

REPLACEMENT PARTS LIST - CONTRACT W535-AC-8131Progress
Report
Date

Date	Part No.	Part Name and Description	No. of Units	Unit Price	Total
9-15-36	503610 503611	Bearing - connecting rod (Rod half and cap half) An oil groove 1/8 wide x 1/32 deep was added at the center of the bearing extending 45° on each side of the parting line. This will increase the oil to both the blade and fork rod bearings. Number's 1, 2 and 3 rod bearings were changed in this manner.	3	1.55	4.65
9-15-36	503610 503611	Bearing - connecting rod (Rod half and cap half) An annular oil groove 1/8 wide x 1/32 deep was added around the inside at the center of the bearing to more effectively oil the bearing and to provide more oil for the blade rod. This was placed on number's 4, 5, and 6 rod bearings.	3	1.55	4.65
9-15-36	503500	Crankshaft The crankshaft plugs as originally designed did not adequately seal against oil leaks due to slight out of roundness and mis-alignment of the bored holes in the crankshaft. These errors were within the drawing limits but it has been determined that to seal in the manner originally designed it is absolutely necessary to have a hole exactly round, in perfect alignment, and have plugs that fit loose within .0005 in. maximum. The crankshaft was returned to Ohio Crankshaft Co. and the holes hand lapped with special laps in an endeavor to put the present crankshaft in a usable condition. Special plugs were made to have the desired fit as determined by tests and now the crankshaft leaks have apparently been completely stopped.	1	184.50	184.50

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9-15-36	503515	Tube - crankshaft oil. Damaged in dis-assembly of crankshaft plugs. Replaced, no change in design.	3	3.28	9.84
9-15-36	503513	Plug - crankshaft journal front oil. Lapping of crankshaft necessitated new oversize plug fit .0008 loose. Replaced with no change in design.	1	19.53	19.53
9-15-36	503514	Plug - crankshaft journal intermediate oil. Lapping of crankshaft necessitated new oversize plug fit .0008 loose. Thickness of bearing surface was increased on castings, requiring a change in the pattern equipment.	12	11.96	143.52
9-15-36	503512	Plug - crankshaft journal end - oil Lapping of crankshaft necessitated new oversize plug fit .0008 loose. Replaced with new part, no change in design.	1	19.53	19.53
9-15-36	503511	Plug - crankshaft crankpin oil Lapping of crankshaft necessitated new oversize plugs fit .0005 loose. These plugs were re-inforced by a rib over the entire length and also at the bearing flange requiring a change in the pattern equipment.	6	15.68	94.08
9-15-36	501065	Bolt - 1/4-28 hex head special drilled. New crankshaft journal plugs necessitated one new bolt.	1	1.57	1.57
9-15-36	503632	Cylinder assembly Re-grind all valve seats	12	No Charge	
9-15-36	503646	Pad - valve rocker adjusting screw Pad loose on screw. Replaced with new part, no change.	1	4.49	4.49
9-15-36	503705	Gasket - exhaust flange Continued use had worn out the gaskets and an entire new set was installed.	12	.14	1.68

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Date	Part No.	Part Name and Description	No. of Units	Unit Price	Total
9-15-36	503785	Pin - piston ring Pins in second groove in pistons 2L and 3L became loose in piston. Replaced with new part fitting tighter in piston.	2	1.14	2.28
9-15-36	501087	Bearing - ball Norma Hoffman #205 The retainer on this bearing was broken and investigation disclosed that this bearing did not have the proper type retainer for this type of service. Replaced with a #205 S. B. bearing	1	No charge	
9-15-36	503680	Shaft - supercharger impeller This shaft in assembly with bearings and impeller was checked for static balance. Upon finding a slight out of balance condition this was corrected.	1	6.16	6.16
9-15-36	503679	Gear - accessory drive shaft rear. The bearing that this gear runs in has been continually scratching up from dirt, and careful examination had shown that the provision for feeding the oil through this gear forms a trap for any dirt and sends it out into the bushing. This was corrected by adding an inner ring on the inside of the gear as shown on SK No. 69.	1	10.23	10.23
9-15-36	501052	Bushing - 1-1/2 I.D. x 1-11/16 O.D. x 1-3/8 shouldered. Bushing scratched up from dirt. (See description above, part no. 503679) Cleaner added to gear and grooves added to the bushing. This should definitely correct this trouble.	1	9.24	9.24
9-15-36	501048	Bushing - 7/8 I.D. x 1-3/32 O.D. x 1-1/16. Bushing scratched up from dirt. (See description above, part no. 503679) This bushing has been giving continued trouble along with bushing no. 501052, however the cause has been in the feeding of the oil to both bushings which now is corrected.	1	8.53	8.53

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Date	Part No.	Part Name and Description	No. of Units	Unit Price	Total
9-15-36	SK No. 71	Adapter An adapter was made to allow the Cuno oil filter to be left out of the engine and an outside Cuno hooked in the oil circuit. Testing equipment.	1	No Charge	
9-15-36		Cuno oil filter Tests disclosed as much as 70 lbs. pressure drop through the original Cuno. A separate unit having two 2-1/4 x 8" cleaning cylinders was connected on the outside of the engine. This filter has three times the capacity of the original one and operated with only 2 to 3 lbs. pressure drop. The oil in the engine is now being properly filtered and provisions will be made in future engines to provide more capacity for filtering within the engine. Testing equipment.	1	No charge	
9-15-36	503589	Gear - magneto drive idler bevel. The shaft diameter was chrome plated to give a .001 press fit in the spur gear as the key in this gear has given continued trouble.	1	2.04	2.04
9-15-36	501006	Key - 1/8 x 3/16 x 5/8 Magneto idler shaft key loosened up in gear. Replaced with new key but gear and shaft now have .001 press fit. This should eliminate this continued trouble.	1	1.53	1.53
9-15-36	501007	Bushing - 1-13/16 I.D. x 2-1/32 O.D. x 1-1/2 shouldered. Starter and generator drive gear bushing seized on shaft and turned in case due to failure of bearing number 503605 cutting off oil supply. Replaced with new part with oil grooves added.	1	14.66	14.66

*These items
Contractors
property.*

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9-15-36	503543	Gear assembly - starter drive idler bevel. Bushings failure caused shaft to pick up and running out of line caused teeth to pick up and feather. Shaft was re-ground and teeth stoned up where feathered. Hardness checked O.K.	1	2.04	2.04
9-15-36	503540	Gear - starter drive shaft. The teeth were feathered from mis-alignment due to failure of bushing number 501007. Teeth were stoned to a smooth surface.	1	No Charge	
9-15-36	503605	Bearing - reduction gear pinion This bearing picked up and badly scored, probably due to improper oiling. Replaced with new bearing having longitudinal oil grooves. This bearing was fit .0045 tight in the case to provide for expansion of aluminum and bored in place after shrinking into case.	1	16.65	16.65
9-15-36	503547	Pinion - reduction gear. The failure of bearing number 503605 caused the shaft to pick up. This was ground down and fitted to the new bearing.	1	2.04	2.04
9-15-36	503587	Bearing - reduction gear idler. This bearing gave indication of heavy bearing on one side and was replaced with a new bearing having longitudinal oil grooves. Fitted to case .0045 tight and re-bored in place.	1	16.08	16.08
9-15-36	503604	Bearing - propeller shaft outer. This bearing was replaced to fit case .005 tight and the new bearing had the longitudinal oil grooves added.	1	19.84	19.84
9-15-36	503587	Bearing - reduction gear idler. This bearing was in good condition but was removed and chrome plated on O.D. to allow .0045 tight fit in the re-bored case. Longitudinal oil grooves added and bearing re-bored in place. Re-worked existing bearing.	1	8.05	8.05

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Date	Part No.	Part Name and Description	No. of Units	Unit Price	Total
9-15-36	501012	Bushing - 1-1/8 I.D. x 1-5/16 O.D. x 1" shouldered. The failure of bearing number 503605 caused the reduction gear case diaphragm to become overheated and distort slightly. This necessitated the re-boring of the housing for the four camshaft idler gear bushings. Replaced with new parts bored in place. No change in design.	4	12.56	50.24
9-15-36	501024	Bolt - 3/8-24 x 1-1/32 special Propeller idler gear shaft bolt cracked at head fillet. This was probably caused by interference at the fillet radius. All the parts affected were checked and any possible interference removed. Replaced with new part, no change.	1	3.21	3.21
		Oil seal propeller shaft. Chicago rawhide seal for blow-by measurements worn out, replaced. Testing equipment	1	No Charge	
9-15-36	503507	Housing - reduction gear front Bearing holes were slightly out of round on removing bearings number 503587 and 503604. Bearing holes re-bored and after assembly the bearings were bored in place.	1	23.66	23.66
9-15-36	503681	Nut - supercharger impeller This nut was cracked possibly due to bearing number 501087 failure. Replaced with new part 1/4" larger hex.	1	9.56	9.56
9-15-36	503508	Housing - reduction gear, rear Bearing holes were slightly out of round due to seizure of bearing number 503605. All bearing holes re-bored and after assembly bearings were re-bored in place.	1	43.00	43.00

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Date	Part No.	Part Name and Description	No. of Units	Unit Price	Total
9-15-36		Carburetor air cleaner and housing. A suitable air cleaner was designed, built and installed between the air bottle and carburetor to remove any foreign matter present in the air. Testing equipment.	1	No Charge	

Total of Replacement Parts List dated 9-15-36 \$737.08

RECAPITULATION

Total of Replacement Parts List dated 6-15-36	\$1,668.73
Total of Replacement Parts List dated 6-30-36	1,703.38
Total of Replacement Parts List dated 7-15-36	0,000.00
Total of Replacement Parts List dated 7-31-36	392.84
Total of Replacement Parts List dated 8-15-36	6.16
Total of Replacement Parts List dated 8-31-36	0,000.00
Total of Replacement Parts List dated 9-15-36	<u>737.08</u>

Total Government liability to date, 9-15-36, over and above the amount specified in Article 17, as provided for in paragraph #3d, Item 3 of Article 15, subject contract\$4,508.19

AIR CORPS INSPECTOR'S CERTIFICATE

I certify that the articles listed on pages one to seven inclusive of this report dated 9-15-36 were inspected and accepted by me in the quantities stated, and that they conform to the contract requirements for articles and parts used in the subject engine, and that the above replacement articles and parts were necessary for the continued operation of the subject engine.

Silas Snyder
Inspector's Signature

Procurement Inspector
U. S. Army Air Corps
Title and Rank

Oct. 2nd 1936
Date