			
Forward of mounting face, in.	7.4	--	--
Above crankshaft C.L., in.	.2	--	--
Propeller shaft, SAE No.	50	--	--
Carburetor model	PD12K10 or 14	--	--
Ignition, dual	SF9LD or SF9LN-4, SF9LD-1 (on -72's)	--	SF9LN-4
Ignition timing, degrees BIC	20	--	--
NOTES	1,2,3,4,5,6,7,8,9	1,2,3,4,6,7,8,9	1,2,3,4,7,8,9

MODELS: Wright Military Cyclone R-1820 Series (Continued)

T.C. NUMBER: T.C. 5E-10 (Continued)

Model	R-1820-74,-76A,-76B	R-1820-76AM1,-76BM1	R-1820-103,-103A	R-1820-103M1,-103AM1
Type - 9FA (reduction gearing)	3:2	--	Direct drive	--
Rating (with low impeller gear ratio)	7.21:1	--	--	--
Maximum continuous, hp, rpm, in.Hg., at:				
Critical pressure altitude (ft.)	1275+2500-45.5-3500	--	1275-2500-47.0-2600	--
Sea level pressure altitude	1275-2500-46.5-S.L.	--	1275-2500-47.5-S.L.	--
Take-off (5 minutes), hp, rpm, in.Hg., at:				
Critical pressure altitude (ft.)	1425-2700-50.5-2600	--	14.5-2700-51.5-2300	--
Sea level pressure altitude	1425-2700-51.5-S.L.	--	1425-2700-52.5-S.L.	--
Rating (with high impeller gear ratio):	10.14:1	--	10.14:1	8.69:1
Maximum continuous, hp, rpm, in.Hg., at:				
Rated pressure altitude (ft.)	975-2500-42.0-18300	--	975-2500-42.0-18300	1125-2500-42.0-11600
Icw critical pressure altitude (ft.)	975-2500-43.5-12000	--	975-2500-43.0-12000	1125-2500-43.5-7800
Fuel (minimum grade aviation gasoline)	100/130	--	--	--
Displacement, cu. in.	1823	--	--	--
Compression ratio	6.8:1	--	--	--
Weight (dry), lbs.	1376 (with Scintilla magnetos)	1361 (with Scintilla magnetos)	1349	--
	1360 (with Edison magnetos)	1345 (with Edison magnetos)		
	1370 (-76A & B with Bosch magnetos)	1355 (-76A & B with Bosch magnetos)		
C.G. location (dry)				
Forward of mounting face, in.	7.4	--	6.64	--
Above crankshaft C.I., in.	.2	--	.2 above, .11 right	--
Propeller shaft, SAE No.	50	--	--	--
Carburetor model	PD12K10 or K14	--	PD12K19	--
Ignition, dual	Edison SF9LD-3 or Scintilla SF9IN-4; Bosch S9LU-2 on -76A and -76B	Bosch S9LU-2	Bosch S9LU-3	--
Ignition timing, degrees BTC	20	--	--	--
NOTES	1,2,3,4,5,7,8,9	--	1,2,3,4,7,8,10	--

NOTE 1. Maximum permissible temperatures are as follows:

Models	Cylinder Head Degrees F.	Barrel Degrees F.	Oil Inlet Degrees F.
R-1820-40,-40C,-56M1,-56AM1,-60,-62M1,-62AM1,-66M2,-71, -72M2,-72AM2	500 *	325	220
R-1820-45,-50,-52,-53	500 *	300	200
R-1820-56,-56A,-56AM2,-56M2,-56AM3,-56M3,-56M4,-56AM4, -56M5,-56AM5,-62,-62A,-62M2,-62AM2,-66,-66M1,-66M3, -70,-72,-72A,-72AM1,-72M1,-72M3,-72AM3,-72M4,-72AM4	475 for T.O., *** 450 for M.C. *** Also see NOTE 9	300	220
R-1820-70M1,-72AM5,-72AM6,-74,-76A,-76AM1,-76B,-76BM1	500 for T.O., 475 for M.C. **	335	220
R-1820-97,-99	500 no turbo, 400 with turbo *	325	220
R-1820-103,-103A,-103M1,-103AM1	500 for T.O., 450 for M.C. **	320 350 for T.O.	220

- * - Spark plug gasket thermo.
- ** - Well type thermo.
- *** - Limits apply to either well type or spark plug gasket thermo.

NOTE 2. Refer to applicable civil engine specification for fuel and oil pressure limits.

NOTE 3.

Engine Model	Characteristics
R-1820-40,-C,-60	Models -40 and -60 are similar to certificated Wright 704C9GC engines. The 40C is similar to the -60 except for the carburetor, oil pump check valve, baffles and rocker which are similar to the -40 style.
R-1820-45,-50	Similar to certificated Wright GR-1820-65 engines.
R-1820-52	Similar to certificated Wright GR-1820-65 engines which include an all steel main crankcase
R-1820-53	Similar to -45 except has different size impeller and various design advances over the -45.
R-1820-56,-56A,-62, -62A,-66,-70,-72, -72A	Similar to certificated Wright 736C9HD engines except they incorporate several types of cylinder baffles, a propeller shaft breather, 1.5:1 generator drive, different cylinder heads and pistons, and no inducer impeller. Some of these engines incorporate a torque-meter. These engines and those which have the suffix "W" are basically similar. The -56W, -56WA, -72W and -72WA engines are equipped with water injection for military operation only. Remove the water regulator equipment and the derichment valve and lines and plug resulting openings, to restore engines to the corresponding model above. The model designation suffix "A" signifies incorporation of the strengthened crankshaft, P/N 423098. The -62 and -62A are single speed engines with 7:1 impeller ratio.
R-1820-56M1,-56AM1	Same as -56 and -56A respectively except has G-202A (-40, -40C, -60, -97) type cylinders and baffles.

R-1820-56M2,-56AM2, Similar to -56, -56A, -62, -62A, -66, -72 and -72A respectively except have C9HD 16:9 nose
-62M2,-62AM2,-66M3, case and reduction gear on -97 16:9 nose case and reduction gear modified to incorporate
-72M1,-72AM1 a nose scavenge pump.
R-1820-56M3,-56AM3 Similar to -56, -56A except has high ratio supercharger clutch and control assembly
removed.
R-1820-56M4,-56AM4, Similar to -56M2, -56AM2, -72M1 and -72AM1 respectively except high ratio supercharger
-72M3,-72AM3 drive removed.
R-1820-56M5,-56AM5, Similar to -56M1, -56AM1, -66, -72, -72A respectively except have high ratio supercharger
-66M1,-72M4,-72AM4 drive removed.
R-1820-62M1,-62AM1 Same as -56M1 and -56AM1 respectively, except has -62 single speed supercharger.
R-1820-70M1 Same as -70 except has C9HE type cylinders and baffles.
R-1820-66M2,-72M2, Same as -66, -72, -72A respectively, except incorporates G-202A (-40, -40C, -60, -97) type
-72AM2 cylinders and baffles.
R-1820-72AM5,-72AM6 These engines are R-1820-72 models modified per Aerodex, Inc. Engineering Authorization
No. 29.
R-1820-74,-76A,-76B These engines and the -74W are similar to certificated Wright 737C9HD1 engines. The -74W
engine is equipped with water injection for military operation only. Remove the water
regulator equipment and the derichment valve and lines and plug resulting openings to
restore engine to Model -74, -76A and B differ in ignition harness only.
R-1820-76AM1,-76BM1 Same as -76A, -76B respectively except incorporates single speed supercharger.
R-1820-97,-71 Similar to certificated Wright 702C9GC engines.
R-1820-99 Similar to certificated Wright 702C9GC engines and same as -97 except has a 3.27:1
generator drive.
R-1820-103,-103A, The -103 engine is similar to certificated Wright 977C9HD1 engines. The -103M1 is similar
-103M1,-103AM1 to certificated Wright 977C9HD2 engines. The letter "A" was used by the military to
identify engines incorporating heavy rods as called for by AD 60-7-8.

NOTE 4. When incorporated in certificated aircraft, the engine nameplate should be stamped "FAA Spec. No. 5E-10."
If there is not room for this information on the existing nameplate, such information may be stamped on a plain
thin metal plate and attached beneath the existing plate by at least two of the mounting screws.

NOTE 5. The following engines are eligible at the indicated ratings using 91 grade fuel (R-1820-40, -40C, -60, -71,
-97, -99 ratings unchanged but use E3 carburetor set to Parts List 392313-4):

	R-1820-56, -56A, -56AM2, -56M2, -56AM3, -56M3, -62, -62A, -66, -66M1, -66M3, -70, -70M1, -72, -72A, -72AM1, -72M1	R-1820-74, -76A, -76B, -76AM1, -76BM1
Maximum continuous, bhp., rpm, in.Hg., alt: (Low ratio 7.14:1)	1100-2500-40.5-S.L. 1100-2500-40.0-5100 (Same as for Grade 100 fuel)	1000-2300-38.0-S.L. 1000-2300-36.5-800 900-2300-46.0-10800 900-2300-35.0-14000
(High ratio 10:1)		
Take-off, bhp., rpm, in.Hg., alt: (Low ratio only)	1200-2700-43.0-S.L. 1200-2500-44.0-S.L. 1200-2500-43.5-2500	1200-2500-43.5-S.L. 1200-2500-42.5-5600

NOTE 6. The -56, -62, -72 engines and their "M" versions originally incorporated an early type crankshaft and are
therefore listed to a maximum takeoff rating of 1300 hp, 2600 rpm, 47.0 in.Hg., at sea level. When crankshaft
number 423098 is incorporated suffix letter "A" should be added to the model designation and the foregoing
restriction no longer is applicable.

NOTE 7. The spark plugs approved for the above engines are as follows:

R-1820-40,-40C,-45,-50,-52,-53,-56M1,-56AM1,-56M5,-62M1, -62AM1,-66M2,-71,-72M2,-72AM2,-97,-99:	AC LS87, LS88, 181, 171, 271, 281; BG 4B2, 4B2S, RB19R2, 3B2, 3B2S, 314GS, RE27R-1; Champion C27S, RC34S, RC35S, R37S-1, R-115, RHA37N, RHB37N, RHA37E, RHB37E, RHB36P, RHB36W, REB37N, REB36W; Hahn 702
R-1820-56, -56A, -56M2, -56AM2, -56M3, -56AM3, -56M4, -56AM4, -62, -62A, -62M2, -62AM2, -66, -66M1, -66M3, -70, -70M1, -72, -72A, -72M1, -72AM1, -72M3, -72AM3, -72M4, -72AM4, -72AM5, -72AM6, -74, -76A, -76B, -76AM1, -76BM1, -103, -103A, -103M1, -103AM1:	AC 171, 181, 271, 281; BG RB19R-2, RB27R-1; Champion R37S-1, R-115, RHA37N, RHB37N, RHA37E, RHB37E, RHB36P, RHB36W, REB37N, REB36W

NOTE 8. Lubricating oil: MIL-L-6082 or WAD Spec. 5815 or 5818.

NOTE 9. C9HC type engines (-56, -56A, -62, -62A, -66, -70, -72, -72A) when modified to incorporate C9HD or C9HE
type cylinders and baffles or C9HC cylinders reworked by an approved agency to the C9HD configuration, will
have cylinder head and base temperature limits corresponding to C9HD engines (-74, -76A, -76B). Ratings and
other limitations remain unchanged. The C9HC cylinder modification referred to above includes replacement
of the threaded type exhaust valve seat with a shrunk-in type seat and reprofiling of the cylinder head fins.
Cylinders so modified are eligible for use on C9HD engines (-74, -76A, -76B) as well as on C9HC engines
(-56, -56A, -62, -62A, -66, -70, -72, -72A). R-1820-56, -62, -66, -70 and -72 and their corresponding "M"
and "AM" counterparts that have been modified to incorporate the above type of cylinders and should have the
letter "s" added to their otherwise appropriate model designation.

Examples:	R-1820-56	becomes R-1820-56S
	R-1820-56AM1	becomes R-1820-56AM1S
	etc.	

The following agencies are approved to accomplish the C9HC cylinder modification:

Aero Cylinder Service, Inc. Farmingdale, New York	Steward-Davis, Inc. Gardena, California	Wright Aeronautical Division Curtiss-Wright Corporation Wood-Ridge, New Jersey
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NOTE 10. These engines are approved for helicopter installation and operation and have a five-minute takeoff
rating in high impeller ratio as follows:

	R-1820-103, -103A	R-1820-103M1, -103AM1
Take-off, bhp., rpm, in.Hg., at:		
Rated pressure altitude (ft.)	1100-2600-49.0-16000	1250-2700-46.5-11400
Low critical pressure altitude (ft.)	1100-2600-50.0-10200	1210-2700-48.5-6400