



Peralatan dan Pengangkutan Tambang Bawah Tanah (UNDERGROUND MINING EQUIPMENT)



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Conveyor

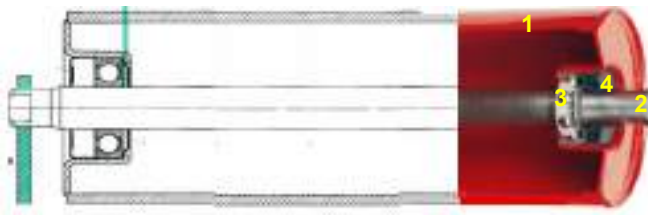
(Course-3)

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Idler

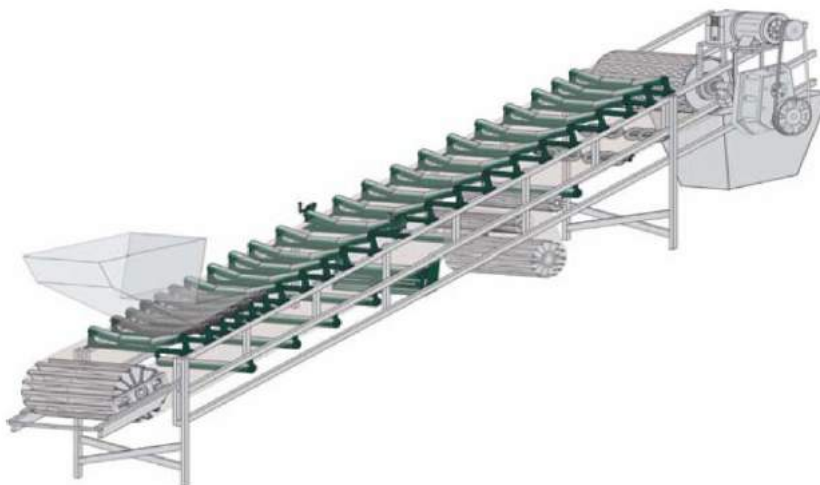
- ❖ Idler adalah roler statis yang sebagai penyangga atau penahan belt
- ❖ Konstruksi idler terdiri dari:
 1. Kulit terluar (Outer shell)
 2. Shaft
 3. Bearing
 4. Seal (segel)



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Idler



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Faktor yang mempengaruhi operasi idler

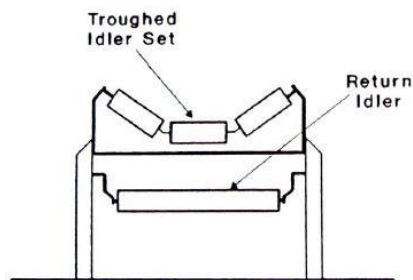
1. Efektivitas segel (seal)
2. Kualitas bearing
3. Penyimpangan Shaft
4. Posisi tengah bearing dengan shell
5. Pelumasan

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Tipe Idler

1. Idler pembawa (Carrying idlers) → berada di atas conveyor; membawa material belt; datar atau bergelombang
2. Idler balik (Return idlers) → berada di bawah conveyor; membawa kosong dan balik belt
3. Impact idlers (optional) → untuk mengurangi tekanan



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TYPES OF IDLERS

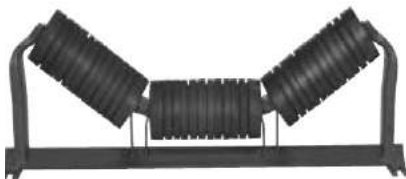
TYPES OF CARRYING IDLERS



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Types of impact idlers (optional)



14, 16, 24, 26, 28, 30, 32, 34, 36, 50, 52, 54, 55, 57, 61

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Types of return idlers

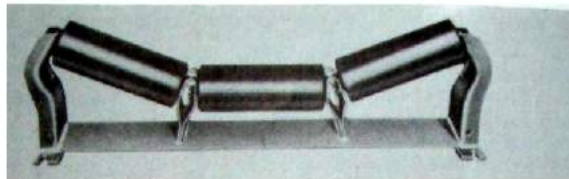


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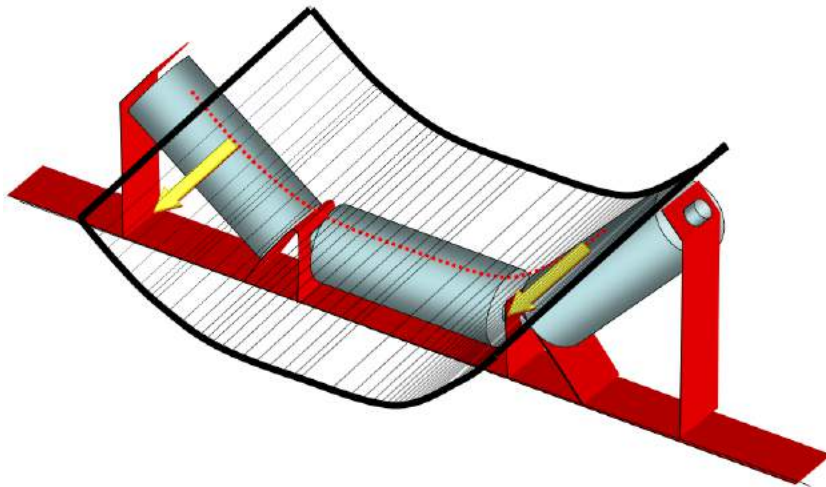
Bentuk idler

❖ Troughing idlers



- consist of three equal rollers attached to rigid frame
- the most common used
- standard angle : 20 - 30 – 40 degree
- higher angle used with flexible belt
- higher angle increase belt capacity

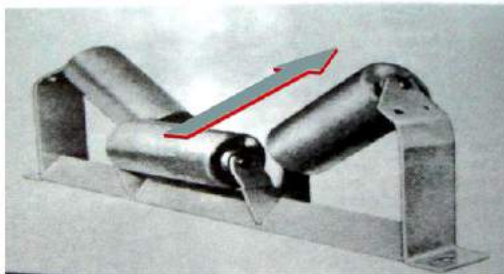
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❖ Offset troughing idlers

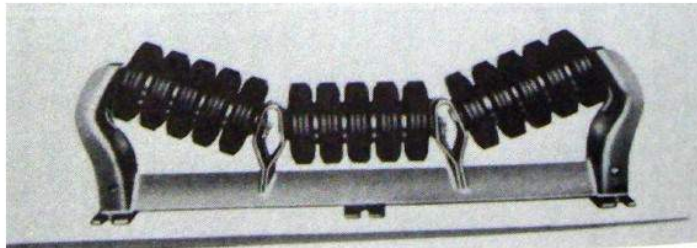


- the horizontal roller is located on a different plane than the inclined pair
- prevent belt pinching
- has non gap between rolls
- suitable for thin belts
- no pinching between rollers

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Impact idlers

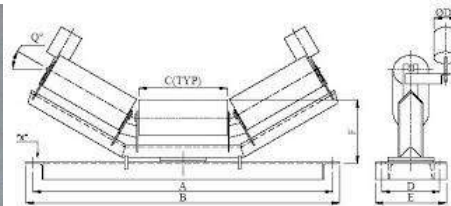
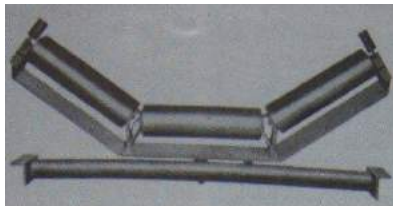


- the idler has a extra roll of resilient rubber
- absorb the impact of large lumps
- used in loading section

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Training idlers

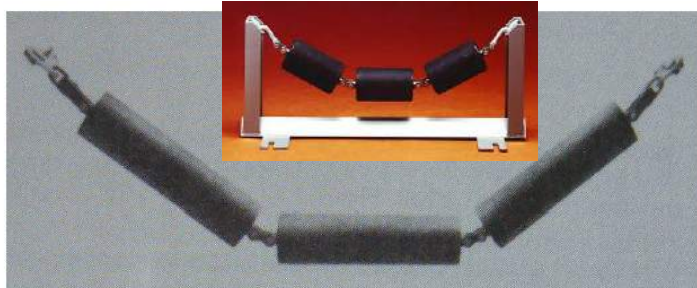


- same construction as regular idler
- the rigid frame is mounted on central pivot
- free rotation of pivot is essential
- off- centered belt touched side roll
- not recommended in vertical curve belt
- take special care when use with reversable belt
- training effect is reduced with increasing belt tension
- normal spacing : not closer than 50m – 75m

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Suspended idlers

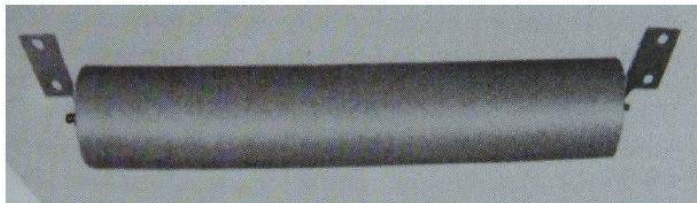


- idlers are attached to each other by movable link or chain
- the chain is suspended from the rigid frame
- compensate off-center loading and belt misalignment
- up to 20 rollers can be used

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Flat return idlers

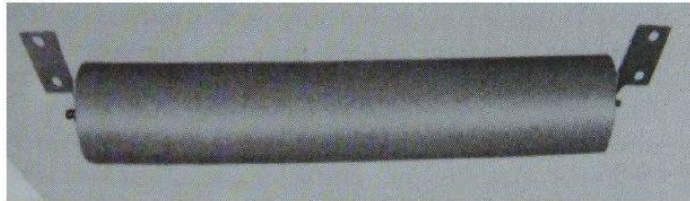


- most common used

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Self return Flat return idlers

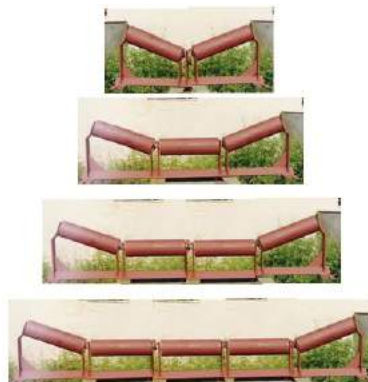


- single roll
- multiple roll
- more effective due to low belt tension and long span

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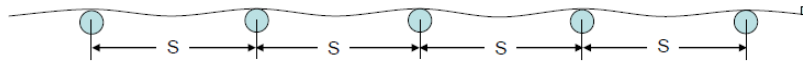
Susunan Idler



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Jarak Idler



Factors considered

- Weight of material and belt
- belt tension
- allowable belt sag

Normal sag

2 – 3 % S

Long spacing

- Load / each idler increase
- belt sag increase
- material spill
- material vibration
- power loss

Small spacing

- cost wise

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Kerusakan idler

- Rapidly wearing contact seals,
- rotating end caps to seize,
- welded-in end caps to wear away,
- non-concentric welding,
- poor bearing support
- premature bearing failure
- disc separation



Bearing failure



Disc separation

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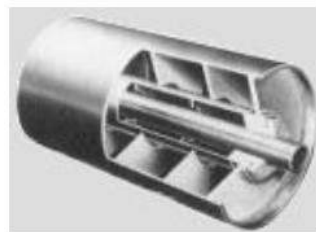
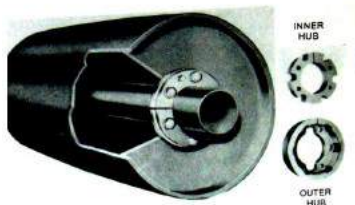
Pulleys

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Konstruksi pulley

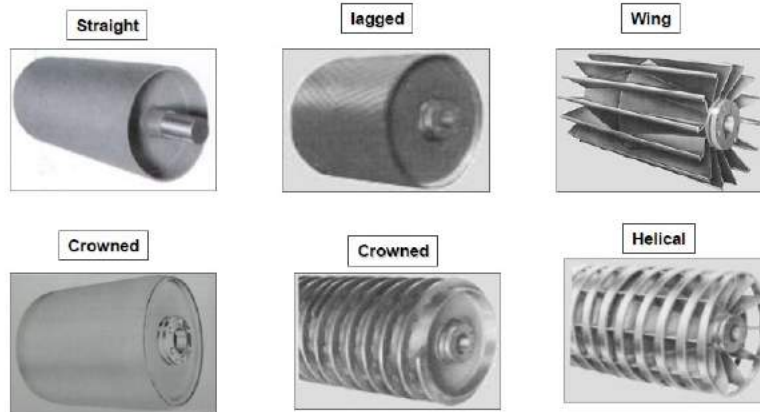
- shell (rim)
- two end discs
- two hubs
- main shaft



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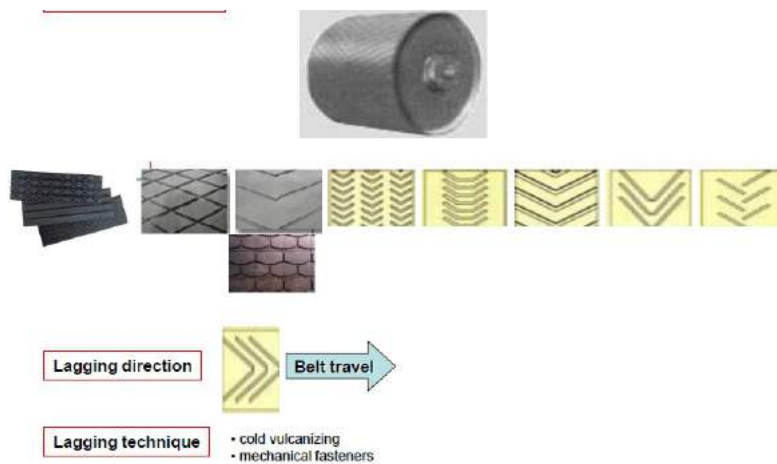
Bentuk Pulley



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Bentuk lapisan lagged pulley



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Ukuran pulley

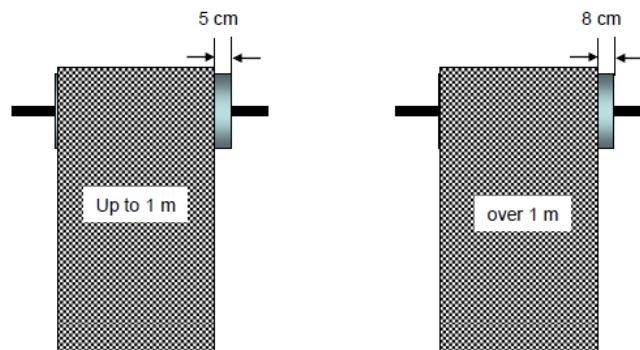
1- Diameter

- must be large enough to affect traction on the belt
- provide the required belt speed
- matched to belt minimum bending radius
- should be matched to conveyor power train : motor and reducer

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Lebar pulley



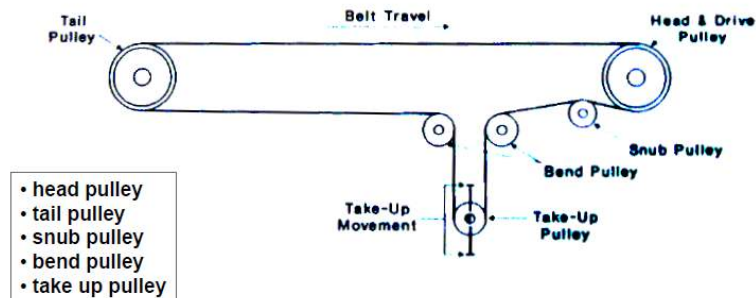
Pulley must be slightly wider than belt

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Tipe pulley

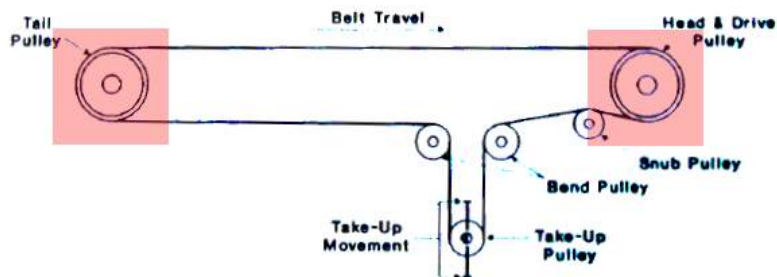
Conveying belt system contain variety of pulleys performing different tasks



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Head dan tail pulley

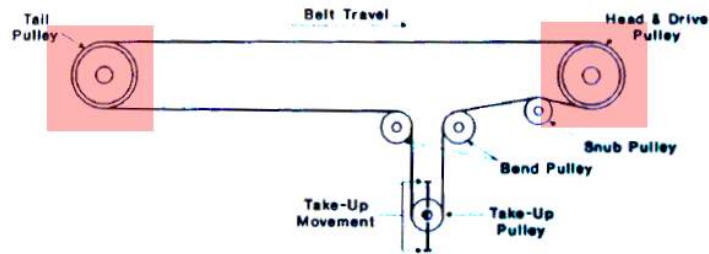


- head pulley is on the discharge end
- tail pulley is on the feed end
- tail pulley is often crowned to help in belt tracking

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Drive pulley (pendorong)

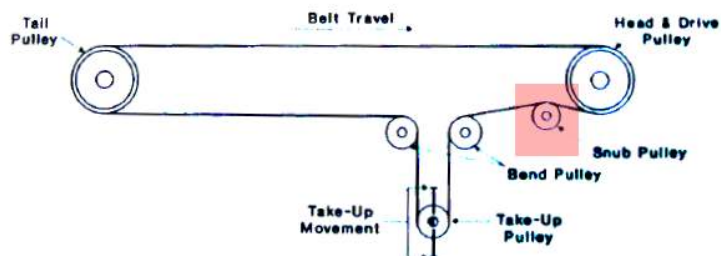


- Transmits force from motor to the belt
- the most common location is at head pulley
- could be located at tail pulley or any independent site

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Snub pulley

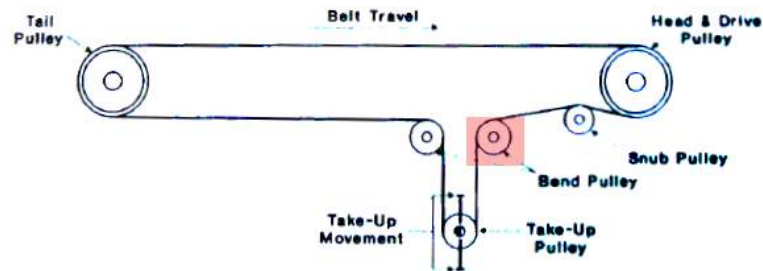


- Smaller in diameter than head or tail pulley
- Increase wrap angle around drive pulley
- mostly crowded to aid in belt tracking

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Bend pulley

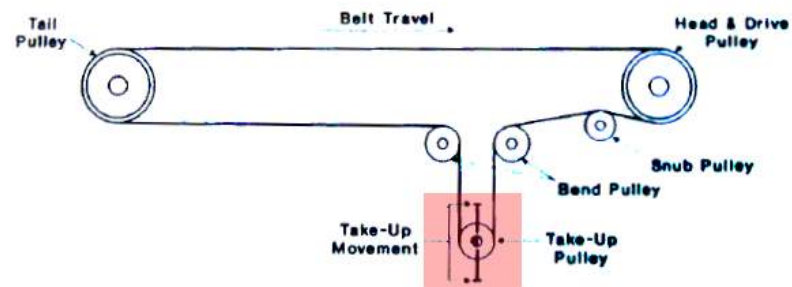


- Direct the belt away from its path

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Take up pulley

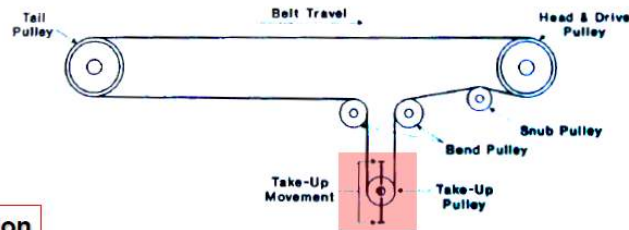


- Allow adjustment of belt tension

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Sistem take up pulley



Function

- Adjust the proper tension
- Absorb any stretching along belt longitudinal axis
- Store a small amount of belt length as spare
- allow to release belt tension for maintenance and repair jobs

Take- up system

- Manual
- Automatic

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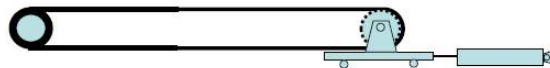


Sistem Manual take up

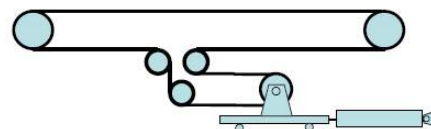
- Compact and inexpensive
- adjusted by screw, spring, ratchet or jack
- Relies on operator judgment
- Needs periodic adjustments
- Normally located opposite to drive side
- Suitable for very short belts
- Could be in /off line of belt plane
- normally located opposite to drive end
- mounted in- line or off- line of belt



In- line type



off- line type



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Sistem otomatis take up pulley

- Pneumatically
- Hydraulically
- Electrically
- By gravity

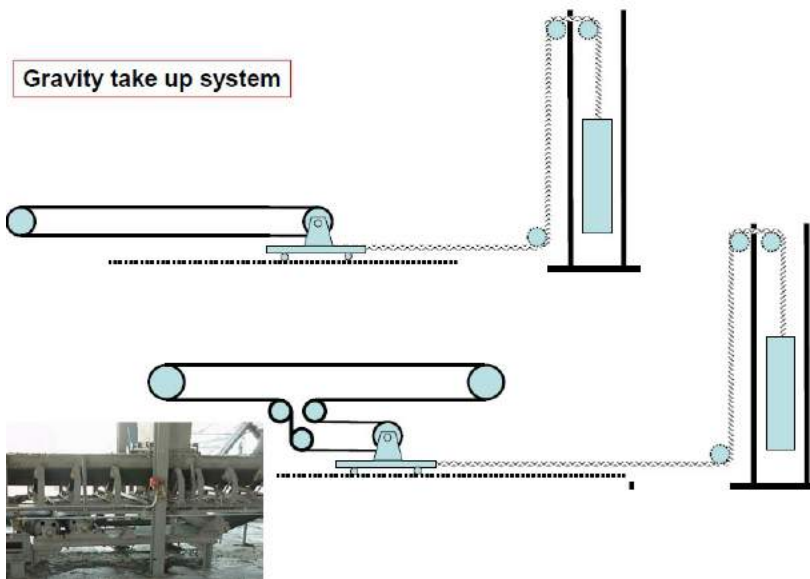
Gravity type is most common used for :

- economical and effective
- installed horizontally or vertically
- self adjusting
- installed anywhere on the return line
- it is desirable to locate close to drive for quick reaction

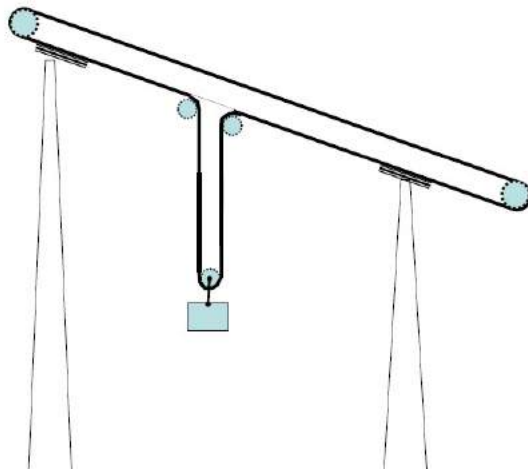
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Gravity take up system



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DRIVING ARRANGEMENT

