C. P. & S. 77671-8.

RESTRICTED

AP 5275 F
BOOK No. 1
CHAP. No. 2

TITLE

PACITOR

TYPE

SYSTEM COMPLETE

PART No.

FITTED TO

Vampire

RESTRICTED

1. RECTIFIER UNIT

a. Before commencing to check the scale length of the Rectifier Unit it is necessary that the 'E' and 'F' adjusters be set to the centre of their electrical traverse.

b. Remove lid of rectifier unit.

c. Empty Adjustment. Using a Multimeter connect the probes to Pin A of the 3 pin plug and the RED terminal on the rectifier element. Check the range of the potentiometer, 0-100 ohms, and set the potentiometer to the centre of its electrical traverse at 50 ohms.

d. Full Adjustment. Using a Multimeter connect the probes to Pins A and B of the 3 pin plug. Check the range of the potentiometer to the centre of its electrical traverse at 800 ohms.

2. TEST SET

a. Using cable GP 742/074/1 (200 pf) and Junction Unit GP 30694 connect RECTIFIER co-axial plug on Test Set to co-axial plug on Rectifier Unit under test.

b. Connect 3 pin plug INDICATOR IN on test set to 3 pin plug on Rectifier Unit.

c. Connect 2 pin plug A.C. OUT on test set to 2 pin plug on Rectifier Unit.

d. Turn SET INDICATOR POINTER knob fully clockwise.

e. Turn switch A to OUTER SCALE.

f. Turn switch B to VAMPIRE 644/032.

g. Turn switch C to F CAP and wait 5 minutes.

h. Turn switch C to E CAP and allow 2-3 minutes to elapse before varying the potentiometer directly under E on rectifier with lid to bring pointer of meter 'A' on to zero.

j. Turn switch C to F CAP position and vary the potentiometer directly under F on rectifier unit lid to bring pointer of meter 'A' to the Mk 5A position.

k. Check the Zero and Mk 5A positions again.

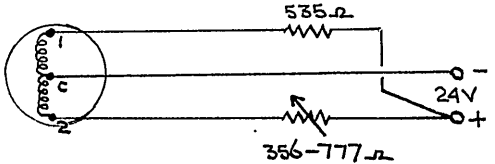
l. Connect cable GP 742/074/1 into the remaining two connections on rectifier in turn and without adjusting E and F check that meter 'A' reads zero and Mk 5A respectively.

3. FUEL GAUGE

a. CONNECT 28 V D.C. FROM D.C. 'IN' TO SUPPLY.
B. FIT GAUGE ON THREE PINS ON TEST SET.
C. SET BOTTOM SWITCH TO ~~0 0 0~~ EMPTY 'R' AND SWITCH ON.
D. SELECT 'SLOW' AND ~~SLOW~~ TURN KNOB AND CHECK FULL SCALE MOVEMENT.
E. SELECT FULL 'R' AND CHECK FULL & EMPTY, TOLERANCE PLUS/MINUS
F) CYCLE AND COMPARE PAPER WORK

CALIB (LBS)	RESIST (Ω)
0	777
5	704
10	623
15	518
20	434
25	382
27	356

TOL ± 1 POINTER WIDTH



1. MAIN COMPONENTS

SECT/REF	PART NO.	
6A/1998	GP 512/001	Power Unit
6A/4333	GP 250/516	Fuel Gauge
6A/4991	GP 6444/032/2	Rectifier Unit

2. CO-AXIAL CABLES

SECT/REF	PART NO.	CAPACITANCE (Pf)
6A/2829	GP 712/079	56 - 61
6A/2830	GP 712/080	215 - 220
6A/2831	GP 733/001	40 - 45
6A/2832	GP 733/003	145 - 150
6A/2833	GP 733/002	93 - 98

3. CONNECTORS

SECT/REF	PART NO.	CAPACITANCE (pf)
6A/2216	GP 912/003	3
10H/19397		5

4. TANK UNITS

SECT/REF	PART NO.	CAPACITANCE (pf)	LOCATION
6A/2820	GP 352/057	80 - 86	Port & Stbd
6A/2821	GP 152/058	98 - 106	Port & Stbd
6A/2822	GP 352/059	147 - 159	Main

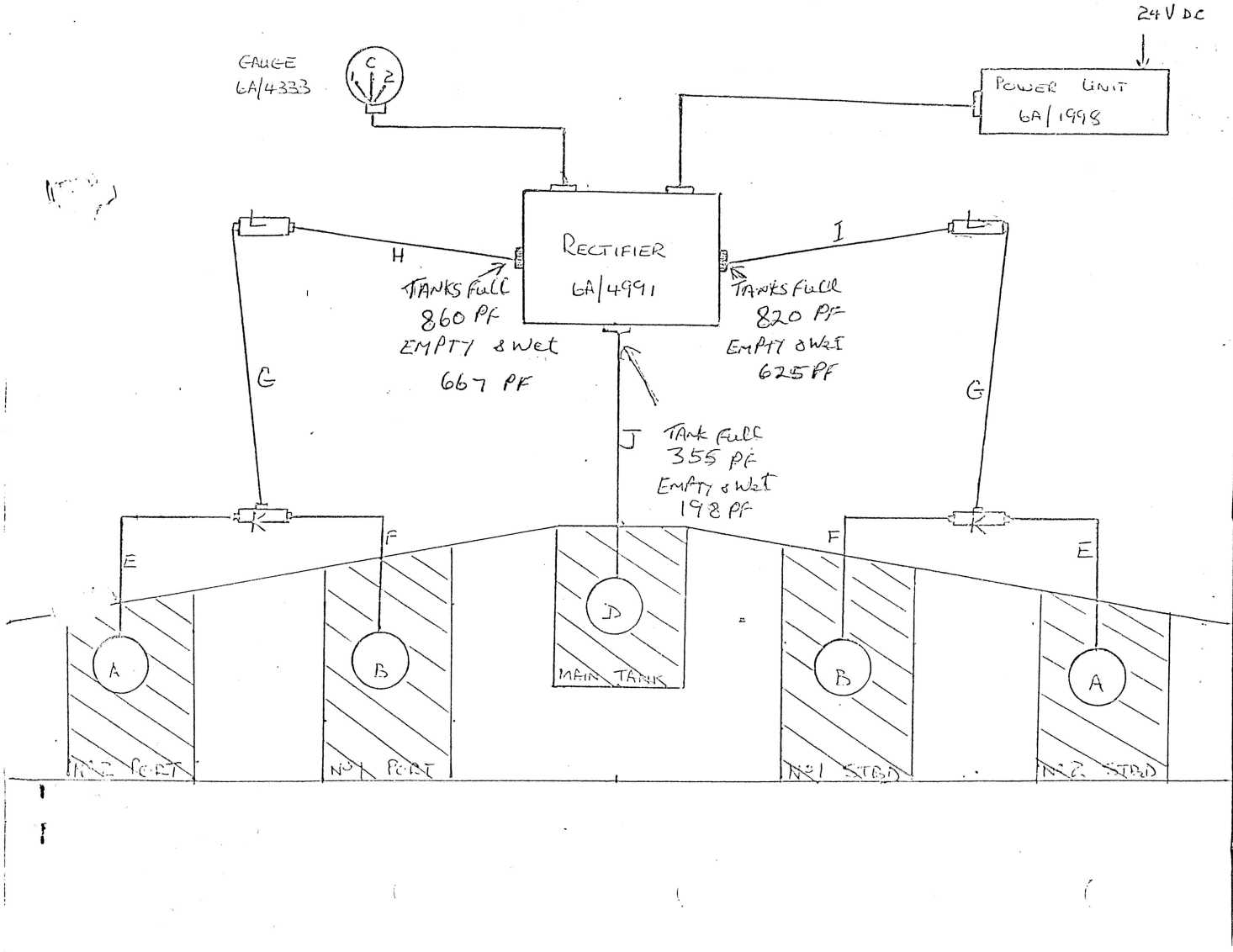
5. OVERALL CAPACITY

Tanks Empty	Main	202	
	Stbd	615	
	Port	667	Total 1484 pf
Tanks Full	Main	355	
	Stbd	820	
	Port	860	Total 2035 pf

6. GENERAL

Co-axial Cable Uni-Radio 31 17.0 pf/Foot.
Tolerance when testing tank units and cables together should be within $\pm$ 4% of total pf value.

VAMPIRE FUEL SYSTEM (PACITOR)



CODE	CAPACITANCE	ITEM	SEC/REF
A	102 pf	TANK UNIT	6A/2821
B	81 pf	" "	2820
D	153 pf	" "	2822
E	220 pf	CO-AXIAL	6A/2830
F	61 pf	" "	2829
G	45 pf	" "	2831
H	50 pf	" "	2832
I	98 pf	" "	2833
J	49 pf	" "	2824
K	3 pf	3 WAY J.B	6A/2916
L	5 pf	SOCKET CONNECTOR	10H/19397 or 1555

Chapter 14

(Completely revised)

FUEL CONTENTS GAUGES, PACITOR, Mk. 5 AND 5A

LIST OF SUB-CHAPTERS

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LIST OF ILLUSTRATIONS

Introduction

1. Fuel contents gauges, Mk. 5 and 5A are designed to give a continuous indication of the quantity of fuel remaining in an aircraft tank or tanks. Gauge readings are considerably less affected by changes in aircraft attitude than earlier types which employ float transmitters. The gauges operate off a 28V (nominal 24V) d.c. supply.

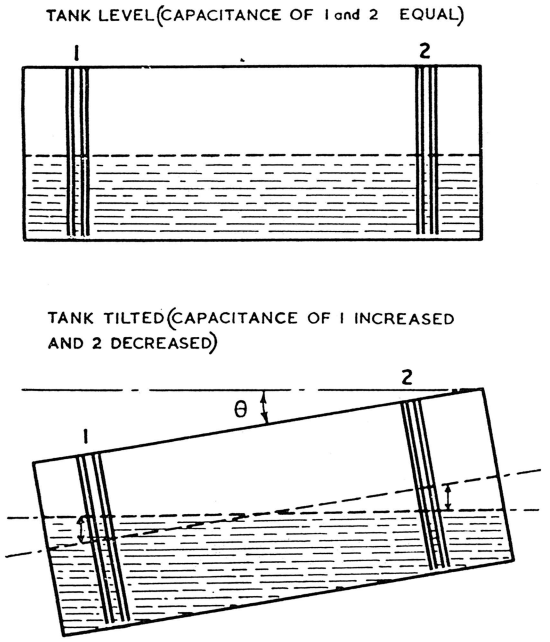

Fig. 1. Action of tank units with change in aircraft attitude or fuel levels

Principle

2. The basic principle used in this type of gauge is that of a variable electrical capacitance, the variation being caused by changes in the dielectric between the plates of a capacitor. One or more tank units, each consisting of two or three concentric metal tubes, with an air gap between the tubes, are installed in the aircraft fuel tank. The fuel/air ratio between the tubes governs the total capacity of the unit.

3. The tank installation shown in fig. 1 consists of two units, so positioned, that if a change in aircraft attitude affects the fuel level and reduces the capacitance of one unit, the capacitance of the unit at the opposite end of the tank will be increased, therefore, the resultant total capacitance of the tank circuit will be a true measure of the quantity of fuel.

Components

4. The basic components required to operate the system are:—

(1) A power unit: to convert the 28V d.c. supply to 70V 19·1 kc/s a.c.
(2) A tank unit: to detect changes in fuel quantity.
(3) A rectifier unit: to provide two direct current outputs (one output being fixed and the other variable) and to house the Empty and Full calibration adjusters.
(4) An indicator: to compare the two output currents from the rectifier unit and display the result on a dial calibrated in terms of either gallons or pounds of fuel.

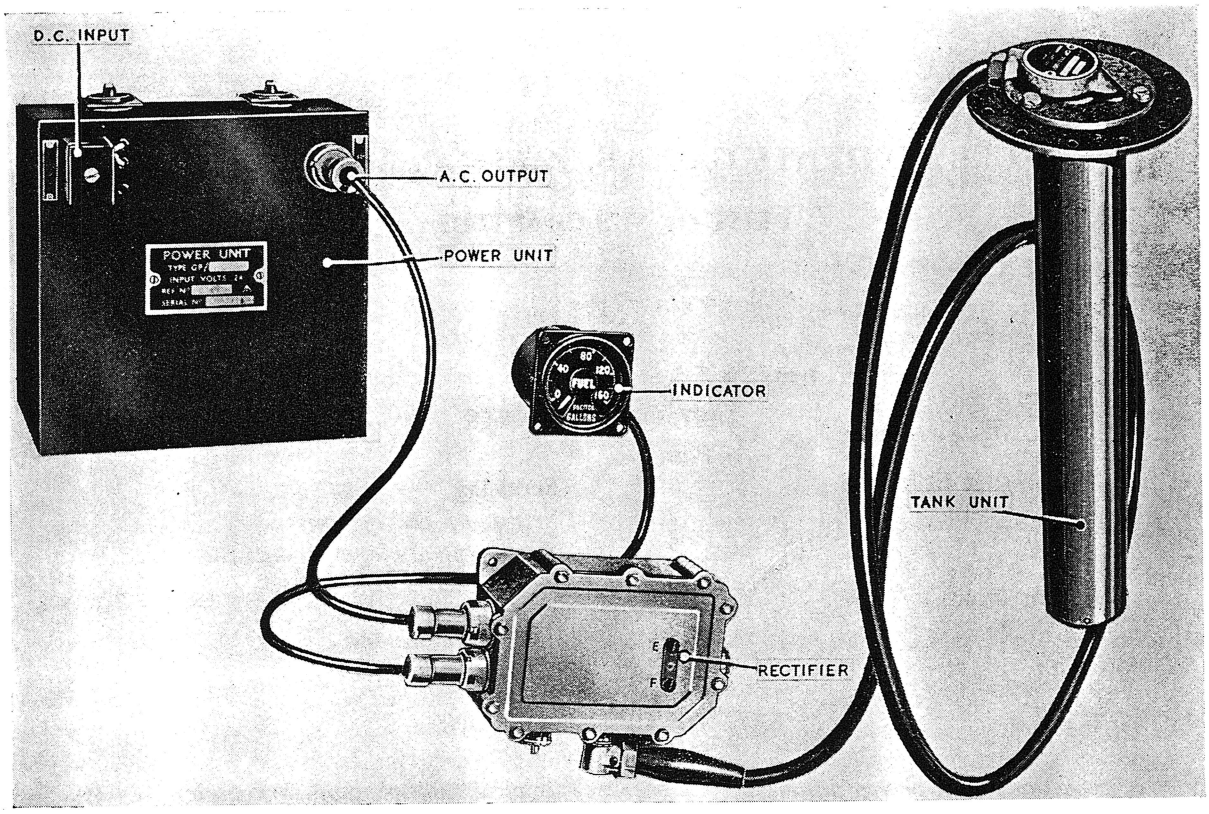

Fig. 2. Typical system components

5. In addition to the components detailed in para. 4, relays are employed when a single indicator is required to provide more than one set of readings. The relays are either embodied in the rectifier unit (i.e. relay/rectifier unit) or combined with the Empty and Full adjusters in a separate case (i.e. relay/adjuster unit).

TYPICAL SYSTEM

6. The typical installation shown in fig. 3 has three tank units, one being fitted in each tank; this type of installation is suitable when tanks are fairly small and changes of aircraft attitude have little affect on the fuel levels. When only one unit per tank is fitted it is usually positioned centrally in the tank.

7. The three tank units are connected to the rectifier unit by coaxial cables. These cables can either be standard size or of the miniature type, depending upon the requirements of a particular installation. Fig. 4 shows various typical cables and junction units employed in the systems.

OPERATION

8. The functional diagram of a typical system is shown in fig. 5. When the d.c. supply to the system is switched on the power unit commences to operate and, after the valve warming up period of approximately 30 sec., provides an output of 19·1 kc/s at 70V a.c.; this output is fed to the rectifier unit. The rectifier unit comprises two basic circuits, control and deflection.

Control circuit

9. The circuit consists of the primary winding of a control transformer connected in series with a fixed control capacitor. The amplitude of the current in the primary winding of the transformer is fixed. Transformed output from the secondary winding is applied to a full-wave bridge rectifier circuit. The resultant fixed d.c. output is fed through the control coil in a moving coil ratiometer indicator and sets up a counterclockwise torque which tends to maintain the indicator pointer on the bottom stop.

Deflection circuit

10. The deflection circuit consists of the primary winding of a transformer connected in series with the variable capacitance of the tank circuit. As the amount of fuel in the tank, or tanks, varies the capacitance of the associated tank circuit varies and so does the amplitude of the current in the primary winding of the deflection transformer. The transformed output from the secondary winding is applied to a full wave bridge rectifying circuit. The resultant varying d.c. output is fed through the deflection coil of the moving coil ratiometer indicator and sets up a clockwise torque which tends to maintain the pointer against the dial top stop.

11. The balance of the torques set up by the control and deflection currents determines the position of the pointer on the dial.

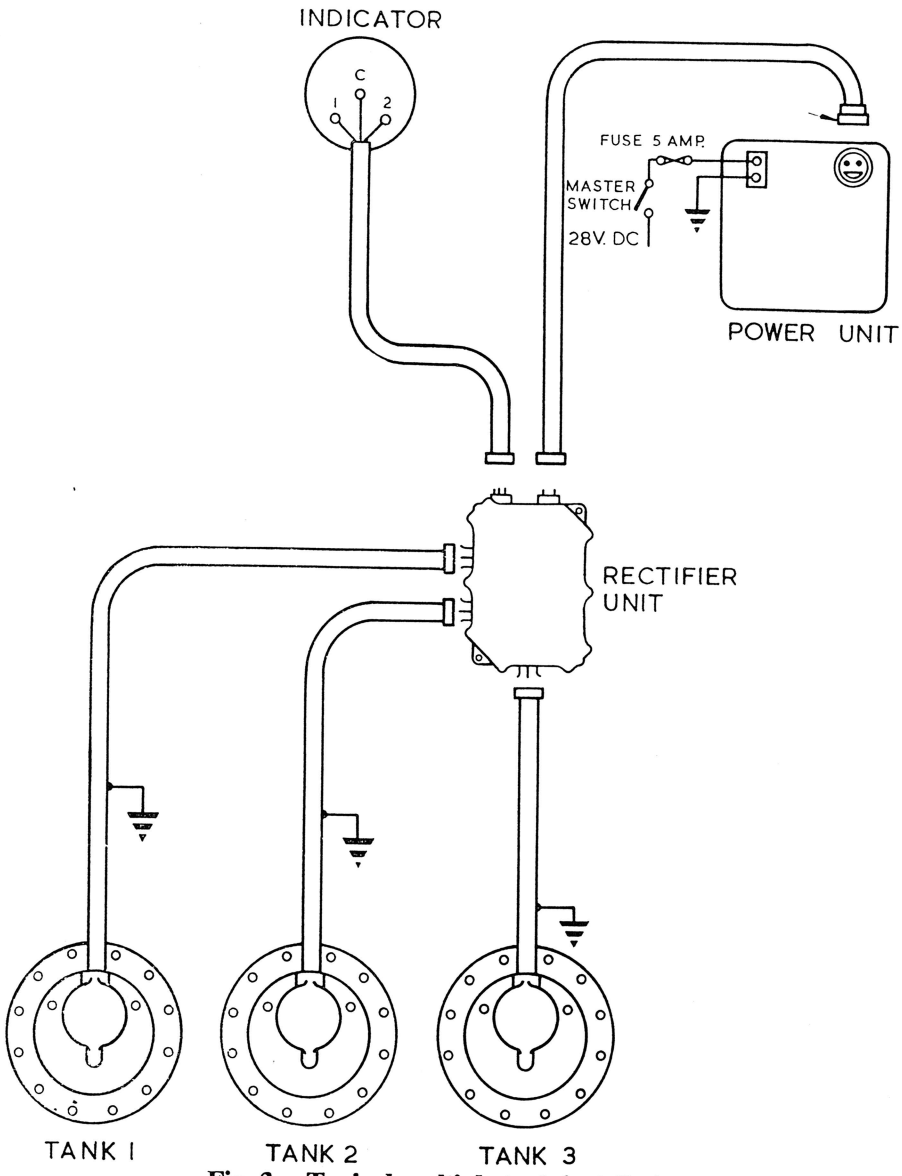

Fig. 3. Typical multiple tank installation

SERVICING

Setting-up the systems

12. Although the theory of setting-up Pacitor, Mk. 5 and 5A systems, is basically the same in all installations, the procedures adopted vary considerably, depending upon aircraft type. When a component has been changed that will affect the Empty and Full calibration of a system, or if the serviceability of the system is in doubt, the setting-up procedure detailed in the appropriate aircraft air publication should be complied with.

13. The Mk. 5 and 5A systems are designed to function with power supplies varying between 22-29V d.c., but errors occur if the system is set-up with the supply voltage different from the normal, i.e. 28V, therefore, ensure that a 28V d.c. supply is provided. Before commencing to set-up the system allow a stabilizing period of 20 minutes to elapse; failure to allow this stabilizing period can cause errors due to power unit drift.

Testing faulty components

14. If a main component in an installation is believed to be faulty the item should be dealt with in accordance with the servicing instructions detailed in the appropriate sub-chapter.

Testing cable assemblies

15. If a coaxial cable, junction box or tank unit connector is believed to be the cause of a fault the item should be tested as follows.

Insulation test

16. Using an insulation tester, Type C, Ref. No. 5G/152, check between the assembly centre (live)

connection and earth; the minimum insulation resistance allowed is 50 megohms.

Capacitance test

17. (1) The equipment to be used can be any one of the three Pacitor Mk. 5 and 5A test sets in service, i.e. Ref. No. 6C/962 (R.A.F.), 6C/964 (R.N.) or 6C/1202 (Valiant).

(2) Connect a 28V d.c. supply to the D.C. IN terminals of the test set.

(3) Connect junction unit GP30694 to the coaxial plug marked CAPACITY on the test set.

(4) Note the part number of the item to be tested and refer to the appropriate aircraft air publication to obtain the capacitance value of the item (this information is usually tabulated in the instrument section of the aircraft publication).

(5) Connect the item to be tested to the appropriate plug of the junction unit GP30694.

(6) Set switch C on the test set to the nearest position below the noted capacitance of the item under test (in most cases switch C will be at its minimium setting).

(7) Press FREQUENCY AND CAPACITY switch and note the reading on meter A.

(8) Add the reading on meter A to the setting on switch C (if other than minimum setting). The result is the checked capacitance of the item under test, this figure should be within the tolerance detailed in the aircraft publication.

Note . . .

The capacitance of junction unit GP30694 is allowed for in the test set calibration. If any other cables are employed to connect an item under test to the test set, the capacitance of the cable used must be determined and deducted from the reading on meter A in order to obtain the correct value of the item.

Fault finding

18. Apart from pilot's reports, attention is usually drawn to faults in a system by the fuel contents indicator either reading below zero, full scale deflection, or by incorrect readings when the tanks are refuelled. Table 1 lists the more usual causes of faults in a system, the table is only intended to give general guidance. Unless a fault is obvious it is suggested that the probable causes should be investigated in the order shown in the table.

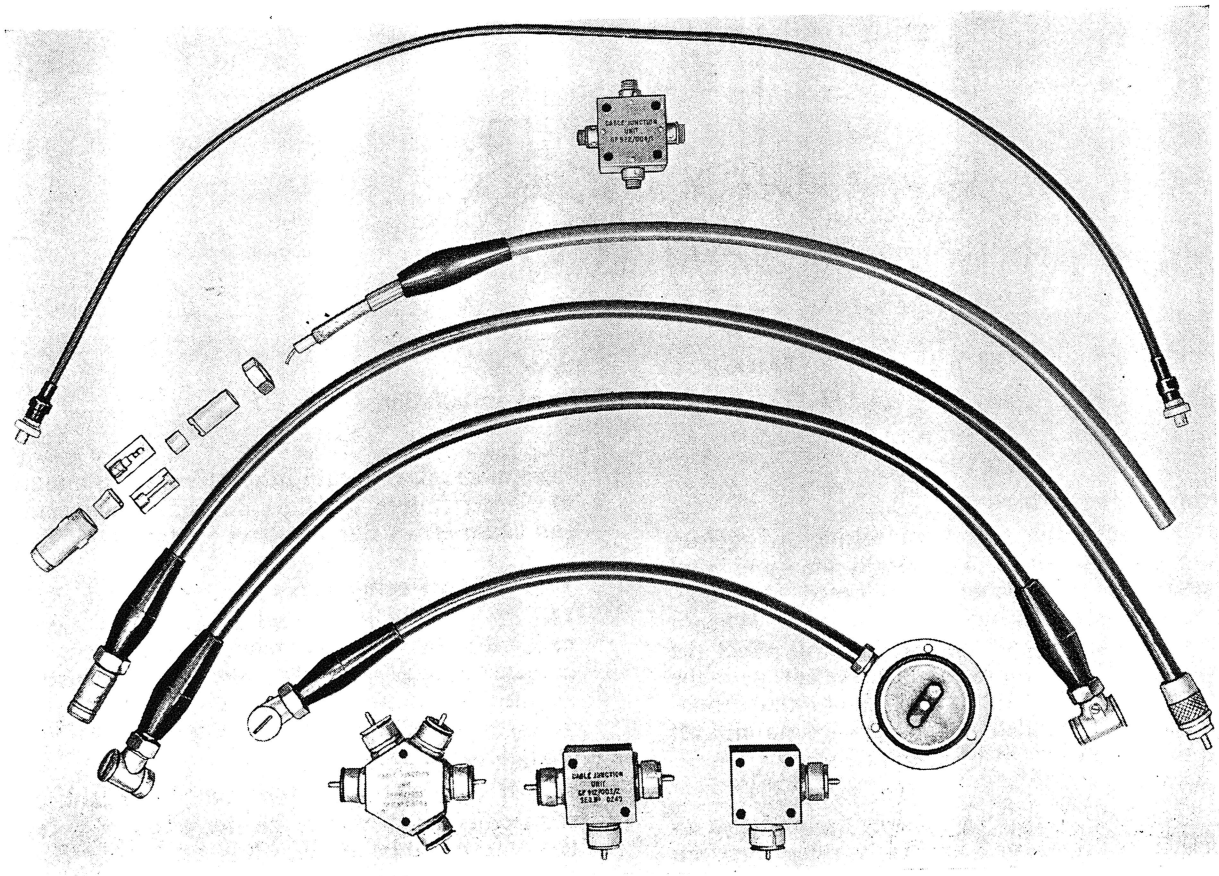

Fig. 4. Cable assemblies and junction units

Table 1

Probable causes of faults

Fault	Probable cause
Fuel contents indicator reads below zero or reads less than the known contents.	(1) Blown fuse in d.c. input to power unit, or if power unit part number has suffix /9 or above, blown 2A fuse on inside of cover. (2) Failure of power unit vibrator, valve, etc. (3) Faulty deflection circuit in rectifier unit or relay rectifier unit. (4) Open circuit in deflection circuit of indicator or cables between rectifier unit and indicator. (5) Open or short circuit in coaxial cables of tank circuit. (6) Water in tank or sludge deposit between tubes of tank unit or units.
Fuel contents indicator reads full scale deflection or reads higher than the known tank contents.	(1) Faulty control circuit in rectifier or relay rectifier unit. (2) Open circuit in control circuit of indicator or cables between rectifier unit and indicator.

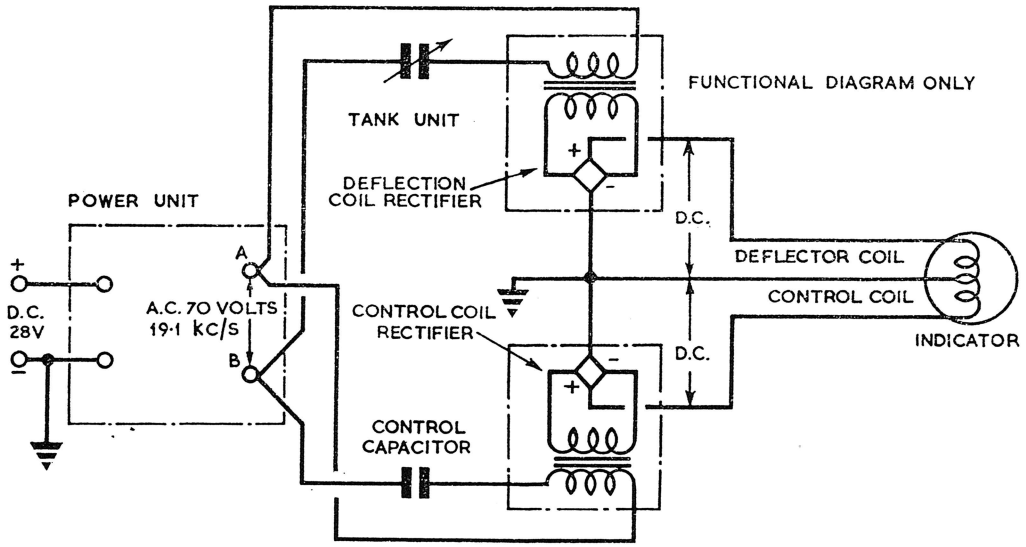

Fig. 5. Functional diagram

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Chapter 14A

POWER UNITS

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Introduction

1. Power units employed with the Pacitor Mk. 5 and 5A fuel contents systems convert a 28V d.c. input to a 70V 19·1 kc/s a.c. output. General information on power units is detailed in this chapter, specific information on a particular type of unit is detailed in the appropriate appendix to the chapter.

DESCRIPTION

2. A typical power unit (*fig.* 1 *and* 2) comprises the following main components:—

(1) A reed vibrator: to provide pulsating d.c. for the primary winding of (2).

(2) Vibrator transformer: to provide an h.t. output to a Hartley oscillator circuit.

(3) Oscillator valve: to maintain oscillations in the Hartley circuit.

(4) Output transformer: to provide an output of 70V 19·1 kc/s to the fuel contents system rectifier unit.

3. In addition to the main components the unit includes various capacitors, chokes and resistors. All the components are mounted on a chassis secured to the inside of the lid of an aluminium case. To gain access to the components, remove the four screws holding the lid in position (one screw located midway along each edge of the lid) and lift the complete assembly clear of the case. The case has holes drilled in the top and bottom to provide ventilation. Protruding through the case are three rubber antivibration mountings. The overall dimensions of the unit are $7\frac{1}{4}$ in. by $8\frac{3}{4}$ in. by 4 in.

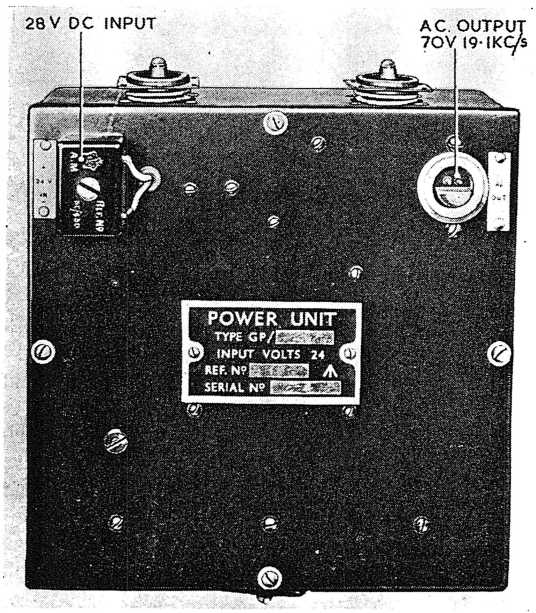

Fig. 1. Typical power unit

OPERATION

Power pack

4. When the supply to the fuel contents system is switched on 28V d.c. is applied to the power unit via the two-way terminal block (*fig.* 3). The positive supply is fed through a fuse to the drive coils of a Type 18 reed vibrator and to the centre tap of the primary winding of transformer T.1. An anti-radio interference filter (L2, C2, C3 and C4) is inserted in the positive line.

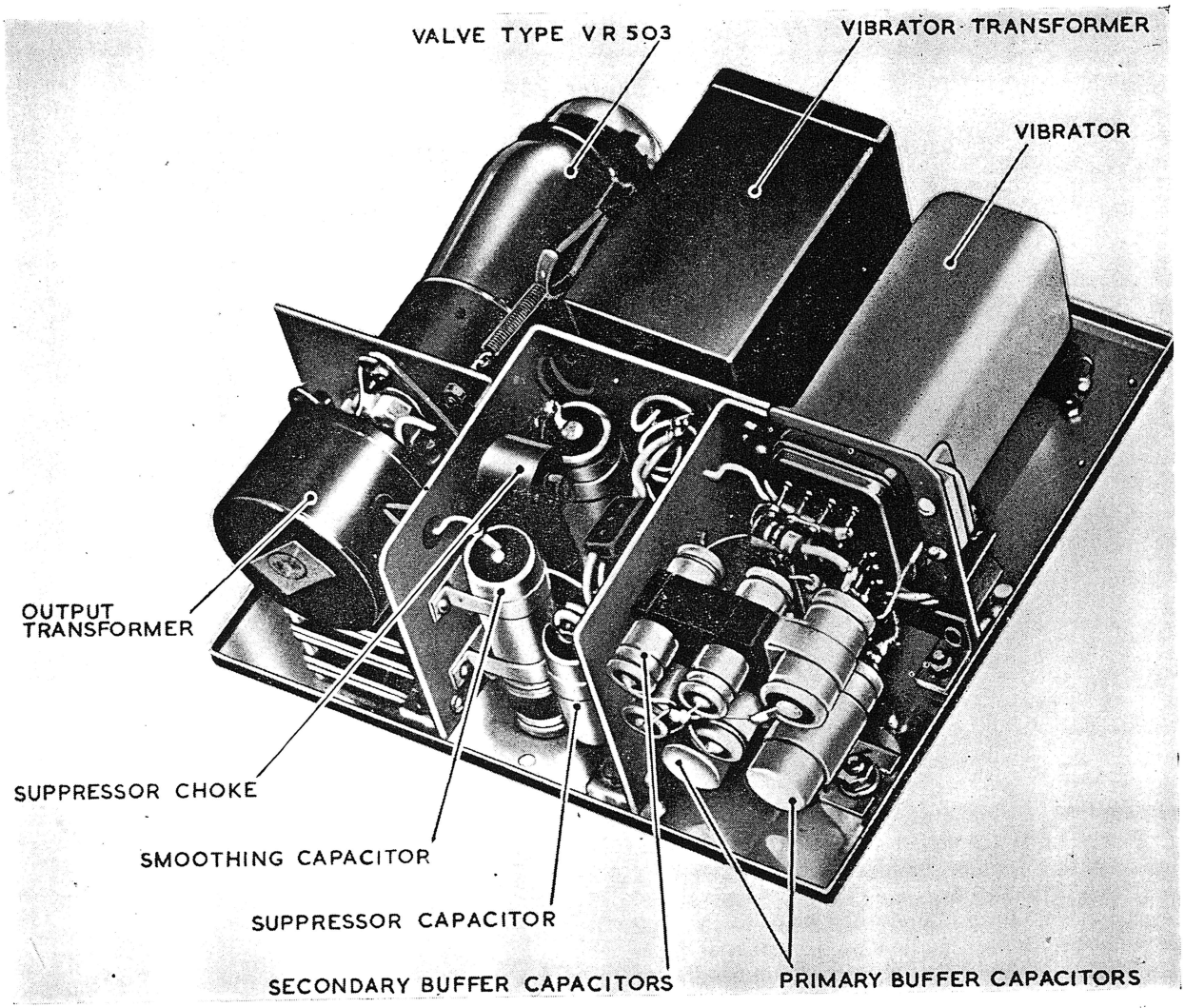

Fig. 2. Internal view of typical power unit

5. Immediately the drive coils of the vibrator become energized the vibrator reed is attracted to the coils and in so doing breaks the drive contacts, the drive coils become de-energized and the reed returns under spring tension to remake the drive contacts; the reed thus vibrates. Spark suppression for the drive contacts is provided by C5 and R5.

6. As the reed vibrates the contacts associated with primary winding of T1 make and break, alternately allowing direct current pulses to flow in each half of the primary winding. The pulses in the primary induce currents in the secondary winding, these currents are fed back to the vibrator reed via a second set of contacts operating in synchronisation with the primary pulses. The action of feeding back the secondary currents to the reed, and so to earth, enables the centre tap of the secondary winding of T1 to be held constantly at approximately 265V d.c. This voltage provides the h.t. supply to the Hartley oscillator circuit via a ripple smoothing circuit comprising L3, C12 and C13.

7. A primary winding buffer stage comprising capacitors C6 and C7 is inserted between the vibrator contacts and earth. A further buffer stage comprising capacitors C8 to 11 and resistors R1 and R2 is inserted between the secondary winding contacts and earth. The purpose of these buffer stages is to minimise vibrator contact deterioration; this is achieved by allowing the currents, derived by the flux collapsing when the contacts are changing over, to charge the capacitors and so cut down the rate of flux collapse which would otherwise be rapid and cause contact arcing. The heater supply for V1 is 28V d.c. and is fed via a radio frequency filter L1.

Hartley oscillator

8. The oscillator is a series fed Hartley circuit. The primary winding of the output transformer T2 is parallel tuned to a frequency of 19·1 kc/s by capacitor C14. To maintain oscillations, positive feedback from anode to grid of the tetrode valve V1 is applied via a d.c. blocking capacitor C15 and resistor R3; R4 is the grid leak and C16 provides decoupling. An output of 70V, 19·1 kc/s is provided by the secondary winding of T2 and is fed to a 2-pole plug on the lid of the unit.

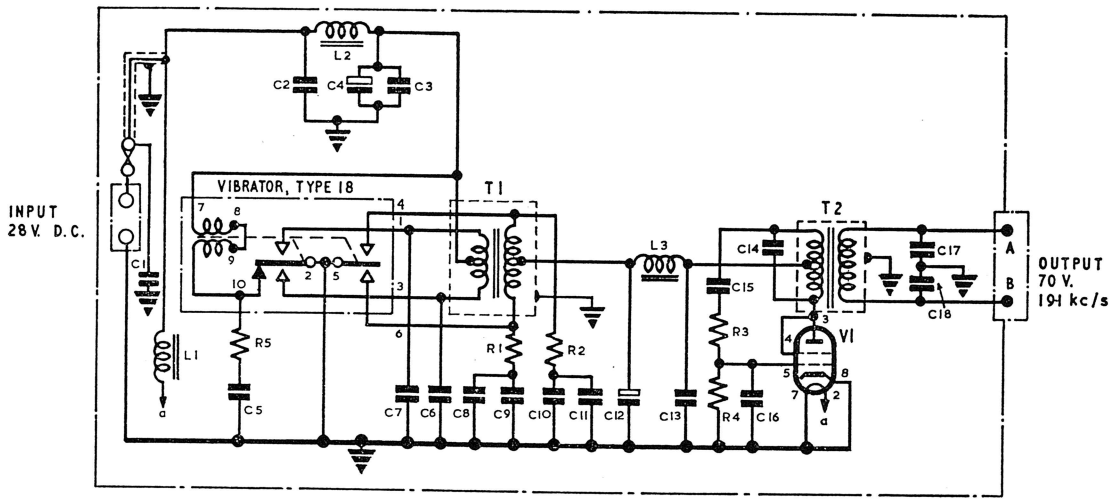

Fig. 3. Circuit diagram of typical power unit

INSTALLATION

9. Before installing a power unit refer to the appropriate aircraft air publication. After installation of a power unit the contents gauges should be checked for correct operation with 28V d.c. applied to the system.

SERVICING

10. If the serviceability of a power unit is in doubt, connect a 28V d.c. supply to the IN terminal block on the lid, note that the vibrator operates. If the vibrator fails to operate and the last suffix of the manufacturer's part number is /10 or above, remove the lid (*para.* 3) and check that the 2A fuse (situated behind the vibrator) is intact; renew fuse as necessary. If the fuse continually blows or if the power unit has a suffix /9 or below then the unit should be disposed of in accordance with the current service instructions.

11. Having ascertained that the vibrator operates, the standard serviceability test detailed in the appropriate appendix to the chapter must be applied. If a power unit fails to meet the requirements of its standard serviceability test the unit should be disposed of in accordance with the current instructions.

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Appendix 1

POWER UNITS, TYPE GP512/001 AND 002

Introduction

1. Power units, Type GP512/001, Ref. No. 6A/1998 and GP512/002, Ref. No. 6A/3507, are capable of supplying power for up to three indicators and rectifier units in a system. The only difference between the two types is that the 001 has a Mk. 3 a.c. output plug and the 002 has a Mk. 4 a.c. output plug.

2. The description, operation, installation and servicing detailed in the chapter apply to these power units. Fig. 1 shows the circuit component values for the units.

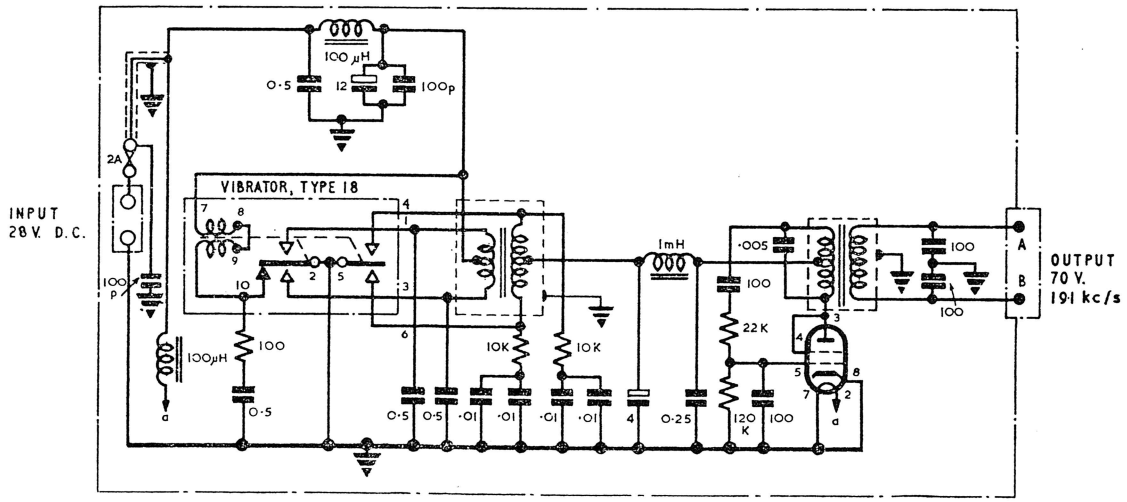

Fig. 1. Circuit diagram of power units, Type GP512/001 and 002

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Appendix 1A

STANDARD SERVICEABILITY TEST

for

POWER UNITS, TYPE GP512/001 AND 002

Introduction

1. The tests detailed in this appendix are to be applied to the power units before they are installed in an aircraft, at any time that serviceability is in doubt and at the appropriate inspection periods at Equipment Depots.

TEST EQUIPMENT

2. The following test equipment will be required:—

(1) Pacitor Mk. 5 and 5A test set; there are three types of test sets in service, any one of which can be used for testing power units:—

Ref. No. 6C/962 (R.A.F.) (*A.P.1275T, Vol.* 1, *Sect.* 5, *Chap.* 3).
Ref No. 6C/964 (R.N.) (*A.P.1275T, Vol.* 1, *Sect.* 5, *Chap.* 7).
Ref. No. 6C/1202 (Valiant) (*A.P.1275T, Vol.* 1, *Sect.* 5, *Chap.* 8).

METHOD OF TEST

3. (1) Connect a 28V d.c. supply to the test set D.C. IN terminals.

(2) Using cable GP30900, connect D.C. OUT terminal block on the test set to the d.c. terminals on the power unit under test.

(3) Using cable GP30978/2 for the type GP512/001 power unit, or cable GP32271 for the type GP512/002, connect A.C. OUT on power unit under test to A.C. IN on the test set.

(4) Turn test set switch C to FREQ. EXT. P.U.

(5) Run the power unit for 15 minutes before commencing tests.

TESTS

Volts d.c.

4. When switch A on the test set is turned to VOLTS D.C. the reading on meter B must be within the tolerance arc marked VOLTS D.C.

Amps d.c.

5. When switch A is turned to AMPS D.C., the reading on meter B must be within the tolerance arc marked AMPS D.C.

Volts a.c.

6. When switch A is turned to VOLTS A.C., the reading on meter B must be within the tolerance arc marked VOLTS A.C.

Frequency

7. Set switch C to FREQ. EXT. P.U., operate the FREQUENCY CAPACITY switch. The reading on meter A must be within the orange band.

Chapter 14B

RECTIFIER UNITS

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Introduction

1. The basic rectifier unit in a Pacitor Mk. 5 and 5A system has two main functions, these are:—

(1) To convert the variable capacitance of the tank circuit, or circuits, and so provide a d.c. output to the deflection coil of a fuel contents indicator.

(2) To provide a fixed reference d.c. output to the control coil of a fuel contents indicator.

2. In addition to the two main functions, certain types of rectifier units are fitted with adjusters to enable the fuel contents system to be calibrated at Empty and Full; also certain types are fitted with relays to enable one fuel contents indicator to read the separate contents of a number of tanks, or the summated contents of all the tanks, as determined by selector switches in the cockpit.

3. This chapter deals with rectifier units generally, specific information on a particular type will be found in the appropriate appendix to the chapter.

DESCRIPTION

4. The typical rectifier unit described here (*fig.* 1 *and* 2) is of the relay/rectifier type and comprises all of the stages which will be encountered in various types of rectifier unit (*para.* 2), i.e. basic rectifier stage, relay stage and adjuster stage.

5. The unit is constructed on three decks, each deck being held in position by screws passing through the fibre end panels. Fig. 1 shows the upper deck complete with four Empty and Full adjuster potentiometers, two tapped holes in the top deck receive screws passed through the top casing and secure the whole assembly to the top casing. The centre deck provides support for two relays and the lower deck (*fig.* 2) has all of the basic rectifier components mounted on either side of it.

6. Protruding through the sides of the top half of the case are three Mk. 4 plugs and three miniature coaxial plugs, these provide circuit connections as shown in fig. 1. Protruding through the top of the case are the slotted shafts of the Empty and Full adjusters, these shafts are passed through grommets, which in addition to providing an airtight seal, also prevent the shafts vibrating from their set positions. Also protruding through the top of the case is the spindle of an air trimmer capacitor, similarly sealed by a grommet; this trimmer capacitor is set up during manufacture or after overhaul and its position must not be altered. To prevent personnel mistaking the trimmer capacitor spindle for an Empty or Full adjuster, a knurled protective cover is fitted.

7. The two halves of the case are constructed of pressed sheet alloy and are held together by sixteen ch.hd. screws and nuts. An "O" ring is inserted between the two halves so that when the screws and nuts are tightened down evenly, a pressure tight seal is made. All the Mk. 4 plugs, the coaxial plugs and the adjuster spindles are

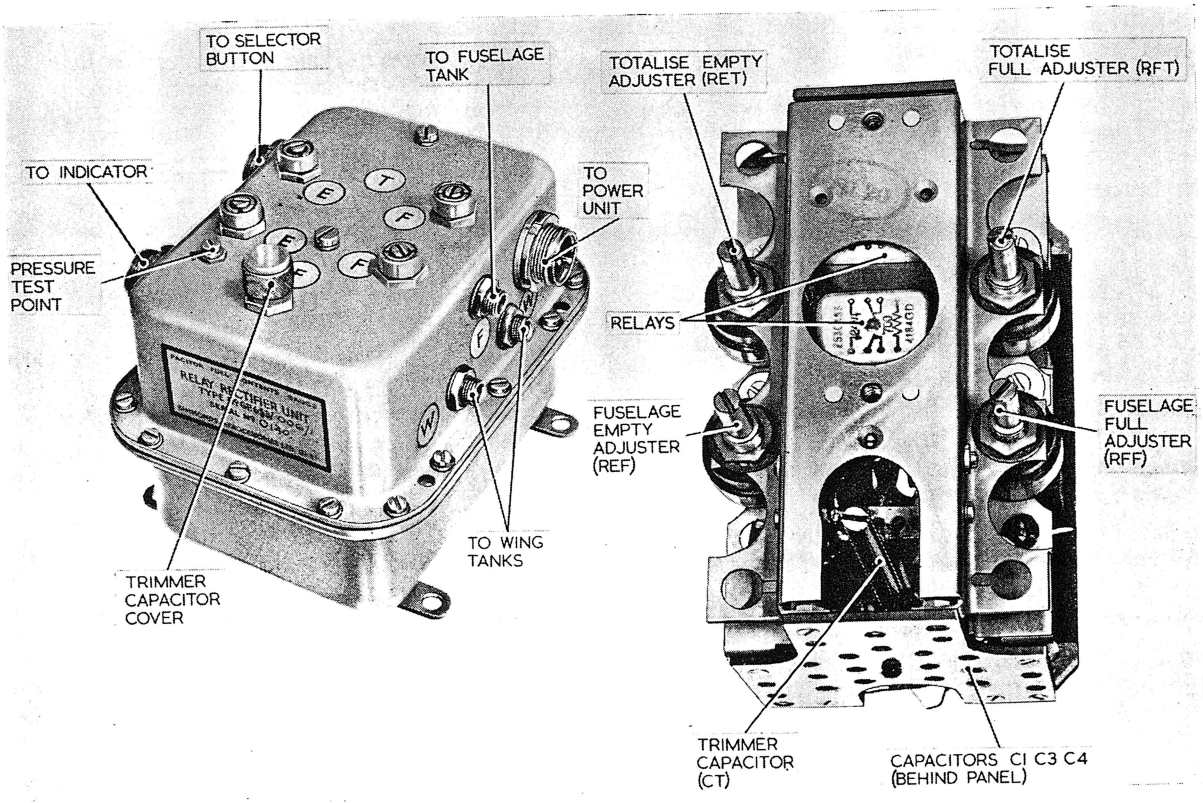

Fig. 1. Typical relay/rectifier unit; external view and view of top deck

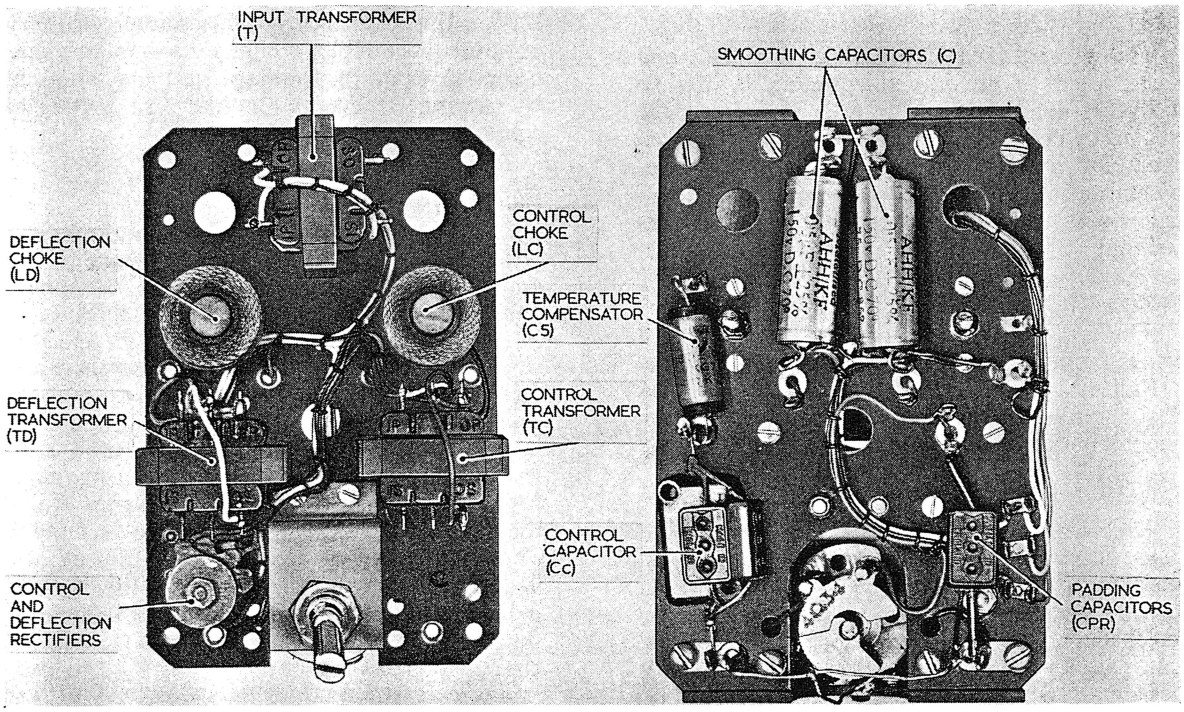

Fig. 2. Lower deck of a typical relay/rectifier unit

provided with pressure seals so that the inside of the case is maintained at ground level pressure. The sealing of the case prevents changes in altitude and climatic conditions having an adverse effect on the components within the unit. A pressure test point, consisting of a 4BA screw and bonded seal, is located on top of the case, and if the case is opened, or one of the plugs or adjusters becomes loose or damaged, then the unit should be pressure tested from this point.

OPERATION

8. The circuit diagram of a typical rectifier unit (*fig.* 3) is sub-divided into three sections for descriptive purposes, i.e. basic rectifier, adjusters and relays.

Basic rectifier

9. When the power supply to the fuel contents system is switched on and the power unit commences to operate, a 70V a.c. 19·1 kc/s supply is applied to the rectifier auto-transformer T via poles A and B. The auto-transformer steps down the input to 15V 19·1 kc/s, which is then fed to the primary windings of the control and deflection transformers TC and TD.

Note . . .

*Earlier types of rectifier units, e.g. GP*612/—, *GP*642 *and GP*644 *series, do not have the auto-transformer fitted and these systems therefore operate at 70V as supplied by the power unit.*

Control circuit

10. Input to the primary winding of TC is then fed through a pre-set tuning choke LC, a temperature compensated capacitor C5 and a control circuit reference capacitor CC to earth. As the capacitance value of the circuit is fixed the current flowing in the primary winding of TC will remain constant and, therefore, the transformed output from the secondary winding of TC will remain constant. This fixed a.c. output from the secondary winding is applied to a bridge rectifier circuit RC, and the resultant d.c. output is fed to the control coil of a fuel contents indicator, via the Empty and Full adjuster network. The output from the bridge rectifier has a ripple component, this ripple is smoothed out by capacitor C.

Deflection circuit

11. Input to the primary winding of transformer TD is then fed through a pre-set tuning choke LD, two parallel padding capacitors, CPR and the air trimmer CT to earth; and also through a temperature compensated capacitor C4 to the appropriate tank circuit or circuits, as selected by the relays (*para.* 16). The tank circuit capacitance varies depending upon the amount of fuel in the tank (*Chap.* 14*D*). As the tank circuit capacitance varies the current in the primary winding of TD will also vary and the transformed output from the secondary winding will follow accordingly. This variable a.c. output is applied to a bridge rectifier circuit RD and the resultant variable d.c. output is fed to the deflection coil of a fuel contents indicator via the Empty and

Full adjuster network. The output from the bridge rectifier has a ripple component, this is smoothed out by capacitor C.

Chokes

12. The control and deflector chokes LC and LD are fitted to provide a trimming facility so that during manufacture or after overhaul, the currents flowing in the primary windings of transformers TC and TD can be correctly adjusted. The calibration is normally carried out in conjunction with the padding capacitor CPR and the air trimmer CT.

Adjusters

13. The typical adjuster network shown in fig. 3 provides facilities for setting-up the correct Empty and Full readings on the fuel contents indicator and so compensate for errors due to manufacturing tolerances, etc., throughout the system.

Empty adjusters

14. D.C. output from the control rectifier RC is fed to either the REF or the RET adjuster, depending upon the position of the relay contacts A2; with the contacts as shown in fig. 3, the d.c. is fed through REF and out via pole A of a Mk. 4, 3-pole plug to the control coil of a fuel contents indicator. Variation of the REF adjuster will alter the value of the resistance which is in series with the control coil of the indicator (*fig.* 4) and, therefore, alter the d.c. flowing in the control coil; by this means the errors due to tolerances in the fuselage section of the circuit can be compensated for. When the relay contacts change over the RET adjuster is brought into circuit and REF is cut out; this enables compensation to be made for errors in both the fuselage and the wings tanks by varying RET until the indicator pointer reads zero.

Full adjusters

15. D.C. output from the deflection rectifier RD is fed to a circuit comprising resistors R15, R16 and either the RFF or the RFT adjuster, depending upon the position of the relay contacts A1. With the contacts as shown in fig. 3, RFF is in circuit, resistor R16 is in series with the deflection coil of a fuel contents indicator via pole B, but R15 and RFF (or RFT) are shunted across both the control and deflections coils of the indicator; fig. 4 shows the circuit in simplified form. Variation of the RFF adjuster will alter the value of the shunted resistance and therefore alter the ratio of the currents flowing in the deflection and control coils. By this means the indicator Full reading can be set correctly for the fuselage tank. When the relay contacts A1 change over RFF is cut out and RFT is brought into circuit; this enables the indicator Full reading to be set correctly for both the fuselage and wing tanks.

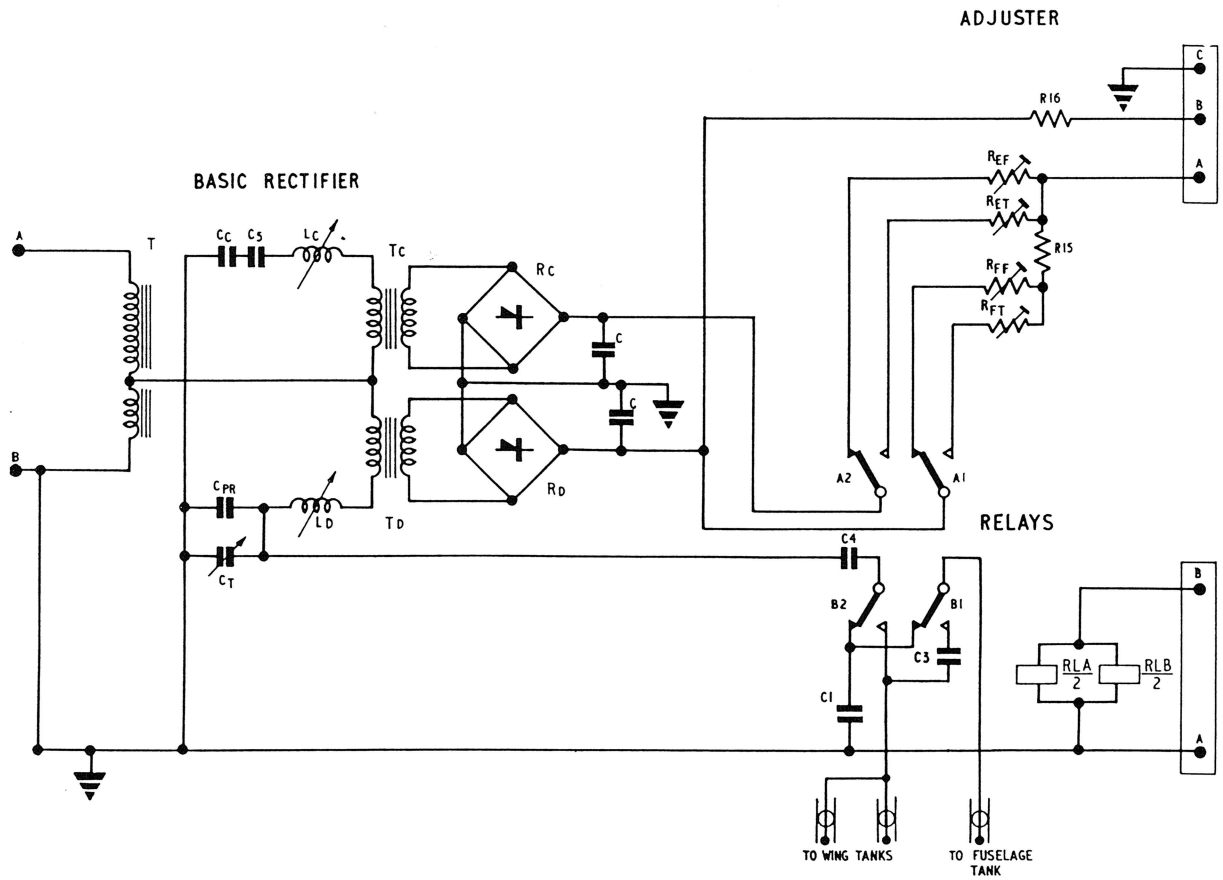

Fig. 3. Circuit diagram of typical relay/rectifier unit

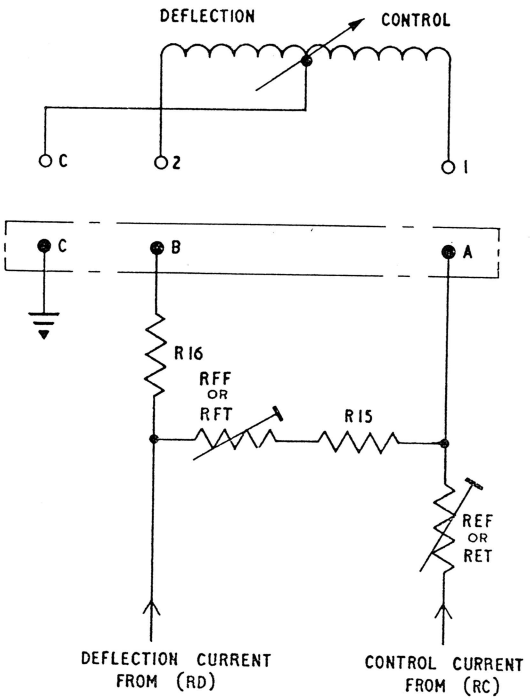

Fig. 4. Simplified adjuster circuit showing connections to indicator

Note . . .
When a fuel contents indicator is required to provide only one set of readings the type of rectifier unit employed in the system will not have relays and, if fitted with Empty and Full adjusters, there will only be one of each and not two as described in para. 14 *and* 15.

Relays

16. When a fuel contents indicator is required to read the individual contents of a number of separate tanks, and also to read the summated contents of the same tanks, the rectifier unit employed in the circuit will be fitted with relays. These relays enable one basic rectifier circuit (*para.* 9 *to* 12) to handle a number of separate inputs, as determined by a crew operated selector switch.

17. The relay section of the typical rectifier circuit (*fig.* 3) enables the basic rectifier to provide two separate outputs, i.e. contents of the fuselage tank only, or the summated contents of both the wing tanks and the fuselage tank. With relays RLA and RLB (*fig.* 3) de-energized the capacitance input from the fuselage tank is fed via relay contacts B1 and B2, through C4 to the deflection side of the rectifier circuit. Connected in parallel across the circuit is a tank padding capacitor C1. The appropriate Empty and Full adjusters i.e. REF and RFF are connected in circuit via relay contacts A1 and A2.

18. When the cockpit selector switch is set to totalize, a 28V d.c. supply is connected across the coils of RLA and RLB via poles A and B of the 2-pole plug. With the relays energized, contacts A1, A2, B1 and B2 change over. Contacts B1 and B2 now connect the fuselage and wing tanks inputs together to provide a totalized capacitance input to the deflection side of the rectifier circuit. The tank padding capacitor C1 is cut out of circuit and C3 is brought in series with the fuselage tank capacitance to provide the necessary padding. Contacts A1 and A2 will now connect the RET and RFT adjusters into circuit and REF and RFF are cut out.

INSTALLATION

19. Before installing a rectifier unit refer to the appropriate aircraft air publication. When a rectifier, relay/rectifier or relay/adjuster unit in a system is changed the Empty and Full calibration procedure detailed in the appropriate aircraft publication must be complied with.

SERVICING

20. Should the serviceability of a rectifier, relay/rectifier or relay/adjuster unit be in doubt, apply the standard serviceability test detailed in the appropriate appendix to the chapter. If a unit fails to meet the requirements of its standard serviceability test, the unit should be disposed of in accordance with the current service instructions (spares are not provisioned for units at 1st or 2nd line).

Appendix 1

RECTIFIER UNITS, TYPE GP612/—SERIES

Introduction

1. Rectifier units of the Type GP612/— series are employed in Pacitor, Mk. 5 equipment. The only difference between the various units is the number of coaxial input plugs from the tank circuits. The installation and servicing detailed in the chapter applies to this series of units.

DESCRIPTION

2. Construction of a Type GP612/— series rectifier (*fig.* 1) differs from the typical rectifier unit described in the chapter as follows:—

(1) Adjusters and relays are not fitted.

(2) The case consists of two light alloy castings; these are bolted together and a rubber washer forms a seal between the castings.

(3) A wax coating over the circuit components protects the unit from changes in climatic conditions and altitude.

(4) The 2-pole and 3-pole plugs are Mk. 3 types and the coaxial input plugs are large push-on types.

OPERATION

3. Operation of the basic rectifier circuit detailed in the chapter applies to this series of units with the following exceptions:—

(1) An input transformer is not fitted (*fig.* 2) and the system therefore operates at 70V a.c.

(2) Tuning chokes are not fitted in the control and deflection transformer primary winding lines and smoothing capacitors are not fitted across the outputs of the bridge rectifiers.

(3) Temperature compensation is achieved by a 25 ohms copper spool fitted in the common return line to the bridge rectifiers.

(4) Scale length calibration for a particular installation is achieved by adjustment of a 25 or 50 ohms bobbin in series with the indicator deflection coils.

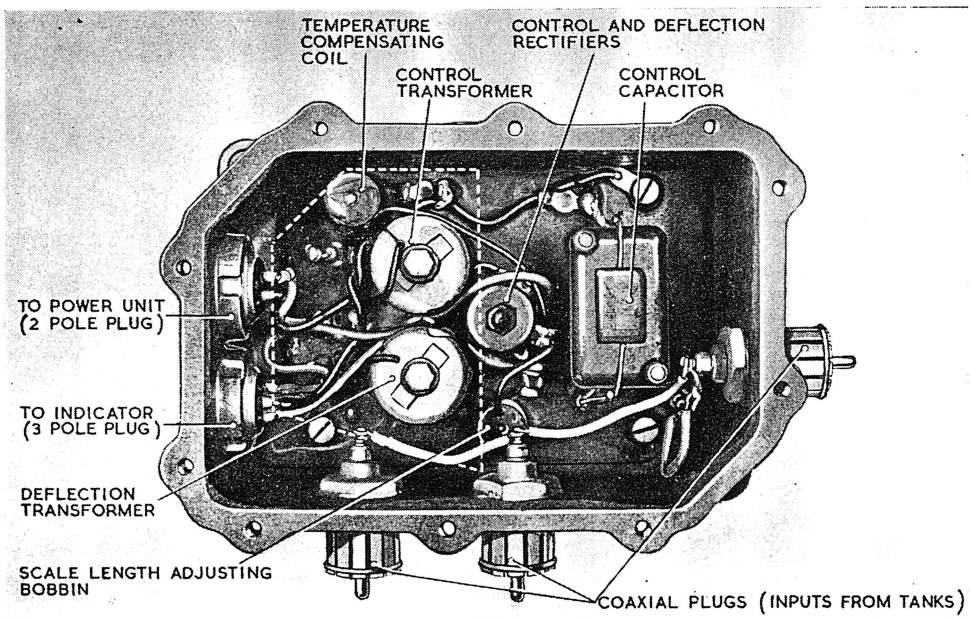

Fig. 1. Rectifier unit, Type GP612/— series

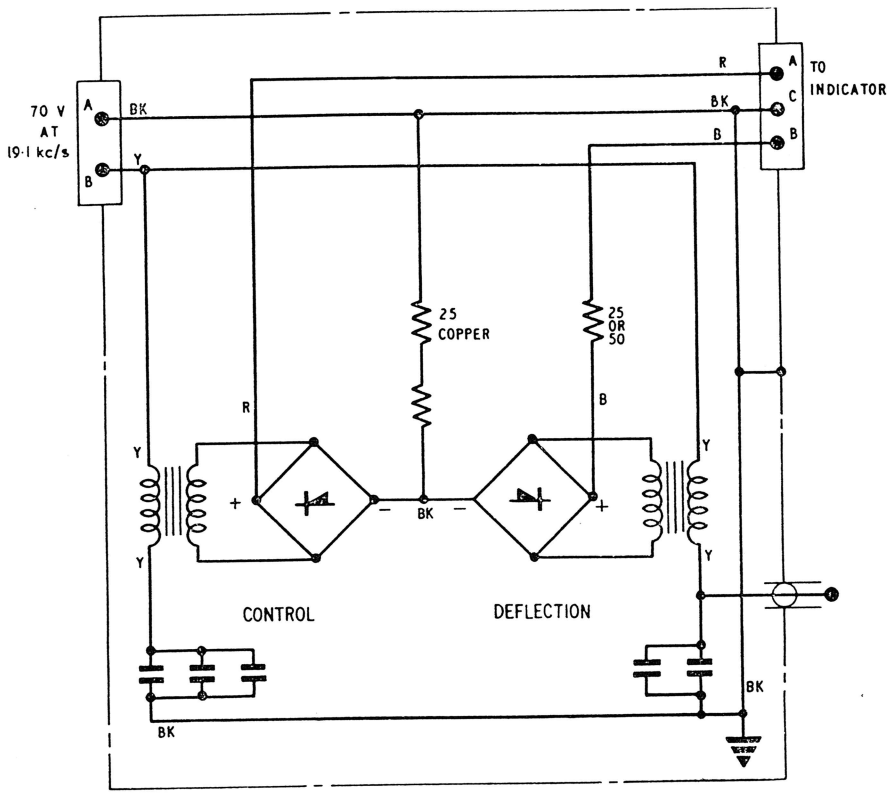

Fig. 2. Circuit of rectifier unit, Type GP612/— series

Appendix 1A

STANDARD SERVICEABILITY TEST

for

RECTIFIER UNITS, TYPE GP612/— SERIES

Introduction

1. The tests detailed in this appendix are to be applied to the rectifier units before they are installed in an aircraft, at any time that serviceability is in doubt and at the appropriate examination periods at Equipment Depots.

TEST EQUIPMENT

2. The Pacitor, Mk. 5 and 5A, test set (R.A.F.) Ref. No. 6C/962 (*A.P.1275T, Vol.* 1, *Sect.* 5, *Chap.* 3) is to be used for the tests.

TESTS

3. (1) Connect a 28V d.c. supply to the D.C. IN terminals of the test set.

(2) Using cable GP742/074/1, junction unit GP30694 and cable GP732/063/3 connect RECTIFIER coaxial plug on the test set to coaxial plug rectifier unit under test.

(3) Using cable GP30978/2 connect the 2-pole A.C. OUT plug on test set to the 2-pole plug on the rectifier unit.

(4) Using cable GP30978/3, connect the 3-pole INDICATOR IN plug on the test set to the 3-pole plug on rectifier unit.

(5) Turn switch C to E CAP.

(6) Turn switch B to type number of rectifier under test (e.g. GP612/034).

(7) Turn switch A to INNER SCALE or OUTER SCALE depending upon whether the type number of the rectifier under test appears on the inner or outer positions of the switch B scale.

(8) Set meter A pointer to zero by operating the SET INDICATOR POINTER knob.

(9) Allow a 10 minute stabilizing period.

(10) Turn switch C to F. CAP. Meter A must read within the yellow arc engraved MK. 5.

(11) Switch off d.c. supply and remove unit under test.

Appendix 2

RECTIFIER UNIT, TYPE GP640/004 AND RELAY/ADJUSTER UNIT, TYPE GP814/008

Introduction

1. Rectifier unit, Type GP640/004, Ref. No. 6A/3899 (*fig.* 1 *to* 3) and relay/adjuster unit, Type GP814/008, Ref. No. 6A/3898 (*fig.* 4 *and* 5) are employed in Pacitor, Mk. 5A, systems. The two units are set up in the aircraft as a pair and are complementary to each other in operation.

2. The installation and servicing detailed in the chapter apply to these units. The description and operation detailed in the chapter apply to the units with the following exceptions:—

(1) The basic rectifier circuit components are contained in a separate case, i.e. GP640/004, and the relay/adjuster circuit components are also contained in a separate case, i.e. GP814/008, the two circuits being interconnected by cables in the aircraft.

(2) The relay adjuster unit is fitted with a water detector switch (*fig.* 4). This facility is provided to enable ground crews to detect water in the fuel tanks. When the spring loaded switch is depressed a water detection probe fitted in the fuel tank, or tanks, is brought into circuit; if water is present in the tank the probe is short circuited, this results in a low capacitance input to the deflection circuit of the rectifier unit and therefore a sub-zero reading on the fuel contents indicator. Information on water detector probes is detailed in Chap. 12B, App. 2.

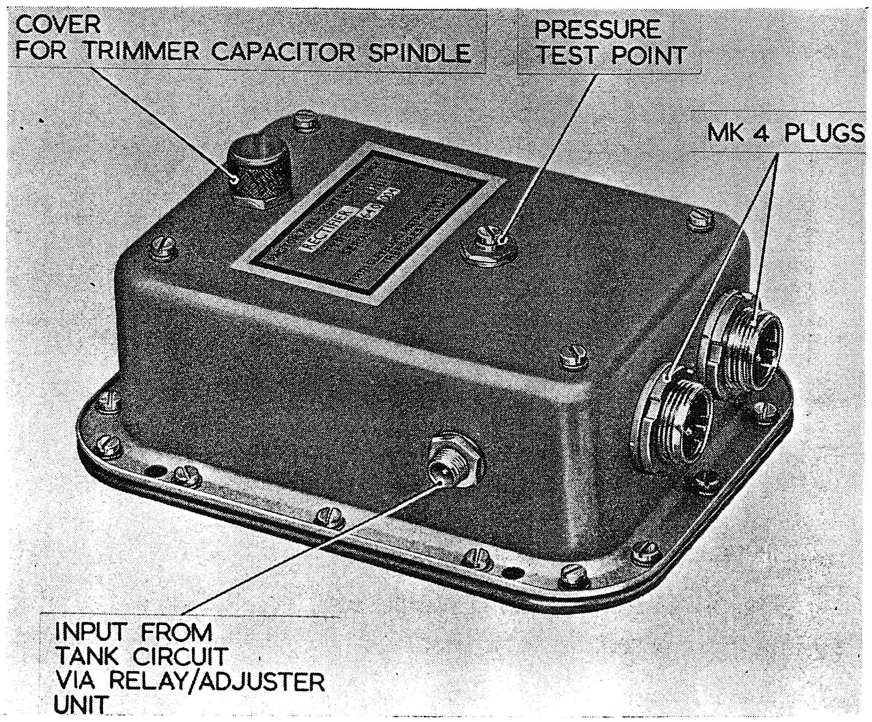

Fig. 1. Rectifier unit, Type GP640/004

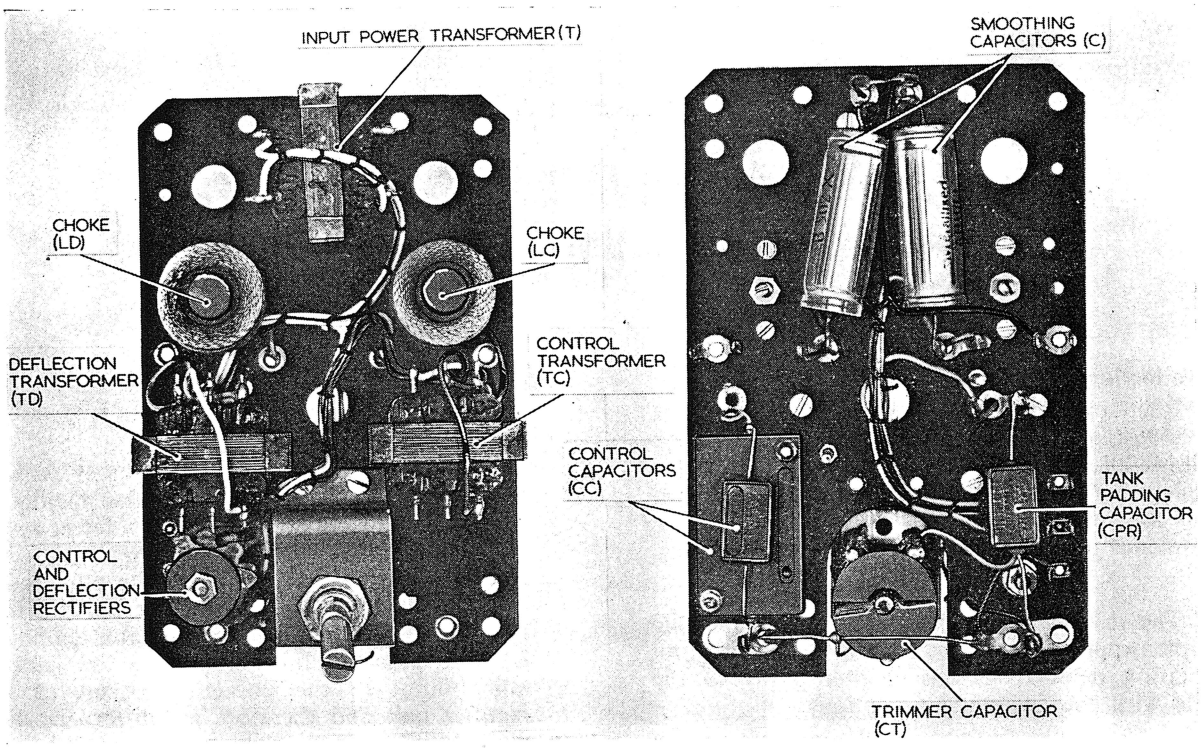

Fig. 2. Chassis layout of rectifier unit, Type GP640/004

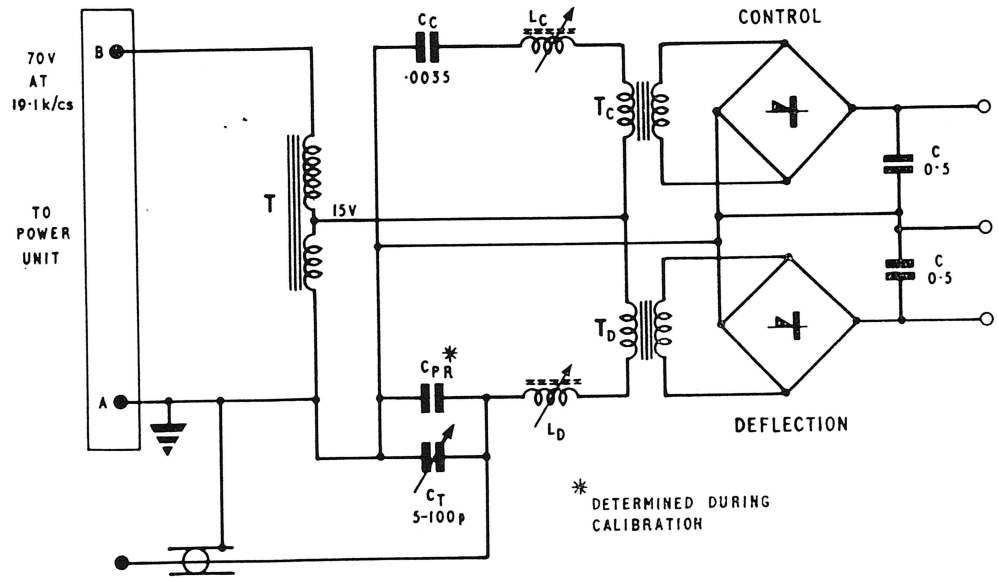

Fig. 3. Circuit diagram of rectifier unit, Type GP640/004

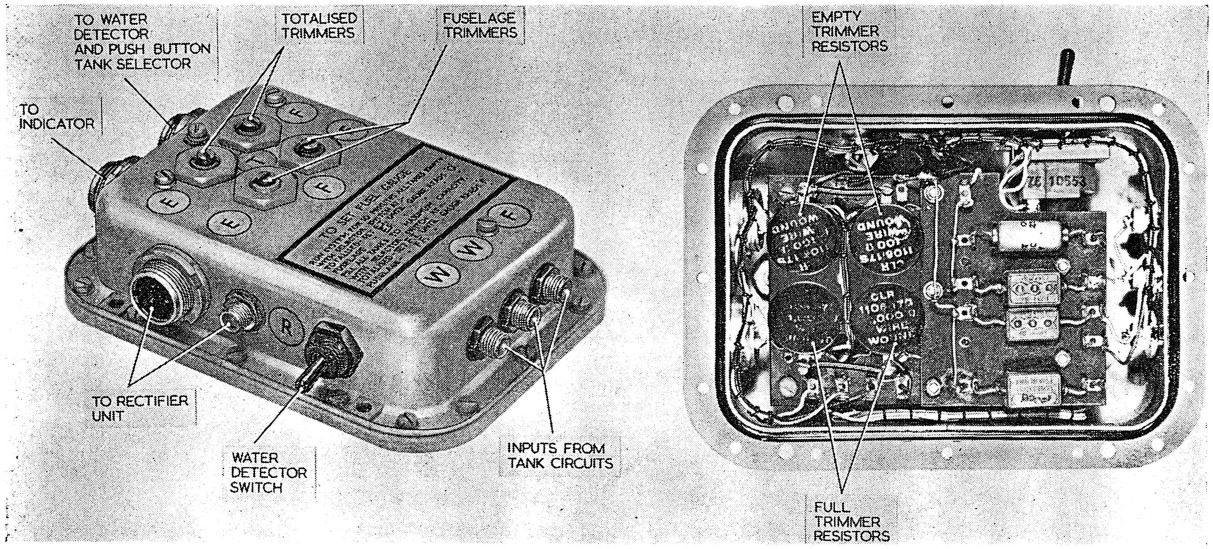

Fig. 4. Relay/adjuster unit, Type GP814/008

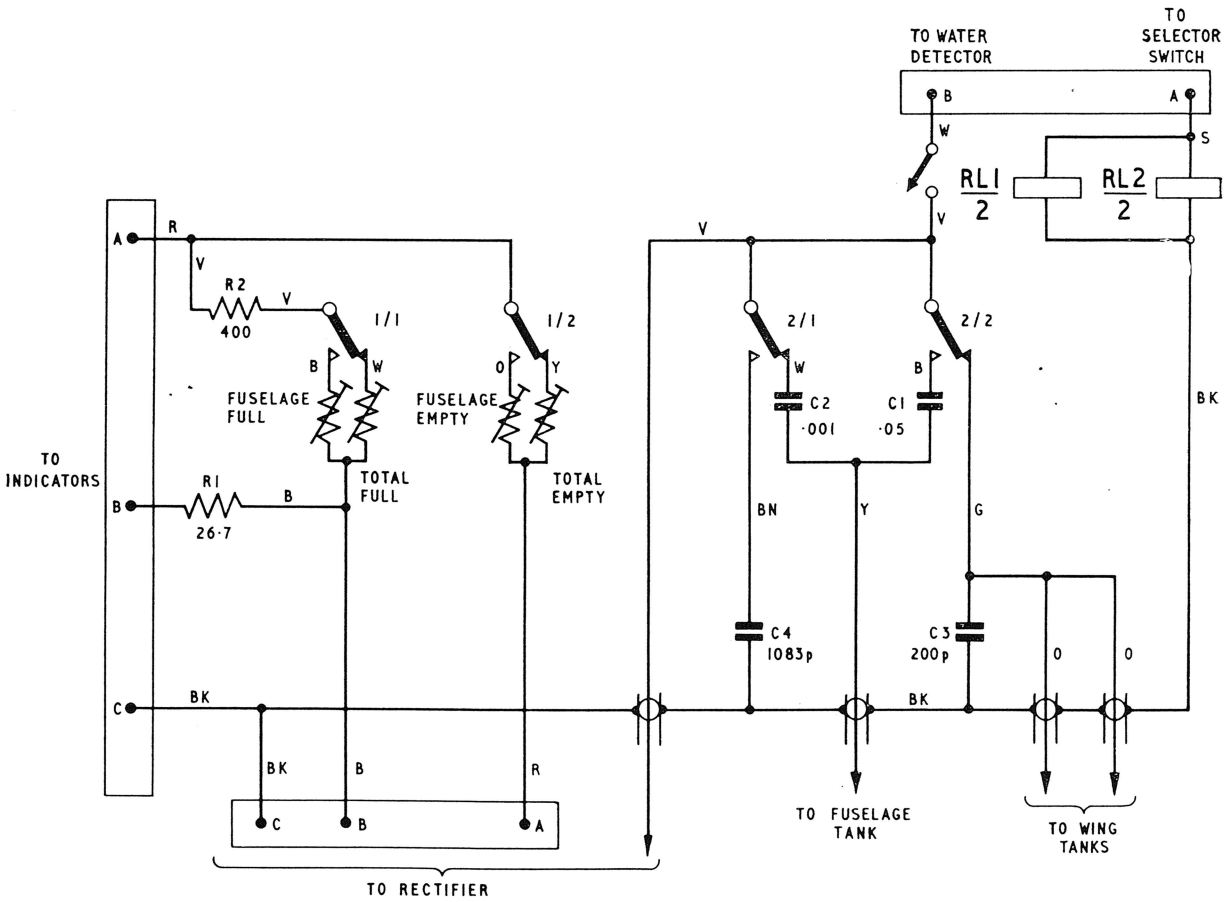

Fig. 5. Circuit diagram of relay/adjuster unit, Type GP814/008

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Appendix 2A

STANDARD SERVICEABILITY TEST
for
RECTIFIER UNIT, TYPE GP640/004 AND RELAY/ADJUSTER UNIT, TYPE GP814/008

Introduction

1. The tests detailed in this appendix are to be applied to the units before they are installed in an aircraft, at any time that serviceability is in doubt and at the appropriate examination periods at Equipment Depots.

TEST EQUIPMENT

2. The Pacitor, Mk. 5 and 5A test set (R.N.) Ref. No. 6C/964 (*A.P.1275T, Vol. 1, Sect. 5, Chap. 7*) is to be used for the tests.

Note . . .

A relay/adjuster unit can be tested directly with the test set but, due to the cables provided, a rectifier unit can only be tested with a relay/adjuster unit connected in circuit. When a rectifier unit is to be tested the associated relay/adjuster unit must first be tested for serviceability (para. 3 to 6) before proceeding with the rectifier unit tests.

TESTS

Relay/adjuster unit

3. To check the Totalise Full adjuster proceed as follows: —

(1) Connect adapters GP31655 (2-pole) and GP31655/2 (3-pole) to the plugs on the end of the relay/adjuster unit and adapter GP31655/1 (3-pole) to plug on side of the unit.

(2) Connect both cables GP30980 to the 3-pole adapters.

(3) Connect cable GP742/074/1 to RECTIFIER coaxial plug on test set and to either W or the F coaxial plug on the unit.

(4) Connect cable GP30967 to the OHMS terminals on test set, i.e. spade clip to black terminal and wander plug to socket.

(5) Turn switch B on test set to SEA VENOM TOTALISE.

(6) Turn switch A to OHMS 300-950.

(7) Supply test set with 28V d.c. via the DC IN terminals.

(8) Zero the ohmmeter by shorting the cable GP30967 leads together and turning the SLOW CHECK AND OHMMETER ZERO knob on test set until meter B reads full scale deflection.

(9) Connect probe to red lead coming from plug on side of relay adjuster unit and connect clip to blue lead coming from plug on end of unit.

(10) Vary the F.T. adjuster on relay/adjuster unit slowly fully clockwise and counter-clockwise, and check that meter B pointer follows the movement of the adjuster smoothly and evenly (i.e. no bad spots on potentiometer). Finally set the F.T. adjuster to bring meter B pointer on to the 600 ohms position.

4. To check the Totalise Empty adjuster proceed as follows: —

(1) Re-zero the ohmmeter by shorting cable GP30967 leads together and turning the SLOW CHECK AND OHMMETER ZERO knob until meter B reads full scale deflection.

(2) Connect probe to blue lead coming from plug on side of relay/adjuster unit and connect clip to the blue lead coming from plug on end of unit.

(3) Turn switch A to OHMS 20-60.

(4) Vary the E.T. adjuster on unit to check potentiometer for bad spots (*para.* 3 (10)). Finally set the E.T. adjuster to bring meter B pointer on to the 50 ohms position.

5. To set the Fuselage Full adjuster proceed as follows: —

(1) Connect cable GP30978/2 to RELAY SUPPLY on test set and to adapter GP31655 on the unit.

(2) Re-zero the ohmmeter (*para.* 4 (1)).

(3) Connect probe to the red lead coming from plug on side of unit and connect clip to blue lead coming from plug on end of unit.

(4) Turn switch A to OHMS 300-950.

(5) Vary the F.F. adjuster on the unit to check potentiometer for bad spots (*para.* 3 (10)). Finally set the F.F. adjuster to bring meter B pointer on to the 600 ohms position.

6. To set the Fuselage Empty adjuster proceed as follows: —

(1) Re-zero the ohmmeter (*para.* 4 (1)).

(2) Connect probe to blue lead coming from plug on side of the unit and connect clip to blue lead coming from plug on end of the unit.

(3) Turn switch A to OHMS 20-60.

(4) Vary the E.F. adjuster on the unit to check potentiometer for bad spots (*para.* 3 (10)). Finally set the E.F. adjuster to bring meter B pointer on to the 50 ohms position.

Rectifier unit (*see note under para.* 2)

7. (1) Couple the coaxial plug on rectifier unit to the coaxial plug R on the relay/adjuster unit using either the aircraft cable GP742/155/1 or a length of coaxial cable having a capacitance value of 21 to 24 pF.

(2) Couple cable GP742/074/1 from the coaxial plug F on relay/adjuster unit to the coaxial plug RECTIFIER on test set.

(3) Connect cable GP30978/3 to INDICATOR IN on test set, couple to adapter GP31655/2 and connect to 3-pole plug on end of relay/adjuster unit.

(4) Connect cable GP31822/1 to rectifier unit, connect adapter GP31655/1 to side of relay/adjuster unit and couple together.

(5) Connect cable GP30978/2 to A.C. OUT on test set, connect cable GP30979/2 to rectifier unit and couple together, using adapter GP30927.

(6) Connect adapter GP31655 to relay/adjuster unit, connect cable GP30978/2 to RELAY SUPPLY on test set and couple together.

(7) Turn switch C to E.CAP, turn switch B to SEA VENOM FUSELAGE and turn switch A to INNER SCALE.

(8) Supply test set with 28V d.c. and wait 5 minutes for rectifier to warm up.

(9) Turn SET INDICATOR POINTER knob to bring meter A pointer to zero.

(10) Turn switch C to F.CAP and wait two to three minutes, then turn switch C to E.CAP and allow a further period of two to three minutes to elapse before varying the E.F. adjuster on relay/adjuster unit to bring meter A pointer to zero.

(11) Turn switch C to F.CAP and vary F.F. adjuster on relay/adjuster unit to bring meter A on to yellow line at end of capacity scale, i.e. 500 position.

(12) Remove coaxial cable GP742/074/1 from the F plug relay/adjuster unit and connect to the W plug on the unit (other end remaining connected to RECTIFIER on test set). ◀Remove adapter GP.31655 from relay/adjuster unit and cable GP.30978/2 from relay supply on test set.▶

(13) Turn switch C to E.CAP, turn switch B to SEA VENOM TOTALISE and turn switch A to OUTER SCALE.

(14) Turn SET INDICATOR POINTER knob to bring meter A pointer on to ZERO.

(15) Turn switch C to F.CAP and wait two to three minutes, then turn switch C to E.CAP and allow a further period of two to three minutes to elapse before varying the E.T. adjuster on the relay/adjuster unit to bring meter A pointer to zero.

(16) Turn switch C to F.CAP and vary the F.T. adjuster on relay/adjuster unit to bring meter A pointer on to yellow line at end of capacity scale, i.e. 500 position.

(17) Switch off d.c. supply and remove unit under test.

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Appendix 3

RECTIFIER UNITS, TYPE GP642/-SERIES

Introduction

1. Rectifier units of the Type GP642/— series are employed in Pacitor, Mk. 5A equipment. The installation and servicing detailed in the chapter applies to this series of units.

DESCRIPTION

2. Construction of a Type GP642/— series rectifier (*fig.* 1) differs from the typical rectifier unit described in the chapter, as follows:—

(1) Relays are not fitted.

(2) The case consists of a light alloy casting with a light alloy lid, which is secured to the case by ten nuts and bolts. A rubber gasket forms a seal between the case and the lid. The empty and full adjuster spindles are accessible through two holes drilled in the cover; dust caps are screwed into the holes. The circuit components are all mounted on a single deck.

(3) A wax coating over the circuit components protects the unit from changes in climatic conditions and altitude.

(4) The 2-pole and 3-pole plugs are Mk. 3 types and the coaxial input plug, or plugs, are large push-on types.

OPERATION

3. Operation of the basic rectifier circuit detailed in the chapter applies to this series of units with the following exceptions:—

(1) An input transformer is not fitted and the system therefore operates at 70V a.c. (*fig.* 2).

(2) The chokes L1 and L2 in the lines to the primary windings of the control and deflection transformers, are fixed.

(3) Temperature compensation is achieved by a 25 ohms copper spool in the common return line to the bridge rectifiers.

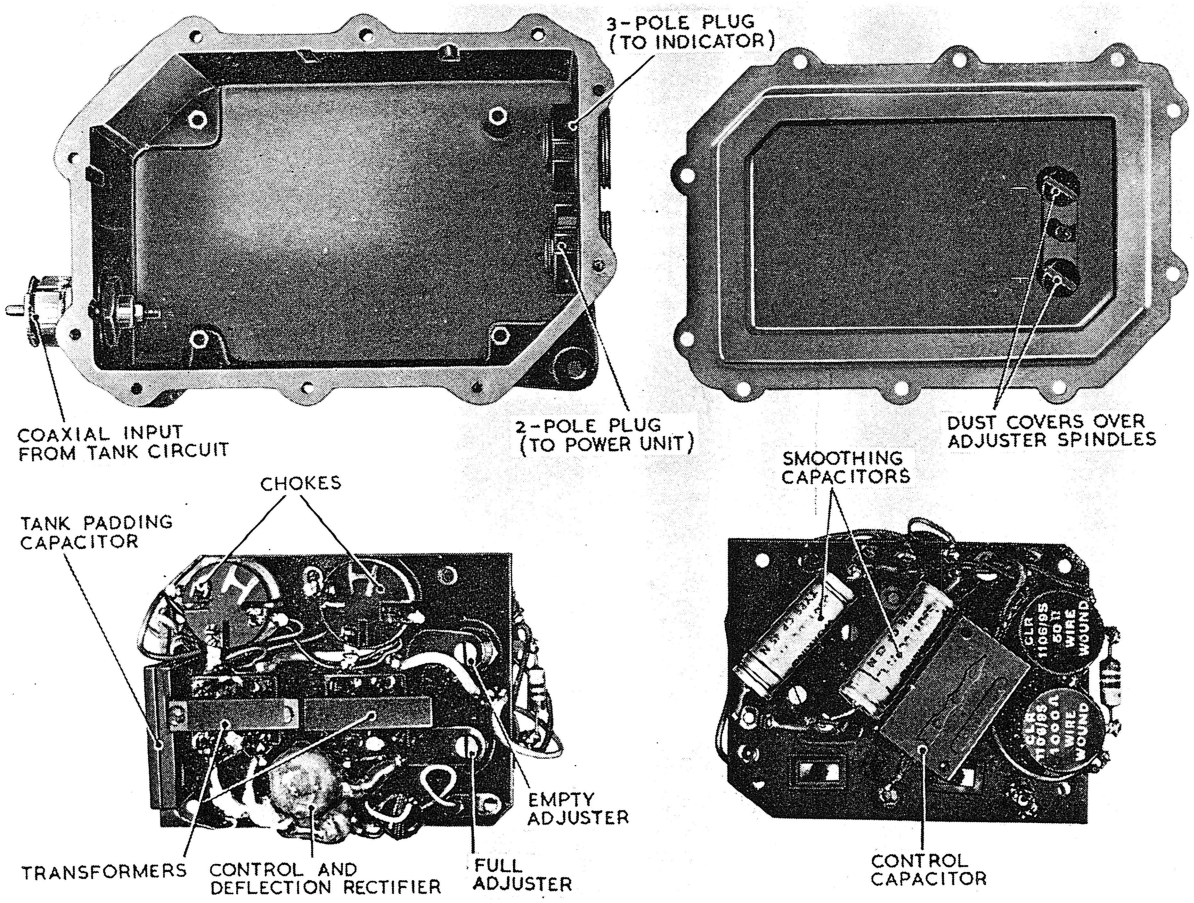

Fig. 1. Rectifier unit, Type GP642/– series

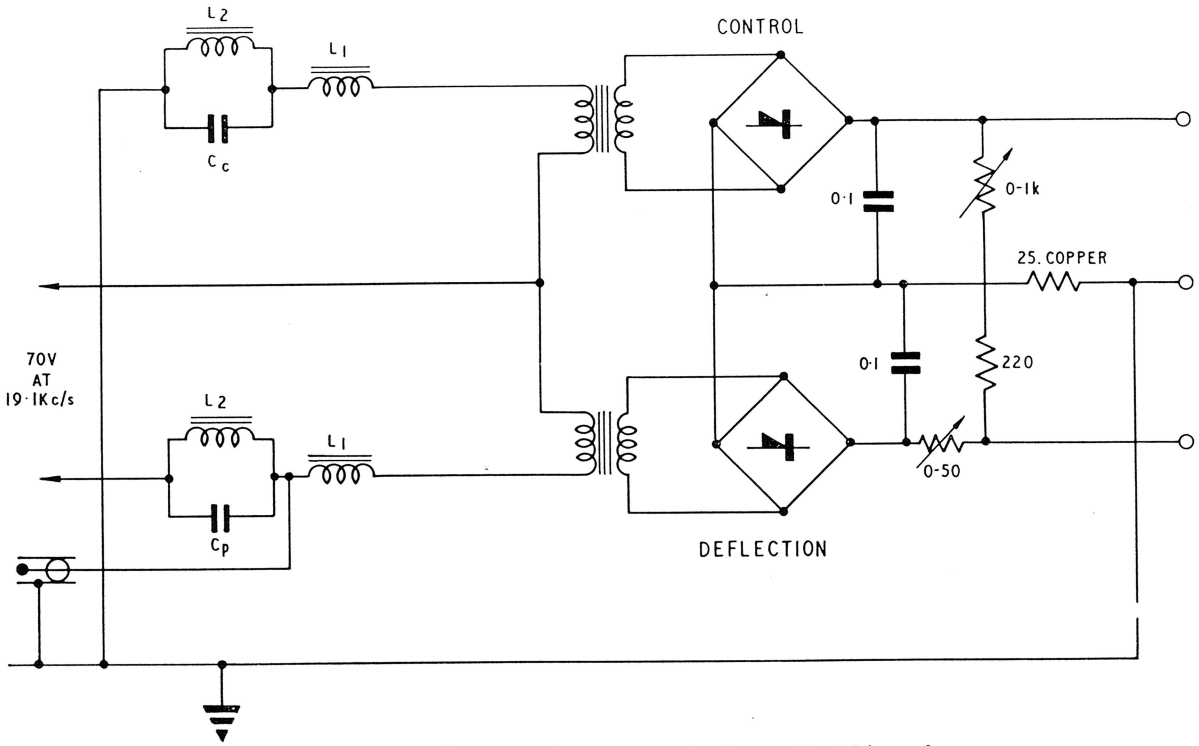

Fig. 2. Circuit diagram of rectifier unit, Type GP642/– series

Appendix 4

RECTIFIER UNITS, TYPE GP644/-SERIES

Introduction

1. Rectifier units of the Type GP644/— series are employed in Pacitor, Mk. 5A equipment. The installation and servicing detailed in the chapter applies to this series of units.

DESCRIPTION

2. Construction of a Type GP644/— series rectifier (*fig.* 1) differs from the typical rectifier unit described in the chapter, as follows:—

(1) Relays are not fitted.

(2) The case consists of a light alloy casting with a light alloy lid, which is secured to the case by ten nuts and bolts. A rubber gasket forms a seal between the case and the lid. The empty and full adjuster spindles are accessible through two holes drilled in the cover; dust caps are screwed into the holes. The circuit components are all mounted on a single deck.

(3) A wax coating over the circuit components protects the unit from changes in climatic conditions and altitude.

(4) The 2-pole and 3-pole plugs are Mk. 3 types and the coaxial input plug, or plugs, are large push-on types.

OPERATION

3. Operation of the basic rectifier circuit detailed in the chapter applies to this series of units with the following exceptions:—

(1) An input transformer is not fitted and the system therefore operates at 70V a.c. (*fig.* 2).

(2) The chokes L1 and L2 in the lines to the primary windings of the control and deflection transformers, are fixed.

(3) Temperature compensation is achieved by a 25 ohms copper spool in the common return line to the bridge rectifiers.

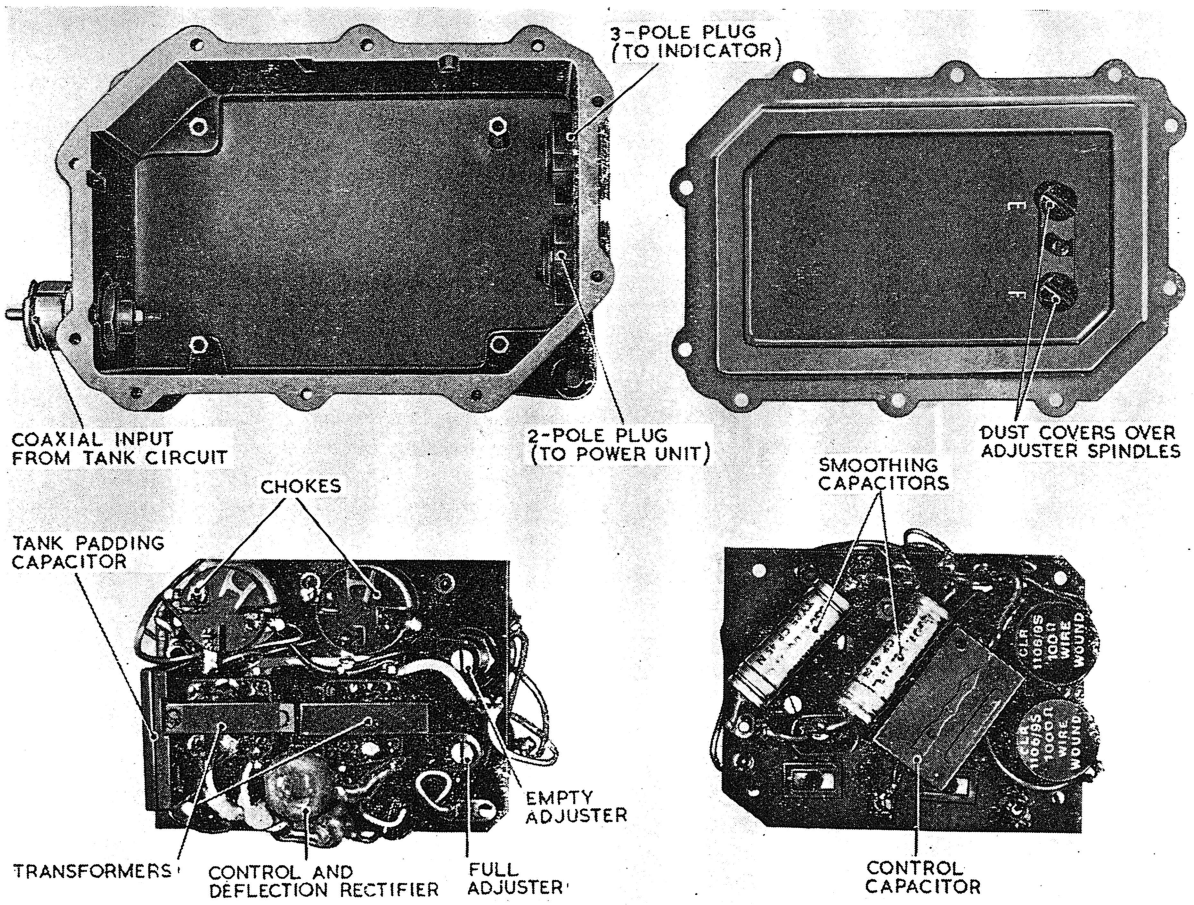

Fig. 1. Rectifier unit, Type GP644/– series

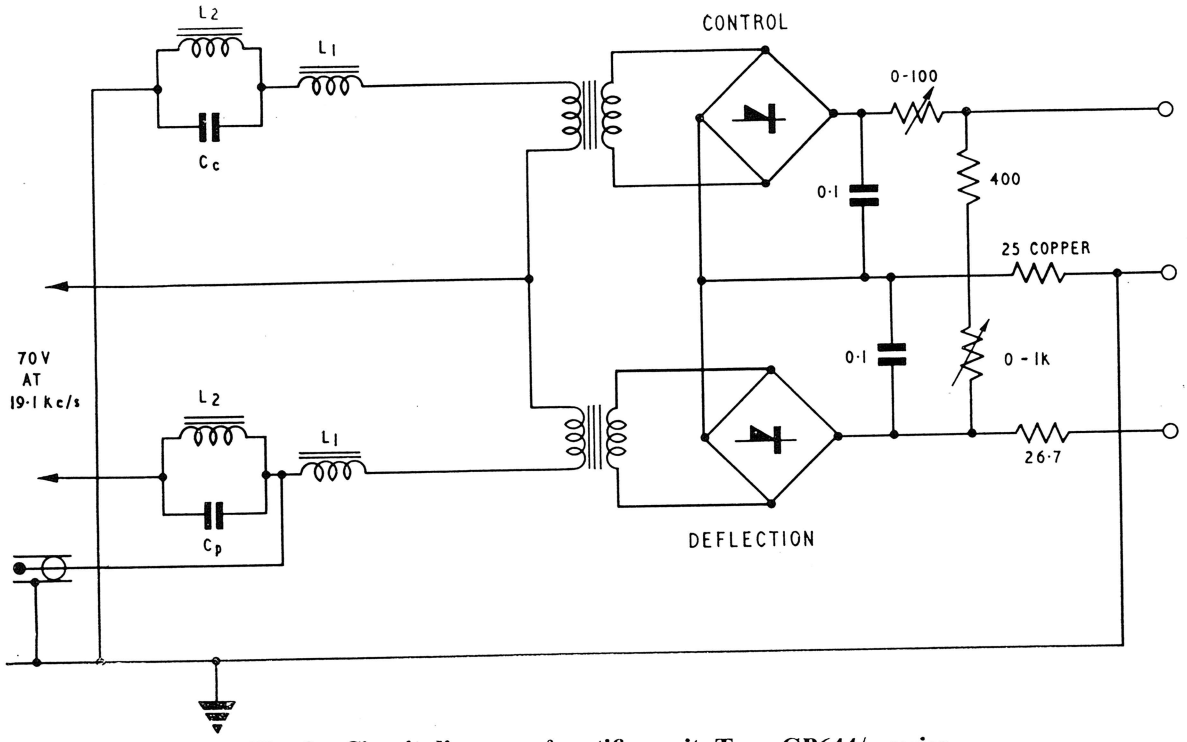

Fig. 2. Circuit diagram of rectifier unit, Type GP644/– series

TEST ON PACITOR RECTIFIER UNIT GP 644/032
using test set MK 5 & MK 5A 6C/962

1/a) Using cable GP 742/074/1, junction unit GP 30694, and cable 732/063/3, connect RECTIFIER, coaxial plug on the test set to the coaxial plug of the rectifier unit under test.
b) Connect the 2-pole plug AC OUT on test set to the 2-pole plug on the rectifier unit using cable GP 30978/
c) Connect the 3-pole plug INDICATOR IN on test set to th 3-pole on rectifier unit using cable 30978/3
d) Connect 28V DC. supply to the D.C IN terminals on test set (leave switched off)

2/ Before commencing to check the scale length of the rectifier it is necessary to set the empty & full adjusters to the approximate midway position. Acceptable accuracy can be achieved by turning the adjuster spindles fully one way and then counting the number of turns required to reach the opposite stop, then halving the number of turns and setting adjuster spindles accordingly to the midway position. (F adjuster - full movement 3/4 of full revolution E adjuster - full movement 7/8 of revolution)

3/a. Turn switch A to alter scale - as it is unsuitable to switch to upper scale as there is no deflection of pointer
b/ Turn Switch B to the according type number of rectifier under test ie. "Vampire 644/032"
c/ Turn Switch C to F Cap
d/ Ensure set indicator pointer is turned fully maximum

4/ Apply 24V and wait for pointer to stabelize (10 minutes)

5/ Adjust F and E adjusters until A pointer is align with MK 5 yellow line terminating minute arc line, after pointer movement is maximum with aid of set indicator pointer.

6/ Change switch C from F Cap to E Cap, meter should read Zero if not it can be set to zero by means of adjusting the E cap adjuster.

7/ disconnect 24V D.C. and remove unit under test

Appendix 4A

STANDARD SERVICEABILITY TEST for RECTIFIER UNITS, TYPE GP644/-SERIES

Introduction

1. The tests detailed in this appendix are to be applied to the rectifier units before they are installed in an aircraft, at any time that serviceability is in doubt and at the appropriate examination periods at Equipment Depots.

TEST EQUIPMENT

2. The Pacitor Mk. 5 and 5A test set (RN), Ref. No. 6C/964 (A.P.1275T, Vol. 1, Sect. 5, Chap. 7) or (RAF), Ref. No. 6C/962 (A.P.1275T, Vol. 1, Sect. 5, Chap. 3), are to be used for the tests.

METHOD OF TEST

3. (1) Using cable GP742/074/1, junction unit GP30694 and cable GP732/063/3, connect RECTIFIER coaxial plug on the test set to the coaxial plug of the rectifier unit under test.

(2) Connect the 2-pole plug A.C. OUT on test set to the 2-pole plug on the rectifier unit using cable GP30978/2.

(3) Connect the 3-pole plug INDICATOR IN on test set to the 3-pole plug on rectifier unit using cable GP30978/3.

(4) Connect a 28V d.c. supply to the D.C. IN terminals on test set (leave switched off).

4. Before commencing to check the scale length of the rectifiers it is necessary to set the empty and full adjusters to their approximate mid-way position. Acceptable accuracy can be achieved by turning the adjuster spindles fully one way, then counting the number of turns required to reach the opposite stop, then halving the number of turns and setting the adjuster spindles accordingly to the mid-way position.

TESTS

Rectifier units, Type GP644/017 and 018

5. (1) Turn switch B on test set to type number of rectifier under test (e.g. 644/017).

(2) Turn switch A to INNER SCALE or OUTER SCALE depending upon whether the type number of the rectifier under test appears on the inner or outer positions of switch B scale.

(3) Turn SET INDICATOR POINTER knob fully clockwise.

(4) Switch on the 28V d.c. supply.

(5) Turn switch C to F.CAP and wait for five minutes to allow the rectifier to warm up and stabilize.

(6) Turn switch C to E.CAP and allow two or three minutes to elapse.

(7) Vary the E adjuster on rectifier unit slowly fully clockwise and fully counter-clockwise, check that meter A pointer follows the movement of the adjuster smoothly and evenly (i.e. no bad spots on potentiometer). Finally set the E adjuster to bring the pointer of meter A on to zero.

(8) Turn switch C to F.CAP and allow one minute to elapse before varying the F adjuster on the rectifier unit to check the potentiometer for bad spots (sub-para. 7). Finally set the F adjuster to bring meter A pointer on to the Mk. 5A position, i.e. 500 position at end of scale.

(9) Switch off d.c. supply and remove unit under test.

Rectifier unit, Type GP644/032

6. (1) Turn switch B to GP644/032.

(2) Turn switch A to INNER SCALE.

(3) Turn switch C to F.CAP.

(4) Set meter A pointer to yellow line at end of scale (i.e. yellow line terminating the white arc line) using SET INDICATOR POINTER knob.

(5) Allow a ten minute stabilizing period.

(6) Turn switch C to E.CAP. Meter A should read approximately zero. If not, it can be set to zero by means of the E adjuster on the rectifier unit.

(7) Switch off d.c. supply and remove unit under test.

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Appendix 5

TANK UNITS, TYPE GP382/—SERIES

Introduction

1. Tank units of the Type GP382/— series (*fig.* 1) are internally mounted units and are fitted with two electrode tubes, one live and one earthed. The units are designed for installation in flexible fuel tanks, the normal method of securing the units is by clamping strips of material between the end cap washers and the tubes and then securing the strips of material to the tank by the use of pip fasteners. Cables from the live and earth terminals on the units are connected to an externally mounted tank connector in the usual manner.

2. The description, operation, installation and servicing detailed in the chapter apply to this series of units. The minimum and maximum capacitance values detailed in Table 1 are to be used in conjunction with the standard serviceability test (*App.* 1).

Table 1

Capacitance values

Tank unit Part No.	Capacitance (pF)	
	Min.	Max.
GP382/002	121	131
003	151	163
004	139	151
005	205	221
006	184	200
007	206	224
008	188	204
009	154	166
032	261	283
033	294	318
035	126	136
036	111	121
073	73	81
074	146	158
082	90	98
083	114	122
084	107	115
085	156	168
086	117	127
087	135	147
089	101	109
090	140	150
091	168	182
092	166	180

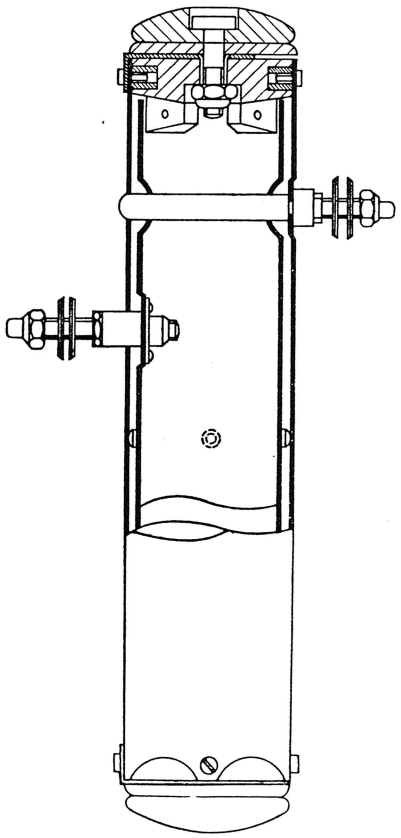

Fig. 1. Tank unit, Type GP382/— series

Appendix 6

TANK UNIT, TYPE GP384/—SERIES

Introduction

1. Tank units of the Type GP384/— series (*fig.* 1) are internally mounted units and are fitted with two electrode tubes, one live and one earthed. The units are usually secured to a baffle plate or a tie rod on the inside of the fuel tank. In a normal installation, two or more of this type of unit are installed in a tank with coaxial cables providing inter-unit connections and a further cable providing the connection to an externally mounted tank connector.

2. The description, operation, installation and servicing detailed in the chapter apply to this series of units. The minimum and maximum capacitance values detailed in Table 1 are to be used in conjunction with the standard serviceability test (*App.* 1).

Table 1

Capacitance values

Tank unit Part No.	Capacitance (pF)	
	Min.	Max.
GP384/004	41	45
005	36	40
006	25	29
007	45	49
008	50	54
009	47	51
010	494	534
023	455	491
040	171	185
043	529	561
044	276	300
045	490	520
046	237	255
047	231	249
087	34	38
088	33	37
089	21	25
090	36	40
091	48	52
092	43	47

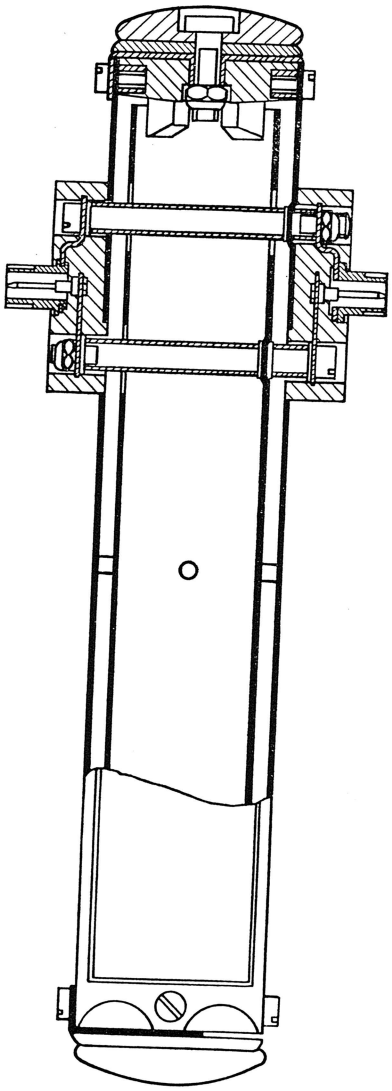

Fig. 1. Tank unit, Type GP384/— series

Appendix 7

TANK UNITS, TYPE GP385/—SERIES

Introduction

1. Tank units of the Type GP385/— series (*fig.* 1) are internally mounted units and are fitted with three electrode tubes, one live and two earthed. The method of installing the units is by inserting tank fitting spiders at either end of the tubes under the end-caps; these spiders are then attached to the inside of the tank. Normally two or more tank units are installed in a tank with coaxial cables providing inter-unit connections and a further cable providing connections to an externally mounted tank connector.

2. The description, operation, installation and servicing detailed in the chapter apply to this series of units. The minimum and maximum capacitance values detailed in Table 1 are to be used in conjunction with the standard serviceability test (*App.* 1).

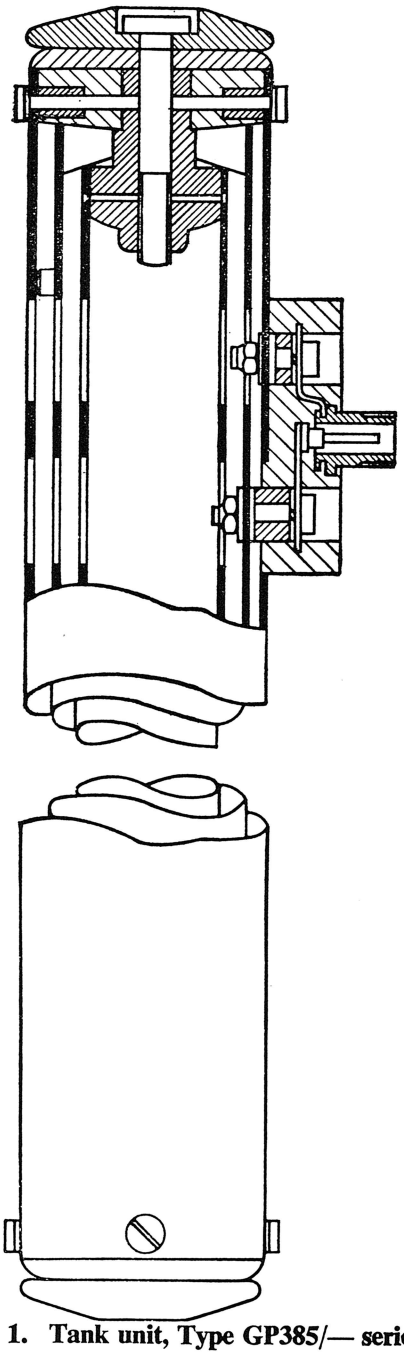

Fig. 1. Tank unit, Type GP385/— series

Table 1

Capacitance values

Tank unit Part No.	Capacitance (pF)	
	Min.	Max.
GP385/001	112	120
002	184	200
003	207	223
004	229	247
005	255	277

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