



Model A Ford Technical Report

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Replacement Ignition Coil Resistance on 6V and 12V systems

In a recent attempt to replace the ignition coil in my 1931 Ford Town Sedan, I was astonished by the bad information and conflicting answers I ran into. I had a 12V system, however the part suppliers were showing 6V coils only and insisted that I must add an external ballast resistor. It's a large unsightly gizmo mounted on the firewall, and not original to the Model A. There had to be a better way.

What I would discover through my research was that there are really only two differences between ignition coils for 6V or 12V systems, and oddly enough the voltage is not the factor. Resistance and the Polarity are key however. To change polarity, positive ground to negative ground, you simply swap the wires connected to the coil. To eliminate the need for an external resistor I had to find a coil that had the correct resistance built in.

Ohm's law states that for a given resistance (R), current (I) is proportional to voltage (V). In other words, if we double the voltage through a circuit we double the current.

When we know Volts and Resistance we can solve for Current (Amperage) $V / R = I$

$$6v \div 1.5 \text{ ohm resistance} = 4 \text{ amps current.}$$

This is the standard current for a Model A Ford ignition coil.

If we double the voltage with the same resistance we double the current.

$$12v \div 1.5 \text{ ohms} = 8 \text{ amps current.}$$

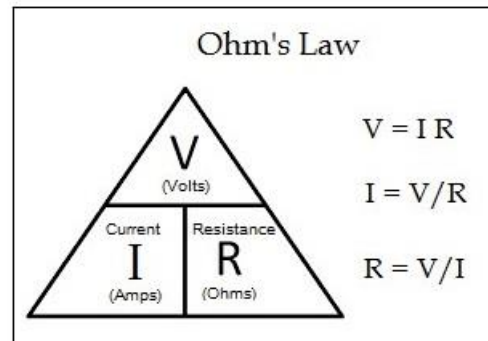
This much amperage will damage ignition system components.

If we double both voltage and resistance the current remains the same.

$$12v \text{ at } 3.0 \text{ ohms} = 4 \text{ amps.}$$

Back to a safe operating current.

To increase resistance we can either add a ballast resistor to the circuit or buy a coil with the correct internal resistance. Internal resisted ignition coils are more reliable and will eliminate an additional failure point added to your car.



Model A Ford Ignition Coil Cross Reference Table

The following table lists replacement coil part numbers that are compatible with the Model A for both 6V and 12V systems. These coils have the proper internal resistance and eliminate the need for an external ballast resistor.

Napa carries 2 lines; their Echlin brand and an economy line noted with the SB suffix. No one I asked could explain the difference other than ~\$18. Their part numbers, IC12 or IC14, will cross reference to any major auto parts store if you need a replacement in an emergency.

Ignition Coil - 6 Volt system, 1.5 ohm resistance

Supplier	Part Number	*Price	
Napa	IC12	\$45.00	Echlin
Napa	IC12SB	\$26.00	Mileage Plus Electric
O'Reilly	MPI 2-5195	\$20.00	Master Pro
Summit Racing	SMP-UC12, UC16T	\$27.00	Standard Motor Products
Birdhaven	T-5007-6V	\$17.50	
Snyder's Original Script Replacement Coil	A-12000-SC A-12000	\$67.00 \$15.50	

Coil Polarity

On **Positive** ground systems, connect the terminal marked **(+)** to the distributor.

Ignition Coil - 12 Volt system, 3.0 ohm resistance

Supplier	Part Number	*Price	
Napa	IC14	\$40.00	Echlin
Napa	IC14SB	\$27.50	Mileage Plus Electric
O'Reilly	MPI 2-5025	\$25.00	Master Pro
Summit Racing	SMP-UC14, UC15T	\$21.00	Standard Motor Products
Birdhaven	T-5007-12V	\$15.00	

Coil Polarity

On **Negative** ground systems, connect the terminal marked **(-)** to the distributor.

Modern Replacement Coil



External Resistor



Ford "Script" Original Coil

