INSTRUCTIONS FOR MODIFICATION OF P-51 AIRPLANES FOR PROJECT PPF

1. The following modifications must be accomplished in order to use P-51 airplanes on Project PPF:
   a. Modify manifold pressure regulator per Packard Service Bulletin #93 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 volute 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 PPF 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 #60192, have been shipped on T.O. #58-9292-10-PPF, in case they are needed. They can be expected to give about 50 hours of operation under the conditions of Project PPF. 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 KLO RS5/3 plugs. Also satisfactory are LEM plugs of American manufacture when they become available.
   2. Install bulged exhaust stacks per T.O. #01-65-JD-32. This is also covered in North American Service Bulletin #73-104. Should be done immediately. No interference to normal operation of airplane.
EXHIBIT C (Contd)

f. Reset supercharger aneroid switch. The optimum shift point will be found at the pressure equivalent to 5000-foot altitude with the V-1650-7 engine and to 13,000-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. Kits were prepared by Packard and shipped under E.R. #58-9232-0C-PFP. The additional 6000 old style seals were covered by E.R. #58-9202-0C-PFP.

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

e. 450 sets of exhaust stacks were shipped sometime ago under E.R. #95E-30071. An additional 120 sets have been shipped under E.R. #95E-30130-PFP. These 450 sets are calculated to be sufficient.

f. No parts required.

3. Project PPP 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-301571 and V-301921 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.
4. If exhaust stacks gasket Packard Part #600194 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.)