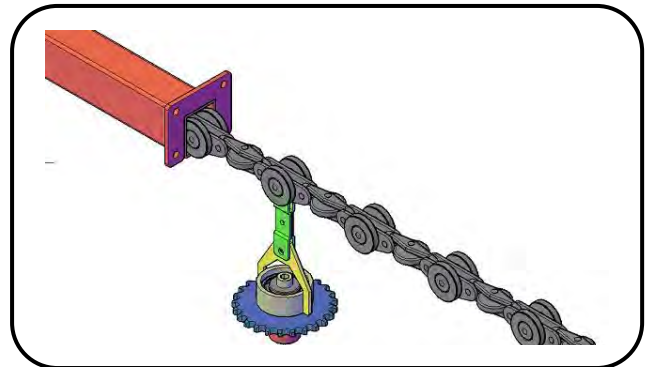




POWERCON JK MONORAIL SYSTEM GUIDE

Why use a Powercon Monorail system:

1. Keep valuable floor space clear. Many factories have unused space in the air or rafters that is not utilised.
2. Doubles as storage and buffering of product
3. Cost effective option to alternative options
4. High efficiency with low power consumption
5. Easy installation
6. Low maintenance costs
7. Safe
8. Clean
9. Versatile
10. Easily re-routed or modified
11. Robust drop forged construction
12. Close pitch on pendants (150mm) means by moving the removable pendant the lif span can be extended further
13. Not susceptible to extreme temperatures.
14. Bi-planer chain allows for multi direction options



Options:

- Power JK 45 Chain = 45kg carrying capacity per pendant
OR 90kg carrying capacity per "Y" Pendant
- Power JK 60 Chain = 60kg carrying capacity per pendant
OR 120kg carrying capacity per "Y" pendant

Guidelines for POWERCON OVERHEAD MONORAIL

A POWERCON, we offer complete turnkey solutions including the design, drawings, specifications and installation as required. However, should you wish to install your own unit, here are a few guide lines to consider when designing your conveyor.

1. Locate a convenient conveyor path. Consider keeping lines parallel and close to simplify support structures and eliminate wasted space.
2. Establish where suitable loading and offloading areas should be. Take into consideration situations such cooling may be required after an oven or drying time for paint.
3. Consider the material to be handled per minute or hour, spacing and clearances required between the products. Longer items may require larger turning spaces.
4. Determine number of carriers per minute or hour.
5. Consider whether supports require being floor mounted and/or roof mounted. There are many options available and in some cases we can use a variety of option simultaneously.
6. Verify all clearances, both horizontal and vertical taking walls, columns etc into consideration.

7. Consider the environment; ovens require expansion joints and track should be run outside of wash tunnels.
8. A layout drawing with elevations will assist us in advising best position for drive, take-up, service unit and expansion joint placement. Show loading and off loading positions as well as much information regardless of whether or not it seems significant.
9. Allow a minimum of 250mm between directional vertical / horizontal changes.
10. Calculate total chain length of the chain. Add all straight sections, the drive, take-up, inspection units, expansion joints and bends into account.
11. Always position your drive at the highest elevation to pull the load.
12. Always position the take-up at a low point directly after the drive, without horizontal bends in between the drive and bend. The best position for the take up is always directly after the drive.

CHAIN PULL CALCULATIONS

The chain pull calculations are to be used conservatively and are to be used as a guide line only. There are many factors to take into account including system age and condition, loading, ambient temperatures, number of bends etc.

Here is an example of a typical system chain pull calculation of an average system.

Please consider that in vertical inclines and declines, the loads cancel each other. However, if the full load in exists on inclined bends but not on declines, you need to factor these loads into the equation.

Example:

Conveyor chain length: 120m
 Weight of chain: 5kg per meter
 Weight of product: 40 kg
 Product spacing: 1200mm (100 total)
 Carrier bar weight: 3kg
 Number of 90° bends: 12
 Speed: 10m/min

Therefore: Total load = $(120 \times 5\text{kg}) + (100 \times 40) + (100 \times 3) = 4,900\text{kg}$ total load
 Rolling friction = 5% (4%-8% depending on system layout – chart below)
 $4,900 \times 5\% = 245\text{kg} = 540\text{Lb}$

The total permissible chain pull is 3000Lb, therefore this is a safe load situation. Should the loading exceed 3000Lb, 2 drives or more may be required. Drive units should be evenly spaced throughout the system.

Rolling friction chart:
Take all horizontal and vertical bends into consideration.
Conveyor with more than 0-10 X 90° bends – 4%
Conveyor with more than 11-20 X 90° bends – 5%
Conveyor with more than 21-40 X 90° bends – 6%
Conveyor with more than 41-60 X 90° bends – 8%

DETERMINING THE CONVEYOR LINE SPEED

Conveyor speed is determined by a combination of carrier capacity and spacing as shown below:

$$V = Q \times P$$

V = Conveyor speed (meter/min)

Q = Quantity of carriers to be handled (nos./min)

P = Carrier spacing (meter)

COMPONENT IDENTIFICATION:

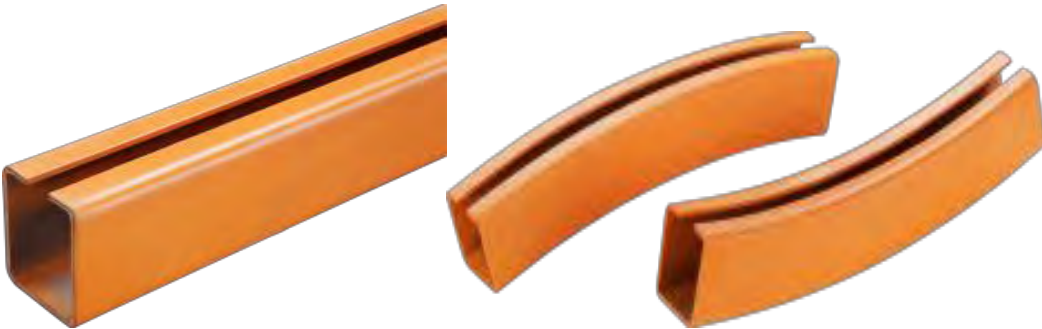
Caterpillar Drive unit



Chain showing Power JK 45 with a single pendant:



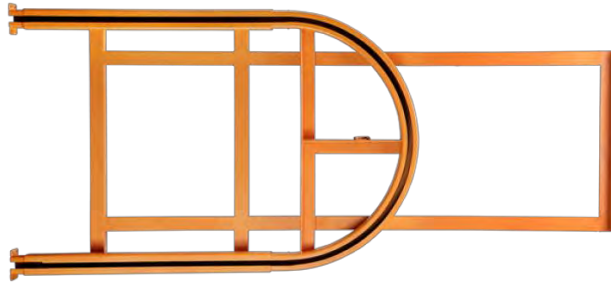
Track



Hanger (optional rotating fork and drip tray)



Take-up unit



MAINTENANCE SCHEDULE

Daily:

Before start up the following inspection needs to be carried out:

1. Check for loose components or damage
2. Ensure no obstructions with chain and or hangers
3. Check there is sufficient tension on take-up springs
4. Check for oil leaks

Weekly:

High temperature applications:

Lubricate chain weekly for at least 3-4 circulations on the circuit. Only use Omega 613 High temperature oil or equivalent SAE 10 suitable for temperatures and micro fog applications.

Method:

- a) Air pressure on regulator – set at 2-3 bars.
- b) Open oil regulator to 1 drop / second.
- c) Check physically if lubrication reaches the chain and bearings.
- d) Use only OMEGA 613 molybdenum based lubricant.
- e) Over-lubrication can cause dripping on products without serving any real purpose.
- f) Check chain tension on conveyor – If pendants are held between the two fingers and pushed upwards, it should move upwards by approximately 30-40 millimetres. (Do this at the inspection section with the lid removed)
- g) Check free movement of the tension unit.
- h) Check correct operation and cleanliness of the torque limiter. Loosen three adjusting bolts until the clutch clips under full load. Tighten each adjusting bolt by approximately one-third revolution at a time until the chain moves. Finally tighten one-quarter turn each. Torque limiter will now slip if the chain jams, but will not slip under the load.

Monthly:

- a) Check gearbox oil level and check for any leaks
- b) Apply, if necessary, an appropriate grease to the transmission chain, taking care not to allow any grease to drip onto the torque limiter.
- c) Check for any excess wear on bearing.
- d) Check for any wear on track and bends.
- e) If V- belt driven, check for V-belt wear, as well as free operation of springloaded variable speed pulley.
- f) Lubricate chain monthly or as required as per schedule above

Chain:

Besides lubrication, chain tension is important. A general rule is the springs should be tensioned to approximately 180% of their original length.

Wear Patterns:

Wear grooves may appear on the friction surfaces over an extended period of time. This is a normal wear condition, and does not impair functioning of the unit. Never machine the friction surface to remove grooves or score marks resulting from normal wear.

Motors and Gearboxes (Reducers):

Except for keeping the units clean and checking the level of oil in the gearboxes maintenance of these units is minimal. Oil levels in gearboxes should be checked when unit is warm, but not running.

If either unit fails, replace it with the same unit. Send the failed unit to the nearest service representative for repairs.

Sprockets:

Sprockets should be checked for proper alignment, that they are securely fastened to shafts and that they are wearing in a normal fashion. If sprockets show signs of wearing on the sides of their teeth this is an indication of miss-alignment. If the tips of their teeth are wearing off this is a sign of an elongated chain or a loose chain. Note: When replacing sprocket, or chain it is advisable that they both be changed.

Taper Lock Hubs/Bushings (when used):

The proper installation of taper lock bushing is critical. If not installed properly, the bushings can break loose, with the potential of damage to equipment and a safety hazard for personnel. Please follow the following instructions for installation of taper lock bushings:

Refer to supplier for torque setting of bushes.