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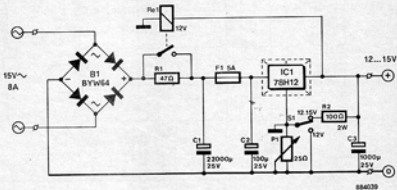
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## SECONDARY POWER-ON DELAY

The circuit described here enables short-circuit protection and power-on delay to be added to a power supply. Power supplies with a large reservoir capacitor may draw such large currents on switch-on that problems occur, even at the primary of the mains transformer. Particularly when a toroidal mains transformer is used, it may be necessary to fit a much heavier primary fuse than is desirable for normal protection.

The current in the secondary is limited by a resistor,  $R_1$ , in series with the reservoir capacitor,  $C_1$ . A few seconds after switch-on,  $R_1$  is short-circuited by a relay contact. Compared with switching at the primary side, this method has the advantage that no separate supply for the relay is necessary and that this does not have to switch the 240 V mains.



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Operation is fairly simple. After switch-on,  $C_1$  is charged slowly via  $R_1$ . After a few seconds, the output voltage has risen sufficiently for the relay to be energized, which causes  $R_1$  to be shorted. When the output of the supply is short-circuited, the output voltage drops to a level where  $R_{e1}$  is de-energized. Because  $R_1$  is then in circuit again, the short-circuit current is limited and nor-

normally the voltage regulator does not have to limit (less dissipation). Switch  $S_1$  enables a choice to be made between a fixed output of 12 V and one variable between 12 and 15 V. With heavy loads it may occur that the output voltage remains too low, because of  $R_1$ , to energize the relay. In that case it will be necessary to remove the load from the supply before this can switch

on. The earth of the circuit is in a somewhat unusual place to enable  $IC_1$  to be mounted on to the heat sink without an insulating washer (IC ground is connected to its case). For this reason, it is not permissible to use the earth for external ground connection.