Chapter Fifty-two

ROTAX HIGH ENERGY IGNITION UNITS

Type NB.25/2

Contents

Illustrations

The information contained in this chapter has been supplied by Messrs. Rotax Ltd., and all enquiries regarding their products should be made to them.

THIS CHAPTER is a reproduction of Rotax Technical Leaflets No. S.L.51 and T.L.51 revised February 1955, and should be read in conjunction with their Service Bulletins contained on page 9 et seq.

DATA

Operating voltage range:	14 to 28 volts.
Sparks:	60 per minute at 21 volts applied.
Stored energy per spark:	12 joules.
Operative temperature range:	—50 deg. C. to +100 deg. C.
Altitude:	60000 ft.
Weight:	4·25 lb.

DESCRIPTION

These high energy ignition units, Fig. 1, have been developed to ensure ignition of the atomised fuel in the combustion chambers of gas turbine engines under all conditions of altitude up to 60000 feet, and air mass flows likely to be encountered in service. They are, therefore, suitable for use with either electric or turbo-starters.

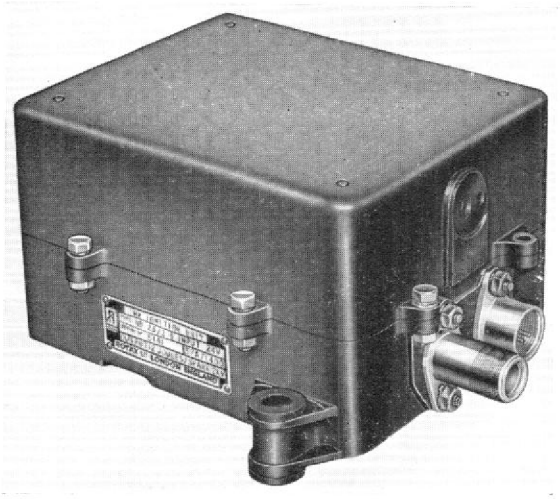

Fig. 1. NB.25/2 high energy ignition unit.

A most difficult condition under which a turbine has to be lit is undoubtedly that of relight in the air and the greater the altitude and speed the more difficult the problem becomes.

In order to obtain relight at really high altitudes and high air mass flows, it has been found that a large amount of energy must be released at the ignition plug in a short time. Ordinary booster coil methods, such as have been in general use, are quite inadequate at anything above 25000 ft., not necessarily because the total energy is too small but because the form in which the energy is finally dissipated at the plug is far from being correct. However, a six microfarad capacitor charged to 2000 volts and discharged across a surface discharge type of plug, in a period of about 100 microseconds, has proved quite satisfactory.

With such a system the efficiency cannot be very high due to the high currents and voltages creating large losses in the circuit. For example, with twelve joules stored in the capacitor, the energy dissipated in the spark may not be more than 50 per cent, therefore these units have been designed to reduce all losses to a minimum and develop the maximum amount of energy at the plug.

Whatever system is adopted it must, of course,

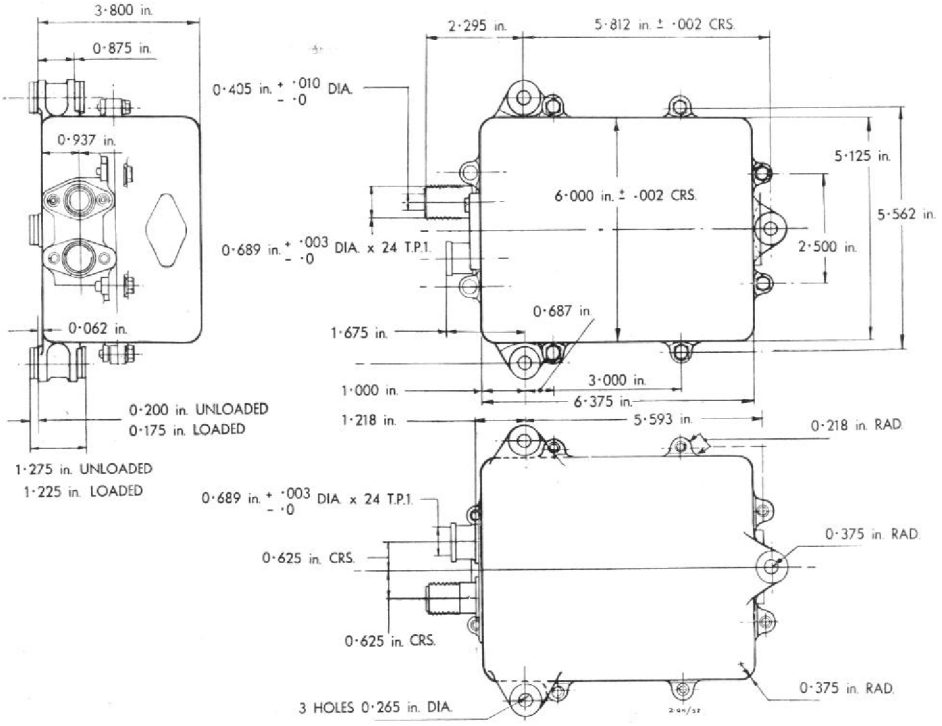

Fig. 2. Details of outside dimensions and mounting feet.

be suitable for all conditions of ground starting, including cartridge and liquid fuel starting as well as starting in the air. For cartridge or liquid fuel starting the periodicity of the sparks is to be considered: in such starts the total run-up time is quite short, of the order of two to five seconds, but ignition will only be satisfactory providing it occurs within a very narrow band of time during the run-up, therefore, the more frequently the sparks occur the better chance there is of obtaining at least one during this optimum period of time. It is with these considerations in view that these ignition units have been designed. To meet the last requirements at least 60 sparks per minute at 20 volts D.C. are being obtained in both these units. This is more than adequate for all forms of starting.

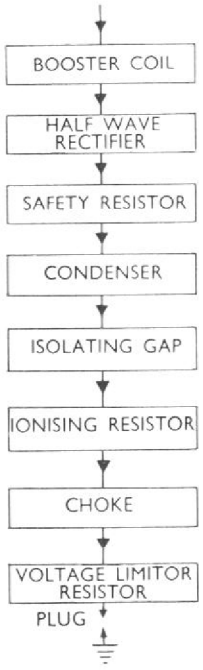

Fig. 3. Block schematic diagram form of NB.25/2 high energy ignition unit.

All components are fitted into a light magnesium alloy casting of which the lid and the base are so arranged to completely seal the unit and prevent it interfering with radio equipment. The choke and voltage limit resistor is fitted into one of two compartments of the insulating base moulding and the discharge tube is fitted into the other compartment. The discharge tube is held in position between two soft rubber mounting blocks. Full details of outside dimensions and mounting feet can be seen in Fig. 2.

OPERATION

The NB.25/2 unit is operated from a 24 volt D.C. supply, and is shown in block schematic diagram form in Fig. 3; the circuit diagram is shown in Fig. 4. In this arrangement the conventional type of booster coil is used to charge, via half-wave selenium rectifiers, a six microfarad capacitor to 2000 volts. Booster coils, although of well-established design, have a modified secondary winding in order to obtain maximum efficiency; all rectifiers are very much under-rated in order to ensure reliability when operating under high ambient temperature conditions. Each capacitor employs a new impregnant which ensures a large margin of safety over a wide range of temperatures, as well as reliability, in such an extremely small and light unit.

A rising voltage across the capacitor will bridge a sealed discharge gap at 2000 volts. This gap by virtue of its ionising electrode maintains its accuracy over long periods. A high resistance is placed between this ionising electrode and earth. In order to extend the spark duration to about 100 micro-seconds, which has been found to give optimum conditions for ignition, a small inductance is connected in series with the discharge tube.

The complete unit is so designed that no excessive voltages will be experienced in the event of a plug becoming open-circuited.

SERVICING

In view of the critical nature concerning the conditions under which the high energy ignition unit operates, and the necessity for special testing equipment, it is strongly recommended that if a fault develops, the unit should be returned to the nearest Rotax Service Department, or authorised service station. Where, however, adequate and efficient repair facilities have been arranged, detailed servicing instructions are contained in this chapter.

Important.—When these units are being serviced it is important to note that the 6 μF. capacitor holds a dangerous charge. This capacitor **MUST** be discharged by "short circuiting" it to the case of the unit. A convenient method of discharging the capacitor is to "short" the discharge gap

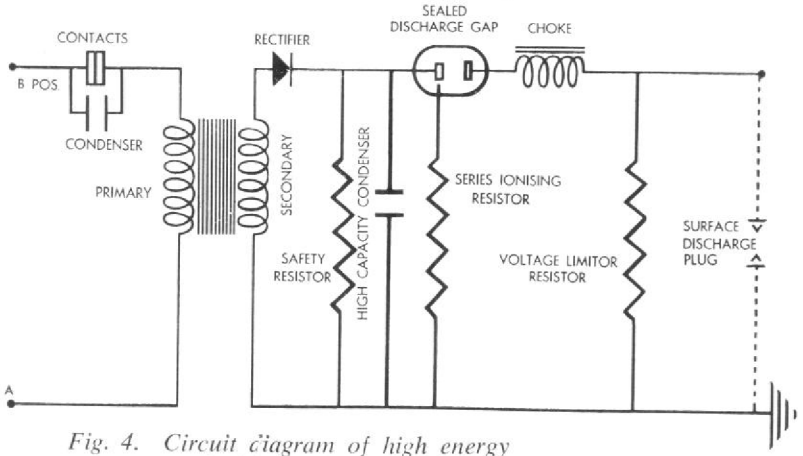

Fig. 4. Circuit diagram of high energy ignition unit.

Fig. 5. Typical peak valve voltmeter.

terminal opposite the choke to the case with a length of wire.

TESTING

After every 1000 hours flying time interval and on completion of any major repairs or replacements, a high energy ignition unit is to be subjected to the tests detailed in this section.

It is essential to have the following test equipment available:—

Drip test rig NT.1813 (see also service bulletin No. 514).
Peak valve voltmeter NT.1815.
Altitude test rig of approved design (NT.1814 if available).
Voltmeter (0-30 V.).
Surface discharge plug. Lodge LH.101/1 or KLG.102 or similar.
Stop watch.
Moving coil ammeter (0-5A).
Thermo-couple milliammeter (0-100 mA.) or Avometer model No. 7.
12000 ohm 100 watt resistor or
16000 ohm 12 watt resistor (N.107652).

The peak valve voltmeter, Fig. 5, may be built up from the components, as shown in the circuit diagram, Fig. 6.

General

These units, after operation, hold a dangerous charge. It is emphasised that in the tests which have to be carried out with the cover removed, extra care must be exercised by the servicing personnel.

Connect the unit plug (pin B positive) to a 16-28 volt D.C. supply, variable by battery tapping, via the moving coil ammeter and a switch, and connect the H.T. output to the surface discharge plug.

Mount the surface discharge plug in a position such that, during testing, a carbon film can be maintained on its sparking surface by dripping paraffin onto it. The paraffin is to be adjusted to give a drip rate of 6/min. A typical rig for this test is shown in Fig. 7.

Load Tests

DISCHARGE GAP VOLTAGE

When carrying out this test it is important to ensure that the spark gap mounting block is clamped firmly down and the discharge resistor on the underside of the discharge tube is making good

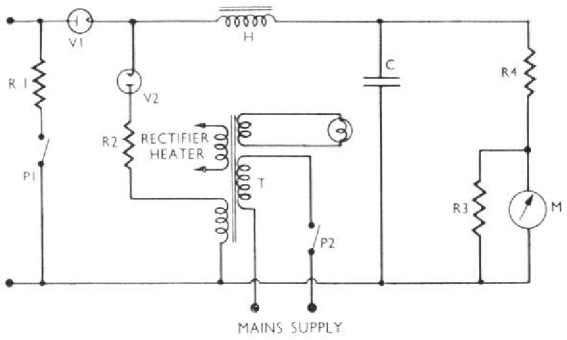

Fig. 6. Peak valve voltmeter circuit.

KEY TO FIG. 6.

R1. *5000 ohms 1 watt.*
R2. *1 megohm ½ watt.*
R3. *Shunt resistor fitted to ammeter.*
R4. *Bank of 8 resistors 2·5 megohm ±1% in series (Welwyn SA 3634 or similar).*

Note: With 1960 volts across the 2 μF. capacitor, resistor (Erie type 100 or 108 or similar) to be added to the 2·5 megohm resistor bank to obtain mid-scale deflection (2 kV. on meter).

V1 & V2. *High voltage diode (U.37 or equivalent).*
H. *Choke 5H 1000 ohms.*
P1. *Push button switch (Rotax Type D.0701 or similar).*
P2. *Single or double pole "on"/"off" switch (Bulgin Type S.278 or S.258 or similar).*
C. *2 μF. 4 kV. working voltage.*
M. *Ammeter 1st grade: minimum 4" scale. 100 μA. full scale deflection. Calibrated 0-4 kV. in 100 V. divisions and 50 V. sub-divisions. R3 which is fitted to ammeter must be trimmed and then permanently fixed to give mid-scale deflection with 97 μA. current flow.*
T. *Transformer wound to the requirements of the circuit. The insulation of the rectifier heater winding must be high compared with 20 megohms.*

Note: A signal lamp is fitted to the voltmeter as shown in circuit diagram.

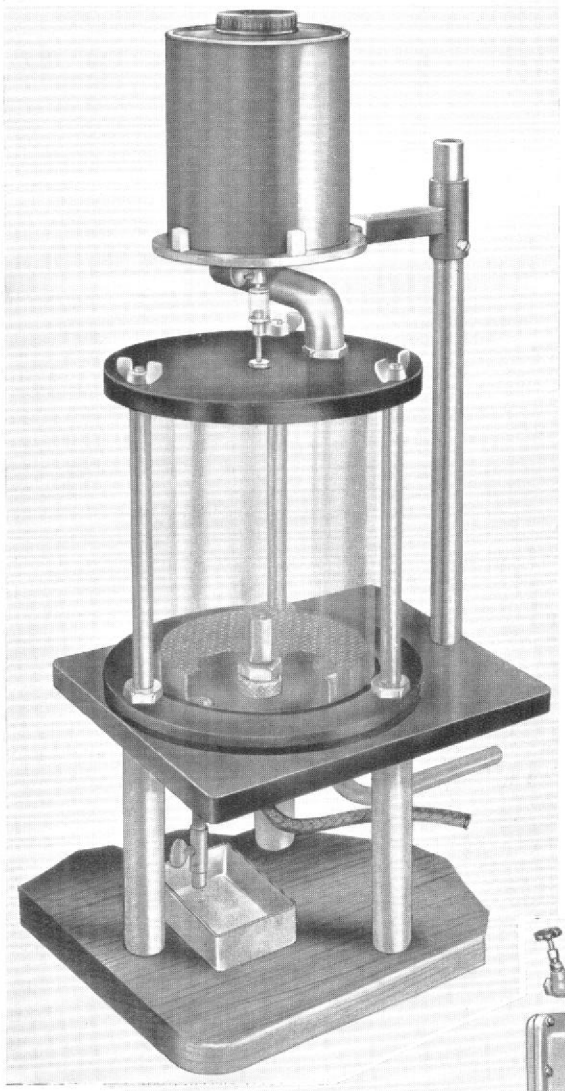

Fig. 7. Drip test rig NT.1813.

connection with the spring contact at the bottom of the insulation base moulding.

Set the input voltage to 28 and switch on the supply; then, using the peak valve voltmeter, measure the voltage across the 6 μF. capacitor and the case. This should be within the limits of 1·9 to 2·1 kV.

Sparking frequency

Adjust the input voltage to 16, 20, 24 and 28 volts in turn and maintain at these inputs for 1, 3, 1 and 1 minute periods respectively; then re-adjust the input voltage to 20 and count the number of sparks over a one minute period. This must not be less than 60 sparks per minute. Should irregular sparking occur during the 3-minute tests at 20 volts, the time taken for 10 sparks measured over a slow period must be checked with a stop watch. This time must not exceed 12 seconds. During the one minute test at 24 volts, measure the input current with the moving coil ammeter. This should be between 1·9 and 2·3 amperes.

Altitude test

Enclose the unit in the altitude box, Fig. 8, a suitable type being a standard magneto altitude box arranged to take a 24 volt supply with an H.T. output socket to enable the surface discharge plug to be connected externally, and slowly evacuate

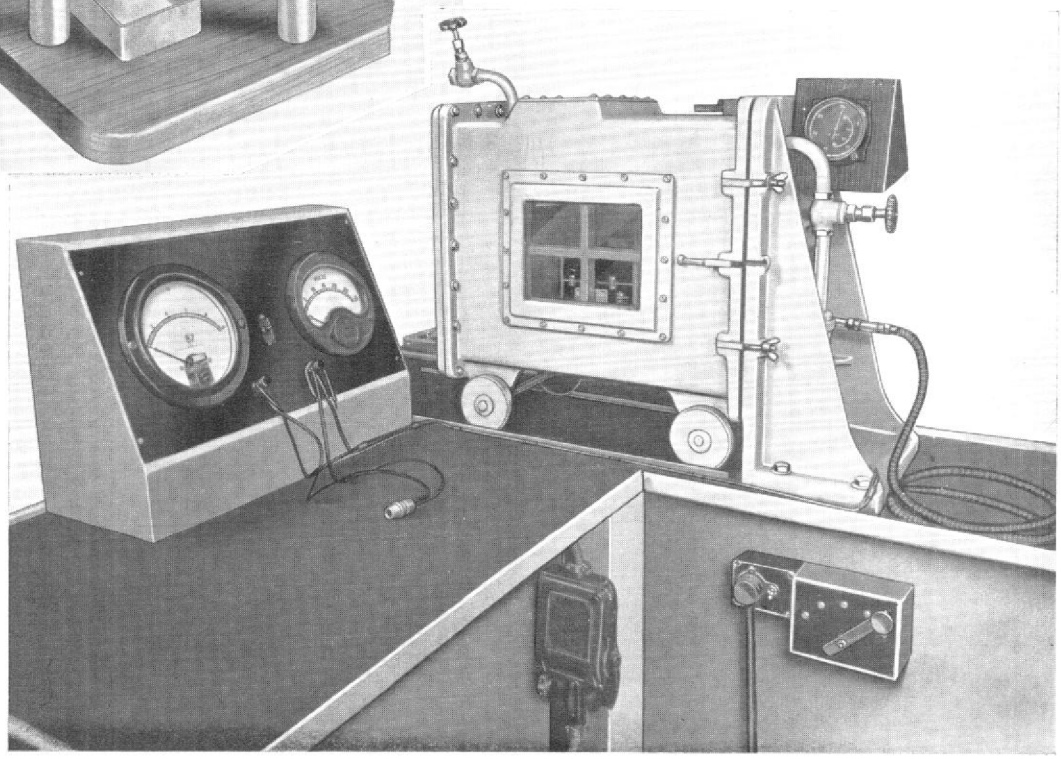

Fig. 8. Typical altitude test rig.

the box until a pressure equivalent is obtained of an altitude of 60000 ft.

Adjust the input voltage to 24 and operate the unit for five 45-second periods with 45-second intervals between each period.

No-load test

With the unit removed from the altitude box, operate it with the surface discharge plug lead disconnected from the H.T. outlet socket; then using the peak valve voltmeter, measure the voltage between the 6 μF. capacitor and earth. This should not exceed 2·5 kV.

Insulation tests

Carry out a "flash test" by applying a 500 volt r.m.s., 50 c.p.s. supply for a one minute period between both L.T. input terminals and the case. During this test the voltage should be gradually increased to its required maximum and gradually reduced to zero before switching off.

Immediately following the previous tests measure the insulation resistance, using a 500 volt "Megger," between the input terminals and frame. This should not be less than 20 megohms.

Faulty operation

If a high energy ignition unit fails to satisfy the preceding tests it should be dismantled sufficiently to ascertain the cause. When found, the faulty part must be replaced and the unit re-assembled and re-tested.

When testing for faults, reference should be made to the defect diagnosis table on page 7.

DISMANTLING

The following paragraphs describe component dismantling operations for the NB.25/2 high energy ignition unit.

Removing the cover

Unscrew and remove the eight 2 B.A. hexagon-headed cover-securing screws and nuts, together with their spring and base washers. Remove the cover, Fig. 9.

Important.—After operation, the 6 μF. capacitor in the ZA.4101 capacitor assembly holds a dangerous charge. This capacitor **MUST** be discharged by "short-circuiting" it to the case of the unit. A convenient method of discharging the capacitor is to "short" the discharge gap terminal opposite the choke to the case with a length of wire.

Removing the ZA.4101 (6 μF.) capacitor

Remove the cover from the rubber terminal block and disconnect the capacitor lead from the "floating" terminal.

Unlock and remove the three 2 B.A. securing nuts and carefully lift out the capacitor from the box assembly.

Removing the booster coil unit

Remove the cover from the rubber terminal block and disconnect the booster coil unit output lead from the "floating" terminal and each of the three leads connected to the booster coil winding and interrupter contacts. Unlock and remove the four 2 B.A. securing nuts, then carefully lift out

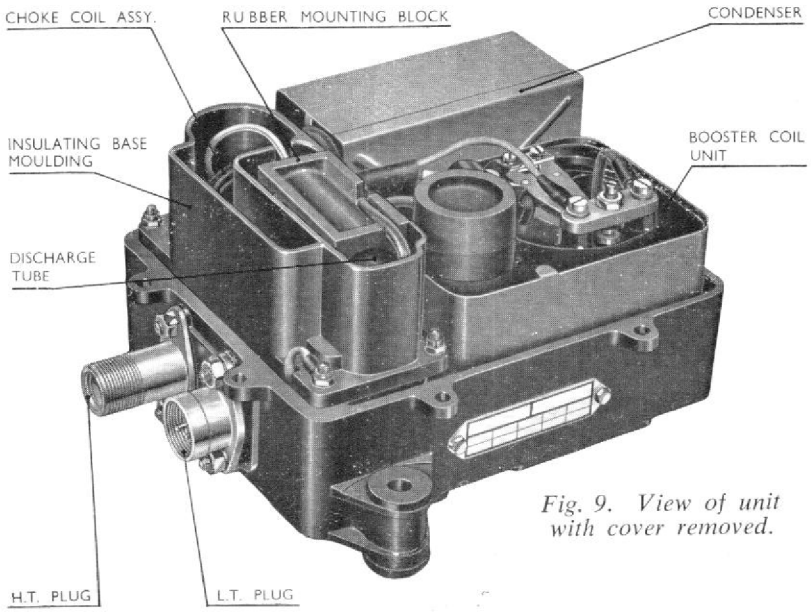

Fig. 9. View of unit with cover removed.

DEFECT DIAGNOSIS

NB.25/2

Fault	*Probable Cause*	*Recommended Action*
Low spark frequency	Low input current	Check the booster coil unit (N.111056) and re-adjust if necessary, otherwise replace. Refer to reasembly section for test instructions.
	High discharge gap voltage	Check discharge gap voltage; if high, replace discharge tube.
	Leaky capacitor ZA.4101 (N.111055/1)	Check insulation resistance with a 250 volt "Megger." The resistance should not be less than 50 megohms.
Very high spark frequency	Low discharge gap voltage	Check discharge gap voltage; if low, replace discharge tube.
	Low capacity (ZA.4101)	To make an approximate check of the capacitor value connect it in series with an ammeter (Avometer on A.C. range) across a 230 volt, 50 c.p.s. supply and measure the current flow. This should not be less than 0·4 ampere.
Continuous sparking at surface discharge plug	ZA.4101 capacitor or connecting lead "open-circuit"	Check capacitor for value and lead for any obvious break. Replace as necessary.
Discharge gap fires but surface discharge plug does not fire	"Open-circuit" surface discharge plug	Carbonise or replace plug.
	"Open-circuited" H.T. leads between discharge gap and surface discharge plug	Check leads for continuity. Repair or replace as necessary.
Spark "cutting-out" at altitude	Flash-over inside unit or H.T. outlet	Examine for obvious signs and if found replace components as necessary. Otherwise reject unit.

Booster Coil Unit (N.111056)

Fault	*Probable Cause*	*Recommended Action*
Low primary current	Incorrect armature adjustment	(*a*) Adjust armature setting. (*b*) Check pull-in current. See instructions in Reassembly section.
Severe arcing at the contacts	Primary capacitors or leads "open-circuit"	Check capacitors for correct valve (0·5 μF.) and connecting leads for continuity. Repair or replace as necessary.
Low secondary current	Booster coil output low	Replace unit.
No secondary output	Rectifiers, booster coil or leads "open-circuit"	Replace unit.
Blows fuses or input current too high	Input and primary capacitor leads incorrectly connected	Check wiring and amend if necessary.
	Capacitors "short-circuit"	Replace.
	Contacts welded	Clean or replace as found necessary.

the unit from the box assembly.

Removing the discharge tube

Remove the rubber mounting block positioned over the discharge tube and lift out the tube still connected to the choke from within the insulating base moulding. The tube can now be isolated from its connecting leads by carefully removing the two clamp securing nuts, and the connecting leads. The nuts should then be replaced and the clamp tightened up. The clamp is not to be removed under any circumstances.

To obviate the possibility of damage occurring to the discharge tube electrodes whilst releasing the connecting lead clamp it is advisable to use two spanners for this operation, i.e., one to secure the nut, the other to remove the bolt.

Removing the insulating base moulding

Prior to commencing this operation it is advisable to remove the discharge tube to prevent damage, instructions for its removal being given under the appropriate heading.

After removing the discharge tube disconnect the H.T. output lead from the terminal forming the common connection to the choke coil and resistor by removing the 4 B.A. hexagon-headed screws, spring and base washers; then remove the four 4 B.A. securing nuts, together with their base washers, and lift the insulating base moulding complete with the choke coil and resistor, away from the base assembly, carefully feeding the H.T. output lead through the slot in the moulding base.

Removing the choke coil, resistor contact spring, primary capacitors and plug and lead assemblies

Prior to dismantling any of these components it is first necessary to remove the discharge tube and insulating base moulding as detailed under the appropriate heading. Proceed then as follows:—

CHOKE COIL

Disconnect the leads of the choke coil and withdraw the coil from the moulding.

RESISTOR AND CONTACT SPRING

Remove the 4 B.A. hexagon-headed terminal and contact spring securing screw from the moulding base. This will release the contact spring and allow the resistor to be withdrawn from the moulding.

PRIMARY CAPACITORS

Unsolder the leads as necessary, making note of the connections to facilitate reassembly; then remove the two 6 B.A. cheese-head clip securing screws together with spring and base washers, in each case and withdraw the respective capacitor with clips, from the base assembly. The clips can now be removed from the capacitor.

L.T. PLUG AND LEAD ASSEMBLY

Unsolder pin "A" lead from the junction of the primary capacitors and release pin "B" lead from the "bunched" leads. Remove the two 2 B.A. nuts and locking tabs and withdraw the complete plug and lead assembly from the box assembly.

H.T. PLUG AND LEAD ASSEMBLY

Remove the two 2 B.A. nuts and locking tabs and withdraw the complete plug and lead assembly from the box assembly.

INSPECTION

All parts should be inspected to ensure that they are not damaged or distorted in any way. Rubber mouldings and rubberised ferrules should be checked for signs of deterioration, which, if found, will necessitate the renewal of the affected part.

Particular attention should be paid to the booster coil contact surfaces. If these are badly pitted or burned the assembly should be renewed. The contact faces can be stoned flat, but the minimum thickness after stoning must not be less than 0·020 inch.

L.T. and H.T. assemblies should be inspected to ensure that the pins and mating surfaces are clean and that the internal or external coupling threads are not damaged in any way.

The tension of the spring contact forming the earth connection for the discharge gap third point resistor should be checked to ensure that it will, with the discharge gap fitted, give a "positive" connection.

All internal leads and connections should be inspected and renewed where necessary.

REASSEMBLY

Contact gap setting (booster coil unit)

Where it has been found necessary to replace, or readjust, any part of the booster coil unit contact assembly, the following procedure must be adopted to ensure a correct contact gap setting.

(*a*) Assemble the moving armature only and connect the booster coil ammeter and regulating resistor, to a 24 volt D.C. supply. Slowly increase the current until the armature just pulls in and note the ammeter reading. This should occur with a current flow of 4·5 to 4·8 amperes and if not, adjust the armature spring tension and repeat the operation, continuing until the correct pull-in current setting is obtained.

To increase the current setting, flex the armature lightly away from the booster coil, i.e., increasing the spring tension.

(*b*) Assemble the fixed contact and connect the complete booster coil unit to a test circuit as shown in Fig. 10.

KEY TO FIG. 10.

A1. Moving coil ammeter (0—5A).
A2. Thermo-couple milliameter (0—100 mA).
C. 1 μF.
R. 12000 ohms ±1% 100 watt or 1600 ohms 12 watt (N.107652)

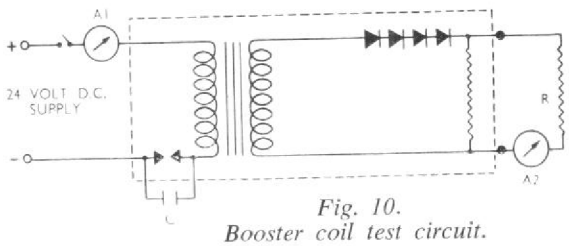

Fig. 10.
Booster coil test circuit.

Switch on the supply and adjust the contact screw to obtain a primary current of between 1·9 and 2·3 amperes. With this setting the secondary current should not be less than 40 mA. measured with a thermocouple milliammeter and a 12000 ohm resistor in circuit, or 12 mA. measured on the D.C. range of a Model 7 Avometer and a 16000 ohm resistor in circuit.

Reassembly should present no real difficulties provided reasonable care is taken, and the instructions given in this chapter for dismantling are followed in approximately the reverse order.

The discharge tube, rubber mouldings and leads should be checked to ensure that they are correctly positioned and secure.

All tabwashers should be renewed and all disturbed nuts and screw heads are to be coated with V.130/1 varnish after tightening.

After reassembly, a high energy ignition unit should be subjected to a complete test, effected in the manner described in the Testing section.

ROTAX SERVICING FACILITIES

Any unit which cannot be serviced satisfactorily by following the instructions contained in this chapter should be replaced by a new one and the original returned to the nearest Rotax Service Department or authorised service station.

When ordering replacement parts quote the correct part name and number and also the serial number of the unit for which the parts are required, together with the number of hours the parts have been in operation. This will ensure correct identification and prompt service.

The following are reproductions of Rotax Service Bulletins applicable to NB.25/2 high energy ignition units, and should be read in conjunction with the contents of this chapter.

SERVICE BULLETIN No. 175, MODIFICATION No. BC.5089

January, 1954

Introduction

This modification introduces a choke coil assembly and condensers of improved impregnation and construction. The modification need only be embodied if, during overhaul of the ignition unit, the choke coil assembly and/or condensers are to be renewed and when all stocks of the existing assemblies have been used.

Procedure

During overhaul of the ignition unit, if the choke coil assembly and/or condensers are to be renewed, with no stocks of the existing assemblies available, replace them by the appropriate new assemblies detailed in the table below.

Parts Affected		*Disposal of*	*New Part*	*Quantity*
Part Name	*Part No.*	*Affected Part*	*No.*	*Per Unit*
Choke Coil Assembly	N.106265/1	Discard†	N.106265/2	1
Condenser, 6μF.	N.111055	Discard†	N.111055/1	1
Condenser, 0·5μF.	ZA.3402	Discard†	ZA.3412	2

† *If unserviceable.*

SERVICE BULLETIN No. 176, MODIFICATION No. BC.5108

January, 1954

Purpose and Recommendation

This modification introduces (*a*) a screw having a screwdriver slot in the head for securing the tag of the 15000 ohms resistor and "D" shaped nuts for the bolts securing the cover to the box assembly, in order to facilitate assembly, and (*b*) spring washers under the stiffnuts securing the insulating base moulding in order to further improve locking. It is recommended that the modification be embodied during the next overhaul of the ignition unit, following the availability of the new items.

Procedure

During overhaul of the ignition unit, remove the hexagon-headed screw (NK.1813-L) securing the tag of the 15000 ohms resistor in the insulating base moulding and fit the new screw, Part No. N.113701 in its place. The new screw has provision for the application of a screwdriver to facilitate removal and refitting.

Unscrew the four stiffnuts securing the insulating base moulding to the box assembly and remove the nuts only. Fit a spring washer N.1378 to each stud and refit the nuts.

When refitting the cover to the ignition unit, use the "D" shaped nuts (N.113705) in place of the hexagon nuts. The nuts must be fitted to the underside, i.e., against the lugs on the box assembly.

MODIFICATION RECORD. On embodiment, record the above modification number on the modification plate of the ignition unit.

Parts Affected				
Part Name	*Part No.*	*Disposal of Affected Part*	*New Part No.*	*Quantity Per Unit*
Screw	NK.1813-L	Discard	N.113701	1
Spring Washer	—	—	N.1378	4
Nut	NK.10005-L	Discard	N.113705	8

SERVICE BULLETIN No. 200, MODIFICATION No. BC.5129

February, 1954

Purpose and Recommendation

This modification introduces an improved discharge tube assembly having pure tungsten electrodes, together with new spark gap mounting blocks and a longer clamp screw to accommodate the Ross Courtney tag on the H.T. lead. It is recommended that the modification be embodied during the next overhaul of the ignition unit, following the availability of the new parts.

Procedure

During overhaul of the ignition unit, remove the clamps and leads from the discharge tube and discard the tube, together with the rubber spark gap mounting blocks. The screw in the clamp carrying the Ross Courtney tag on the H.T. lead should be removed and replaced by the longer screw (NK.1829-L). Check that each clamp screw is provided with a spring washer (N.1378) under the head, in addition to that behind the nut.

Secure the clamps and leads to the new discharge tube (N.115983), taking care to prevent damage to the tube as the nuts are tightened.

Fit the new lower spark gap mounting block (N.116416), followed by the discharge tube (checking that the third point makes good contact with the earth spring contact) and then fit the new upper spark gap mounting block (N.116417).

For future spares requisitioning purposes, the Spare Parts List dealing with the above ignition unit should be amended as follows:—

Item 17, spark gap mounting block: alter Part No. to N.116416.

Item 18, discharge tube: alter Part No. to N.115983.

Item 19, clamp: note that the clamp screws are now 1 off NK.1825-L and 1 off NK.1829-L. 4 off spring washer N.1378 are used and not 2 off as stated.

Item 20, spark gap mounting block: alter Part No. to N.116417.

MODIFICATION RECORD. On embodiment, record the above modification number on the modification plate of the ignition unit.

Parts Affected		*Disposal of Affected Part*	*New Part No.*	*Quantity Per Unit*
Part Name	*Part No.*			
Discharge Tube Assembly	N.79882	Discard	N.115983	1
Spark Gap Mounting Block (Upper)	N.109493	Discard	N.116417	1
Spark Gap Mounting Block (Lower)	N.109494/1	Discard	N.116416	1
Clamp Screw	NK.1825-L	Discard 1 OFF	NK.1829-L	1

SERVICE BULLETIN No. 248, MODIFICATION No. BC.5154

May, 1954

Introduction

This bulletin introduces a new type of choke coil in the ignition unit to increase the spark efficiency. This modification need only be embodied if, during overhaul, the choke coil is to be replaced and when all existing stocks of the old type choke coil have been used. Future replacements should be ordered under the new part number listed in the table below.

Part Affected		*Disposal of*	*New Part*	*Quantity*
Part Name	*Part No.*	*Affected Part*	*No.*	*Per Unit*
Choke Coil	N.106265/2	Discard	N.117472	1

SERVICE BULLETIN No. 471, MODIFICATION No. BC.5251

October, 1955

Introduction

This modification introduces a stainless steel screw of increased length to replace the existing screw, which secures the junction of the discharge coil, the 15000 ohms resistor and the H.T. output terminal. This change is recommended to facilitate assembly of the unit.

This modification need only be embodied if, during overhaul, the part listed in the table below has to be renewed and all stock of spares have been used. Future spares should be ordered under the new part number as detailed in the table below.

Part Affected		*Disposal of*	*New Part*	*Quantity*
Part Name	*Part No.*	*Affected Part*	*No.*	*Per Unit*
Screw	N.113701	Discard†	N.113701/1	1

† *If unserviceable.*

SERVICE BULLETIN No. 514, INSTRUCTION LEAFLET No. 47

January, 1956

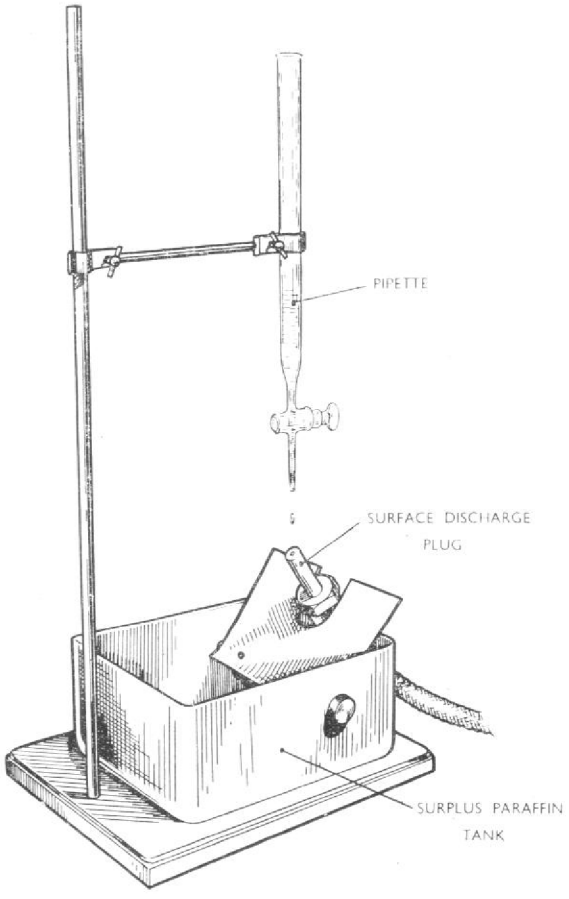

Fig. 11. Drip test rig alternative to NT.1813

In the instructions for the testing of these units, (Rotax Service Leaflet No. S.L.51 Revised, February, 1955) a drip test rig is illustrated for testing the units, Fig. 7. This test rig was designed for use in workshops where wide cut fuels are used and where the presence of vapour from these fuels would constitute a danger from exposed sparking. In workshops where wide cut fuel is not used, the less elaborate test rig illustrated in Fig. 11, may be used provided the apparatus is kept away from inflammable material and its use does not infringe local fire regulations.

SERVICE BULLETIN No. 541, MODIFICATION No. BC.5341

March, 1956

Introduction

This modification introduces an improved high voltage condenser to eliminate the possibility of breakdown in service. When servicing these units, all condensers, part number N.111055/1 should be examined and those bearing serial numbers 12301 to 16296 inclusive are to be replaced by condensers of part number N.111055/2.

The change of part number should be recorded in the appropriate parts list.

Procedure

If, during overhaul, the condenser assembly, part number N.111055/1, is found to have a serial number in the range quoted on left, replace it with a condenser part number N.111055/2 or a condenser of the old part number outside this range.

ENSURE THAT THE CONDENSER TO BE REMOVED IS FULLY DISCHARGED.

MODIFICATION RECORD. On embodiment, record the number of this modification on the modification plate of the unit.

Special Tools

There are no special tools, other than the normal overhaul tools, required to embody this modification.

Part Affected		*Disposal of*	*New Part*	*Quantity*
Part Name	*Part No.*	*Affected Part*	*No.*	*Per Unit*
Condenser Assembly	N.111055/1	Discard†	N.111055/2	1

† *If unserviceable.*

SERVICE BULLETIN No. 678, MODIFICATION No. BC.5455

October, 1956

Introduction

This modification introduces new rubberised ferrules to the ignition unit with the metal parts in steel. The metal in the existing ferrules is of brass and tends to crush when the securing bolts are tightened.

It is recommended that this modification be embodied at the next overhaul of the unit after the new part has become available.

The new part number should be recorded in the Spare Parts List.

Special Tools

There are no special tools, other than the normal overhaul tools, required to embody this modification.

Part Affected		*Disposal of*	*New Part*	*Quantity*
Part Name	*Part No.*	*Affected Part*	*No.*	*Per Unit*
Ferrule	N.111362	Discard	N.133241	6

Procedure

During overhaul of the unit, remove the six ferrules fitted to the three fixing holes on the case of the unit and fit six new ferrules N.133241.

During transit of the H.E. Ignition Unit a wire loop should be fitted through the ferrules in order to obviate the possibility of the ferrules becoming lost.

MODIFICATION RECORD. After the embodiment of this modification record the number 5455 on the modification plate.