BBIFMAC EEGAI Matching a pump to a pipeline system – Burdekin April ’15

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ENERGY EFFICIENCY GAINS FOR AUSTRALIAN IRRIGATORS
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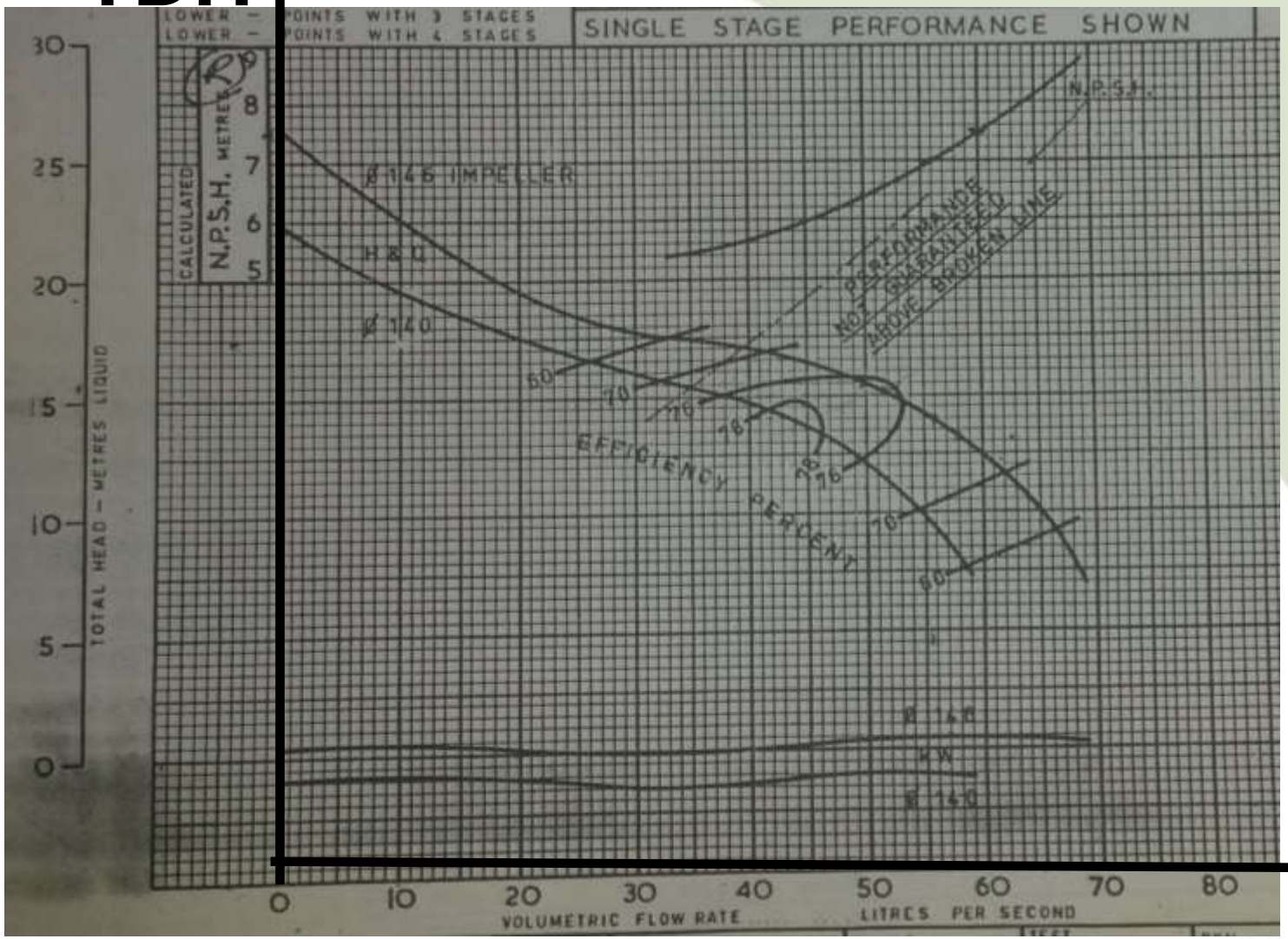
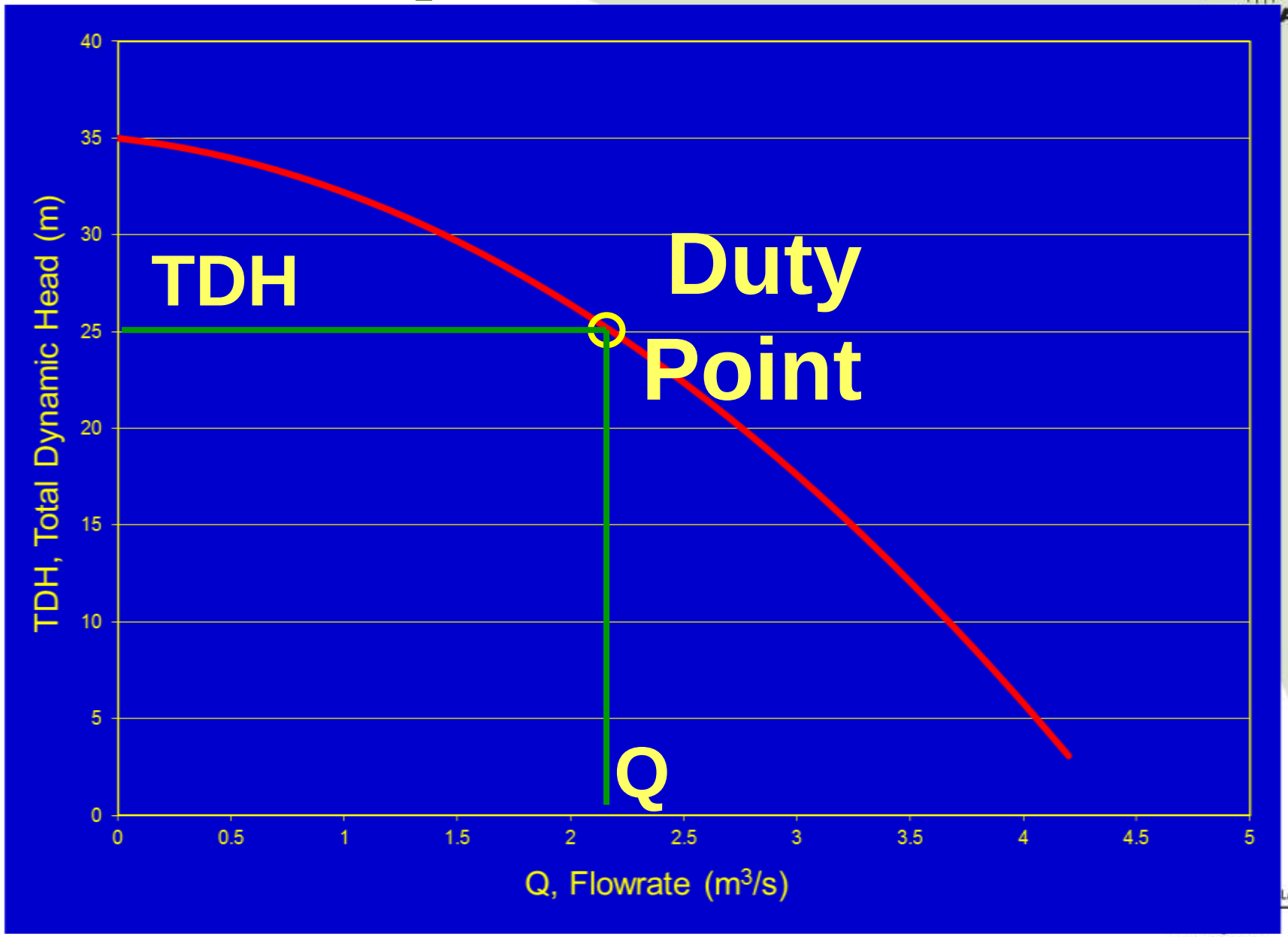
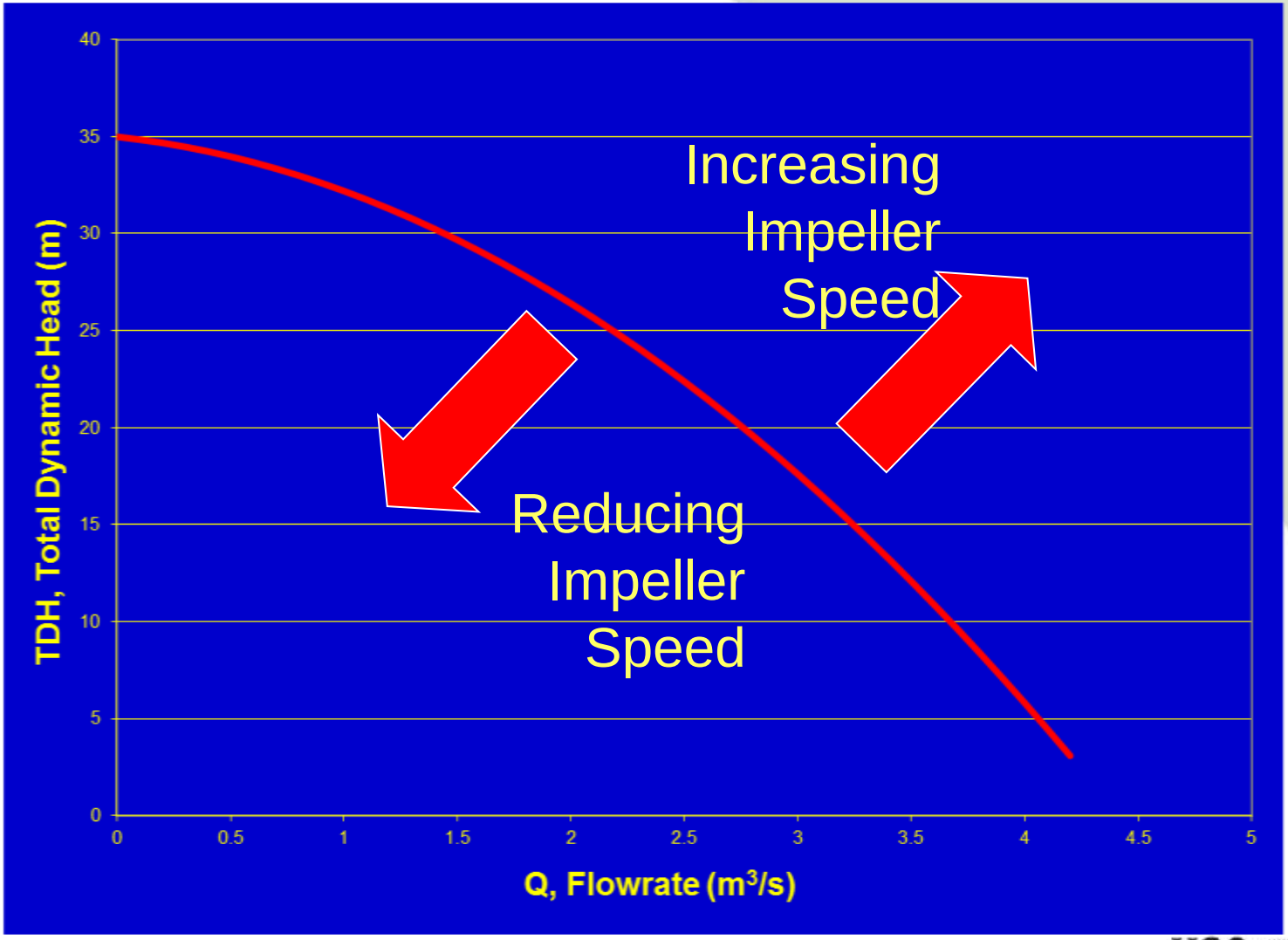
Giles & Gaskin 180HC Curve



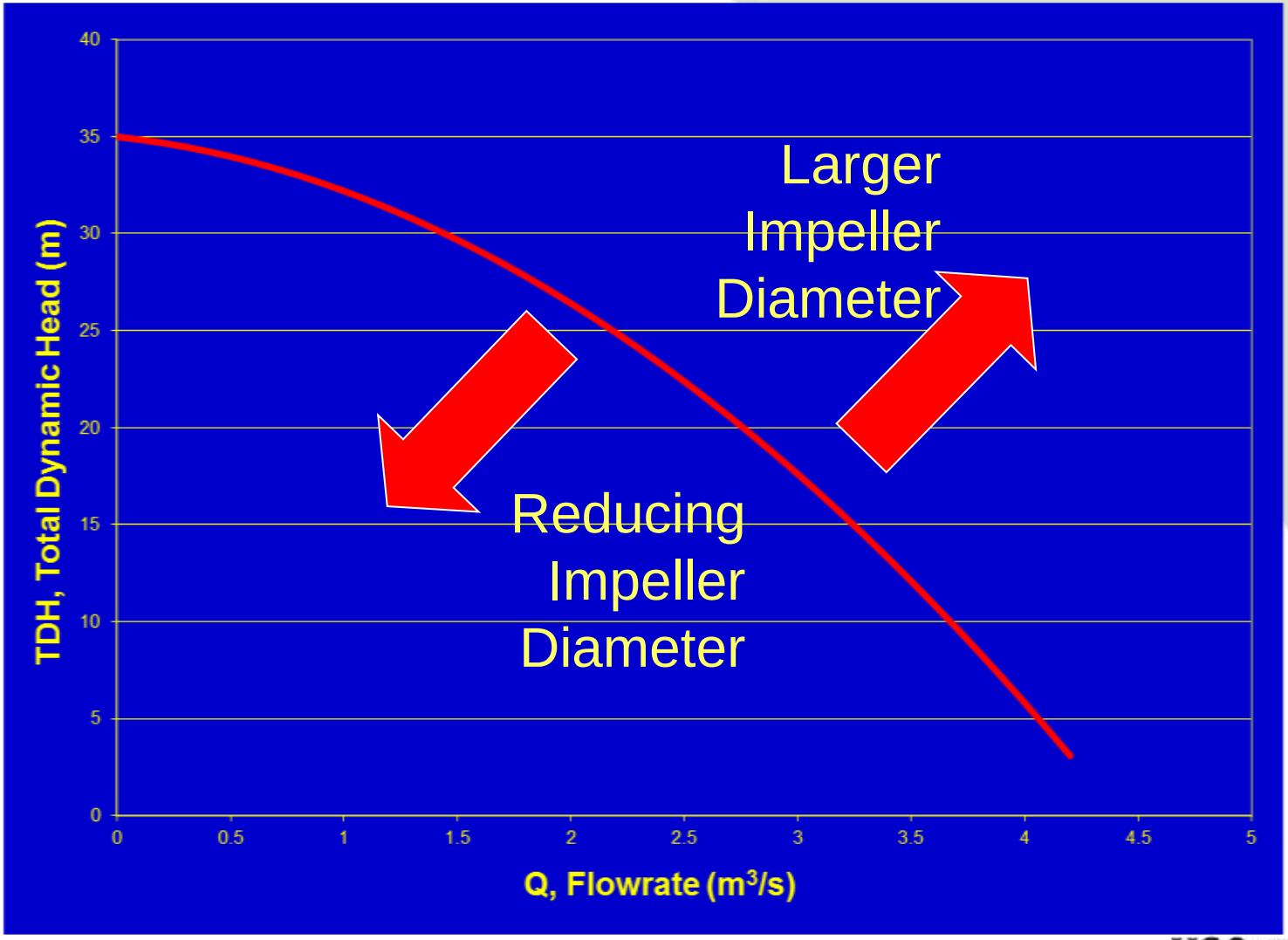
Pump Curve


TDH
Duty
Point
Q
TDH, Total Dynamic Head (m)
Q, Flowrate (m³/s)
0
5
10
15
20
25
30
35
40
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

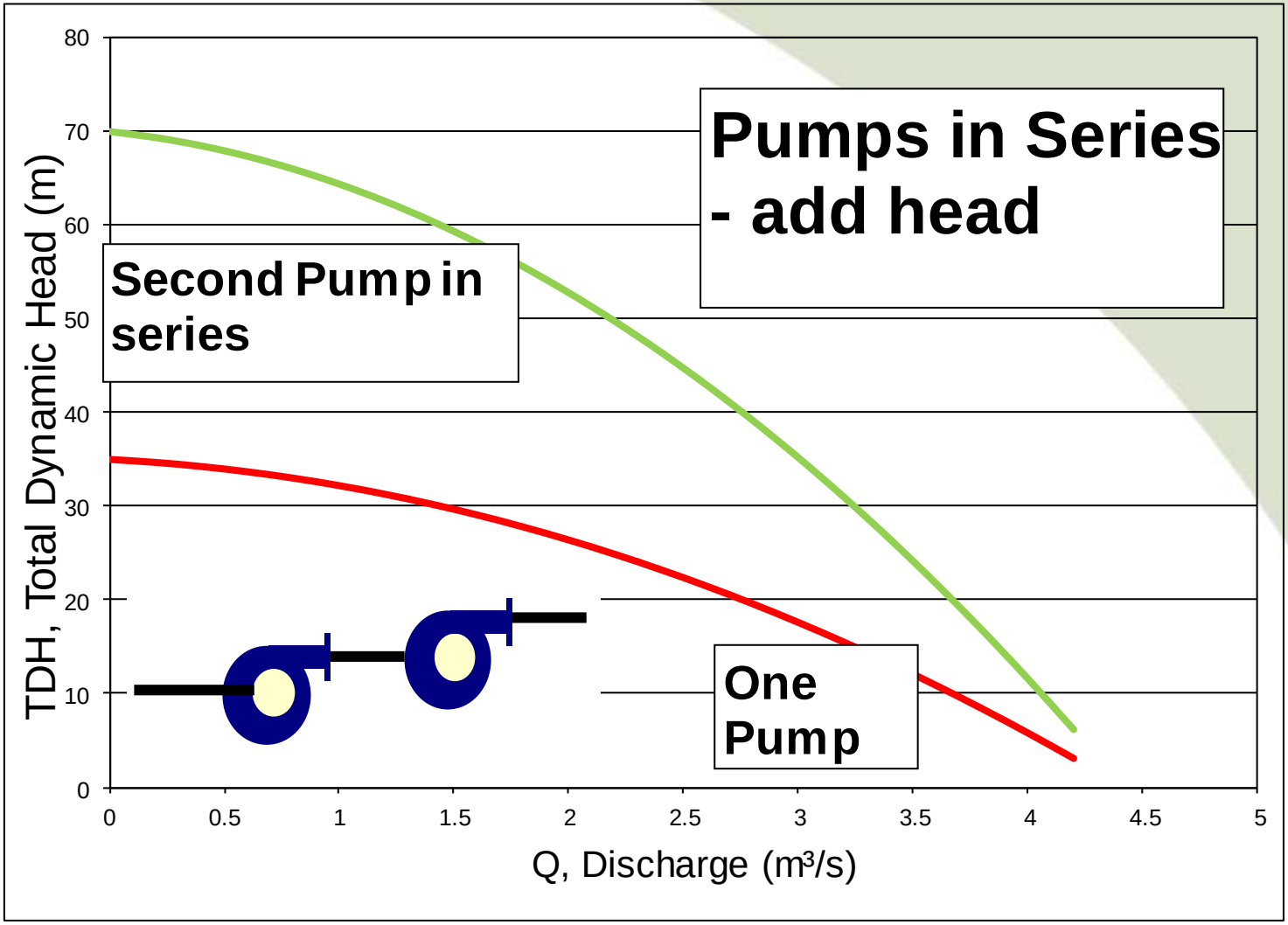
Reducing & Increasing Speed



Reducing (trimming) your Impeller or replacing with new Larger Impeller



Pumps in Series



Total Dynamic Head

- Total Dynamic Head
  - Is a measure of the energy per unit weight imparted to the water by the pump
- Calculate from :
  - the discharge dynamic head minus the suction dynamic head
  - suction dynamic head – measured relative to the pump centreline

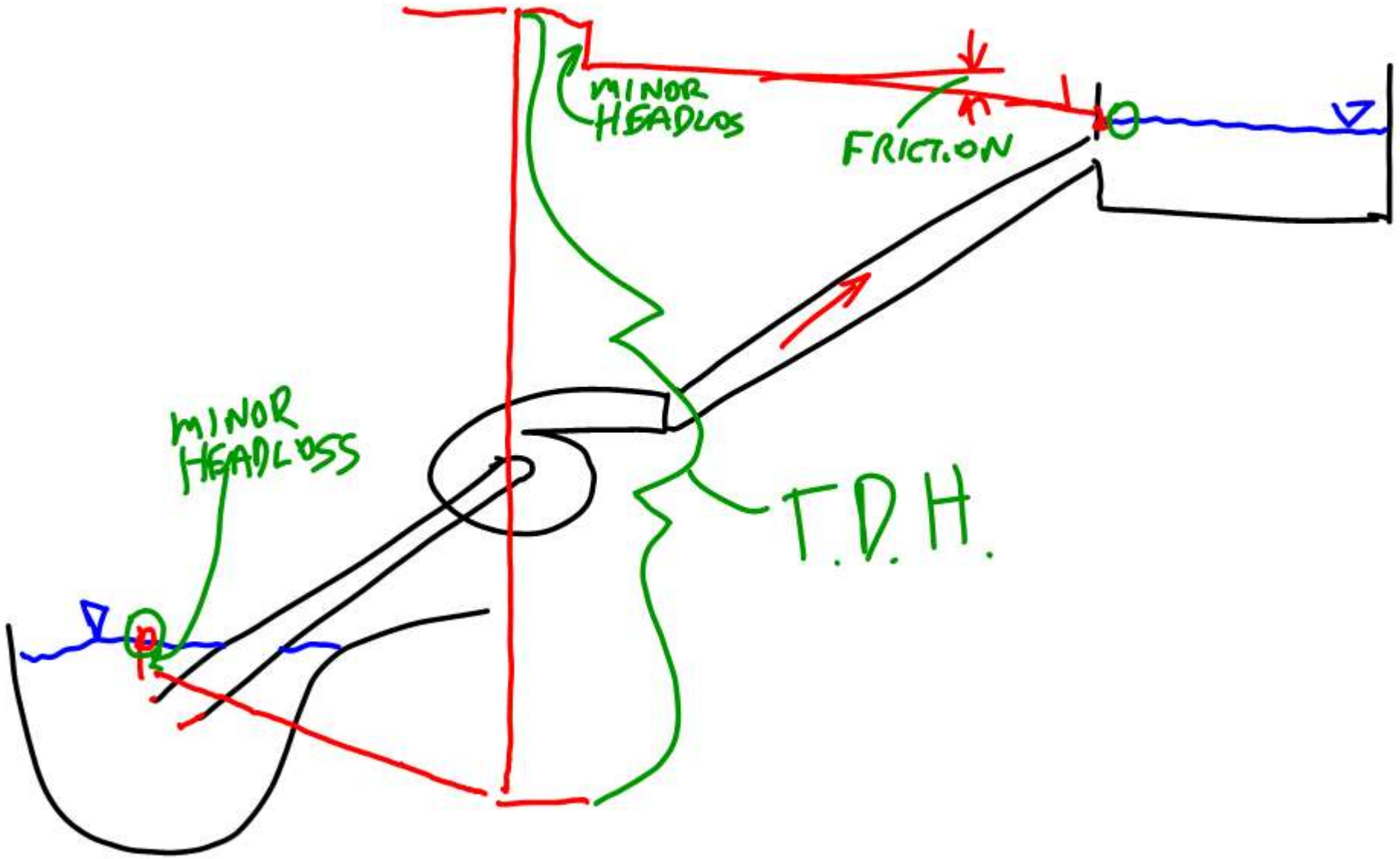
Five key parts involved in pump Total Dynamic Head

- Pressure Head
- Elevation Head
- Velocity Head
- Friction Headloss
- Minor Headloss

Energy or TDH Line

- Energy line is made up of the five components of Head and Headloss just discussed above
- Shows all parts of Total Dynamic Head
- Units of metres head of water
- Graphical way of “seeing” the energy line and change through a pumped system

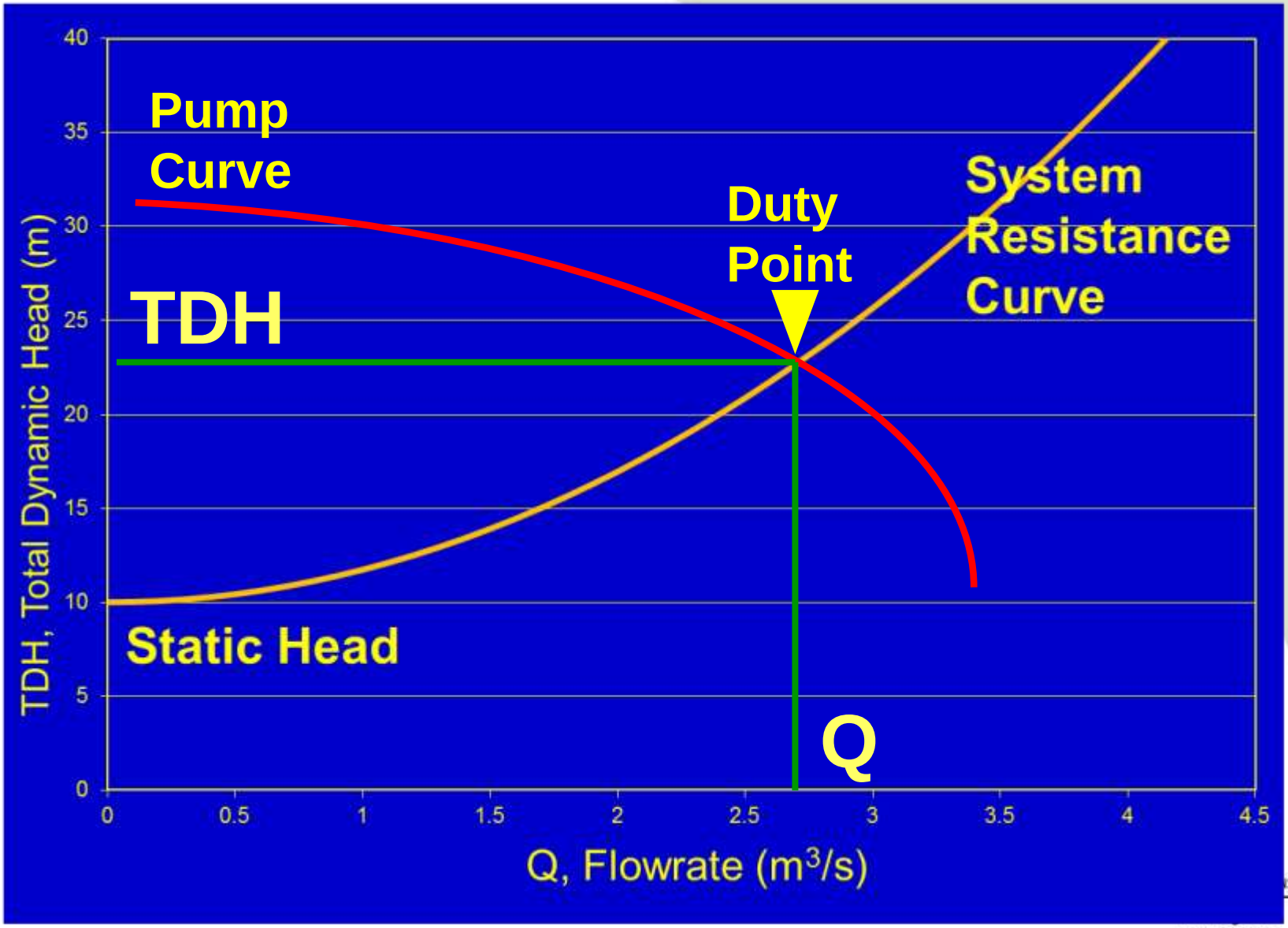
Pump Total Dynamic Head & Energy Line



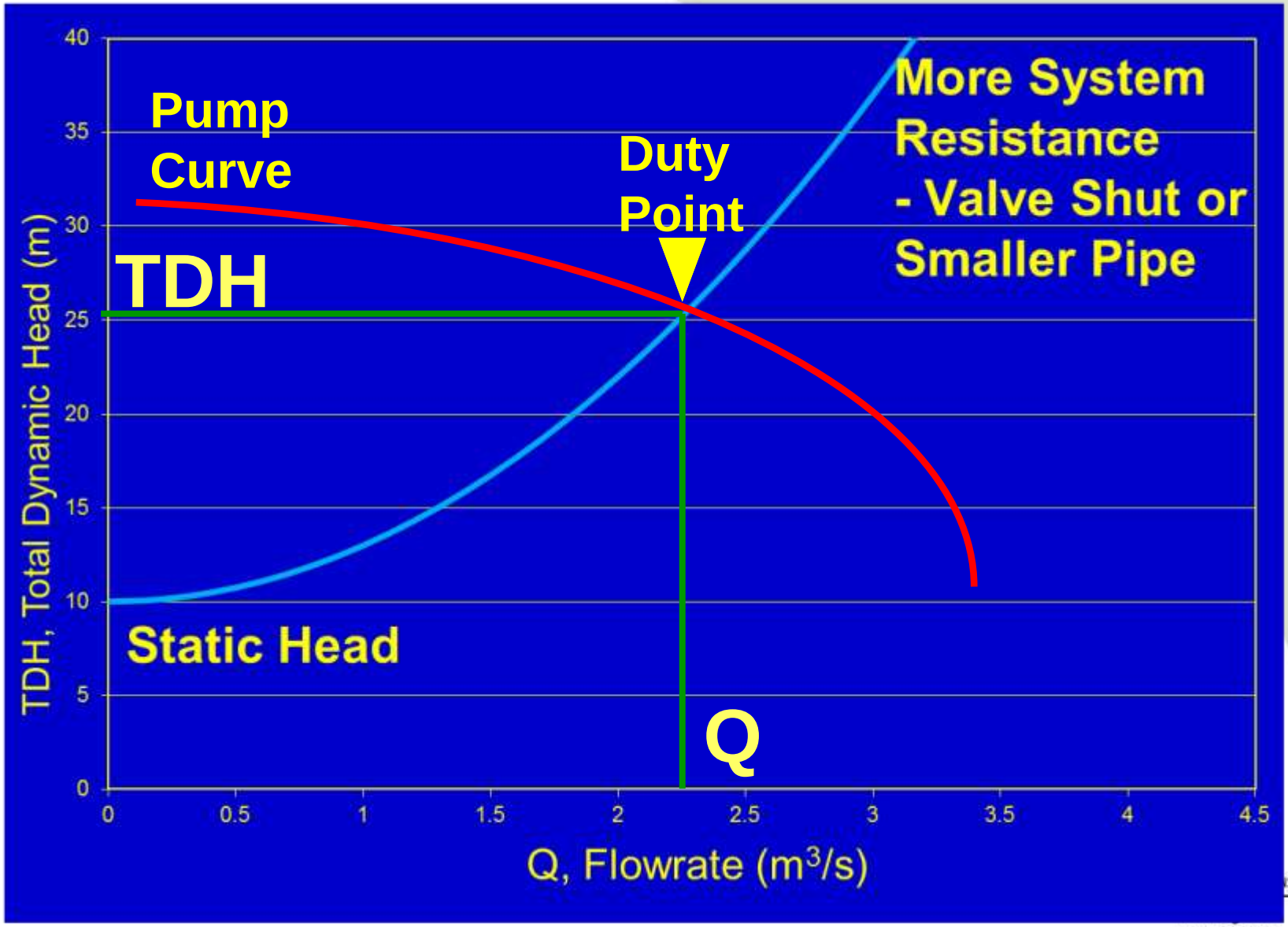
System Resistance Curve = Pipeline Resistance Curve

- Describes the relationship between the head and discharge for a specific pipeline configuration
- accounts for the static, friction & minor head loss over a wide range of discharge
- developed for increments of *flowrate*, calculating *headlosses* for each

System Resistance and Pump Curve



Altering System Curve



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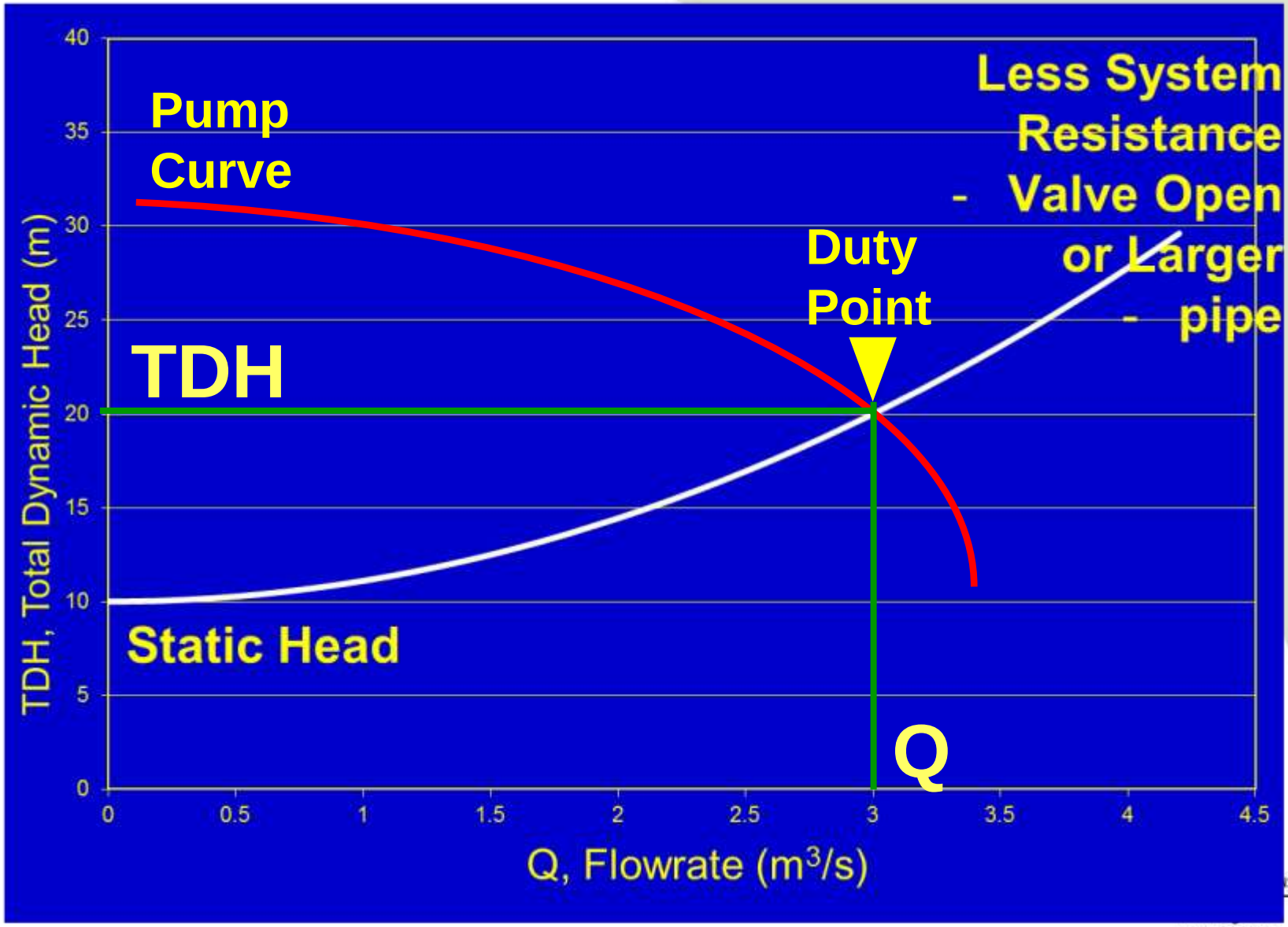
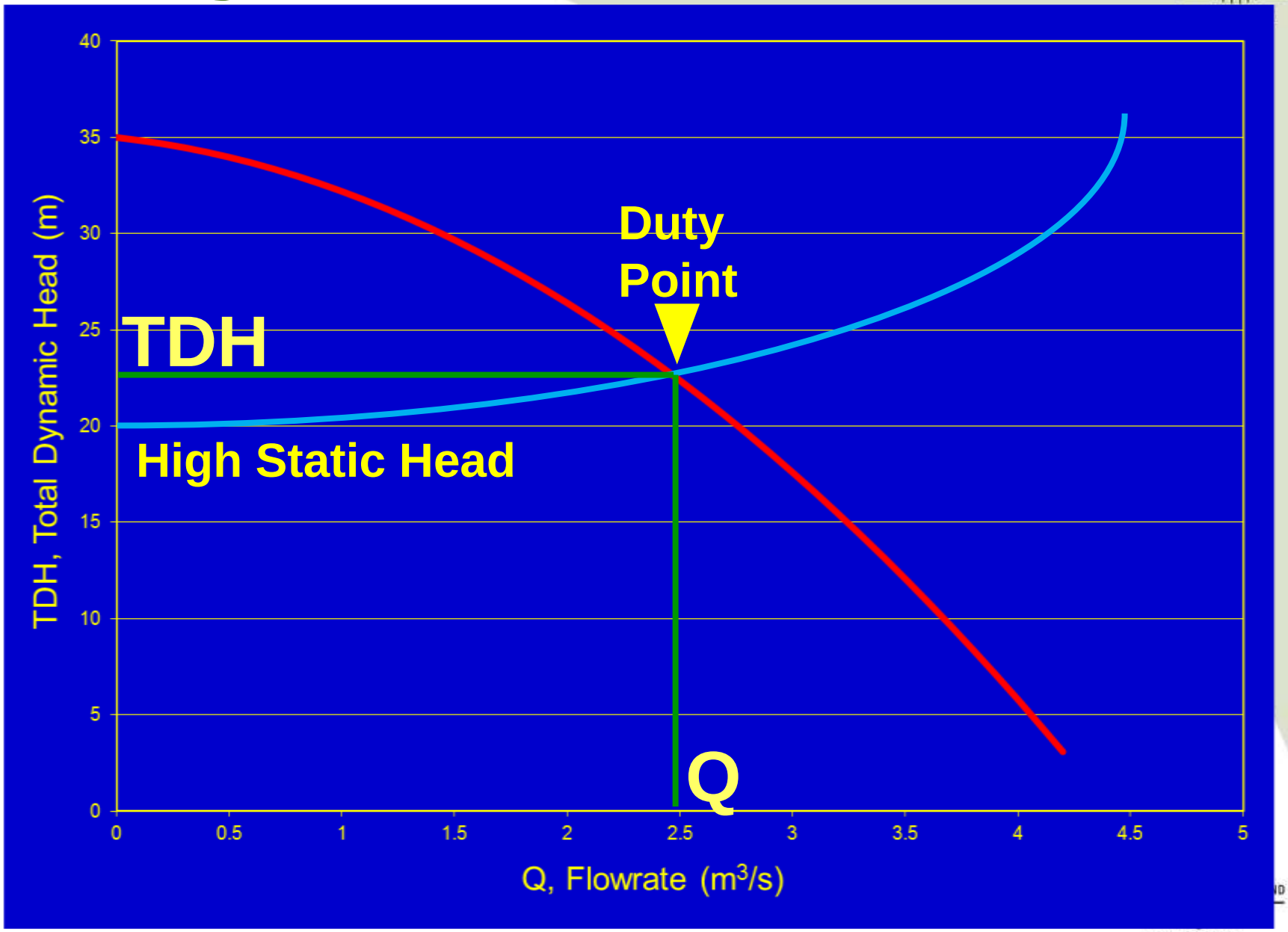
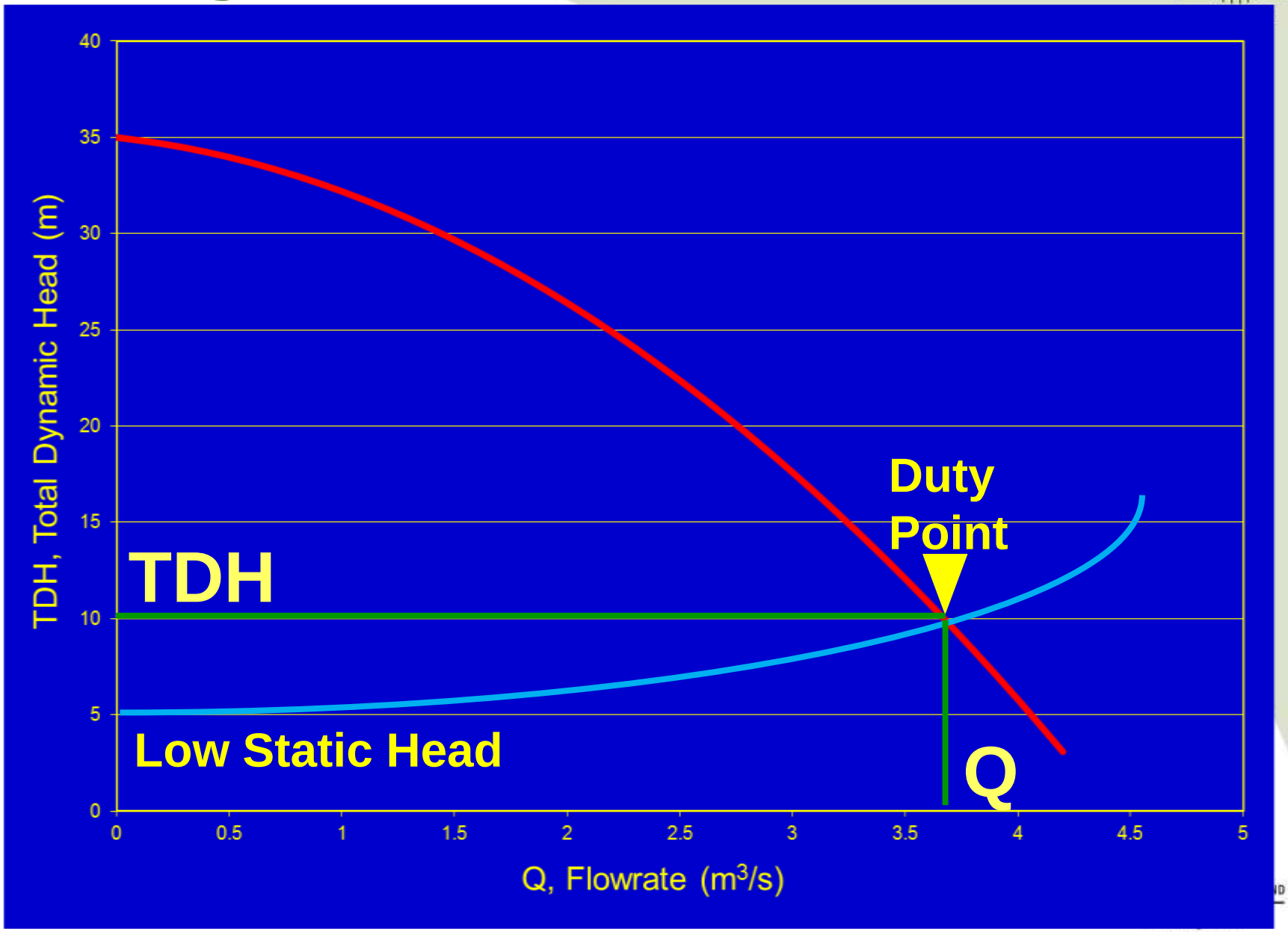


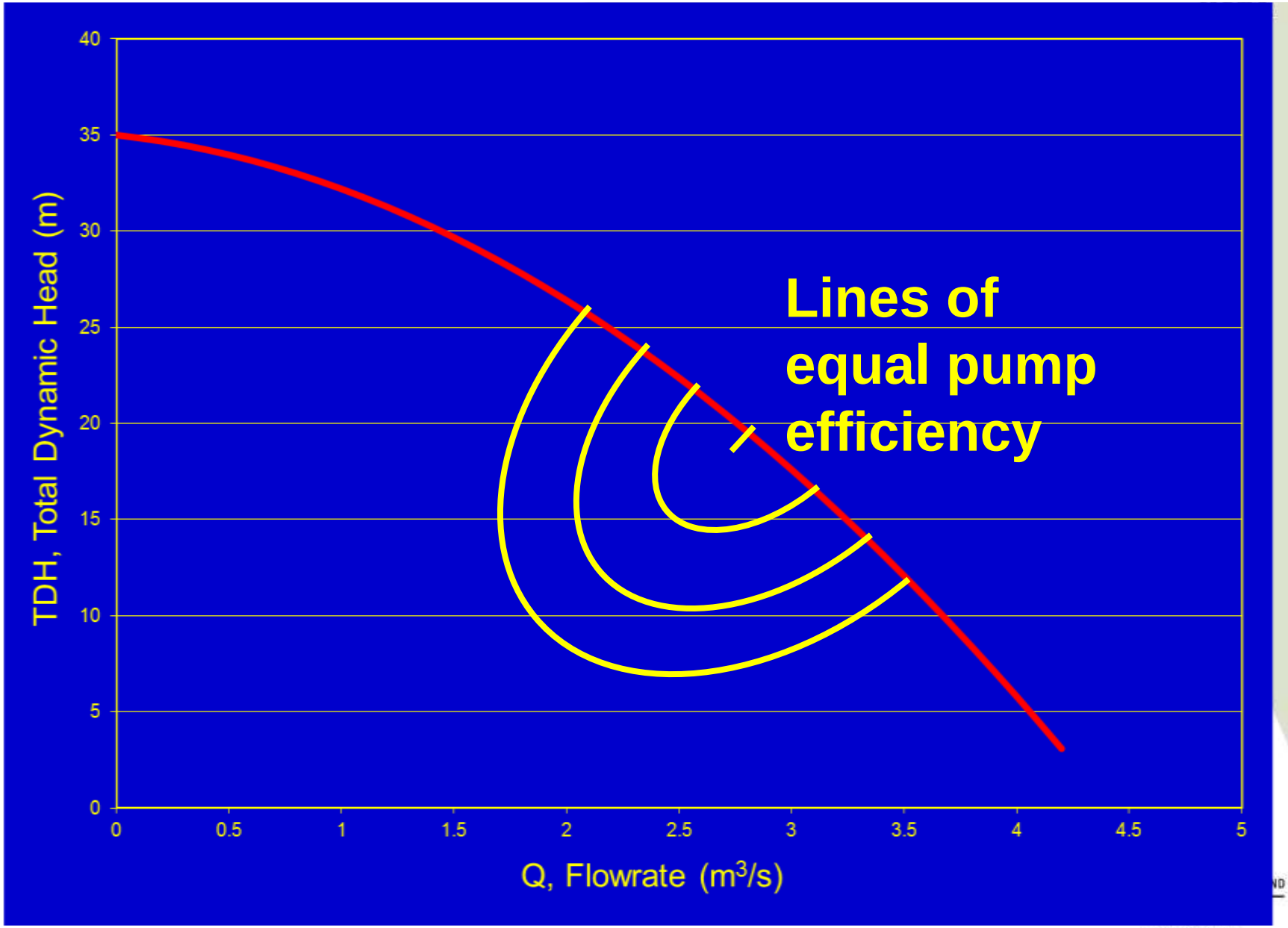
System Curve



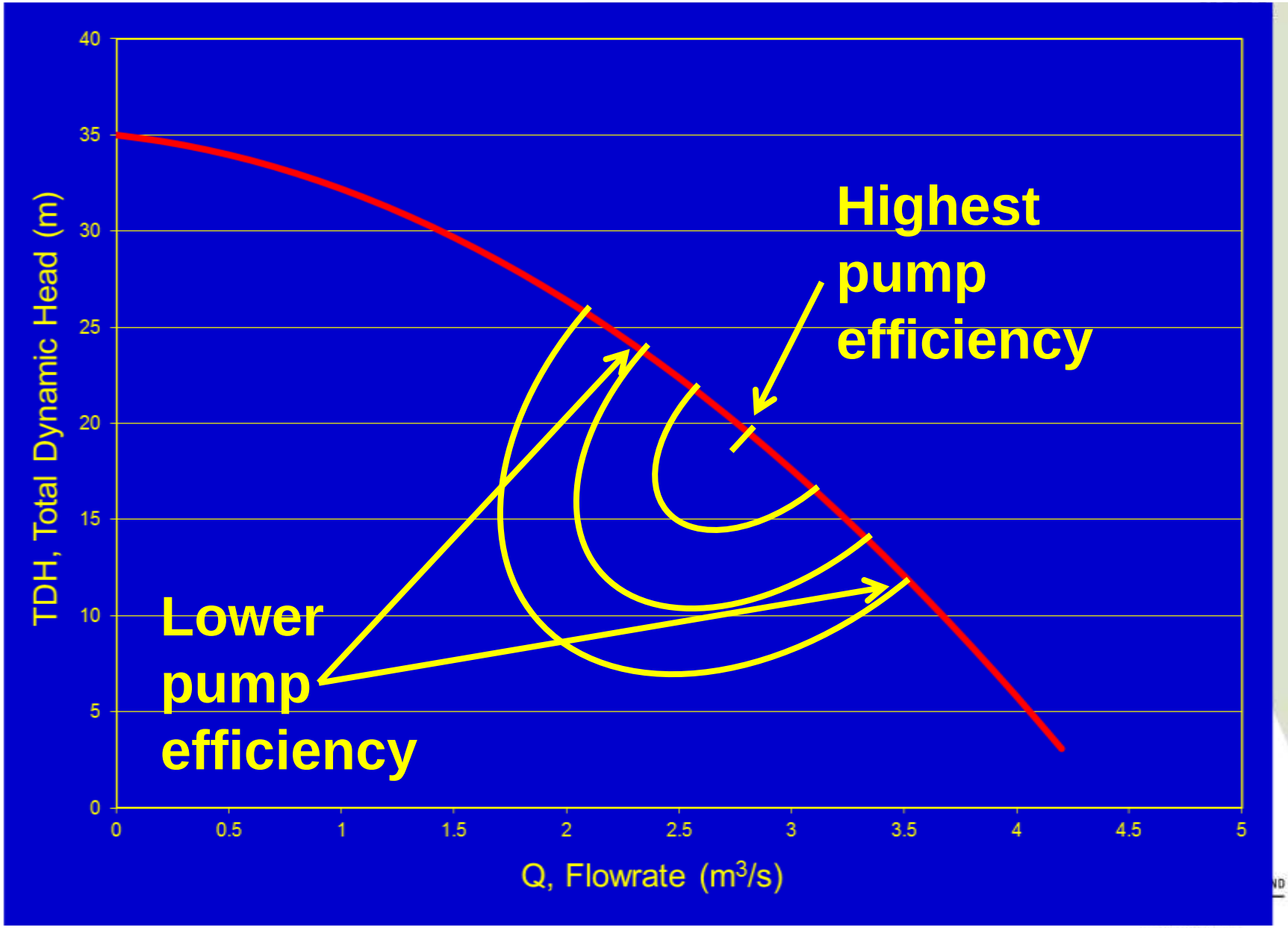
System Curve



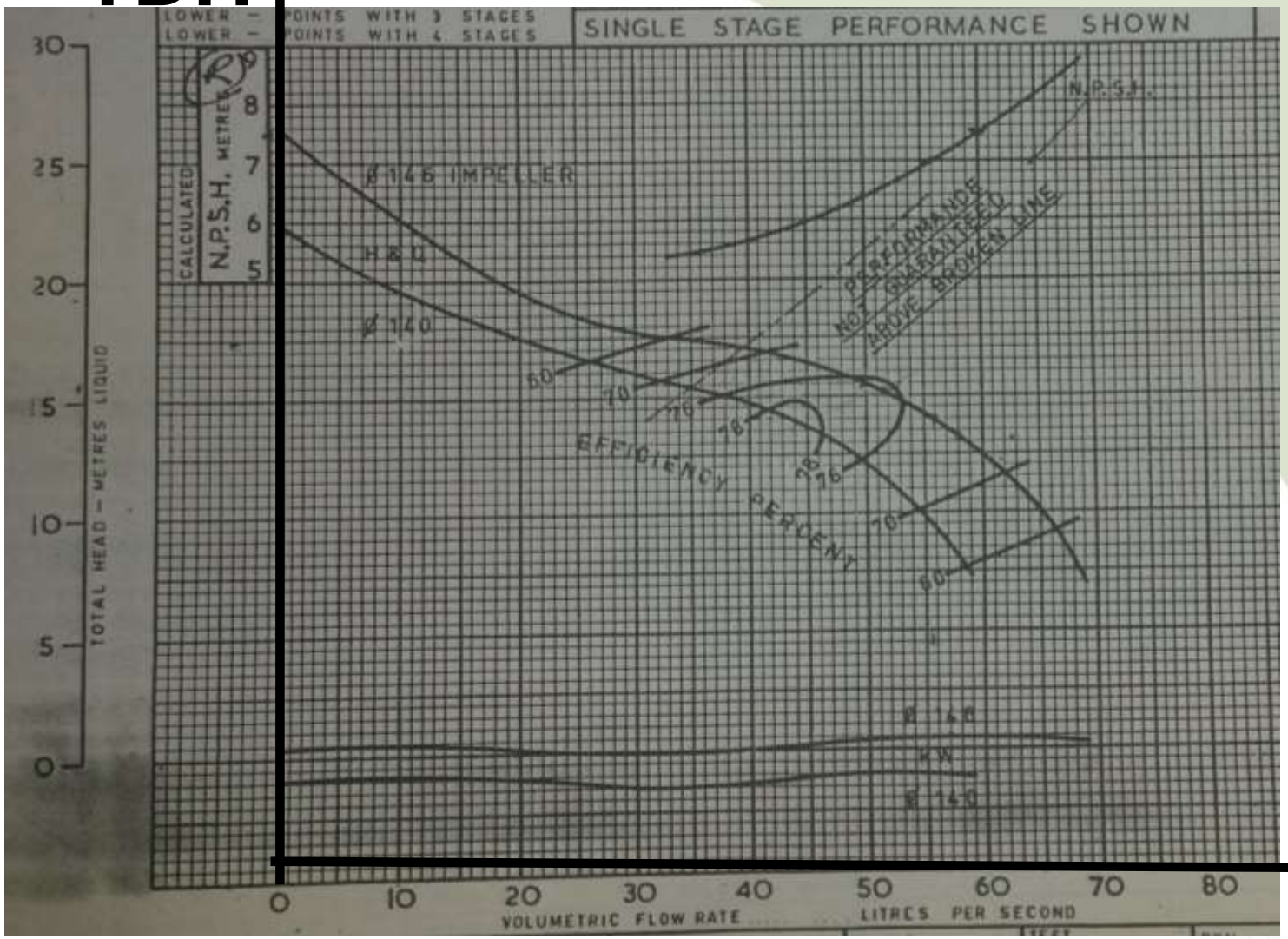
Pump Efficiency Curves



Pump Curve + Efficiency



Giles & Gaskin 180HC Curve



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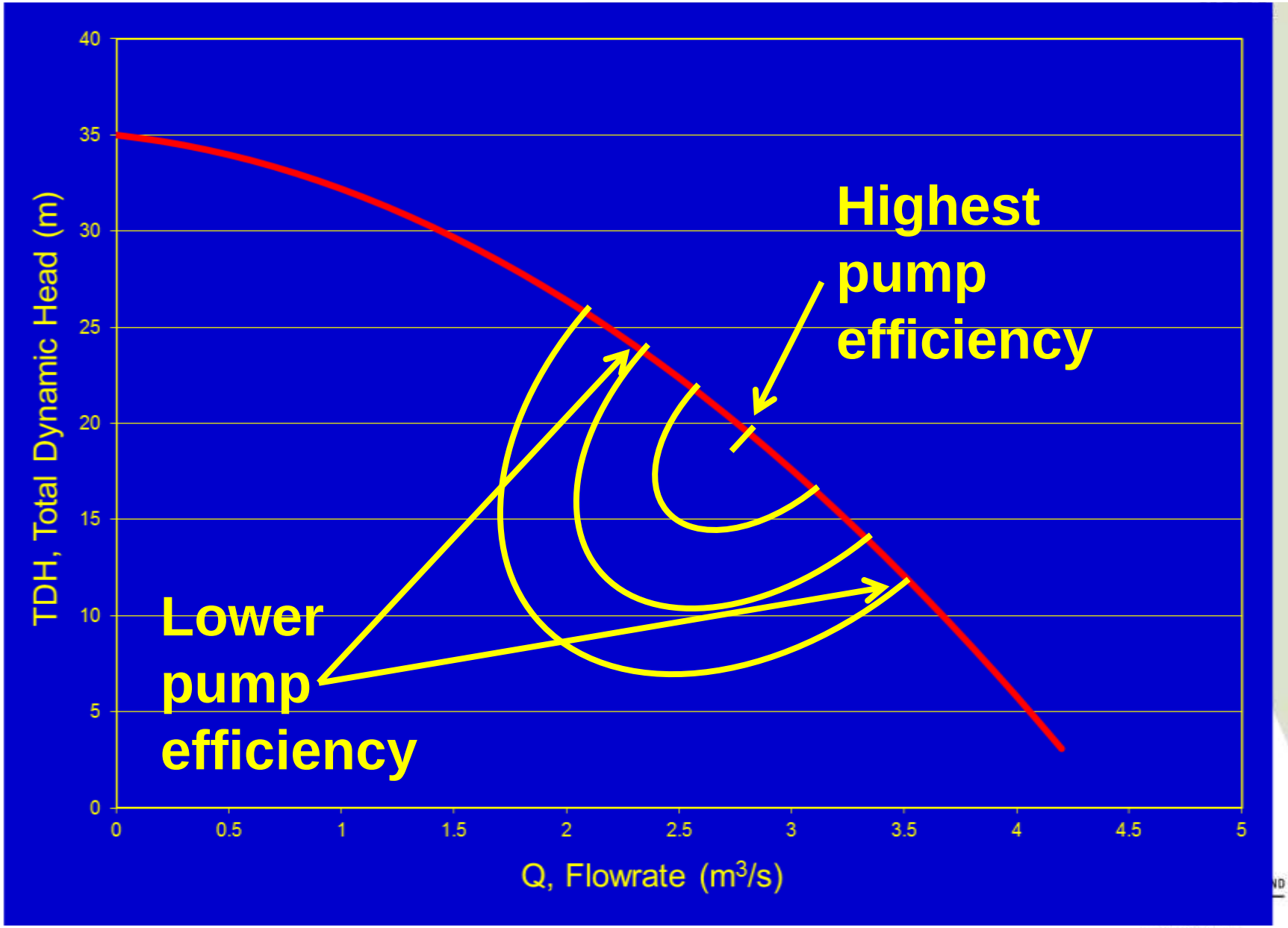
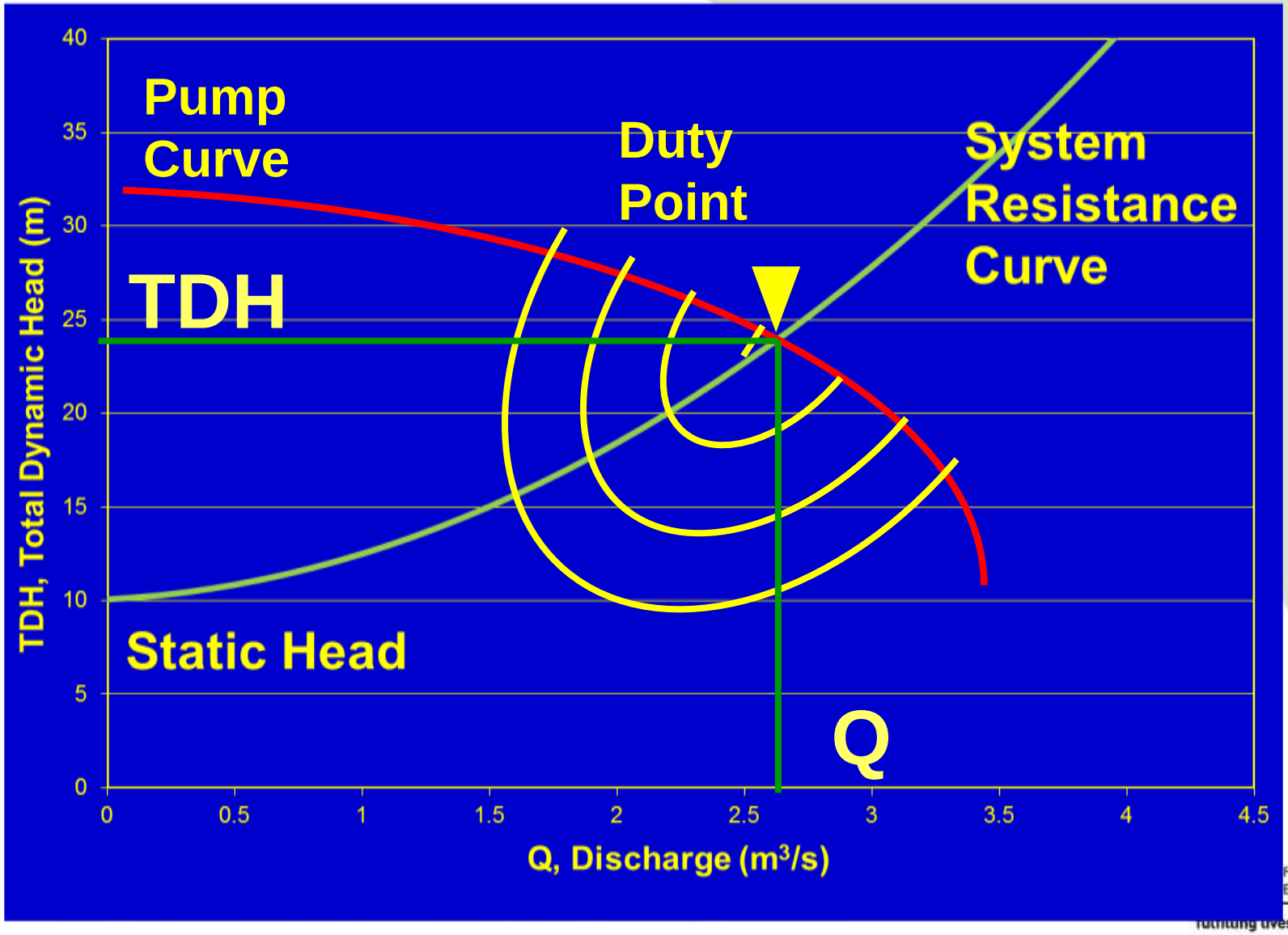


Altering Duty Point



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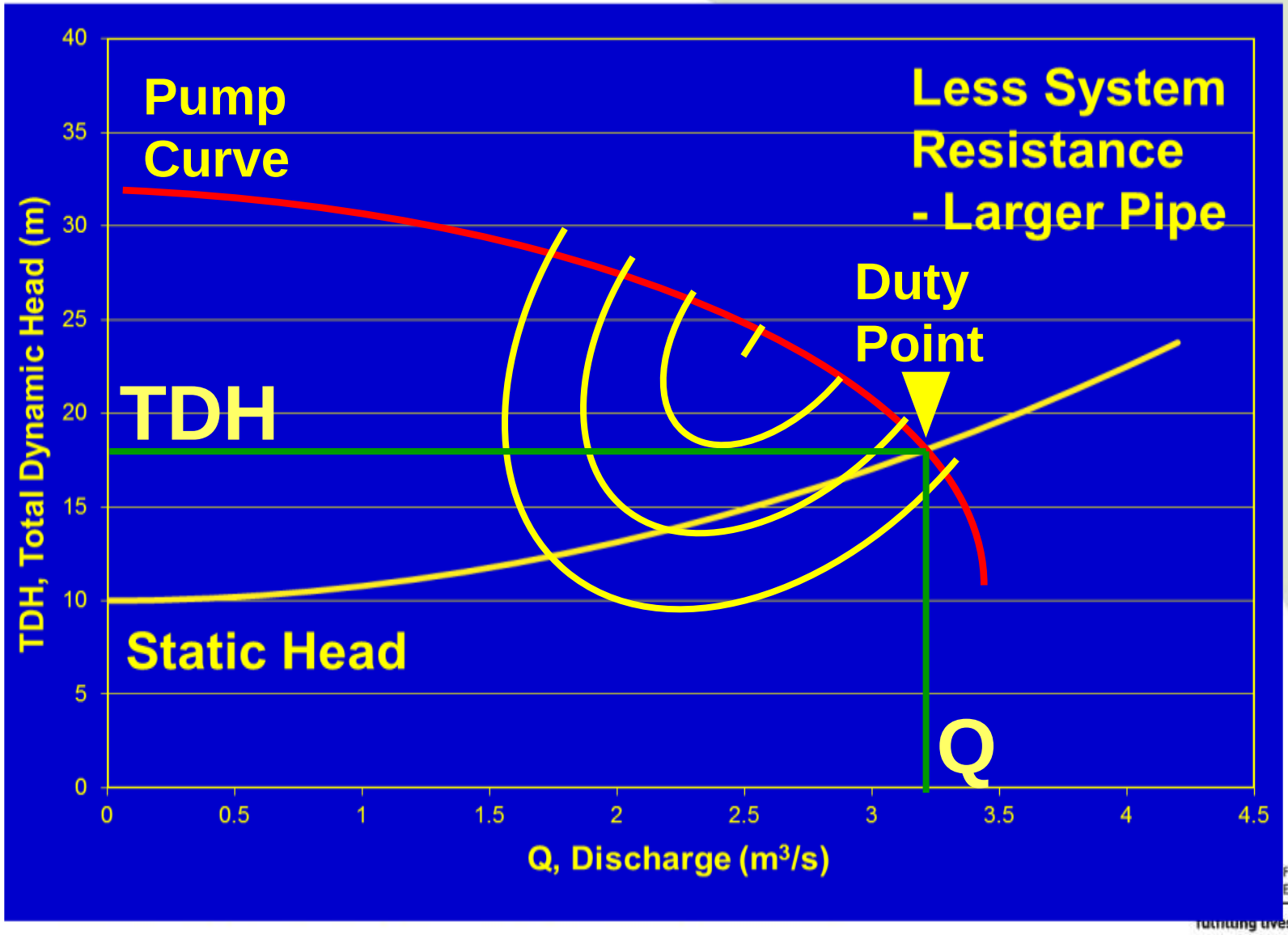

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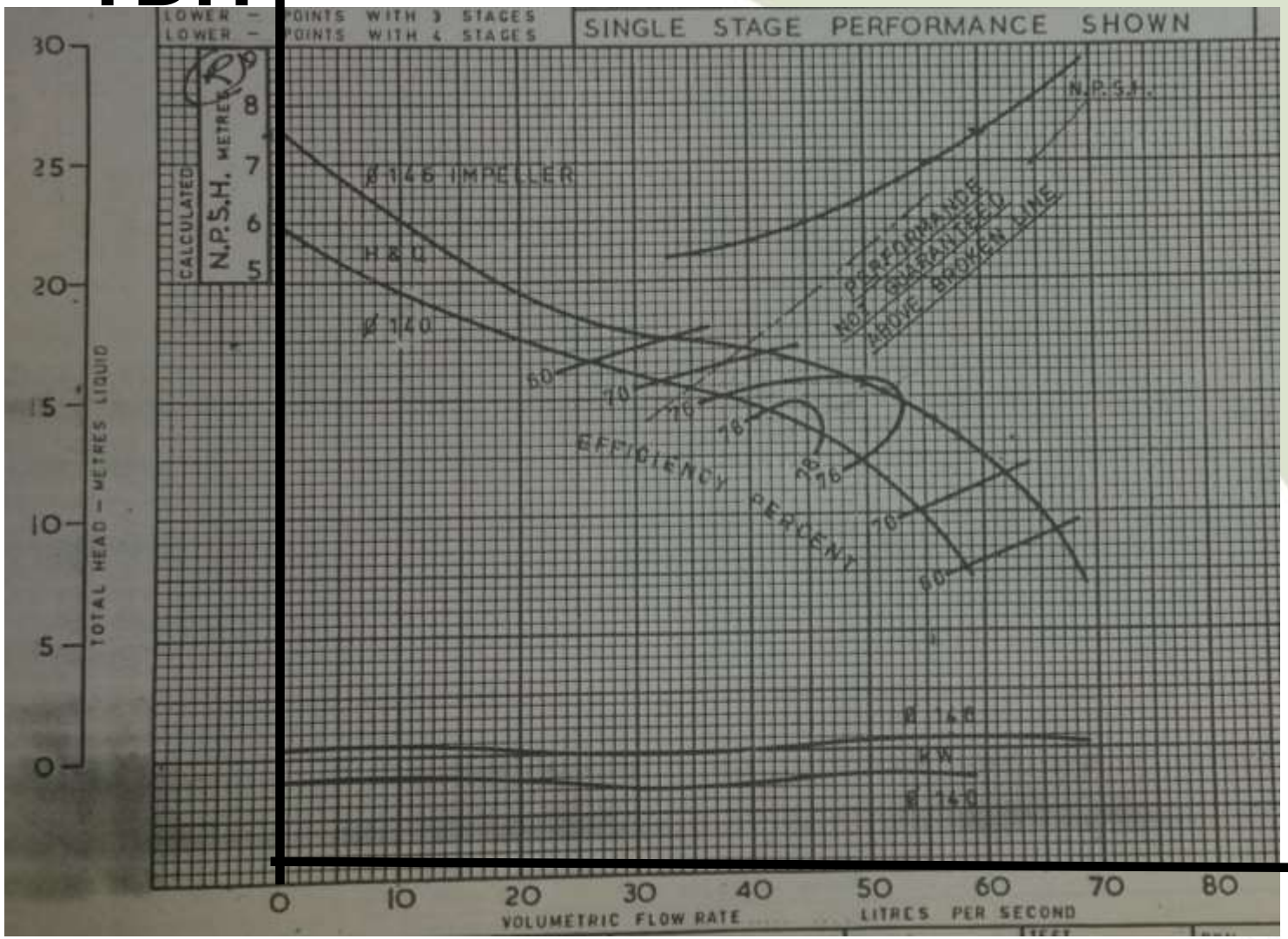

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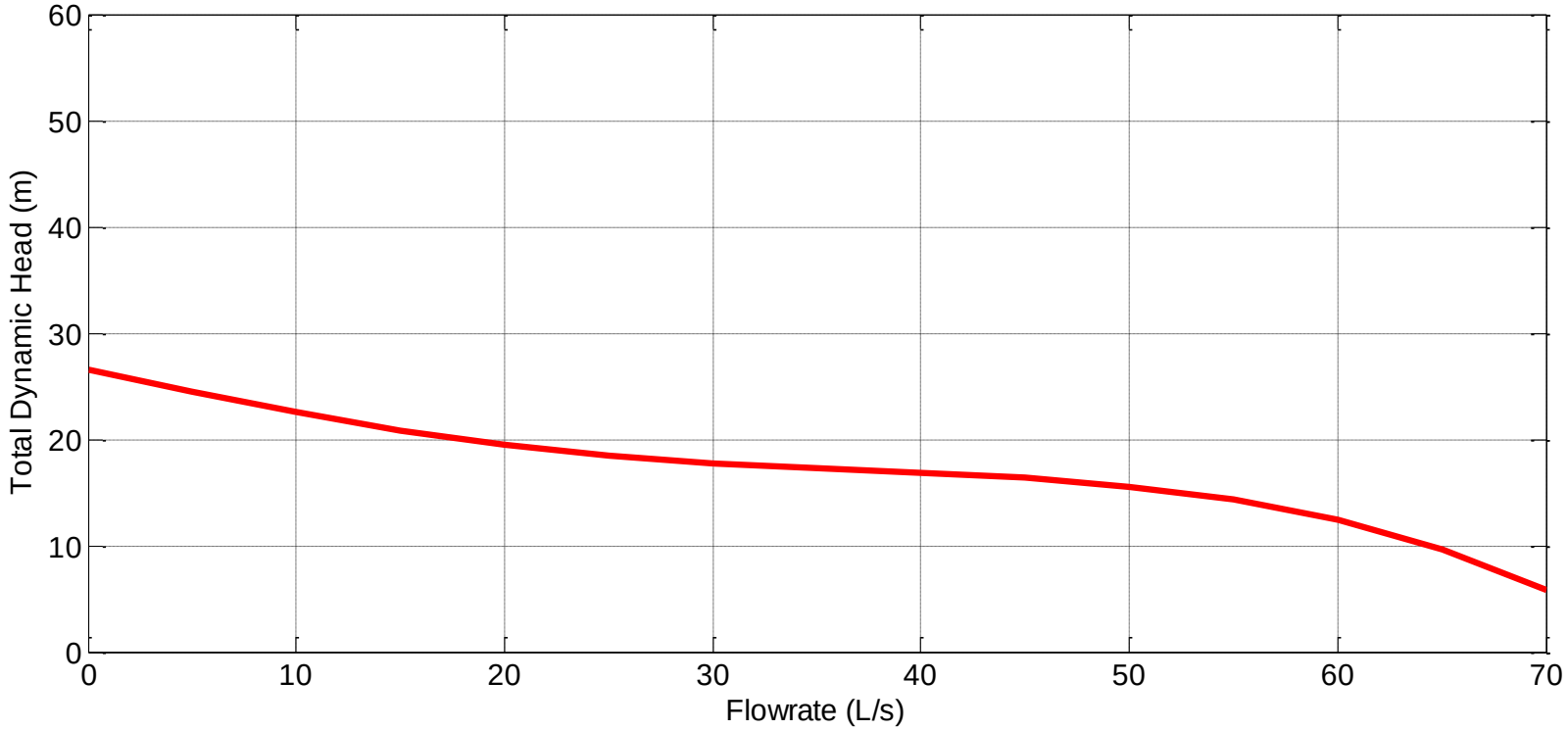

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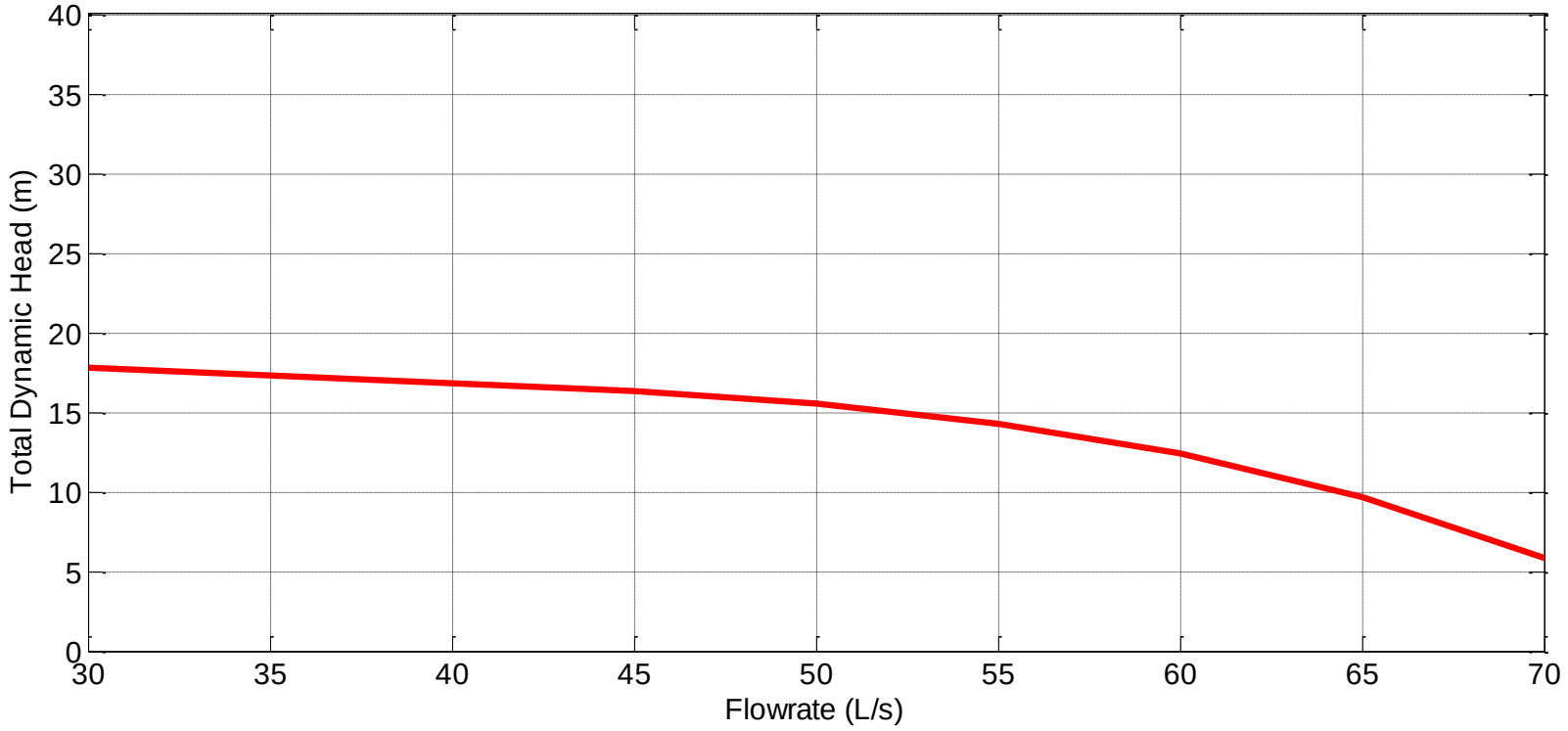

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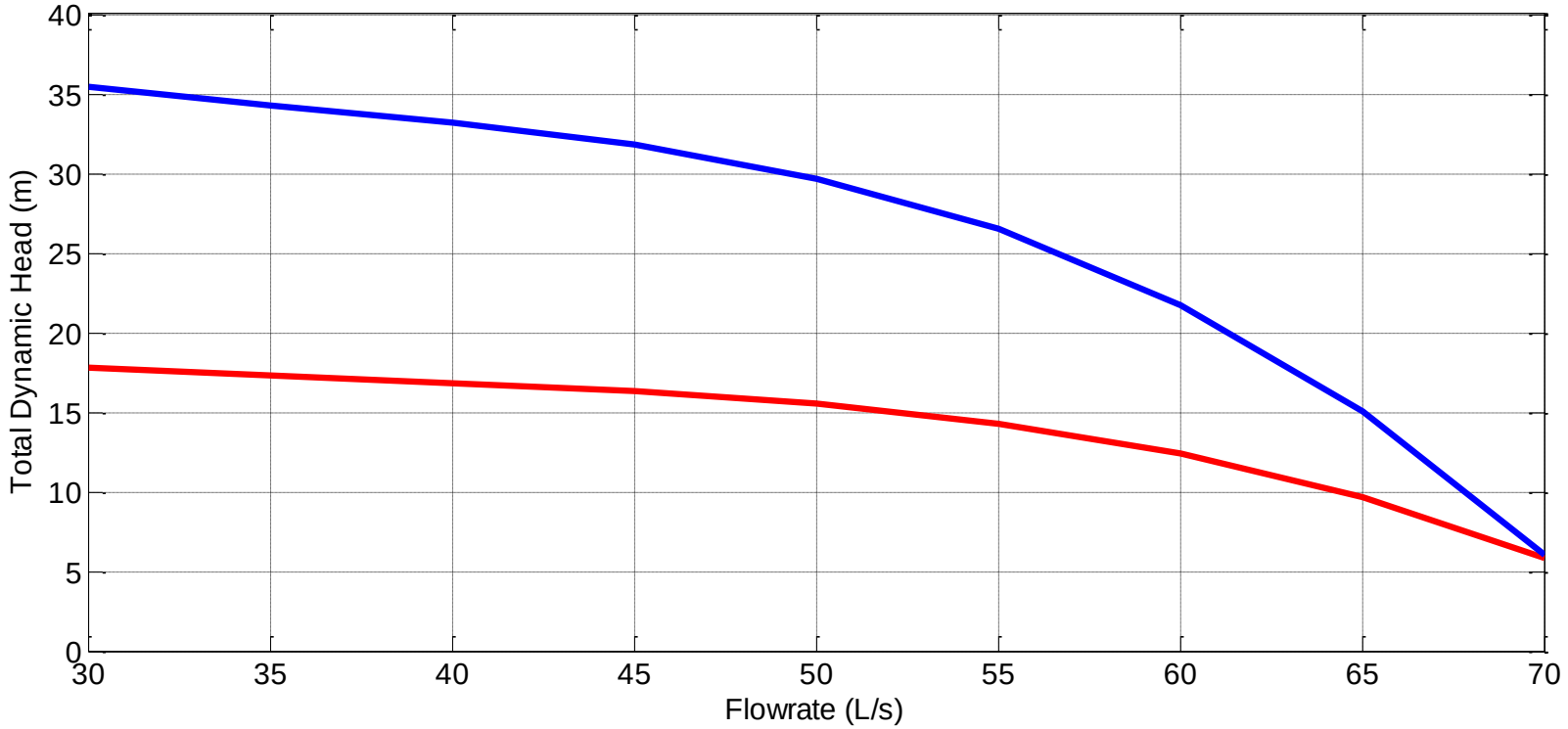

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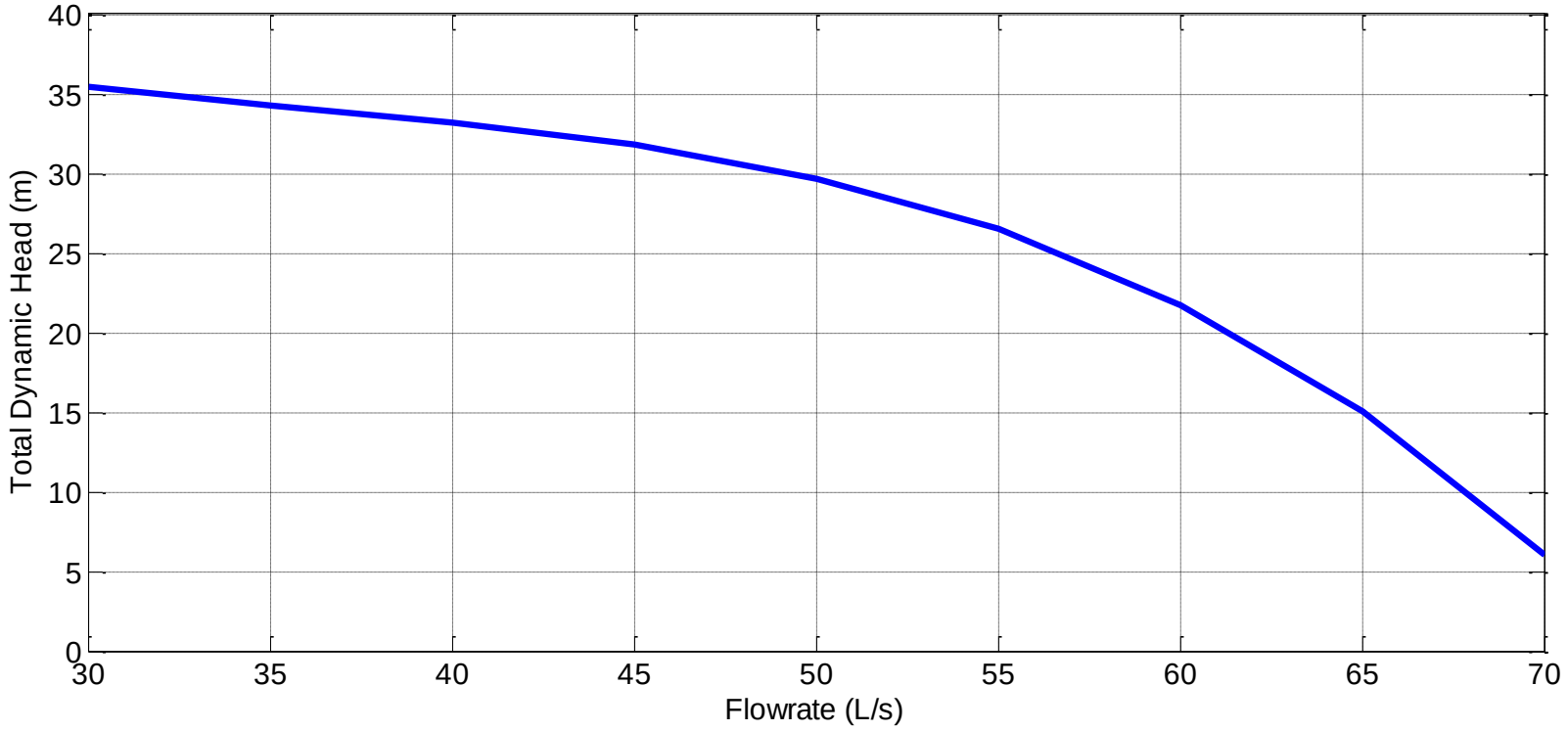

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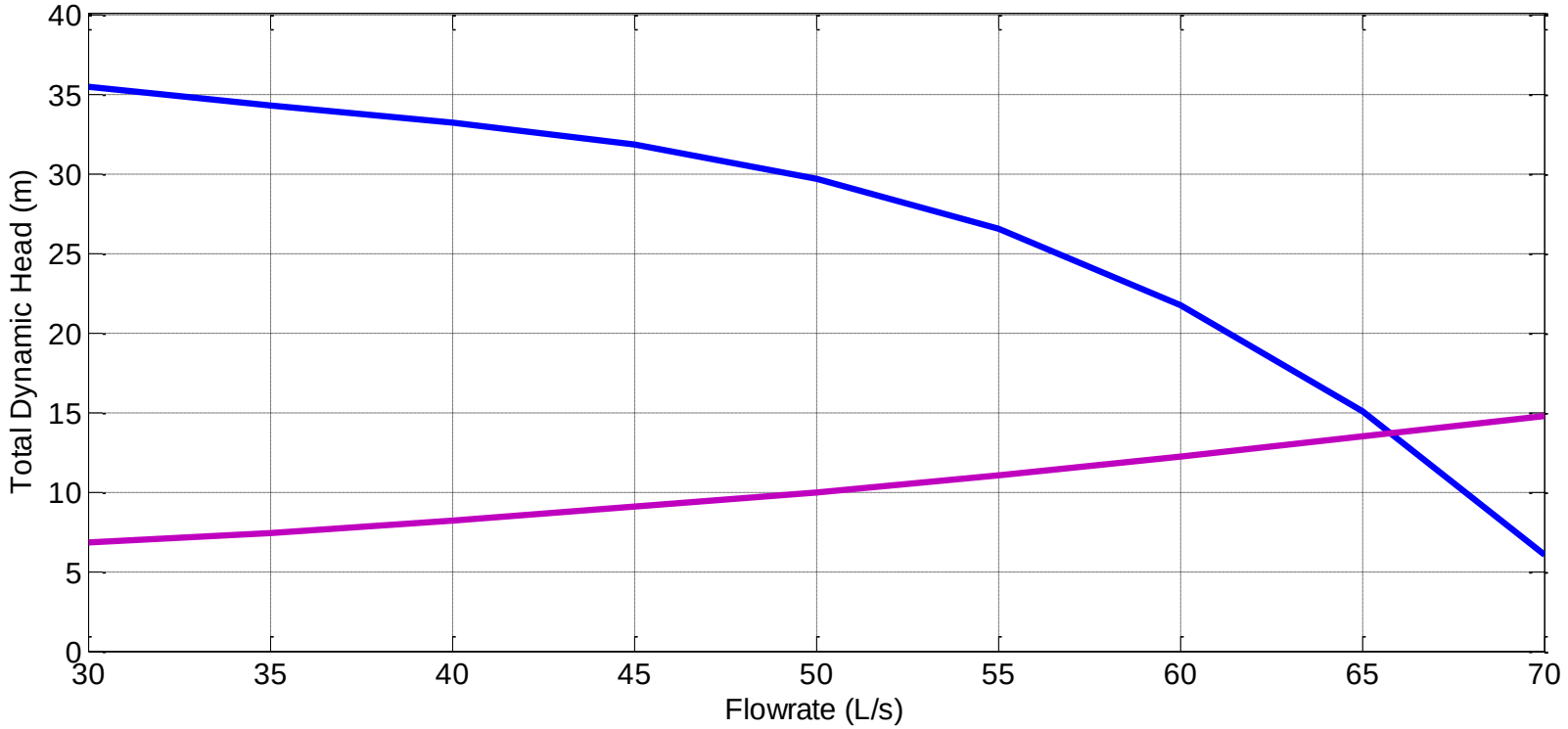

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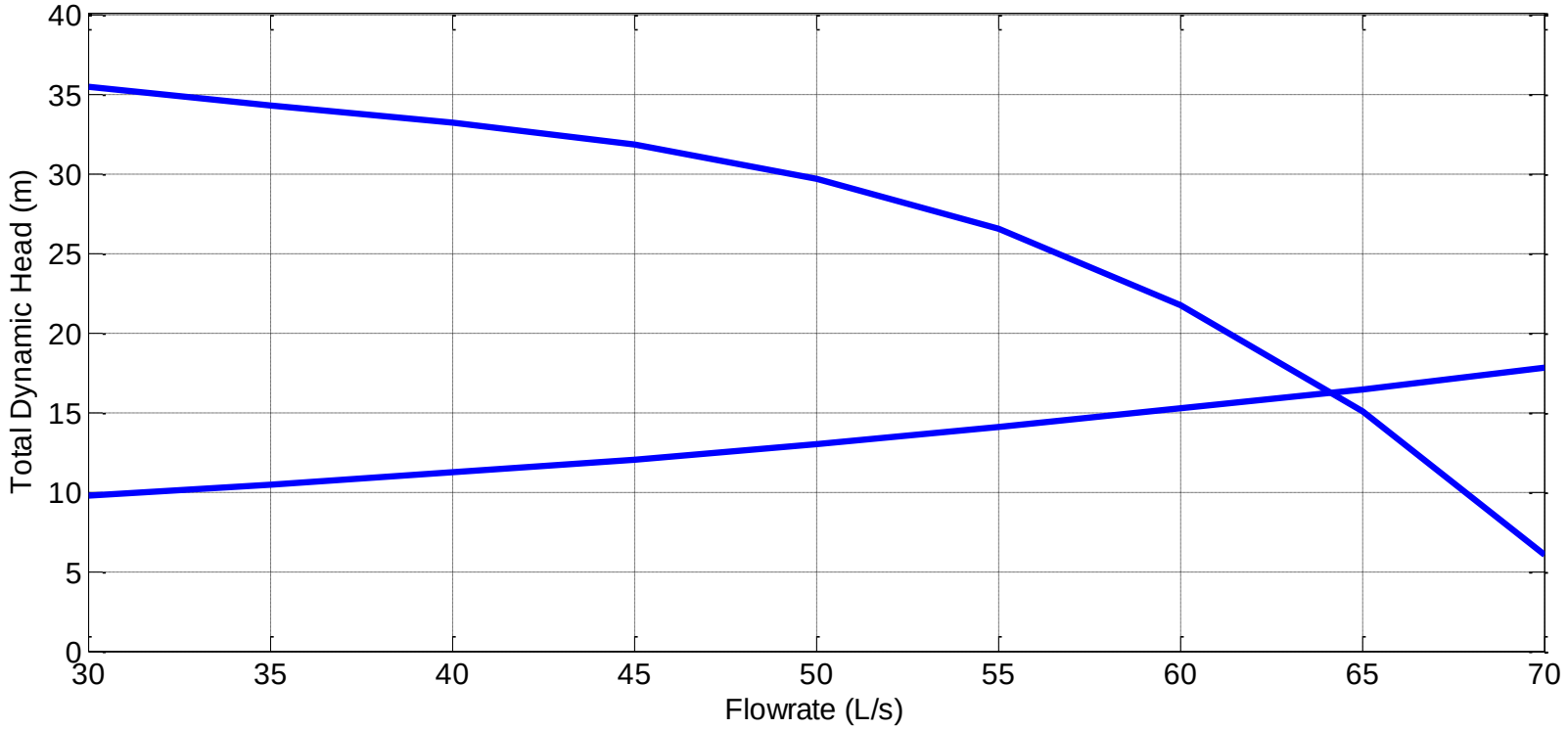

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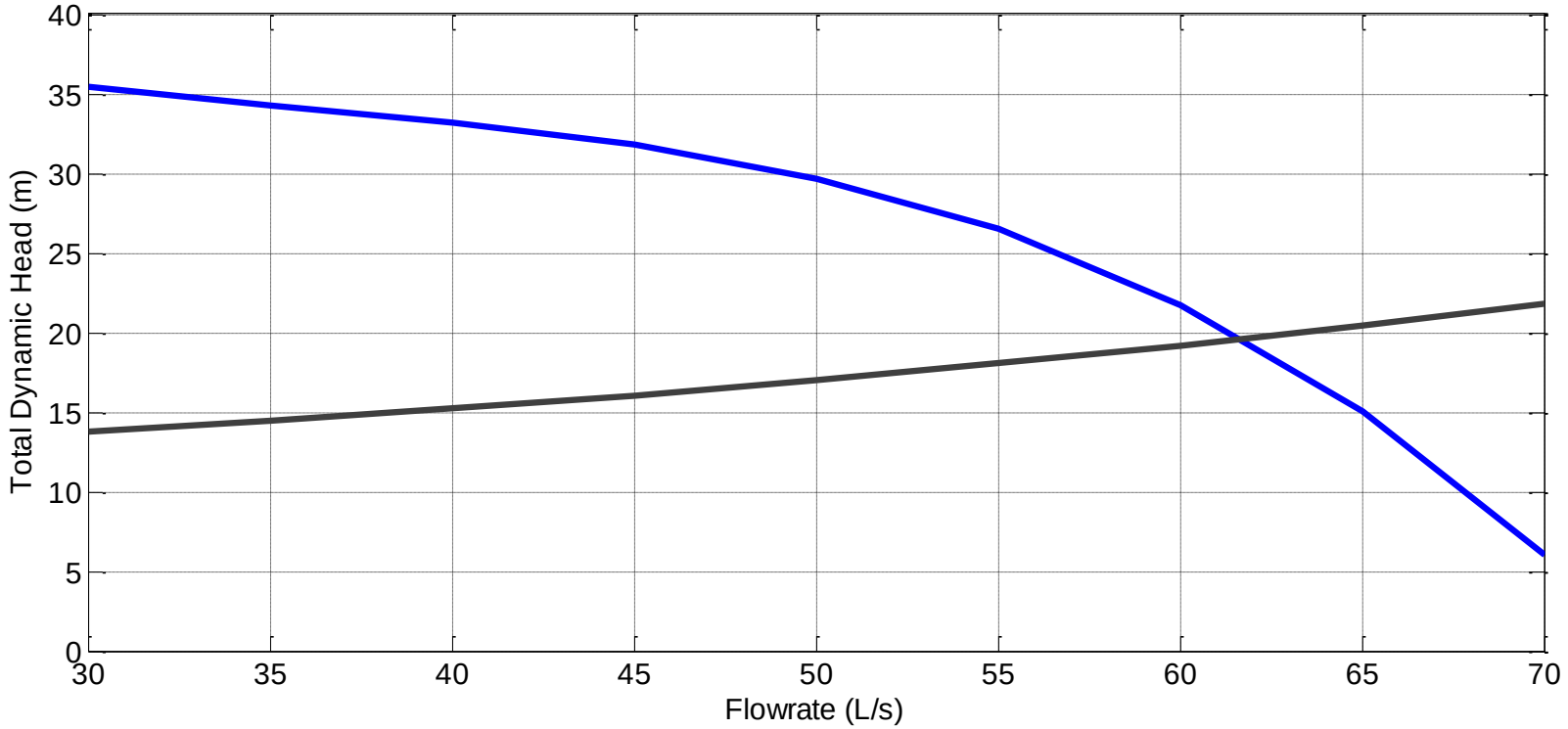

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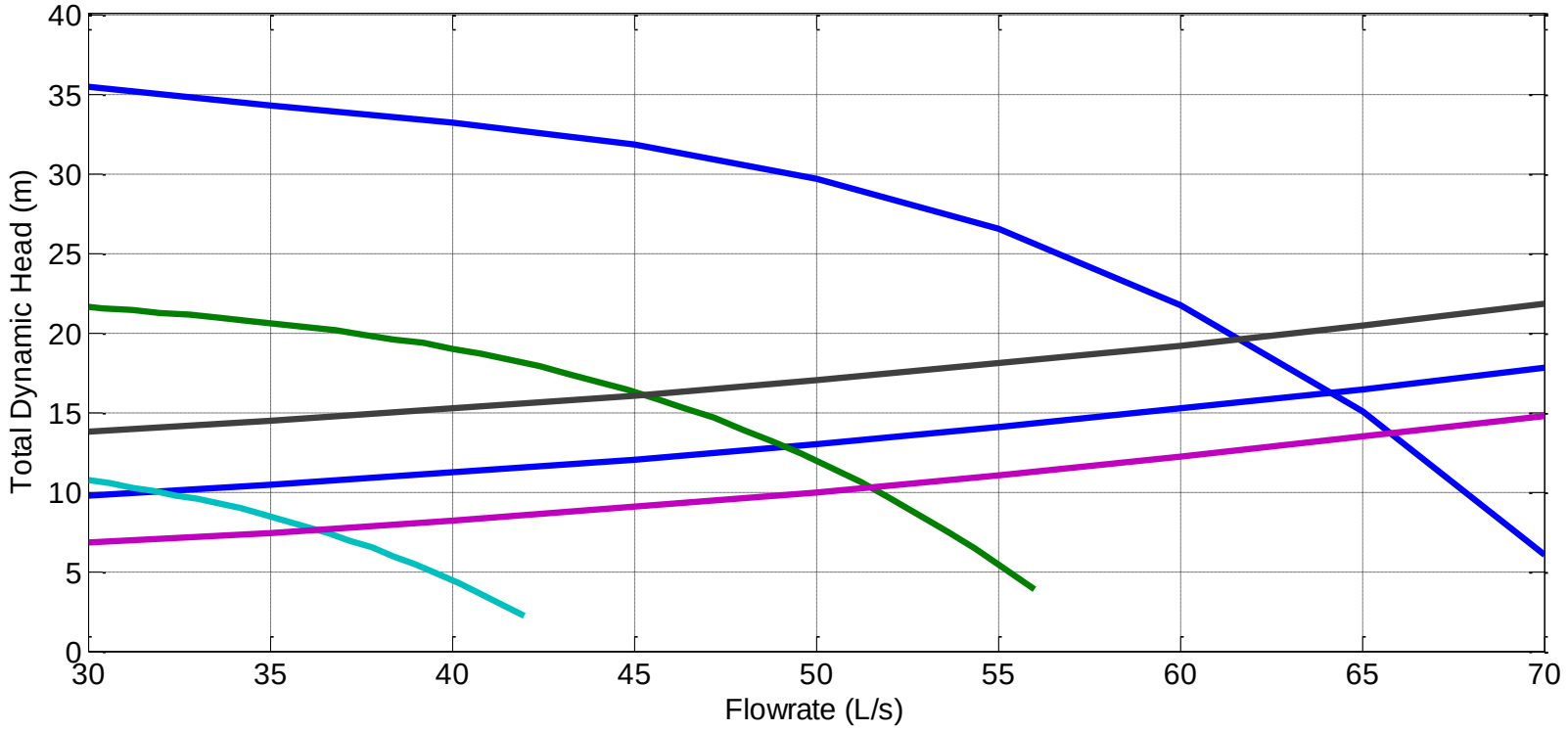

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