GROUND TEST INSTRUCTIONS

SECTION 7

ENGINE OR E.C.U.

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SECTION 7

ENGINE OR E.C.U.

PART 1

The protective measures detailed in this Section must be taken on engines or E.C.U.'s in storage or during periods when 'Not in Use'.

1. STORAGE PERIODS (including 'Not in Use').

Engines that are not being run must be protected against corrosion and the ingress of moisture and foreign matter.

The minimum action to be taken is as follows:–

UP TO ONE WEEK

Fit all engine covers and blanks.

UP TO ONE MONTH

As for ONE WEEK plus the following:–

Inhibit fuel system (as detailed in para.2).
Top up oil tank.
Grease controls ball ends.
Grease pneumatic ram spindle.
Grease accessory gearbox drive coupling flange.
Spray starter breech barrel and threads with D.T.D.698.
Internally inhibit (as detailed in D.Eng.RD Spec.2028). (See para.3).

Note...

As an alternate to inhibiting, engine may be ground run every SEVEN days. (TEN minutes at idling speed plus ONE minute at cruising speed).

ONE TO SIX MONTHS

As for ONE MONTH plus the following:–

Clean engine externally with white spirit.
Apply external protective treatment.
Internally inhibit (as detailed in D.Eng.RD Spec. 2028), (See para.3).
Seal off all apertures.
Fit all covers.

2. INHIBITING FUEL SYSTEM

The following special equipment is required for inhibiting fuel system:–

(a) Compressed air operated oil rig, adjusted to supply 10 p.s.i. working pressure (but not to exceed 20 p.s.i. under any circumstances).

2. INHIBITING FUEL SYSTEM (Contd.).

(b) If (a) not available, use as alternative the following assembly:—

Oil tank (min. capacity 5 galls.) mounted to give minimum head of THREE feet above highest bleed point of upper fuel pump.

100 mesh filter (fitted to tank outlet).

Pipeline to engine fuel inlet ($^{7}/_{8}$ to 1 in. bore).

Cock in pipeline (fitted as near as possible to engine inlet connection).

Inhibit the fuel system by the following operation which must be made in the sequence given:—

(i) Drain fuel from all fuel system components.

(ii) Fill components with oil, D.T.D.44D.

(iii) H.P. cock 'OFF'; L.P. cock 'OFF'; fuel switch 'OFF'; throttle valve 'CLOSED'.

(iv) Disconnect electrical supply to booster coils.

(v) Remove blanking plugs from highest bleed points in each fuel pump.

(vi) Slacken knurled nuts to retract plungers and fit bleed tools (to (v) bleed points).

(vii) Loosen L.P. filter drain valve.

(viii) Drain fuel system (depress bleed tool plungers to permit GRAVITY draining).

(ix) Remove L.P. filter bowl and element.

(x) Inspect filter element (renew if necessary).

(xi) Refit element and L.P. filter bowl; tighten and re-lock drain valve.

(xii) Disconnect and blank off fuel delivery pipe to L.P. filter.

(xiii) Connect inhibiting rig pipe to L.P. filter.

(xiv) Check rig tank contains 5 galls. (MIN.) of oil.

(xv) Rig oil supply 'ON'; ignition switch 'ON'.

(xvi) Press 'Relight' button for 10 secs.

(xvii) Check satisfactory inhibition of torch igniters (indicated by oil flowing from combustion chamber drain).

(xviii) Depress bleed tool plungers on both pumps until oil stream free from air bubbles is emitted.

(xix) Ignition switches 'OFF'.

(xx) If engine installed in aircraft, remove bleed tools; refit blanking plugs and carry out ONE motoring cycle (using starter).

When speed begins to fall proceed as follows:—

(a) H.P. cock 'ON'.

(b) Throttle valve 'ON'.

(c) Check oil flow through fuel section of oil cooler and burner manifolds (indicated by steady oil flow from combustion chamber drains).

2. INHIBITING FUEL SYSTEM (Contd.).

(xxi) If engine NOT installed in aircraft proceed as follows using hand turning tool (NW.10821):—

(a) Depress bleed tool plungers on both pumps.

(b) Hand turn at 50 r.p.m. for THREE minute period (equivalent to ONE motoring cycle).

(c) Release bleed tool plungers.

(d) H.P. cock 'ON'.

(e) Throttle valve 'ON'.

(f) Hand turn at 120 r.p.m. for 30 secs. period.

(g) Remove bleed tools; refit blanking plugs.

(xxii) After (xx) or (xxi) (whichever applicable), allow engine to come to rest.

(xxiii) H.P. cock 'OFF'; throttle valve 'OFF'.

(xxiv) Oil supply 'OFF'; disconnect rig pipe.

(xxv) Blank off fuel inlet on L.P. filter at once (to minimise loss of oil from engine oil system).

(xxvi) Check electrical supply 'OFF'.

(xxvii) Reconnect booster coils.

3. INHIBITING ENGINE

Inhibit the Engine by the following operations which must be made in the sequence given:—

(i) Clean engine externally with brush and white spirit (ensure no spirit enters air intake or any other engine aperture).

(ii) Carefully fit all blanks and covers to engine apertures (place grease proofed paper between canvas covers and casings).

(iii) Apply D.T.D.698 to accessory gearbox drive coupling.

(iv) Apply D.T.D.825 to controls ball ends.

(v) Coat pneumatic ram spindle with D.C.4. grease.

(vi) Externally spray D.T.D.121D to all parts forward of expansion chamber to air casing joints taking the following precautions:—

(a) Fire extinguishing system pipes must be suitably masked to protect spray holes.

(b) Avoid spraying nozzle box, exhaust unit, and combustion chamber air casings (temperature under running conditions exceeds flash point of D.T.D.121D).

(vii) Internally inhibit engine (as detailed in D.Eng.R.D. Spec.2028). If installed in aircraft, first gain access to engine at 'King' couplings, and fit engine inhibiting pipe (SE1255). (Fuel system side coupling must be blanked off).

(viii) After completion of (vii) seal off ALL paertures immediately. If installed in aircraft, restore original connections.

4. PRIMING ENGINE FUEL SYSTEM

The engine fuel system must be primed under any ONE of the following conditions:—

Engine newly installed into airframe.

Engine has been inhibited.

Fuel system has been disconnected at any point.

Fuel tanks have been drained.

Engine has been run down with L.P. cock 'CLOSED' and H.P. cock 'OPEN'.

The engine fuel system must be primed by bleeding the fuel pumps to remove air or inhibiting oil from the fuel supply lines and fuel pumps.

Prime the engine fuel system by the following operations, which must be made in the sequence given:—

(i) Remove blanking cap from bleed union on pump.

(ii) Screw back knurled nut (to retract plunger).

(iii) Attach bleed tool (BA.26904).

(iv) H.P. cock 'OFF'; ignition switches 'OFF'.

(v) Booster pumps 'ON'; L.P. cock 'ON'.

(vi) Screw in knurled nut to depress bleed tool plunger.

(vii) Direct drain pipe into suitable container.

(viii) If engine has been inhibited, oil will be forced out followed by fuel when oil is exhausted.

(ix) Submerge end of drain pipe into fluid already collected in container.

(x) Allow flow to continue until fuel free from air bubbles passes from drain pipe (indicating pump and supply line FULLY PRIMED).

(xi) Release bleed tool plunger.

(xii) Remove bleed tool; refit blanking cap.

5. AUXILIARY GEARBOXES

New and reconditioned auxiliary gearboxes (awaiting fitment to engine units) may be found to contain either lubricating or inhibiting oil of uncertain specification.

To ensure that oil of incorrect specification is not introduced into the engine system all auxiliary gearboxes must be drained, flushed and filled with oil to aircraft Volume 1 specification immediately prior to fitment to engine units.