

REPAIR

The end user must not repair or modify any component associated with this device without written permission from TMAC.

If repair is required contact TMAC.

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DEFECTS / WARRANTY

DEFECTS

Goods are warranted to be free from defects. Provided they have been used strictly as recommended and subjected only to fair wear and tear, Goods (including parts within) which are found to be defective within 90 days after delivery to the Buyer will be repaired or replaced at the option of the Seller and at its expense. Repair or replacement by the Seller is the exclusive remedies of the Buyer.

WARRANTY

To the maximum extent permitted by law, the Seller makes no warranties, either express or implied, as to merchantability, fitness for purpose or otherwise with respect to the Goods other than in paragraph above and as required by statute. The Seller is not liable for any prospective profits or special, indirect or consequential damages or any general loss or damage, or for any expense resulting from use by the Buyer or others of defective Goods. The Seller's liability is limited to no more than the sale price of the Goods plus replacement delivery charges. Prior authority for the return of goods is required by the seller.

Please contact the seller by email sales@tmacgroup.com.au, phone 07 3826 6000 or fax 07 3826 6066 for claims related to defective / warranty of goods provided.

FOR THE FULL TERMS AND CONDITIONS PLEASE REFER TO TMAC "STANDARD TERMS OF TRADE"



Temporary Crossarm LV With Fixed or Lifting Bracket

ELECTRICAL • INDUSTRIAL | TOOLS • TECHNOLOGIES
TMACTM
THEW & McCANN GROUP

ACTIVE INNOVATION



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LIFTING BRACKET

- Disassemble the assembly before inspection;
- Check that the serial numbers match on lifting bracket and crossarm lifter;
- Check the lifting bracket for signs of damage or distortion;
- Check the six pole feet for damage;
- Check that the hinge on the crossarm clamp swings freely, but is tight without excessive play in the hinge pin;
- Check the ratchet mechanisms for firm, positive movement. Lubrication of the ratchet is not necessary and is not recommended;
- Check the webbing straps for fraying or other damage;
- Check the ratchet, strap hooks and their bolts for distortion or damage;
- Check for surface damage to the crossarm lifter insulating poles and clean off excessive dirt and grease with acetone and allow to dry. Then wipe over with a silicone cloth;
- Clean off loose dirt or grease with a clean dry cloth;
- Check for damage to the 4 nylon bushes within the lifting bracket guide tubes.

ROUTINE MAINTENANCE & INSPECTIONS

Routine Workshop Maintenance Inspection must be conducted at intervals of no more than 6 months apart.

TEMPORARY CROSSARM

- Check for surface damage to fiberglass. Clean off loose dirt or grease with a clean dry cloth;
- Check condition of PVC and black mastic liner. All should be undamaged and tight-fitting onto the fiberglass;
- Check condition of W.L.L. label and ensure it is legible;
- Clean off excessive dirt and grease with acetone, and allow drying time. Then wipe over with a silicone cloth to reinstate a water-repellent surface.
- To ensure the electrical integrity of the crossarm, a wet dielectric test should be conducted at 5kV per 300mm, as per IEC 60855.

CROSSARM INSULATORS

- Check for surface damage to insulators;
- Check there is no damage or distortion to the insulator strain links;
- Check there is no damage to the shackles;
- Check that the wing nut turn freely and that there is no damage to the threads;
- Check that the insulator latch gate moves freely open and shut;
- Clean off excessive dirt and grease with acetone, and allow to drying. Then wipe over with a silicone cloth;
- Periodic wet insulator test need to preform to ensure the integrity of the insulator with no tracking, puncture marks and no excessive temperature rise during the test.

FIXED BRACKET

- Check the fixed bracket for signs of damage or distortion;
- Check the four pole feet for damage;
- Check that the toggle latch is free to move and locks the temporary crossarm in position;
- Check the ratchet mechanism for firm, positive movement. Lubrication of the ratchets is not necessary and is not recommended;
- Check the ratchet strap for fraying or other damage;
- Check the ratchet strap hook and securing bolt for distortion or damage.

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STORAGE

Temporary Crossarm

When not in use the Temporary Crossarm must be stored in the bag supplied.

Crossarm Insulators

When not in use the Nylon Insulators must be stored in the bag supplied. *In storage they must be kept dry at all times.*

Ensure the Insulators are completely dry before placing them into the bag.

If the insulators are subject to prolonged moisture absorption, this will reduce the overall strength and increase the part dimensions.

Fixed Bracket

When not in use, the Bracket should be stored in a safe and secure place, to prevent abrasion or damage while in transit.

Lifting Bracket

When not in use, the Bracket should be stored in a safe and secure place, to prevent abrasion or damage while in transit.

Lifting Bracket Components

When not in use, the Lifting Bracket components must be stored in the bag supplied.



Figure 31 - Components packed ready for transport

1. Determine the best position on the pole for the pole bracket. Ensure when mounting the bracket to the pole all feet are in contact with the pole;
2. Ensure the insulators are aligned with the conductors then ensure all wing nuts firmly hand tightened;
3. Open the insulator latch gate on the temporary cross arm;
4. INTERMEDIATE WITH LINE DEVIATION
 - a. Raise the lifting mechanism to the required height, (maximum of 300mm) before applying the load. This is indicated by a black vertical stripe;
 - b. Ensure the insulators are aligned with the conductors then ensure all wing nuts are firmly hand tightened;
 - c. Open the insulator latch gate on the temporary cross arm;
 - d. Transfer the conductors from the permanent crossarm into the U-Clevises on the temporary crossarm;
 - e. Close the insulator latch gate;
 - f. Remove the permanent crossarm;

NOTE: A spanner may be inserted behind the pole bracket to access the kingbolt head or nut.

- g. Install the new permanent crossarm;
 - h. Proceed to step 6;
5. INTERMEDIATE WITH NO LINE DEVIATION
 - a. Raise Lifting bracket until the conductors are captured by the U-clevises;
 - b. Close the insulator latch gate;
 - c. Raise the Lifting Ratchet so the temporary crossarm clears the wooden crossarm. (ensure service bridging conductors are not stretched);
 - d. Remove the permanent crossarm;

NOTE: A spanner may be inserted behind the pole bracket to access the kingbolt head or nut.

- e. Install the new permanent crossarm;
 - f. The conductors may be lowered onto the new permanent crossarm;
 - g. Proceed to step 6;
6. Position the conductors next to the insulators on the new crossarm, and secure each conductor. Remove the insulator up out of the 'U' clevis to release the conductor;
7. Transfer the services from the temporary crossarm to the new permanent crossarm, ensuring conductor tensions are transferred in pairs to balance loads;
8. Remove the Temporary Crossarm from the bracket, then remove the bracket from the pole;
9. Dismantle all components and inspect them for damage. Clean as necessary;
10. Store all parts carefully in the bags provided.

BEFORE YOU START

GENERAL PRECAUTIONS



Read and understand this guide before operating this equipment.

The TMAC Temporary Crossarm with Fixed or Lifting Brackets to be used only by qualified personnel and must be used in conjunction with the user's own working and safety procedures, without compromising the integrity of the TMAC product supplied.

Follow all safety instructions contained within this guide.

QUALIFIED PERSON

A qualified person is one who is familiar with the installation, construction, operation or maintenance of the equipment and the hazards involved. In addition this person is competent, trained and authorized to undertake the work involved in accordance with established safety and working procedures.

SAFETY SYMBOLS USED IN THE GUIDE



Mandatory Action - This symbol indicates the action must be taken to avoid a hazard. Any information that follows this symbol must be obeyed to avoid possible harm.



Hazard Identification - This is a general warning sign. It is used to alert the user to potential hazards. Any information that follows this symbol must be obeyed to avoid possible harm.



Prohibition - This symbol indicates an action that must not be taken or must be stopped. Any information that follows this symbol must be obeyed to avoid possible harm.

LIFTING BRACKET – MATCHING SERIAL NUMBERS

Both the Lifting Bracket and Crossarm Lifter are matched components. Ensure the serial numbers on each are identical. This will ensure the correct alignment of the two components.

GENERAL INFORMATION

DESCRIPTION

The T-Mac® LV Temporary Crossarm with the Fixed Bracket is designed to temporarily support energized/de-energized low voltage conductors and de-energized HV conductors at their points of attachment while a damaged permanent crossarm is replaced. It may be used on a round wood, steel or concrete pole.

The T-Mac® LV Temporary Crossarm with the Lifting Bracket incorporates all of the features of the fixed LV temporary crossarm. Additionally, it incorporates the capability to lift all LV mains conductors together, to allow the mains to be raised and held clear of the LV insulators and crossarm. The Lifting Bracket must have all six (6) feet in contact with the pole. The design was developed over a 3 year period and is based on thorough research and development including extensive testing.

PRODUCT INFORMATION

Temporary Crossarm



Figure 1 - Fibreglass Crossarm

Crossarm Insulators

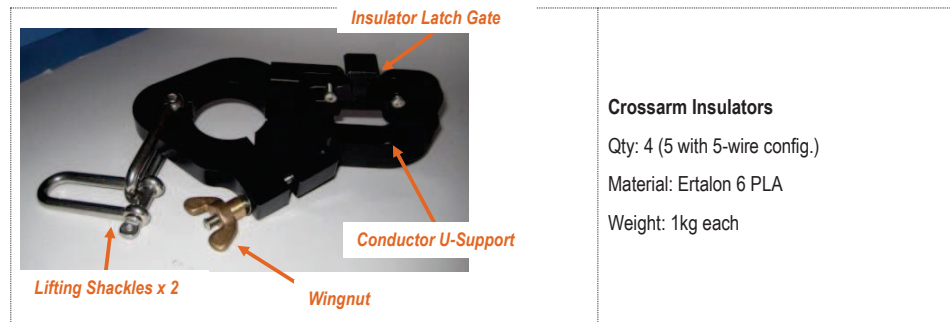


Figure 2 - Crossarm Insulators

7. Remove the permanent crossarm;

NOTE: A spanner may be inserted behind the pole bracket to access the kingbolt head or nut.

8. Install the new permanent crossarm;
9. Transfer the conductors and services from the temporary crossarm to the new permanent crossarm, ensuring conductor tensions are transferred in pairs to balance loads;
10. Remove the Temporary Crossarm from the bracket, then remove the bracket from the pole;
11. Dismantle all components and inspect them for damage. Clean as necessary;
12. Store all parts carefully into the bags provided.

LIFTING BRACKET - INTERMEDIATE AND ANGLE CONSTRUCTION PROCEDURE



ALWAYS take care to maintain even loadings on the crossarm at all times;

ALWAYS remove the temporary crossarm from the bracket before removing the pole bracket from the pole;

ALWAYS check that the locking pins are in place if the pole bracket is to be dismantled as a single piece;

If attaching additional services to the temporary crossarm, ensure the W.L.L. is not exceeded and the load remains balanced.

When using on an intermediate construction with line deviation, the bracket may be raised to a maximum of 300mm whilst UNLOADED. This is indicated by a black vertical Stripe.



NEVER Raise or Lower the LV Lifter on an intermediate construction with line deviation while under load.

Construction Type	Limitations of Use			
	Raise/Lower Under Load	Raise/Lower No Load	Raise to Max Height	Raise to 300mm Lift
Intermediate	Yes	Yes	Yes	Yes
Angle	No	Yes	No	Yes

Table 4 -Limitations of Use - Intermediate / Angle Poles

BALANCING 2 AND 4 WIRE LOADS

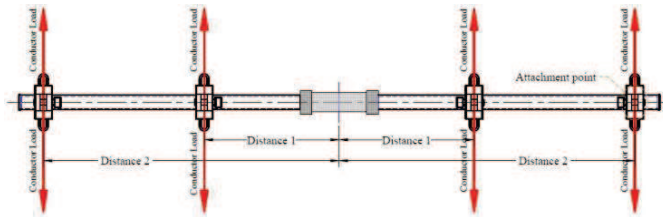


Figure 29 - Balancing Loads - Two and Four Wire



Care must be taken to keep the load as balanced as possible and the insulators must be evenly spaced. Ensure that;

- Distance 1 approximately equal both sides
- Distance 2 approximately equal both sides

BALANCING 5 WIRE LOADS (4 WIRE LINE PLUS STREETLIGHT SWITCH WIRE)

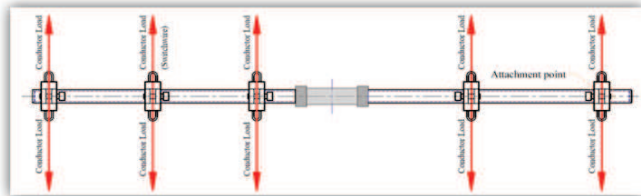


Figure 30 - Balancing Five Wire System



Care must be taken to keep the load as balanced as possible. A 5-wire construction is considered to be a balanced load. The spacing of the permanent crossarm conductor supports are spaced as such, to keep the load balanced.

FIXED BRACKET – INTERMEDIATE/ANGLE CONSTRUCTION PROCEDURE



ALWAYS take care to maintain even loadings on the crossarm at all times;

If attaching additional services to the temporary crossarm, ensure the W.L.L. is not exceeded and the load remains balanced.

1. Determine the best position on the pole for the pole bracket.
2. Ensure the insulators are aligned with the conductors and ensure all wing nuts are firmly hand tightened;
3. Open the insulator gates on the temporary cross arm;
4. Transfer the conductors away from the permanent crossarm into the U-Clevises on the temporary crossarm insulators;
5. Close the insulator latch gates;
6. Repeat steps 4-5 for the other conductors;

Fixed Bracket

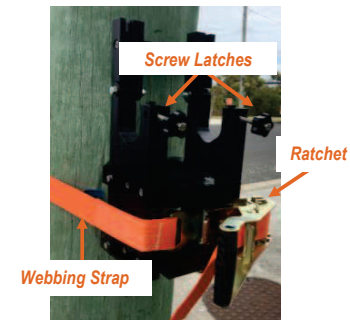


Figure 3- Fixed Bracket

Fixed Bracket

Material: Ertalon 6 PLA

Weight: 5.7kg

Lifting Bracket

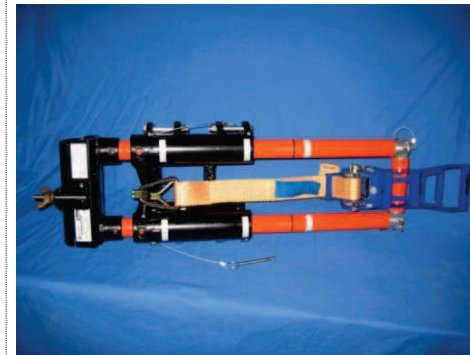


Figure 4 - Lifting Bracket

Lifting Bracket

Weight: 17kg

Note:- Must be used with all six (6) feet in contact with the pole.

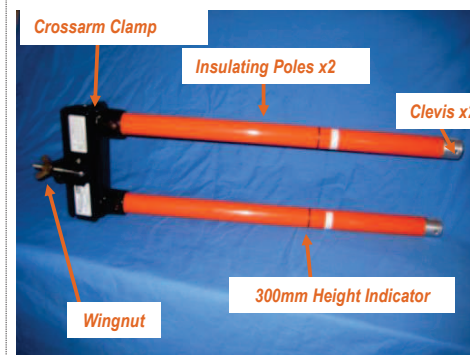


Figure 5 - Crossarm Lifter

Crossarm Lifter

Material: high strength aluminium, with insulating fiberglass supports

Weight: 4.1kg

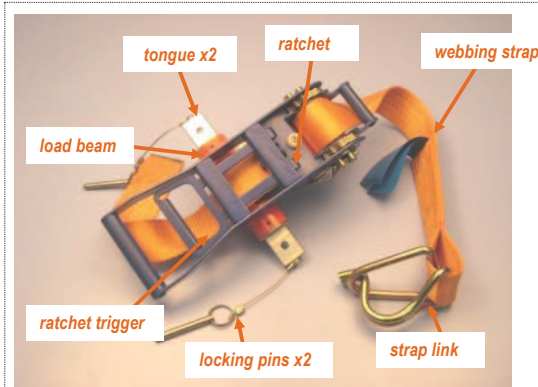


Figure 6 - Lifting Ratchet Complete

Lifting Ratchet Complete

Qty: 1

Weight: 3.1 kg



Figure 7 - Ratchet Device

Ratchet Device

Qty: 2

Weight: 1.6kg

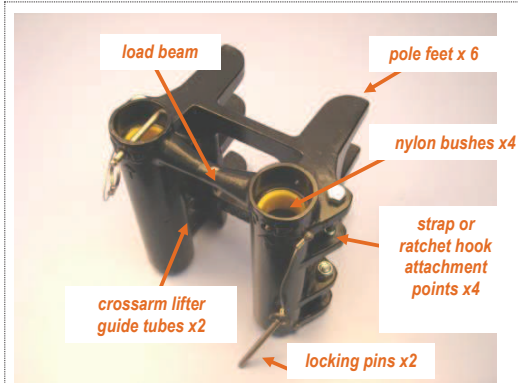


Figure 8 - Lifting Bracket

Lifting Bracket

Material: high strength aluminium

Weight: 6.5kg

LOWERING THE LV TEMPORARY CROSSARM

1. Pull the trigger on the ratchet, and raise the handle to the fully upright position. This engages the lowering ratchet, which allows the load to be lowered under complete control;
2. Release the trigger. Ratchet up and down to lower the Temporary Crossarm;

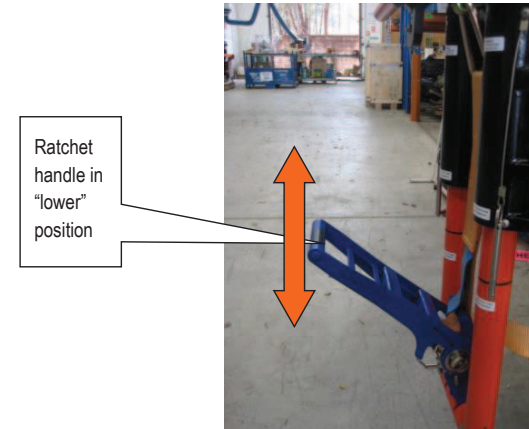


Figure 27 - Lowering the Crossarm

3. When at the required position, pull the ratchet trigger and push the ratchet lever straight down to the "locked" position;
4. When the crossarm lifter is dropped back to the pole bracket, insert the locking pins.

INTERMEDIATE/ANGLE CONSTRUCTION

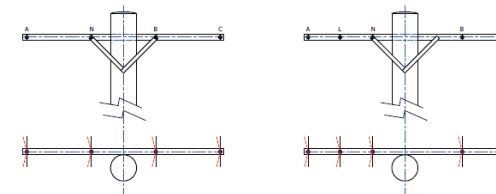


Figure 28 - Four and Five Wire Poles



WARNING Ensure the required separation distance is maintained from the above conductors, when raising the bracket.

1. **Remove the crossarm locking pins**, start lifting the crossarm using the lifting ratchet. The ratchet is lifted from its locked position by pulling the trigger in the handle, then cranking it from the horizontal downward position;
2. Release the trigger. Ratchet up and down to raise the temporary crossarm;

Ratchet handle in "raise" position

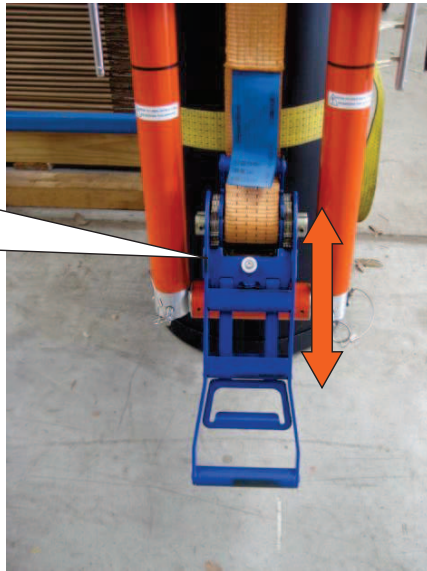


Figure 26 - Raising the Crossarm

3. When at the required position, pull the ratchet trigger and push the ratchet lever straight down to the "locked" position.

SAFETY

WORKING LOAD LIMITS

The T-Mac® LV Temporary Crossarm with Fixed Bracket is designed to -

- support conductors at straight-through poles with line deviation angles within the Working Load Limits of the arm;
- hold conductor tensions at termination poles within working load limits of the arm.

The T-Mac® LV Temporary Crossarm with the Lifting Bracket is designed to -

- support and raise conductors at straight-through poles within the Working Load Limits of the arm;
- support conductors at straight-through poles with line deviation angles within the Working Load Limits of the arm;
- hold conductor tensions at termination poles within working load limits of the arm.

The Working Load Limit of the T-Mac® LV Temporary Crossarm with the Fixed or Lifting Brackets depends on the number of conductor attachments, and is expressed as a "Working Load Limit per insulator":

Maximum W.L.L. per Nylon Insulator		
Application	Vertical & Horizontal Load	Side Load
2 wire	271kg (2.66kN)	100kg (0.98kN)
4 wire	194kg (1.90kN)	50kg (0.49kN)
5 wire	140kg (1.37kN)	40kg (0.39kN)

Table 1 - Maximum Working Load Limits



TMAC rates the LV Temporary Crossarm with the brackets for the working load limits as specified. However the user must determine in each case whether the loads applied in the field fall within the working load limits.

LIMITATIONS OF USE

T-Mac® LV Temporary Crossarm with The Fixed Bracket



DO NOT USE ON ENERGISED HIGH VOLTAGE LINES – the Temporary Crossarm is primarily designed for use on energized LV (415/240V) lines (It may be used on de-energized HV lines providing the W.L.L. is not exceeded);

DO NOT USE ON UNBALANCED LOADS – this can cause the arm to twist around the pole or deviate from the horizontal plane;

DO NOT USE ON HIGH LOADS exceeding the W.L.L.

T-Mac® LV Temporary Crossarm and Lifting Bracket



Do not Raise or lower on termination, angle constructions or unequal strain constructions while the crossarm is under load. (May be raised to a maximum of 300mm before applying the load, this is indicated by a black circular stripe on the insulating supports.);

Do not extend the leverage on the handle of the ratchet.

BEFORE USE



ALWAYS Inspect the LV Temporary Crossarm and Brackets for faulty components or damage before use.

ENSURE the serial numbers match on the Lifting Bracket and Crossarm Lifter to allow for correct alignment of the two components.



DO NOT use the LV Temporary Crossarm or Brackets if any component is faulty or damaged.

TEMPORARY CROSSARM

- Check for surface damage to fiberglass. Clean off loose dirt or grease with a clean dry cloth;
- Check condition of PVC and black mastic liner. All should be undamaged and tight-fitting onto the fiberglass;
- Check condition of W.L.L. label and ensure it is legible and is in test date.

CROSSARM INSULATORS

- Check for surface damage to insulators;
- Clean off any loose dirt or grease with a clean dry cloth;
- Check there is no damage or distortion to the attached shackles;
- Check that the wing nut turn freely and that there is no damage to the threads;
- Check the conductor latch gate opens and shuts freely and the locating screw is in place.

FIXED BRACKET

- Check the fixed bracket for signs of damage or distortion;
- Check the four pole feet for damage;
- Check that the toggle latch is free to move and locks the temporary crossarm in position;
- Check the ratchet mechanisms for firm, positive movement. Lubrication of the ratchet is not necessary and is not recommended;
- Check the webbing strap for fraying or other damage;
- Check the strap hook and bolts for distortion or damage.

LIFTING BRACKET

- Disassemble the assembly before inspection;
- Check that the serial numbers match on lifting bracket and crossarm lifter;
- Check the lifting bracket for signs of damage or distortion;
- Check the six pole feet for damage;
- Check that the hinge on the crossarm clamp swings freely, but is tight without excessive play in the hinge pin;
- Check the ratchet mechanisms for firm, positive movement. Lubrication of the ratchet is not necessary and is not recommended;
- Check the ratchet, strap hooks and webbing straps for fraying or other damage;
- Check for surface damage to the crossarm lifter insulating poles and clean off loose dirt or grease with a clean dry cloth;
- Check for damage to the 4 nylon bushes within the lifting bracket guide tubes.

Note:- The Lifting Bracket must only be used with the six (6) feet in contact with the pole.

NOTE: For in-line poles with little or no deviation loads, the conductors are supported in the U-clevises of the insulating brackets. They may be above or below the crossarm. The insulating clevis will support the full rated load of the fitting.

ATTACHING THE TEMPORARY CROSSARM TO THE LIFTING & FIXED BRACKET



NEVER use a tool such as a spanner or pliers to tighten the wing nut on the Lifting Bracket as this may cause damage to the assembly. The wing nut should be hand tightened only. On the Fixed Bracket ensure the toggle latch moves freely and is not distorted or damaged.

1. Open the crossarm support;
2. Lift the temporary crossarm into position in the top of the crossarm clamp, ensuring the black mastic liner is in the clamp and located between the PVC locating sleeves;
3. Then hand tightens the wing nut.



Figure 21 - Crossarm Support – Open



Figure 22 - Black Mastic Liner and Locating Sides



Figure 23 - Crossarm Inserted and Tightening



Figure 24 - Fixed Bracket in Position



Figure 25 - Lifting Bracket in Position

OPERATING THE LIFTING RATCHET

Raising the LV Temporary Crossarm



For termination, deviation or strain construction with unequal conductor loads on either side, raise the bracket to the required height before applying the load, to a MAXIMUM of 300mm. This is indicated by a black horizontal stripe.

For intermediate construction and equally loaded strain construction the bracket may be raised or lowered under load when the conductors are captive.



NEVER Raise or Lower under load on a termination, deviation or strain construction with unequal conductor loads either side. The fiberglass supports will slightly flex and may bind and cause excessive wear.

MOUNTING AND OPERATING THE CROSSARM INSULATORS



WARNING - If mounting the insulators at the pole top, take appropriate precautions to do this safely without strain. Sliding the insulating conductor brackets onto the crossarm up the pole involves stretching to the end of the crossarm.



NEVER use a tool such as a spanner or pliers to tighten the wing nuts as this may cause damage to the assembly. The wing nuts should be hand tightened only.



Figure 19 - Crossarm Insulator / Lifting Point / Conductor Holder

1. Slide the insulators onto the crossarm. Ensure the gate opening is facing the appropriate way;
2. Locate each insulator on the Crossarm to correspond to the conductors to be supported;
3. Ensure the insulators are fixed by evenly hand tightening the wingnut on each insulating bracket.



Figure 20 - Insulator on Crossarm

OPERATION

MOUNTING THE FIXED BRACKET TO THE POLE



NEVER use the fixed bracket in the upside-down position. The crossarm clamp should only be mounted in the upright position with the Crossarm Holder to the top.

1. Check all components are available, and are in serviceable condition;
2. Carry out worksite risk assessment and determine conductor loads to be taken by the LV Temporary Crossarm.
3. Check that the loads are within the capability of the LV Temporary Crossarm;

Maximum W.L.L. per Nylon Insulator		
Application	Vertical & Horizontal Load	Side Load
2 wire	271kg (2.66kN)	100kg (0.98kN)
4 wire	194kg (1.90kN)	50kg (0.49kN)
5 wire	140kg (1.37kN)	40kg (0.39kN)

Table 2 - Maximum WLL Fixed Bracket

4. Assess at what position the bracket is to be mounted on the pole;
5. Lift the pole bracket to the work position, ensuring the temporary crossarm insulators are close to the conductors when the crossarm is mounted;
6. Ensure the bracket is square on the pole. Then attach the strap hook to the bolt on the left hand side of the bracket. Ensure the strap is square and clear of projections;
7. Tighten the strap firmly with the ratchet mechanism. Do not utilize excess force or leverage to tighten the strap on the pole.



Figure 9 - Attaching Bracket to Pole



Figure 10 - Webbing Strap Tightening

MOUNTING THE LIFTING BRACKET TO THE POLE



WARNING - When lifting the pole bracket assembly to the work position fully assembled, ensure the crossarm locking pins are inserted before lifting.



NEVER use the lifting bracket in the upside-down position. Observe the arrows and labels showing the right way up with the Crossarm Bracket to the top.

1. Remove all the components from the protective bags.
2. Check all components are available, and are in serviceable condition. Check the condition of all ratchet straps for fraying and general condition and their attachment bolts are not distorted or damaged;
3. Carry out worksite risk assessment and determine conductor loads to be taken by the LV Temporary Crossarm and the Lifting Bracket. Check that the loads are within the capability of the equipment;
4. Assess at what position the Lifting Bracket is to be mounted on the pole;
5. Determine which 'Limitations of Use' are applicable for the construction type (listed below);

Construction Type	Limitations of Use			
	Raise/Lower Under Load	Raise/Lower No Load	Raise to Max Height	Raise to 300mm Lift
Intermediate	Yes	Yes	Yes	Yes
Angle	No	Yes	No	Yes
Strain	Yes	Yes	Yes	Yes
Unequal Strain	No	Yes	No	Yes
Termination	No	Yes	No	Yes

Table 3- Limitations of Use

ASSEMBLE OF THE LIFTING BRACKET;

NOTE: The LV Lifter may be assembled on the ground or at the pole top. Determine which is most suited to your situation. Take note of the weight of the assembly listed below.

LV Lifter fully assembled: 17kg

LV LIFTER BRACKET Only: 6.5KG

1. Insert the insulating poles into the pole bracket guide tubes. Insert the crossarm locking pins to lock the crossarm lifter in position;
2. Insert the lifting ratchet into the clevises on the ends of the insulating poles. Then fix with the securing pins;
3. With enough slack in the webbing strap, connect the strap link over the top load beam of the pole bracket;



Figure 11 - Inserting Crossarm Lifter



Figure 12 - Inserting Lifter Locking Pins

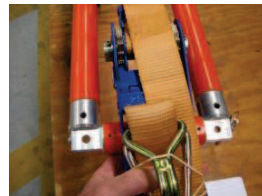


Figure 13 - Inserting Lifting Ratchet

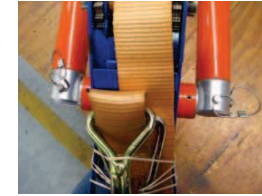


Figure 14 - Securing Lifting Bracket Locking Pins



Figure 15 - Connecting Lifting Strap to Load Beam

4. Lift the pole bracket to the work position, ensuring the crossarms insulating conductor brackets are close to the conductors when the crossarm is mounted;
5. Ensure the bracket is square on the pole. Then attach the reversible ratchets on either the left or right hand side of the bracket. Ensure the bracket is square on the pole; both straps are square around the pole and clear of projections. Check the straps are firm but do not utilize excess force or leverage to tighten the strap onto the pole.

NOTE: It is recommended to fix the bracket with the top strap first, and then secure the bottom strap.



Figure 16 - Fixing Ratchet to Bracket



Figure 17 - Tightening Webbing Strap



Figure 18 - Completed Bracket Pole Mounted