

SPECIAL QUALITY HALF-WAVE RECTIFIER

M809 I

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 VALUES⁴ (absolute ratings)

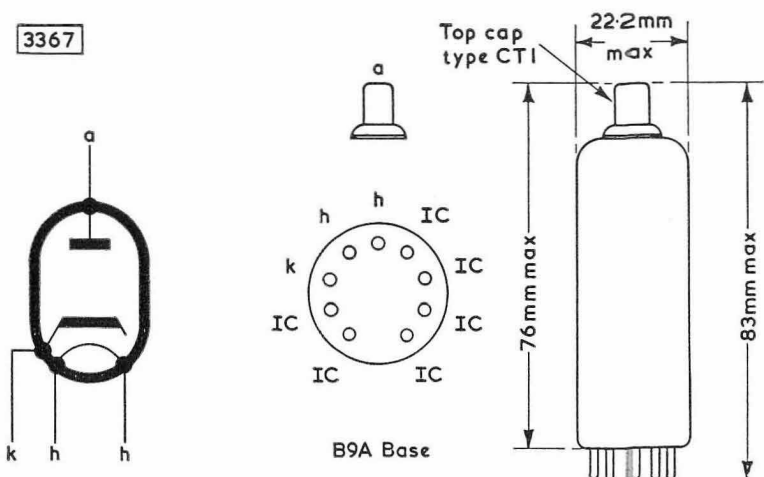
P.I.V. max.	2.0	kV
$i_a(\text{pk})$ max.	900	mA
V_{h-k} max.	650	V
Maximum altitude for full P.I.V. rating	60,000	ft
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	220	°C

TYPICAL OPERATION OF TWO M8091 AS FULL-WAVE RECTIFIER

Capacitor input

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

3367



M8091

SPECIAL QUALITY
HALF-WAVE RECTIFIER

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
(%)

Individuals⁶
Bogey⁹ Min. Max.

GROUP A

Voltage breakdown	0.25	—	—	—
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GROUP B

Heater current	0.65	—	0.9	1.4	A
Heater to cathode leakage current. $V_{h-k} = 330V$ (cathode positive) ..	0.65	—	—	150	μ A
Anode voltage. $I_a = 150mA$	0.65	—	18	26	V
Output current	0.65	—	120	—	mA
Group quality level ¹⁰	1.0	—	—	—	

GROUP C

Output current. $V_{in(r.m.s.)} = 500V$, $R_{load} = 3k\Omega$	2.5	—	145	—	mA
† 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	..	..	..	..	..	6.5	—	—	—
Base strain test ¹² . No applied voltages	..	..	..	..	..	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)	2.5	—	—	200	μA
Output current	2.5	—	120	—	mA

Shock¹⁵

No applied voltages, 500g.

Post shock tests

Heater to cathode leakage current. $V_{h-k} = 330V$ (cathode positive)	2.5	—	—	200	μA
Output current	2.5	—	120	—	mA
Voltage breakdown	2.5	—	—	—	
Group quality level ¹⁰	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. $I_a = 150mA$ 1.0 — — 10 %

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)

Inoperatives ¹⁶	..	..	..	..	..	..	..	{ 500 hours	2.5	—	—	
								{ 1000 hours	4.0	—	—	
Heater current	..	..	..	..	..	..	..	500 hours	2.5	0.9	1.4	A
Heater to cathode leakage current.	$V_{h-k} = 300V$ (cathode positive)							{ 500 hours	2.5	—	150	μA
								{ 1000 hours	4.0	—	150	μA

Sub-group (b)

Output current	..	..	..	..	..	..	..	{ 500 hours	4.0	120	—	mA
								{ 1000 hours	6.5	120	—	mA
Group quality level ¹⁰	..	..	..	..	..	..	..	{ 500 hours	6.5	—	—	
								{ 1000 hours	10	—	—	

GROUP G

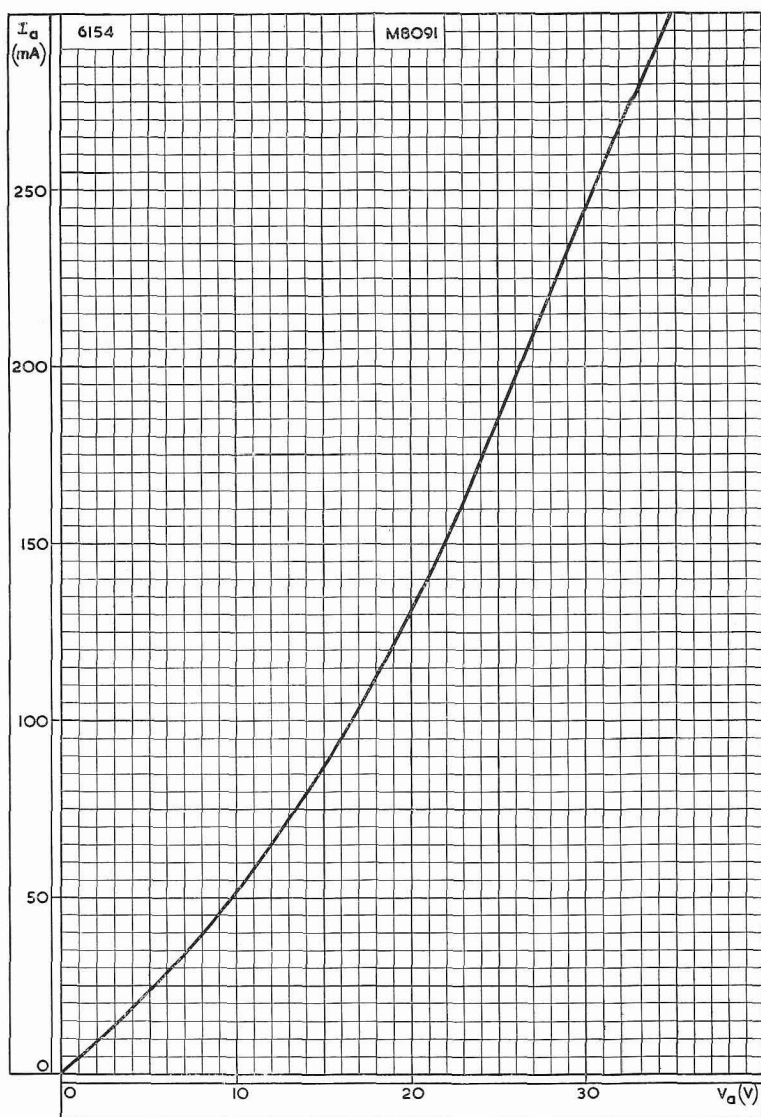
Valves are held for 28 days and retested for

Inoperatives¹⁶ 0.5 — —

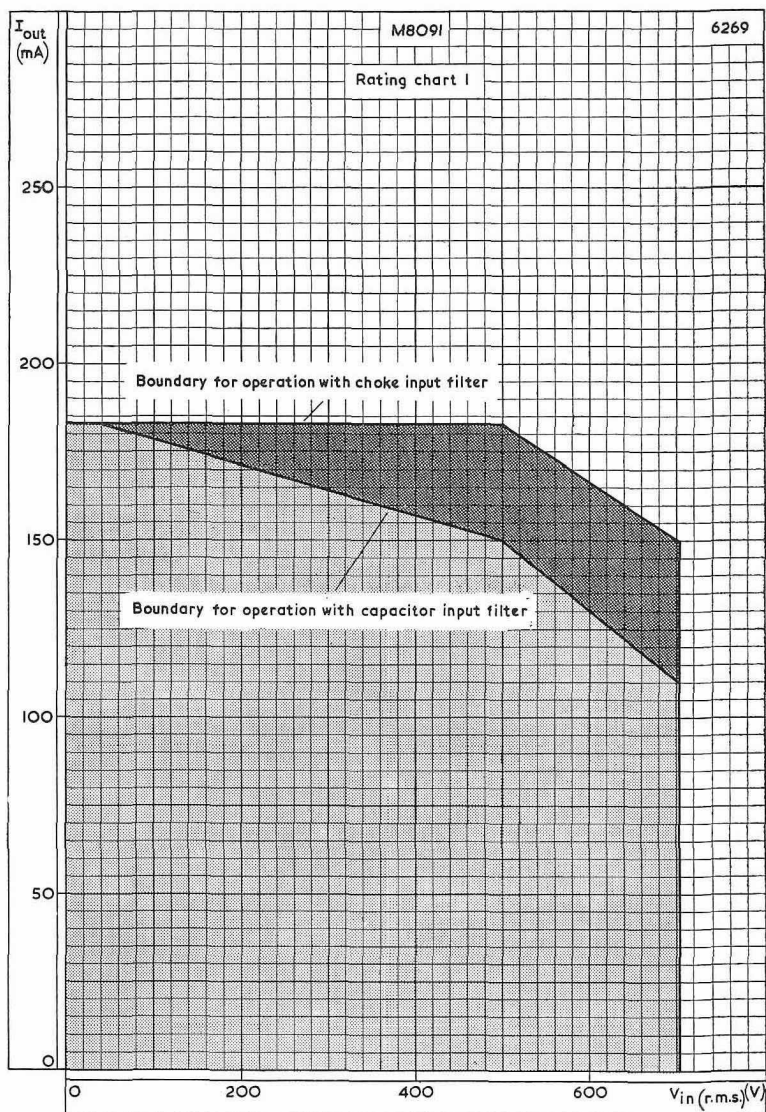
A.Q.L.⁵
(%)

Individuals⁶
Bogey⁹ Min. Max.

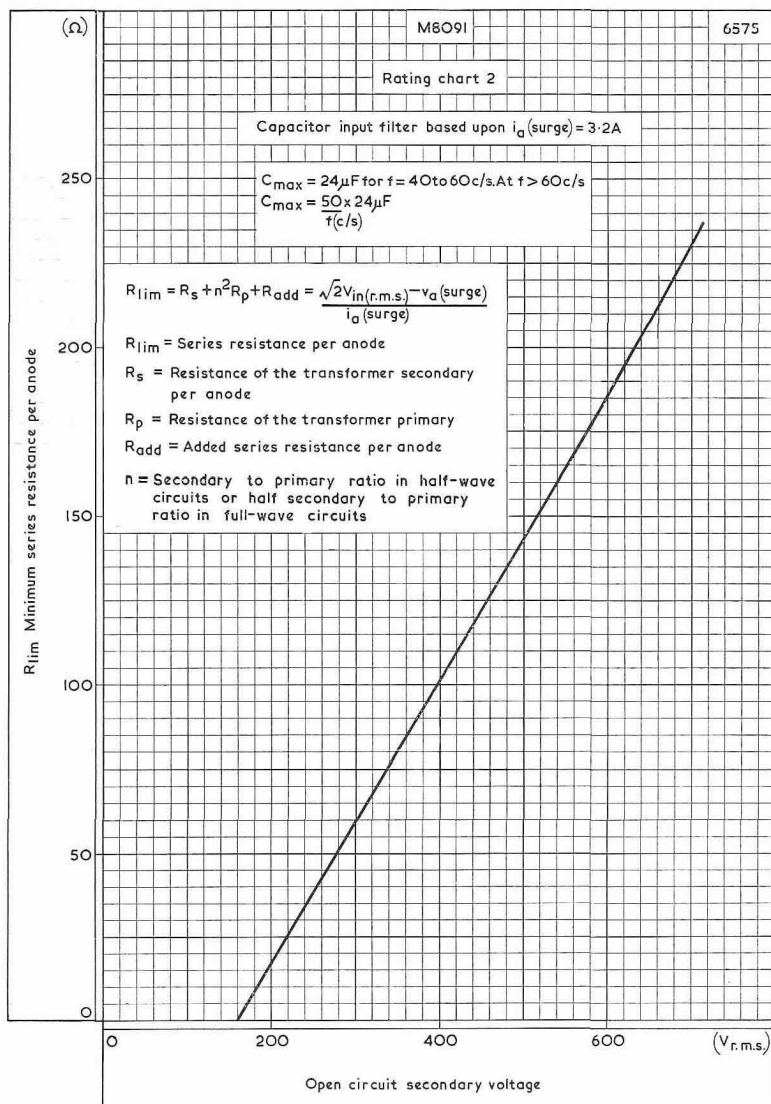
A.Q.L.⁵
(%) Min. Max.



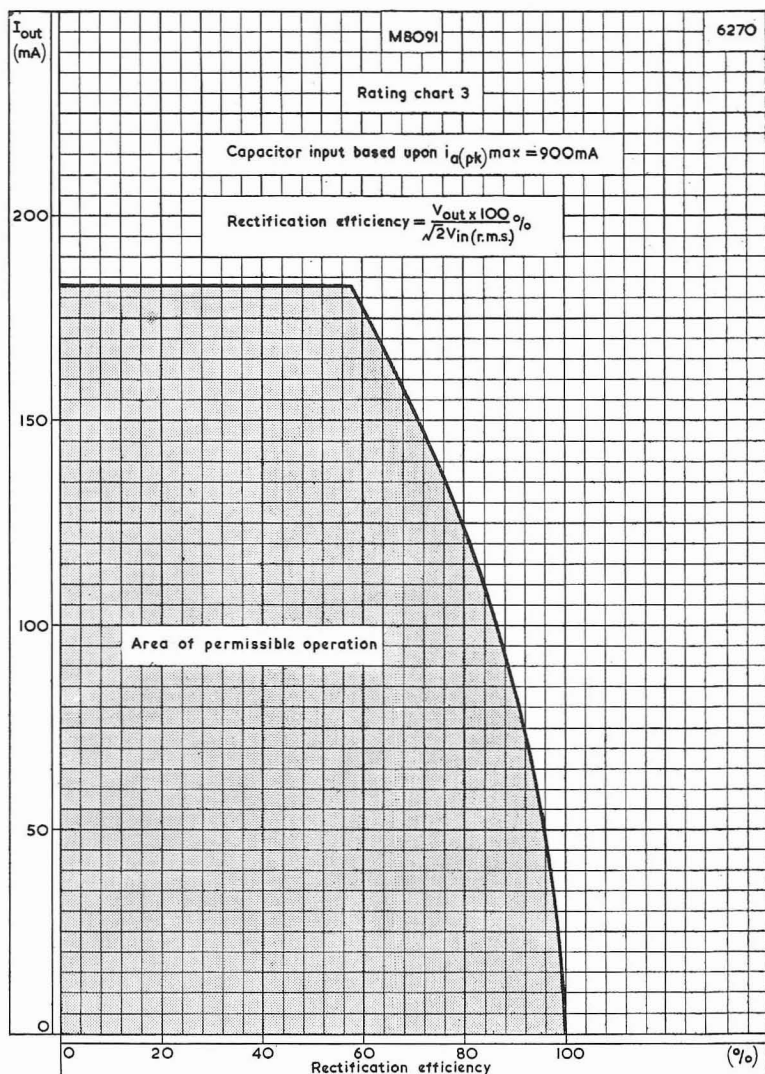
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE



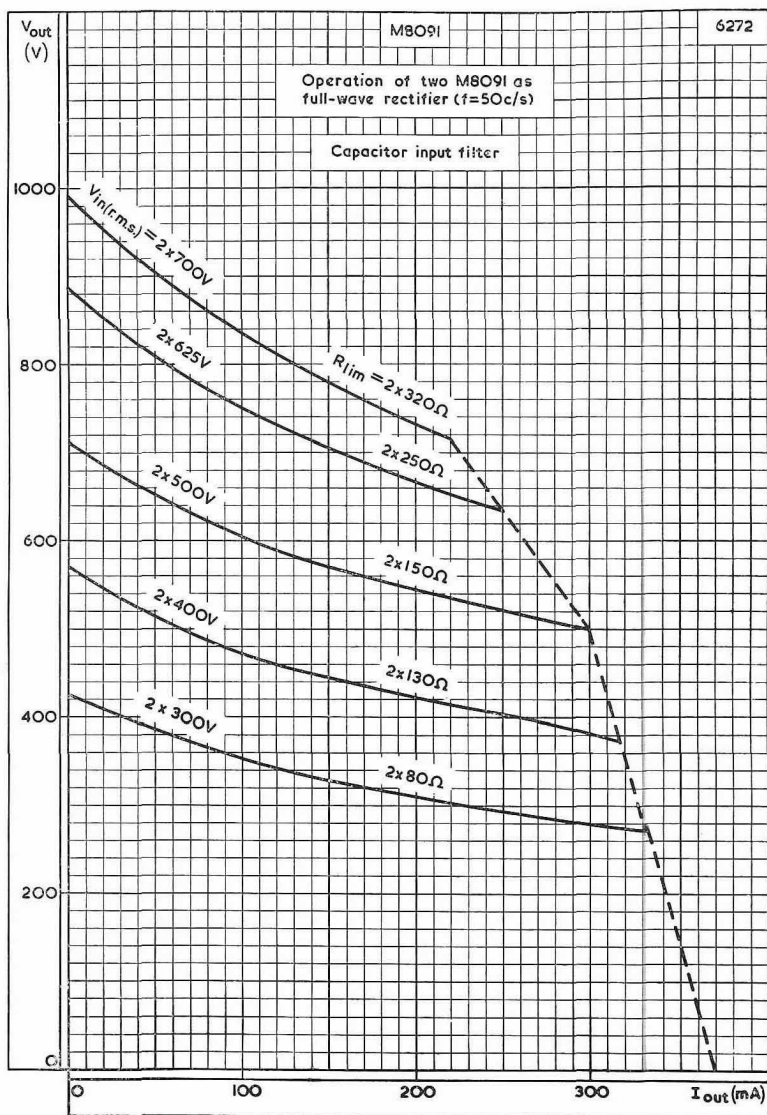
BOUNDARY OF OPERATION WITH CAPACITOR OR
CHOKE INPUT FILTER



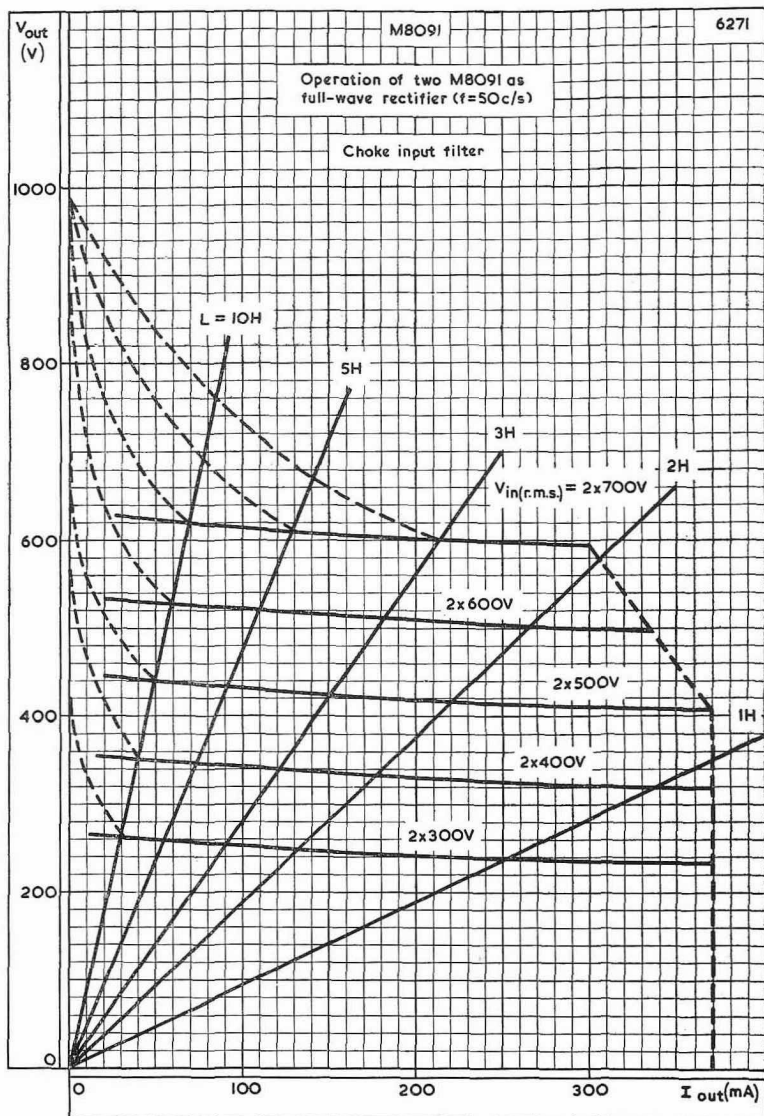
MINIMUM SERIES ANODE RESISTANCE PLOTTED AGAINST
OPEN CIRCUIT SECONDARY VOLTAGE



OUTPUT CURRENT PLOTTED AGAINST RECTIFICATION EFFICIENCY



CAPACITOR INPUT FILTER REGULATION CURVES



CHOKE INPUT FILTER REGULATION CURVES