

MECHANICAL ANALOG RELATIONSHIPS

Voltage - V = Force - N
 Current - A = Velocity - m/s
 Charge - Coul. = Displacement - m.
 Resistance - Ohms = Damp. Coeff. - Ns/m
 Inductance - Hy = Mass - Kg
 Capacitance - Fd = Compliance - m/N

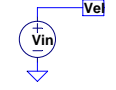
YUMA2 PARAMETERS

.param K=1.201 N/m (estimated)
 .param rs= 1380 V/m
 .param M0 = 0.0875 Kg
 .param M1 = 0.0875 Kg (estimated)
 .param Gn = 9.27 N/A
 .param Z=0.15 N/m/s
 .param Rcoil=41 Ohms
 .param LLeak=3m Henries - leakage (est)
 .param Moff=35e-6 Kg - Mass imbalance

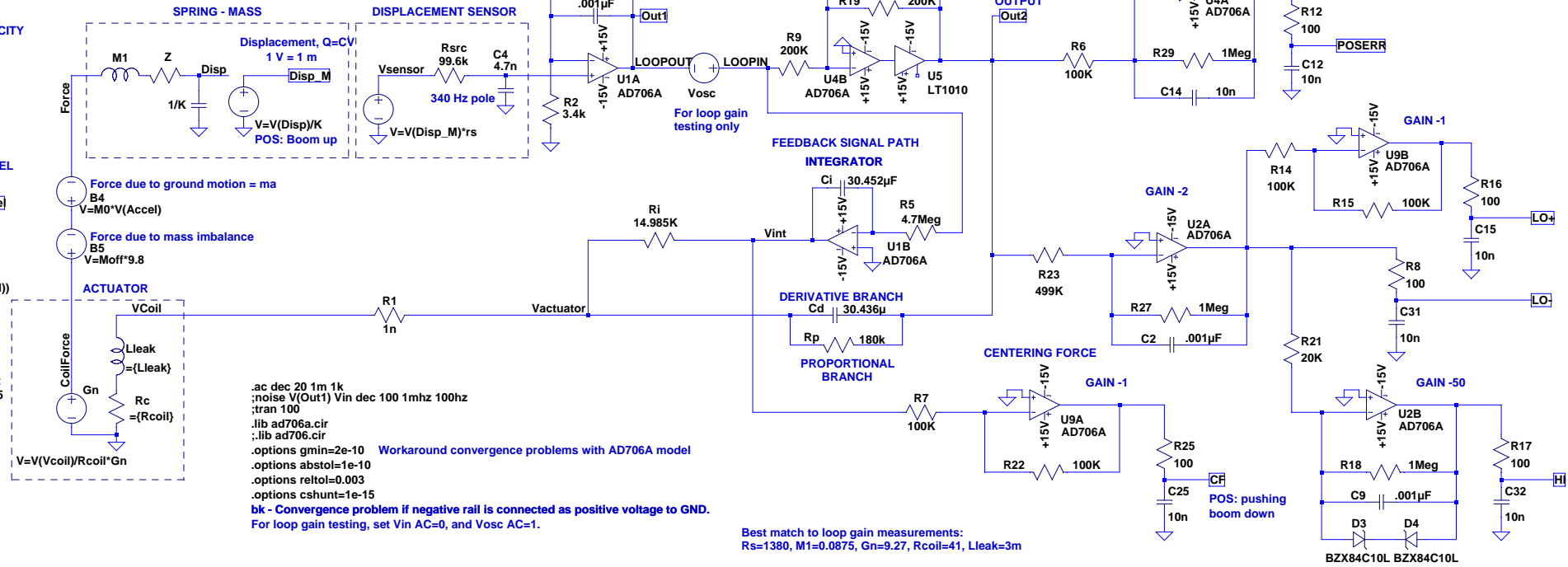
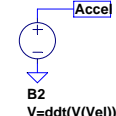
POLARITIES

Ground moves up
 Boom moves down
 U1A-1 -
 U5-3 +
 U2A-2 +
 Vactuater +
 Coil force on boom +
 Hi + Out +
 Lo+ Out +

GROUND VELOCITY
 1 V = 1 m/s



GROUND ACCEL
 1 V = 1 m/s^2



```
.ac dec 20 1m 1k
;noise V(Out1) Vin dec 100 1mhz 100hz
;tran 100
.lib ad706a.cir
.lib ad706.cir
.options gmin=2e-10 Workaround convergence problems with AD706A model
.options abstol=1e-10
.options reltol=0.003
.options cshunt=1e-15
bk - Convergence problem if negative rail is connected as positive voltage to GND.
For loop gain testing, set Vin AC=0, and Vosc AC=1.
```

Best match to loop gain measurements:
 Rs=1380, M1=0.0875, Gn=9.27, Rcoil=41, Leak=3m