HEAD OF "P" BRANCH

A.F.O. 5968/44

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ADMIRALTY FLEET ORDER

AIRCRAFT AND AERO-ENGINES— PRESERVATION—REPORTS

ADMIRALTY, S.W.1,
9th November, 1944.

The following Order having been approved by My Lords Commissioners of the Admiralty is hereby promulgated for information and guidance and necessary action.

By Command of Their Lordships,

H.V. Markham

Distribution Limited

To all Commanders-in-Chief, Flag Officers, Senior Naval Officers, Captains and Commanding Officers of H.M. Ships and Vessels fitted for Aircraft, and H.M. Naval Air Stations and Sections, and Aircraft Maintenance and Repair Yards.

NOTE:—The scale of distribution is shown in the Admiralty Fleet Order Volume, 1941, Instructions, paragraph 10.

HEAD OF "P" BRANCH

5968.—Aircraft and Aero-Engines—Preservation—REPORTS

(A.M.R. 1056/44.—9 Nov. 1944.)

Aircraft.—Reserve aircraft which can be put at six days' notice to fly should be put in a state of preservation in accordance with Appendix "A" and the following :—

(i) *Engines* inhibited. (A.F.O. 4145/44 or Appendix III.)

(ii) *Guns and cannon* unloaded and with signal pistols removed, cleaned, inspected, rectified as necessary, treated with oil lubricating, G.P. thin or G.S. mineral, and refitted in the aircraft. C.A.F.O. 717/44 refers.

(iii) *Ammunition and pyrotechnics* removed, including those stowed in the dinghy, starter cartridges, dinghy inflation cartridge, etc.

(iv) *Radio equipment* removed, other than fixed parts, cleaned, inspected, tested functionally, rectified as necessary, and stored under cover if available, otherwise reinstalled in the aircraft.

(v) *Batteries* removed and maintained in accordance with A.P. 1059C, Section 1.

(vi) *Fuel system* drained if possible, otherwise completely filled. (C.A.F.O. 1787/44 refers.)

(vii) *Oil system* normally filled.

(viii) *Coolant system* filled neutral coolant.

(ix) *Hydraulic system* normally filled after complete functional test with servicing trolley.

(x) *Covers* fitted at all times to propeller, engine, cockpit, guns, pitot tube pressure heads and tyres ; removed only when necessary and for minimum time.

(xi) *Flying controls* locked by the devices provided in pilot's cockpit. In the open, control surfaces fitted with locking clamps.

2. In general, reserve aircraft should be stowed in the best hangar accommodation available, particularly in tropical climates ; where this cannot be done, as much protection as possible must be provided from the direct rays of the sun and from rain by locally constructed shelters which must allow free air circulation round the aircraft.

3. Where adequate shelter cannot be provided, aircraft must be properly picketted on hard standing, generally in accordance with A.P. 1464, Volume I, Part 8, Section 1, Chapter 2. Wings must be spread and locked.

4. In tropical climates aircraft should be trestled with the wheels clear of the ground to preserve the tyres (pressures reduced to about 10 lb./sq. in.) and to allow full operation of all hydraulic services.

5. *Periodic Inspections :—*

Daily—

(i) Check securing gear and covers for correct position and security.

(ii) Inspect aircraft externally for signs of deterioration and damage.

(iii) Check visually that tyres are properly inflated and that oleo leg pressures are correct (except trestled aircraft).

(iv) Check position of the propeller on aircraft with engines inhibited to see that it has not been turned.

Weekly—

(i) Run engine if not inhibited.

(ii) Operate hydraulic and pneumatically-operated services (except undercarriage on untrestled aircraft), flying controls and propeller pitch control mechanism.

(iii) Check tyre and oleo pressures by gauge.

(iv) Thoroughly inspect aircraft inside and out for signs of damage, deterioration and corrosion ; rectify as necessary. Renew anti-corrosion preservatives as necessary.

(v) Inspect electrical wiring, particularly where leads enter junction boxes.

(vi) Replenish fuel and oil tanks, hydraulic and coolant systems as necessary.

Monthly—

(i) Insulation test on all electrical services ; test all electrical circuits for continuity and all lamps for serviceability. (N.A.M.O. General/L.2.)

(ii) Test all radio equipment fitted under normal ground operating conditions.

Quarterly—

(i) Minor inspection as laid down in the appropriate Inspection Schedule amended as necessary to meet local requirements.

(ii) Flight test and functional test of all equipment ; renew all anti-corrosive treatment as necessary.

Note.—Aircraft embarked in stored condition are to be maintained in accordance with N.A.M.O. General/G.2.

6. *Cased Aircraft and Components.*—Stow packing cases on close and evenly spaced supports well clear of the ground.

In tropical climates, brick, stone, concrete or other material not liable to rot or insect attack should be used and the air space should be as large as possible. Precautions must be taken to prevent supports sinking into the ground.

7. In conditions of high humidity remove hand hole covers at case ends and sides to increase ventilation ; in the open the entry of rain must be prevented by covering these openings with gauze or by rigging awnings.

8. In tropical climates, cased aircraft, and components necessarily stowed in the open must be provided with locally constructed shelter against sun and rain.

9. *Periodic Inspections :—*

Weekly—

(i) Inspect cases for signs of rot or damage, security of covers and sinking of supports. In tropical climates, keep vegetation clear of the bottom and sides of the case.

Monthly—

(i) Open cases sufficiently to inspect contents without necessarily disturbing them and to inspect inside of case for mould growth and other indications of damp and deterioration.

(ii) If signs of deterioration are found, remove contents of case, rectify as necessary and retreat with preservative as detailed in Appendix II.

(iii) Replace gear and resecure cases ; see that ventilation holes are clear.

Quarterly—

(i) Remove contents of all cases, inspect thoroughly, rectify faults and renew preservative as necessary.

(ii) Embody outstanding modifications for which parts are obtainable.

10. *Aircraft and Component Cases.*—Slinging eyes, rings and similar fittings are to be protected against rusting with anti-rust paint or grease, G.S. Ref. 34A/4.

11. Empty cases (other than engine and power plant cases) should be shaken and the sections stowed flat on top of each other, separated and clear of the ground by close and evenly spaced timber supports.

In tropical climates protect case section stacks against sun and rain by locally constructed shelters which permit free air circulation round the sections.

12. *Engines.*—British engines which cannot be run every seven days are to be inhibited in accordance with A.F.O. 4145/44.

13. American engines installed in aircraft which cannot be run every seven days are to be inhibited in accordance with Appendix III. American engines not installed in aircraft are to be inhibited in accordance with A.F.O. 4145/44.

14. Engines installed in reserve aircraft are to be reinhibited at minimum intervals of six months in temperate climates and three months in tropical climates.

15. Engines not installed in aircraft (except as detailed in paragraph 16) are to be reinhibited at minimum intervals of twelve months in temperate climates and six months in tropical climates.

16. American engines in pliofilm bags and British engines in metal lined sealed cases should not be disturbed until the humidity indicator shows the presence of excessive moisture. Then, the leak in the container must be located and repaired, the silica-gel renewed or reactivated by drying in an oven, and the container resealed in as dry an atmosphere as possible.

If this cannot be done the engine is to be inhibited in accordance with A.F.O. 4145/44.

17. In tropical climates, engines and power plants must be stowed under cover. In temperate climates they may be stowed in the open only if they are in weather-proof cases which should be protected against weather by tarpaulin and supported well clear of the ground.

18. Uncased engines must be protected by dust covers at all times when work is not actually being carried out on the engine.

19. The date when the engine was last inhibited is to be clearly and permanently marked on the outside of the case or on a securely attached robust label on uncased engines.

20. *Engine and Power Plant Cases.*—New type weatherproof packing cases for engines and power plants are made of tongued and grooved boarding, lined with roofing felt, the roof reinforced with 3-ply and the case edges armoured. The joint between the two parts of the case is made water-tight with jointing compound 33C/922 which is plastic and need not be renewed every time the case is opened but should be remoulded to form a sealed joint.

21. To unseal the new type metal lined case, remove all vertical metal work from the lower part of the case, tear off sealing strip from sealed joint in accordance with the stencilled instructions on the case, remove lower half of locating tongue, bend lapped seam at right-angles to the case side around the perimeter and remove upper part of the case, taking care not to damage the metal lining.

Note.—The overlapping joint is not soldered and should be broken merely by lifting the upper part of the case. A sharp tool must not be used as this will damage the lining.

22. To remove the engine from the new type case, remove the four nuts from the securing bolts, remove the battens, taking care to avoid damaging the bolt seals, and lift the engine on its stand out of the lower part of the case.

23. Empty engine and power plant cases may be stowed in the open provided the inside is protected from the weather and kept dry.

Empty metal lined cases need not be resealed, but the flanges of the metal lining must be protected by light wooden battens nailed along the sides and ends, when cases are to be transported empty.

All fittings and components of the case must be fitted in their proper location when cases are despatched.

24. *Propellers.*—All propellers cased or otherwise are to be checked on receipt for completeness, examined for signs of corrosion or damage and rectified as necessary.

25. Propellers stored in a dismantled condition must be restowed in their correct type packing case and stored under cover, particularly in tropical climates.

If stored in an assembled state, they must be stowed under cover on suitable racks with the weight taken by the hub, and the hub covered to exclude dust and dirt.

26. Before stowing, propellers are to be treated with preservative as detailed at paragraphs 28 or 29 as appropriate.

27. Monthly inspection of propellers is to be made for signs of corrosion or damage and faults are to be rectified. Any outstanding modifications for which parts are obtainable are to be embodied at that time.

28. *Preservation of Dismantled Propellers :—*

Treatment	Part	
	Hydraulic operated propellers	Electrically operated propellers
Spray with inhibitor fluid. Ref. 33C/777.	Interior of hub assembly working parts. Interior of dome assembly.	—
Apply with brush Lanolin resin solution D.T.D. 663, Ref. 33C/924.	Exterior of hub (unpainted parts), cone seat, splines, threads. Exterior of dome assembly if unpainted. Unpainted parts of root end of blades; from shank to end including operating pin; after bearings have been packed with grease. Unpainted metal blades.	Exterior unpainted parts of hub, cone seats, splines, threads. Exterior of motor and reduction gear assembly including driving bevel wheel. Unpainted parts of blade root end including bevel gear, after bearings have been packed with grease. Unpainted metal blades.
Apply Lanolin resin solution D.T.D. 663, Ref. 33C/924, by dipping, spraying or brushing.	Cylinder group. Piston. Inner and outer oil tubes. Spinner support plate.	Slip ring housing. Suppressors (threads only). External metal parts of harness.
Apply Lanolin resin solution D.T.D. 663, Ref. 33C/924, by dipping, spraying or brushing.	Shaft nut. Extractor nut. Front cone. Split pins. Loose nuts, bolts, etc.	Shaft nut. Extractor nut. Front cone. Seeger circlips, etc.
Coat with mineral jelly, Ref. 33C/513.		Harness terminals.
Enclose in greaseproof paper envelope and secure all openings.	Complete hub or hub and dome assemblies. Root ends of blades.	Complete hub assembly, less motor and reduction gear. Root ends of blades.
Store with electrical equipment.		Motor and reduction gear.
Wrap in greaseproof paper and secure along with appropriate propeller.	Piston, cylinder, oil tubes, spinner support, nuts and cones, etc.	Slip ring housing. Suppressors. Harness. Nuts, cones and circlips.

29. *Preservation of Assembled Propellers.*—(i) Remove one blade, spray interior of hub working parts with inhibitor fluid, Ref. 33C/777, and replace blade.

(ii) Spray interior of dome assembly (hydromatic propellers) with inhibitor fluid and assemble dome to propeller.

(iii) Coat external exposed metal parts, including splines, cone seats and threads, with Lanolin resin solution, Ref. 33C/924.

(iv) Wrap hub with grease-proof paper to exclude dust and dirt.

30. *Armament Equipment.*—All armament equipment removed from aircraft for storage is to be treated and stored as follows :—

(i) *Guns.*—Lubricate with oil G.P., thin, Ref. 34A/12, or G.S. mineral. Label with aircraft number and position. Stow in gun chests or racks.

(ii) *Firing units.*—Blank off end of pneumatic pipe lines. Stow in cupboards.

(iii) *Signal pistols.*—Lubricate with oil, G.P., thin, or G.S. mineral. Stow in cupboards.

(iv) *Ammunition chutes and tanks.*—Lubricate with oil, G.P., thin, or G.S. mineral. Stow in bins.

(v) *Bomb racks and torpedo carriers.*—Coat all threads and unpainted parts except release slips with Lanolin resin solution, Ref. 33C/924. Coat release slips with mineral jelly. Stow in racks.

(vi) *R.P. installations.*—Coat unpainted parts with Lanolin resin solution except blast tubes. Coat blast tubes with oil, G.P., thin. Stow in racks.

(vii) *American bomb racks and shackles.*—If already treated by American process with "Tetryl", store as received, otherwise treat as for British bomb racks. Electrical parts to remain untreated. Stow in racks.

(viii) *Gun sights.*—Stow in suitable boxes on racks.

31. *Periodic Inspection.—Weekly.*—Inspect guns for corrosion if fired prior to being placed in storage.

Fortnightly.—Inspect gun sights for deterioration or damage.

Monthly.—Inspect guns, signal pistols, ammunition chutes and tanks, bomb racks, torpedo carriers and R.P. installations for corrosion or damage and rectify as necessary.

32. *Radio Equipment.*—All radio equipment removed from aircraft is to be cleaned, tested functionally, and stowed in clean, weatherproof, well-ventilated accommodation. Units are to be stowed on shelves with an air space of at least 3 in. between units. The lowest shelf must have a minimum floor clearance of 6 in. No equipment is to be stowed on the floor.

33. Weekly inspection is to be made of all equipment for signs of condensation; any present is to be removed by thoroughly drying out the unit, and all possible action taken to prevent further condensation occurring.

34. Equipment containing vacuum tubes is to be run up on the bench on "filaments only" for at least two hours prior to re-use.

35. *Instruments.*—All instruments received for storage, whether in air tight containers or otherwise, are to be passed to the instrument shop for inspection, calibration and test.

36. When passed as serviceable and free from corrosion, they are to be wrapped in grease-proof paper, placed in a plio-film bag containing silica-gel, and sealed before being stowed. Plio-film bags may be made up from material obtained from discarded American engine bags, which can be sealed by application of a warm iron (sealing temperature is 325° F. to 350° F.).

Instruments are to be stowed in racks. Bin stowage is not to be used.

37. Blind flying panels with all instruments properly positioned are to be stowed in sealed plio-film bags. The anti-vibration mountings must not be under load.

38. Flexible drives are to be stowed straight when possible but if coiled, a radius of not less than 9 in. is to be used.

39. Compasses are to be stowed in the transit cases in which they are supplied and kept in a normal attitude so that magnets are free to rotate. The stowage must be clear of magnetic fields of generators, degaussing rings, etc.

Compasses removed from aircraft are to be clearly and indelibly labelled with the serial number of the aircraft and the position from which removed.

Note.—If air-conditioned storage is available, sealing in plio-film bags is not necessary.

40. *Despatch of Aircraft for Packing or Shipment.*—Before despatching an aircraft for packing or shipment the following is to be carried out:—

The inspectional state is to be as laid down in A.F.O. 4594/43 unless approval of higher authority is obtained:

(i) Clean aircraft thoroughly inside and out and remove any corrosion.

(ii) Repair or replace any damaged or broken parts.

(iii) Check aircraft for completeness to standard checking list and see that all equipment is properly stowed and secured.

(iv) Fit new dry batteries of a type marked "overseas" or "suitable for use in tropical climates" if existing batteries are more than six months old by date of manufacture or are not so marked. Fully charge and fit electric accumulators.

(v) Install all guns and cannon, and line up. Test synchronized guns on stop butts. Test all gun firing control mechanisms.

(vi) Remove all ammunition and pyrotechnics, including those stowed in the dinghy.

Note.—If the aircraft is transferred by air, sufficient ammunition and pyrotechnics for the delivery flight are to be placed in aircraft, and the pilot warned that he must report the presence of any such items to the Packing Centre on arrival. A notation is to be made in the aircraft's Form A.700, showing the quantity and location of all ammunition or pyrotechnics.

(vii) See that American aircraft with "Flyaway" oil in their systems have the label in the cockpit and entries in their log cards called for at paragraph 1 (xiv) and (xv) of Appendix III.

(viii) To avoid accumulation of fuel at packing centres, leave the minimum amount of fuel in the aircraft's tanks compatible with safety of flight.

If despatched by road all fuel tanks are to be empty.

41. *Preparation of Aircraft for Embarkation in Aircraft Transports or Carriers for Passage only.*—Aircraft to be embarked are to be put into a serviceable condition as laid down at paragraph 40 (i) to (v). In addition the following is to be carried out:—

(i) Inhibit engine as laid down in A.F.O. 4145/44 or Appendix III of this Order.

(ii) Drain fuel system completely. Replace filler caps and drain plugs.

(iii) Unload all guns and cannon and remove all ammunition and pyrotechnics from the aircraft including those stowed in the dinghy.

(iv) Preserve guns, cannon and signal pistols in accordance with C.A.F.O. 717/44, paragraph 7 (ii).

(v) Treat R.P. gear as follows:—

(*a*) Blank off all electric sockets with blanking caps or gum patch, Ref. 32B/612.

(*b*) Wrap the 5-pin plug with gum patching and tie securely against movement to adjacent tube.

(*c*) Coat all exposed metal parts with Lanolin resin solution, Ref. 33C/924 or 923, including blast tubes.

(vi) Coat all unpainted parts of bomb and torpedo gear (except release units) with Lanolin resin solution. Fit all electric plugs in their respective sockets, or tie securely to adjacent member, and blank off sockets with blanking caps or gum patch.

Coat quick release units with mineral jelly.

(vii) Remove all radio sets, and pack in correct type transit cases. Place a bag of silica-gel in each case and seal case lids with bituminous compound, Ref. 33C/805.

Note.—Quantity of silica-gel to be used is 4-oz. per cu. ft. of case capacity.

(viii) Top up oil system with standard oil or "Flyaway" oil as necessary.

(ix) Check coolant for acidity. Top up, or drain and refill with neutral coolant as necessary.

(x) Top up hydraulic system.

(xi) Coat exposed metal parts of all loose equipment (other than radio or armament) stowed in the aircraft with Lanolin resin solution, Ref. 33C/923 or 924.

(xii) Apply preservatives to all parts of aircraft as detailed at column 2, Appendix II, of this Order.

(xiii) Secure flying control by devices fitted in cockpit. Fit all external covers, including tyre covers, and fasten securely. Fit control surface locking boards.

Note.—Tyre covers are to be made from local resources until they are supplied. They are to be as tight fitting as possible.

(xiv) Enter on Form 700 and log cards details of action taken to place aircraft in state of preservation.

Note.—1. All log cards, Forms 700, vouchers, etc., pertaining to each aircraft are to be handed over to the Air E.O. of the carrier or Officer-in-Charge of aircraft aboard aircraft transports.

Note.—2. Aircraft are to be maintained on board in accordance with NAMO. General G/2.

42. *Receipt of Cased Aircraft Abroad.*—On receipt of cased aircraft abroad the following action is to be taken :—

(*a*) If aircraft is to be held in an erected condition—
- (i) Carry out erection at once.
- (ii) Rectify and remove any faults or corrosion found during erection.
- (iii) Flight test aircraft and after satisfactory completion of test store as laid down at paragraphs 1 to 5 of this Order.

(*b*) If aircraft are to be held in a cased condition—
- (i) Withdraw airframe from its case, on the cradle to which it is attached, and remove all components from their cases.
- (ii) Examine thoroughly and completely, the aircraft and components (including engine if installed) for corrosion and damage and rectify as necessary.
- (iii) Renew all preservative materials removed, using those detailed at column 3, Appendix II of this Order (re-inhibit engine if installed).
- (iv) Re-stow airframe and components in the cases and in the position in which previously packed.
- (v) Transfer radio equipment, propeller, and separately packed instrument boxes to their appropriate section for storage in accordance with this Order.

  Alternatively, if proper storage facilities do not exist, re-stow these items in their respective boxes after inspection, rectification and re-treatment as necessary. Renew or re-activate silica-gel in sealed boxes and re-stow boxes in packing cases from which they were taken.
- (vi) Re-secure all cases, and store as detailed at paragraphs 6 to 10 of this Order.

Note.—Cased aircraft are accompanied by a box containing small fittings, nuts, bolts, etc., removed during dismantling for packing. The box is secured in one of the main packing cases. Such loose lines are to be examined for corrosion on receipt, but must be replaced in the box and remain with the aircraft to which they belong until used in erection. These assembly-parts boxes must not be robbed to service other aircraft, except at the discretion of the Air E.O., and items taken then must be made up as soon as replacement parts demanded are obtained.

43. *Special Reports.*—Special reports are to be made in full to the Administration Authority and repeated to Admiralty on the following points :—
- (i) Deterioration of reserve aircraft, due to local conditions, or lack of or ineffectiveness of preservative treatment, etc.
- (ii) Poor condition of aircraft at time of receipt, which could have been prevented by better preservative treatment or packing.
- (iii) Any local methods which have proved effective in overcoming deterioration of reserve aircraft.
- (iv) Construcitve criticisms of preservative treatment, packing methods or case design.

44. Reports should contain full details to enable all action to be taken and full investigation to be carried out. The details required are :—
- (i) Serial No. of aircraft and/or engine.
- (ii) Nature of defect and full description of parts affected, with part and reference number.
- (iii) Date of receipt, or period since aircraft was last flown.
- (iv) Date of last inspection or preservative treatment.
- (v) Nature of storage condition, *i.e.*, erected, cased, in open, in hangars, etc., or method of delivery.
- (vi) Number of aircraft or engines affected.

Appendix I

List of Preservatives

Name	Specification	Stores Ref.	Application	Remarks
Inhibitor fluid ...	D.T.D.587	33C/777	Special spray gun and nozzle, Ref.4A/1261.	Not necessary to remove, except accumulation in engine cylinders, which should be drawn off by syringe before starting up.
Flyaway oil (British)	—	34A/180	Used as engine lubricant.	Drain off while hot.
Lanolin resin solution.	D.T.D.663	33C/923 or 33C/924	Brush dip spray from standard paint. Spray gun.	Wash off with paraffin, Grade A, or white spirits.
Rust preventive ...	D.T.D.121D	33C/527	Brush dip or spray...	Wipe off with clean cloth or wash off in paraffin or white spirits.
Pigmented Lanolin	D.T.D.279B	33C/584	Brush or dip. *Must not be sprayed.*	*See* footnote.
Lanolin grease ...	—	33C/511	Smear (apply warm in temperate climates).	Wipe off or wash with white spirits or paraffin.
Grease G.S. ...	—	34A/4	Smear	Wipe off or wash in paraffin.
Mineral jelly ...	D.T.D.55	33C/513	Smear (or hot dip) when combined with beeswax.	Wipe or boil in clean water if mixed with beeswax.
Bituminous sealing compound.	—	33C/805	Brush warm, or smear	Not necessary. (Used for sealing case joints.)
Plastic sealing compound.	—	33C/922	Apply by hand and mould to shape to fill joint.	Not necessary. Used for sealing weatherproof engine cases. May be remoulded by hand. Will stay plastic.
Gum patch ...	—	32B/612	Apply by hand. (Form of adhesive tape.)	Strip off by hand.
Greaseproof paper	—	32B/402	Wrap	N.A.
Silica-gel ...	—	E.6/182	Place in linen bags. (Used in sealed cases to absorb moisture.)	N.A.
Oil, G.P., thin ...	—	34A/12	Smear	Wipe.

Note.—Pigmented Lanoline 33C/584 contains chromate pigment which is dangerous to health and to the skin. Use of this substance on aircraft is being discontinued. Use white spirits, or brush-wash to remove. Do not hold swabs in the hand. Use mops or brushes.

Appendix II

Application of Preservative

To Aircraft

Parts	Preservative and when to apply		
	Erected aircraft stored in hangars	Erected aircraft stored in open or for shipment by sea transport	Cased aircraft in storage and during transit
Exposed metal parts of radio and electrical fittings	33C/511	33C/511	33C/511
Cockpit control chains and sprockets ...	34A/4	34A/4	34A/4
All control rods and cables	34A/4	33C/924	33C/924
Cockpit hood lock and release gear ...	34A/4	34A/4	34A/4
Safety harness lock and release gear			
Emergency release mechanisms ...			
Seat attachment fittings			
Control surface hinges			
Rudder bar pivots and adjusters ...			
Undercarriage and tail oleo sliding struts			
Hydraulic jack rams and locking pins			
Undercarriage locking gear			
Wing root end fittings and locking pins ...	33C/527	33C/927	33C/924
Exterior of engine including propeller-shaft if propeller is removed	33C/924	33C/924	33C/924
Metal propeller blades (unpainted)	33C/527	33C/527	33C/924
All exposed metal parts on power plant ...	33C/527	33C/924	33C/924
Interior of spinner	33C/527	33C/527	33C/924
Unpainted parts of propeller hub	33C/527	33C/527	33C/924
Interior of engine cowlings	Nil	33C/527	33C/527
Jettison fuel tank fittings	33C/527	33C/924	33C/924
Joint faces of wing and airframe detachable portions	N.A.	N.A.	33C/924*
Fairing attachment screw holes	N.A.	N.A.	33C/924
Radio masts	33C/527	33C/924	33C/924
Brake drums of wheels when removed for storage or transit	N.A.	H.A.	33C/924
Bomb and torpedo attachment fittings ...	33C/527	33C/924	33C/924
R.P. gear	*See* C.A.F.Os. 717/44 and 721/44	*See* C.A.F.Os. 717/44 and 721/44	*See* C.A.F.Os. 717/44 and 721/44
Guns, cannon and signal pistols ...			
Bomb racks			
Interior of metal main planes, wing tips, and gun wells (sprayed through openings)	N.A.	33C/527	33C/527
Interior of metal tail plane, rudders, detachable rear ends, when removed for packing	N.A.	N.A.	33C/527

Note.—Preservative or grease is not to be applied to any part of the oxygen equipment which is to be masked before any treatment is applied to any parts in its vicinity.

If lubrication is required, dry graphite (blacklead) powder may be sparingly used.

Appendix III

Preservation of American Aero-Engines installed in Naval Aircraft

1. American engines in aircraft which cannot be run every seven days are to be treated as follows :—

(i) If the oil system does not already contain " Flyaway " oil, completely drain the oil system, including the coolers, and refill with " Flyaway " oil, Ref. 34A/180.

(ii) Run engine for 15 minutes at an oil inlet temperature of 95–105° C., using normal approved fuel. If necessary oil coolers may be blanked off or by-passed to obtain this temperature.

(iii) Stop engine, and while still hot, drain oil from engine by removing sump drain plugs. Leave drain plugs out until engine is cool. Remove all spark plugs. Remove rocker covers from engines without pressure lubricated rocker gear. Do not drain " Flyaway " oil from oil tank.

(iv) Using spray apparatus, Store Ref. 4A/1261, thoroughly spray exhaust valves with inhibitor fluid, Ref. 33C/777, through the spark plug holes with exhaust valves open.

(v) On engines without pressure lubricated rocker gear, thoroughly spray all rocker box parts with inhibitor fluid.

(vi) Rotate crankshaft at least 4 revolutions to work inhibitor fluid into exhaust valve guides.

(vii) With each piston at bottom dead centre in turn, spray interior of cylinders through spark plug hole with inhibitor fluid in quantities quoted below, taking care to cover all interior surfaces.

Quantity of inhibitor fluid to be used is :—

Pratt and Whitney engines	12–14 c.c. per cylinder.
Wright engines	15–20 c.c. per cylinder.
Scarab engines	4– 5 c.c. per cylinder.
Lycoming engines	4– 5 c.c. per cylinder.

(viii) Without further turning of crankshaft, spray the inside of each cylinder again, using half the quantity of inhibitor fluid quoted at sub-paragraph (vii).

The crankshaft must not be rotated after this operation.

(ix) When obtainable, fit dehydrator plugs, Part No. AN–4062, tightly in all spark plug holes, and plugs, Part No. AN–4061, in crankcase sump otherwise refit standard blanking plugs.

Replace rocker covers where these have been removed.

Where dehydrator plugs have been used, secure normal sump plug to the sump with locking wire.

(x) Place a minimum of ½ lb. bag of silica-gel in each exhaust outlet and in the air intake scoop. Seal these openings with suitable airtight covers well secured with adhesive tape. Attach the silica-gel bags to the covers to ensure removal when these are taken off.

(xi) Inhibit carburettors as follows :—

(*a*) *Stromberg injection carburettor.*—In accordance with Leaflet A.P. 2152A/6–W, paragraph 4.

(*b*) *Stromberg float type carburettor.*—No inhibiting required.

(*c*) *Holley carburettors.*—Disconnect fuel lines to carburettor and install suitable nipple in the carburettor fuel inlet connection. Introduce oil D.T.D. 44D, Ref. 34A/43, or 141 (or if this is not available, oil, Ref. 34A/123 or 152) into the carburettor. through this nipple, to flood all fuel passages completely. Remove drain plugs in bottom of carburettor and flush through with oil several times. Finally drain carburettor of oil, replace drain plugs, make all connections and lock.

(xii) Using paint spray gun, spray complete exterior of the engine with Lanoline resin solution, Ref. 33C/924 or 923.

Note.—Lanoline resin solution is inflammable whilst being sprayed and has a slightly toxic effect. Suitable precautions are to be taken.

(xiii) Instal cowlings and engine covers and securely fasten.

(xiv) Place a date notice in the cockpit to state " the oil system of this aircraft (No.) contains " Flyaway " oil, Ref. 34A/180.

This notice is to be readily visible when seated in the cockpit but placed so that it may be left in position during flight without inconvenience to the pilot. The notice is not to be removed until the oil system has been cleared of " Flyaway " oil.

(xv) Place a notice on the propeller in a prominent position to state " ENGINE INHIBITED. DO NOT TURN PROPELLER ".

(xvi) Make suitable entry in Engine and Airframe Log Cards to state that oil system has been filled with " Flyaway " oil and quoting date of inhibiting in engine log.

2. *Preparation for Delivery Flight.*—Reserve aircraft whose engines have been treated as detailed at paragraph 1 which are required for delivery by air are to have their engines prepared as follows :—

(i) Remove all dehydrator plugs, drain plugs, blanking covers and bags of silica-gel.

(ii) Prepare carburettors as follows :—

(*a*) *Stromberg injection carburettors.*—Remove blanking plugs from fuel inlet, the fuel strainer and drain plug at the side of fuel control unit. Drain off inhibitor oil. Replace drain plug and strainer and connect up the fuel supply pipe.

(*b*) *Holley carburettors.*—No action required. Carburettors are drained of oil after initial inhibiting.

Note.—Carburettors are to be primed with fuel and allowed to stand at least eight hours before running the engine.

(iii) Using suitable syringe or hand pump withdraw as much as possible of inhibitor fluid from each cylinder through spark plug hole. Piston should be at T.D.C. for this operation.

(iv) Rotate engine slowly by hand at least four revolutions of propeller in normal direction of rotation with spark plugs or dummy plugs in position.

(v) Repeat operation (iv) with spark plugs removed.

(vi) Remove inlet elbows of two lower cylinders on single bank engines, and five lower cylinders on double bank engines, and drain oil or inhibitor fluid collected therein. Replace and secure inlet elbows.

(vii) Fit spark plugs securely and connect up ignition. Fit all drain plugs and lock in place.

(viii) Prepare engine for flight in normal manner, but do not drain system of " Flyaway " oil and do not remove notice from cockpit indicating " Flyaway " oil is in use.

(ix) Enter in log cards " Engine prepared for flight using ' Flyaway ' oil ".

3. *Preparation for Service.*—Before placing an aircraft in which " Flyaway " oil is in use, into general service, the following procedure is to be carried out :—

(i) If the engine has been inhibited as detailed at paragraph 1 of this Appendix proceed as for preparation for delivery flight at paragraph 2, sub-paragraphs (i) to (vii).

(ii) Drain " Flyaway " oil from oil tank, pipelines and oil coolers and refill with clean lubricating oil of approved grade.

(iii) Run engine for 15 minutes at oil temperature of 95° to 105° C.

(iv) Remove notice from cockpit stating that system contains " Flyaway " oil.

(v) Make entry in log cards that oil system has been drained of " Flyaway " oil and refilled with approved grade oil.

4. If aircraft has been delivered by air using " Flyaway " oil and is to be put into immediate use, proceed as follows :—

(i) Run engine for normal warming up period, and drain " Flyaway " oil from engine and oil system including radiators.

(ii) Refit drain plugs and fill oil system with clean lubricating oil of approved grade.

(iii) Proceed as detailed at paragraph 3, sub-paragraph (iii) to (v).

Note.—" Flyaway " oil has been introduced under Stores Ref. 34A/180. This oil contains ·25 per cent. inhibitor concentrate and is of high viscosity. It may be used in reserve aircraft for flight test or delivery flights not exceeding five hours total flying, but must not be used on general or operational flights.

Oil dilution may be used in the normal manner.

The same oil may be used again once only, provided it has been drained direct from the aircraft in which previously used into clean oil drums through a fine mesh filter.

(*C.A.F.Os. 717/44, 721/44, 1787/44 and A.F.Os. 4594/43, 4145/44.*)

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