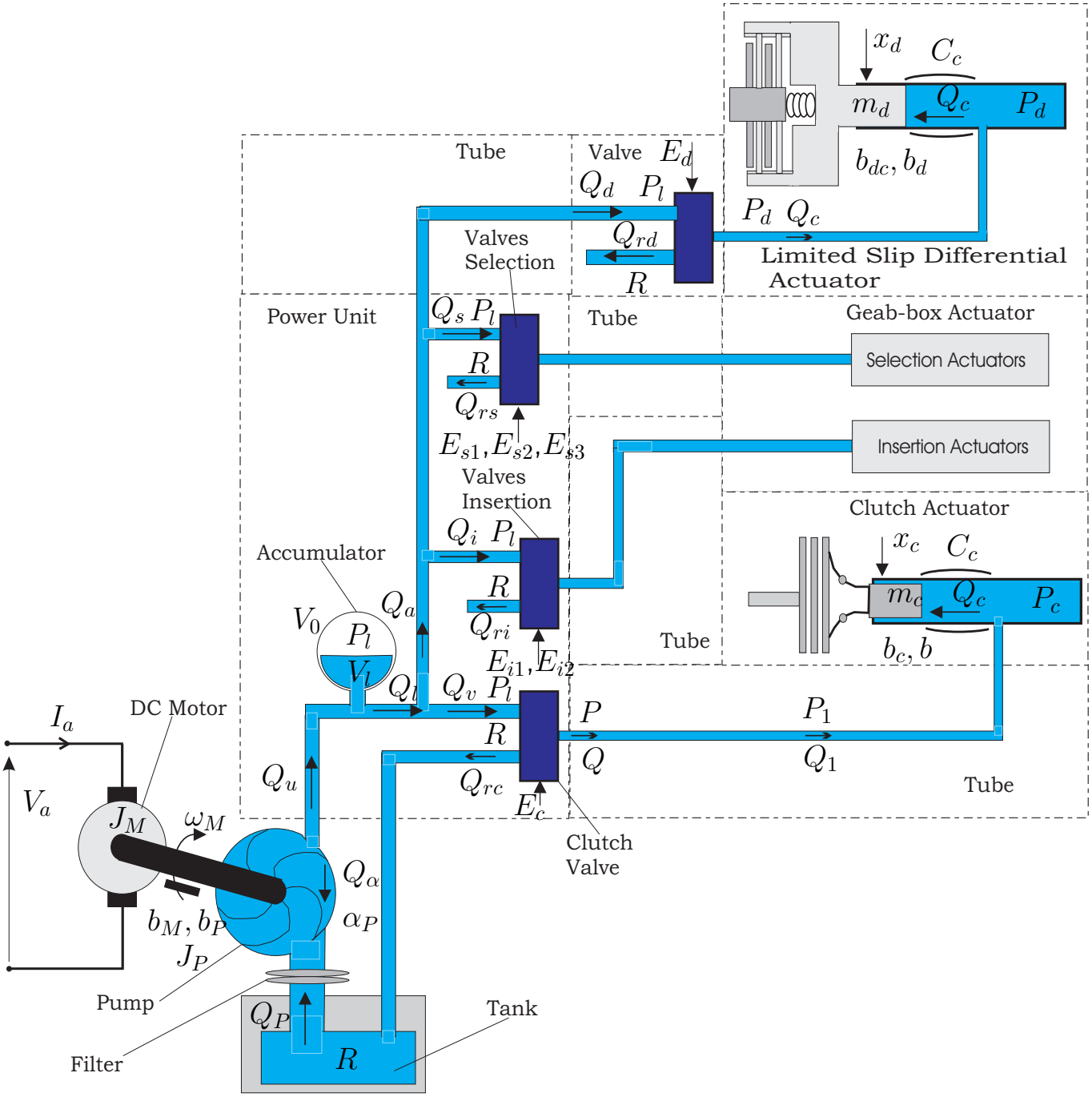
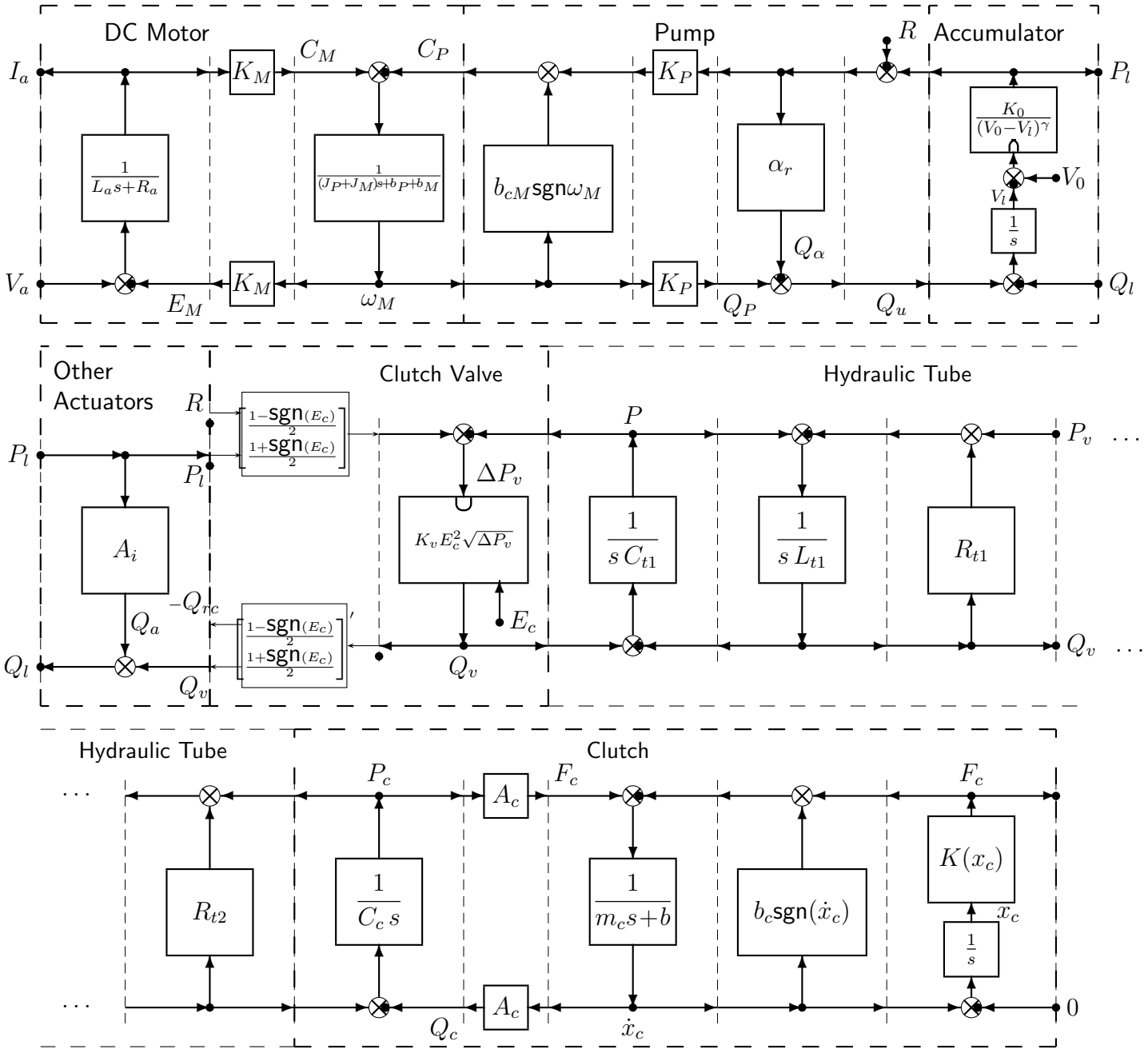
Hydraulic system of a car



The system which provides hydraulic power to a car is essentially composed by an electric motor, a gear hydraulic pump, an hydraulic accumulator and some electric valves controlling the power flowing toward the loads (clutch actuator, differential actuator, selection actuator, insertion actuator, etc.).



POG bock scheme of the following physical elements:

- Electric motor (inductance L_a, resistance R_a, torque constant K_M, inertia J_M and linear friction coefficient b_M).
- Hydraulic pump (gain K_P, liking and friction coefficients α_r and b_{cM})
- Accumulatore idraulico (volume a vuoto V_0, costante elastica del gas K_0)
- Hydraulic circuit controlling the clutch: electric valve, hydraulic tube, hydraulic capacitance C_c, mass m_c, piston section A_c, piston friction b_c, cup spring $K(x_c)$.