

AGENDA CENG 5437 February 1, 2023

WEB Files

[PhysicsReview](#) [Inertia](#) [Stopping\\_Distances](#)

[WHY LEARN PHYSICS](#)

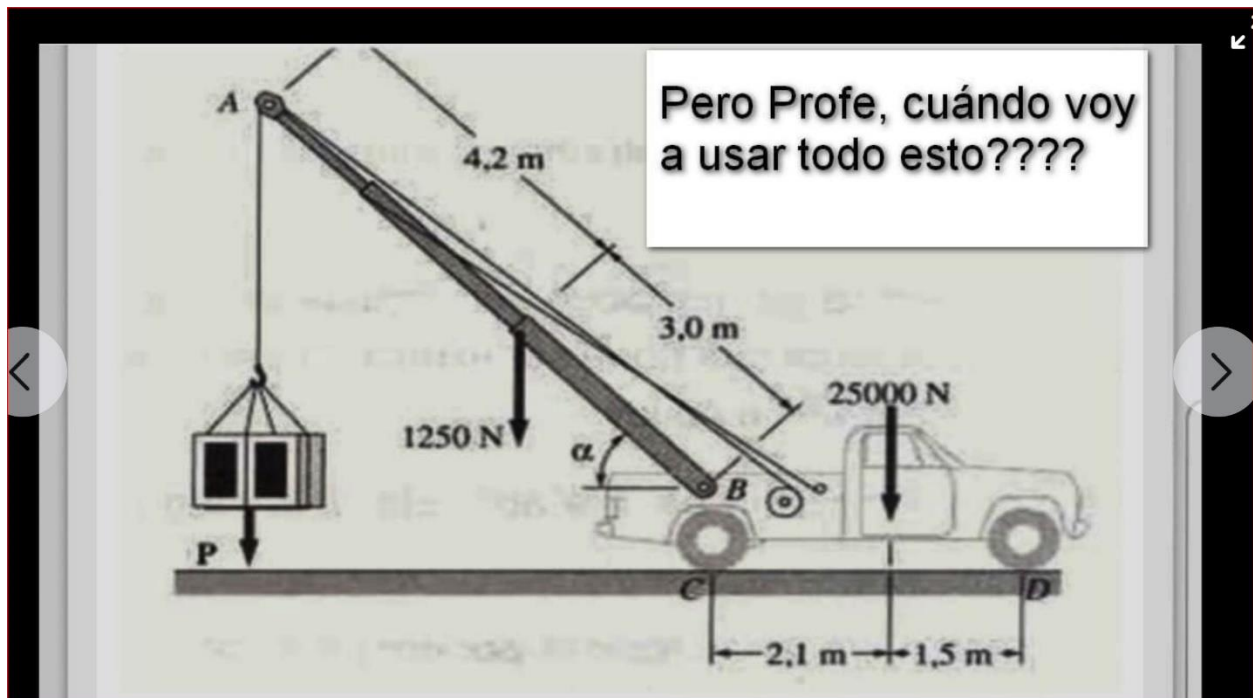
[MotorSelection Videos](#)

[Control\\_PID\\_TLH](#)

[PID\\_EXAMPLES&Video](#) (Start)

[WHY LEARN PHYSICS](#)

<https://www.facebook.com/604107455/videos/pcb.10157972910537456/10157972910262456>



1. Why Learn Physics - Prof - When would we use this stuff??

## PhysicsReview



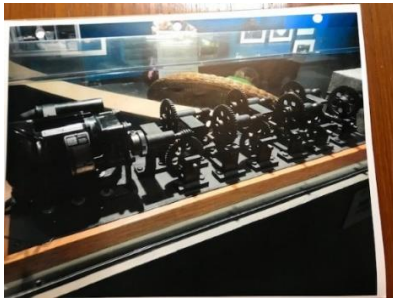
1a\_physicsReviewsca  
n0001.pdf

## **2. Basic Physics and Gears**



2A\_GEARs SFO  
Exploratorium.pdf

GEARS at the SFO Exploratorim



## Inertia

### **3. Inertia and URDF Chapter 2 in Textbook (5435 Web – Text)**



3\_InertiaLectureWeb.  
pdf

## Stopping Distances



4\_Stopping  
Distances.pdf

## Motor Selection Videos



5\_References Motor Sizing and Selection2

**Understanding Motor Sizing & Selection**

- Presentation Overview:
  - Understanding Applications & Customer
  - Understanding Motion Profiles (velocity vs. time)
  - Calculating Speed and Acceleration
  - Calculating Peak Torque and System Inertia
  - Understanding Motor Torque vs. Speed Curves
  - Calculating Continuous Torque
  - Motor Selection

**Example System**

- Autonomous Warehouse Fork Lift For Picking Up Pallets and Transporting Them

**ROBOT**  
Controls  
Traction Drive  
Lift Drive  
Batteries

**LOAD**  
65 kg max

Lift Platform: 4 kg

BALLSCREW DRIVEN LIFT

6" DIAMETER WHEELS (ONE DRIVEN BY TRACTION MOTOR)

TOTAL WEIGHT (ROBOT AND LOAD) = 418 pounds → 190 kg mass

## Control PID TLH



6\_PIDcontrolforRobots\_TLH.pdf

## PID EXAMPLES&Video



7\_PID\_ExamplesVideo  
oDigital PID Control

## Demo and Car video

REMIND ME TO RECORD WHEN NECESSARY. TURN OFF MY MIKE FOR YOUTUBES!

Pero Profe, cuándo voy a usar todo esto????

