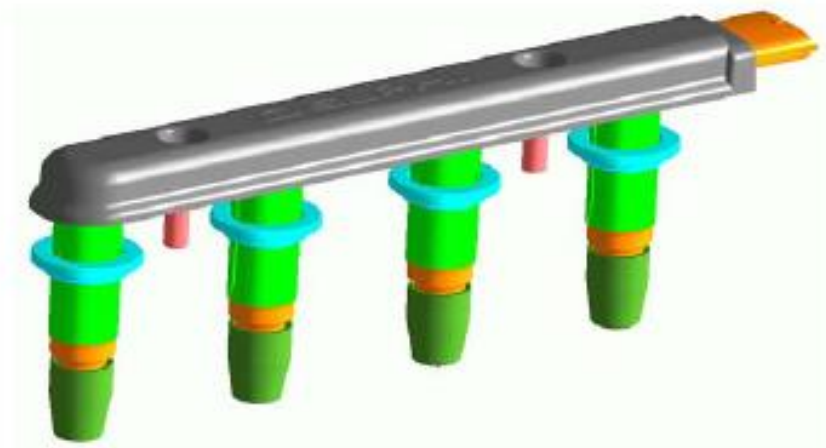
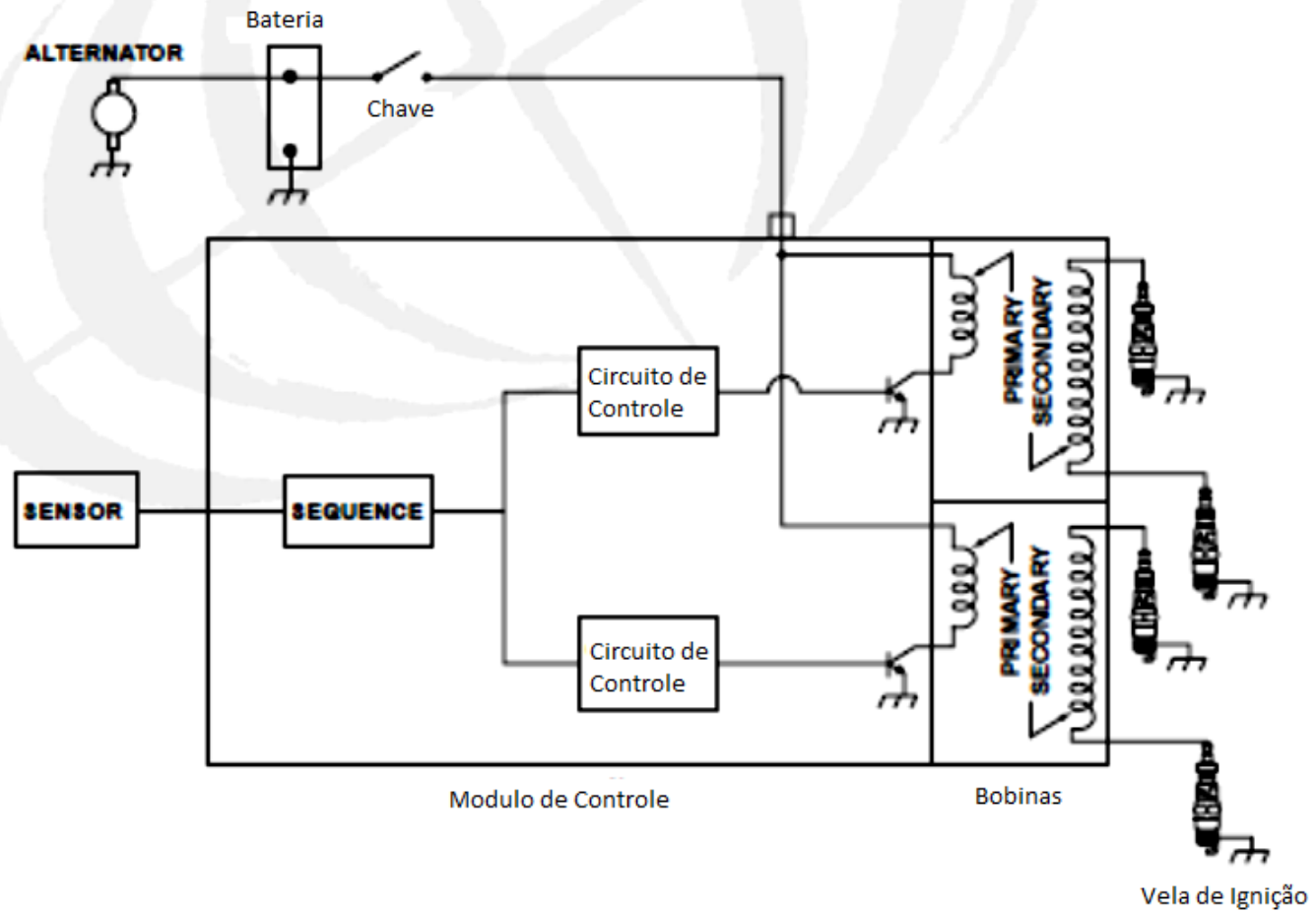


SISTEMA DE IGNIÇÃO



Ignition Systems
Delphi Energy and Chassis Systems

Sistema de Ignição



EFFECT OF AIR-FUEL RATIO ON EMISSION

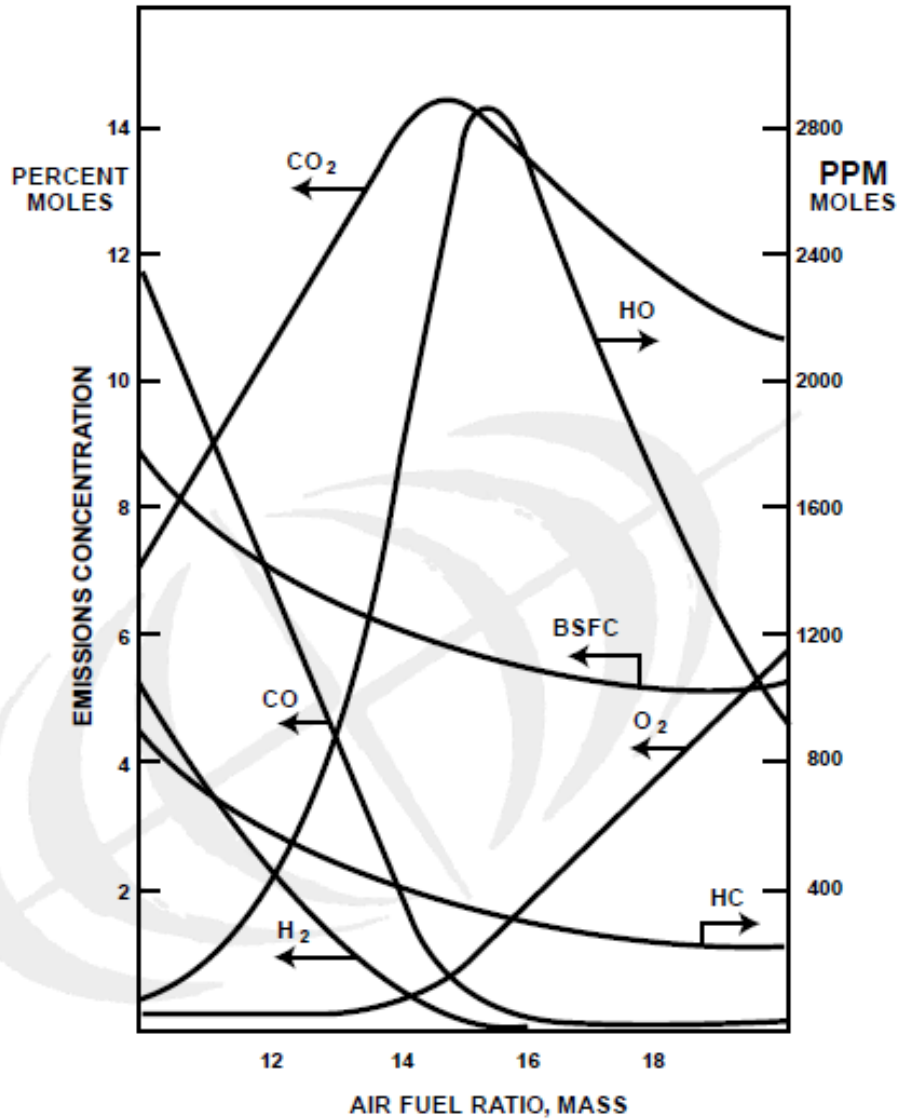


Figure 2-2. Engine out emissions vs. air/fuel ratio.

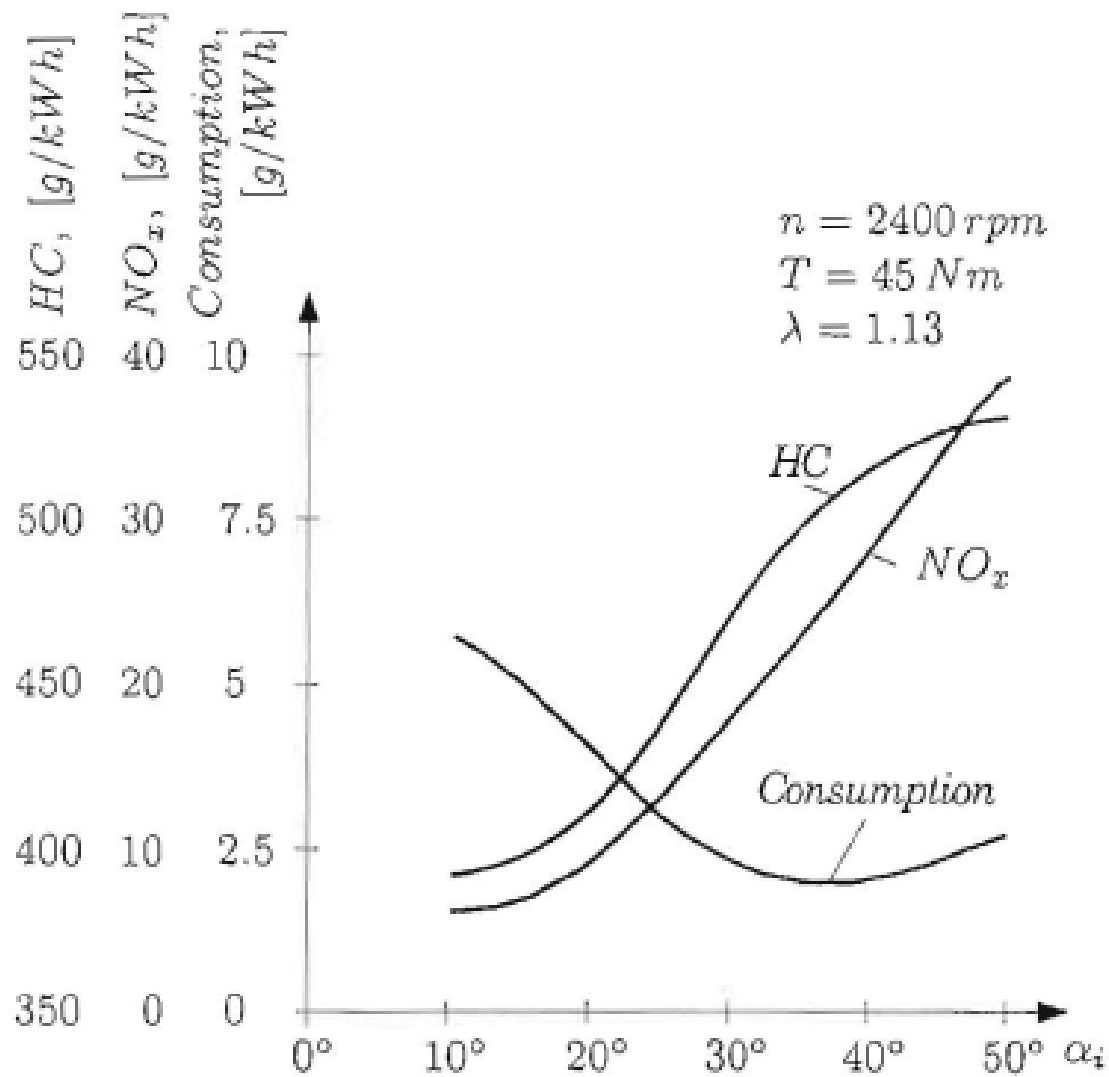


Figure 3.22 Fuel consumption and emission levels over ignition angle α_i .

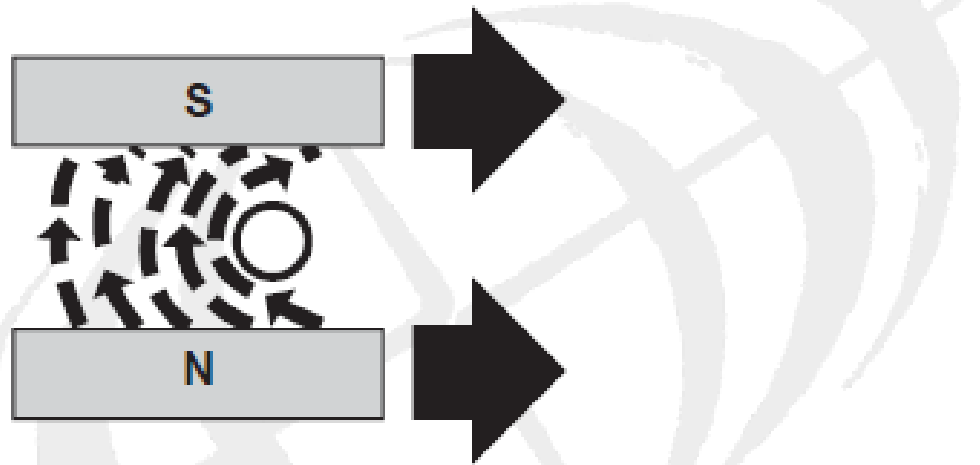


Figure 2-3. Electromagnetic induction.

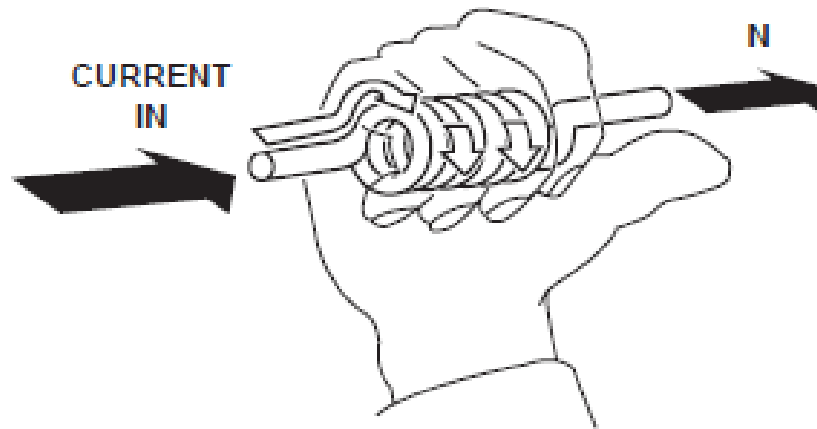
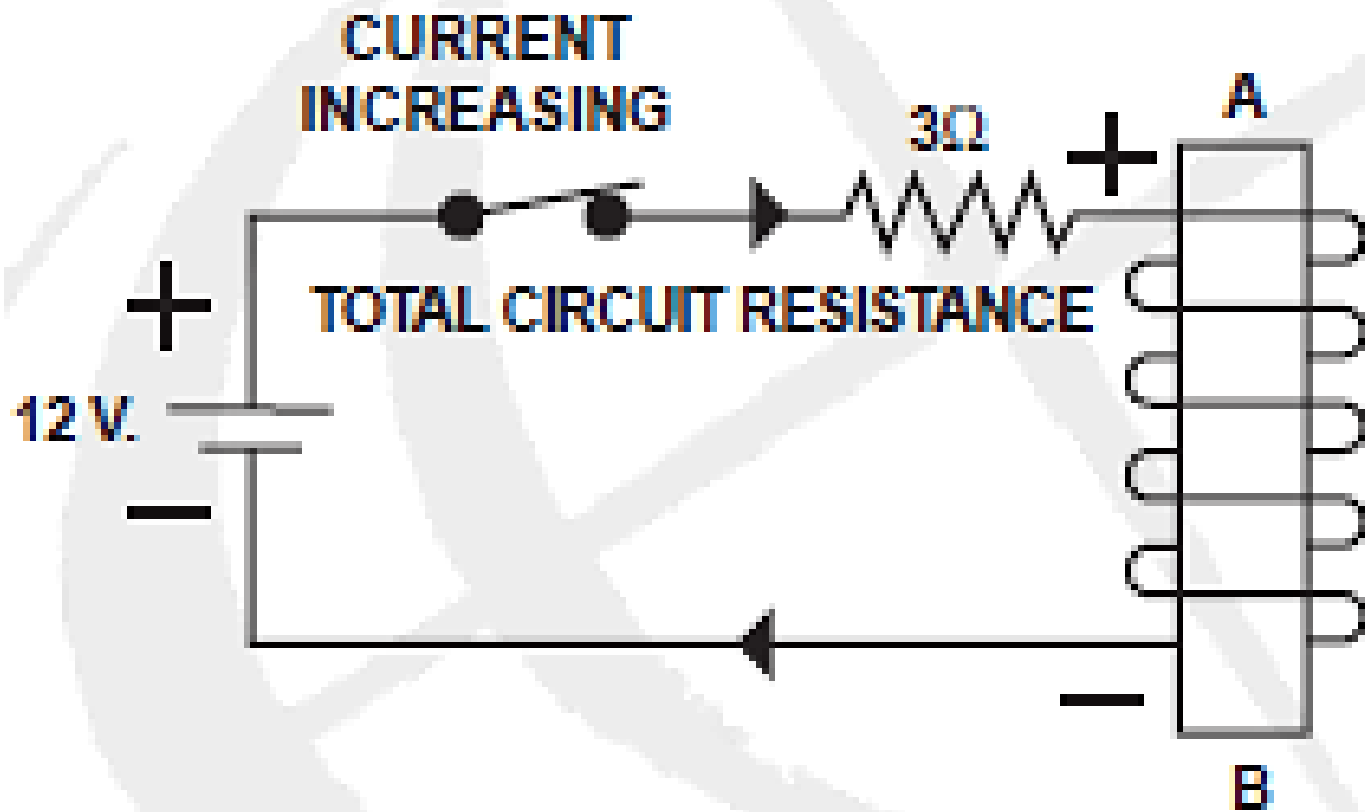


Figure 2-4. Right Hand Rule.



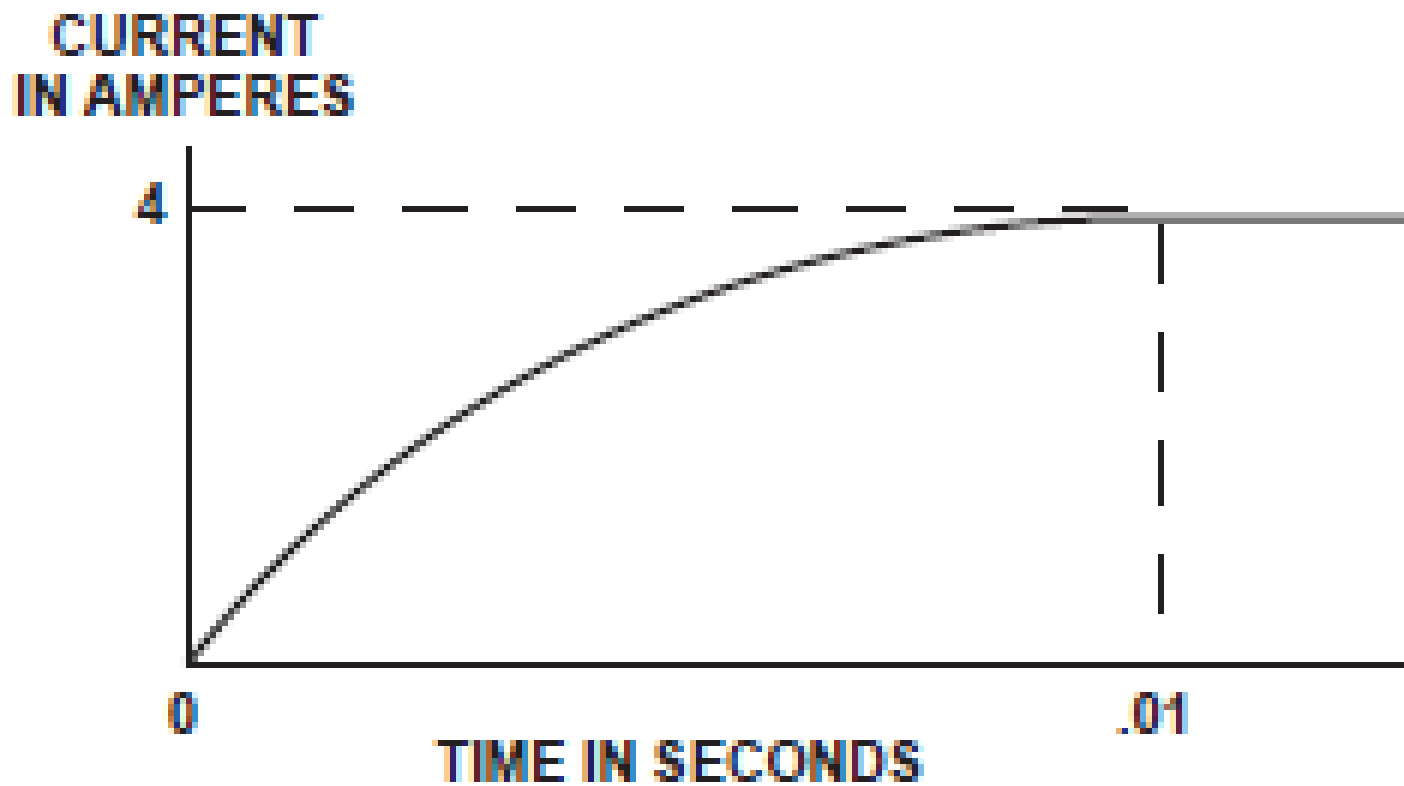
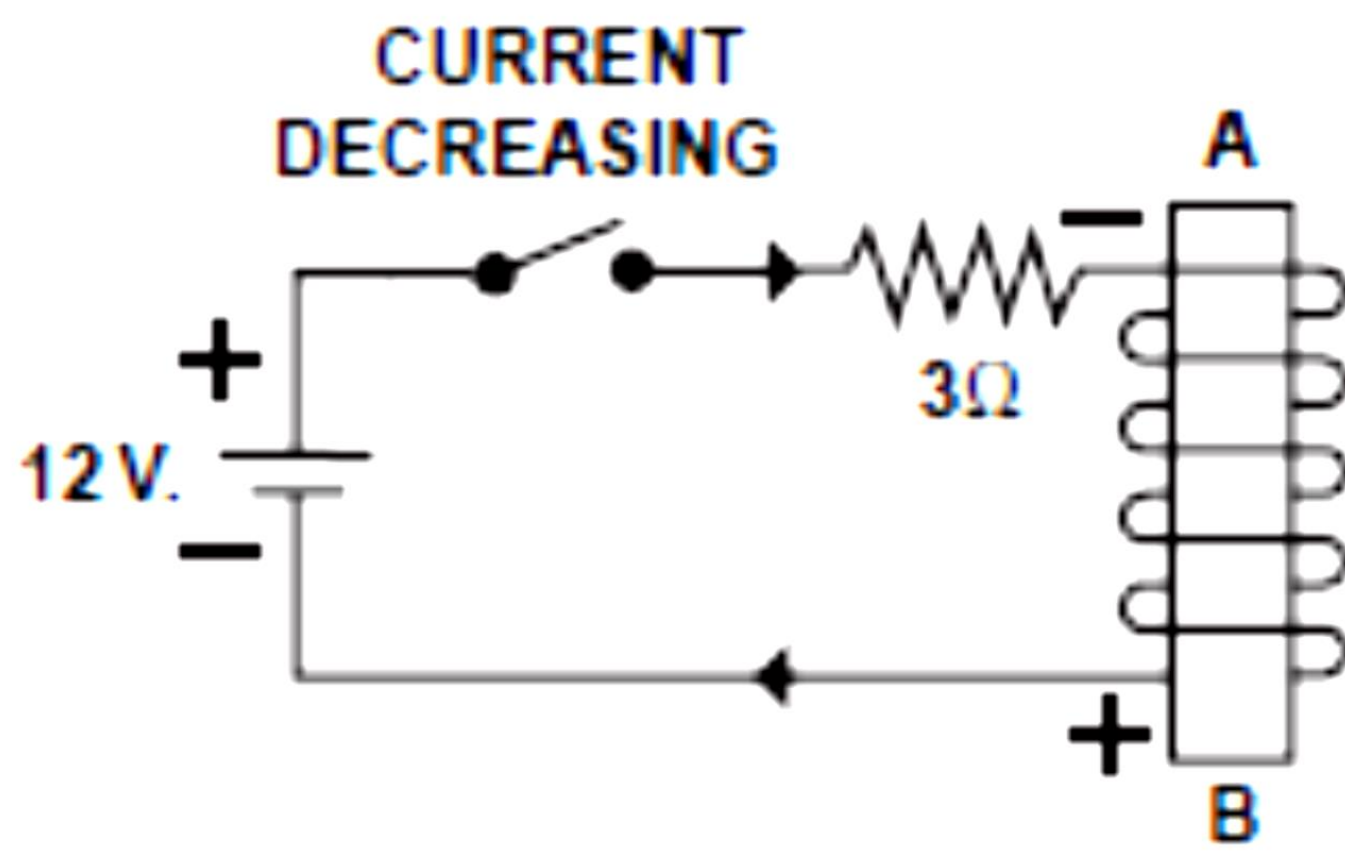
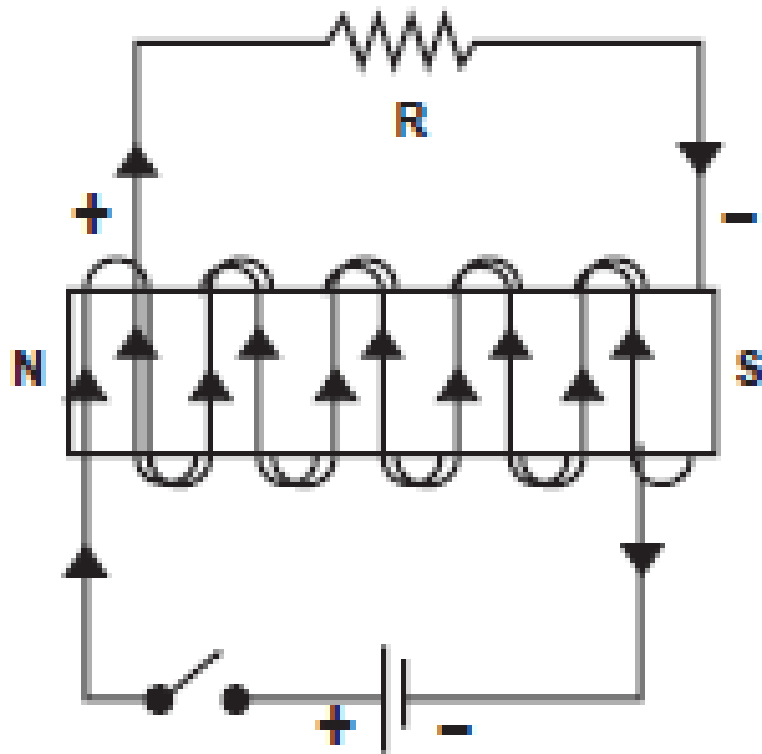
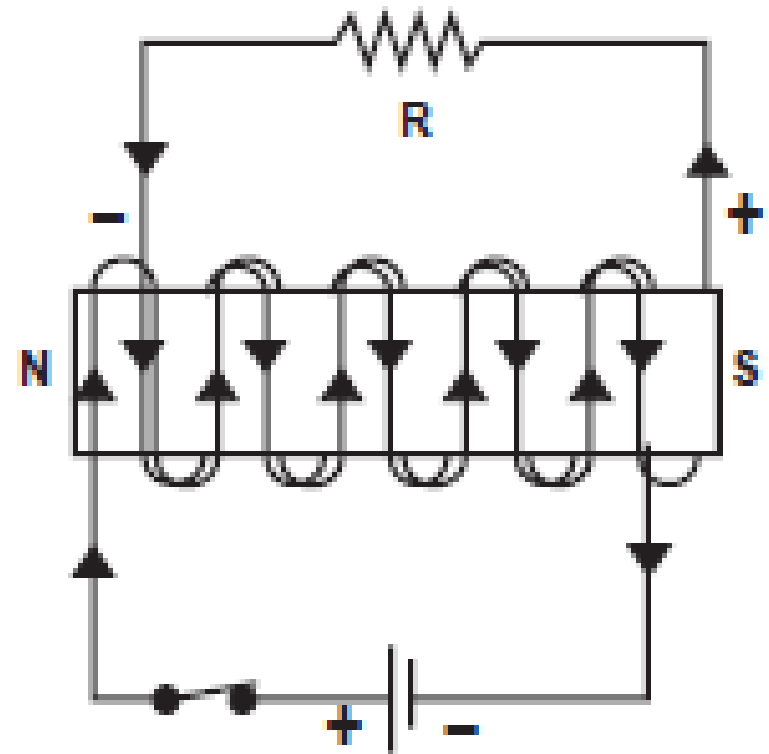


Figure 2-6. Current time lag.





CURRENT DECREASING



CURRENT INCREASING

Figure 2-8. Mutual induction.

Parameter	Compression Pressure	Spark Plug Gap	A/F Ratio	Ignition Polarity	Electrode Shape	Operating Temperature
Higher Required Secondary Voltage	High	Wide	Lean or Rich	Positive	Rounded Massive	Cold
Lower Required Secondary Voltage	Low	Narrow	Stoichiometric	Negative	Sharp	Hot

Table 2-1 — System Parameters

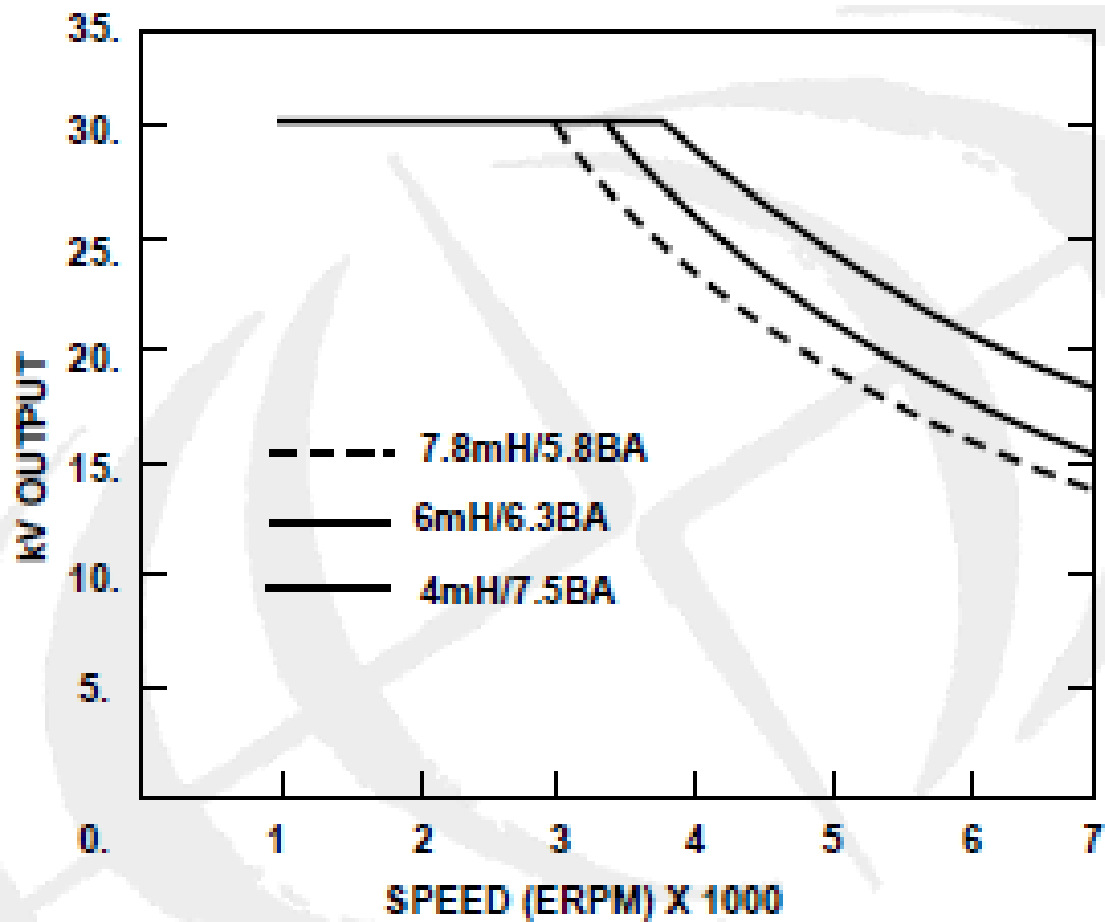


Figure 2-9. Available kV output vs. ERPM.

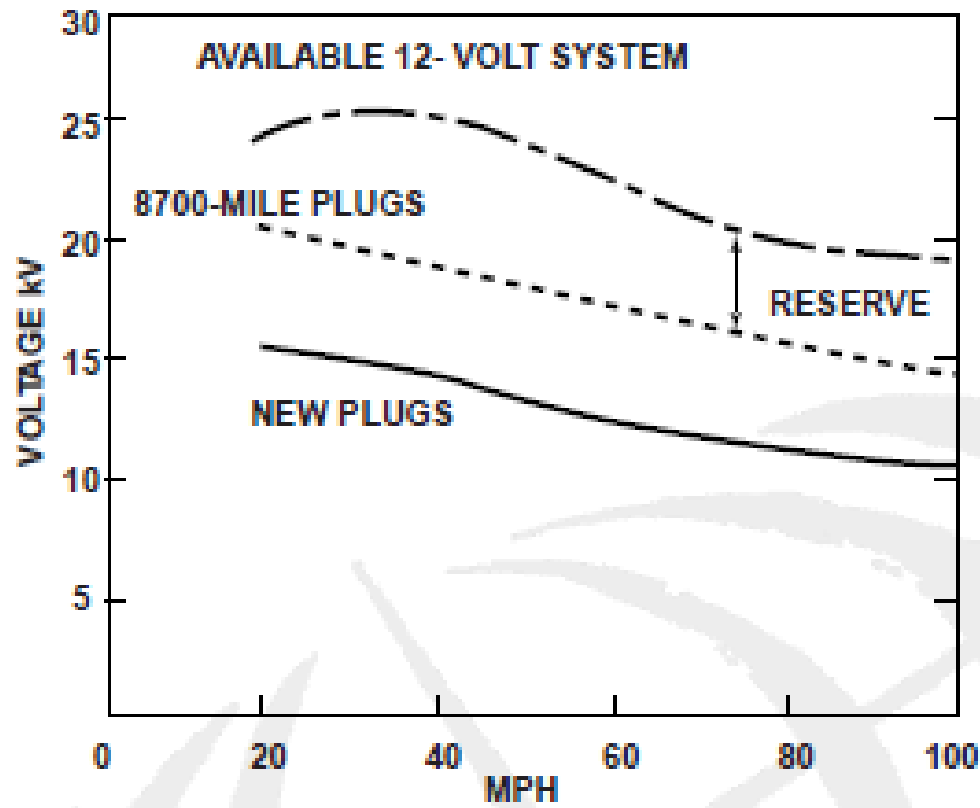


Figure 2-10. Ignition performance on a 10:1 compression ratio engine.

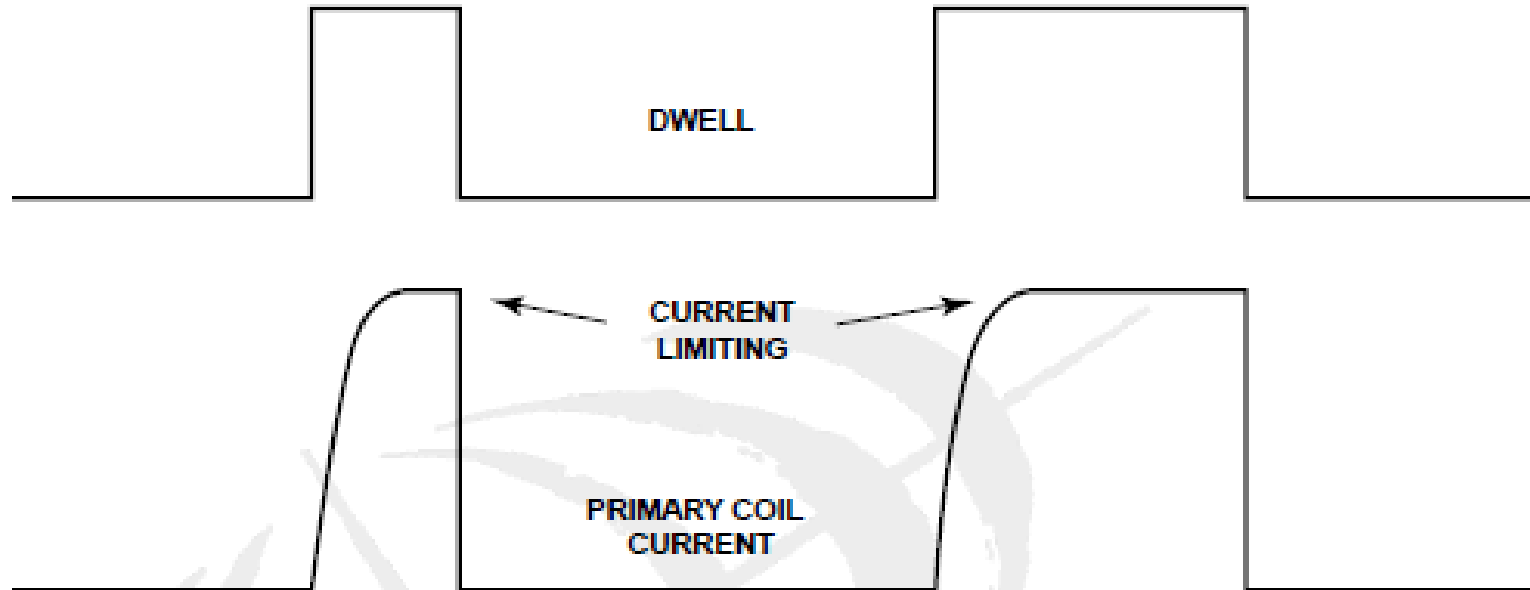


Figure 2-11. Coil Primary Current Controlled By Current Limiting Circuitry.

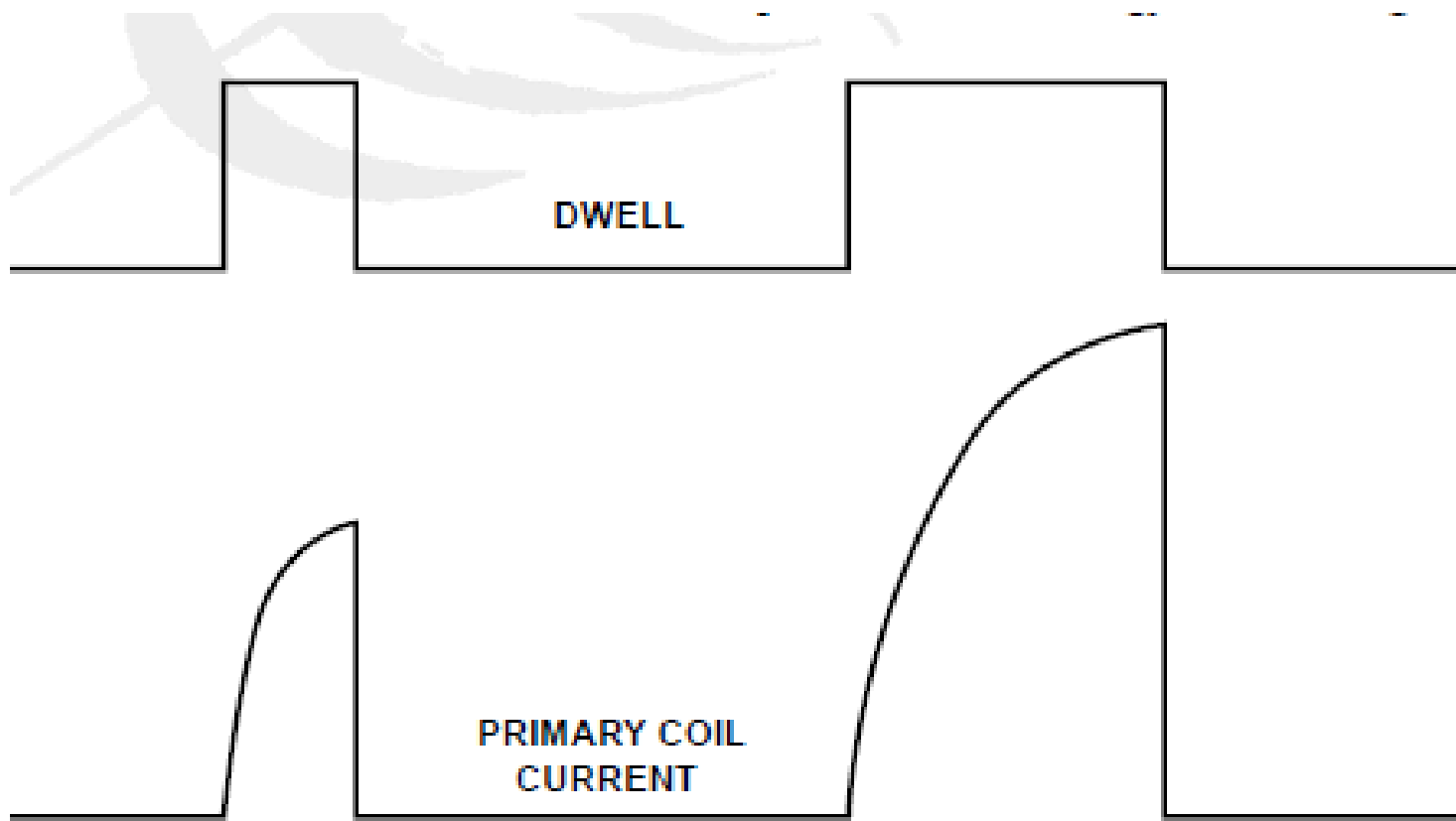
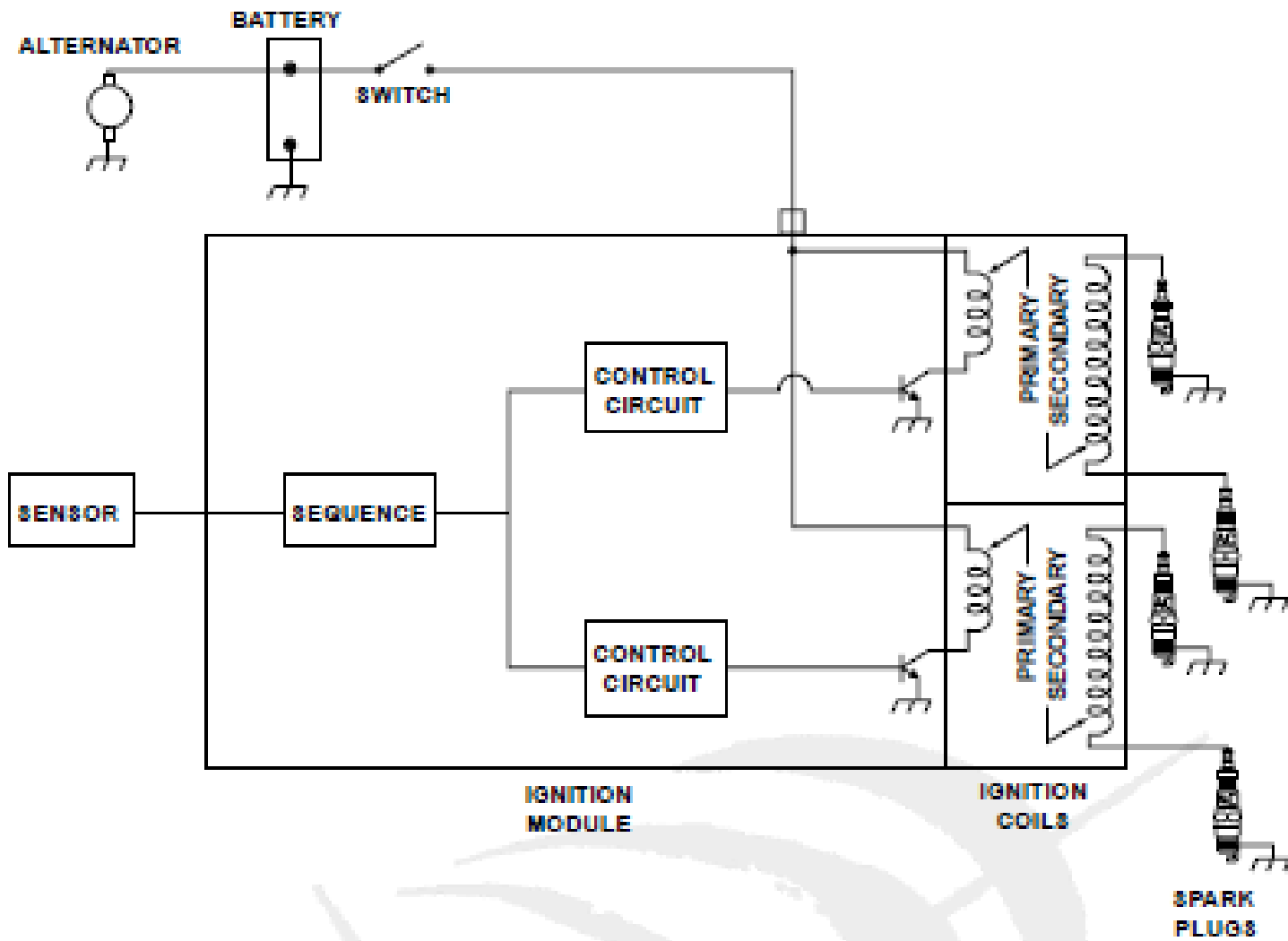
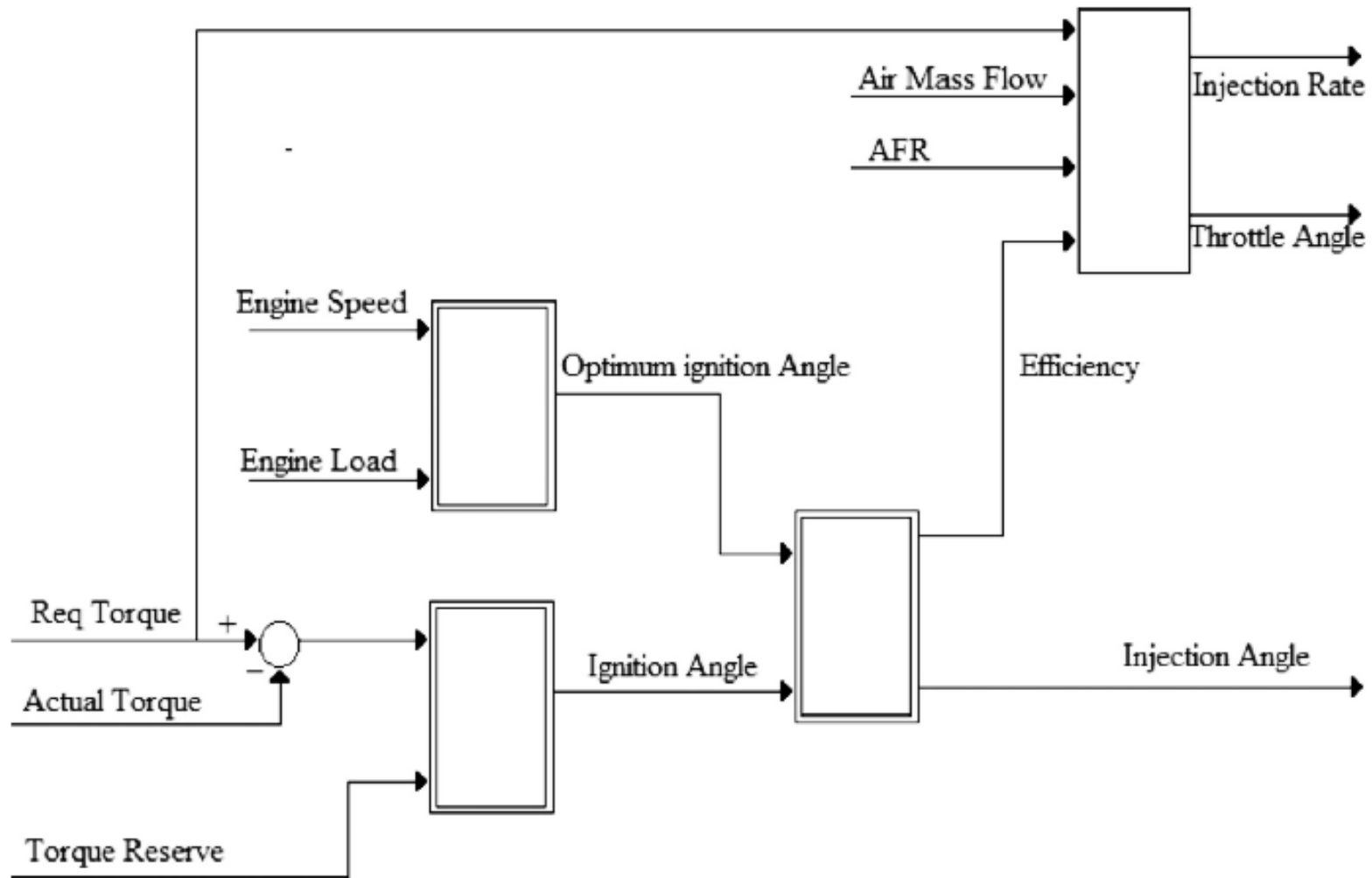


Figure 2-12. Coil Current Controlled By Dwell "Ramp and Fire".



Controle de Ignição



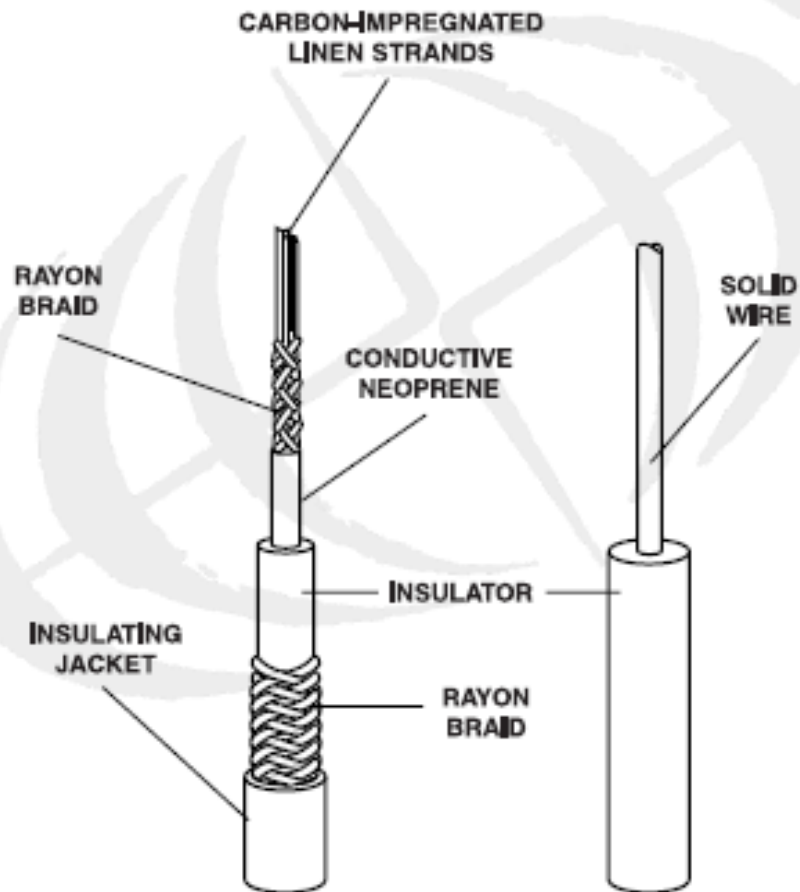


Figure 2-14. TVRS cable and solid conductor cable.

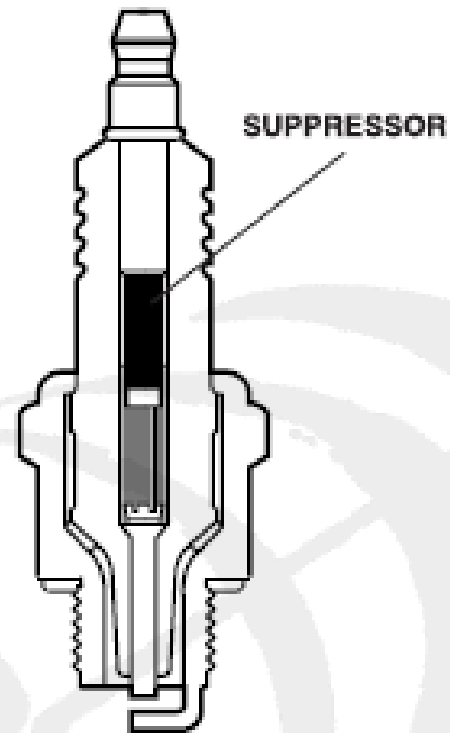


Figure 2-15. A one-piece integral suppressor reduces RF interference.

4 Ciclos

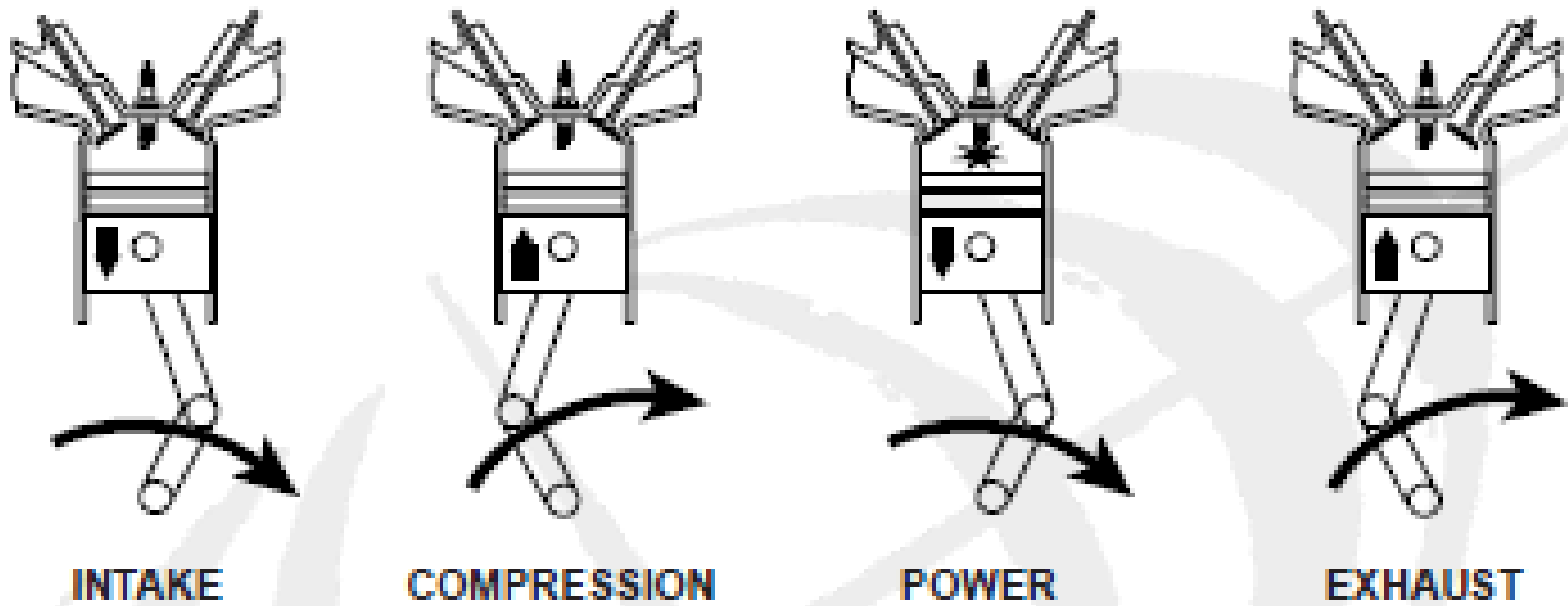


Figure 2-15. Four Stroke Combustion Process.

3.5.2.2 High Value Ignition Performance

Measurement Description	Typical Value	
Energy (mJ)	70	#
Peak secondary current (mA)	74	#
Secondary voltage available (kV)	32.0	*
Spark duration (mS)	2.6	#
Secondary resistance (Ohm)	5800	
Primary resistance (Ohm)	0.20	
Primary charge time @ 14V (mS)	2.50	
Weight (gr)	600	
Primary Current (A)	9.20	
Sample Availability	production	

= 800 Volt Zenor test, no secondary load.

* = with 50 PF Secondary Load

Table 3-1. High Voltage Ignition System Specifications.

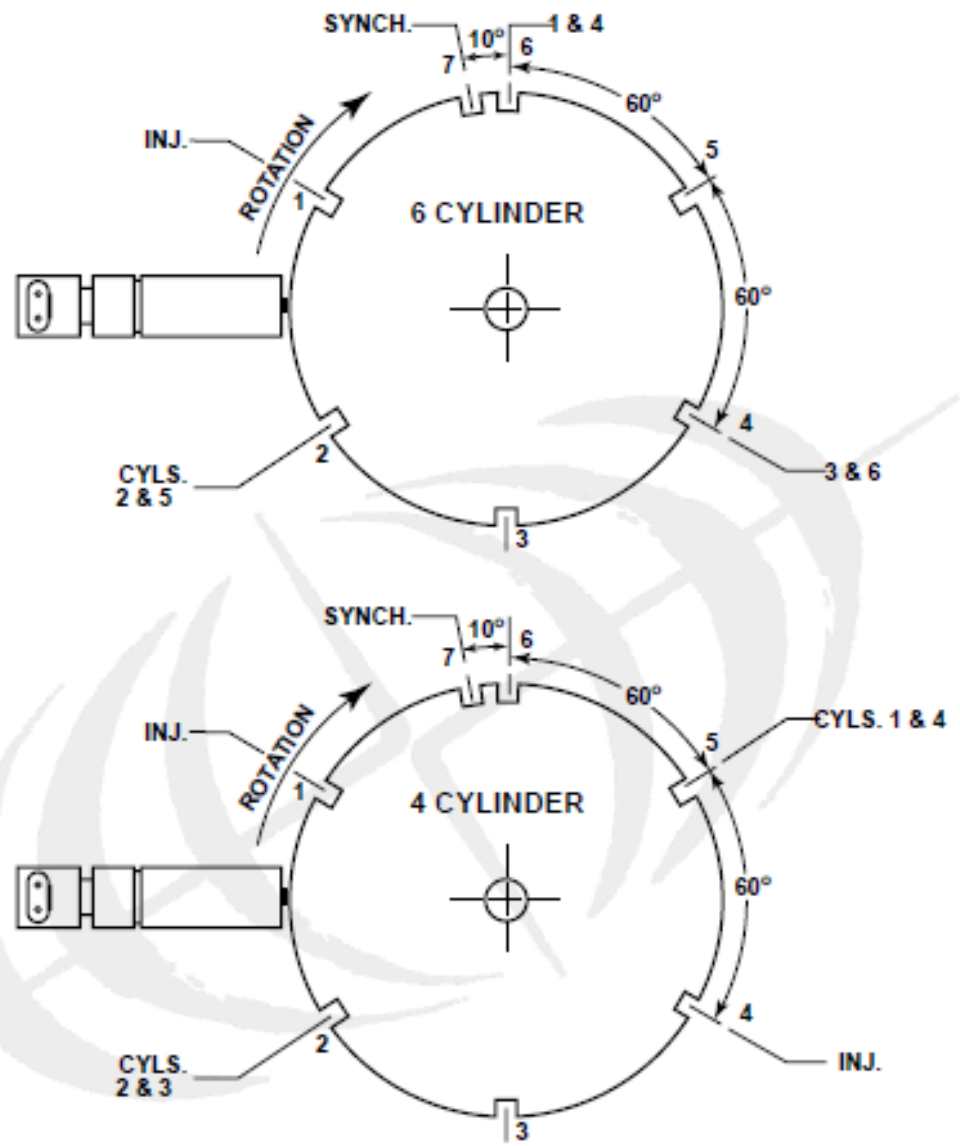


Figure 3-3. Firing order.

Segunda geração de bobinas integradas e eletrônicas

- Metade do numero de drivers de bobinas.
- Redução do tamanho e massa.
- Redução das emissões RFI.
- Núcleo de ferro, encapsulado.
- Uma bobina para cada par de cilindro.
- O potencial é distribuído para a vela através de cabos.

Measurement Description	Typical Value
Energy (mJ)	69
Peak secondary current (mA)	97
Secondary voltage available (kV)	37 *
Spark duration (mS)	1.1
Secondary resistance (Ohm)	5100
Primary resistance (Ohm)	0.50
Primary charge time @ 14V (mS)	2.6
Weight (gr)	950
Primary Current (A)	9.5
Sample Availability	current

= 1500 Volt Zener test with no secondary load.

* = with 50 PF Secondary Load

Table 3-2. I.C.E. Specifications.

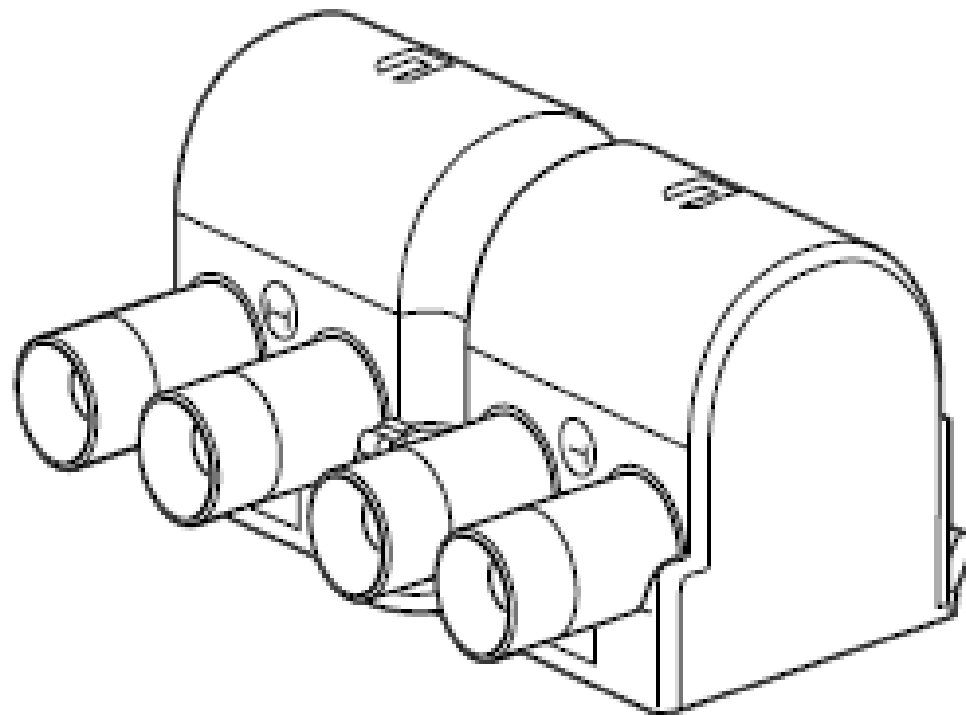
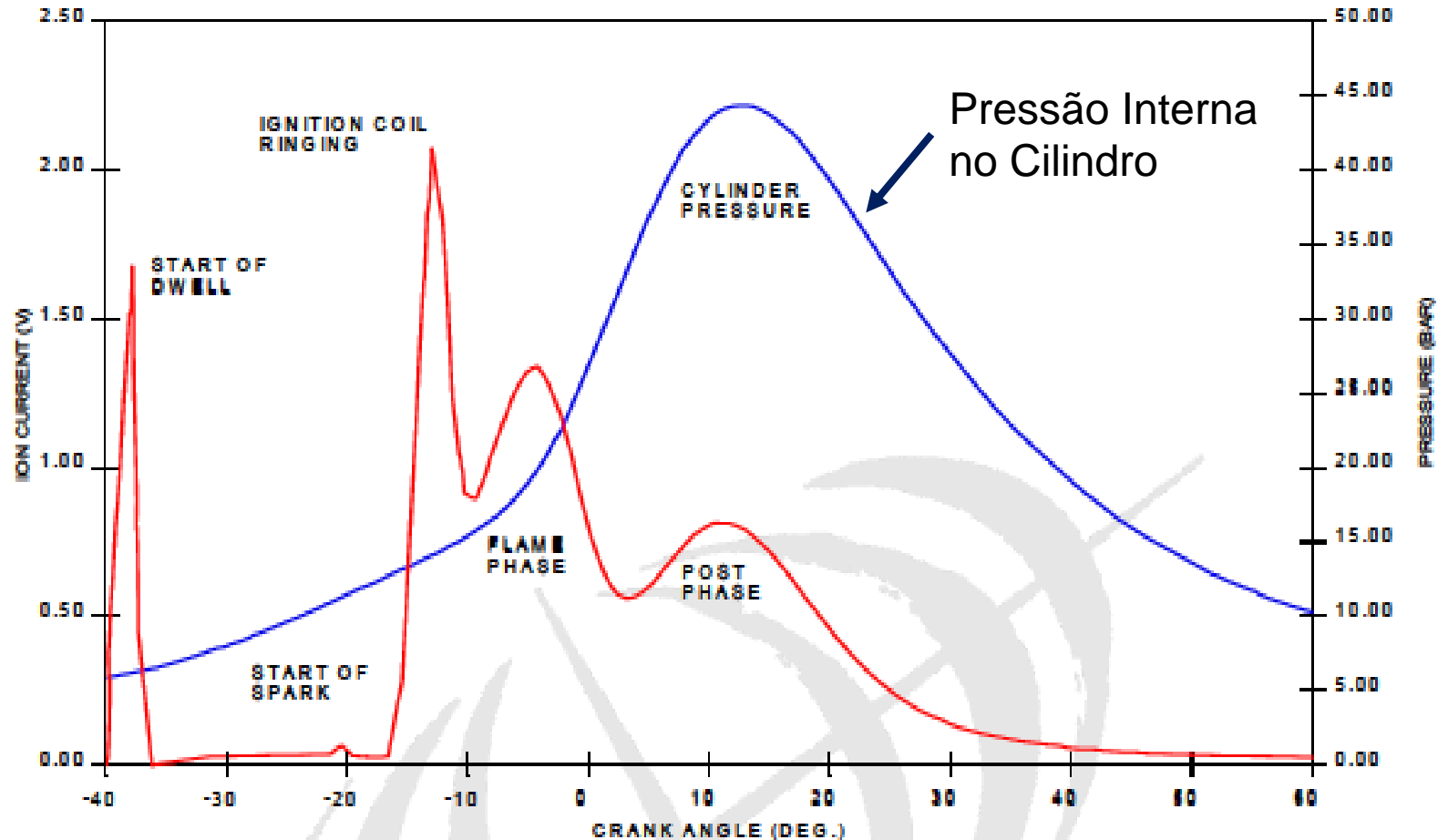
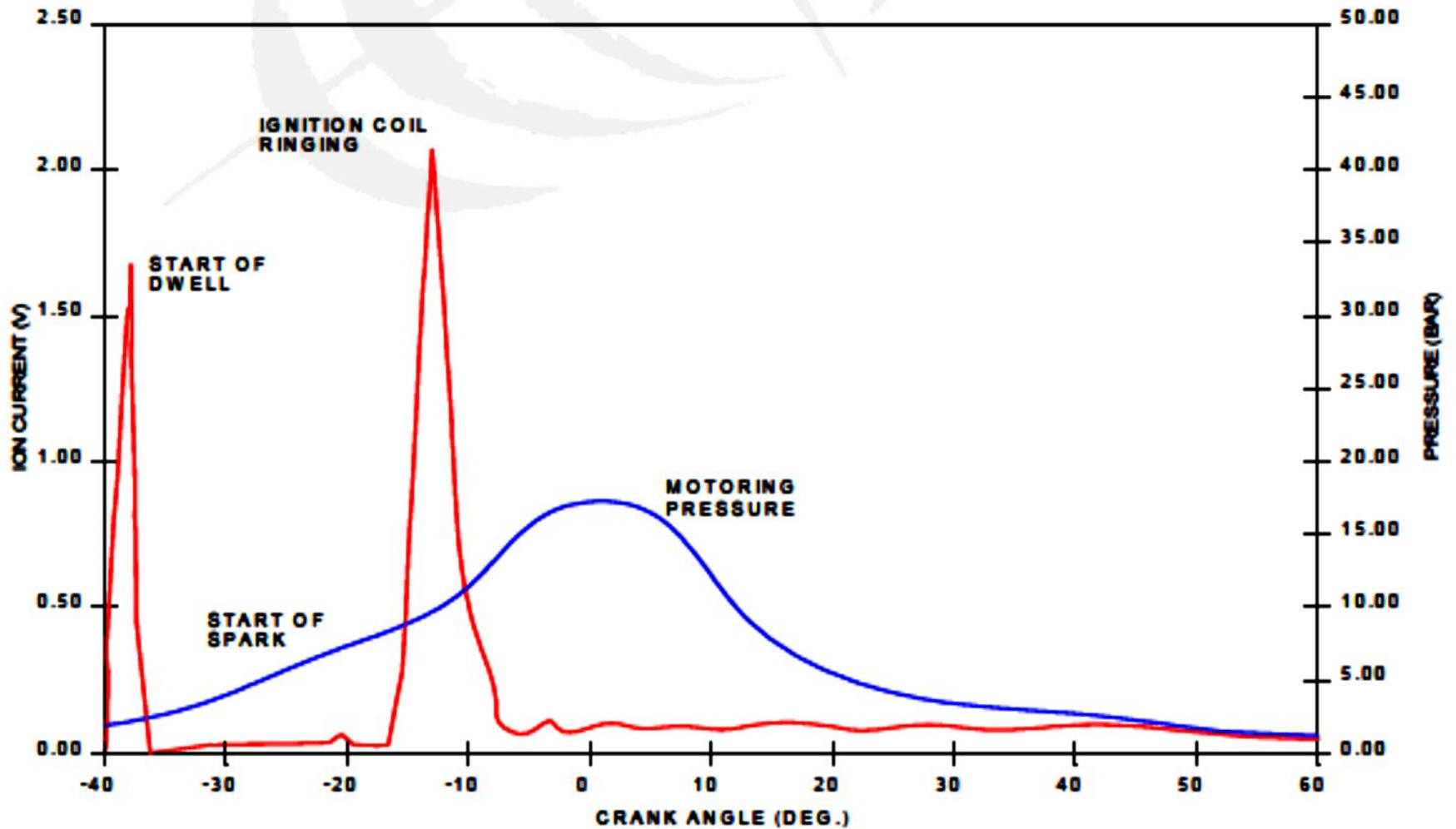


Figure 3-4. Integrated Coil and Electronics Assembly.

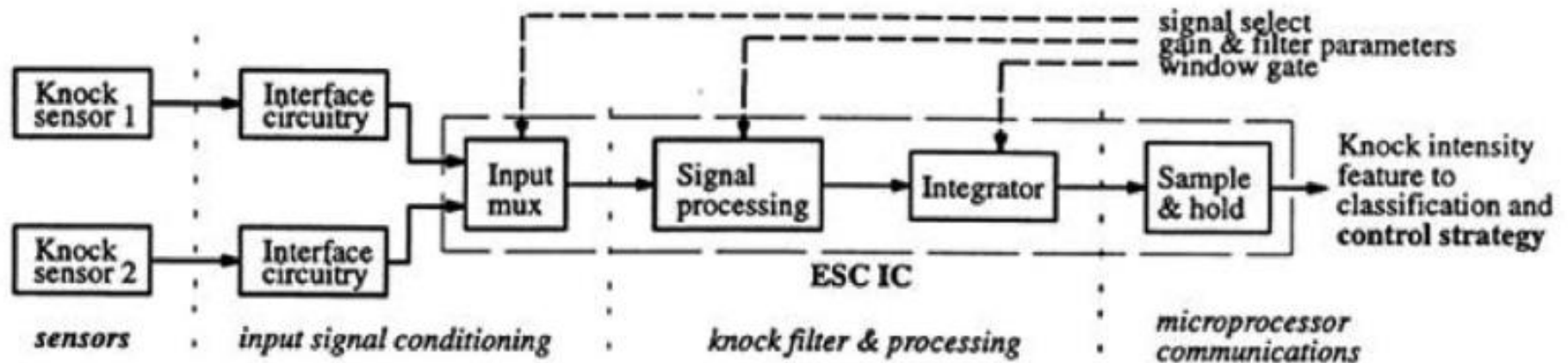
Combustão Normal



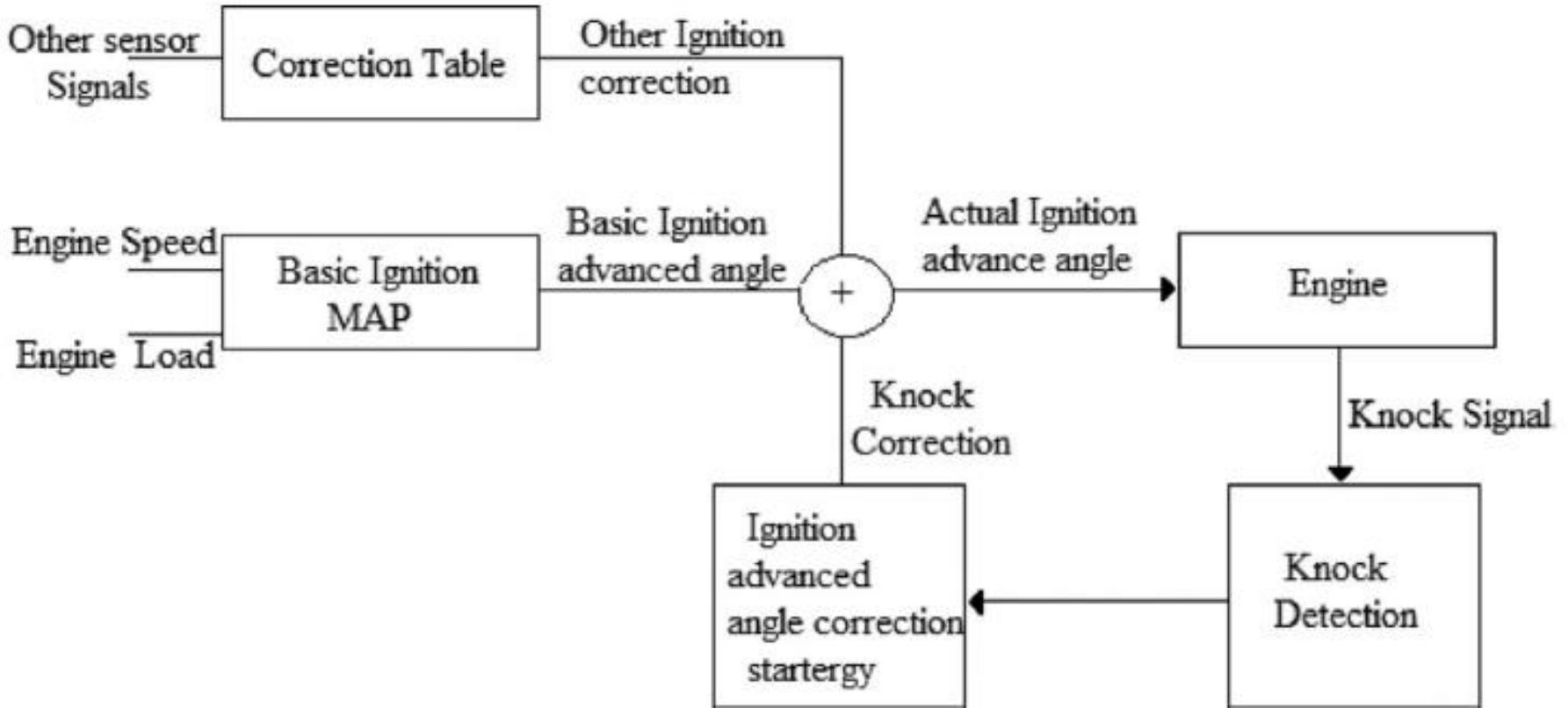
Misfire



Knock Detection



Knock Control



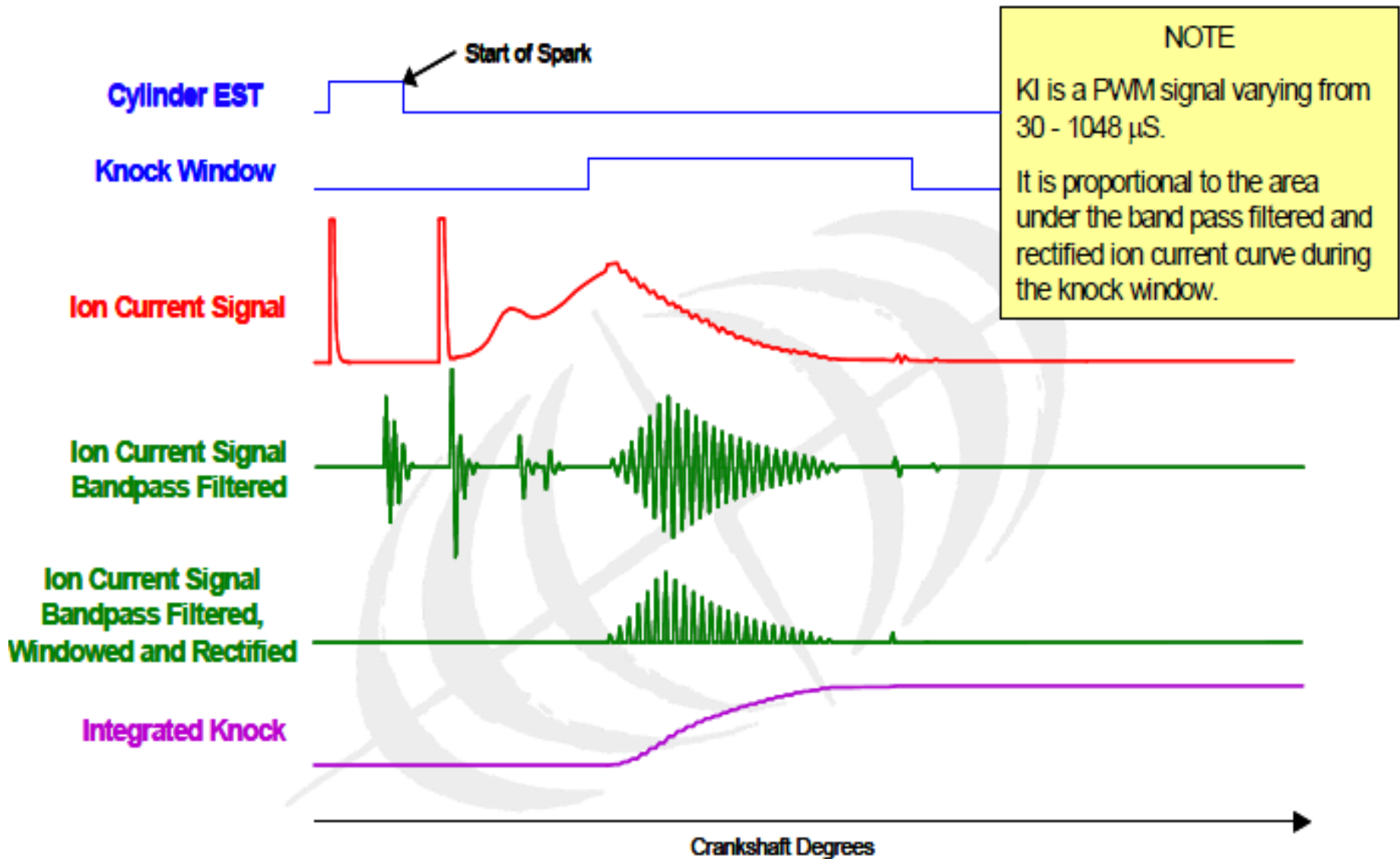


Figure 3-12.

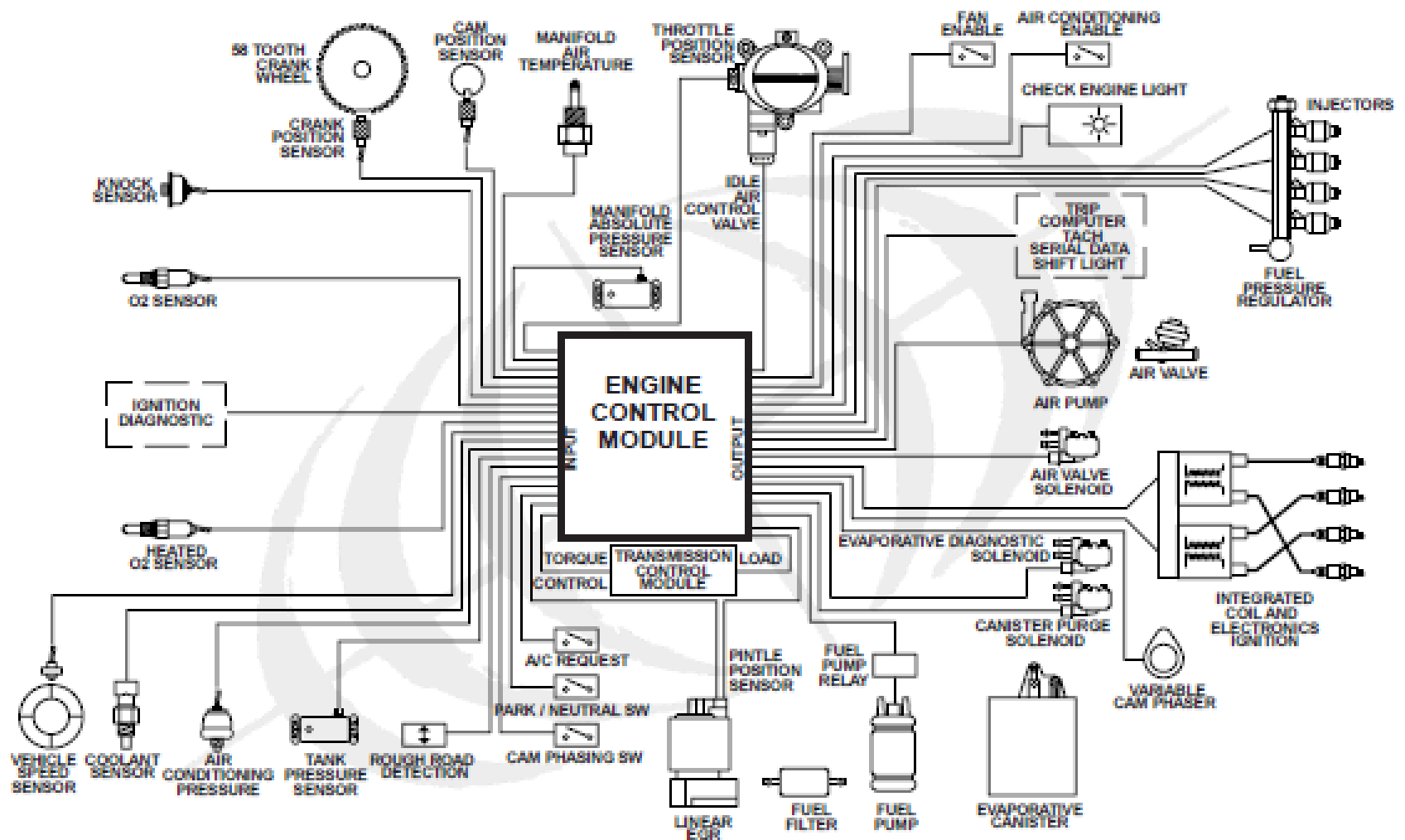


Figure 4-1. Ignition System Interfaces.

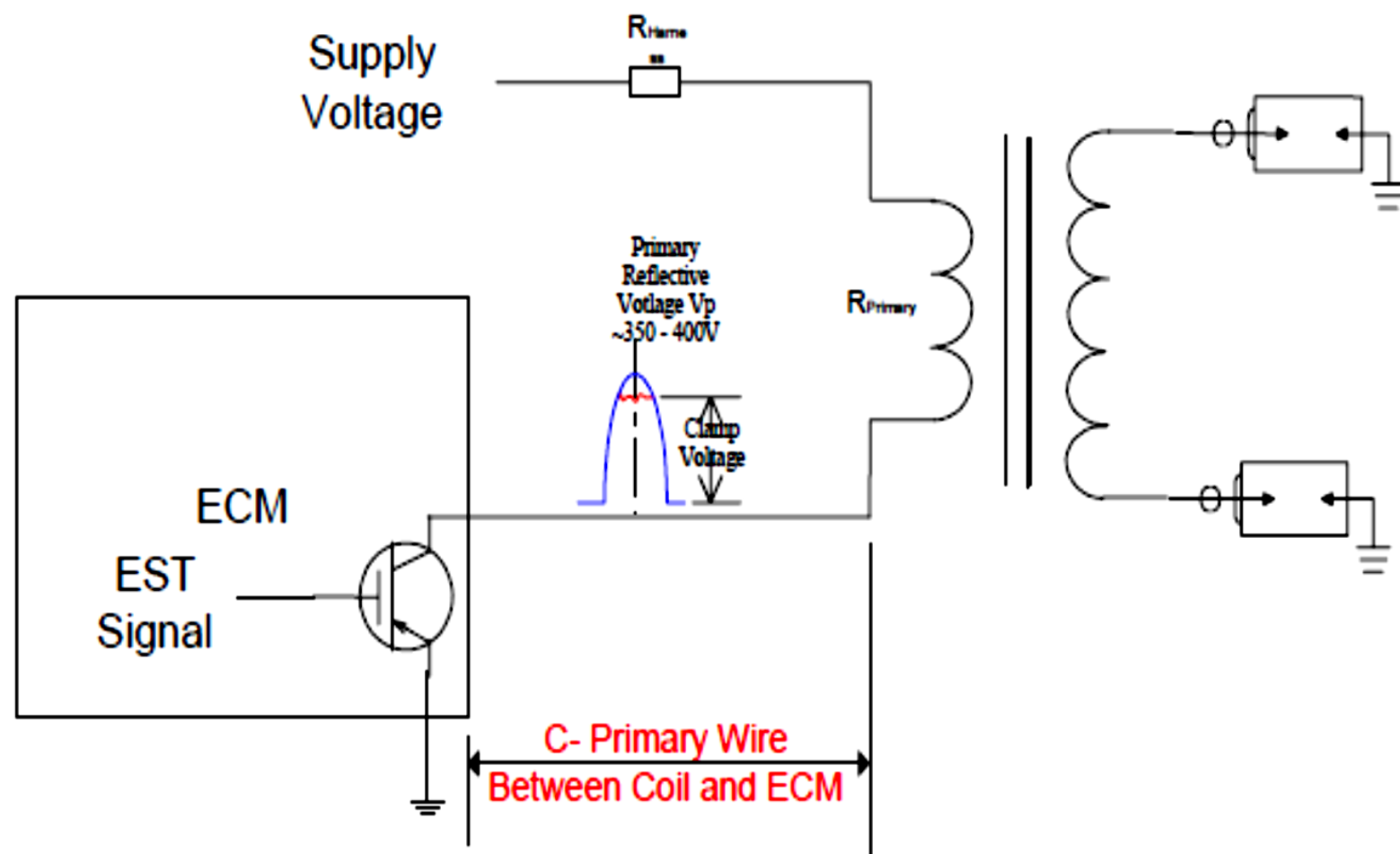


Figure 4-4. A typical reflected primary voltage for a coil where the driver is in the ECM