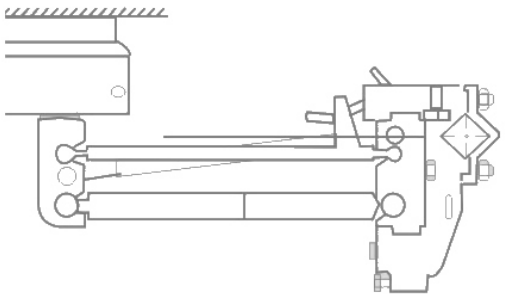
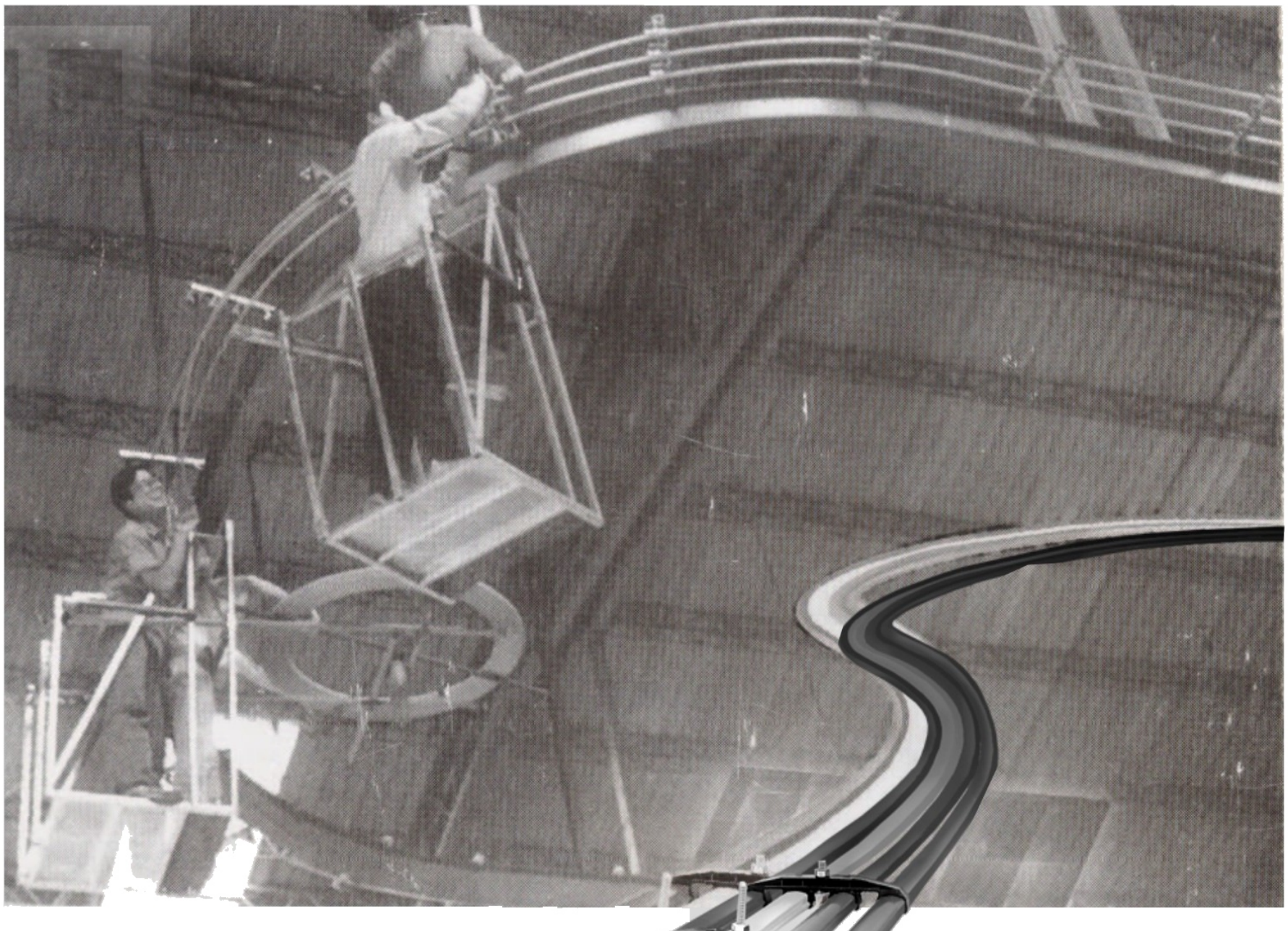
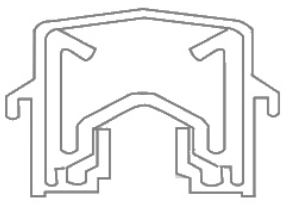
SafePower

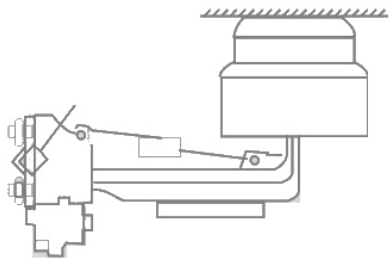
Compact Shrouded Conductor BUS BAR System



Installation and Maintenance Manual







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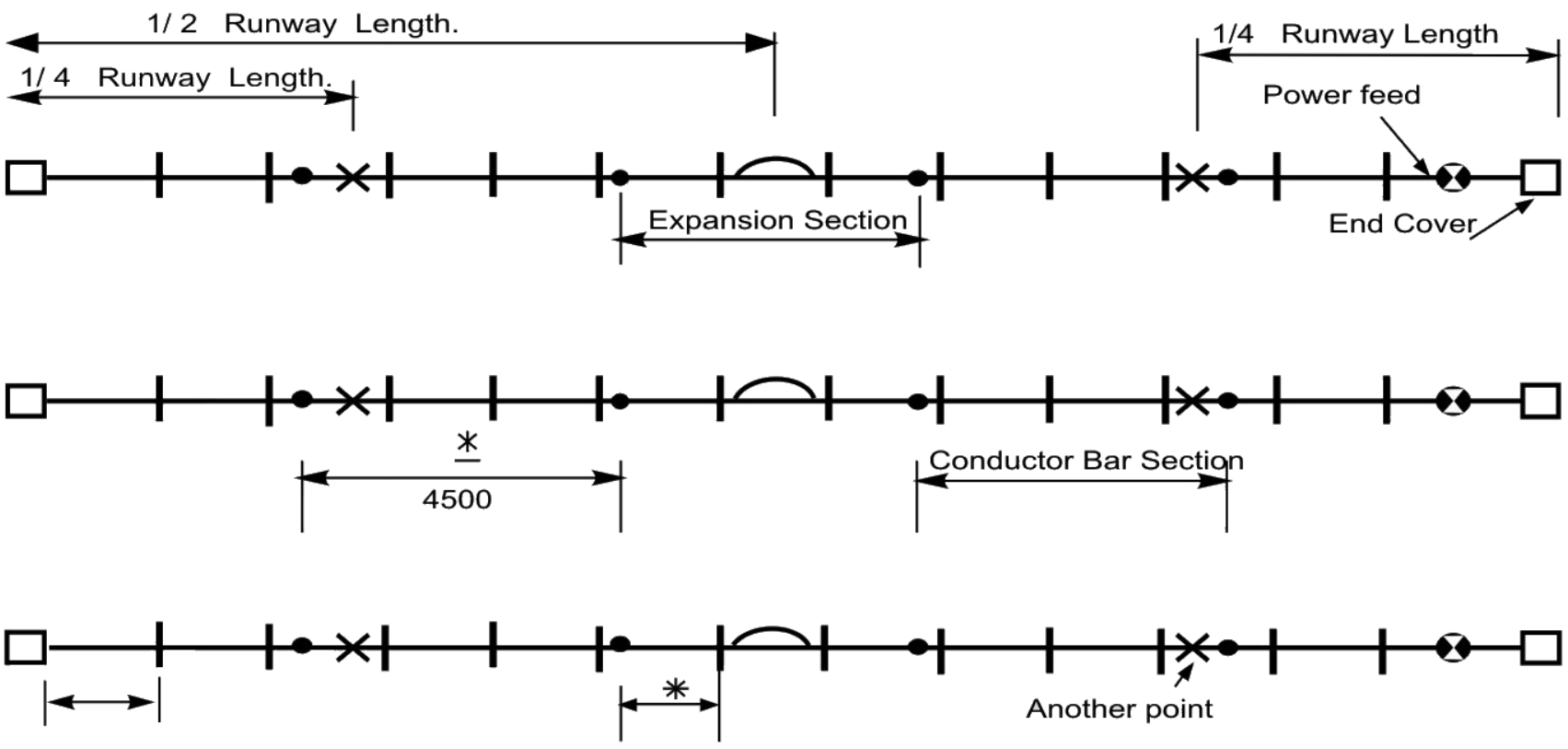
Compact Shrouded Conductor BUS BAR System

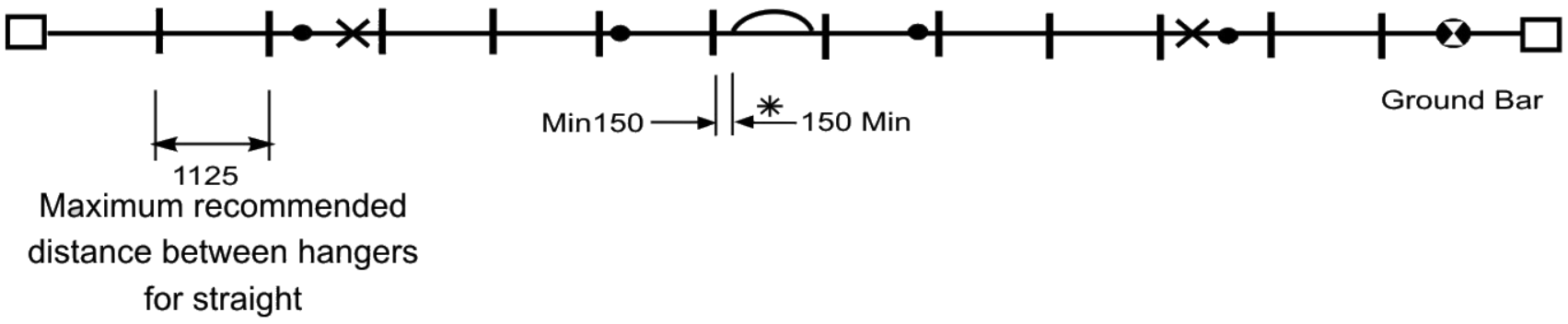
INDEX

TYPICAL LAYOUT OF A 3 PHASE AND GROUND CONDUCTOR SYSTEM

NOMENCLATURE

- Single Conductor
- Conductor System
- Expansion Section
- Transfer Guide
- End cap
- Isolating Section
  Isolating=Insulating Material
- Isolating Switch
- Hanger Clamp
- Anchor Position
- Power feed
- Pickup Guide
- Isolation Section
  Isolation = Air Gap
- Collector
- Switch Fuse





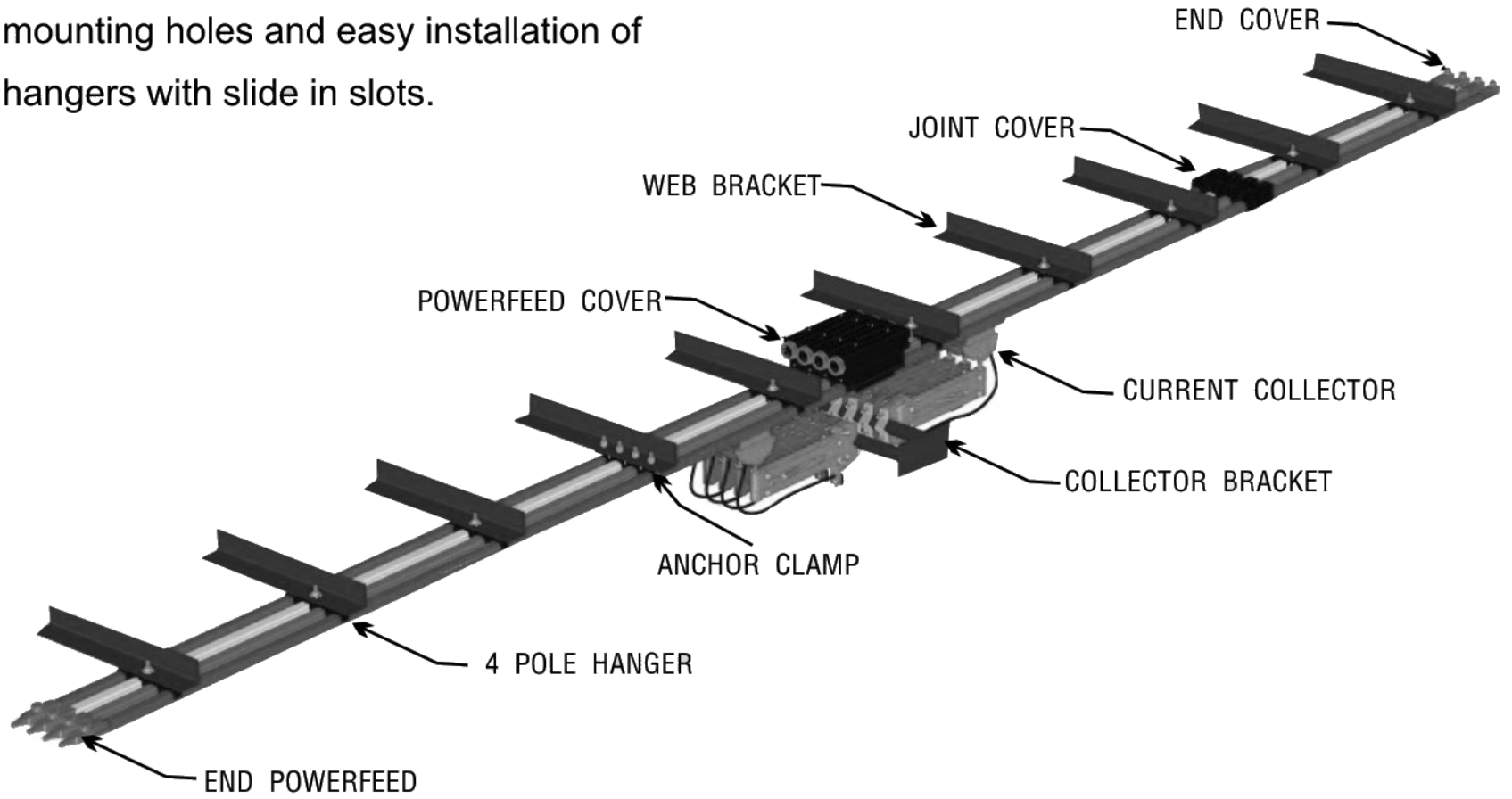
Note : For systems with curves. Maximum recommended hanger spacing on curved selection only -0.562 Meters.

SYSTEM ARRANGEMENT

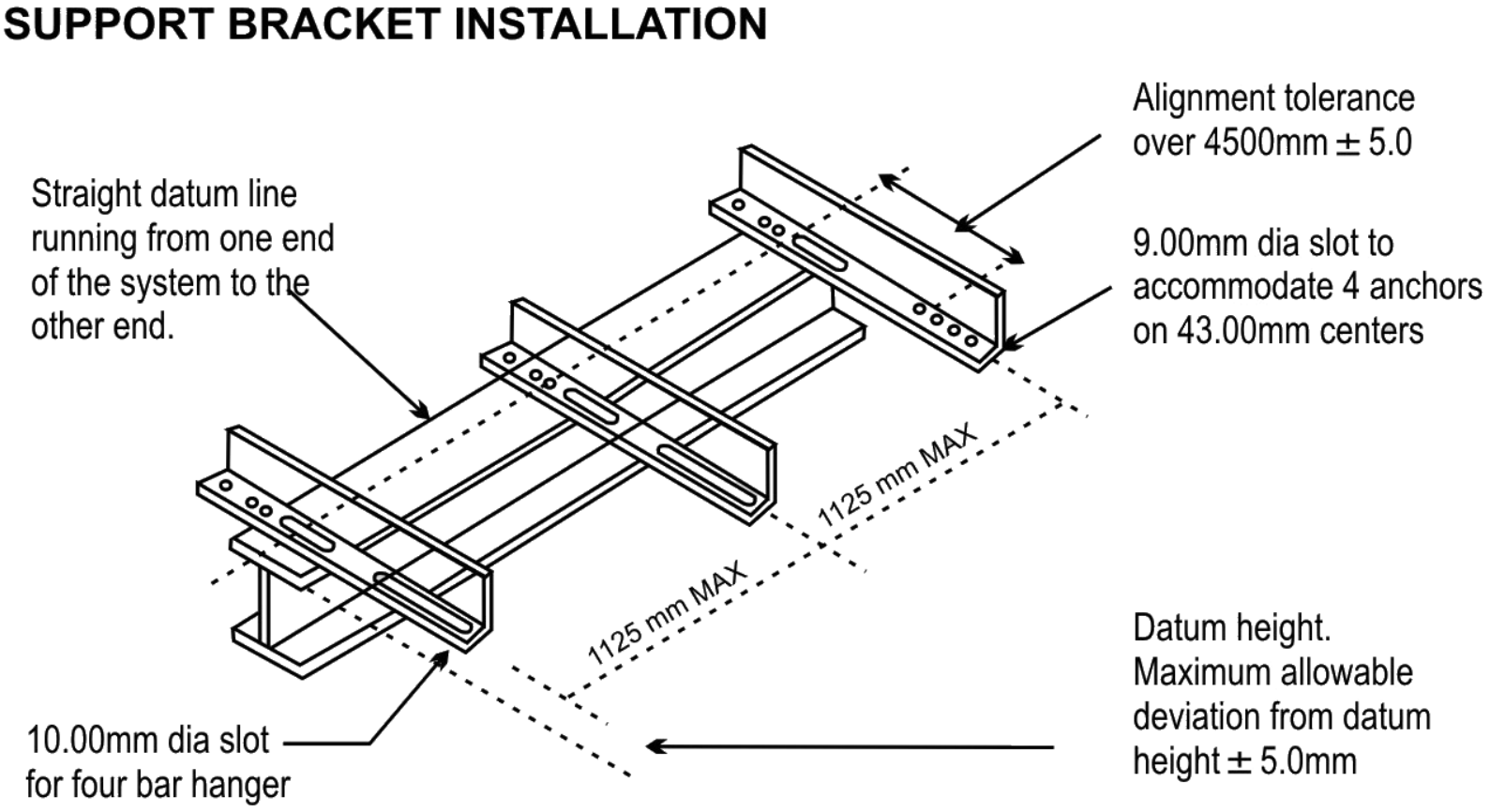
1. Locate and secure support brackets at the recommended spacing .
NOTE : Locate support brackets at a spacing that is divisible into the conductor bar lengths. This will always insure that the joint positions do not interfere with the supports brackets.

2. Observe all alignment tolerance

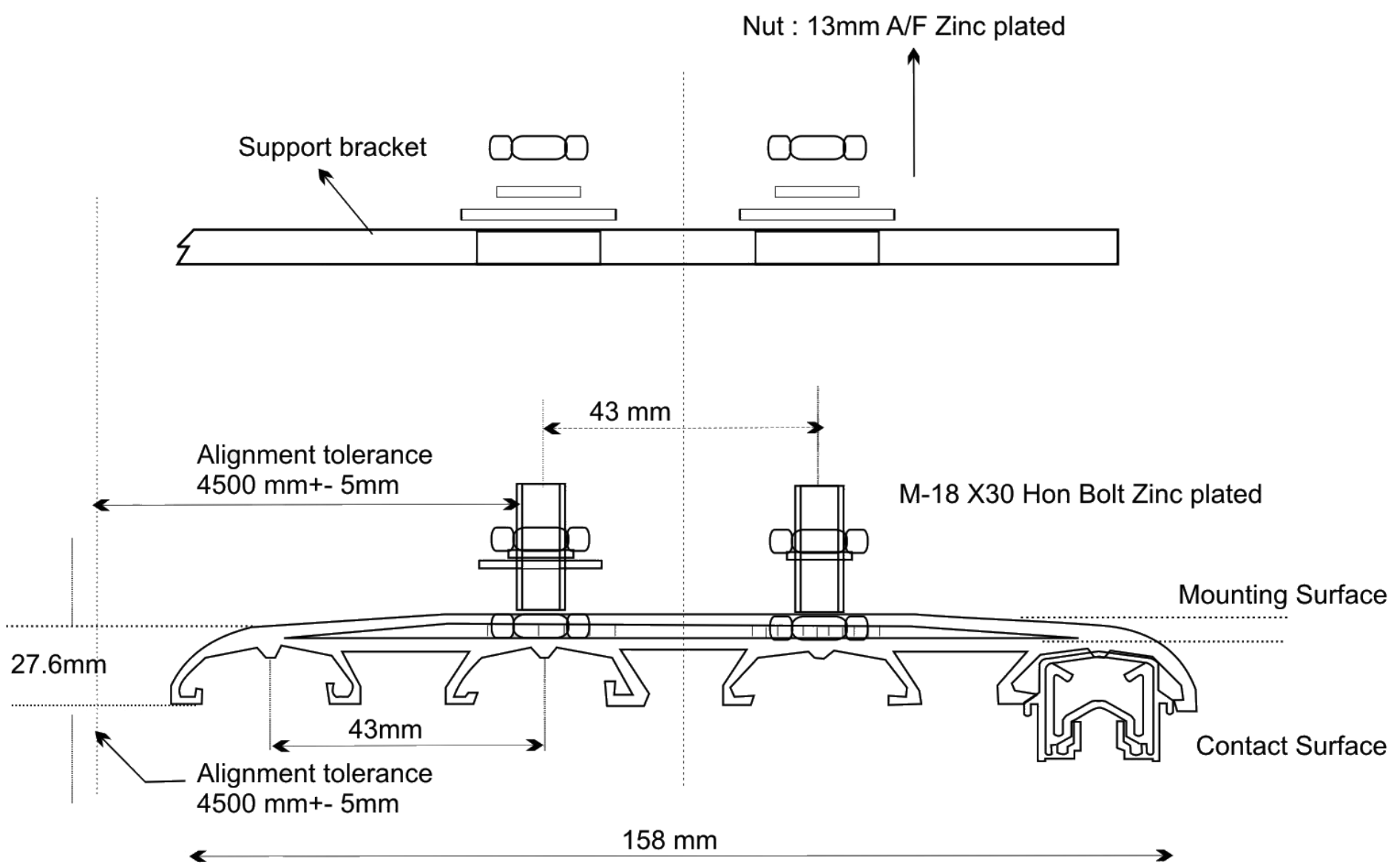
- Hanger support brackets come complete with all necessary mounting holes and easy installation of hangers with slide in slots.

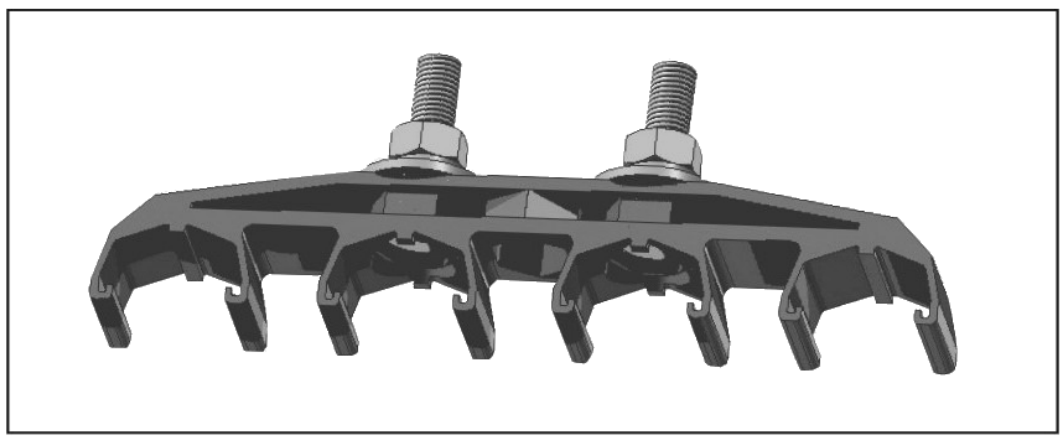


SUPPORT BRACKET INSTALLATION



MOUNTING DETAILS OF FOUR BAR CONDUCTOR HANGER FOR INDOOR AND OUTDOOR USE



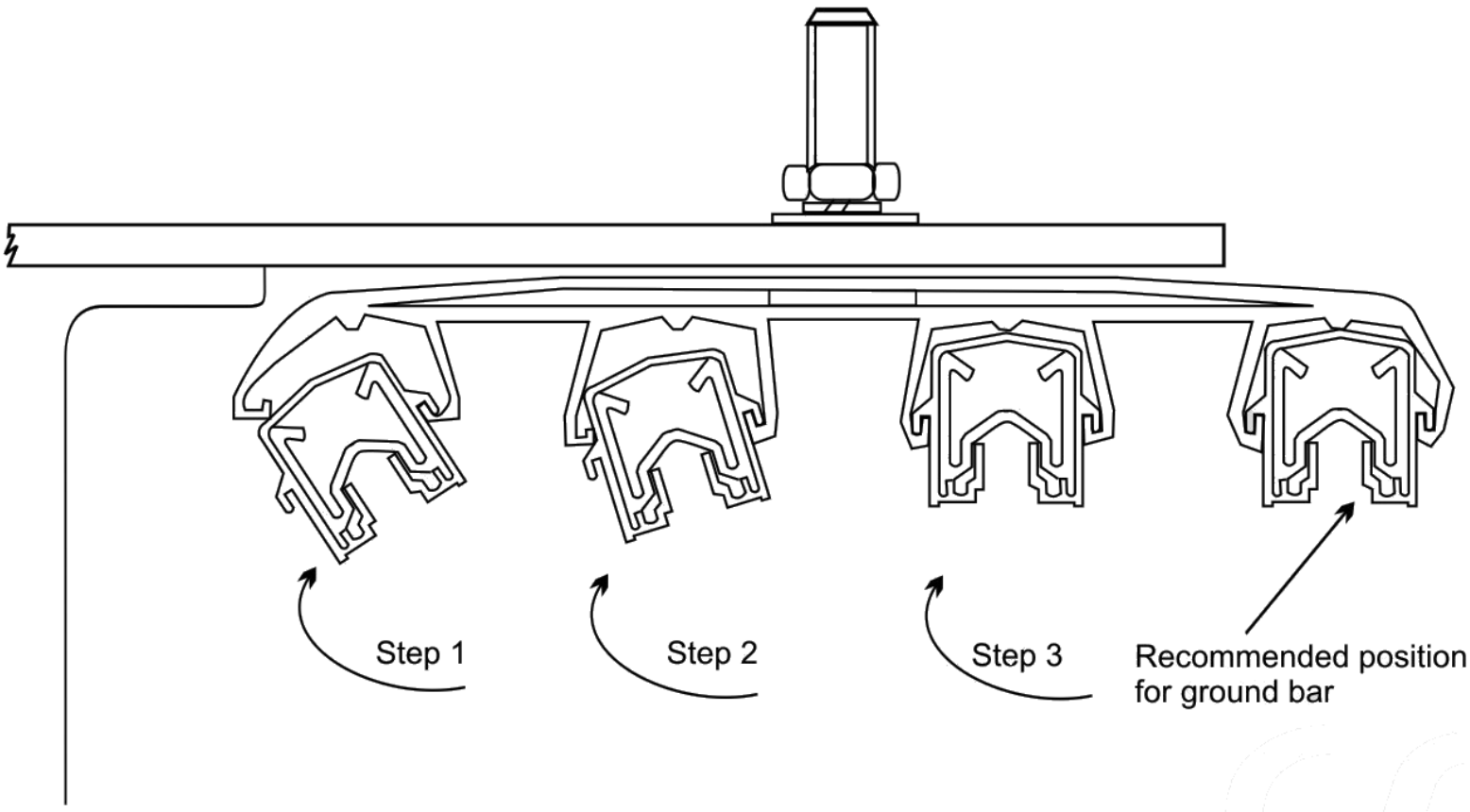


TOOLS REQUIRED

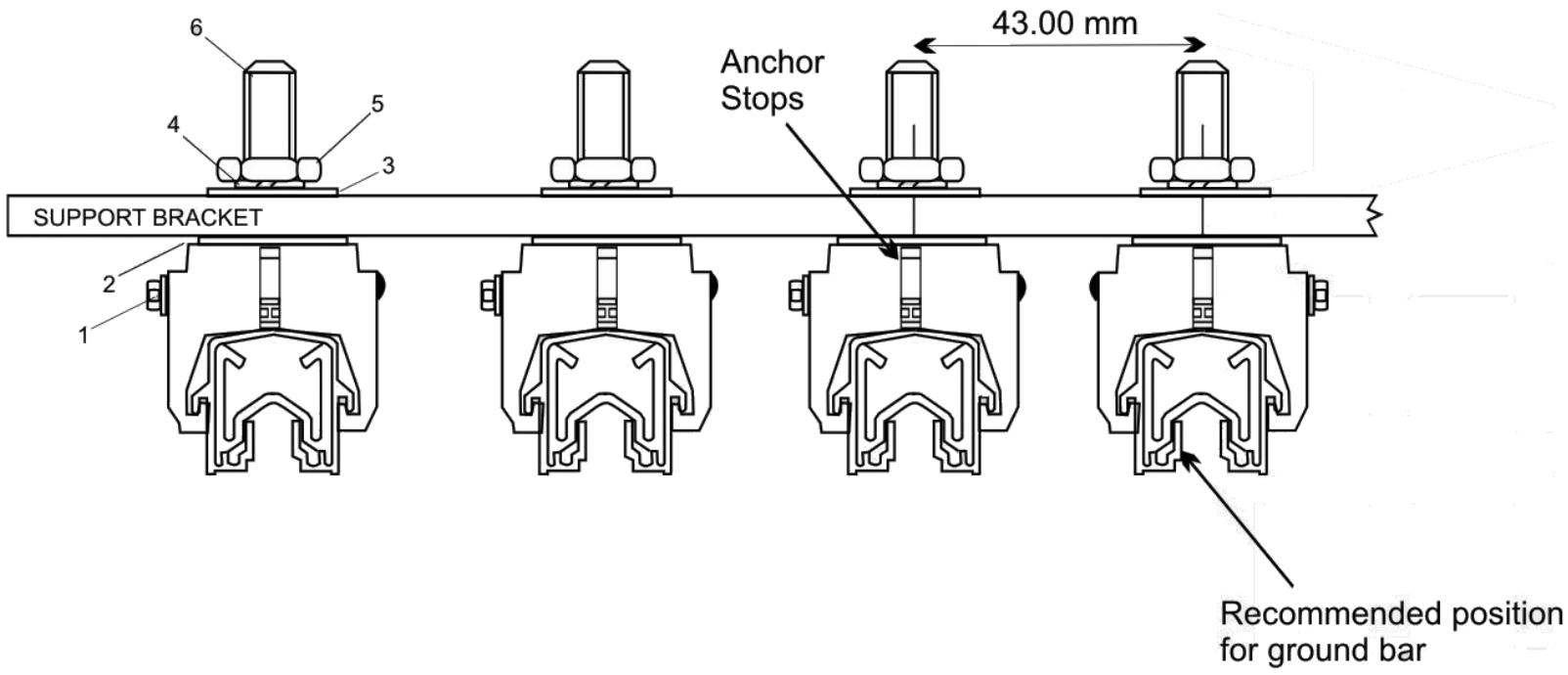
. 1.13MM A/F wrench

1. Remove nut, spring washer and washer from hanger assembly
   (The M8 bolt will stay in place inside the molding)
2. Assemble as shown in the diagram ensuring the correct alignment is observed.
3. Finger tighten M8 nut.
4. Fit conductor bars into hangers.
5. Tighten M8 nut to torque of 2kg.

FITTING CONDUCTORS INTO FOUR BAR CONDUCTOR HANGER



ANCHOR HANGER SUPPORT ASSEMBLY



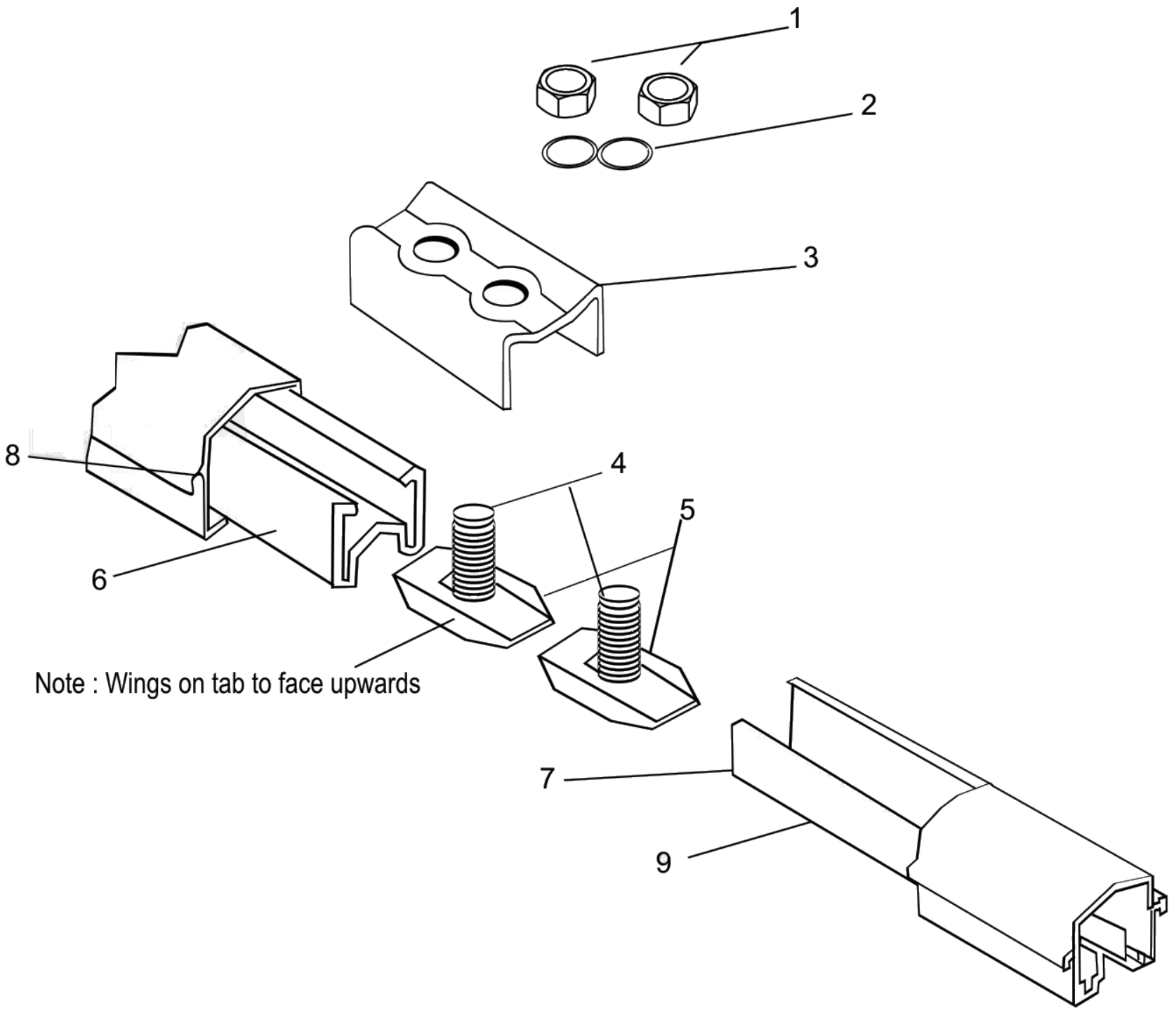
TOOLS REQUIRED

- 3mm A/F open ended wrench
- 8mm A/F open ended wrench

1. Remove items 3,4 &5 from assembly.
2. Clip anchor hanger over so that it free to slide.
3. Insert anchor hanger in support bracket.
4. Reassemble items 3,4 & 5, ensure item 5 is finger tight.
5. Tighten item 1 until anchor stops meet (check anchor is tight on cover).
6. Tighten item 5 to a torque of 3kgm.

Note : For ease of access to clamping setscrews (item 1),
Install anchor hanger assemblies as shown above.

ASSEMBLY OF BOLTED GALVANISED STEEL & COPPER JOINTS



TOOLS REQUIRED

- 10 mm A/F open ended wrench
- Electrical joint compound

1. Apply electrical joint compound to the face shown.

2. Slide item 4 and 5 into 6 and 7 respectively.

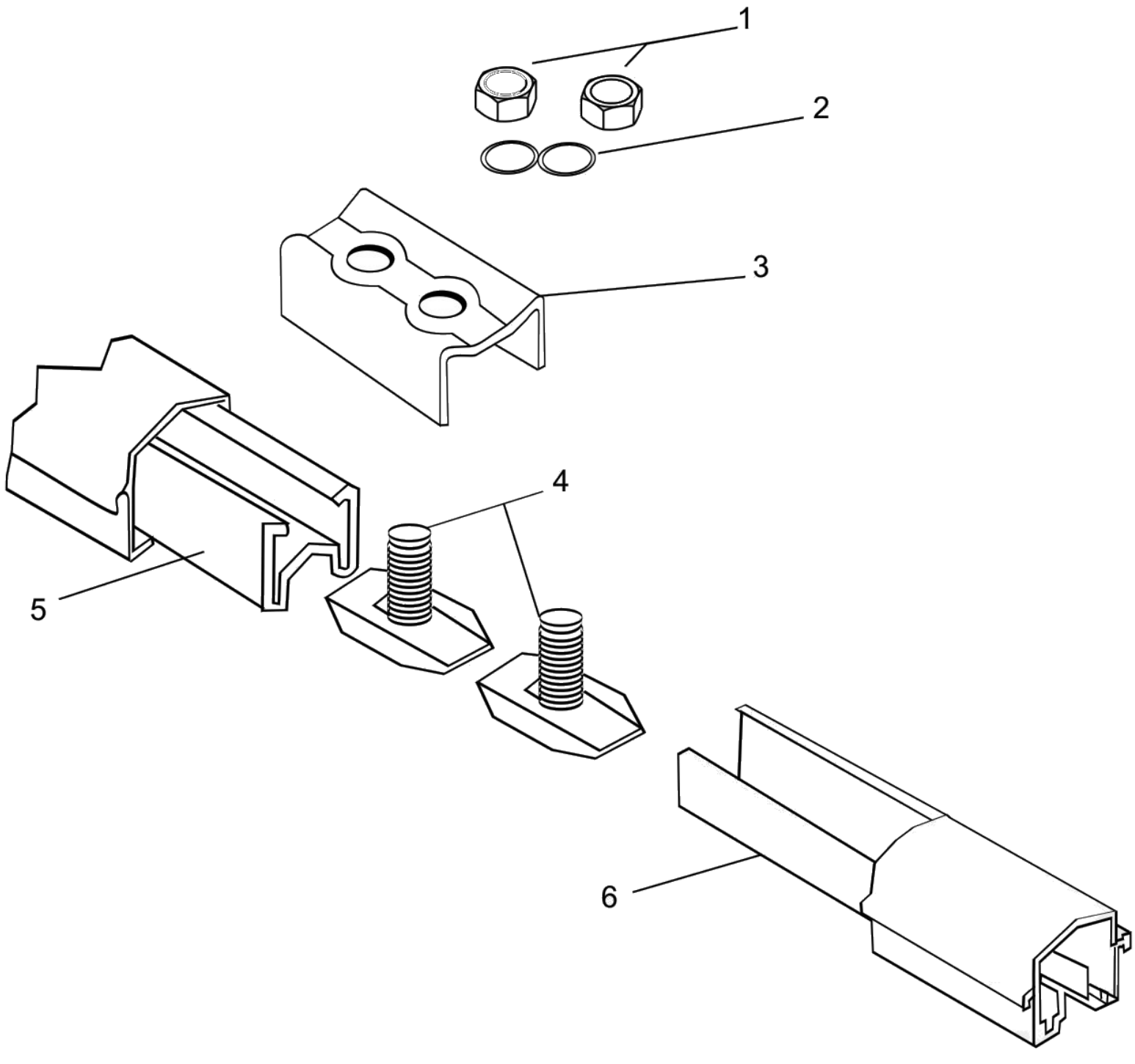
3. Place item 3 over 4 and 5.

4. Fit 2 and 1 in the order shown.

5. Tighten item 1 to a recommended torque of 1 Kgm. (with help of torque wrench).

6. Finally check that both faces of the conductor bar are touching each other and there is no gap exceeding 0.50 mm at the faces.

ASSEMBLY OF ALUMINIUM BOLTED JOINT IN



TOOLS REQUIRED

- 10 mm A/F open ended spanner
- Electrical joint compound

1. Fit item 4 into item 5.(Ensure tab captivates the head on the setscrew).

2. Slide item 4 into item 5 and item 6 respectively.

3. Place item 3 on item 4 making sure alignment with end faces of conductor bar.

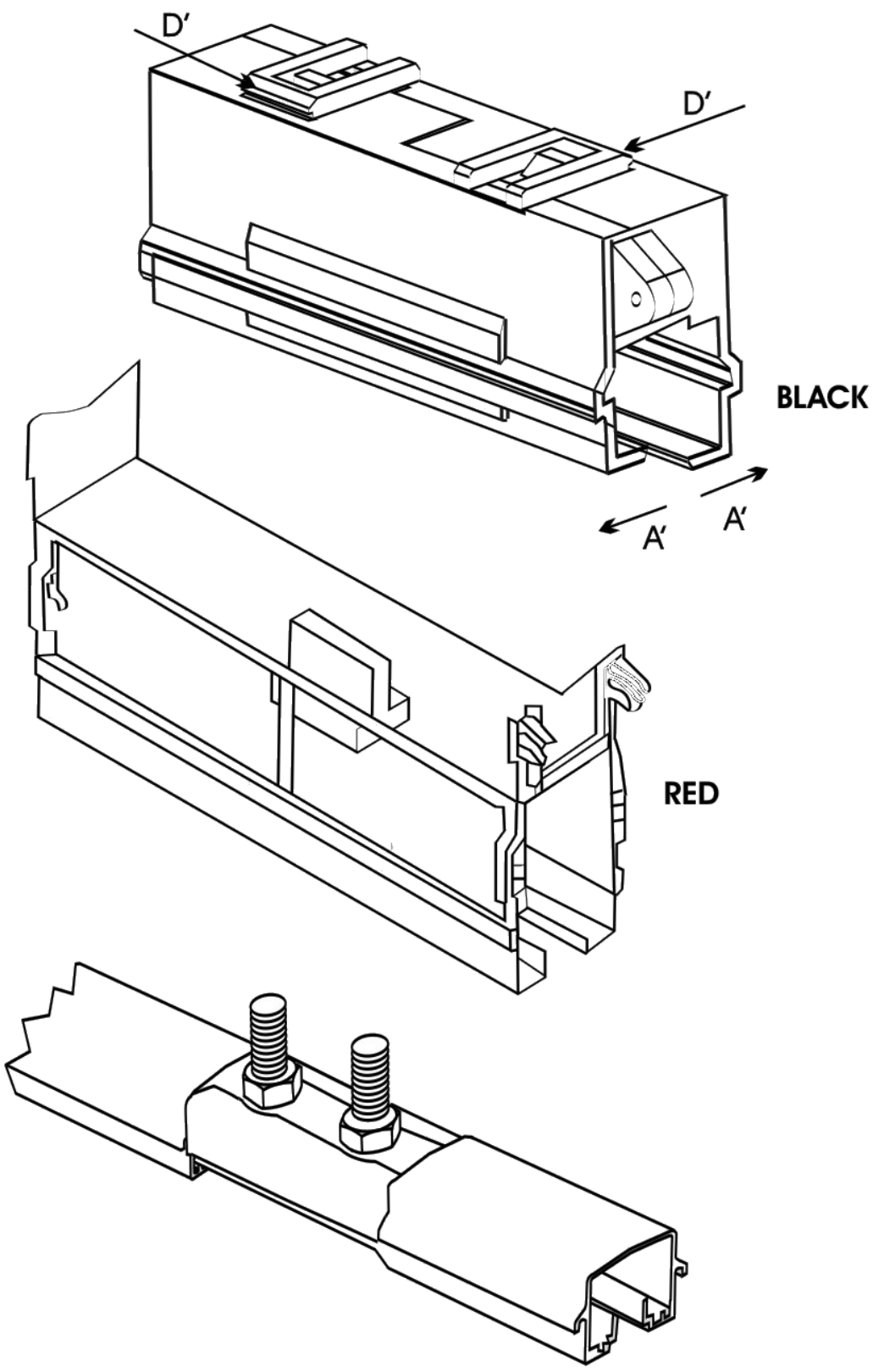
4. Fit item 2 and 1 in the order shown.

5. Tighten item 1 to a recommended torque of 1 kgm .

6. Check that both faces of the conductor bar are touching each other and there is no gap exceeding 0.5 mm at the faces.

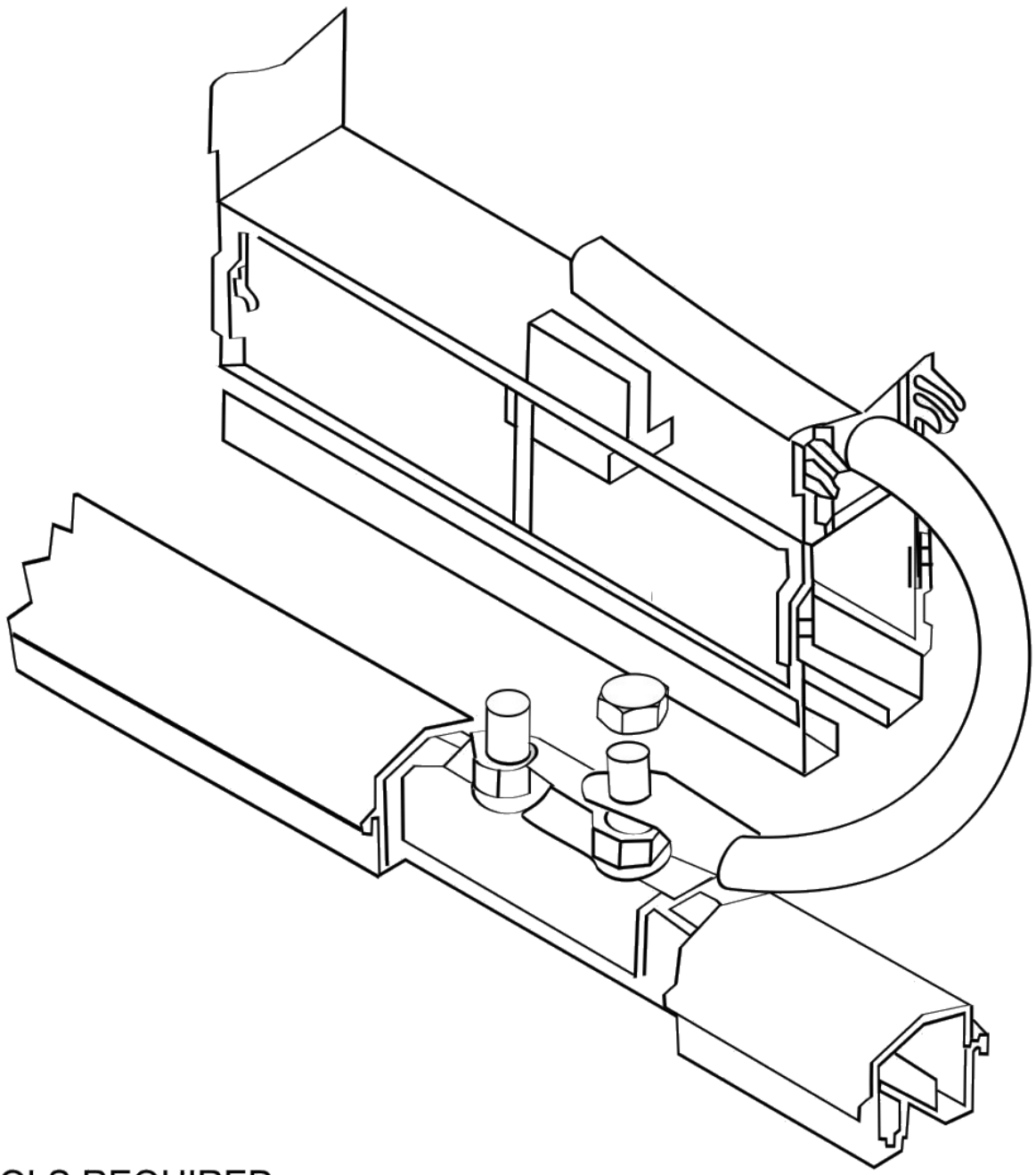
ASSEMBLY OF JOINT COVER ONTO BOLTED JOINT ASSEMBLIES

1. Unlock “D & D” upward to open joint cover on both direction as shown “A-A”
2. Fit the joint cover bolted joint **3** Joint must not be opened more than 2mm
4. Close the lock in reverse direction of “A-A”



1. Spring legs out in the directions ‘A-A’ as shown
   (This is to ease the fitting of the joint cover over the conductor bar).
2. Fit the joint cover over the bolted joint. Joint cover MUST NOT be opened more than 45 . Ensure the “Location Section”sits between the two bolts.
3. Close the flaps in the direction ‘D’. Ensure the flaps ‘click’ home on both sides.

ASSEMBLY OF LOW AMP JOINT POWER FEED



TOOLS REQUIRED

- 10MM A/F wrench
- Suitable sharp knife
- Cable strippe
- Cable crimping tool
- Suitable cable terminal

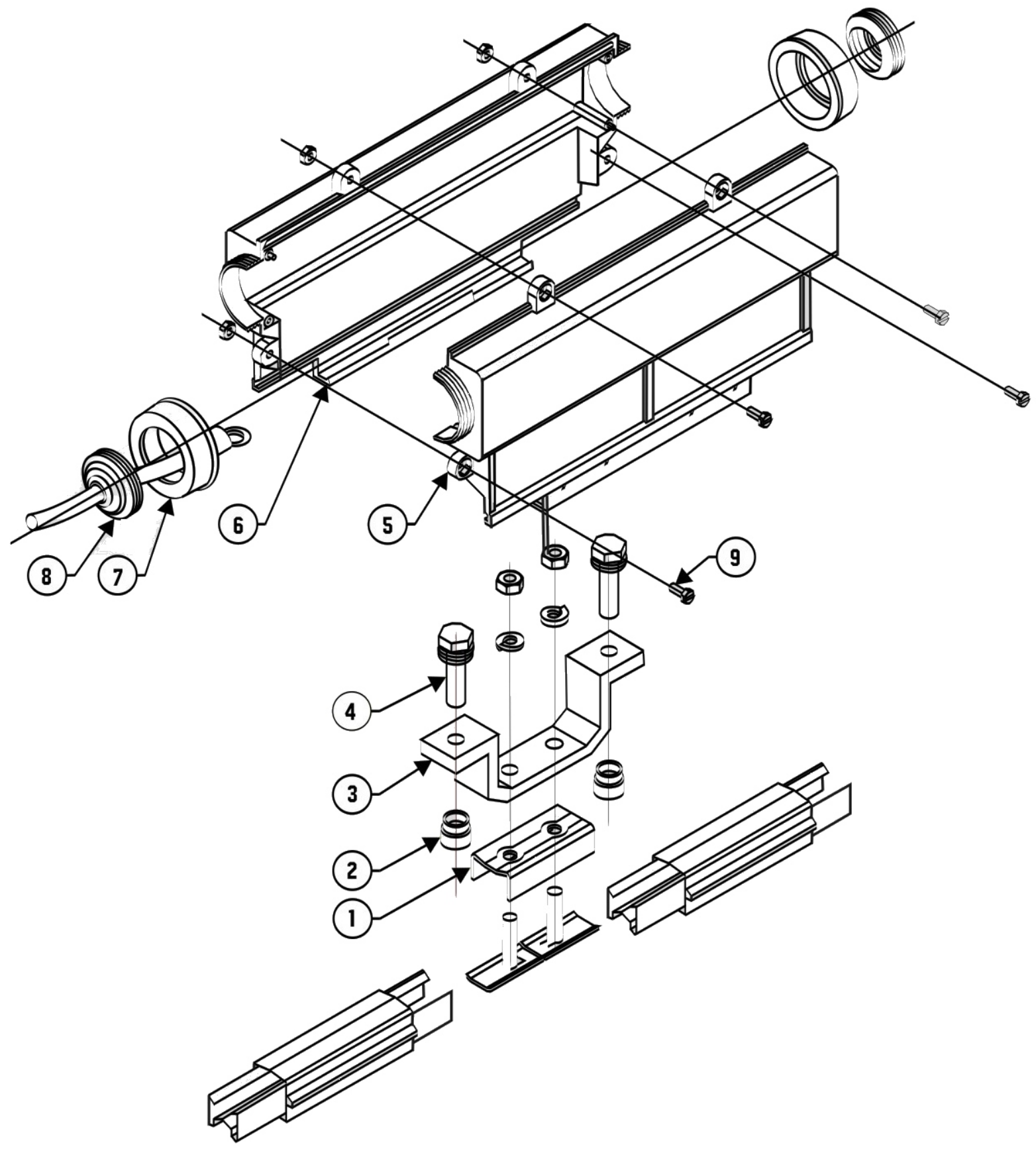
1. Cut hole in grommet to suit cable.
2. Assemble joint to conductor bar
3. Pass supply cable through grommet.
4. Crime terminal to supply cable.
5. Secure terminal to joint using items 1& 2 and tighten item 2 to an torque of 1.1 kgm
6. Fit item 3 over assembly. Ensure the cable is threaded carefully through grommet.
7. Once in position close flaps and ensure flaps click home

Note : Joint must not support the cable.

ASSEMBLY OF POWERFEED AND COVER

TOOLS REQUIRED

1. Cut hole in grommet item 8 to suit cable.
2. Assemble joint as shown in fig in sequence (1,2,3,4)
3. Pass supply cable through grommet (7,8)
4. Crimp terminal to supply cable
5. Secure terminal to joint Item No. 4 & tighten item no. 4 to an torque of 1.1 kgm.
6. Fit item 5 over assembly with help of item No. 9
7. Ensure the cable is threaded carefully through grommet
8. Thread item No. 7 assembly of item No. 5



ASSEMBLY OF LOW AMP JOINT POWERFEED AND JOINT

TOOLS REQUIRED:

- 13mm A/F wrench
- 10mm A/F wrench
- Flat bladed screwdriver
- Cable crimping tool suitable cable terminal
- Sharp Knife.
- Cable Stripper.

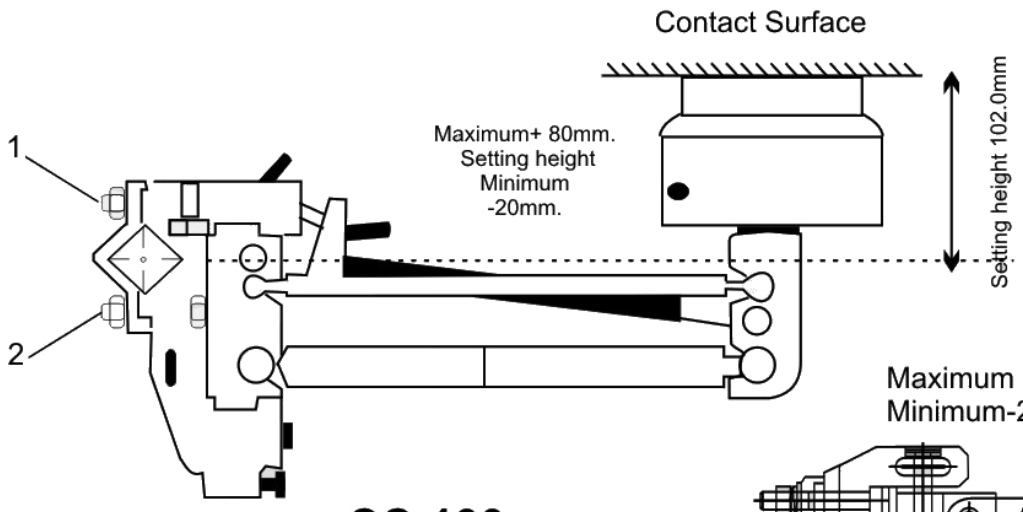
UP TO AND INCLUDING 250AMPS

1. Assemble joint to conductor bar
2. Fit aluminum top hot section item 3 to join assembly.
3. Discard spring washers originally fiyyed to the joint assembly and fit external shake proof washers item 1.
4. Fit joint powerfeed cover item 4 as shown
5. Cut grommet item 17 out using suitable knife and fit over cable.
6. Crimp terminal to supply cable.
7. Ensure the terminal is properly crimped as failure to do so will result in over-heating of the powerfeed assembly.
8. Fit terminal to item 3 and secure using items 5,6 and 7.
9. Item 14,15 and 16 are for use with two cable feeds, and should be left tight in item 3
10. Fit powerfeed cover item 18 to assembly.
11. Ensure both grommets are fitted into item 18 before closing halves together.
12. Make sure the legs of the cover fit under the conductor cover support ears(A little pressure at points x-x will ensure this)
13. Fit items 19 to item 18 secure with item 20.

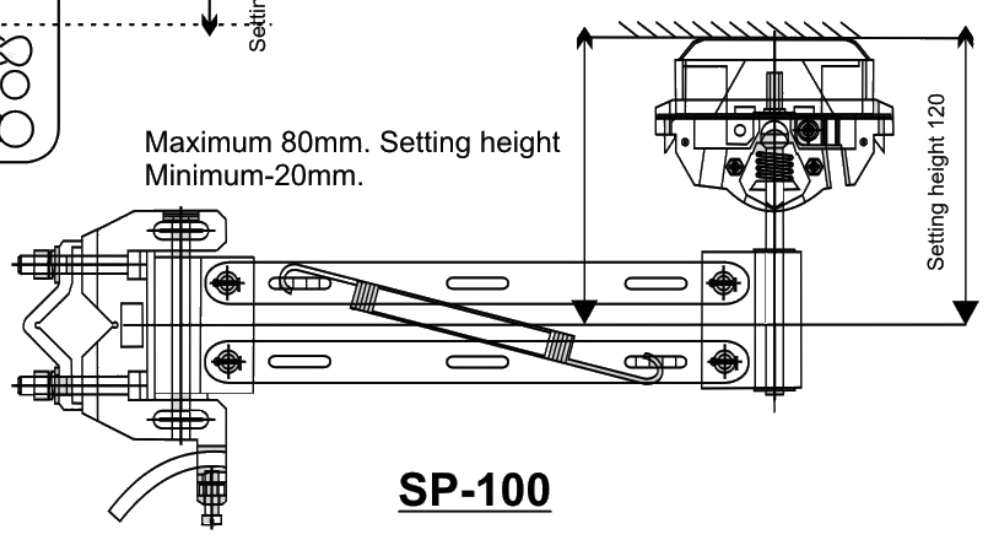
For 400 Amps

Fit lug to the center of item 8 and secure using items 10, 11, 12 and 13 in the order shown

MOUNTING DETAILS OF COLLECTOR (CC-100 & SP-100)



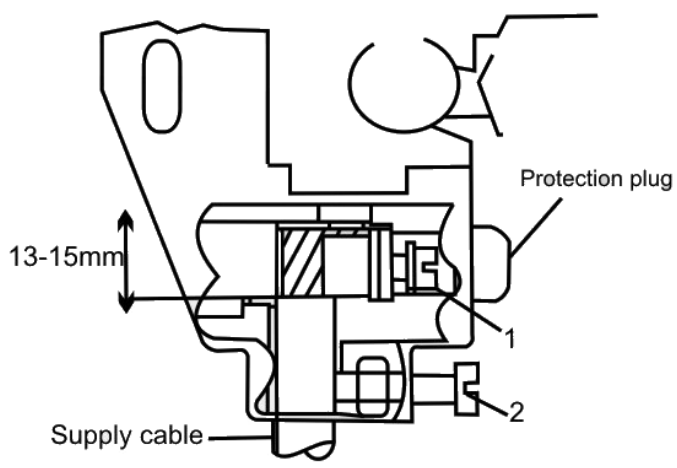
CC-100



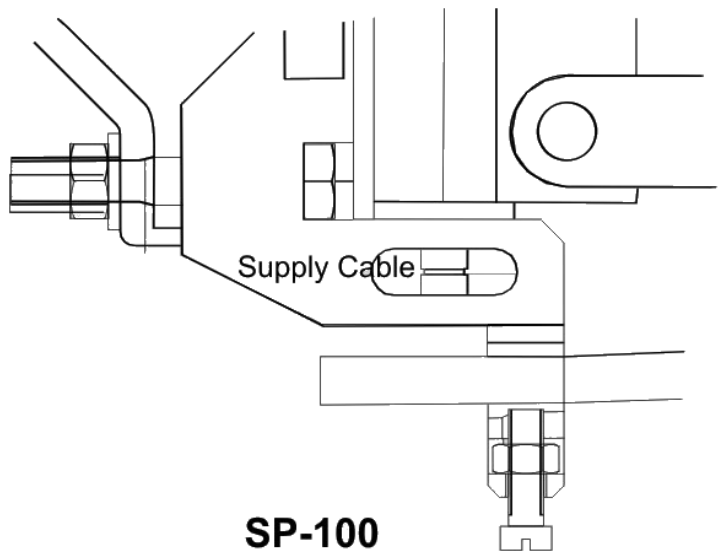
SP-100

1. Fix collector mounting bracket to a suitable support at the correct setting height (see diagram)
2. Place collector on the mounting bracket.
3. Tighten nuts 1 & 2 to recommended torque of 3 kgm.

CUSTOMERS SUPPLY CABLE INSTALLATION



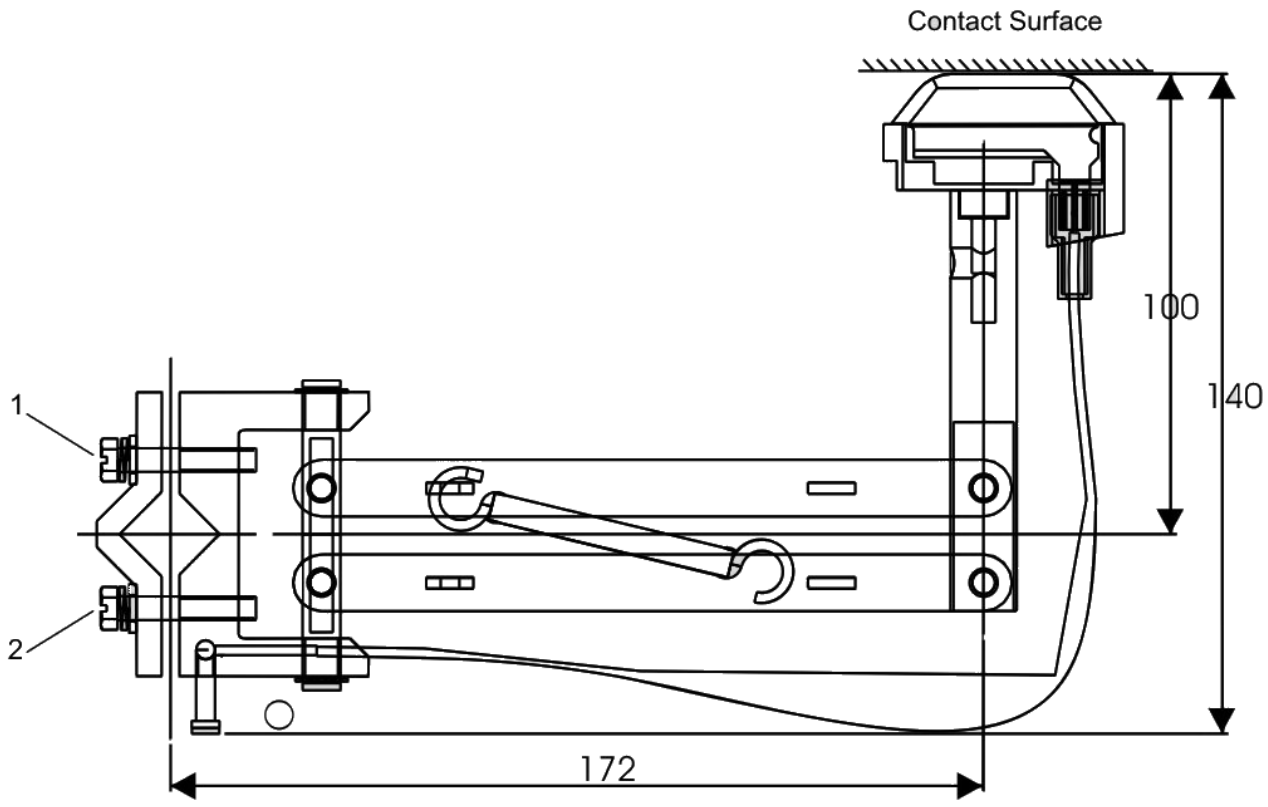
CC-100



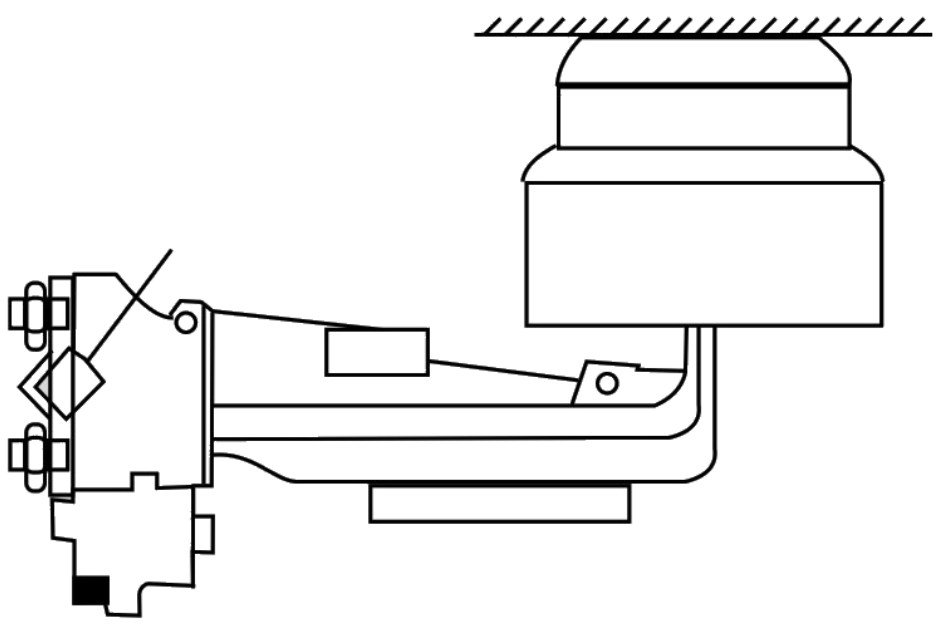
SP-100

1. Strip customers supply cable back 13-15mm , using suitable cable stripping tool.
2. Remove protection plug from the hole.
3. Loosen screw number 1.
4. Loosen screw number 2 until from entry hole.
5. Push customer supply cable into entry hole.
6. Tighten screw number 1 fully and ensure that the cable is clamped firmly in position.
7. Tighten cable clamp screw number 2.
8. Replace protection plug .

MOUNTING DETAIL FOR CURRENT COLLECTOR (CC -50 & CC -25)



CC 25 Amps



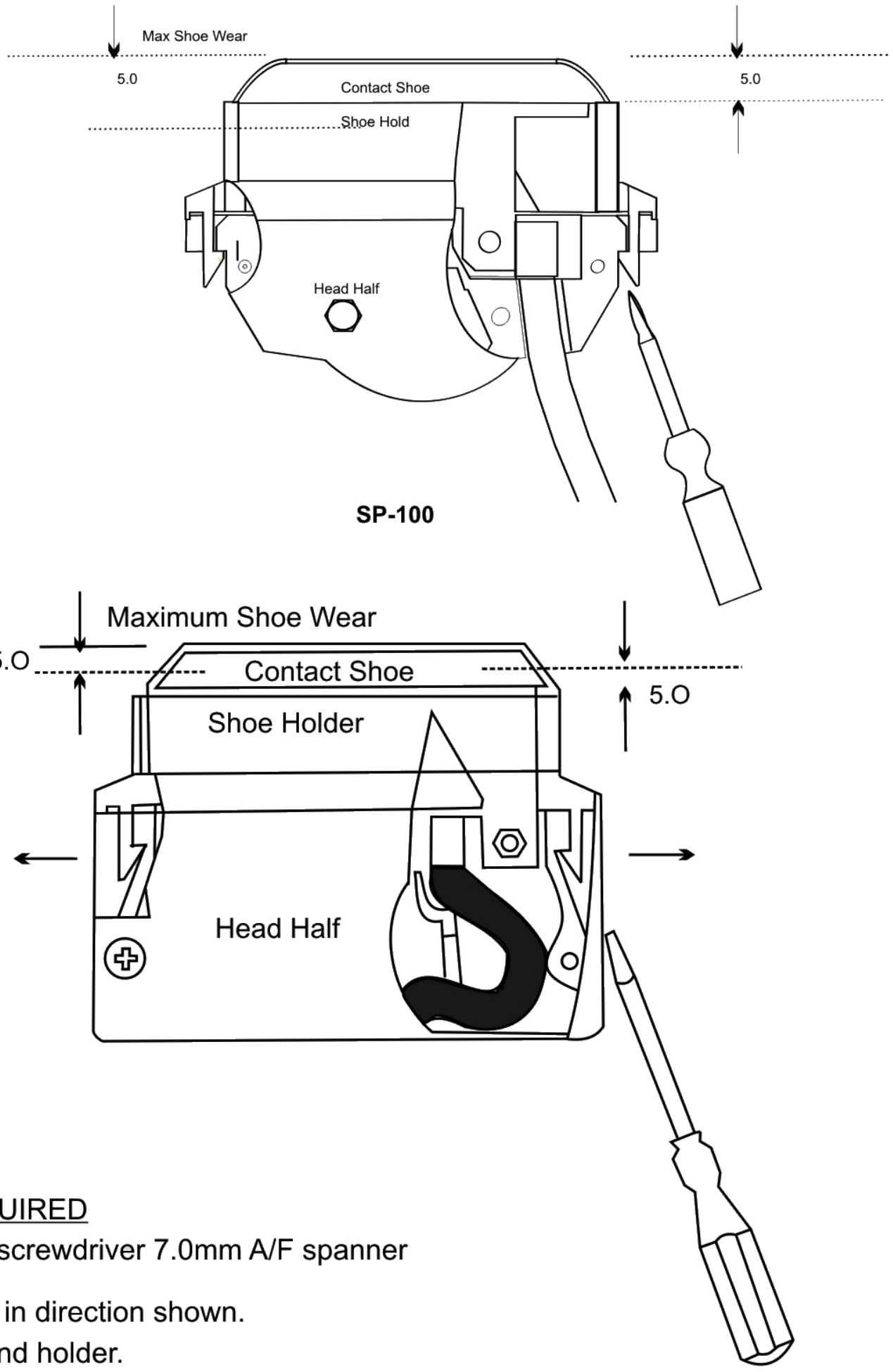
CC 50 Amps

TOOLS REQUIRED

- 8.0 mm A/F
- Steel rule or suitable tape measure.

1. Fix collector mounting bracket to a suitable support at the correct Setting height (see diagram).
2. Place collector on the mounting bracket.
3. Tighten setscrew item 1

REPLACEMENT OF COLLECTOR CONTACT SHOE AND SHOE HOLDER



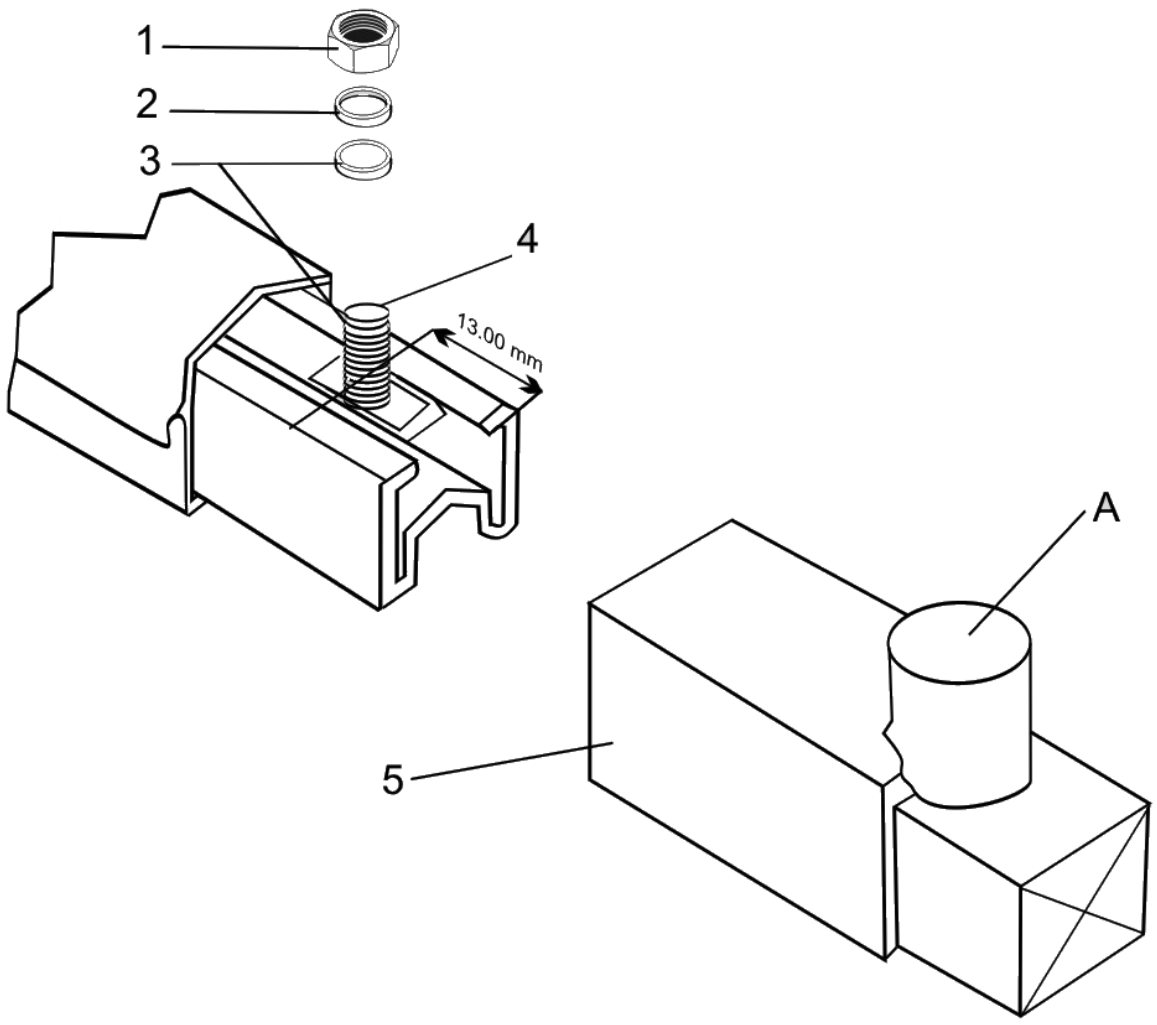
TOOLS REQUIRED

Flat blade screwdriver 7.0mm A/F spanner

1. Lever lugs in direction shown.
2. Lift shoe and holder.
3. Disconnect cable.
4. Reverse procedure to fit new shoe.

Note : Collector contact shoe and shoe holder are supplied as replacement part

ASSEMBLY OF END CAP ONTO ALUMINIUM / STAINLESS STEEL CONDUCTOR BARS



TOOLS REQUIRED :

- Steel rule or suitable measure
- 10MM A/F Open ended spanner.

1. Mark conductor bar surface 13mm in from end face.

2. Place item 4 into conductor bar.

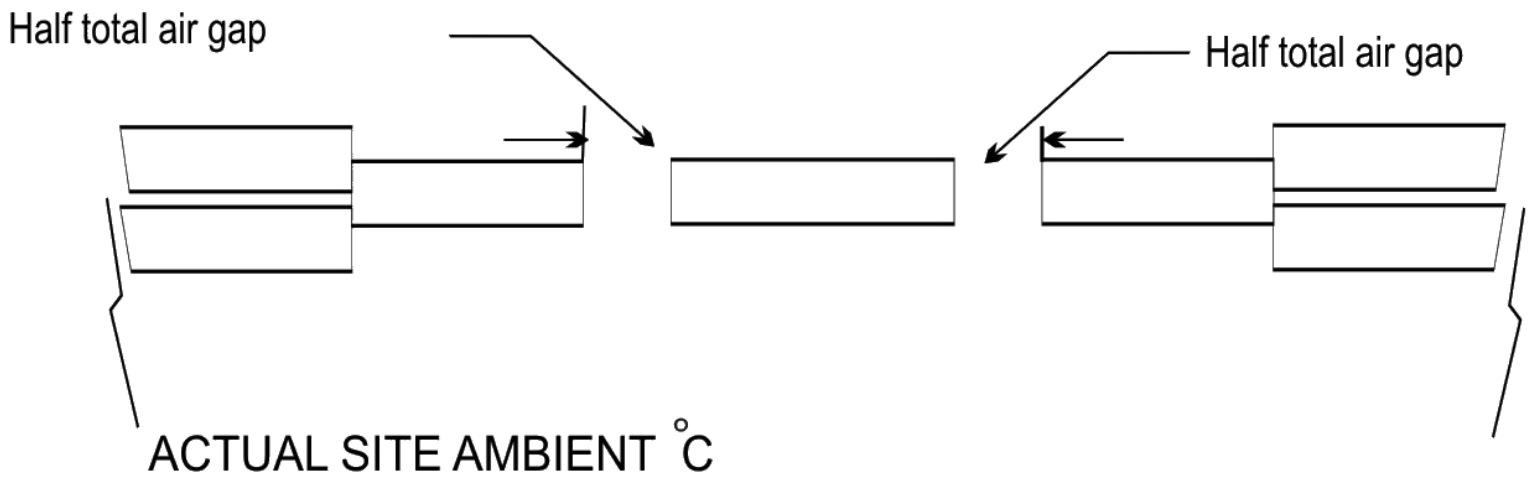
3. Ensure center line of setscrew item 4 is on the center line mark on the conductor surface.

4. Place item 3, 2 and 1 on to item 4 in the order shown..

5. Tighten item 1

6. Push item 5 over assembly. (Ensure item 4 is located in point ‘A’ on item 5).

EXPANSION AIR GAP SETTING FOR CONDUCTOR BARS WITH PVC COVER



LOWEST POSSIBLE SITE AMBIENT °C SEE NOTE

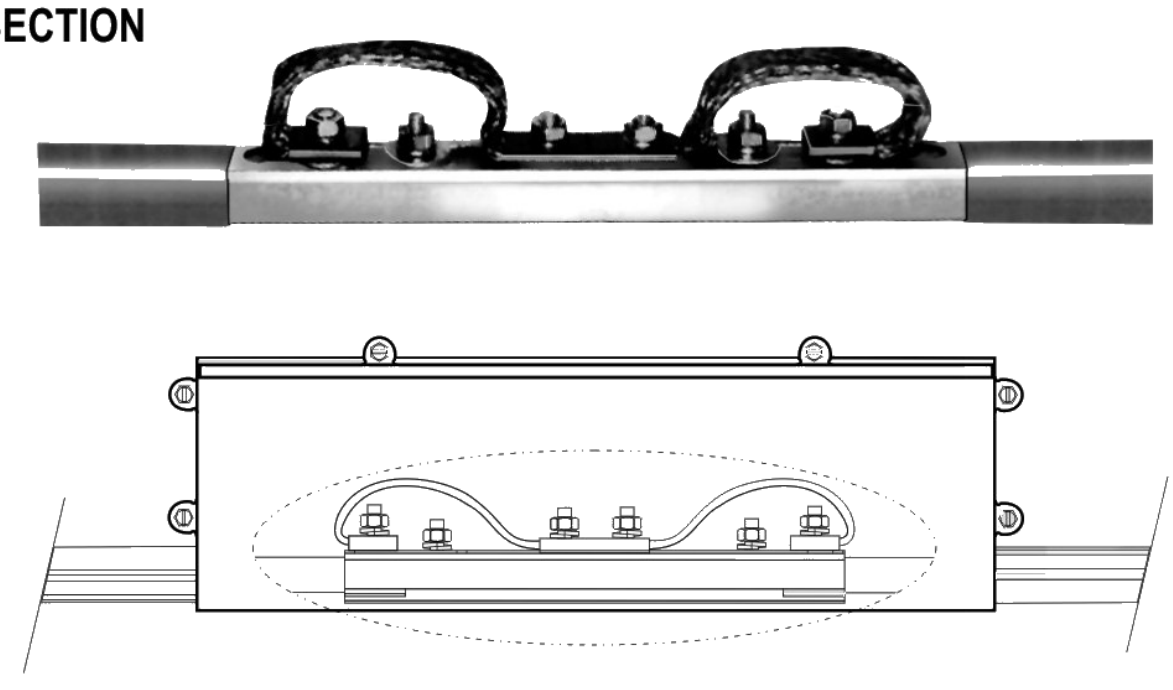
ACTUAL SITE AMBIENT °C

	-25°	-20°	-15°	-10°	-5°	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°
25°											50	45	41	36	32	27	23
20°										50	46	42	38	33	29	25	21
15°									50	46	42	38	35	31	27	23	19
10°								50	46	43	39	36	32	29	25	21	18
5°							50	47	43	40	37	33	30	27	23	20	17
0°						50	47	44	41	38	34	31	28	25	22	19	16
-5°					50	47	44	41	38	35	32	29	26	24	21	18	15
-10°				50	47	44	42	38	26	33	31	28	25	22	19	17	14
-15°			50	47	45	42	39	37	34	32	29	26	24	21	18	16	13
-20°		50	48	45	43	40	38	35	33	30	28	25	23	20	18	15	13
-25°	50	48	45	43	40	38	36	33	31	29	26	24	21	19	17	14	12

TOTAL GAP SETTING (mm)

Note : This figure is the lowest possible ambient °C used in calculation to determine the number of expansion section required for phase.

EXPANSION SECTION



EXPANSION SECTION ASSEMBLY

1. The maximum allowable conductor system length without an expansion section is as follows:

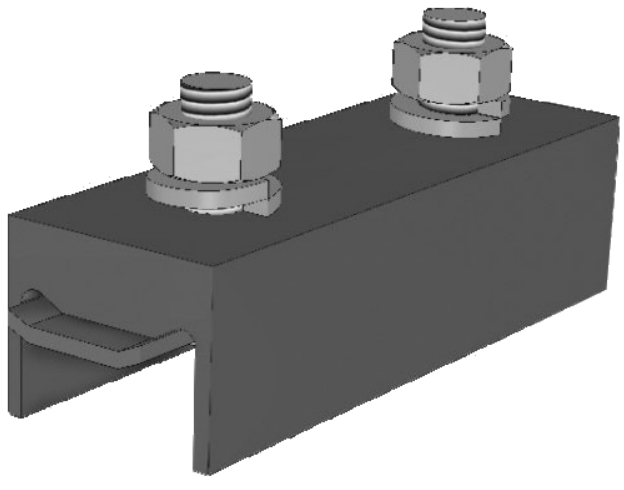
   Safe-Power 60 amps.....150 meters
   Safe-Power 100 amps.....150 meters
   Safe-Power 125 amps.....150 meters
   Safe-Power 160 amps.....150 meters
   Safe-Power 250 amps.....150 meters
   Safe-Power 400 amps.....150 meters
   Safe-Power 200 amps.....150 meters

2. The maximum distance between anchor points with an expansion section at approximately mid-point is as follows.

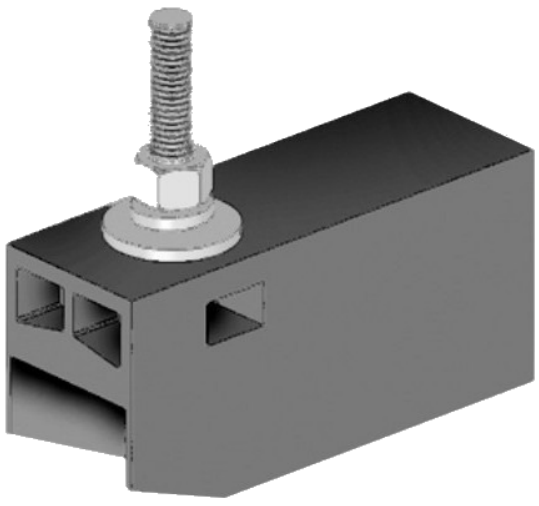
   Safe-Power 60 amps.....75 meters
   Safe-Power 100 amps.....75 meters
   Safe-Power 125 amps.....75 meters
   Safe-Power 160 amps.....75 meters
   Safe-Power 250 amps.....75 meters
   Safe-Power 400 amps.....75 meters
   Safe-Power 200 amps.....75 meters
   Safe-Power 315 amps.....75 meters

3. Set expansion air gaps when fitting assembly to appropriate gap setting for ambient temperature,(see chart). The gap is adjusted by sliding the moving lengths of conductor in or out of the expansion assembly (NOTE : BOTH HALVES BE SET EQUAL). Always allow sufficient time for the conductor bar to achieve ambient temperature before setting Expansion gap. All expansion assemblies must be set, they are not pre-set before leaving our factory. Failure to set this part correctly good result in buckling of all conductors.

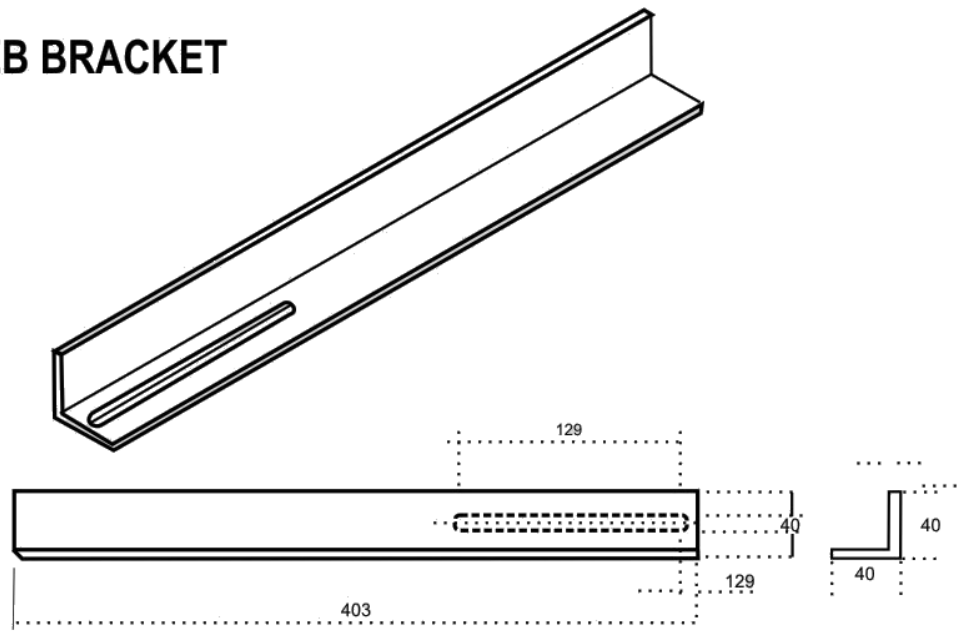
ISOLATION SECTION



TRANSFER CAP



WEB BRACKET



SYSTEM MAINTENANCE & INSTALLATION NOTES

1. Ensure all mains power is isolated before attempting to install or maintain the system.
2. Ensure all electrical joints are free from any contamination.
3. Ensure correct alignment of support brackets.
4. Ensure for conductor joints are not against hanger clamps. Adequate clearance must be allowed for expansion & contraction.
5. Ensure correct alignment of collector with conductor bar..
6. Ensure all power cables are flexible to allow expansion and contraction in the conductor bar system.
7. Ensure all armored cables terminated into suitable junction box and only flexible cables are install into the power feed assemblies.
8. Ensure conductor bars DO NOT support the weight of the main cable.

Maintenance notes:

1. Contact shoes should be checked for wear on monthly bases until a wear pattern can be established.
2. Check the alignment of collector to conductor bars.
3. Check conductor system to ensure no damage to insulated cover.
4. In environments that are subject to considerable build up of dust, especially conductive dust, remove at regular intervals by brushing.
5. Check collector pivot points are free from any contamination.

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