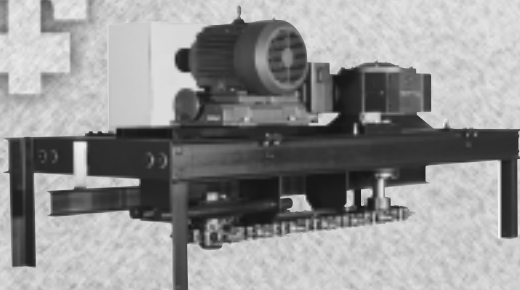
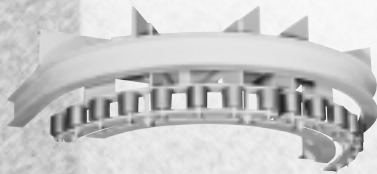
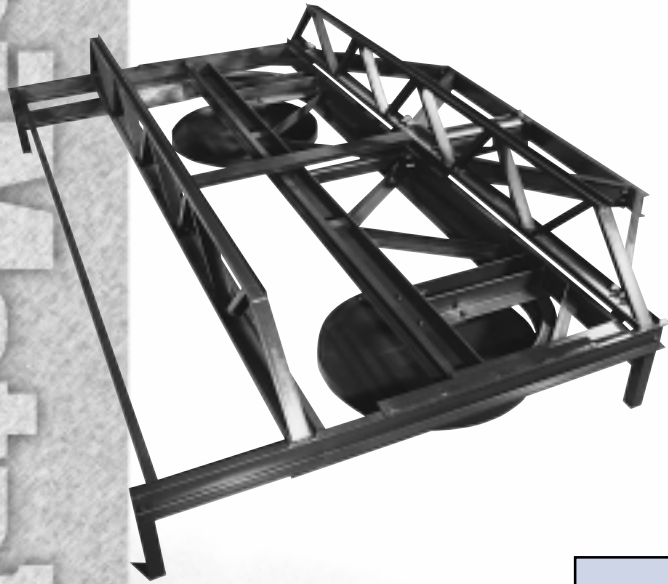


# Overhead Components Monorail



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Sumit Metalcraft Corp

- Precision steel wheels designed specially for rigorous conveyor service.
- Precision ball bearings with “double” triple labyrinth seals for extra protection from dust and contaminants.
- Fittings provided for easy lubrication. Lubricated-for-life types also available.
- Rugged attachments available to meet your specific needs.
- Sturdy double-bolt construction firmly holds trolley together and ties trolley bracket to load attachment for single unit strength.



One of the first and most basic considerations in planning an Overhead Conveyor System is the right size and type of trolley to be used. The total load to be carried on each trolley, including the weight of the trolley itself, the carrier and the actual load, are key factors in determining the size of trolley and also the size rail and chain to be used. The conditions under which the trolleys will operate, including the degree of contamination and temperatures to which they will be subjected, are important factors in the choice of the type of trolley, wheel and seal selected.

Omni Metalcraft Corp. offers four basic sizes of trolleys - 2", 3", 4" and 6" - in all the variations shown in the selection chart below. Offered as “standard” is the vertical hole pattern, with one bolt above and one below the chain, which holds the chain firmly in place. Trolleys are also available in these sizes with a horizontal hole pattern, with two bolts above the chain which provide a means of adding or removing trolley assemblies under conditions where the chain cannot be slackened.

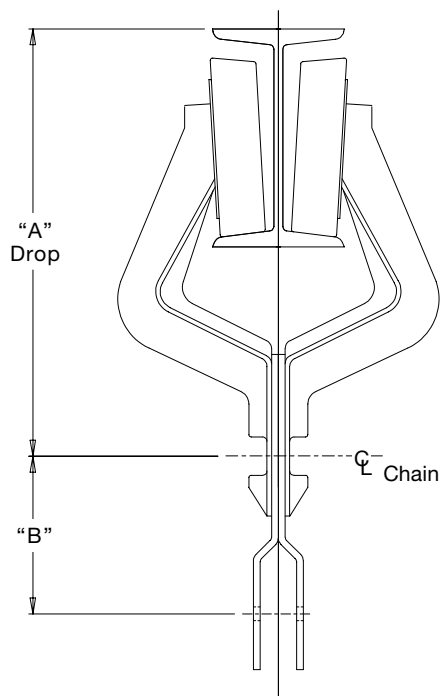
| TROLLEY SELECTION CHART |                  |                 |      |                 |                |                   |         |
|-------------------------|------------------|-----------------|------|-----------------|----------------|-------------------|---------|
| TROLLEY SIZE            | TROLLEY CAPACITY | TROLLEY SPACING |      | FOR I-BEAM SIZE | FOR CHAIN SIZE | CHOICE OF BRACKET |         |
|                         |                  | Min.            | Max. |                 |                | Type              | Drop    |
| 2"                      | 100 Lbs.         | 4"              | 24"  | 2-5/8"          | 228            | Forged            | 4-1/2"  |
| 3"                      | 250 Lbs.         | 6"              | 30"  | 3"              | 348            | Forged            | 5-1/2"  |
| 4"                      | 400 Lbs.         | 8"              | 32"  | 4"              | 458            | Forged            | 7-3/16" |
|                         |                  |                 |      |                 | 458            | Forged            | 8"      |
|                         |                  |                 |      |                 | 678            | Forged            | 7-7/16" |
| 6"                      | 1200 Lbs.        | 12"             | 36"  | 6"              | 458            | Forged            | 7-7/16" |
|                         |                  |                 |      |                 | 678            | Forged            | 10"     |

## Selecting the Size and Type

Described here are the many different variations available with a selection chart to help you choose the type best suited for your customers' needs. The chart below shows the load-carrying capacity and other basic characteristics of the various trolleys. Note that the load-carrying capacity of each size can be doubled, if desired, by the use of load bars which divide the total load over two trolleys. In figuring the load, it is generally desirable to stay well within the maximum load capacity of any trolley selected. This ensures longer trolley life, less friction and lower maintenance.

Normally the I-beam and chain sizes match the trolley size. However, in cases of moderate load and heavy chain pull, it is practical to use a 4-inch trolley with a 6-inch chain, or in the case of a heavy load and moderate chain pull, to use a 6-inch trolley with a 4-inch chain. Special trolleys are available for this purpose, as shown.

Another factor to be considered is the trolley spacing required. The trolleys must be spaced wide enough apart so that the loads will not touch each other on vertical rises or descents or on horizontal curves. A means of checking this is covered on page 17 of "Planning A System". Added spacing can be accomplished, when needed, by using "I" attachments on alternate trolleys as spacers.



## Forged or Stamped Brackets

Normally, a forged bracket is selected where strength and rigidity are desired, and the stamped bracket where economy is important and the demands on the trolleys are minimal. We offer stamped brackets in 3" and 4" sizes that have a strength comparable to the forged bracket. This offers the dual advantage of both economy and strength.

|            | TROLLEY SIZE |        |                             |                   |
|------------|--------------|--------|-----------------------------|-------------------|
|            | 2"           | 3"     | 4"                          | 6"                |
| "A" (Drop) | 4-1/2"       | 5-1/2" | 7-3/16"<br>7-7/16"<br>or 8" | 7-7/16"<br>or 10" |
| "B"        | 1-7/8"       | 3-1/8" | 2-7/8"                      | 3-5/8"            |
| Weight     | 1.5 Lbs.     | 3 Lbs. | 6.3 Lbs.                    | 20 Lbs.           |



## Choice of Wheel Connections

**Swaged** - This type is the most popular and commonly used type due to its relatively low cost, strength and overall capabilities. It has permanently fastened trolley wheels. It is used particularly where there is seldom any need to remove or replace wheels.

**Bolted** - This type is designed for applications where there may be a need to remove and replace wheels, such as high load and contaminant conditions. The two nuts on each side of the wheels provide a means of replacement.

## Choice of Bearing Seals

**Splashproof®** - This design has in effect a "double" triple labyrinth seal with a series of shields protecting against dirt and liquid contaminant conditions. While slightly higher in cost than some competitive types, this cost is more than offset by the longer trouble-free operation and its ability to withstand contaminant conditions. As a result, many users standardize on this type throughout their operations.

**Lubricated-for-life** - This type is designed specifically for high contaminant conditions and is commonly used with the full ball type wheel for this reason. It consists basically of the Splashproof® seal design with an additional wiper seal added. This effectively retains grease in the bearing cavity and normally requires no additional lubrication while in service.

If desired, however, these seals can be "purged" under high pressure and relubricated with a contaminant-resisting lubricant without damaging the seal. Alemite fittings can be provided for this purpose. Purging of the seal is sometimes desirable under very high contaminant conditions.

**Other Types** - In addition, other special types of seals are available to meet special conditions.



## Choice of Wheels

Two basic types of wheels are offered which are designed to meet most operating conditions. These are available as parts of trolleys or separately for replacement.

**Retainer Type** - This is the most widely used type, particularly where only light or moderate loads and low contaminant conditions are involved, such as in transportation, parts delivery and assembly operations. In this type, precision steel balls are held in a steel retainer ring. This ensures low friction, minimum ball wear and requires the least drive energy. This type is designed to operate continuously in temperatures of up to 325 degrees F.



## Full Ball Type -

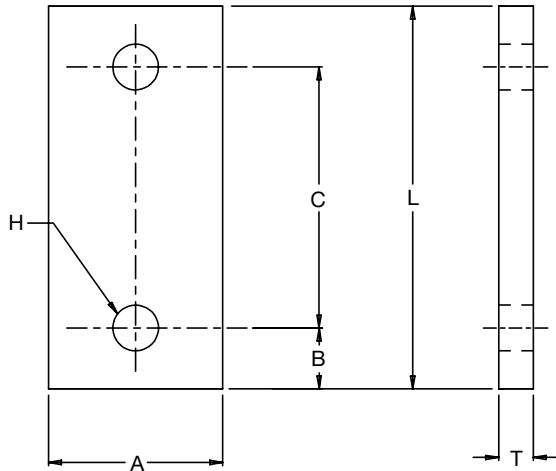
This type is designed for use under high load, thrust, temperature and contaminant conditions (Ex.: foundries, oven systems or processing lines). These wheels require somewhat more horsepower than the other two types. They are designed to operate in continuous temperature conditions up to 500 degrees F.



# Trolley Attachments

## "I" Attachments

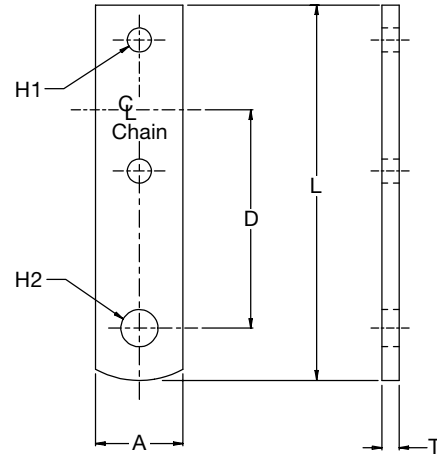
For use on intermediate trolleys that carry no load. Intermediate trolleys are required when loaded trolley spacing exceeds 36 inches.



| Size | A      | B     | C      | H      | L      | T    |
|------|--------|-------|--------|--------|--------|------|
| 2"   | --     | --    | --     | --     | --     | --   |
| 3"   | 1-1/4" | 7/16" | 1-7/8" | 21/64" | 2-3/4" | 1/4" |
| 4"   | 1-3/4" | 7/16" | 2-1/8" | 7/16"  | 3"     | 3/8" |
| 6"   | 3"     | 5/8"  | 2-3/4" | 17/32" | 4-1/8" | 1/2" |

## "C" Attachments

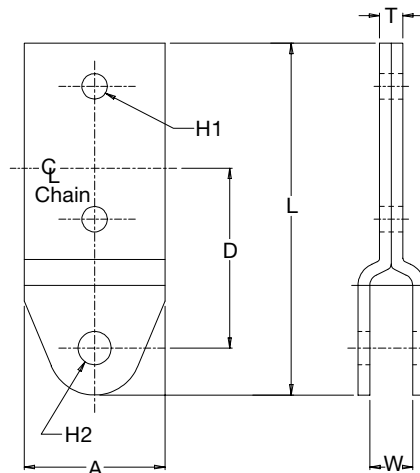
Used when carrier design has a clevis. Can also be used with a bent rod hook to carry light parts.



| Size | A      | D      | H1     | H2     | L      | T    |
|------|--------|--------|--------|--------|--------|------|
| 2"   | --     | --     | --     | --     | --     | --   |
| 3"   | 1-1/4" | 3-1/8" | 11/32" | 17/32" | 5-3/8" | 1/4" |
| 4"   | 1-3/4" | 2-7/8" | 13/32" | 9/16"  | 5-5/8" | 3/8" |
| 6"   | 3"     | 3-3/4" | 17/32" | 13/16" | 7-3/8" | 1/2" |

## "H" Attachments

This is the most commonly used type of attachment. It is suitable for suspending almost any type of hook, tray or rack.

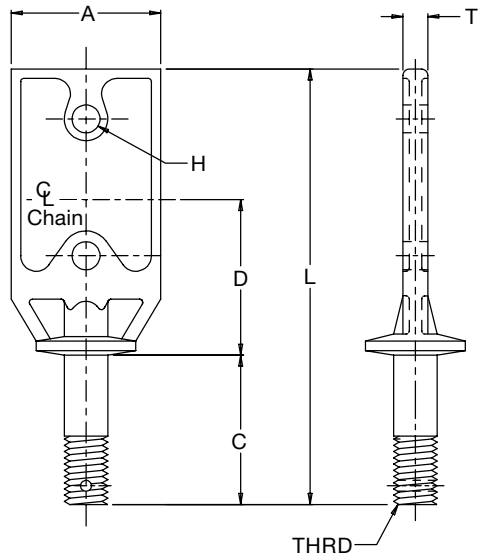


| Size | A      | D        | H1     | H2     | L        | T    | W      |
|------|--------|----------|--------|--------|----------|------|--------|
| 2"   | 1"     | 1-29/32" | .191"  | 17/64" | 3-19/32" | 1/4" | 3/8"   |
| 3"   | 1-5/8" | 3-1/8"   | 21/64" | 17/32" | 5-1/4"   | 1/4" | 9/16"  |
| 4"   | 2-1/4" | 2-7/8"   | 13/32" | 17/32" | 5-5/8"   | 3/8" | 11/16" |
| 6"   | 3"     | 3-5/8"   | 17/32" | 13/16" | 7-1/16"  | 1/2" | 13/16" |

# Trolley Attachments

## "B" Attachments

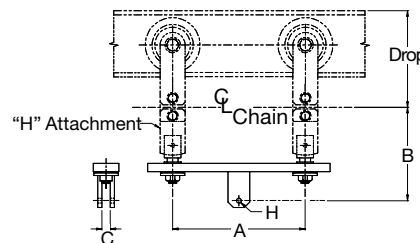
Normally used to support the load bar from a pair of trolleys but can be used for other applications.



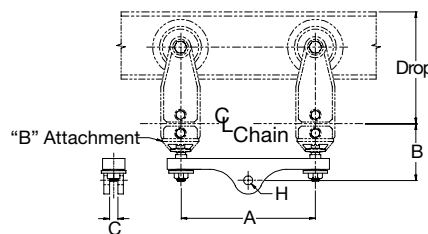
| Size | A      | C        | D        | H      | L      | T    | THRD   |
|------|--------|----------|----------|--------|--------|------|--------|
| 2"   | --     | --       | --       | --     | --     | --   | --     |
| 3"   | 1-1/2" | 1-13/16" | 2-7/16"  | 21/64" | 5-3/4" | 1/4" | 1/2-13 |
| 4"   | 2"     | 2-1/8"   | 2-15/16" | 13/32" | 7"     | 3/8" | 5/8-11 |
| 6"   | 3"     | 3"       | 3-1/8"   | 9/16"  | 8-3/4" | 1/2" | 7/8-9  |

## Load Bars

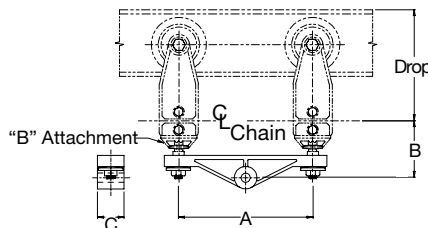
The use of a load bar bridging two trolleys provides a means of doubling the load carrying capacity. They are designed to provide freedom of movement on both horizontal and vertical curves.



| Size | A  | B      | C    | H     |
|------|----|--------|------|-------|
| 2"   | 8" | 5-1/4" | 3/8" | 7/16" |

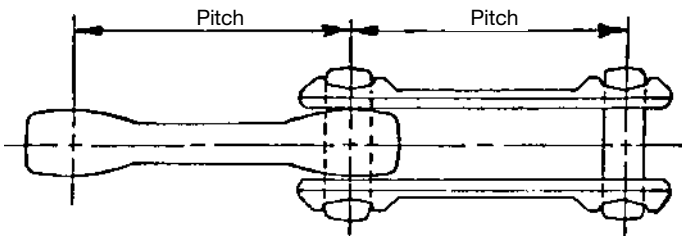


| Size | A  | B      | C      | H      |
|------|----|--------|--------|--------|
| 3"   | 6" | 4-1/4" | 9/16"  | 9/16"  |
| 4"   | 8" | 4-7/8" | 11/16" | 11/16" |



| Size | A   | B      | C      | H      |
|------|-----|--------|--------|--------|
| 6"   | 12" | 5-5/8" | 2-3/8" | 13/16" |

# Chain



After the choice of the trolley, the size and type of chain is probably the most important element in an Overhead Conveyor System. Actually the two are really interrelated since the trolley size usually determines the size of the chain. However, there are cases where the chain pull is so light, it is practical to use a 6-inch trolley with a smaller-size chain; or, where the chain pull is quite heavy to use a larger-size chain with a smaller size-trolley. These types are shown in the Trolley Selection Chart on page 280.

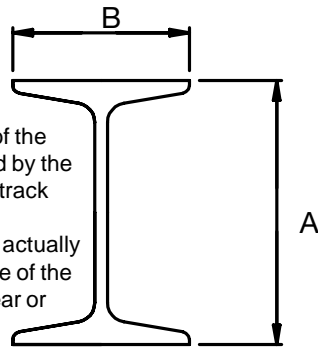
The most important factors in choosing the size of chain are the total chain pull in the system and the number of drives, which enable you to determine the maximum chain pull in any area. A method of figuring this is given in the section on "Planning A System." The total chain pull is also determined by the friction factors and conditions under which the system will operate. For pitch, allowable chain tension, and other factors and dimensions, see Table D on page 298.

Omni Metalcraft Corp. offers a very high-quality type of chain specially designed for use on trolley conveyors. It is drop-forged and heat-treated for added strength and resistance to corrosive and abrasive action. This advanced type of chain has the advantages of a high strength-to-weight ratio, excellent wear qualities, and the ability to flex easily both horizontally and vertically for negotiating curves. The heat-treating also provides the ability to withstand high shock loads. Another feature is the symmetrical design of the chain which allows for 180 degree rotation if new wear surfaces are required. If desired, the parts can also be magnaflux tested to detect possible defects in the chain.

# Track and Accessories

## Track

Since the I-Beam Track must sustain the entire load carried by the Overhead Trolley Conveyor, and the lower flange of the I-Beam must withstand the wear caused by the trolley wheels, it is important to choose track that will withstand this weight and wear satisfactorily. As a rule, the trolleys can actually carry heavier loads than the lower flange of the I-Beam can withstand without undue wear or peening. In planning a system, this sometimes dictates the need for a larger-size track than would be required just based on the trolley loading to ensure trouble-free operation and low friction in the system.



| A- BEAM SIZE | BEAM WT. PER FT. | B     |
|--------------|------------------|-------|
| 2-5/8"       | 3.73 Lbs.        | 1.84" |
| 3"           | 5.7 Lbs.         | 2.33" |
| 4"           | 7.7 Lbs.         | 2.66" |
| 6"           | 12.5 Lbs.        | 3.33" |

Omni Metalcraft Corp. offers I-Beams made of a special high carbon steel that has outstanding wear and load-carrying characteristics. The straight track is stocked in standard 20-foot lengths which can be cut to any desired length.

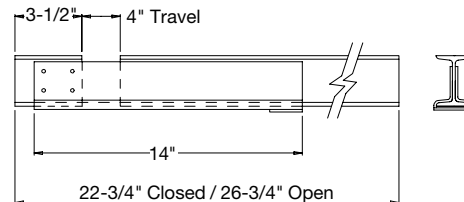
# Track Expansion Joints

In planning a new or revised system another important consideration is the need for expansion joints. They are used to compensate for elongation caused by wear or temperature changes and to keep the chain tight. Expansion Joints available for this purpose become an expandable link in the conveyor track. We offer two types: a Take-up Expansion Joint and an Oven Expansion Joint.

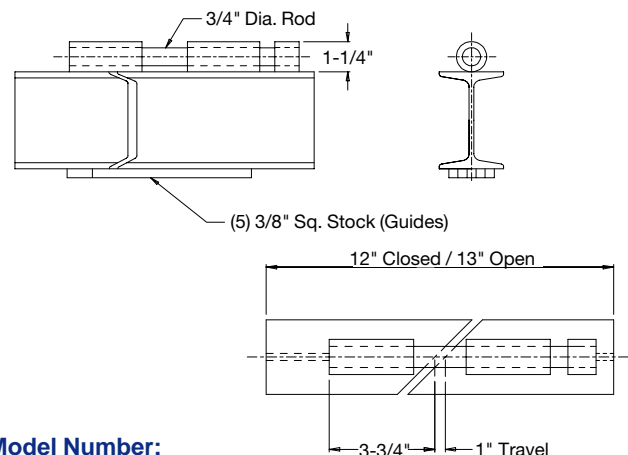
Oven Expansion Joints must be used on any conveyor passing through an oven or other heat treating process to compensate for the extra expansion caused by the processing heat. A normal expansion rate is 3/4" per 100 feet of track for each 100 degree temperature rise.

Expansion Joints are available in both types for all 2", 3", 4" and 6" systems. Their dimensions are shown.

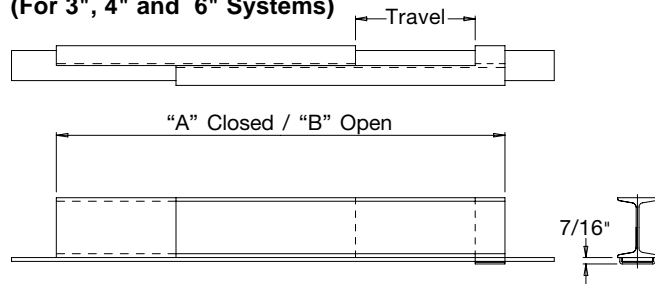
## Take-up Expansion Joint (For 2" Systems)



## Oven Expansion Joint (For 2", 3", 4" and 6" Systems)



## Take-up Expansion Joint (For 3", 4" and 6" Systems)



| TRAVEL | BEAM SIZE  | "A"        | "B"        |
|--------|------------|------------|------------|
| 8"     | 3", 4", 6" | 14"<br>18" | 22"<br>26" |
| 16"    | 3", 4", 6" | 22"<br>26" | 38"<br>42" |
| 24"    | 3", 4", 6" | 30"<br>34" | 54"<br>58" |

### Model Number:

**TUEX 4 - 24**

TRAVEL (1", 8", 16", 24")  
I-BEAM SIZE (2-5/8", 3", 4", 6")  
TYPE

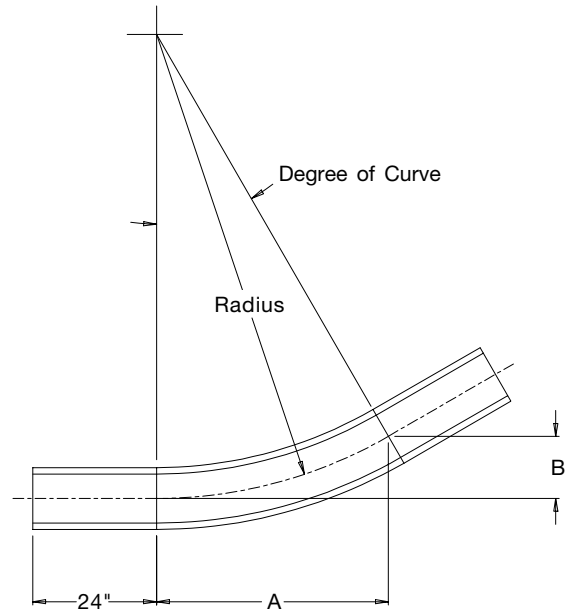
(TUEX) Take-up Expansion Joint  
(OVEX) Oven Expansion Joint

# Vertical Curves

Vertical curves provide for the changes of elevation that may be desired in a system. The selection of the type desired depends primarily on the amount of elevation or drop desired. It can also be affected, however, by other factors, such as the type of load and hangers involved. It may be necessary, for example, to provide sufficient clearance between the carriers when they are moving on the incline so that they will not interfere with each other. When large loads are involved it may be a good idea to make a sketch of the operation as described in the section "Planning A System" on page 296.

Because of carrier sway, it is also frequently necessary to provide extra clearance between the top of the carrier and the conveyor chain. Table B in the section on "Planning A System" shows the minimum recommended radii for vertical curves based on chain size and trolley spacing.

Whenever possible more than minimum radii should be used in the system. The objective is to provide a free flow of chain and load along the vertical curve, and minimum resistance, taking into account the available space and the requirements of the system. Minimum radii should be used only after careful consideration of all the factors involved.



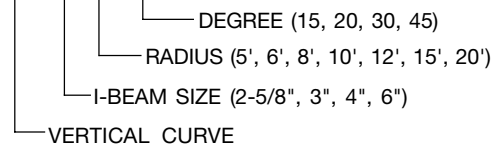
| RADIUS | 15 DEGREES  |             | 20 DEGREES  |              | 30 DEGREES |            | 45 DEGREES   |             |
|--------|-------------|-------------|-------------|--------------|------------|------------|--------------|-------------|
|        | A           | B           | A           | B            | A          | B          | A            | B           |
| 5'-0"  | 1'-3-1/2"   | 0'-2"       | 1'-8-9/16"  | 0'-3-5/8"    | 2'-6"      | 0'-8-1/16" | 3'-6-3/8"    | 1'-5-3/16"  |
| 6'-0"  | 1'-6-5/8"   | 0'-2-7/16"  | 2'-0-5/8"   | 0'-4-3/8"    | 3'-0"      | 0'-9-5/8"  | 4'-2-5/16"   | 1'-9-1/8"   |
| 8'-0"  | 2'-0-13/16" | 0'-3-5/16"  | 2'-8-13/16" | 0'-5-13/16"  | 4'-0"      | 1'-0-7/8"  | 5'-7-7/8"    | 2'-4-1/8"   |
| 10'-0" | 2'-7-1/16"  | 0'-4-1/8"   | 3'-5"       | 0'-7-1/4"    | 5'-0"      | 1'-4-1/16" | 7'-0-7/8"    | 2'-11-1/8"  |
| 12'-0" | 3'-1-5/16"  | 0'-4-15/16" | 4'-1-1/4"   | 0'-8-11/16"  | 6'-0"      | 1'-7-1/2"  | 8'-5-13/16"  | 3'-6-3/16"  |
| 15'-0" | 3'-10-5/8"  | 0'-6-1/8"   | 5'-1-9/16"  | 0'-10-13/16" | 7'-6"      | 2'-0-1/8"  | 10'-7-9/32"  | 4'-4-23/32" |
| 20'-0" | 5'-2-1/8"   | 0'-8-3/16"  | 6'-10-1/16" | 1'-2-1/2"    | 10'-0"     | 2'-8-1/8"  | 14'-1-11/16" | 5'-10-1/4"  |

Vertical Curves are fabricated from high carbon steel rail and care is exercised to form smooth uniform bends. These are available in a wide variety of sizes and curves to meet your needs. These curves are normally available with a short stretch of straight track 12" or 24" beyond the tangent point. For further dimensional data, contact Omni Metalcraft Corp.

Vertical curves are usually shipped as single bends of a given radius and degree. Two single bends are assembled on site to form a complete compound vertical curve. A straight piece of straight rail is then inserted between the bends to gain the required elevation.

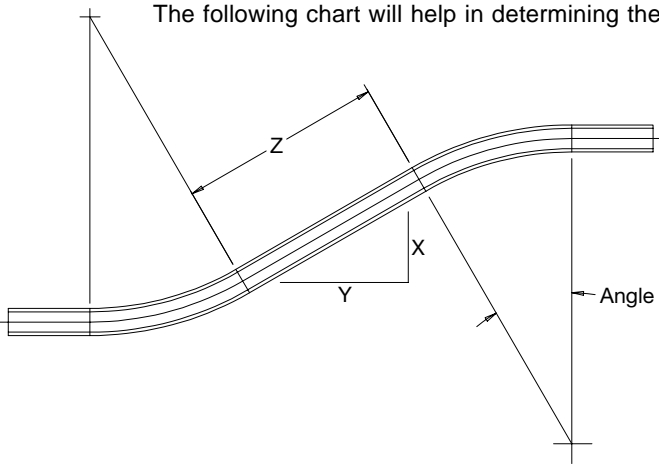
### Model Number :

**VCRV 3 - 8 - 15**





# Vertical Curve Safety Devices



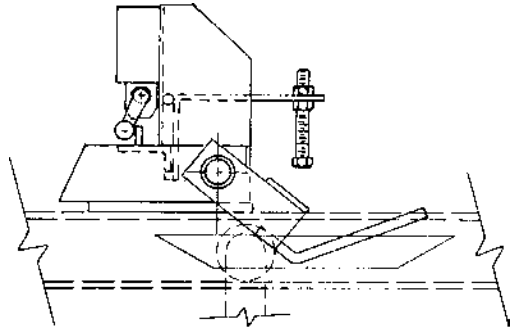
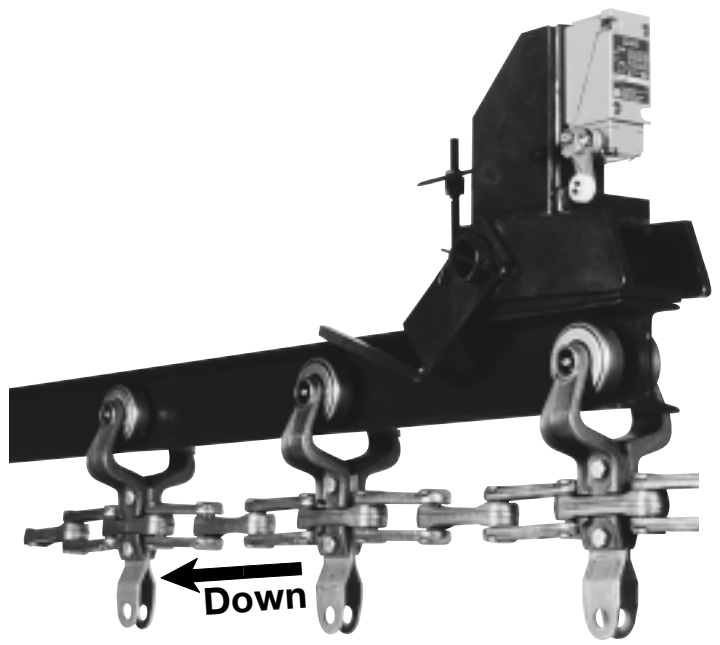
The following chart will help in determining the length of straight rail required for a given rise in the track.

| ANGLE | X     | Y           | Z           | EACH ADDITIONAL<br>1" OF RISE ADD... |          |
|-------|-------|-------------|-------------|--------------------------------------|----------|
|       |       |             |             | TO Y                                 | TO Z     |
| 15°   | 1'-0" | 3'-8-13/16" | 3'-10-3/8"  | 3-3/4"                               | 3-7/8"   |
| 20°   | 1'-0" | 2'-9"       | 2'-11-1/16" | 2-3/4"                               | 2-15/16" |
| 30°   | 1'-0" | 1'-8-13/16" | 2'-0"       | 1-3/4"                               | 2"       |
| 45°   | 1'-0" | 1'-0"       | 1'-5"       | 1"                                   | 1-7/16"  |

Safety Devices preventing runaway or backup in the event of chain breakage must be considered, particularly where changes of elevation of 10 feet or more are involved in the system. We offer two types.

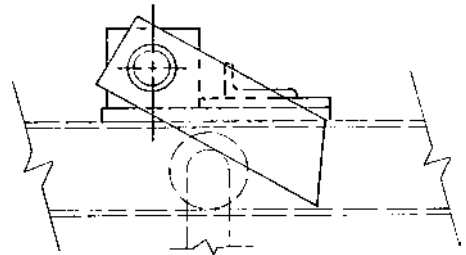
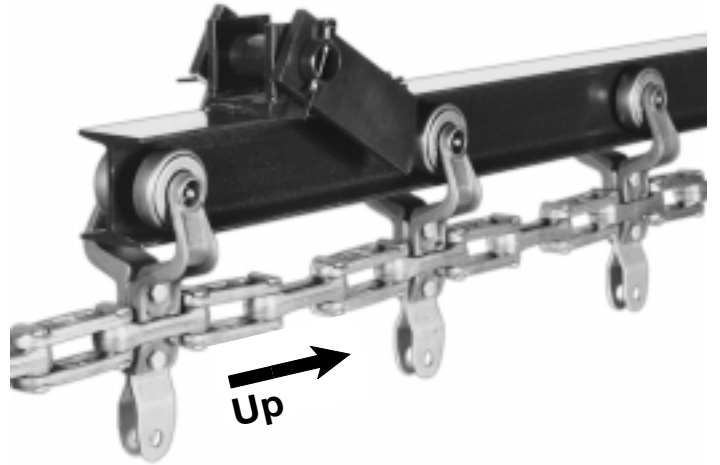
### Anti-Runaway (Downhill) Safety Device

Our downhill safety device prevents runaway if the chain should break or travel faster than normal on downhill vertical curves. These devices are furnished standard with a limit switch which not only stops the chain but the drive, as well.



### Anti-Backup (Uphill) Safety Device

This device prevents reverse conveyor travel on uphill vertical curves in case of chain breakage.



**Model Number:**

- ANTB 3**
- I-BEAM SIZE (2-5/8", 3", 4", 6")
- TYPE
- (ANTB) Anti-Backup
- (ANTR) Anti-Runaway

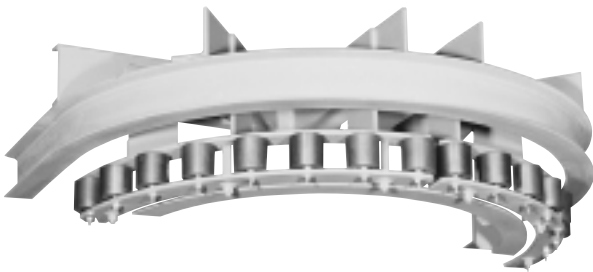
Overhead Monorail Components

# Horizontal Turns

There are two basic types of Horizontal Turns: Roller Turns and Traction Wheel Turns. In selecting sizes of either type, minimum sizes should be avoided wherever practical. The larger radius allows smoother chain action, less drag and more efficient trolley operation. In planning horizontal turns, it is also important that there be adequate load clearance around the turn based on the load size and spacing.

Information on horizontal load clearance as well as the minimum recommended horizontal turn sizes are covered in the section "Planning A System" on page 296.

## Roller Turns

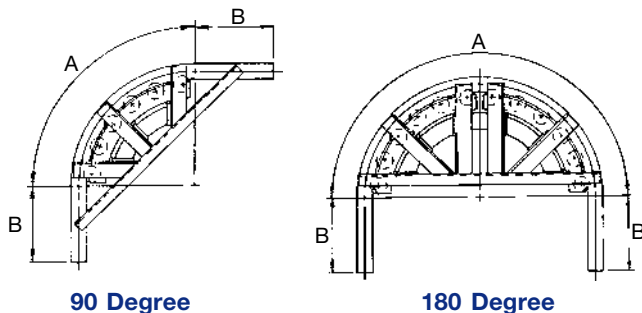
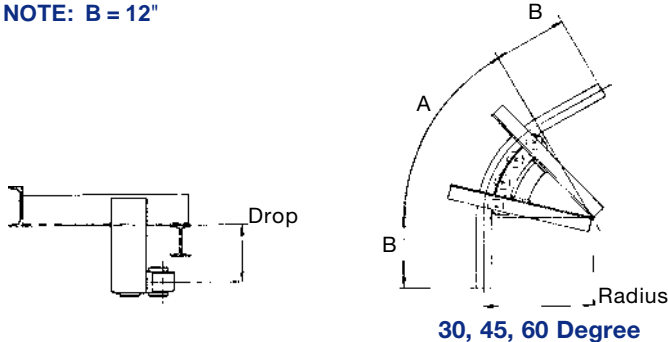


Roller Turns offer the most economical means of providing chain and trolley alignment during horizontal changes of direction.

Roller Turns are available in three types to meet your different needs: Standard Turns with 30, 45, 60, 90 or 180 degree changes in direction; a Spread Design for special requirements; and the unique 180 degree Ransburg Turn.

All have segment bars bolted to a heavy structural steel frame with an I-Beam track carefully shaped to provide smooth trolley operation. Rollers are available with double row ball bearings, tapered bearings or with a metalized carbon bearing. Roller Turn sizes other than those listed are available on request.

**NOTE: B = 12"**



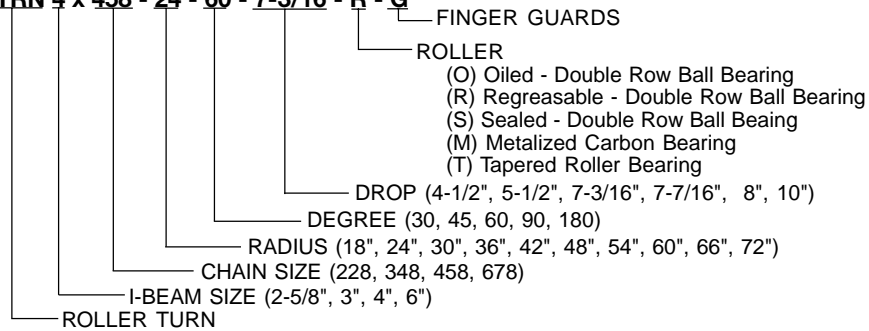
| STANDARD ROLLER TURNS FOR<br>2", 3", 4" AND 6" SYSTEMS |                |                  |                    |                   |
|--|----------------|------------------|--------------------|-------------------|
| RADIUS   | DEGREE<br>TURN | "A"<br>DIMENSION | NO. OF<br>BRACKETS | NO. OF<br>ROLLERS |
| 18"  | 30             | 0'-9-7/16"       | 2                  | 2                 |
|  | 45             | 1'-2-1/8"        | 2                  | 3                 |
|  | 60             | 1'-6-7/8"        | 2                  | 4                 |
|  | 90             | 2'-4-1/4"        | 2                  | 6                 |
|  | 180            | 4'-8-9/16"       | 4                  | 12                |
| 24"  | 30             | 1'-0-9/16"       | 2                  | 3                 |
|  | 45             | 1'-6-7/8"        | 2                  | 4                 |
|  | 60             | 2'-1-1/8"        | 2                  | 6                 |
|  | 90             | 3'-1-11/16"      | 3                  | 8                 |
|  | 180            | 6'-3-3/8"        | 6                  | 16                |
| 30"  | 30             | 1'-3-11/16"      | 2                  | 4                 |
|  | 45             | 1'-11-9/16"      | 2                  | 5                 |
|  | 60             | 2'-7-7/16"       | 2                  | 7                 |
|  | 90             | 3'-11-1/8"       | 3                  | 10                |
|  | 180            | 7'-10-1/4"       | 6                  | 20                |
| 36"  | 30             | 1'-6-7/8"        | 2                  | 4                 |
|  | 45             | 2'-4-1/4"        | 2                  | 6                 |
|  | 60             | 3'-1-11/16"      | 3                  | 8                 |
|  | 90             | 4'-8-9/16"       | 3                  | 12                |
|  | 180            | 9'-5-1/8"        | 6                  | 24                |
| 42"  | 30             | 1'-10"           | 2                  | 6                 |
|  | 45             | 2'-9"            | 3                  | 7                 |
|  | 60             | 3'-8"            | 3                  | 12                |
|  | 90             | 5'-6"            | 4                  | 14                |
|  | 180            | 11'-0"           | 8                  | 28                |
| 48"  | 30             | 2'-1-1/8"        | 2                  | 6                 |
|  | 45             | 3'-1-11/16"      | 3                  | 8                 |
|  | 60             | 4'-2-1/4"        | 3                  | 12                |
|  | 90             | 6'-3-3/8"        | 4                  | 16                |
|  | 180            | 12'-6-13/16"     | 8                  | 32                |
| 54"  | 30             | 2'-4-1/4"        | 2                  | 6                 |
|  | 45             | 3'-6-7/16"       | 3                  | 9                 |
|  | 60             | 4'-8-9/16"       | 3                  | 13                |
|  | 90             | 7'-0-13/16"      | 4                  | 18                |
|  | 180            | 14'-1-5/8"       | 8                  | 36                |
| 60"  | 30             | 2'-7-7/16"       | 2                  | 7                 |
|  | 45             | 3'-11-1/8"       | 3                  | 10                |
|  | 60             | 5'-2-13/16"      | 4                  | 14                |
|  | 90             | 7'-10-1/4"       | 5                  | 20                |
|  | 180            | 15'-8-1/2"       | 10                 | 40                |
| 66"  | 30             | 2'-10-9/16"      | 3                  | 7                 |
|  | 45             | 4'-3-13/16"      | 3                  | 11                |
|  | 60             | 5'-9-1/8"        | 4                  | 15                |
|  | 90             | 8'-7-11/16"      | 5                  | 22                |
|  | 180            | 17'-3-3/8"       | 10                 | 44                |
| 72"  | 30             | 3'-1-11/16"      | 3                  | 8                 |
|  | 45             | 4'-8-9/16"       | 3                  | 12                |
|  | 60             | 6'-3-3/8"        | 4                  | 16                |
|  | 90             | 9'-5-1/8"        | 5                  | 24                |
|  | 180            | 18'-10-3/16"     | 10                 | 48                |

**NOTE: Finger Guards (not shown) are required where roller turns and traction wheel turns are not guarded by location. Order separately.**

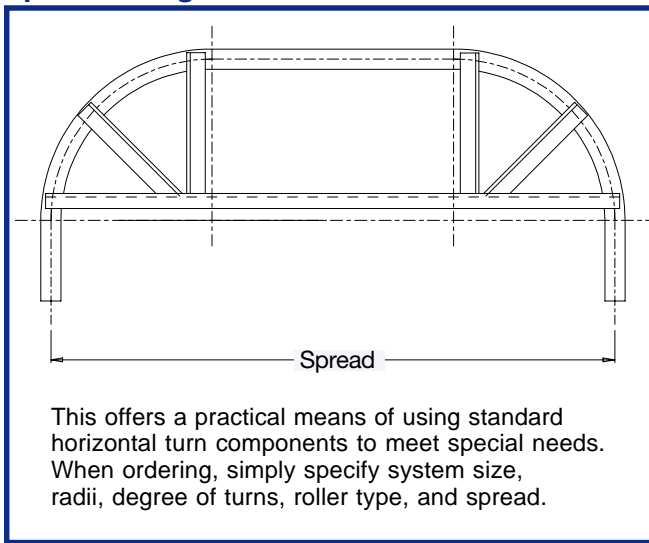
# Roller Turns

## Model Number :

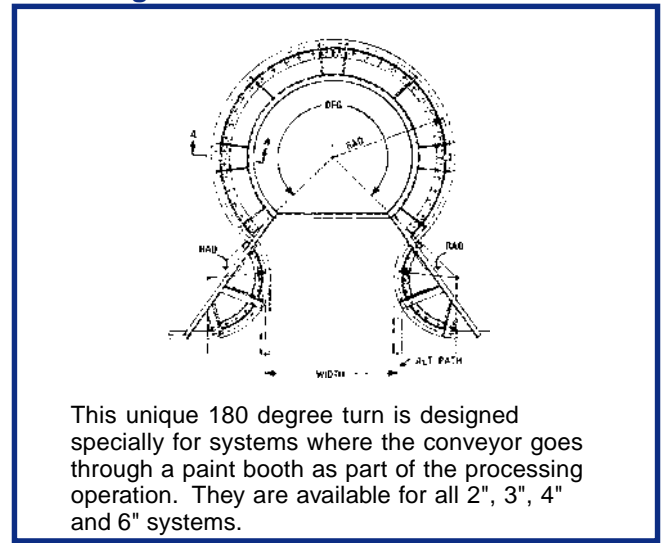
**RTRN 4 x 458 - 24 - 60 - 7-3/16 - R - G**



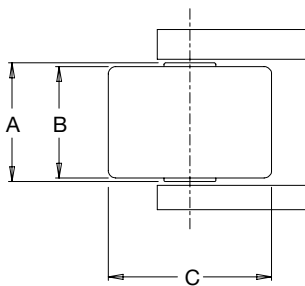
## Spread Design



## Ransburg Turn



## Roller Turn Rollers



|            |                | ROLLER DIMENSIONS |          |        |        |          |          |
|------------|----------------|-------------------|----------|--------|--------|----------|----------|
| CHAIN SIZE | TYPE AVAILABLE | TYPE O, R, S, M   |          |        | TYPE T |          |          |
|            |                | A                 | B        | C      | A      | B        | C        |
| 228        | O              | 1-1/2"            | 1-3/8"   | 2-1/8" | --     | --       | --       |
| 348        | O, R, S, M     | 2-1/8"            | 1-15/16" | 2-3/4" | --     | --       | --       |
| 458, 678   | O, R, S, M, T  | 2-3/4"            | 2-9/16"  | 2-3/4" | 2-3/4" | 2-21/32" | 2-13/16" |

Roller Turn Rollers are of heavy duty construction with the outer tread hardened for extra wear resistance. Five types are available. Each type is suitable for temperatures up to 250 degrees F except for Type M which is practical up to 750 degrees F.

**Type O** offers an *oiled* double row ball bearing. It is practical for low or medium speeds.

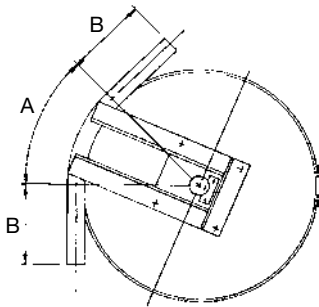
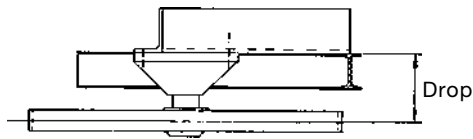
**Type R** offers a *regreasable* double row ball bearing with a seal for dust protection. It has a zerk type fitting for lubrication.

**Type S** contains a double row ball bearing permanently lubricated and sealed-for-life. It has a rubber *seal* to retain lubricants and keep out contaminants.

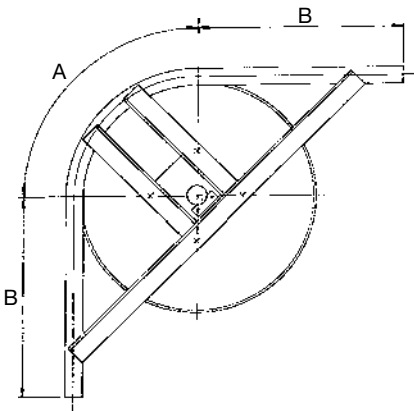
**Type T** contains a *tapered* roller bearing permanently lubricated and sealed-for-life. It has a rubber seal to retain lubricants and keep out contaminants.

**Type M** offers a *metalized* carbon bearing. It is suitable for temperatures up to 750 degrees F and requires no lubrication.

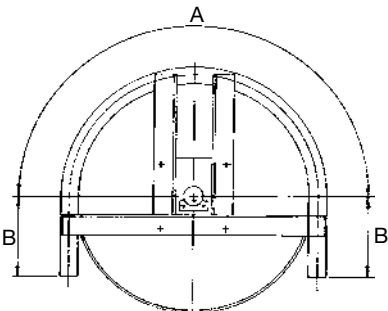
# Traction Wheel Turns



30, 45, 60 Degree Turns



90 Degree Turn



180 Degree Turn

| STANDARD TRACTION WHEEL TURNS FOR 2", 3", 4" AND 6" SYSTEMS |             |               |               |      |
|---|-------------|---------------|---------------|------|
| PITCH DIAMETER  | DEGREE TURN | "A" DIMENSION | "B" DIMENSION |      |
|   |             |               | 2", 4", 6"    | 3"   |
| 18"   | 30          | 0'-4-11/16"   | 1'0"          | 1'0" |
|   | 45          | 0'-7-1/16"    | 1'0"          | 1'0" |
|   | 60          | 0'-9-7/16"    | 1'0"          | 1'0" |
|   | 90          | 1'-2-1/8"     | 1'9"          | 2'3" |
|   | 180         | 2'-4-1/4"     | 1'0"          | 1'0" |
| 24"   | 30          | 0'-6-1/4"     | 1'0"          | 1'0" |
|   | 45          | 0'-9-7/16"    | 1'0"          | 1'0" |
|   | 60          | 1'-0-9/16"    | 1'0"          | 1'0" |
|   | 90          | 1'-6-7/8"     | 2'0"          | 2'6" |
|   | 180         | 3'-1-11/16"   | 1'0"          | 1'0" |
| 30"   | 30          | 0'-7-7/8"     | 1'0"          | 1'0" |
|   | 45          | 0'-11-3/4"    | 1'0"          | 1'0" |
|   | 60          | 1'-3-11/16"   | 1'0"          | 1'0" |
|   | 90          | 1'-11-9/16"   | 2'3"          | 2'9" |
|   | 180         | 3'-11-1/8"    | 1'0"          | 1'0" |
| 36"   | 30          | 0'-9-7/16"    | 1'0"          | 1'0" |
|   | 45          | 1'-2-1/8"     | 1'0"          | 1'0" |
|   | 60          | 1'-6-7/8"     | 1'0"          | 1'0" |
|   | 90          | 2'-4-1/4"     | 2'6"          | 3'0" |
|   | 180         | 4'-8-9/16"    | 1'0"          | 1'0" |
| 42"   | 30          | 0'-11"        | 1'0"          | 1'0" |
|   | 45          | 1'-4-1/2"     | 1'0"          | 1'0" |
|   | 60          | 1'-10"        | 1'0"          | 1'0" |
|   | 90          | 2'-9"         | 2'9"          | 3'3" |
|   | 180         | 5'-6"         | 1'0"          | 1'0" |
| 48"   | 30          | 1'-0-9/16"    | 1'0"          | 1'0" |
|   | 45          | 1'-6-7/8"     | 1'0"          | 1'0" |
|   | 60          | 2'-1-1/8"     | 1'0"          | 1'0" |
|   | 90          | 3'-1-11/16"   | 3'0"          | 3'6" |
|   | 180         | 6'-3-3/8"     | 1'0"          | 1'0" |
| 54"   | 30          | 1'-2-1/8"     | 1'0"          | 1'0" |
|   | 45          | 1'-9-3/16"    | 1'0"          | 1'0" |
|   | 60          | 2'-4-1/4"     | 1'0"          | 1'0" |
|   | 90          | 3'-6-7/16"    | 3'3"          | 3'9" |
|   | 180         | 7'-0-13/16"   | 1'0"          | 1'0" |
| 60"   | 30          | 1'-3-11/16"   | 1'0"          | 1'0" |
|   | 45          | 1'-11-9/16"   | 1'0"          | 1'0" |
|   | 60          | 2'-7-7/16"    | 1'0"          | 1'0" |
|   | 90          | 3'-11-1/8"    | 3'6"          | 4'0" |
|   | 180         | 7'-10-1/4"    | 1'0"          | 1'0" |
| 66"   | 30          | 1'-5-1/4"     | 1'0"          | 1'0" |
|   | 45          | 2'-1-15/16"   | 1'0"          | 1'0" |
|   | 60          | 2'-10-9/16"   | 1'0"          | 1'0" |
|   | 90          | 4'-3-3/16"    | 3'9"          | 4'3" |
|   | 180         | 8'-7-11/16"   | 1'0"          | 1'0" |
| 72"   | 30          | 1'-6-7/8"     | 1'0"          | 1'0" |
|   | 45          | 2'-4-1/4"     | 1'0"          | 1'0" |
|   | 60          | 3'-1-11/16"   | 1'0"          | 1'0" |
|   | 90          | 4'-8-9/16"    | 4'0"          | 4'6" |
|   | 180         | 9'-5-1/8"     | 1'0"          | 1'0" |

**NOTE:** Finger Guards (not shown) are required where roller turns and traction wheel turns are not guarded by location. Order separately.

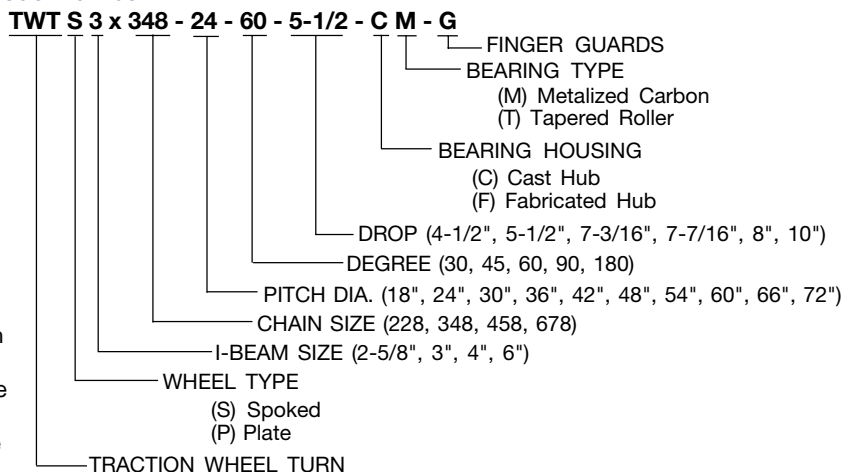
# Traction Wheel Turns

Traction Wheel Turns offer the most efficient means of maintaining chain and trolley alignment in horizontal turns. Because the chain rides the wheel around the turn, there is less chain wear. Chain pull is also reduced because there is less turning friction. In addition, maintenance costs are reduced as only one point of lubrication is required. While the initial cost is somewhat higher than Roller Turns, Traction Wheel Turns offer many long-term benefits.

Traction Wheel Turns are of two basic types: plate type or spoke type. Both types have a heavy rolled steel rim concentric with a bearing hub. Traction Wheel Turns with a pitch diameter over 48 inches are normally of the spoke type while pitch diameters of 48 inches or less are generally plate type. A heavy structural steel frame and an accurately rolled I-Beam track make up the complete unit.

A Spread Design for special requirements is available. Traction Wheel Turn sizes other than those listed are available on request.

## Model Number :

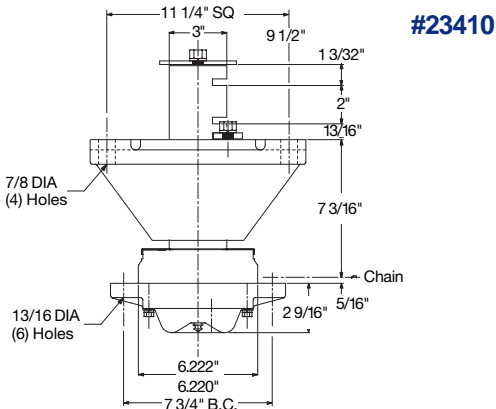


# Traction Wheel Hubs

## Bearing Housing

Omni Metalcraft Corp. offers two different designs to house the traction wheel bearings: a cast hub or a fabricated hub.

**Omni Cast Hub** - This type is for use with the plate type Traction Wheel Turn only. It provides an easy means of disassembling and replacing the hub and base without replacing the entire turn. This could also decrease system down-time.



**Fabricated Hub (not shown)** - This type can be used with the plate or spoke type Traction Wheel Turn. The shaft holding mechanism becomes a part of the heavy duty welded frame.

| PART # | TYPE   | WEIGHT | MAX. CAPACITY |
|--------|--|--------|---------------|
| 23410  | Tapered Roller Bearing                       | 135    | 8000 #        |
| 23626  | Metalized Graphite                           | 145    | 8000 #        |
| *40127 | Metalized Graphite Inverted Power & Free     | 135    | 8000 #        |
| *40562 | Tapered Roller Bearing Inverted Power & Free | 125    | 8000 #        |

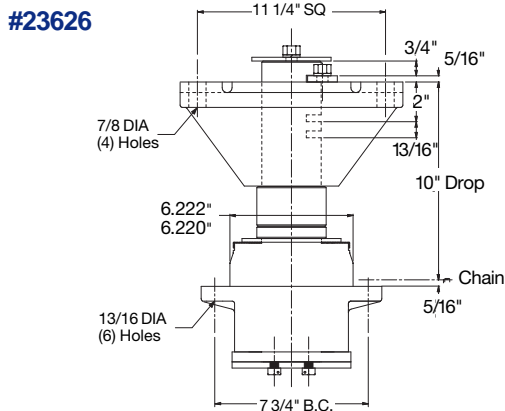
\*Contact our engineering department for specifications

## Traction Wheel Bearings

These two types of traction wheel bearings cover the vast majority of system requirements. Both types can be utilized with a cast hub or with a fabricated hub and are suitable for all speed ranges.

**Tapered Roller Bearings\*** - These Style T bearings are normally furnished as standard. They are suitable for operating temperatures up to 250 degrees F. This bearing design has a lubricant reservoir so that the bearing only has to be lubricated at extended intervals.

**Metalized Carbon Bearings** - These Style M bearings are designed for use in higher temperatures up to 750 degrees F. A typical application is where oven or washers are involved in the system.



Most Overhead Conveyor Systems require the use of a take-up unit to compensate for chain stretch, chain wear and thermal expansion or contraction. These devices maintain chain tension, reduce slack and ensure the smooth operation of the system. Only in rare cases can a take-up be omitted.

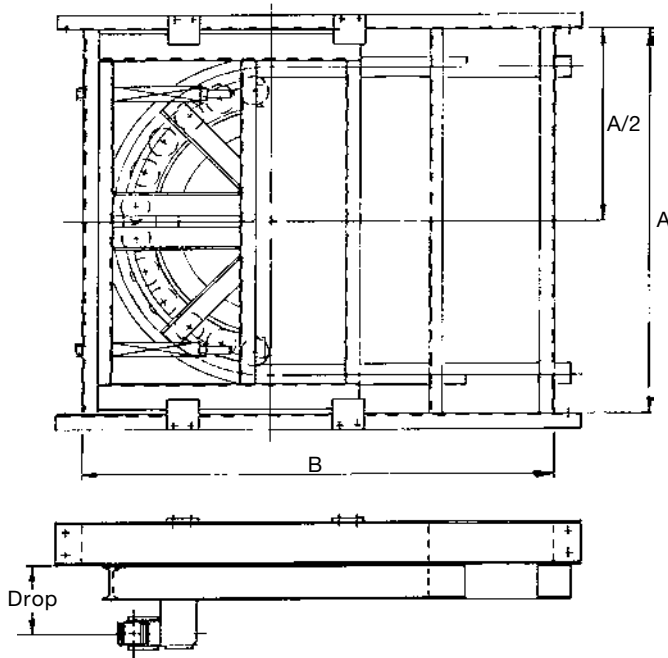
The best location for a take-up unit is usually at the lowest point in the system and immediately following the drive unit. This allows the take-up to assist in stripping the chain from the drive unit and to compensate for the slack chain frequently experienced at the bottom of a vertical drop.

While take-ups are available for both 90 and 180 degrees, the 180 degree turn is recommended for most purposes. These take-ups are also available in a spread design.

Take-ups are available with either the Roller Turn or Traction Wheel Turn type construction. Four "V" groove wheels provide true alignment for the floating frame section ensuring smooth trolley movement around the unit.

Omni Metalcraft Corp. offers four types of Conveyor Take-ups: Spring Type, Screw Type, Air Cylinder Type and Counter Weight Type.

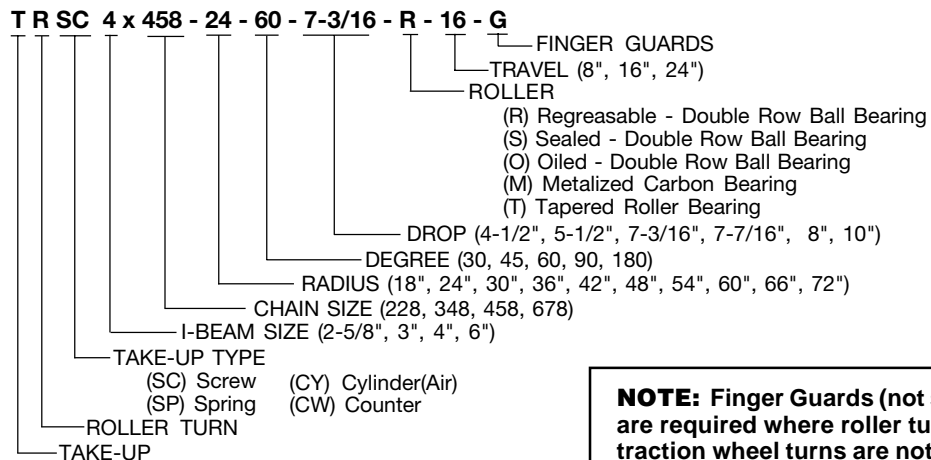
## Roller Turn Take-Up Assembly



| RADIUS | A      | B          |
|--------|--------|------------|
| 18"    | 3'-9"  | 4'-5-3/8"  |
| 24"    | 4'-9"  | 4'-11-1/2" |
| 30"    | 5'-9"  | 5'-5-1/2"  |
| 36"    | 6'-9"  | 5'-11-1/2" |
| 42"    | 7'-9"  | 6'-5-5/8"  |
| 48"    | 8'-9"  | 6'-11-5/8" |
| 60"    | 10'-9" | 7'-11-5/8" |
| 72"    | 12'-9" | 8'-11-5/8" |

**Note:** Dimensions listed are for an 8" travel take-up. Take-ups with 16" or 24" travel are also available.

### Model Number :



**NOTE:** Finger Guards (not shown) are required where roller turns and traction wheel turns are not guarded by location. Order separately.

# Lineshaft Driven Live Roller Conveyor

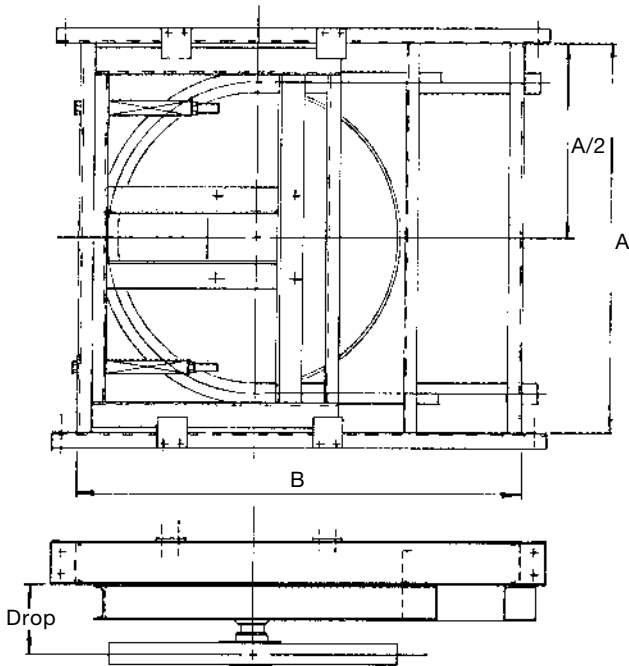
**Spring Type** - This is the most popular type. The springs provide automatic tension. They are best suited, however, for short chain travel distances.

**Screw Type** - This is the most economical on an initial cost basis, however, it requires inspection and manual adjustment of the chain tension on a fairly frequent basis to ensure proper chain tension. They are similar in design to the spring type.

**Air Cylinder Type** - These provide another means of ensuring chain tension over the full range of take-up travel without the need for manual adjustment and are well suited to applications requiring the maintenance of high chain tension over long travel distances. Pneumatic controls can be provided for easy adjustment of tension.

**Counter Weight Type** - These provide another means of automatically ensuring chain tension over any travel distance. They also have the advantage of allowing adjustable loading. The counter weights are normally supplied mounted directly on the take-up unit, although they can be separately mounted in a convenient area nearby if space permits.

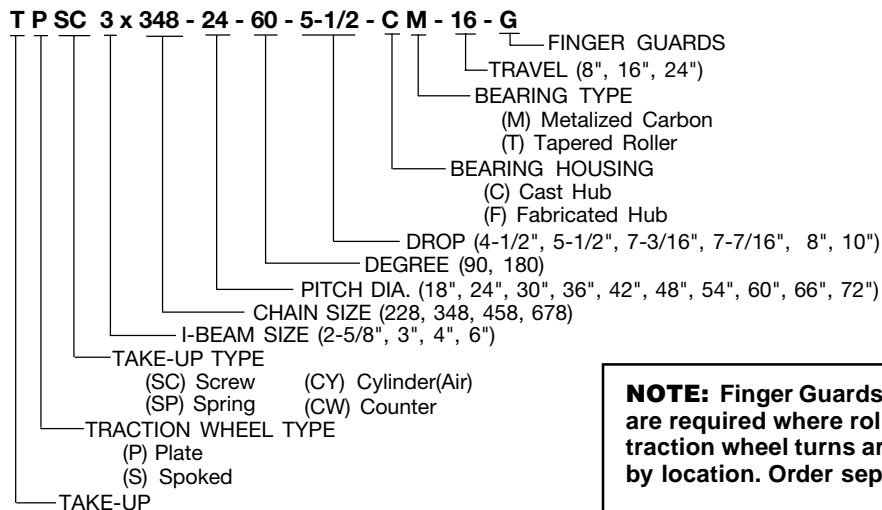
## Traction Wheel Take-Up Assembly



| PITCH DIAMETER | A     | B          |
|----------------|-------|------------|
| 24"            | 2'-9" | 3'-11-3/8" |
| 30"            | 3'-3" | 4'-2-3/8"  |
| 36"            | 3'-9" | 4'-5-3/8"  |
| 42"            | 4'-3" | 4'-8-1/2"  |
| 48"            | 4'-9" | 4'-11-1/2" |
| 54"            | 5'-3" | 5'-2-1/2"  |
| 60"            | 5'-9" | 5'-5-1/2"  |
| 72"            | 6'-9" | 5'-11-1/2" |

Note: Dimensions listed are for an 8" travel take-up. Take-ups with 16" or 24" travel are also available.

### Model Number :



**NOTE: Finger Guards (not shown) are required where roller turns and traction wheel turns are not guarded by location. Order separately.**

The selection of the correct drive or drives for an Overhead Conveyor System is one of the most important factors in developing a successful system. The drive not only powers the system, but it can also provide the desired speed, speed range, speed control, reversibility or other special characteristics desired in the system.

Omni Metalcraft Corp. offers two basic types of drives: a Caterpillar Drive and a Sprocket Drive. Each has its own advantages and can be adapted to fit a wide range of requirements.

## Caterpillar Drives

This type of drive has the advantage that it can be located in a straight run of conveyor track. This permits the installation at any point in the system, which is a particular advantage for multiple drive applications. This type is also more practical where mixes of old and new chain are to be used, as when a system is revised or expanded. A caterpillar drive is solidly constructed throughout for long, durable operation and is supplied either as a right-hand or left-hand unit. It drives the chain by means of "driving dogs" that engage the links of the chain to provide the driving force. This is available in two basic types: a floating frame or a fixed frame.

**Floating Frame** - This design has an inner frame which is spring-loaded and "floats" or "travels" within the fixed frame to adjust for changes in the chain pull. In case of excessive chain pull, the floating frame trips a limit switch which shuts off the drive preventing damage to the chain components. The drive can then be easily restarted after the source of the malfunction is eliminated.

**Fixed Frame** - This design, as stated, has a fixed "non-floating" frame. It is furnished with a shear hub to protect your system in case of excessive chain pull.

## Sprocket Drives

These drives are designed for installation at a horizontal turn and can be used to replace one turn in the system. They are lower in initial cost. The drive powers the chain by means of a sprocket which directly engages with the conveyor chain. They are available for 90 or 180 degree turns as required and furnished with fixed frames only.

## Speed Controls

There are various options available to complete the power train of the drive depending on the speed, speed range and control characteristics desired for the system.

A fixed-ratio **V Belt Drive** is most commonly used for constant speed applications, particularly on single drive systems where no speed adjustment is required. They are an economical answer to this need.

Where variation in conveyor speed is desired, particularly for balancing drives where multiple drives are involved that require "synchronizing" the system, a number of choices are available. Most popular is the **Variable Speed Motor Pulley Drive** which allows a 3:1 variation in conveyor speed.

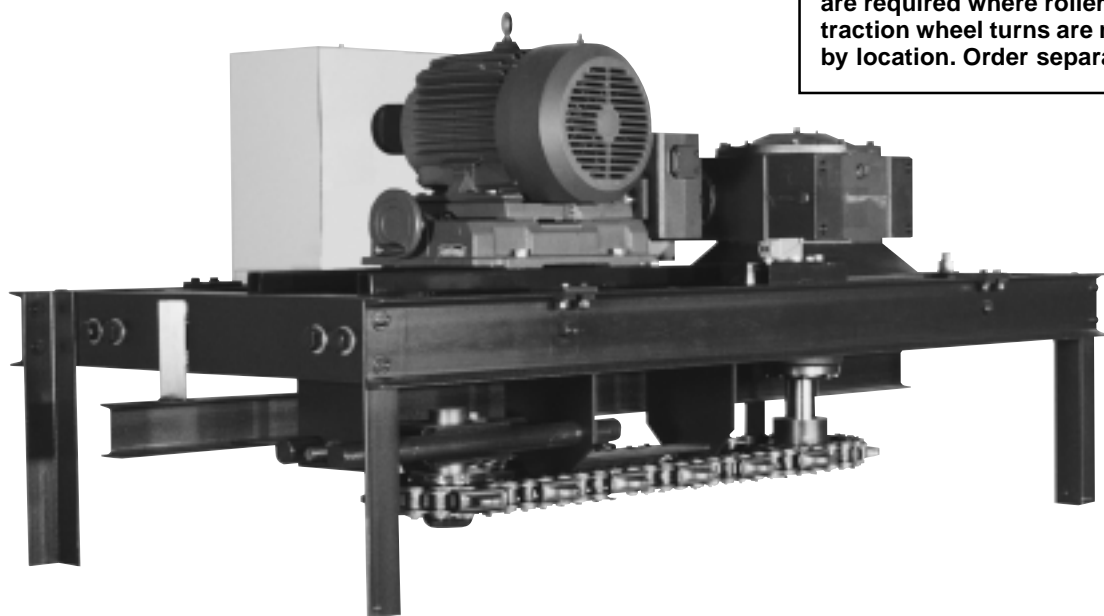
Also available are variable mechanical transmissions, hydraulic motors, DC compound wound motors and variable frequency AC controllers. These can all be provided with remote and/or automatic speed controls.

## Application Help

Because of the wide variations in the types of drives involved, it may be desirable to discuss your requirements with our engineers to determine the type best suited to your needs.

The table on the following page gives dimensional data and chain pull capacity ratings for our Caterpillar Drives.

## Typical Floating Caterpillar Drive

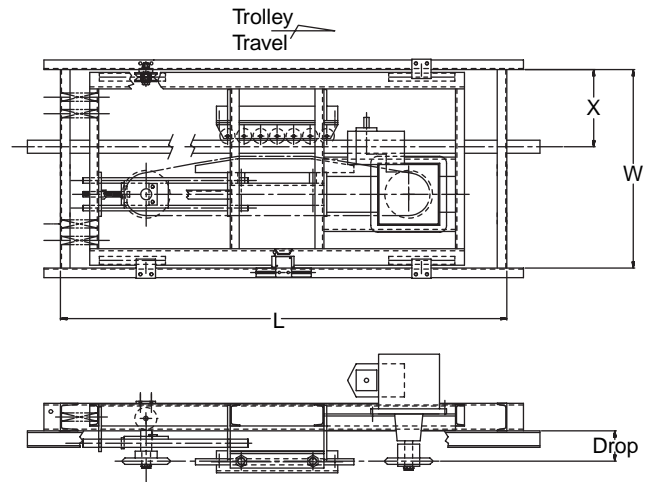


**NOTE: Finger Guards (not shown) are required where roller turns and traction wheel turns are not guarded by location. Order separately.**



## When Ordering a Caterpillar Drive, Specify:

- Fixed or floating frame
- Chain pull
- Conveyor speed in feet per minute
- I-Beam and chain size
- Drop
- Constant or variable speed
- Right hand or left hand



**RIGHT HAND  
DRIVE ILLUSTRATED**

| DRIVE SIZE | CHAIN PULL CAPACITY | I-BEAM SIZE | FRAME DIMENSIONS |       |       |
|------------|---------------------|-------------|------------------|-------|-------|
|            |                     |             | L                | W     | X     |
| 30         | 600 Lbs.            | 3" & 4"     | 6'-9"            | 3'-0" | 1'-2" |
| 35         | 900 Lbs.            | 3" & 4"     | 6'-9"            | 3'-0" | 1'-2" |
| 40         | 1200 Lbs.           | 3" & 4"     | 6'-9"            | 3'-0" | 1'-2" |
| 50         | 1800 Lbs.*          | 3"          | 6'-9"            | 3'-0" | 1'-2" |
| 50         | 2200 Lbs.           | 4"          | 6'-9"            | 3'-0" | 1'-2" |
| 60         | 3000 Lbs.           | 4" & 6"     | 7'-1 1/8"        | 3'-5" | 1'-4" |
| 70         | 3950 Lbs.           | 4" & 6"     | 7'-1 1/8"        | 3'-5" | 1'-4" |

\* Chain size is limiting factor      Specifications subject to change.

## Caterpillar Drive Selection Chart

This chart should be used after the required chain pull and speed have been determined. It applies to fixed and floating frame caterpillar drives. Cross reference the chain pull required with the chain speed required (FPM) to locate the appropriate motor size. (Horsepower - RPM)

| CATERPILLAR DRIVE SELECTION CHART |   |   |  |   |   |   |        |   |               |       |
|-----------------------------------|---|---|--|---|---|---|--------|---|---------------|-------|
| REDUCER RATIO                     | 600# PULL<br>3" & 4" I<br>Size 230<br>Reducer | 900# PULL<br>3" & 4" I<br>Size 232<br>Reducer | 1200# PULL<br>3" & 4" I<br>Size 242<br>Reducer | 1800# PULL<br>3" I<br>Size 252<br>Reducer | 2200# PULL<br>4" I<br>Size 252<br>Reducer | 3000# PULL<br>4" & 6" I<br>Size 2600<br>Reducer | FPM    | 3950# PULL<br>4" & 6" I<br>Size 2700<br>Reducer | REDUCER RATIO |       |
| 1000:1                            | 1/4-1750                                      | 1/4-1750                                      | 1/4-1750                                       | 1/3-1750                                  | 1/2-1750                                  | 1/2-1750  | 2      | 3/4-1750  | 1500:1        |       |
|                                   | 1/4-1750                                      | 1/3-1750                                      | 1/2-1750                                       | 1/2-1750                                  | 3/4-1750                                  | 3/4-1750  | 3      | 1-1750  |               |       |
| 600:1                             | 1/4-1750                                      | 1/3-1750                                      | 1/2-1750                                       | 3/4-1750                                  | 3/4-1750                                  | 1-1750  | 4      | 1-1/2-1750                                      |               |       |
|                                   | 1/3-1750                                      | 1/2-1750                                      | 1/2-1750                                       | 3/4-1750                                  | 1-1750                                    | 1-1/2-1750                                      | 5      | 1-1/2-1750                                      |               |       |
|                                   | 1/3-1750                                      | 1/2-1750                                      | 3/4-1750                                       | 1-1750                                    | 1-1750                                    | 1-1/2-1750                                      | 6      | 2-1750  |               |       |
| 300:1                             | 1/3-1750                                      | 1/2-1750                                      | 3/4-1750                                       | 1-1750                                    | 1-1750                                    | 1-1/2-1750                                      | 7      | 2-1750  |               | 400:1 |
|                                   | 1/2-1750                                      | 3/4-1750                                      | 3/4-1750                                       | 1-1750                                    | 1-1/2-1750                                | 1-1/2-1750                                      | 8      | 2-1750  |               |       |
|                                   | 1/2-1750                                      | 3/4-1750                                      | 3/4-1750                                       | 1-1/2-1750                                | 1-1/2-1750                                | 2-1750  | 9      | 3-1750  |               |       |
|                                   | 1/2-1750                                      | 3/4-1750                                      | 3/4-1750                                       | 1-1/2-1750                                | 1-1/2-1750                                | 2-1750  | 10     | 3-1750  |               |       |
| 3/4-1750                          | 1-1750  | 1-1750  | 1-1/2-1750                                     | 2-1750                                    | 3-1750                                    | 12  | 3-1750 |   |               |       |
| 3/4-1750                          | 1-1750  | 1-1/2-1750                                    | 1-1/2-1750                                     | 2-1750                                    | 3-1750                                    | 15  | 5-1750 | 200:1   |               |       |
| 150:1                             | 3/4-1750                                      | 1-1/2-1750                                    | 1-1/2-1750                                     | 3-1750                                    | 3-1750                                    | 5-1750  | 20     |   | 5-1750        |       |
| 150:1                             | 1-1750  | 1-1/2-1750                                    | 2-1750   | 3-1750                                    | 3-1750                                    | 5-1750  | 23     |   | 5-1750        |       |
| 150:1                             | 1-1750  | 1-1/2-1750                                    | 2-1750   | 3-1750                                    | 3-1750                                    | 5-1750  | 25     |   | 5-1750        |       |
| 75:1                              | 1-1750  | 1-1/2-1750                                    | 2-1750   | 3-1750                                    | 3-1750<br>1930# Pull                      | 5-1750  | 30     | 5-1750  | 100:1         |       |
|                                   | 1-1/2-1750                                    | 1-1/2-1750<br>700# Pull                       | 2-1750<br>1100# Pull                           | 3-1750<br>1650# Pull                      | 3-1750<br>1650# Pull                      | 5-1750  | 35     | 7-1/2-1750                                      |               |       |
|                                   | 1-1/2-1750                                    | 1-1/2-1750<br>690# Pull                       | 2-1750<br>960# Pull                            | 3-1750<br>1440# Pull                      | 3-1750<br>1440# Pull                      | 7-1/2-1750                                      | 40     | 7-1/2-1750                                      |               |       |

Notice that a lower chain pull may accompany the motor size. This happens when the horsepower required to achieve the specified chain pull and speed yields a motor too large for the reducer. Decreasing the motor size to fit the reducer thus also decreases chain pull available.

An overhead conveyor system adds a high level of versatility to the work area. It is especially useful for utilizing normally unused plant space above the actual work area. An overhead system is also helpful for handling heavy loads or odd-shaped items and it is easily modified. It can be incorporated into procedures such as heat treating or painting.

Things to consider in the preliminary overhead system path layout, especially at load and unload points, are aisles in the work place, and any obstructions such as vertical beams and equipment.

**Determine the Type of Carried** - The type of carrier is dependant upon the size of the load being carried. Special types of carriers can be fabricated to meet specific needs.

**Plan the Material Flow** - The speed at which the conveyor will operate is calculated as follows:

$$\text{Conveyor Speed} = \frac{\text{Parts Per Hour} \times \text{Carrier Spacing}}{\text{FPM} \quad 60 \times \text{Parts Per Carrier}}$$

A typical range where loading and unloading is utilized is 10 FPM minimum to 25-30 FPM maximum. The speed also determines the type of drive(s) needed.

Consider the conditions under which the system will operate. This includes the amount of dirt and heat involved, paint or chemical contamination and the accessibility for lubrication or other factors which would have important bearing on the types of components to be used. This is particularly true in the selection of the type of trolleys, turns and bearings required.

**Consider Other Factors & Options** - the number of lifts and drops, the amount of friction, and the possible need for expansion joints are examples of other factors to consider. Options needed may be safety devices for uphill or downhill applications, guards or drip pans.

**Choose the Horizontal and Vertical Curves** - Based on the size of load and desired carrier spacing, determine the best radii for the horizontal and vertical curves. Tables A & B show the minimum radii recommended based on trolley spacing. It is best to use more than the minimum radii for curves. This will give smoother system operation with less friction and wear in the system.

**TABLE A**

Minimum Recommended Horizontal Turn for Trolley Centers

| CHAIN SIZE | TROLLEY C/C | ROLLER TURN | TRACTION WHEEL |
|------------|-------------|-------------|----------------|
| 228        | 8"          | 12" Radius  | 18" P.D.       |
| 228        | 12"         | 12" Radius  | 18" P.D.       |
| 228        | 16"         | 12" Radius  | 18" P.D.       |
| 228        | 20"         | 12" Radius  | 24" P.D.       |
| 228        | 24"         | 18" Radius  | 30" P.D.       |
| X348       | 6"          | 12" Radius  | 24" P.D.       |
| X348       | 12"         | 12" Radius  | 24" P.D.       |
| X348       | 18"         | 12" Radius  | 24" P.D.       |
| X348       | 24"         | 18" Radius  | 30" P.D.       |
| X348       | 30"         | 18" Radius  | 36" P.D.       |
| X458       | 8"          | 12" Radius  | 24" P.D.       |
| X458       | 16"         | 18" Radius  | 24" P.D.       |
| X458       | 24"         | 18" Radius  | 30" P.D.       |
| X458       | 32"         | 24" Radius  | 36" P.D.       |
| X678       | 12"         | 18" Radius  | 36" P.D.       |
| X678       | 24"         | 24" Radius  | 42" P.D.       |
| X678       | 36"         | 36" Radius  | 48" P.D.       |

**TABLE B**

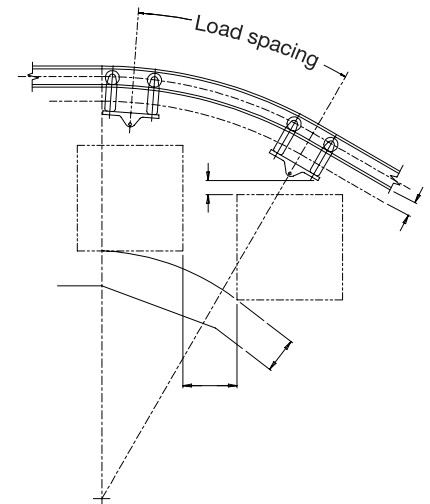
Minimum Recommended Radii for Vertical Curves Based on Trolley Spacing and System Chain Size

| 228     |        | 348     |        |
|---------|--------|---------|--------|
| SPACING | RADIUS | SPACING | RADIUS |
| --      | --     | 12"     | 5'-0"  |
| 8"      | 4'-0"  | 18"     | 6'-0"  |
| 20"     | 6'-0"  | 24"     | 8'-0"  |
| 24"     | 8'-0"  | 30"     | 10'-0" |
| 458     |        | 678     |        |
| SPACING | RADIUS | SPACING | RADIUS |
| 8"      | 5'-0"  | --      | --     |
| 16"     | 6'-0"  | 12"     | 12'-0" |
| 24"     | 8'-0"  | 18"     | 15'-0" |
| 32"     | 10'-0" | 24"     | 20'-0" |

**Review the Path Layout** - Be sure there is a free flow of the material along the desired path. On any horizontal or vertical curves there should be a straight stretch of track at least equal to one trolley spacing between horizontal and vertical changes of direction to ensure proper chain alignment.

**Select the Drive and Take-up Location** - A high point in the system for the drive immediately preceding a vertical fall will help strip slack chain from the drive unit. The take-up unit should be located at the low point of the system, following the drive, in order to take up the slack chain at this point.

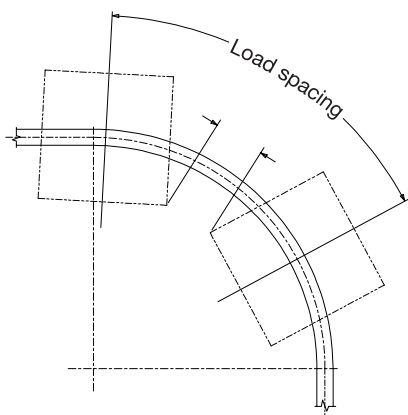
### Load Clearance At Vertical Curves



**Figure the Total Chain Pull** - One means of figuring the chain pull is the total moving load method described on the following page. This also helps determine the size of chain needed or the need for additional drives.

**Total Moving Load Method** - This can help indicate whether a second drive may be needed, but it is most suitable for simple systems involving only one drive and with less than 18 changes in direction. On a more complicated system, a point-to-point analysis may be needed.

## Load Clearance At Horizontal Curves



The Total Moving Load Method is calculated by multiplying the loaded length of conveyor by the weight per foot of the loaded section. Then take the unloaded length and multiply by the unloaded weight in pounds per foot. The sum of the two yields the Total Moving Load. Multiply the Total Moving Load (TML) by a friction factor, as given in Table C, based on the type of trolley, chain and track selected. In the example used, the friction factor is .025. This will give the total pounds of load pull required for the basic system.

Where vertical rises and drops are involved in the system, consider the lift load involved. This is the total force in pounds required to elevate a moving load to the top of a vertical curve. This can be calculated for individual curves by multiplying the lift height (in feet) by the weight per foot of the moving load.

In many cases this load will be cancelled out by a counter balancing fall of the moving load.

It is only when there is an unbalanced moving load, such as when the unloading point is at the top of a vertical curve or when an unloaded

conveyor is started up that this load need be considered. In the example shown, a load of this type is included.

The result of these calculations provides the Total Chain Pull on the system. This can then be checked against the strength of the size chain selected (Table D, page 298) to see if this size is adequate for the chain pull required, or if another size chain or a second drive might be needed to share the load. An ample safety factor is usually included to allow for jerking or other factors. Table D also shows the maximum recommended chain length per drive.

## Example

$$\text{Conveyor length loaded} \times \text{lbs./ft.} = 325 \text{ ft.} \times 85 \text{ lbs./ft.} = 27,625 \text{ lbs.}$$

$$\text{Conveyor length unloaded} \times \text{lbs./ft.} = 340 \text{ ft.} \times 12.6 \text{ lbs./ft.} = 4,284 \text{ lbs.}$$

$$\text{Total Moving Load (TML)} = 31,909 \text{ lbs.}$$

$$\text{TML (Total Moving Load)} \times \text{friction factor } .025 = 798 \text{ lbs.}$$

$$\text{Lift Load} = \text{Live load per foot} \times \text{lift height} = 85 \text{ lbs./ft.} \times 5 \text{ ft.} = 425 \text{ lbs.}$$

$$\text{Total Chain Pull} = 1,223 \text{ lbs.}$$

### TABLE C

Additional Chain Pull Due to Trolley Friction (%)

| TROLLEY | TRACK AND CHAIN SIZE | TOTAL MOVING LOAD FACTOR (%) |
|---------|----------------------|------------------------------|
| 2"      | 2-5/8"1,228          | .035                         |
| 3"      | 3"1,348              | .030                         |
| 4"      | 4"1,458              | .025                         |
| 6"      | 6"1,458              | .020                         |
| 6"      | 6"1,678              | .020                         |

# Operating Conditions

## Condition A (Ideal)

- Not more than about 20 turns and dips combined per drive.
- No severe heat or atmospheric conditions.
- Good radii of roller turns and vertical curves.
- Speed under 120 FPM, good lubrication and maintenance.

## Condition B (Average)

- Heat up to 250 degrees F but no severe atmospheric conditions.
- Good lubrication and general maintenance.

## Condition C (Severe)

- Requires special analysis of chain pull (such as where horizontal and vertical curves may be minimum allowable radius).
- System with many turns and dips.
- Heavy individual loads or high lift loads.
- Severe atmospheric conditions, such as heat over 250 degrees F, dusty or dirty conditions (such as in a foundry) or use in unprotected outside building (cold, rust conditions, etc.).

**TABLE D**  
Selection Factors for Overhead Trolley Conveyor  
Standard Drop Forged Heat Treated Rivetless Chain

| TYPE OF CHAIN                               | 228  | 348         | 458         | 678         |
|---|--|-------------|-------------|-------------|
| Nominal Pitch                               | 2.000  | 3.015       | 4.031       | 6.031       |
| Pin Diameter                                | 1/4"   | 1/2"        | 5/8"        | 7/8"        |
| Wt. per Foot                                | 0.8 lbs.   | 2.3 lbs.    | 3.1 lbs.    | 6.5 lbs.    |
| Ultimate Strength                           | 6,000 lbs.                                       | 24,000 lbs. | 48,000 lbs. | 85,000 lbs. |
| Working Load Straight Line Pull             |  |             |             |             |
| --Maximum                                   | 750 lbs.   | 3,200 lbs.  | 7,000 lbs.  | 12,000 lbs. |
| --Recommended                               | 600 lbs.   | 2,400 lbs.  | 4,800 lbs.  | 8,500 lbs.  |
| Maximum Recommended Chain Tension           |  |             |             |             |
| Condition A - Ideal                         | 600 lbs.   | 2,000 lbs.  | 3,300 lbs.  | 6,000 lbs.  |
| Condition B - Average                       | 400 lbs.   | 1,400 lbs.  | 2,200 lbs.  | 4,000 lbs.  |
| Condition C - Severe                        | To be determined by analysis of individual jobs. |             |             |             |
| Maximum Recommended Chain Length per Drive* |  |             |             |             |
| Condition A - Ideal                         | 450 ft.  | 1,500 ft.   | 2,000 ft.   | 2,500 ft.   |
| Condition B - Average                       | 450 ft.  | 1,500 ft.   | 2,000 ft.   | 2,500 ft.   |
| Condition C - Severe                        | To be determined by analysis of individual jobs. |             |             |             |

\* If factors like slow speed (around 10 FPM), small horizontal or vertical curve radii, or high chain tension are present which cause surge, these lengths will have to be reduced.

# Safety Factors

## Safety

- It is the responsibility of the systems engineers, installers, and owner to insure that the final conveyor system configuration\* meets the safety standards as set forth by CEMA and ANSI standards and as required by OSHA. This may very well entail special guarding in addition to standard guarding available from Omni Metalcraft.
- Omni Metalcraft Corp. is the supplier of quality components only.

\*Reference C.E.M.A. #201 and A.S.M.G. B20.1