

## Film Capacitors in Automotive Horns

Long before the days of interstates, backup cameras and drive-through, drivers made use of warning signals to alert other road users to their approach or possible danger. Unsurprisingly, before long, car owners and manufacturers realized it would be much more efficient to have drivers operate their warning devices themselves from inside their vehicles.

Automobile owners around the globe had their choice of whistles, sirens and bells so they could manually alert pedestrians and other road users. In 1910 another game-changer entered the market. An Englishman named Oliver Lucas developed a basic electric car horn that transferred sound more effectively and could be heard over a mile away. His electric klaxon worked by electromagnet acting upon a steel diaphragm while a contactor intermittently interrupted the electric current. These two inventions lie at the foundation of what we call car horns today.

Let us now understand the basic working of a horn as per the circuit shown below.

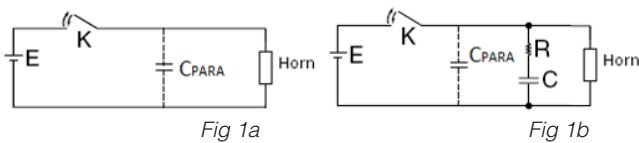
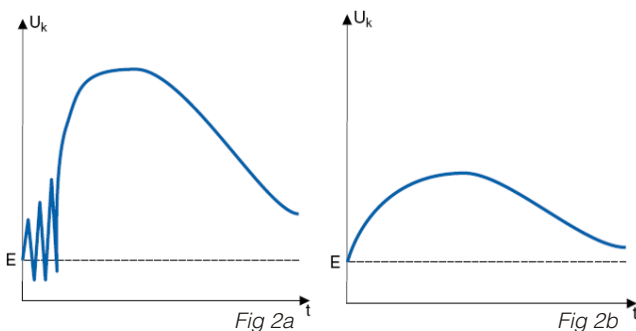


Figure 1a shows the horn circuit without a horn capacitor whereas  $C_{PARA}$  is the parasitic capacitance of the wires present in the circuit

Figure 1b shows the horn circuit with a horn capacitor  $C$  whereas  $R$  is the capacitor's internal resistance and  $C \gg C_{PARA}$

When the relay or switch  $K$  is on, the capacitor  $C_{PARA}$  gets charged and provides output to the horn. The moment, the switch  $K$  is off, a high voltage spike at rate of  $V = I * X_{C_{PARA}}$  will appear across the switch (shown in Fig 2a) that creates spark on the switch and will lead to failure of horn due to erosion of contacts.



When the capacitor  $C$  is added in parallel to Horn, then since the capacitance of  $C$  is high compared to  $C_{PARA}$ , a lesser voltage  $V = I * X_C$  ( $C \gg C_{PARA}$ ) will appear on the

switch  $K$  (shown in Fig 2b). Thus protecting the erosion of switch or relay and suppressing the voltage spikes. Hence it is necessary that the capacitor  $C$  should have good voltage handling capability.

Deki's technical centre has closely worked with the leading horn manufacturers around the globe. Today Deki Electronics is supplying its capacitors to major automotive horn manufacturers. Deki provides its customers with custom built capacitors for horn applications.

