MAZDA

PEN. 453 DD

DOUBLE DIODE BEAM POWER AMPLIFIER FOR AC/DC MAINS

RATING.

Heater Voltage	45·0
Heater Current (Amps.)	0·2
Maximum Anode Voltage	200
Maximum Screen Voltage	200
*Mutual Conductance (mA/V)	12
Maximum Anode Dissipation (watts)	10

Taken at Ea = 100 ; Es = 100 ; Eg 0.

TYPICAL OPERATION.

Anode Voltage	138	150	160
Screen Voltage	150	150	175
Grid Bias Voltage	8·7	8·75	10
Anode Current (mA.)	50	50	64
Screen Current (mA.)	10	10	13
*Anode Load (ohms)	2,800	2,900	2,600
*Power Output (watts)	2·65	2·95	3·75
*Input Swing (volts) (RMS)	4·7	4·8	5·5
Bias Resistance (ohms)	145	145	130

* For 5 per cent. Third Harmonic, and Second Harmonic not exceeding 5 per cent.

INTER-ELECTRODE CAPACITIES.

*Anode to Earth	13·0 $\mu\mu$F.
*Grid to Earth	18·75 $\mu\mu$F.
Anode to Grid	0·75 $\mu\mu$F.
*Diode 1 to Earth	4·75 $\mu\mu$F.
*Diode 2 to Earth	4·5 $\mu\mu$F.
Diode 1 to Diode 2	0·05 $\mu\mu$F.

* " Earth " denotes the electrodes of any second valve section and the remaining earthy potential electrodes of the section under measurement, H and M joined to cathode.

DIMENSIONS.

Maximum Overall Length	131 mm.
Maximum Diameter	54 mm.

GENERAL.

The PEN.453 DD is an indirectly heated double diode output pentode for use in A.C./D.C. mains receivers. In operation the two diodes and the pentode are independent of each other except for the common cathode sleeve, and the two sections may be treated as two separate valves as far as circuit considerations are concerned. The characteristics are identical with those of the PEN. DD.4021, and a band of metallising covers the lower portion of the bulb. The valve is fitted with a Mazda octal base, the connexions to which are given overleaf.

APPLICATION.

When used with average A.C. mains with series speaker field circuit, in which the speaker field requires approximately 6 watts, a screen voltage of the order of 145 to 150 will be obtained. Approximately 2·7 watts will be delivered, without exceeding 5 per cent. of either second or third harmonic, with an output transformer resistance of 250 ohms.

In the case of parallel speaker fields, approximately 3·75 watts will be delivered using an output transformer with resistance of 250 ohms, and a 300 ohms smoothing choke smoothing a speaker field of 6 watts.

The valve should always be self-biased, and the value required is given on the preceding page. The grid to cathode circuit resistance should be kept as low as possible and should not exceed 1 megohm for an anode dissipation limit of 10 watts. The grid circuit must be efficiently decoupled, and this may be achieved either by connecting an electrolytic condenser of 50 to 75 μF. across the self-bias resistance, or decoupling the grid circuit in the usual manner. An anti-parasitic resistance of the moulded type, and of a low self-capacity should be connected in the grid or anode circuit, and mounted close to the actual valve terminals. A value of 50 ohms is satisfactory in the case of an anode resistance.

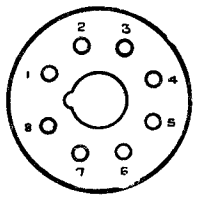
In the normal operation one diode (connected to Pin No. 5) is employed as an audio detector, and the other (connected to Pin No. 7) to provide the A.V.C. voltage. The load resistance of the detector diode should be returned to cathode, and that of the A.V.C. diode to a negative voltage to provide the requisite delay voltage. A value of 15 to 20 should be employed, and $8\frac{1}{2}$ to 10 volts may be obtained from the voltage drop across the resistor. For a higher value, an additional resistor should be placed between the terminal of the self-bias resistor and the chassis (H.T. negative) of the receiver.

The anode load should be accurately determined, and kept reasonably constant by the provision of a suitable condenser filter.

The heater is designed to operate at 0·2 amps., and the series heater resistance should be such that the heater current has this value at average line voltage.

BASING.

Pin No. 1. Heater.
2. Cathode.
3. Anode.
4. Screen.
5. Diode 2.
6. Metallising.
7. Diode 1.
8. Heater.
Top Cap. Control Grid.



Viewed from the free end of the base