

SPECIAL QUALITY HALF-WAVE RECTIFIER

M809I

Special quality half-wave rectifier primarily intended for operation at high altitudes in equipment where mechanical vibration and shocks are unavoidable.

This data should be read in conjunction with GENERAL NOTES—SPECIAL QUALITY VALVES which precede this section of the handbook, and the index numbers are used to indicate where reference should be made to a specific note.

HEATER

V_h^1	6.3	V
I_h	1.15	A

MOUNTING POSITION

Any

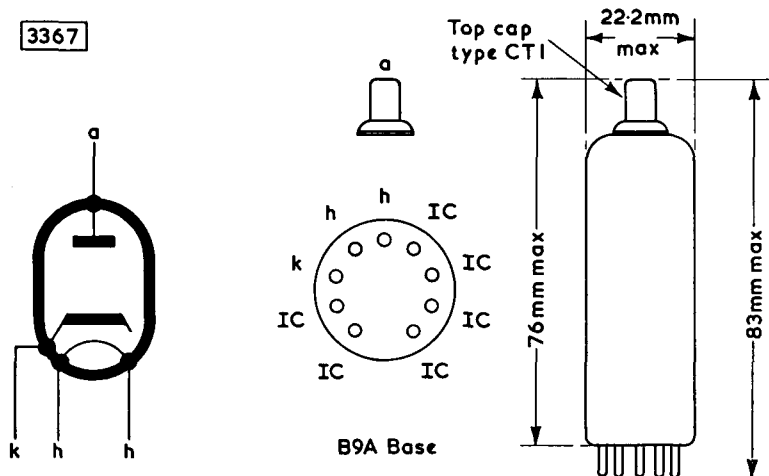
LIMITING VALUES¹ (absolute ratings)

P.I.V. max.	2.0	kV
$i_a(pk)$ max.	900	mA
V_{h-k} max.	650	V
Maximum altitude for full P.I.V. rating	60,000	ft
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	220	°C

TYPICAL OPERATION OF TWO M809I AS FULL-WAVE RECTIFIER

Capacitor input

$V_{in(r.m.s.)}$	2×500	2×625	V
R_{lim} min. (per anode)	150	250	Ω
C max.	16	16	μF
I_{out} max.	300	250	mA



TEST CONDITIONS (unless otherwise specified)

V_h (V)	$V_{in(r.m.s.)}$ (V)	R_{load} (k Ω)	C (μ F)
6.3	625	5	8

TESTS

A.Q.L.⁵
(%)

Bogey⁹ Min. Max.

GROUP A

Voltage breakdown 0.25

GROUP B

Heater current 0.65

Heater to cathode leakage current. $V_{h-k} = 330V$ (cathode positive) .. 0.65

Anode voltage. $I_a = 150mA$ 0.65

Output current 0.65

Group quality level¹⁰ 1.0

GROUP C

Output current. $V_{in(r.m.s.)} = 500V$, $R_{load} = 3k\Omega$ 2.5

†Hot switch 2.5

†Hot switch. $f = 1.5$ to $2.4kc/s$ C reduced to suit frequency 6.5

†The anode voltage is switched on and off six times and no arcing must occur within the valve.



GROUP D

Glass strain test^{11A}. No applied voltages

Base strain test¹². No applied voltages

6.5
6.5

—
—

—
—

GROUP E

Fatigue¹⁴

$V_h = 7.0V$, 1 minute on 3 minutes off. No other voltages applied, minimum peak acceleration = 5g, $f = 170c/s$ for 33 hours in each of 3 mutually perpendicular planes.

Post fatigue tests

Heater to cathode leakage current. $V_{h-k} = 330V$ (cathode positive)

Output current

μA
mA

200
—

—
120

2.5
2.5

Shock¹⁵

No applied voltages, 500g.

Post shock tests

Heater to cathode leakage current. $V_{h-k} = 330V$ (cathode positive)

Output current

Voltage breakdown

Group quality level¹⁰

μA
mA

200
—

—
120

2.5
2.5
2.5
6.5

GROUP F

Life¹⁴

Running conditions. $V_{in(r.m.s.)} = 500V$, $R_{load} = 3k\Omega$
 $V_{h-k} = V_{out} + 150V_{r.m.s.}$, $C = 8\mu F$

Stability life test end point

Change in anode voltage after 1 hour. $I_a = 150mA$

Intermittent life test

Running conditions. $V_{in(r.m.s.)} = 500V$, $R_{load} = 3k\Omega$
 $V_{h-k} = V_{out} + 150V_{r.m.s.}$, $C = 8\mu F$

Intermittent life test end points

Sub-group (a)

Inoperatives¹⁶

Heater current

Heater to cathode leakage current. $V_{h-k} = 300V$ (cathode positive)

Sub-group (b)

Output current

Group quality level¹⁰

A.Q.L.⁵
(%)

Bogey⁹

Individuals⁶
Min. Max.

1.0

10

A.Q.L.⁵
(%)

Min. Max.

2.5
4.0

500 hours
1000 hours

2.5
4.0

500 hours
1000 hours

A

μA

μA

4.0
6.5

500 hours
1000 hours

6.5
10

500 hours
1000 hours

mA

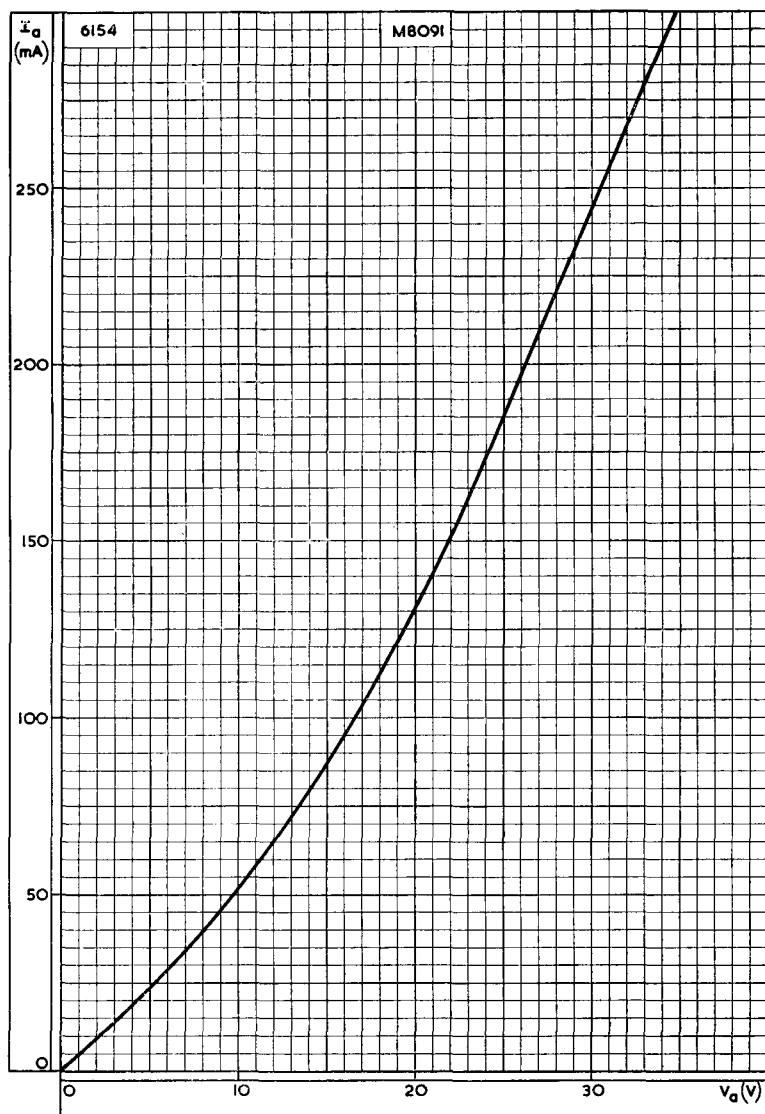
mA

GROUP G

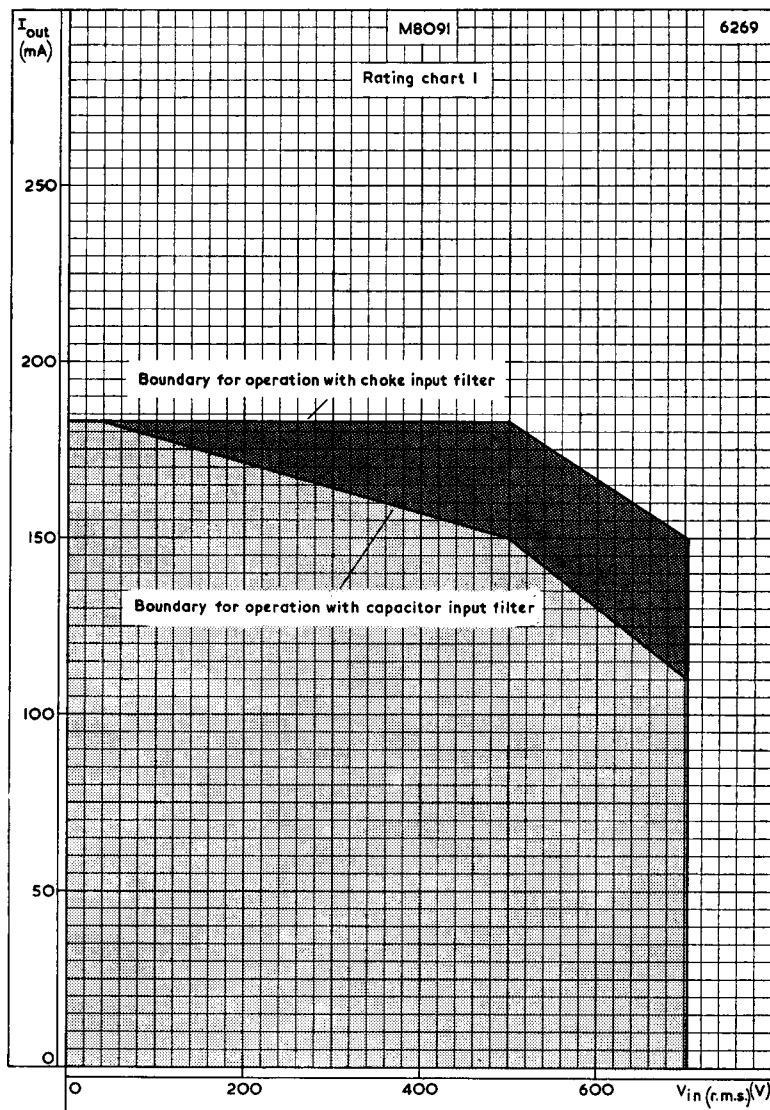
Valves are held for 28 days and retested for

Inoperatives¹⁶

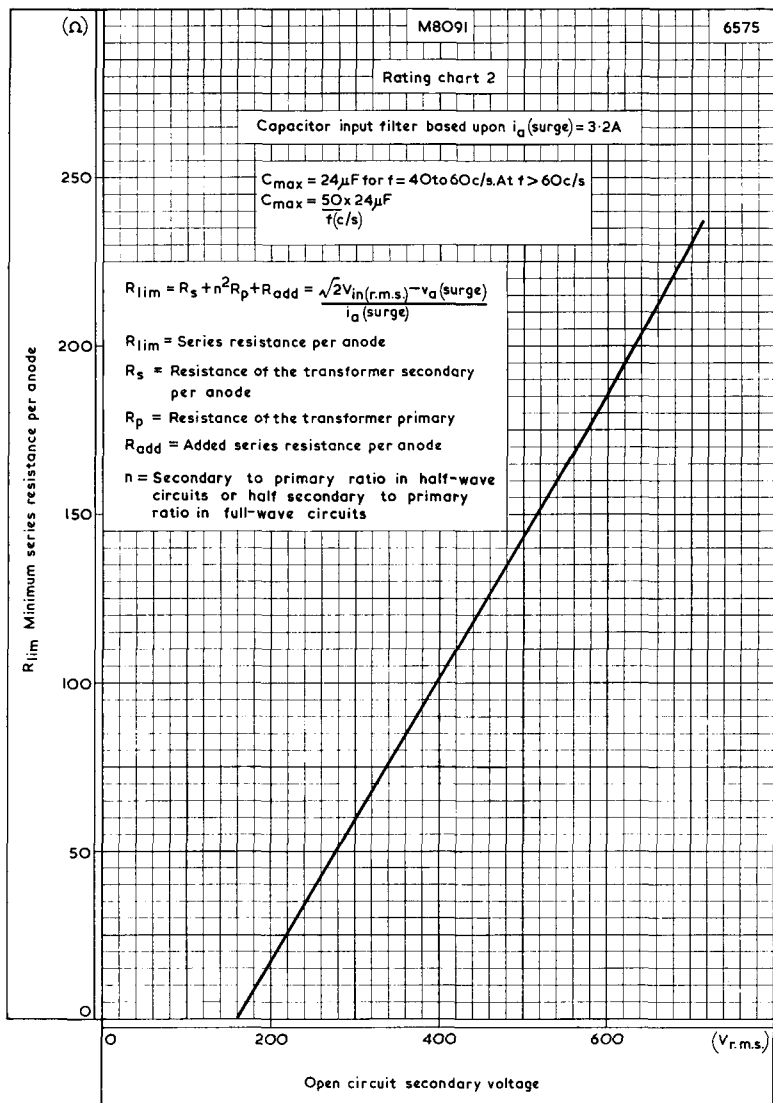
0.5



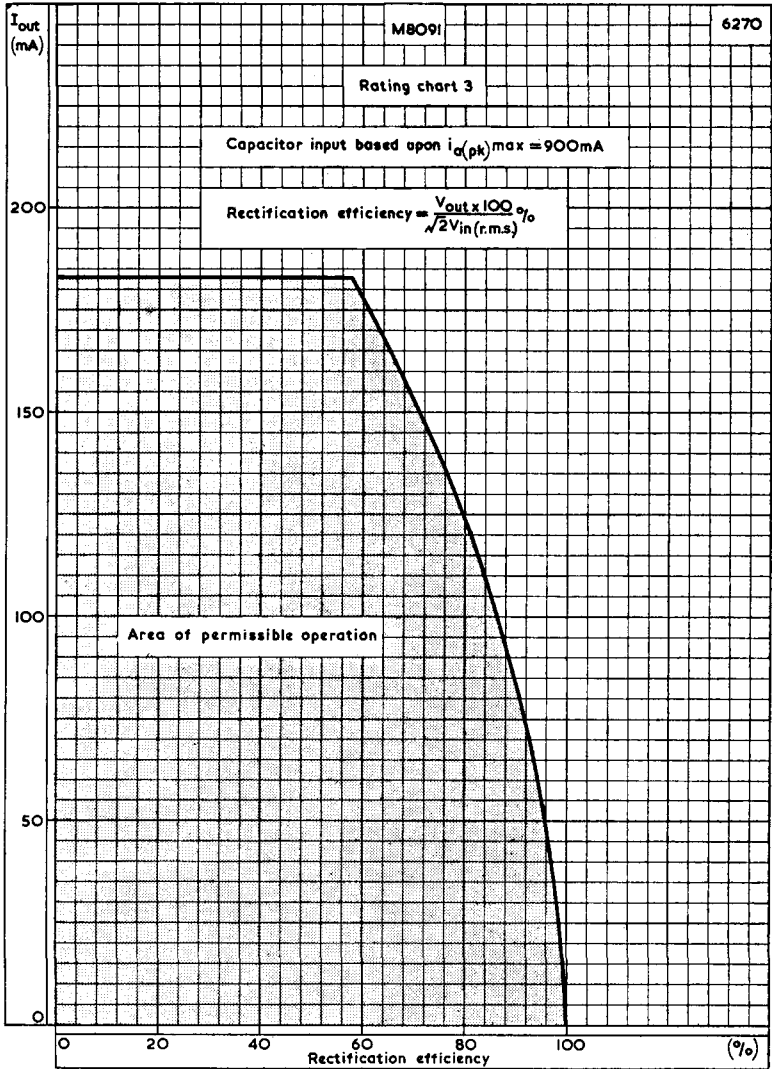
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE



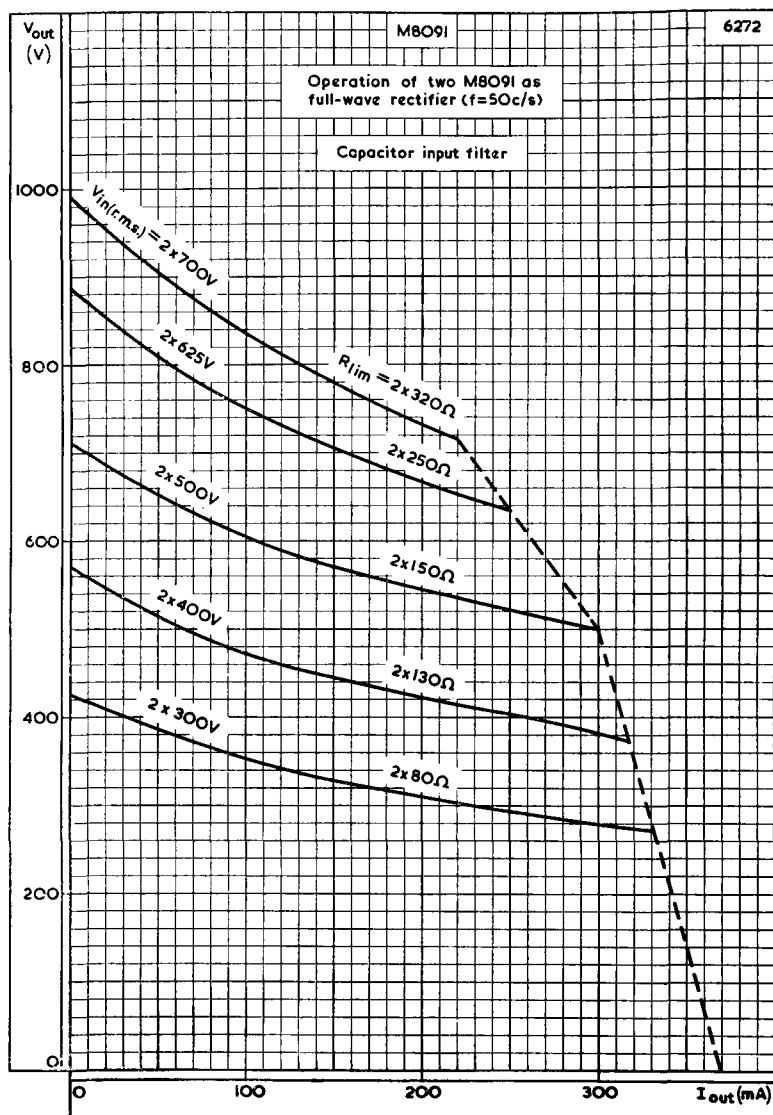
BOUNDARY OF OPERATION WITH CAPACITOR OR
CHOKE INPUT FILTER



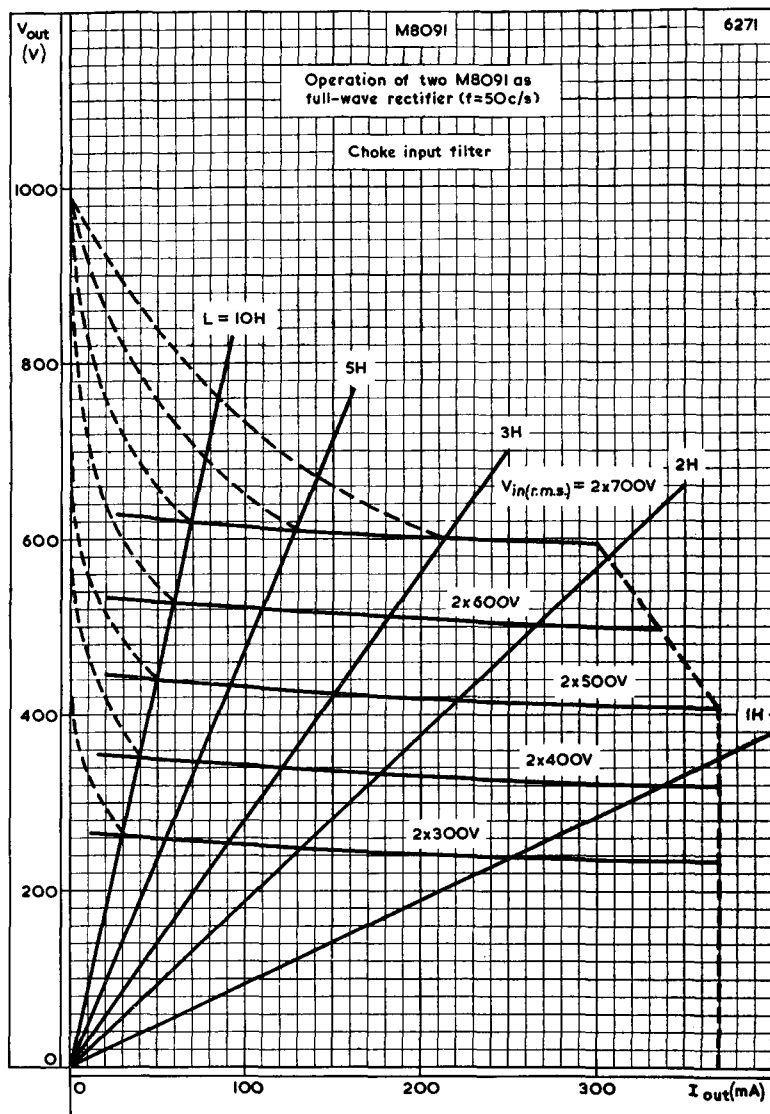
MINIMUM SERIES ANODE RESISTANCE PLOTTED AGAINST
OPEN CIRCUIT SECONDARY VOLTAGE



OUTPUT CURRENT PLOTTED AGAINST RECTIFICATION EFFICIENCY



CAPACITOR INPUT FILTER REGULATION CURVES



CHOKE INPUT FILTER REGULATION CURVES