

```
clear all
close all
clc

% Initialize motor component objects
mtr=Motor;
mag=Magnet;
wir=Wiring;
biron=Backiron;

% Set interdependencies
mtr.Magnets=mag;
mtr.Wiring=wir;
mtr.Backiron=biron;
mag.Motor=mtr;
wir.Motor=mtr;
biron.Motor=mtr;

% Initialize Motor properties
mtr.Poles=24;
mtr.NominalSpeed=776; % RPM
mtr.Torque=14.4/2; % N*m
mtr.TorquingRadius=0.127; % m (5")

% Initialize Magnet properties
mag.Br=1.28; % T
mag.RadialLength=0.0254*2; % m (2")
mag.AxialLength=0.00635; % m (1/4")

% Initialize Wiring properties
wir.CPPPP=9;

% Initialize Backiron properties
biron.Saturation=1.6; % T

display(mtr)
display(mag)
display(wir)
display(biron)

mtr =

Motor handle

Properties:
    Poles: 24
    Magnets: [1x1 Magnet]
    Wiring: [1x1 Wiring]
    Backiron: [1x1 Backiron]
    NominalSpeed: 776
    Torque: 7.200000000000000
    TorquingRadius: 0.127000000000000
    NominalSpeedRadians: 81.262529972855972
    MagneticForce: 56.692913385826770
    Gap: 0.010725329758223
    FieldGap: 0.545201563086500
    Mass: 7.767997644695280
    WeightPounds: 17.114743012143379
    Km: 4.565854895841906
    Kt: 1.519526478704628
    Kv: 1.519526478704628
    Efficiency: 99.576789856917841
    PowerOutput: 5.850902158045631e+002
    PowerInput: 5.875769008473568e+002
    ODInches: 11.999999987760001
    NoLoadSpeed: 62.902720436140577
```

MaxSpeed: 62.560075422220720

mag =

Magnet handle

Properties:

Motor: [1x1 Motor]
Br: 1.2800000000000000
RadialLength: 0.0508000000000000
AxialLength: 0.0063500000000000
PolePitch: 0.261799387799149
MagnetMD: 0.2540000000000000
MagnetID: 0.2032000000000000
MagnetOD: 0.3048000000000000
TangentialLengths: [3x1 double]
Mass: 1.930878330573623

wir =

Wiring handle

Properties:

Motor: [1x1 Motor]
CPPPP: 9
Conductors: 648
Current: 4.738318220119391
EndTurnLength: 33.842873491335403
TotalWireLength: 66.761273491335402
WireDiameter: 0.002931839622763
WireArea: 6.751034091854879e-006
Resistance: 0.110757293316751
ResistiveVoltage: 0.524803300933869
ResistivePower: 2.486685042793750
Mass: 4.038340394866649
DriveVoltage: 1.240053693212170e+002

biron =

Backiron handle

Properties:

Motor: [1x1 Motor]
Saturation: 1.6000000000000000
Thickness: 0.005664733219151
Mass: 1.798778919255008