



REGION I

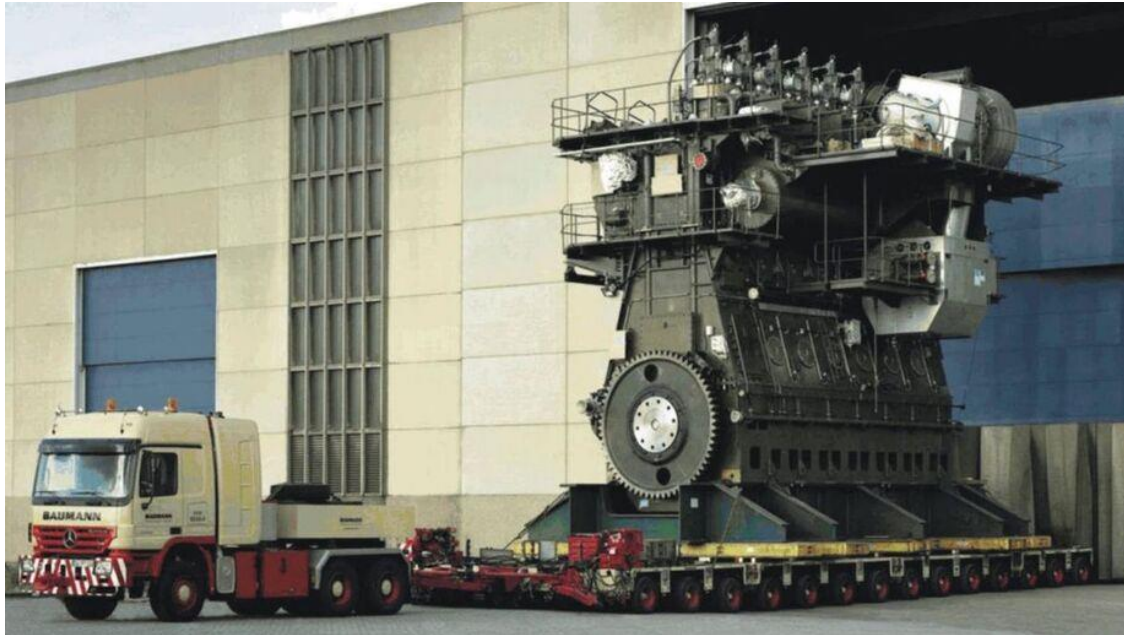
ROAD PATROL TRAINING FOR EXCELLENCE



Powered by



ELECTRICAL ENGINE



114 000 HP



49 000 HP (36,5 MW)



\$\$\$



Variable Reluctance

Permanent Magnet

Hybride

Stepper motor

Variable Reluctance

brushless

CC

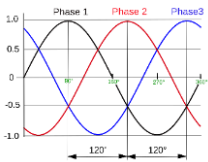
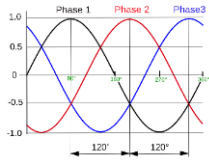


Linear

Asynchrone

Synchrone

Universel



\$



FOR THE EV'S

Synchrone
variable
reluctance
(SynRM)

Tesla

Toyota

Synchrone
permanent
magnet
(Ne Fe B)

Chevrolet volt

Nissan leaf

Bmw i3

Kia soul

VW Id bus

VW ID 3-4

BYD

Synchrone
Winding rotor
(squirrel cage)

Renault Zoé

Smart Electric
drive

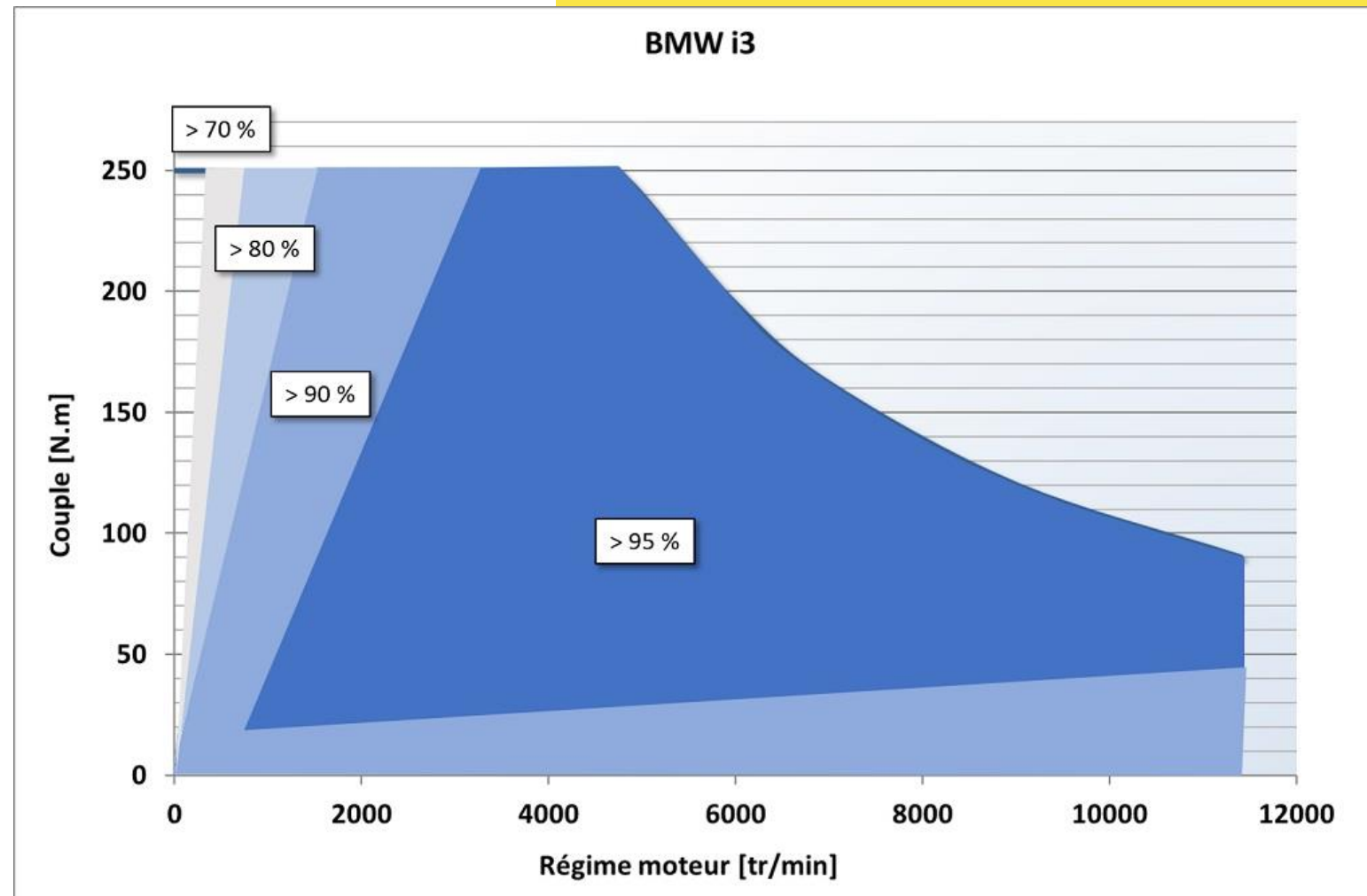
E mehari

Asynchrone
induction

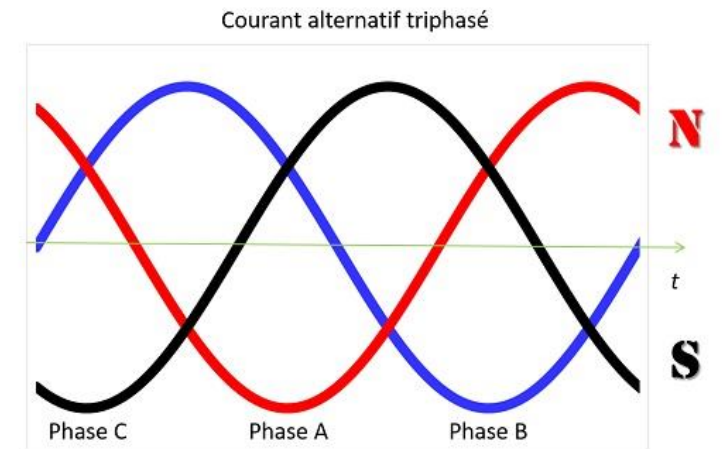
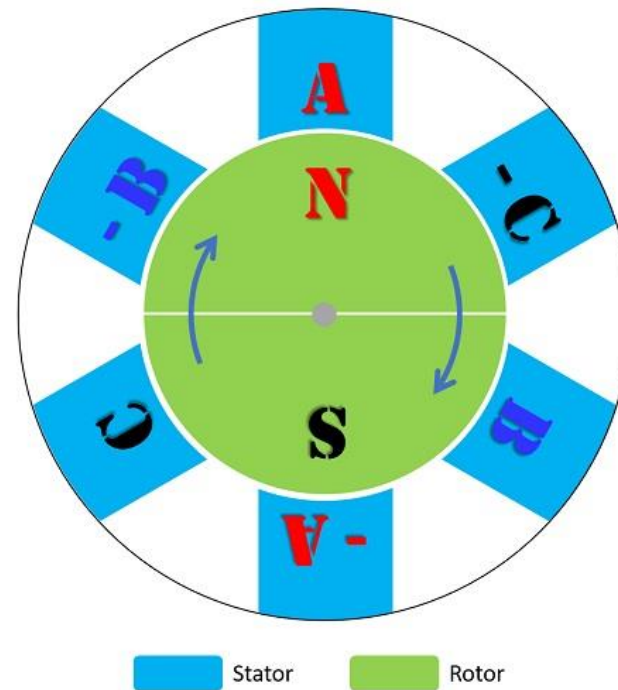
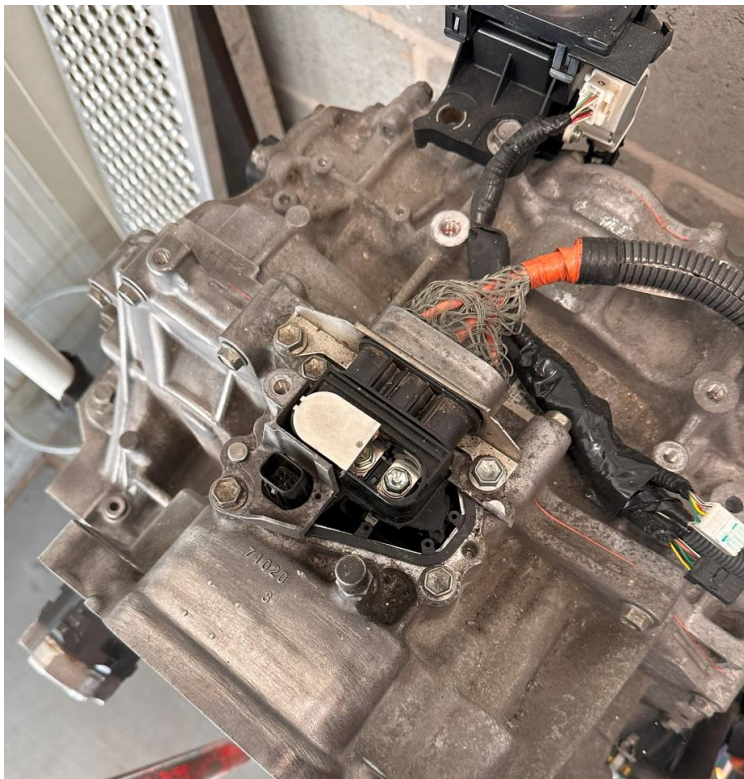
Tesla S

Tesla X

EFFICIENTY



3 PHASES MOTOR

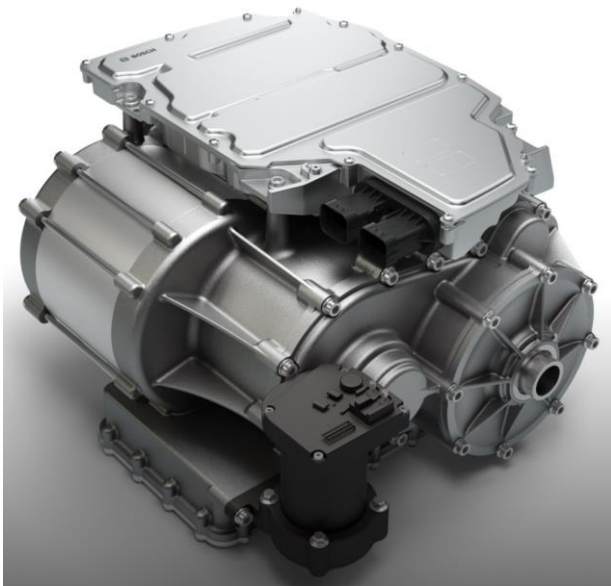


Note :

- 2km copper wire
- Speed controled by frequency

EV TRANSMISSION

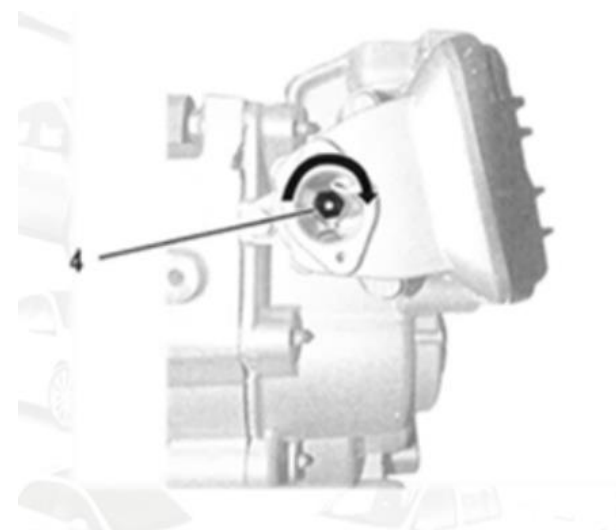
- Reducer (nissan leaf – tesla 3)
- 1 gear (peugeot, volkswagen,.....)
- 2 gear (taycan – e-tronGT)





TRANSMISSION P POSITION

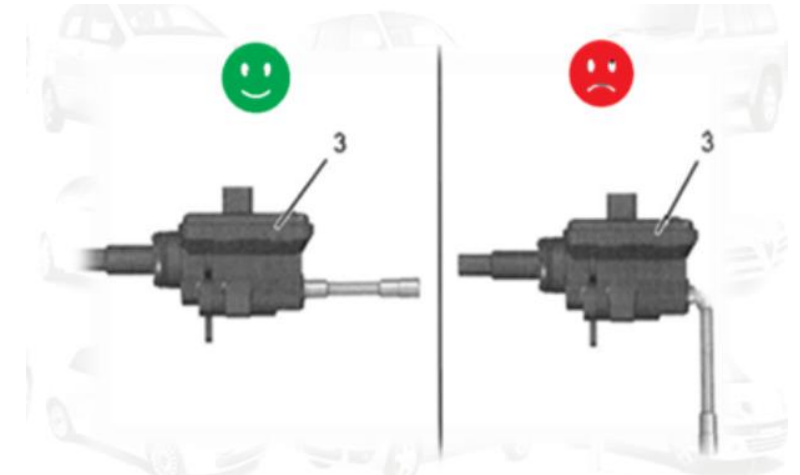
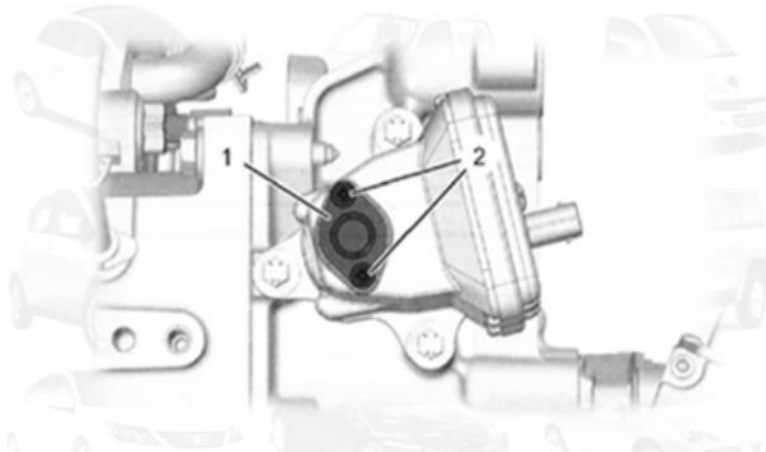
1. Secure the car
2. Unscrew (2)
3. Remove the caps (1)



4. Turn (4) clockwise 90 turns

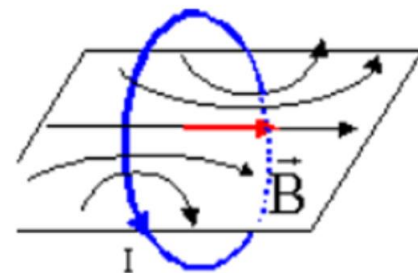
Note :

- Turn carefully to avoid breaking piece



THE MAGIC OF THE MAGNETT

- Magnet could be premanent or electrical
- The unit of the magnetic field is **Tesla**
- From North to South



$$B = \frac{\mu_0 N i}{2R}$$

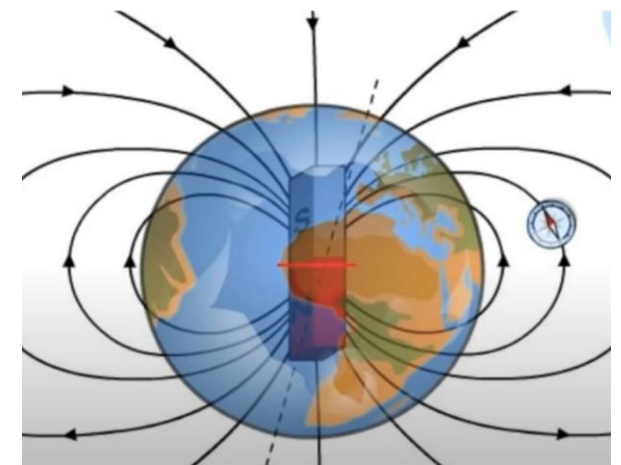
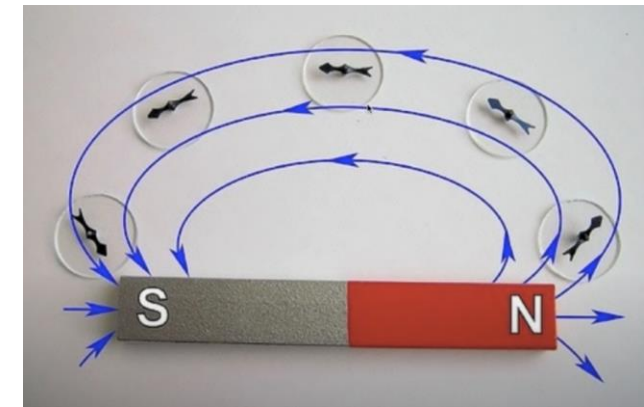
B en tesla (T)

i en ampère (A)

R rayon (m)

$\mu_0 = 4 \pi 10^{-7}$

N nombre de spires



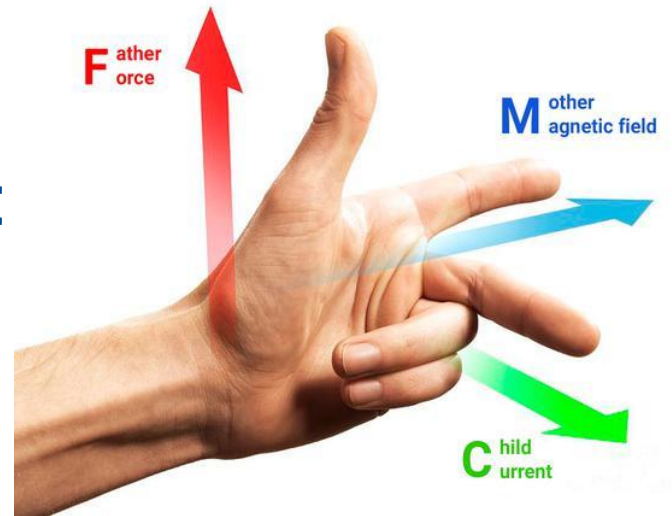
FUNDAMENTALS PRINCIPLES

Laplace law :

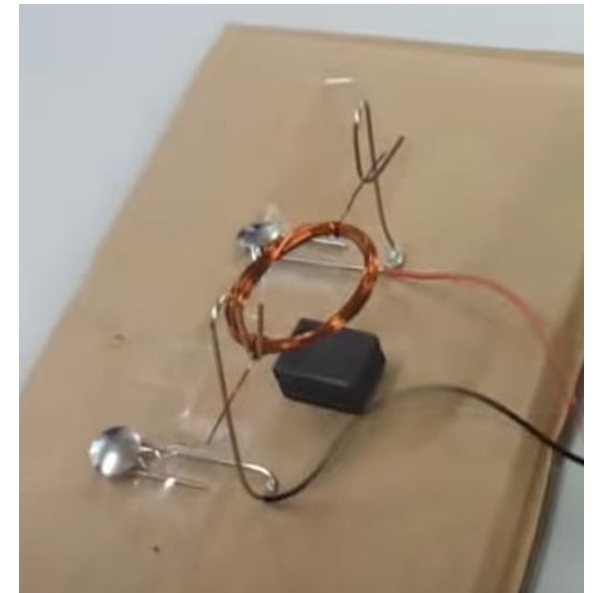
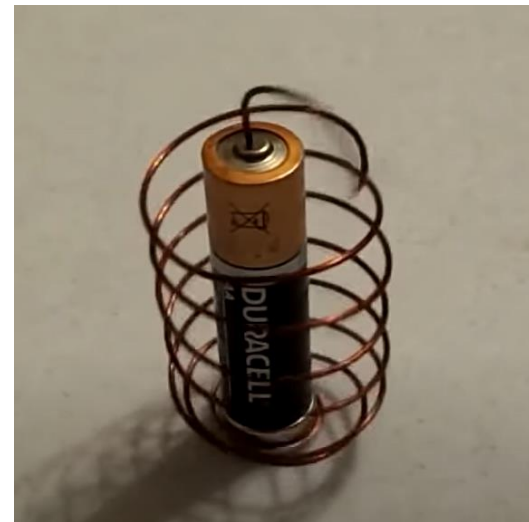
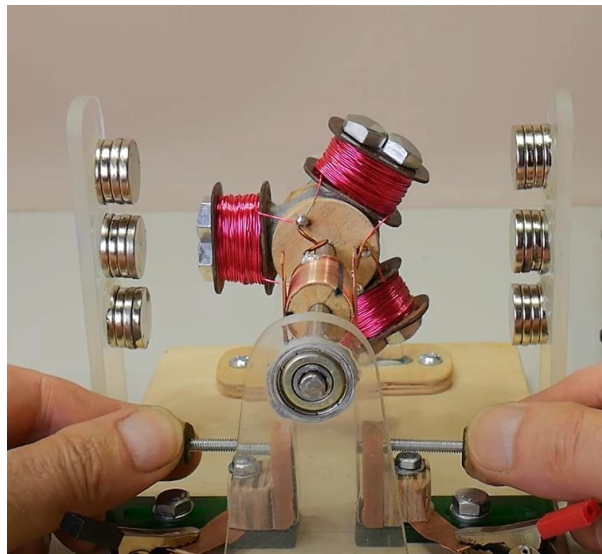
$$F = B * I * L$$

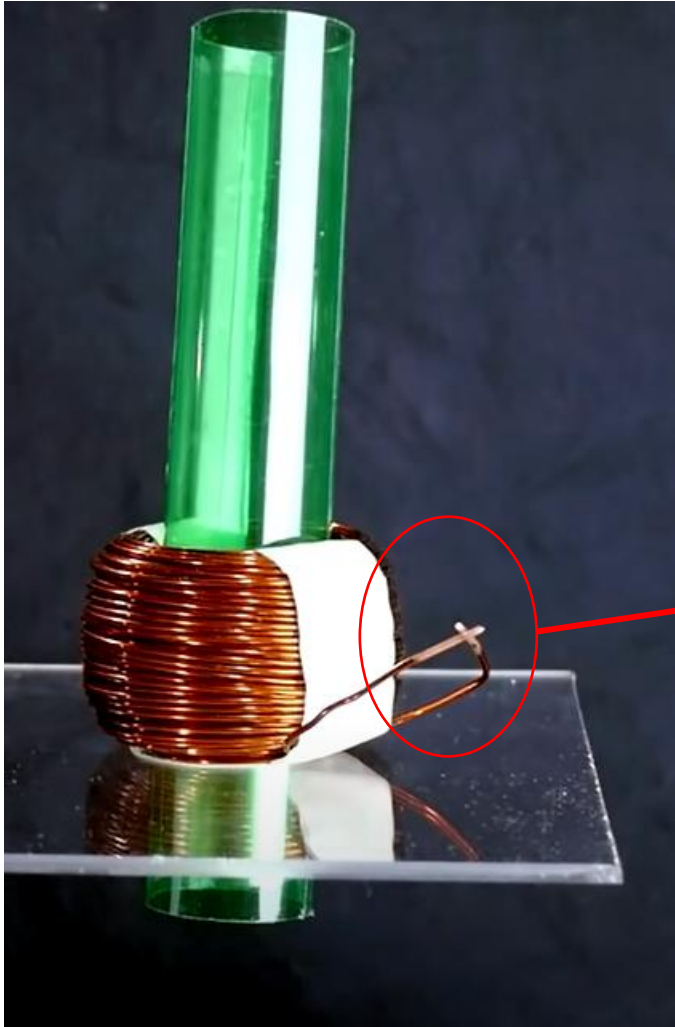
- F : EMF
- B : Magnetic induction (Tesla)
- I : Current
- L : length of the wire

Right hand rule :



BASIC DC ENGINE





Must ber shorted
to create a
magnetic field



TESLA MODEL 3 : WORKSHOP

1. Open glove compartment / hood / trunk
2. Find booster connection points
3. Open the hood with the booster
4. Put vehicle in jack mode
5. Switch vehicle to towing mode
6. Put vehicle in service mode + set 12v battery connection.
7. Visit vehicle menus + try to win Mario kart game