



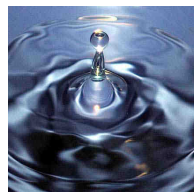
Design and Modeling of Fluid Power Systems

ME 597/ABE 591 - Lecture 13

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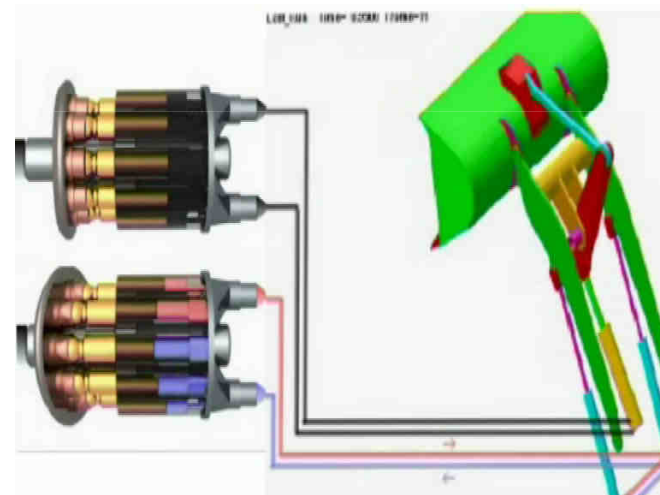


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Displacement Controlled Systems



- Secondary controlled actuator

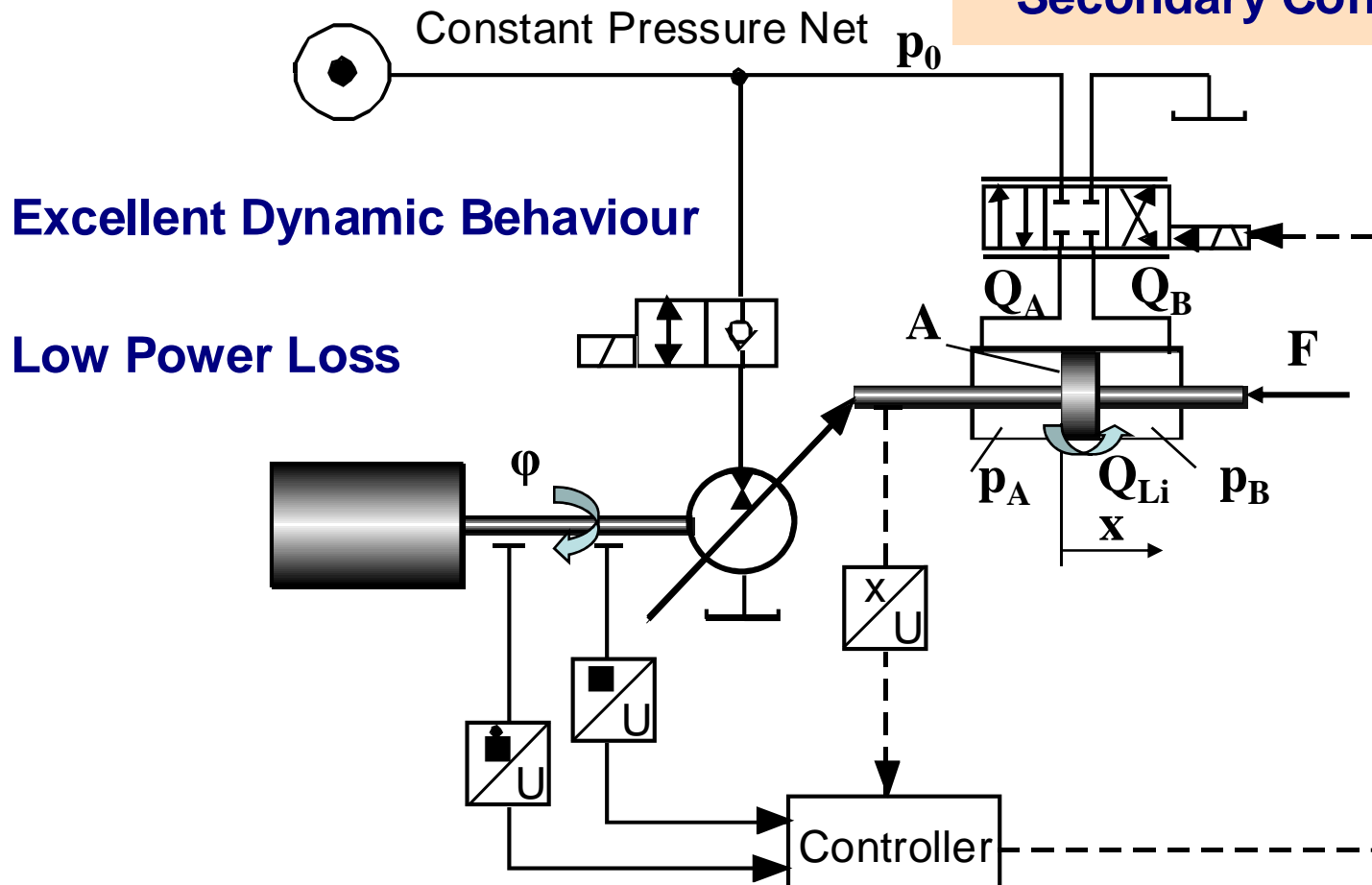


Requires constant pressure supply



$$M_{Sx} = \frac{R}{\cos^2 \beta} \cdot \sum_{i=1}^z F_{AKi} \cdot \cos \varphi_i$$

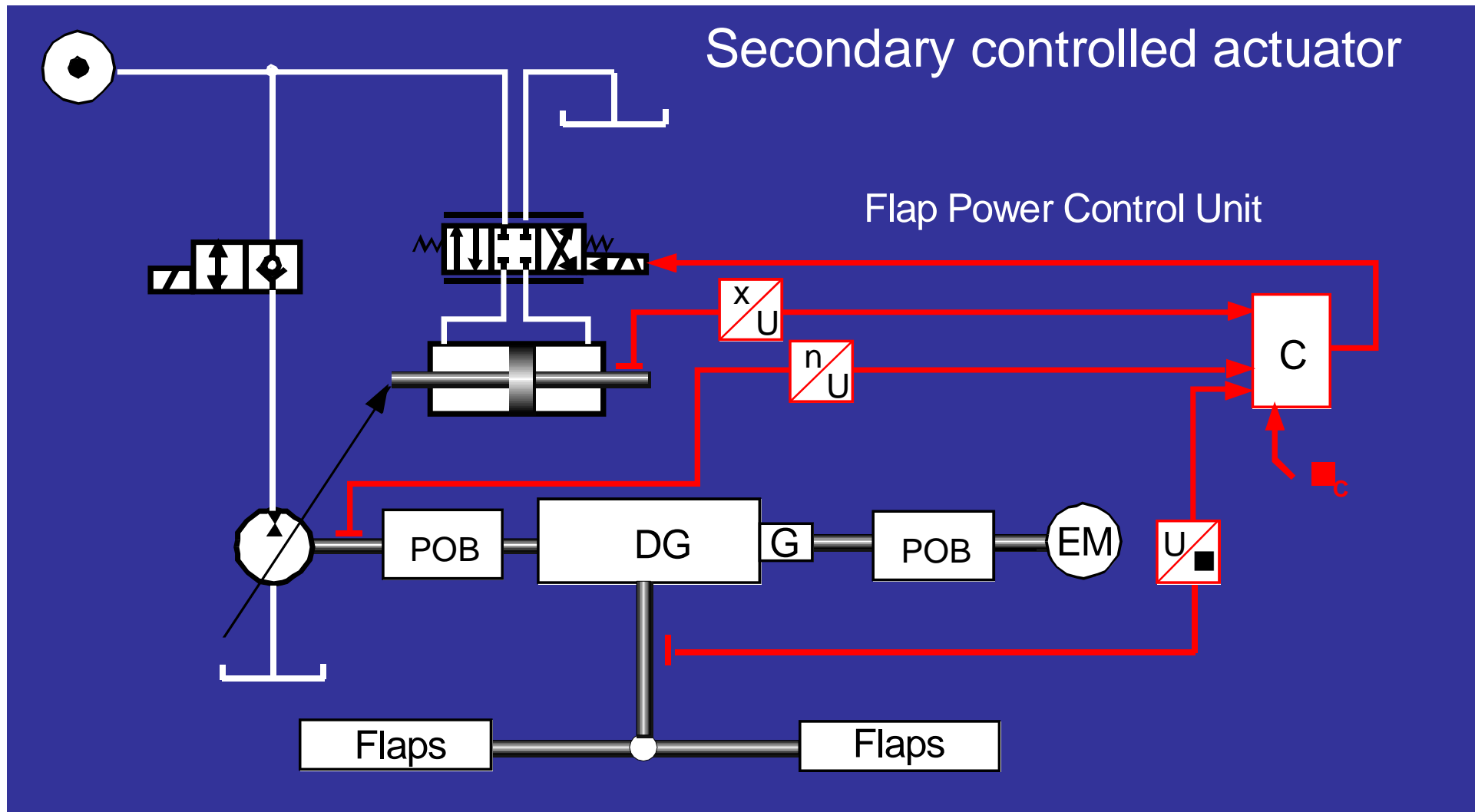
Secondary Controlled Drive



$$F = \frac{M_{Sx}}{r_c}$$



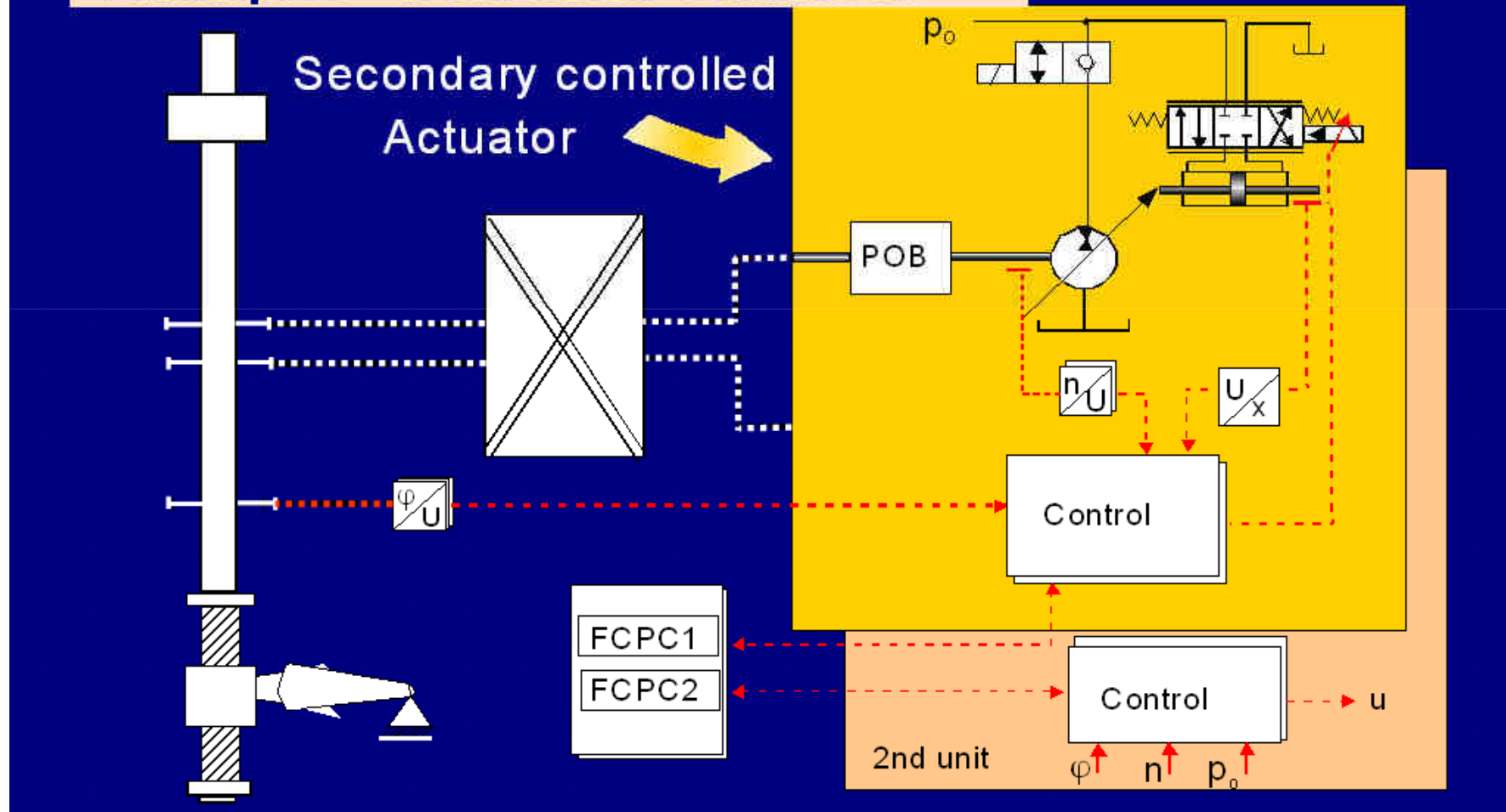
Examples - High Lift System



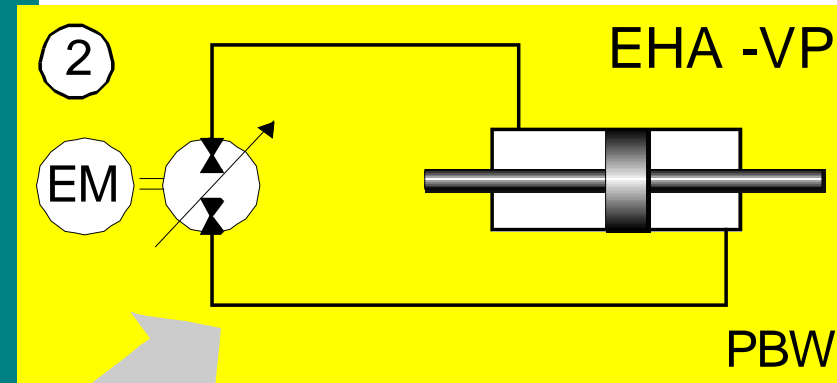
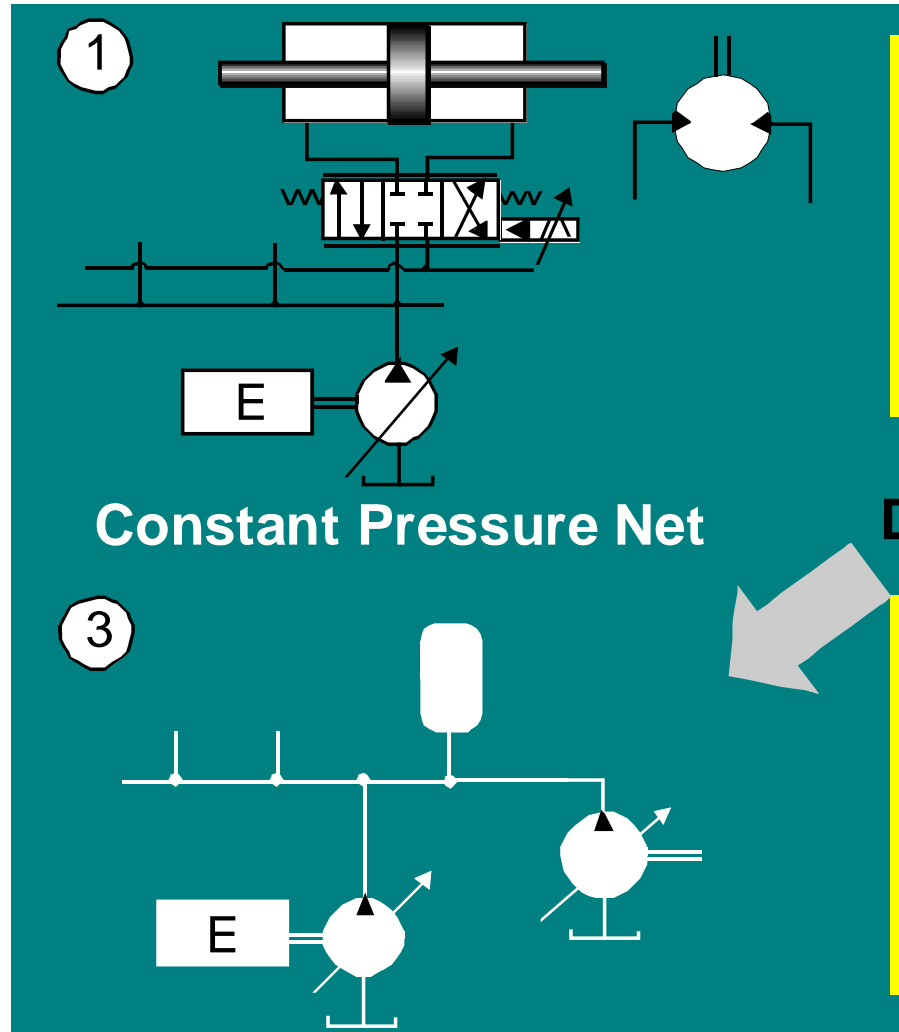
Secondary controlled actuator



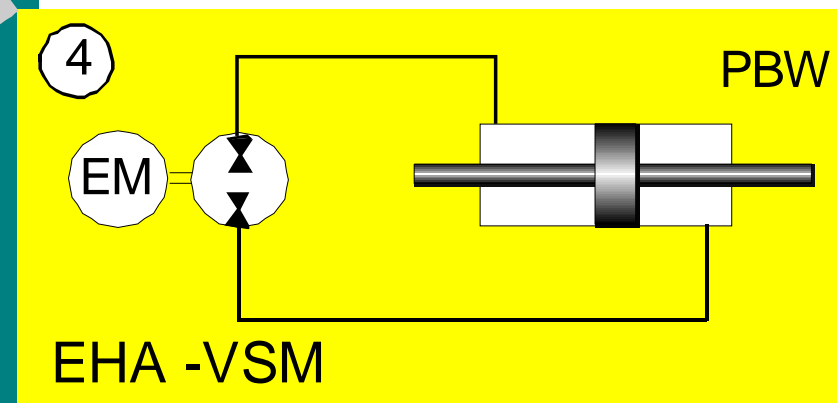
Examples - Horizontal Stabiliser



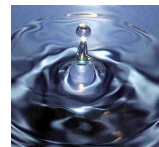
Hydraulic actuator principles



Displacement Controlled Actuator



Hydraulic actuator principles



Classification & Main System Properties

Valve Controlled
Actuator

1



Proportional valve

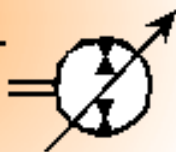
Servo valve

LS- valve

- Energy Dissipation
- High Bandwith
- Central Pressure Supply
- ~~Energy Recover~~

Displacement Controlled
Actuator

2



Pump Control

Secondary Control

- ~~Central Pressure Supply~~
- Energy Recover
- High Bandwith
- Central Pressure Supply

Speed Controlled
Actuator

3



Electric Motor Control

- ~~Central Pressure Supply~~
- Energy Recover