

EXHIBIT C

INSTRUCTIONS FOR MODIFICATION OF P-51 AIRPLANES  
FOR PROJECT PFF

1. The following modifications must be accomplished in order to use P-51 airplanes on Project PFF:

a. Modify manifold pressure regulator per Packard Service Bulletin #98 dated 20 April 44. Note that the enclosed copy (Encl. #6) of this Service Bulletin contains some additions and corrections which were not made to the copies enclosed with the kits prepared and shipped by Packard. Can be done immediately. Will not interfere with normal operation of the airplane.

b. Modify the supercharger white drain valve per Packard Service Bulletin #99 dated 20 April 44 (Encl. #7). Note that failures of the diaphragm in this valve have already been experienced in service and modification is also called for by T.O. #02-55AC-21 dated 20 April 44. The modification as outlined in the Packard bulletin is different from that described in the Technical Order. Either will be satisfactory for Project PFF at the option of Group Engineering Officers. The Packard modification requires parts which are included in the kits from Packard. Can be done immediately. Will not interfere with normal operation of the airplane.

c. Install new type induction center manifold extension gland seals as outlined in Packard Bulletin #100 dated 20 April 44 (Encl. #8). 2000 of the new type seals are included in the Packard kits. In addition, 6000 of the old type seals, part #601932 have been shipped on E.R. #38-9292-10-PFF, in case they are needed. They can be expected to give about 50 hours of operation under the conditions of Project PFF. May be done at any convenient time. No interference to normal operation of airplane.

d. Spark Plugs - Lodge RS5/5 plugs will give the best service. Usable, but considered second choice are the K1G R05/3 plugs. Also satisfactory are IEL4 plugs of American manufacture when they become available.

e. Install bulged exhaust stacks per T.O. #01-60-JD-32. This is also covered in North American Service Bulletin #73-104. Should be done immediately. No interference to normal operation of airplane.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

EXHIBIT C (Contd)

f. Reset supercharger aneroid switch. The optimum shift point will be found at the pressure equivalent to 8000-foot altitude with the V-1650-7 engine and to 13,800-foot pressure altitude with the V-1650-3 engine when following the 75" manifold pressure curves. A set of engine power curves is attached for use in case it is desired to set the aneroid switch to operate at the optimum point for some other curve such as the 67" curve. If decision is made to set the aneroid switch for operation at the optimum point on the 75" curve, it will then probably be necessary to issue instructions to pilots to fly with the supercharger switch in the manual low blower position when operating at reduced throttle until a desired altitude for shift is reached.

2. Necessary parts for accomplishment of the above changes have been shipped as follows:

a, b and c - Kits were prepared by Packard and shipped under E.R. #3E-9282-RO-PPF. The additional 6000 old style seals were covered by E.R. #3E-9292-RO-PPF.

d. It is understood that sufficient spark plugs are available overseas.

e. 450 sets of exhaust stacks were shipped sometime ago under E.R. #9E-30071. An additional 180 sets have been shipped under E.R. #9E-30130-PPF. These 630 sets are calculated to be sufficient.

f. No parts required.

3. Project PPF can only be applied to V-1650 series engines when they are equipped with double girder pistons. The following engines were equipped with these pistons at the factory:

V-1650-3 - Serial Nos. V-301550 through V-301579.  
Serial Nos. V-301874 and V-301924 and subsequent.

All V-1650-7 engines except V-320001 and V-320002.

Technical Order #02-55AC-13 calls for the installation of double girder pistons in all other engines, and if complied with they become available for this project. Up to the present date, V-1650-7 engines only have been cleared, for this project. Tests are in progress on V-1650-3 engines equipped with the double girder pistons and if they are cleared advice will be forwarded.

\*\*\*\*\*

~~CONFIDENTIAL~~

EXHIBIT C (Concl'd)

~~CONFIDENTIAL~~

29 April 1944

4. If exhaust stacks gasket Packard Part #60019; blows out at high power operation and no replacement gaskets are available a satisfactory fix may be obtained as follows:

a. Remove exhaust stack and flange and true flange with grindstone.

b. Reinstall flange without gasket. (Tighten bolts with 80-90 inch-pounds torque.)

Archives of M. Williams

COM. GEN.
TECH. ENG.
ASST. ENG.
C.O.
UL. OFF.
EXP. ENG.
CONTRACT
INS.
PROD. DIV.
TEST. DIV.
W.R. DIV.
PROD. CONT.
E.P.D.
E.S.C.
TECH. DATA
OFF. DESK
OTHERS

1. The following list of P-40, P-47, and P-51 series airplanes is for information only. It is not intended to be used as a basis for the issuance of technical orders in the following circumstances:

- 1. General Instructions for P-40
- 2. General Instructions for P-47
- 3. General Instructions for P-51
- 4. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 5. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 6. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 7. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 8. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 9. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 10. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 11. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 12. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 13. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 14. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 15. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 16. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 17. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 18. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 19. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 20. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 21. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 22. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 23. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 24. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 25. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 26. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 27. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 28. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 29. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 30. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 31. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 32. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 33. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 34. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 35. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 36. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 37. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 38. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 39. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 40. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 41. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 42. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 43. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 44. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 45. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 46. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 47. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 48. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 49. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 50. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 51. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 52. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 53. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 54. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 55. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 56. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 57. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 58. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 59. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 60. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 61. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 62. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 63. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 64. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 65. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 66. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 67. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 68. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 69. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 70. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 71. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 72. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 73. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 74. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 75. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 76. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 77. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 78. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 79. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 80. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 81. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 82. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 83. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 84. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 85. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 86. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 87. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 88. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 89. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 90. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 91. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 92. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 93. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 94. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 95. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 96. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 97. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 98. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 99. Lockheed Service Bulletin 100-100 dated 24 Apr 44
- 100. Lockheed Service Bulletin 100-100 dated 24 Apr 44

Technical orders referred to in the above material are hereby cancelled. It is recommended that they all be cancelled to the extent they are not cancelled because of the known fact that the issuance of technical orders in the theatre is often unavoidably delayed for months.

Operating Instructions will be forwarded at a later date upon completion of tests now being conducted by the Material Command. The P-51 series airplanes are now released for 75" manifold pressure and 80" (with and without water injection) in the P-47.

AUTH: C.D. 356

~~CONFIDENTIAL~~

Date: 11/1/44

~~CONFIDENTIAL~~