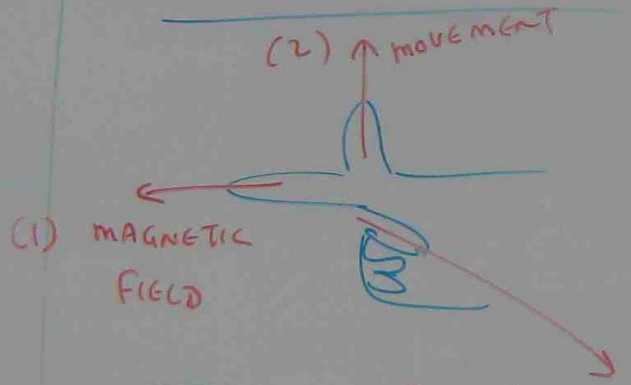
DIRECT MACHINE

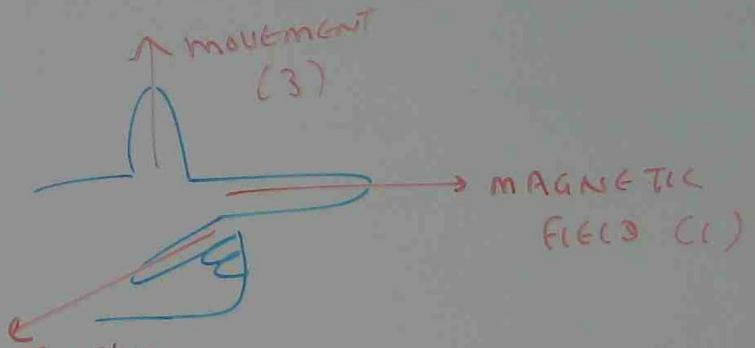
GENERATOR — CONVERT MECHANICAL ENERGY ⟶ ELECTRICAL ENERGY

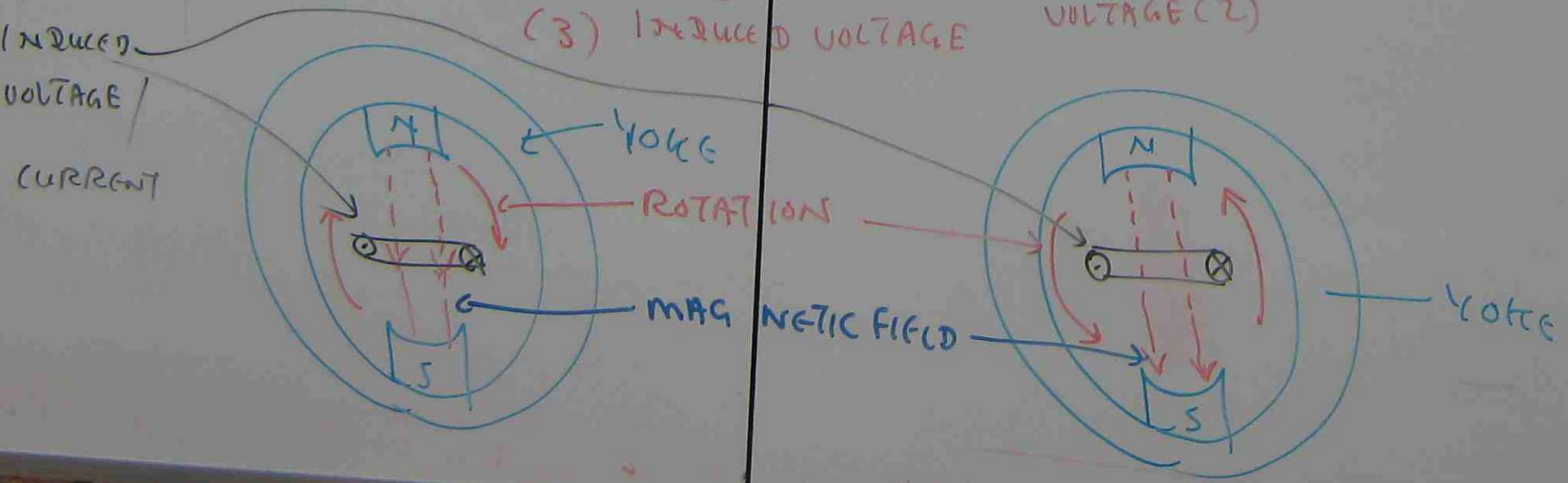
MOTOR — CONVERT ELECTRICAL ENERGY ⟶ MECHANICAL ENERGY

GENERATOR ACTION



MOTOR ACTION





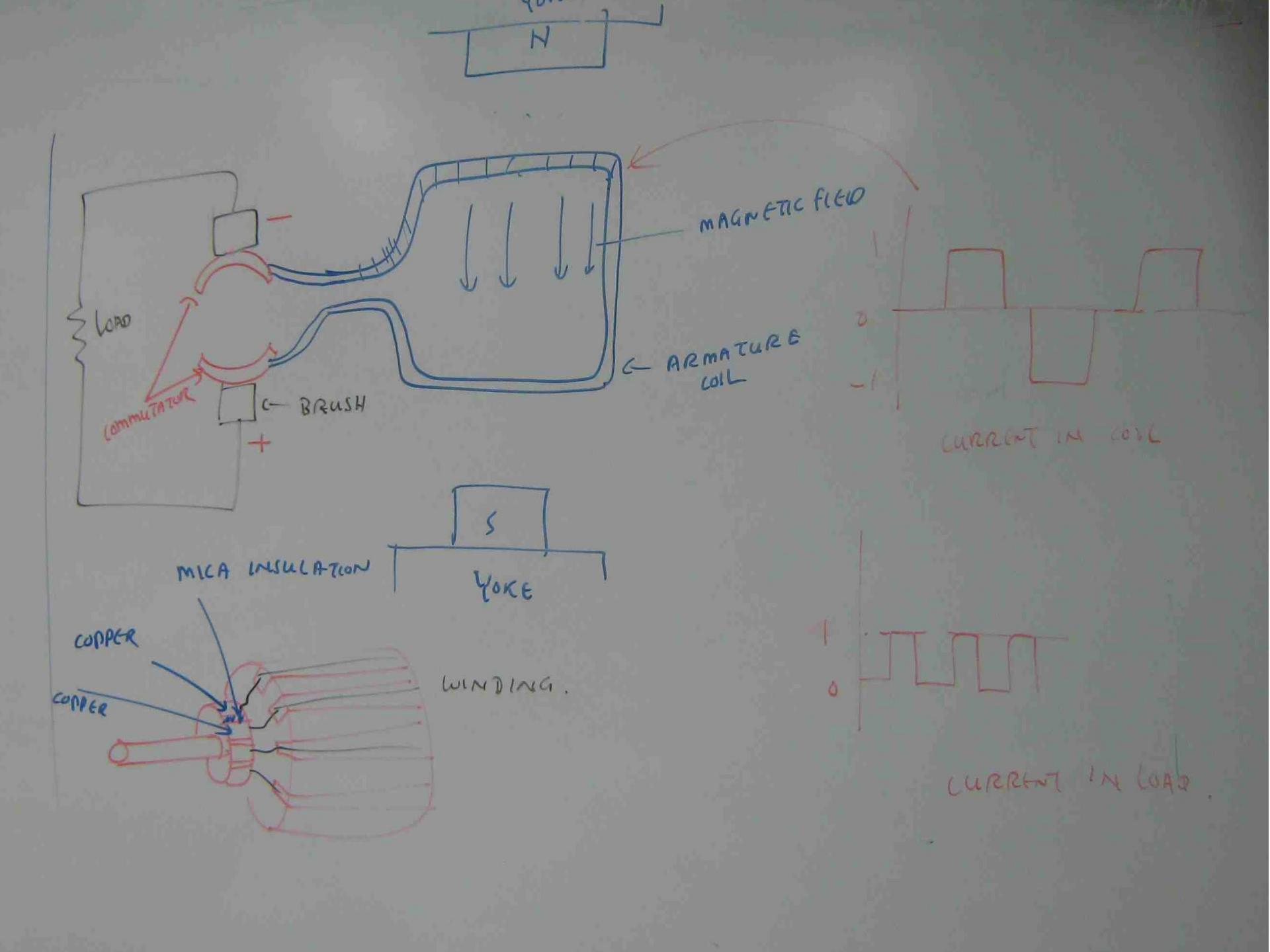
GENERATOR

AN EMF IS INDUCED IN A CONDUCTOR WHEN THE CONDUCTOR MOVES IN SUCH A DIRECTION RELATIVE TO A MAGNETIC FIELD THAT THE CONDUCTOR CUTS THE MAGNETIC FIELD

THE MAGNITUDE OF THE EMF IS GOVERNED BY THE RATE OF CUTTING

MOTOR

MOTOR ACTION IS BASED UPON THE FACT THAT A MECHANICAL FORCE IS EXERTED ON A CURRENT CARRYING CONDUCTOR IN A MAGNETIC FIELD. THE MAGNITUDE OF THE FORCE DEPENDS ON THE FIELD STRENGTH AND CURRENT.


N
MAGNETIC FIELD
LOAD
ARMATURE COIL
COMMUTATOR
BRUSH
CURRENT IN COIL
S
MICA INSULATION
YOKE
COPPER
COPPER
WINDING.
CURRENT IN LOAD.

GENERATED VOLTAGE EQUATION

$$e = B\ L\ V\ \sin\theta$$

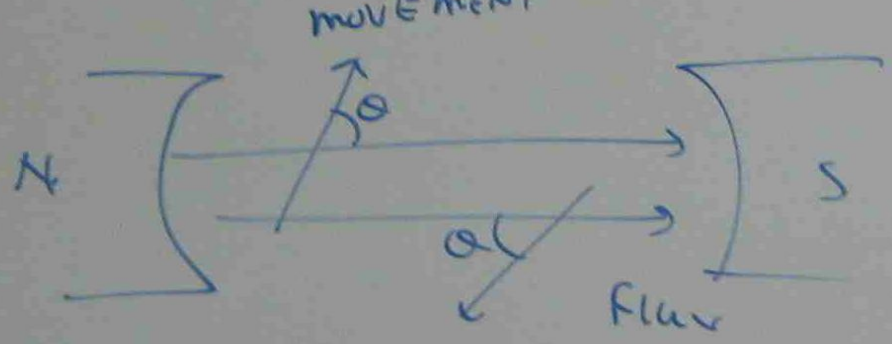
e = GENERATED VOLTAGE (VOLT)

B = FIELD FLUX DENSITY (TESLA)

L = EFFECTIVE LENGTH OF CONDUCTOR (m)

V = VELOCITY OF CONDUCTOR

θ = ANGLE BETWEEN FLUX AND MOVEMENT



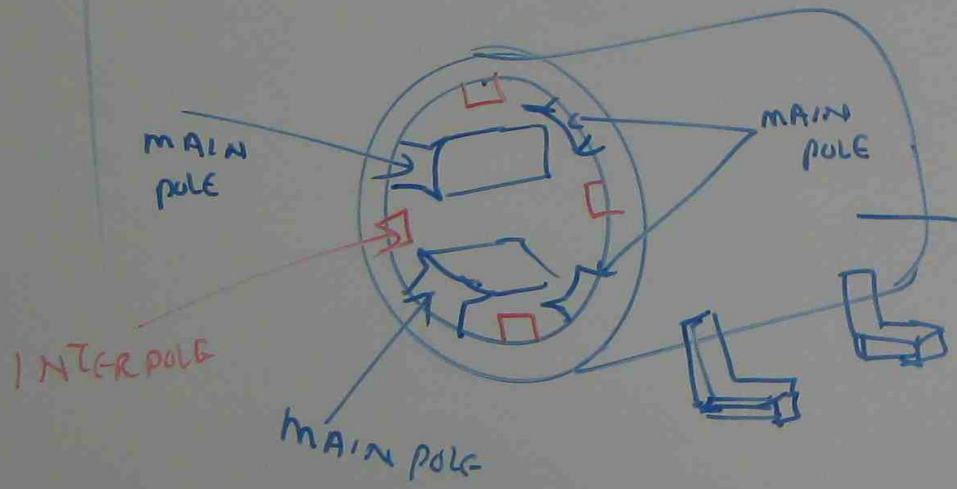
ELECTRICAL POWER OUTPUT $(P) = BLV \sin\theta \; I$

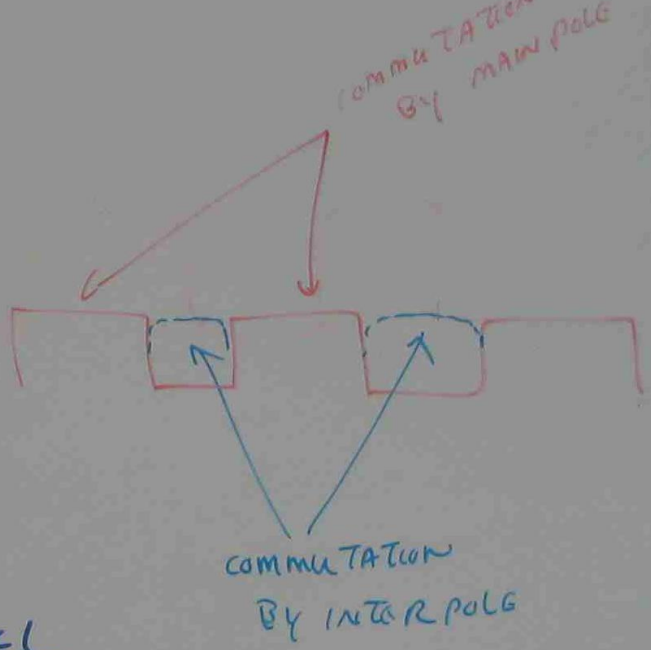
P = ELECTRICAL POWER (WATT)

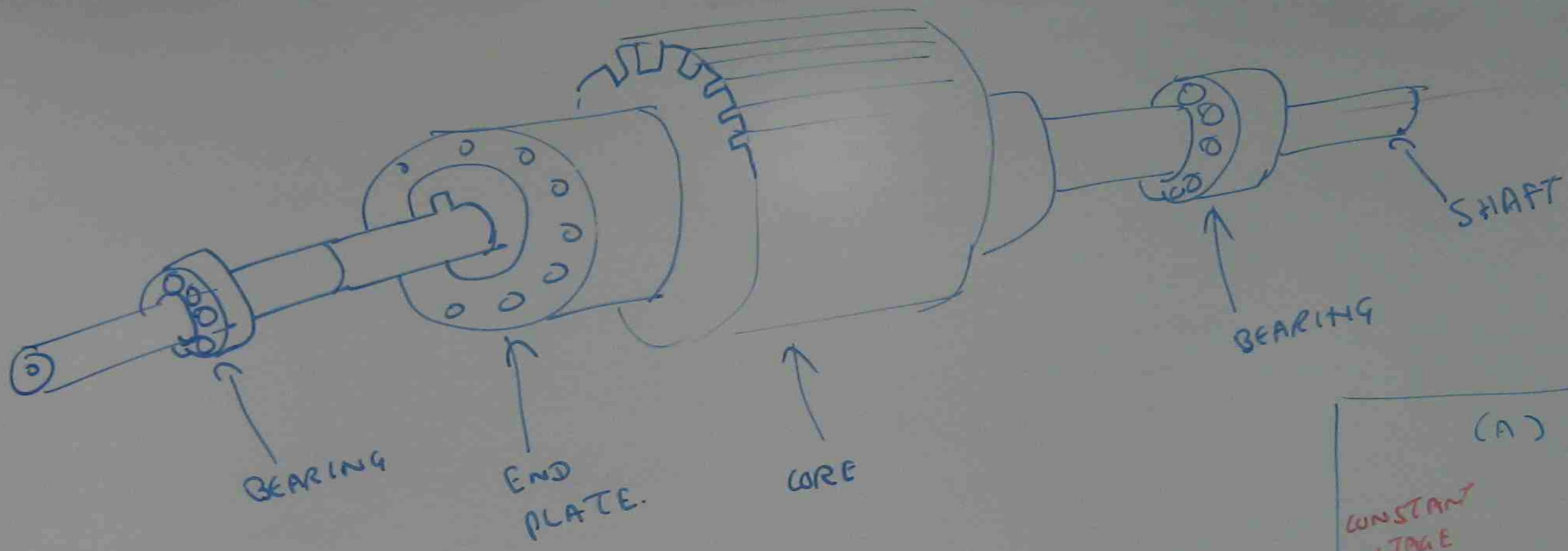
I = CURRENT (AMPERE)

PARTS of DC MACHINE

YOKE (FRAME, BODY)



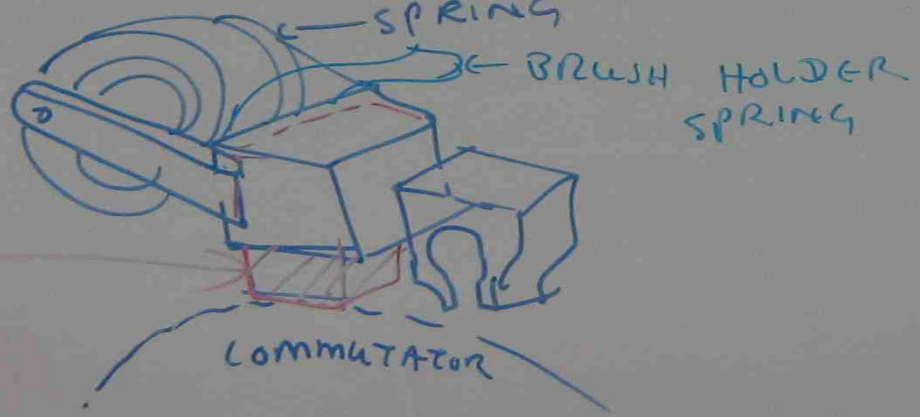


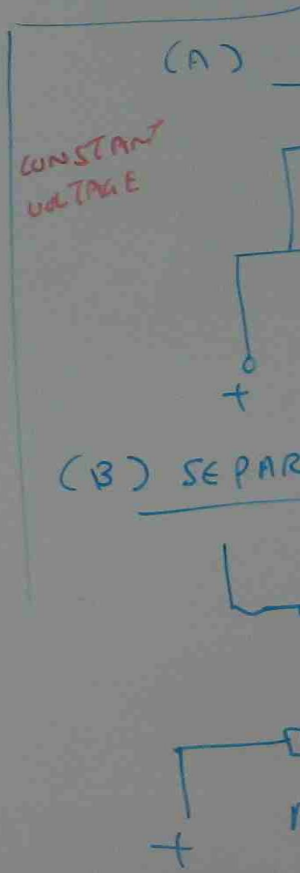


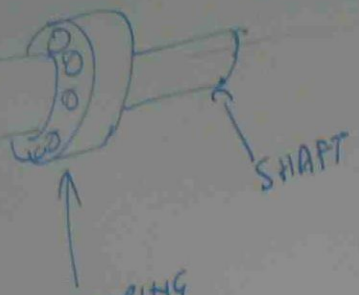
COMMUTATOR

- HARD DRAWN OR SILVERED COPPER
- INSULATION VEE ARE FILLED WITH MICA

BRUSH



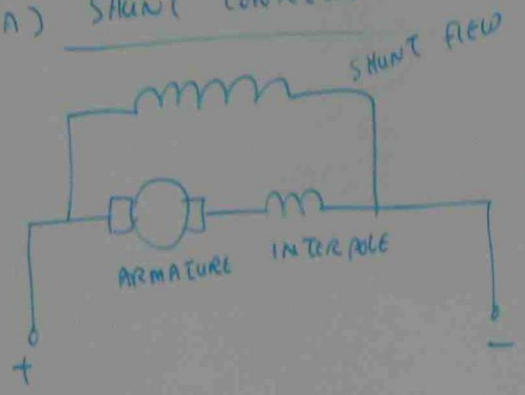




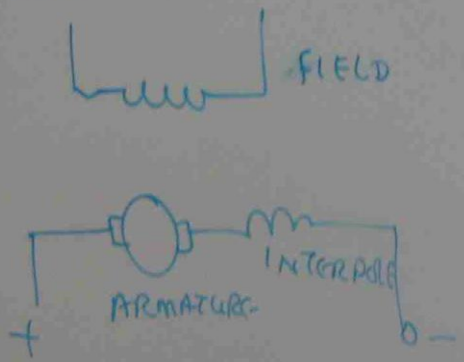
YOKE

CONNECTION OF DC MACHINES

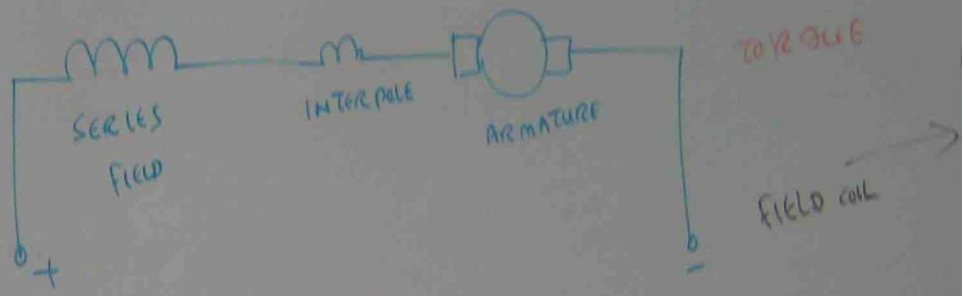
(A) SHUNT CONNECTION



(B) SEPARATELY EXCITATION



(C) SERIES CONNECTION



(D) COMPOUND CONNECTION

GOOD FOR STABILITY