Starting and Running Procedure for Hercules XVI Engine. HalifaxIII. A/C.

1. Have aircraft facing into wind when possible.
2. Turn on fuel cocks.
3. Connect ground battery.
4. Turn propellers two complete revolutions by hand.
5. Turn propellers two complete revolutions by starter (if free rotation is impeded during operations 4 or 5 suspect hydraulic locking)
6. Select cylinder priming to appropriate engine by the distributor cock in undercarriage bay and operate fuel priming pump until increase of resistance to movement indicates that priming system and pump are filled with fuel.
7. Set controls. Throttle slightly off closed position.
   Propeller control MAX.R.P.M. position.
   Supercharger 'M' gear.
   Air-Intake "COLD".
   Cowl gills "OPEN" (unless air temperature is below 0.C, when cowl gills should not be operated until engine has run a few minutes.)
8. Switch on ignition, press starter and booster coil button, vigourously operate priming pumps until engine fires and continue then to operate until engine picks up and runs smoothly.
9. Disconnect ground battery and turn off priming cock in undercarriage bay.
10. Warming up. Run at 800 R.P.M. for the first 2 minutes especially when the air temperature is low, to prevent the building up of high oil pressure in the scavenge system, open gradually in steps of approximately 100 R.P.M. to 1000 1200 R.P.M. taking care not to exceed a 120. lbs. per square inch oil pressure guage reading, run at this speed until oil pump has risen to 150 C and cylinder head temperature 150 C, and steady oil pressure is obtained.
11. Checking performances and power output.
    A. Open up to + 6 lbs boost to assist clearing of spark plugs.
    B. Open uo to zero lbs. boost and note that R.P.M. is within 50 of the figure normally obtained for engine concerned at this control setting.
    C. Change to 'S' Gear and note slight drop of R.P.M. approx. 80 to 100 and momentary fall and immediate recovery in oil pressure, return to 'M' gear and note recovery of R.P.M. and fall and recovery of oil pressure, (a more specific check can be made by setting propeller control to 2400R.P.M. running at zero lbs boost engaging 'S' Gear, then open open throttle to Rated and 6lbs boost and note that the boost pressure remains constant and without fluctuation, throttle back to zero lbs boost and change to 'M' gear.
    D. Open throttle to EC.B and check boost pressure + 2 lbs, operate propeller control to give drop of 400-500 R.P.M. open and close throttles slightly, note that R.P.M. is regained.
    E. Open throttle to 6lbs boost and switch off each magnet in turn, note that drop does not exceed 50. R.P.M. a pause for a few seconds after switching on one magneto before switching off another magneto should be made to allow plugs to clear.
    F. Open throttle to Take-Off and check boost pressure + 8½lbs. R.P.M. should settle at 2800 but owing to variations in engine output and atmospheric conditions, maximum R.P.M. 2800 may not be obtained against checks but will be obtained during a normal take-off.

NOTE. During above checks careful observation should be kept of oil and cylinder temperatures, if these rise unduly throttle back to 800 to 900 R.P.M. and allow engine to cool off.

12. Shutting down pressure.
    A. Face aircraft head to wind if possible.
    B. Exercise supercharger and already detailed in para. 11.c.
    C. Run at 800-900 R.P.M. until cylinder head temperatures has ceased to fall or is below 200.C.
    D. Open up to 2 lbs. boost by slow movement of the throttle and run at this condition for 5 seconds then slowly close throttle down to 800-900 R.P.M. and run at this condition for 2 minutes to cool engine and allow correct oil scavenging then turn off Pilots fuel cock which also operates engine cut-out, switch off ignition when engine has ceased to rotate.
    E. Allow cowl gills to remain open 10-15 mins to prevent over heating of ignition leads.