Description	Translational Mechanical	Torsional Mechanical	Electrical	Thermal	Fluid/ Acoustic	Photometric	Economic	Magnetic
Static (Quantity)	Position	Angle	Charge	Heat	Volume	Luminous Energy?	?	Magnetic flux
Motion (Flux)	Velocity	Angular Velocity	Current	Heat flow	Volumetric Flow	Spectral Power	?	Magnetic flux rate
Push (Potential)	Force	Torque	Voltage (potential difference or electromotive force)	Temperature	Pressure	Wavelength	?	Magnetomotive force
Dissipative element	Friction/ Damper	Rotational Friction	Resistance	Thermal Resistance	Fluid Resistance	Photosynthesis?	Resistance to Consume	gyrator/dualizer?
Motion storage	Mass	Inertia	Inductance	1/Heat capacity	Inertance	Photonic Microresonator?	Apparent Capital	Magnetic Inductance?
Push storage	Spring	Torsion	Elastance (1/Capacitance)	1/Thermal capacitance	1/Fluid capacitance	electromagnetically-induced transparency?	(1/credit) or parasitism?	Reluctance
Impulse	Momentum	Angular Momentum	Magnetic Flux	?	Dynamic Viscosity	Wavespeed	?	?

Could I include: genetics, control systems, cosmology, chemistry, law, radiometry?

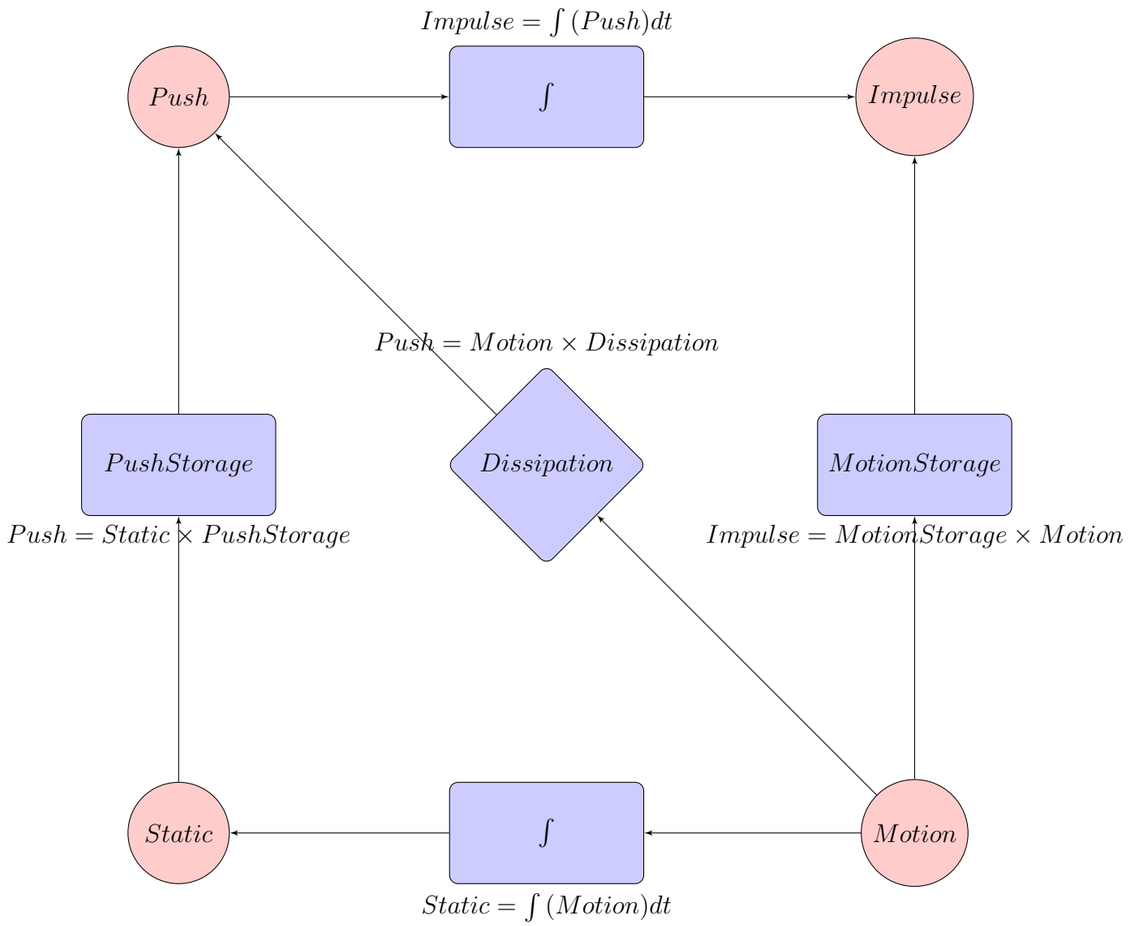
NOTE: Different analogies are possible, e.g. using parallel circuits (the above is for series), or using an alternative mechanical analogy (e.g. equating Force with Current)

Push = Effort = Across

Motion = Flow = Through

General Kirchhoff Potential Law (GPL) and General Kirchhoff Flow Law (GFL) apply

Description	Translational Mechanical	Torsional Mechanical	Electrical	Thermal	Fluid/ Acoustic	Photometric	Magnetic
Static (Quantity)	m	$rad = \frac{m}{m}$	$C = s.A$	$W.s$	m^3	?	$Wb = \frac{kg.m^2}{A.s^2}$
Motion (Flux)	$\frac{m}{s}$	$\frac{rad}{s} = \frac{1}{s}$	A	$W = J.s = \frac{kg.m^2}{s}$	$\frac{m^3}{s}$	$\frac{W}{m}$	$\frac{Wb}{s} = V = \frac{kg.m^2}{A.s^3}$
Push (Potential)	$N = \frac{J}{m} = \frac{kg.m}{s^2}$	$N.m = \frac{J}{rad} = \frac{kg.m^2}{s^2}$	$V = \frac{kg.m^2}{A.s^3}$	K	$Pa = \frac{J}{m^3} = \frac{kg}{m.s^2}$	m	A
Dissipative element	$\frac{N.s}{m} = \frac{kg}{s}$	$\frac{N.m.s}{rad} = \frac{kg.m^2}{s}$	$\Omega = \frac{V}{A} = \frac{kg.m^2}{A^2.s^3}$	$\frac{K}{W} =$	$\frac{kg}{m^4.s}$	?	Ω?
Motion storage	kg	$kg.m^2$	$H = \frac{V.s}{A} = \frac{kg.m^2}{A^2.s^2}$	$\frac{K.s}{W} =$	$\frac{Pa.s^2}{m^3} = \frac{kg}{m^4}$	?	?
Push storage	$\frac{N}{m} = \frac{kg}{s^2}$	$\frac{N.m}{rad} = \frac{kg.m^2}{s^2}$	$\frac{1}{F} = \frac{V}{c} = \frac{kg.m^2}{A^2.s^4}$	$\frac{K}{W.s} = \frac{K}{J} = \frac{s^2K}{kg.m^2}$	$\frac{kg}{m^4.s^2}$	?	$\frac{A}{Wb} = \frac{1}{H} = \frac{s^2.A^2}{m^2.kg}$
Impulse	$N.s = \frac{kg.m}{s}$	$N.m.s = \frac{kg.m^2}{s}$	$Wb = V.s = \frac{kg.m^2}{A.s^2}$	$K.s$	$Pa.s = \frac{kg}{m.s}$	?	?



$$PushStoredEnergy = \frac{1}{2} PushStorage \times Static^2 = \frac{1}{2} \frac{Push^2}{PushStorage} \tag{1}$$

$$MotionStoredEnergy = \frac{1}{2} MotionStorage \times Motion^2 = \frac{1}{2} Motion \times Impluse \tag{2}$$

(above not valid for thermal?)

$$DissipatedPower = Push \times Motion = Dissipation \times Motion^2 = \frac{Push^2}{Dissipation} = Heat \tag{3}$$

$$PushTimeConstant = Dissipation \div PushStorage \tag{4}$$

$$MotionTimeConstant = MotionStorage \div Dissipation \tag{5}$$