MAZDA

SP.2220

A.C./D.C. MAINS H.F. PENTODE

RATINGS.	SP.2220
Heater Voltage	22
Heater Current (amps.)	0·2
Maximum Anode Voltage	250
Maximum Screen Voltage	250
*Mutual Conductance (mA/V)	2·7

*Ea=250 ; Es=200 ; Eg=0.

TYPICAL OPERATION.	Noise Suppression.	Automatic Tuning.
Screen Voltage	200	200
Grid Bias, G1	3·0	2·85
Grid Bias, G3	0—20	4·3
Mutual Conductance (G1)	2·65	1·45
Anode Current (mA)	4·9	2·9
Screen Current (mA)	4·1	6·2

INTER-ELECTRODE CAPACITIES (Cold).

*Grid to Earth	13·0 $\mu\mu$F.
*Anode to Earth	8·75 $\mu\mu$F.
Anode to Grid	0·0035 $\mu\mu$F.

* "Earth" denotes the remaining earthy potential electrodes and metallising joined to cathode.

DIMENSIONS.

Maximum Overall Length	125 mm.
Maximum Diameter	45 mm.

GENERAL.

The SP.2220 is a screened pentode for use in noise suppression and automatic tuning circuits. The performance of the valve is characterised by the fact that the gain available for an input on the control grid G1 can be reduced to zero by applying 15 volts negative to the grid G3. The valve is based in a standard 7-pin base, the connections to which are given overleaf.

APPLICATION.

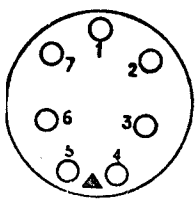
In noise suppression circuits the valve is used as an L.F. amplifier and the grid G3 is initially biased to approximately 15 to 20 volts negative. This can also be the delay voltage for the A.V.C. diode. The incoming carrier is then rectified in such a manner as to apply positive volts to the grid G3, so that when the carrier output on the last I.F. valve reaches the delay voltage the initial bias on Grid G3 is neutralised and the valve is working at its full amplification.

A resistance of between $\frac{1}{2}$ and 1 megohm should be included in series with the grid G3, in order to prevent it being driven positive, and this resistance together with a condenser between G3 and cathode may be utilised as the filter to remove audio-frequency components. An anode resistance of between 10,000 and 20,000 should be employed, and this will give working gains of the order of 20–40.

Both the initial biases of the grids G1 and G3 should be obtained by means of a tapped self-bias resistance in the cathode circuit.

When this valve is used in automatic tuning arrangements, the tuned circuit of the oscillator is included in the anode circuit of the valve, and a resistance of the order of 100,000 ohms, in series with a blocking condenser, is connected between the anode and grid G1, while a small condenser is connected between grid G1 and cathode ; in this manner a voltage in quadrature is applied to the control grid, and this gives an anode circuit admittance equivalent to a negative inductance across the oscillator tuning circuit. This admittance is directly proportional to the working slope of the grid G1. By initially biasing grid G3 in the middle of its operating characteristic it is possible to vary the frequency of the oscillator either up or down by applying either additional positive or negative volts from a frequency-discriminating circuit to grid G3. The initial biases on grid G1 and G3 should be obtained by the self-bias method, and the resistance in the grid G3 should not exceed $3\frac{1}{2}$ megohms.

BASING.



Viewed from the free end of the base.

Pin No. 1. Metallising.
2. Control Grid.
3. Suppressor Grid.
4. Heater.
5. Heater.
6. Cathode.
7. Anode.

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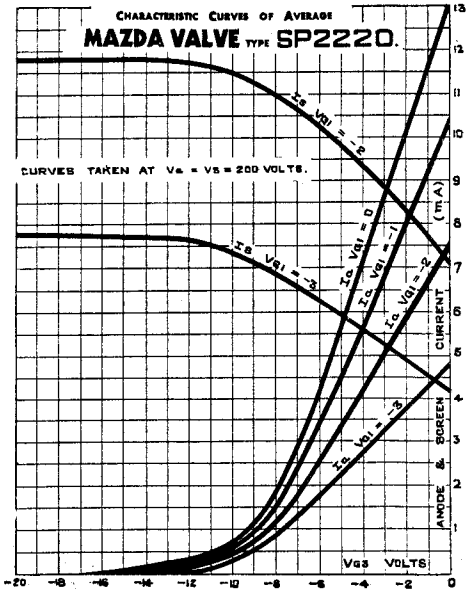

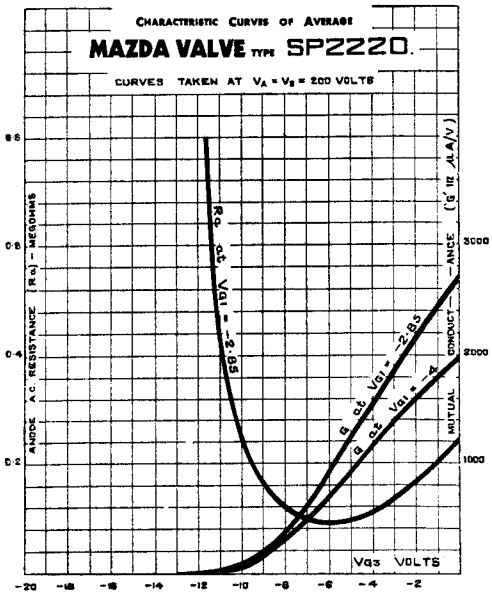

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Mazda Radio Valves are manufactured in Great Britain for the British Thomson-Houston Co., Ltd., London and Rugby.

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