

CA. 88
800.

GOVERNMENT OF INDIA
MINISTRY OF COMMUNICATIONS
CIVIL AVIATION DEPARTMENT



NOTICES
TO
**AIRCRAFT OWNERS AND
GROUND ENGINEERS**

1930-1948

(AI, 17-114-II)

D53.2
H9

D53.2
H9
045563

PRINTED BY THE MANAGER OF PUBLICATIONS, DELHI, INDIA
MANAGER, GOVERNMENT OF INDIA PRESS, NEW DELHI, INDIA.
1939

Price Rs. 1/2/- or 1sb. 9d.



GOVERNMENT OF INDIA

NOTICES TO AIRCRAFT OWNERS AND GROUND
ENGINEERS, 1930-1948.

(1) The following Notices to Aircraft Owners and Ground Engineers issued during the years 1930-1948 remain in force on the 31st December 1948 and are reprinted herein with amendments incorporated in certain cases :—

- 1930 . Nos. 4, 5, 17 and 29.
- 1932 . Nos. 10, 18, and 35.
- 1936 . Nos. 4, 5 and 54.
- 1937 . Nos. 9 and 24.
- 1938 . Nos. 7 and 18.
- 1939 . Nos. 11 and 30.
- 1940 . Nos. 1 and 5.
- 1941 . No. 10.
- 1943 . No. 6.
- 1944 . No. 1.
- 1946 . Nos. 4, 11, 13 and 14.
- 1947 . Nos. 2, 5, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24, 25, 26, 27, 28, 30, 32, 33, 35, 36, 37, 38 and 39.
- 1948 . Nos. 3, 4, 6, 7 and 8.

(2) All Notices issued during the years 1930-1948 other than those listed above should be regarded as cancelled. It is pointed out that the cancellation of Notices issued to draw attention to regulations, etc., in no way affects the regulations in question.

T. P. BHALLA,

Director General of Civil Aviation in India.

NEW DELHI ;

The 20th April 1949.

INDEX

AIRCRAFT.—General.

	<i>No. of Notice.</i>
Advertising streamers and banners on aircraft	4 of 1930.
Air Locking of Fuel Systems—Precautions	5 of 1940.
American Aircraft materials and spares—Acceptance of	30 of 1939.
Airscrews approved for use on civil aircraft	16 of 1947.
Certificate of Airworthiness—grant of, in respect of private aircraft	18 of 1932.
Certification of parts fitted in aircraft by Ground Engi- neers holding 'B' and 'D' licences	1 of 1940.
Cleanliness of Aircraft	10 of 1932.
Compasses in aircraft—formation of bubbles	17 of 1930.
Compasses, aircraft	11 of 1946.
Constructor's No. of aircraft built from salvage and spares in India	4 of 1936.
Drain holes in control surface tabs	19 of 1947.
Dual control in passenger aircraft	54 of 1936.
Fire—Safety precautions against	5 of 1947.
First Aid Equipment in aircraft—provision of.	10 of 1947.
Flexatex C. 6 Hose—pulling away from the end connec- tions or distortion of tank shells due to shrinkage	23 of 1947.
Heating systems of cockpits and cabins	29 of 1930.
Procedure with regard to the issue of certificates etc., for aircraft imported into India from the United King- dom and the United States of America, under the Indian Aircraft Rules, 1937	18 of 1938.
Safety belts and harness—renewal of the cord attaching release pins to—	7 of 1938.
Safety belts and harness—Inspection of	11 of 1939.
Safety harness or belts during flight—use of	28 of 1947.
Timber for aircraft—testing of	24 of 1937.
Timber shrinkage on aircraft, effects of	5 of 1930.
Weights for petrol, crew and passengers carried on air- craft	4 of 1946.

AIRCRAFT—BRITISH.

Anson and Consul aircraft—Vokes air filters—Fracture of the element spacing fingers	36 of 1947.
Anson aircraft—Voltage Regulators—Incorrect cables fitted	37 of 1947.
Avro XIX aircraft—Chafing of the oil pipe from tank to feathering pump	38 of 1947.
Avro XIX and Anson Aircraft—Defect Reports	12 of 1947.
Avro XIX aircraft—Defect Report	17 of 1947.
Avro XIX aircraft—Brake cable fracture at operating end	32 of 1947.
D. H. 82 Tiger Moth and Dragon Rapide aircraft spares.	6 of 1948.
D.H. 90A "Rapide" aircraft —Flap operating cables—failure adjacent to splice	33 of 1947.
Dove, Lancastrian, Proctor, Short Boats, Viking and York aircraft—Defect Report. Voltage Regulators—Alteration of setting to 28 volts	26 of 1947.
Oxford and Consul aircraft—Development of fatigue cracks on propeller blades	15 of 1947.
Viking aircraft—Defect Report—Voltage Regulator : earthing of current coil to magnet case	27 of 1947.
Viking and Wayfarer aircraft—undercarriage brake failures	20 of 1947.
Viking, Wayfarer and Freighter aircraft—Defect report general	24 of 1947.
Viking, Wayfarer and Freighter aircraft—Constant Speed Units Type PAY5100 and CAY5100	39 of 1947.

AIRCRAFT—U.S.A.

D. C. 3 Dakota types of aircraft— Essential Modifications	14 of 1946, & 25 of 1947.
D. C. 3(C. 47) aircraft—Damage to Elevator fabric	8 of 1947.
Dakota Aircraft—Aileron Trimming Tab Control Rod—Fouling the stiffening plate between the aileron main spar and rib	30 of 1947.
Dakota Aircraft—Defect Report. Voltage Regulators—alteration of setting to 28 volts.	26 of 1947.
Stinson Sentinel L—5 aircraft Fuel Tanks contents gauges	2 of 1947.
Stinson Sentinel L—5 aircraft—Splitting of packing blocks on mainplane spars at lift strut attachment :	18 of 1947.

ENGINES—GENERAL

Accidental operation of ignition systems—Precautions against	10 of 1941..
Engine Tests after overhaul	1 of 1944.
Magnetos B. T. H. type MCI-I	9 of 1937..
Maximum Running times between complete overhauls of engines	8 of 1948..
Oil consumption on aero-engines	5 of 1936.

ENGINES—BRITISH

Gipsy Major Engines: Examination for cracks in the main bearing housings of crankcases	6 of 1943.
Cirrus Minor Series II Aero engines—Modification to increase diameter of the hub sleeve and front plate	14 of 1947..

ENGINES—U.S.A.

P. & W. Twin Wasp engines—Engine failures due to accumulation of oil and/or petrol in the cylinders.	4 of 1948.
P. & W. Twin Wasp R—1830 series engines—Maximum running period between overhauls and oil changes	7 of 1948..

ADMINISTRATIVE.

Ground Engineers.

Gyroplanes: validity of Ground Engineer's licences in categories 'A' and 'B'.	35 of 1932.
Taxying of multi-engined aircraft by Engineering personnel	13 of 1946.

MISCELLANEOUS.

Import of aircraft parts and materials from United Kingdom and United States of America—Payment of Customs Duty at Concessional Rate	35 of 1947..
Purchase of "British Civil Airworthiness Requirements"	3 of 1948.
Starting up of Aircraft engines without chocks and running engines in hangars	13 of 1947..

1930.

4. Advertising streamers and banners on aircraft.

The attention of Ground Engineers and all concerned who contemplate attaching streamers or advertising banners to aircraft is drawn to the fact that the attachment of such banners is considered to be a modification which affects the safety of the aircraft. No such banner should be fitted until Government approval has been given.

The 27th January 1930.

5. Effects of timber shrinkage on aircraft.

1. The attention of all Ground Engineers is directed to the importance of maintaining as tight as possible without damage or distortion of the wood, all bolts which, in passing through wooden members, are connected by metal plates embedded in or on the face of the timber, as, in the case of fittings of this type, timber shrinkage may cause slackening of the bolt. Frequent examination is therefore essential, and, in the case of important fittings such as main spar joints, this examination must be made at least twice a year.

2. In cases such as the above, timber shrinkage may also cause cracks in the neighbourhood of the bolt holes. If the bolts are situated within a short distance of the extremity of the wooden member and the cracks are small and occur only between the bolt and the end, their presence need not normally be considered serious. If, however, the cracks pass through the bolt holes into the main body of the member, there is danger of the strength of the member being seriously reduced, and its reinforcement or replacement in an approved manner becomes essential.

3. The ends of spars must, therefore, be frequently examined, and when cracking is discovered, the wing must be opened up and the spar examined to see how far the cracks extend.

The 27th January 1930.

17. Formation of bubbles in aircraft compasses.

In view of the fact that trouble has been experienced through the formation of bubbles in liquid compasses installed in Service and Civil aircraft, the attention of all concerned is directed to the following report on this subject:—

“1. The presence of a bubble in a liquid compass renders the liquid liable to disturbance whenever the movement of the aircraft changes in any way. These movements of the liquid affect the magnet system and usually render the compass completely unreliable. For this reason it is essential that aircraft compasses should be constructed so that they will remain free from bubbles under all normal flying conditions.”

2. The formation of bubbles may be due to any of the following causes:—

(a) Leaking at one or more places where joints have been made, e.g., filling plug, verge ring, expansion chamber.

(b) Expansion chambers which are too small or too stiff to cope with the temperature range experienced.

(c) Inadequate de-aeration of the compass liquid before the bowl is finally sealed up.

3. Attention is particularly drawn to 2 (c) above, owing to the fact that alcohol normally holds in solution a considerable volume of air and, if the pressure on the liquid is gradually decreased, some of this air will be liberated and will form a bubble. Such conditions occur when aircraft climb to high altitudes where the air pressure is low. Aircraft compasses should, therefore, be guaranteed by their makers to be free from bubbles if placed in a chamber in which the air pressure is reduced to 3 lbs. to the square inch.

4. When a bubble is found to have formed in an aircraft compass, the compass should be removed from the aircraft and, if possible, the cause of the formation of the bubble determined.

5. In cases where the compass leaks and where such leak may be readily rectified (i.e., leak at filling plug, verge ring, etc.) and where there is a shortage of not more than half a tea-spoonful of compass liquid, the compass may be rectified by carefully refilling with compass liquid, or, if this is not obtainable, with freshly made distilled water. This refilling should be carried out in the shortest possible time to avoid air being taken up by the liquid. The operation is best performed when the temperature of the atmosphere is low (early morning, etc.). After refilling, the compass casing should be oscillated in order to thoroughly mix the liquid.

6. If bubbles re-occur after refilling and no leak can be traced it must be concluded that the trouble is due to aerated liquid or to an unsuitable design of expansion chamber. Modifications to the design of compass may only be carried out by the makers and repairs to compasses with aerated liquid are best carried out by the manufacturers. Under no circumstances may liquid other than the stipulated specific gravity of approved compass liquid be used for refilling compasses to a greater extent than that permitted under paragraph 5.

7. Attention is directed to the fact that all repairs to instruments used in aircraft carrying passengers or goods, for hire or reward must be inspected by a licensed Ground Engineer who is required to take full responsibility for all such repairs accepted by him and to make entries in the respective log books covering such work.

The 20th June 1930.

29. Heating systems of cockpits and cabins.

1. The attention of aircraft owners, ground engineers and all concerned is drawn to the fact that heating systems which depend on jacketted exhaust pipes may, under certain circumstances, develop leaks which will enable exhaust gases containing carbon monoxide to enter the cabin or cockpit.

2. Frequent examination of the exhaust pipes concerned should be made, particularly of the portions within the jacket or muff, to ensure that they are adequately gas tight.

The 23rd December 1930.

1932

10. Cleanliness of Aircraft.

It has been brought to notice that certain aircraft for which Certificates of Airworthiness are in force are not kept in a clean condition. Oil and sand have been found accumulated over a long period. The attention of Ground Engineers is drawn to the importance of keeping aircraft scrupulously clean, since not only does a dirty condition of moving parts accelerate the rate of wear, but deposits of dirt may obscure developing defects. Aircraft in a dirty condition should not be given a daily certificate of safety for flight. Evidence of repeated neglect of this important point will be taken into account in relation to the licence of the Ground Engineer responsible.

The 23rd February 1932.

18. Grant of Certificates of Airworthiness in respect of private Aircraft.

While in accordance with the regulations at present in force in India, private aircraft are not required to be certified as airworthy, owners of such aircraft are advised that, should they at any time desire to have their aircraft so certified, whether with a view to using them for public transport or not, considerable difficulty will be experienced in obtaining certificates of airworthiness unless the aircraft in question have been subjected to regular supervision and inspection. The grant of certificates of airworthiness will be conditional on the overhaul of the aircraft being carried out by licensed Ground Engineers to the extent which may be indicated in each case by the Controller of Aeronautical Inspection, having regard to the amount of information available as to its history and as to the repairs, overhauls and modifications carried out from time to time.

The 6th May 1932.

35. Gyroplanes : Validity of ground engineers' licences in categories 'A' & 'B'.

(1) Ground Engineers' Licences in Categories A and B endorsed in general terms (e.g., "Landplanes" "Single Engine Landplanes", "All Heavier-than-air Aircraft", etc.), do not empower Ground Engineers to issue daily certificates of safety for flight in respect of Gyroplanes, or to certify overhauls, repairs, etc., in respect of such aircraft.

(2) Ground Engineers intending to operate with Gyroplanes are required to obtain a special licence endorsement to cover this class of aircraft.

(T-89/937.)

The 5th July 1932.

1936

4. Constructor's number of aircraft built from salvage and spares in India.

In future, whenever an aeroplane is built up in India from salvaged parts or spares, and thus becomes substantially a new machine, the club or company which has rebuilt the machine, will be required to take the responsibility as constructors and to allot a "Constructor's Number", e.g., ".....Flying Club, India. No. 1." This number should be engraved on a plate and attached to the fuselage. [The Aircraft Log Book should bear, as an inset after the "Rigging Data" page, a typewritten page showing the origins of the components of the airframe, signed by the Ground Engineer responsible for the rebuilding]. When such a rebuilt machine embodies components obtained from machines which held no Certificate of Airworthiness, the issue of a Certificate of Airworthiness for the new machine will be conditional on the inspection of such components.

(R. 4/191.)

*The 7th February, 1936.***5. Oil consumption on Aero Engines.**

The control of oil consumption on aero-engines is always a major problem requiring careful supervision by Ground Engineers. A case recently occurred where a pilot during the course of a cross-country flight had occasion to change the sparking plugs at a number of aerodromes, the plugs being found oily at each change. Eventually a forced landing occurred and the aeroplane was wrecked.

2. Aero engines are tested by the manufacturers under specified conditions. It does not follow that the oil consumption obtained on tests will be reproduced under flight conditions. Ground Engineers should, therefore, ascertain the actual consumptions by reference to hours run and oil used and not rely on memory. These figures must be entered in the engine log books at 50-hour periods. Inspectors will check these figures and, if not available, may require a one-hour test flight to determine the oil consumption prior to renewal of Certificates of Airworthiness.

3. The following points should be borne in mind by Ground Engineers:—

- (a) The oil tank vent pipes must be kept clear of obstructions.
- (b) Avoid using higher oil pressures than the makers recommend.
- (c) Clearance of main bearings must be as manufacturers recommend. Fitting main bearings tight throttles oil circulation and acts like a cock in the oil delivery pipe.
- (d) Pistons and cylinder barrels must be maintained inside makers' limits.
- (e) Piston rings should be tested at top overhauls for 'spring' on the usual test rig. Piston rings should also be lapped in prior to fitting.

(f) Piston rings should be renewed at every complete overhaul.

4. If, after following the instructions given in paragraph 3 above, the oil consumption still remains high, the only alternative other than engine alteration is to fit a larger oil tank and/or an oil cooler in the system.

(R. 8/54.)

The 25th February, 1936.

54. Dual controls in Aircraft : safety precautions.

1. When an aircraft which is fitted with dual controls is to be flown otherwise than for instruction or by co-pilots, arrangements should be made to prevent any possibility of interference with the set of controls not in use.

2. Suitable protection may, in general, be provided by removing the duplicate control column and by disconnecting the duplicate rudder bar and engine and ignition controls, or by fitting them with covers which, whilst allowing free movement of the controls, would preclude interference therewith.

3. When, for the purposes of the grant of a certificate of safety for flight in accordance with rule 60 of the Indian Aircraft Rules, 1937, a ground engineer is making an inspection of an aircraft in which provision is made for dual control, he must satisfy himself—

(a) in cases where it is the intention for the aircraft to be flown for instruction in flying, or by co-pilots, that the duplicate controls are properly connected and in order, and

(b) in all other cases, that the controls which are not to be used are properly protected from interference by passengers and from being fouled by safety belt or harness or by other loose articles in aircraft.

4. Before commencing any flight, "the pilot or commander" [vide rule 60 of the Indian Aircraft Rule, 1937] of an aircraft fitted with dual controls must satisfy himself that the precautions outlined in this Notice have been observed.

(R. 6/9.)

The 26th January, 1937.

1937

9. B. T. H. Magnetos MC1-1 Type.

(Commonwealth of Australia—Department of Defence— Civil Aviation Board—Technical Memorandum No. 192 of 1936).

A report has been received that an elusive fault has occurred in some cases in magnetos of the above type in Gipsy VI engines. A magneto would frequently become inoperative upon replacement of the contact breaker assembly after maintenance. Upon examination, it was discovered that it was only when the final nip was given to the contact breaker centre screw that the magneto failed to function. The armature was stripped down and it was found that, through the frequent removal and reassembly of the contact breaker, the condenser and plate into which the contact breaker centre screw tightens, had become distorted, compressing the empire cloth insulation until fracturing of the

latter occurred, resulting in a short circuiting of the condenser with the armature end plate. Subsequent examination of a number of magnetos of this type disclosed distortion of the condenser.

The trouble may be minimised, however, if care is taken not to over-tighten the contact breaker centre screw.

(R-6/7.)

The 4th March, 1937.

24. Testing of Aircraft Timber.

Facilities for the testing of aircraft timber and plywood are provided at the Forest Research Institute, Dehra Dun, for the convenience of Ground Engineers, aircraft operators and firms.

The fees for testing are Rs. 10 only for each 48 inch specimen (spruce, mahogany, ash, walnut and other substitutes) and Rs. 5 only for each batch of four specimens in the case of three-ply boards or for each batch of two specimens in the case of multi-ply boards. Fees should be sent with the application to the Chief Research Officer, Forest Research Institute, New Forest P.O., Dehra Dun, U.P.

Application forms giving full particulars of size and form of test pieces may be obtained from the Chief Research Officer direct.

(R-8/169.)

The 21st September, 1937.

1938

7. Renewal of the cord attaching release pins to safety belts and harness.

The attention of Ground Engineers is called to the danger, when renewing the cord attaching release pins to safety belts and harness of using an unnecessary length of cord for the attachment of the pin. The cord should be of sufficient length only to enable the pin to be put into place, leaving just sufficient cord to grip for withdrawing the pin. An excess of slack in the cord may become engaged with the control column, preventing its free movement.

(R 6-20.)

The 28th March, 1938.

18. DOCUMENTS REQUIRED FOR REGISTRATION, ETC., OF AIRCRAFT IMPORTED INTO INDIA FROM THE UNITED KINGDOM AND THE UNITED STATES OF AMERICA, UNDER THE INDIAN AIRCRAFT RULES, 1937

A.—Aircraft to be imported by air.

I. *Certificates of Registration.*—(i) Application for the grant of Indian Certificates of Registration should be made well in advance in Form C.A. 28 and should be forwarded to the Director General of Civil Aviation in India, New Delhi, along with a Treasury Receipt (Form C.A. 5) for the prescribed fee *vide* rule 35 of the Indian Aircraft Rules,

1937. The application (Form C.A. 28) should be completed as far as possible, but no action will be taken unless items 1, 5 and 7—15 are filled in

(ii) On receipt of the application (Form C.A. 28) and the Treasury Receipt (Form C.A. 5), Indian Nationality and Registration Marks will be allotted to the aircraft and the marks communicated to the applicant. In no case will marks be allotted unless the required fee has been received.

Where an incomplete application has been forwarded, the applicant will be asked to instruct his agents in England to hand over, as soon as possible, a complete application to the Ministry of Civil Aviation, U.K.

(iii) The Certificates of Registration will be prepared in the Office of the Director General of Civil Aviation in India and forwarded to the Ministry of Civil Aviation, U.K., for issue to the aircraft owners, agents in England. Such certificates will be endorsed "Valid only until first landing at a customs aerodrome in India", *vide* rule 32 of the Indian Aircraft Rules, 1937. The aircraft owner or the applicant will be informed accordingly and asked to inform the Civil Aviation Department, New Delhi, India, of the airport in India, at which the aircraft will first land and the likely date of its arrival.

(iv) On receipt of information regarding the port and probable date of arrival, a permanent Certificate of Registration will be sent to the Aerodrome Officer at that station, who will be asked to hand it over to the aircraft owner's representative on receipt of the restricted Certificate of Registration and after he has satisfied himself that customs duty has been paid in respect of the import of the aircraft into India.

II. *Certificate of Airworthiness.*—(i) Applications for grant of Indian Certificates of Airworthiness should be made in form C.A. 25, and should be forwarded to the Director General of Civil Aviation in India, New Delhi, along with a Treasury Receipt (Form C.A. 5) for the appropriate fee *vide* rule 62 (1) of the Indian Aircraft Rules, 1937. The application form should be completed as far as possible, but no action will be taken unless items 1—7, 11 and 12 are filled in. A fully completed application form together with three unmounted photographs of the aircraft (in profile size 4-1/4 ins. × 3-1/4 ins.) should later be forwarded to the Ministry of Civil Aviation, U.K., by the Applicant or his agent in England as soon as all the particulars become available.

(ii) On receipt of the application (Form C.A. 25) and the Treasury Receipt (Form C.A. 5), a partially completed Indian Certificate of Airworthiness will be prepared in duplicate and forwarded to the Ministry of Civil Aviation, U.K. for completion of the remaining particulars with instructions to hand over the original copy of the certificate to an authorised representative of the aircraft owner and forward the duplicate copy to this office. On arrival of the aircraft at its base in India a "Record of Components" in usual form (C.A. 59) should be sent to the Director General of Civil Aviation in India, New Delhi.

B.—Aircraft to be imported by sea.

I. *Certificate of Registration.*—Application for the grant of an Indian Certificate of Registration should be made in the same manner and on

the same forms as in the case of an aircraft imported by air. On receipt of the application and the required fee. Indian Nationality and Registration Marks will be allotted to the aircraft and the marks communicated to the applicant. If the application is partially completed, a partially completed Indian Certificate of Registration will be prepared and kept in the Headquarters Office to be issued to the aircraft owner on receipt of a fully completed application form. In cases of extreme urgency, however, such partially completed Certificates of Registration will be forwarded to the Aerodrome Officer in charge of the customs aerodrome where the aircraft is due to arrive, with instructions to hand over the certificates, after completion of the remaining particulars (which must in the meantime be forwarded by the aircraft owner to the Aerodrome Officer concerned *direct*) to an authorised representative of the aircraft owner.

II. *Certificate of Airworthiness*.—(i) Application for the grant of an Indian Certificate of Airworthiness should be made in Form C.A. 25 and should be accompanied by the following documents :—

(a) Treasury Receipt (Form C.A. 5) for the appropriate fee *vide* rule 62 (1) of the Indian Aircraft Rules, 1937 ;

(b) Certificate of Erection signed by a Ground Engineer holding an Indian licence in the appropriate categories ;

(c) Certificate of Flight Test certified by a person holding an Indian pilot's B licence ;

(d) Three unmounted photographs of the aircraft (in profile), size 4-1/4 ins. × 3-1/4 ins. ;

(e) A valid Certificate of Airworthiness granted by the Ministry of Civil Aviation, U. K.

(f) Record of Components certified by a Ground Engineer holding an Indian licence in the appropriate categories.

(ii) In the case of aircraft imported from the U. S. A. the conditions outlined above will apply with the exception of II (c). The following document should accompany the application for an Indian Certificate of Airworthiness :—

The American Certificate of Airworthiness for export granted within 3 months of the date of application.

(iii) On receipt of these documents an Indian Certificate of Airworthiness will be issued to the aircraft owner *direct*.

(iv) In cases of urgency, however, an Indian Certificate of Airworthiness will be prepared and forwarded to the Aerodrome Officer in whose jurisdiction the aircraft is imported, for transmission to the aircraft owner, provided the application form duly completed and the documents mentioned at (a) and (e) above have been received in the Civil Aviation Department. In such cases the remaining documents, *i.e.*, those mentioned in (b), (c), (d) and (f) should be forwarded to the Aerodrome Officer who will then hand over the Certificate of Airworthiness (after affixing a photograph in the space provided), to the aircraft owner or his representatives.

C.—Aircraft already imported under British or American Registration.

I. In the case of applications for the grant of Indian Certificates of Registration and/or Airworthiness in respect of aircraft which have already been imported into India bearing British or American Registration, the requirements laid down in Part B will apply with the following additions :—

(a) *Certificate of Registration.*—(i) Documentary evidence that Customs duty has been paid ;

(ii) the current Certificate of Registration.

(b) *Certificate of Airworthiness.*—(i) The current Certificate of Airworthiness.

NOTE.—Copies of the Forms mentioned in this Notice may be obtained on application from the Civil Aviation Department or the local aerodrome or aeronautical inspection offices.

(R.4—91.)

The 27th July, 1938.

1939

11. Inspection of safety belts and harness.

The attention of Ground Engineers is called to the necessity for the thorough inspection of safety belts and harness, and to the danger of using unsuitable material for marking such equipment. Recently a Sutton type safety harness broke while a pilot was carrying out inverted flying in an open cockpit type of aircraft. Examination of the harness showed that the webbing broke just inside the steel end attachment fitting. The cotton of the webbing at this point showed a brown discoloration due to moisture lodging inside the edges of the fitting and rusting the steel. Any harness showing signs of this discoloration or any other signs of weathering should be regarded with suspicion. It should not continue in use until a proof load test as given in the relevant specification of the country of origin has been applied.

In another case the webbing of a harness was found to have deteriorated badly at a point where identification marks had been applied with some unknown marking ink. Marking ink should not be applied to fabric unless the ink has been approved. Application should be made to the suppliers of the belt or harness in such case.

(R8-224.)

The 1st April, 1939.

30. ACCEPTANCE OF AMERICAN AIRCRAFT MATERIAL AND SPARES.

The conditions of acceptance of material and parts used in the overhaul or repair of aircraft are laid down in Section E, Schedule III of the Indian Aircraft Rules, 1937. The acceptance of Release Notes for material and parts issued by firms, whose inspection organisation is approved either by the Ministry of Civil Aviation, U.K., or by the Government of India, is considered as an acceptance under this Section of the Indian Aircraft Rules, when used in conjunction with evidence of identification.

2. In regard to the acceptance of American parts and material, however, similar documentary evidence is not available, because there is not in the United States a Release Note system, exactly similar to that in use in Great Britain and India. It has been decided in consultation with the American Trade Commissioner at Calcutta, who is acting in conjunction with the Civil Aeronautics Authority in the United States, that the following arrangements will, in future, be made for the certification of American parts, components and material (the present system of acceptance of complete aircraft imported into India from the United States does not require modification) :—

For materials and for spare parts, whether the latter are made by the manufacturers of the aircraft for which they are intended, or by other manufacturers, a sworn statement will be made by the suppliers before a Notary Public that the materials or parts comply with one of the following requirements :—

- (1) With the original type certificate.
- (2) With Army, Navy or S. A. E. Specification No.....
- (3) With Civil Aeronautics Authority type certificate No.....
- (4) That they are proprietary articles which are covered by current approval by Army, Navy or Civil Aeronautics Authority. Three copies of such sworn statement will be supplied to the user with each consignment.

3. The statement in question may be considered as equivalent to a Release Note issued by firms, whose inspection organisation has been approved.

(R10-88.)

The 8th December, 1939.

1940

1. Certification of parts fitted in aircraft by Ground Engineers holding 'B' & 'D' Licences.

Ground engineers' 'B' and 'D' licences at present are endorsed in many cases with the statement that they are "restricted to the fitting of parts inspected and approved by a competent authority".

The endorsement was made so that Ground Engineers who were competent to carry out repairs but who had insufficient knowledge of the nature and testing of materials to obtain a full 'B' licence could obtain a licence enabling them to carry out repair work with parts already approved. As from February 1st, 1940, licences so endorsed will be re-endorsed, if desired by the holder with the words "restricted to the fitting of parts made of materials which have been inspected and approved by a competent authority". This will enable the licence holder to make up the parts himself provided that he has evidence of the suitability of the material used.

All 'B' and 'D' licence holders will thus be permitted to certify parts made up to drawings, approved by the makers of the parts.

In the present emergency conditions, it may happen that parts are required to be made up from a sample approved part without maker's

drawings being available. This may be done provided that the following conditions are complied with:—

(1) A drawing of the part must be made and endorsed with the signature of the Controller of Aeronautical Inspection.

(2) The drawing must be fully dimensioned (with tolerance when accurate fitting is required) and must show a schedule of materials and a statement of heat treatment required (if any) and of protective treatment. The drawing should be numbered to correspond with the part number when this can be ascertained, and should have the letter 'R' added to the part number.

(3) Processes such as heat treatment, cadmium or Zinc plating, anodic treatment, etc., which need to be done under controlled conditions, must be certified by a firm or organisation approved for that purpose.

Since it is necessary for the Controller of Aeronautical Inspection to approve of each drawing, application must be made to him for approval when submitting the drawing, stating the reason for desiring the part to be made up without reference to a maker's drawing. The application will be in the form of an application for a concession, and should be given a serial number.

It must be understood that the approval of the Controller of Aeronautical Inspection is a technical approval only and does not absolve the person or firm making up the parts from any responsibility as to infringement of patent or copyright.

Approval having been given to a drawing, any number of parts may be made in accordance with it.

(R8—229.)

The 16th January, 1940.

5. Precautions to avoid Airlocking of Fuel Systems.

(1) The attention of aircraft operators and ground engineers is drawn to the tendencies inherent in some fuel systems to introduce air into the fuel stream with the possibility of airlocking or interruption of the supply.

(2) In systems having a cock at the upper part of the pipe line and none at the lower part of the system, the head of petrol depending from the cock when the latter is closed will, if left standing for some time, induce air through any very small leak at the cock or at the connections at the upper part of the systems, even though no outward leakage of fuel is observable.

(3) In systems of the form of a U having a tank at each extremity of the U and feeding through a supply line at or near the bottom of the U, there is a possibility of trapping a considerable volume of air under certain circumstances. These circumstances occur when the system has been completely emptied, the tank cocks turned off, and the tanks refilled. Under these conditions, a flow test will normally be taken by disconnecting the pipe line at the carburetter, but unless both cocks are turned on simultaneously, the fuel from one tank will pass down one leg of the U, then along the pipe line to the carburetter but trapping the volume of air between a point near the bottom of the U and the other cock.

Turning on the other cock will then produce no flow from the tank which it controls. The mere turning on of both cocks, under these circumstances and checking the flow from the open pipe at the carburetter does not indicate that the whole system is clear of air

(4) In systems in which the supply to the carburetter is by pumps sucking from tanks at a lower level, there is a possibility of one tank draining more quickly than another resulting in the sucking of air into the system from the empty tank.

(5) Precautions to be taken to avoid the risks referred to in paragraphs (2), (3) and (4) above are :—

Paragraph (2).—Ensure that all connections at the upper part of the fuel system are air-tight.

Paragraph (3).—Carry out the flow test by operating each cock separately, whether a flow test with both cocks on is made or not.

Paragraph (4).—Operate from one tank at a time only, except for short periods.

(R8—182).

The 24th April, 1940.

1941

10. Precautions Against Accidental Operation of Ignition Systems.

Three accidents (one fatal) have occurred in India within the last three years due to lack of proper precaution against the accidental operation of ignition systems while engines are being cleaned, overhauled or adjusted in aircraft. It is essential that Ground Engineers undertaking or supervising any work on engines while these are installed aircraft should realise the dangers arising from carrying out such work without first taking precautions against the accidental operation of the ignition system.

The risks to be guarded against during cleaning are —

Fire

If the airscrew is moved, fire may be caused by a high tension spark being generated in the vapour arising from petrol or in the spray of paraffin or a paraffin and oil mixture used for lubrication. Therefore :—

1. Never move the airscrew or carry out adjustments while cleaning is going on.
2. To provide against accidental movement of the airscrew :
 - (a) Never clean an installed engine with petrol.

(b) Whatever fluid is used for spraying or cleaning make quite certain that the engine is not turned until the liquid has completely dried off

(c) If high tension leads have to be removed from plugs, protect the ends of the leads with wooden thimbles

(d) Do not think that taking off the distributor cover removes the source of danger from fire. It may accentuate it because a spark across the safety gap in the magneto is then open to the air.

(e) Remember to see that all switches are in the "safe" position. Normally this means the "off" position but in an installation such as the Tiger Moth where master switches are used, the master switch (which will in future be labelled "Rear switch control" when in the "off" position merely disconnects the rear switch and does not leave the ignition system safe. The whole switch system must be in the "safe" position.

(f) Remember that in removing the contact breaker cover if the earth system is connected through the cover this will render the system "live" although the switches are in the "safe" position.

The risks to be guarded against during adjustment or overhaul are —

Kicking over of the Engine.

This may result from movement of the airscrew while the ignition system is "live," therefore :—

(a) Do not touch the airscrew until the whole ignition system has been put in a "safe" condition. [See (e) and (f) above]

(b) If the airscrew has to be turned for adjustment of contact breaker requiring the removal of the contact breaker cover, and the earthing system is connected through this cover, the engine is liable to kick over, therefore disconnect the high tension leads from the engine, protecting them with wooden thimbles, or remove the distributor cover.

With a battery system of ignition, removal of the battery, or the removal of the main leads from the battery, removes all source of danger from fire or kick over. If the leads are removed they should be protected with wooden thimbles.

Never move the airscrew of a hot engine whether all these precautions have been taken, or not, without due precaution against a kick over

It is the duty of the Ground Engineer not only to see that these precautions are carried out but to warn all unskilled or in-experienced workers that when such precautions have been taken they must not on any account interfere with switches, magnetos, electric leads, or to turn the airscrew except under the direct supervision of the Ground Engineer.

(R5-374)

The 7th November, 1941.

1943

**6. GIPSY MAJOR ENGINES:
EXAMINATION FOR CRACKS IN THE MAIN BEARING
HOUSINGS OF CRANKCASES.**

1. After varying periods of running, slight cracks sometimes develop in the main bearing housings of Gipsy Major engine crank-cases. These originate at the bottom of the slot on the inner edge of the front face and travel down the bore of the main bearing housing in a line with the axis of the bearing cap studs.

2. If not dealt with, such cracks, initially unimportant, might extend with further prolonged running and eventually produce a slackening of the bearing stud and the scrapping of the crankcase.

3. At each complete overhaul and/or when other opportunity occurs, a close examination of each main bearing housing should, therefore, be made through a suitable magnifying lens, particular attention being paid to Nos. 1 and 5 housings.

4. If any cracks so found do not exceed 7/8 inch in length on either or both sides of housings when measured from the inner edge of the front face, they should be dealt with as follows:—

After carefully locating the end of the crack, remove the adjacent bearing cap stud and drill a hole 3/16 inch diameter at the end of the crack through the stud hole at an angle, following so far as can be ascertained the transverse line of the crack. Finally remove all trace of drillings and burns from the inside of the stud whole and carefully refit the stud.

5. Suitable endorsement of the engine repair records and log-book should be made following the completion of the above work.

6. Crankcases with cracks exceeding the length specified in para. 4 above should be treated as unserviceable. If a crack has extended beyond a locating hole and its length is still within the specified limit, an additional hole should be drilled at its extremity. If the holes break into each other, they should be neatly joined to form a slot with complete absence of sharp edges.

(R6-39.)

The 13th December, 1943.

1944

1. Engine Tests after Overhaul.

1. All overhauled aero engines which are to be fitted to aircraft for which a Certificate of Airworthiness is required should be ground tested in accordance with the requirements of the authority who certified the "Type" engine as airworthy for civil aircraft and/or in accordance with the tests recommended by the manufacturers of the engine.

2. If any uncertainty exists in determining what run-in and tests are required a reference should be made to the Controller of Aeronautical Inspection, supervising the area who will specify the necessary tests.

(R8-391).

The 10th February, 1944.

1946

4. Weights for petrol, crew and passengers carried on aircraft.

In the compilation of the load sheets stipulated in paragraph 4, Section D, Schedule III to the Indian Aircraft Rules, 1937, in respect of public transport aircraft effecting public transport, the following weights for petrol and oil should be used.—

	<i>Lb. per gallon.</i>
Petrol	7.25
Mineral Oil	9
Castor base Oils	9.7

2. Normally, facilities or weighing passengers, crew, luggage, mails, freight etc., are provided at all stations on the route of scheduled air services. Where, however, such facilities are not available, the weight per passenger and that of each member of the crew should be estimated at 170 lbs. per person.

3. To ensure that the maximum total weight authorised in respect of an aircraft is not exceeded, the owner or hirer of the aircraft shall make due allowance when he has reason to believe that fuel and oil of greater densities than those mentioned in paragraph 1 are used.

4. The Captain or the pilot in charge of the aircraft is responsible that the maximum permissible weight of his aircraft does not exceed that authorised by the Certificate of Airworthiness.

5. Certificates of airworthiness of all aircraft will be withdrawn for amendment of paragraph 25 indicating the total weight of fuel at 7.25 lbs. per gallon.

(R8-112)

The 20th April, 1946.

11. Aircraft Compasses.

In accordance with paragraph 1 (2) (d), Section B, Schedule III of the Indian Aircraft Rules, 1937, all public transport flying machines are required to carry a compass. By this, a magnetic compass is implied, that is to say, a compass in which the direction sensing component consists of one or more permanent magnets or groups of magnets. An instrument constructed on the principle of the Sperry "Gyrosyn" compass in which the direction sensing element is electrically activated is not considered as a satisfactory substitute for the magnetic compass.

(2) Two classes of magnetic compasses are in use, namely, direct and remote reading. The latter is used when a direct reading compass cannot be relied upon to show correct and consistent readings of the desired accuracy, owing to the presence of unavoidable disturbing magnetic fields in the vicinity of mounting locations in the aeroplane.

(3) In case an aeroplane is fitted with a remote reading compass for increased accuracy in navigation, it shall also be required to carry a "standby" direct reading compass. The location of the "standby" compass

shall be the best possible magnetically, bearing in mind the fact that as far as practicable the pilot should be able either to use it as a steering compass or failing that to set his directional gyro from it, in case there is a breakdown of the electrical system of the remote reading compass.

(AI. 8-492)

The 3rd October, 1946.

13. Taxiing of Multi-engined Aircraft by Engineering Personnel.

An accident causing extensive damage to an aircraft has recently occurred as a result of it being taxied by an engineer unfamiliar with the handling of the particular type of aircraft on the ground.

2. As a means of eliminating such occurrences in the future, it has been decided that :—

(i) No multi-engined aircraft shall be taxied or manoeuvred on the ground by engineering personnel unless such engineers are licensed on the type of engine installed and in addition have received adequate instruction in the handling of the particular type of aircraft under the tuition and direction of a fully licensed pilot, and have been certified as competent to handle and taxi this type of aircraft by a captain of an aircraft duly licensed as a pilot on the type in question.

(ii) Certificates to this effect must be provided by the owners of the aircraft to the Aeronautical or Aircraft Inspector in charge of the station or area in which these aircraft are operated.

3. Arrangements are being made for engineer's licences to be duly endorsed for certification for the handling of aircraft on the ground.

(RD3-44)

The 23rd November, 1946.

14. D. C. 3 and Dakota types of aircraft—Essential Modifications. Modification DAK/1097 (Class II) Research Mods. 46.

Several accidents have occurred to Dakota aircraft as a result of the wing fillets at the point of interception of the mainplane and of the fuselage, coming adrift in flight. The above modification has, therefore, been introduced in respect to all service Dakota aircraft.

2. An alternative to this modification has been approved by the Air Registration Board of the United Kingdom in respect to civil operated aircraft, as described in the following instructions :—

(i) The wing cuffs of the mainplanes are to be removed and Neo-prime sealing strips introduced between the jointing faces of the fuselage and the wing skin. All existing Phillips screws are to be replaced by the standard type of round

or stove head slotted screw, and in addition screws are to be inserted with an approved jointing compound to act as a binding.

- (ii) All aircraft holding Certificates of Airworthiness are required to be modified in accordance with the above instruction at the next major overhaul and under no circumstances later than March 31st, 1947. Certificates of Airworthiness will be withdrawn from all aircraft that are not modified by this date.
- (iii) Pending the incorporation of this modification routine inspections are to include special inspection of the wing cuff attachment joints and maintenance schedules are to be amended accordingly.
- (iv) Neoprene sealing strips are manufactured by Messrs. Paraline Ltd., Bath Somerset, G.B.

(RD9-44)

The 27th December, 1946.

1947

2. Stinson Sentinel L-5 Aircraft.

The attention of owners of Stinson Sentinel L-5 aircraft and Ground Engineers responsible for the maintenance of such aircraft is drawn to the fact that fuel tanks contents gauges of these aircraft are at times unreliable. Ground Engineers in charge of or signing out this type of aircraft are directed to ensure that the unreliability of these gauges is drawn to the attention of all pilots before embarking on flights.

2. Pilots should be informed that the petrol consumption at normal cruising R. P. M. is from 11 to 12 gallons per hour and that the maximum endurance of each tank is approximately one hour and 15 minutes. As due allowance must be made for running up and taxiing, the safe endurance time for flight will not exceed one hour and 10 minutes in the most favourable circumstances.

The 21st January, 1947.

(RD3-21)

5. Safety precautions against fire.

A recent accident, which may have resulted in a serious fire, happened due to an inspection lamp without proper guards for ground use accidentally resting against the top surface of the wing. Attention of all Ground Engineers and Aircraft Owners is drawn to the necessity of using only an approved type of inspection lamp for ground use when working on aeroplanes. The inspection lamps are a standard part of the Ground Station Equipment and are not carried on aeroplanes. There are two types of such lamps. One for general use where there is no likelihood

1947

22

of petrol being present and the other type of lamp is specially designed for use where there are likely to be petrol fumes or other combustible gases. A filament lamp of the appropriate voltage should be used, a 16 candle-power lamp being suitable for most purposes.

The 30th January, 1947.

(RD3-47.)

8. Douglas D. C. 3 (C-47) aircraft—Damage to Elevator fabric.

A case has recently occurred where a large area of the fabric covering of an elevator has been extensively burnt due to the projection of the sun's rays from the highly polished surface of the rudder metal trimming tab on to the elevator when the aircraft was parked in the open.

2. Immediate inspection is to be made of the fabric covering of rudders and elevators of all aircraft that are fitted with highly polished trimming tabs to ensure that deterioration of the fabric has not taken place. The fabric is to be replaced where necessary.

3. All polished surfaces of metal trimming tabs of rudders and elevators of all types of aircraft are to be rendered impossible of reflecting the sun's rays by painting or spraying the surfaces with an approved matt surface paint or dope in order to avoid risk of burning or extensive deterioration to the fabric as the result of reflected rays.

(RD3-67.)

The 6th March, 1947.

10. Provision of first-aid equipment in aircraft.

Equipment essential for rendering first-aid in case of an accident is required to be carried on board an aircraft holding a Certificate of Airworthiness and operating a scheduled service or operating on charter. A statement showing the contents of such a box is given on the reverse of this notice. All aircraft operators are required to adopt this list as a guide in future.

2. It is essential that the first-aid box should be sealed and the seal checked at each inspection in connection with daily certificate of safety by the Ground Engineer signing out an aircraft. In case the seal is found broken, the contents of the box should be checked and shortages, if any, made good and the box sealed again. The contents of the box should be checked for serviceability at least once every month. The responsibility for finally checking the box should rest with the Ground Engineer signing out the aircraft.

The 12th April, 1947.

(AI4-1147.)

Section I (a)

Anti burn Jelly 1 oz. tubes	Tubes	2
Ampoules, morphia $\frac{1}{4}$ gr., (Syringe) or substitute		6
Ampoules, morphia, box tin for		1
Ampoules, Morphia, labels, for		6
Nicamide in bottle		1
Ampoules, iodine 2 per cent., 30 minims in each Amps		2
Capsules, Aromatic ammonia		12
Mosquito deterrent (Sketofax, or substitute)	1 Bottle.	
Sulphanilamide powder, 25-gram. bottle	1 Bottle.	

Section I (b)

Anti-Venom outfit	1
-----------------------------	---

Section II

Tablets, aspirin, grs. v	25
Tablets, Navigan (or substitute) grs. v	25
Tablets, Mepacrine 0.1 grm. in tube	38
Tablets, Halazone (or substitute) grs. v	100
Tablets, vegetable laxative—Sugar coated	25

Section III

Bandages, compressed pleated $2\frac{1}{2} \times 6$ Yards	10
Bandages Triangular	2
Dressings, Wound, medium (No. 8)	4
Dressings, wound, large (No. 9)	4
Dressings, burn, medium (No. 11)	4
Dressings, burn, large (No. 12)	4
Lint, white, 1 oz. packets	1

Section IV

Plaster, adhesive 1" spool	1
Pins, safety, in boxes of 6	Boxes] 2
Splints, extension, interlocking	1 set of 3
Tourniquet, St. John	1

Section V

Forceps, artery, Spencer Wells, 5"	1
Scissors, surgical, Vigo 5"	1

Section VI

Case, tin, black Japanned, to hold above	1
----------------------------------------------------	---

Miscellaneous

Pencil copying	1
--------------------------	---

12. DEFECT REPORTS ON AVRO XIX AND ANSON AIRCRAFT.

Modifications issued by the Air Registration Board in regard to aircraft registered in the United Kingdom are reproduced below for general information.—

"I. Defect report AVRO XIX/2.—

A case has been reported of the cable loom, carrying the starter and feathering motor cables, having been chafed by the taper pin securing the lever to the outer end of the mixture control lay shaft running along the front spar, at a point a few inches behind the lower end of the under-carriage jack.

2. As soon as possible a check should be made of this point and care taken to ensure that there is adequate clearance through out the full travel of the mixture control lever, and any necessary alteration should be made to the cable run.

3. Cases found of this defect should be reported to the Director General of Civil Aviation in India, New Delhi."

"II. Defect report ANSON/3.—

4. Cases have been reported of the elevator control rod being locked by ice accumulation in the trough of rear bottom panel (Part No. 5C/1679) and the intermediate bottom panel (Part No. 6C/1679) located in the fuselage below the tailplane. A.P. 1525 A. & E., Vol. 3, Part I, page 233 and Plate 74 refers.

5. Before next flight examine the bottom rear panel, and ensure that the drain hole in the bottom of the trough is present and not restricted by fabric or foreign matter. If the drain hole has been omitted, drill one quarter inch hole in the bottom of trough, one inch aft of joint between the intermediate and rear bottom panels".

(RD9-62)

The 9th May, 1947.

13. STARTING UP OF AIRCRAFT ENGINES WITHOUT CHOCKS AND RUNNING ENGINES IN HANGARS.

Several aircraft accidents have occurred which were due to starting up the engines without chocks having been previously placed in front of the under-carriage wheels.

2. Pilots and Engineering personnel are warned that aircraft engines should never be started up unless chocks are first placed in their proper position. This instruction includes reference to aircraft which may be fitted with wheel brakes.

3. An exception to this Rule is made in the case of Multi-engine aircraft that have been taxied upto the departure platforms to pick up passengers when engines are not required to be run upto full power in the vicinity of buildings and other aircraft.

4. Aircraft engines should not be started up or run when an aircraft is inside a hangar or within 15 yards thereof. When starting, the aeroplane should be placed well clear of the hangar, neither heading towards the hangar nor in such a position that the slip stream enters the hangar.

5. Except in case of emergency, the power plant of an aircraft is not to be started up or run unless the pilot's seat is occupied by a licensed pilot or a licensed Ground Engineer certified for this purpose.

The 10th May, 1947.

(RD3-35)

14. CIRRUS MINOR SERIES II AERO ENGINE.

1. Continual tightening of the bolts which secure propellers, manufactured by the Airscrew Company Limited, to the hubs of Cirrus Minor Series II engines has caused the outer laminations of the propellers to be crushed and penetrated by the 150 mm. diameter hub sleeve and front plate. In some cases this has also caused cracks to start in the edge joint of birch faced propellers.

2. So as to avoid the continual tightening of the bolts which is at present necessary, Blackburn Aircraft Limited have introduced Modifications Nos. 687, 688 and 689, to increase the diameter of the hub sleeve and front plate to 170 mm and to reduce the length of the spinner.

3. Particulars of these modifications and the necessary parts may be obtained on application to Blackburn Aircraft Limited, Engine Department, Brough, East Yorks.

4. Before fitting the modified parts, it will be necessary to face off the front and rear laminations of propellers which have been damaged as described in paragraph 1 above.

5. If, after facing off to remove indentations on the boss faces, the distance between the boss faces is less than the minimum distance prescribed by the engine hub (*viz.*: 85 mm.), it will be necessary to fit a packing piece. In this case, application should be made to the Airscrew Company Limited, Weybridge, Surrey, under intimation to the Director General of Civil Aviation in India, for details of their recon-ditioning scheme which includes the fitting of birch ply packing pieces. When a packing piece is not required, the unprotected wood left after facing should be treated with one coat of wood filler to Specification BS. 2X11, two coats of undercoating varnish to Specification BS. 2X8 and one coat of finishing varnish to Specification BS 2X12.

6. Propellers with edge jointed birch outer laminations should be examined for cracks in the edge joint near the hub flange. If cracks are visible the propeller must be regarded as unserviceable and returned to the Airscrew Company Limited, Weybridge, for repair.

7. The design of propellers manufactured by firms other than the Airscrew Company Limited, may be such that unless complementary modifications to particular propellers are also introduced, it will not be possible to embody the modifications detailed in paragraph 2 above. In such cases, application for particulars of any modifications which may be necessary should be made to the manufacturer of the propeller concerned.

8. Propellers on which the indentation exceeds $1\frac{1}{2}$ mm. (0 060 inches) in the case of mahogany outer laminations and 1 mm. (0 040 inches) in the case of birch outer laminations, should be modified immediately, but in all other cases the above modifications must be embodied not later than the 31st March, 1947. Certificates of Airworthiness of aeroplanes concerned will, in the event of failure by the owners to embody the modifications by that date, be liable to suspension or cancellation.

9. After these modifications have been embodied it should only be necessary to check the tightness of the bolts securing the propeller to the hub after the first flight, and thereafter at the periods quoted in the aircraft constructor's Handbook or approved Maintenance Schedule.

(AI6-53).

The 14th June, 1947.

15. PROPELLERS TO DRAWING NOS. A. 66410 AND A. 66460 FITTED TO "OXFORD" AND "CONSUL" AIRCRAFT.

1. Cases of fatigue cracks occurring in the blades of the above types of propellers have been reported. These cracks usually start as a hair line extending from beneath the boss blocks.

2. Propellers of the above types must be inspected daily "in situ" and particular attention paid to both the sides and edges of the blades adjacent to the boss blocks.

3. In addition, the propellers must be removed for full strip examination at periods not exceeding each 100 hours flying.

4. Any propeller which is suspected of having developed a fatigue crack should be reported to the Director General of Civil Aviation in India.

(AI6-53).

The 14th June, 1947.

16. PROPELLERS APPROVED FOR USE ON CIVIL AIRCRAFT.

1. Propellers listed in the attached Appendix are approved for use on civil aircraft in respect of which there are in force certificates of airworthiness duly issued or rendered valid by the Director General of Civil Aviation in India.

2. For convenience, propellers are listed under types of engines, but each propeller is approved only for the specific engine-airframe combination shown.

3. A propeller drawing-number is frequently followed by an issue number. Such issue numbers are used mainly to indicate minor modifications to the propeller, which do not affect safety. When a propeller drawing-number is not followed by an issue number it may be assumed that all issue numbers of that propeller are approved.

4. Before fitting a variable-pitch propeller it is essential to ensure that the basic pitch-range setting conforms with the latest setting approved for the particular engine-airframe combination.

5. If it is desired to use a propeller not included in the list, application for approval should be made in writing to the Director General of Civil Aviation in India.

(AI6 53).

The 14th June, 1947.

APPENDIX

Drawing No.	Diam. (ft)	Pitch (ft.)	Aircraft
BMW 132Z			
PAK9/20020A7	9.5	7.5	JU.52
CATARACT II			
Z2700	7.09	6.14	B.A. Swallow II
Z304/1	7.4	6.40	B.A. Swallow II
CATARACT III			
LA503	7.18	5.6	Klegam Swallow
Z2700	7.09	6.14	B.A. Swallow II
CHEETAH IX			
61271A/X3	7.50	7.10	Anson I
A66365	7.50	7.10	Anson I
Z3580/2	7.25	6.63	Envoy
Z3790/1	7.33	7.43	Envoy
CHEETAH X			
A66410	8.00	7.55	Consul, Oxford
A66410/5/X1	8.00	6.94	Oxford I, Oxford II, Consul
A66460/X4	8.00	7.55	Consul, Oxford
Z3931/4	7.33	6.96	Oxford II
LA591/5	7.33	6.96	Oxford
LA613C	7.33	6.96	Oxford
CHEETAH XV			
R30/242/1	8.25	VP	Anson XII, Avro XIX
CIRRUS MINOR I			
LA617	6.65	2.75	Taylorcraft "D"
Z8020	5.87	3.27	Taylorcraft "D", B.A. Swallow II
LA505	5.87	3.38	Taylorcraft "D", B.A. Swallow II
Z3711	5.75	4.07	Auster V. J. 4, Taylorcraft "C" Wicko
CIRRUS MINOR II			
Z5435/1	5.50	4.65	Miles Gemini
Z5641/1	6.00	4.04	Auster V.J. I
A66580/XI	6.00	4.61	Auster V. J. I
A66580/X2/2	6.00	4.52	Auster V. J. I
Z5701	5.5	4.78	Miles Gemini
HR 702	5.75	3.97	Auster V. J. I
Z5646	6.0	4.04	Auster V. J. I
Z5702	5.5	4.78	Miles Gemini
Z5642	6.0	4.04	Auster V. J. I
Z5647	6.0	4.04	Auster V. J. I
HR702/2	5.75	4.11	Auster V.J. I

Drawing No.	Diam. (ft.)	Pitch (ft.)	Aircraft
CIRRUS MAJOR I			
61456A/X1	6 75	6 02	Miles Hawk
61456A/X2	6 75	5 77	Miles Hawk
LA543	7 0	4 0	Blackburn B2
A66019/1.XI	7 00	4 98	Perovval Gull
A66038/XI	7 00	5 31	Miles Hawk
94518A/X3	7 00	5 31	Miles Hawk
Z3754	6 30	5 15	Miles Hawk
A66317/3/X2	7 00	4 66	Perovval Gull
LA669	5 7	3 41	Miles Messenger
CIRRUS MAJOR II			
A66016/X4	7 00	4 58	G.A. Cygnet
LA520	6 67	4 59	G.A. Cygnet
A66290/XI	7 00	4 58	G.A. Cygnet, G.A. Owllet
Z974/1	6 23	5 26	Miles M18
CIRRUS MAJOR III			
A66016X4	7 00	4 58	G.A. Cygnet
LA520	6 67	4 59	G.A. Cygnet
3756/2	6 30	5 15	Miles Messenger III
Z6010/3	6 75	4 70	Miles Messenger IIA, Miles Aerovan I & II.
Z5620/2	6 50	4 33	Miles Aerovan
A66290/5/X2	7 00	5 45	Miles Mercury Mk VI
Z6011	6 75	4 51	Miles Messenger IIA, Miles Aerovan
CIVET I			
95193A/X2	7 00	4 44	Autogiro C30A
CONTINENTAL C75-12			
1188/3	6 33	3 48	Auster V.J. 2
1188/4	6 33	3 29	Auster V.J. 2
CYCLONE G205 A. (704C9GC)			
Blade 6139A-12	} 10 50	VP	Lockheed 18 (Lodestar).
Hub 23E50			
Blade 6339A-12			
Hub 23E50-285-471			
CYCLONE (DOUBLE ROW) GR 2600-A2A (579C14ACI)			
Blade 6243A-3	} 14 75	VP	Boeing 314A
Hub 23E50 -189			
-241 -393			
Blade 6443A-3	} 14 75	VP	Boeing 314A
Hub 23E50-287 473			
GIPSY I			
DH5180/5	6 33	5 08	DH60

Drawing No.	Diam. (ft.)	Pitch (ft.)	Aircraft
GIPSY II			
DH5180/14	6.33	5.00	DH60G
GIPSY III			
LA 506	6.5	4.35	DH82
LA623	6.1	2.65	Miles Mercury
E860/1	6.875	4.26	Blackburn B2
LA623/2	6.84	3.56	Miles Mercury
DH5218/C/4	6.50	5.16	DH80A
LA520	6.67	4.59	DH80A
LA543	7.0	4.0	Blackburn B2
GIPSY MAJOR I			
Z970	6.23	5.72	Miles Hawk
Z970-2	6.38	6.23	Perceval Gull
Z971	6.23	5.26	Miles Hawk, Miles Monarch, Miles Whitney Straight
Z972	6.50	5.98	Miles Hawk
Z973	6.23	5.50	Miles Hawk, Miles Monarch, Miles, Whitney Straight, DH89 A Miles Falcon
Z1510	6.36	5.20	DH84
Z2010	6.50	5.65	Miles Hawk, Miles Falcon
Z2011	6.50	5.49	Miles Hawk
Z3101	6.42	5.22	DH. 90
Z3104	6.50	5.42	DH. 90, DH90A
DH5212/A	6.17	5.25	DH. 90
DH5212/C	6.17	5.17	DH. 84
DH5212/D	6.17	5.42	Miles Whitney Straight, DH.84, DH. 90, DH80A
DH5212/G	6.17	5.14	DH. 84
DH5218/B	6.50	5.10	DH. 84, DH.80A, DH. 82
DH5220/G	6.33	4.58	DH.82A, DH. 83
DH5220/P	6.33	4.58	DH. 82
DH5220/H	6.33	4.92	DH. 82A, DH. 84, DH. 83
DH5220/MS/20	6.33	4.60	DH. 82, DH. 82A
DH 5228/A	6.00	5.25	DH. 84
DH5228/B	6.00	5.12	DH. 84
DH 5232/A	6.50	5.10	DH. 84, DH.85, DH. 82A, DH. 80A, DH. 83
DH5232/B	6.50	5.30	DH. 84, DH. 85, DH.82, DH.83
DH5234/A	6.75	5.08	DH.85, DH.80A
DH5234/B	6.75	4.95	DH.85, DH.80A
DH5234/D	6.75	4.80	DH.85, DH. 87, DH. 80A
DH5234/E	6.75	4.50	DH. 85, DH.87A, DH.873
DH5234/H	6.75	4.30	DH. 87B
DH5234/J	6.75	4.40	DH. 87B, H.8
DH5250/B	6.33	5.17	DH.90A
61187A/XI	6.75	5.50	Miles Whitney Straight, Miles Hawk, Miles Hawk Trainer M14A
61187A/X3	6.75	5.80	Miles Hawk
61187A/X5	6.75	5.77	Miles Hawk
61187A/X9	6.75	5.24	Miles Hawk, Miles Monarch
61189A/X5	7.00	6.96	Miles Hawk
611826A/XI	6.17	5.92	DH.85, Miles Whitney Straight, Miles Hawk

Drawing No.	Diam. (ft.)	Pitch (ft)	Aircraft
GIPSY MAJOR I (Contd.)			
61326A/X2	6-17	5-56	Miles Whitney Straight
61236A/X4	6-17	6-58	DH. 85
61236A/X6	6-17	6-27	Miles Hawk
61326A/X8	6-17	6-01	DH.85, Miles Whitney Straight
61326A/X9	6-17	5-72	Miles Whitney Straight, Miles Monarch.
61326A/X10	6-17	5-85	Miles Whitney Straight
61456A/X2	6-75	5-77	Miles Hawk
61987C/X1	6-50	5-77	Miles Hawk
A66016/X1	7-00	5-58	G.A. Cygnet
A66016/X2	7-00	5-24	G.A. Cygnet
A66016/X4	7-00	4-58	G.A. Cygnet
B66131/XI	5-92	5-92	Miles Monarch
B66143/XI	6-74	5-49	DH. 85
67104A/X2	7-00	5-10	DH 85, DH.80A, DH.83
67104A/X4	7-00	4-77	DH.85, DH.87B, DH. 82A, DH. 83
67104A/X6	7-00	5-33	DH.85, DH.80A, DH.83
67104A/X10	7-00	4-60	DH.82A, DH.85, DH.87B, DH.83
67104A/X11	7-00	5-52	DH. 85
66104A/X12	7-00	5-18	DH. 85, DH. 87B
67104A/X13	7-00	5-40	DH. 85
67104A/X14	7-00	4-52	DH. 85, DH. 83
67104A/X15	7-00	5-01	DH. 85
67575A/X1	7-00	4-71	DH. 82A.
84723A/X1	7-00	4-84	DH. 87B, DH. 82
OP60/B	6-16	5-42	Miles Whitney Straight
BA211/2	6-18	5-41	Miles Whitney Straight, Miles Hawk
LA510	6-50	5-36	Miles Monarch, Miles Whitney Straight
LA520	6-67	4-59	DH. 90
LA550/1	6-67	5-05	DH. 85, Miles Hawk
5232/A/1	6-50	5-10	DH. 83
61187A/3/11	6-75	5-50	Miles Hawk
Z973/1	6-23	5-50	Miles Falcon
5220/X/6	6-33	4-92	Club Cadet
LA/596/3	6-50	5-00	Miles Messenger IV, Miles Hawk Trainer M. 14A
LA/506/3	6-50	4-35	DH. 82
LA/594/2	6-50	4-35	DH. 82
LA/604/A	6-50	4-58	DH. 82
ZD5220/1	6-33	4-83	DH. 82
DH 5220MR	6-33	4-58	DH. 82
LA543	7-00	4-00	Blackburn B2 Trainer
LA523	6-5	5-16	Wicko
LA547	6-5	5-10	Wicko
LA550	5-67	6-05	Wicko GM1 and GM1A, Miles Hawk Trainer M.14A
Z2010/2	6-50	5-65	Miles Hawk
Z3750	6-25	5-72	Desford Trainer
LA623/2	6-84	3-56	Miles Mercury
LA546	6-33	5-43	Miles M18
GIPSY MAJOR IC			
Z5620/2	6-5	4-33	Miles Messenger II

Drawing No.	Diam. (ft.)	Pitch (ft.)	Aircraft
GIPSY MAJOR ID			
Z5620/2	6.50	4.33	Miles Messenger II
GIPSY MAJOR IIA			
Blade P51156	7.00	BP	Miles Mercury IV
Hub P.2-1-0-3			
GIPSY MAJOR III			
LA600	6.5	5.0	Miles M18
LA600/3	6.5	4.72	Miles M18
GIPSY MAJOR (AUSTER III)			
DH5220/P25	6.33	4.58	Auster III
GIPSY MAJOR 10			
Z971	6.23	5.26	Miles Messenger II A
A66578/1/X1	6.90	4.64	DH. 85
A66097/3/X3	6.5	6.23	DH.TK. 2.
GIPSY MAJOR (High Compression)			
61187A/XI	6.75	5.50	Miles Sparrowhawk
61187A/X4	6.75	5.83	Miles Hawk
61187A/X6	6.75	6.29	Miles Sparrowhawk
61187A/X7	6.75	6.10	Miles Sparrowhawk, Miles Hawk
61187 A/X8	6.75	6.19	Miles Sparrowhawk
GIPSY MINOR			
DH5258/A	5.88	3.96	DH. 94
DH5258/E	5.88	4.19	DH. 94
DH5258/J	5.88	4.03	DH. 94
DH 5258/K	5.88	4.00	DH 94
GIPSY SIX I			
Z1800	6.92	6.20	Miles Hawk
Z2192	6.75	6.18	DH. 89, DH. 89A
Z2682/1 to 6	6.72	6.20	DH. 89, DH. 89A, DH. 86
Z2682/7	6.56	6.18	DH. 89, DH. 89A
Z2688	6.56	6.29	DH. 89, DH. 89A
DH5238/F	6.75	6.30	DH. 89, DH. 89A, DH. 86
DH5238/G	6.75	6.40	DH. 86, DH. 89, DH. 89A, Hendy Heck.
DH5238/H	6.75	6.40	DH. 89, DH. 89A
DH 5238/J	6.75	6.20	DH. 89, DH. 89A
DH5244/A	6.75	6.40	DH 89, DH. 89A.
DH5244/B	6.75	6.30	DH. 89, DH. 89A
DH5246/B	6.75	6.20	DH. 89, DH. 89A, DH. 86
61025 A/X2	7.00	6.47	DH. 89, DH. 89A, DH. 86
61025 A/X3	7.00	6.29	DH. 89, DH. 89A
61025 A/X5	7.00	6.03	DH. 89, DH. 89A
61186 A/X2	7.00	6.66	DH. 89, DH. 89A, DH. 86, DH. 86B
61186 A/X3	7.00	6.56	DH. 89, DH. 89A.
61186 A/X4	7.00	6.48	DH. 89, DH. 89A
61186 A/X5	7.00	6.39	DH 89, DH. 89A
61186 A/X6	7.00	6.33	DH. 86B, DH. 89, DH. 89A, Vega Gull, DH. 86
1186 A/X9	7.00	5.94	DH. 89A

Drawing No.	Diam. (ft.)	Pitch (ft.)	Aircraft
GIPSY SIX I (contd.)			
61189 A/XI/1	7 00	6 73	Miles Hawk
61189 A/XI/2 or later	7 00	7 11	Miles Hawk
61189 A/X3	7 00	6 87	Miles Falcon
C1189 A/X5	7 00	6 96	Miles Hawk
61189 A/X7	7 00	6 84	Miles Hawk
61189 A/X8	7 00	7 29	Miles Hawk
61203 A/XI	7 00	7 07	Hendy Heck
61203 A/X3	7 00	6 30	Hendy Heck
61267 A/X4	7 00	6 66	Hendy Heck
61267 A/X5	7 00	6 37	Hendy Heck
61375 A/X1	7 00	6 76	Percival Gull, Vega Gull
61375 A/X2	7 00	7 03	Miles Hawk
61375 A/X5	7 00	6 59	Vega Gull
61375 A/X8	7 00	6 50	Vega Gull
61375 A/X7	7 00	6 35	Vega Gull
61375 A/X10	7 00	6 94	Vega Gull
66 66026/X1	6 67	6 81	DH. 89, DH. 89A
C. 66093/X1	6 75	6 66	DH. 89, DH. 89A, DH. 86B
B 66 28/X1	6 75	6 75	DH. 89, DH. 89A
GIPSY SIX II			
Blade P. 51150/B/1	7 50	VP	Heston Phoneix, Vega Gull, Percival "Q" 6
Hub P.2-1-0-3			
Blade P.51156/B	7 00	VP	Vega Gull, Hendy Heck, Nighthawk
Hub P.2-1-0-1			
Blade P.51156/B	7 00	VP	Vegal Gull
Hub P.2-1-0-3			
Blade P.51156/B	7 00	VP	Proctor, I, II, III, IV, V
Hub P.2-1-0-6			
Type 1/2	7 5	VP	Percival "Q" 6
LA 509	6 66	6 05	DH. 86
GIPSY SIX III			
61186 A/X4	7 00	6 48	DH. 89A
61186 A/X6	7 00	6 33	D.H. 89A, DH. 86, DH. 86B
61186 A/X9	7 00	5 94	DH. 89 A
61186 A/X12	7 00	6 41	DH. 89A
A66327/3/X2	6 75	5 90	DH. 89A
GIPSY QUEEN 70			
CD25/312/1	7 50	VP	DH.104
CD36/312/1	7 50	VP	DH.104
GIPSY QUEEN II			
CD30/211/1	7 00	VP	Proctor I, II, III, IV, V
HERCULES XIV			
Blade P.4551151A-17	14 50	VP	Short S26
Hub 33 EX-2			
HERCULES XVI			
DHC 55/19	13 00	VP	Halifax III

Drawing No.	Diam. (ft.)	Pitch (ft.)	Aircraft
HERCULES 100			
Blade P.451177A	} 13-00	VP	Halifax C VI, Halifax C VIII
Hub PX 535			
CD35/356/1			
CD35/356/2	13-00	VP	Halton
HERCULES 630-639 Inclusive			
CD29/446/1	13-25	VP	Viking
R41/4B6/16	13-25	VP	Viking
CD34/446/1	13-25	VP	Viking
R44/456/2	13-25	VP	Viking
CD43/446/1	13-25	VP	Bristol 170
R39/456/1	13-25	VP	Bristol 170
CD31/446/1	13-25	VP	Bristol 170
CD24/446/1	13-25	VP	Bristol 170
HERMES I			
Y685/2	6-75	4-90	Avian IV M
HERMES II			
ZII39/2	6-75	5-12	Widgeon
HERMES IV A			
LA543	7-0	4-0	Blackburn B2
J.A.P. J. 99			
LA10	5-5	2-33	Aeronca 100
LYCOMING O-145			
LA538	5-83	3-6	Taylorcraft "C"
LYCOMING O-145-A2			
LA538/3	5-83	3-50	Taylorcraft "C"
LYCOMING O-290/3			
Z5600/2	6-50	3-48	Auster V
Z5594	6-00	3-67	Auster V
LYNX IV			
Y756/3	8-25	5-09	Avro 626
LYNX IV C			
95449A	8-00	6-26	Courner (AS5A)
Z.2362/1	7-58	5-68	Courner (AS5A)
MERCURY 30			
DH4/8	9-50	VP	Miles Martinet 'M. 725,' Master II

Drawing No.	Diam. (ft.)	Pitch (ft.)	Aircraft
MERLIN XII			
RS7/24	10 25	VP	Spiritfire II A
MERLIN T24 or 500			
Type A5/148	13 00	VP	Lancaster, Lancastrian, York
CD24/445/2	13 00	VP	York
Type A5/159	13 00	VP	Lancaster, Lancastrian, York
A5/173	13 00	VP	York, Lancastrian
A5/172	13 00	VP	York, Lancastrian
Type A5/122	13 00	VP	York
MERLIN 28			
A5/138	13 00	VP	Lancaster III
A5/138 J	13 00	VP	Lancaster III
MERLIN 30			
RX5/7	11 25	VP	Fulmer II
MERLIN 38			
A5/138	13 00	VP	Lancaster III
A5/138D	13 00	VP	Lancaster III
MERLIN 76 and 77			
A5/160	12 00	VP	Mosquito PR XVI
MERLIN 600			
CD27/445/1	13 00	VP	Tudor I
MONGOOSE III			
Y689/6	7 50	4 75	Hawker Tomtit
NIAGARA II			
Z2310/2	7 38	6 78	Short Scion Junior I
Z1947/1	6 67	7 71	Monospar ST 25
NAIGARA III			
Z2700	7 09	6 14	B.A. Swallow II
PEGASUS VI			
228928/H/3	10 00	8 00	Walrus I
PEGASUS XXII			
Blade P 55253	} 12 75	VP	Short S. 23, S. 30, S. 33
Hub P 3-5-3-1			
PEGASUS 38 and 48			
C5/46	12 75	VP	Sunderland III, Sandringham
C5/47	12 75	VP	Sunderland III, Sandringham
C5/48	12 75	VP	Sunderland III, Sandringham

Drawing No	Diam (ft)	Pitch (ft.)	Aircraft
PEREGRINE I			
DH4/4	10	VP	Whirlwind
POBJOY B			
Z5740	6 50	8 26	Comper Swift
Z271/1	6 50	8 52	Comper Swift
PRAGA B			
A5242/1	5 25	3 28	Hillsen Praga
PRATT AND WHITNEY TWIN WASP SIC3G			
Blade 6153 A-18	} 11 50	VP	Douglas C 47 (Dakota)
Hub 23E50-233 -391			
Blade 6353 A-18	} 11 50	VP	Douglas C 47 (Dakota)
Hub 23E50-287 -473			
Blade 6477A-O	} 11 5	VP	Douglas C 47 (Dakota)
Hub 23E50-473 -505			
Blade 6353A-12	} 12 0	VP	Sunderland V
Hub 23E50-287 -473			
PRATT AND WHITNEY TWIN WASP 3304G			
Blade 6153 A-12	} 12 00	VP	Consolidated 32 (Liberator)
Hub 23E50-109 -181			
-233			
-431			
-531			
-337 -359 -391			
Blade 89303-18	} 11 50	VP	Consolidated 32 (Liberator)
Hub C532D-F22			
Blade 6353 A-18	} 11 50	VP	Consolidated 32 (Liberator), Douglas C 47 (Dakota)
Hub 23E50-287 -473			
A5/158	12 00	VP	Sunderland V, Sandringham IV
A5/158D	12 00	VP	Sunderland V, Sandringham IV
PRATT AND WHITNEY HORNET SIE3G			
Blade 6139A-12	} 10 5	VP	Lockheed 18 (Lodestar)
Hub 23E50-233 -391			
Blade 6339A-12	} 10 5	VP	Lockheed 18 (Lodestar)
Hub 23E50-287 -473			

Drawing No.	Diam. (ft.)	Pitch (ft.)	Aircraft
PRATT AND WHITNEY TWIN WASP S4C4G			
Blade 6353 A-18	} 11.50	VP	Consolidated 32 (Liberator)
Hub 23E50-287			
473			
403	} 11.50	VP	Consolidated 32 (Liberator)
Blade 6153 A-18			
Hub 23E50-233			
391	} 11.50	VP	Consolidated 32 (Liberator)
Blade 89303-18			
Hub C532D-F22			
PRATT AND WHITNEY R1340/S3H1			
Blade 6101 A-12	} 9.0	VP	Fokker F22
Hub 12D40-211			
RANGER 6 Cylinder			
Z3960	7.25	4.03	Fairchild 24
WALTER MIKRON II			
A66049/1XI	4.75	3.59	Tipsy Trainer
LA511	5.05	3.92	Tipsy Trainer
66167/4/X4	5.50	3.44	Tipsy Trainer
LA553/2	5.35	3.22	Tipsy Trainer
A66164/4X4	5.50	3.44	Tipsy Trainer
WARNER SUPER SCARAB			
LA527	7.00	5.20	Fairchild 24

17. Defect Report on AVRO XIX Aircraft.

Defect report issued by the Air Registration Board in regard to Avro XIX aircraft is reproduced below for general information:—

1. Fracture of the Fuel Feed Pipe in the engine nacelle due to the pipe being fouled by the air filler valve on the outboard undercarriage leg.

2. Fractures of the fuel feed pipe (Part No. 4P/1778) connecting No. 1 Tank to the fuel cock on the rear fireproof bulkhead, have been reported as a result of fouling by the air filler valve on the outboard leg when lowering the undercarriage.

3. Before the next flight examine the fuel pipes in port and starboard nacelles for signs of fouling or fracture, and ensure that no loops are present where the pipes (Part No. 4P/1778) are clipped to the feathering pipes. If loops are present, re-clip the fuel pipe to the feathering pipe accommodating surplus outside the outboard bracket of the oil tank.

4. Where fouling or fracture of these pipes is found, reports should be made to the Controller of Aeronautical Inspection of the area in which the aircraft is based and also the Director General of Civil Aviation in India, New Delhi.

The 24th May, 1947.

(RD9-62).

18. Splitting of packing blocks on mainplane spars at lift strut attachment on Sentinel L.5 aircraft.

1. It has come to the notice of Inspecting Officers that packing blocks of mainplane spars *i.e.*, front and rear, at the lift strut attachment on Sentinel L.5 aircraft were split. This splitting originates at the end where the packing block is 'V' shaped and travels right through the length of the block through the bolt holes which secure the attachment fittings of the lift strut to the main spar.

2. All aircraft owners and Ground Engineers are advised to inspect immediately the packing blocks mentioned above for splitting. Aircraft having such defects are to be grounded until the packing blocks are renewed. The original packing blocks are made of silver spruce; in replacing these blocks silver spruce may be replaced by plywood blocks built up to the required measurements by two thicknesses of approved plywood glued together subject to inspection by the local inspection authorities. Aircraft holding certificates of airworthiness will not be signed out for certificate of safety by the Ground Engineers unless the above defect has been rectified.

The 26th May, 1947.

(RD9-67)

19. Drain holes in control surface tabs.

1. It has been noticed that the drain holes provided in the control surface tabs of certain aircraft are either inadequate for the proper drainage of rain water that might collect inside or found to be inadvertently blocked by rubber compound, paint and other foreign matter.

2. Since the accumulation of water inside the tab might cause control surface flutter with very serious consequences, it is essential that all tab drain holes should be checked for these defects; and where drain holes have not been provided they should be incorporated at the earliest opportunity.

3. If the drain holes are found to be extremely small they should be enlarged to about 3/32" diameter. This will not only facilitate proper drainage of water but will also entail lesser risk of the holes being blocked up by paint or other foreign matter.

The 30th May, 1947.

(RD9-71).

20. Undercarriage Brake Failures—Dunlop Pneumatic Brakes.

Four cases have recently occurred of failure of the above type of brakes fitted to Viking and Wayfarer aircraft.

In each instance it has been found that the annular air expansion chamber has failed along the inner side of the circumferential vulcanised seam apparently as a result of:

- (1) Defective vulcanising,
- (2) Friction and chafing at places between the edges of the surface of the brake clips and the flanges of the channels.

The normal inspection of the brake assembly is recommended by the aircraft manufacturers at 100 hours, but this does not include examination of the air expansion chambers. Inspection has, however, been made of these as a matter of routine, but failures have still occurred.

From the date of this notice wheel brake assemblies must be dismantled at the 40 or 50 hour routine inspection and the air expansion chamber carefully examined. Where cracks in the vulcanising of the seam or chafing and abrasion are found, the expansion chamber must be replaced.

The 17th June, 1947.

(RD9-72.)

23. Flexatex C. 6 Hose.

1. The attention of all concerned is drawn to the fact that "Flexatex" C. 6 Hose is liable to shrink up to a maximum amount of 7%, and that this in some cases has resulted in the pipes pulling away from the end connections and in other cases in the distortion of tank shells.

2. All "Flexatex" C. 6 Hose installed in aircraft must be examined immediately and thereafter weekly for any sign of pipes pulling away from end connections or distortion of tank shells.

3. All cases of pipes pulling away from end connections or distortion of tank shells must be reported to the Director General of Civil Aviation in India.

4. Where "Flexatex" C. 6 Hose is already installed or where it can be installed with suitable bends to provide for the shrinkage of not less than 7% in length, without causing tension in the hose or its end fittings, no further action other than normal periodic inspection is necessary.

5. MODIFICATION ACTION.

5.1 In cases where straight runs of hose prevent installation to provide for contraction in length, modification action is to be taken as soon as possible. Modifications on the following lines will accord with recommended practice :—

Replace all affected hose by an approved type of hose not subject to shrinkage. In cases where such hose is metal armoured or wire wound, due regard should be paid to the requirements for electrical bonding of metallic components,
or

Replace all affected hose by light alloy pipes to Specification DTD-310 where these can be adequately supported and suitably jointed with short lengths of hose to B.S.I. Specification 6F7. Electrical bonding must be provided for by using approved methods.

5.2 Provision should be made for the double clipping of all joints and for end fittings to have beaded ends. Beads or swaged

+ .002

ends should be .020 ins.—.000 ins. in depth by .187 ins. in width. Sharp corners liable to cause abrasion of the tube inner member must be avoided.

6. Replacements in accordance with paragraph 5.1 constitute a modification and must be approved by the Director General of Civil Aviation in India or his representative. The owners of aircraft affected should apply to the manufacturers of such aircraft for details of any modification which may be necessary.

(AI6-53).

The 25th June, 1947.

24. —Defect Report General 5 (Based on STIMIWC. 142).

1. S.B.A.C. Electrical Wiring System—Defective Socket Assemblies.

2. S.B.A.C. terminal blocks, incorporating single and double 19 amp. socket assemblies—Stores Ref. 5H/15 and 5H/16.

3. Failures have occurred of these socket assemblies, due to the half sockets cracking across the hole, or breaking at the ends which grip the cable ferrule.

4. At the earliest opportunity examine all distribution and terminal blocks incorporating these socket assemblies and check the leads for security by a gentle pull. Where the leads are slack or pull away, the block is to be dismantled and the half sockets carefully examined for distortion or cracking. Defective half sockets are not individually replaceable and only complete socket assemblies are to be fitted as replacements. Cracking can be easily started by overtightening the centre clamping screw, therefore, care should be taken to ensure that the screws are not overtightened.

“In the case of two tier socket assemblies which have two wires leading in on the one side and one wire leading out on the other, or in single tier sockets with commoning strips and a single cable and ferrule in one side only it is essential that a blank 19 amp. ferrule, Stores Ref. 5H/26, be fitted in the spare socket in order to balance the assembly. If difficulty is experienced in obtaining 19 amp. ferrules, then 4 amp. ferrules, Stores Ref. 5H/24 or 7 amp. ferrules, Stores Ref. 5H/25 may be used.”

5. The following aircraft are affected in India :—

Bristol Wayfarer, Bristol Freighter, Vickers Viking.

The 15th July, 1947.

(RD9-62).

25. D. C. 3 and Dakota types of aircraft—Essential Modifications Modification DAK/1097 (Class II) Research Mods. 46.

Attention of all concerned is drawn to Notice to Aircraft Owners and Ground Engineers No. 14 of the year 1946 in connection with the attachment of the wing cuffs of the mainplanes of D.C. 3 and Dakota types of aircraft by fitting neoprine sealing strips between the jointing faces of the fuselage and the wing skin.

2. In para. 2, sub-para. (ii), it was stipulated that all aircraft holding Certificates of Airworthiness are required to be modified by March 31st 1947. In view of the neoprine strips not being available in India, the date was extended and the modifications are required to be completed

by the end of August 1947. It is understood that stocks of neoprene strips have now arrived in India, and the following conditions should be observed :

- (I) All aircraft of the above Series that have been overhauled since the issue of this order and have been fitted with sealing strips of American synthetic rubber, as carried out by Hindustan Aircraft Ltd., may be operated until the next Certificate of Airworthiness overhaul when neoprene strips must be introduced, failing which Certificate of Airworthiness will not be renewed.
 - (II) All aircraft not yet modified, as described above, must have neoprene strips fitted by the end of August 1947.
3. It is understood that the material has now arrived in India, and is available with Messrs. A. R. Haseler & Company, Bombay.

(RD9—44).

The 15th July, 1947.

26. Defect Reports General/2 (Based on S.T.I./Misc./134).

1. Voltage Regulators—alteration of setting to 28 volts.

2. The following types of Voltage Regulator now set to a charging rate of 29 or 28.5 volts, are to be reduced by means of the trimmer resistance to 28 volts maximum. Where adjustment by means of the trimmer resistance is not possible the regulators should be removed from the aircraft and adjusted on the bench. This alteration is due to reported instances of electrolyte boiling in accumulators as a result of high charging rates and high ambient temperatures.

5U/1013	Type	C.
5U/192	"	F.24
5U/215	"	H.
5U/522	"	J.
5U/2573	"	J2.
5U/2899	"	32
5U/2702	"	A
5U/2830	"	A2
5U/2844	"	23

(In the case of installations using 3 or 4 generators adjust to 22 volts on no-load, or 24 volts where only two generators are employed, at the same time as the type 32 regulator is re-set to 28 volts. This is necessary in order to keep within the working resistance of the latter.)

3. These regulators are fitted to the following aircraft operating in India and any other types affected, not shown on this list, should be notified to this office.

Dakota, Dove, Lancastrain, Proctor, Short Boats, Viking, York.

(RD9—62).

The 15th July, 1947.

27. Defect Reports General/4 (Based on S.T.I./Misc./137).

1. Voltage Regulators, Type 23, Stores Ref. 5U/2844, Earthing of current coil to magnet case.

2. Voltage regulators have been found burnt due to the insulation of the current coil connectors being chafed by the magnet case at the exit slot. This is caused by the clamp screws, holding the terminal ends of the current coil connectors, being loose, allowing movement in the magnet case exit slot.

3. As soon as possible all voltage regulators should be examined to ensure that the current coil connectors are central in the exit slot and there is no evidence of chafing. This should be followed by tightening of clamp screws and an insulation test.

4. Following aircraft are known to be affected.—

Viking

(RD9—62).

The 15th July, 1947.

28. Use of safety harness or belts during flight.

During the investigation into the causes of an accident to a light aircraft in which the three occupants were killed, it was found that the safety harness with which the aircraft was equipped had not been used. From the nature of the accident and the fact that all three occupants received severe head injuries whilst only the pilot had severe injuries to his legs, it is evident that had the safety harness been used, the results might not have been fatal. All occupants of light aircraft should, therefore, in their own interests be properly secured in their seats with the safety harness or belts with which the aircraft is equipped.

(RD3—99).

The 22nd July, 1947.

30. Defect Report DAKOTA/1.

(Based on STI/Dakota/14).

•Aileron Trimming Tab Control Rod—Fouling the stiffening plate between the aileron main spar and rib.

Defect report issued by the Air Registration Board in regard to Dakota aircraft is reproduced below for general information:—

1. All Dakota aircraft.

2. Chafing of the aileron trimming tab control rod can occur, at the point where it passes through the diagonal stiffening plate between the aileron main spar and the aileron rib.

3. As soon as possible, all aircraft should be examined to ensure that clearance exists at this point throughout the full range of movement of the control rod. Where fouling occurs, the radius of the hole should be increased to permit free movement, care being taken to remove the minimum amount of metal.

4. Access to this control rod is obtained by cutting the fabric on the top surface of the aileron on a line immediately above the aileron trimming control rod.

(RD9—62)

The 8th August, 1947.

32. Defect Report Avro XIX/4.

Based on S. I./Anson/4.

Brake Cable Fracture at Operating End.

Defect report issued by the Air Registration Board in regard to Avro XIX/4 aircraft is reproduced below for general information:—

1. Avro XIX aircraft with Mod. 694 not embodied.

2. At the next and subsequent daily inspections on Avro XIX aircraft not embodying Mod. 694 examine the brake cable for signs of fraying or fracture of cable strands adjacent to the soldered nipple at the operating lever end.

Renew defective cables, ensuring that the new cables are correctly splayed over the nipple, and that the solder is limited to 1/4" beyond the nipple joint to preserve flexibility of the cable.

(RD9—62).

The 29th August, 1947.

33. Defect Report Rapide/1.

Flap operating cables, failure adjacent to splice.

Defect report issued by the Air Registration Board in regard to D.H. 89A Rapide aircraft is reproduced below for general information:—

1. All D.H.89A Rapide aircraft.

2. Three instances have occurred recently in which the flap operating cables have failed near the final tuck of the splice. This is presumed to be due to fatigue hardening of the cable, after excessive beating of the final tuck prior to serving the splice.

3. Not later than the next 50 hour inspection, remove the serving on the splices, and inspect the cables for fracture or fatigue hardening of the strands. The splices on serviceable cables should then be reserved.

4. Reports of any defective cables found, quoting the particulars given on the cable identification tab, should be made to the Director General of Civil Aviation in India, New Delhi.

(RD9—62).

The 16th September, 1947.

35. Import of Aircraft Parts and Materials from United Kingdom and United States of America—Payment of Customs Duty at Concessional Rate.

Before the World War II the following documents constituted evidence for the acceptance of aircraft parts and material as such by the Customs Authorities for the purpose of levying customs duty at the concessional rate :—

- (i) *Aircraft material imported from United Kingdom.*—A Release Note issued by the Manufacturers under the authority of the Air Registration Board declaring the parts, components etc., as aero-material.
- (ii) *Aircraft material imported from the United States of America.*—
A sworn statement made before a Notary Public that such parts etc., comply with one of the following requirements :—
 - (a) With the original type or production certificates.
 - (b) With Army or Navy Specification.
 - (c) With Civil Aeronautics Authority Air Transport Certificate.
 - (d) That they are proprietary articles which have been approved by the Army, Navy or Civil Aeronautics Authority.

2. The above procedure was not followed during the War as the supply of material from the United Kingdom was received through the Master Provision Officer, Air Forces, for all British aircraft while material from United States of America was received under Lease Lend.

3. With the termination of the War it is necessary that the above procedure which lapsed during the war should be revived. As, however, the manufacturers and exporters in the United Kingdom and the United States of America are not at present fully complying with it and the documents mentioned in para. 1 above are not always supplied with the material, such material is held up in Ports of entry in India by the Customs Authorities for identification and classification purposes for levying appropriate import duty, which causes inconvenience to aircraft operators and other importers of aircraft materials etc. Action has been taken with the authorities in the United Kingdom and the United States of America to ensure that manufacturers and exporters of aircraft material comply with the requirements specified in para. 1 above. Aircraft operators and other importers of aircraft material are, however, advised that in their own interest they should ensure that the manufacturers and other exporters of aircraft material from the United Kingdom and the United States of America to this country comply with the requirements in order to avoid complications on arrival of the material at the ports of entry in India.

(AI-53—119).

The 23rd July, 1947

36. Vokes Air Filters—Part No. D.14099.**Fracture of the element spacing fingers.**

Defect report issued by the Air Registration Board in regard to above is reproduced below for general information:—

1. All Anson, and Consul aircraft fitted with Vokes air filters Part No. D. 14099.

2. Instances have been reported, where the fingers spacing the filter element have fractured and entered the engine.

3. Not later than the next equivalent to a 50 hour maintenance inspection or check, these filters elements should be removed for examination.

4. Any fingers projecting from either side or centre supports of the filter element body, on the engine side of the filter, are to be removed by breaking at the point where they join the supports.

(RD9—62).

The 9th October 1947.

37. Defect Report Anson/4

(Based on STI/Anson/12).

Voltage Regulators—Incorrect cables fitted.

Defect report issued by the Air Registration Board in regard to Anson/4 aircraft is reproduced below for general information:—

1. All Anson aircraft with 12 volt electrical system.

2. Cases have been reported of an incorrect size of electrical cable being fitted, causing overheating of the cable and fire risk.

3. As soon as possible inspect the cables from generator positive and negative, to the accumulators through voltage regulators, terminal blocks and cut-outs, and replace all cables of less than 37 Ampere rating, Ref. Unicell 37.

NOTE.—Cable supplying voltage coil current to voltage regulator in Anson Mk. XII aircraft wired to AD. 4258 Issue April 1945, is not affected by the above.

(RD9—62).

The 9th October, 1947.

38. Chafing of the oil pipe from tank to feathering pump—applicable to all Avro XIX Aircraft.

A defect report issued by the Air Registration Board in regard to Avro XIX aircraft is reproduced below for general information:—

1. Damage to the pipe (Part No. 3/0·2932), from the tank to the feathering pump, has been caused by chafing of this pipe by the main wheel outer cover when the undercarriage is in the retracted position

2. Not later than the next daily inspection :—

2. 1. Examine the above mentioned pipe for signs of chafing and change the pipe if necessary.
2. 2. If necessary, reset the pipe to ensure that it is clear of the main wheel outer cover when the undercarriage is in the retracted position. Care should be taken to ensure that end fittings are not strained or damaged.

(RD9—62)

The 5th November, 1947.

39. Vickers Viking, Bristol wayfarer and Freighter.

CONSTANT SPEED UNITS TYPE PAY 5100 & CAY 5100.

It has been found necessary to strengthen the engine to constant speed unit drive coupling as service experience has shown that under certain operational conditions the drive shaft and coupling serrations are subject to abnormal wear. It is essential therefore that operators carry out the undermentioned inspection procedure pending the introduction of re-designed parts; the design and testing of which is in hand. All operators will be notified of the modification action to be taken when the new parts are available.

Inspection Procedure.

1. After first 100 hours flying of the constant speed unit from new or after overhaul, and as soon as possible on those which have already exceeded 100 hours flying.
 - (a) Remove the constant speed unit from the engine.
 - (b) Remove circlip P21684 and coupling, and after cleaning with petrol examine serrations carefully both in the drive shaft bore and on the coupling. It is advisable that a magnifying glass is used as the wear is not always discernible to the naked eye. The form of this wear is illustrated in the accompanying sketch (Fig. 1).
 - (c) Excessive wear to either the drive shaft or coupling serrations will necessitate the c.s. unit being returned for overhaul.
 - (d) If the serration form is not unduly worn, the coupling may be reassembled and retained by circlip P21684, which must be replaced if damaged.

Extreme care must be taken to locate this circlip correctly in the drive shaft groove and the coupling loaded against the circlip as a further precaution.

Note: Coupling P24519/1 (Fig. 3) as introduced by Modification C153 for PAY 5100 units and Modification C146 for CAY 5100 differs from coupling P24519 by the addition of a pin through the wasted portion. Where this coupling is used it is not possible to obtain maximum serration engagement unless it is supported in the bore of constant speed unit drive shaft by circlip P25787 as illustrated in Fig. 4. The introduction of this circlip is covered by Modification C207 for PAY 5100 units and C206 for CAY 5100 units and it is essential that the fitment of this circlip be checked irrespective of the modifications appearing on the constant speed unit history plate. Circlips P25787 and coupling retention circlips P21684 will be supplied free of charge on application to the Service Manager, De-Havilland Propellers Ltd., Hatfield, Hertfordshire, England.

2. After every further 50 hours flying the above must be repeated until the constant speed unit reaches its overhaul period which is the same as that of the engine.

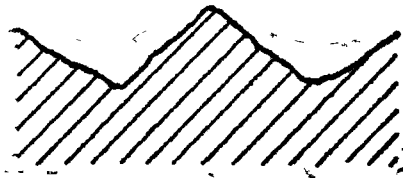
(RD9—79).

The 6th November, 1947.

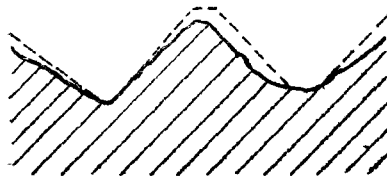
FIG N^o. 1



True Form

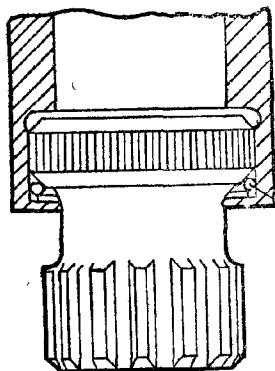


Excessive Wear



Comparison of True
Form with Excessive
Wear

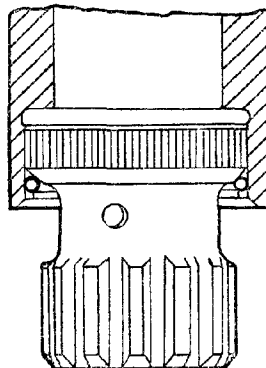
FIG. 2



CIRCLIP
P 21684

COUPLING
P 23199

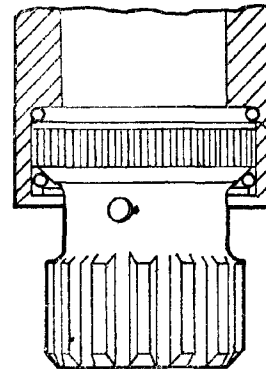
FIG. 3.



COUPLING
P 24519/1

INTRODUCED BY
MOD 146 FOR CAY 5100
MOD 153 FOR PAY 5100

FIG. 4.



CIRCLIP P 25787

INTRODUCED BY
MOD 206 FOR CAY 5100
MOD 207 FOR PAY 5100

Drive Shaft Coupling Modifications in C.S.U. Types CAY 5100 and PAY 5100.

1948

3. PURCHASE OF "BRITISH CIVIL AIRWORTHINESS REQUIREMENTS."

The Air Registration Board in the United Kingdom has decided to accord to all holders of current Indian Ground Engineer's Licences a concession to purchase a set of "British Civil Airworthiness Requirements" at a reduced cost. The normal cost is £2/2/- (two guineas) but the concession permits current licence holders to make the purchase at £1/1/- (one guinea).

All those Ground Engineers desirous of obtaining a set of these Requirements are advised to apply to

The Air Registration Board,
Publications Department,
Greville House,
37, Gratton Road,
Cheltenham. (England).

Applications must state the number of the applicant's licence and its expiry date and must be accompanied by the requisite fee of £1/1/- (one guinea).

(AI-3—881).

The 21st June, 1948.

4. Pratt and Whitney Twin Wasp Engines—Engine failures due to accumulation of oil and/or petrol in the cylinders.

Several engine failures have recently occurred due to oil and/or petrol being trapped in the lower cylinders during starting. In one case the cause was found to be attributable to the supercharger casing drain valve being blocked with foreign matter.

2. In future, the supercharger drain valves must be removed, cleaned and checked at every 50 hours routine maintenance.

3. Prior to starting of these engines the following procedure is to be adopted to test cylinders for freedom from oil and/or fuel accumulation in the bottom cylinders.

4. If the engine has been idle for more than two hours or if inadvertently the fuel priming pump has been used excessively prior to starting, the propeller is to be manually rotated through two complete revolutions. Make sure that the ignition switches are off before rotating the propeller. The lower sparking plugs should be removed if there is excessive resistance to turning, as such resistance is an indication that fuel or oil has been trapped in the cylinders.

5. Ground Engineers must also make sure while turning the engines by hand that this is only done in the normal direction of rotation.

(RD21—1).

The 13th April, 1948.

6. Tiger Moth and Dragon Rapide Spares.

Information has been received that the De Havilland Aircraft Company, Hatfield, England, will continue the manufacture of Dragon Rapide Spares to the end of 1951, and the manufacture of Tiger Moth Spares until the end of 1949, although these aircraft are no longer in production. It is necessary that orders for Tiger Moth spares should reach the company by the end of this year, and for the Dragon Rapide by the middle of 1950. Operators of the above types of aircraft are therefore advised to review their spares position and place orders on the De Havilland Aircraft Company, United Kingdom, for their total requirements. Small stocks of some Leopard Moth parts also exist with the company and may be ordered, if required.

(RD2—81).

The 11th September, 1948.

7. P. & W. TWIN WASP R1830 SERIES ENGINES.

As a result of the satisfactory operation of the subject model engines for a considerable period under varying circumstances it has been decided that the following limitations may now be observed in this country :—

1. The maximum running life since new or since complete overhaul is now extended to 700 hours. All test running and ground running will be included in the 700 hour period
2. The maximum period between oil changes on these engines is now extended to 100 hours.

Under no circumstances whatever will Ground Engineers sign daily Certificates of Safety for flight in favour of engines that have exceeded the above-mentioned periods unless under special concession from a representative of the Director General of Civil Aviation in India. Such concessions will only be issued for experimental purposes.

Operators of public transport aircraft, in which the subject model engines are installed, are advised to use discretion when permitting their engines to run to the limits quoted above. It should not be necessary to point out that engines operating in dust-laden atmosphere or over routes that require frequent high power take-offs may necessitate more frequent overhauls and oil changes. Moreover, the running to 700 hours under adverse conditions may lead to more expensive overhauls than those engines operated under more favourable conditions.

Local Controllers of Aeronautical Inspection may from time to time require samples of oil that has been used for 100 hours in aircraft systems, and if subsequent tests show that the condition of the oil is in any way unsatisfactory, the operators from whom such samples were taken will be asked to reduce the oil change period.

(R D 9—100).

The 30th September, 1948.

8. MAXIMUM RUNNING TIMES BETWEEN COMPLETE OVERHAULS OF ENGINES.

The maximum permissible running times between complete overhauls for various engines are given below. These figures are based on Maker's recommendations and operational experience in this country.

ENGINES OF BRITISH DESIGN AND MANUFACTURE.

Armstrong Siddley Cheetah X	1200 hrs.
" " Cheetah XV and XVII	460 "
	500 hrs. if mod.
	835 incorporated.
Blackburn Cirrus Minor I & II	600 hrs.
De Havilland Gipsy Major, I, Ic, & 10	1000 "
" " Six I	750 "
" " Queen II	750 "
" " Queen III	750 "
" " Queen 70	400 "

ENGINES OF AMERICAN DESIGN & MANUFACTURE.

Continental type A 40	400 hrs.
" " A 65	600 "
" " C 75	600 "
" " C 85	600 "
" " C 145	600 "
" " E 165	600 "
" " E 185	600 "
" " R 670-5	750 "
Franklin type 6 A 4-165	500 "
Franklin " 6 A 8-215	500 "
Lycoming type 0-235	500 "
" " 0-290	500 "
" " 0-435	500 "
Pratt & Whitney Wasp Junior R-985	600 "
Pratt & Whitney Wasp R 1340	600 "
" " Twin Wasp R-1830 series	700 "
Ranger type 6-440c	500 "
Warner Super Scarab-165	500 "
Jacobs L-5	450 "

All test running and ground running times must be included in log books for the purpose of compilation of the above figures. Under no circumstances whatever will Ground Engineers sign daily certificates of safety for flight in favour of engines that have exceeded the above mentioned periods unless under special concession from a representative of the Director General of Civil Aviation in India. Such concessions may only be issued for experimental purposes.

Operators of aircraft are advised to use discretion when permitting their engines to run to the limits quoted above. Conditions under which engines are operated may necessitate in some cases top overhauls during the periods or reductions in the times laid down.

Permissible overhaul times pertinent to any engine not cited above should be ascertained from the local Controller of Aeronautical Inspection.

This Notice cancels all previous instructions on this subject.

(AE. 9—103).

The 25th November, 1948.