Conductor Bar Manual

8-Bar

CONDUCTIX wampfler

DELACHAUX GROUP

Conductix Incorporated

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1.0 Safety

SAFETY WARNINGS

Disconnect Power and follow all lock-out tag-out procedures as described in Appendix A of OSHA Section 1910.147.

All personnel must practice strict adherence to both local and national safety procedures, codes, regulations, and ordinances.

All personnel installing a power rail system should be familiar with the layout details and the component locations.

Warning: The law recognizes that electrical energy as commonly utilized in industrial and transit operations is dangerous and capable of causing serious damage, injury or death. Requirements governing the handling and use of electricity, some general and some very specific and detailed, are found in various statutes like the **Workmen's Compensation Acts, Employer's Liability Acts, National Electrical Safety Code** (U.S. Dept. of Commerce), **Occupational Safety and Health Administration** (OSHA), etc. and city or local ordinances. When using electrical power, the law imposes the general obligation to use care to protect against accidental injury or damage to properties.

2.0 Installation Notes

GENERAL NOTES

Required Hand Tools

Torque Wrench
Socket Wrench Set
Small Ball Peen Hammer
Hacksaw
Screwdriver Set
3/8" Drill & Drill Bit Set
Small File Set

All Installations

Conductor Bar should be stored overnight in the installation environment to assure that all bar has equalized to the ambient air temperature. The bar must be installed with a relatively uniform temperature to allow proper gaging of the expansion section gap setting.

Standard Mounting

Conductix-Wampfler-Bar is typically installed with bar profile oriented vertically and the collector shoe entering from the bottom.
Installations that operate in a wet or dirty atmosphere or corrosive environment must be vertically mounted.

Lateral Mounting

Some installations require the collector shoe to enter from the side. Conductix-Wampfler-Bar can be adapted to this configuration when required. Consult the factory for further assistance.

Nomenclature

Anchor Tight: The clamping force required to overcome movement due to the heating and cooling of the conductor bar.

Sliding Tight: The clamping force required to hold the bar in place while allowing movement due to the heating and cooling of the conductor bar. Plastic and Steel Snap-In Hangers are both designed to provide a sliding tight fit.

All conductor bar that is not specified to be anchor tight must be installed sliding tight to assure reliable operation.

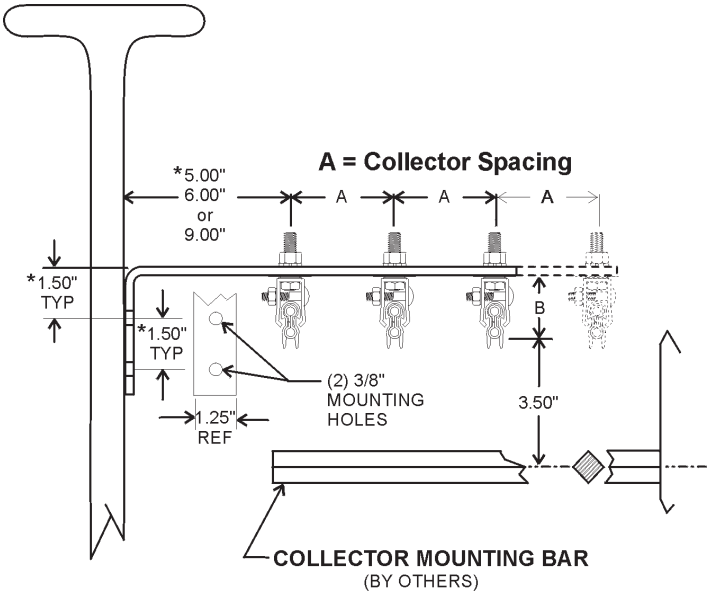
Additional Information

Any questions regarding the installation or use of Conductix-Wampfler-Bar that are not addressed in this manual can be answered by Conductix-Wampfler Engineering.
Contact the factory: **800-521-4888**

3.0 Typical installation

1.0 Typical Installations

A. Standard Vertical Mounting We Brackets



"A" - Hanger/Conductor Bar Spacing

3" Recommended

2" Minimum (Collectors Adjacent).

1-1/2" Minimum (Collectors Staggered).

3" or 4" when Pickup Guides are used.

2" Minimum in systems with curves.

2" Minimum (Insulated Hangers).

"B" - Support to Contact Surface

1-3/4" Plastic Snap-In, Cross-Bolt and Anchor Clamp w/ Spacer.

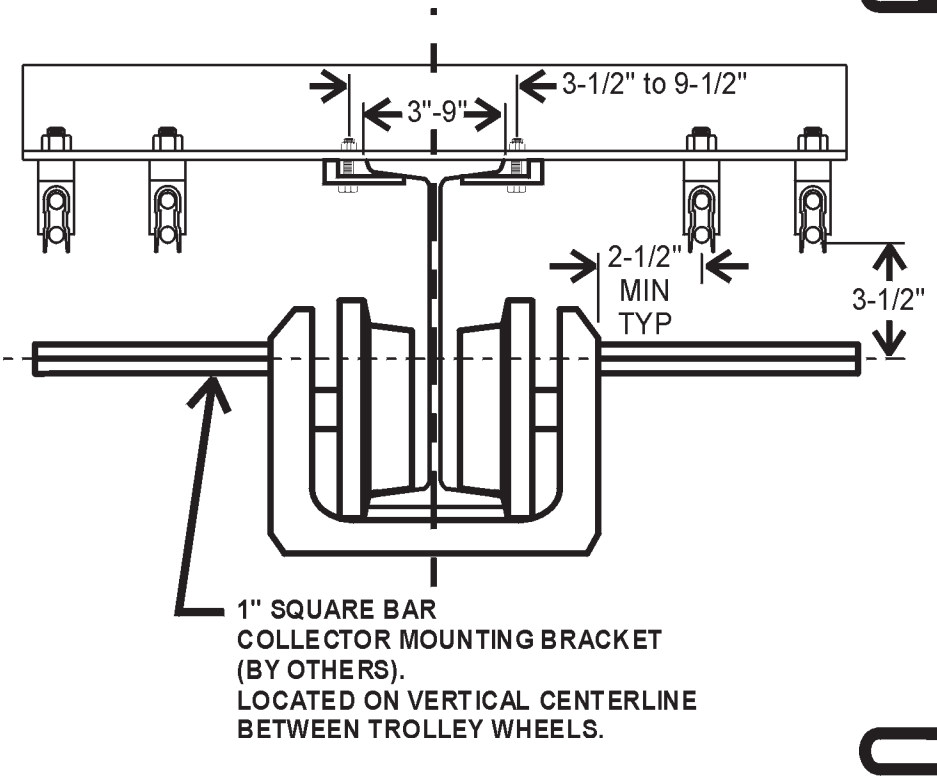
1-3/8" Steel Snap-In and Anchor w/o Spacer

** For Hangers with Insulators
Add 1" to above dimensions.

*Note: Mounting Dimensions Depend on Bracket used in Installation

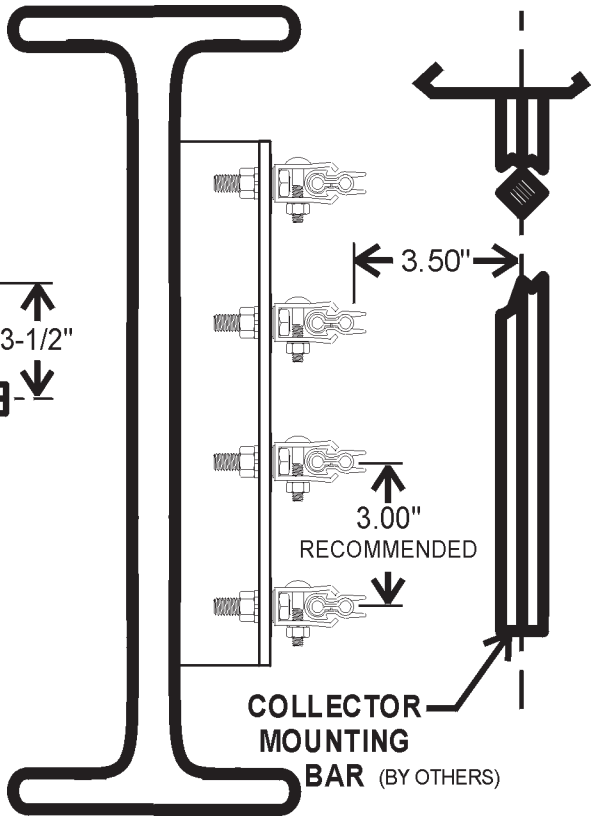
B. Standard Monorail / Underhung Crane Application

- Flange Brackets



C. Lateral Mounting

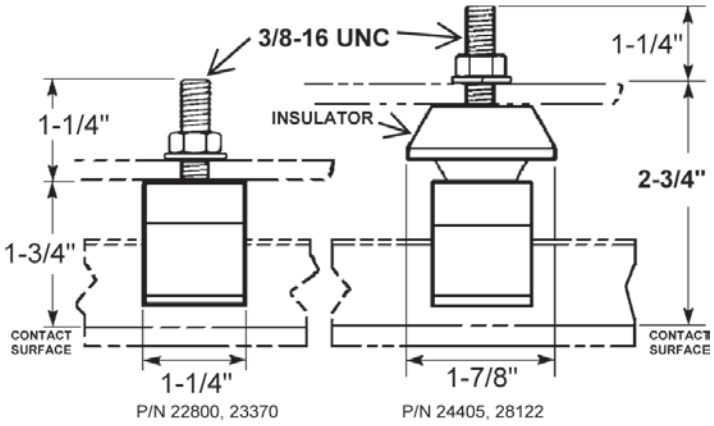
(Not recommended for wet or dirty environments.)



3.0 Typical Installations

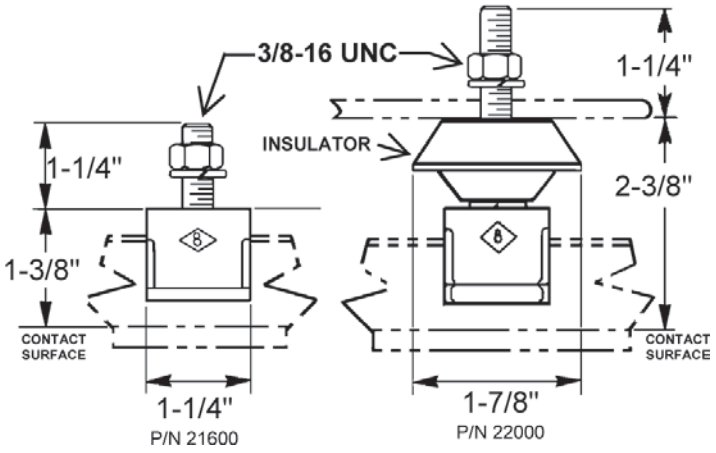
Plastic Snap-In Hanger Clamps

(not recommended for lateral mount or curves)

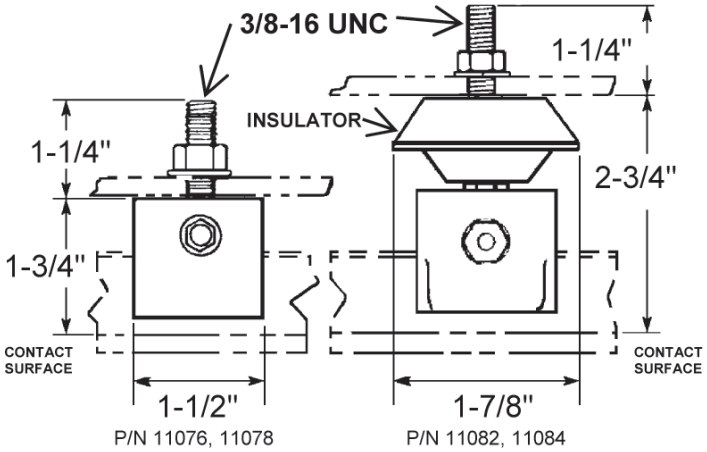


Steel Snap-In Hanger Clamps

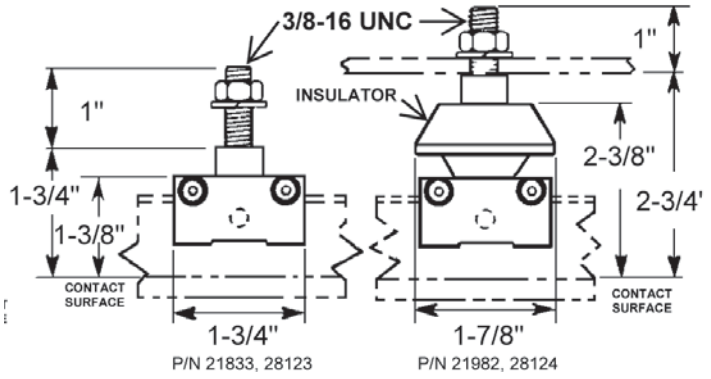
(not recommended for lateral mount or curves)



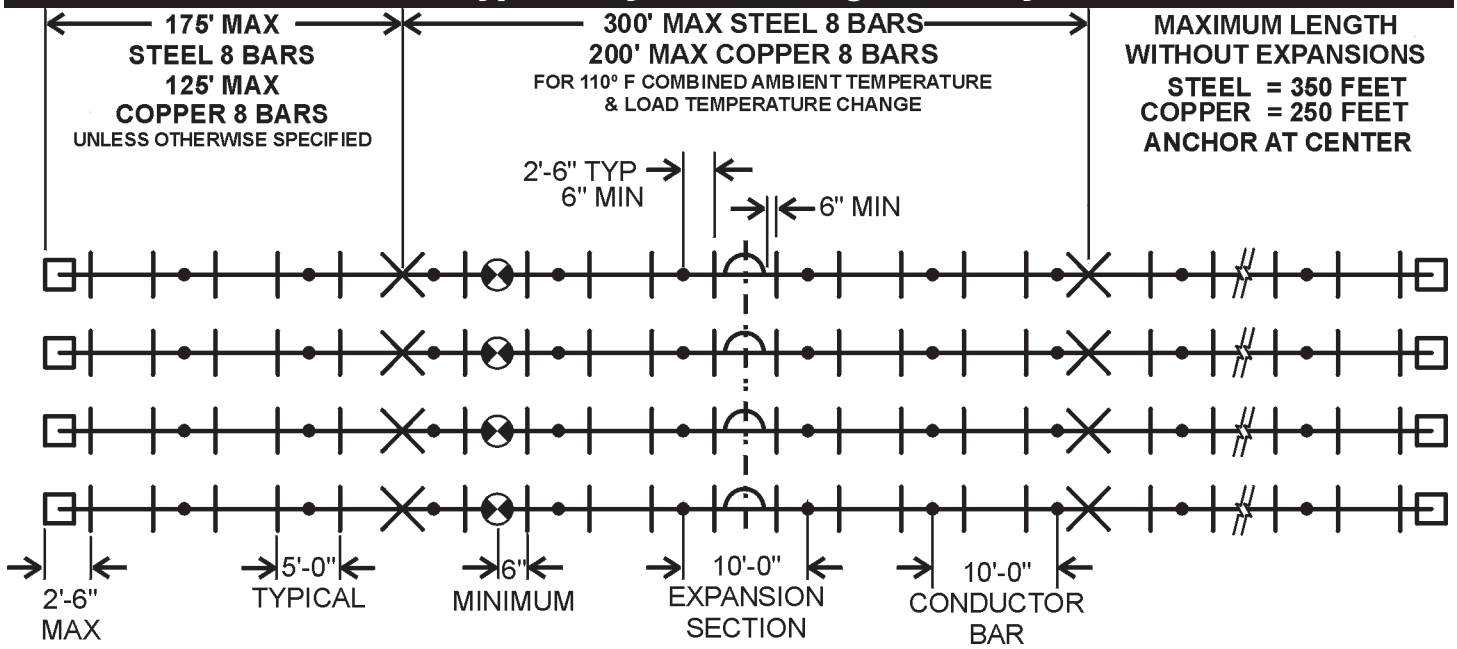
Cross-Bolt Hanger Clamps



Anchor Clamps



4.0 Typical Layout for Straight Runways



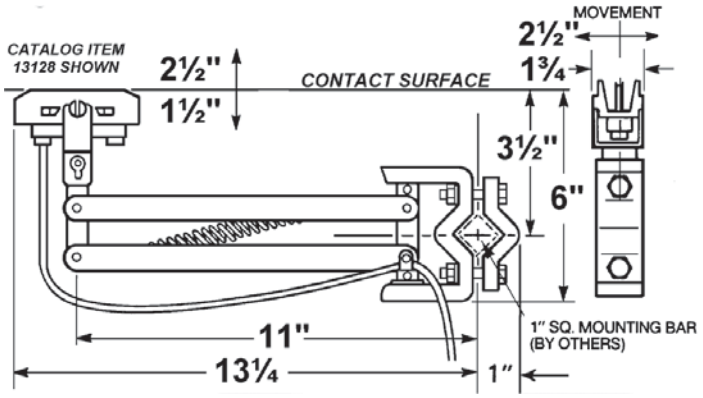
This information applies only to straight bottom entry runway installations of conductor bar. Installations that include curved sections require special consideration. Please contact the factory for assistance.

END COVER | HANGER | POWERFEED
EXPANSION SECTION | ANCHOR POINT | SPLICE JOINT

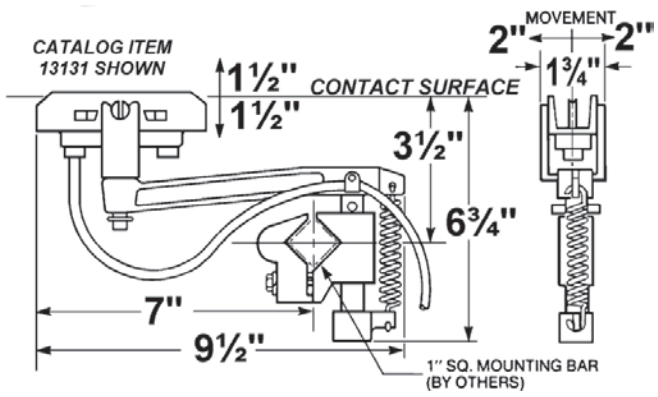
5.0 Typical Collector Mounting

Standard Vertical Mount

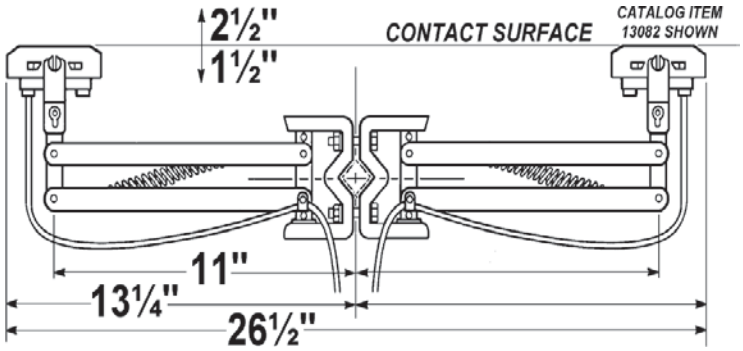
"C" Base, Standard Mount



"H" Base, Standard Mount

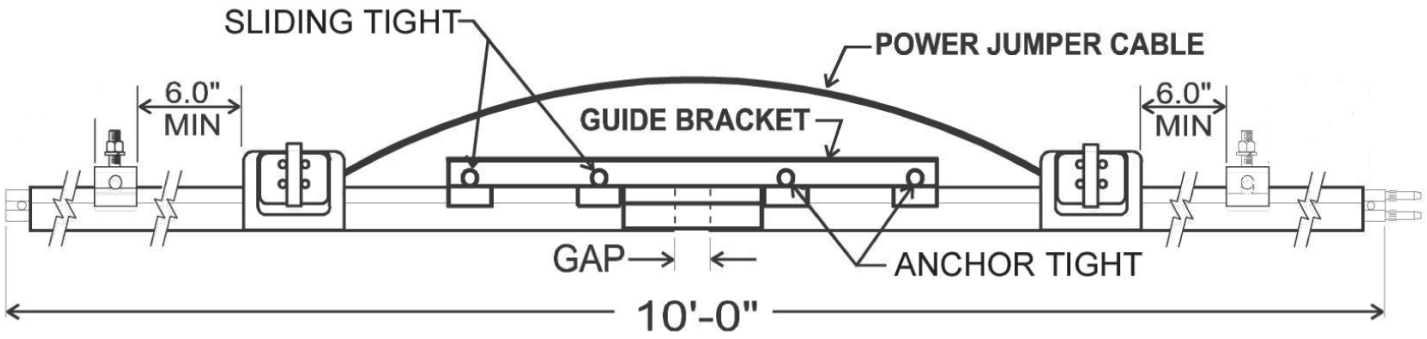


"C" Base, Tandem Mount



Torque mounting hardware to 8 - 10 ft lbs.

6.0 Typical Expansion Gap & Anchoring Requirements



Installation of Expansion Sections.

Expansion Sections are installed in the same manner as standard 10' Sections of Conductor Bar. See Step 2.

Expansion Sections are shipped with two guide bracket clamps secured anchor tight and the other two guide bracket clamps at sliding tight. Note that the anchor tight side is the side with the pin installed at the end of the bar. (Refer to above picture). After installation, set the expansion gap according to the table below. Tighten the two sliding tight guide bracket clamps to anchor tight. Note that the ones to be tightened are on the side without the pin at the end of the conductor bar. Proceed with installation of the remaining conductor bars.

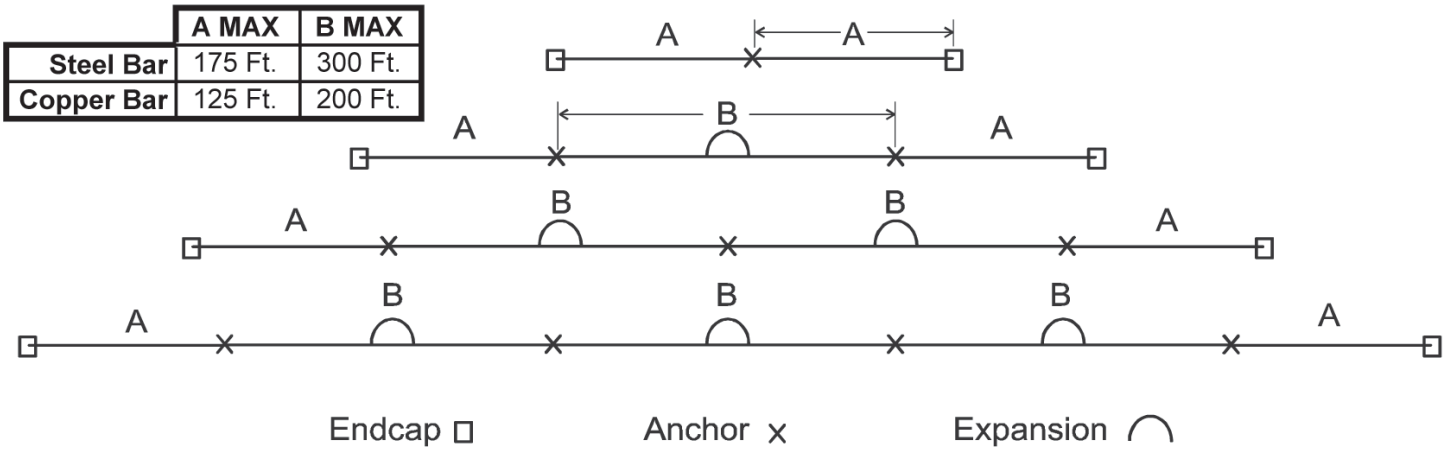
IMPORTANT: After all conductor bars have been installed, loosen the two clamp bolts on side of guide bracket which was tightened to anchor tight (as done above) on all expansion sections to sliding tight. Recheck the expansion gap after installation and adjust if necessary.

6.0 Typical Expansion Gap & Anchoring Requirements

Expansion & Anchor Location Diagram

Location of expansion sections is critical for proper functioning of the system.
Follow installation drawing or, if no drawing is available, refer to below diagram.

	A MAX	B MAX
Steel Bar	175 Ft.	300 Ft.
Copper Bar	125 Ft.	200 Ft.

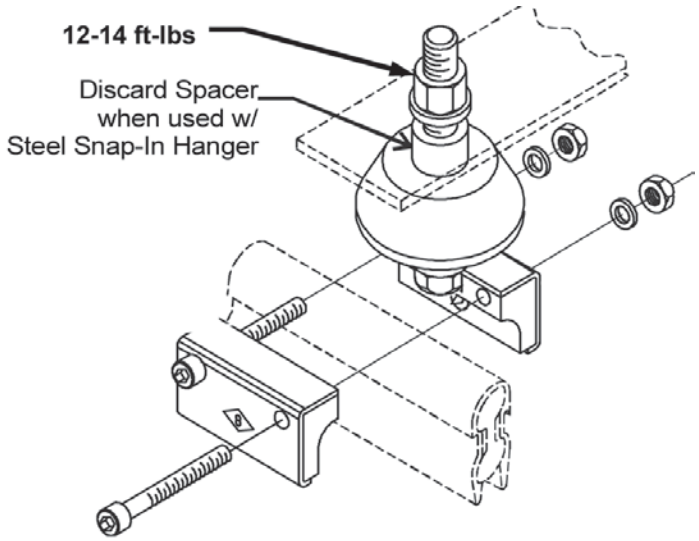


Expansion Gap Settings Table															
Ambient Temp Range (ºF)	0º-100ºF					20º-120ºF					40º-140ºF				
Ambient Temp (ºF)	0	25	50	75	100	20	45	70	95	120	40	65	90	115	140
Gap Setting (in)	2.25	1.75	1.25	.75	.25	2.25	1.75	1.25	.75	.25	2.25	1.75	1.25	.75	.25

Anchors

Anchor points are required at midpoint on all systems without expansion sections. For systems with expansion sections, anchors are required midpoint between expansions and between the first and last expansions and the ends of the run, as shown in above diagram.

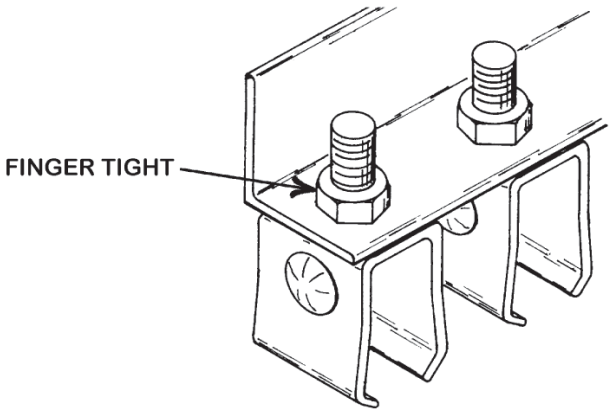
Cross-Bolt hangers can be used as anchors on systems without expansion sections. See Section V, Step 2 for appropriate torque values. On systems with expansion sections it is recommended that anchor clamps be used. Proper torque for anchor clamp cross bolts is 2-4 ft-lbs.



7.0 Installation Procedure

Step 1

Install Hanger & Anchor Clamps as required

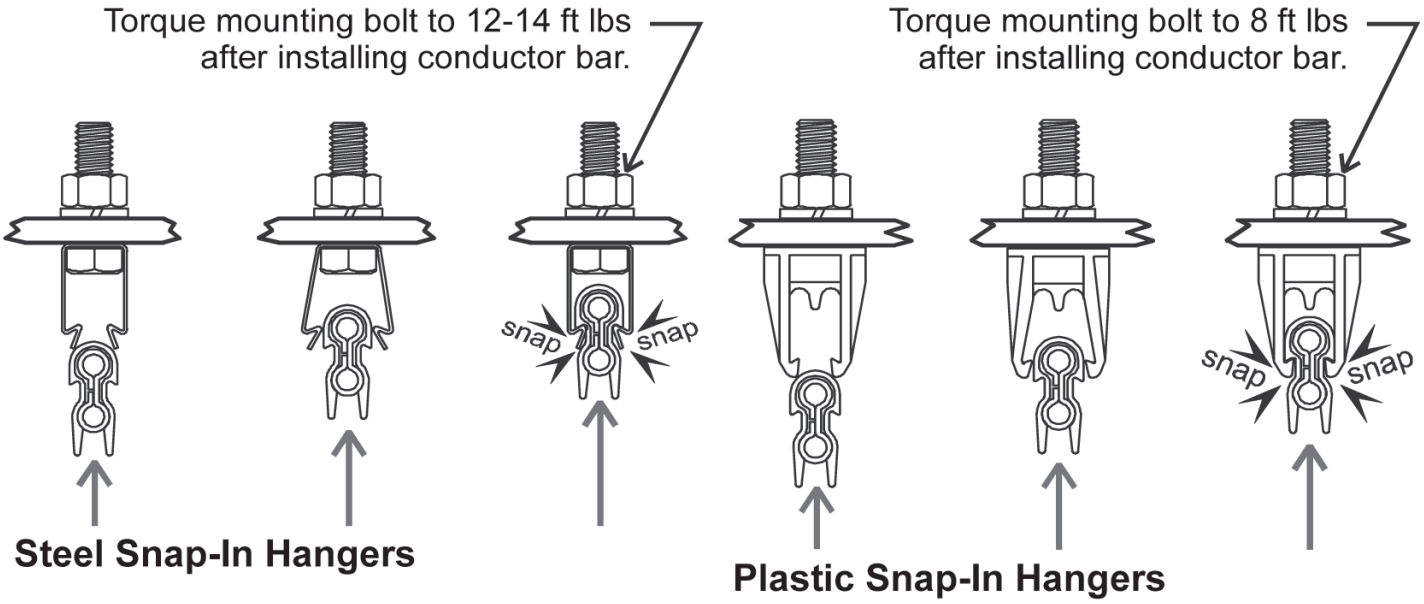


7.0 Installation Procedure

Step 2

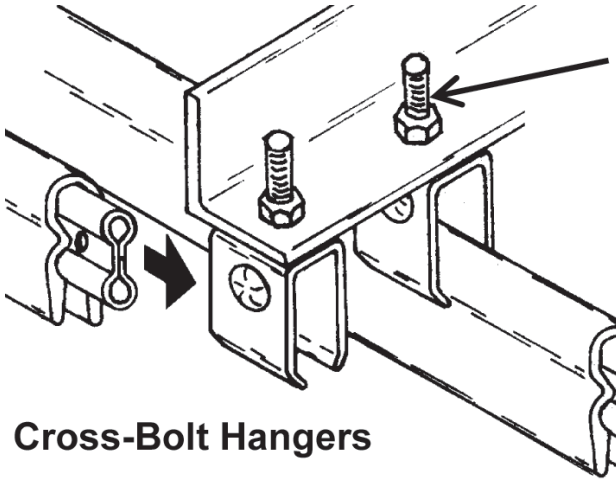
Install Conductor Bar

Note: For Expansion Section Installation Refer to Section 4.0



Steel Snap-In Hangers

Plastic Snap-In Hangers



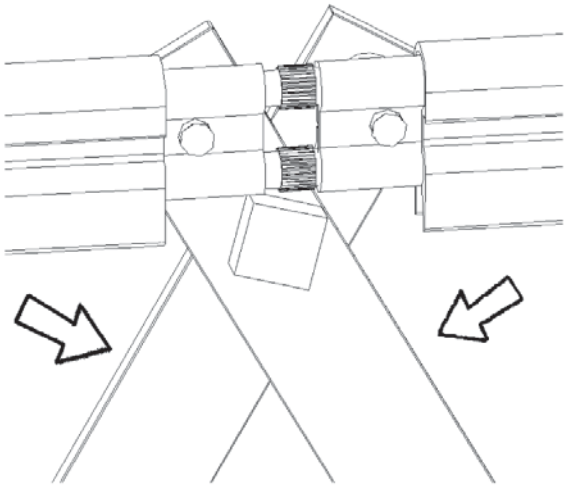
Torque mounting bolt to 12-14 ft-lbs after installing all conductor bar.

Cross-Bolt Hangers

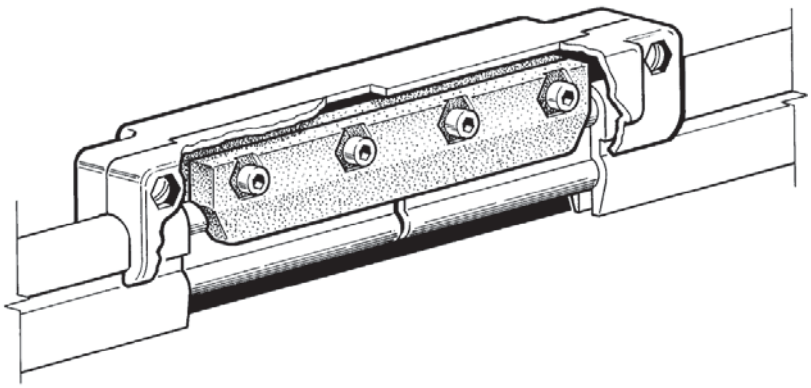
Cross-Bolt Hanger Torque Specs			
Hanger Material	Part No.	Sliding Tight	Anchor Tight
Plated Steel	11076	2.5 ft-lbs	4.0 - 5.0 ft-lbs
Stainless Steel	11078	1.5 ft-lbs	3.0 - 4.0 ft-lbs
Sliding Torque specified in the table is not to be exceeded. Anchor Torque should fall within the range specified.			

Step 3

Join Conductor Bar



3a. Joining Pinned Conductors.



3b. Joining Bolted Conductors. (500 Amp Solid Copper Conductors.)

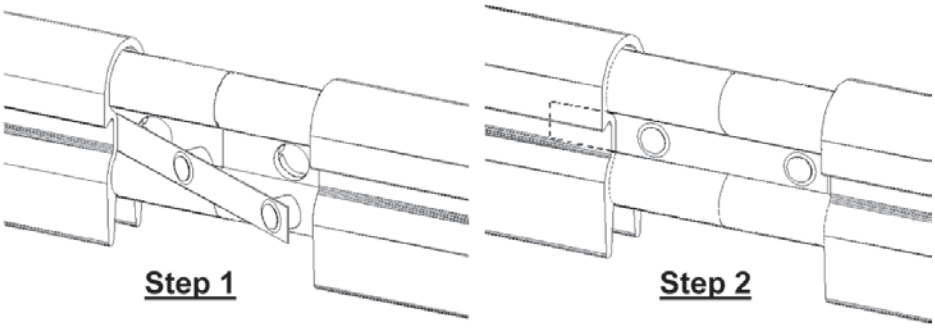
7.0 Installation Procedure

Step 4

Install Joint Keepers **Only Copper Bars require Joint Keepers.**

Slide the long end of the joint keeper under the conductor bar cover on the smooth side of the bar.

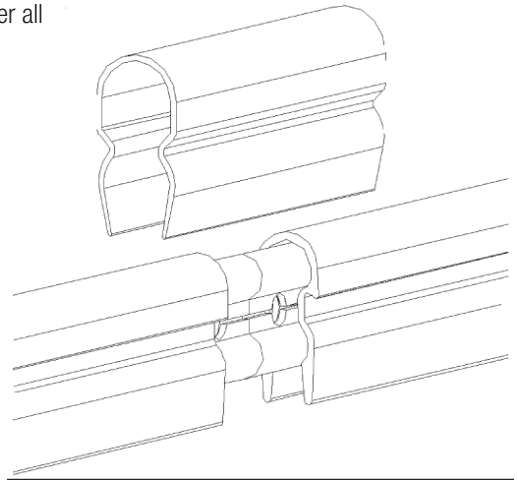
Push the pins into the holes of the bar .



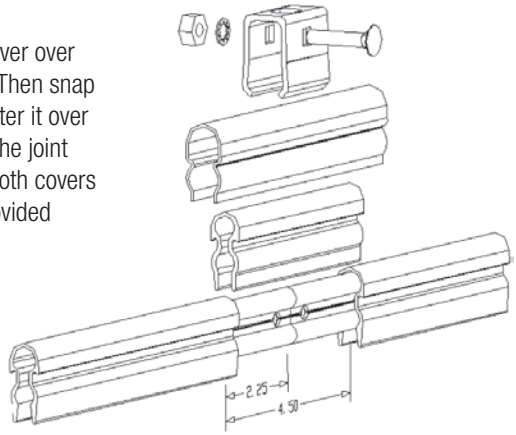
Step 5

Install Joint Covers

Snap Joint Cover over all 8-Bar joints.



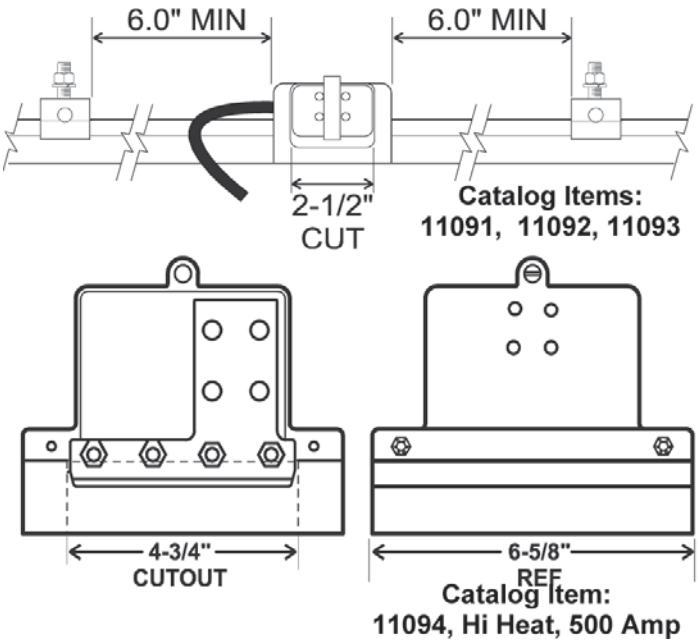
If you have High Heat Joint Cover (P/N 11123):
First snap 4-1/2" cover over exposed conductor. Then snap on 6" cover and center it over the joint. Complete the joint cover by clamping both covers in place with the provided cross-bolt clamp.



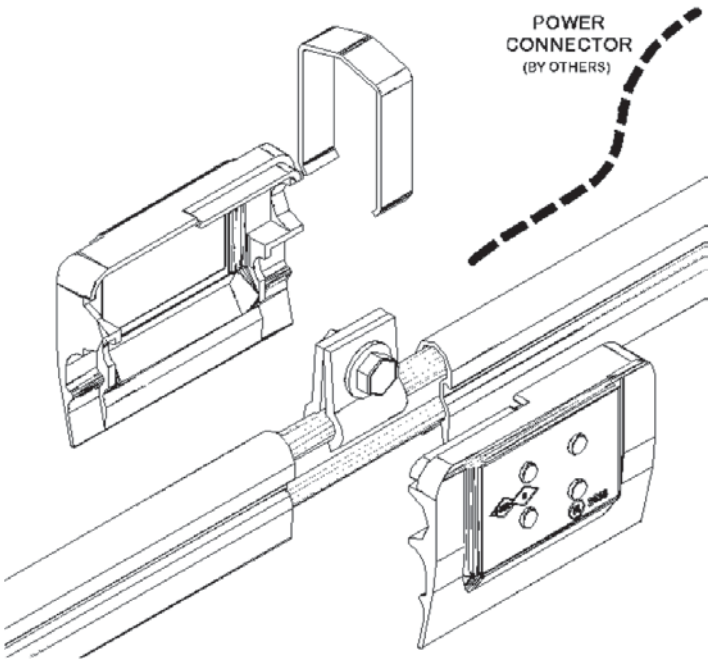
Step 6

Install Power Feeds

Install Powerfeeds at locations shown on installation drawing. If no drawing was provided, locate powerfeeds following the designated space considerations as shown. Cut conductor bar cover as shown.



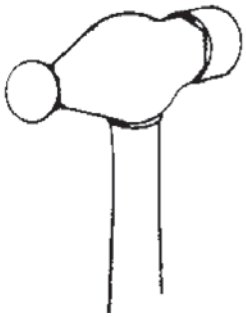
When using large cables, be sure that the customer supplied connector is attached to the clamp in such a manner that it does not interfere with the powerfeed case.

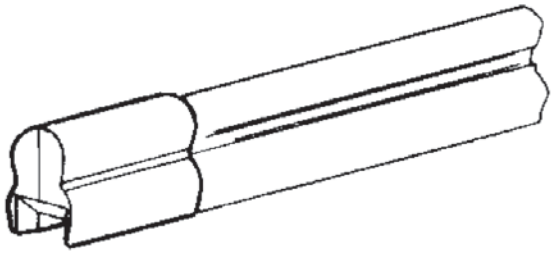


7.0 Installation Procedure

Step 7

Install End Covers / Transfer Caps





Center End Cover / Transfer Cap on the end of the bar. Tap lightly with a hammer until securely seated.

Step 8

Install Collectors **Refer to Installation Dimensions in Section 3.0**

Step 9

Final Inspection

1) Sight down the installed conductor runs and straighten any areas where conductor bar is out of alignment. Verify all mounting bolts on hangers are torqued to their proper values.

2) Make sure collectors are aligned properly with the conductor bar.

3) Check the distance between the centerline of 1" square bar collector mounting staff and contact surface of conductor bar. Distance should be 3-1/2"

4) Make sure anchor clamps are properly positioned and anchor tight.

5) Make sure clamps on one side of expansion section have been made sliding tight. Verify that the expansion section air gap is correct for the ambient bar temperature.

6) Make sure all joint covers and, if applicable, all joint keepers are securely in place.

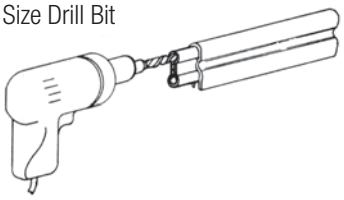
7) Check all electrical connections

8) Prior to introducing the system to service run the application at slow speed through the entire runway length in both directions to verify operation.

8.0 Special Applications

A. Field Cutting

1) Cut conductor with a hack saw to desired length
2) Cut Cover:
   PVC Cover: 0.75" shorter than conductor bar.
   Hi-Heat Cover: 2.25" shorter than conductor bar.
3) Deburr/File field cut end as necessary.
4) Ream Conductor Lobes:
   40, 110-350 Amp Bar: "D" Size Drill Bit
   90 Amp Bar: "M" Size Drill Bit
5) Install as usual.



B. Curves

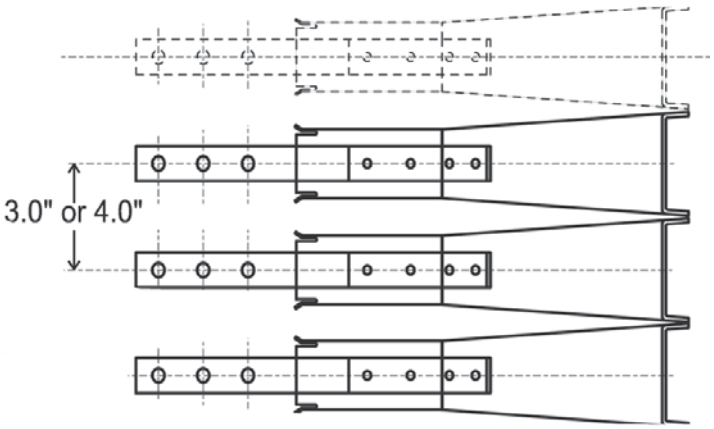
1) Install curved sections of conductor bar before any straight sections.
2) Maximum Hanger Spacing on curves is 3'.
3) Curves are generally anchored at the apex, at midway between the straight sections. Contact the factory with specific application questions for further information.
4) Minimum conductor bar spacing is 2" on curves, 3" recommended.
5) Cross Bolt Hanger Clamps must be used on all curves.

C. Discontinuous Systems

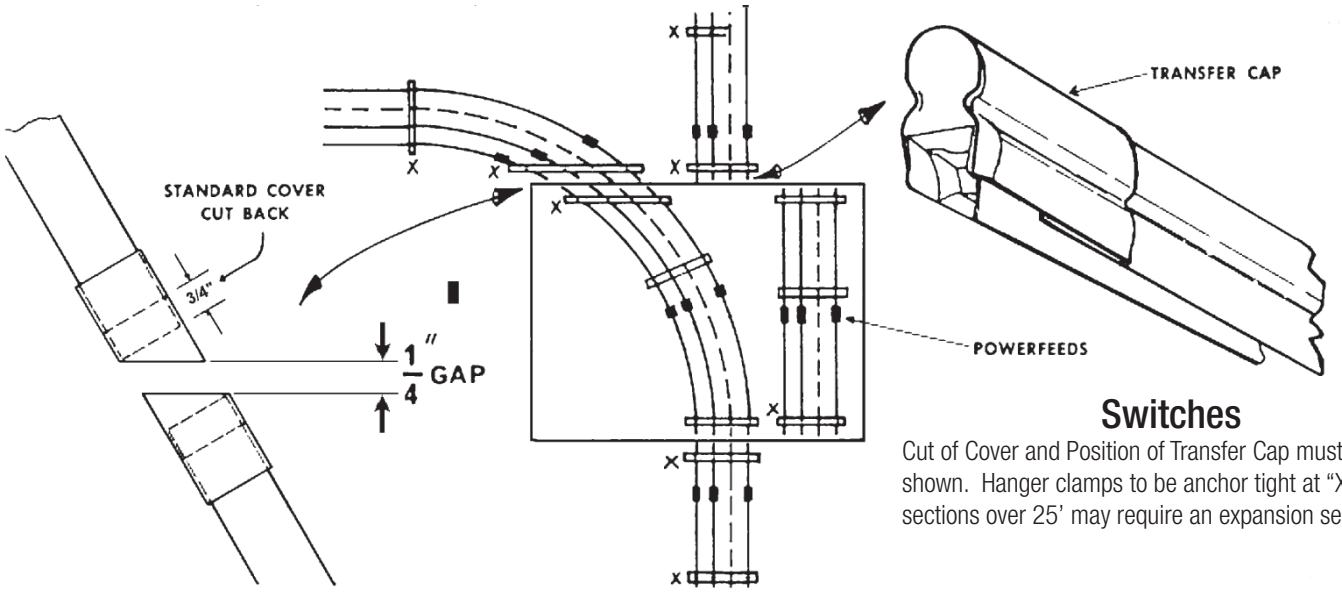
Cross-Bolt Hanger clamps on Pickup Guide Assemblies are required to be anchor tight.

Notes:

1. Pickup Guides must be mounted on 2 hanger supports.
2. Collectors should not be used to interrupt current.



D. Interlock, Switches, or Fixed Gaps



Switches

Cut of Cover and Position of Transfer Cap must be as shown. Hanger clamps to be anchor tight at "X". Switch sections over 25' may require an expansion section.

E. For Laterally Mounted Systems Contact the Factory 800-521-4888

9.0 Troubleshooting

8-Bar Conductor Troubleshooting		
Problem	**Probable Cause**	**Solution**
Burned joints or burned cover at joints	Loose joint, excess vibration, or over-tightened hanger clamps. Joint keeper not used.	Tighten joint, install joint keeper, check hanger clamps, and replace joint cover.
Distorted cover	Too high ambient temperature, under-rated bar.	Use high or medium heat cover. Check total current draw under worst conditions.
Pitted or burned conductor	Improper shoe pressure or worn out shoe.	Check collector mounting and spring pressure. Check for worn out shoe. If the above are corrected & condition persists, install tandem collectors.
Damaging environment	Acid fumes, salt air, extremely dirty atmosphere	May require copper or stainless steel conductor. Under these conditions conductor should always be mounted for vertical entry.

8-Bar Collector Troubleshooting		
Problem	**Probable Cause**	**Solution**
Shoes wear unevenly	Collector not mounted directly under conductor. Square bar is rotated out of position.	Remount or adjust collector
	Lead wire no slacked.	Loosen lead wire.
	Collector movement too tight	Free collector movement & lubricate
Shoes pitted and burned	Insufficient shoe pressure. Excessive bouncing or hand-pulled trolley not stable.	Check shoe pressure and mounting distance. Excessive bouncing can be reduced with tandem collectors. Install guide rollers and hand pulled trolleys. Also see: Pitted or burned conductor.
De-tracking	Distroted cover or joint cover.	Check condition and replace as necessary
	Misalignment at switches or crossovers	Re-align and re-anchor. Check switch movement
	Improperly installed.	Correct misalignment. Bad misalignment may require long arm collectors or expansion sections.
	Hanger clamp (cross-bolt type) too tight making bar “snake” to where collectors interfere with each other.	Loosen hangers so bar will slide. Tighten one hanger in center or between each expansion section.

10.0 Replacement Parts

The following is a suggested list of maintenance parts for use in the field:

- One extra set of contact shoes for each collector.
- One extra spring for each collector.
- Six extra lengths of bar or 5% of total footage for average sized installations.
- One clamp connector and cover for each extra length of bar where clamp replacement is desirable.
- Three complete collectors for 3 phase system, where use is severe.

Notes

Notes

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