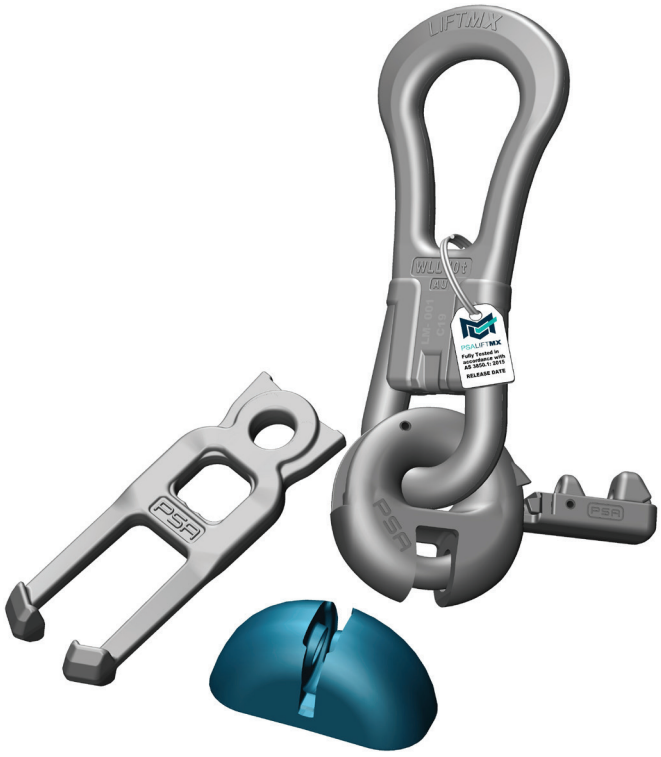
PSA

DESIGN GUIDE

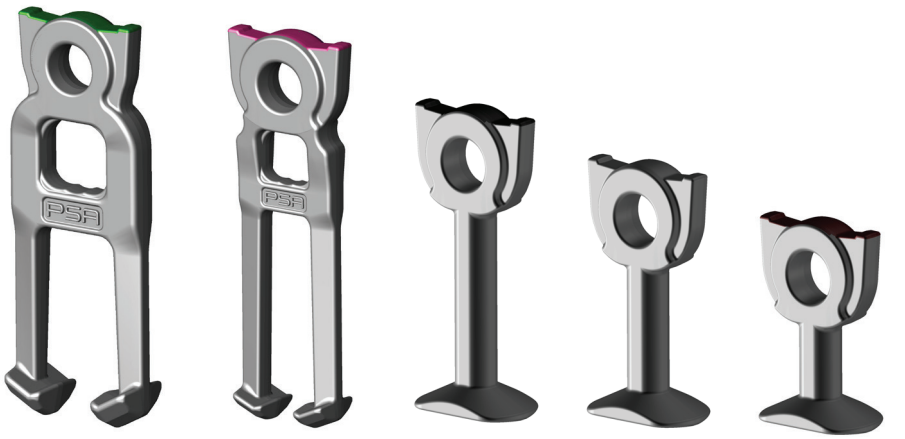
PSA LIFTMX LIFTING SYSTEM

PSALIFTMX

PSA LIFTMX® COMPONENTS



ONE CLUTCH... ONE VOID... ONE SYSTEM



10 TONNE EDGE LIFTER

8 TONNE EDGE LIFTER

7 TONNE FACE LIFTER X 145 MM

7 TONNE FACE LIFTER X 120 MM

7 TONNE FACE LIFTER X 95 MM

PSA LIFTMX

THE PERFECT SYNERGY BETWEEN STRENGTH, SAFETY AND PERFORMANCE

Introducing PSA LiftMX, an innovative edge and face lifting system accommodating panels upwards of 100mm thickness.

With a revolutionary patent pending design, PSA LiftMX is proven through vigorous testing to meet numerous configurations.

Suitable for commercial, residential and civil applications, PSA LiftMX is engineered for strength, versatility and easy use, from factory to site. Its cutting-edge design reduces visual cracking and spalling and maximises smooth engagement and manoeuvring.

With LiftMX PSA offers a "one clutch, one void, one system" saving time and labour both in-yard and on-site through its compatibility in using the same void former and clutch for the entire LiftMX lifter range: 8 tonne edge lifter, 10 tonne edge lifter, and 7 tonne face lifter.

PSA LIFTMX® FEATURES AND BENEFITS

- Compliant with AS 3850 Prefabricated Concrete Elements, Australian National Code of Practice for Precast, Tilt-up and Concrete Elements in Building Construction and independently tested by a NATA accredited testing company.
- Working load limits determined according to provisions in AS 3850.1 Appendix A and clause 2.2.
- Excellent ductility for added safety.
- Compact, light-weight design for ease of use in various precast element types, even in congested areas.
- Structural components are batch coded with clutches uniquely identifiable per AS 3850.
- Suitable for use in most precast elements, including columns, beams and thin precast units.
- Clutch allows for secure engagement and smooth manoeuvring, and extra safety features with lock.
- Void Former engineered to minimise concrete ingress.
- Constructed from quality ductile, forged and cast steel, to ensure optimum load capability between the varying parts.
- Lifters are hot-dip galvanised for durability to inhibit the effects of oxidation or corrosion.

PSA LiftMX lifters are compatible with PSA LiftMX Clutches and PSA LiftMX Void Formers only. Substitution with any alternative components or products other than the designated PSA range is not permitted in accordance with AS 3850.

PSA LIFTMX PERFORMANCE DATA

10 TONNE EDGE LIFTER - GREEN

PANEL THICKNESS (mm)	PART #	MAX WLL (t)	IN-YARD STRIPPING			PLACEMENT (WLL)			TENSION BAR
			12MPa	15MPa	20MPa	25MPa	32MPa	40MPa	Ø AND LEG LENGTH (mm)
			TENSILE*/ SHEAR** (t)	TENSILE*/ SHEAR** (t)	TENSILE*/ SHEAR** (t)	TENSILE (t)	TENSILE (t)	TENSILE (t)	
125	LME10	10	7.0/ 1.80	7.1/1.90	7.3/ 2.20	7.8	8.2	8.2	N16 x 500
150	LME10	10	7.20/ 2.15	7.80/ 2.40	8.30/ 2.70	9.25	9.25	10	N16 x 500
175	LME10	10	7.45/ 2.40	8.30/ 2.70	8.50/ 3.0	9.25	10	10	N16 x 500
200	LME10	10	7.80/ 2.50	8.60/ 2.80	8.90/ 3.0	9.25	10	10	N16 x 500
250	LME10	10	8.5/ 3.30	9.15/ 3.40	9.5/ 3.5	10	10	10	N16 x 500
300	LME10	10	8.9/ 3.75	9.3/ 3.75	10/ 3.75	10	10	10	N16 x 500

Compliant with AS 3850.1
Minimum reinforcement requirement: SL82 mesh and N16 perimeter bar centrally placed.
Refer page 8 of this document for installation instructions.
Shear spalling is possible if the recommended loads are exceeded.
Stripping & placement concrete strengths are noted as a guide only.
Please refer to the PSA Engineering Department for any additional information.
**Tensile WLL's for in-yard stripping.*
***Shear capacity data is based on avoiding concrete spalling during in-yard stripping.*

8 TONNE EDGE LIFTER - PINK

PANEL THICKNESS (mm)	PART #	MAX WLL (t)	IN-YARD STRIPPING			PLACEMENT (WLL)			TENSION BAR
			12MPa	15MPa	20MPa	25MPa	32MPa	40MPa	Ø AND LEG LENGTH (mm)
			TENSILE*/ SHEAR** (t)	TENSILE*/ SHEAR** (t)	TENSILE*/ SHEAR** (t)	TENSILE (t)	TENSILE (t)	TENSILE (t)	
100	LME08	8	4.2/ 1.30	4.45/ 1.35	4.6/ 1.5	5.0	5.0	5.0	N16 x 500
125	LME08	8	6.0/ 1.70	6.5/ 1.90	6.7/ 2.1	7.4	8.0	8.0	N16 x 500
150	LME08	8	6.7/ 1.90	7.45/ 2.15	8.0/ 2.40	8.0	8.0	8.0	N16 x 500
175	LME08	8	6.7/ 2.20	7.45/ 2.35	8.0/ 2.60	8.0	8.0	8.0	N16 x 500
200	LME08	8	6.7/ 2.30	7.45/ 2.50	8.0/2.80	8.0	8.0	8.0	N16 x 500

Compliant with AS 3850.1
Minimum reinforcement requirement: SL82 mesh and N16 perimeter bar centrally placed.
Refer page 8 of this document for installation instructions.
Shear spalling is possible if the recommended loads are exceeded.
Stripping & placement concrete strengths are noted as a guide only.
Please refer to the PSA Engineering Department for any additional information.
**Tensile WLL's for in-yard stripping.*
***Shear capacity data is based on avoiding concrete spalling during in-yard stripping.*

7 TONNE FACE LIFTER

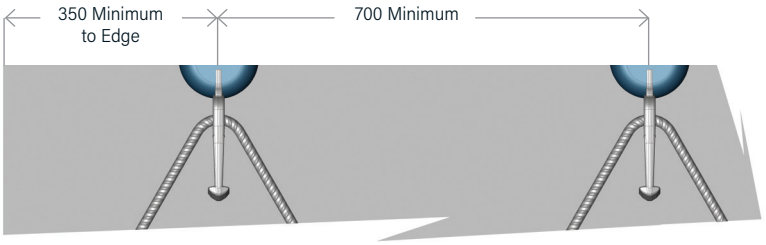
PRODUCT INFORMATION					TENSILE WLL AT SPECIFIC CONCRETE COMPRESSIVE STRENGTHS (F'_c, MPa) AT LIFT (TONNE)					
WLL (t)	PART NUMBER	COLOUR	LIFTER LENGTH (mm)	EMBEDMENT DEPTH (mm)	12	15	20	25	32	40
7.0	LMF07-095	Brown	95	105	2.2	2.5	2.8	3.2	3.6	4.0
7.0	LMF07-120	White	120	130	3.0	3.4	3.9	4.4	4.9	5.5
7.0	LMF07-145	Black	145	155	3.9	4.4	5.5	6.5	6.7	7.0

WLL capacities based on minimum panel reinforcement: SL82 centrally placed.
Note: Reduced edge distances will not affect these values provided they are ≥ 1.5 x Embedment Depth.
Minimum spacing required: 3 x Embedment Depth.
LMF07-095 - suit minimum panel thickness of 125mm
LMF07-120 - suits minimum panel thickness of 150mm
LMF07-145 - suits minimum panel thickness of 175mm

PSA LIFTMX LIFTER SPACING + CRITICAL EDGE DISTANCE SPECIFICATION

MINIMUM REQUIRED EDGE AND SPACING PARAMETERS

MIN. PANEL THICKNESS (mm)	EDGE DISTANCE (mm)	LIFTER SPACING (mm)
100 (For LiftMX 8T)	350	700
125 (For LiftMX 10T)	350	700



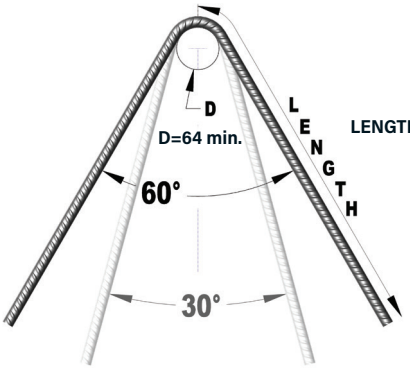
Refer to PSA Engineering Department for lifting solutions if edge distances and spacings are less than the above.
The above mentioned minimum dimensions are based on applications in reinforced concrete members using standard concrete mix.

ADDITIONAL COMPULSORY REINFORCEMENT
N16 TENSION BAR

BAR DIAMETER (mm)	LENGTH (AS PER DIAGRAM)	D (mm)
16	500	64 min

Please note that a 12mm tension bar may be used on 100mm thick panels as determined by the erection design engineer. Cover around lifters needs to be approved by structural engineer.

N16 TENSION BAR



PSA LIFTMX COMPONENTS



10 TONNE EDGE LIFTER



8 TONNE EDGE LIFTER



7 TONNE FACE LIFTER X 145MM



7 TONNE FACE LIFTER X 120MM



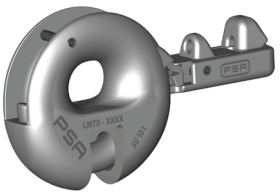
7 TONNE FACE LIFTER X 95MM



10 TONNE CLUTCH



10 TONNE SAFETY CLUTCH



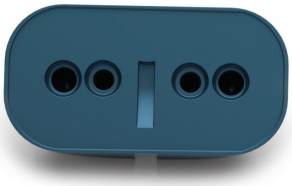
10 TONNE SAFETY CLUTCH TORUS ONLY

PSA LIFTMX LIFTERS AND CLUTCHES

PART	EDGE LIFTERS		FACE LIFTERS			LIFTING CLUTCH	SAFETY LIFTING CLUTCH	SAFETY LIFTING CLUTCH (TORUS ONLY)
WLL (t)	10	8	7	7	7	10	10	10
PSA PART NUMBER	LME10	LME08	LMF07-095	LMF07-120	LMF07-145	LMC10	LMC10-SAF	LMC10-SAFTOR
DIMENSIONS (TxWxL) (mm)	36 x 75 x 215	27 x 65 x 205	41 x 65 x 95	41 x 65 x 120	41 x 65 x 145	110 x 120 x 330	110 x 120 x 330	110 x 190 x 40
WEIGHT (kg)	1.06	0.71	0.55	0.60	0.67	4.3	4.5	1.8
MATERIAL	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
FINISH	Galvanised	Galvanised	Galvanised	Galvanised	Galvanised	Plated	Plated	Plated
LIFTER COLOUR CODE	Green	Pink	Brown	White	Black	-	-	-



VOID FORMER



VOID FORMER



VOID FORMER WITH PLATE RECESS



VOID FORMER WITH THREADED INSERTS



VOID PLASTIC LOCATOR PLATE



ANTENNA

PSA LIFTMX					
PART	Void Former	Void Former with Plate Recess	Void Former with Threaded Inserts	Void Former Plastic Locator Plate	Antenna
PSA PART NUMBER	LMV	LMVP	LMVT	LMPLP	LMA
DIMENSIONS (mm)	58 x 68 x 132	58 x 68 x 132	58 x 68 x 132	24 x 51 x 96	Ø9 x 19
WEIGHT (kg)	0.28	0.22	0.25	0.024	0.001
STIFFNESS	Flexible	Flexible	Flexible	Rigid	Flexible

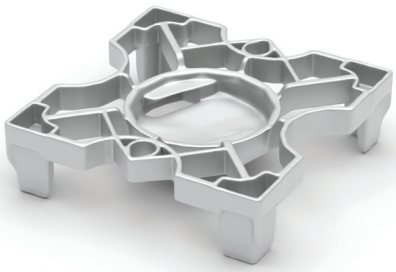
PSA LIFTMX COMPONENTS



PSA LIFTMX FACE LIFTER ASSEMBLED



VOID FORMER PLASTIC LOCATOR PLATE



FACE LIFTER CHAIR

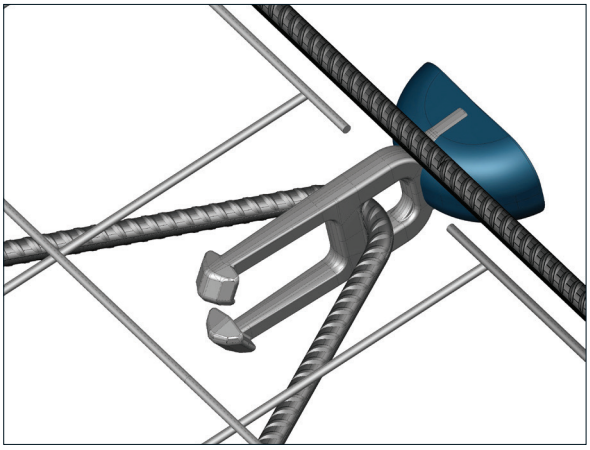
PSA offers a range of three purpose-designed chairs to suit the PSA LiftMX Face Lifters. These chairs are engineered to keep the lifter securely positioned and level throughout the concrete pour, helping to ensure accurate placement of the anchors. The table below outlines the panel thicknesses that can be achieved using various combinations of anchors and chairs.

PLASTIC FACE LIFTER CHAIR			
PSA PART NUMBER	LMFC30-S150/L175	LMFC35-L180	LMFC55-S175/L200
PANEL THICKNESS (MM) USING LMF07-095	125	130	150
PANEL THICKNESS (MM) USING LMF07-0120	150	155	175
PANEL THICKNESS (MM) USING LMF07-0145	175	180	200

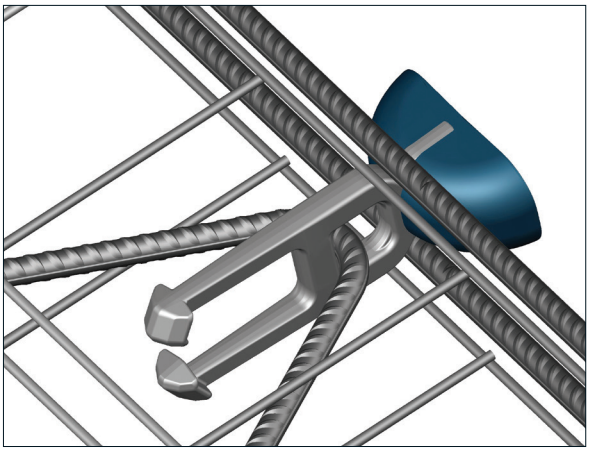
PSA LIFTMX EDGE LIFTER INSTALLATION INSTRUCTIONS

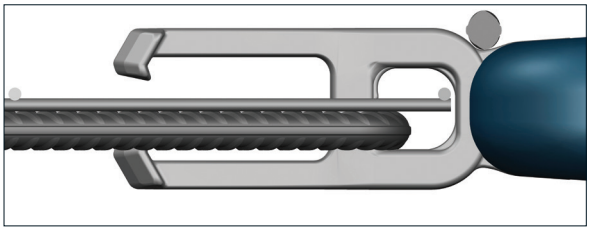
1. Insert lifter into void former and position the lifter central to the panel thickness and hard up against the formwork. Ensure lifter is fully enclosed by the void former and void former is clear of any concrete residue.
2. N16 continuous bar ("perimeter bar") must be placed on top of the lifter for central mat applications, and can be placed top and bottom of the lifter for double mat applications.
3. Position the tension bar within the LiftMX tension bar opening, sitting firmly against the solid inner cross member (lifter bridge) and tie onto the reinforcement mesh.

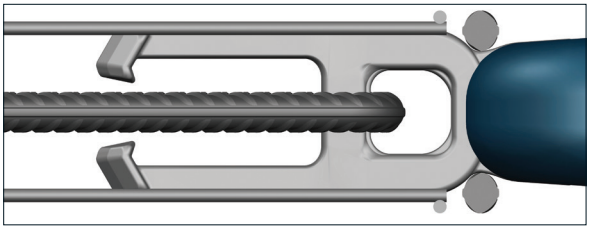
CENTRAL MESH APPLICATION



DOUBLE MESH APPLICATION







CENTRAL MESH

Tension bar must be placed through the LiftMX tension bar opening, either above or below the central mat. Perimeter bar location is best suited on top of the lifter neck. Alternative placement of bar should be confirmed with erection design engineer.

DOUBLE MESH

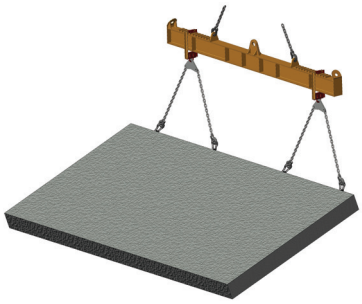
Tension bar must be placed inside of the LiftMX tension bar opening. Perimeter bars can rest in the neck of the lifter, top and bottom. Tie up the tension bar to the lifter bridge. Alternative placement of bar should be confirmed with erection design engineer.

CONCRETE COVER

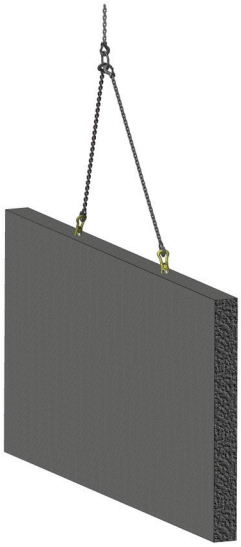
PART NUMBER	PANEL THICKNESS (mm)	PERIMETER BAR CONFIGURATION	SL82 MESH CONFIGURATION	CONCRETE COVER (mm)
LME08/LME10	125	N16 Central	Central	25mm to edge of galvanised lifter
LME08/LME10	175	N16 Double	Double	30mm to edge of mesh

Please note that lifter must be installed as per specifications above. Welding around lifters is not permitted.
Please refer to PSA Engineering Department for additional information.

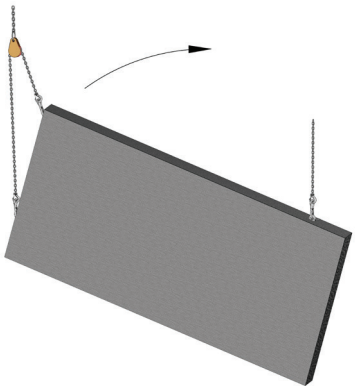
PSA LIFTMX TYPICAL RIGGING DIAGRAMS



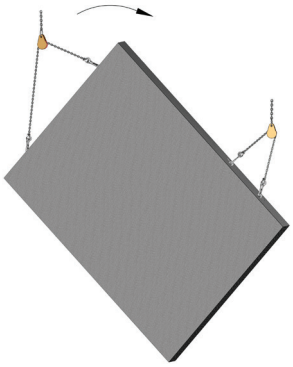
LIFT FROM AN EDGE



VERTICAL LIFT FOR TRANSPORT



ROTATION WITH ONE TAILING ANCHOR

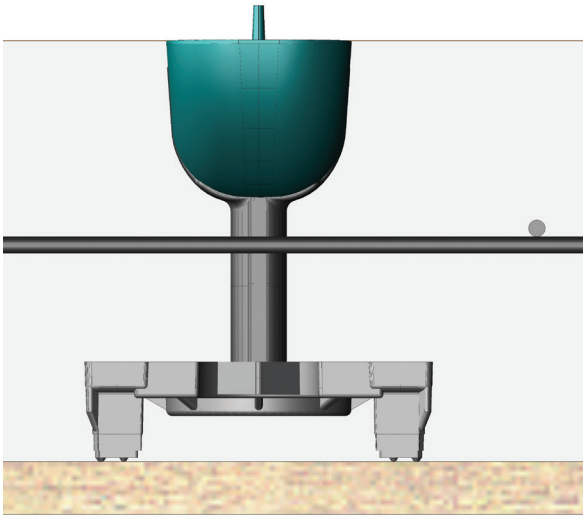


ROTATION WITH TWO TAILING ANCHORS

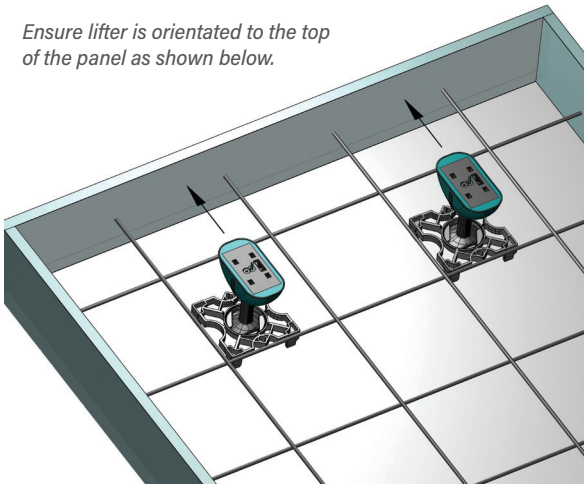
Refer to AS 3850.2015 Guidelines for the various application of safe lifting techniques.

PSA LIFTMX FACE LIFTER INSTALLATION INSTRUCTIONS

1. Insert face lifter into void former and ensure lifter is fully enclosed by the void former and void former is clear of any concrete residue.
2. Void former and lifter assembly must be firmly fixed so that the void former is level with lifting surface (near face). To ensure void former is flush and securely assembled please use compatible PSA LiftMX Face Lifter Chair. Lifter may also be tied into reinforcement for non standard thicknesses
3. Locate the lifter so that the narrow end of a void former points towards lifting direction. Lifters should be oriented in the same direction as the chain angle. An example of a panel is shown below.

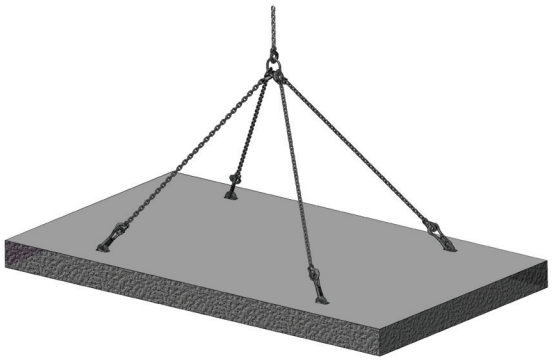


Ensure lifter is orientated to the top of the panel as shown below.

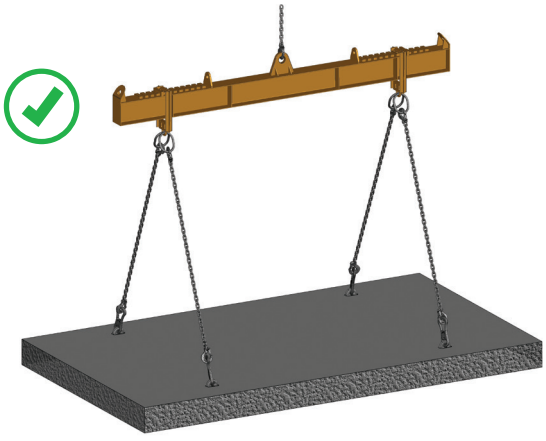


Please note that orientation of lifter will have an impact on the tensile performance of the lifter and the shear capacity performance. Contact PSA Engineering department for shear performance data of LiftMX face lifters.

PSA LIFTMX FACE LIFTING

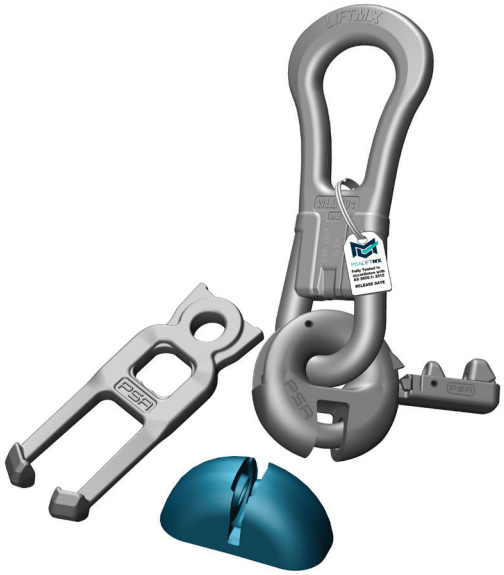


*Note: Flat lift, four lifting points, but only **two** points share full load*



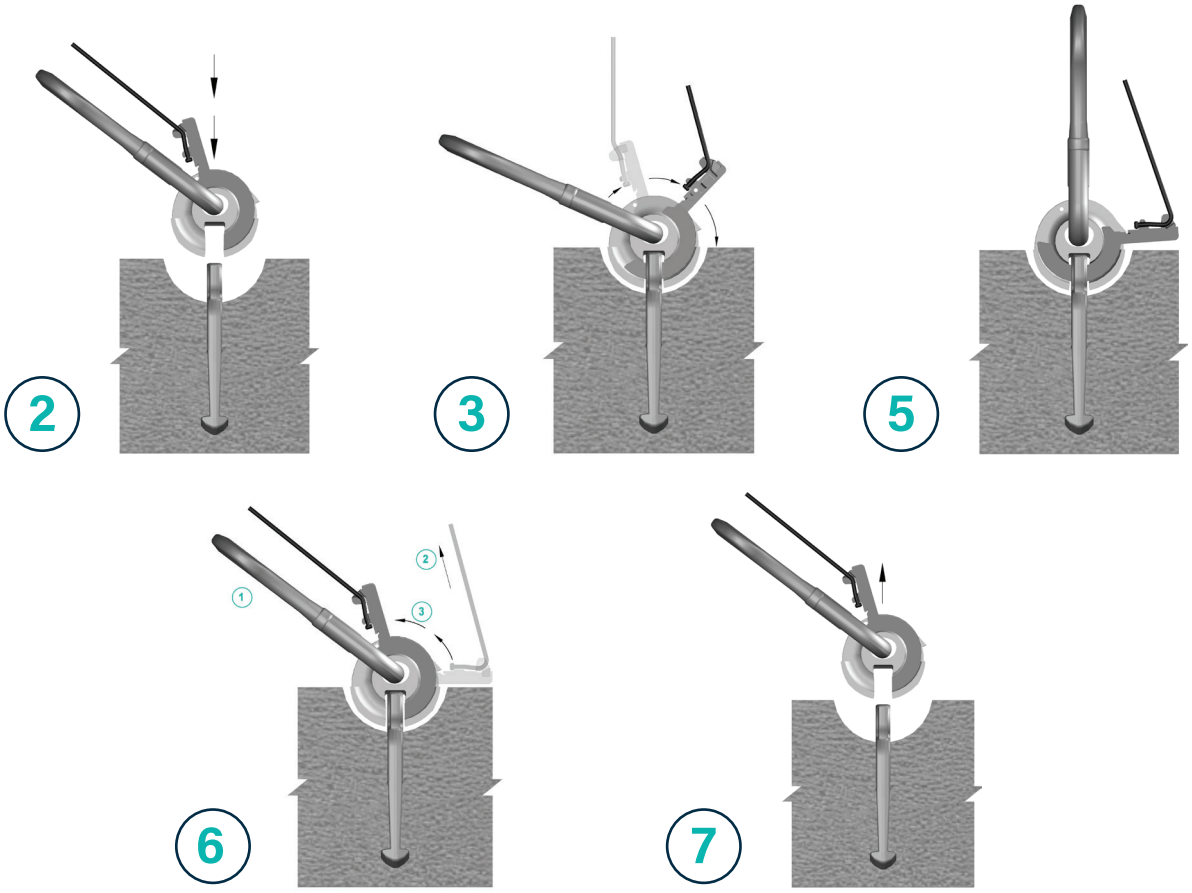
*Note: Use lifting beam, or other means to ensure load equalisation all **four** lifters are equally loaded*

PSA LIFTMX SAFETY CLUTCH - RIGGER SAFE HANDLING GUIDE



1. Carefully check the head of the LiftMX Anchor as well as the LiftMX Clutch for visible damage or deformations.
2. Install the LiftMX Safety Clutch over the head of the lifter. The handle of the Locking Ring should be orientated outwards (away from the centre of lift).
3. Fully rotate the handle of the locking ring towards the panel. Once the clutch is fully engaged, the handle will be automatically locked against the torus.
4. For ease of release feed a rope connected to the locking ring handle loosely through a lifting chain link or an additional ring connected to the chain. This is ideally done 500 to 800 mm above the shackle. It is beneficial to use an additional ring that is connected to the chain instead of feeding the rope through the chain link as this will avoid the rope getting stuck between two chain links.
5. Ensure the clutch is fully engaged with the handle of the locking against the concrete surface and proceed with the lift as per lifting certification. Monitor the clutch handle and the release rope during the entire lift. Should there be an entanglement of the handle or the release rope stop the lifting process, re-adjust the rigging and start again.
6. After the concrete element has been safely installed and was secured (1) release the load on the shackle, (2) pull the release rope to unlock the locking ring handle until (3) the locking ring rotates and disengages.
7. Remove the clutch from the panel.

Note: The Clutch will not disengage; until the full load has been released and until the lock handle is rotated sufficiently for the lock ring to be out of the anchors lifting hole.



Refer to AS 3850.2015 Guidelines for the various application of safe lifting techniques.

PSALIFTMX

PSA

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