Introduction

Instructions for crane operators

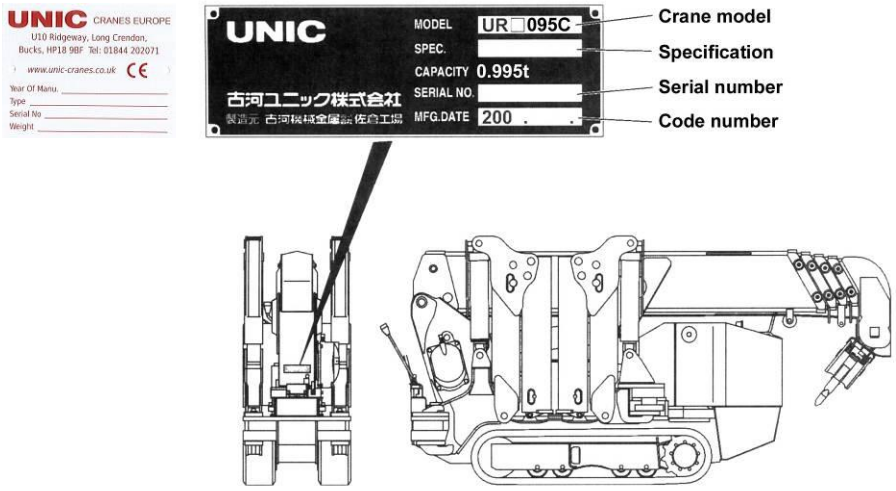
This operator's manual contains correct operational procedures plus simple servicing and inspection instructions for the UNIC pedestrian operated series of cranes (URW 094, 095, 245 and 295). Many of the set-up, operational and maintenance features of this series of cranes are the same throughout. However, certain models have unique features; where this is the case, additional model specific information is also contained in this manual.

Ensure you read this manual prior to carrying out any operation of the crane.

Although we take all possible measures to ensure the quality of the crane and all accompanying literature, please contact UNIC Cranes Europe if you have a query.

When making enquiries, or ordering spare parts or requesting repairs please ensure that you have the model number, specification (if applicable), serial number and date of manufacture available to speed the process.

All of this information is available on the data plate on the rear of the kingpost.



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1 SAFETY INSTRUCTIONS

a. Instructions to operators

- The UNIC pedestrian operated crane is designed in accordance with all relevant safety requirements. However, errors in operation and misuse will increase the risk of:

  i. Serious injury or loss of life to the operator and others;
  ii. Damage to lifted materials or infrastructure;
  iii. Incorrect function and efficiency of the crane.

- Only personnel who have received adequate instruction and training may operate this machine.

- All persons involved with the set-up, operation and maintenance of the crane must read and observe the instructions in this manual. Failure to follow these instructions may compromise the safety of yourselves and others.

- Pay attention to any prohibition and hazard signs as explained in this manual. Failure to do so could lead to serious injury, loss of life and /or damage to equipment and property.

- Always make sure that this manual is available to the operator.

- Unauthorised alteration to the structure or operational controls of the crane is prohibited for safety reasons. If alteration of the crane is required contact UNIC Cranes Europe. in the first instance.

- Only operate the crane in accordance with its intended use, which requires complying with the operating manual and following the recommended inspection and maintenance schedules.

- Failure to operate and maintain the crane as per the instructions and as intended will result in any warranty claim being voided.

- The crane must only be operated within the limits of the Working Range Chart and Rated Load Chart.

Explanation of symbols used in this manual

	**Prohibition: DO NOT carry out**		**NO SMOKING or naked flames**
	**General Hazard: Be very cautious**	**NB**	**Operational notes**
	**Highly Flammable**		**Toxic Substances**

b. Loading and Unloading using a Crane

When loading and offloading the crane with another crane, only use the lifting points shown below. Use of other points for lifting may result in failure of the suspension point or lifting gear. This may cause serious or fatal injury to personnel and serious damage to the crane.

Always ensure that the lifting points are fitted with shackles of the correct size and capacity. Use of the wrong type will result in damage to, and maybe failure of, the lifting point or lifting accessory.

Loading and off-loading operations must only be carried out by an operator authorised to use the type of equipment used. Loading/unloading operations must always be supervised by a competent person.

Where a ramp is used, that is not an integral part of the transport vehicle, it must be of sufficient strength to bear the weight of the crane. It must be at least four times as long as the height of the truck platform. For further details read the Loading and Unloading Procedures information plate.

Without
Electric Pack

With Electric Pack

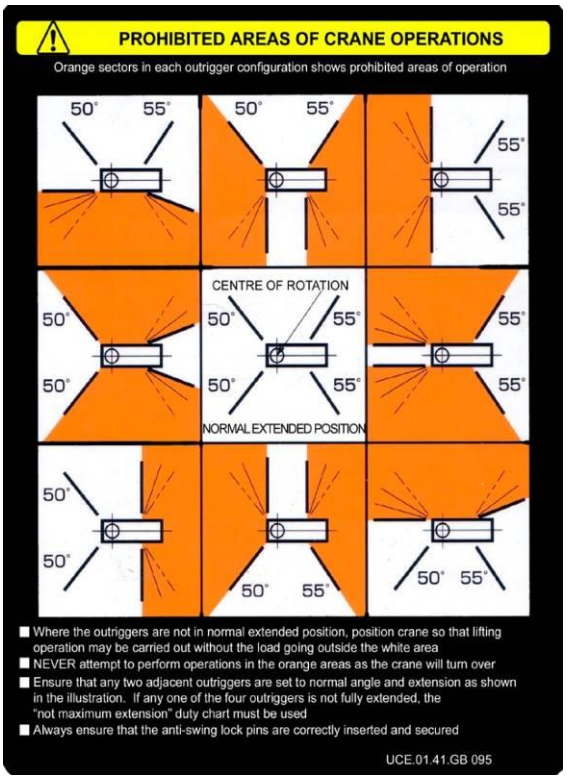
c. Important Points to Note - URW 095

This section provides additional safety information for operators. The URW 095 is based on, and is visually very similar to, the URW 295. However, there are some extremely critical differences that the operator must be aware of before operating this particular crane.

i. Outrigger Settings

Important: Each outrigger on this model has variable pin settings on the carrier chassis and can be configured in any one of five different positions; in order for the crane to be set up so that the boom can be slewed safely throughout its 360 degree range, the angle of the outriggers must be positioned to 50° at the Rear (Kingpost end) and 55° at the Front (Crane control end). This is known as the “standard” operating position and is indicated on the crane by yellow arrow decals on both the carrier chassis and each outrigger. If the outriggers are positioned to any other position other than the one mentioned above, the safe slew area becomes restricted and is indicated by a decal located close to the control levers on the crane.

The outriggers on the URW 095C may be set independently in a number of positions. It is important to note that any change from the Standard Position will affect the safe operational areas of the crane.
If any changes are made from Standard Position, then reference must be made to the ‘Prohibited Area of Operations’ decal on the crane to determine where lifting is permitted.



UNDER NO CIRCUMSTANCES MAY LIFTING OPERATIONS TAKE PLACE IN AN AREA DESIGNATED AS PROHIBITED (ORANGE ARC) ON THE DECAL. NOT EVEN IN AN EMERGENCY

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2 SAFETY INSTRUCTIONS FOR CARRIER OPERATIONS

a. ***Before operation***

- Always wear correct PPE for the task. Do not wear loose or torn clothing as this may cause a hazard with rotating machinery or wire rope. If wearing loose jewellery or hair is worn long, take additional precautions to ensure that it cannot come into contact with moving machine parts.

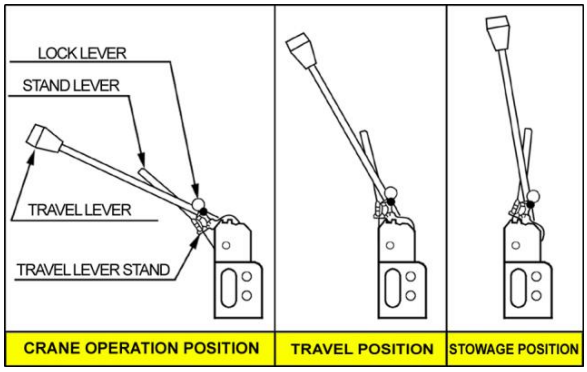
- Carry out pre-use inspection and ensure a pre-use checklist is completed. If a defect is found, do not carry on the operation until it has been rectified.

- Ensure all safety covers are correctly fitted. Failure to do so may leave moving machinery exposed.

- The engine must be stopped with the ignition turned off before re-fuelling or lubrication can commence. Remove all naked flame and incandescent heat sources from area.

- Do not operate the machine inside buildings using petrol/diesel option without adequate ventilation. To do so may cause carbon monoxide poisoning and eventual asphyxiation.

- Move the 'crane-crawl' lever to crawl or the travel position. This allows the driving control levers to move and engages the crawl function. No crane operations can function with the interlock in this position.



b. ***During operation***

- Due to the small size of the carrier, the overall crane has a high centre of gravity. Particular care must be taken when crossing uneven ground, traversing slopes or negotiating obstacles, otherwise the crane may overturn.

- When travelling, the outriggers must be stowed and locked.

- The crane must never be moved with a load suspended on the hook or without the hook being stowed correctly. The boom must be fully retracted and stowed correctly.

- When travelling over rough ground ensure that the crane is being driven at slowest speed.

- Do not travel the crane over any particularly rough ground, e.g. lying rocks with sharp edges, rough solid rock, small broken stones, edges of steel plate, steel bars for reinforcement, scrap metals, and waste materials on a route such as near a riverside where covered with many stones which may significantly shorten service life of the crawler tracks.

- Passengers are not permitted on the carrier at any time.

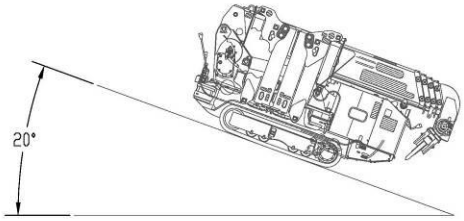
- Where there are obstacles or depressions, ensure that the crane is driven directly at them to minimise any stress to the carrier chassis caused by twisting.

- Make sure a board/sufficient support is used where the crane has to go over a vertical rise of more than 150mm.

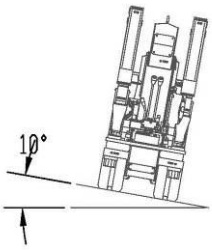
- When driving on a slope ensure that crane is only driven at slowest speed. Do not abruptly change course on a slope. Avoid crossing a slope. When travelling straight up and down a slope, if visibility is restricted, use a banksman or signaller to assist.

- When parking on a slope ensure that the tracks are adequately chocked.

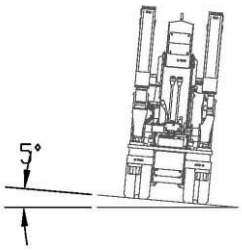
- Do not attempt to travel up or down an incline of greater than 20°, or traversing across an incline of greater than 10°. The ground (or ramp) must be of sufficient load bearing capacity to support the weight of the crane and should be smooth with no undulations or non-linear surface. If traversing an incline where the surface is undulating or unstable, this angle must be reduced to 5°. The same 5° angle must also be adhered to if the surface is wet. When traversing any incline, it is prohibited to make any changes in direction (either left or right).



Traversing up and down the incline



Traversing along the incline



Traversing along the incline on unstable ground or in wet conditions

- Do not travel with anything stowed on the vehicle. This may cause a shift in the centre of gravity and cause the crane to turn over.

c. ***Loading and unloading***

- Use non-slip boards of sufficient strength, width and length

- Drive the vehicle straight up and down, do not change direction. Where possible always reverse up the ramp/incline and drive down forwards.

- Stop the engine and chock the tracks to secure the crane.

d. ***After operation***

- Return the travel levers to the neutral position and allow the engine to idle.

- Move the ‘crane-crawl’ lever to the ‘Crane’ position. This electronically engages the crane function. The drivetrain to the tracks however is always active, so care should be taken not to inadvertently operate the levers in this position.

- Stop the engine and clean the crane. Pay attention to avoid getting electrical areas such as wiring or battery wet, as this could potentially cause a short circuit, leading to a fire. Likewise ensure all hot running areas of the engine, including the silencer, are thoroughly cleaned, once they have cooled sufficiently.

- Either park the crane in a garage or use a cover to protect it. If fitting the cover ensure all hot parts of the crane have cooled sufficiently, in order to reduce the risk of fire.

- Remove the ignition key and store it safely. If being left for long periods of time, disconnect the negative lead from the battery.

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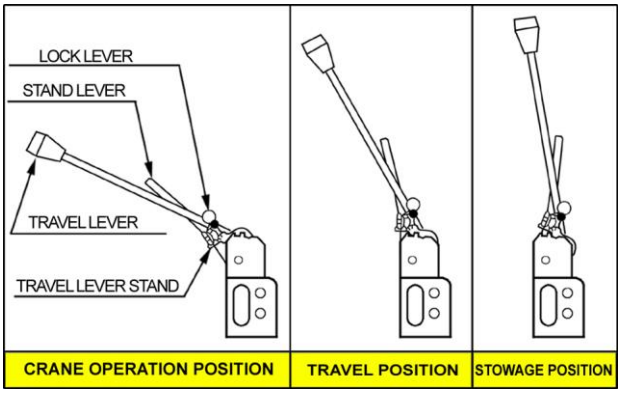
3 SAFETY INSTRUCTIONS FOR CRANE OPERATIONS

a. Before operation

- Carry out pre-use inspection on carrier, crane and any lifting accessories you may be using.
- Move the 'crane-crawl' lever to Crane



- Ensure that all safety devices are functioning properly.
- Ensure that adequate distance is maintained between the crane and any high voltage electricity cables. Refer to National Standards and guidance.
- Do not operate crane when wind speed exceeds 10m/sec (36 kph or 22 mph).
- Do not operate crane when there are electrical storms (lightning) in the immediate vicinity of the operation.
- Ensure that the ambient lighting is adequate to carry out the task safely. For guidance on adequate lighting refer to relevant legislation and guidance.
- Ensure that the work area is adequately cordoned and signed to prevent unauthorised persons entering.
- Ensure that the area where the outriggers are to be set is level, uniform and firm. This may require the use of spreader mats or road plates.
- Using the outriggers, lift the crane approximately 50mm from the floor (as a minimum). Ensure the carrier bed is level. If not use the outriggers to level it.
- In normal operation ensure the outriggers are fully extended.

b. *During Operation*

- Where there is a possibility that the load may traverse over the operator position the operator must use the remote control to position themselves a safe distance OUTSIDE of the arc of traverse.

- Pay attention to the hook block over-hoist. Remember that the hook is hoisted during boom extension and if the hook strikes the boom it may cause damage to the wire rope or sheaves and may lead to loss of the load.
- Operate the controls slowly and smoothly
- Slew the crane at slow speed. High speed slewing causes the load to swing out, increasing the working radius which may lead to instability.
- Never operate the crane in an overload condition, to do so may lead to serious injury or loss of life.
- Never attempt to pull/drag a load using the crane, this can lead to overturning or serious damage to the crane structure.
- Always perform a trial lift. Lift the load approximately 50mm from the floor and check the stability of the load and the correct positioning of the lifting attachments before proceeding with the lifting operation.
- When lowering a load always stop approximately 100mm from the floor and lower the remaining distance slowly.
- Never leave a suspended load unattended.
- Never ride the hook or the load.
- Never stand underneath a suspended load.
- Do not allow rope to go slack when lowering a load to the ground, or when retracting the jib as it will cause the rope to unwind from the drum. This will cause irregular winding of the rope on take-up, dramatically shortening the life of the rope. If unwinding does occur, apply tension to the rope manually and take-up slowly, ensuring the rope feeds on evenly until the load or hook is clear of the floor.
- Ensure that there are a minimum of three turns of rope left on the winch drum at all times. This may occur where the hook is lowered below floor level, e.g. from the roof or into an underground shaft.
- Stop crane operations when the hydraulic oil temperature exceeds 80°C. Excessive temperature may cause gasket or seal failure allowing scalding oil to be ejected at very high pressure.

c. ***After Operation***

- Ensure that the boom, outriggers and hook have been correctly stowed prior to crawling.
- Do not carry out any maintenance or repairs on the machine until the hydraulic and gear oil has sufficiently cooled.

4 *a.* **DESCRIPTION OF CARRIER EQUIPMENT – 095/295 PETROL VERSION**

1. **Crawler Track**. Cored bar and steel fabric cords are integrally moulded into the rubber.

2. **Wheel Sprocket.** Transmits the drive to the track.

3. **Idle Roller.** Supplies the correct tension to the track.

4. **Truck Roller.** Supports the weight of the crane and rolls on the rubber track.

5. **Crawling Motor.** Hydraulic motor with reduction gearing built inside the wheel sprocket housing.

6. **Travel Lever.** Allows the operator to change the direction of the machine and control travel speed.

7. **Accelerator Lever.** Controls engine speed in travel mode only.

8. **Horn Switch.**

9. **Fuel Tank.** Lead free petrol.

10. **Hydraulic Oil Tank.** This reservoir supplies both the carrier and the crane.

11. **Starter Switch.**

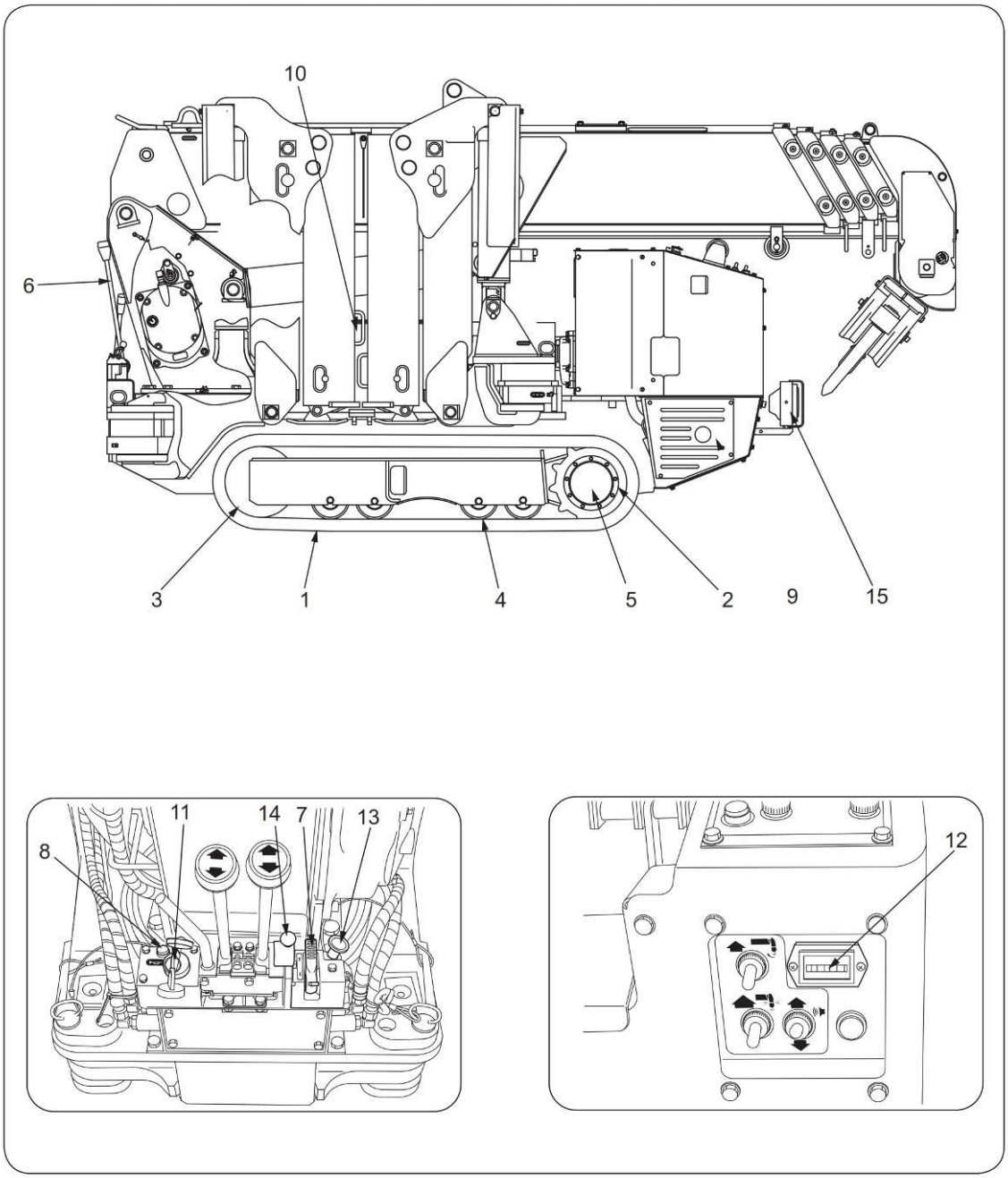
12. **Hour Meter.** This indicates total cumulative engine running time.

13. **Choke Knob.** (petrol engine variants only).

14. **Lock Lever.** Holds the travel lever stand in position.

15. **Work Light.**

CARRIER EQUIPMENT – 095/295 PETROL VERSION



4 *b.* **DESCRIPTION OF CARRIER EQUIPMENT – 095/295 DIESEL VERSION**

1. **Crawler Track**. Cored bar and steel fabric cords are integrally moulded into the rubber.

2. **Wheel Sprocket.** Transmits the drive to the track.

3. **Idle Roller.** Supplies the correct tension to the track.

4. **Truck Roller.** Supports the weight of the crane and rolls on the rubber track.

5. **Crawling Motor.** Hydraulic motor with reduction gearing built inside the wheel sprocket housing.

6. **Travel Lever.** Allows the operator to change the direction of the machine and control travel speed.

7. **Accelerator Lever.** Controls engine speed in travel mode only.

8. **Horn Switch.**

9. **Fuel Tank.** Diesel oil.

10. **Hydraulic Oil Tank.** This reservoir supplies both the carrier and the crane.

11. **Starter Switch.**

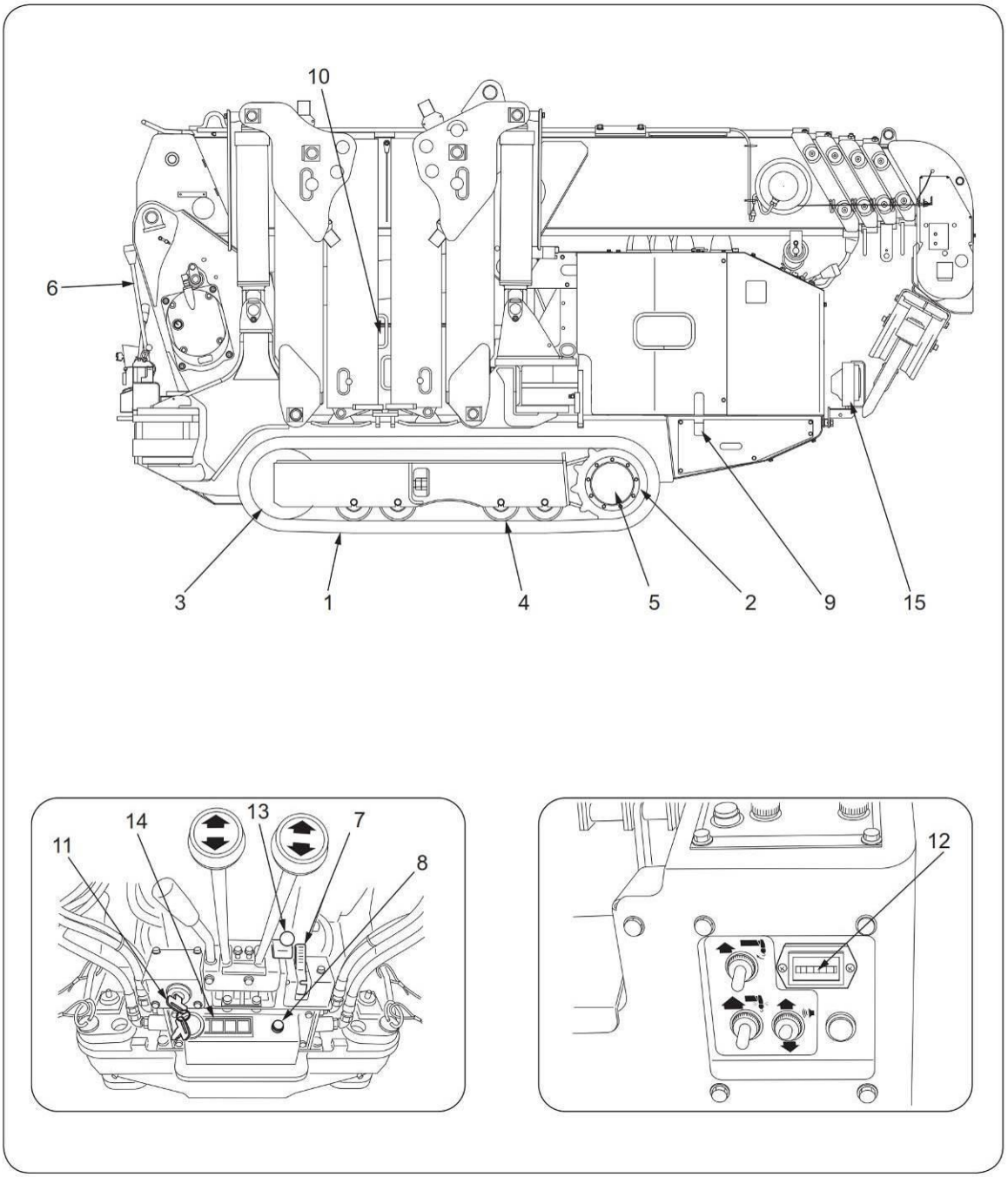
12. **Hour Meter.** This indicates total cumulative engine running time.

13. **Lock Lever.** Holds the travel lever stand in position.

14. **Warning/Indicator Lights.** Provide visual warning or indication of the following:
    - Engine Oil Pressure
    - Water Temperature
    - Low Battery/Charging Problem
    - Engine Preheat (Glow Plugs operating)

15. **Work Light.**

CARRIER EQUIPMENT – 095/295 DIESEL VERSION



5 DESCRIPTION OF CRANE EQUIPMENT 095/295

1. **Boom or Jib.** Extends and retracts by hydraulic power.

2. **Column or Kingpost.** Vertically mounted member on which boom, winch and derrick cylinders are mounted. This can be slewed 360 degrees.

3. **Frame.** This is the carrier and supports the column and outriggers.

4. **Hoist Winch.** For rotating the wire rope drum.

5. **Slewing Device.** Rotates the column via hydraulic motor.

6. **Derricking Cylinder.** Raises and lowers the boom.

7. **Telescoping Cylinder.** Extends and retracts the boom.

8. **Outrigger.** This supports and stabilises the crane during operation.

9. **Crane Operating Levers.** Respective levers operate crane functions, such as raising and lowering boom, telescoping and slewing boom, raising and lowering load.

10. **Outrigger Control Lever.** This lever controls the raising and lowering of the outriggers.

11. **Hook and Hook Block.**

12. **Over-Hoisting Alarm/Device.** Alerts the operator that the hook is approaching the top of the boom and they should stop hoisting otherwise damage and/or loss of the load could occur. The cut-out device will stop both hoisting up and telescoping out movements, until the device is released.

13. **Warning Horn.** Depressing the button activates the horn manually to warn others of your presence.

14. **Wire Rope.**

15. **Load Indicator.** The needle reads the capacity of the crane against a load chart, depending on crane configuration.

16. **Automatic Stop.** This device stops the drum automatically when the wire rope is approaching 3 turns left on the drum.

17. **Level.** This is for checking the horizontal plane of the crane body.

18. **Turn Over Protection Device (095 only).** Detects loss of ground bearing pressure on the outriggers.

19. **Outrigger Selection Switches.** These select the active outrigger and its operating direction.

20. **Slew Restrictor (Boom Storage only).** Limits rotation of the boom to avoid striking the crane/controls during boom storage operation.

21. **Load Meter (095 only).** Provides an indication of load weight being hoisted.

22. **Outrigger Monitor Lamps (295 only, 2018 onwards).** Green lamps will illuminate when ground contact is made with each individual outrigger. Crane will not operate unless all four lights are illuminated

23. **Boom Storage Monitor Lamp (295 only, 2018 onwards).** When the boom is stored correctly, the green lamp will illuminate.

24. **Operation Mode Switch.** Selects between crane operation and outrigger modes.

25. **Control Mode Selector Switch.** Selects between manual crane controls and the radio remote control device.

26. **Voice Control Switch.** Toggles between voice on and off.

27. **Over-Hoisting Override Switch.** In the event of the over-hoist device being activated, operating this switch allows continued operation of the hook or boom telescoping.

NOTE: This switch should only be operated as a last resort when movement cannot be achieved by any other means.

28. **Hook Storing Switch.** Toggle and hold the switch to bring the hook block into its storage position.

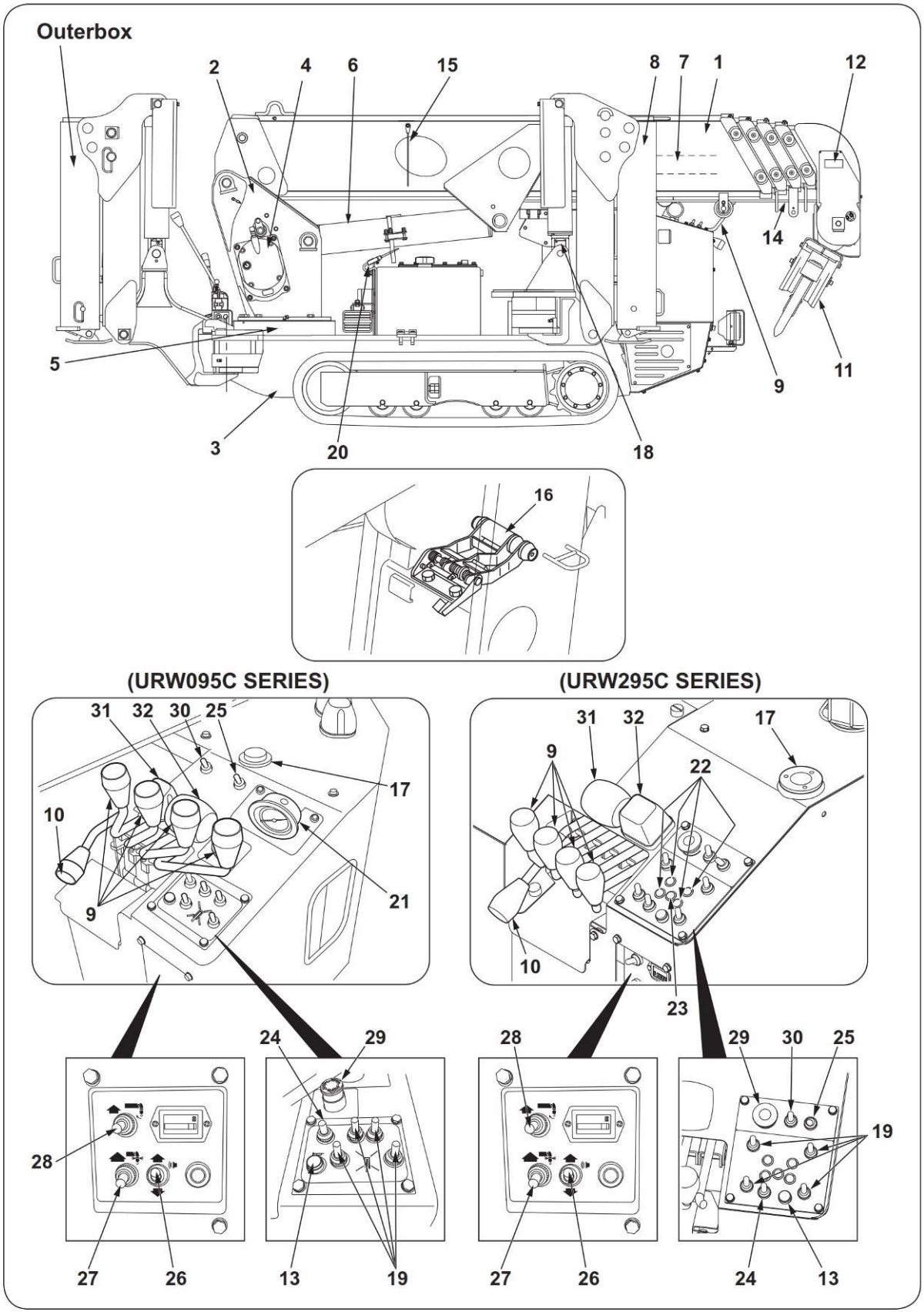
29. **Emergency Stop Button.** Pressing the button will disable all crane and travel functions and stop the engine, but will not isolate the battery.

30. **Work Light Switch.** Toggles between on and off.

31. **Outrigger Mode Indicator Lamp.** Illuminates when the operation mode switch is set to outrigger mode.

32. **Control Mode Indicator Lamp.** Illuminates when the control mode selector switch is set to radio remote control.

URW 095/295C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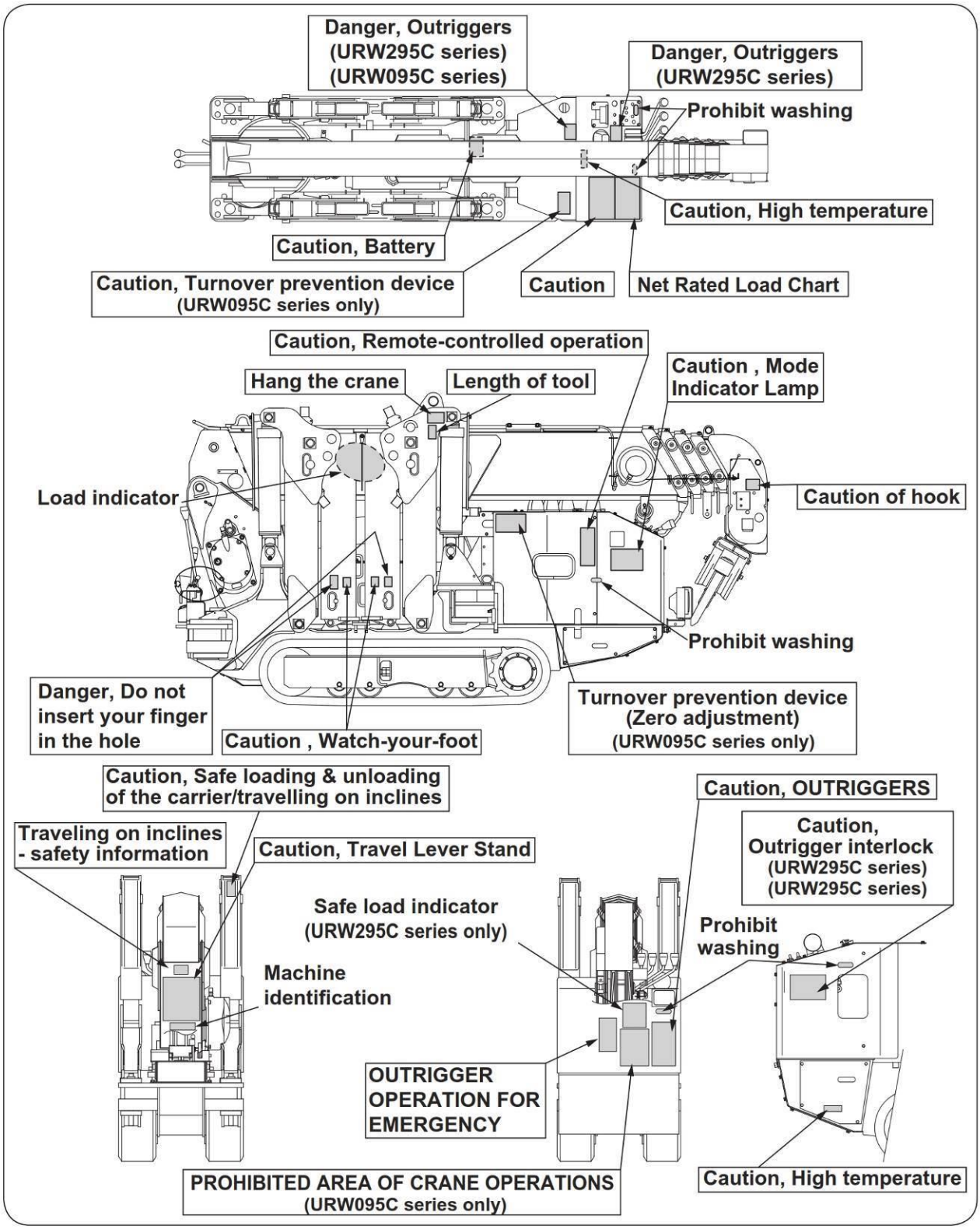
6 INFORMATION PLATES (095/295)

a. Position of information plates

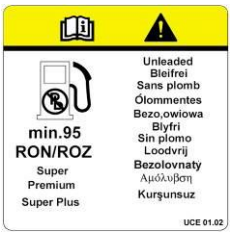


b. ***Index of decals***

The following index of decals relates to safety related and key important decals only. Please contact your UNIC Cranes Europe Representative for a list of all decals for your crane.

Decal	Description	Model	Qty
UCE 01.02	Lead free	094/095/295	1
UCE 01.03	Beware feet	All	4
UCE 01.04	Beware trapping in rope	All	2
UCE 01.05	Emergency stop	All	1
UCE 01.06	Beware rotating parts	All	1
UCE 01.07	Flammable	All	1
UCE 01.08	High pressure hydraulic oil	All	2
UCE 01.09	Adequate ventilation	All	1
UCE 01.10	Beware trapping in belts	All	1
UCE 01.12	Striking hazard	All	4
UCE 01.13	095/295 CR Total weight	095/295 CR	2
UCE 01.14	095/295 CRE Total weight	095/295 CRE	2
UCE 01.19	Battery	All	1
UCE 01.20	Corrosive	All	1
UCE 01.21	Trapping hazard	All	4
UCE 01.22	General warning	All	4
UCE 01.23	Electrical hazard	All	1
UCE 01.24	Hot surface	All	1
UCE 01.27	Maximum gradeability	All	1
UCE 01.28	Lifting point	All	4
UCE 01.29	Read manual	All	1
UCE 01.30	Read service manual	All	1
UCE 01.31	Do not put fingers in holes	All	4
UCE 01.34	No hands	All	1
UCE 01.35	Smoking prohibited	All	1
UCE 01.38b	095 Noise Level	095	1
09R886080	Outrigger positions	095/295	1
09R886070	Outrigger prohibition	095	1
09R886360	Outrigger emergency	095/295	1
09HP81010	Mode indicator lamp	All	1
30CF81050	Loading/Offloading	All	1
UCE 02.45	Trained personnel	All	1
09R886220	Travel lever stand	094/095/295	1
UCE 01.47	Characteristics of performance	All	1
09R886350	Remote control operation	All	1
09EE86010	Working range chart	095/295	1
30D786050	Rated load chart	095	1
09R886170	Outrigger Mode Indicator	094/095/295	1
09EM86020	Mode Selection Switch	All	1
09R886270	Caution of Hook	095/295	1
09R886250	Danger do not insert finger	095/295	4
09HP81120	Turnover prevention (Zero Adjustment)	095	1
09HP 81110	Turnover Prevention device	095	1
09CU81260	Buzzer Switch for Outrigger	095/295	1
094383110	Mind your feet	095/295	1
09HP81030	Zero Reset	095	1
09EM86030	Boom Storing Position	095/295	1
094383140	Caution, Battery	095/295	1
30CF81060	Travelling on Inclines	All	1

Decal	Description	Model	Qty
09EM 37070	Searcher Hook Rated Load Chart	095/295	1
09EM 37080	Lifting Capacity	095/295	1
09EM 37090	Angle Position for Searcher Hook	095/295	1
09EM 37110	Angle Position for Searcher Hook	095/295	1
607834130	Working Range Chart (Extension Jib)	095/295	1
607834120	Net Rated Loads (Searcher Hook)	095/295	1
09KK23470	Caution when fitting and removing fly jib	095/295	2
09EM23130	Lifting Capacity (extension jib)	095/295	1



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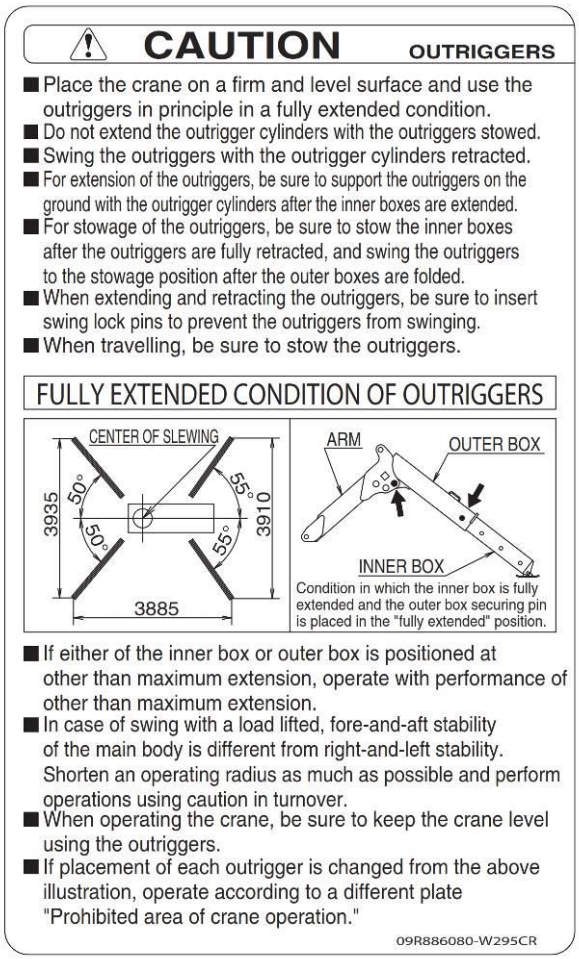
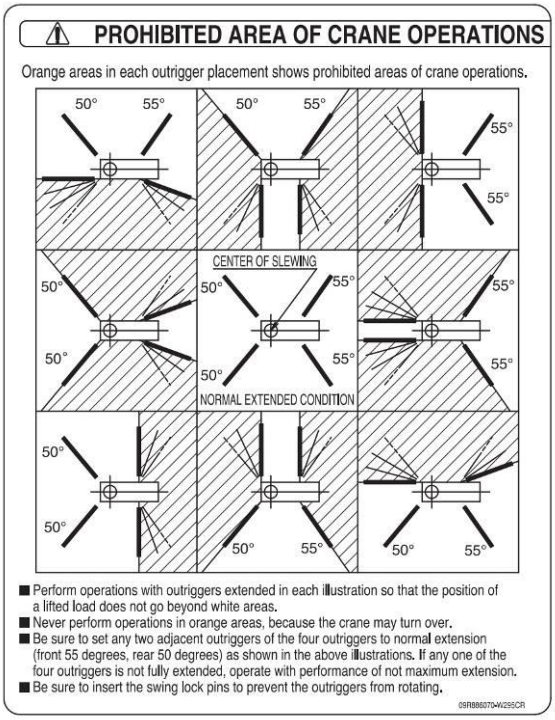


09R886080 **095 / 295**



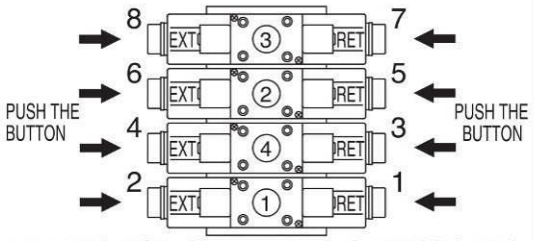
09R886070 **095 Only**

⚠ OUTRIGGER OPERATION FOR EMERGENCY

When the outriggers do not operate normally with normal operation methods, operate them in a make-shift manner in the following procedures.
When the specific work is complete, have the outriggers inspected and repaired at your nearest service shop of our products as soon as possible.

1. Remove this cover of the outrigger valves.
2. Push the solenoid valve button of the following outriggers to be operated with a narrow rod such as a screwdriver.
3. Operate the outrigger control lever while pushing the solenoid valve button.

OPERATION		OPERATION METHOD
OUTRIGGER①	RET.	Push 1 and operate the lever.
	EXT.	Push 2 and operate the lever.
OUTRIGGER②	RET.	Push 5 and operate the lever.
	EXT.	Push 6 and operate the lever.
OUTRIGGER③	RET.	Push 7 and operate the lever.
	EXT.	Push 8 and operate the lever.
OUTRIGGER④	RET.	Push 3 and operate the lever.
	EXT.	Push 4 and operate the lever.



VALVES FOR OPERATING OUTRIGGERS

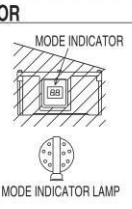
Note: When removing the cover or pushing the solenoid valve switch, be careful not to damage the wiring.

09R8 86360-W295CR

09R886360 **095 / 295**

⚠ CAUTION MODE INDICATOR

INDICATOR (LIT)	OPERATION MODE (STATUS)	MODE INDICATOR LAMP	POSSIBLE OPERATION
00	CRANE MODE	ON	RADIO CONTROL
01		OFF	MANUAL
04	OUTRIGGER MODE	ON	RADIO CONTROL
		OFF	MANUAL
10	OVERWINDING	——	——
13	STORAGE OF HOOK	——	——
14	CANCELLATION OF AUTO-STOP	——	——
15	AUTOMATIC STOP	——	——
96	LEAVING MINIMUM WIRE ROPE	——	——
oF	TRAVEL MODE	——	——

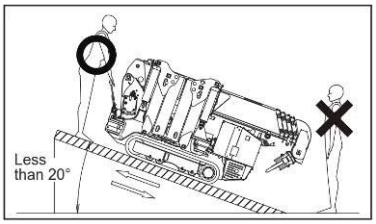


- The above table shows the main mode indication. For details, see the instructions.
- The mode selection switch opposite to the mode indicator lamp allows selection of ON and OFF of radio-controlled operation.
- When mode indicator lamp is ON, radio-controlled operation can be performed.
- When mode indicator lamp is OFF, manual operation can be performed.
- Flashing of the mode indicator shows abnormality of operation or the equipment. Follow instructions of the instruction manual.

09HP81010-W095CDE

09HP81010 **094 / 095 / 295**

⚠ Safe loading & unloading of the carrier/travelling on inclines

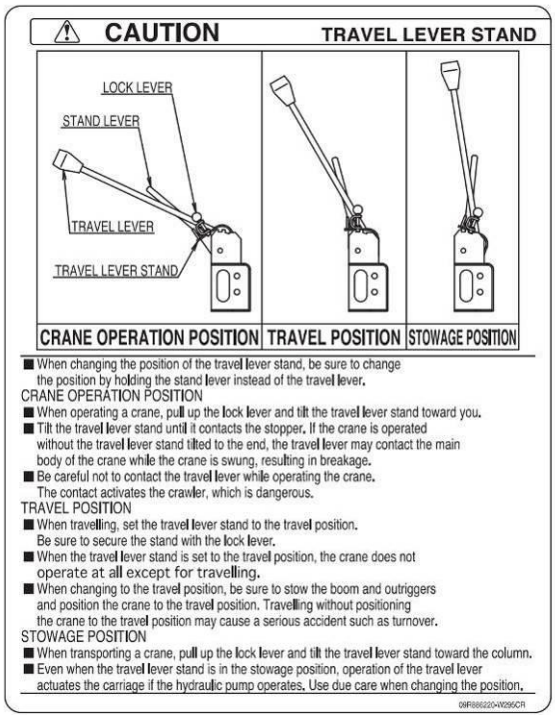


- Always ensure that the gradient of the ramp or surface is not greater than 20 degrees and has sufficient grip.
- Ensure that the ramp or surface will support the total weight of the crane and the operator.
- Scaffold boards or other materials not designed for use as ramps must not be used.
- Ensure that all other persons are kept clear from the carrier during travel.
- The operator must always drive the carrier from the uppermost position on the incline, i.e. reverse up the incline and follow the carrier down the incline.
- Never attempt to turn the carrier on an incline, always drive straight up and down.
- The carrier must always be manoeuvred slowly during travel up and down inclines.
- In the event that control of the carrier is lost during loading/unloading, do not attempt to step the carrier from falling.

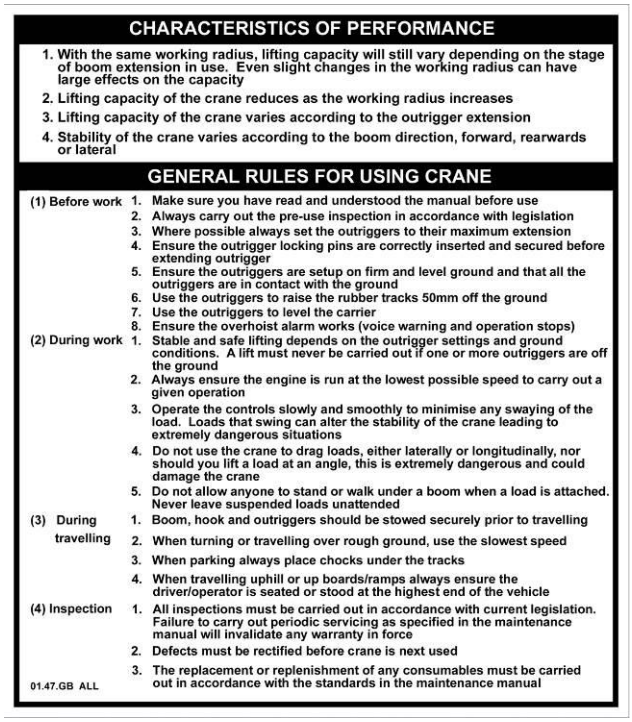
30CF81050-W245CP2A

30CF81050 **094 / 095 / 295**

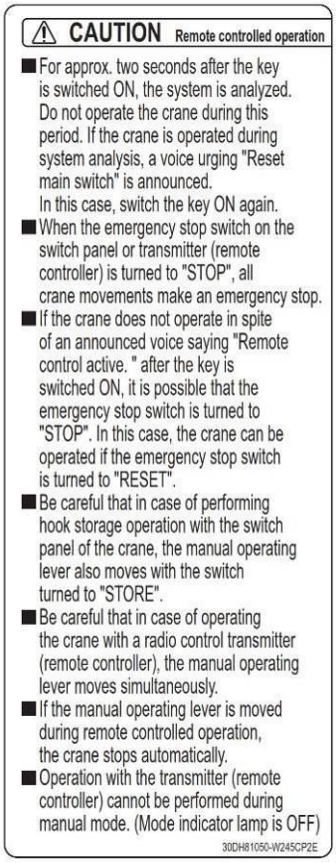
UCE 02.45 **094 / 095 / 295**



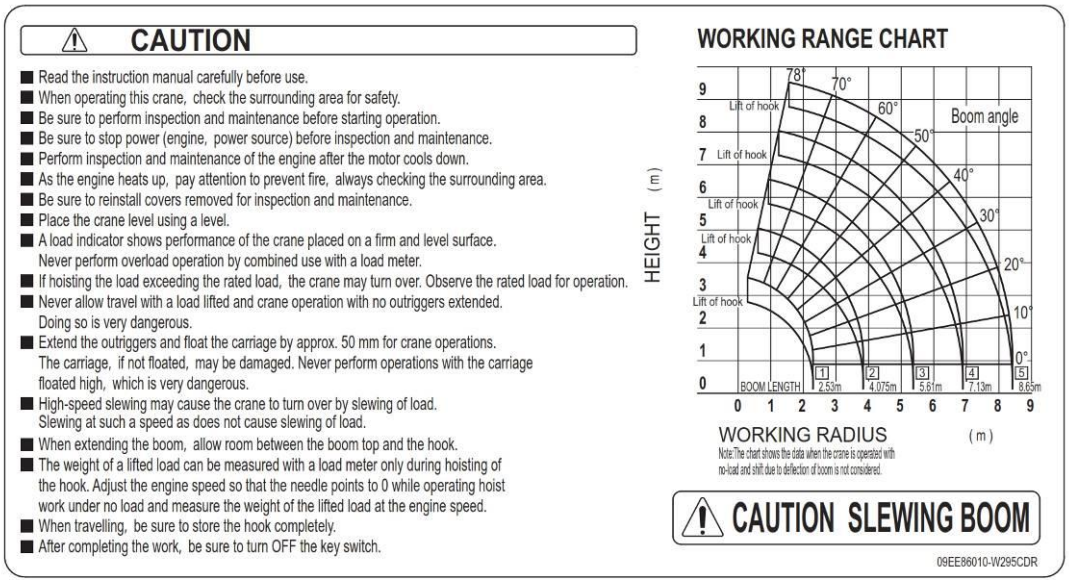
09R886220 **094 / 095 / 295**



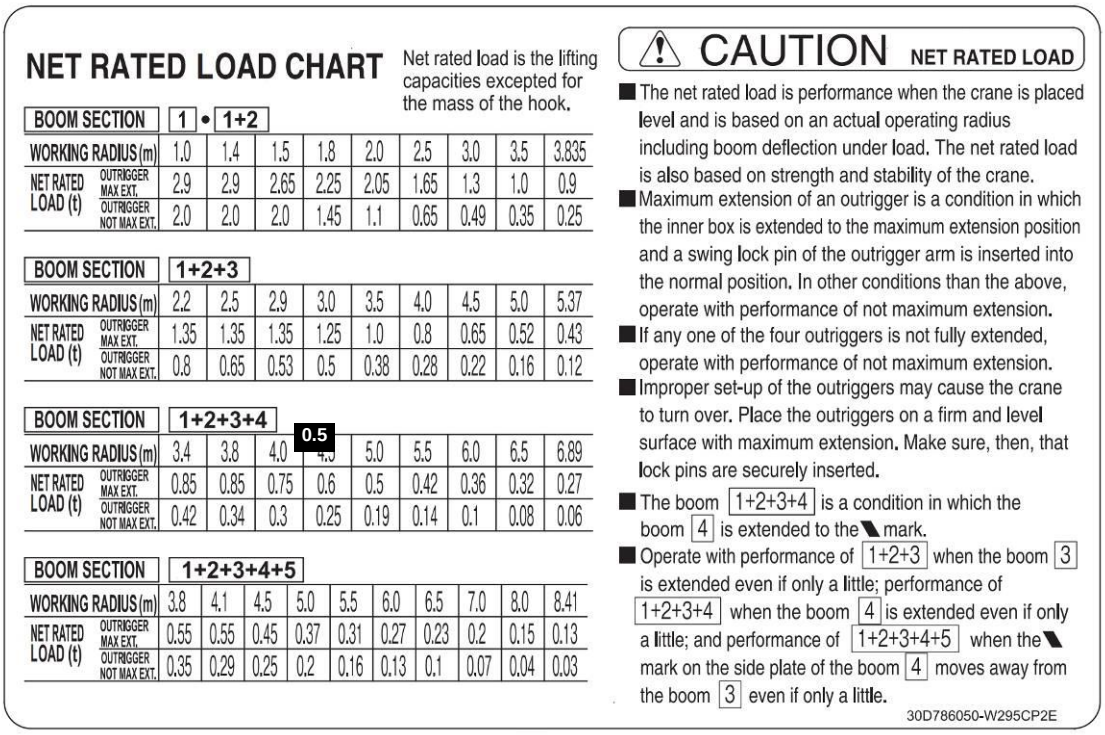
UCE 01.47 **094 / 095 / 295**



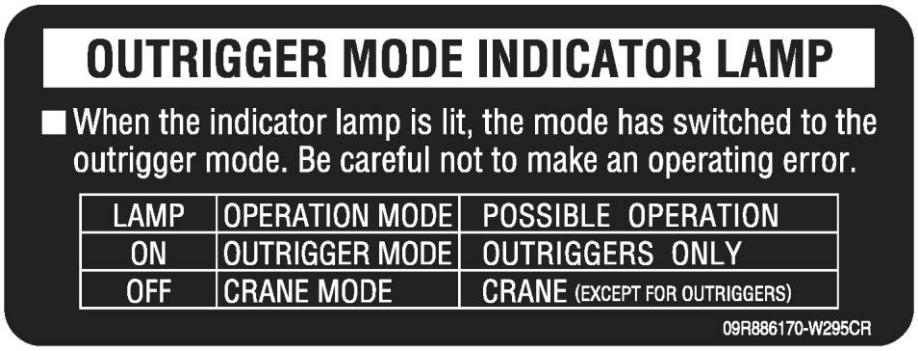
09R886350 **095 / 295**



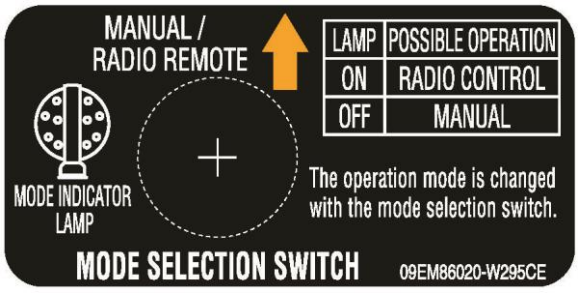
09EE86010 **095 / 295**



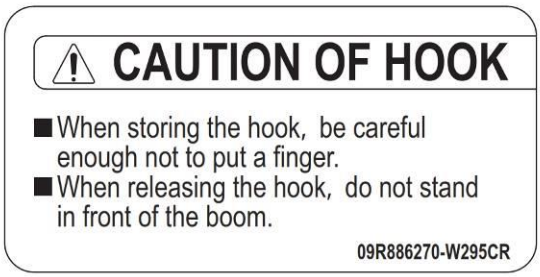
30D786050 **295 Only**



09R886170

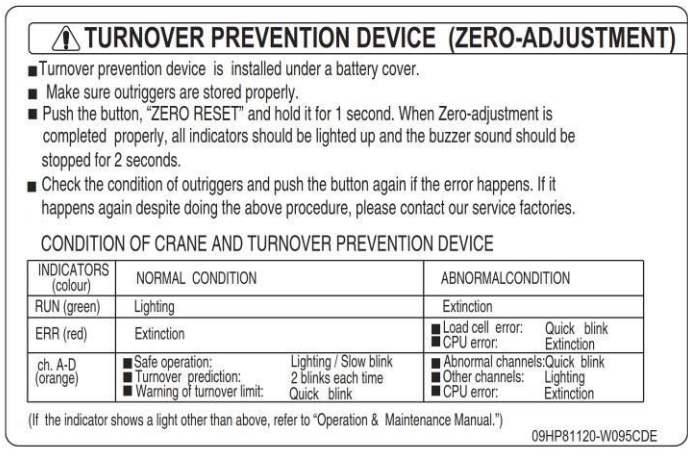


09EM86020

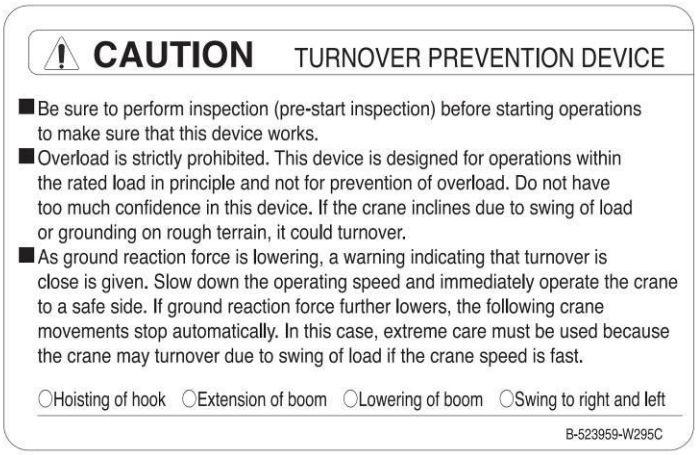


09R886270 095 /295

09R886250 095 /295



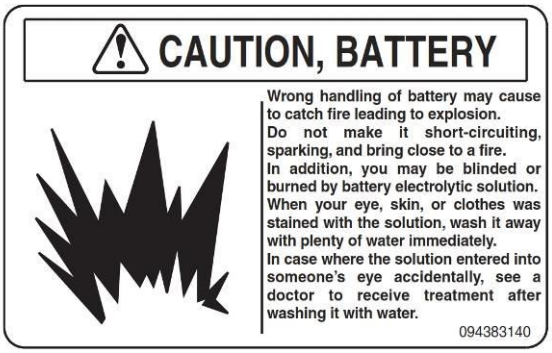
09HP81120



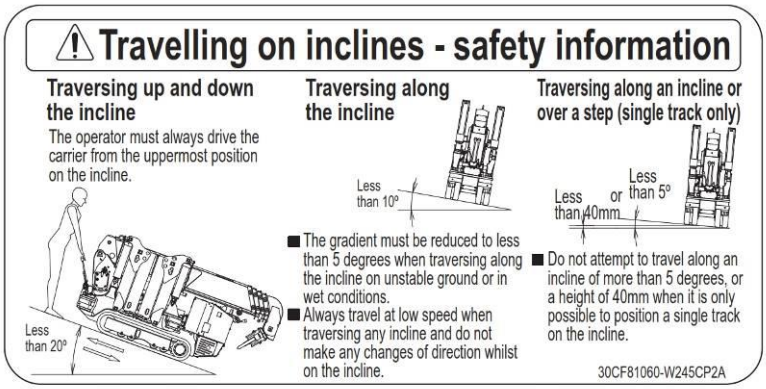
09HP 81110

09CU81260 095/295 **094383110 095/295** **09HP81030 - 095**

09EM86030 - 095/295



094383140 095/295



30CF81060 095/295

500mm Searcher Hook (where fitted) – 095 / 295

NET RATED LOADS (FOR SEARCHER HOOK)

WORKING RADIUS (m)	OUTRIGGERS MAX EXT	OUTRIGGERS NOT MAX EXT
3.5	300	300
4.0	300	220
4.5	300	170
5.0	300	120
5.5	300	90
6.0	260	60
6.5	220	50
7.0	180	PROHIBITED
8.0	130	AREA OF CRANE
8.9	100	OPERATION

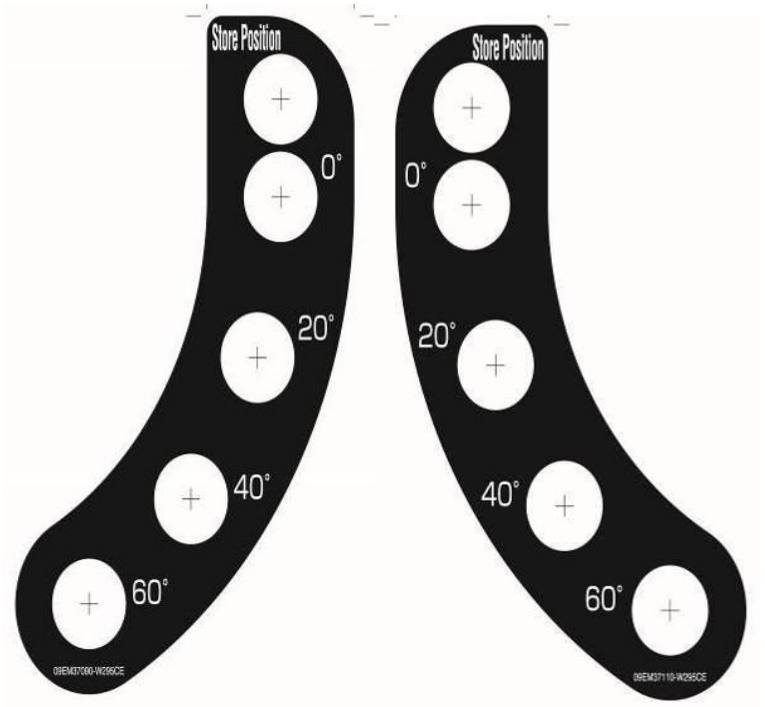
CAUTIONS

- Net rated loads are performance when the crane is placed level and is based on an actual working radius including boom deflection under load.
- Net rated loads are also based on strength and stability of the crane.
- Net rated loads must be reduced in accordance with wind, ground condition and operation speed.
- In order to make correct operation, read the instruction manual carefully before crane operation.

09EM37070

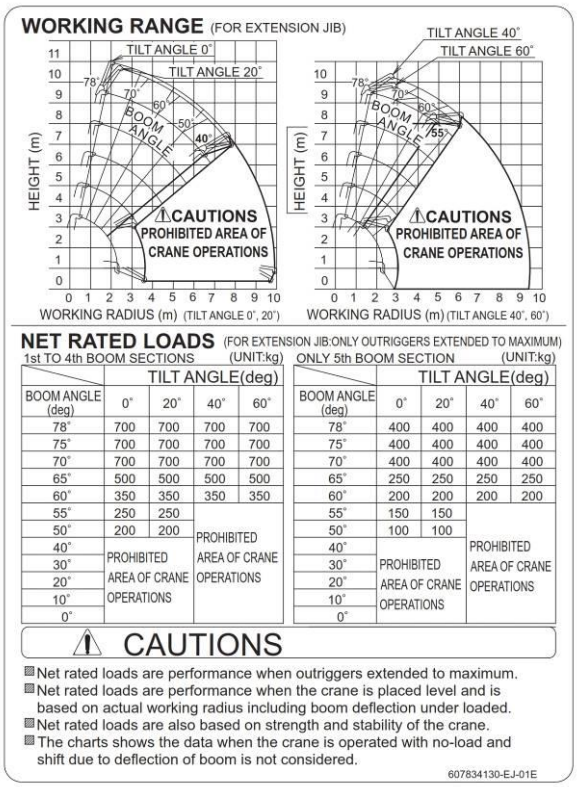
09EM 37070 **095 / 295**

09EM 37080 **095 / 295**

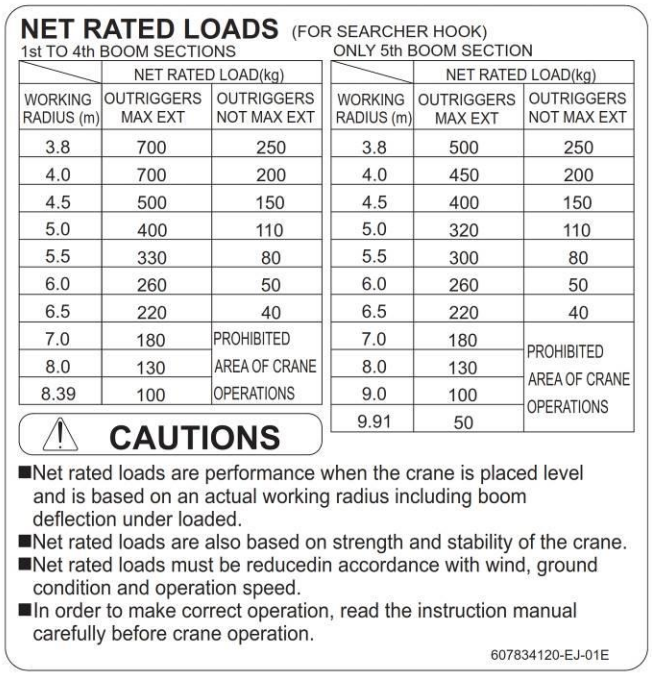


09EM 37090 **095 / 295** **09EM 37110**

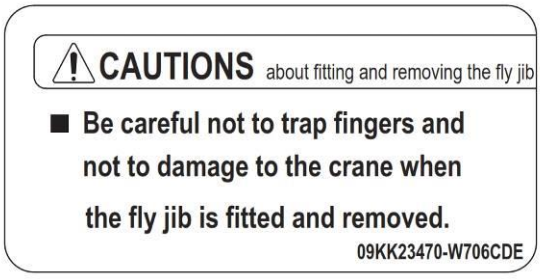
Jib Extension & Searcher Hook (where fitted) – 095/295 only



607834130 - 295



607834120 - 295



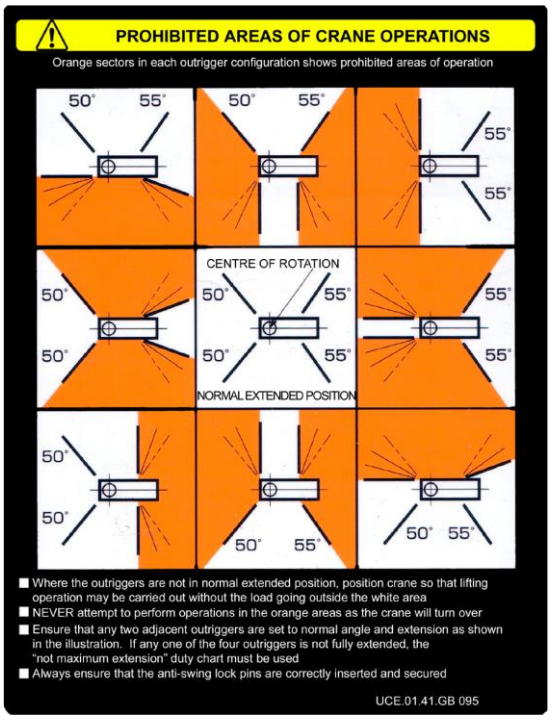
09KK23470

09EM23130

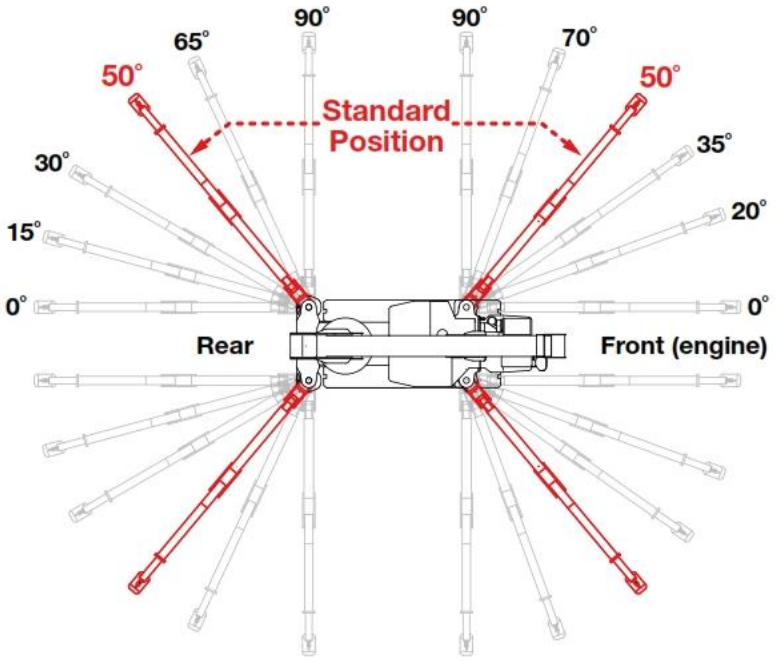
7 DEFINITION OF TERMS

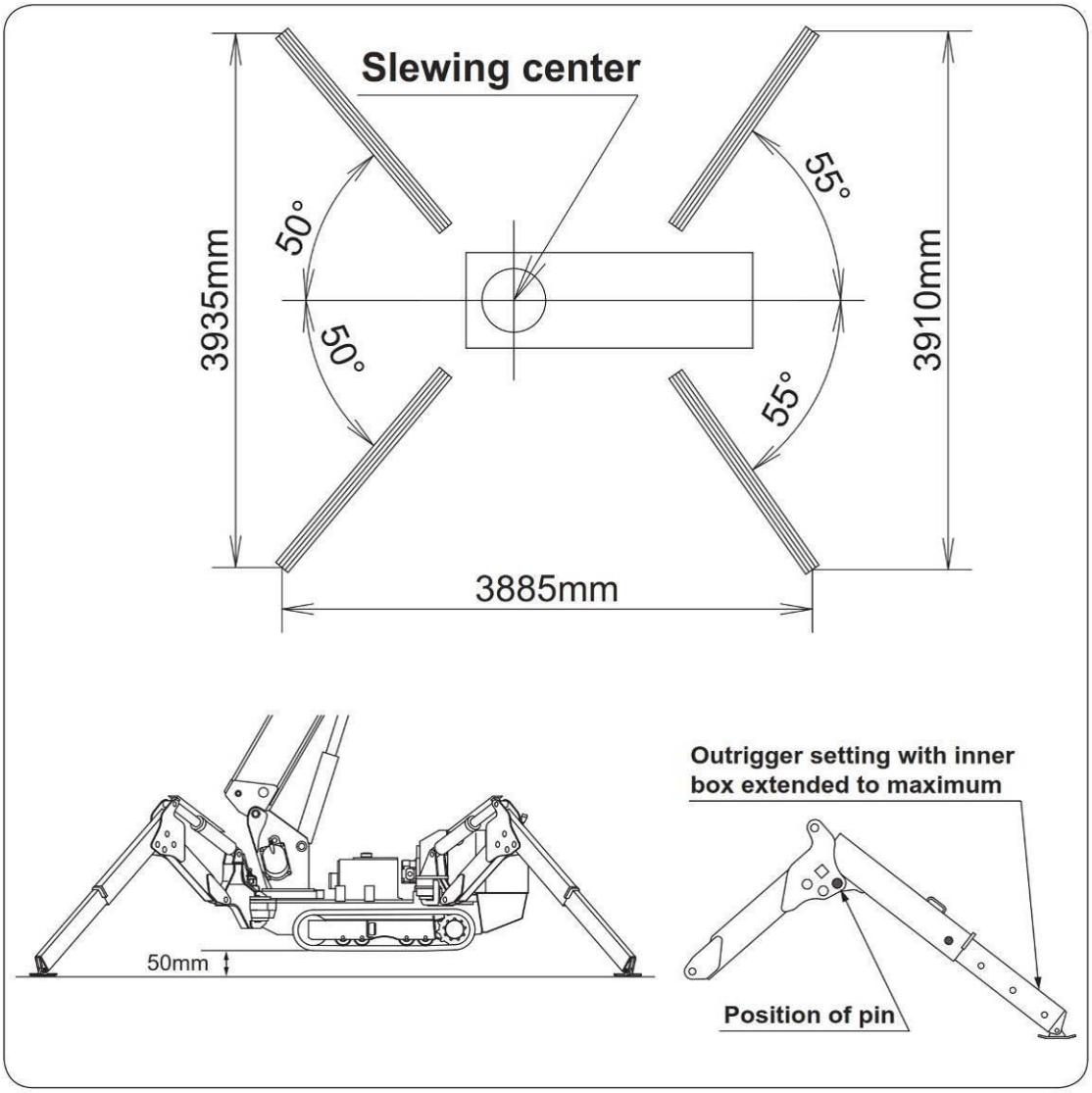
a. *Outrigger extension*

On the URW 095 model there are a number of optional angles that may be selected other than standard. If the outriggers are used at any angle other than standard, reference MUST be made to the Prohibited Area of Crane Operations information plate (UCE 01.41.)



Loads must never be moved into any of the Prohibited Areas. Failure to comply with this warning may lead to the crane over-turning.

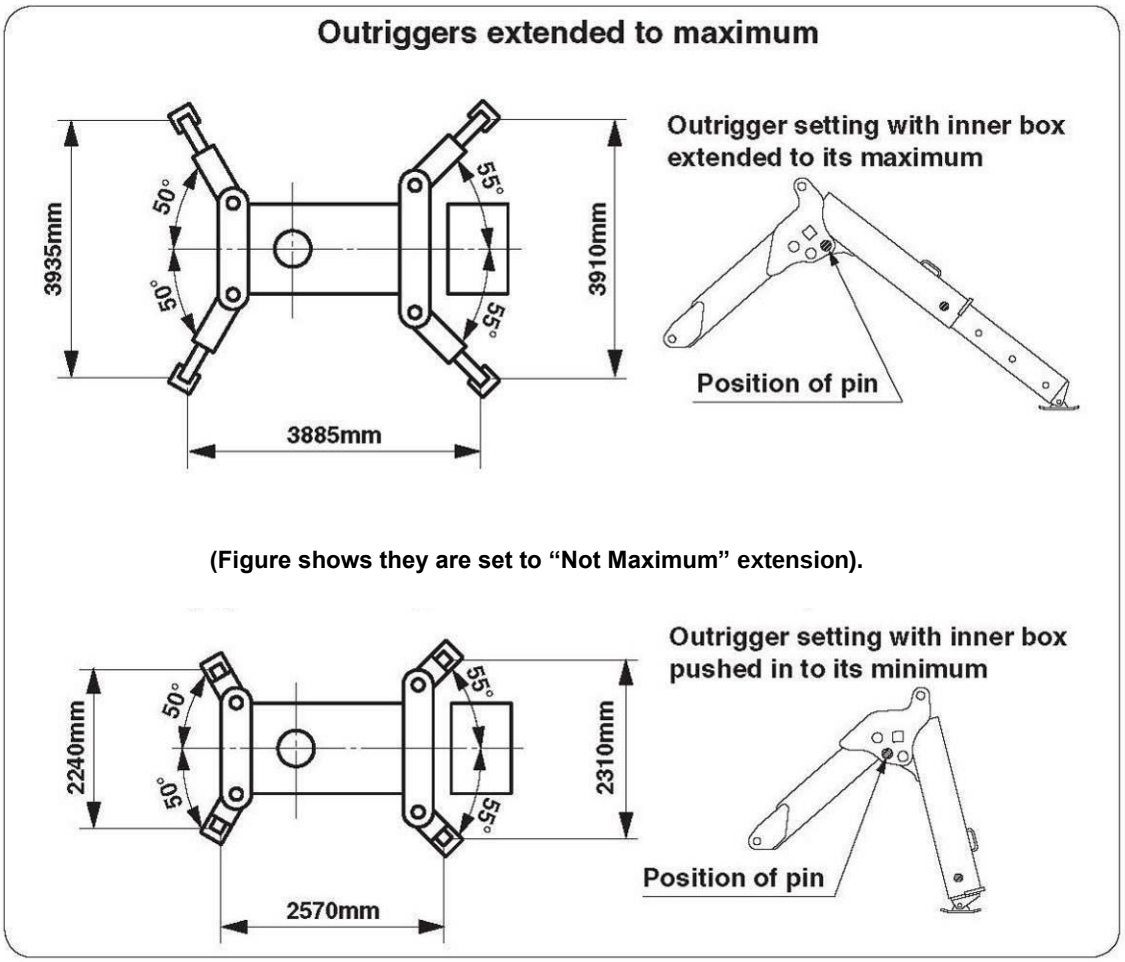




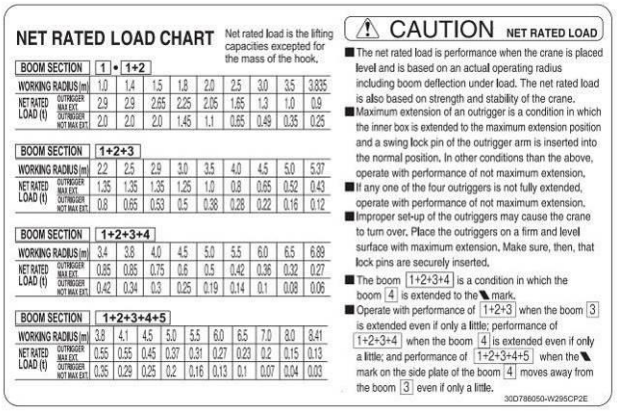
The figure above shows the outriggers extended to maximum setting. Operation of the crane can only commence after ensuring the outriggers deployed on firm, level and uniform ground. This may require the use of supporting material of adequate load bearing capacity. Extend the outriggers to their maximum position and raise the crane chassis approximately 50mm from the ground, ensuring it is level in both horizontal axes.

The rated capacity will vary according to outrigger set up and configuration, therefore the rated capacity has been calculated on 2 pre-determined extension positions (“Maximum and “Not Maximum”).

The Figures below show the dimensions where the outriggers are set to “Maximum”, or “Not Maximum”.



The load capacities displayed on the rated load chart show both maximum outrigger extension and not maximum extension.



NET RATED LOAD CHART Net rated load is the lifting capacities excepted for the mass of the hook.

BOOM SECTION	1 • 1+2									
WORKING RADIUS (m)	1.0	1.4	1.5	1.6	2.0	2.5	3.0	3.5	3.835
NET RATED LOAD (t) OUTRIGGER MAX EXT.	2.9	2.9	2.65	2.25	2.05	1.65	1.3	1.0	0.9
NET RATED LOAD (t) OUTRIGGER NOT MAX EXT.	2.0	2.0	2.0	1.45	1.1	0.65	0.49	0.35	0.25

BOOM SECTION	1+2+3								
WORKING RADIUS (m)	2.2	2.5	2.9	3.0	3.5	4.0	4.5	5.0	5.37
NET RATED LOAD (t) OUTRIGGER MAX EXT.	1.35	1.35	1.35	1.25	1.0	0.8	0.65	0.52	0.43
NET RATED LOAD (t) OUTRIGGER NOT MAX EXT.	0.8	0.65	0.53	0.5	0.38	0.28	0.22	0.16	0.12

BOOM SECTION	1+2+3+4								
WORKING RADIUS (m)	3.4	3.8	4.0	4.5	5.0	5.5	6.0	6.5	6.89
NET RATED LOAD (t) OUTRIGGER MAX EXT.	0.85	0.85	0.75	0.6	0.5	0.42	0.36	0.32	0.27
NET RATED LOAD (t) OUTRIGGER NOT MAX EXT.	0.42	0.34	0.3	0.25	0.19	0.14	0.1	0.08	0.06

BOOM SECTION	1+2+3+4+5									
WORKING RADIUS (m)	3.8	4.1	4.5	5.0	5.5	6.0	6.5	7.0	8.0	8.41
NET RATED LOAD (t) OUTRIGGER MAX EXT.	0.55	0.55	0.45	0.37	0.31	0.27	0.23	0.2	0.15	0.13
NET RATED LOAD (t) OUTRIGGER NOT MAX EXT.	0.35	0.29	0.25	0.2	0.16	0.13	0.1	0.07	0.04	0.03

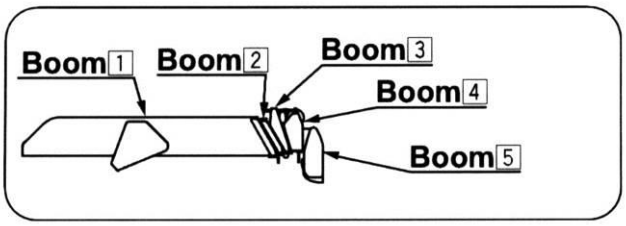
⚠ CAUTION NET RATED LOAD

- The net rated load is performance when the crane is placed level and is based on an actual operating radius including boom deflection under load. The net rated load is also based on strength and stability of the crane.
- Maximum extension of an outrigger is a condition in which the inner box is extended to the maximum extension position and a swing lock pin of the outrigger arm is inserted into the normal position. In other conditions than the above, operate with performance of not maximum extension.
- If any one of the four outriggers is not fully extended, operate with performance of not maximum extension.
- Improper set-up of the outriggers may cause the crane to turn over. Place the outriggers on a firm and level surface with maximum extension. Make sure, then, that lock pins are securely inserted.
- The boom 1+2+3+4 is a condition in which the boom 4 is extended to the ◥ mark.
- Operate with performance of 1+2+3 when the boom 3 is extended even if only a little; performance of 1+2+3+4 when the boom 4 is extended even if only a little; and performance of 1+2+3+4+5 when the ◥ mark on the side plate of the boom 4 moves away from the boom 3 even if only a little.

30D786050-W295CP2E

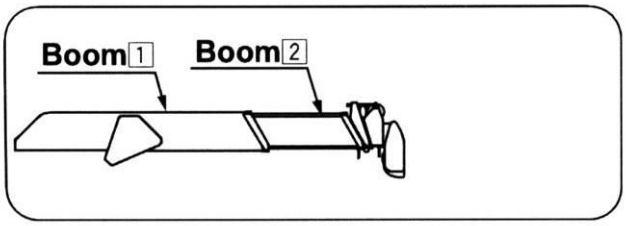
When using the crane, if any one of the four outriggers is extended to not maximum, the load capacity should be taken as not maximum duty. When using the crane in this configuration it must be operated by making reference to and using the not maximum extension load capacities indicated on the rated load chart. Failure to do this could lead to loss of stability resulting in the crane over-turning.

b. ***How boom sections are extended (095/245/295)***



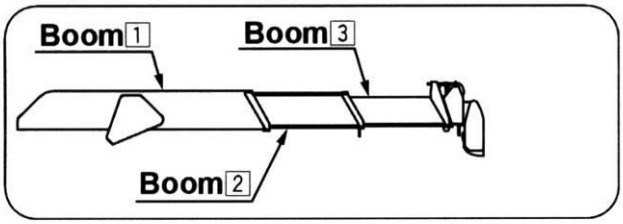
Boom: 1

All boom sections are retracted



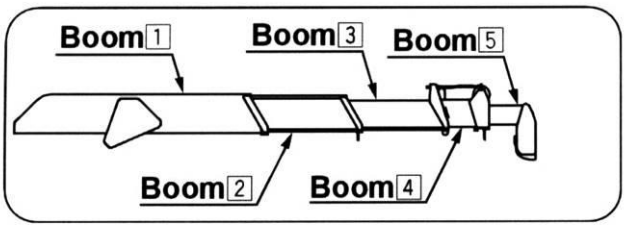
Boom: 1+2 or 2

Only boom section 2 is extended

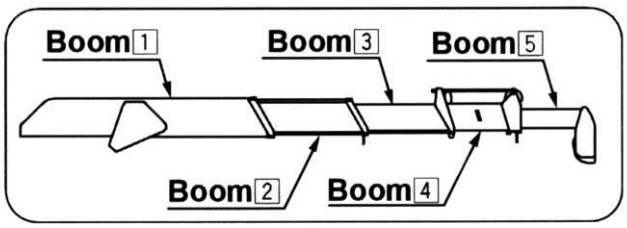


Boom: 1+2+3 or 3

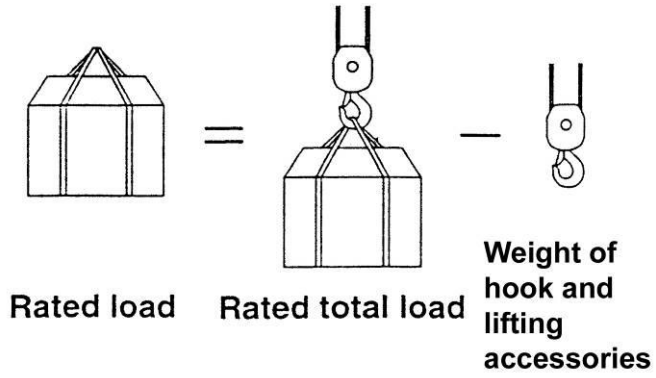
Boom sections 2 and 3 are fully extended



Boom: 1+2+3+4 or 4
Boom sections are extended until the mark ◥ on boom section 4 is just visible



Boom: 1+2+3+4+5 or 5
Boom 5 is anywhere between the mark ◥ on boom section 4 being visible, and all sections being fully extended



c. ***Rated Load***

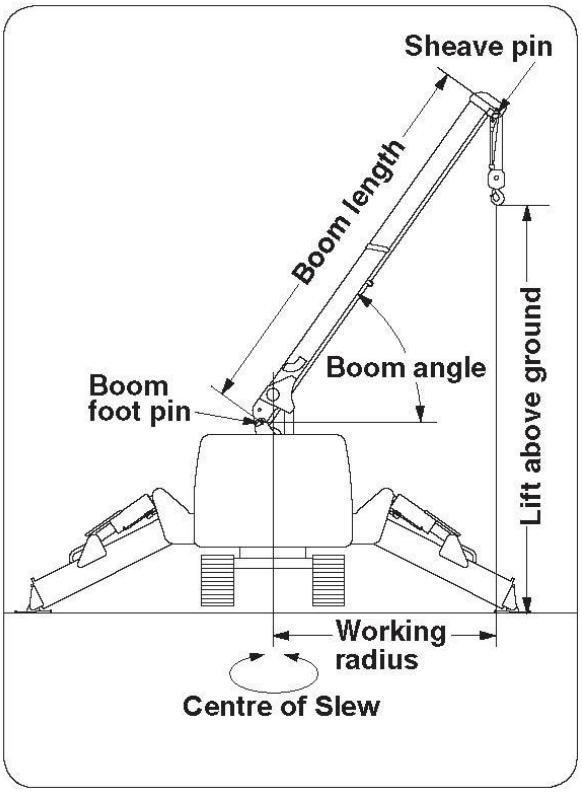
Net load that can be lifted determined by the configuration of the crane.

d. ***Rated Total Load***

Maximum load including hook and lifting accessories that can be lifted at a determined boom angle and boom length based on the configuration of the crane.

e. ***Lifting Capacity***

This is the maximum rated load for the crane configuration as described in item d above.



f. ***Working Radius***

This is the horizontal distance measured from the centre of rotation of the column to the centre of the hook.

g. ***Boom Length***

This is the distance from the boom foot pin to the sheave pin at the top of the boom.

h. ***Boom Angle***

This is the angle between a horizontal line drawn from the boom foot pin and the axis line of the boom.

i ***Lift above ground***

This refers to the vertical distance between the bottom of the hook and ground level when the hook is wound up until it is touching the Over-Hoist Alarm detector weight.

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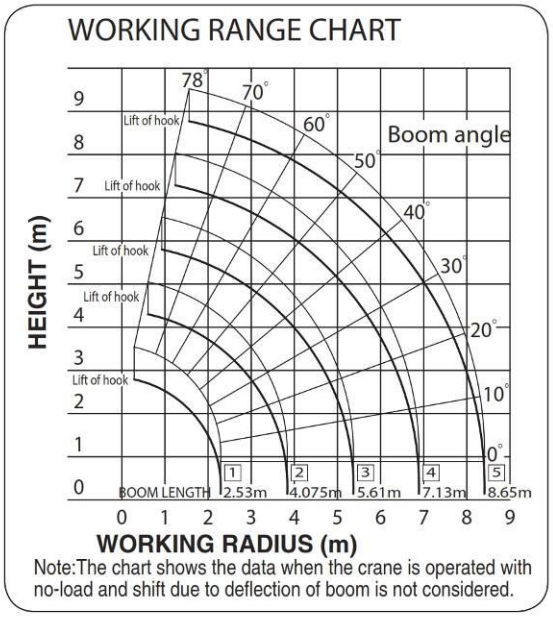
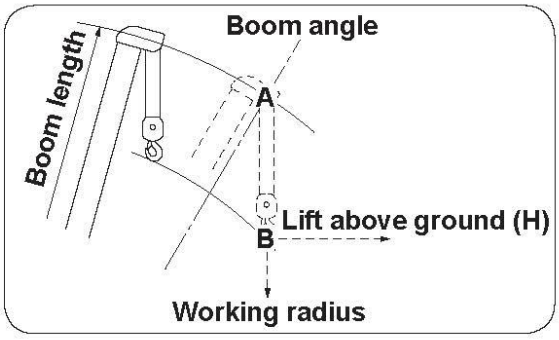
8 HOW TO USE THE WORKING RANGE CHART AND RATED LOAD CHART

These charts are placed in front of the crane operation levers. The method of interpreting these charts is illustrated below.

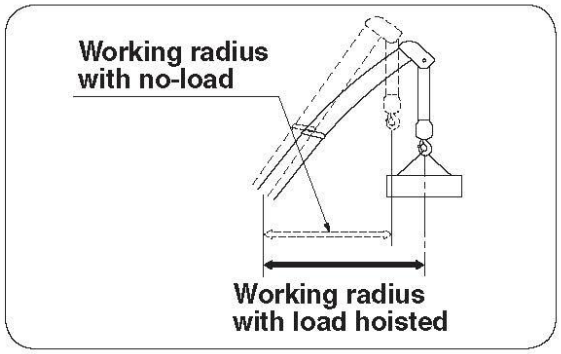


a. ***Working Range Chart***

This chart shows the relationship between boom length and working radius, boom angle and lift above ground



Although Point A and Point-B follow the same track along the working radius, due to boom deflection Point A refers to the boom angle and Point B refers the lift above ground.



The working range chart does not take into account any movement due to boom deflection.
Bear in mind that the actual working radius is somewhat greater due to the deflection when hoisting a load.

b. ***Rated Load Chart (095)***

This chart shows the load that can be lifted for a specified combination of boom length and working radius.

Boom-sections extended: 1 & 1+2

Working radius (m)		1.0	1.4	1.5	1.8	2.0	2.5	3.0	3.5	3.835
Rated load (t)	Outriggers extended to maximum	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.9
	Outriggers extended to not maximum	0.995	0.995	0.995	0.995	0.995	0.65	0.49	0.35	0.25

Boom-sections extended: 1+2+3

Working radius (m)		2.2	2.5	2.9	3.0	3.5	4.0	4.5	5.0	5.37
Rated load (t)	Outriggers extended to maximum	0.995	0.995	0.995	0.995	0.995	0.8	0.65	0.52	0.43
	Outriggers extended to not maximum	0.8	0.65	0.53	0.5	0.38	0.28	0.22	0.16	0.12

Boom-sections extended: 1+2+3+4

Working radius (m)		3.4	3.8	4.0	4.5	5.0	5.5	6.0	6.5	6.89
Rated load (t)	Outriggers extended to maximum	0.85	0.85	0.75	0.6	0.5	0.42	0.36	0.32	0.27
	Outriggers extended to not maximum	0.42	0.34	0.3	0.25	0.19	0.14	0.1	0.08	0.06

Boom-sections extended: 1+2+3+4+5

Working radius (m)		3.8	4.1	4.5	5.0	5.5	6.0	6.5	7.0	8.0	8.41
Rated load (t)	Outriggers extended to maximum	0.55	0.55	0.45	0.37	0.31	0.27	0.23	0.2	0.15	0.13
	Outriggers extended to not maximum	0.35	0.29	0.25	0.2	0.16	0.13	0.1	0.07	0.04	0.03

The chart shows lifting capacity when the crane is set up level with the outriggers deployed. The data is based on actual working conditions which incorporates movement due to boom deflection under load

The rated loads specified are based upon the strength of the crane and stability of the carrier.
Ensure that the rated load is correct for the extension of the outriggers

c. ***Rated Load Chart – Searcher Hook and Extension Jib (095/295)***

300 Kg Searcher Hook Only

	Net Rated Load (kg)	
Working Radius (m)	**Outrigger Extend to Maximum**	**Outrigger Extend to Not Maximum**
3.5	300	300
4.0	300	220
4.5	300	170
5.0	300	120
5.5	300	90
6.0	260	60
6.5	220	50
7.0	180	**PROHIBITED AREA OF CRANE OPERATION**
8.0	130	
8.91	100	

700 Kg Extension Jib Boom Sections 1 to 4 only

	Tilt Angle (deg)			
Boom Angle (Deg)	**0º**	**20º**	**40º**	**60º**
78º	700	700	700	700
75º	700	700	700	700
70º	700	700	700	700
65º	500	500	500	500
60º	350	350	350	350
55º	250	250	PROHIBITED AREA OF CRANE OPERATIONS	
50º	200	200		
40º	PROHIBITED AREA OF CRANE OPERATIONS			
30º				
20º				
10º				
0º				

700 Kg Extension Jib Boom Section 5 only

	Tilt Angle (deg)			
Boom Angle (Deg)	**0º**	**20º**	**40º**	**60º**
78º	400	400	400	400
75º	400	400	400	400
70º	400	400	400	400
65º	250	250	250	250
60º	200	200	200	200
55º	150	150	PROHIBITED AREA OF CRANE OPERATIONS	
50º	100	150		
40º	PROHIBITED AREA OF CRANE OPERATIONS			
30º				
20º				
10º				
0º				

Extension Jib (Searcher Hook) Boom Sections 1 to 4 only

	NET RATED LOAD (Kg)	
WORKING RADIUS (m)	OUTRIGGERS MAX EXT	OUTRIGGERS NOT MAX EXT
3.8	700	250
4.0	700	200
4.5	500	150
5.0	400	110
5.5	330	80
6.0	260	50
6.5	220	40
7.0	180	PROHIBITED AREA OF CRANE OPERATIONS
8.0	130	
8.39	100	

Extension Jib (Searcher Hook) Boom Section 5 only

	NET RATED LOAD (Kg)	
WORKING RADIUS (m)	OUTRIGGERS MAX EXT	OUTRIGGERS NOT MAX EXT
3.8	500	250
4.0	450	200
4.5	400	150
5.0	320	110
5.5	300	80
6.0	260	50
6.5	220	40
7.0	180	PROHIBITED AREA OF CRANE OPERATIONS
8.0	130	
9.0	100	
9.91	50	

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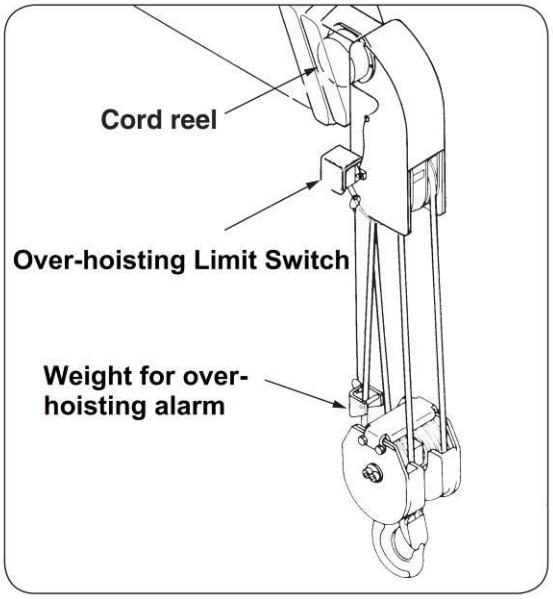
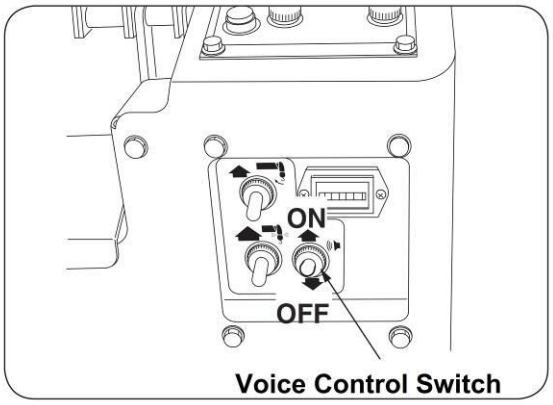
9 DESCRIPTION OF SAFETY CONTROLS



a. *Over-Hoisting Alarm*

i. Function of over-hoisting alarm

The device automatically sounds the voice warning system (if the voice function is turned off, no sound is heard) and halts the selected function to prevent the operator over-hoisting the wire rope and causing damage to the sheaves, rope, hook block and possible loss of load.



ii. Operating procedures

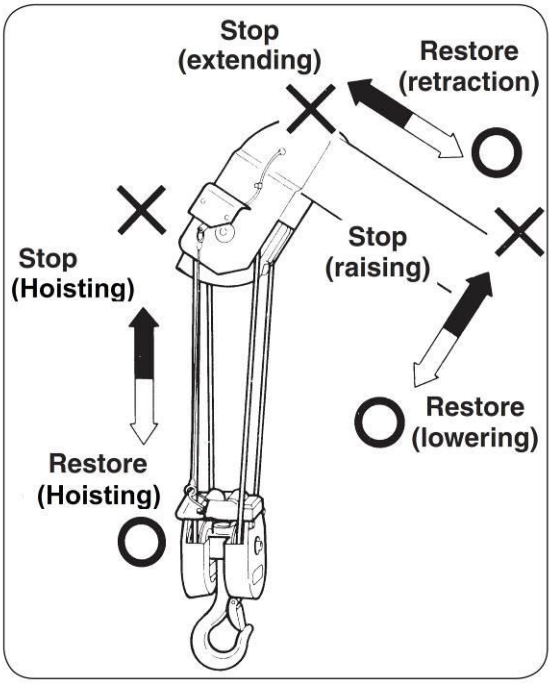
- Ensure the voice warning switch is set to ON before crane operation starts.
- If the voice alarm sounds during hoisting up or telescoping the boom, stop operations immediately and lower the hook or retract the boom.

Do not tamper with the length of the overwind alarm detector wire. This is potentially an illegal act, contravenes manufacturers specifications and could also endanger life.

If the wires connecting the alarm at the top of the boom are broken or damaged, the alarm will not function. Check the wires for breaks as part of your pre-use inspection.

INTERFERENCE WITH ANY SAFETY SYSTEM, PARTICULARLY THE ANTI-TWO BLOCK (OVER HOIST) SYSTEM, MAY LEAD TO INJURY OR DEATH AND MAY ALSO LEAD TO CRIMINAL PROSECUTION AND ANY ACCOMPANYING FINES AND/OR IMPRISONMENT

b. Automatic Over-Hoisting Stop




Override for automatic stop

i. Function of Automatic Stop

When the over-hoisting alarm detector is touched by the hook, the automatic stop will halt the following functions, raising the hook, raising or extending the boom.

To allow normal operation to continue, the hook must be lowered or the boom retracted, to stop the alarm and regain normal function of the crane.

N.B. Since the viscosity of hydraulic oil increases in cold conditions the raising and lowering of the hook may not stop exactly where you release the controls. This may lead to it inadvertently hitting the automatic stop detector. Wait until the oil has reached its operating temperature range before carrying on operations.

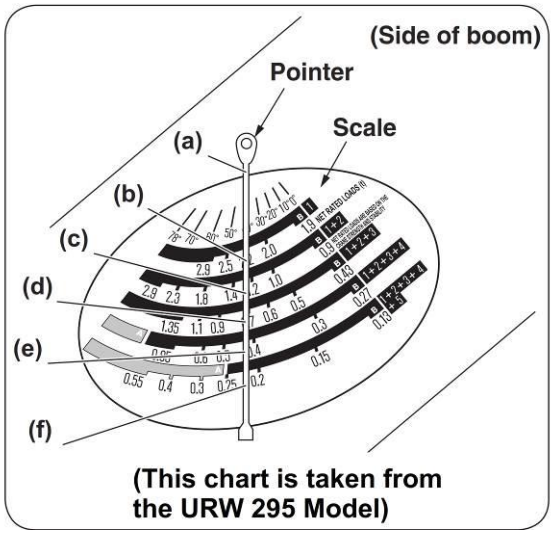
ii. Overriding the Automatic Stop if it is malfunctioning

If the crane cannot be operated due to automatic stop failure, it is possible to override the automatic stop.

- Turn the automatic stop override switch to “Off”. **(Note that the switch is covered to prevent accidental or unauthorised use.)** The hook can now be operated by the crane lever to raise/lower the hook, extend or raise the boom and stow the crane. Take extra care to ensure the hook block does not contact the boom head during operation, prior to stowing hook.

The switch is intended for emergency use only, enabling the crane to be stowed. Ensure that the crane is repaired by an authorised UNIC dealer before using it again.

c. *Load Indicator (With Angle Indicator)*



(This chart is taken from the URW 295 Model)

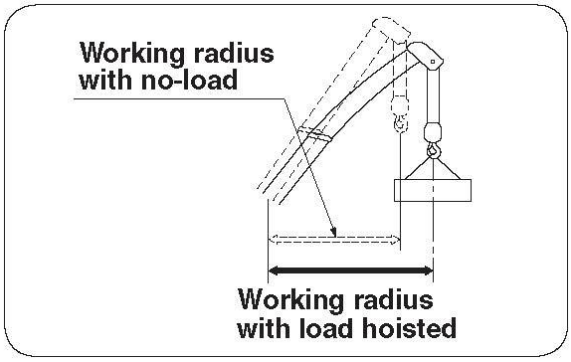
The indicator reads the rated load corresponding to the boom extension and angle. This is the maximum load that can be lifted at that point. The reading is a net rated load.

Example
The indicator needle reads 41° at point (a) on the boom angle scale.

Maximum load that can be lifted (rated load) reads:

Boom 1 2.20t at (b)
Boom 2 1.20t at (c)
Boom 3 0.70t at (d)
Boom 4 0.42t at (e)
Boom 5 0.22t at (f)

The load indicator reads the maximum rated load for fully extended outriggers and using the standard 4 fall hook block configuration. It cannot be used when the outriggers are at the 'not maximum' position, or when a non-standard hook block is fitted.
Use the scale band according to the number of booms extended.



When any boom section is partially extended, treat it as a fully extended section.

- **When boom section [2] is extended from section [1] take the rated load for [1+2] (1.2t in the above example)**

Since the working radius increases due to boom deflection when a load starts to be lifted, set the boom angle slightly inside the desired value.

How to obtain the correct lifting capacity when the outriggers are extended to not maximum.

As a general rule, **the outriggers should always be extended to their maximum.**

Otherwise obtain the capacity as shown below.

- Find the working radius.
- The rated load is found by using the 'outriggers extended to Not Maximum' row according to the number of boom sections extended.

- Operating with a working radius of 3.5m with boom sections 1+2 and the outriggers extended to not maximum; the capacity is 0.35t

- Operating with a working radius of 3.0m with boom sections 1+2+3 and outriggers extended to not maximum; the capacity is 0.5t

Boom-sections extended: 1 & 1+2

Working radius (m)		1.0	1.4	1.5	1.8	2.0	2.5	3.0	3.5	3.835
Rated load (t)	Outriggers extended to maximum	2.9	2.9	2.65	2.25	2.05	1.65	1.3	1.0	0.9
	Outriggers extended to not maximum	2.0	2.0	2.0	1.45	1.1	0.65	0.49	0.35	0.25

Boom-sections extended: 1+2+3

Working radius (m)		2.2	2.5	2.9	3.0	3.5	4.0	4.5	5.0	5.37
Rated load (t)	Outriggers extended to maximum	1.35	1.35	1.35	1.25	1.0	0.8	0.65	0.52	0.43
	Outriggers extended to not maximum	0.8	0.65	0.53	0.5	0.38	0.28	0.22	0.16	0.12

The load indicator on the side of the boom cannot be used with the outriggers set at not maximum, or when a non-standard hook block is used.

When the outriggers are set to unequal extensions the rated load is determined by using the 'outriggers extended to not maximum'

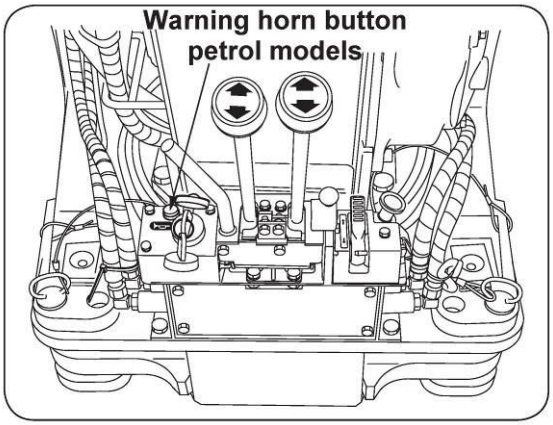
NB

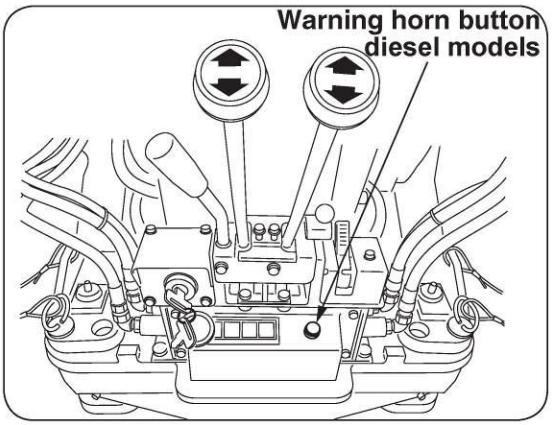
Important Note: The Rated Capacity Indicator (where fitted) will automatically select the relevant duty chart according to the outrigger extension as follows:

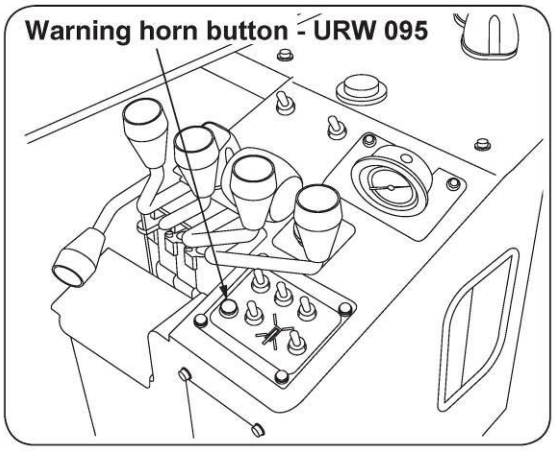
Maximum: Duty 2
Not Maximum: Duty 1

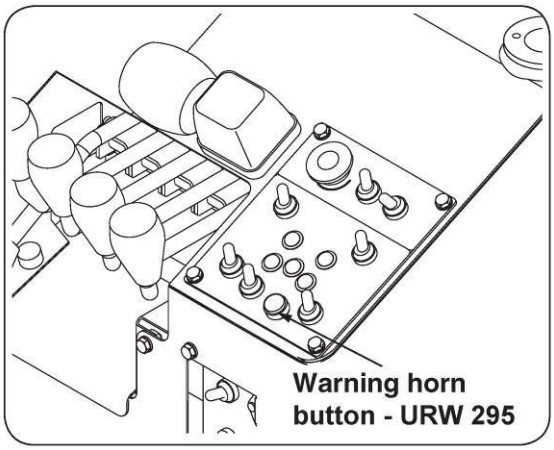
d. ***Warning Horn***

Press the warning horn button to warn people that the crane is in operation and an activity is about to commence, for example slewing or travelling with the crane.

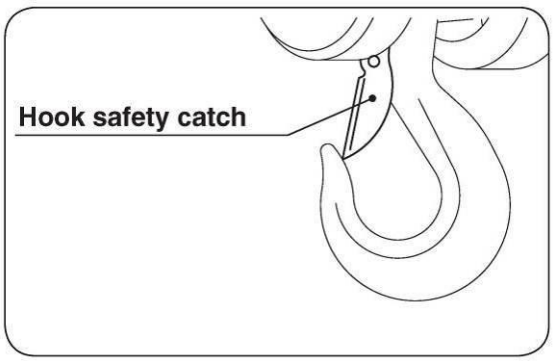








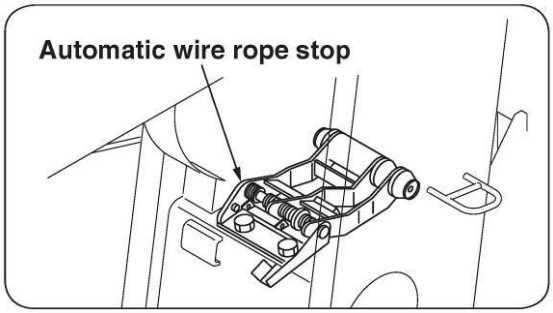
e. ***Hook Safety Catch***



The hook safety catch is used to retain lifting accessories in the correct place on the hook

It is essential that all lifting accessories are seated correctly on the hook and the safety catch is closed fully. If the safety catch is damaged or faulty, it must be repaired before any further crane operation.

f. ***Automatic Wire Rope Stop***



This device prevents the wire rope on the drum from slackening when the hook makes an abrupt stop or when the hook/load is lowered to the ground.

In addition it stops the drum unwinding when the rope is approaching the last 3 turns left on the drum, preventing the rope from unwinding fully.


Override for automatic stop

In the event of the automatic stop failing and preventing crane operation, the automatic stop override switch can be operated in order to restore operation of the crane, to facilitate storing of the boom and the hook. Contact your UNIC dealer to arrange for repair of the wire rope stop as soon as possible.

g. Voice Announcement System

The voice announcement system provides verbal indication of different operating modes. Additionally, it also provides warning when the crane is operated in a way that could lead to a hazardous situation.

1. When the ‘crane-outrigger’ switch is moved to crane the system vocalises:

   CRANE MODE, CRANE MODE

2. When the crane-outrigger operation switch is positioned to “outrigger” the system announces:

   “OUTRIGGER MODE, OUTRIGGERS MOVING”

3. When the over-hoist alarm weight is lifted by the hook block, either by winching the rope up or by extending the boom, the action is stopped by the over-hoist stop switch and the system announces:

   “STOP WINCH UP, STOP WINCH UP”

4. When the hook store button is operated, either on the crane or the remote control, the system announces

   “SECURING LIFTING HOOK, SECURING LIFTING HOOK”

5. When the boom is raised and reaches approximately 78° the action is stopped and the system Announces:

   “STOP WINCH UP, STOP WINCH UP”

6. When the radio remote control is activated or the cable remote control (if fitted) is plugged in and the remote control button is pressed the system announces:

   “REMOTE CONTROL READY, REMOTE CONTROL READY”

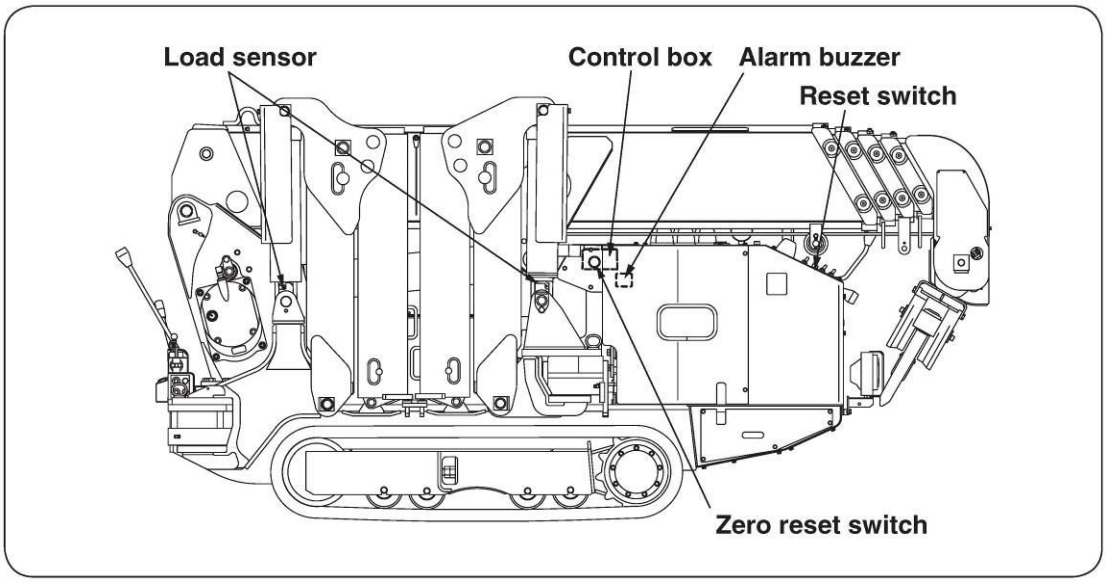
7. If the battery power in the radio remote control is running low the system will announce:

   “LOW TRANSMITTER BATTERY, LOW TRANSMITTER BATTERY”

8. If a problem is detected in the control box during operation, the system will announce:

   “CHECK ERROR CODE, CHECK ERROR CODE”

h. Turn Over Protection Device – Main Components



095 Diesel variant

Before any operation of the crane, it is vitally important that the operator makes a physical check of the Turnover Protection Device. The description of the system and the checks that need to be carried out as part of the Pre-Use Inspection are explained below.

i. Function of Turnover Protection Device (095 Only)

The alarm system has two stages; an advance alarm providing warning that the crane is at the end of its safe working range and a threshold alarm when the crane has reached the point of stability loss. The device uses load pressure sensors fitted to each outrigger, triggering the alarm system when a loss of pressure is detected on any two adjacent outriggers. The alarm stages are identified by an intermittent audible alarm and yellow warning light in advance warning and a continuous tone alarm and red light when threshold point is reached. The following crane operations are disabled at this point:

- Hoisting hook
- Extending boom
- Lowering boom
- Slewing boom

Be aware that excessive load swing caused by operating the crane at high speeds may cause the crane to overturn if brought to an abrupt stop and/or the turnover protection device has activated. Note that this is only a warning system and will not prevent the crane overturning if the crane is overloaded or operated in an unsafe manner.

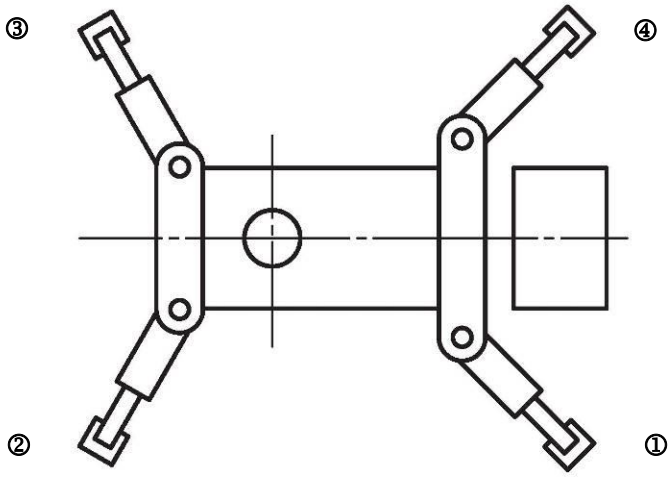
j. Pre-Use inspection and testing of the device

NB

1. Once the outriggers have been positioned horizontally and all sections (arms and Inner boxes) have been set to the desired configuration, a continuous tone alarm should sound until the outriggers have made positive contact pressure with the ground. If the alarm does not sound, first check the alarm buzzer switch is activated, located inside the inspection hatch in the engine cover (see diagram on next page). **THE ALARM BUZZER SHOULD BE LEFT ON AT ALL TIMES.** If the alarm is inoperable, consult your UNIC dealer as soon as possible.

2. When at least 3 outriggers have made positive contact with the ground, the continuous tone alarm should de-activate.

3. In order to confirm that the turn over protection device is functional, a before use function test needs to be carried out. This is done by selecting and slowly raising pairs of outriggers in turn, so that the ground bearing pressure is released. The alarms will sound as the outriggers lose pressure. The sequence for checking the alarms is depicted below.

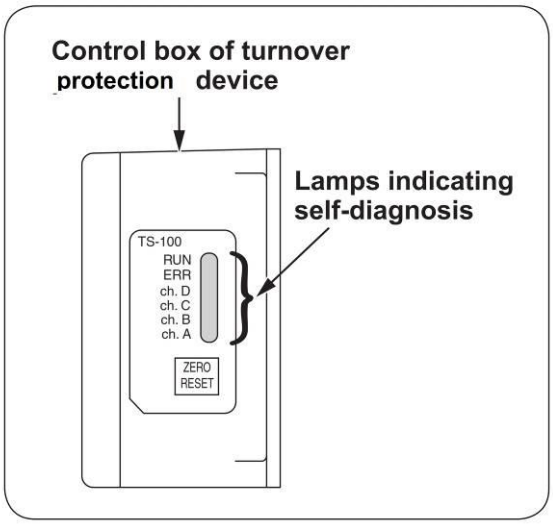


Pattern	Setting - Up	Raising	Alarm Activation
①	① - ④	①,②	Approach Alarm Engine idle speed only followed by Main Alarm
②		②,③	
③		③,④	
④		④,①	

Once the above check has been performed and the crane has been raised and made level, it is vitally important that the operator makes a physical check of each outrigger to ensure all outriggers are bearing load, before any further operation of the crane. Failure to carry out this check may lead to crane instability and overturning.

Finally, before any operation of the boom is possible, the hook block must be lowered to a position below the Over-hoisting alarm, whilst remaining clear of the ground. This is done by pushing the hook block lever away from the operator to lower the hook.

k. ***System Diagnosis and Zero Reset***



i. Self-Diagnosis Function

Indicator lamps mounted on the control box of the turnover protection device display the status of the system during operation.

- "Run" Lamp (green) – Indicates normal operation of device.
- "Err" Lamp (red) – Illuminates if a fault with a load sensor is present.
- "ch D" Lamp (amber) - Illuminates or flashes to indicate normal function of load sensor on outrigger No 4.
- "ch C" Lamp (amber) - Illuminates or flashes to indicate normal function of load sensor on outrigger No 3.
- "ch B" Lamp (amber) - Illuminates or flashes to indicate normal function of load sensor on outrigger No 2.
- "ch A" Lamp (amber) - Illuminates or flashes to indicate normal function of load sensor on outrigger No 1.

NB

The self-diagnosis lamps will all illuminate for approximately 2 seconds when the crane travel levers have been moved to the crane operation position, indicating that the device is carrying out a boot up and function self-test.

ii. Table showing lamp status in normal operation

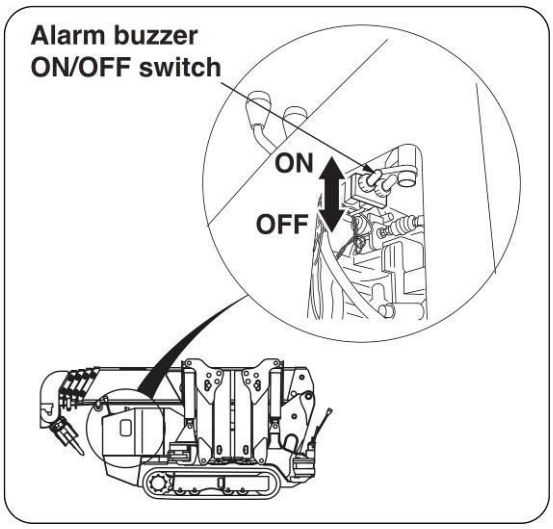
Lamp	Indication	Operational State
RUN	Illuminated	Turnover Protection device is functioning correctly.
ERR	Off	
ch. D ch. C ch. B ch. A	2 flashes intermittently	The load sensor has detected initial loss of pressure on outriggers, indicating approach to threshold limit.
	Rapid Flashing	(a) The device is indicating overturn threshold as load sensors have detected a further loss of pressure to outriggers. (b) The outriggers have been raised and stowed.
	Slow Flashing or Illuminated	The load sensors are detecting sufficient ground bearing pressure on outriggers. It is safe to operate the crane.

iii. Table showing lamp status in fault condition

Lamp	Indication	Operational State
RUN	Off	Load Sensor is malfunctioning.
ERR	Rapid Flashing	
ch. D ch. C	Rapid Flashing	Load Sensor is malfunctioning.
ch. B ch. A	Illuminated	Load Sensor is functioning correctly.

If the crane is cannot be operated due to a malfunction with the turnover protection device, turn off the crane via the ignition key and re-start the crane. If the crane will still not operate, then follow the procedure explained on the next page. If this fails to remedy the problem, contact your UNIC service dealer.

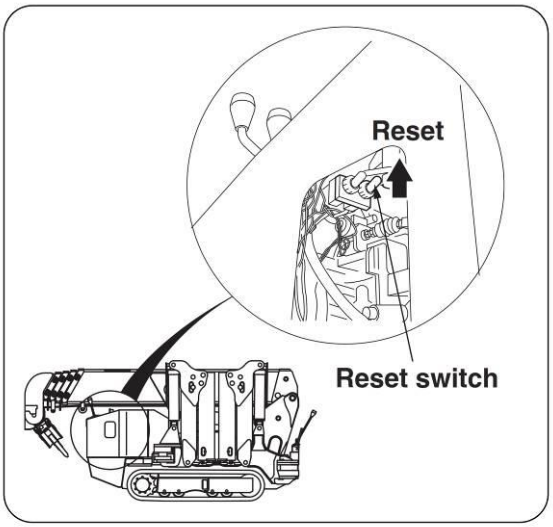
I. ***Location of switches for Turnover Protection Device (095 Only)***



Alarm buzzer switch – Always leave on during normal operation.

The following steps should only be carried out if the turn over protection device is found to be unserviceable, or the crane cannot be operated or stored because of a fault in the device.

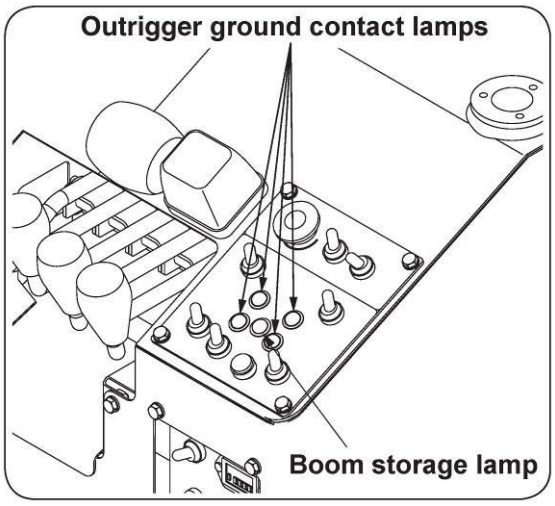
Note also that when the reset switch is activated, the turn over protection device will be disabled, therefore DO NOT attempt to lift any load with the crane when operating in this condition. Use of the switch is to enable de-rigging of the crane only, prior to consulting your UNIC service dealer for assistance.



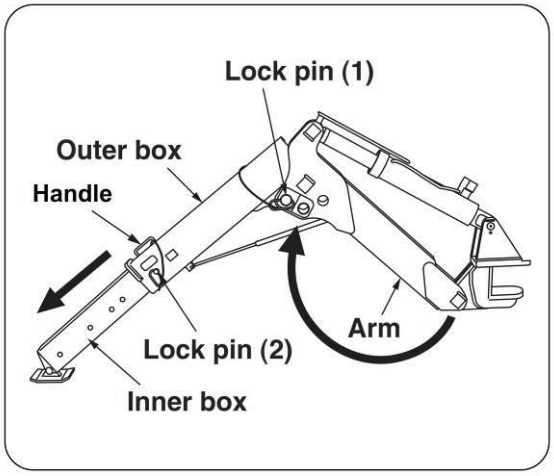
Reset Switch – Press and hold the switch to operate crane/outrigger controls.

m. Outrigger Ground Contact Sensors and Boom Storage (295, 245)

The outriggers on the URW 295 and 245 models are fitted with a detection and monitoring system, enabling the crane operator to confirm that all outrigger floats are in contact with the ground when setting up and operating the crane (images are from 295 model).



The system becomes active once the outriggers have been manually opened out, pinned and the outer box sections pinned to either the “maximum” or “not maximum” setting. The ignition must be on and the engine running.



Once all four outriggers have been opened up, the crane will automatically default to outrigger operation mode, as long as the main boom is stored and the boom storage indicator lamp is illuminated.

The outriggers should then be set up as described in Section 11 of this manual. Note that during outrigger set up the red “traffic light” warning system will flash intermittently and an audible alarm will sound until all four outriggers make ground contact.

When sufficient ground bearing pressure has been achieved on each outrigger, the relevant outrigger ground contact lamp will illuminate.

Once all four outriggers are in full contact with the ground, the four ground contact lamps must remain illuminated in order to be able to activate crane operation mode.

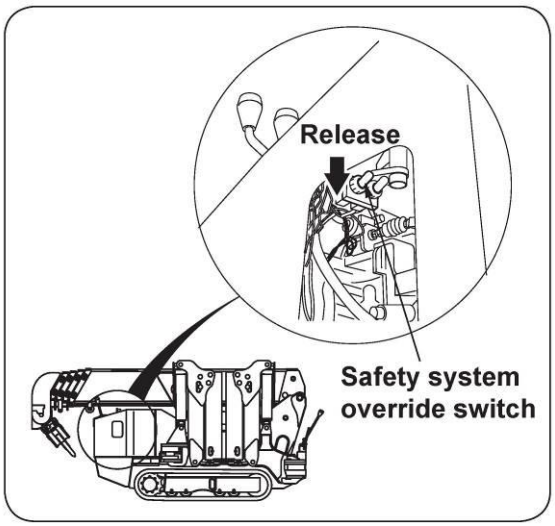
Once the crane is ready for use in crane mode, the green “Traffic Light” will flash intermittently and the audible alarm will silence.

Once the boom is raised, the boom storage lamp will extinguish until such time as the boom has been correctly lowered and stored. **No outrigger function is possible whilst the boom storage lamp is off.** In order to activate the boom storage lamp and ensure the boom is correctly stored, the boom must firstly be lowered and slewed (slowly and under control), towards the strike switch positioned next to the hydraulic oil reservoir tank.

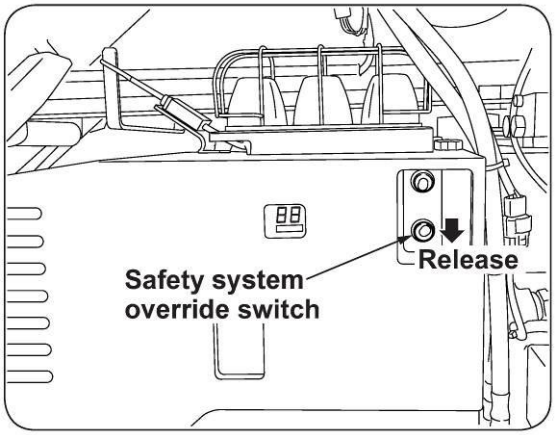
Once contact with the strike switch is made, the boom storage lamp will illuminate. The crane boom should now be in line with the decal on the crane engine cover.

Take extra care when slewing the boom into its final storing position, do not use excessive speed and pay close attention to the proximity of the boom to the crane operation levers and the rated capacity indicator (Risk of striking components and/or trapping fingers).

In the event of a malfunction of the ground contact/boom storage interlock system (or an emergency situation), there is an override switch which will disable this safety system, when operated. Only use as an emergency function!



295 Model



245 Model

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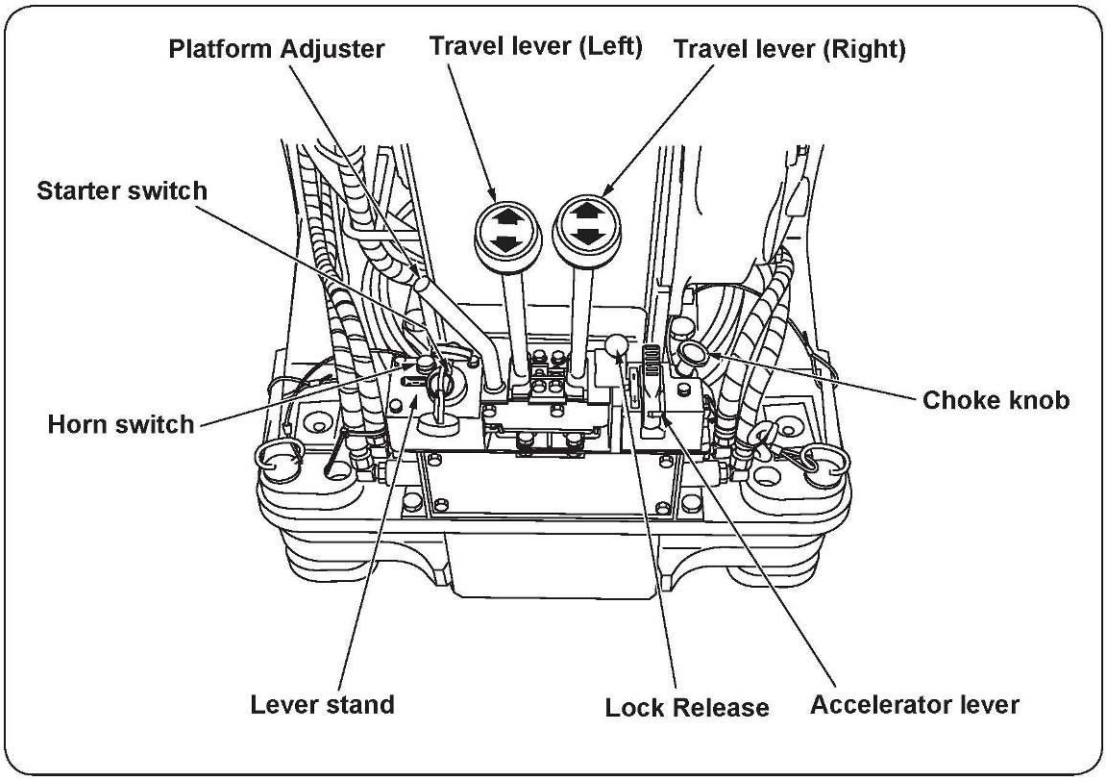
10 CARRIER OPERATIONS

a. *Description and location of control levers*



b. *Before Use*

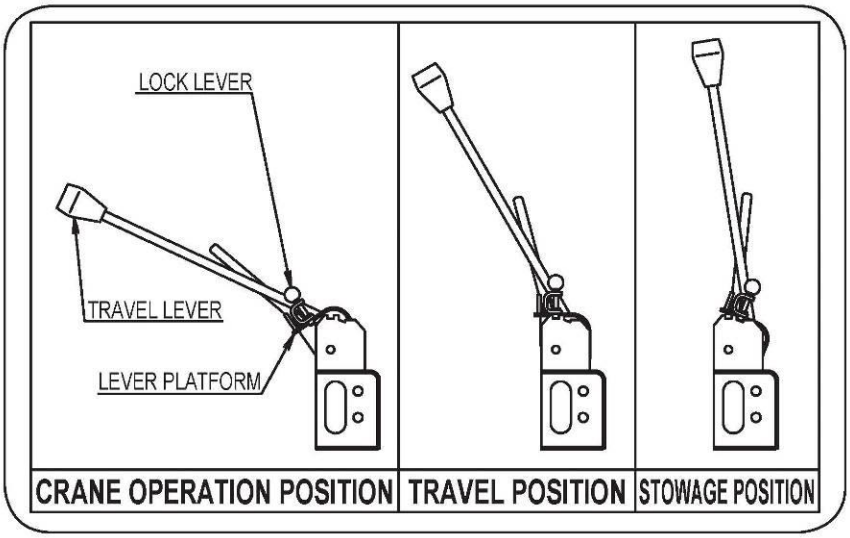
DO NOT Start or run the engine in enclosed areas unless using the LPG option. In all cases, ensure there is adequate natural ventilation, if not, forced ventilation MUST be provided. Danger of death from suffocating fumes is EXTREMELY high.

DO NOT Start the engine until you have cordoned the area and confirmed there are no non-essential personnel nearby. This will reduce the risk posed by any inadvertent movement of the boom or hook block.

NB

Heavy duty operation of the crane whilst new may lead to poor performance and a dramatically reduced in-service life. Avoid abrupt starting, acceleration and continuous heavy operation for the first 100 hours

- Shift the crawling lever stand to the ‘TRAVEL’ position.



- Ensure both travel levers are in the neutral position

- Confirm that the machine is correctly configured for travel
  - Boom is lowered fully
  - Outriggers are correctly stowed and locked
  - Hook is correctly stored

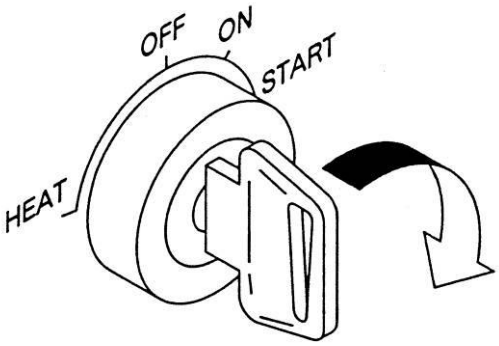
- The engine should not be running when changing the position of the travel levers, this will avoid inadvertent movement of the tracks whilst adjusting.

- Adjust the accelerator position to just above idling

c. Starting/Stopping the Engine

NB

Continuous running of the starter motor will discharge the battery and damage the motor. Do not run the starter for more than 20 seconds at a time.
If the engine does not start wait at least 1 minute before retrying.



i. *Starting Petrol engine variant under normal conditions*

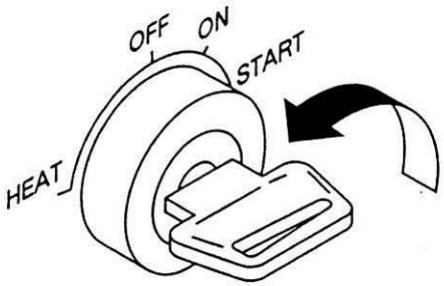
- Insert the key and turn it to the 'ON' position.
- Pull the choke knob if the engine is cold.
- Turn the key to 'START' position.
- Release the key when engine starts.
- Return the choke knob to its original position once the engine has started.

ii. Changing between Petrol and LPG (once engine is running)

- Move fuel selector to "Off" position.
- Run the engine until it stalls.
- Turn off ignition and move fuel selector switch to "LPG"
- Open tap on LPG cylinder.
- Turn the key switch to "On" position and wait 2 seconds. Turn back to off position and repeat this action a further two times.
- Turn key to "Start" position.
- Release the key when engine starts.

iii. Changing between LPG and Petrol (once engine is running)

- Close tap on LPG cylinder.
- Move the fuel selector switch to "Off " position
- Run the engine until it stalls.
- Turn off ignition and move fuel selector switch to "Petrol"
- Turn key to "Start" position.
- Release the key when engine starts.

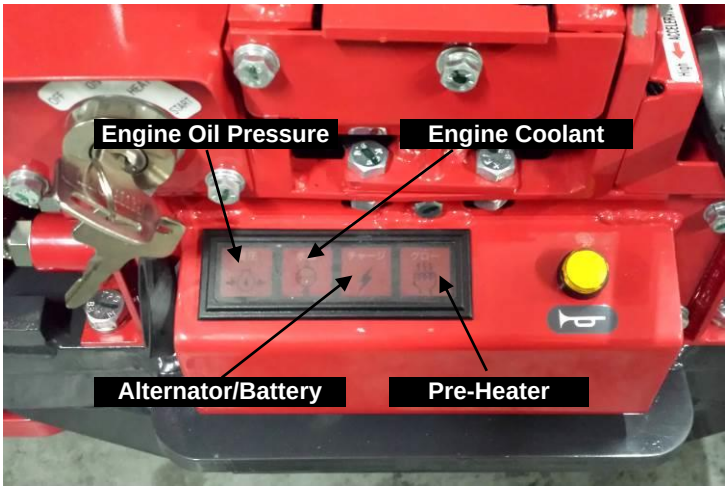


iv. ***Starting the engine in cold weather***

- Pull the choke knob and adjust the accelerator lever to higher than the idle position.
- Turn the key to “START”, release the key when the engine starts.
- Once the engine is running, slowly return the choke knob to its original position.
- Adjust the accelerator lever to the slowest speed where the engine runs smoothly.

v. ***Starting Diesel engine variant under normal conditions***

- Insert the key and turn it to the ‘ON’ position.
- Adjust the accelerator lever to a position slightly above idle.
- Turn the key to ‘START’ position.
- Release the key when the engine starts.
- Set accelerator lever to the slowest speed where engine runs smoothly.



Diesel Engine Warning Lights

vi. ***Starting Diesel engine variant in cold weather***

- Insert the key, turn it to the “Heat” position and hold there until the pre-heater warning lamp goes out (approximately 10 seconds).
- Adjust the accelerator lever to a position above idle.
- Turn the key to ‘START’ position.
- Release the key when the engine starts.
- Set accelerator lever to the slowest speed where the engine runs smoothly.

Warm Up the engine for about 5 minutes

vii. ***After the engine has started***

- After idling the engine for approximately 5 minutes to warm up, move each lever with the accelerator positioned halfway to warm up the hydraulic system. This allows the hydraulic oil to circulate and lubricate the system but also allows the engine to warm up to operating temperature gradually.
- Check the engine for unusual vibration, noise, odour and colour of the exhaust gas. If there are any doubts contact UNIC Cranes Europe.
- Check the hydraulic equipment and engine for oil leakage

d. ***Travelling Operations***

DO NOT drive the crane until the area around the crane has been checked for any proximity hazards, e.g. People, other plant or equipment, excavations. Consider the use of a banksman or marshal.

DO NOT attempt to travel the carrier until the boom is fully retracted and stowed correctly.

DO NOT attempt to travel the carrier until the outriggers are stowed and correctly secured.

DO NOT park the vehicle over areas that may catch fire due to the heat from the exhaust, e.g. dry grass, straw, cloths, etc.

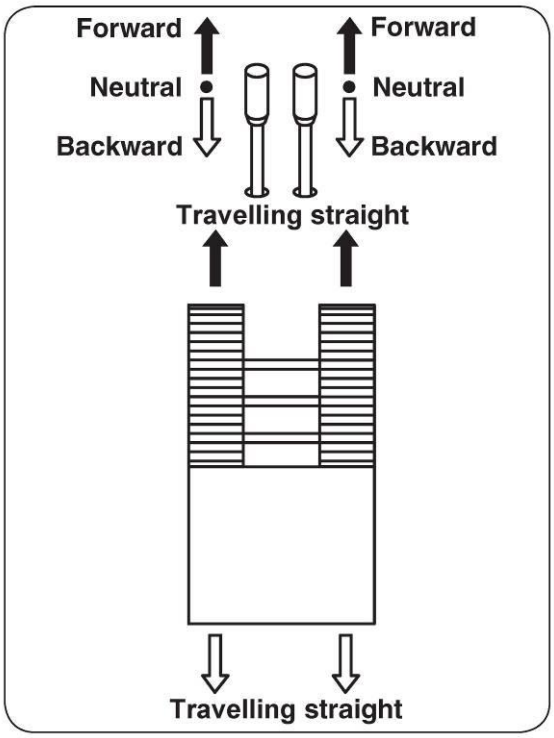
Travel as slowly as possible when turning or travelling on rough terrain. Always assess the route before travelling.

After travelling operations, be sure to stop the engine, remove the key and move the travel lever stand to the stowage position. If you are leaving the crane for a long period chock the tracks.

<u>This operation should only be carried out when absolutely necessary.</u> If it is necessary to carry out a spin turn or "turn on the spot", ensure the engine is at idle speed only and turn the carrier slowly and gently. Harsh or abrupt movements will significantly shorten the life of the rubber tracks and may induce "bouncing" of the carrier and cause further damage or loss of stability to the crane.

When operating in, or fording water ensure you do not exceed the maximum permissible depth which is half the depth of the tracks. Whenever possible avoiding tracking through water, as the ground beneath the water may be uneven or unstable.

When manoeuvring the carrier, ensure that both travel levers are always operated together whenever possible. Failure to do this will cause excessive wear on the rubber tracks and may cause bouncing as described above.

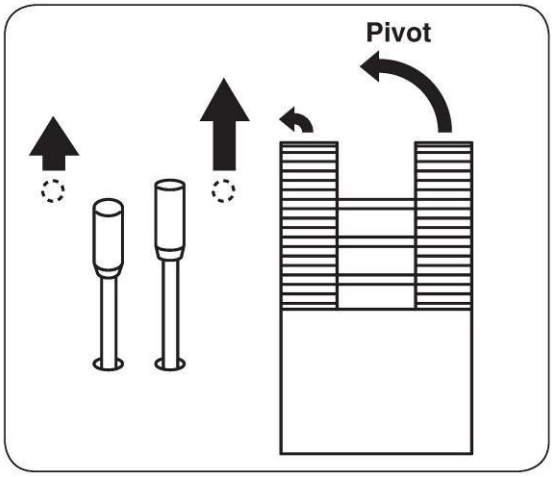


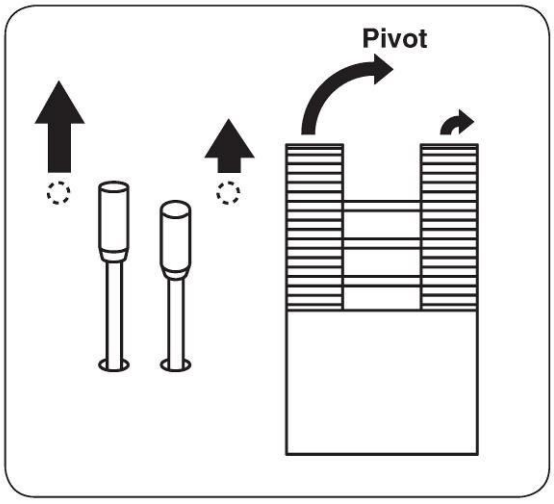
i. Travelling forward and reversing

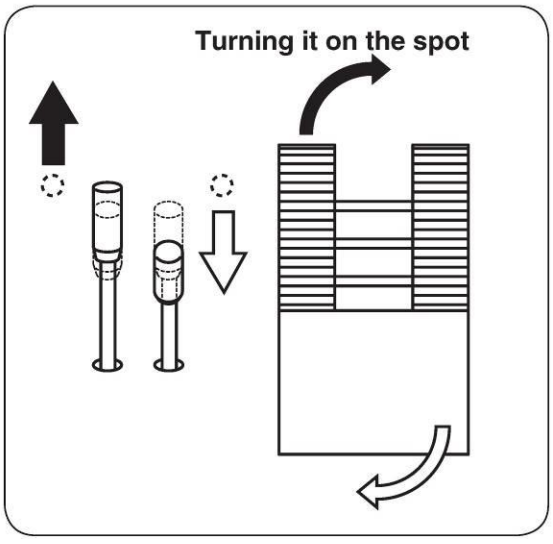
- To travel forward: push both levers away from you (forwards). They should both travel the same distance to ensure you do not crawl in a curve.
- To travel in reverse: pull both levers toward you.
- When travelling, fine speed adjustment is carried out by moving the levers away from neutral (faster) or towards neutral (slower).
- Coarse speed adjustment is achieved by way of altering the accelerator lever in the desired direction.

When travelling over obstacles e.g. kerbstones, it is important that the crawler tracks approach the obstacle head on, perpendicular to the kerb. Approaching at an angle is likely to result in the crane overturning. Always travel up and down slopes on a perpendicular to the slope, to minimise the effects of instability.

Do not carry out turns when climbing or descending an incline or slope.







ii. Making a turn

Making a turn whilst the crane is moving

- When moving forward: moving the left hand lever towards neutral, whilst keeping the right hand lever forward, causes the crane to turn to the left and vice versa.
- When moving backwards: moving the left hand lever to neutral, whilst keeping the right hand lever forward, causes the crane to turn to the right and vice versa.

Making a turn while the crane is stationery

- Pushing the left hand lever away from you causes the crane to turn right and vice versa.
- Pulling the left hand lever towards you causes the crane to turn left and vice versa

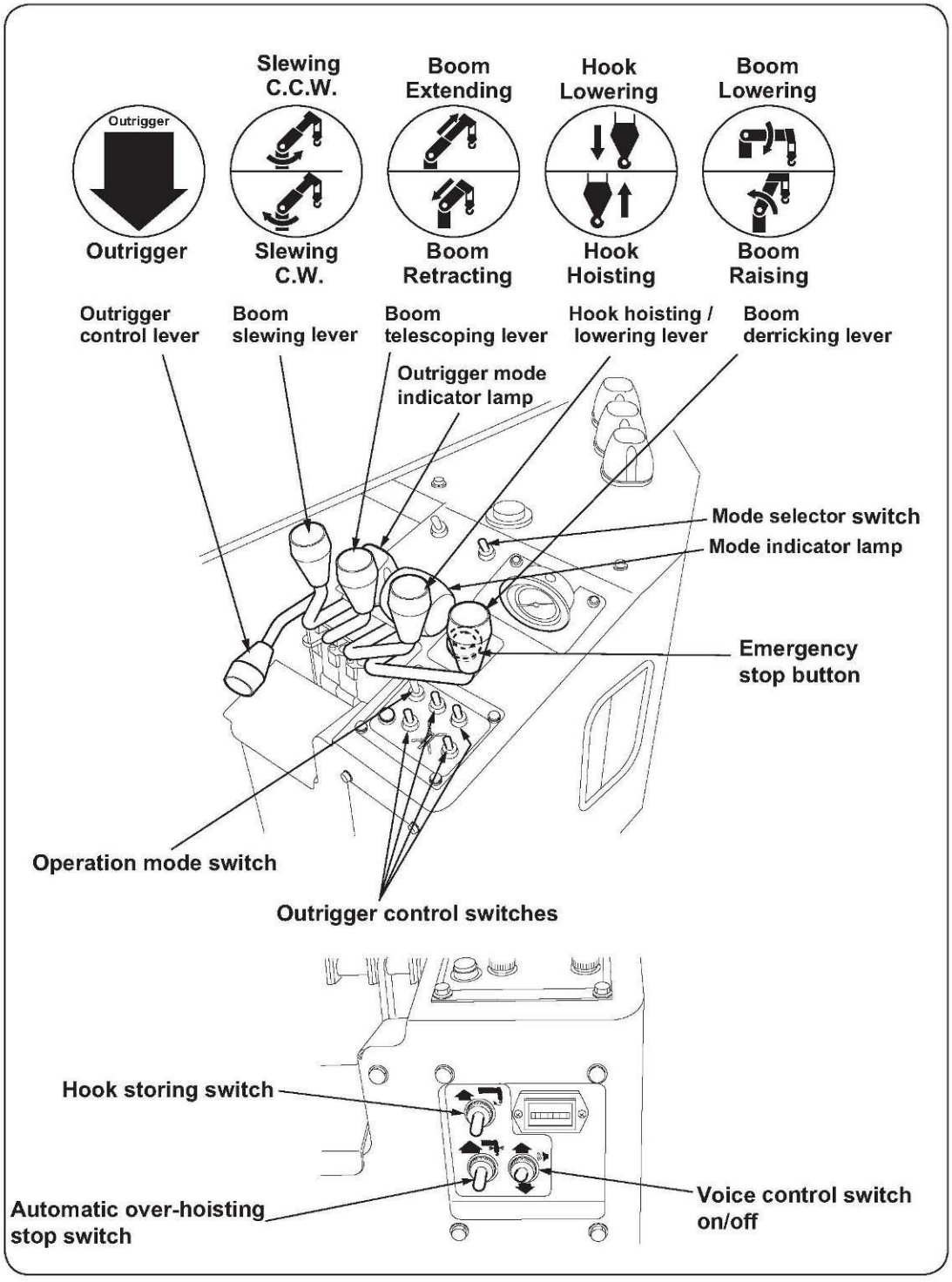
Making a turn on the spot

- Pushing the left hand lever away from you while pulling the right hand lever towards you at the same time causes the crane to spin on its own centre axis to the right (or clockwise) and vice versa

This manoeuvre should only be carried out with extreme care, in order to avoid excessive “bounce” during travel, which could lead to damage to the ground and/or tracks and avoid possible overturning of the crane.

11 CRANE OPERATIONS

a. ***Description and location of the control levers***

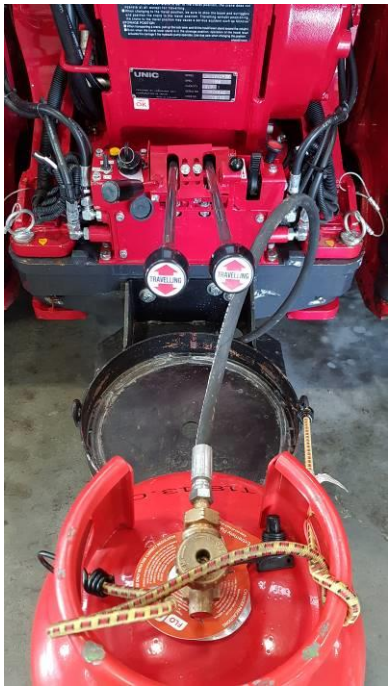


b. ***Before operation***

DO NOT allow anyone to stand near the hook when it is released from stowage position. As the hook may swing when released, anyone standing close, may be struck by the hook.

During cold weather always allow the engine to run for 5 minutes after start up. This allows the hydraulic oil to reach operating temperature. This ensures smooth, consistent, predictable and safe operation of the crane. Also, as the viscosity of the oil is higher during cold weather, high speed running of the pump could lead to incorrect circulation of the oil and may lead to pump failure.

- Make sure that all of the outrigger control switches are in neutral position.
- Where fitted, remove the LPG bottle from its stand and place on the ground.
- Move the lever platform to the “Crane operation” position.
- The crane is now ready to deploy the outriggers.



NB

Ensure the engine is SWITCHED OFF before removing the LPG bottle, to avoid the risk of inadvertently snagging the LPG supply hose and operating the travel levers.

c. ***Outrigger set-up procedures***

Any operation of the crane without the outriggers set-up in accordance with these instructions is STRICTLY PROHIBITED.

DO NOT set-up the outriggers on uneven or soft ground, or where the outrigger would be on a slope. If the surface is soft, uneven or sloped always ensure that a support such as a steel road plate or timber dunnage of adequate load bearing capacity is placed under the outrigger foot. This must stop the outrigger foot from moving, sliding or sinking under load. If this is not done it could lead to reduced rated load and/or tipping of the crane.

ALWAYS check the rated load and actual load weight in relation to the extension of the outriggers, maximum or minimum. Failure to do this may cause a tipping hazard. Consult the Rated Load chart in front of the operator's position.

ALWAYS ensure the locking pin is in place when extending or storing the outriggers to stop the outrigger inadvertently rotating. Once outrigger is deployed on the ground, failure to do so could cause the outrigger to rotate under load, leading to crane collapse. Failure to use the locking pin when stowing may lead to the outrigger rotating during crawling and creating a striking hazard.

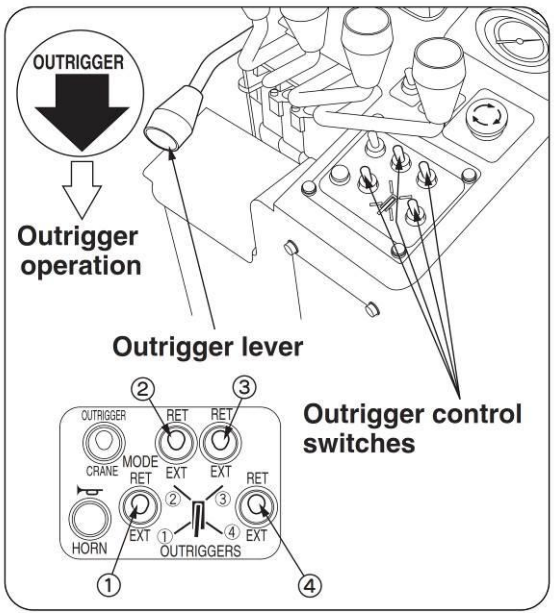
DO NOT place your foot or any other body part under the outrigger when extending. There is the potential for severe crushing injuries.

DO NOT put fingers near the inner box sections when retracting, this is a severe nip hazard. Similarly, when stowing the outriggers a potential crush hazard exists between the outrigger/carrier and outrigger/outrigger. Always ensure you use the handles provided to move the outriggers.

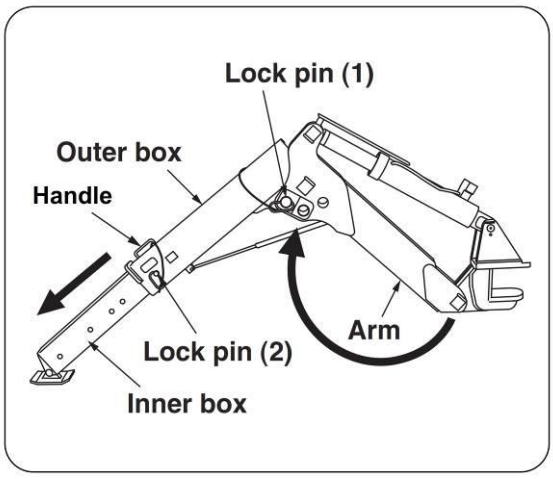
ALWAYS extend the inner box section of the outrigger before operating and extending the hydraulic cylinder towards the ground. Retract in reverse order.

ALWAYS set-up the crane on firm, level and uniform ground and then raise the carrier until the bottom track is approximately 50mm above the ground.

The crane must not be operated until all outriggers are in contact with the ground and pressure has been applied to them. Ensure all ground contact sensors (where fitted) are functioning correctly and monitor throughout any operation of the crane.



Photograph of pin set and arrows in standard position



There are four directional switches and one lever used to control the outriggers.

- Selecting the outrigger and its function i.e. extend (EXT) or retract (RET) and then use the outrigger lever to carry out that function.

Set-up the outriggers as follows:

- Extract the set pin and manually rotate the outrigger to line up the arrows. This allows for 360º slew capability (see photograph to left) of the crane. Insert the pin securely. **NB. (094/095 only) If the crane is to be set up in any other configuration than standard position, you must first consult the Prohibited Area of Operations chart (See Page 8 for 095 or Page 190 for 094)**

- Remove the lock pin (1) and raise the arm to the 'max ext' or 'not max ext' position as required and re-secure with the lock pin and clip pin.

- Remove the lock pin (2) and pull out the inner box fully (If it is secured at any other position, the outrigger is set to "Not maximum" position). Re-secure with the lock pin and clip pin.

- Repeat for all outriggers.

- Select each outrigger control switch and use the outrigger lever to lower each outrigger to the ground, ensuring that the crane is fully supported by the outriggers.

- On models fitted with ground contact sensors, check that all 4 green lights have illuminated.

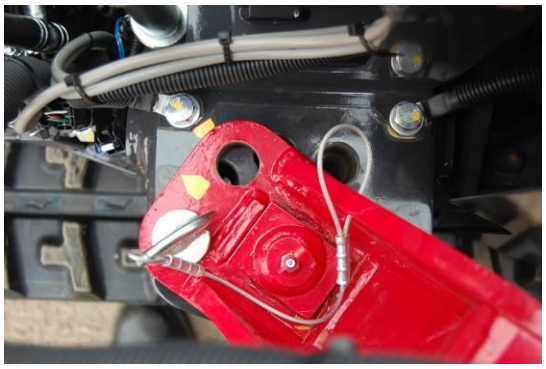
- **(095 only) Before the crane is levelled, carry out a function check of the Turnover Protection System (Pages 60 and 61)**

- De-select the outrigger control switches and re-select them individually to level the crane in both axes.

- **Ensure that the crane is level and the tracks are raised at least 50mm clear of the ground.**

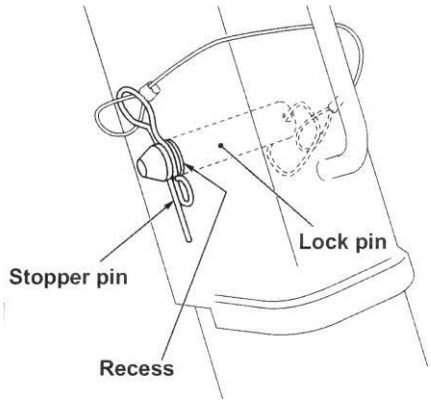
Insert each set pin securely when the outriggers are being set up or stowed. Insufficient insertion of the set pin may allow the pin to be dislodged. This may cause rotation of the leg under load and collapse or overturning of the crane.

This is especially important where the multiple pin set outrigger positions are possible. Some pin positions are not as visible and it is therefore essential that the correct insertion of the pin is checked both visually and manually



Photograph shows pin set in non-standard position

After the relevant lock pin has been inserted. Be sure to replace the clip pin in the recess to securely retain the lock pin. Failure to replace the clip pin correctly may lead to the lock pin coming loose which will cause collapse of the outrigger and the crane to overturn.

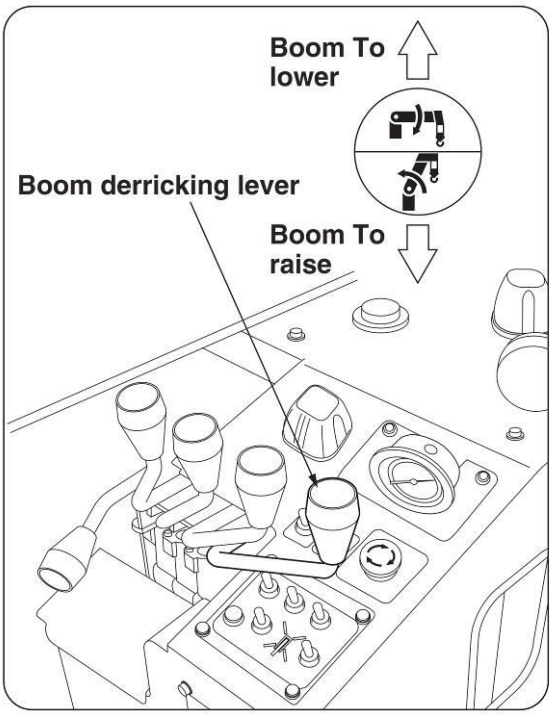


d. ***Derricking the boom (raising and lowering) (All models)***

DO NOT cause the crane to start or stop abruptly when operating the control levers, this may cause excessive shock to the crane which could cause loss of load, as well as damage or overturning of the crane.

ALWAYS REMEMBER, when lowering the boom with a load attached the working radius increases which decreases the capacity. Check the readings on the load indicator/use rated load charts to confirm the available crane capacity before lowering commences.

The longer the length of the boom, the faster the load is raised when derricking the boom. The crane control levers are fully proportional, i.e. the further from neutral you push or pull the lever, the faster the operation of the crane. Operate the controls slowly and smoothly.

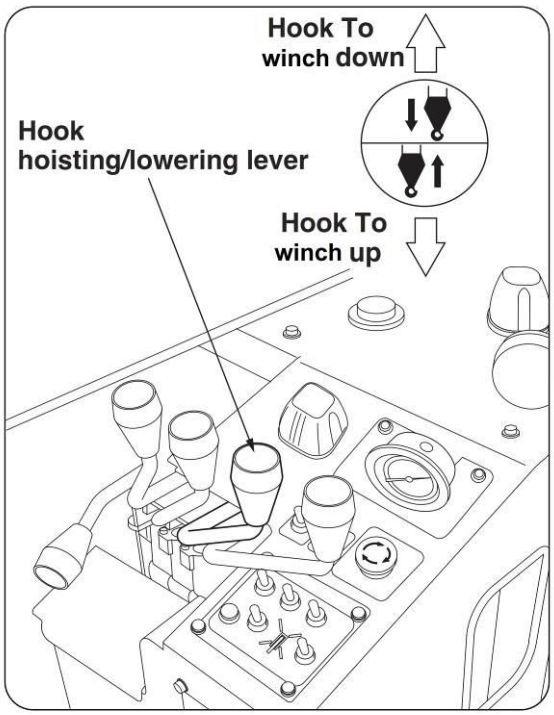


To Raise the boom upwards:

- Pull the lever to 'RAISE' to lift the load.
- Push the lever towards 'LOWER' to lower the load.
- To stop either operation return the lever to the neutral position.
- The operation of the lever is proportional and speed of operation increases in tandem with increasing engine speed.
- **DO NOT release the lever suddenly except in an emergency situation. Always return it to neutral under control.**

e. ***Hook operation (All models)***

DO NOT allow the hook to be over-hoisted. Allowing the hook to strike against the top of the boom can cause serious damage to the wire rope and the sheaves, which could lead to a loss of load.



To winch up and down:

- Push the lever to' DOWN' to low to lower the hook/load
- Pull the lever towards 'UP' to raise the hook/load.
- To stop either operation return the lever to the neutral position.
- **DO NOT release the lever suddenly except in an emergency situation. Always return it to neutral under control.**

Paying out more rope once the load or hook has reached the ground causes the rope to unwind off the drum. If the rope is taken up it will be wound on irregularly. This will cause the top layers to place undue pressure on the layers below. This will damage the rope leading to a dangerous condition and seriously shorten the life of the rope.

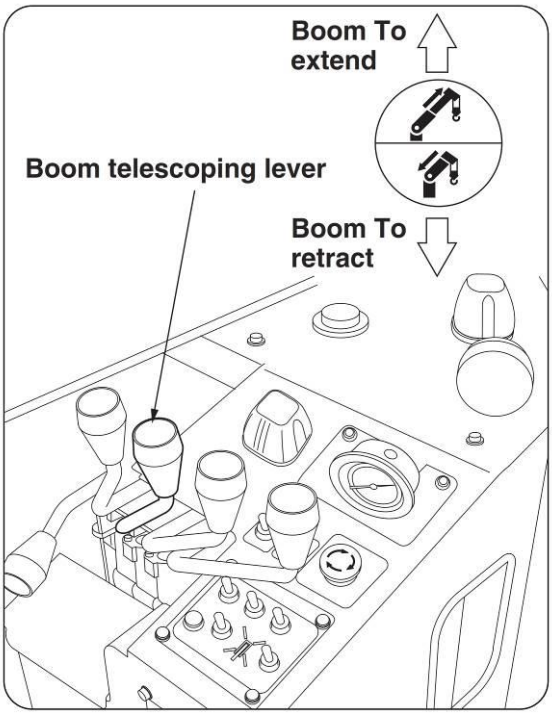
If the rope does unwind off the drum, firstly either raise the boom or telescope the boom out to recover the hook block from the ground. Lower the rope slowly to free loose windings and then slowly hoist up, feeding the rope onto the drum ensuring it is tightly and evenly wound.

When unwinding rope further than ground level, such as over building edges or into excavations or underground workings, ensure that at least 3 turns of rope are left on the drum.

If the hydraulic oil temperature exceeds 80°C all crane operations must cease immediately until the oil has reached its normal operating temperature again. The oil is prone to overheating when the hoist and lower is repeatedly operated, particularly with long lifts.

f. ***Telescoping the boom (All models)***

DO NOT operate without the over-hoist alarm operating correctly. When the boom is extended the hook raises. If the over-hoist alarm is not working the hook will strike against the top of the boom causing serious damage to the wire rope and the sheaves, which can lead to a loss of load.



To operate boom extension/retraction:

- Push the lever forward to extend the boom.
- Pull the lever backwards to retract the boom.
- To stop either operation return the lever to the neutral position.
- **DO NOT release the lever suddenly except in an emergency situation. Always return it to neutral under control.**
- When the viscosity of the oil is high, due to low temperature or environment, speed of boom operation will be affected. To warm the oil, carry out a full extension and retraction prior to commencing any lifting.

Note that when the boom is extended or retracted, it will raise or lower the hook accordingly. Ensure that you are aware of the position of the hook block when operating the boom.

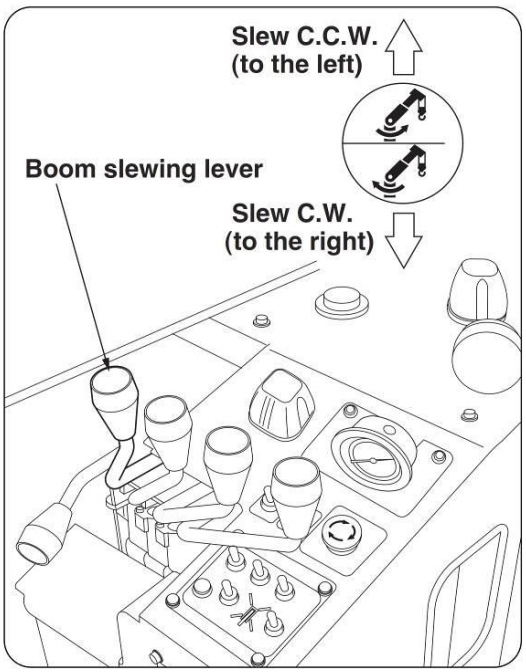
g. ***Slewing the boom (All models)***

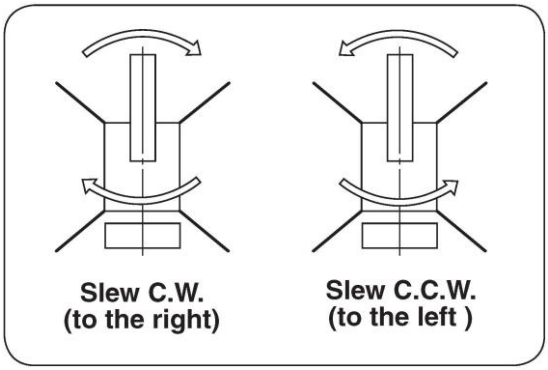
DO NOT race the engine during slewing operations

DO NOT slew the boom with the outriggers raised or not properly deployed, or slew the boom over the operator controls whilst in use by the operator.

DO NOT make abrupt starts and stops. This will cause the load to swing and may cause personal or material damage by striking someone or something. It may even lead to tipping of the crane. Always operate controls slowly and smoothly.

The longer the boom length and the smaller the derricking angle, the faster the load will move during slewing. The faster the load moves, the greater the inertia, the harder it is to stop the load. The load will also swing more violently when slewed quickly. This will cause a serious risk to all operating near the crane. Always slew at a speed consistent with the configuration of the crane and load.





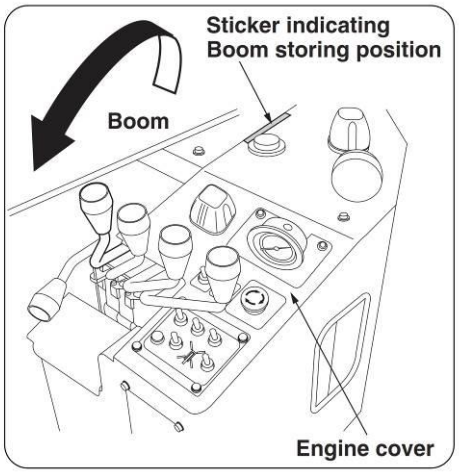
To slew the crane:

- Pull the lever to slew the boom clockwise.
- Push the lever towards to slew the boom anti-clockwise.
- To stop either operation return the lever to the neutral position.
- **DO NOT release the lever suddenly except in an emergency situation. Always return it to neutral under control.**
- 'Slew right' means slewing the boom in the same direction as the hands of a clock would move (if the crane was seen from above) i.e. 'clockwise'.
- 'Slew left' means slewing the boom in the opposite direction to the hands of a clock (if the crane was seen from above) i.e. 'anti-clockwise' or 'counter-clockwise'.

h. ***Storing the boom (095/295 only)***

All models of the URW095/295 are fitted with a switch that prevents the boom slewing and/or lowering onto the control levers and damaging them, or possibly jamming the boom.

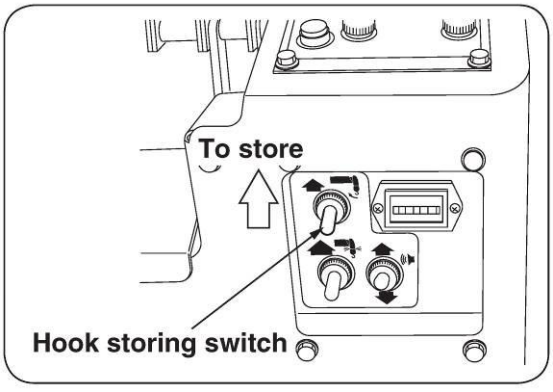
Anti-Strike Switch
The switch is located on a bracket adjacent to the hydraulic reservoir. It has a spring mounted sensor finger projecting upwards into the path of the boom. Should the boom either lower onto the finger and depress it, or slew into it and displace it from its central position, the power from the engine will immediately be reduced from Full Power to Slow down Mode. The selected function of the boom in the chosen direction will then stop. The only available movement of the boom will be away from the switch allowing it to return to its neutral position.



- Retract the boom fully.
- Slew the boom in an anti-clockwise direction to the rear of the engine compartment.
- Lower the boom until it stops.
- Align the boom with the sticker on the engine cover.
- Store the hook

i. ***Storing the hook (095/295 only)***

DO NOT store the hook until all boom sections have been retracted and the boom has been stowed correctly. Ensure the hook is not swinging and is at rest before storing to avoid damage to the hook and the rope.



- Hoist up the hook with the hook up/down control until the over-hoist alarm sounds.
- Stop hoisting up.
- Use the hook storing switch to raise the hook into its final storage position.
- **It is important that you watch the hook continuously during this operation.**
- When it reaches its stowage position release the hook storage switch immediately, otherwise the rope may be damaged.

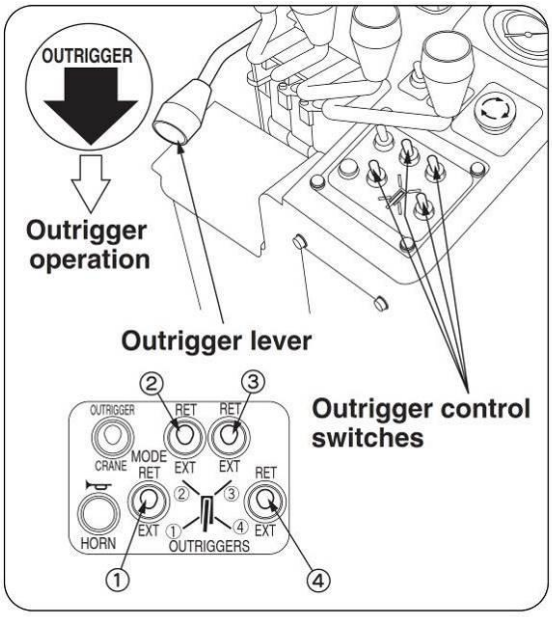
j. *Storing the outriggers (All models)*

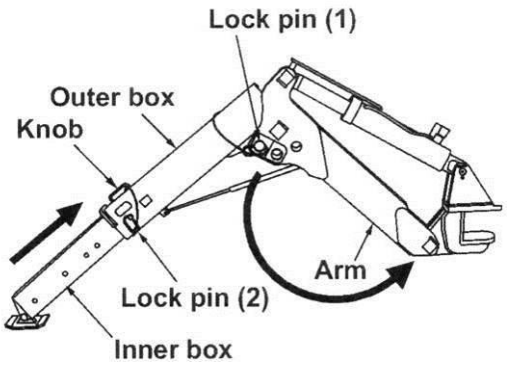
DO NOT store outriggers before boom has been stored.

DO NOT retract the inner boxes until the vertical cylinders have been retracted fully.

ALWAYS ensure the locking pin is in place when extending or storing the outriggers to stop the outrigger inadvertently rotating. Once outrigger is deployed on the ground, failure to do so could cause the outrigger to rotate under load, leading to crane collapse. Failure to use the locking pin when stowing may lead to the outrigger rotating during travel and creating a striking hazard.

On models fitted with ground contact sensors, the outriggers will not operate until the boom is correctly stowed and the boom storage indicator lamp is illuminated.

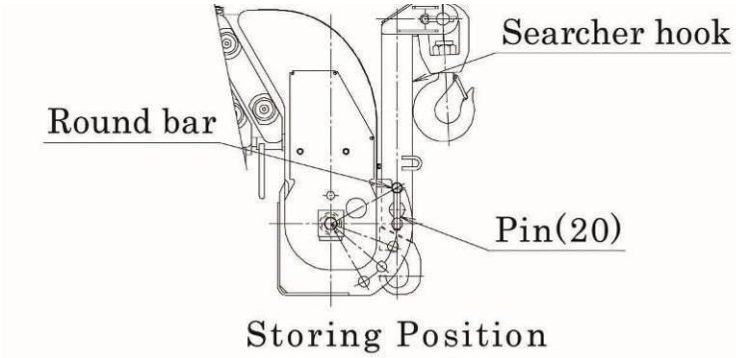




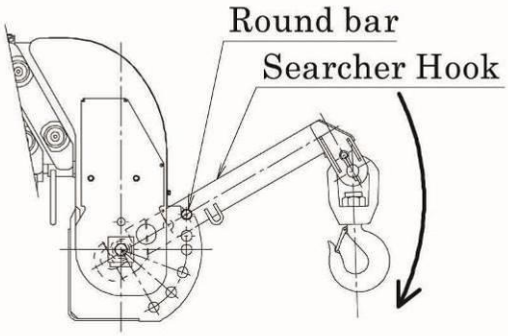
- Retract the vertical cylinder fully.
- Remove the locking pin (2) and retract the inner box section fully.
- Re-insert the locking pin, ensuring that they are properly in place and secured with the clip pin.
- Remove the locking pin (1) and push the outer box to its storage position and re-secure with the locking pin.
- Re-insert the locking pin, ensuring that it is properly in place and secured with the clip pin.
- Remove the set pin and manually rotate the outrigger to its storage position.
- Re-insert the set pin, ensuring that it is securely in place.
- Repeat for all outriggers.
- Return all outrigger control switches to their neutral position.

k. ***Optional 300Kg Searcher Hook (095/245/295 only)***

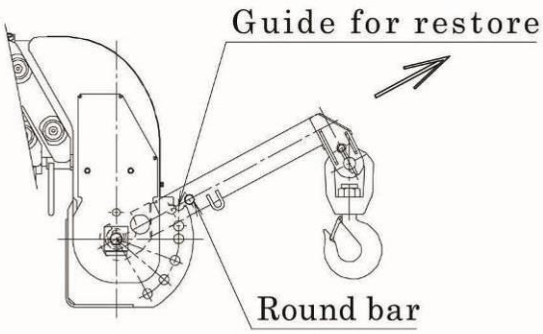
How to set up Searcher Hook



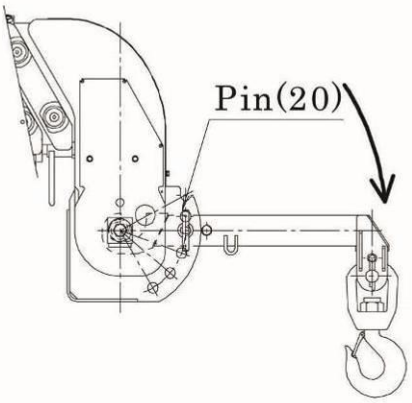
Remove pin (20) and turn searcher hook around the round bar.



Rotate until the rear of the searcher hook rests against the top sheave pin.

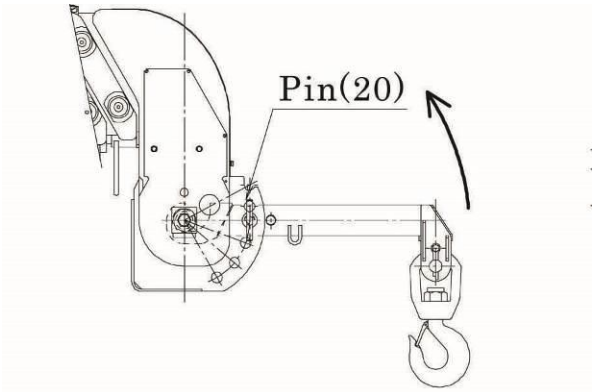


Searcher hook is pulled out and upwards ensuring the searcher hook engages around the top sheave pin

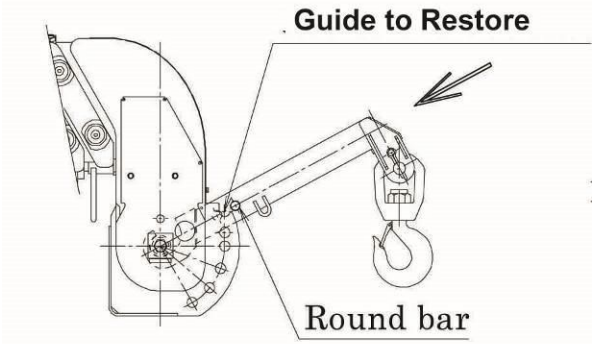


The pin (20) is inserted through the searcher hook and pinset at the desired tilt angle to be used.
Ensure clip pin is fitted to prevent the pin from coming loose.

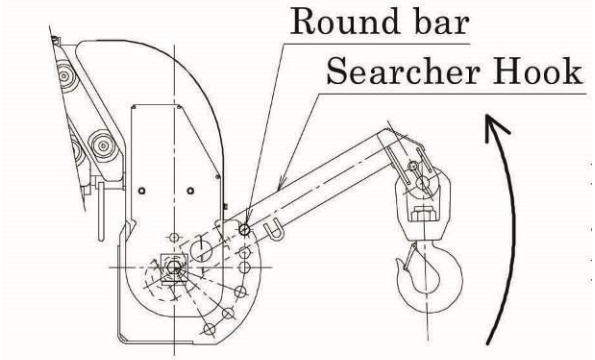
How to Store Searcher Hook



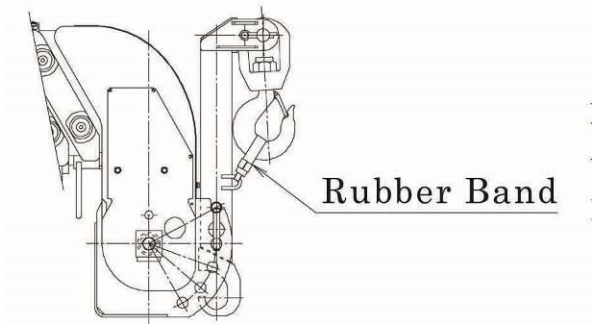
Remove pin (20) and rotate searcher hook around the top sheave pin.



Place the round bar on the notch at the top of the pin set guide.



Remove the hook from the top sheave pin and lift up around the round bar on searcher hook.

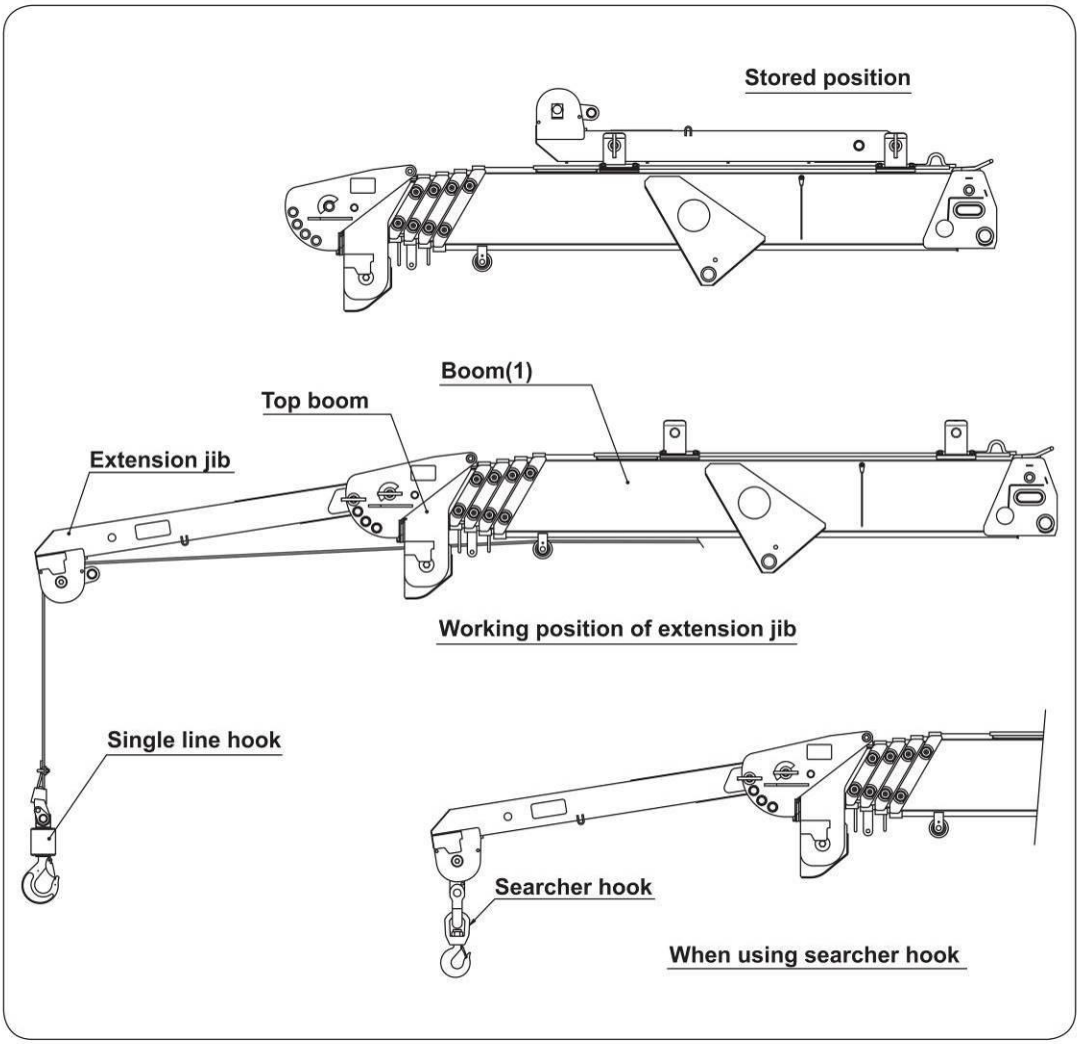


Insert pin (20) into the hole on the bracket “store position”. Secure the hook with the rubber band to prevent it swinging during travel.

I. ***Optional 700Kg Extension Jib (095/295 0nly)***

(i). Fitting and using the jib

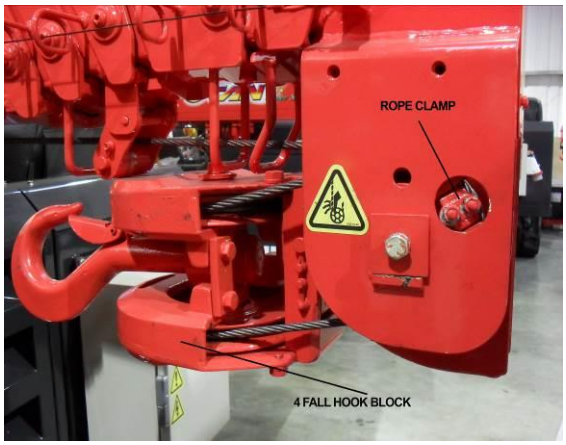
Overall view of Extension Jib



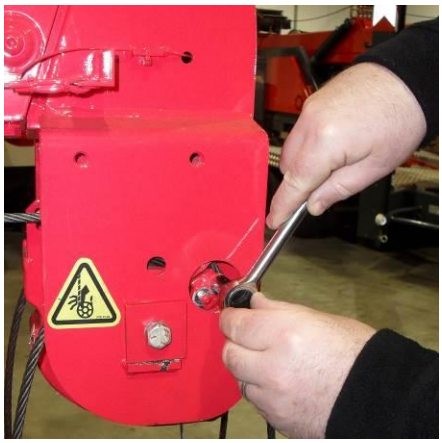
The Extension jib (when fitted with single fall hook block) can only be used when the outriggers are set to maximum extended. Failure to follow this procedure may result in the crane becoming unstable and result in the crane to tipping over.

NB. The extension jib must be used with either the single fall hook block or searcher hook fitted; instructions on the removal and fitting of hook block(s) are set out on the next pages:

ii. Removal of 4 fall hook block (095/295 only)



- Lower the hook block to the ground.



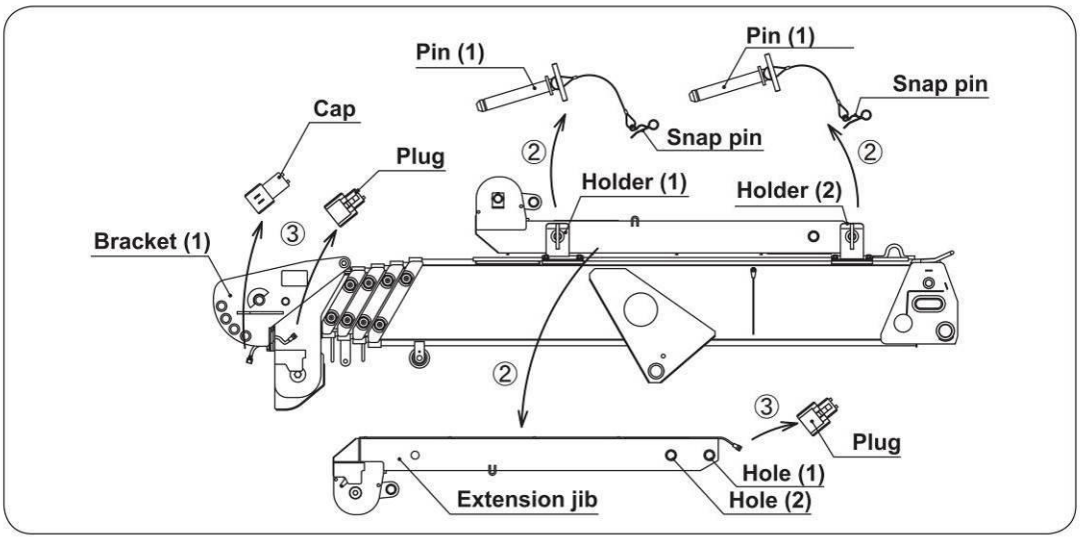
- Remove retaining nuts from rope clamp and remove clamp

- Gently tap the wedge out from the rope socket using a punch and hammer and remove wedge.

- The rope can now be removed from the crane sheave and 4 fall hook block ready for the rigging of the single fall hook block
-
- For re – fitting of the 4 fall hook block, carry out this operation in reverse order

- For further information on the reeving of the 4 fall hook block, refer to the diagram on page 115 of this manual.

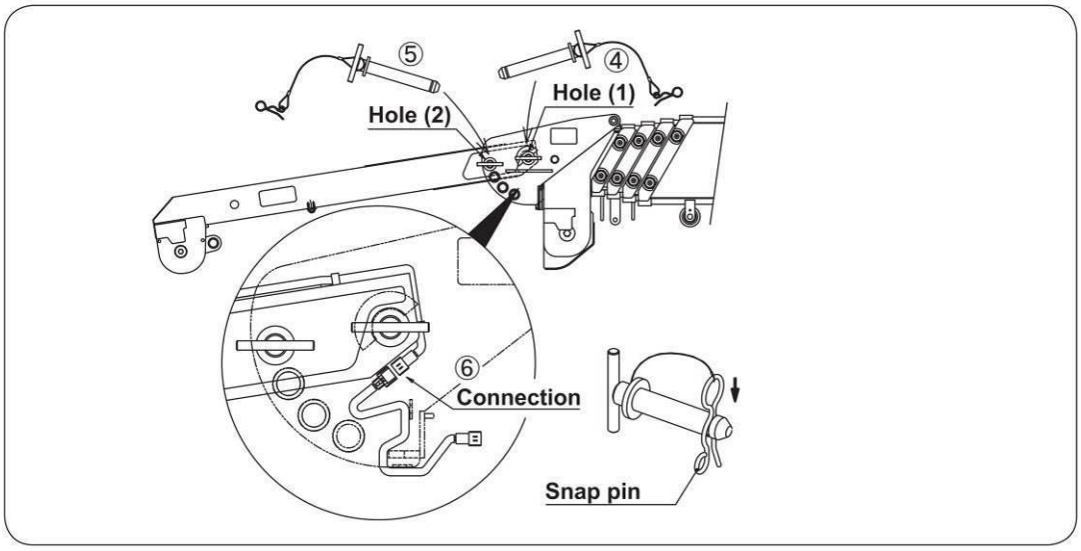
iii. Setting up the Extension Jib



NB

It is recommended that this operation is carried out with 2 persons, in order to avoid possible manual handling injuries.

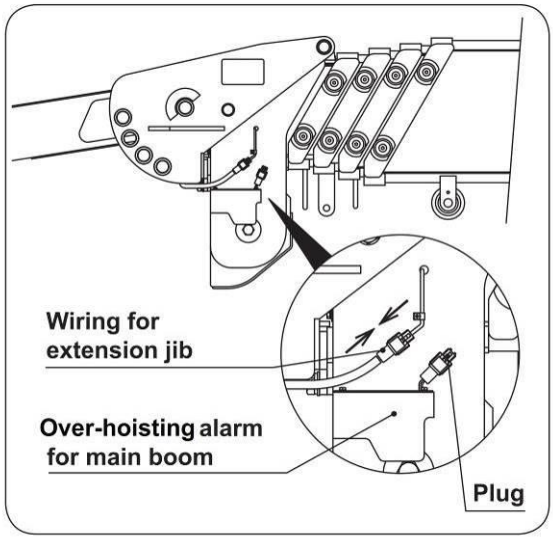
- Extend outriggers and level the crane.
- Remove the snap pin from each pin (1) in turn and remove each pin from holders (1) and (2). The extension jib can now be removed from the main boom.
- Remove the waterproof caps and plugs from their respective connectors at the end of the main boom bracket and the end of the extension jib (1). Unplug the connector to the Over-hoisting alarm on the main boom. Ensure that all caps are stored safely.



- Align hole (1) at the end of the extension jib with hole (1) in bracket (1) at the end of the boom and insert pin (1) (See (4) above). Once inserted, ensure the snap pin is correctly re-fitted.

- Align Hole (2) on extension jib with the desired tilt angle hole, depending on the required tilt angle of the extension jib and insert pin (1) (See (5) above). Once inserted, ensure the snap pin is correctly re-fitted. There are four angle settings, 0°, 20°, 40° or 60°. **Note that if a tilt angle of either 40º or 60º is required, the boom must be first raised to approximately 10º before fitting.**

- Connect the extension boom plug to the connecting socket and wire on bracket (1) and then connect the other end of the connecting wire to the plug at the end of the main boom (See (6) above). Ensure that the waterproof caps are fitted to any unused connections, see diagram below.

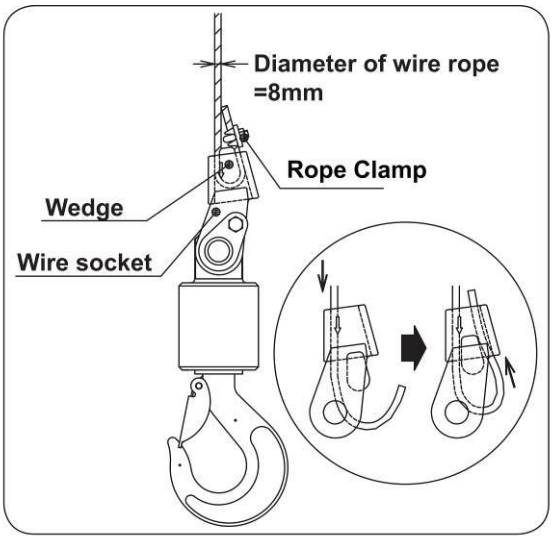


To de-rig and store the extension Jib, carry out these instructions in reverse.

Once the extension has been fitted the rated capacity indicator must be re-configured to extension jib duties. (See Appendix 1 for details).

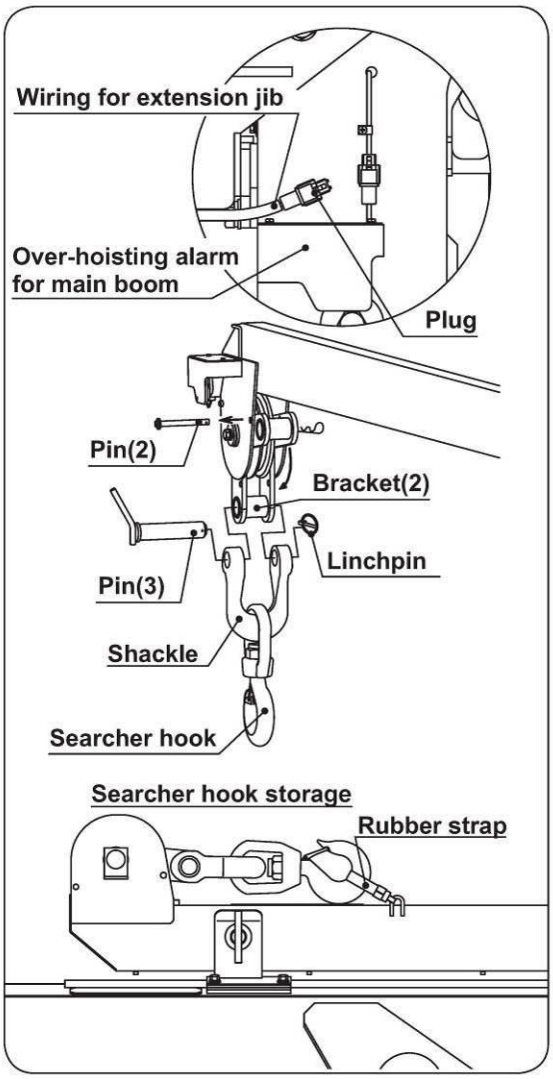
Ensure that the voice control switch is switched "On" before using the crane, or no alarm will be heard when over-hoisting. Carry out a function check of the alarm prior to use.

iv. Fitting the single fall hook block



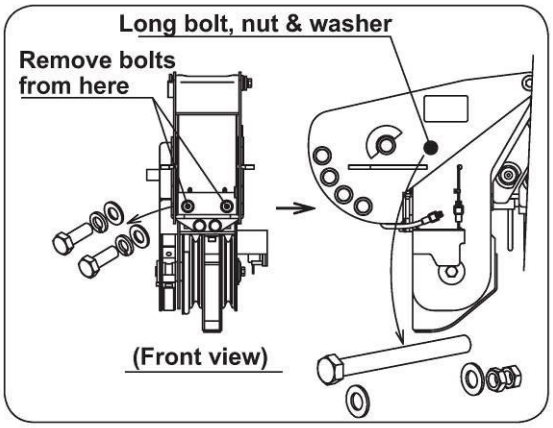
- The rope should first be fed through the sheave at the end of the extension jib before the hook block is fitted.
- Detach the cable and Over-hoisting weight from the alarm device on the main boom and re-fit the cable to the alarm device at the end of the extension jib. The rope should then be fed through the Over-hoisting weight before fitting the hook block
- The single fall hook block can now be fitted by feeding the rope through the socket and inserting the wedge as shown in the diagram opposite.
- Ensure the rope clamp is fitted to the loose end of the rope as shown in the diagram opposite.
- **Do not fit the rope clamp to either the "live" (load bearing) or both lines of rope together.**

v. Fitting of Extension Jib Searcher Hook

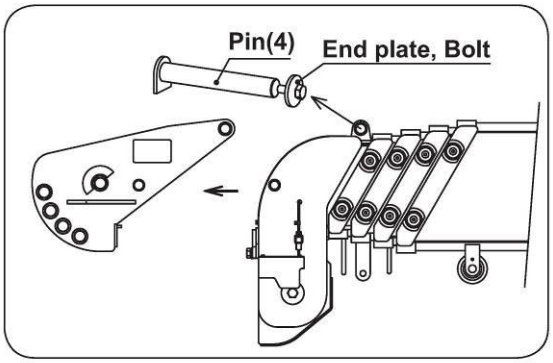


- Connect the main jib connector to the Over-hoist alarm device on the main boom and fit the waterproof cap on the extension jib connector.
- Remove pin (2) that fastens bracket (2) on the extension jib. Pin (2) can now be stored away.
- Insert pin (3) through the shackle and bracket (2) and secure the linchpin into the end of pin (3).
- The searcher hook is stored as shown in the diagram opposite.
- To remove the searcher hook carry out these actions in reverse order.

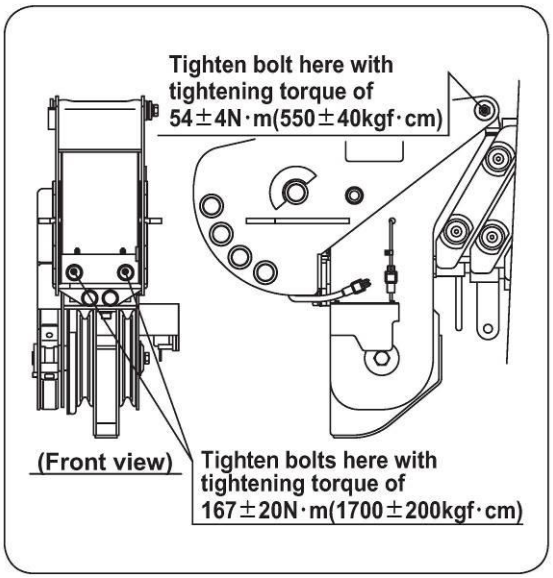
vi. Removal and fitting of the extension jib bracket



- Unfasten and remove the 2 retaining bolts located inside the bracket housing at the front of the main boom.
- Unfasten and remove the retaining bolt and nut located on the side of the bracket.



- Unfasten and remove the bolt and end plate from pin (4) at the rear of the bracket, then remove pin (4) whilst supporting the weight of the bracket.



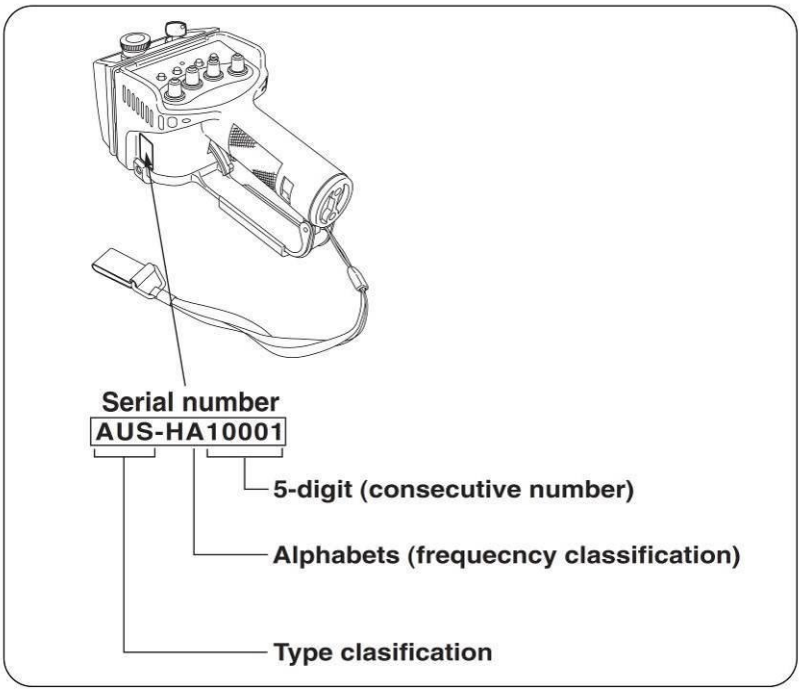
- To re-fit the bracket, carry out this procedure in reverse, but ensure bolts are tightened to the correct torque as indicated in the diagram opposite.

12. RADIO REMOTE CONTROL UNIT (RCU) (All models)

This section of the manual gives a detailed explanation on the correct operation, service and maintenance of the radio remote control unit. Only use the remote control unit after reading and understanding the remainder of this manual in carrying out the safe and correct operation of the crane.

If there are any issues with the remote control unit, or any further assistance is required, please contact UNIC Cranes Europe.

When making any enquiry with reference to the remote control unit, please quote the unique serial number on the transmitter, illustrated below:



a. ***Safety Precautions***

Ensure that all of the following precautions are taken with regard to the safe operation of the remote control unit (RCU). Failure to comply could result in damage to the remote control, or a serious accident or incident.

- Ensure that you stay within sight of the crane at all times during operation, pay attention to any hazards in the vicinity of the crane, or anything that may affect the stability of the crane.

- Be aware that radio interference could possibly affect the crane operation whilst using the RCU, causing an abrupt stop of the crane during operation. This may cause load swing.

- In order to reduce the possibility of radio interference, the operator should stay within the maximum working radius of the crane where possible and always within sight of the crane. The transmitter antenna is located inside the handgrip guard; ensure this is repaired or replaced if there are signs of damage.

- Sources of possible radio interference may emanate from some engines, e.g. generators; Sirens using contacts, e.g. reversing alarms on vehicles; some electrical motors.

- Remove the batteries from the RCU if it is not to be used for extended periods of time, this will prevent potential leakage of corrosive substances from the batteries.

- Ensure that batteries are correctly disposed after use.

- Do not attempt to disassemble or modify the RCU in any way, seek assistance from UNIC Cranes Europe.

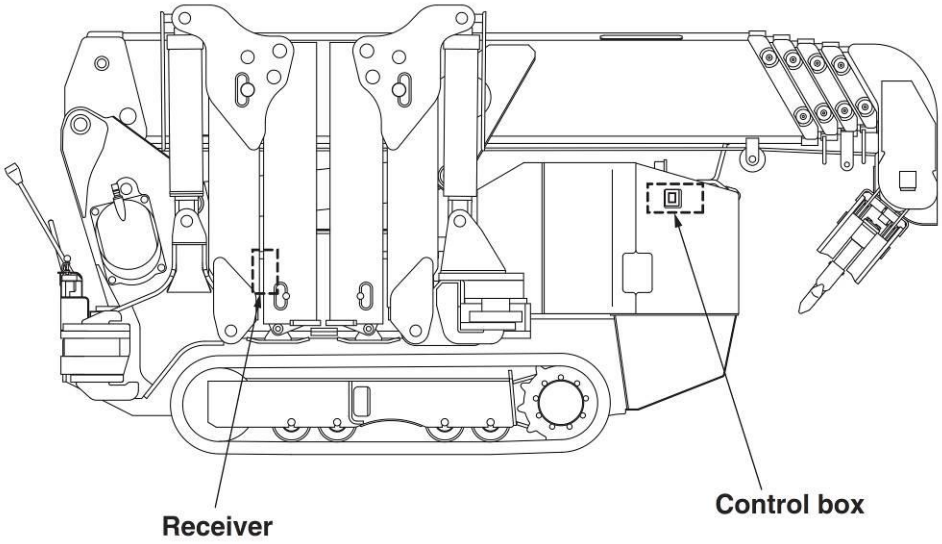
- Avoid dropping or any impact of the RCU, as internal damage may result. The batteries may also become dislodged in the event of accidental impact, ensure they are checked for correct positioning.

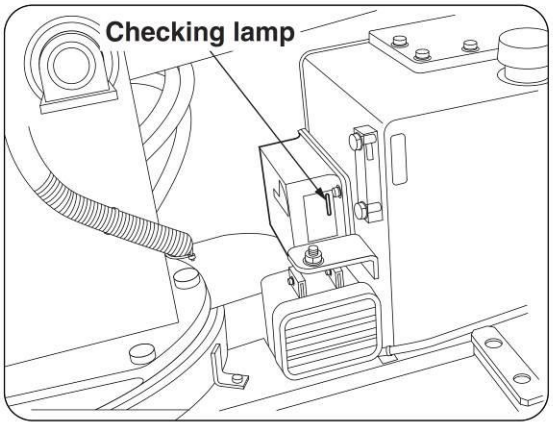
- Do not wash or immerse the RCU in water/liquids. Clean with a damp cloth only and avoid using strong detergents/alcohol, as this may damage the transmitter housing.

- Do not submit the RCU to extreme changes of temperature, this may cause condensation build up inside the electrical components.

- Do not store the RCU in direct sunlight or near any strong heat source.

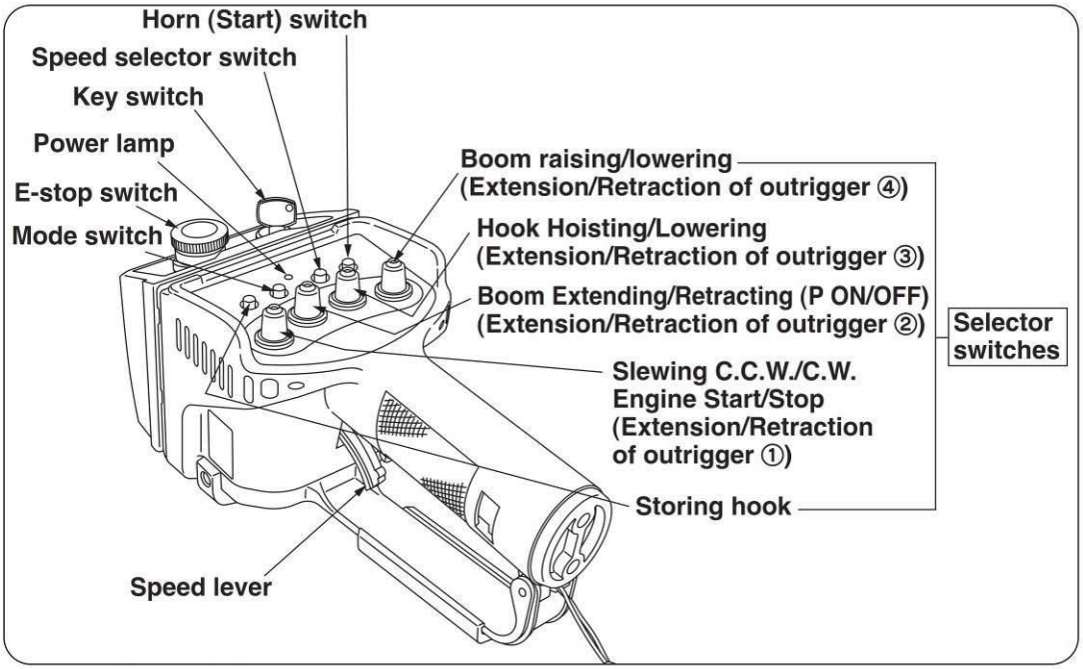
b. ***Description of Associated Equipment***



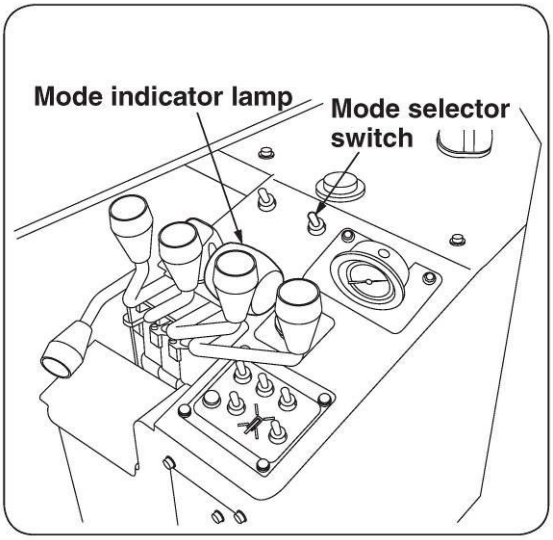


The antenna is built into the receiver unit

c. ***Description of the Transmitter***



d. ***Selecting Remote Control Operation***



To switch the crane to remote control operation, carry out the following procedure:

- Press and hold the remote control mode selector switch.
- The following voice message will be heard, “Remote control active, Remote control active”. The orange RCU mode indicator light will also illuminate.
- The crane is now ready to be connected to the RCU transmitter
- Pressing the mode selector switch a second time will cancel remote control operation. The following voice message will be heard, “Crane mode, crane mode”. The RCU mode indicator light will switch off.

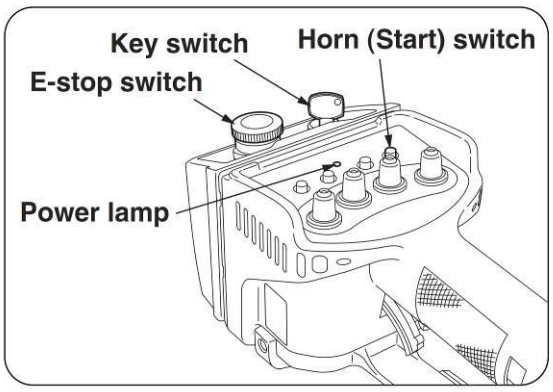
Once in remote control operation, all manual crane operation levers are disabled, until the RCU mode selector switch is set back into crane mode.
The table below illustrates the available operations of the crane, dependant on the operation mode selected:

Crane operation		**Operation mode**	
		Manual	**Radio remote control**
Manual lever	Boom Raising / Lowering	O	X
	Hook Hoisting / Lowering	O	X
	Boom Extending/Retracting (JIB tilt Raising / Lowering)	O	X
	Slewing C.C.W. / C.W.	O	X
	Outrigger Extend / Retract	O	X
Radio remote control transmitter	Boom Raising / Lowering	X	O
	Hook Hoisting / Lowering	X	O
	Boom Extending / Retracting	X	O
	Slewing C.C.W. / C.W.	X	O
	Storing hook	X	O
	Mode	X	O
	Speed select	X	O
	Horn	X	O
	Emergency stop	X	O
	Engine Start/Stop	─	O

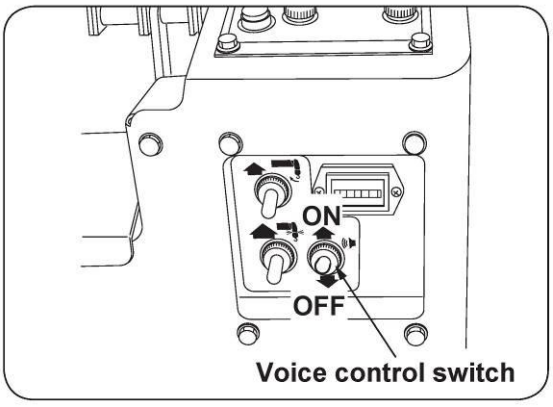
Key: O = Operation enabled X = Operation disabled

Note:
i. The crane cannot be operated simultaneously in both crane and remote control operation.
ii. The set operation mode is retained in the control box memory if the ignition is turned off and back on again.

e. ***Configuring the RCU for Operation***

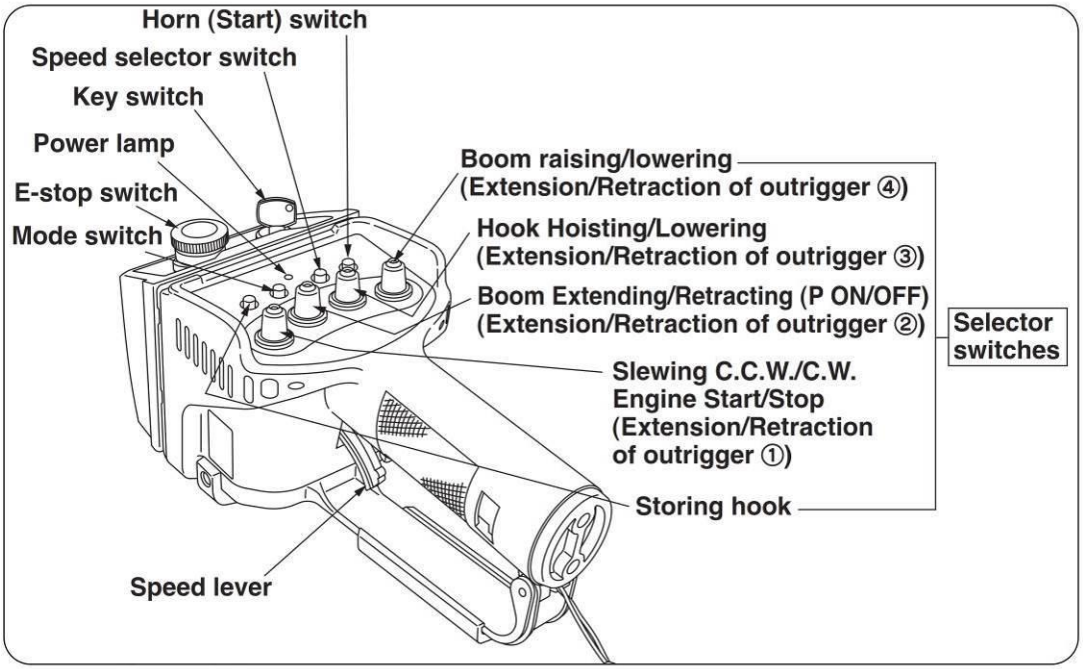


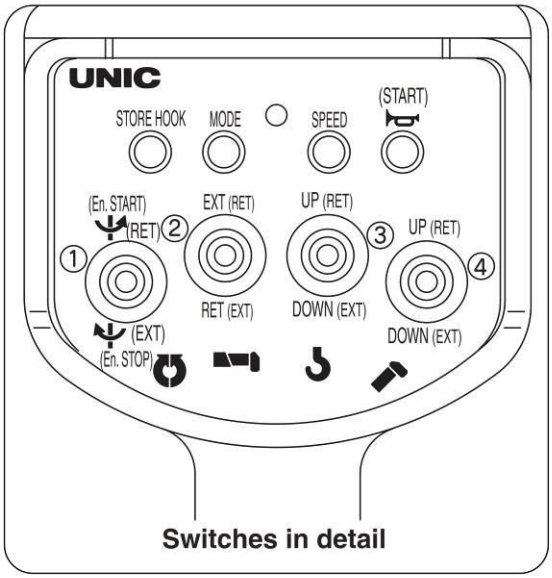
- Set up and configure the outriggers to the desired extension using the manual control levers as described in section 11- C of this manual.
- Note – If any crane operation is attempted whilst extending or retracting the outriggers, the crane will apply an automatic stop function until all levers are released. Operation of the outriggers will then be restored.
- Ensure that the emergency stop switch is de-activated (turn clockwise in direction of arrows to release), then turn the key switch from position “0” to position “I”.
- Note - Pressing the emergency stop switch down will de-activate the transmitter and stop all communication between the crane and the RCU.



- Press the horn switch, this will activate the transmitter and connect to the receiver. Once connected, pressing the horn switch will operate the signal horn, this can be used to warn others in the operating area when the crane is being used.
- To disconnect the transmitter and turn the power off, turn the key switch back to position “0”.
- With the voice control activated, press the radio remote control mode selector switch on the crane control panel. The remote control operation indicator light will illuminate and the voice message “Remote control active, remote control active” message will be heard. The mode indicator will also read (0 0).

f. *Operating the crane using the Remote Control Unit*



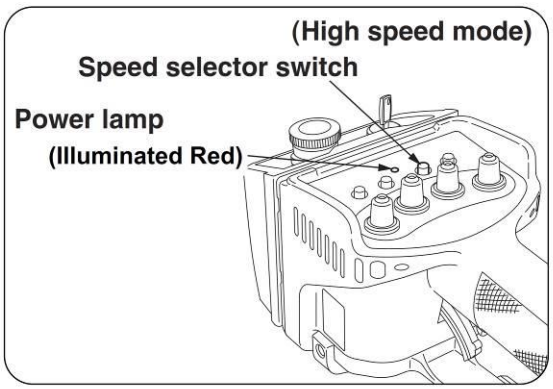


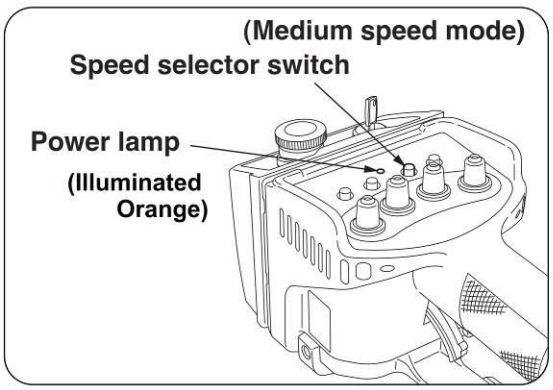
Quick Start Guide

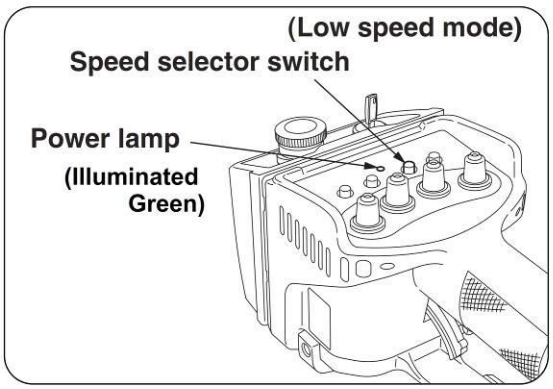
- Once connected, first operate and hold the desired directional control of the crane,
- **Slowly** pull the speed lever on the RCU to engage the desired crane operation. The further the lever is pulled toward the hand grip, the faster the crane will operate.
- To stop the movement, anticipate your stopping distance and slowly release the speed lever until the crane comes to rest at the desired position, then release the speed lever.
- Operating multiple switches will increase engine speed to provide proportional crane movement.
- **NOTE: It is recommended that the operator becomes fully familiar with the RCU before use, by reading the remainder of this section.**

g. ***Confirmation and changing the Speed Mode***

The speed mode can be changed on the RCU, to suit operating conditions or to limit the running speed of the engine, to reduce noise levels when working at night for example.







Confirming the speed mode

- Confirm the current speed mode setting by reading the display indicator on the LCD screen. The 3 speed settings are indicated by the diagrams on the left.

- To change the speed mode, confirm the current speed mode setting and then press speed selector. Each time the selector switch is pressed, the speed mode will change setting, cycling from high speed through to low speed.

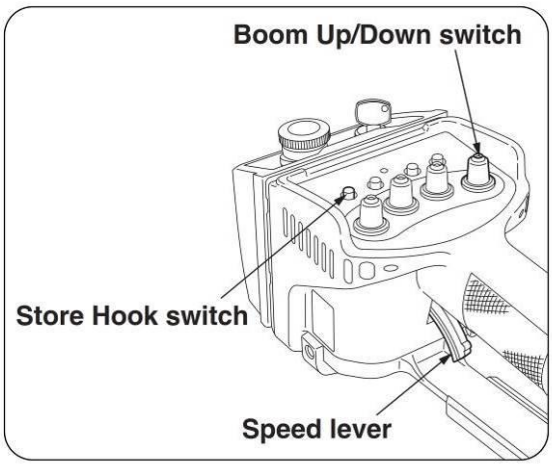
- Note – Once a particular speed mode has been set by the transmitter, this setting is memorised by the crane, even if the transmitter is disconnected and switched off. Stopping and re-starting the engine from the main key switch will re-set the speed mode value to its default value of “high”.

h. ***Interlocking balance control function***

Interlocking is where 2 or more function switches on the remote control are selected at the same time. The system provides a method of balancing the hydraulics to give the optimum performance for each selected function.

When returning to “independent” function from interlocked function, i.e. releasing all other selected functions to use only one, the selected function may be slower than normal. This is a safety feature, it prevents the sudden, unexpected, acceleration of the function. If you want to return to proper independent function, release all interlocked controls and reselect the desired independent control.

The interlocking balance control function can be disabled on the transmitter by pressing the hook store switch and boom control down switch together (see diagram below). The voice message “Change control mode, change control mode” will be heard. The mode indicator will read (o F) when the system is being disabled. Pressing the store hook and boom control up switch together, will re-enable the interlocking balance control function. The same voice message will be heard and the mode indicator will read (o N) when the system is being enabled.



i. ***Temporary change of interlock balance (Click function)***

When carrying out “2-interlock” operation (2 selector switches used together), the speed balance of a selected interlocked function can be temporarily adjusted. Simply click the selector switch for the desired function and that function speeds up in relation to the other function. The more times you click the selector, the faster it gets, until you achieve the maximum possible speed. To return the balance to its’ normal speed relationship, release both selection levers and restart the interlocked functions.

NB

This does not work in 3-interlock and 4-interlock operations.

Example of 2-Interlock Operation

- Pull the speed lever after selecting the “hook up/down” switch selected to “down” and the “Boom Extend/Retract” switch selected to “Extend”. This will operate both controls simultaneously.
- To increase the boom extension speed, “Click” the boom telescoping switch from Extend to off and back to Extend again, whilst remaining steady control of all other switches and speed lever. This will proportionally increase the speed of the boom extension incrementally each time the switch is “clicked”.
- **Notes** – The speed will increase up to a point where the second selected operation will eventually stop. To reset the functions, release all control switches and re-start the procedure.

  If one of the selected switches is released during interlock operation, the speed of the remaining crane control may increase.

  The “Click” function only operates when the transmitter is being used in 2-interlock mode. It will not work when using 3 or 4 interlocked operations or when using a single crane control.

5. Reduced Shock Function

The RCU incorporates a selectable function that reduces the amount of shock loading to the load and the crane during operation. This functions by allowing the crane to come to a slow stop, rather than an immediate stop if any of the function switches are suddenly released, or released accidentally.

BE AWARE that the crane may still make slight movements when the selected function is deselected suddenly. All personnel operating in the vicinity of the crane must be aware of this.

To disable the reduced shock function, select the hook Up/Down to “Down” whilst simultaneously pressing the mode switch. To re-enable the reduced shock function select the hook Up/Down switch to “Up” while the mode switch is depressed.

The mode indicator will display the digits [**00**] to [**07**] (in crane operation) when the reduced shock function is enabled. When the reduced shock function is disabled, the left digit of the pair will show as [**-**], i.e. [**-0**] to [**-7**].

Check that the indicator changes accordingly when the function is activated or de-activated. When the mode indicator display shows [1 0], over-hoist condition, this condition must be removed by lowering the hook or retracting the boom, before the reduced shock function can be changed.

BE AWARE, the remote control memorises the reduced shock function setting when the power is turned off.

j. ***Engine speed control function***

The RCU is equipped with a system to limit the engine speed to a suitable speed for the operating conditions. During independent control of the crane operation the system limits the engine speed during operation. When interlocked operation is selected, the engine speed does increase, to cope with the increased hydraulic demands, but there is no increase in the selected maximum engine speed on the transmitter. During outrigger operation the engine will always run at medium speed.

k. ***Storing the hook using the RCU***

DO NOT stand near the hook whilst operating any of the controls as the hook may strike you. Always store the hook with the boom fully retracted and lowered.

DO NOT operate the hook storage control while operating any other control this will cause a malfunction and possible breakdown.

DO NOT try to stow the hook while it is still swinging, this will cause damage to the boom, the wire rope and the hook itself.

- Ensure the boom is fully retracted and lowered into the storing position prior to storing the hook.
- Raise the hook with hook Up/Down switch selected to “Up”. The hook will automatically stop being winching up when the hook block contacts the over-hoist alarm weight. The voice warning system will announce:

“STOP WINCH UP, STOP WINCH UP”

When the hook comes to a standstill, select the hook storing switch and the voice warning system will announce:

“SECURE LIFTING HOOK, SECURE LIFTING HOOK”

Pull the speed lever and the hook winches up slowly and the mode indicator lamp shows [**13**] during this operation. When the hook is stored correctly, return the speed lever and hook storing switch to the neutral position to stop further winding up. If the hook does not appear to be storing correctly, wind down the hook and start again.

l. *Starting/Stopping the engine using the RCU*

- The main ignition key must be in the on position for the transmitter to be able to perform this function.
- Press and hold the mode switch whilst simultaneously operating the Slew switch to “CCW” (also identified as “En START”). This will operate the starter motor and start the engine.
- Press and hold the mode switch whilst simultaneously operating the Slew switch to “CW” (also identified as “En STOP”). This will stop the engine.

The engine is not fully isolated when stopping with the RCU. To fully isolate turn the main ignition off and remove the key. Also, if the engine is to be switched off for long periods, the main ignition should again be isolated.

The RCU carries out a system diagnosis each time the power is switched on, do not operate the controls until this diagnosis has completed. Failure to do this may result in the voice message “Service remote control”. In the event of this message, press the reset control box switched located as shown on page 60.

On hearing the above voice message when no controls were operated, or the reset not being successful, contact UNIC Cranes Europe for further assistance.

m. *Low Temperature Operation*

When operating in low temperatures it is possible to re-set the crane to run in an alternative configuration to operate more effectively, by changing engine running and hydraulic pressure settings.

The viscosity of the oil becomes high at lower temperatures. This can cause excessive loads to be imposed on the hydraulic pumps which may cause damage.

In low temperature always run the engine for 10 minutes to warm the oil and always begin operations in Low Temperature Operation Mode.

Selecting Low Temperature Operating Mode

- Select the slewing switch to CCW, **then** depress the hook storing switch. **It is important that it is carried out in that order**.
- The mode indicator lamp changes to [06] and the voice warning system announces:

“CHANGE CONTROL MODE, CHANGE CONTROL MODE“

The mode indicator will not change if it is at [04] or [1 0]

Resetting the Low Temperature Operating Mode

- Select the slewing switch to CW, **then** depress the hook storing switch. It **is important that it is carried out in that order**.

- The mode indicator lamp changes to [00] and the voice warning system announces:

“CHANGE CONTROL MODE, CHANGE CONTROL MODE “

The mode indicator will not change if it is at [04] or [1 0]

Low temperature operation mode will reset automatically 10 minutes after it was selected, if it is not de-selected prior to this time period and the voice warning system and mode indicator lamp will respond as if it had been manually reset.

n. ***Changing the batteries in the RCU***

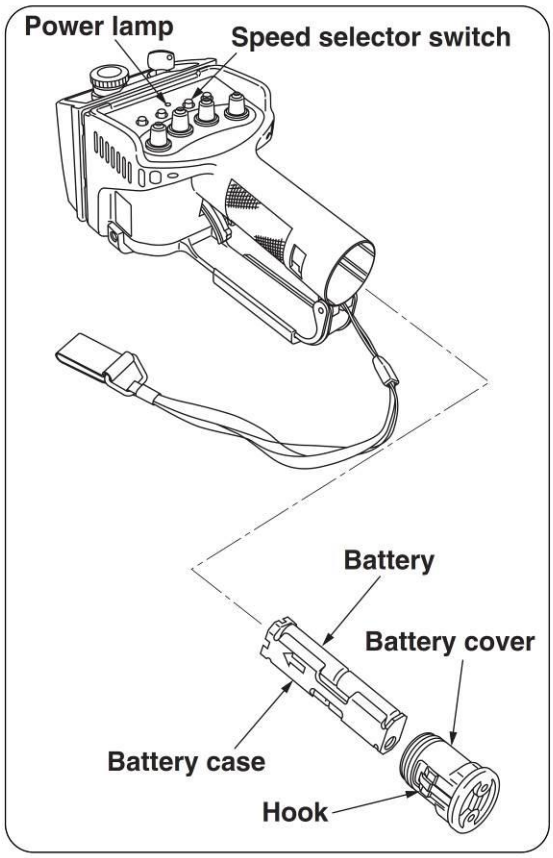
When indicated, change batteries as soon as possible. Leaving the batteries in the handset may cause the batteries to leak. This may damage the electrical contacts and housing. If the batteries do leak, wipe the battery compartment thoroughly before inserting new batteries.

The use of alkaline batteries is recommended. If rechargeable batteries (NiCd or NiMH) are used beware of the following:

Messages suggesting replacement of battery might not be issued.

Batteries may become drained suddenly

Full charge may not be achieved with NiCd batteries due to memory effect



Turn on power to the transmitter to check remaining battery charge, indicated by the power lamp.

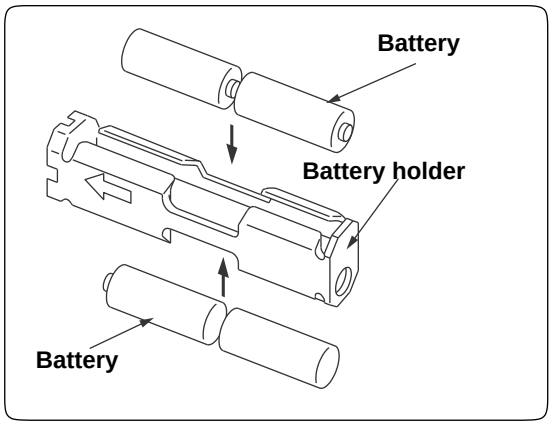
1. If the lamp remains constantly illuminated, there is sufficient charge in the batteries.

2. If the lamp is flashing intermittently (every 1 second) there is approximately 1 hour of charge left. The batteries should be replaced as soon as possible.

3. If the lamp flashes rapidly (every 0.1 second) the batteries are exhausted and need replacing immediately. The transmitter will be inoperable.

4. If the lamp does not illuminate the batteries need replacing immediately and the transmitter will be inoperable.

• When indication of remaining battery charge has reached the condition described in (2) above, following voice message is issued. "Low transmitter battery, Low transmitter battery"
The Mode indicator lamp will also display diagnostic code [99] .



How to replace batteries

- Turn OFF power to the crane (Turn OFF the starter switch.).
- Pull out the battery cover with the latches on the cover pushed in.
- Replace old batteries in the battery holder with new ones.
- Insert the battery holder into the transmitter hand grip. Ensure the arrow marker is pointing upwards and the plastic lug on the holder is correctly aligned with the recess inside the hand grip
- Turn ON the power supply to the transmitter and check the power lamp for remaining charge of the battery.

CAUTION

- ★ **Pay attention to polarity of batteries. (Fit them as indicated on the battery holder)**
- ★ **Do not connect between (+) and (-) terminals directly with conductive materials.**

CAUTION

- ★ **Ensure that no water enters the inside of the hand grip.**

Emergency Stop

Where an immediate stop is needed for safety reasons, press any Emergency Stop button on the crane. This will stop the engine running and halt ALL operations. Be aware that if the emergency stop on the RCU transmitter is pressed, this will only stop control of the crane via the RCU and will NOT stop the engine.

o. ***Daily Checks***

Basic daily checks should be carried out on the RCU to avoid problems when the remote control is in-use.

- Check the exterior of the RCU housing for cracks. These could allow the ingress of moisture or dust which could lead to incorrect operation of the remote control.
- Wipe down the RCU and switches to ensure mud and debris do not get into the RCU.
- Carry out a functional check of the function control switches.

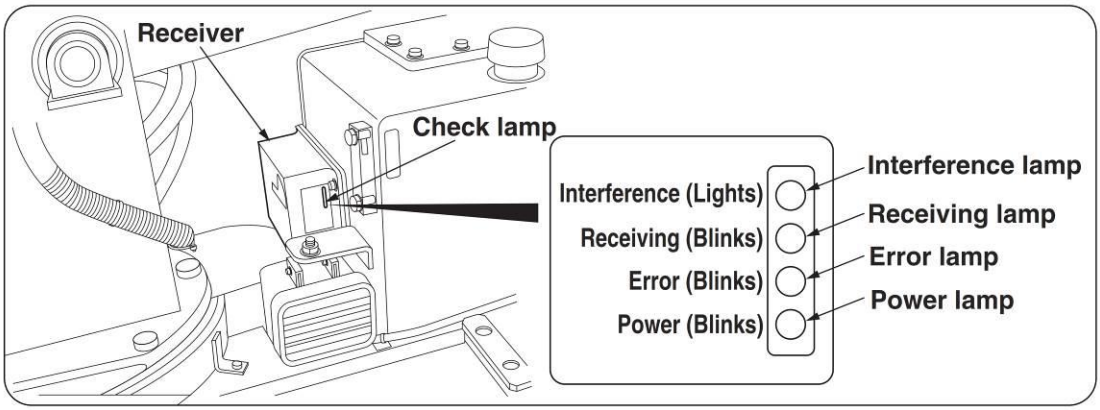
p. ***Fault diagnosis***

If any of the switches fail to operate correctly, or the remote control as a unit fails to operate, check the following and then contact your nearest UNIC Cranes Europe service agent.

Check if;

- The crane can still be operated by the manual levers;
- The power lamp is displaying sufficient battery charge;
- Switches and control levers on the RCU carry out the correct function and the transmitter rear hand guard is not damaged (this is where the antenna is located);
- The mode indicator illuminates correctly to show when power to the remote control is on, code (0 0).

Ensure also that the receiver unit on the crane is serviceable, as shown below:



- Power lamp – Green lamp flashes intermittently when crane is switched on
- Receiving lamp – Green lamp flashes intermittently when receiving signal from transmitter.
- Interference lamp – Red lamp illuminates if a radio signal is being received from an external source, when the power to the transmitter is off.
- Error lamp – Red lamp flashes intermittently either when there is a fault with the transmitter or the transmitter batteries have become discharged.

13 INSPECTION AND MAINTENANCE OF CRANE CARRIER (All models)

DO NOT carry out any maintenance work until power to the crane and carrier is isolated. A 'MAINTENANCE IN PROGRESS' warning signboard must be hung over the controls in the drivers position prior to any maintenance work being carried out.

NB

All replaceable items must be replaced according to the criteria outlined in this manual. Failure to do so may cause damage to the machine and will invalidate any current warranties.

NB

When parts need replacing (other than running spares) or anything abnormal is found, contact your local UNIC dealer for inspection, replacement or advice.

a. *Pre-use Inspection*

ENSURE the engine is stopped, the boom and outriggers are stowed prior to carrying out this inspection.

NO SMOKING during inspection or maintenance.

DO NOT carry out any inspection or maintenance until all working parts have cooled down sufficiently

In order to ensure that the crane carrier works correctly, efficiently and safely inspect each part of the carrier in accordance with the table below.

Device	Servicing item	Device	Servicing Item
Engine	Fuel Leakage Remaining fuel quantity Engine oil quantity/topping up Battery electrolyte solution level check Coolant check (diesel engines). Unusual vibration. Noise. Loose or broken bolts.	Hydraulic oil tank	Oil leaks. Oil quantity. Topping up
		Interlock for crane-travel lever	Function
		Travel lever	Slack, travel
		Wheel Sprocket	Loose bolts
		Rubber tracks	Cracks. Damage. Tension
		Frame	Bends. Cracks. Deformation
		Truck roller	Loose nuts. Oil leaks

i. Check for remaining fuel quantity/Draining water

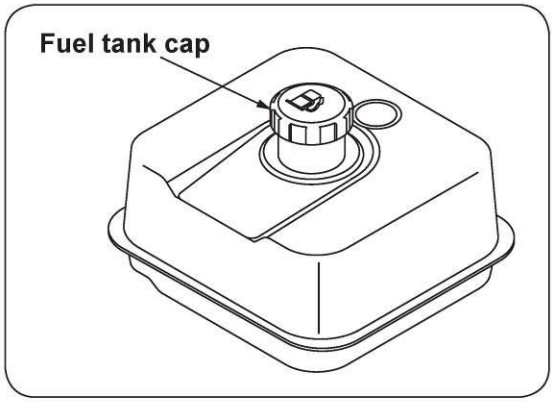
NO SMOKING The fuels used, petrol (gasoline), diesel oil and liquefied petroleum gas (LPG or Propane) are extremely flammable. If there is a fire the LPG container may explode adding a risk of shrapnel injury to that of fire.

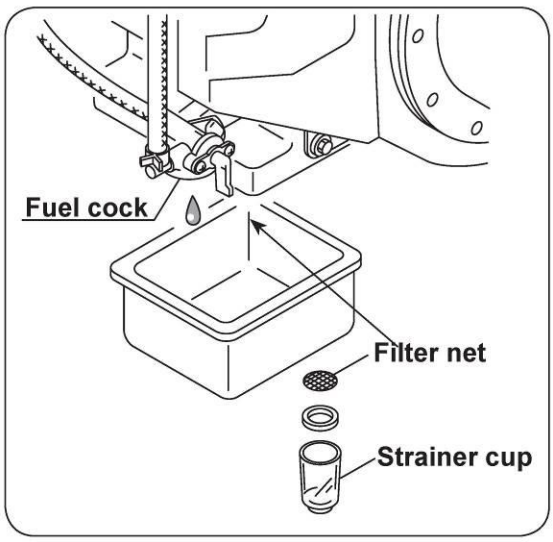
Absorb and/or wipe up fuel after spillage. Wash down area thoroughly. Spilt fuel is a fire hazard. It also increases the risk of personnel slipping and injuring themselves

- When refuelling, remove the filler cap and ALWAYS ensure the fuel strainer is in place to prevent the ingress of debris and moisture.
- When changing the gas cylinder always ensure the cylinder valve is turned off first.

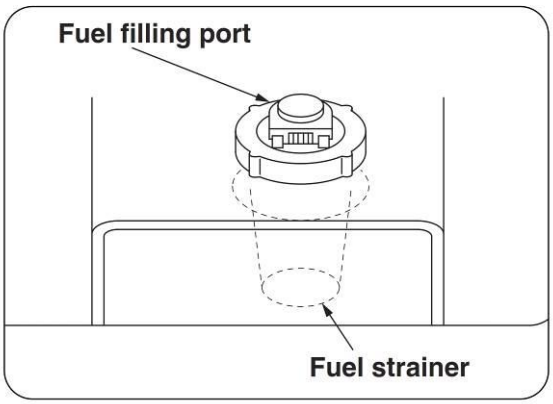
N.B. The gas hose spigot that is removed from the cylinder to fit into the replacement one has a LEFT HAND THREAD.

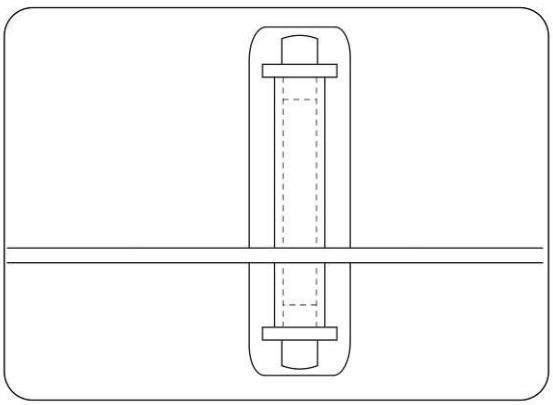
Petrol Fuel System





Diesel Fuel System





ii. Check for engine oil level/filling up/changing

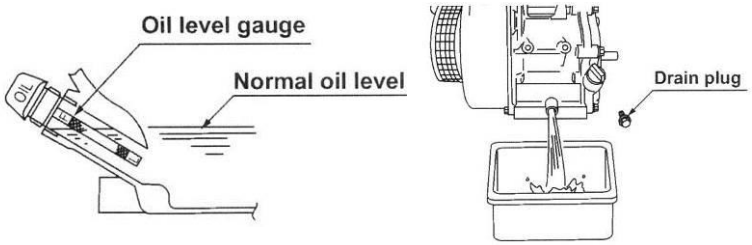
CARCINOGENIC SUBSTANCE. Used engine oil is classified as a carcinogenic substance. If in doubt about what precautions are required contact your company health and safety personnel or the local branch or local government Occupational health advisors.

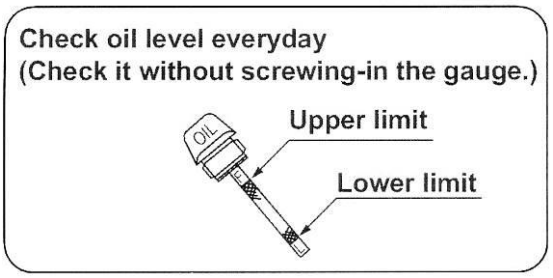
DO NOT allow spilt oil to build up. It is both a fire and slip hazard.

NB

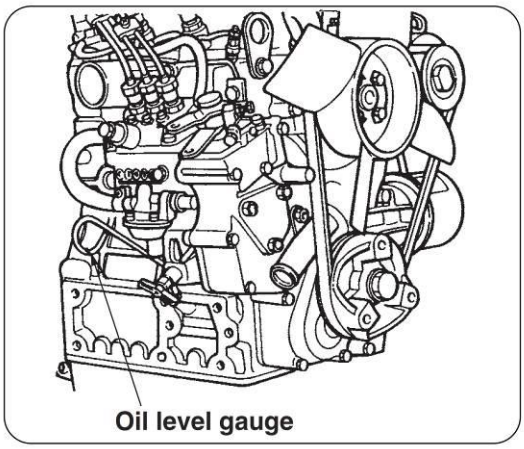
Replace engine oil after the first 25 hours of operation or 1month whichever is the later. It must be changed every 50 hours after that.

Petrol Engine Models



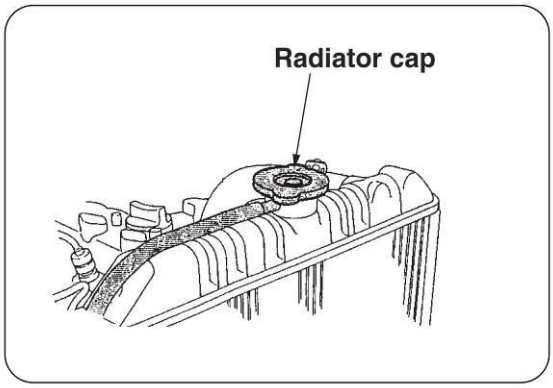


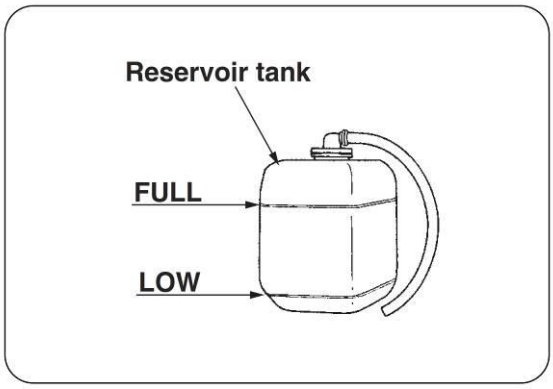
Diesel Engine Models (095/295 only)



- Check the engine oil level before starting the engine.
- If the engine has previously been started allow at least 5 minutes before checking the level.
- Remove the oil level gauge (dipstick) and wipe it with a **clean** rag or paper towel.
- Re-insert the dipstick and remove it slowly and ensure the oil level is between the limits marked.
- Check the condition of the oil at the same time.
- If the oil level is too low, top it up.
- **DO NOT** overfill. Pour small quantities of oil into the engine and re-check frequently.
- Oil quantity 1.2 litres maximum

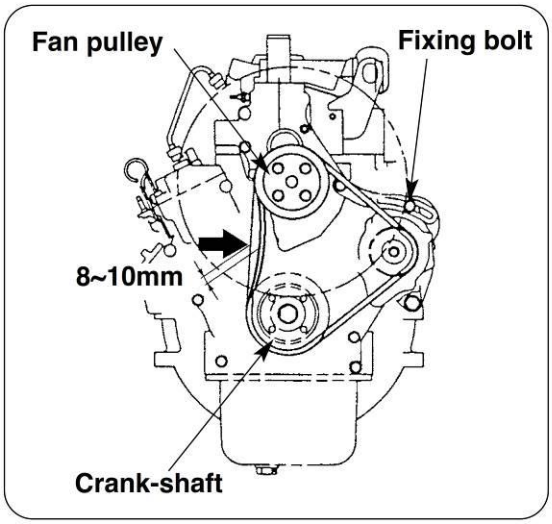
iii. Check for engine coolant level/Topping up (Diesel Engine only)





- The correct level of coolant is where the fluid is between the level indicators **"FULL"** and **"LOW"** on the reservoir.
- If the coolant level is at or below the **"LOW"** mark, top up with coolant to the **"FULL"** mark**.**
- If there is no coolant remaining in the reservoir tank, remove the radiator cap and fill it up to the neck of radiator.
- **NOTE:** If the radiator requires a significant amount of coolant to fill it up, inspect the engine hoses and radiator for leaks. If a leak is confirmed, contact UNIC Cranes Europe for further assistance.

iv. Check for fan belt tension (Diesel Engines Only)



- Check the fan belt for tension, wear and damage.
- The correct tension is 8~10mm of deflection when the belt is pushed with your finger in the centre section of the belt between the water pump pulley and the crank-shaft.
- To make an adjustment, loosen the fixing bolt for alternator and re-position the alternator so that correct belt tension is obtained.

v. Battery electrolyte level

EXTREMLY FLAMMABLE Hydrogen Gas is given off from battery electrolyte solution. This burns hot enough to combust skin on contact and has no flame. NO SMOKING or NAKED FLAMES are to be close to the battery when topping up or charging – This could have potentially fatal consequences.

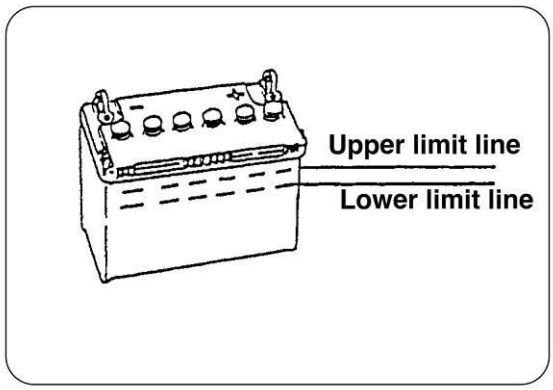
DO NOT allow the electrolyte to splash on to your body or clothing. Electrolyte contains sulphuric acid which may cause severe burns or blindness. If your clothing is splashed remove it at once. If your skin or eyes are splashed wash immediately with copious amounts of water for at least 10 minutes and seek medical assistance immediately afterwards.

ALWAYS wear rubber gloves, cotton clothing and chemical resistant safety goggles when handling batteries

NB

If the crane is stored for any length of time disconnect the negative (-) battery lead. The battery will require charging using the following regime:

Warm weather:	**Once every two months**
Cold weather:	**Once a month**



- Check that the battery electrolyte level is between the upper and lower limits with the battery placed on a level surface.
- If the solution is below the lower limit remove the caps and top up with distilled or de-ionised water.
- Tighten the caps securely after topping up.
- **DO NOT** overfill. If the electrolyte is above the upper limit it may leak and corrode the carrier body.

vi. Check hydraulic oil level

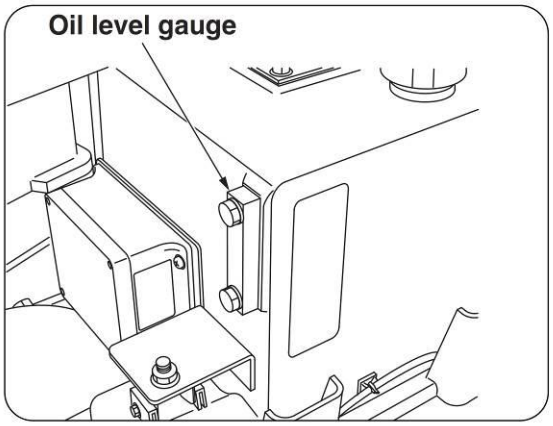
DO NOT attempt any work with the hydraulic system when the crane has been operating. The temperature of the oil and components, including the tank can reach 80˚C

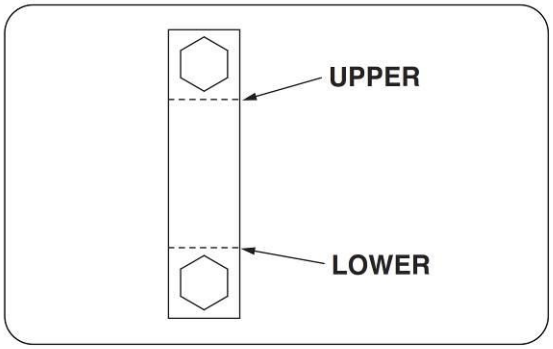
NB

Replace hydraulic oil after first three months of operation, then annually.

NB

Hydraulic oil levels should be checked when the crane is de-rigged and correctly stowed, to avoid taking a false reading





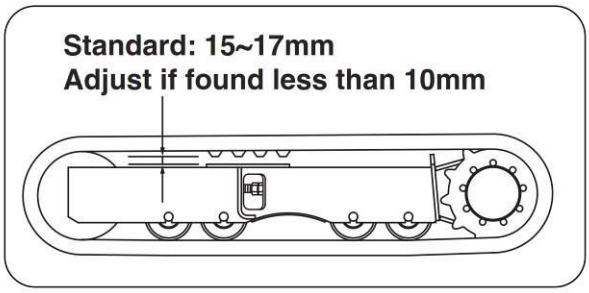
- Ensure the crane is parked on level ground.
- If the oil is hot, it must be allowed to cool (between 20-40ºC) before taking any reading on the gauge. Hydraulic oil will expand when hot and will provide a false reading.
- Check the level of the hydraulic oil on the oil level gauge located at the front of the oil reservoir.
- The correct level is between the 'UPPER' and 'LOWER' limits illustrated left
- If the oil level is below the 'LOWER' limit, remove the cap and top up with specified oil.

Do not Check the oil level with the craned rigged, as the oil will be distributed around the hydraulic system on the crane. The gauge will display as if the reservoir tank is empty. Topping up the oil level when the crane is rigged will result in excess oil being forced out through the filler cap, when the crane is de-rigged.

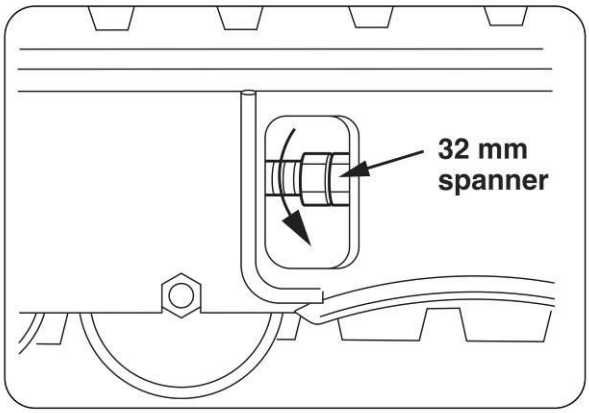
vii. Check for track tension (094,095,295)

DO NOT work on tracks with the carrier body raised off the ground on its outriggers

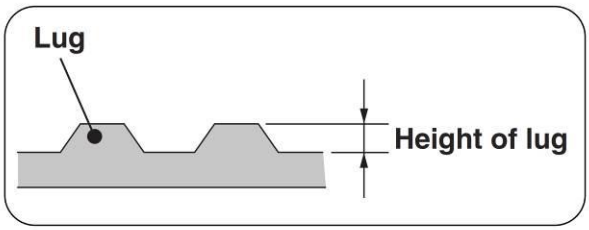
NB **Track tension testing must be carried out with the tracks touching the ground**



- Check the rubber track for wear and tension regularly as wear varies according to operating and ground conditions.



- The tension should be checked and adjusted after 30 hours of operation.
- When tensioning the rubber track, turn the nut in the direction of the arrow and the lock with another nut
- If the tension is too tight it will shorten the life of the drive wheel sprocket.



- Replace the track when the lug height is below 3mm

NB

Do not travel over rocks or stones which have sharp edges.
Do not change direction when there is a difference in ground level on each track.
Do not make sudden changes of direction as this may dislodge the track from its wheels.
Do not allow oils such as diesel fuel, engine or hydraulic oil to remain on the track, wash them off immediately.
Do not operate where there is a high salt content on the ground.
For long term storage protect the vehicle from the sun and inclement weather.

b. ***Periodic Inspection - 250 hour or 3 monthly Inspection (All combustion engine models)***

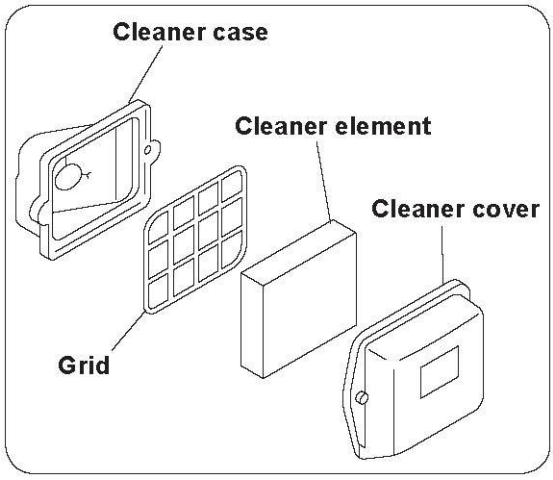
i. **Checking the air filter element**

DO NOT attempt to clean or replace the air filter when the engine is running

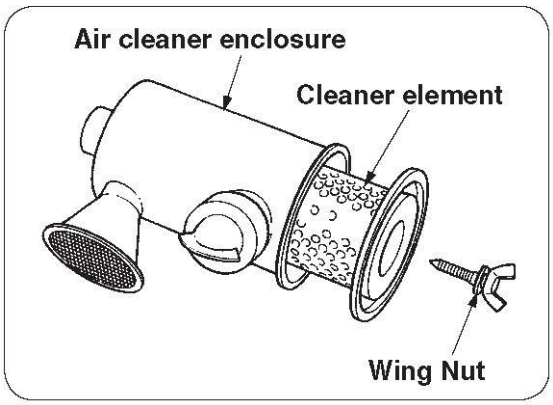
NB

If the crane is operated in abnormally dusty conditions the period of inspection should be reduced

Petrol Engine Models



Diesel Engine Models



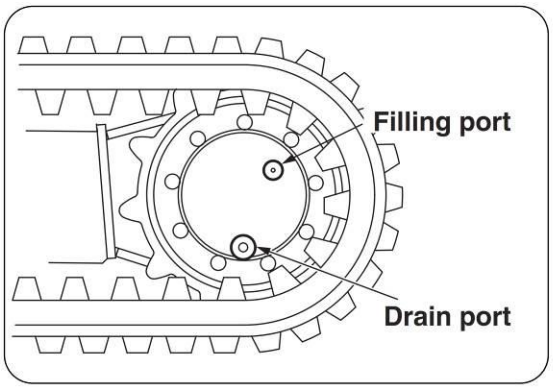
Check the air filter element every 250 hours or 3 months

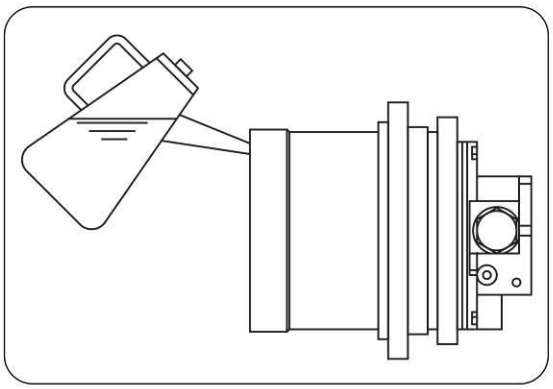
- Unfasten the screws/wing nut to remove the air cleaner cover
- Clean the air filter element

ii. **Check** travel gearbox assembly **reduction gearing oil level**

DO NOT work on the travel gearbox assembly for at least 20 minutes after the carrier has finished operating as there is a high temperature hazard with the motor casing and oil

BEWARE there is a high-pressure oil hazard inside the reduction gears. Open the filling port plug NO MORE than 2 – 3 turns to release the internal pressure





- Park the crane on flat, level ground.
- Position the sprocket so that the 2 plugs are as shown in the illustration (drain port at lowest point and stop the engine.
- Slowly Unfasten the filling port plug to release any pressure.
- Remove the plug for the filling port.
- If oil flows from the filling port it is at the correct level.
- If not, fill it up until it does
- Check the ‘O’ ring on the plug and replace with a new one if it is damaged
- Replace and tighten plug

c. ***Storage (All models)***

Stop the engine and thoroughly remove dirt and debris stuck on the carrier body. In particular, be sure to remove the debris stuck to the battery, electric wiring and any parts directly affected by heat, such as the silencer as this could cause a fire

Shift the travel levers to the neutral position to lock the platform

Avoid storing the crane in direct sunlight

Disconnect the negative (-) side of the battery

14 INSPECTION AND MAINTENANCE OF CRANE (ALL MODELS)

DO NOT carry out any maintenance work until power to the crane and carrier is isolated. A 'MAINTENANCE IN PROGRESS' warning signboard must be hung over the controls in the drivers position prior to any maintenance work being carried out.

NB

All replaceable items must be replaced according to the criteria outlined in this manual. Failure to do so may cause damage to the machine and will invalidate any current warranties.

NB

When parts need replacing (other than running spares), or anything abnormal is found contact your local UNIC dealer for, inspection, replacement or advice.

a. *Pre-use inspection*

Device	Servicing Item
Hook	Block rotation, function of hook retaining mechanism
Wire Rope	Damage, condition of rope end fixing
Overhoist Alarm	Correct function, voice warning system function
Interlock for Crane-Crawl	Crane will not function when set to "Travel" position. Carrier will not crawl when set to "crane" position.
Load Meter **094/095 only**	Oil leaks Function
Signal Horn	Correct function
Hydraulic Pipes	Oil leakage, damage

Device	Servicing Item
Hydraulic Pump	Tightness of each mounting, oil leakage, unusual noise
Hydraulic Oil Tank	Oil level, oil leaks
Outriggers	Normal function, deformation, oil leakage, cracks
Winch	Function, function of brake, irregular winding
Slewing	Correct function, oil leakage
Boom Derricking	Correct function, oil leakage, mounting of foot pin
Boom Telescoping	Correct function, oil leakage, deformation, cracks, mounting of fixing pin

Device	Servicing Item
Frame	Mounting of crane body, cracks, tightness of bolts, missing bolts
Lifting Accessories	Items necessary for lifting operation are provided
Automatic Hook Storage	Correct function of automatic stop and storing operations
Automatic Stop for Leaving Minimum Wire Rope	Unwinding stops when only 3 turns of rope are left on the winch drum
Turn over protection device	Refer to information on page 56. Check wiring for damage. Check sensors are secure.

b. ***Cleaning***

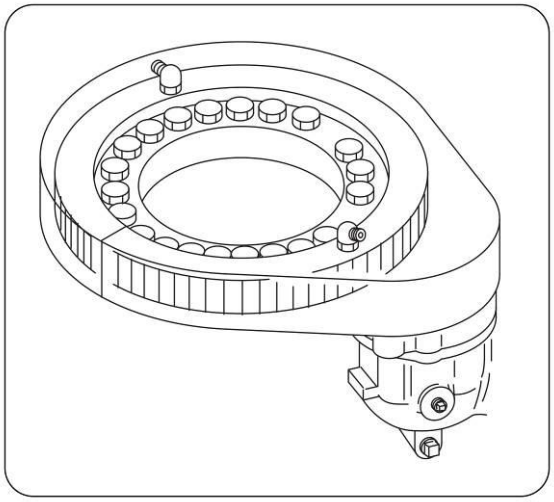
When washing with high-pressure water take particular care not to allow water to enter the electrical system. This may well cause the crane or carrier to malfunction and present a hazard

Keep the crane clean at all times

Sand and dust will cause accelerated wear on carrier and crane parts, ensure the crane is clean and serviceable after operating in this type of environment

c. ***Inspection of slew bearing mounting bolts***

ENSURE the outer ring mounting bolts are checked for correct torque every 6 months. Breakage of the bolts could lead to collapse of the boom



If the slew ring makes an unusual noise when operating or travelling, or excessive movement is observed when operating the crane, or if a gap is observed on the mounting surface, contact your UNIC service agent immediately for inspection and/or repair.

- Torque settings: Bolts (M14 x 40L) 167 Nm (17Kgf m)
- Torque settings: Tempered bolts (M18 x 75L) 153 Nm (36 Kgf m)

d. ***Inspection of wire rope***

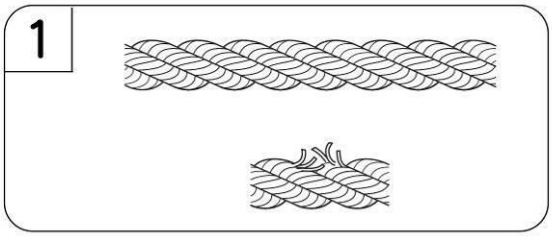
Wire rope is an expendable item. It may be damaged in many ways leading to a reduction in its safety factor. Replace the rope according to the following criteria.

NB

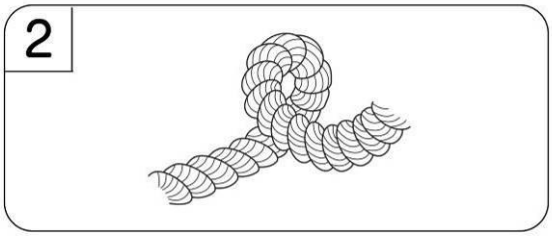
This section should be read in conjunction with BS 7121-2:2012

Wear leather gloves when replacing the wire rope

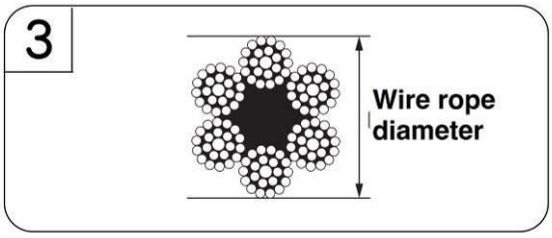
i. Replacement criteria



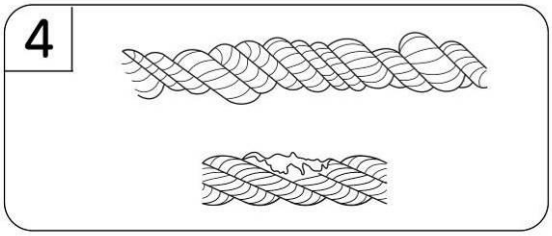
1. A rope in which the amount of broken wire strands (except filler wires) is more than 10%, within the pitch of the twist.



2. When a rope is kinked. It may be a twisted kink as illustrated, or a flat kink

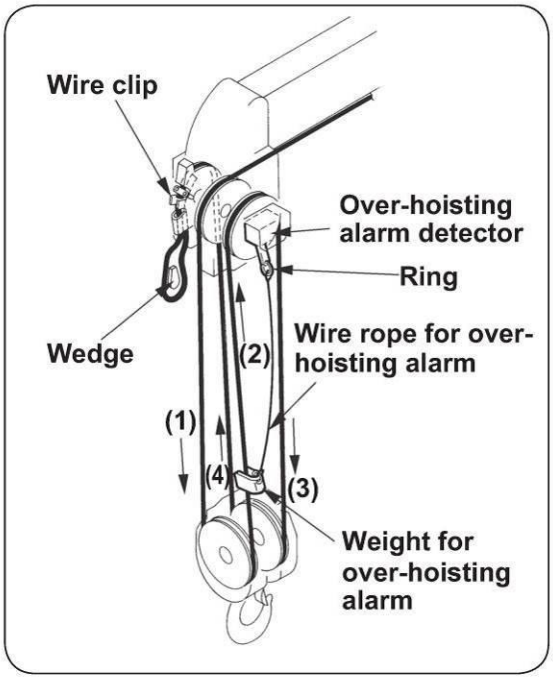


3. A rope whose diameter has decreased by more 7% of the nominal diameter. For example: where a rope of 8mm nominal diameter is used, replace it when any part of the rope is 7.5mm

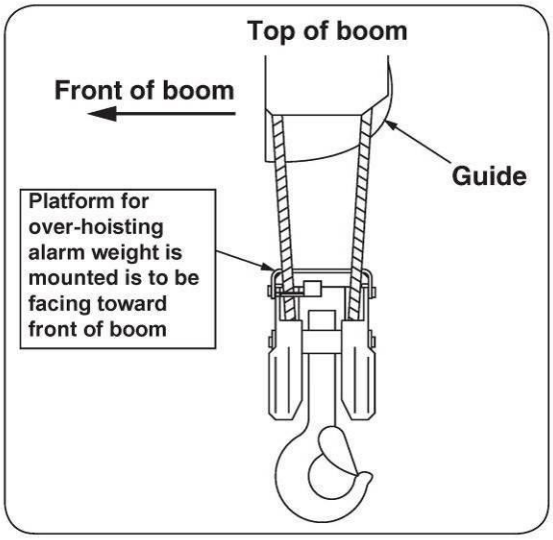


4. A rope that has become deformed or excessively corroded

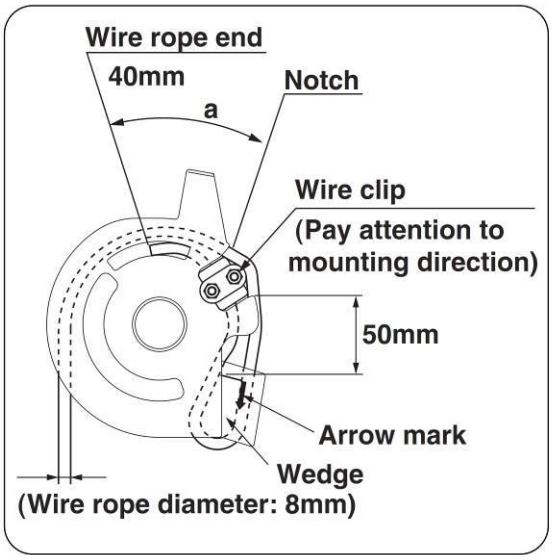
ii. Wire rope reeving

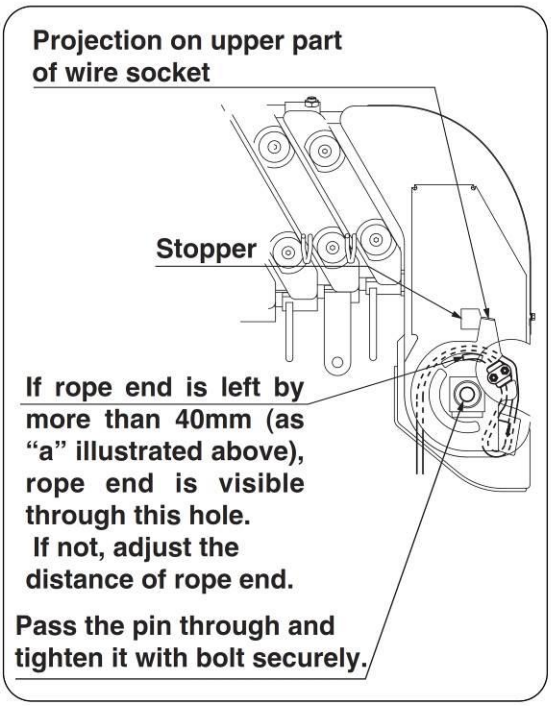


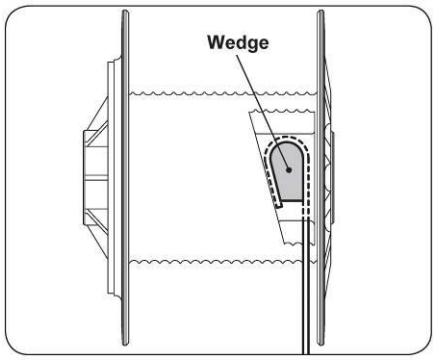
- Refer to the illustration on the left to follow the routing (reeving) of the rope and determine the mounting position of the weight for the over-hoist alarm.



- Refer to the illustration on the left for the correct way to attach the hook block
- **Failure to follow this will stop the hook block from auto stowing**







Replacing and securing the wire rope

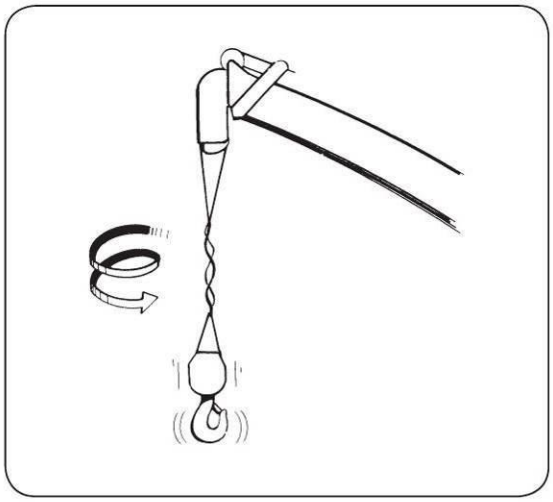
- Remove the bolt holding the wire socket on the end of the boom.
- Remove the wire clip, knock out the wedge and remove the old rope.
- Remove the old rope from the winch drum.
- Refit the new rope to the winch drum.
- Feed the rope through the guides on the boom and route it through the hook block as shown previously.
- When passing the new wire rope end through the socket, be sure to pass it as indicated by the arrow mark on the socket.
- If it is passed the other way the rope will be damaged, shortening the life of the rope.
- Always mount the wedge and wire clip as illustrated left.
- Ensure there is more than 40mm between the notch and the wire end as shown at 'a'.
- Re-position the wire socket in the boom end and tighten securely.

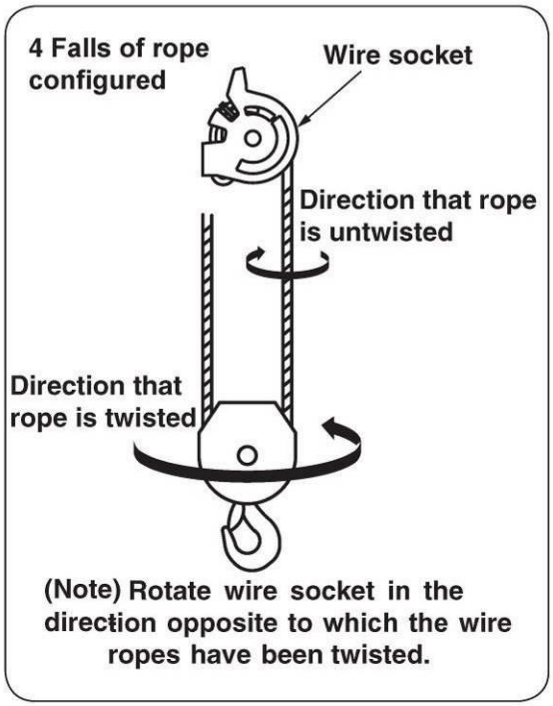
Winch Drum

When reeving the rope through the winch drum, the end of the rope must pass inside the wedge as sown on the illustration on the left.

Ensure the rope is wound on under tension, regularly and that the 1st layer aligns in the grooves on the drum. Subsequent layers should align in the gutter formed by thee previous rope windings.

iii How to correct twisted ropes





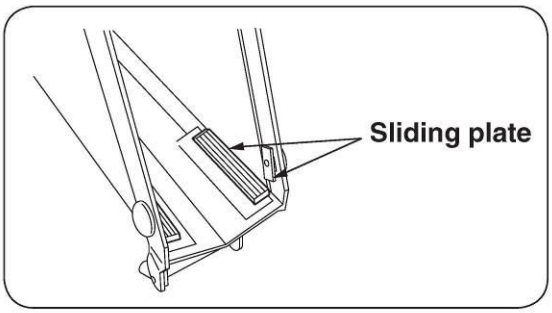
Wire ropes tend to turn in an 'untwisting' direction when under tension.

When fitting a new rope the twist should be taken out when fitting the rope to the drum.

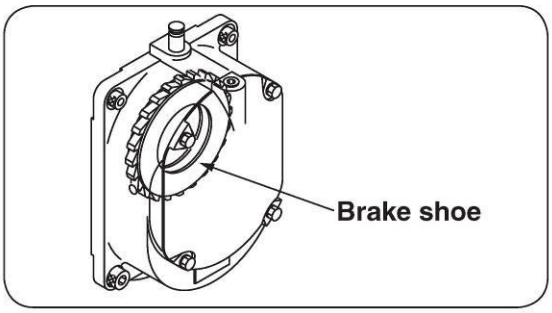
If wire ropes become twisted during use, correct them as follows:

- Remove any load from the hook.
- Extend the boom fully.
- Raise the boom to an approximate angle of 65°.
- Lower the hook until it is almost on the ground.
- Count the number of turns the wire rope has twisted.
- Slowly hoist up the hook and retract/lower the boom.
- Remove the wire socket and turn the socket in the opposite direction to the twists by as many turns as the ropes have been twisted, multiplied by the falls of rope e.g. 2 full clockwise twists on the rope at the hook on 4 falls of rope = 8 x anti-clockwise twists of the socket
- Re-attach the wire socket, extend boom fully and raise to an angle of 65°.
- hoist the rope up and down 2 or 3 times, between the top of the boom and the ground.
- Ensure the twisting of the ropes has been corrected. If they remain twisted, repeat the procedure detailed above.

e. ***Replacement of expendable parts***

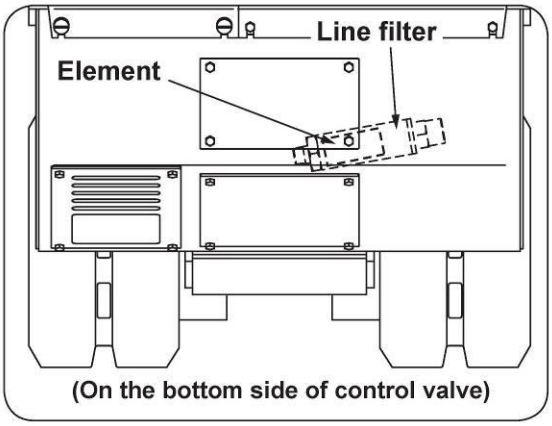


- Although timing of replacement parts varies according to how frequently the crane is used and environmental conditions, replace hydraulic cylinder gaskets and seals every 3 calendar years of operation (this includes the periods the crane is not in use).



- Replace the sliding plates in the boom every 3 calendar years

- Replace the brake shoe in the winch drum every 3 calendar years



- Replace the In line filter element in the hydraulic oil system after 1 year of operation. The filter should then be replaced when the hydraulic pump is replaced and again after 1 more year of operation.

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15. CARRIER LUBRICATION (ALL MODELS)

DO NOT SMOKE, EAT OR DRINK when handling hydraulic oil, grease or fuel

DO NOT attempt any work with the hydraulic system when the crane has been operating. The temperature of the oil and components, including the tank can reach 80˚C

WIPE UP any spills as these cause a fire and slip hazard

ALWAYS wear the appropriate Personal Protective Equipment. Hydraulic oil (both new and used) is a known cause of occupational dermatitis

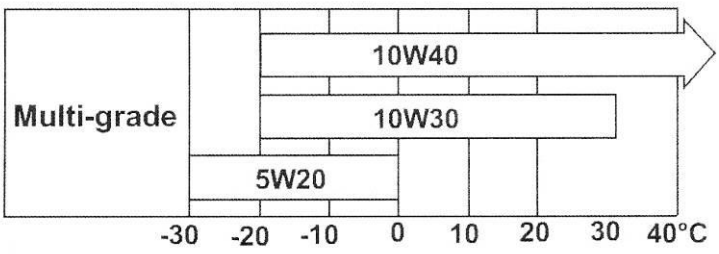
a. *Precautions when carrying out lubrication*

Lubricate in accordance with the Lubrication Charts and bear the following points in mind;

- Cleaning filling ports and grease nipples thoroughly before carrying out any replenishment.
- Always use new lubricant and prevent the entry of any dust and debris.
- When replenishing grease, inject it until old grease is forced out.

b. *Recommended lubricants*

Use engine oil as shown below:



The selection of the correct engine oil is vital to the engine. Choosing the wrong oil or neglecting an oil change can result in severe damage to the engine.

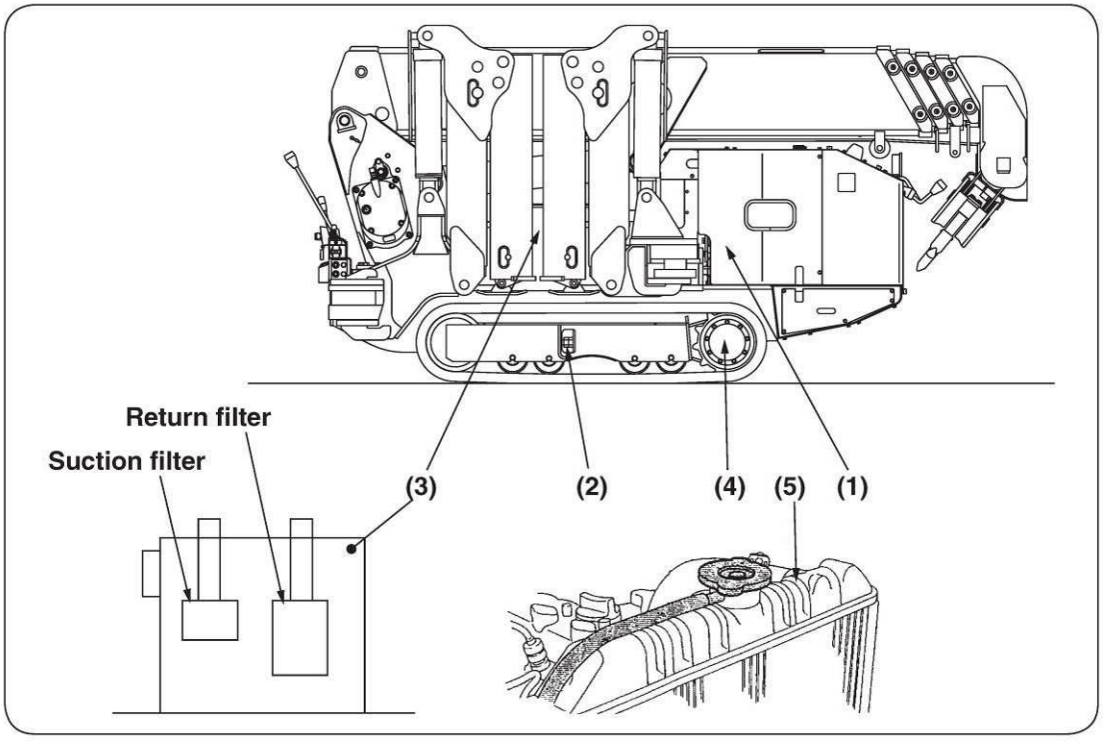
Recommended hydraulic oil is the same as that used in the crane.
Recommended gear oil for crawler motor reduction gearbox.

Manufacturer	Brand
SHELL	DONAX TT or TD
CALTEX	RPM TRACTOR HYDRAULIC FLUID
CHEVRON	TRACTOR HYDRAULIC FLUID
TEXACO	TDH
MOBIL	MOBILAND SUPER UNIVERSAL

c. ***Carrier lubrication chart***

Service Interval	Where to Lubricate	Number of Parts	Lubricant	Tool
Initial: Replace every 25 hours After: Replace every 50 hours	① Engine 1,2 Litres	1	Engine oil	
Initial: 30 hours, then whenever necessary	② Tension adjustment of track	2		32mm Spanner
Initial: Replace after 3 months After: Replace every year	③ Hydraulic oil tank (27 Litres) 095/295	1	Hydraulic oil	
Replace every 1000 hours	④ travel gear reduction gear oil (0,33 Litres)	2 Right/Left	Diesel engine oil	
Replace Antifreeze every 2 years (Diesel engines only)	⑤ Radiator (4 Litres) Diesel engines only	1	Antifreeze solution	

Fuel	Petrol/Diesel
Tank Capacity	6 Litres/10 Litres



16 CRANE LUBRICATION (ALL MODELLS)

a. *Precautions when carrying out lubrication*

DO NOT SMOKE, EAT OR DRINK when handling hydraulic oil, grease or fuel

ALWAYS wear the appropriate Personal Protective Equipment. Hydraulic oil (both new and used) is a known cause of occupational dermatitis

DO NOT attempt any work with the hydraulic system when the carrier has been operating. The temperature of the oil and components, including the tank can reach 80˚C

DO NOT open any filling or draining ports when the oil is still hot. The pressure of any fluid increases when heated. There is a risk of scalding hot oil being ejected under pressure. This would not only scald the skin but could be injected under the skin causing a severe risk to personal health .

WIPE UP any spills as these cause a fire and slip hazard

Keep filling ports and grease nipples clean. Clean thoroughly before carrying out lubrication. Always use new lubricants. When forcing grease into each nipple, ensure you continue to inject until the old grease is ejected.

b. *Recommended lubricants*

Only use industrial hydraulic oils
ISO VG 46 is for temperatures over 0°C
ISO VG 22 is for temperatures under 0°C

Recommended hydraulic oil
The recommended hydraulic oil is the same for the crane

Maker	Brand	
	ISO VG 22	ISO VG 46
SHELL	Shell Tellus Oil 22	Shell Tellus Oil 46
CALTEX	Spindura Oil 22	Rando Oil 46
ESSO	Spinesso 22	Teresso 46
MOBIL	Mobil DTE 22	Mobil DTE Medium Oil

Recommended Gear Oil
Use API Service GL-4 type Gear Oil

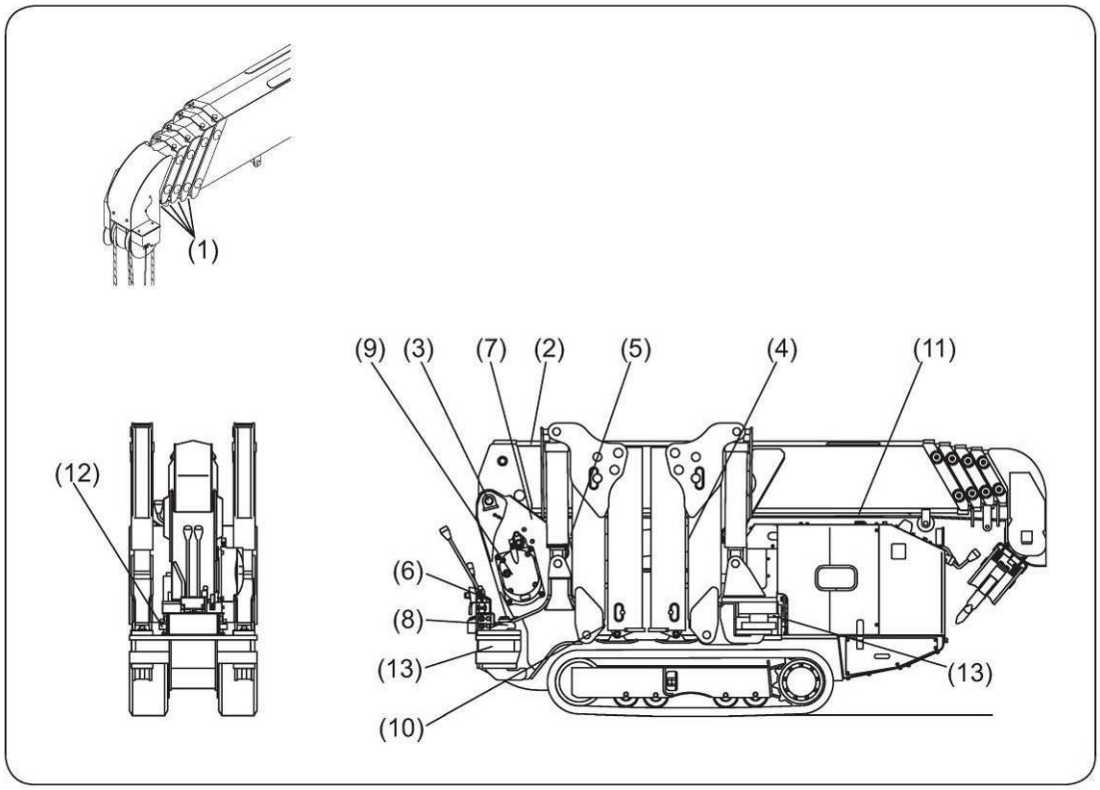
Maker	Brand
SHELL	Shell Spirax EP 90
CALTEX	Universal Thuban SEA 90
ESSO	Standard Gear Oil 90
MOBIL	Molylube GX 90

Recommended Grease
a. Chassis Grease:
NLGI No.2 grade for normal temperatures
NLGI No.1 grade for extremely low temperatures

b. Molybdenum Grease:
Use NLGI No.2 grade

Maker	Brand
SHELL	Retinax AM
CALTEX	Molytex Grease EP2
ESSO	Beacon G2
MOBIL	Mobyplex Special

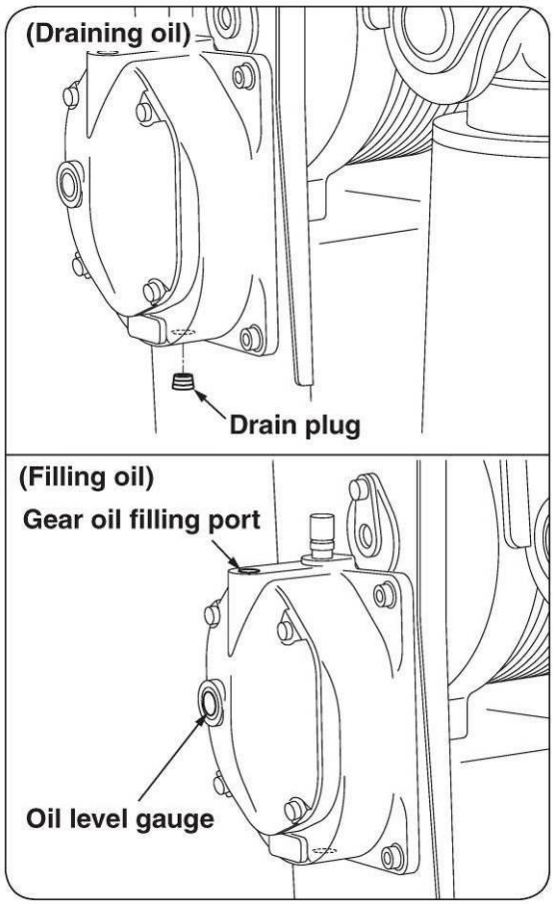
c. ***Crane lubrication chart***



Service Interval	Where to Lubricate	No of Parts	Lubricant	Tool
Daily	**1** boom slide plate (Underside & side face of boom sections ②③④⑤) for 5 section booms	4	Molybdenum Grease	Manual
	2 Boom slide plate (Upper side of boom section ①)	4	Molybdenum Grease	Manual
	3 Boom foot pin	1	Chassis Grease	Grease Pump
	4 Upper support pin of derricking cylinder	1	Chassis Grease	Grease Pump
	5 Lower support pin of derricking cylinder	1	Chassis Grease	Grease Pump
	6 Control Lever (Pins on both sides and bearing)	3	Chassis Grease	Manual
Weekly	**7** Winch drum gears	1	Chassis Grease	Grease Pump
	8 Slewing gears	1	Chassis Grease	Manual
Monthly	**9** Winch reduction gears (approx. 1,0 Litre)	1	Gear Oil	
	10 Slew reduction gears (approx. 0,3 Litre)	1	Gear Oil	
	11 Wire rope	1	Rope Grease	Spray Gun
	12 Slew bearings	2	Chassis Grease	Grease Pump
	13 Outrigger fulcrum pin	4	Chassis Grease	Grease Pump

d. ***Lubrication of reduction gears, slew gears and wire rope***

Winch Reduction Gear



Replacement of Gear Oil
(Winch reduction gears and slewing gears)

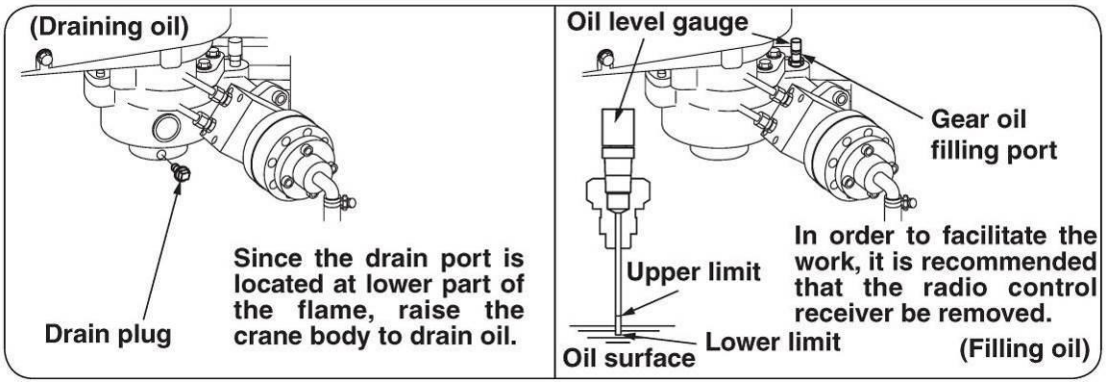
Air enters the gear casing and can introduce moisture and dust/dirt. Additionally, as the hydraulic components wear, particles will enter the system.

Therefore, the gear oil should be replaced after the first 6 months of use.

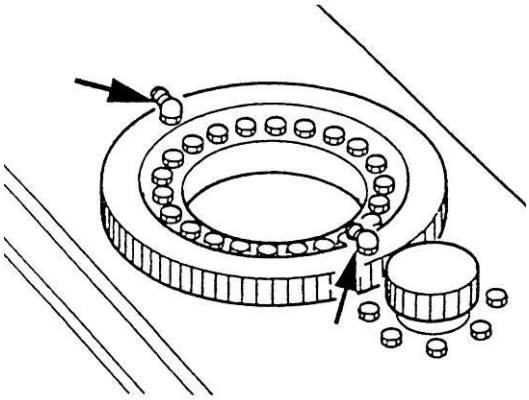
Thereafter, replace gear oil;
Annually for the reduction gears and,

Every 2 years for slew reduction gears.

Slew Reduction Gear



Lubrication of slew bearings



The slew ring uses a ball race assembly as its bearing surface.

Grease the bearings once a month during normal operation and once a week during heavy operation.

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17. SPECIFICATION

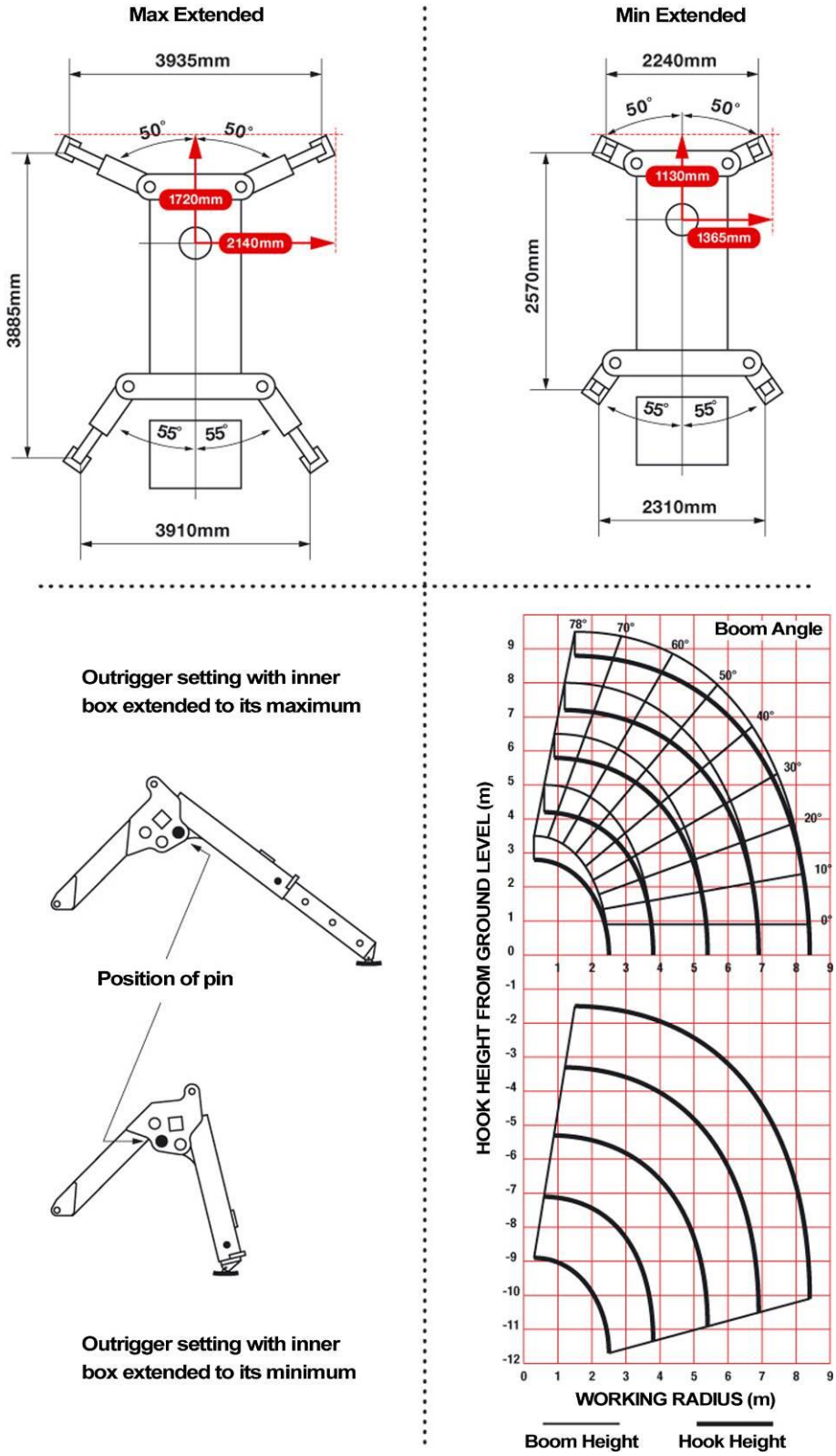
a. *URW 095 Specification (Petrol)*

Model		**URW095CP2E (5-section boom)**
Crane capacity		0.955t × 3.5m (With outriggers extended fully)
Maximum lift above ground (Hook)		Approx. 8.8m with 4-part line
Boom section extensions:		2.53m ~ 4.075m ~ 5.61m ~ 7.13m ~ 8.65m
Maximum working radius		8.41m
Winch speed (Rope speed)		40m/min (At 4th layer on the drum)
Hoisting speed of hook		10m/min (At 4th layer on the drum, with 4-parts of line)
Extension speed of boom		6.12m/20sec
Derricking speed of boom		0° ~ 78°/11sec
Slewing speed		1.5 r.p.m
Slewing range		360°(continuous)
Hoist rope	Construction	IWRC 6×WS (26) Class B (Breaking load: 42.4kN{4320kgf})
	Diameter×length	8mm×54.0m
Outrigger		Double acting hydraulic cylinder (directly connected to hydraulic automatic locking device)
Hydraulic pump	Rated pressure	Crane: 20.6MPa(210kgf/cm^2) Travel: 21.6MPa(220kgf/cm^2)
	Rated discharge	Approx. 36 L/min
	Rated rotation	Approx. 1800rpm
Hydraulic oil tank Capacity		27 liters

Model	URW095CP2E (5-section boom)
Boom telescoping	Boom:5-section, Hexagonal box beam
	Direct pressure from hydraulic cylinder and wire rope (With hydraulic automatic locking device) (2nd & 3rd sections: sequential actuation, 4th & 5th sections: simultaneous actuation)
Boom derricking	Direct pressure from hydraulic cylinder (With hydraulic automatic locking device)
Hoisting	Hydraulic motor: Axial plunger type
	Reduction gears: Spur-gear reduction
	Brake: Automatic mechanical brake
Slewing	Hydraulic motor: Trochoid type (With hydraulic automatic locking device)
	Reduction gears: Worm gear + Spur gear reduction (Supported by ball bearings)
	Brake: Worm self-lock
Hydraulic pump	Variable delivery piston pump
Hook capacity	0.995t Number of lines of rope: 4
Safety devices	Pressure relief valve for hydraulic circuit
	Hydraulic automatic lock (Counterbalance valves and pilot-operated check valves)
	Device to prevent overload (Load meter)
	Automatic stop for over-hoisting
	Over-hoisting alarm
	Load indicator (With angle meter)
	Alarm buzzer
	Hook safety latch
	Interlock for crane-crawl lever and outriggers
	Spirit Level
	Turnover prevention device
Weight	Approx. 1850kg

Model	URW095CP2E (5-section boom)
Track type	Endless rubber crawler
Track size	180×40×72FR
Length of ground contact	1050mm
Pressure of ground contact	48.0kPa (0.49kgf/cm^2)
Crawling speed	Forward/Backward: 0~2.3km/h
Maximum incline	20°
Engine	Rated output : 6.6kW (9.0PS)/1800rpm
	Model : GB400LE-402 (Mitsubishi Heavy Industries, LTD)
	Displacement : 391cm^3
	Fuel type : Petrol (Gasoline)
Drive system	Independently driven by hydraulic power
Braking system	Disc brake with hydraulic built in motor
Engine starting system	Electric starter
Fuel tank	Capacity: 6 liters
Noise Output	LpAeq = 77 dB(A)

b. ***095/295 Outrigger Plans and Working Range Chart***



Note: The above figures are based on no-load condition and do not include the deflection of the boom.

c. ***URW 095C Rated Load Chart***

Boom-sections extended: 1 & 1+2

Working radius (m)		1.0	1.4	1.5	1.8	2.0	2.5	3.0	3.5	3.835
Rated load (t)	Outriggers extended to maximum	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.9
	Outriggers extended not to maximum	0.995	0.995	0.995	0.995	0.995	0.65	0.49	0.35	0.25

Boom-sections extended: 1+2+3

Working radius (m)		2.2	2.5	2.9	3.0	3.5	4.0	4.5	5.0	5.37
Rated load (t)	Outriggers extended to maximum	0.995	0.995	0.995	0.995	0.995	0.8	0.65	0.52	0.43
	Outriggers extended not to maximum	0.8	0.65	0.53	0.5	0.38	0.28	0.22	0.16	0.12

Boom-sections extended: 1+2+3+4

Working radius (m)		3.4	3.8	4.0	4.5	5.0	5.5	6.0	6.5	6.89
Rated load (t)	Outriggers extended to maximum	0.85	0.85	0.75	0.6	0.5	0.42	0.36	0.32	0.27
	Outriggers extended not to maximum	0.42	0.34	0.3	0.25	0.19	0.14	0.1	0.08	0.06

Boom-sections extended: 1+2+3+4+5

Working radius (m)		3.8	4.1	4.5	5.0	5.5	6.0	6.5	7.0	8.0	8.41
Rated load (t)	Outriggers extended to maximum	0.55	0.55	0.45	0.37	0.31	0.27	0.23	0.2	0.15	0.13
	Outriggers extended not to maximum	0.35	0.29	0.25	0.2	0.16	0.13	0.1	0.07	0.04	0.03

d. *Cranes with Electric Pack Option (095/295 Combustion engines only)*

Electrical Data

Detail	URW095C/URW295C
Power Output	**3,7kW**
Volts	**AC400 ± 5%**
Frequency	**50/60Hz ± 5%**
Phase	**3**
Cable size	**1,25mm^2**
Earth (very important)	**1,25mm^2**
Motor direction seen from motor shaft	**left**

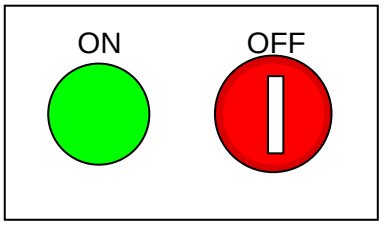
i. Before Operation

NEVER open the Regulation Box when mains power is applied to the crane

1. The engine must be stopped and the starter key turned to OFF.
2. Press the (Green) ON button on the Regulation Box.
3. If the motor does not start, check the circuit breakers in the Regulation Box.
4. In the case of reverse rotation: Isolate power supply, then remove and check the male connector plug pins. If the plug is of the “phase rotation” type, turn the two rotational pins through 180º, re-connect and switch on the power supply. See image below.

5. If the plug is not of the phase rotational type, then two of the wires in the 3 phase plug must be swapped by a competent electrician.

Regulation Box



6. When the OFF button is pressed it can only be released by unlocking it with the key provided. This is to stop unauthorised use of the crane.

7. Confirm that the hydraulic system is working by lowering and raising the hook.

8. Confirm that the 12V DC for the Remote Control is available by checking that the Remote Control is working.

ii. During Operation

1. When the crane is operating under electrical power, it is less noisy. The operator must ensure that all personnel in the area are made aware that the crane is working. The operator must remain observant throughout the operation.

2. The crane speed will be fixed when using the Electric Pack due to the constant speed of the output shaft.

3. When the crane is not working, turn OFF at the Regulation Box.

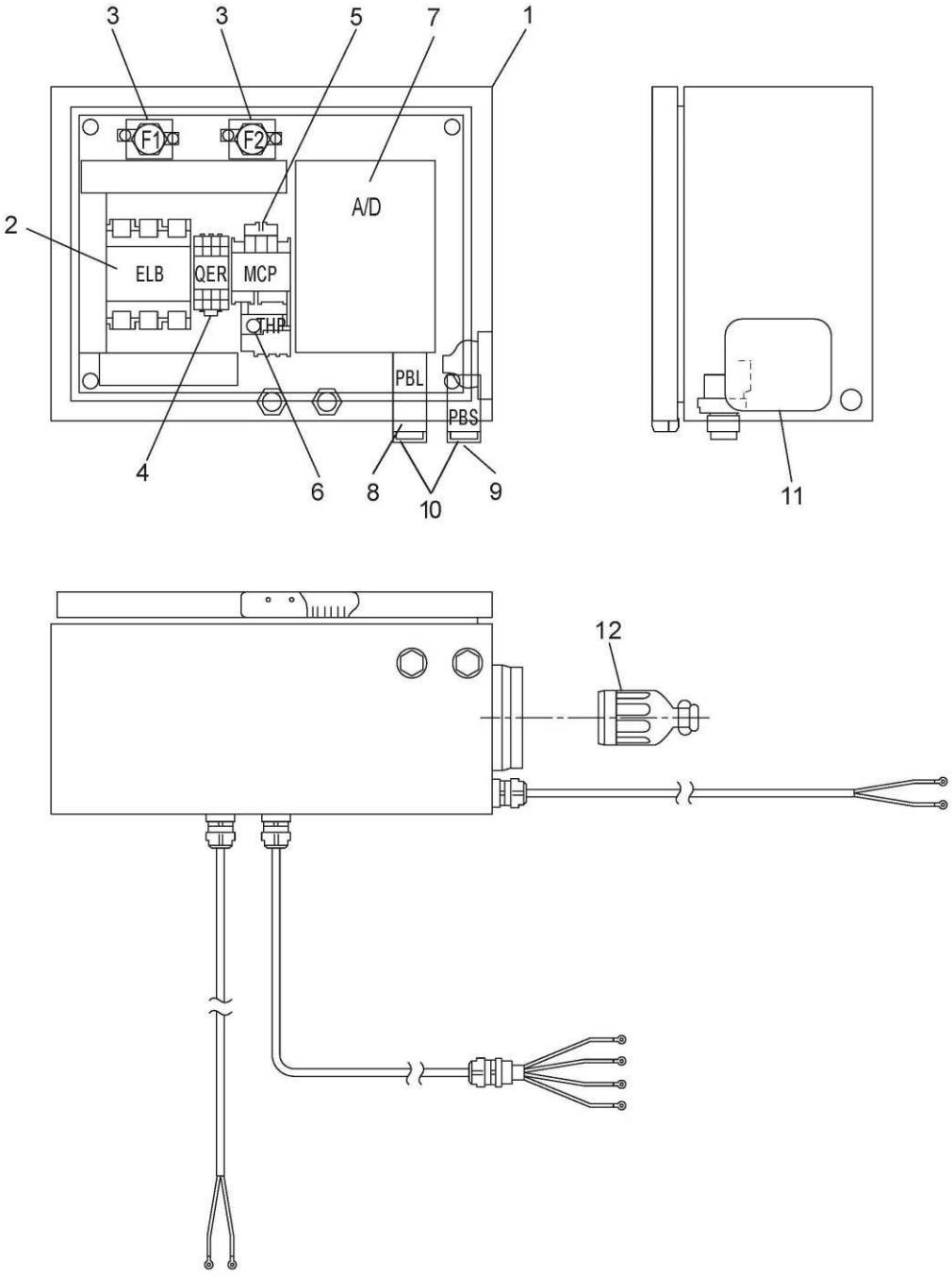
iii. After Operation

1. Turn the electric motor off.

2. Remove the key and push in the emergency isolator switch

3. Remove the mains supply cable.

Electric Pack components – URW 095 and 295



Parts List (URW 095 CR(E)/URW 295 CR(E))

No	Symbol	Part Name	Part No	Type	Company	Qty
1		Regulation Box	750716010	CL20-34	Nittou	1
2	ELB	Earth Leakage Circuit Breaker	750319010	EG33C/20-30-MA	Fuji Electric	1
		Terminal Cover		BZ6TSH10C3	Fuji Electric	1
3	F1,2	Fuse	750309025	AFaC-5	Fuji Electric	2
		Terminal Cover		GC-30	Fuji Electric	2
4	QER	Right Rotation Relay	750307049	QE-40N	Fuji Electric	1
5	MCP	Magnetic Contactor	750319012	SC-05H/2a-AC400V	Fuji Electric	1
6	THP	Thermal Relay	750307050	TK-ON/6A	Fuji Electric	1
		Terminal Cover		SZ-JW2	Fuji Electric	1
7	A/D	Converter	750111007	46904	Legrand	1
8	PBL	Light Switch Button	750303057	AR22EOL-10T3G	Fuji Electric	1
9	PB2	Switch Button	750303058	AR22EOR-01R	Fuji Electric	1
10		Waterproof Cap	750714001	AR9D797	Fuji Electric	2
11		Connector Inlet	750501210	4365NW	American	1
12		Connector Wire	750501211	4364R	American	1
13		Connector	750501212	OA-W1611	Ohom	1
14		Connector	750501213	OA-2	Ohom	1
15		Connector	750501214	OA-W15M07	Ohom	1
16		Wire	750604054	2PNCT 1,25sq 4c		1
17		Wire	750604056	2PNCT 1,25sq 1c		1

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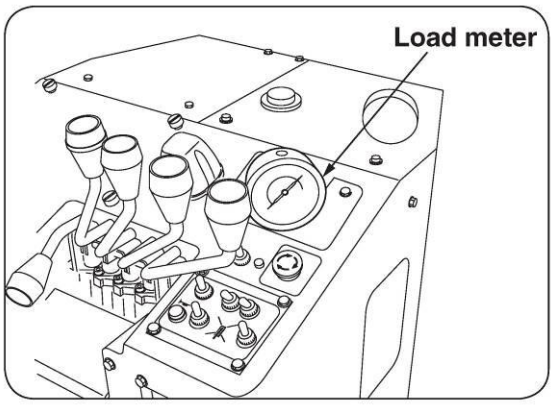
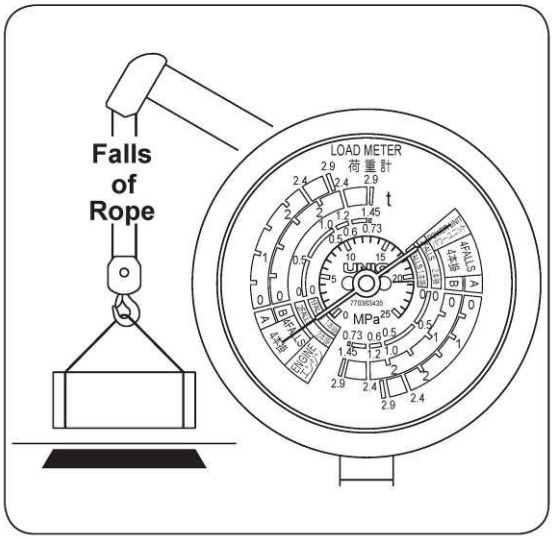
18. LOAD METER (095)

a. *Load Meter Overview*



- The meter shows the weight of a load being hoisted. Read the scale band corresponding to the number of falls of rope



- The dial of the meter has scale bands corresponding to the A and B bands on the boom load indicator for 4 fall configuration.
- It also has a scale for the 1 and 2 fall configurations.

b. ***Using the 095 Load Meter***

Check the boom load indicator to check whether the pointer is in Band A or Band B. This will determine which 4 fall scale to use on the meter.

Attach hook to load, use a lifting sling which will allow the hook to have sufficient free upward travel (approx 30 – 60cm) before the load is hoisted.

Run the engine at slow speed. Adjust the hoisting speed of the hook so that the needles point to 0 on the meter. Continue to lift the cargo with the hoist lever in EXACTLY the same position. Any movement from this position will cause very inaccurate readings.

For Example:

With the boom extended to 1+2+3 using a 4 fall system. The boom load indicator shows (point a) that the crane can lift 0.7t at that extension and elevation. The needle of the indicator is within the B scale of the indicator, therefore we would use the B scale of the load meter.

Read the load meter as the load is being hoisted by the above method to approximately 30cm off the ground.

The meter shows (point b) a weight of 0.5t. This means that the crane is being operated with a safety margin of 0.2t in this example.

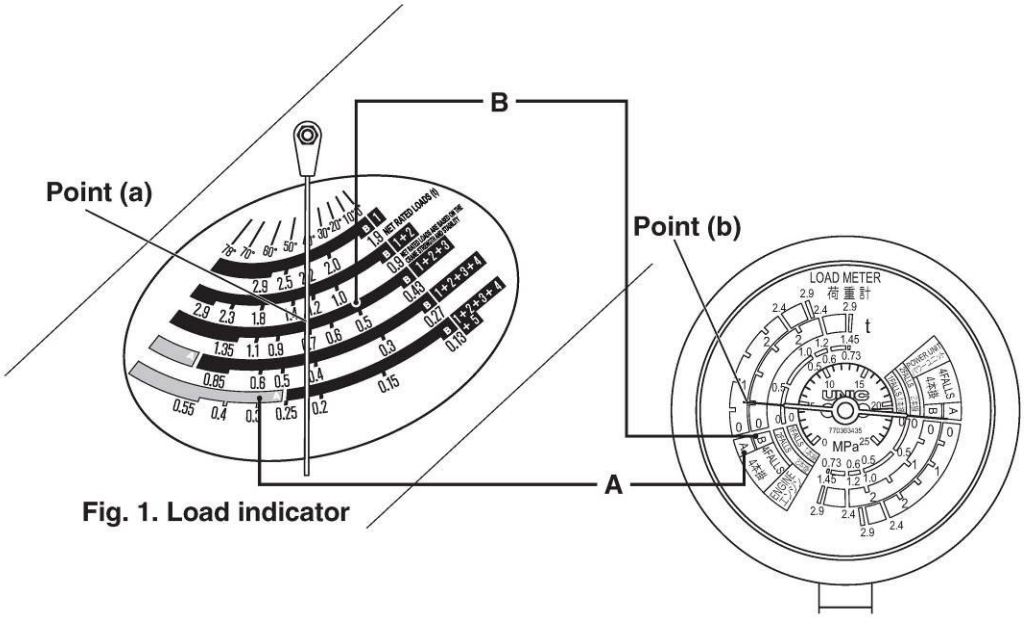
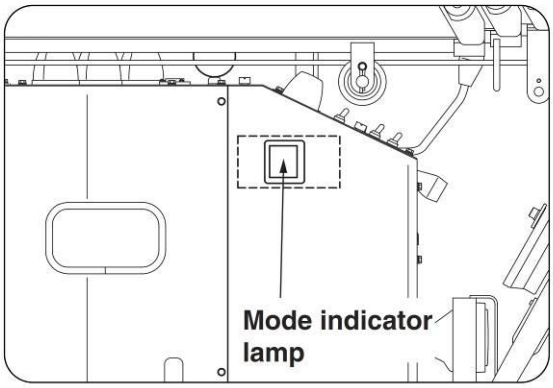


Fig. 1. Load indicator

Fig. 2 Load meter

19 MODE INDICATOR (CONTROL BOX) (ALL MODELS)

The Mode Indicator provides visual information (via an LED displaying codes) as to the operation mode the crane is operating in and provides fault diagnosis information in the event of certain crane malfunctions.



When the “Mode indicator LED” indicates a code constantly illuminated, the crane system is working normally.

When the “Mode indicator LED” blinks, the crane system is malfunctioning or a prohibited operation is being carried out.

a. ***Mode Indications during normal Operation***

Mode	Mode description	Radio control operation	Manual operation mode	Priority
oF	Current control is set to travel mode. No operation other than travelling is possible either by manual control or by radio remote control.	X	X	1
00	Current control is on normal crane operation mode. Operation is possible by radio remote control.	O	X	9
01	Current control is on normal crane operation mode. Operation can be carried out manually but not through radio remote control device.	X	O	9
04	Current operation is in outrigger radio control mode. Extension and retraction of outriggers can only be possible by manual control when in manual control mode or by radio remote control when in radio remote control mode. Operation other than the above is impossible either by manual or by radio remote control.	O	X	6
		X	O	
06	Current control is on low temperature operation mode. Operation can be carried either by manual control or by radio remote control device.	(O)	(O)	8

Mode	Mode description	Radio control operation	Manual operation mode	Priority
07	Current control is on low temperature operation mode. Operation can be carried by manual control but not through radio remote control.	X	O	8
10	Hook hits against weight for over-hoisting alarm (over-hoisted condition).	–	–	7
13	During operation of storing hook.	–	–	5
14	Automatic stop for over-hoisting reset switch is being controlled.	–	–	4
15	Outriggers are not in contact with the ground or turnover protection threshold alarm is activated	–	–	2
16	Outriggers are not bearing adequate ground pressure or turnover protection advance alarm is activated	–	–	3

b. ***Mode Indications during Crane Malfunction***

When the “Mode indicator LED” is displaying flashing figures higher than [42], the crane system is malfunctioning (system malfunction indication).
Identify the system malfunction indication on the “Mode indicator LED”, and refer to the code description on the table illustrated below:
If the crane is unable to be operated, ask an authorised UNIC Cranes Europe service dealer for advice and repair.

Mode	Mode description	Radio control operation mode	Manual operation mode
	No operation is possible either by radio control or by manual control.	X	X
	Turn OFF power once then turn it ON. If the trouble persists, contact an authorised UNIC service agent for repair. (Although it can be operated either by radio control or manually, shock-less function returns to “active”)	O	O
	No radio control operation is possible.	X	O
	Radio control receiver is not connected. Check that cable connector (located inside switch box) of receiver is securely connected. Check cable to receiver for damage and condition.	X	O
	Either “mode selector switch”, “hook storing switch” or “radio control selector switch” in the control box is faulty. (Failed switch cannot be controlled but crane operation is possible.)	O	O
	No operation is possible either by radio control or by manual control.	X	X
	No operation is possible either by radio control or by manual control. Turn OFF power once then turn it ON again.	X	X
	Radio control operation cannot be possible and engine speed control and safety devices will not function.	X	O

Mode	Mode description	Radio control operation mode	Manual operation mode
60~65	Manual lever is not at its neutral position when power is turned ON. Do not operate the crane as it is carrying out system diagnosis for about 3 seconds after power has been turned ON. If this appears even when the crane has not been operated, contact an authorised UNIC service agent for repair.	X	X
66~69	Either one of “Outrigger control switches” in switch panel of the crane is in failure mode. (Failed switch cannot be controlled but crane operation is possible.)	O	O
70~74	Stop radio control operation and try controlling levers manually. Check that the manual controls operate smoothly and that all levers are not obstructed with anything. If indication fails to return to normal, ask an authorised UNIC service agent for repair.	X	X
75	Engine speed control is not operating correctly. Crane can be operated but if this appears more frequently, contact an authorised UNIC service agent for repair.	O	O
76~79	No radio control operation is possible.	X	O
80~85	No operation is possible either by radio control or by manual control.	X	X
98	Capacity of batteries has dropped. Try actuating reset switch in the control box to reset it once. If the trouble persists, ask a UNIC authorised service agent for repair. Replace old batteries with new ones as capacity of them is already reduced.	X	X
99	Batteries of radio control transmitter are running out. Replace old batteries with new ones and turn OFF power once then turn it ON again.	O	O

c. ***Additional Mode Indications during Operation***

When a prohibited operation or combination of operations which may cause a hazard has been carried out, the "Mode indicator LED" will flash code numbers (operation error indication).
Confirm the code and refer to the table illustrated below:

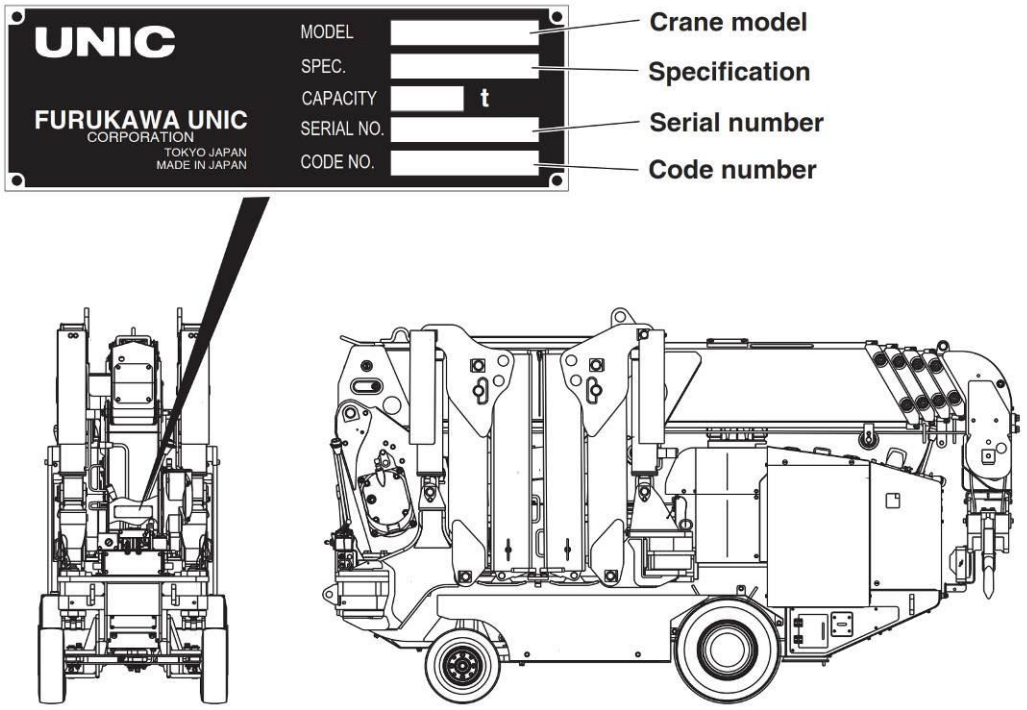
Mode	Symptoms	Measures to be taken
00	Manual control operation is carried out in radio remote control mode.	Manual control cannot be carried out in radio remote control mode. When operating with manual control, turn the selector switch located on the top of cover to manual control mode. ●Mode indicator lamp located in front of crane control levers will not be lit when in manual control mode.
04	Crane is being operated when in outrigger mode.	Crane cannot be operated when in outrigger control mode. When operating crane, turn the mode selector switch to "crane" to select crane mode.
	Crane and outriggers are operated simultaneously.	When crane and outriggers are operated simultaneously, both operating functions are stopped automatically to avoid a risk. Stop the simultaneous operation once and carry out either one of those operations.
06	"Low temperature operation mode" is being switched during crane operation.	In order to avoid a risk, "low temperature operation mode" cannot be switched during crane operation. Stop crane operation once to switch it to "low temperature operation mode". For switching "low temperature operation mode", refer to section 12 j "low temperature operation" (on page 88).

Mode	Description of wrong operation	Measures to be taken
	One of the following operations such as "boom Up", "hook Up", or "boom Extend" (when operated on para-hook mode) is being carried out while hook has hit against weight for over-hoisting alarm.	Detach hook from weight for over-hoisting alarm. ●When raising boom through radio control device with hook hit against the weight for over-hoisting alarm, boom is to be "Up" while hook is winding "Down" as this operation allows hook to be released. Do not lift up a load while this is being indicated.
	When operating in remote control communication between RCU Transmitter and the receiver on the crane has been lost.	Release the RCU emergency stop (if engaged), re-connect the RCU.
	Operation of winching down hook is carried out while the sensor detecting minimum wire rope is being activated.	Stop winching down hook and winch up so that the sensor detecting minimum wire rope will not be activated.
	In the boom/outrigger interlocking device, out-rigger operation is being carried out without boom being stored.	Stop outrigger operation without boom being stored. Operate outriggers after boom has been stored.

20 SPECIFIC INSTRUCTIONS FOR ECO CRANE MODELS (095/295 ONLY)

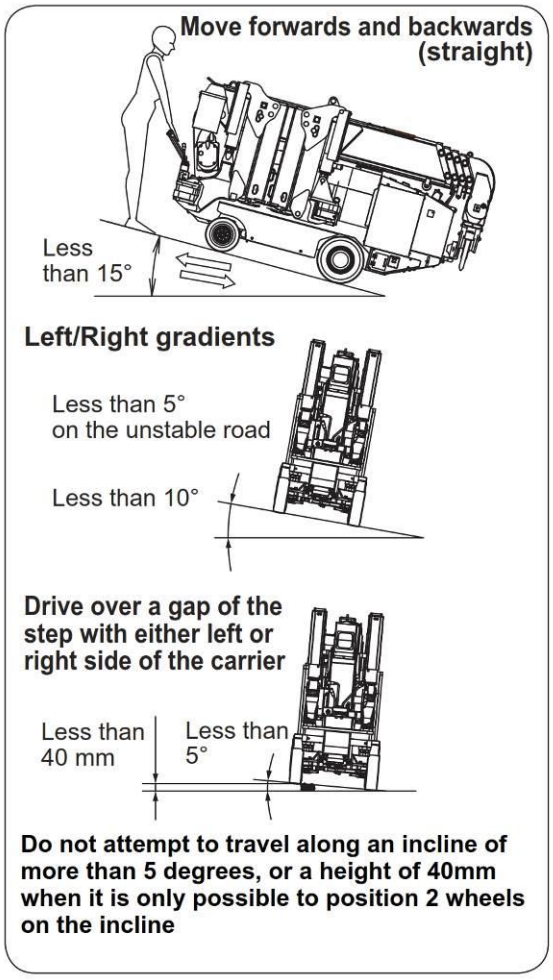
a. *Introduction*

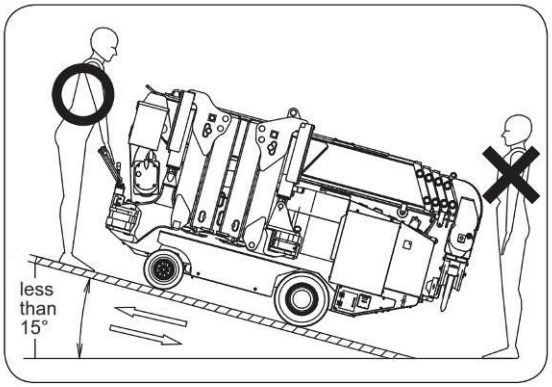
This section of the manual provides additional instructions and information relating to the ECO battery operated versions of the URW 095/295 crane. The ECO models are available in both tracked and wheeled variants. Many of the features incorporated into the ECO 095/295 follow similar set up and operating procedures as for the standard URW 095/295 model, therefore this section of the manual is only concerned with those specific variations in set up and operation of the ECO model. For information relating to operation of the tracked ECO model, refer back to the main body of the manual.



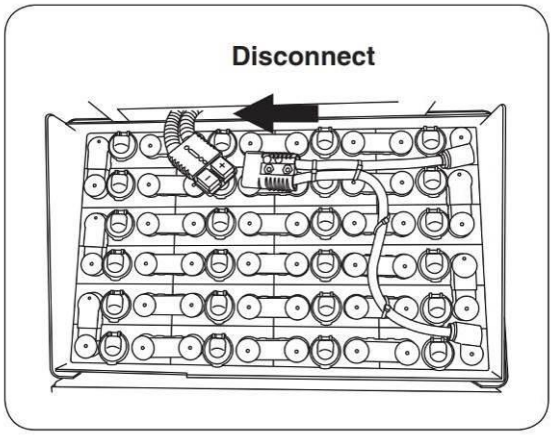
b. ***Safety Instructions for Carrier Operations***

i. **Travelling the Carrier (wheeled version only)**



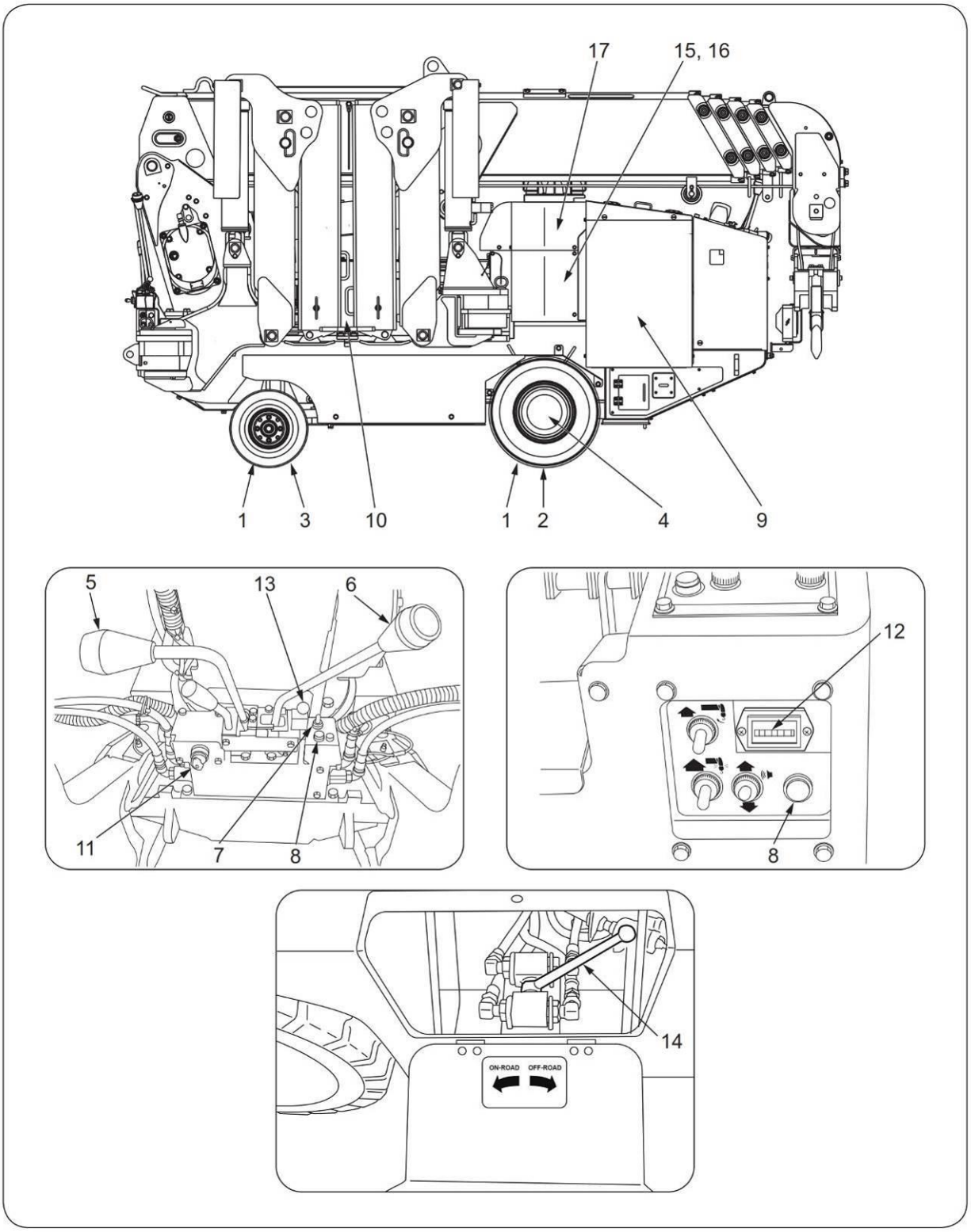


ii **After Operation (all ECO models)**



If the ECO crane is to be stored for any long period of time, ensure the battery terminals are disconnected as shown on the illustration to the left.

c. ***Description of Carrier Equipment (wheeled version)***



1. Solid rubber tyre.

2. Drive Wheel – Power is transmitted from the drive motor.

3. Steering Wheel – Directional changes are made via the steering linkage.

4. Drive Motor – Hydraulic motor with reduction gears which transmit power to the drive wheel.

5. Travel Lever – Operate to adjust travel speed and direction (forward or reverse drive).

6. Steering Lever – Operates the steering wheels to change direction of travel.

7. Accelerator Switch – Provides control over the drive motor speed.

8. Horn Switch.

9. Liquid type Lead/Acid Battery Cell

10. Hydraulic Oil Tank.

11. Starter Switch – Switches main motor power on and off.

12. Hour Meter – Indicates total motor running time.

13. Lock Lever – Secures travel lever stand.

14. Travel Mode Selector Switch – switches between normal wheel drive “on road” and differential locking of the wheels “off road”. **It is important to note that the “off road” function is not intended for use on rough terrain, this is merely a device to aid with traction of the wheels when travelling.**

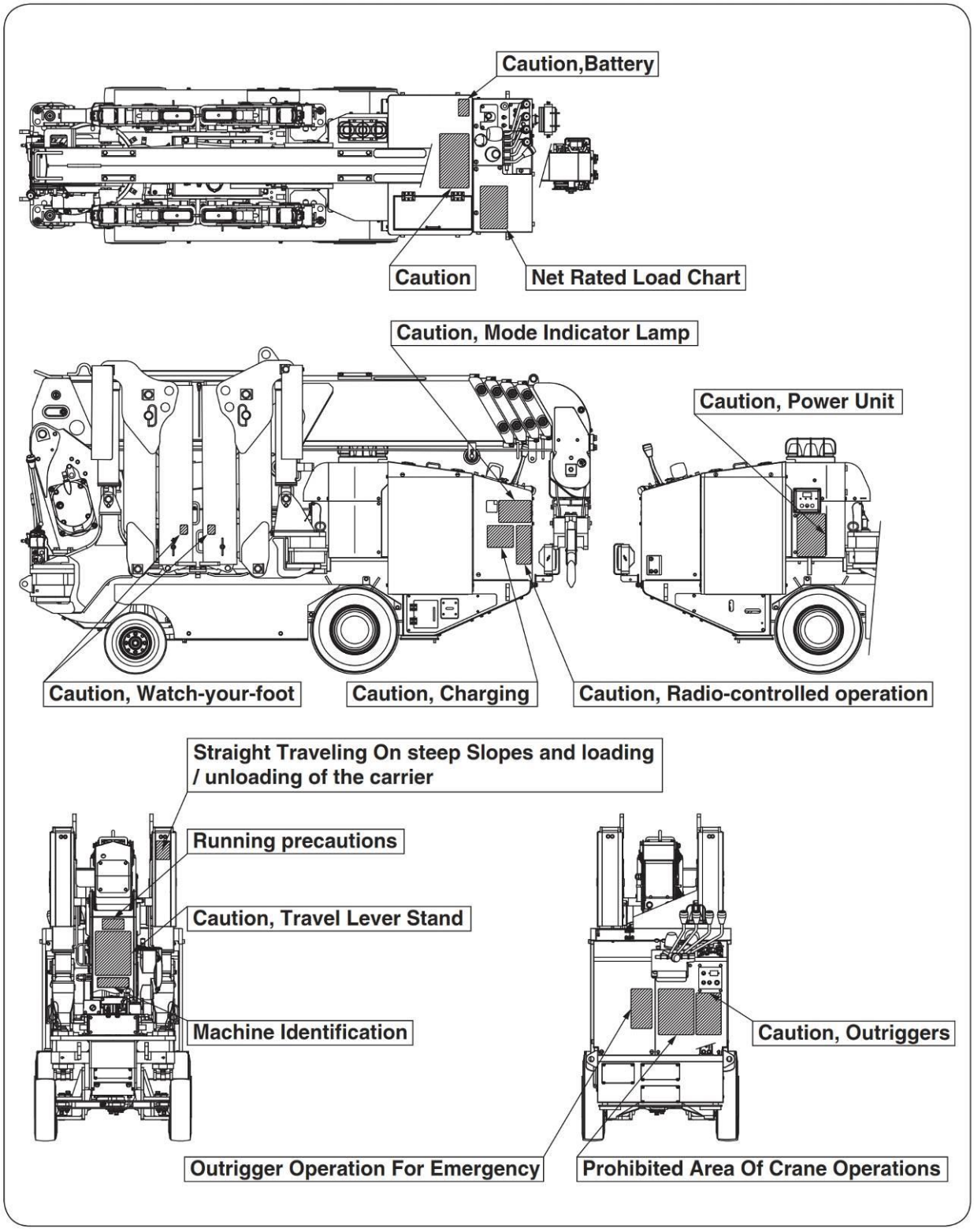
15. Main Motor.

16. Inverter.

17. Battery Charger

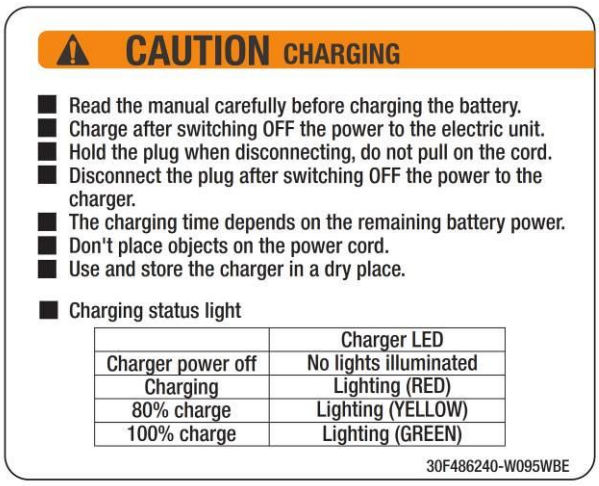
d. ***Information Plates***

i. Position of Information Plates

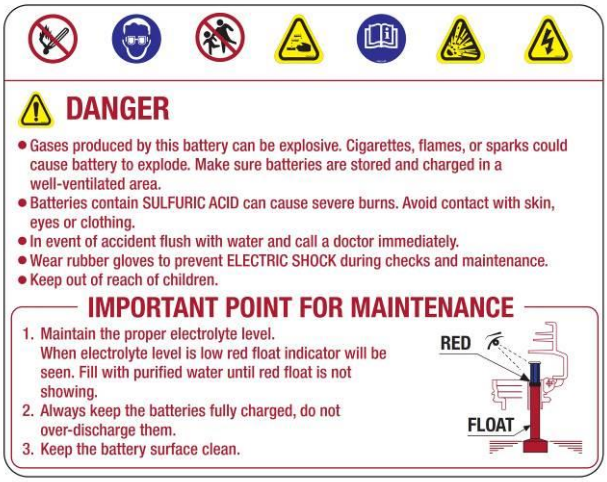


ii. Index of Decals (ECO crane specific)

Decal	Description	Model	Qty
30F486050	Travel Speed	ECO 095/295	1
30F486240	Caution Charging	ECO 095/295	1
30F486060	Travelling	ECO 095/295	1
30F486320	Danger (Battery Information)	ECO 095/295	1
30F486230	Caution Power Unit	ECO 095/295	1
30F486330	On Road – Off Road	ECO 095/295	1
30F486290	Safe Loading	ECO 095/295	1
30F486310	Travelling on Inclines	ECO 095/295	1

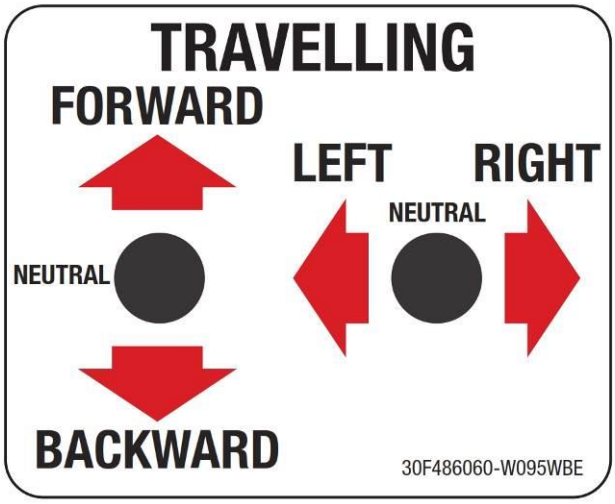


30F486240

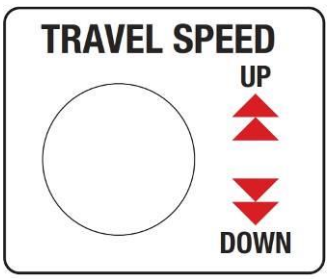


30F486320

30F486330



30F486060



30F486050

⚠ CAUTION POWER UNIT

- Read the manual carefully before operating the crane.
- Immediately after the power is ON, battery level may not display correctly.
- A warning display appears when the battery level drops and the operation speed is reduced.
- Power will automatically stop if the crane is left idle for 30 minutes. (Flashing SLP Sleep mode) The power will restart if used again.
- The main switch must be reset before and operations can be made
- Do not pressure-wash the crane.
- The table below displays the main message. Please refer to the instruction manual for more information.
- Operation mode select

Std	Standard	This is the normal mode of operation
HI	High Speed	Power consumption will increase, but you can do the operation at high speed

- Battery level warning

1~10	Slowdown	The battery level is less than 10%.
End	Stop	Unit was stopped because the battery power was exhausted. Charge the battery. If you need to operate the crane urgently, please press the reverse button and hold for more than 5 seconds.
rES	Reserve mode (Significant slowdown)	This mode will provide the power needed to withdraw the crane from the work site. Power supply is limited, therefore please charge as soon as possible.
End	Complete Stop	Unit was stopped because the battery power was completely exhausted. Charge the battery.

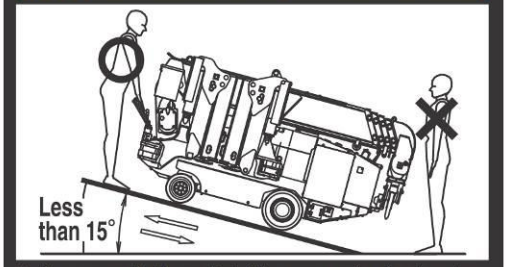
- Error message

E.07	An error has occurred in the CAN-bus communication of the inverter. Please restart the power.
E.13	Emergency stop switch has been pressed. If you want to restart, please release the switch.
E.94	Crane has been in operation during the initial check. Please do not operate the crane in the first 3 seconds after start-up. Please restart the power.
E.95	Voltage of the battery is too low. Turn off the power, please charge.

30F486230-W095WBE

30F486230

⚠ Safe loading & unloading of the carrier/travelling on inclines



- Always ensure that the gradient of the ramp or surface is not greater than 15 degrees and has sufficient grip
- Ensure that the ramp or surface will support the total weight of the crane and the operator
- Scaffold boards or other materials not designed for use as ramps must not be used
- Ensure that all other persons are kept clear from the carrier during travel
- The operator must always drive the carrier from the uppermost position on the incline, i.e. reverse up the incline and follow the carrier down the incline
- Never attempt to turn the carrier on an incline, always drive straight up and down
- The carrier must always be manoeuvred slowly during travel up and down inclines
- In the event that control of the carrier is lost during loading/unloading, do not attempt to stop the carrier from falling

30CF86290-W245CP2A

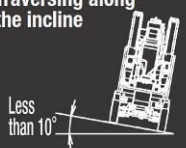
30F486290

⚠ Travelling on inclines - safety information

Traversing up and down the incline

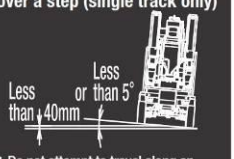
The operator must always drive the carrier from the uppermost position on the incline

Traversing along the incline



- The gradient must be reduced to less than 5 degrees when traversing along the incline on unstable ground or in wet conditions
- Always travel at low speed when traversing any incline and do not make any changes of direction whilst on the incline

Travelling along an incline or over a step (single track only)



- Do not attempt to travel along an incline of more than 5 degrees, or a height of 40mm when it is only possible to position a single track on the incline

30CF86310-W245CP2A

30F486310

e. *Description of Equipment for Battery Drive (All ECO models)*

i. General

Ensure that the electric power unit is used as intended. Improper use may lead to electric shock or high operating temperatures, leading to the risk of fire or personal injury.

DO NOT connect or disconnect any electrical plugs whilst the power unit is running.

DO NOT charge the battery cell whilst the power unit is running.

DO NOT disassemble the power unit or clean with high pressure washers.

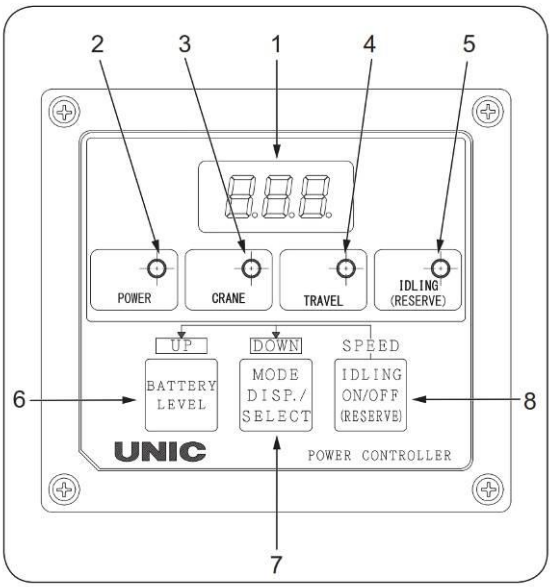
The power unit will become hot during continuous extended use of the crane. Avoid contact during operation.

Always remove the starter key when not in use, to prevent unauthorised use of the crane.

NB

The crane runs a system diagnosis when initially being started. This process takes around 3 seconds. Do not operate the crane until this diagnosis has completed. During start up and diagnosis, the battery charge level may also not be indicated.

ii. Battery Drive Control Panel (all ECO models)



1. Mode Indicator
Displays the operation mode and battery level.

2. Power LED Lamp
Illuminates when the power unit is activated. Lamp will flash when the battery level is at 10% or less.

3. Crane Mode LED Lamp
Illuminates when crane mode is activated.

4. Travel Mode LED Lamp
Illuminates when travel mode is activated.

5. Idling/Reserve Mode LED Lamp
Illuminates when idling mode is activated. Lamp will flash when reserve mode is activated.

6. Battery Level Check Button
Press to confirm battery status.
Press once, the battery level (0 – 100%) will be displayed. The display will clear after 3 seconds.

7. Operation Mode Button
Press once to display current operating mode, pressing again whilst mode is displayed will change the operation mode.

8. Idling On/Off Button
Pressing this button activates or de-activates idling mode.

f. ***Charging the Battery (All ECO models)***

EXTREMLY FLAMMABLE Hydrogen Gas is given off from battery electrolyte solution. This burns hot enough to combust skin on contact and has no flame. NO SMOKING or NAKED FLAMES are to be close to the battery when topping up or charging – This could have potentially fatal consequences.

The battery requires either a single phase 200 – 240 volt or 110 volt power supply to charge the battery (Model dependent). Ensure that the power supply used for charging is fused and earthed.

DO NOT connect or disconnect any electrical plugs whilst the power switch of the charger is on. Any spark may cause a fire or an explosion.

DO NOT charge the battery whilst the power unit is running.

DO NOT disassemble the charger and battery.

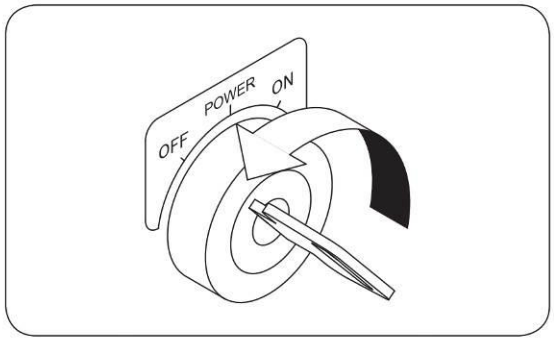
Charging of the battery must be carried out in a well ventilated area. Smoking and any naked flames are STRICTLY PROHIBITED anywhere in the vicinity of the charging area. Appropriate signage and barriers should be positioned during charging operation.

Ensure there is sufficient levels of electrolyte in the battery cells prior to charging. Replenish levels with distilled water if levels are low. (Further Information on electrolyte levels can be found on page)

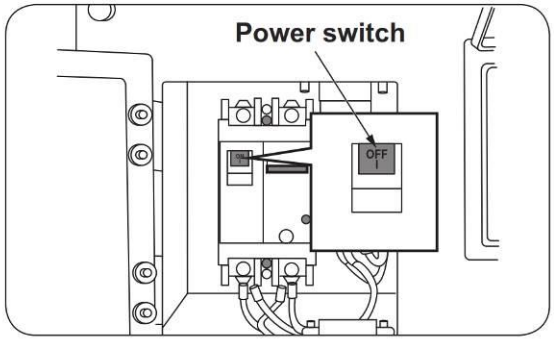
NB

Inspect and check all cables and plugs for condition and serviceability prior to use. Ensure cables are not trapped or pinched, this may break down the insulation and cause electric shock, short circuit or fire

i. Charging Procedure (All ECO models)



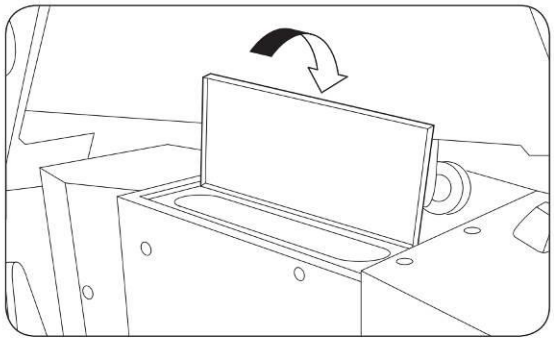
1. Ensure that the main power key switch is turned OFF.



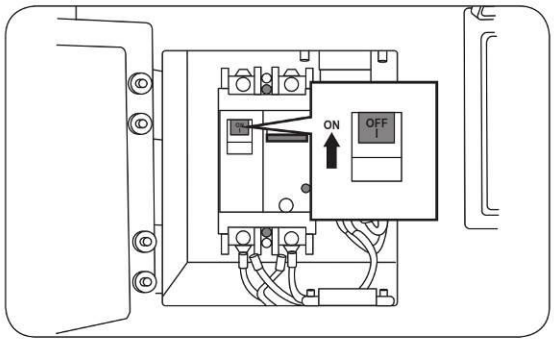
2. Ensure that the power switch on the charger is turned OFF. The switch is located behind the panel to the left of the charging port.

3. Ensure mains power is isolated, then connect the power cable plug to the mains supply.

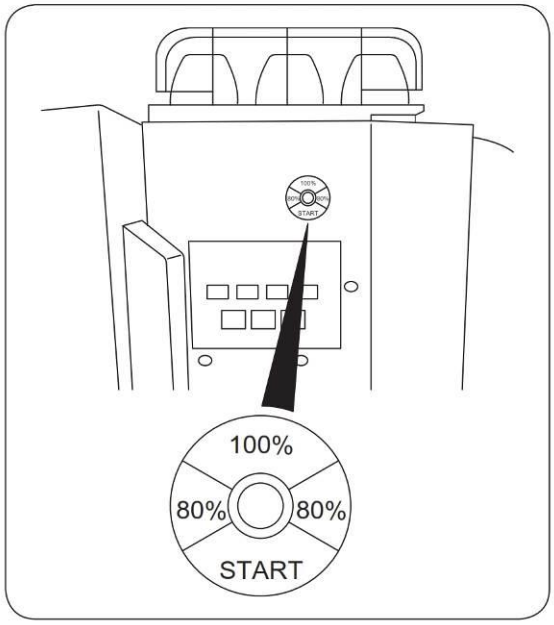
4. Locate the charging port socket (see photograph on left) and connect the other end of the power cable and plug into the charging port.



5. Open the ventilation cover located on top of the battery.



6. Turn on the mains power and then turn on the power switch for the charger unit.



7. On completion of normal charging, the yellow (80%) LED will illuminate. Normal charge time is approximately 5 hours (dependent on battery condition).

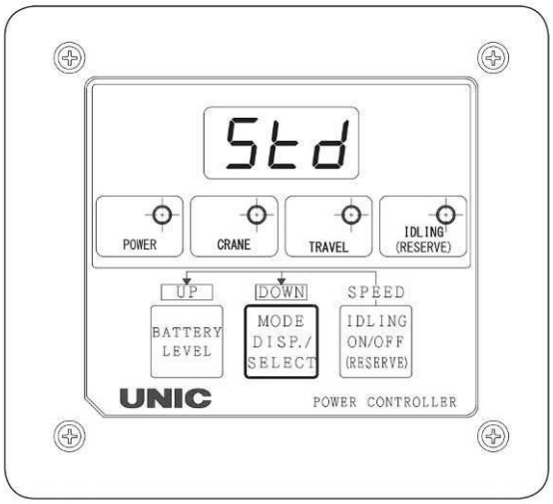
8. To complete a full charge requires a further 5 hours of charge time (dependent on battery condition). The green (100%) LED will illuminate.

Charger Status	LED Colour
Charger Power OFF	Not illuminated
Charging	Red
Normal Charge Complete (80%)	Yellow
Full Charge Complete (100%)	Green

Ensure both the charger unit and mains power supply are isolated, prior to removing the charging cable and plugs. Ensure charging port cover is closed.

If the charger unit fails to operate, or any other fault is detected, stop using the charger immediately, isolate the supply and contact your UNIC service agent.

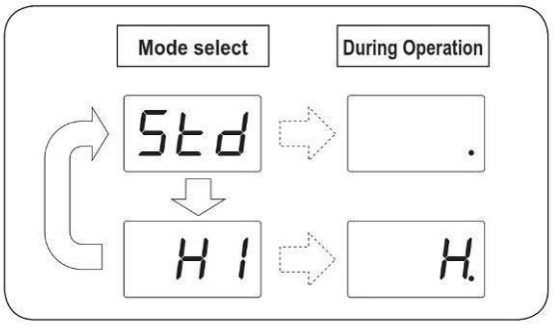
g. *Operation of the Battery Drive Control Unit (All ECO models)*



1. Switching Operation Modes

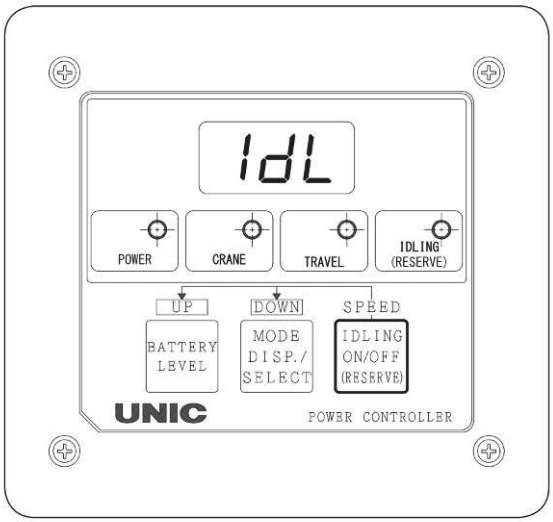
The unit can be configured to operate depending on the nature of the task the crane is to be used for.

When the “Mode Display/Select” button is initially pressed, the LED display will indicate the current operation mode. Pressing the button again whilst the current mode is still being displayed will change the operation mode. If the display is left for more than 2 seconds without any further buttons being pressed the display will cancel.



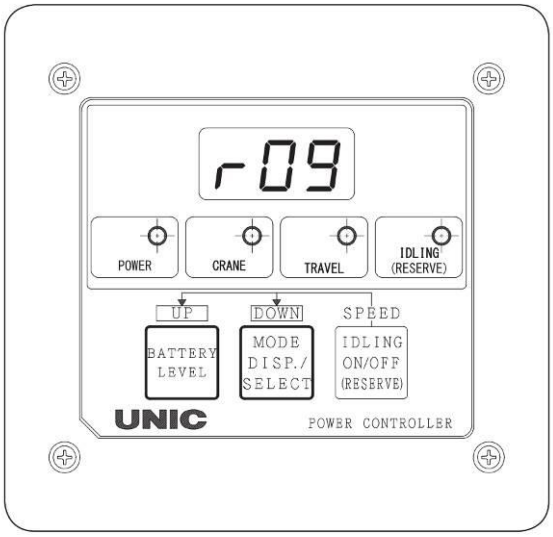
- Standard Operation Mode – This is the normal operating mode, the display screen will read “Std”
- High Speed Operation – This mode can be selected when higher speed operations are required. The display screen will read “Hi”

In high speed mode, the battery will be discharged far more quickly than in standard operation mode. When the battery level drops to a specified level, the high speed mode will automatically become disabled and the crane will revert to standard operation mode. The battery must be re-charged to re-enable high speed mode.



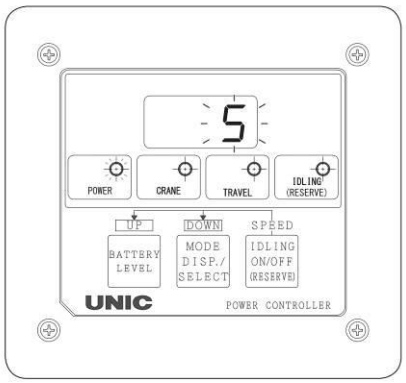
2. Idling Mode

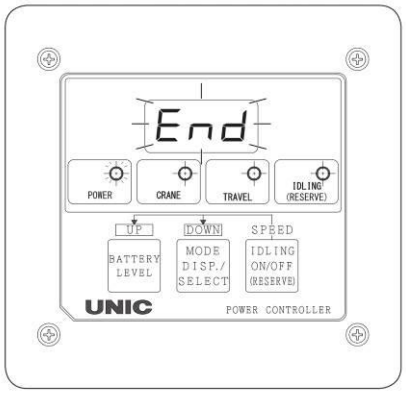
When the “Idling Mode” button is pressed, the drive motor will run at a pre-determined fixed speed. The LED display will indicate “Idl” followed by a display of the rotational speed the motor is set to (see example below “r09”, meaning 900 rpm).
Press the idling button again to cancel idling mode.

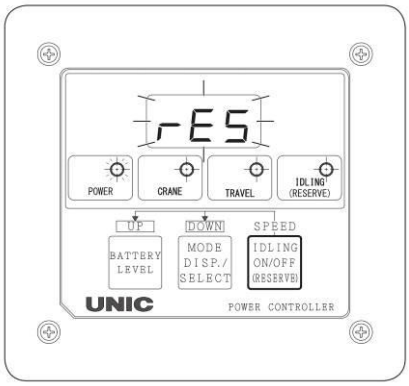


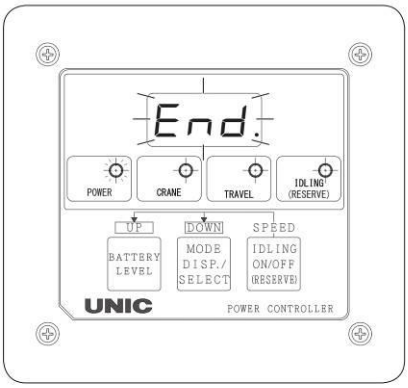
- Rotation Speed Adjustment – The motor speed can be adjusted via the control unit in incremental steps, using the “UP” (Battery level button) and “DOWN” (Operation mode button).
- Battery Level Check – Pressing the “Battery Level” will indicate the battery level (as a percentage).

When the battery level displays “End”, idling mode is disabled.









3. Reserve Mode (Emergency Use)

The reserve mode provides the crane with additional temporary emergency power. This mode would be used in a situation where the normal powers runs out during a lifting operation and has rendered the crane inoperable.

- If the battery level drops to 10% or below, the LED display will indicate this by flashing the figure in the display.

- Continuing to operate the crane until the battery is exhausted will result in the crane becoming disabled. The LED display will indicate the word "End" flashing in the display.

- To enable the reserve power mode, press and hold the "Idling ON/OFF (Reserve)" button for 5 seconds. The LED display will indicate "Res" flashing in the display. **The crane will now operate at a significantly reduced speed. Reserve power duration is approximately 30 minutes.**

- Continuing to operate the crane until the reserve power is exhausted will result in the crane becoming completely disabled. The LED display will indicate the word "End" flashing in the display. **The crane must now be re-charged before any further use.**

It must be stressed that the reserve power mode is designed for emergency use only.
Excessive discharging of the battery cell can reduce the effective life of the battery.

h. *Additional Functions of Battery Drive Control Unit (All ECO models)*

- **Contactor automatic stop function**

If the crane is not operated for 2 minutes, this function stops the contactor (the main power for the motor control circuit) in order to conserve power. If either the radio remote control or manual control levers are operated while the contactor is stopped, the contactor activates and normal crane function is resumed.

- **Crane automatic power stop function**

If the crane is not operated for 30 minutes, this function shuts off the power to the crane to prevent inadvertent operation of the crane. During crane automatic power stop, the LED display will indicate "slp" flashing in the display. The crane will be disabled either operated with the radio remote control or operation levers. Restart the electric power unit to restore power and normal operation.

- **Automatic Speed Reduction Function (electric power unit overheating)**

If the power unit overheats, this function lowers the operational speed of the crane in order to cool down the power unit. During the automatic speed reduction due to overheating, the LED display will indicate the word "hot" flashing in the display. If the power unit temperature continues to rise, the crane shuts down as a safety measure. When the crane has stopped due to overheating, "hot" is again displayed.
When the temperature of the electric power unit drops sufficiently, the speed reduction function will cancel.

- **Automatic Speed Reduction Function (Low battery indication)**

When the remaining battery power capacity reaches the low battery warning state, the operating speed of the crane will automatically be reduced. The LED display will indicate the low battery state as described on page 148.

Power Unit Display Codes

Display	Action	Description
10 - 1	Speed Reduction	Battery level is between 10 and 1 %
End	Unit shuts down	The unit stops due to battery becoming discharged. Battery requires charging.
Res	Reserve mode (Reduced speed)	Press and hold the idling button for 5 seconds when “End” is displayed to enable emergency power supply.
End	Unit completely shuts down	Battery is completely discharged. Battery requires immediate charging.

- **Warm Up Function**

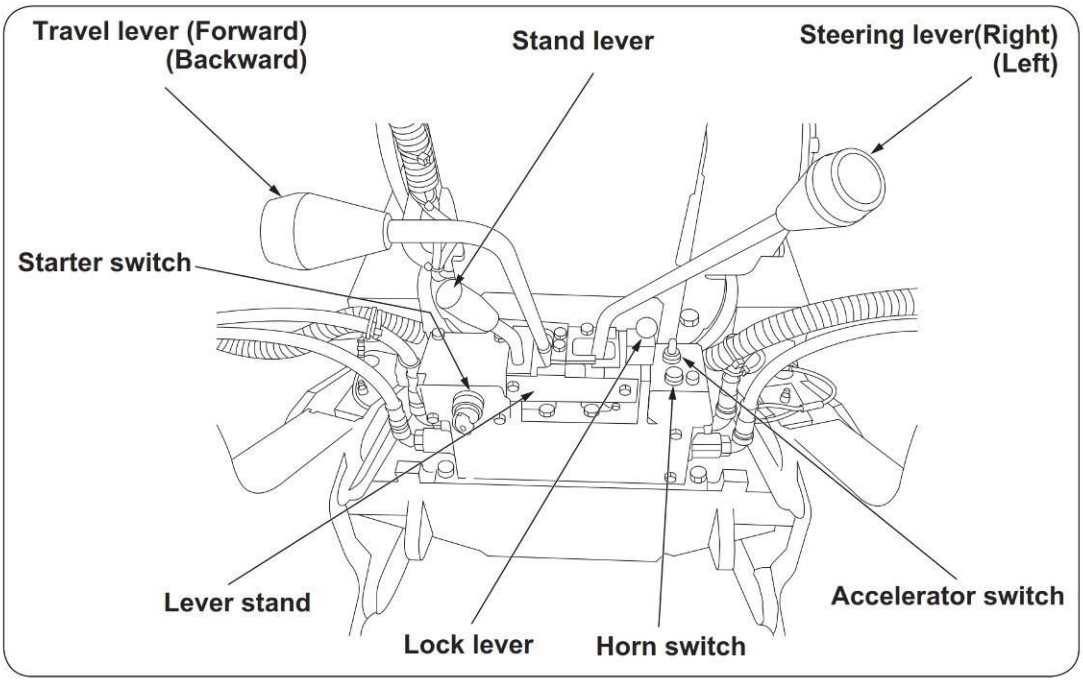
This mode will enable when operating in extremely low temperatures (reference temperature is -35°C). The internal temperature of internal components and circuits will be heated to prevent damage. During warm up, "d + (remaining warm up time)" will be indicated in the LED display.

Table of Emergency codes (Control unit LED display)

Error Code	Reset action	RCU Operation	Manual Operation
E 13	Emergency stop button is activated or battery voltage is low. Release E stop button and re-start or turn off power and re-charge battery.	X	X
E 00 **E 16 – E 17**	Abnormal high internal temperature. Turn off the power, allow components to cool before re-starting.	X	X
E 07 – E 09 **E 12** **E20 – E 23** **E 32** **E 38** **E 47 – E 48** **E 52**	Error signals being received from the inverter. Turn off power and re-start. If error not cleared, consult UNIC service agent.	X	X
E 39	The capacitor is overheated. Turn off power and allow capacitor to cool before re-starting.	X	X
E 93	Non OEM inverter has possibly been installed. Contact UNIC service agent.	X	X
E 94	Controls were operated during 3 second boot up check. Turn off power and re-start.	X	X
E 95	The battery voltage is low. Turn off power and re-charge battery.	X	X
E 96	Crane power is turned on during charging. Turn off the charger unit and disconnect cable and plug.	X	X

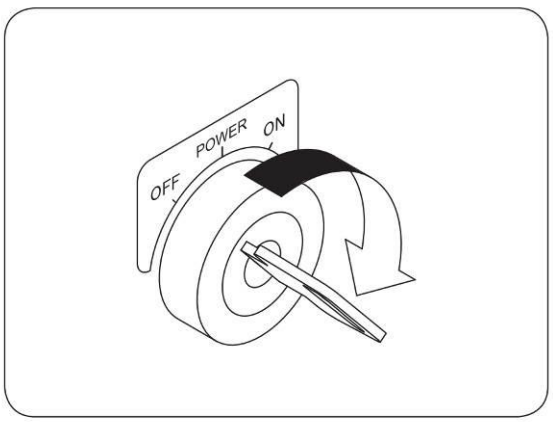
i. *Carrier Operations (Wheeled version only)*

i. Description of Travel Controls



ii. Starting the Carrier/Crane

If the crane requires charging prior to use, the starter key MUST be switched off before charging commences.



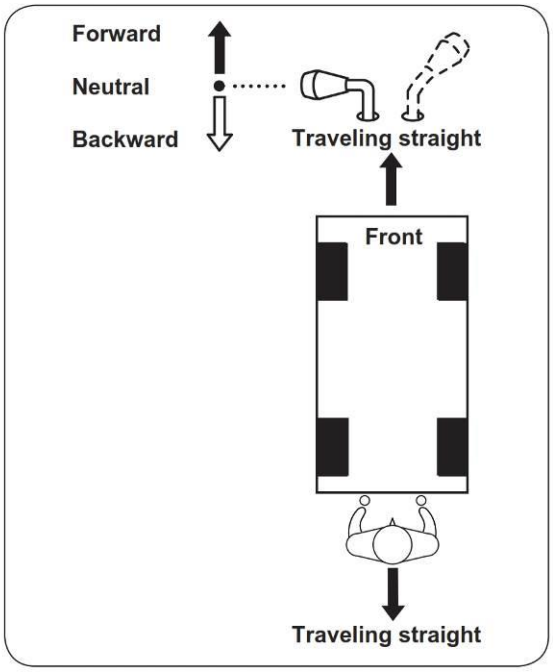
- Starting under normal conditions

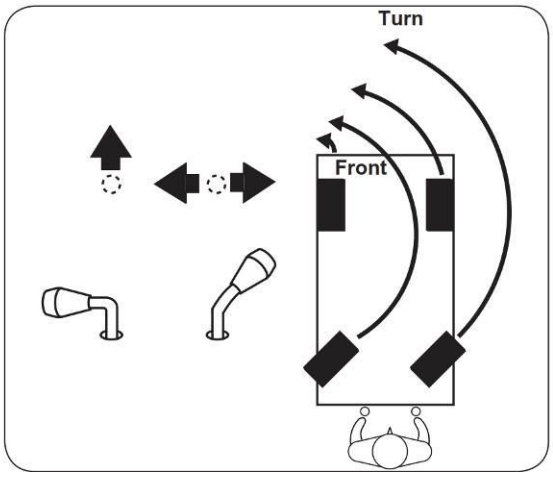
  Insert the key into the starter switch and turn it to the “ON” position.

  NOTE: After the power has been turned on, wait 3 seconds before operating the crane, as the crane is performing a self-diagnosis during this period. Operating too quickly, will cause the crane to stop all functions. If this happens, turn the key to “OFF” and then re-start.

iii. Travelling the Carrier/Crane

Ensure that the safety precautions and instructions covered on pages 8, 9, 49 and 140 (NOTE: Eco crane tracking angles differ from standard model) have been read and understood before travelling the carrier/crane. Additionally, travel over soft ground MUST be avoided, to avoid the wheels sinking and becoming immovable.





Starting, travelling and stopping the carrier/crane

- Ensure the travel lever stand is in the travel position
- Select the running speed of the motor via the accelerator switch on the lever stand.
- Push the left hand travel lever forward to engage forward drive. The lever is fully proportional and speed will increase, the further forward the lever is pushed.
- Pull the travel lever back to engage drive in reverse.
- To stop the carrier, return the lever to the neutral position. This will automatically apply the brake.
- To turn the crane either left or right, operate the steering lever in the corresponding direction, whilst applying either forward or reverse movement with the travel lever.
- **Important Note**: The steering wheels do not return to their central in-line position once the steering lever has been operated.

Be sure to visually confirm the position of the steering wheels prior to any movement of the carrier; failure to do this may result in the crane being travelled in a direction not intended by the operator and cause a collision with the crane and any persons or objects in the immediate area of the crane.

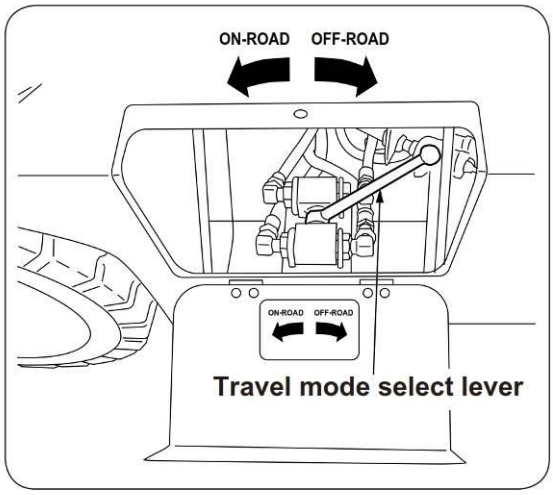
iv. Travel Mode Switching

Before switching, ensure the drive motor has stopped and the travel lever stand is in the stowed position.

- "On Road" Mode
  This mode is for general purpose use where the ground is smooth flat and level, e.g. a paved road or concrete flooring. The carrier is fitted with hydraulics to equalise differences in speed between inner and outer wheels when turning, allowing smooth travel of the carrier.

- "Off Road" Mode
  In this mode the hydraulics will operate the left and right wheel speed independently to increase stability.

- **Important Note: The term off road here does not infer rough terrain use, the carrier is not designed for travel on uneven or rough surfaces.**



Switchover Procedure

- Remove the thumbscrew and open the cover on the left hand side of the crane (viewed from the driver position). See illustration on the left.

- Move the selector lever to the right to engage "off road" mode.

- Close the cover and replace the thumbscrew.

j. *Inspection and Maintenance of the Carrier (Wheeled version only)*

i. Pre-Use Inspection and Maintenance

ENSURE the motor is stopped and the battery is disconnected prior to carrying out this inspection.

NO SMOKING during inspection or maintenance.

DO NOT carry out any inspection or maintenance until all working parts have cooled down sufficiently.
DO NOT connect or disconnect any electrical components with wet hands.

In order to ensure that the crane works correctly, efficiently and safely inspect each part of the carrier in accordance with the table below.

Device	Servicing item	Device	Servicing item
Battery	Damaged wires	Hydraulic oil tank	Oil leakage, Oil quantity, Filling up
	Battery electrolytic solution level check	Interlock for crane-travel lever	Function
	Amount of electrolyte solution	Steering lever Traveling lever	Slack, Travel
	Electrolyte specific gravity	Wheel	Loose bolt
	Corrosion	Solid rubber tire	Crack, Damage
Motor	Loose bolt, Broken bolt Strange noise Abnormal vibration Abnormal smell	Frame Steering	Bend, Crack, Deformation Loose nut, Oil leakage

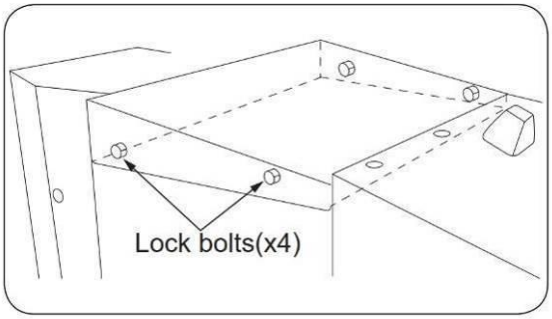
ii. Inspection of the Battery (All ECO models)

EXTREMLY FLAMMABLE Hydrogen Gas is given off from battery electrolyte solution. This burns hot enough to combust skin on contact and has no flame. NO SMOKING or NAKED FLAMES are to be close to the battery when topping up or charging – This could have potentially fatal consequences.

DO NOT allow the electrolyte to splash on to your body or clothing. Electrolyte contains sulphuric acid which may cause severe burns or blindness. If your clothing is splashed remove it at once. If your skin or eyes are splashed wash immediately with copious amounts of water for at least 10 minutes and seek medical assistance immediately afterwards.

ALWAYS wear rubber gloves, cotton clothing and chemical resistant safety goggles when handling batteries

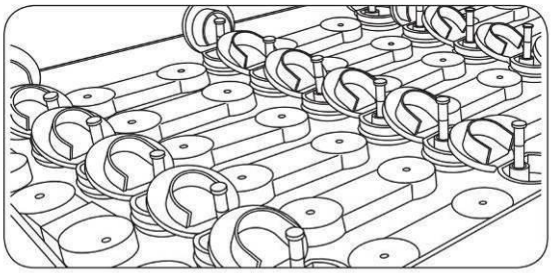
DO NOT clean the battery with any materials or cloths that may cause static electricity build up. This could cause a spark and ignite the highly flammable gases given off by the battery.

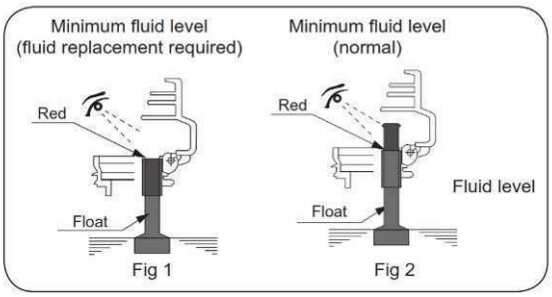


The outriggers must be deployed and the boom raised prior to removing the battery cover for inspection of the battery.

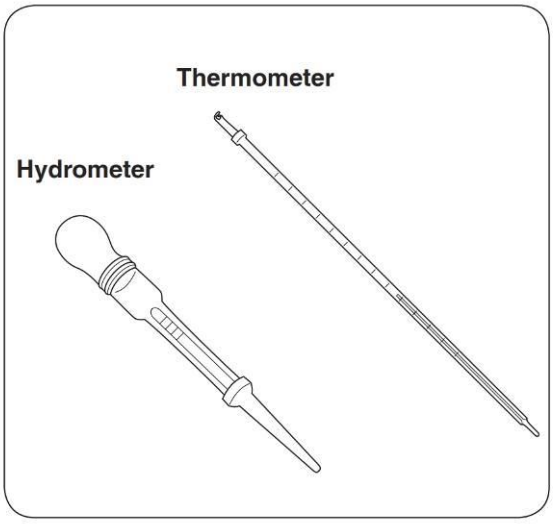
To remove the battery cover, remove the 4 locking bolts as shown in the illustration on the left.

The ECO 295 model has a Rated Capacity Indicator (RCI) display located o the cover. This must be disconnected when removing the cover. Disconnecting the RCI display will disable all crane functions





- The electrolyte level in the battery will evaporate over time during charging cycles. Levels must be maintained by the addition of distilled water **ONLY**. Follow the steps below to top up levels.
- Open the battery cell caps and observe the fluid level float (see illustration on left).
- If the float is at minimum level (fig 1), add distilled water immediately.
- As fluid is added, the float will rise. When the float has risen sufficiently so a change of colour is observed (fig 2), stop adding distilled water.
- Ensure levels are always maintained between minimum and maximum, in order to prolong the life of the battery cells.
- Check fluid levels on a weekly basis.
- Take care not to overfill the cells this may lead to a short circuit and corrosion of the battery.
- Do not place metal implements across battery terminals this will lead to a short circuit and could cause electric shock.



Specific Gravity Inspection

Measure the liquid temperature with a thermometer and convert the specific gravity measurement in terms of the specific gravity at 20°C. The hydrometer formula is as follows.

D20 = Dt + 0.0007 (t-20)

• D20: Specific gravity when converted at 20°C

• Dt: Specific gravity measurement

• t: Temperature of the electrolyte solution (°C) at the time of measurement

• If the specific gravity has reached 1.150 (20°C) or less, always charge the battery until it reaches a specific gravity of 1.280 (20°C).

• Specific gravity when fully (total) charged 1.280 (20°C)

iii. Inspection of the Tyres and Steering (Wheeled version only)

Travelling on damaged rims or tyres can be very dangerous, as there is a risk that the crane may slide. If any damage is noted, contact your UNIC service agent for further information and advice on replacement.

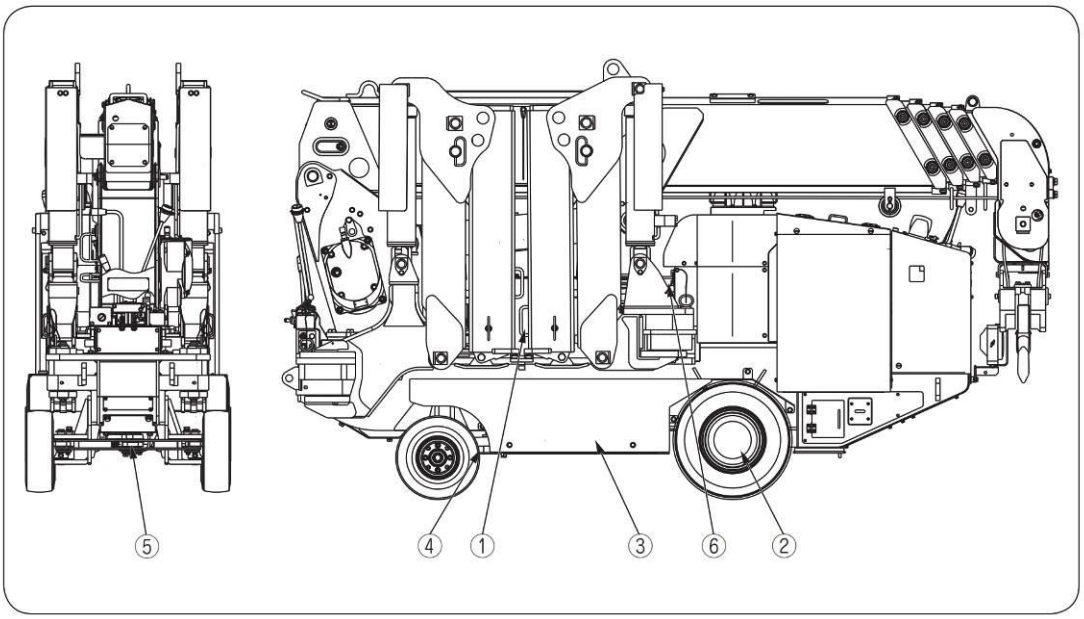
DO NOT travel the crane over lying rocks, or stones with sharp edges. DO NOT operate the crane on ground where the temperature will exceed 60°C.

The crane should only ever be travelled over flat, level ground. Avoid areas where the tyres may come into contact with oils, fuels or other chemicals that may damage the rubber of the tyres.

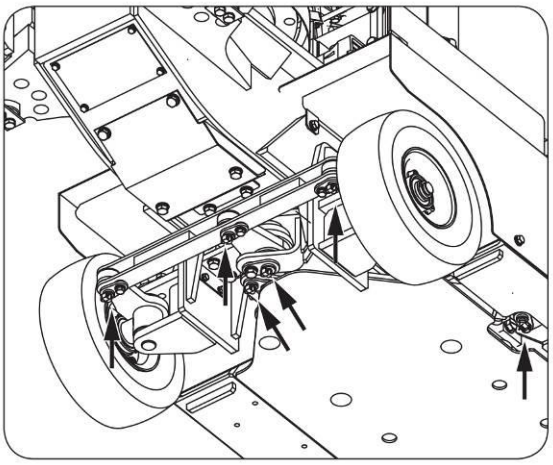
DO NOT operate the crane in area where salt content is high.

- The tyres should be visually inspected on a daily basis; check for physical damage to the tyre and rim, excessive loss of tread.
- The steering system should be checked before each use. Stop the crane in a safe area, move the steering lever to the left and right, ensure the wheels turn correctly. Check that each wheel turns fully left and fully right.

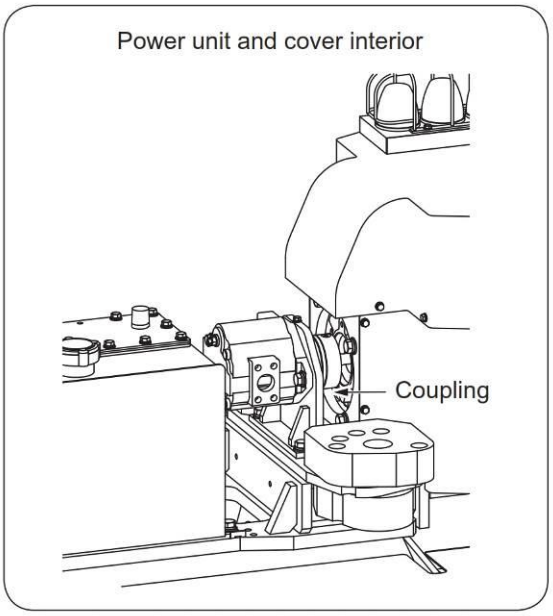
k. ***Lubrication of the Carrier Wheeled version only)***



Service interval	Where to lubricate	No. of part	Lubricant	Tool
Initial: Replace after 3 months After : Replace once a year or every 500 hours	①Hydraulic oil tank (27 liters)	1	Hydraulic oil	
Replace every 1000 hours	②Reduction gears of traveling motor (0.33 liters)	2 (Right/ Left)	Diesel engine oil	
Daily	③Front support pin of steering cylinder	1	Chassis grease	Grease pump
	④Rear support pin of steering cylinder	1	Chassis grease	Grease pump
	⑤Steering link (Each pin of the link and shaft connects the left and right tires)	6	Chassis grease	Grease pump
Replace every 6 month	⑥Coupling input shaft and hydraulic pump input shaft	1	Chassis grease	Manual application



- Important Note: There are grease nipples located under the crane chassis on the steering rack at the steering cylinder See illustration on left.
- Ensure these are lubricated regularly to avoid damage and possible failure of the system.
- It is recommended that this is carried out daily.



- The motor coupling should be lubricated when performing periodic inspections at 6 monthly intervals.
- The following lubricant is recommended for the coupling:

  Chassis Grease No 1
  (Consistency 310 to 340)
  Application Point – Input shaft and hydraulic pump shaft.

I. ***Eco Crane Specification***

NOTE: Figures in **RED** are specific for tracked version of the ECO crane.

Model		**URW095WBE (CBE) (5-section boom)**
Crane capacity		0.995t×3.5m (With outriggers extended fully)
Maximum lift above ground (Hook)		Approx. 8.9m with 4-part line
Boom section extensions:		2.53m ~ 4.075m ~ 5.61m ~ 7.13m ~ 8.65m
Maximum working radius		8.41m
Winch speed (Rope speed)		Standard: 32**(28)**m/min (At 4th layer on the drum)
		Highspeed: 36.4m/min (At 4th layer on the drum)
Hoisting speed of hook		Standard: 7.0m/min (At 4th layer on the drum)
		Highspeed: 9.1m/min (At 4th layer on the drum)
Extension speed of boom		Standard: 6.12m/31sec
		Highspeed: 6.12m/23sec
Derricking speed of boom		Standard: 0° ~ 78°/17sec
		Highspeed: 0° ~ 78°/12sec
Slewing speed		1.5 r.p.m.
Slewing range		360°(continuous)
Hoist rope	Construction	IWRC 6×WS (26) Class B (Breaking load: 42.4kN{4320kgf})
	Diameter × length	8mm × 65.0m (Breaking load: 43.1kN(4395kgf))
Outrigger		Double acting hydraulic cylinder (directly connected to hydraulic automatic locking device)
Hydraulic pump	Rated pressure	Crane: 20.6MPa(210kgf/cm^2) Travel: 21.6MPa(220kgf/cm^2)
	Rated discharge	Standard: 18l/min
		Highspeed: 26.4l/min
	Rated rotation	Standard: Approx. 1500rpm
		Highspeed: Approx. 2200rpm
Hydraulic oil tank Capacity		27 L

Model	URW095WBE (CBE) (5-section boom)
Boom telescoping	Boom:5-section, Hexagonal box beam
	Direct pressure from hydraulic cylinder and wire rope (With hydraulic automatic locking device) (2nd & 3rd sections: sequential actuation, 4th & 5th sections: simultaneous actuation)
Boom derricking	Direct pressure from hydraulic cylinder (With hydraulic automatic locking device)
Hoisting	Hydraulic motor: Axial plunger type
	Reduction gears: Spur-gear reduction
	Brake: Automatic mechanical brake
Slewing	Hydraulic motor: Trochoid type (With hydraulic automatic locking device)
	Reduction gears: Worm gear + Spur gear reduction (Supported by ball bearings)
	Brake: Worm self-lock
Hydraulic pump	Variable delivery piston pump
Hook capacity	0.995t Number of lines of rope: 4
Safety devices	Pressure relief valve for hydraulic circuit
	Hydraulic automatic lock (Counterbalance valves and pilot-operated check valves)
	Device to prevent overload (Load meter)
	Automatic stop for over-hoisting
	Over-hoisting alarm
	Load indicator (With angle meter)
	Alarm buzzer
	Hook safety latch
	Interlock for crane-crawl lever and outriggers
	Spirit Level
	Turnover prevention device
Weight	Approx. 2380kg (2350kg)

Model	URW095WBE (CBE) (5-section boom)
Travel method	Wheeled type (with rubber tyres)(Endless Rubber Track)
Tyres/wheels	Front wheel 4.00-8 (Rim3.00D-8) Rear wheel 3.5-5 (Rim3.00SP-5) (180 x 40 x 72 FR)
Pressure of ground contact	Front wheel: 671KPa (6.84+kgf/cm2) (Track: 60.8kPa) Rear wheel: 637KPa (6.50 kgf/cm2) (0.62 kgf/cm2)
Travel speed	Forward/Backward : 0 ~ 2.6km/h) (0-1km/h or 0-1.4km/h)
Steering angle	L50°, R50°
Maximum incline	15° (20°)
Motor	Motor model: 14310-13950-71(Toyota Industries Co. Ltd.)
	Power supply voltage: 48 V DC
	Rated output : Standard 4.0 KW : Highspeed 6.0 KW
	Rated RPM : Standard 1500 rpm : Highspeed 2200 rpm
Drive system	Independently driven by hydraulic power
Braking system	Disc brake with hydraulic motor built-in
Battery	Model:VCI-225 (48V DC-225 Ah)
	Continuous operating time : Standard Approx. 270 min : Highspeed Approx. 240 min
	Charging time : 80% Approx. 5 hour : 100% Approx. 10 hour
Charger	Model: NG3
	Input Voltage: AC200V-230V AC (50Hz~60Hz) Single-phase (50Hz to 60Hz)
	Input current : 16A
	Output voltage : 48V
	Output current : MAX 36A
Noise Output (Maximum)	LpAeq = 71.3 dB(A)

Model		URW295WBE (CBE) (5-section boom)
Crane capacity		2.93t×1.4m (With outriggers extended fully)
Maximum lift above ground (Hook)		Approx. 8.9m with 4-part line
Boom section extensions:		2.53m ~ 4.075m ~ 5.61m ~ 7.13m ~ 8.65m
Maximum working radius		8.41m
Winch speed (Rope speed)		Standard: 28m/min (At 4th layer on the drum)
		Highspeed: 36.4m/min (At 4th layer on the drum)
Hoisting speed of hook		Standard: 7.0m/min (At 4th layer on the drum)
		Highspeed: 9.1m/min (At 4th layer on the drum)
Extension speed of boom		Standard: 6.12m/31sec
		Highspeed: 6.12m/23sec
Derricking speed of boom		Standard: 0° ~ 78°/17sec
		Highspeed: 0° ~ 78°/12sec
Slewing speed		1.5 r.p.m.
Slewing range		360°(continuous)
Hoist rope	Construction	IWRC 6×WS (26) Class B (Breaking load: 42.4kN{4320kgf})
	Diameter × length	8mm × 54.0m (Breaking load: 43.1kN(4395kgf))
Outrigger		Double acting hydraulic cylinder (directly connected to hydraulic automatic locking device)
Hydraulic pump	Rated pressure	Crane: 20.6MPa(210kgf/cm^2) Travel: 21.6MPa(220kgf/cm^2)
	Rated discharge	Standard: 18l/min
		Highspeed: 26.4l/min
	Rated rotation	Standard: Approx. 1500rpm
		Highspeed: Approx. 2200rpm
Hydraulic oil tank Capacity		27 L

Model	URW295WBE (CBE) (5-section boom)
Boom telescoping	Boom:5-section, Hexagonal box beam
	Direct pressure from hydraulic cylinder and wire rope (With hydraulic automatic locking device) (2nd & 3rd sections: sequential actuation, 4th & 5th sections: simultaneous actuation)
Boom derricking	Direct pressure from hydraulic cylinder (With hydraulic automatic locking device)
Hoisting	Hydraulic motor: Axial plunger type
	Reduction gears: Spur-gear reduction
	Brake: Automatic mechanical brake
Slewing	Hydraulic motor: Trochoid type (With hydraulic automatic locking device)
	Reduction gears: Worm gear + Spur gear reduction (Supported by ball bearings)
	Brake: Worm self-lock
Hydraulic pump	Variable delivery piston pump
Hook capacity	2.9t Number of lines of rope: 4
Safety devices	Pressure relief valve for hydraulic circuit
	Hydraulic automatic lock (Counterbalance valves and pilot-operated check valves)
	Device to prevent overload (Load meter)
	Automatic stop for over-hoisting
	Over-hoisting alarm
	Load indicator (With angle meter)
	Alarm buzzer
	Hook safety latch
	Interlock for crane-crawl lever and outriggers
	Spirit Level
	Turnover prevention device
Weight	Approx. 2380kg **(2350kg)**

Model	**URW295WBE (CBE) (5-section boom)**
Travel method	Wheeled type (with rubber tyres)**(Endless Rubber Track)**
Tyres/wheels	Front wheel 4.00-8 (Rim3.00D-8) Rear wheel 3.5-5 (Rim3.00SP-5) **(180 x 40 x 72 FR)**
Pressure of ground contact	Front wheel: 671KPa (6.84+kgf/cm2) **(Track: 60.8kPa)** Rear wheel: 637KPa (6.50 kgf/cm2) **(0.62 kgf/cm2)**
Travel speed	Forward/Backward : 0 ~ 2.6km/h) **(0-1km/h or 0-1.4km/h)**
Steering angle	L50°, R50°
Maximum incline	15° **(20°)**
Motor	Motor model: 14310-13950-71(Toyota Industries Co. Ltd.)
	Power supply voltage: 48 V DC
	Rated output : Standard 4.0 KW : Highspeed 6.0 KW
	Rated RPM : Standard 1500 rpm : Highspeed 2200 rpm
Drive system	Independently driven by hydraulic power
Braking system	Disc brake with hydraulic motor built-in
Battery	Model:VCI-225 (48V DC-225 Ah)
	Continuous operating time : Standard Approx. 270 min : Highspeed Approx. 240 min
	Charging time : 80% Approx. 5 hour : 100% Approx. 10 hour
Charger	Model: NG3
	Input Voltage: AC200V-230V AC (50Hz~60Hz) Single-phase (50Hz to 60Hz)
	Input current : 16A
	Output voltage : 48V
	Output current : MAX 36A

21 SPECIFIC INSTRUCTIONS FOR URW 295 (including 295 with variable outrigger positioning AKA 295-3)

a. Introduction

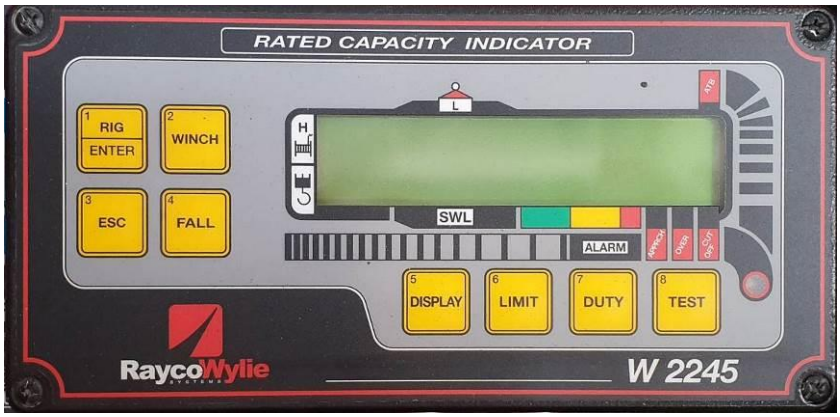
This section of the manual provides additional instructions and information relating to the URW 295 model variants. The majority of features incorporated into the URW 295 follow the same set up and operating procedures as for the URW 095 model, therefore this section of the manual is only concerned with those specific variations in set up and operation of the URW 295 and 295 (variable outriggers) models.

b. URW 295-3

The URW 295-3 is fitted with the additional functionality of a variable position outrigger system, similar to that of the URW 095. Additionally, the 295-3 is equipped with an intelligent sensor system, that feeds back information to an upgraded rated capacity indicator (RCI). The RCI then provides the operator with at-a-glance safety information on where maximum capacity is either reduced or lifting is prohibited, within the set configuration and radius of the crane. For detailed instructions on the function and use of this system, refer to separate instructions provided at Appendix 1 to this manual.

c. Description of Additional Equipment

i. Rated Capacity Indicator (overview)



RaycoWylie 2245 Version

RaycoWylie 4500 Version

The Rated Capacity Indicator (RCI) is a device to provide the operator with audible and visual warnings that the crane is approaching its maximum capacity for the set configuration and further warnings when the maximum capacity is reached. At this point crane operations will be disabled, in addition to audible and visual alarms. The RCI also provides the operator with comprehensive information on the crane configuration during normal operations. For further details on the set up and operation of the RCI and the specific model fitted, see separate instructions at Appendix 1 of this manual.

ii. Outrigger/Crane Sensors (2245 system)

Outrigger Outer Box Sensor

Outrigger Operational Sensor

Outrigger Inner Box Sensor

Boom Angle Sensor

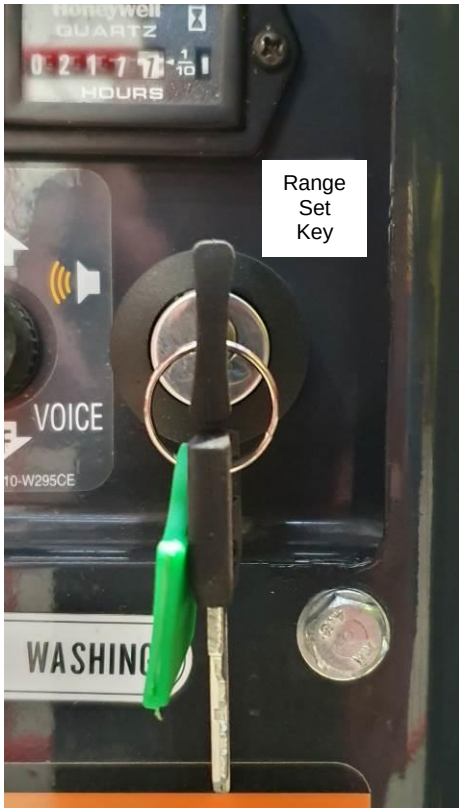
Lower Limit Sensor

Iii Additional Sensors/Components (4500 system)

Boom Angle Sensor

Outrigger Position Sensor

Slew Position Encoder

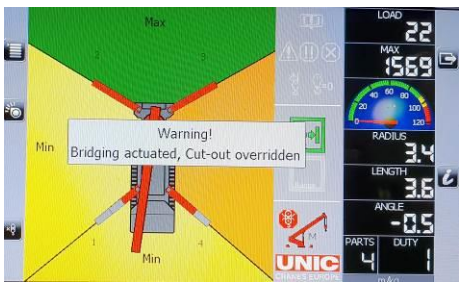


Range Set Key

The range set key allows a range of parameters to be programmed into the RCI via the key switch. These parameters can then be locked in and the key removed. This prevents any alteration of those set parameters until the key switch is activated again, or the RCI is fully reset.

Override Key

The override key provides a method of regaining operation of the crane, in the event of a malfunction of the RCI system, or in the event of an emergency.
Turning the key switch will illuminate the override indicator LED and allow operation of any crane function. To re-instate safety protocols, press the reset button.



Whilst the override function is enabled, the audible alarm system will continuously sound and there is a visible warning on the RCI screen (see image on left of page). The alarms will cancel once the system has been reset.

iv. Function and Checking of the Sensors

All sensors should be checked for condition and security as part of the pre-use inspection. Failure of any of the sensors can result in the Rated Capacity Indicator (RCI) providing incorrect data on the rated capacity for the crane configuration.

Overview – The RCI and crane control system are programmed to automatically select the correct outrigger duty or interpret signals, dependant on the outrigger configuration and any signals received from the sensors. For the outriggers for example, there are two duty settings, “Maximum” and “Not Maximum”, which determine the overall rated capacity of the crane. The crane will only default to “maximum” duty when all four outriggers have been deployed and all sensors on all four outriggers have been activated. In the event of any outer or inner box section sensor not activating, the crane will automatically default to “Not Maximum” duty. An outline of sensor functions follows.

Outrigger Operational Sensor – This sensor provides a signal to the crane control system, which allows hydraulic function of each outrigger, but only when all four outer box sections have been opened and each sensor has been activated.

Outer Box Sensor – This sensor is activated when the outer box section is opened and the pin set is positioned in the “Maximum” duty configuration.

Inner Box Sensor – This sensor will only activate when the inner box section has been fully extended. This is achieved by releasing the locking pin and physically pulling out the inner box section fully.

Boom Angle Sensor – This sensor is located at the base of the main boom, above the winch drum brake assembly and gearbox. This sensor relays signals to the RCI providing information on the angle of the boom during operation.

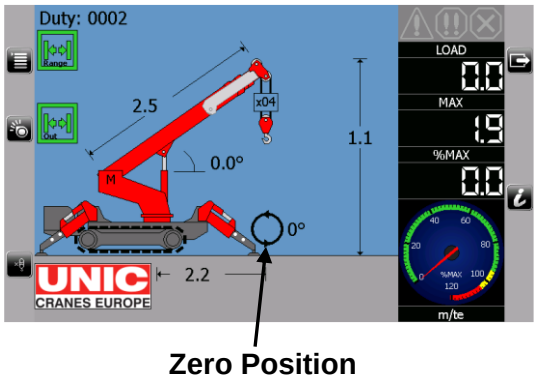
Lower Limit Sensor – This sensor is mounted on the kingpost of the crane just in front of the winch drum brake assembly and gearbox. This sensor de-activates all crane functions when the main boom is lowered on to it.

Upper Limit Sensor – This sensor is mounted on the kingpost of the crane just behind the boom angle sensor. This sensor stops the jib from derricking any further when the boom angle reaches 78°.

Slew Position Encoder (4500 system only) - The encoder is mounted adjacent to the slew ring assembly on the crane chassis. The encoder relays signals to the RCI providing information on the relative position of the main boom, from 0º to 360º.

It is important that a function check of the encoder is performed as part of the pre-use inspection, to ensure the system is correctly calibrated. Failure to carry out this check may result in the crane allowing unsafe operations, which could de-stabilise and possibly tip over the crane. Follow the instructions below to complete the check.

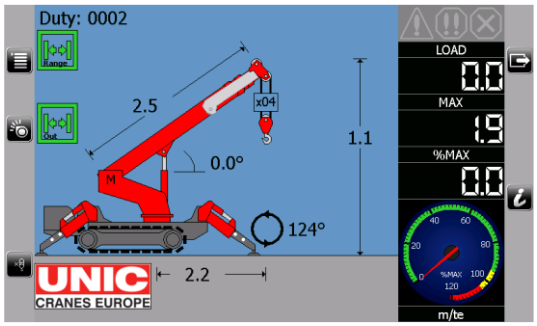
Once the crane has been set up, the boom must be raised sufficiently to clear head height and any other obstructions and positioned at the “zero position” point, directly over the carriage of the crane. A decal at the foot of the crane will indicate the boom is in the correct position. See image on left.



Zero Position

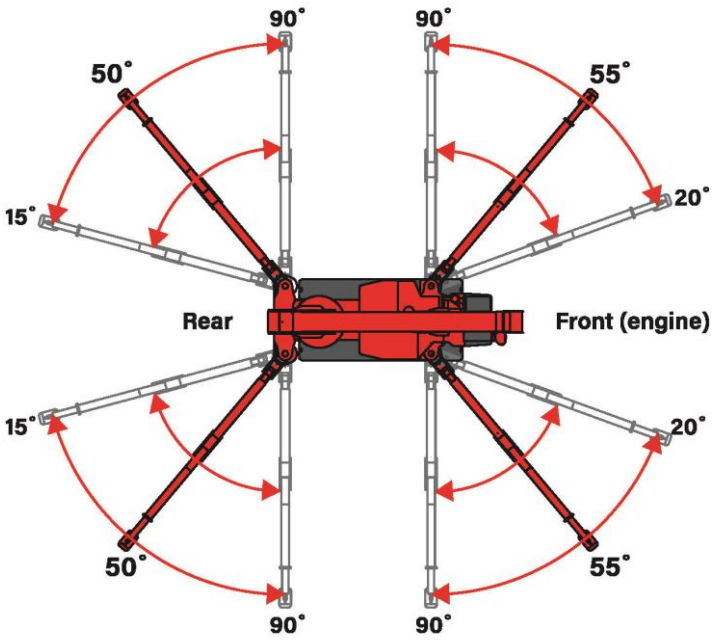
Check the RCI display will indicate the relative position and angle of slew; in the “zero position” it should read 0º. See graphic on left.

The boom must then be slewed through 360º to complete function check.

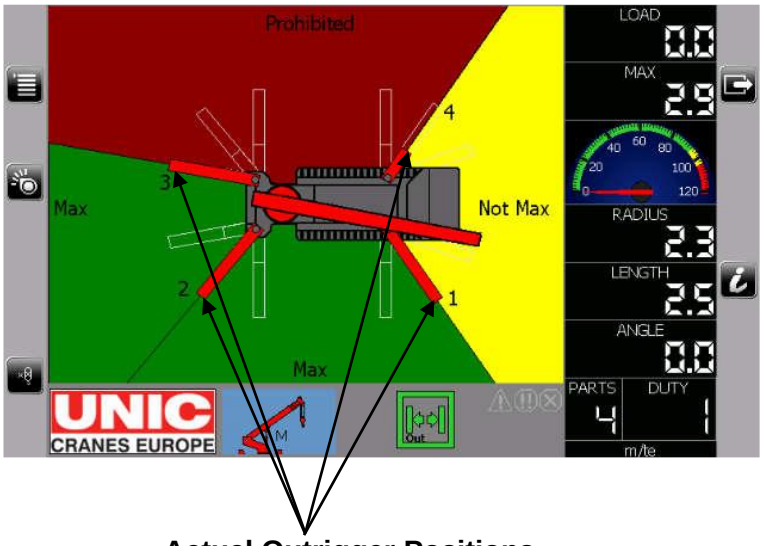


Ths RCI will indicate the boom angle position as it is being slewed through 360º.

Outrigger Position Sensor (4500 system only) – Mounted at the joint between outrigger and main chassis, this sensor relays signals to the RCI providing information of the pin set position of each outrigger. The variable positions are shown below.



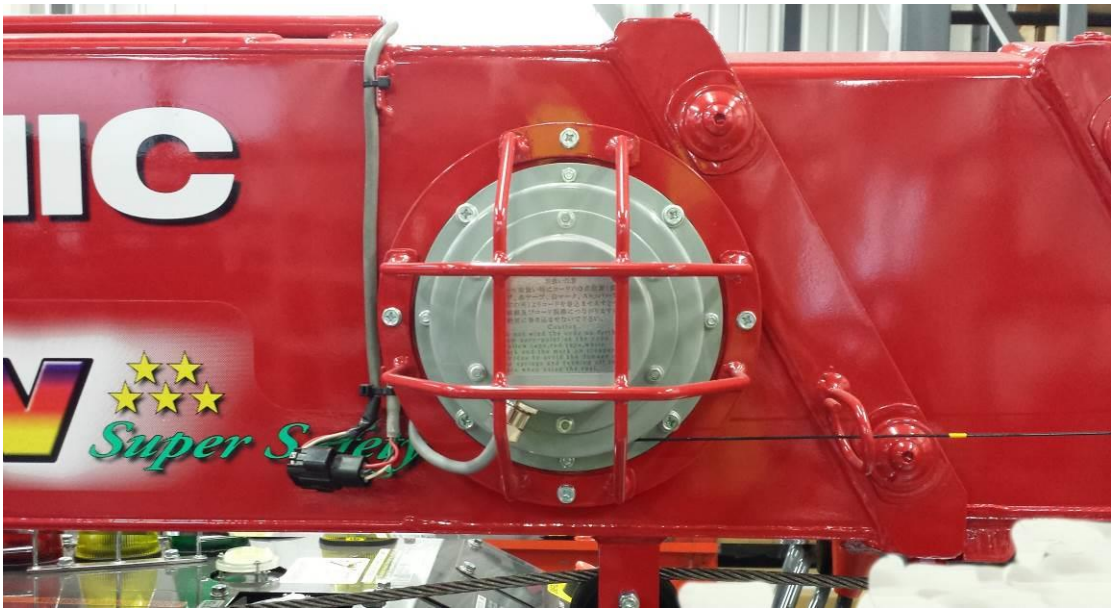
Each outrigger can be set in 3 different positions. Once the outriggers have been deployed, the RCI will indicate the actual position of the outriggers on the display screen, as shown below.



Actual Outrigger Positions

It is important that a visual check is made to both the RCI screen and the actual real time position of each outrigger, in order to confirm the system is functioning properly. Failure to carry out this check may result in the crane allowing unsafe operations, which could de-stabilise and possibly tip over the crane.

v. Boom Length Detector (Recoil Drum)



This device consists of an electrical sensor attached to a sprung loaded cable reel, the end of the cable being attached to the end of the 5th boom section. As the boom extends, the cable is pulled outwards, measuring the boom length and relaying this signal back to the RCI. Care must be exercised not to trap or entangle this cable during normal operation, this may result in damage or the cable breaking, which will render the device unusable.

d. ***Rated Load Chart URW 295***

This chart shows the load that can be lifted for a specified combination of boom length and working radius.

Boom-sections extended: 1 & 1+2

Working radius (m)		1.0	1.4	1.5	1.8	2.0	2.5	3.0	3.5	3.835
Rated load (t)	Outriggers extended to maximum	2.9	2.9	2.65	2.25	2.05	1.65	1.3	1.0	0.9
	Outriggers extended not to maximum	2.0	2.0	2.0	1.45	1.1	0.65	0.49	0.35	0.25

Boom-sections extended: 1+2+3

Working radius (m)		2.2	2.5	2.9	3.0	3.5	4.0	4.5	5.0	5.37
Rated load (t)	Outriggers extended to maximum	1.35	1.35	1.35	1.25	1.0	0.8	0.65	0.52	0.43
	Outriggers extended not to maximum	0.8	0.65	0.53	0.5	0.38	0.28	0.22	0.16	0.12

Boom-sections extended: 1+2+3+4

Working radius (m)		3.4	3.8	4.0	4.5	5.0	5.5	6.0	6.5	6.89
Rated load (t)	Outriggers extended to maximum	0.85	0.85	0.75	0.6	0.5	0.42	0.36	0.32	0.27
	Outriggers extended not to maximum	0.42	0.34	0.3	0.25	0.19	0.14	0.1	0.08	0.06

Boom-sections extended: 1+2+3+4+5

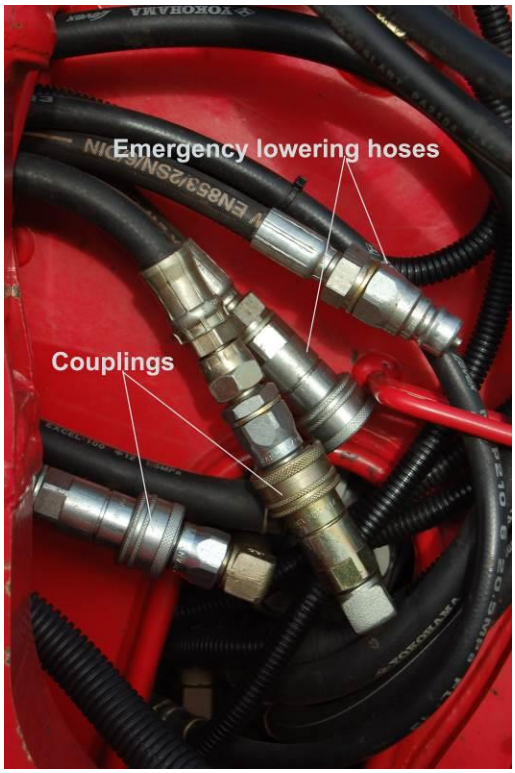
Working radius (m)		3.8	4.1	4.5	5.0	5.5	6.0	6.5	7.0	8.0	8.41
Rated load (t)	Outriggers extended to maximum	0.55	0.55	0.45	0.37	0.31	0.27	0.23	0.2	0.15	0.13
	Outriggers extended not to maximum	0.35	0.29	0.25	0.2	0.16	0.13	0.1	0.07	0.04	0.03

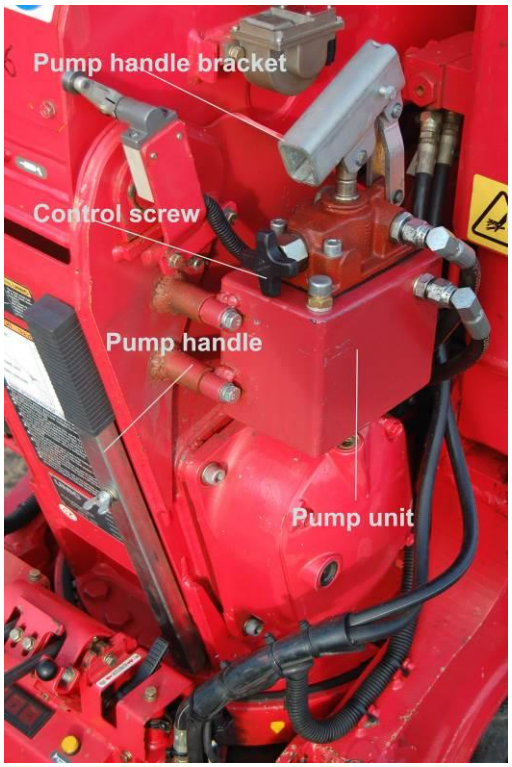
The chart shows lifting capacity when the crane is set up level with the outriggers extended. The data is based on actual working conditions which incorporates movement due to boom deflection under load

The rated loads specified are based upon the strength of the crane and stability of the carrier.
Ensure that the rated load is correct for the extension of the outriggers

e. ***Emergency Lowering Device (where fitted)***

On certain models, primarily as an additional safety measure for specific lifting operations, an emergency lowering pump may be fitted as shown below.





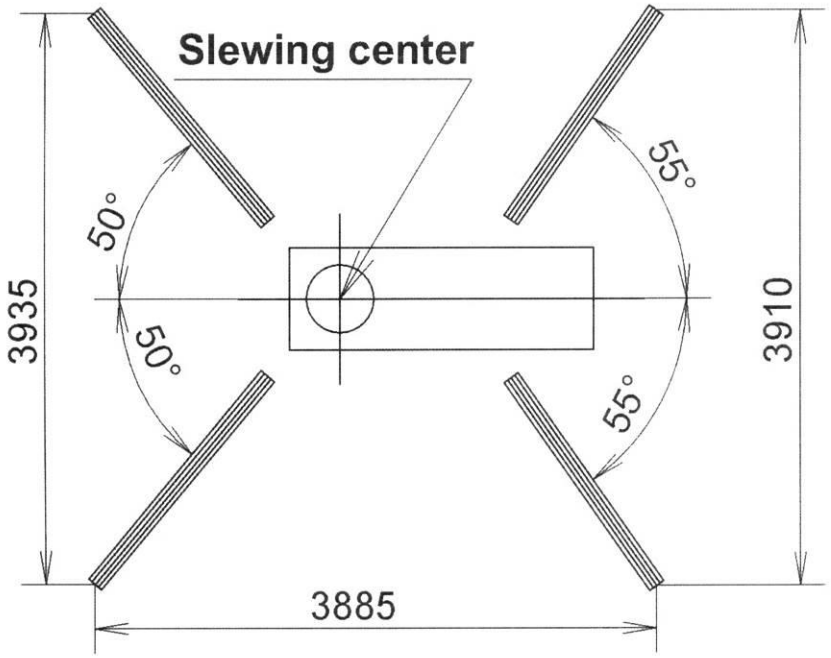
Set up and operation

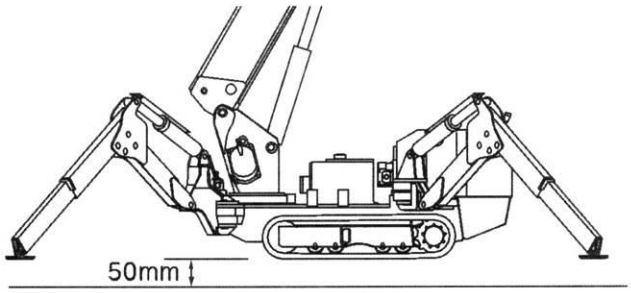
- Ensure engine is switched off
- Disconnect winch hydraulic hoses from quick release couplings on left hand side of crane kingpost
- Re-connect emergency lowering hoses into their male and female couplings respectively
- Remove pump handle from crane kingpost by undoing the securing wing nut
- Insert pump handle into pump handle bracket
- Ensure control screw is turned fully clockwise before operation of pump
- To disconnect carry out these instructions in reverse.

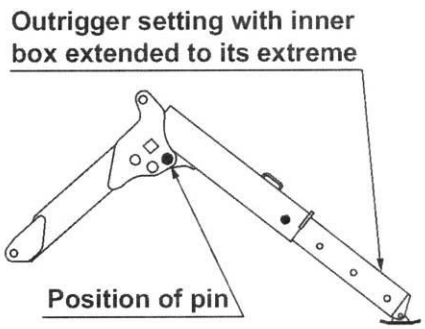
NB This device is fitted for emergency purposes only in the event of complete failure of the winch. Once the load has been lowered to safety, contact UNIC Cranes Europe as soon as possible in order to rectify the fault

f*.** ***Extension and Footprint of Outriggers

The outriggers on the URW 295 may only be set at the standard angles as shown below. On the URW 094/095 models there are a number of optional angles that maybe selected other than standard. Note this is not permissible on the 295 model.







g. ***URW 295 Specification (Diesel)***

Model		**URW295C4E/C4E-1 (5-section boom)**
Crane capacity		2.93t × 1.4m (With outriggers extended fully)
Maximum lift above ground (Hook)		Approx. 8.8m with 4-part line
Boom section extensions:		2.53m ~ 4.075m ~ 5.61m ~ 7.13m ~ 8.65m
Maximum working radius		8.41m
Winch speed (Rope speed)		40m/min (At 4th layer on the drum)
Hoisting speed of hook		10m/min (At 4th layer on the drum, with 4-parts of line)
Extension speed of boom		6.12m/22 sec
Derricking speed of boom		0° ~ 78°/12 sec
Slewing speed		1.5 r.p.m
Slewing range		360°(continuous)
Hoist rope	Construction	IWRC 6×WS (26) Class B (Breaking load: 43.1kN{4395kgf})
	Diameter×length	8mm×54.0m
Outrigger		Double acting hydraulic cylinder (directly connected to hydraulic automatic locking device)
Hydraulic pump	Rated pressure	Crane: 20.6MPa(210kgf/cm^2) Travel: 21.6MPa(220kgf/cm^2)
	Rated discharge	Approx. 30 L/min
	Rated rotation	Approx. 2600rpm
Hydraulic oil tank Capacity		27 liters

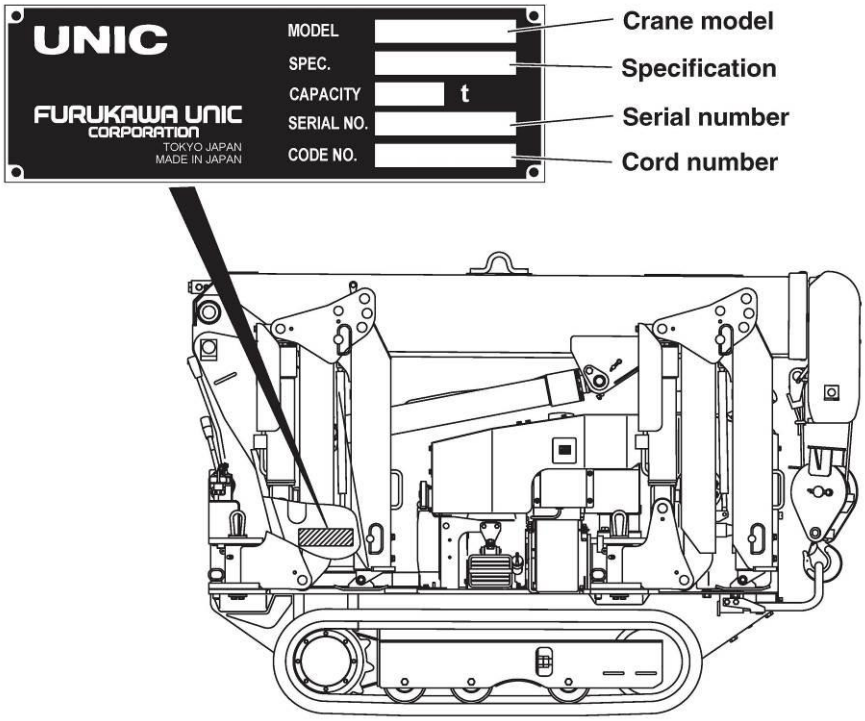
Model	URW295C4E/C4E-1 (5-section boom)
Boom telescoping	Boom:5-section, Hexagonal box beam
	Direct pressure from hydraulic cylinder and wire rope (With hydraulic automatic locking device) (2nd & 3rd sections: sequential actuation, 4th & 5th sections: simultaneous actuation)
Boom derricking	Direct pressure from hydraulic cylinder (With hydraulic automatic locking device)
Hoisting	Hydraulic motor: Axial plunger type
	Reduction gears: Spur-gear reduction
	Brake: Automatic mechanical brake
Slewing	Hydraulic motor: Trochoid type (With hydraulic automatic locking device)
	Reduction gears: Worm gear + Spur gear reduction (Supported by ball bearings)
	Brake: Worm self-lock
Hydraulic pump	Variable delivery piston pump
Hook capacity	2.9t Number of lines of rope: 4
Safety devices	Pressure relief valve for hydraulic circuit
	Hydraulic automatic lock (Counterbalance valves and pilot-operated check valves)
	Device to prevent overload (Load meter)
	Automatic stop for over-hoisting
	Over-hoisting alarm
	Load indicator (With angle meter)
	Alarm buzzer
	Hook safety latch
	Interlock for crane-crawl lever and outriggers
	Spirit Level
	Turnover prevention device
Weight	Approx. 1920kg

Model	URW295C4E/C4E-1 (5-section boom)
Track type	Endless rubber crawler
Track size	180×40×72FR
Length of ground contact	1050mm
Pressure of ground contact	49.8kPa (0.51kgf/cm^2)
Crawling speed	Forward/Backward: 0~2.0km/h
Maximum incline	20°
Engine	Rated output : 7.2kW (9.8PS)/2600rpm
	Model : Z482-E4B-CNFK-1 (Kubota Co. Ltd.
	Displacement : 479 cm^3
	Fuel type : Diesel
Drive system	Independently driven by hydraulic power
Braking system	Disc brake with hydraulic built in motor
Engine starting system	Electric starter
Fuel tank	Capacity: 10 liters

22 SPECIFIC INSTRUCTIONS FOR URW 094

a. Introduction

This section of the manual provides additional instructions and information relating to the URW 094 model variant. The majority of features incorporated into the URW 094 follow the same set up and operating procedures as for the URW 095 model, therefore this section of the manual is only concerned with those specific variations in set up and operation of the URW 094 model.



b. Loading and Unloading using a Crane

When loading and offloading the 094 with another crane, only use the lifting points shown below. Use of other points for lifting may result in failure of the suspension point or lifting gear. This may cause serious or fatal injury to personnel and serious damage to the crane.

094 Lifting points

Ensure the hook is correctly stored before lifting the crane via the lifting points, see page 194 for further information.

Always ensure that the lifting points are fitted with shackles of the correct size and capacity. Use of the wrong type will result in damage to, and maybe failure of, the lifting point or lifting accessory.

Loading and off-loading operations must only be carried out by an operator authorised to use the type of equipment used. Loading/unloading operations must always be supervised by a competent person.

Where a ramp is used, that is not an integral part of the transport vehicle, it must be of sufficient strength to bear the weight of the crane. It must be at least four times as long as the height of the truck platform. For further details read the Loading and Unloading Procedures information plate.

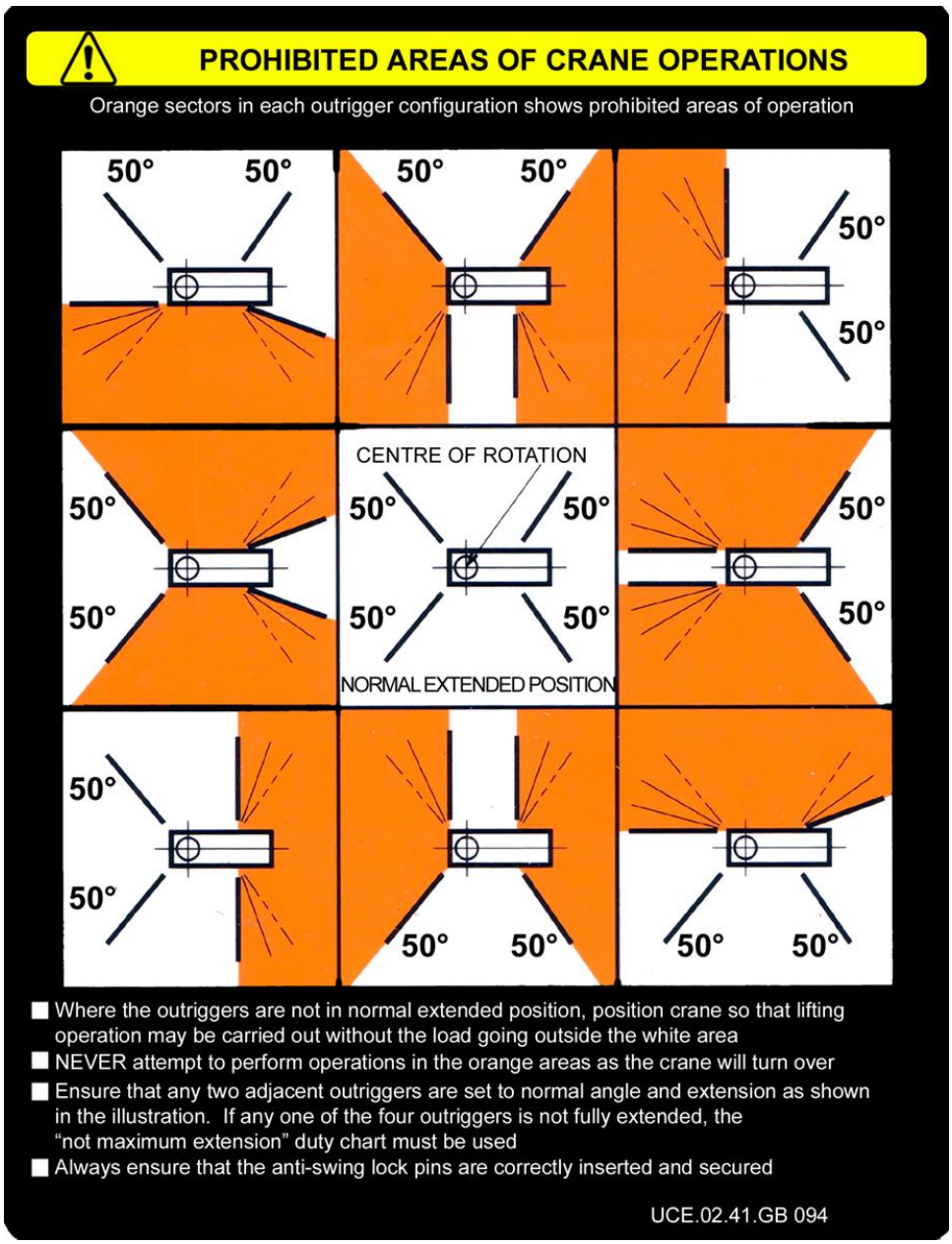
c. Important Points to Note - URW 094C

This section provides additional safety information for operators. The URW 094C is based on, and is similar in operation to, the URW 095C. However, there are some extremely critical differences that the operator must be aware of before operating this particular crane.

i. Outrigger Settings

Important: Each outrigger on this model has variable pin settings on the carrier chassis and can be configured in any one of five different positions; in order for the crane to be set up so that the boom can be slewed safely throughout its 360 degree range, the angle of the outriggers must be positioned to an angle of 50° at both the front and rear of the crane (see illustration below). This is known as the “standard” operating position and is indicated on the crane by yellow arrow decals on both the carrier chassis and each outrigger. If the outriggers are positioned to any other position other than the one mentioned above, the safe slew area becomes restricted and is indicated by a decal located close to the control levers on the crane (as per illustration on next page). This feature is similar to that of the 095 model.

The outriggers on the URW 094C may be set independently in a number of positions. It is important to note that any change from the Standard Position will affect the safe operational areas of the crane.
If any changes are made from Standard Position, then reference must be made to the 'Prohibited Area of Operations' decal on the crane to determine where lifting is permitted.



UNDER NO CIRCUMSTANCES MAY LIFTING OPERATIONS TAKE PLACE IN AN AREA DESIGNATED AS PROHIBITED (ORANGE ARC) ON THE DECAL. NOT EVEN IN AN EMERGENCY

Additionally, one pin set hole on each outrigger at the carrier chassis is marked in blue; this is intended to simplify the identification of the correct pin location when setting the outriggers up in “standard” configuration only (See illustration below). When setting up the outriggers in any other configuration than standard, refer to the prohibited area chart for further guidance.

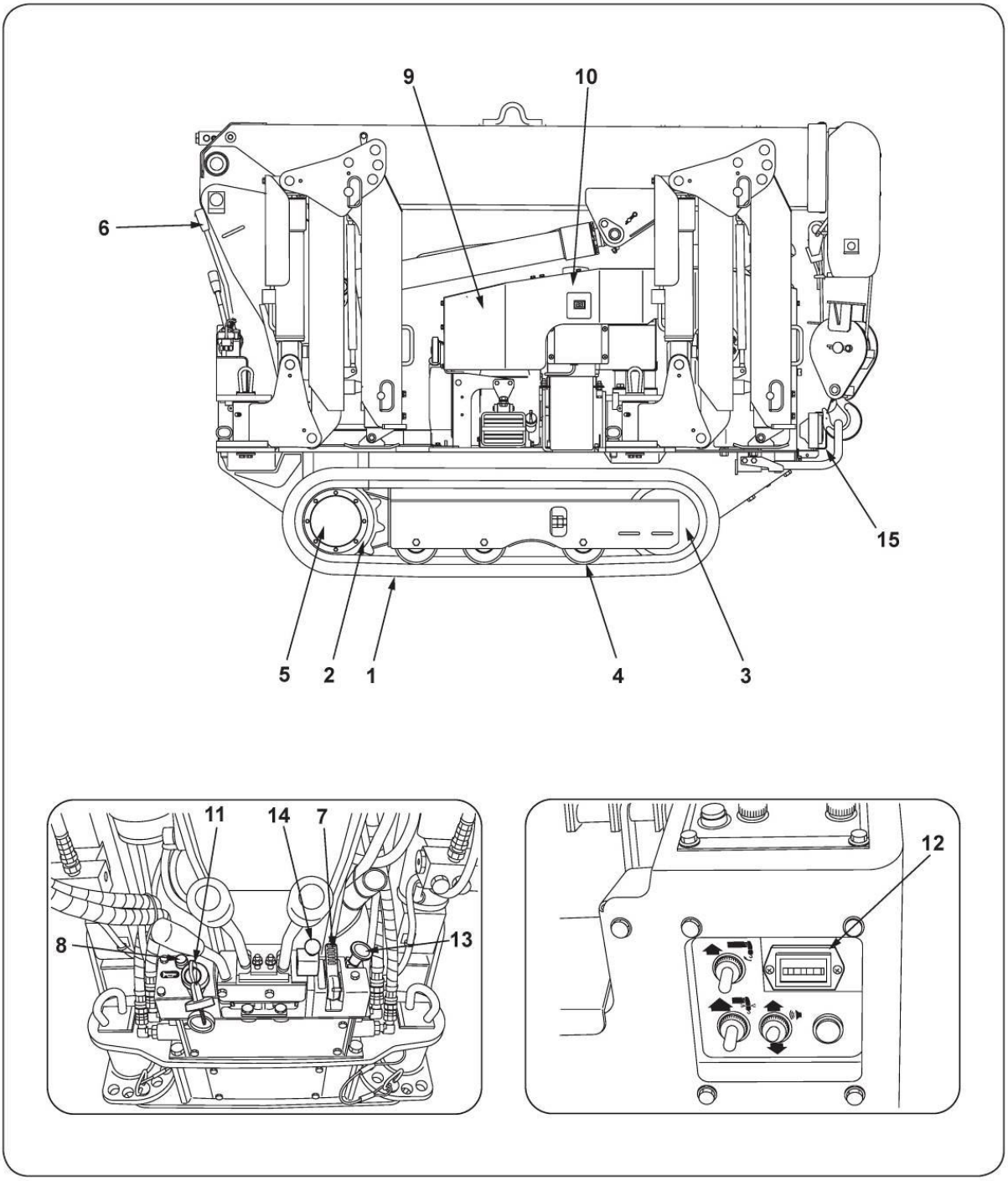
ii. Audible/Visual Warning Devices

The 094 is fitted with the voice control system, providing warnings of over-hoisting and indication when the hook is being stored.

It is very important to note however, that the 094 model is not fitted with any rated capacity indicator (295) or turn over protection system (095), therefore the crane will not provide the operator with any visual or audible warnings of approaching maximum capacity, overload or instability, during operation.

d. Description of Carrier Equipment

1. **Crawler Track**. Cored bar and steel fabric cords are integrally moulded into the rubber
2. **Wheel Sprocket.** Transmits the drive to the track.
3. **Idle Roller.** Supplies the correct tension to the track.
4. **Truck Roller.** Supports the weight of the crane and rolls on the rubber track.
5. **Travel Motor.** Hydraulic motor with reduction gearing built inside the wheel sprocket housing.
6. **Travel Lever.** Allows the operator to change the direction of the machine and control travel speed.
7. **Accelerator Lever.** Controls engine speed in travel mode only.
8. **Horn Switch.**
9. **Fuel Tank.** Lead free petrol only.
10. **Hydraulic Oil Tank.** This reservoir supplies both the carrier and the crane.
11. **Starter Switch.**
12. **Hour Meter.** This indicates total cumulative engine running time.
13. **Choke Knob.**
14. **Lock Lever.** Holds the travel lever stand in position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e. ***<u>Description of Crane Equipment</u>***

1. **Boom or Jib.** Extends and retracts by hydraulic power.

2. **Column or Kingpost.** Vertically mounted member on which boom, winch and derrick cylinders are mounted. This can be slewed 360 degrees.

3. **Frame.** This is the carrier and supports the column and outriggers.

4. **Hoist Winch.** For rotating the wire rope drum.

5. **Slewing Device.** Rotates the column via hydraulic motor.

6. **Derricking Cylinder.** Raises and lowers the boom.

7. **Telescoping Cylinder.** Extends and retracts the boom.

8. **Outrigger.** This supports and stabilises the crane during operation.

9. **Crane Operating Lever.** Respective levers operate crane functions, such as raising and lowering boom, telescoping and slewing boom, raising and lowering load.

10. **Outrigger Control Lever.** Lever controls raising/lowering and extending/retracting outriggers.

11. **Hook.**

12. **Over-hoisting Alarm.** Alerts the operator that the hook is approaching the top of the boom and they should stop hoisting otherwise damage and/or loss of the load could occur.

13. **Load Meter.**

14. **Warning Horn.** Depressing the button activates the horn manually to warn others of your presence.

15. **Wire Rope.**

16. **Load Indicator.**

17. **Automatic Stop.** This device stops the drum automatically when the wire rope is approaching 3 turns left on the drum.

18. **Level.** This is for checking the horizontal plane of the crane body.

19. **Outrigger Selection Switches.** These select the active outrigger and its direction.

20. **Slew Restrictor (Boom Storage only).** Limits rotation of the boom to avoid striking the crane/controls during boom storage operation.

21. **Outrigger Monitor Lamps**. Green lamps will illuminate when ground contact is made with each individual outrigger. Crane will not operate unless all four lights are illuminated.

22. **Boom Storage Monitor Lamp.** When the boom is stored correctly, the green lamp will illuminate.

23. **Operation Mode Switch.** Selects between crane and outrigger operation.

24. **Remote Control Selector Switch.** This is for selecting or deselecting the radio remote control.

25. **Voice Control Switch.** Toggles between voice on and off.

26. **Over-Hoisting Override Switch.** In the event of the over-hoist device being activated, operating this switch allows continued operation of the hook or boom telescoping.

NOTE: This switch should only be operated as a last resort when movement cannot be achieved by any other means.

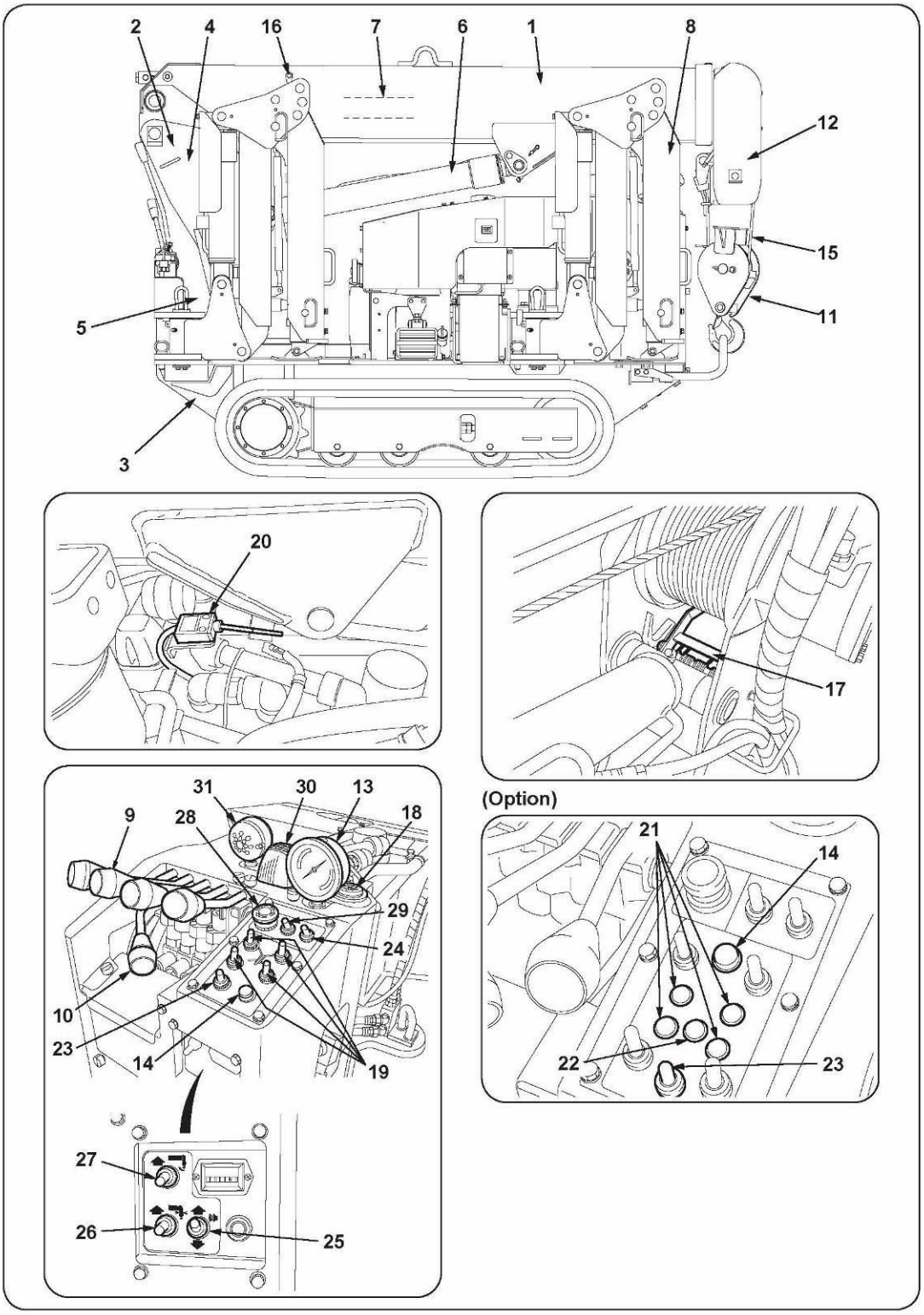
27. **Hook Storing Switch.** Toggle and hold the switch to bring the hook block into its storage position.

28. **Emergency Stop Button.** Pressing the button will disable all crane and travel functions and stop the engine, but will not isolate the battery.

29. **Work light Switch.** Toggles between on and off.

30. **Outrigger Mode Indicator Lamp.** Illuminates when the operation mode switch is set to outrigger mode.

31. **Control Mode Indicator Lamp.** Illuminates when the control mode selector switch is set to radio remote control.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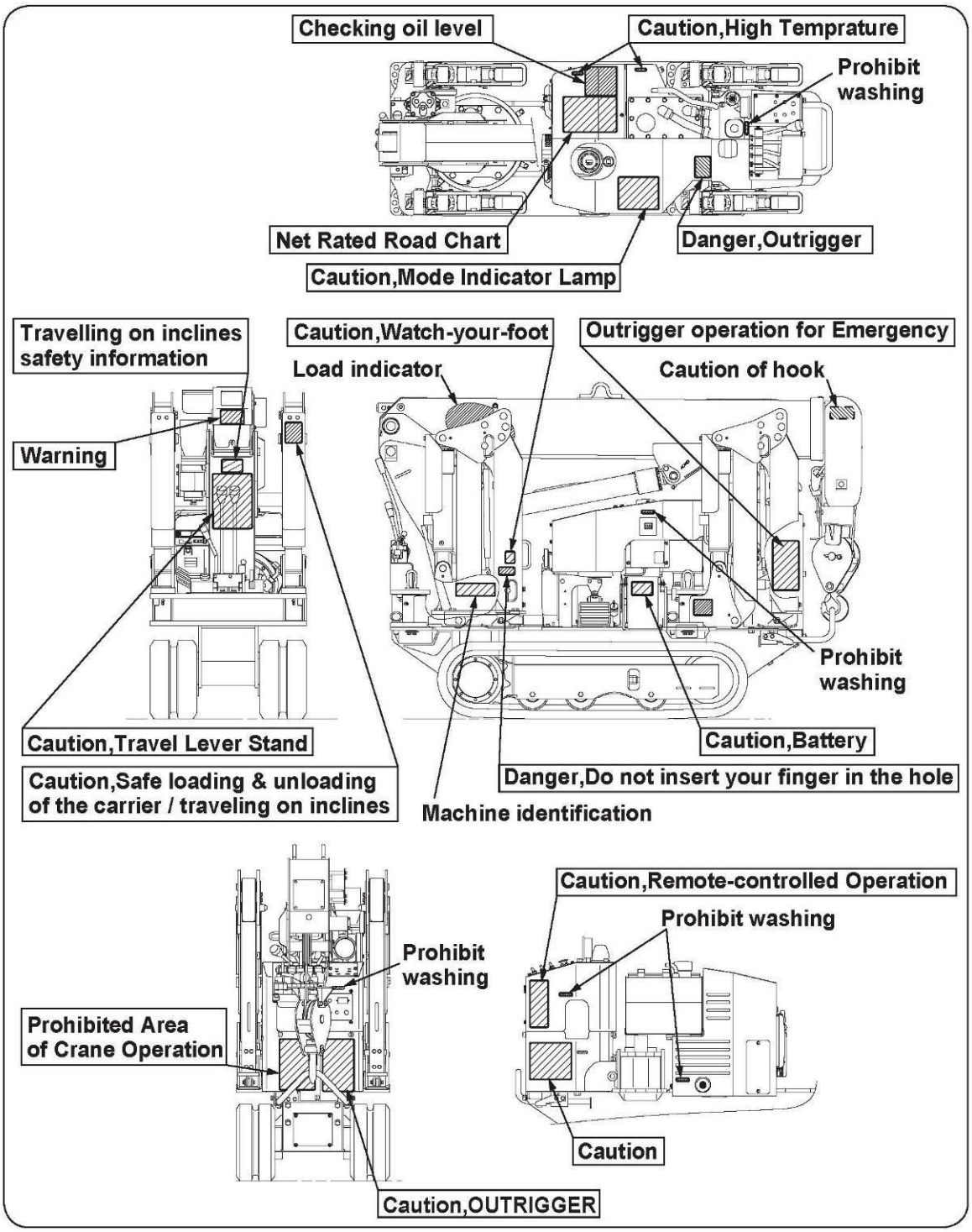
f. ***Information Plates***

i. 094 Position of information plates

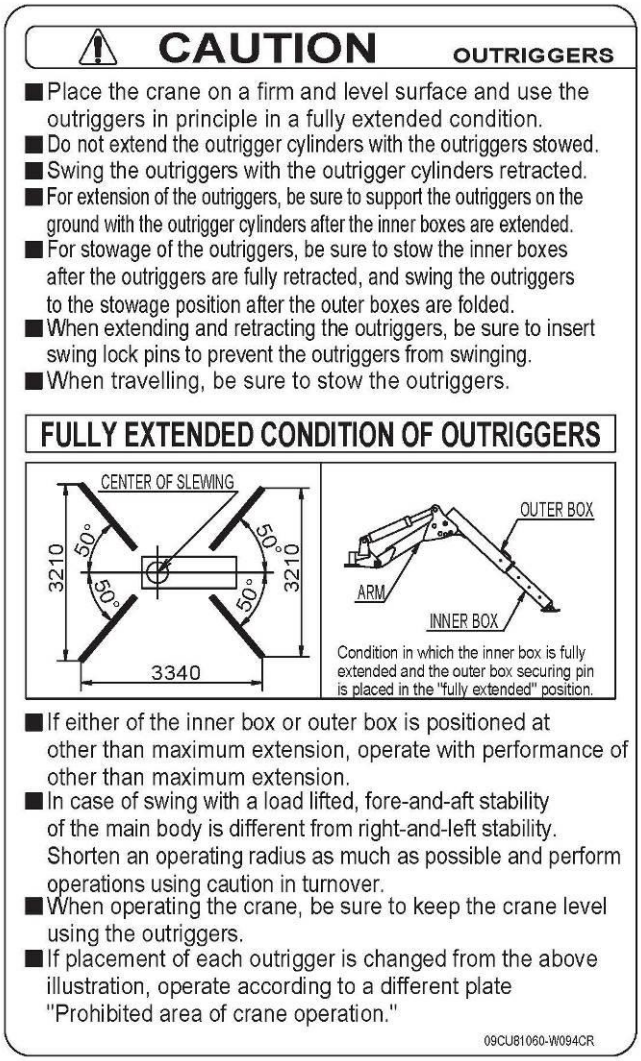


g. ***Index of Decals***

Decal	Description	Model	Qty
UCE 01.36	094 Total Weight	094	1
UCE 01.38a	094 Noise Level	094	1
09CU81060	Outrigger Positions	094	1
09CU81050	Outrigger Prohibition	094	1
09CU81270	Outrigger Emergency	094	1
09CU81131	Working Range Chart	094	1
09CU81010	Caution!	094	1

UCE 01.36

UCE 01.38a



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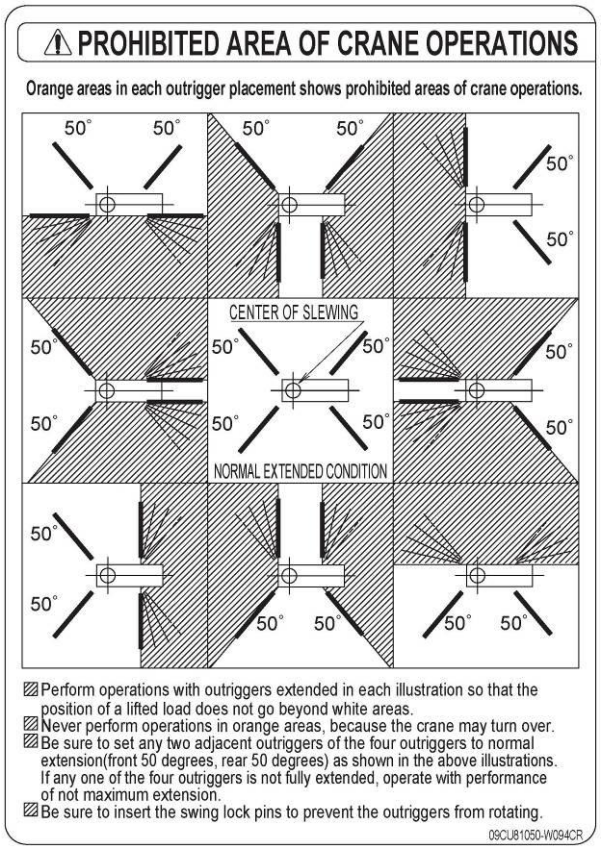

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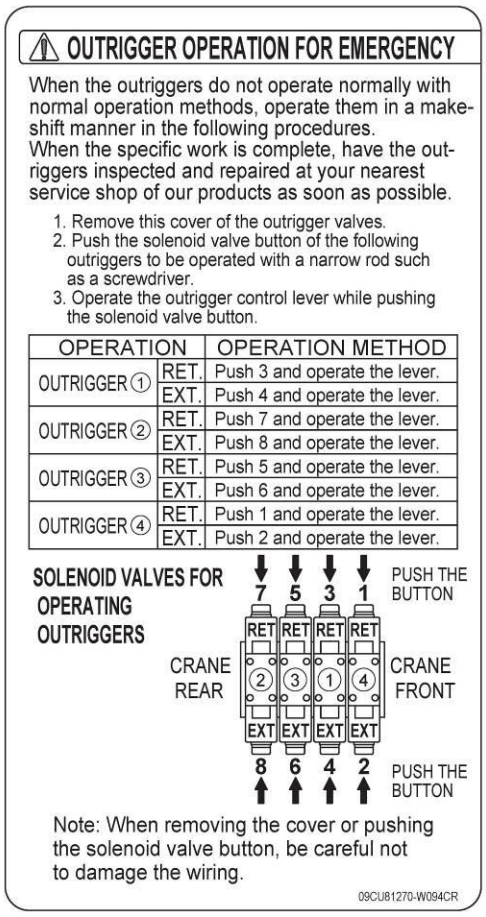

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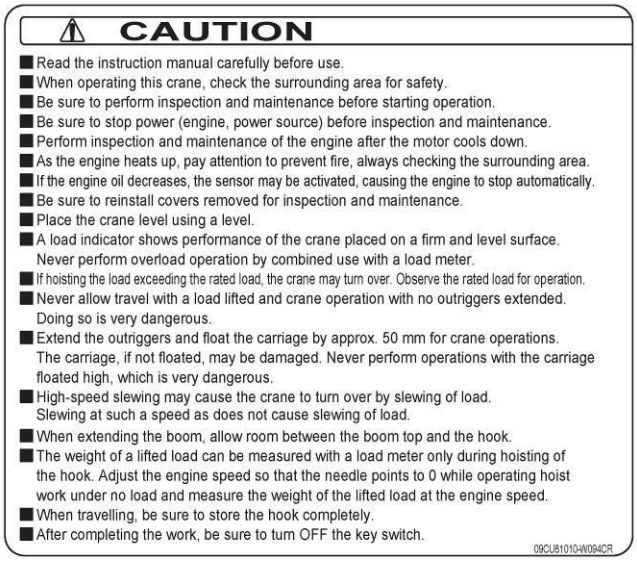

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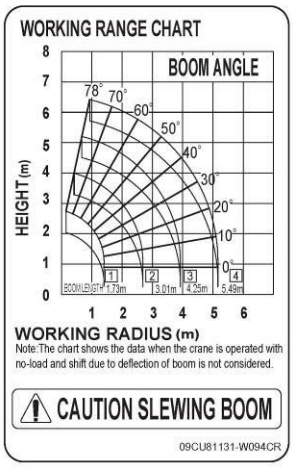

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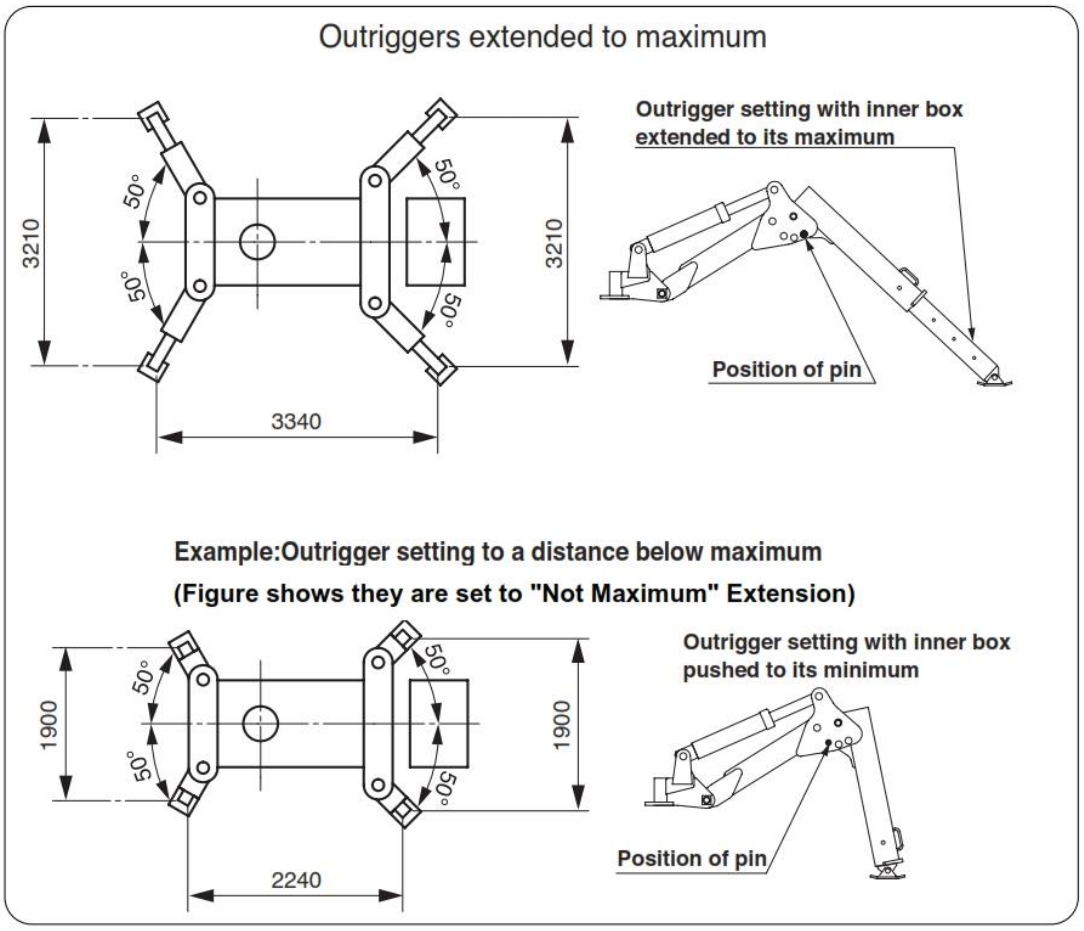
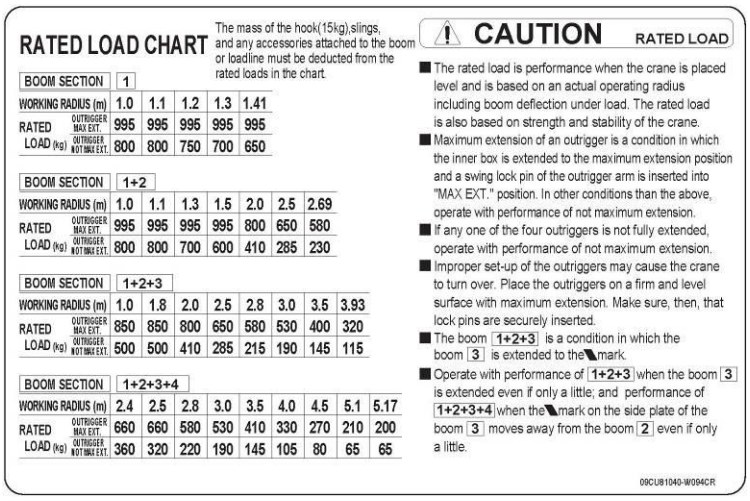
h. Extension and Footprint of Outriggers



The load capacities displayed on the rated load chart show both maximum outrigger extension and not maximum extension.



RATED LOAD CHART

The mass of the hook(15kg),slings, and any accessories attached to the boom or loadline must be deducted from the rated loads in the chart.

BOOM SECTION	1				
WORKING RADIUS (m)	1.0	1.1	1.2	1.3	1.41
RATED LOAD (kg) OUTRIGGER MAX EXT.	995	995	995	995	995
RATED LOAD (kg) OUTRIGGER NOT MAX EXT.	800	800	750	700	650

BOOM SECTION	1+2						
WORKING RADIUS (m)	1.0	1.1	1.3	1.5	2.0	2.5	2.69
RATED LOAD (kg) OUTRIGGER MAX EXT.	995	995	995	995	800	650	580
RATED LOAD (kg) OUTRIGGER NOT MAX EXT.	800	800	700	600	410	285	230

BOOM SECTION	1+2+3							
WORKING RADIUS (m)	1.0	1.8	2.0	2.5	2.8	3.0	3.5	3.93
RATED LOAD (kg) OUTRIGGER MAX EXT.	850	850	800	650	580	530	400	320
RATED LOAD (kg) OUTRIGGER NOT MAX EXT.	500	500	410	285	215	190	145	115

BOOM SECTION	1+2+3+4								
WORKING RADIUS (m)	2.4	2.5	2.8	3.0	3.5	4.0	4.5	5.1	5.17
RATED LOAD (kg) OUTRIGGER MAX EXT.	660	660	580	530	410	330	270	210	200
RATED LOAD (kg) OUTRIGGER NOT MAX EXT.	360	320	220	190	145	105	80	65	65

⚠ CAUTION RATED LOAD

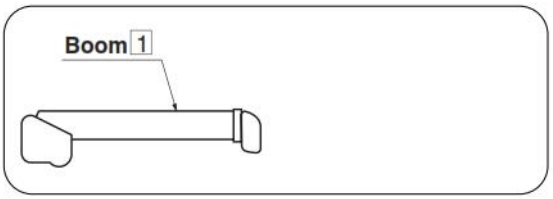
- The rated load is performance when the crane is placed level and is based on an actual operating radius including boom deflection under load. The rated load is also based on strength and stability of the crane.
- Maximum extension of an outrigger is a condition in which the inner box is extended to the maximum extension position and a swing lock pin of the outrigger arm is inserted into "MAX EXT." position. In other conditions than the above, operate with performance of not maximum extension.
- If any one of the four outriggers is not fully extended, operate with performance of not maximum extension.
- Improper set-up of the outriggers may cause the crane to turn over. Place the outriggers on a firm and level surface with maximum extension. Make sure, then, that lock pins are securely inserted.
- The boom 1+2+3 is a condition in which the boom 3 is extended to the ◥ mark.
- Operate with performance of 1+2+3 when the boom 3 is extended even if only a little; and performance of 1+2+3+4 when the ◥ mark on the side plate of the boom 3 moves away from the boom 2 even if only a little.

09CUB1040-W094CR

When using the crane, if any one of the four outriggers is extended to not maximum, the load capacity should be taken as not maximum duty. When using the crane in this configuration it must be operated by making reference to and using the not maximum extension load capacities indicated on the rated load chart. **Failure to do this could lead to loss of stability resulting in the crane over-turning.**

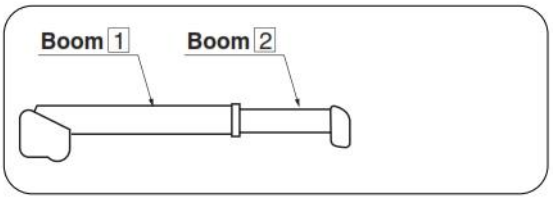
i. ***How Boom Sections are Extended***

4 - Section Boom



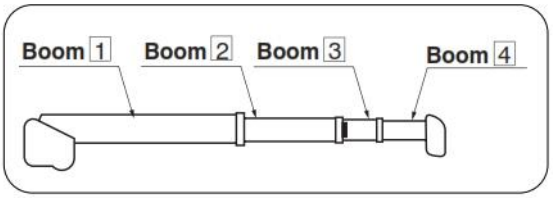
Boom: 1

All boom sections are retracted



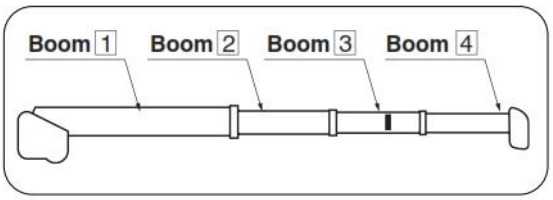
Boom: 1+2 or 2

Only boom section 2 is extended



Boom: 1+2+3 or 3

Boom section 3 is fully extended when the mark ▰ is visible



Boom: 1+2+3+4 or 4
Boom sections 2, 3 and 4 are all fully extended

j. ***Rated Load Chart URW094C***

This chart shows the load that can be lifted for a specified combination of boom length and working radius.

Boom-sections extended: 1

Working radius (m)		1,0	1,1	1,2	1,3	1,41
Rated load (t)	Outriggers extended to maximum	0,995	0,995	0,995	0,995	0,995
	Outriggers extended not to maximum	0,8	0,8	0,75	0,7	0,65

Boom-sections extended: 1+2

Working radius (m)		1,0	1,1	1,3	1,5	2,0	2,5	2,69
Rated load (t)	Outriggers extended to maximum	0,995	0,995	0,995	0,995	0,8	0,65	0,58
	Outriggers extended not to maximum	0,8	0,8	0,7	0,6	0,41	0,285	0,23

Boom-sections extended: 1+2+3

Working radius (m)		1,0	1,8	2,0	2,5	2,8	3,0	3,5	3,93
Rated load (t)	Outriggers extended to maximum	0,85	0,85	0,8	0,65	0,58	0,53	0,4	0,32
	Outriggers extended not to maximum	0,5	0,5	0,41	0,285	0,215	0,19	0,145	0,115

Boom-sections extended: 1+2+3+4

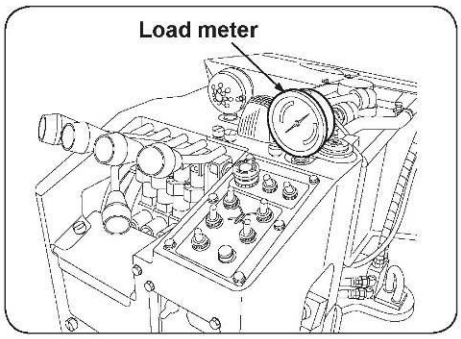
Working radius (m)		2,4	2,5	2,8	3,0	3,5	4,0	4,5	5,1	5,17
Rated load (t)	Outriggers extended to maximum	0,66	0,66	0,58	0,53	0,41	0,33	0,27	0,21	0,2
	Outriggers extended not to maximum	0,36	0,32	0,22	0,19	0,145	0,105	0,08	0,065	0,065

The chart shows lifting capacity when the crane is set up level with the outriggers extended. The data is based on actual working conditions which incorporates movement due to boom deflection under load

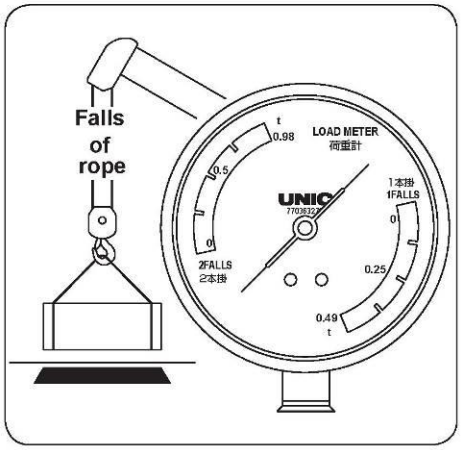
The rated loads specified are based upon the strength of the crane and stability of the carrier.
Ensure that the rated load is correct for the extension of the outriggers

k. ***LOAD METER URW 094***

i. Load Meter Overview



- The meter shows the weight of a load being hoisted. Read the scale band corresponding to the number of falls of rope



- The dial of the meter has scale bands corresponding to the configuration of falls of rope, either single or 2 falls.

ii. Using the 094 Load Meter

Attach hook to load, use a lifting sling which will allow the hook to have sufficient free upward travel (approximately 30 – 60cm) before the load is hoisted.

Run the engine at slow speed. Adjust the hoisting speed of the hook so that the needles point to 0 on the meter. Continue to lift the cargo with the hoist lever in EXACTLY the same position. Any movement from this position will cause very inaccurate readings.

For Example:

With the boom extended to 1+2+3 using a 2 fall system. The boom load indicator shows at Point (a) that the crane can lift 0.5t at that extension and elevation. This indicates a maximum load of 500kg. (See Fig.1 on facing page).

Read the load meter as the load is being hoisted by the above method to approximately 30cm off the ground.

The meter shows at Point (b) a weight of 0.24t, which is the indicated load weight. This means that the crane is being operated with a safety margin of 0.26t in this example. The long needle of the indicator is to be used and will be read from the 2 fall scale. See Fig.2 on facing page).

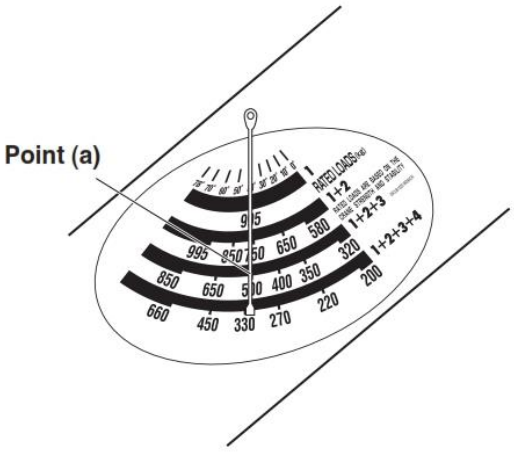


Fig. 1. Load indicator

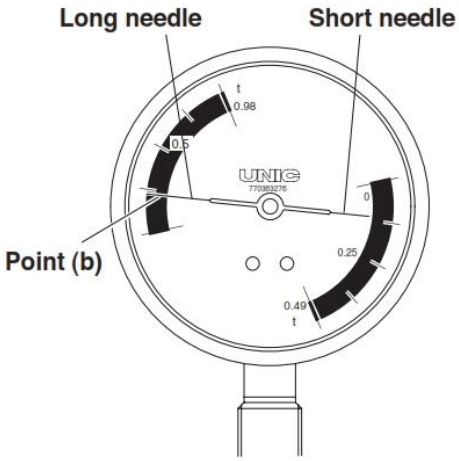
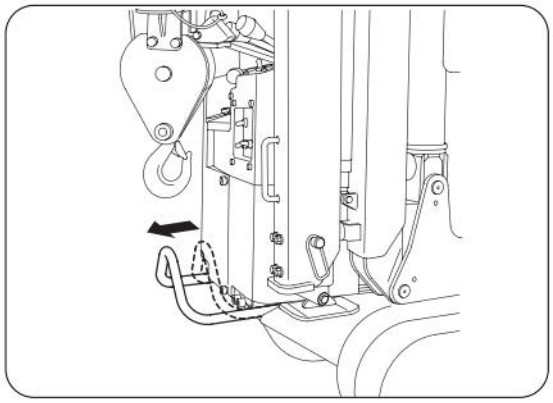


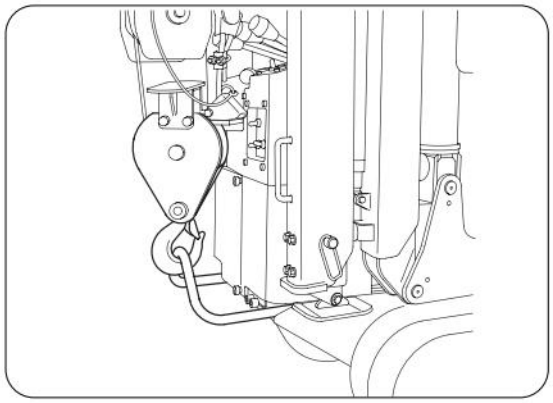
Fig. 2 Load meter

The load meter is for guidance only. Overloading of the crane will result in loss of stability and may lead to the crane overturning. Always operate within the capacity of the crane and remember that there are no turn over protection devices fitted to this model.

I. ***Storing the hook***

The hook can be stored in the same manner as described in Section 11 on page 69 of this manual. However due to the fact that the crane lifting points on the 094 model are located on the main boom section, there is a risk that the main boom derricking cylinder could be extended during lifting of the crane. Therefore if the 094 is likely to be lifted with another crane, the hook must be stored as described below.



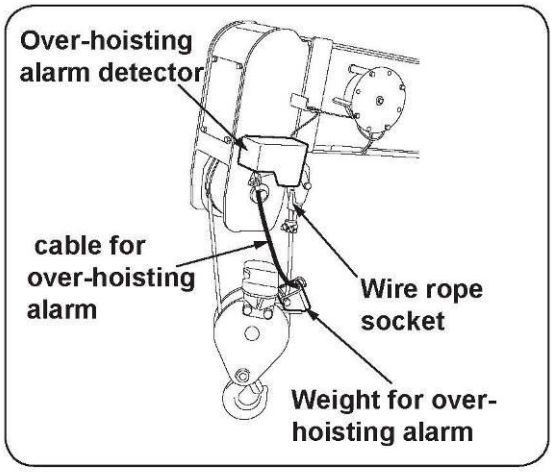


Set up and operation

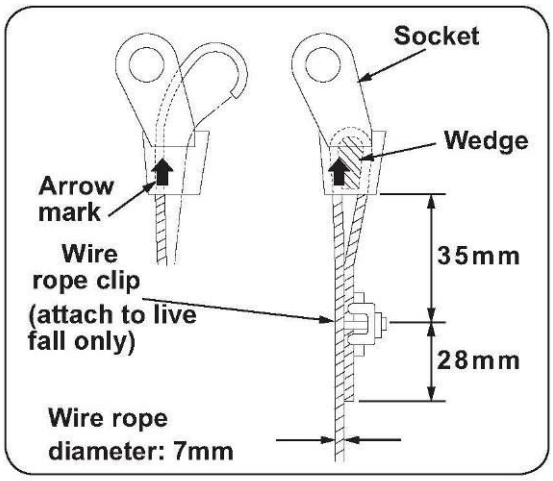
- Ensure the crane boom has been correctly stored.
- Extend the hook storing bracket by pulling outwards from the chassis frame.
- Lower the hook if required to ensure there is sufficient rope to allow the hook to be attached to the bracket.
- Attach the hook to the bracket.
- Operate the “Store Hook” switch until the slack is taken up in the rope, then immediately release the switch.

NB. When storing the hook on the bracket, take care not to over-tension the rope whilst storing. Over tensioning may result in damage to the hook store bracket mounts.

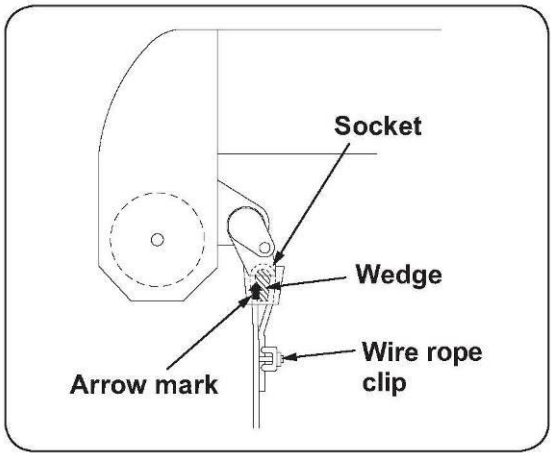
m. <u>Wire Rope Reeving</u>



- Refer to the illustration on the left to follow the routing (reeving) of the rope and determine the mounting position of the weight for the over-hoist alarm.

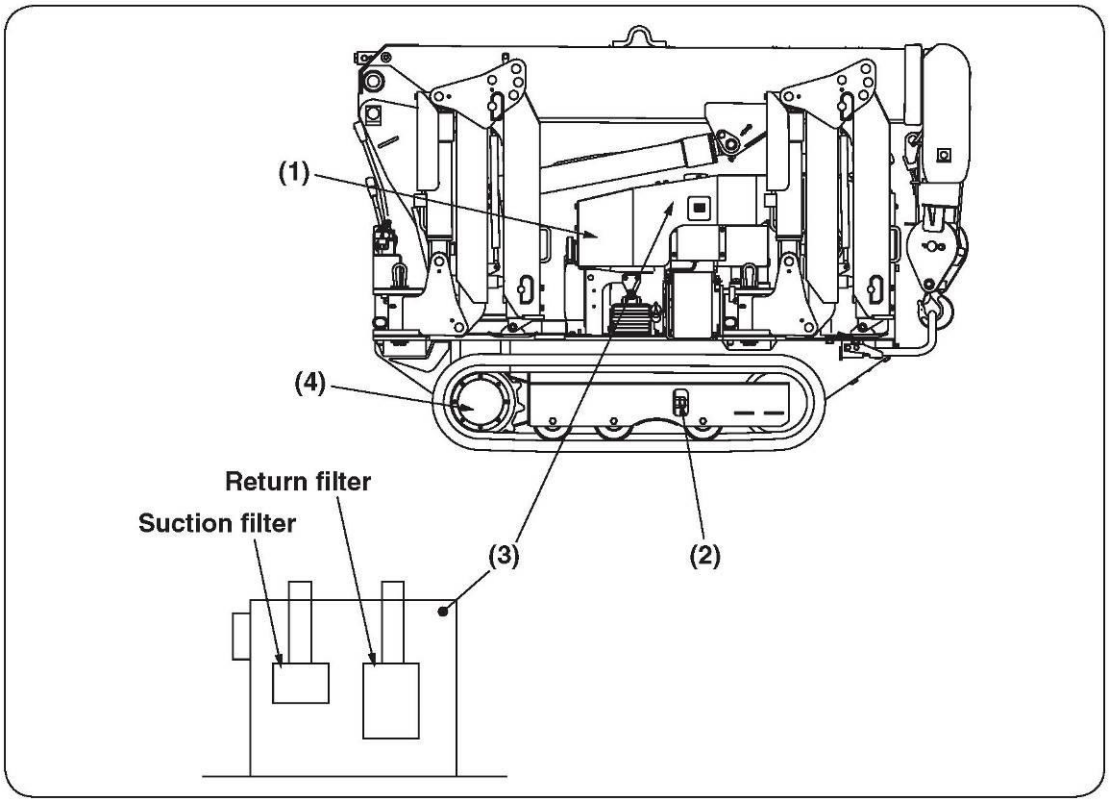


- When securing the end of the rope, ensure the “live” fall of rope is threaded through the socket as shown in the illustration on the left and the “dead” end of the rope is **NOT** secured to the live rope by means of the wire rope clip.
- **The clip is to be secured to the live fall only and a blanking pin placed in front of the live fall, before securing.**



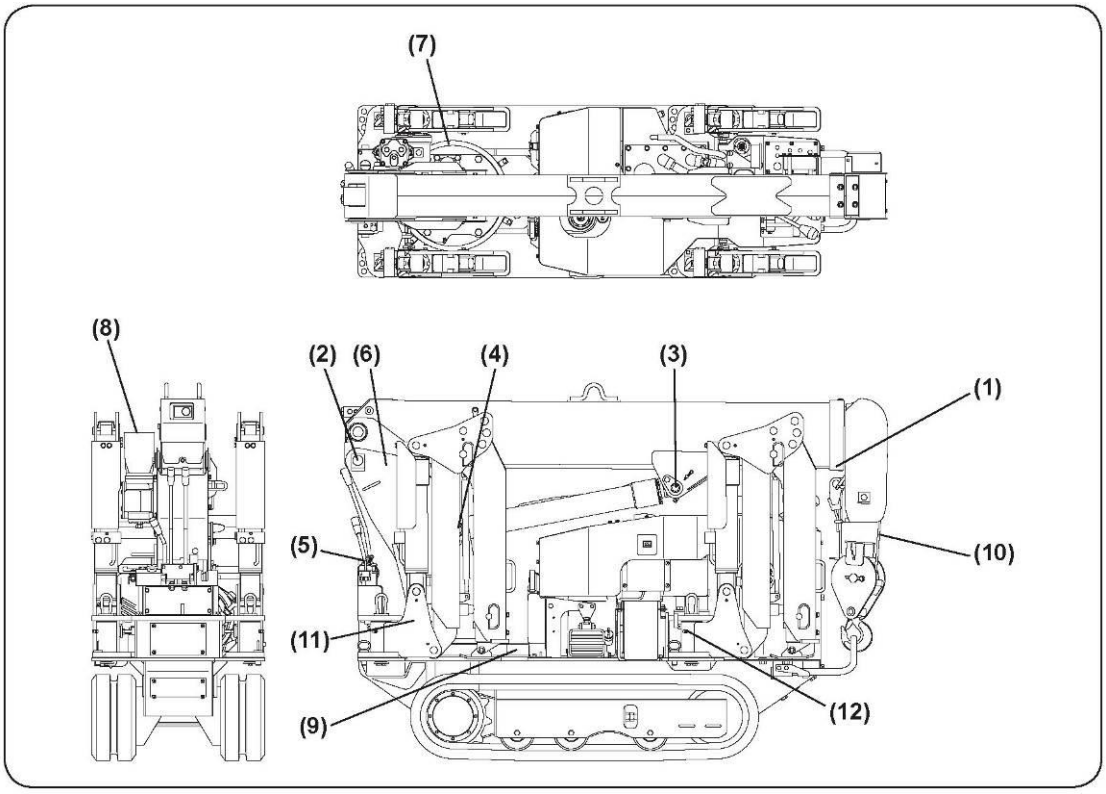
- The socket should be orientated and attached to the boom as shown in the illustration on the left.

n. ***Lubrication of the Carrier***



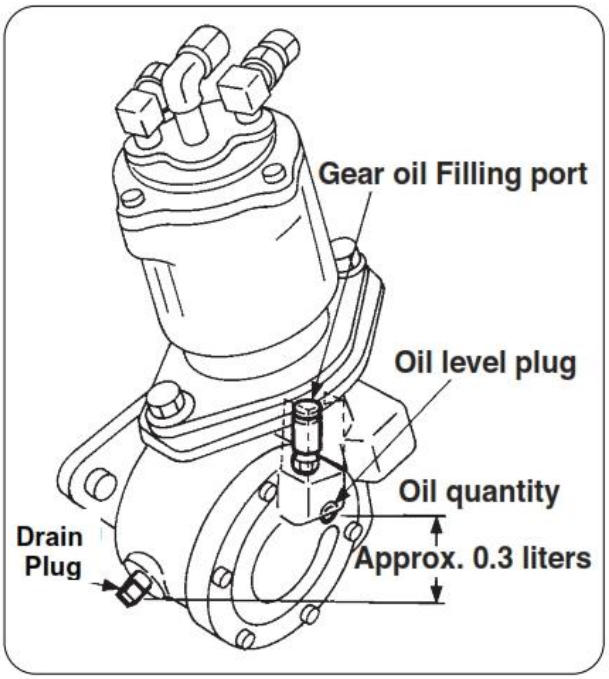
Service Interval	Where to Lubricate	Number of Parts	Lubricant	Tool
Initial: Replace every 25 hours After: Replace every 50 hours	① Engine 1,2 Litres	1	Engine oil	
Initial: 30 hours, then whenever necessary	② Tension adjustment of track	2		32mm Spanner
Initial: Replace after 3 months After: Replace every year	③ Hydraulic oil tank (17 Litres)	1	Hydraulic oil	
Replace every 1000 hours	④ Crawling gear reduction gear oil (0,33 Litres)	2 Right/Left	Diesel engine oil	

o. ***Lubrication of the Crane***

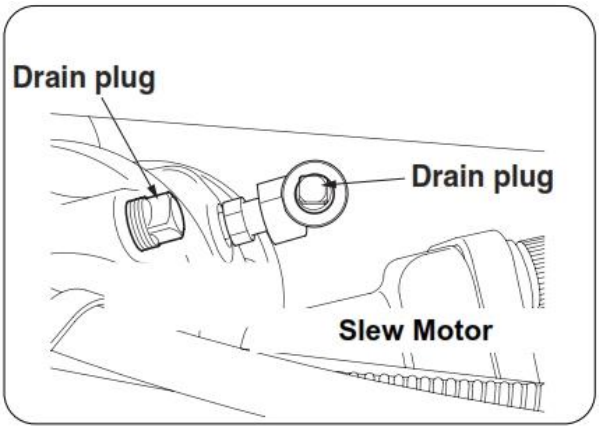


Service Interval	Where to Lubricate	No of Parts	Lubricant	Tool
Daily	**1** boom slide plate (Underside & side face of boom sections ②③④) for 4 section booms **2** Boom foot pin. **3** Upper support pin of derricking cylinder **4** Lower support pin of derricking cylinder **5** Control Lever (Pins on both sides and bearing)	4 1 1 1 3	Molybdenum Grease Chassis Grease Chassis Grease Chassis Grease Chassis Grease	Manual Grease Pump Grease Pump Grease Pump Manual
Weekly	**6** Winch drum gears **7** Slewing gears	1 1	Chassis Grease Chassis Grease	Grease Pump Manual
Monthly	**8** Winch reduction gears (approx. 0.3 Litre) **9** Slew reduction gears (approx. 0.3 Litre) **10** Wire rope **11** Slew bearings **12** Outrigger fulcrum pin	1 1 1 2 4	Gear Oil Gear Oil Rope Grease Chassis Grease Chassis Grease	 Spray Gun Grease Pump Grease Pump

p. ***Lubrication of Reduction and Slew Gears***



Winch Reduction Gears



Slew Reduction Gear

The drain plugs for the slew reduction gear are located underneath the crane chassis. The illustration on the left shows location when viewed from underneath.

NOTE: The crane must be raised and properly supported before carrying out any work underneath the chassis.

q. ***URW 094 Specification***

Model		**URW094CP2E (4-section boom)**
Crane capacity		0.995t × 1.5m (With outriggers extended fully)
Maximum lift above ground (Hook)		Approx. 5.6m with 2-part line
Boom section extensions:		1.73m ~ 3.01m ~ 4.25m ~ 5.49m
Maximum working radius		5.17m
Winch speed (Rope speed)		17m/min (At 3rd layer on the drum)
Hoisting speed of hook		8.5m/min (At 3rd layer on the drum, with 2-parts of line)
Extension speed of boom		3.67m/17sec
Derricking speed of boom		0° ~ 78°/6.5sec
Slewing speed		1.5 r.p.m
Slewing range		360°(continuous)
Hoist rope	Construction	6×Fi (29) Grade B (Breaking load: 28.9kN{2950kgf})
	Diameter×length	7mm×27.0m
Outrigger		Double acting hydraulic cylinder with double pilot operated check valves (directly connected to hydraulic automatic locking device)
Hydraulic pump	Rated pressure	Crane: 20.6MPa(210kgf/cm^2) 21.6MPa(220kgf/cm^2)
	Rated discharge	Approx. 20 L/min
	Rated rotation	Approx. 1800rpm
Hydraulic oil tank Capacity		17 liters

Model	URW094CP2E (4-section boom)
Boom telescoping	Boom:4-section, Box beam
	Direct pressure from hydraulic cylinder and wire rope (With hydraulic automatic locking device) (2nd section: sequential actuation, 3rd & 4th sections: simultaneous actuation)
Boom derricking	Direct pressure from hydraulic cylinder (With hydraulic automatic locking device)
Hoisting	Hydraulic motor: Axial plunger type
	Reduction gears: Spur-gear reduction
	Brake: Worm self-lock
Slewing	Hydraulic motor: Trochoid type (With hydraulic automatic locking device)
	Reduction gears: Worm gear + Spur gear reduction (Supported by ball bearings)
	Brake: Worm self-lock
Hydraulic pump	Variable delivery piston pump
Hook capacity	0.98t Number of lines of rope: 2
Safety devices	Pressure relief valve for hydraulic circuit
	Counterbalance valves for boom raising and boom telescoping cylinders.
	Double pilot-operatedcheck valves for outrigger cylinders
	Boom angle indicator with load indicator
	Hook safety latch
	Automatic stop for over-hoisting
	Over-hoisting alarm
	Automatic stop for minimum rope length on drum
	Interlock for crane-crawl lever and outriggers
	Spirit Level
	Emergency stop button (Ignition cut)
Weight	Approx. 1000kg

Model	URW094CP2E (4-section boom)
Track type	Endless rubber crawler
Track size	150×36×72
Length of ground contact	900mm
Pressure of ground contact	36.3kPa (0.37kgf/cm^2)
Crawling speed	Forward/Backward: 0~2.2km/h
Maximum incline	20°
Engine	Continuous Rated output : 5.5kW (7.5PS)/1800rpm
	Model: GB300LE-402 Mitsubishi Heavy Industries Ltd
	Displacement : 296cm^3
	Fuel type : Petrol (Gasoline)
Drive system	Independently driven by hydraulic power
Braking system	Disc brake with hydraulic built in motor
Engine starting system	Electric starter
Fuel tank	Capacity: 6 liters
Noise Output	LpAeq = 73 dB(A)

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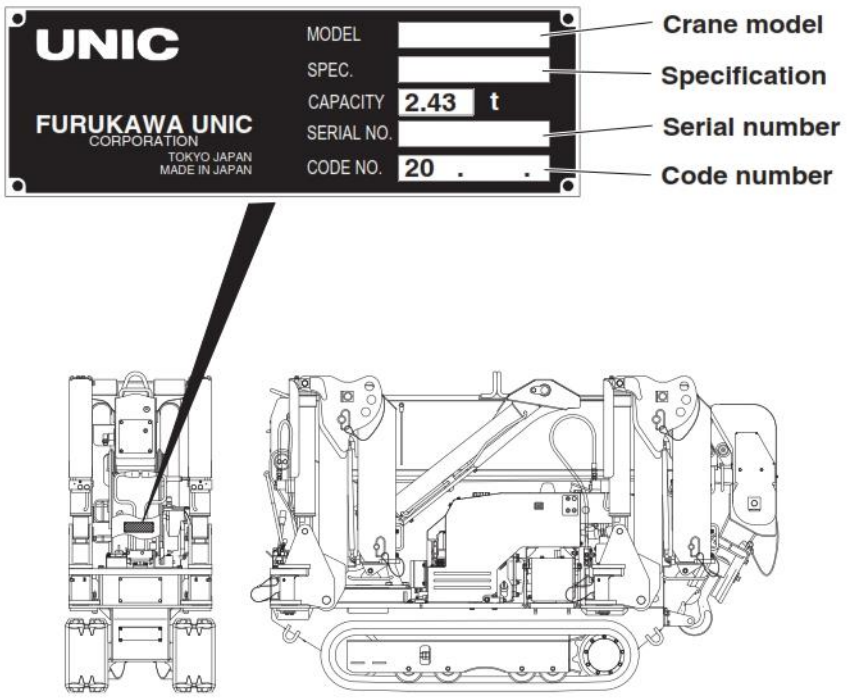
23 SPECIFIC INSTRUCTIONS FOR URW 245

a. Introduction

This section of the manual provides additional instructions and information relating to the URW 245 model variant. The majority of features incorporated into the URW 245 follow the same set up and operating procedures as for both the URW 095 and 295 models, therefore this section of the manual is only concerned with those specific variations in set up and operation of the URW 245 model.
The URW 245 is fitted with a Rated Capacity Indicator (RCI) of the same specification to that fitted on the URW 295, for specific information on the operation and use of the RCI please refer to either Appendix A or B as required at the end of this manual.



b. Loading and Unloading using a Crane

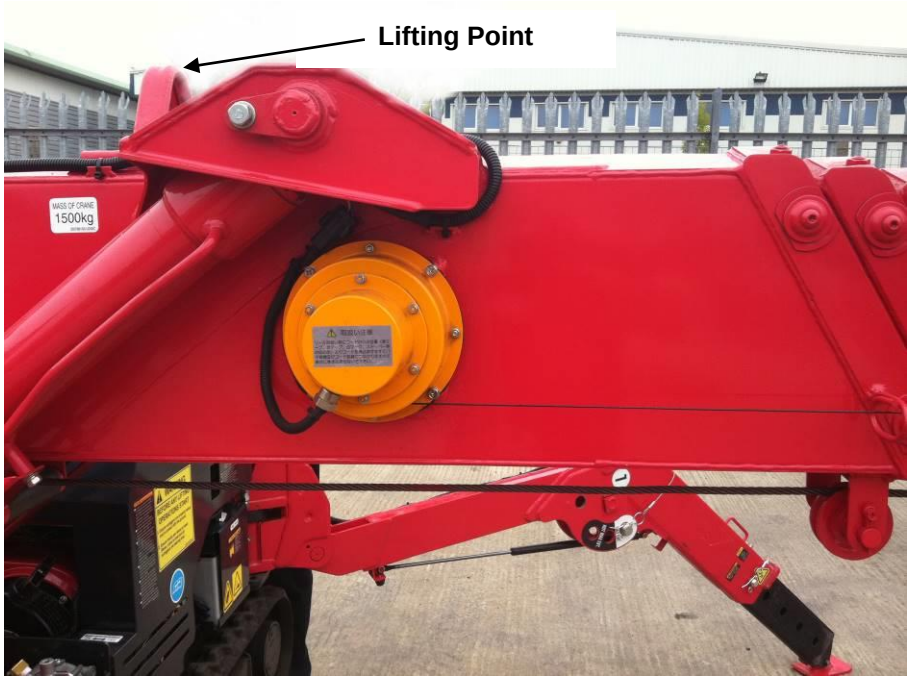
When loading and offloading the 245 with another crane, only use the lifting points shown below. Use of other points for lifting may result in failure of the suspension point or lifting gear. This may cause serious or fatal injury to personnel and serious damage to the crane.

Ensure the hook is correctly stored before lifting the crane via the lifting point, see page 222 for further information.

Always ensure that the lifting point is fitted with a shackle of the correct size and capacity. Use of the wrong type will result in damage to, and maybe failure of, the lifting point or lifting accessory.

Loading and off-loading operations must only be carried out by an operator authorised to use the type of equipment used. Loading/unloading operations must always be supervised by a competent person.

Where a ramp is used, that is not an integral part of the transport vehicle, it must be of sufficient strength to bear the weight of the crane. It must be at least four times as long as the height of the truck platform. For further details read the Loading and Unloading Procedures information plate.



c. ***<u>Description of Carrier Equipment</u>***

1. **Crawler Track**. Cored bar and steel fabric cords are integrally moulded into the rubber

2. **Wheel Sprocket.** Transmits the drive to the track.

3. **Idle Roller.** Supplies the correct tension to the track.

4. **Truck Roller.** Supports the weight of the crane and rolls on the rubber track.

5. **Travel Motor.** Hydraulic motor with reduction gearing built inside the wheel sprocket housing.

6. **Travel Lever.** Allows the operator to change the direction of the machine and control travel speed.

7. **Accelerator Lever.** Controls engine speed in travel mode only.

8. **Horn Switch.**

9. **Fuel Tank.** Lead free petrol only.

10. **Hydraulic Oil Tank.** This reservoir supplies both the carrier and the crane.

11. **Starter Switch.**

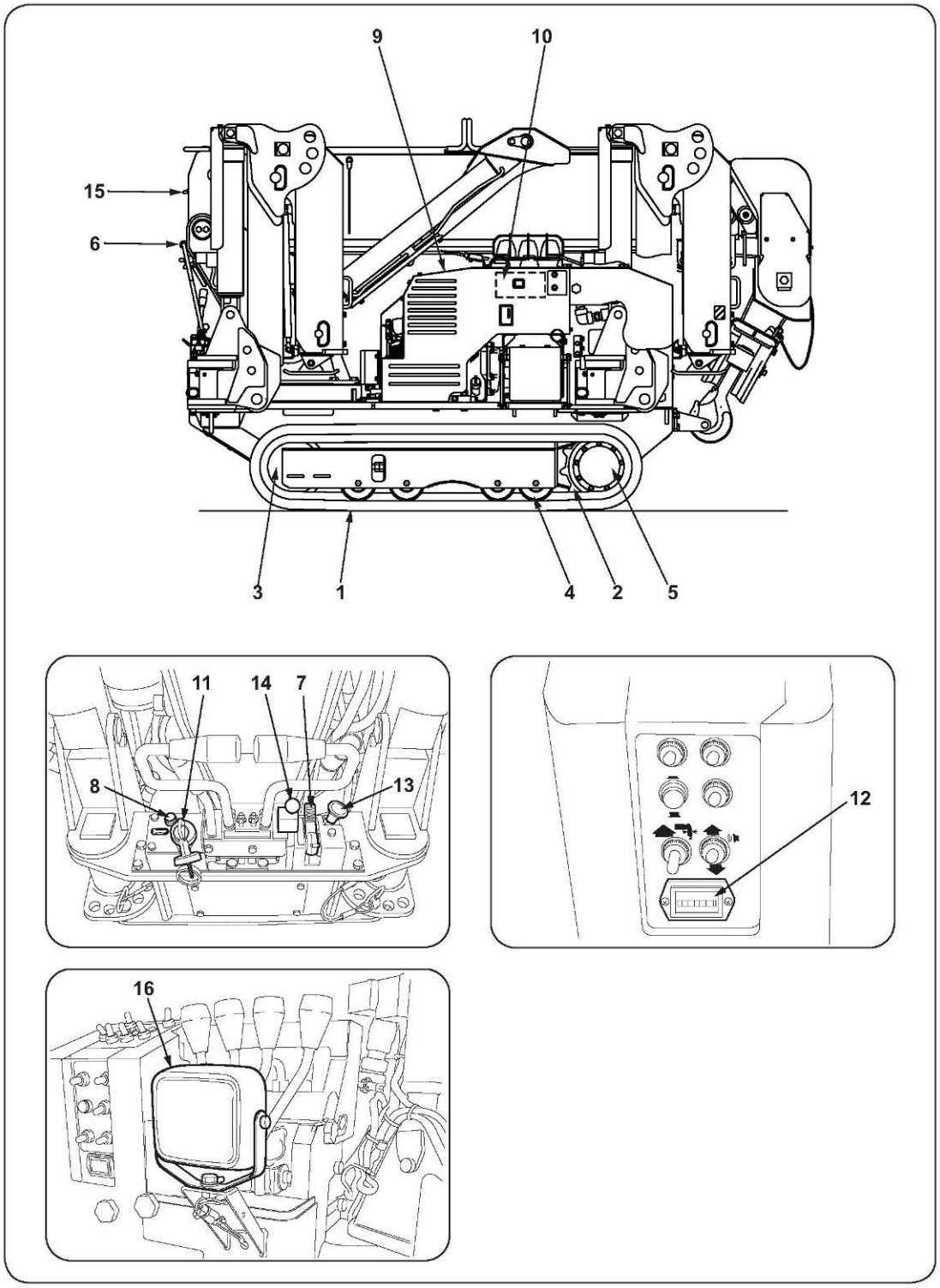
12. **Hour Meter.** This indicates total cumulative engine running time.

13. **Choke Knob.**

14. **Lock Lever.** Holds the travel lever stand in position.

15. **Travel Speed Mode Selector Switch.** Allows pre-set running speed to be selected, either high or low speed setting.

16. **Work Light.**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d. ***<u>Description of Crane Equipment</u>***

1. **Boom or Jib.** Extends and retracts by hydraulic power.

2. **Column or Kingpost.** Vertically mounted member on which boom, winch and derrick cylinders are mounted. This can be slewed 360 degrees.

3. **Frame.** This is the carrier and supports the column and outriggers.

4. **Hoist Winch.** For rotating the wire rope drum.

5. **Slewing Device.** Rotates the column via hydraulic motor.

6. **Derricking Cylinders**. Raise and lower the boom (One cylinder either side of boom).

7. **Telescoping Cylinder.** Extends and retracts the boom.

8. **Outrigger.** This supports and stabilises the crane during operation.

9. **Crane Operating Levers.** Respective levers operate crane functions, such as raising and lowering boom, telescoping and slewing boom, raising and lowering load.

10. **Outrigger Operation Switch.** Controls the raising/lowering and extending/retracting outriggers.

11. **Hook.**

12. **Over-hoisting Alarm.** Alerts the operator that the hook is approaching the top of the boom and they should stop hoisting otherwise damage and/or loss of the load could occur.

13. **Work Light Switch.** Switches work light on and off.

14. **Warning Horn.** Depressing the button activates the horn manually to warn others of your presence.

15. **Wire Rope.**

16. **Load Indicator.**

17. **Automatic Stop.** This device stops the drum automatically when the wire rope is approaching 3 turns left on the drum.

18. **Spirit Level.** This is for checking the horizontal plane of the crane body.

19. **Outrigger Selection Switches.** They select the active outrigger and its direction.

20. **Operation Mode Switch.** Selects between crane and outrigger operation.

21. **Remote Control Selector Switch.** This is for selecting or deselecting the radio remote control.

22. **Voice Control Switch.** Toggles between on and off.

23. **Over-Hoisting Override Switch.** In the event of the over-hoist device being activated, operating this switch allows continued operation of the hook or boom telescoping.

NOTE: This switch should only be operated as a last resort when movement cannot be achieved by any other means.

24. **Hook Storing Switch.** Toggle and hold the switch to bring the hook block into its storage position.

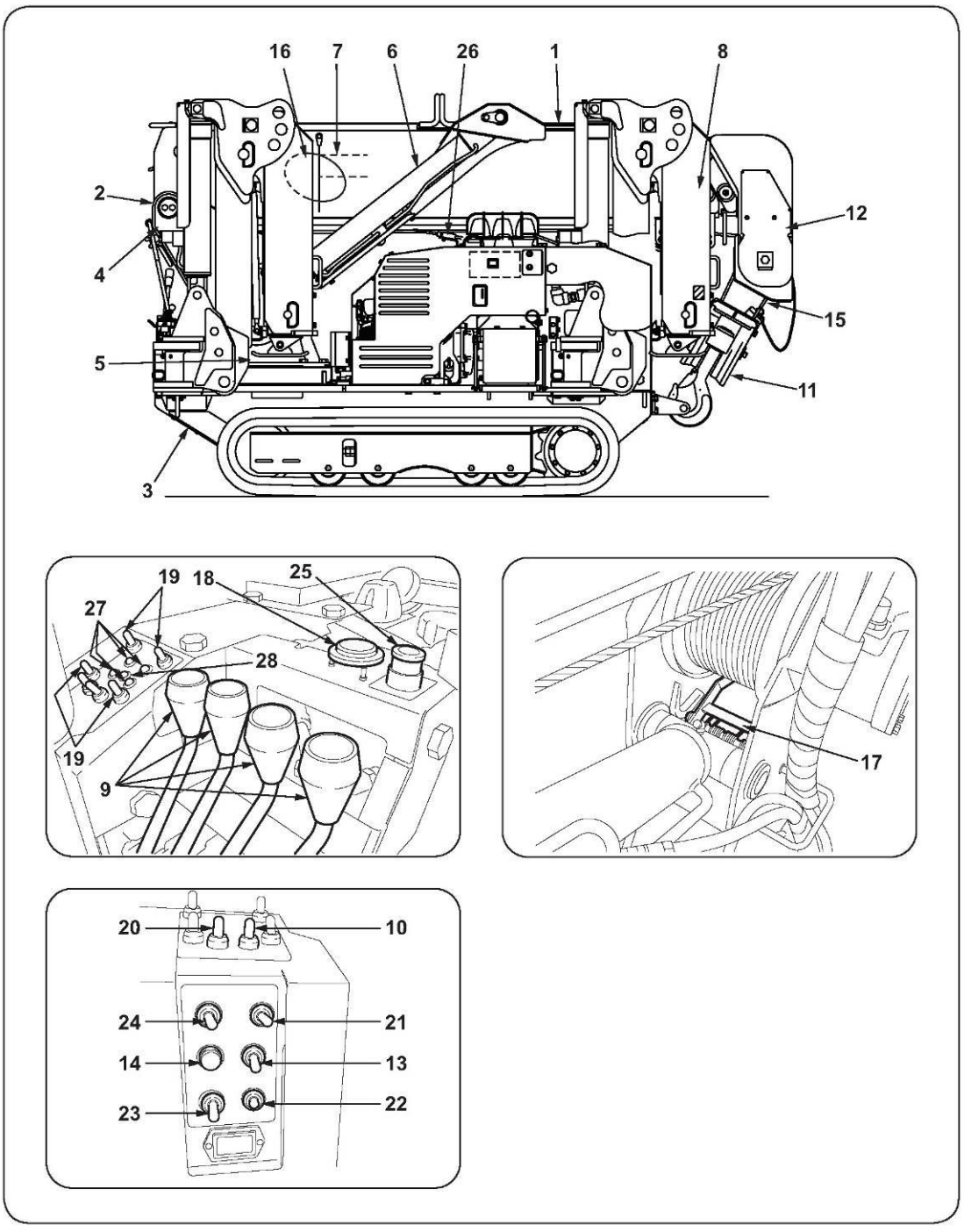
25. **Emergency Stop Button.** Pressing the button will disable all crane and travel functions and stop the engine, but will not isolate the battery.

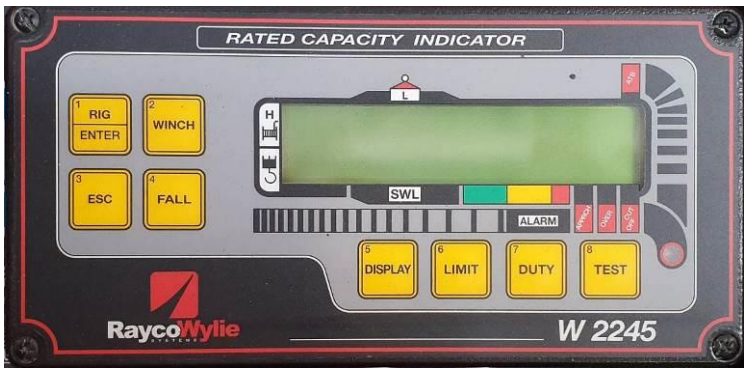
26. **Slew Restrictor (Boom Storage only).** Limits rotation of the boom to avoid striking the crane/controls during boom storage operation.

27. **Outrigger Monitor Lamps**. Green lamps will illuminate when ground contact is made with each individual outrigger. Crane will not operate unless all four lights are illuminated.

28. **Boom Storage Monitor Lamp.** When the boom is stored correctly, the green lamp will illuminate.

29. **Rated Capacity Indicator.** Provides warnings and information on load capacity and crane configuration.

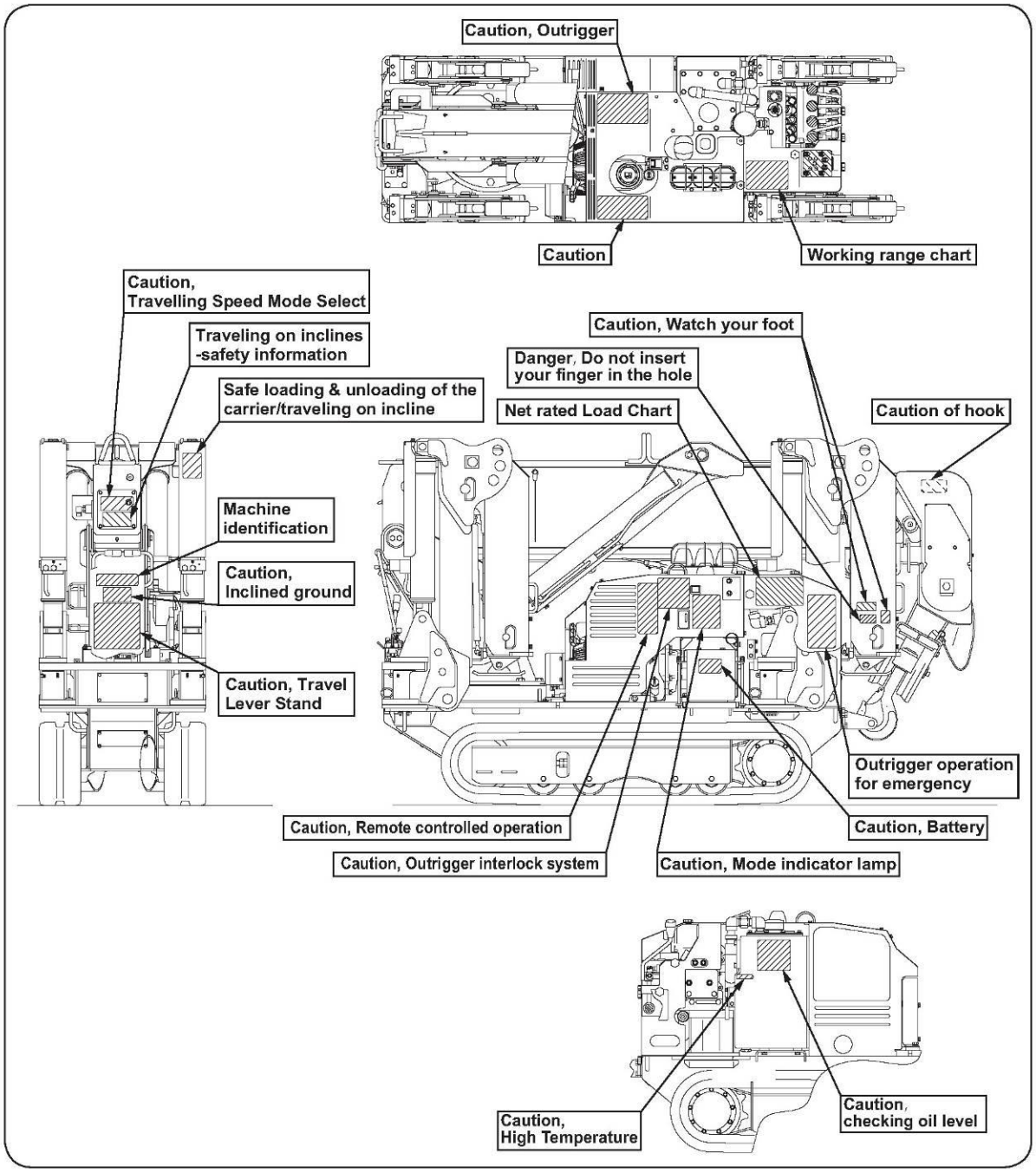




29. Rated Capacity Indicator

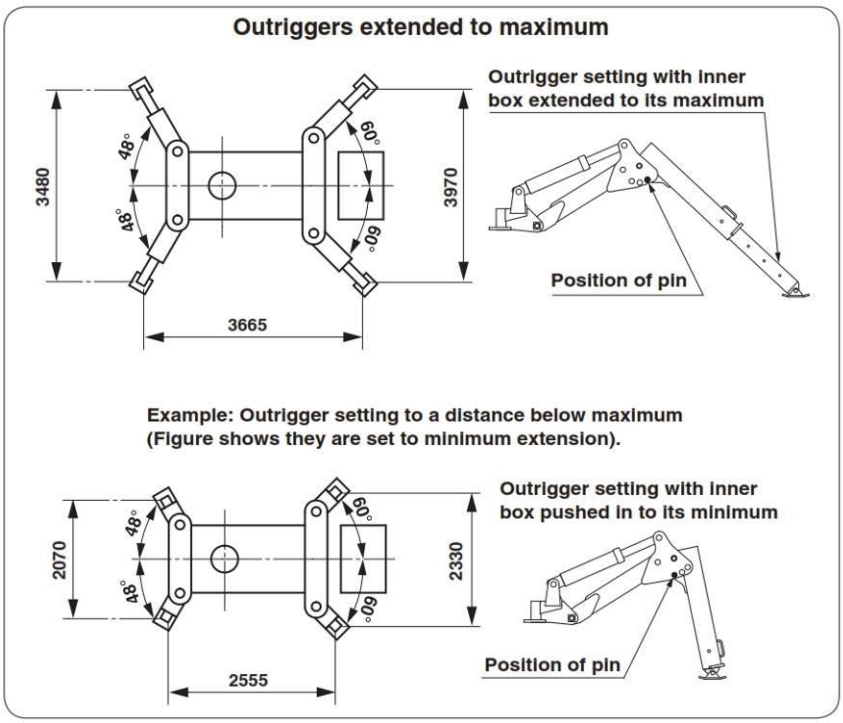
e. ***Information Plates***

i. Position of Information plates 245



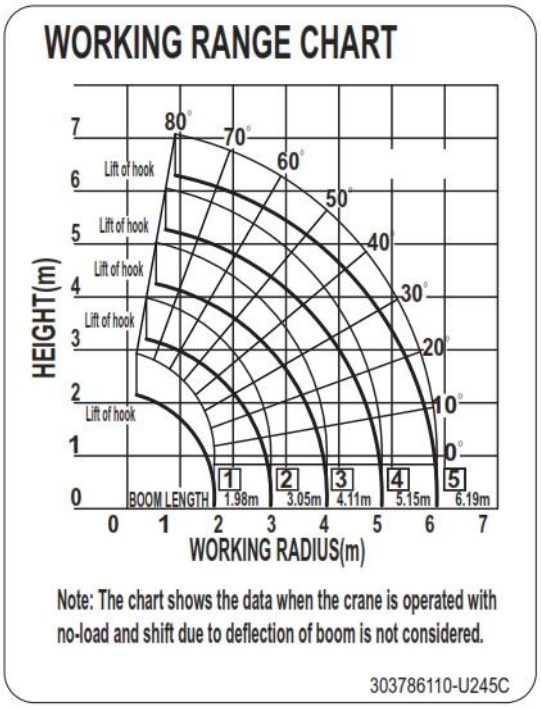
f. ***Extension and Footprint of Outriggers***

The outriggers on the URW 245 may only be set at the standard angles as shown below. On the URW 094/095 models there are a number of optional angles that maybe selected other than standard.
Note this is not permissible on the 245 model.



g. ***Rated Load Charts URW 245***

i. Working Range Chart



ii. Rated Load Chart (245)

This chart shows the load that can be lifted for a specified combination of boom length and working radius.

Boom-sections extended: 1 & 1+2

Working radius (m)		1.3	1.5	1.8	2.0	2.5	2.71
Rated load (t)	Outriggers extended to maximum	2.4	2.4	1.96	1.76	1.4	1.35
	Outriggers extended to not maximum	1.15	1.15	0.7	0.55	0.33	0.31

Boom-sections extended: 1+2+3

Working radius (m)		2.0	2.6	3.0	3.5	3.77
Rated load (t)	Outriggers extended to maximum	1.3	1.3	1.06	0.83	0.71
	Outriggers extended to not maximum	0.35	0.35	0.23	0.17	0.15

Boom-sections extended: 1+2+3+4

Working radius (m)		3.0	3.7	4.0	4.5	4.81
Rated load (t)	Outriggers extended to maximum	0.66	0.66	0.59	0.42	0.4
	Outriggers extended to not maximum	0.17	0.17	0.15	0.1	0.08

Boom-sections extended: 1+2+3+4+5

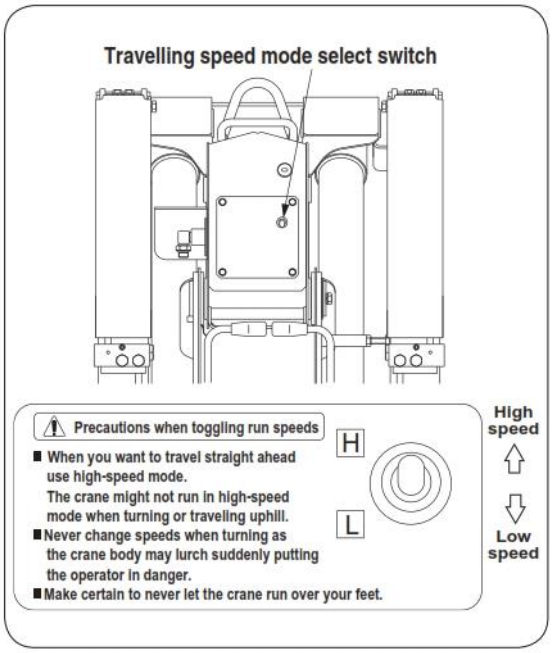
Working radius (m)		3.5	4.0	4.5	5.0	5.5	5.85
Rated load (t)	Outriggers extended to maximum	0.45	0.45	0.4	0.36	0.25	0.22
	Outriggers extended to not maximum	0.15	0.15	0.1	0.08	0.06	0.05

The chart shows lifting capacity when the crane is set up level with the outriggers deployed. The data is based on actual working conditions which incorporates movement due to boom deflection under load

The rated loads specified are based upon the strength of the crane and stability of the carrier.
Ensure that the rated load is correct for the extension of the outriggers

h. Carrier Operations

Travel Speed Mode Selector Switch



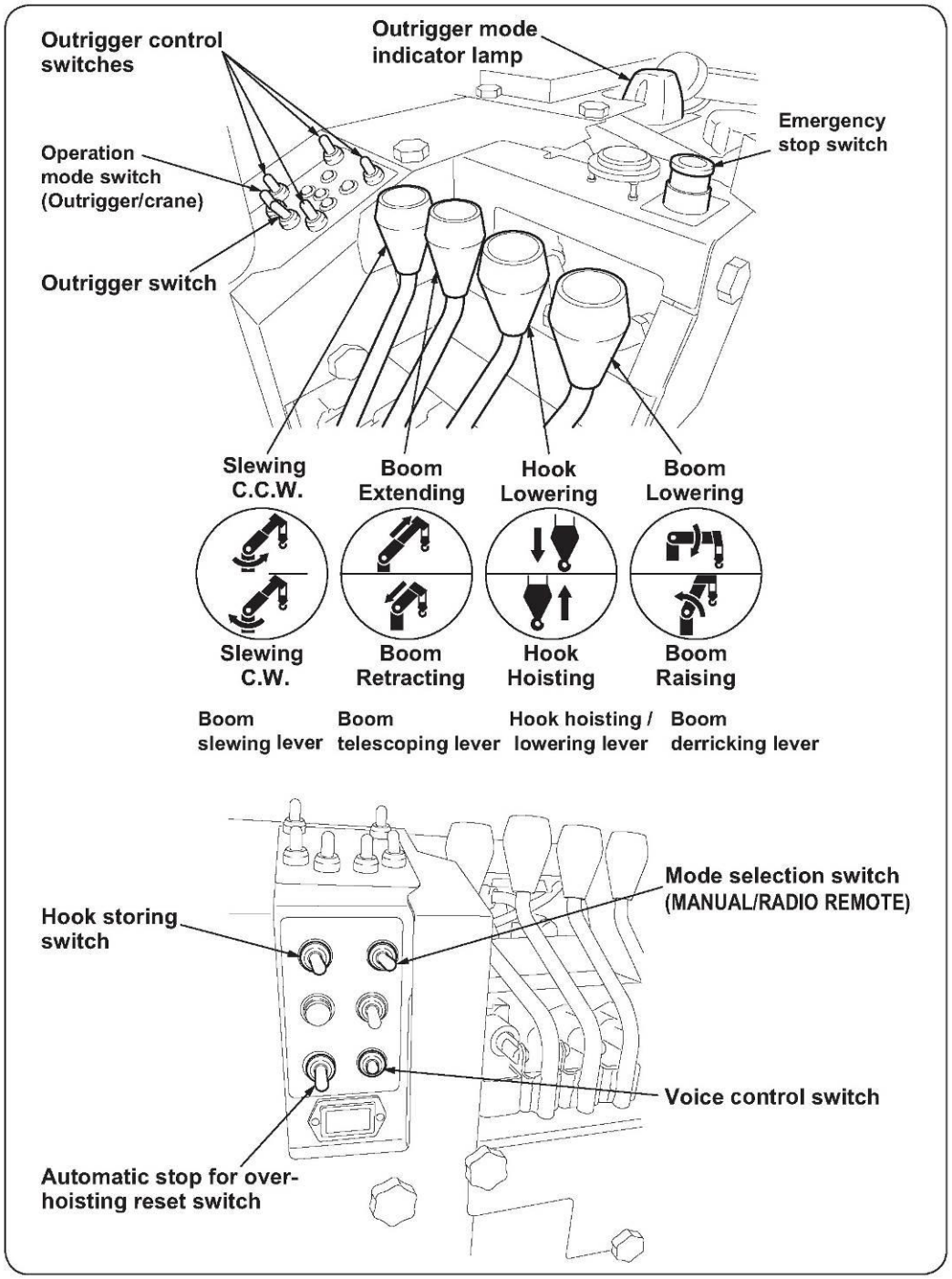
Operation

- The switch is located on the rear of the boom and allows the operator to select either high or low speed travel
- Switch to high speed when travelling straight routes with no turns.
- Switch to low speed when it is likely that changes in direction are likely.
- Use low speed setting when travelling over rough or uneven ground and when travelling on slopes.

NB. Always ensure the crane is stationary before operating the travel speed switch. Operating the switch whilst the crane is in motion may lead to the crane abruptly moving or jumping, causing instability.

i. ***Crane Operations***

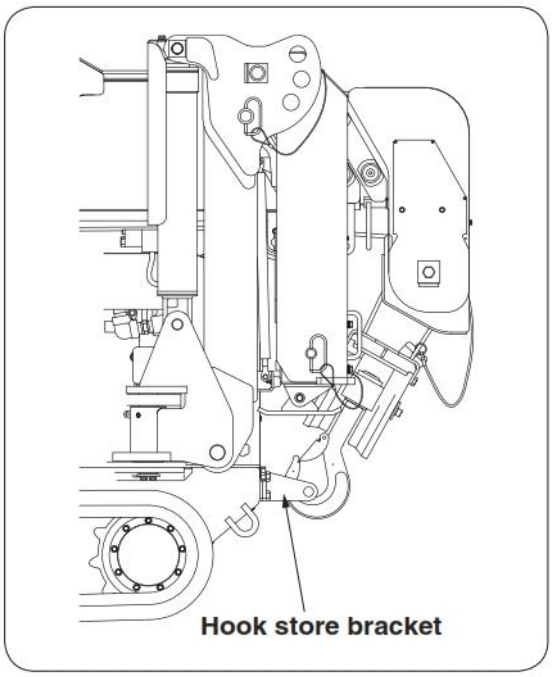
Location of control switches and Levers



Note: Operation of outriggers:

The URW 245 outrigger hydraulic extension and retraction is operated by using the outrigger operation switch on the control panel to move each outrigger. There is also an outrigger operation lever situated below the crane operation levers. Access to the lever requires removal of the panel that the work light is mounted on. If it is found necessary to use this lever, take care not to damage the wiring and connections to the work light, when removing the panel.

j. Storing the Hook



Set up and operation

- Ensure the crane boom has been correctly stored.
- Lower the hook if required to ensure there is sufficient rope to allow the hook to be attached to the bracket.
- Attach the hook to the bracket.
- Operate the “Store Hook” switch until the slack is taken up in the rope, then immediately release the switch.

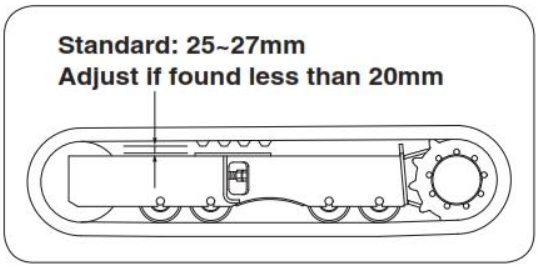
NB. When storing the hook on the bracket, take care not to over-tension the rope whilst storing. Over tensioning may result in damage to the hook store bracket.

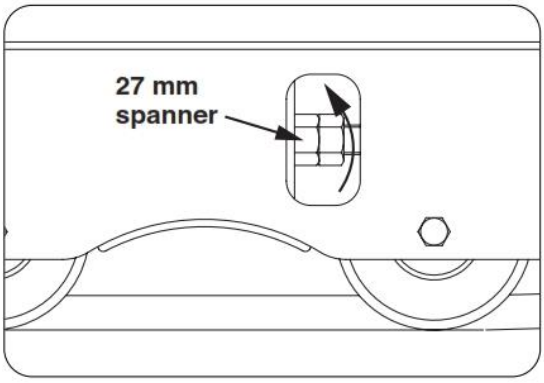
k. Check for Track Tension

DO NOT work on tracks with the carrier body raised off the ground on its outriggers

NB

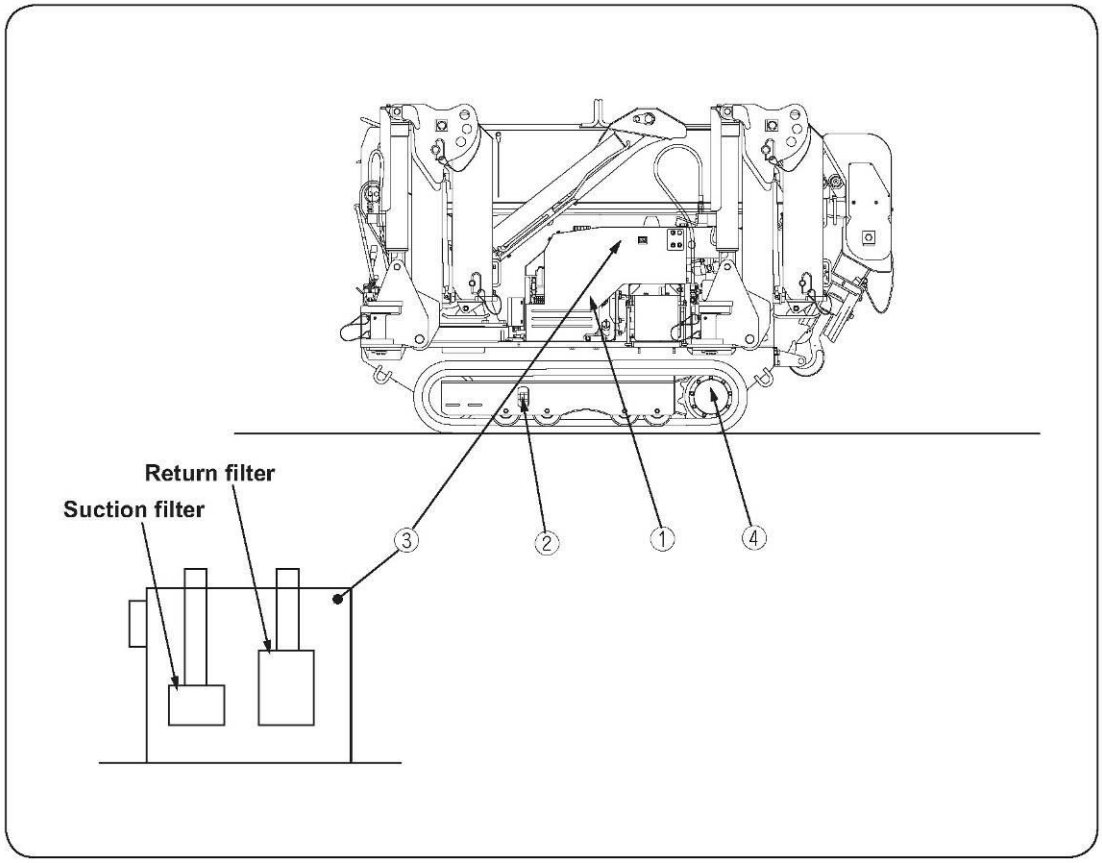
Track tension testing must be carried out with the tracks touching the ground





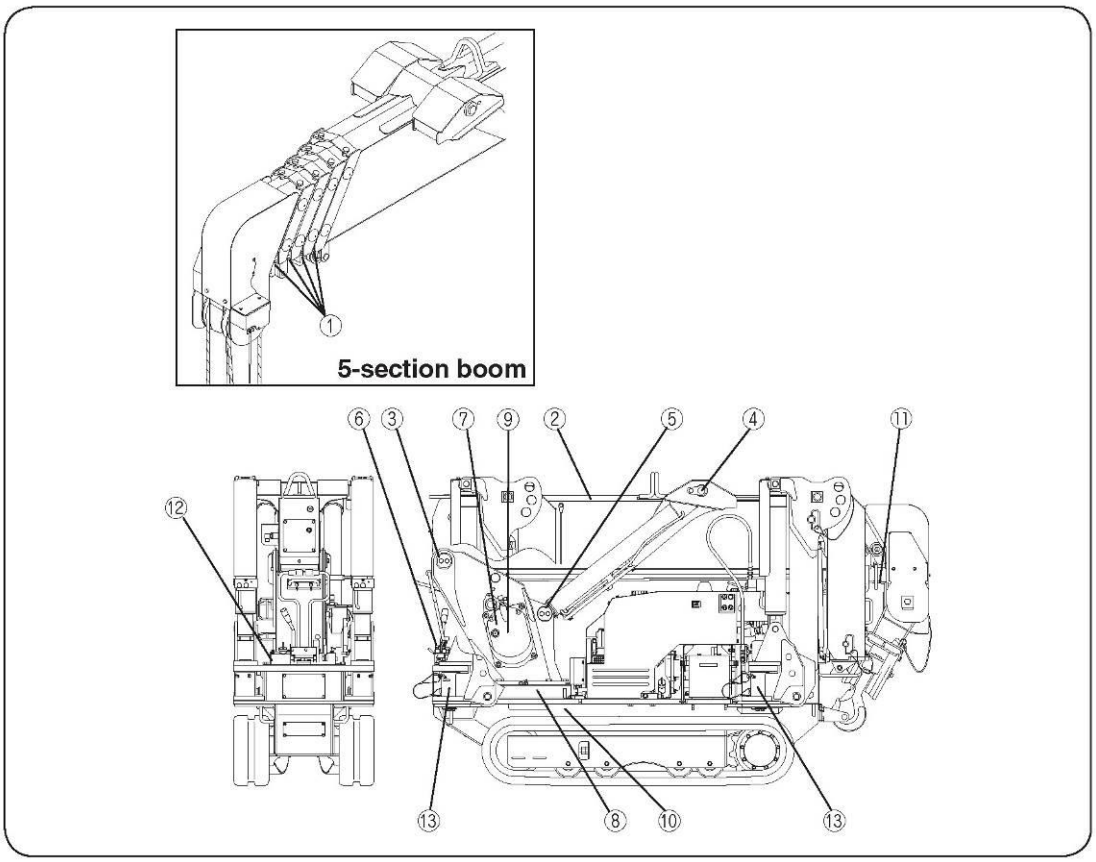
- Check the rubber track for wear and tension regularly as wear varies according to operating and ground conditions.
- Initial check and adjustment after 30 hours of operation and then whenever necessary.
- When tensioning the rubber track, turn the nut in the direction of the arrow and the lock with another nut
- If the tension is too tight it will shorten the life of the sprockets.
- Replace the track when the lug height is below 3mm

I. Lubrication of the Carrier



Service Interval	Where to Lubricate	Number of Parts	Lubricant	Tool
Initial: Replace every 25 hours After: Replace every 50 hours	① Engine 1,2 Litres	1	Engine oil	
Initial: 30 hours, then whenever necessary	② Tension adjustment of track	2		32mm Spanner
Initial: Replace after 3 months After: Replace every year	③ Hydraulic oil tank (23 Litres)	1	Hydraulic oil	
Replace every 1000 hours	④ Travel gearbox reduction gear oil (0,33 Litres)	2 Right/Left	Diesel engine oil	

m. Lubrication of the Crane



Service Interval	Where to Lubricate	No of Parts	Lubricant	Tool
Daily	**1** boom slide plate (Underside & side face of boom sections ②③④⑤) for 5 section booms	4	Molybdenum Grease	Manual
	2 Boom slide plate (Upper side of boom section ①)	4	Molybdenum Grease	Manual
	3 Boom foot pin	1	Chassis Grease	Grease Pump
	4 Upper support pin of derricking cylinder	1	Chassis Grease	Grease Pump
	5 Lower support pin of derricking cylinder	1	Chassis Grease	Grease Pump
	6 Control Lever (Pins on both sides and bearing)	3	Chassis Grease	Manual
Weekly	**7** Winch drum gears	1	Chassis Grease	Grease Pump
	8 Slewing gears	1	Chassis Grease	Manual
Monthly	**9** Winch reduction gears (approx. 1,0 Litre)	1	Gear Oil	
	10 Slew reduction gears (approx. 0,3 Litre)	1	Gear Oil	
	11 Wire rope	1	Rope Grease	Spray Gun
	12 Slew bearings	2	Chassis Grease	Grease Pump
	13 Outrigger fulcrum pin	4	Chassis Grease	Grease Pump

n. URW 245 Specification

Model		**URW245CP2E (5-section boom)**
Crane capacity		2.43t × 1.5m (With outriggers extended fully)
Maximum lift above ground (Hook)		Approx. 6.3m
Boom section extensions:		1.98m ~ 3.05m ~ 4.11m ~ 5.15m ~ 6.19m
Maximum working radius		5.85m
Winch speed (Rope speed)		52m/min (At 3rd layer on the drum)
Hoisting speed of hook		13m/min (At 3rd layer on the drum, with 4-parts of line)
Extension speed of boom		4.21m/14sec
Derricking speed of boom		0° ~ 80°/10sec
Slewing speed		2.0 r.p.m
Slewing range		360°(continuous)
Hoist rope	Construction	IWRC 6×WS (26) Class B (Breaking load: 43.1kN{4395kgf})
	Diameter×length	8mm×51m
Outrigger		Double acting hydraulic cylinder (directly connected to hydraulic automatic locking device)
Hydraulic pump	Rated pressure	Crane: 20.6MPa(210kgf/cm^2) Travel: 21.6MPa(220kgf/cm^2)
	Rated discharge	Approx. 36 L/min
	Rated rotation	Approx. 1800rpm
Hydraulic oil tank Capacity		23 liters

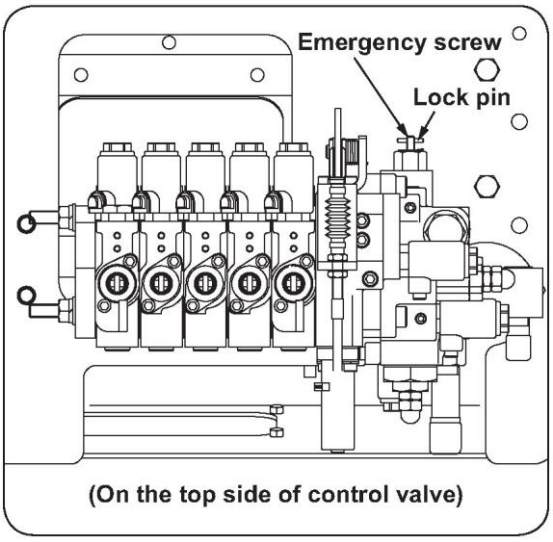
Model	URW245CP2E (5-section boom)
Boom telescoping	Boom:5-section, Hexagonal box beam
	Direct pressure from hydraulic cylinder and wire rope (With hydraulic automatic locking device) (2nd & 3rd sections: sequential actuation, 4th & 5th sections: simultaneous actuation)
Boom derricking	Direct pressure from hydraulic cylinder (With hydraulic automatic locking device)
Hoisting	Hydraulic motor: Axial plunger type
	Reduction gears: Spur-gear reduction
	Brake: Automatic mechanical brake
Slewing	Hydraulic motor: Trochoid type (With hydraulic automatic locking device)
	Reduction gears: Worm gear + Spur gear reduction (Supported by ball bearings)
	Brake: Worm self-lock
Hydraulic pump	Variable delivery piston pump
Hook capacity	2.4t Number of lines of rope: 4
Safety devices	Pressure relief valve for hydraulic circuit
	Counterbalance valves and pilot-operated check valves for boom raising and boom telescoping cylinders
	Double pilot-operatedcheck valves for outriggers
	Load indicator (With angle meter)
	Hook safety latch
	Automatic stop for over-hoisting
	Over-hoisting alarm
	Automatic stop for minimum rope on winch drum
	Interlock device for crane and crawling levers
	Interlock for crane-crawl lever and outriggers
	Spirit Level
Weight	Approx. 1500kg

Model	URW245CP2E (5-section boom)
Track type	Endless rubber crawler
Track size	150×40×72FR
Length of ground contact	1050mm
Pressure of ground contact	47.0kPa (0.48kgf/cm^2)
Crawling speed	Forward/Backward: 0~2.1km/h (0~3.8km/h high speed)
Maximum incline	20°
Engine	Rated output : 6.6kW (9.0PS)/1800rpm
	Model : GB400LE-402 (Mitsubishi Heavy Industries, LTD)
	Displacement : 391cm^3
	Fuel type : Petrol (Gasoline)
Drive system	Independently driven by hydraulic power
Braking system	Disc brake with hydraulic built in motor
Engine starting system	Electric starter
Fuel tank	Capacity: 6 liters
Noise Output	LpAeq = 73 dB(A)

19. EMERGENCY CONTROL FUNCTION

In the event that any of the crane controls malfunction or cease to operate correctly (despite the fact that there is no fault code displayed on the Mode Indicator), use the table below to assist in fault diagnosis and possible rectification.

Malfunction	Possible cause	Action to be taken
Crane will not operate when using Remote Control Unit (RCU)	Transmitter Batteries are discharged or not fitted	Fit or replace batteries as required
Crane operates when actuating operation selector switch only	Speed control trigger/lever on the RCU is faulty	Contact authorised UNIC Service centre to have the unit repaired.
Crane operates arbitrarily without operation of any controls, including manual lever operation	One (or more) solenoid control valves has failed	Depress EMERGENCY STOP switch immediately to stop any further crane operation. Tighten the emergency screw fully, but avoid excessive force (see diagram below). Release the EMERGENCY STOP button. Check and ensure that no further unintended crane operations occur. De-rig and store the crane using manual levers if possible and contact your authorised UNIC service centre for further assistance.



Note:

The emergency screw is secured with a locking pin. Remove the locking pin before turning the emergency screw.