

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

E-214  
Revision 3  
WARNER ENGINE COMPANY

WARNER SUPER SCARAB  
SERIES 165 (R-500-1, -7),  
165-A, 165-B, 165-D

September 27, 2000

TYPE CERTIFICATE DATA SHEET NO. E-214

Engine of models described herein conforming with this data sheet (which is a part of type certificate No. E-214) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated 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 Holder                      Warner Engine Company, LLC.  
P.O. Box 9  
Palmer Lake, Colorado 80133

Type Certificate Holder Record:        George Olson Company transferred TC E-214 to Warner Engine Company ,LLC  
on September 27, 2000.

Models - Super Scarab	165, 165-A	165-B, 165-D
Type	7 RA	--
Rating,:		
Maximum continuous,		
hp., r.p.m at S.L. pressure altitude	165-2100	
Take-off (5 minutes), hp, r.p.m., full		--
throttle	175-2250	
Fuel (minimum octane aviation gasoline)	73	--
Bore and stroke, in.	4.625 x 4.250	--
Displacement, cu. in.	500	--
Compression ratio	6.4:1	--
Weight (dry), lbs.	341	348
C.G. location (dry)		
Forward of mounting lug face , in.	4.75	--
Propeller shaft, SAE No.	20	--
Carburetor	Stromberg NA-R5A with 1-15/16 in. venturi or Holley 419 carburetor with 1-11/16 or 1-49/64 in. venturi	--
Ignition, dual	Scintilla MN7DF or VMN7DF magnetos	--
Timing, degrees BTC	28.5	--
Spark plugs	EG-5B2, 317-S; Champion C-26, S, C-27, S, M-4, S; Simmonds-Benton 3B5, S; K.L.G. V. 17/15-RL, R-V. 17/5; Firestone MA-3, -S: Auto-Lite 18-A-1, SH- 2K1, SH-2K	--

Certification Basis                              Type Certificate No. 214

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## NOTES:

NOTE 1. Maximum permissible cylinder head, barrel and oil inlet temperatures 525 degrees F., 300 degrees F., and 200 degrees F., respectively.

NOTE 2. The following accessory provisions and typical engine accessories are eligible at the indicated weight increases:

	Weight (lbs)
Starter	
Eclipse type 393, model 4 (hand inertia type complete with crank).	17
Uses adapter 8144, bracket 8188 which covers generator drive jaw 8145.	4
Eclipse type 397, model 20, style B (old designation E-80)	18
Eclipse type 396, model 2, style A (old designation Y-150)	18
Generator	
Eclipse type 309, model 1, style A (15 volt, amp.)	22
Fuel Pump	
Titan model 200, type L2X3-10 or -12 or M2X3-13 (anti-clock rotation, square drive)	2
Vacuum Pump	
Pesco type B-6, P/N 3P-194D (cannot be used in models 165 and 165-B prior to serial number SS2034)	4
Uses drive assembly number 8190-1	1
Miscellaneous	
Magneto impulse coupling -	
Apollo No. 8248 (denoted by engine serial number suffix "E")	1
Short Nose crankcase and crankshaft, P/Ns 7484 and 7786, respectively for Models 165 and 165-A only are denoted by serial suffix letter "G".	3
<u>Net decrease</u>	
Shielded ignition system	10
Control valve for two-position hydraulic propeller (Model 165-B only)	1
Propeller governor drive (Model 165-D only)	1

NOTE 3: Engine serial number suffix letters as indicated below should be added to the engine nameplate to denote when the following modifications have been incorporated.

Suffix "A" to denote 3/8 in. cylinder base studs and 0 type cylinder base oil seals.

Suffix "F" to denote special drive at starter pads - offset magneto drives, and opposite rotation magnetos.

Suffix "L" to denote special crankshaft 1 in. longer than standard between thrust nut and spline to accommodate 6-1/4 inch length propeller hubs.

Suffix "p" to denote cylinder bores chrome plated by Spartan Eng. Company.

NOTE 4: Military model R-500-1 is identical to model 165. Military model R-500-7 is similar to model P-500-1 except that it incorporates heavier pistons, 1-49/64 in. carburetor venturi (Holley ), and shielded ignitor with weight (dry) of 351 lbs.

Prior to use of any engine of the above models in certificated aircraft, the generator drive gear, P/N 7859, should be removed and magnetically inspected for cracks. The Champion E-2411 generator used on these engines in military aircraft should not be reinstalled in these engines or in any other Warner 165 series engine. Drive gear failures have been experienced when using this generator which does not incorporate a flexible torsion drive.

The designation plate of a military engine used in certificated aircraft should be stamped with the corresponding certificated engine model designation and the Type Certificate No. If there is no room for this information on the existing plate, 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: Approval expired 9/7/50. No engines of these models manufactured after this date eligible for use in certificated aircraft.

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