

DEPHIA

DEPHIA

DE termination

PH asing

I njection

A ignition

Advantage of the system

Cost of DEPHIA

www.CarGeek.ir

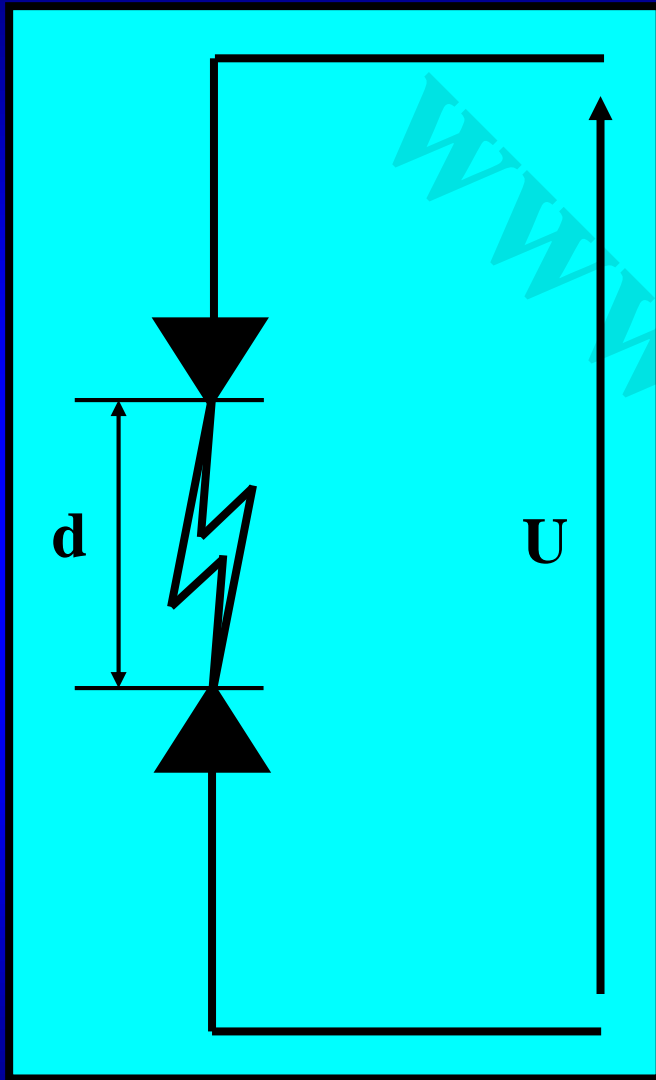
	Trad. phasing	DEPHIA
Target	1.80	
Target mounting	3.00	
Camshaft machining	0.50	
Camshaft cover machining	0.50	
Sensor mounting	1.80	
sensor	32.00	
Wiring	25.50	19.00
Coil surplus		13.00
ECU surplus		1.00
TOTAL	65.10	33.00
Gain		32.10

How to produce a spark?

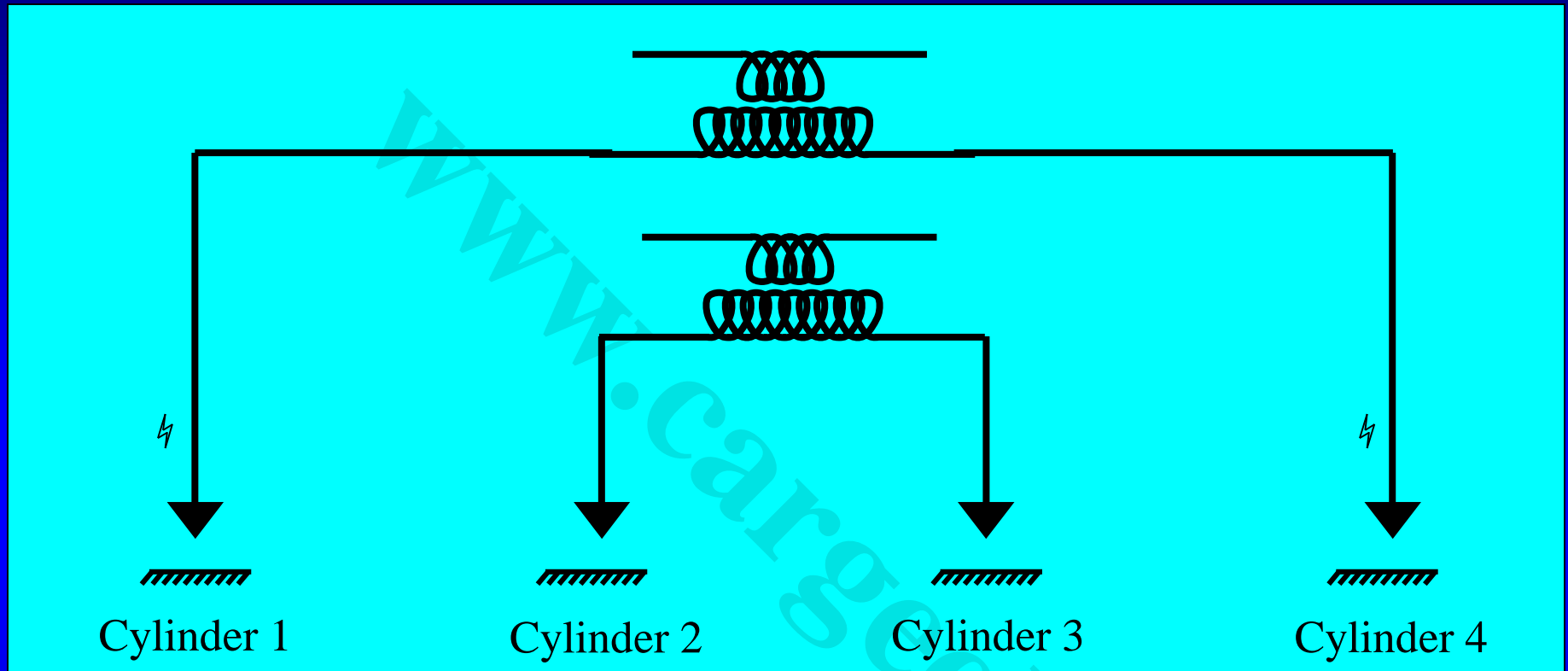
In order to produce a spark, sufficient voltage must be applied between the two electrodes of the spark plug.

This voltage depends on two things:

- the distance **d** between the two electrodes
- The pressure of the gases between the two electrodes

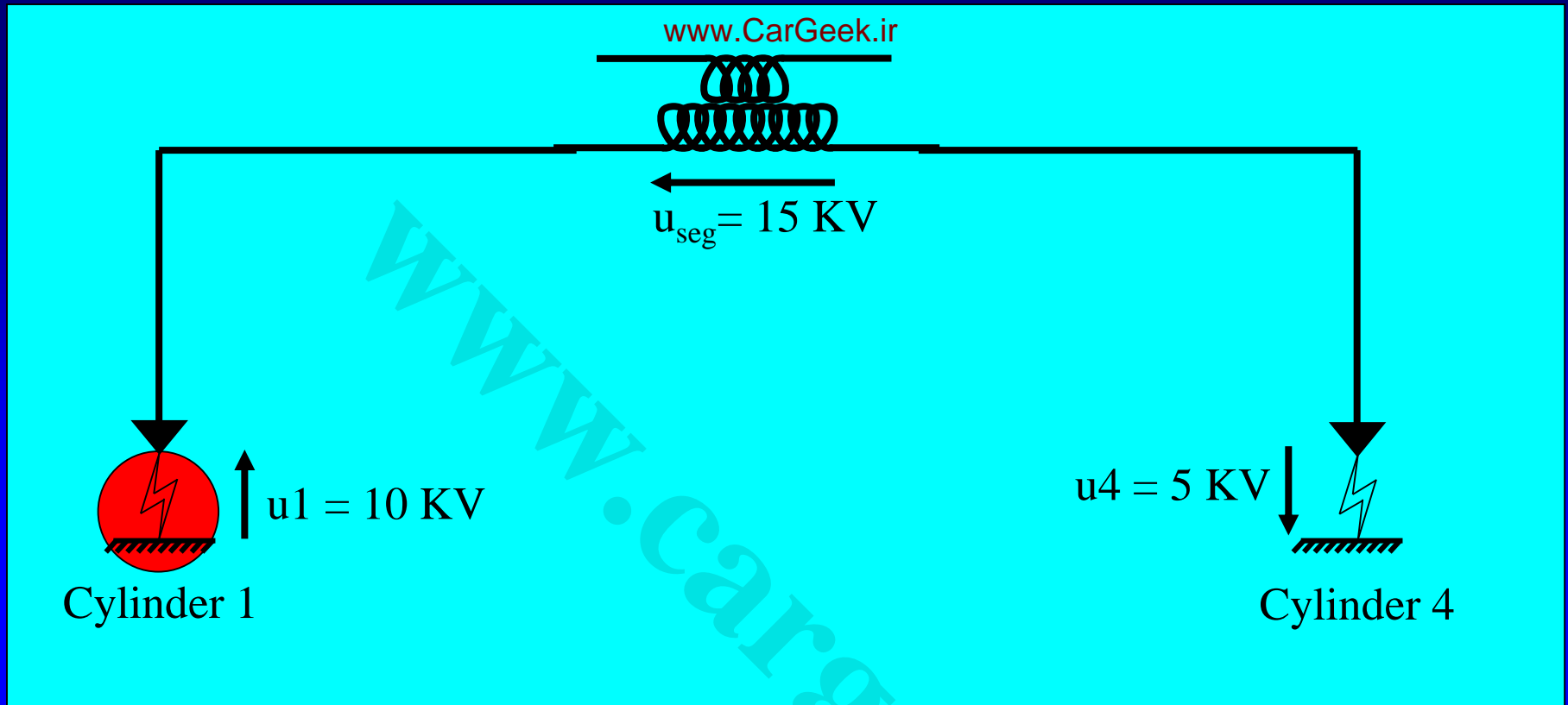


The twin-coil ignition



This type of coil creates a spark for two cylinders at the same time

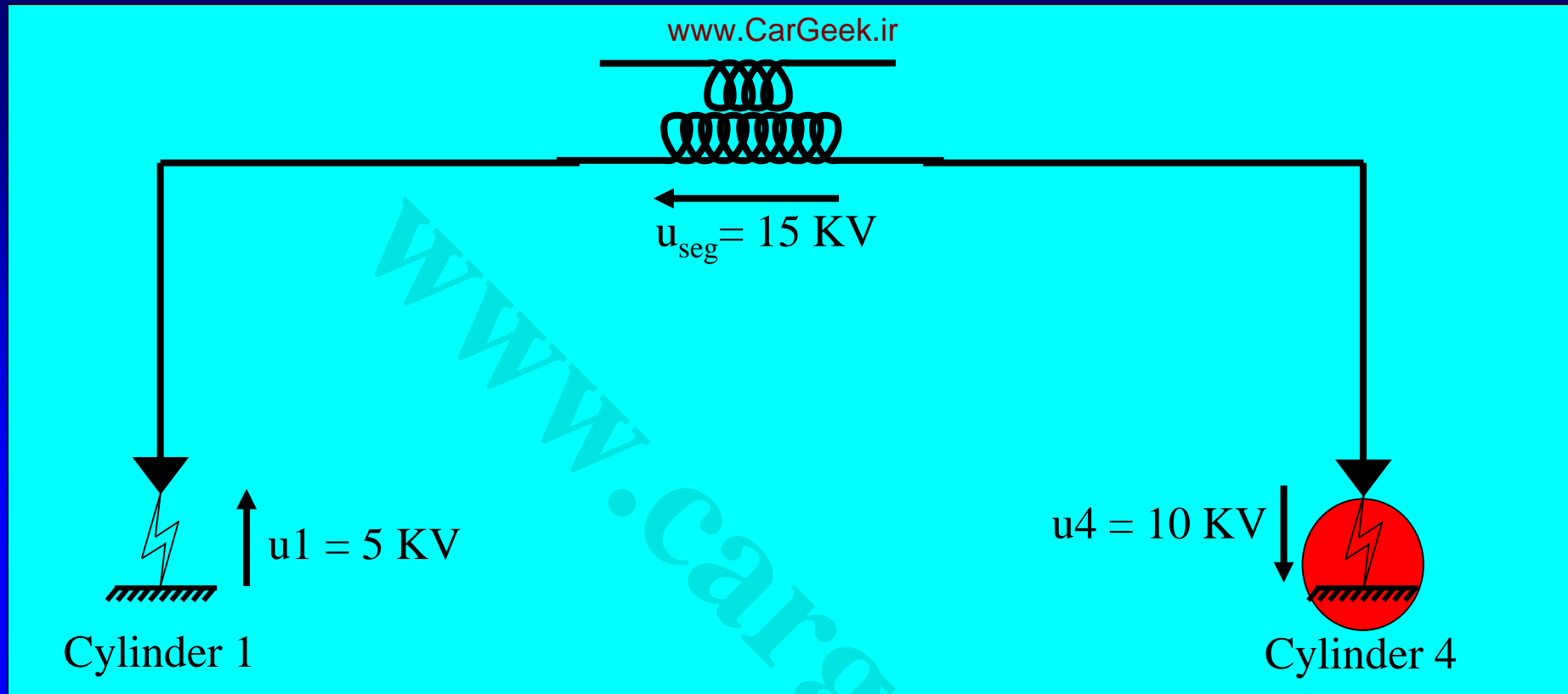
Analysis of voltages



While cylinder 1 is in compression, cylinder 4 is in exhaust.

The pressure in cylinder 1 is greater than that in cylinder 4.

The ignition voltage in cylinder 1 will be greater than in cylinder 4.

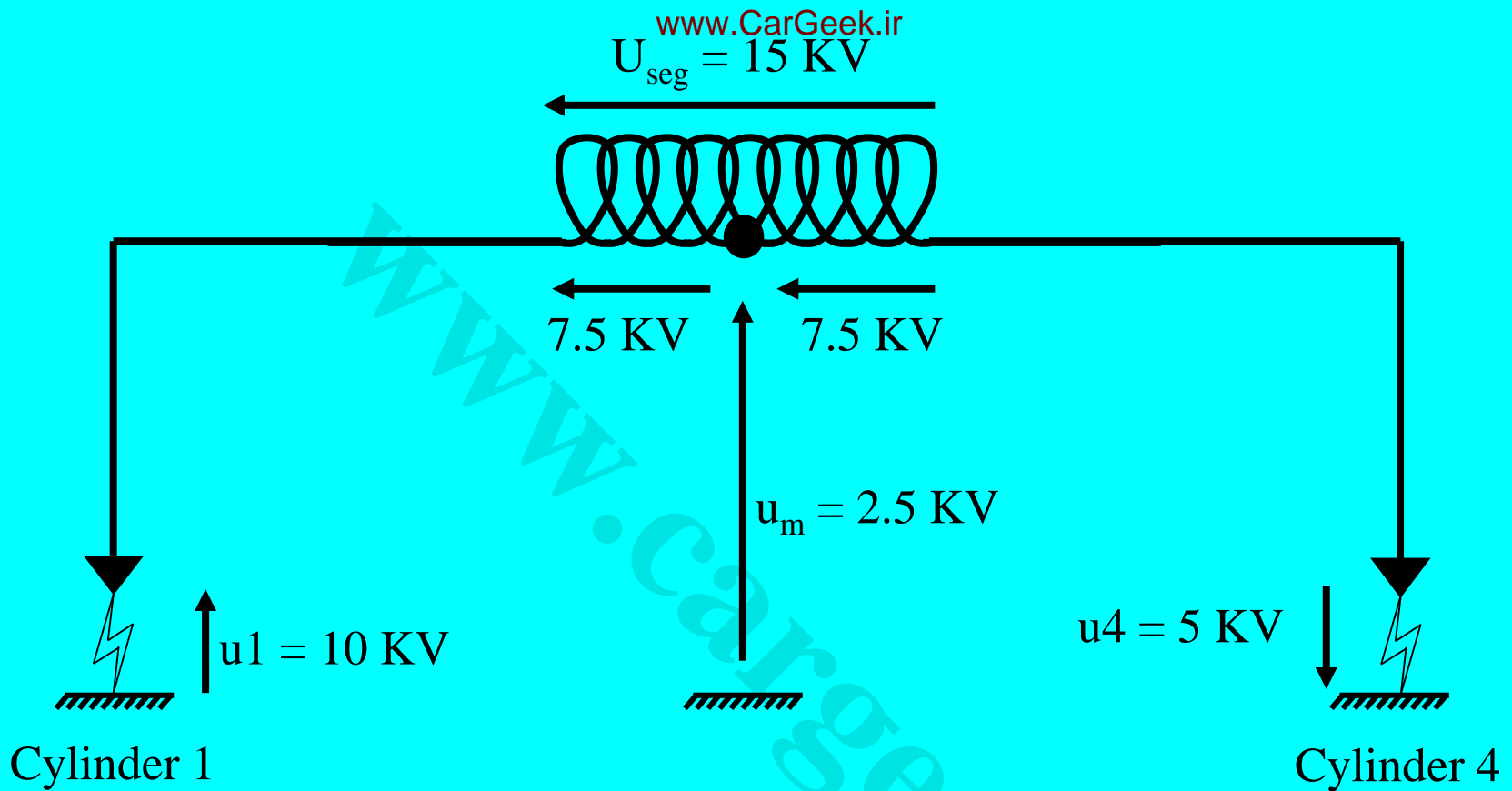


While cylinder 4 is in compression, cylinder 1 is in exhaust.

The pressure in cylinder 4 is greater than that in cylinder 1.

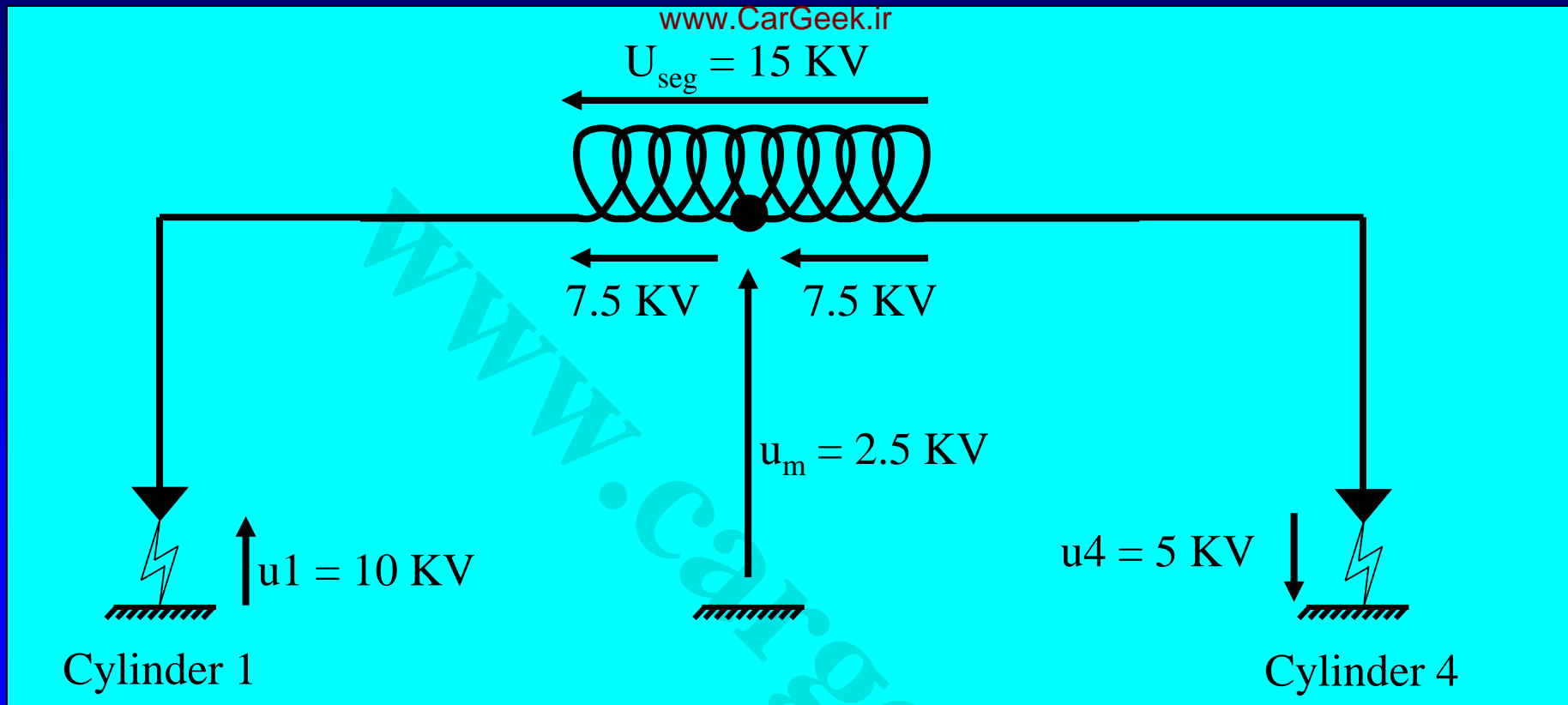
The ignition voltage in cylinder 4 will be greater than in cylinder 1.

Centre point



The voltage at the centre point of the secondary (u_m) is used to know if cylinder 1 is in compression .

Calculating voltage u_m .



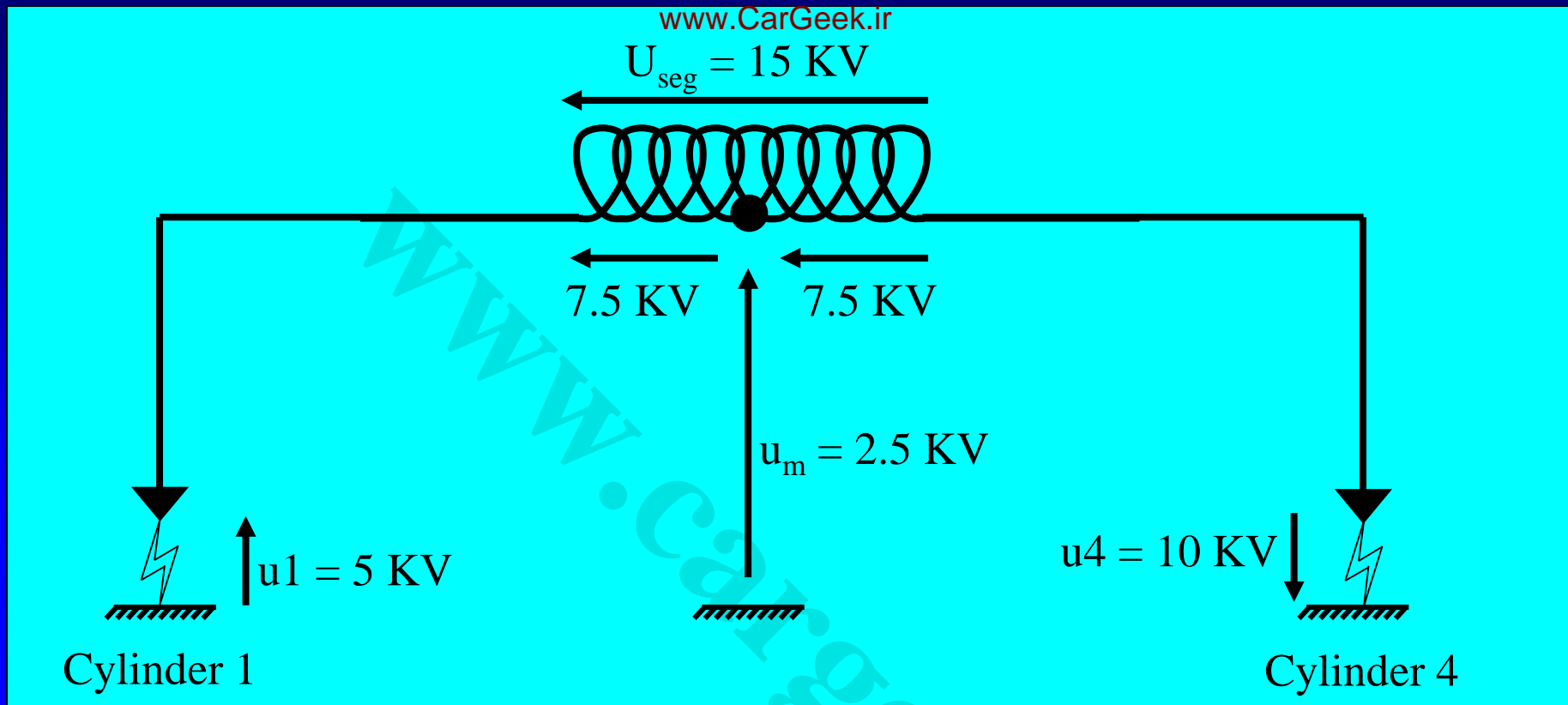
Cylinder 1 is in compression, cylinder 4 in exhaust.

Calculating u_m from cylinder 1:

$$u_m = 10 \text{ KV} - 7.5 \text{ KV} = 2.5 \text{ KV}$$

Calculating u_m from cylinder 4:

$$u_m = 7.5 \text{ KV} - 5 \text{ KV} = 2.5 \text{ KV}$$



Cylinder 4 is in compression, cylinder 1 in exhaust.

Calculating u_m from cylinder 1:

$$u_m = 5 \text{ KV} - 7.5 \text{ KV} = - 2.5 \text{ KV}$$

Calculating u_m from cylinder 4:

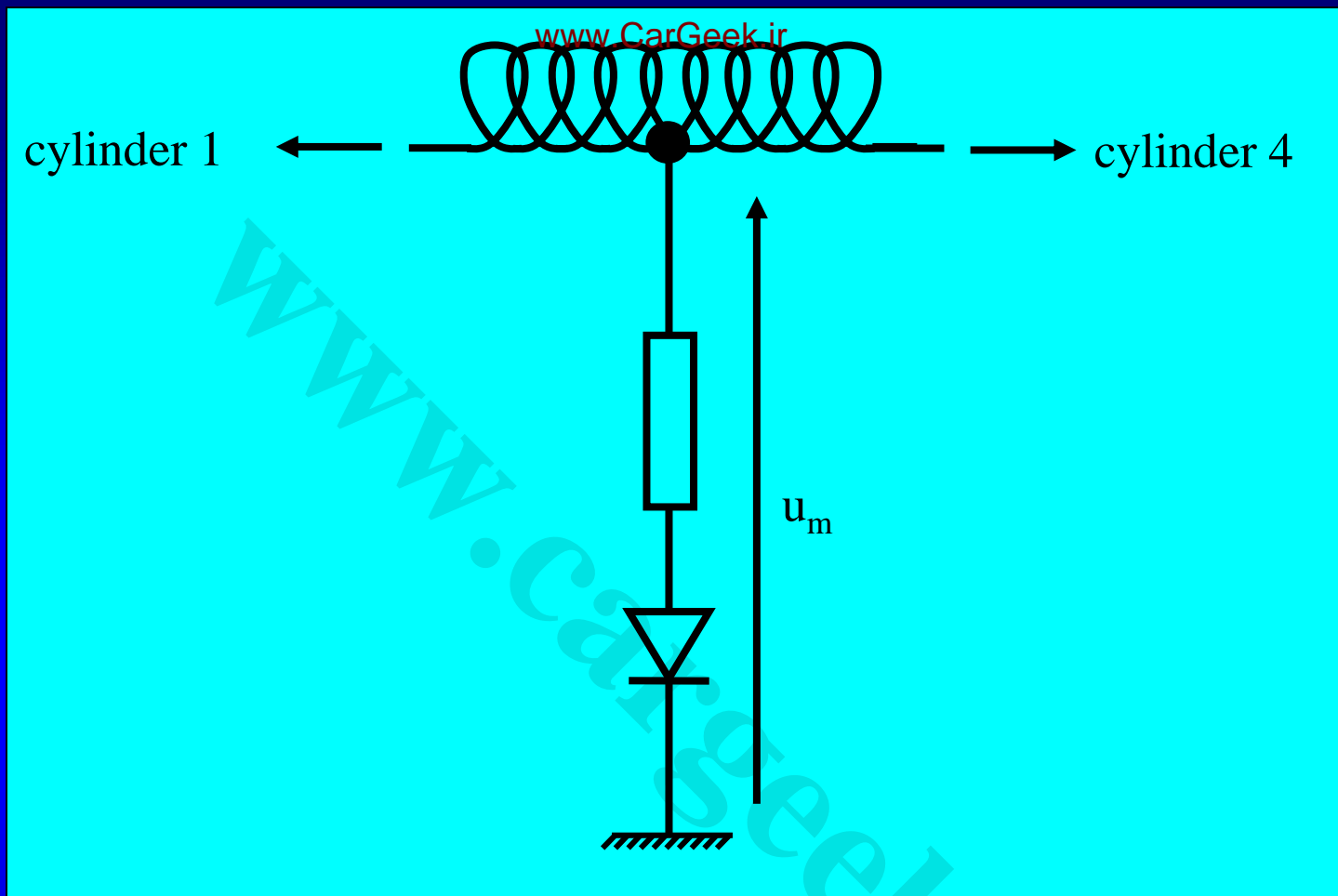
$$u_m = 7.5 \text{ KV} - 10 \text{ KV} = - 2.5 \text{ KV}$$

Interpreting the results

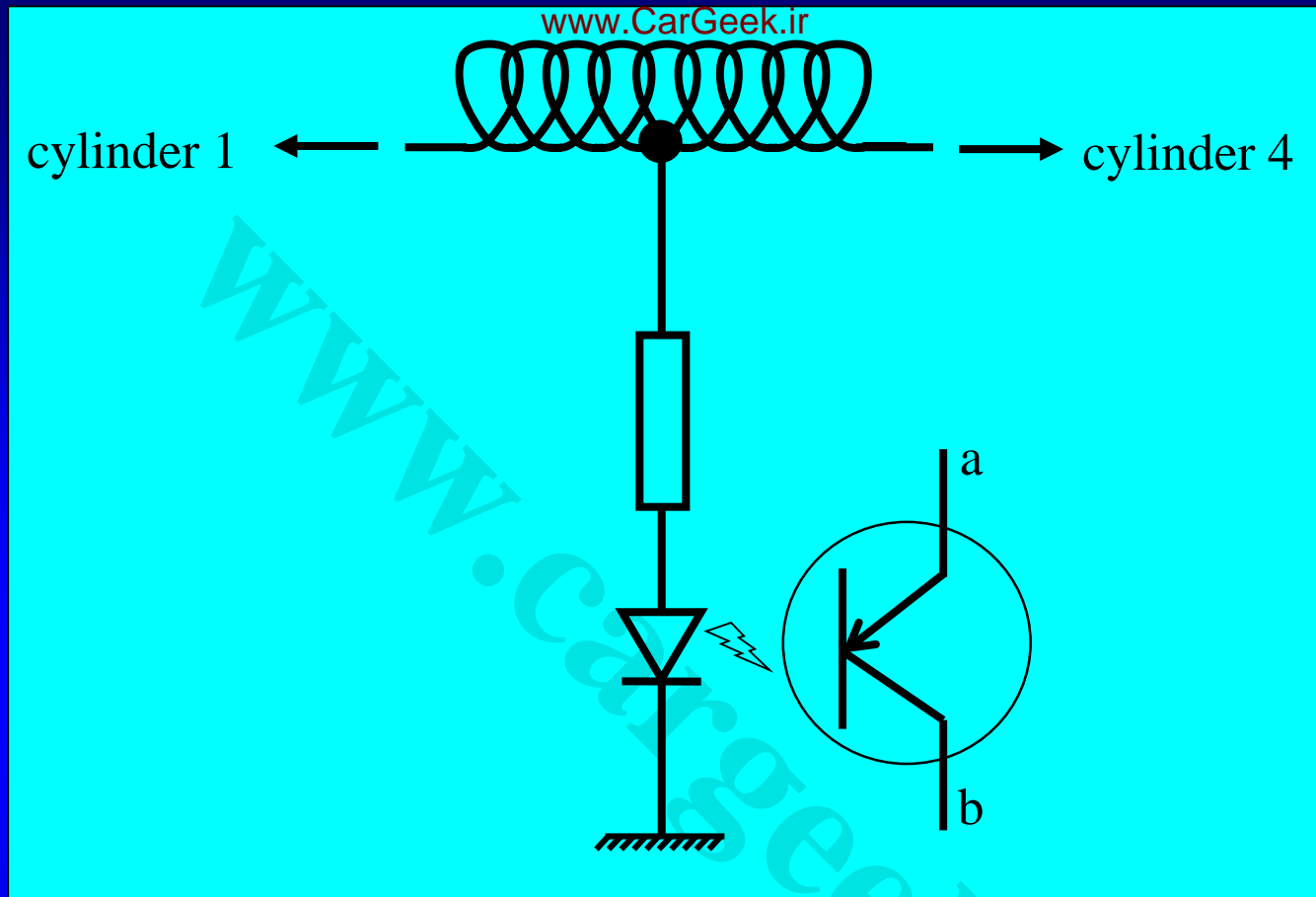
If $u_m > 0$, cylinder 1 is in compression.

If $u_m < 0$, cylinder 1 is in expansion.

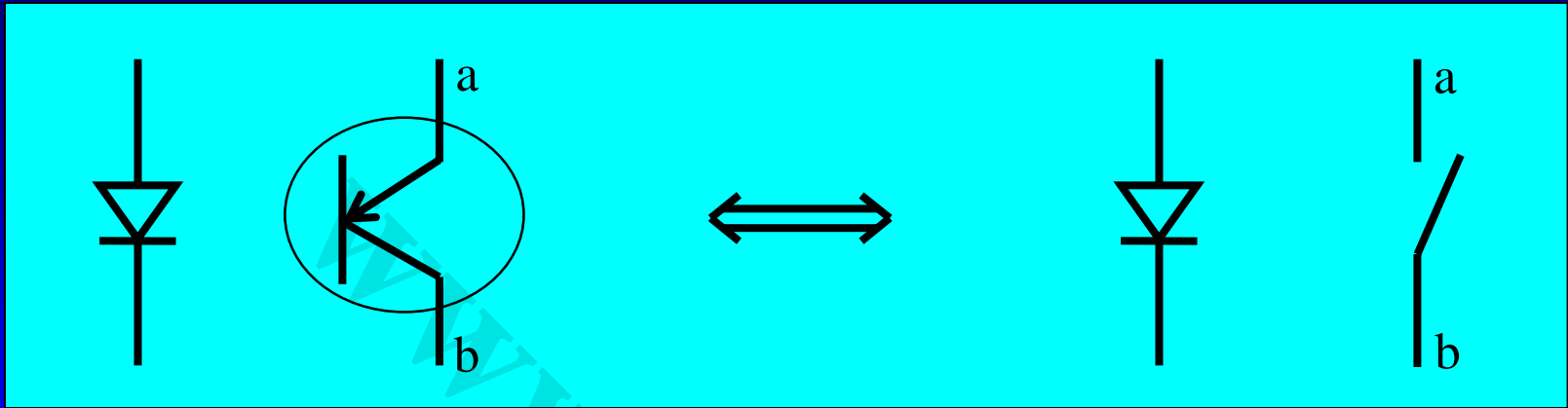
Processing u_m data.



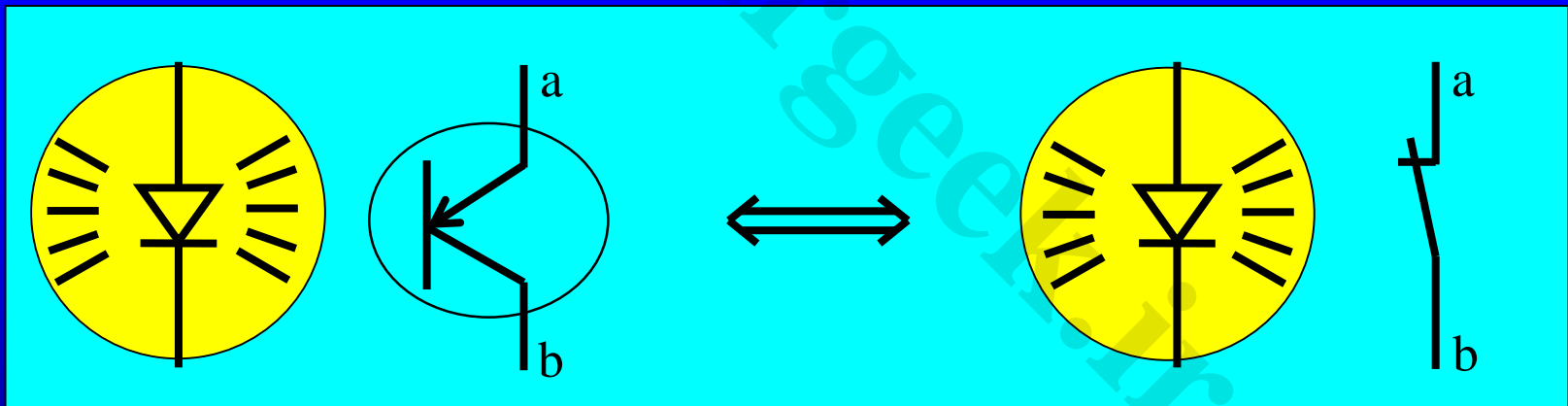
Between the centre point and the ground a photo-diode is wired in series with a resistance.



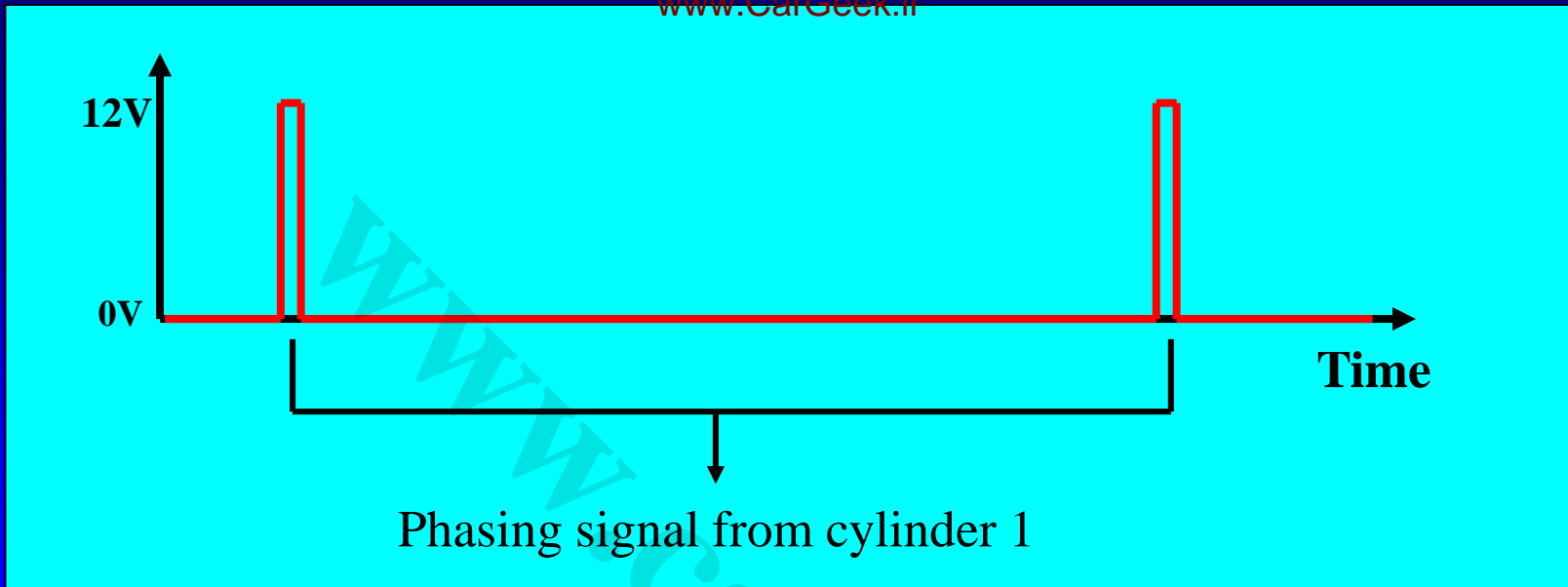
The light signal from the diode is used to control a transistor to transmit a 0-12V pulse to the engine ECU



U_m is negative, the diode is blocked, the transistor does not conduct \Rightarrow Contact open



U_m is positive, the diode is active, the transistor conducts \Rightarrow Contact closed



The ECU can thus synchronise ignition with injection using the above signal.

The signal is very short: ~1 ms