

# FROG XT<sup>2</sup> USER MANUAL

Rev 0

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Original Instructions



## Introduction

This manual contains information for operating, maintaining, and storing the FROG-XT2 personnel carrier. Appropriate training and pre-operational briefings should be provided for all personnel involved in the use of this device.

**Risk awareness and planning** - Crane transfers (like other forms of marine transfer) are complex operations and operators must take account of a wide range of operational variables. By their nature they usually require the management of an interface between two separate organisations (most frequently an installation operator and a vessel operator). It is essential that all the key risk factors are taken into account and proper planning and preparation is done and that all personnel involved are aware of their roles and have the necessary competence to perform them.

**Best practice references** - Please refer to Offshore Personnel Transfer by Crane. This is a separate document that contains comprehensive guidance and information on each element of operation. It is for those researching, planning, managing or carrying out the safest possible crane transfers.

10 Golden Rules: Personnel Transfer by Crane video also provides a useful overview of the key risks and considerations in planning crane transfer operations.

### Key references

- i. Offshore Personnel Transfer by Crane, Marine Transfer Forum, <http://www.marinetransferforum.org/resources>
- ii. 10 Golden Rules: Personnel Transfer by Crane, Reflex Marine, <https://www.youtube.com/watch?v=JDljjCqr2Zw>

Safe and proper use of the FROG-XT2 is the responsibility of the user, taking due consideration to the information provided in this document. The user should ensure compliance with all relevant legislation and good industry practice.

**Control of manual** – This manual is controlled by Reflex Marine and may be revised from time to time. The latest revision may be obtained by contacting RML or by downloading the latest version from [www.reflexmarine.com/support](http://www.reflexmarine.com/support).

**Note:** *For the purposes of this manual RML will be deemed to mean Reflex Marine Limited*

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# 1 Product Specifications

Table 1 Product Specifications

<b>Model No.</b>		XT2
<b>Dimensions (Nominal)</b>	Width 1	1600 mm
	Width 2 (Across Buoyancy)	1600 mm
	Height	2071 mm
<b>Weight</b>	Maximum Gross Mass	500 kg
	Tare Weight	258 kg
	Payload - SWL	242 kg
<b>Materials</b>	Frame	316L stainless steel, A4 stainless fixings
	Central Column / Load Plate	316L stainless steel, A4 stainless fixings
	Other Steel Components	All stainless
	Buoyancy	Polyethylene (PE) moulded shell with Polyurethane (PU) closed cell foam fill
	Seat Base/ Seat Back	Polyolefin shell filled with polystyrene closed cell balls
	Landing Feet	EVA closed cell foam
	Floor grating	GRP
<b>Operating Temperatures</b>	Standard Model	-20 °C to +50 °C
<b>Suspension</b>	Springs-dampers	2 x stainless steel gas-springs oil dampers
<b>Seating</b>	Seats	2 x full height seats
	Harnesses	3-point, quick release buckle
	Grab Handles	1 per seat
<b>Lifting Point SWL</b>		500 kg
<b>Wire Rope Lifting Assembly</b>	Safe Working Load	500 kg
	Wire Rope	Galvanised steel wire rope
<b>Number of Passengers</b>		2
<b>Impact Protection</b>	Vertical impacts	Passengers are protected during heavy landings at speeds of up to 3.1 m/s
	Lateral impacts	Passengers are protected from lateral impacts by means of soft-contact buoyancy panels
<b>Stability</b>	Horizontal	Greater than 30° for all directions and load scenarios
	Submerged Self-Righting	Up to 180° inverted to the vertical position
<b>Certification</b>	Class	CE Marked by independent body
<b>Quality</b>	System	Manufactured to ISO 9001:2015
<b>Standards</b>	National Technical Standards	UK, BS EN 1993 series: 'The Use of Structural Steel in Building'
	Industry European Standards	EC Machinery Directive EN 14121-1, BS EN 12100-10 Load Test – ILO152 / LOLER
	National Regulations	UK, PUWER / LOLER

## 2 Operating Parameters

### 2.1 General

The FROG-XT2 has been designed to ensure passenger safety in the most demanding conditions.

There are a large number of factors that affect the safe conduct of marine personnel transfers. These include: crew skill and experience, met-ocean conditions, landing areas, vessel station keeping capability and response to sea conditions, visibility and line of sight. A combination of many factors will determine the risk involved.

#### Sea State

The FROG-XT2 has a suspension and damping system which prevents passengers from experiencing shock loads up to relative velocities of 3.1 m/s. The maximum recommended significant wave height is based on the maximum relative velocity between the load (or hook) and the deck.

The calculated operational sea states detailed below are based on vertical impact speeds and bio-mechanical considerations. They reflect the ability to withstand such impacts with minimal risk of injury to the human body. However, there are many additional factors that may affect the safety of crane transfer operations. These include vessel station-keeping, crew competence, wind and visibility. The operator should always refer to general guidelines on crane transfers operations to assess overall risks.

#### Technical note:

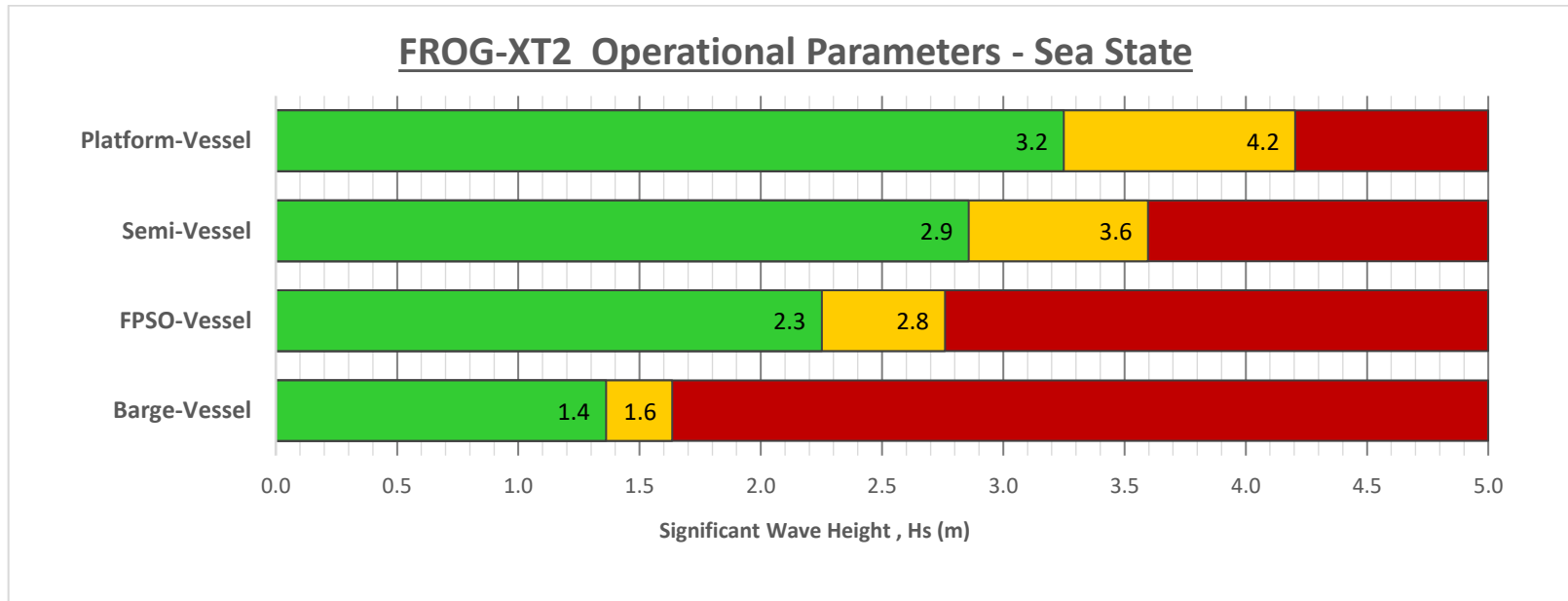
The calculation for relative velocity used here is based on the European offshore crane standard, BS EN 13852-1:2013. Whereby the maximum anticipated relative velocity between a load and a vessel deck, is given by the following;

$$\text{Relative velocity} = (0.5 * \text{Hook velocity})^1 + \sqrt{(\text{Vessel deck velocity}^2 + \text{Boom tip velocity}^2)}$$

<sup>1</sup> Equal to 1.67 m/s (100 m/min) for lifts below 5 tonnes. Higher crane hook speeds may be available, and it follows that the higher the available crane speed the higher the possibility of a heavy landing or take off. However, with a qualified Crane Operator, it is considered unlikely that the FROG-XT will be landed at full hook speed on a deck rising at full speed.

If there are concerns about heavy landings, operators may wish to consider the following methods to reduce risks; dry runs without passengers, landing in centre of deck where there is less vessel movement, transferring fewer passengers to increase damping, using a hook speed indicator.

Table 2 Operating Parameters.



Note:

- **Recommended Operating Window** - For an impact at worst case scenario\* under these sea conditions, FROG-XT2 is well within performance range. Consideration of all risk factors and pre-job planning are still requisite.
- **Extended Operating Window** - For an impact at worst case scenario\* under these sea conditions, XT product performance has been designed, tested, and validated to provide complete passenger protection. In such elevated sea states other risk factors will increase. A thorough risk assessment and trials should be conducted to ensure. Contact Reflex Marine if you need assistance.
- **High Risk Operating Window** - Operating in this window presents risk of exceeding XT product safety performance. For any operations in this window, specific measurements of relative motion are recommended to ensure they are within safety margin. A thorough risk assessment and trials should be conducted to ensure. Please contact Reflex Marine for any guidance.

## 2.2 Recommended Operating Parameters

Table 3 Recommended Operating Parameters

Parameter	Recommendation	
Vertical Impact Protection	3.1 m/s	10.2 ft/s
Lateral Impact Protection	2 m/s	6.6 ft/s
Wind Speed	20 m/s	40 knots
Visibility	Crane Operator should have a clear view of the pickup and set down areas.	
Vessel Motion	10° Pitch and Roll	
Vessel Station-Keeping Radius	3 m	10 ft
Landing Area	Must be clear of any obstructions or hazards	
Landing Area on Vessel	4 m x 4 m	13 ft x 13 ft
Landing Area on Installation	2.5 m x 2.5 m	8 ft x 8 ft
Crane Requirements	Crane must be suitable for lifting personnel	

## 2.3 Crane Transfer Planning Tool

We have developed a planning tool that can be used to determine whether the conditions are suitable for transfers to take place.

### Using the Crane Transfer Planning Tool

There are four main sections that need to be completed

- i. Risk Assessment
- ii. Pre-Transfer Checklist
- iii. Passenger Log
- iv. Post Transfer Review

The Crane Transfer Planning Tool can be found on the flash drive contained in your user pack, or alternatively you can download a copy from our website.

It is important that the conditions are assessed prior to every set of transfers as conditions are never exactly the same.

It is recommended that a trial run is always conducted as this provides real time feedback on the conditions.

The operator should always refer to general guidelines on crane transfers operations to assess overall risks.

**If there is ever any concern about the conditions or the safety of the operations transfers should be stopped.**



## 3 Using the FROG-XT2

### 3.1 Safety Features

#### **Protected Seating Position:**

Seats are positioned behind the buoyancy panels and framework. This provides maximum protection and minimises sense of exposure. The arrangement of the seats and individual entry / exit points allow rapid access and egress, allowing faster and more efficient transfers.

#### **Fall Protection:**

3-point harness system and grab handles protect from the risk of falling during transfer.

#### **Vertical impact protection:**

- i. Seats mounted on a suspension system which comprises stainless steel gas-spring dampers
- ii. Semi-upright seat position and soft, pommel seats
- iii. Impact absorbing EVA foam feet

#### **Lateral impact protection:**

- i. Stainless steel frame
- ii. Buoyancy panels
- iii. High backed headrest designed to reduce risk of whiplash
- iv. Grab handles and saddle shaped seat cushion for secure seating position

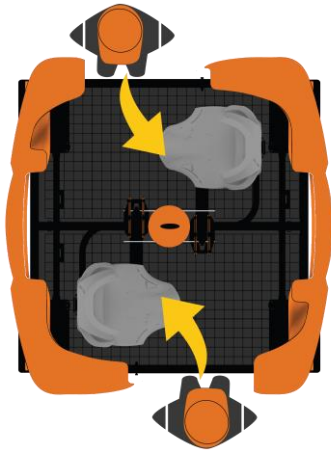
#### **Floatation:**

Buoyancy panels ensure the FROG-XT2 floats with both passengers above the water line. The FROG-XT2 self-rights up to 180° inverted to the vertical position and is very stable in a range of conditions.

### 3.2 Passenger Instructions

- i. Enter the carrier and take the appropriate seat.
- ii. Fasten seat harness.
- iii. Keep hands and feet inside the carrier.
- iv. Hold the grab handle or the chest straps of the seat harness to keep body stabilised.
- v. Place feet onto the floor in front of the buoyancy panel.
- vi. Bear weight slightly onto feet in order to adopt a comfortable semi-squat position especially during landing and take-off.

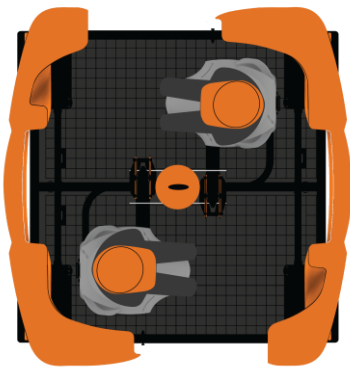
### 3.3 Entry and Exit



Passenger entry and exit should only be conducted with the carrier in a stable position on deck as advised by the crane operator to the deck crew member in charge of the transfer operation.

*Note: All exiting passengers must be clear of the carrier before any new passengers attempt to board.*

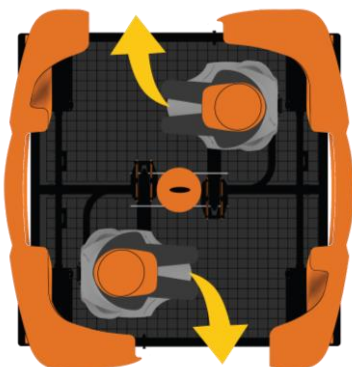
Each individual seat has a dedicated entry / exit point to prevent confusion and ensure an efficient operation. Chevrons on the buoyancy panels are present to indicate the direction of entry.



#### Entry

When advised to do so by the deck crew, passengers should proceed as directed to one of the two entrances and be aware of any tripping hazard. When instructed, all passengers should enter the carrier as illustrated and take their assigned seat. Please refer to section 3.4 for detailed loading instructions.

Passengers should ensure they are securely seated and ensure the seat harness is securely fastened. Grab handles are provided on the left side of each seat, passengers should grip these firmly whenever seated. **Passengers should never place their hands near the moving parts.**



#### Exit

Following landing, and when advised to do so by the deck crew, passengers should unfasten the safety harness, stand and exit (note trip hazard) using the exit to their right.

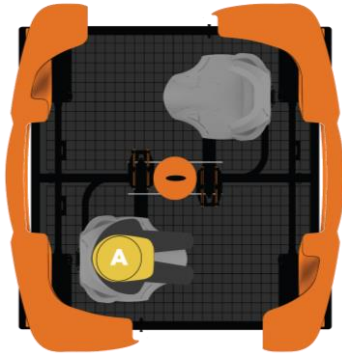
Passengers should move clear of the carrier as directed by the deck crew, ensuring they remain clear of the lifting assembly.

### 3.4 Passenger Flow

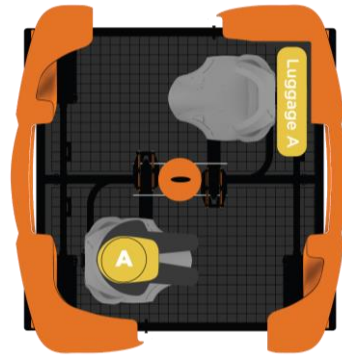
In order to perform loading efficiently and safely, the following procedures are recommended:

#### One passenger

- i. Confirm that passenger and luggage weight does not exceed the SWL of the carrier;
- ii. Assign passenger to seat "A";
- iii. If carrying one piece of luggage, drop bag on "Passenger A Luggage Area"



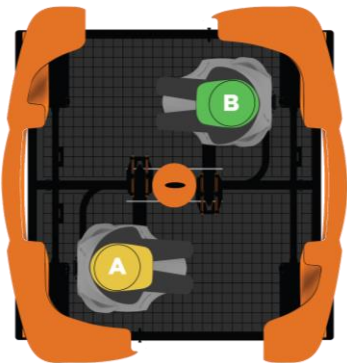
ONE PASSENGER – NO LUGGAGE



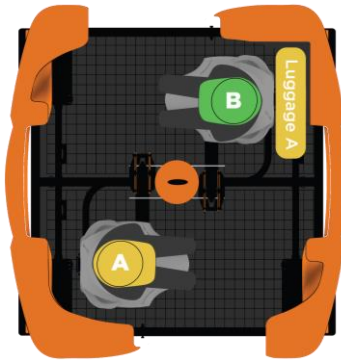
ONE PASSENGER – ONE PIECE OF LUGGAGE

#### Two passengers

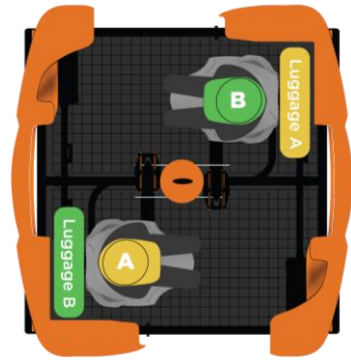
- i. Confirm that passengers and luggage weight does not exceed the SWL of the carrier.
- ii. Assign heaviest passenger to seat "A" and lighter one to seat "B".
- iii. If one piece of luggage is carried, locate it in "Passenger A Luggage Area"
- iv. If two pieces of luggage are carried, locate heaviest piece in "Passenger A Luggage Area" and the lighter one in "Passenger B Luggage Area"



TWO PASSENGERS – NO LUGGAGE



TWO PASSENGERS – ONE PIECE OF LUGGAGE



TWO PASSENGERS – TWO PIECES OF LUGGAGE

### 3.5 Deck Crew Instructions

#### Briefings

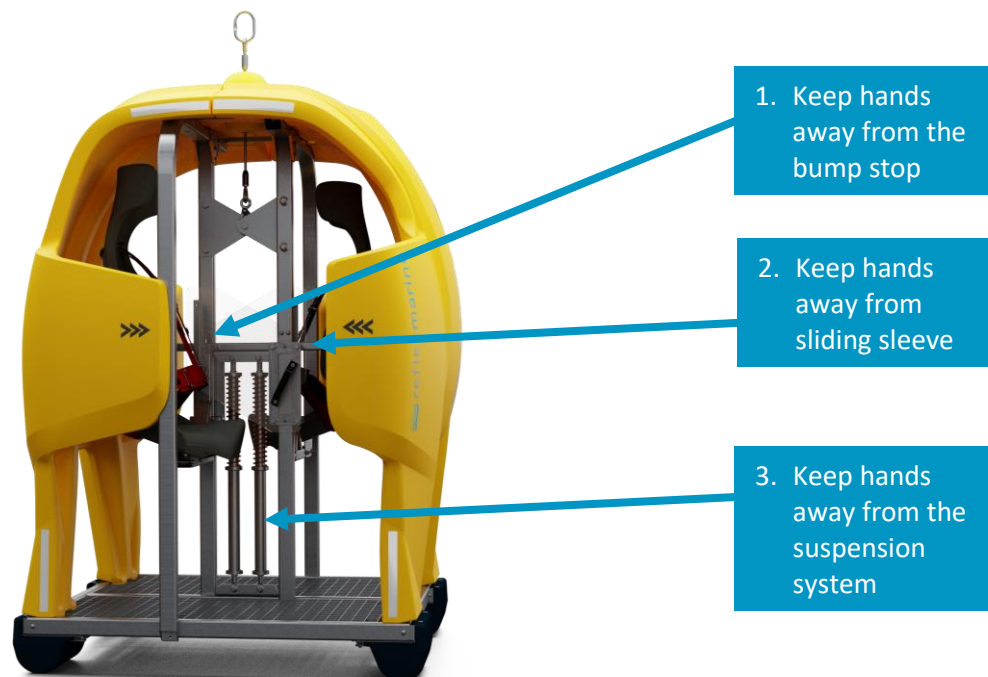
Deliver passenger briefings prior to every transfer lift, it should contain the following information:

- i. Location specific instructions
- ii. Loading and unloading procedures
- iii. Emergency procedures
- iv. Potential hazards
- v. Seating position

#### Other Responsibilities

- i. Highlight potential hazards to passengers e.g. trip hazards during entry/exit
- ii. Remain alert from any hazards as they arise and take appropriate action
- iii. Check that passengers' harnesses are secured and correctly fitted
- iv. When the carrier is in the static position on deck for passenger entry and exit, the wire rope lifting assembly or crane line will be in a static position and may obstruct one or more of the entry / exit points. Ensure passengers remain clear of the wire rope or crane line. Deck crew may need to clear the wire rope from carrier entrances.
- v. Ensure passengers keep hands clear of any pinch points, as illustrated below. A polycarbonate panels are fitted to minimise risk of pinch points.

Figure 1 Pinch Points



*Figure 2 Pinch points hazard indication*

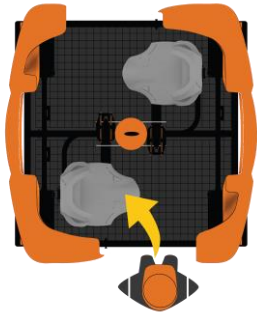


### 3.6 Passenger Instructions

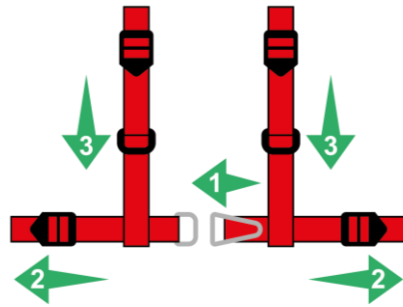
To make passenger entry more efficient, where possible, deck crew or passengers should loosen all harnesses prior to entering the carrier.

All passengers should be familiar with seating procedure and practice entry prior to operations.

## ENTRY



1 Take your allocated seat



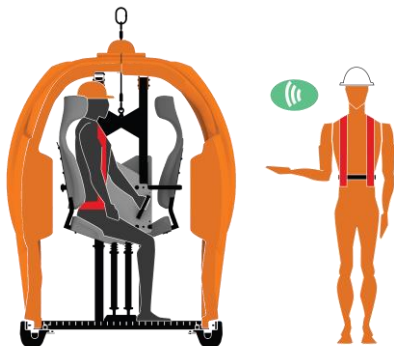
2 Fasten buckle. Tightening lower straps, then upper straps



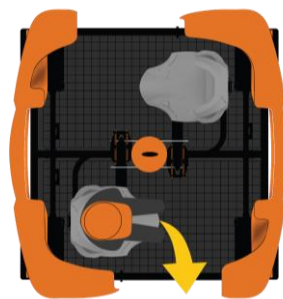
3 Give thumbs up when ready



4 Use handholds and keep feet inside



5 Wait for instructions



6 Exit and move to safe area



### 3.7 Safety Harness Procedure

**Step 1**  
Enter the carrier from the righthand side of your chosen seating position



**Step 2**  
Pull the harness straps over your shoulders and pull the buckle together



**Step 3**  
Take the lap fastener clip and feed through eye.



**Step 4**  
Fold over the clip and the safety belt is secure



**Step 5**  
Next pull the LOWER straps first



**Step 6**  
Then the UPPER straps to make a tight fit



**Reverse the operation for quick release**

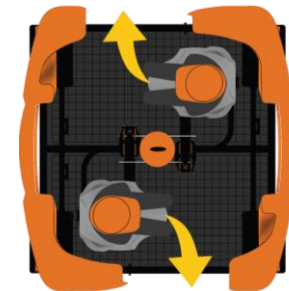
**Step 7**  
Fold back buckle



**Step 8**  
Pull apart harness straps

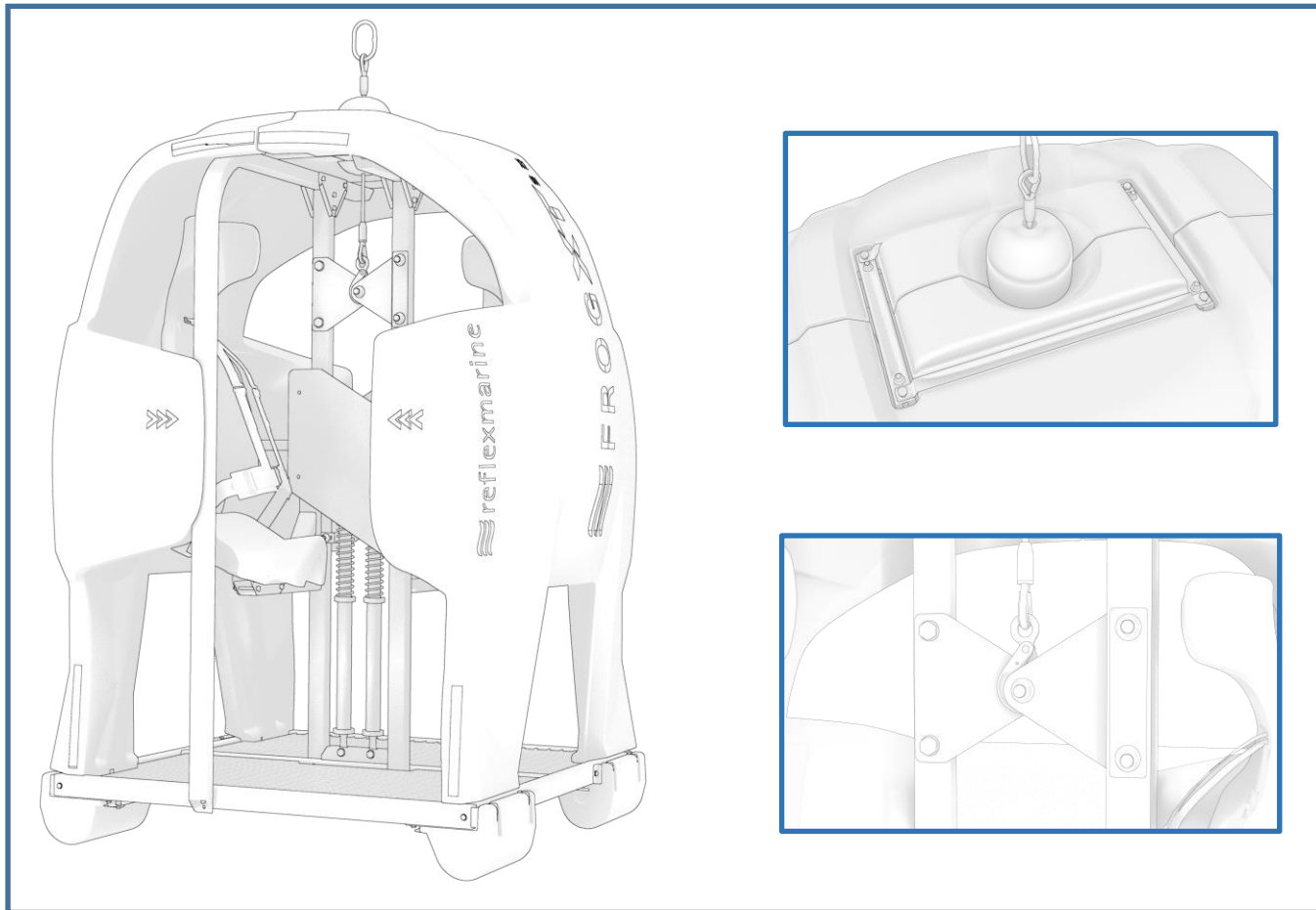


**Step 9**  
Exit the carrier to the right



### 3.8 Lifting Assembly Connection

Figure 3 Lifting Assembly



Lifting assembly is fitted to the FROGXT2 by initially lowering it through the round opening at the top of the capsule.

The lifting assembly is fitted with a hook termination at bottom end.

The hook termination connects with the lifting point located in the middle point between the load plates



### 3.9 Control of Lifting Assembly

The FROG-XT2 is designed to stay firmly on the deck of the vessel whilst passengers are entering or leaving the carrier. The lifting assembly has been kept to a short length to allow for use on smaller crane installations that have limited maximum hook height, considering requirements to clear hand railing.

Due to the short sling length, in order to allow for potential vessel drift, sufficient slack of the crane line must be provided to accommodate such vessel movement.

*Table 4 Sling lengths*

Sling Length	Recommended Slack	Allowable Drift
0.6 m	2 m	4 m



**Note: Please thoroughly evaluate the lift to be conducted taking into account the type of crane in use and any limitation on the boom height and wire travel (such as limit switches, hand rail clearance, etc.) and the effect the sling length will have on the lift.**

For applications where crane height is not a limitation or interfaces with larger crane hooks are required, please contact Reflex Marine Ltd. to assess requirements for longer sling assemblies or larger master links.

## 4 Inspection & Maintenance

Following the recommended procedures set out in this section will help to ensure safe operation of the FROG-XT2.

### 4.1 Definitions

#### Transfer Lift

A transfer is defined as one pickup and put down when passengers are on board, or when the unit carries more than its tare weight.

#### Usage Category

This is defined by the number of transfer lifts per year. There are four different usage categories from low to very high.

#### Critical Parts

These are the identified set of load bearing parts.

#### Competent Person

A competent person is a person who has appropriate practical and theoretical knowledge and experience of the equipment. This will enable them to detect defects and weaknesses and to assess their importance in relation to the safety and continued use of the equipment. It is essential that the competent person is sufficiently independent and impartial to allow objective decisions to be made.

#### Non-Destructive Testing

Although not considered necessary, some operators choose to adopt a dye penetrant crack inspection prior to any re-installation of a critical part.

## 4.2 Care in use / Preventative maintenance

All components in the FROG-XT2 are designed for purpose and selected to be as durable as possible for their specific function. However, operational and storage environments can propagate deterioration if the equipment is not kept in good condition. Factors causing of deterioration can include:

- UV
- Sea Spray
- Dirt
- Humidity
- Grease and chemical
- Radiated heat
- Wind
- Handling and operational damage.
- Sea water with high chlorine content
- High/Excessive vibration
- Mould growth

Components that may specifically be affected by one or a combination of these factors are:

**Wire rope lifting assembly.** The wire rope lifting assembly 'sling' is the most safety critical and vulnerable component in the whole FROG assembly. It is vulnerable to damage from handling and operations and susceptible to corrosion from sea spray and moisture build-up. The lifting assembly should be inspected by a competent person prior to every use. To prevent damage or corrosion the following is advised:

- When not in use the lifting assembly is removed and stored on the floor grating of the FROG.
- When not in use for long periods the lifting assembly should be removed from the FROG and stored in a secure, dry place.
- If the FROG is kept on an open vessel deck and subject to sea spray, where possible, keep equipment covered or keep in a deck area sheltered from sea spray. Note: for high speed craft wind effects may cause covers to fray.

**Seat damping springs.** Sea spray, particularly on equipment that is kept on vessel open deck, can propagate corrosion and cracking in the springs therefore the following is advised in such situations:

- Where possible equipment is covered or kept in a deck area sheltered from sea spray. Note: for high speed craft wind effects may cause covers to fray.
- Gas springs are washed down with fresh water at regular intervals, i.e. after each voyage.

**Seat harnesses.** A combination of the factors listed above can cause deterioration of the seat harnesses. These should be cleaned regularly with fresh water and mild detergent. When stored the harnesses should be fastened so that they do not flap in the wind. For longer durations of storage, it is recommended that the equipment is covered, or the harnesses are secured with cable ties. Signs of damage will be fraying and brittle webbing weave.



**Landing feet.** Heat radiated from deck can cause accelerated compression in the shock mitigation foam landing feet. For periods where the FROG-XT2 is stored for long periods it is recommended that the unit is chocked (raised) from the deck.

**Transport and vibration.** For longer periods of storage in environment with vibration, and when equipment is transported, the threaded fixings on the unit should be inspected to ensure no slackening has occurred.

**General.** The FROG-XT2 should be washed with fresh water regularly to prevent build-up of salt, dirt, and any contaminants.

## 4.3 Inspection Types

Table 5 Inspection Types

Inspection Type	Description
<b>Pre-use Check</b>	A check of key areas prior to each use without dismantling the assembly. Carried out by a competent person.
<b>Visual</b>	A careful and critical assessment of the components, carried out by a competent person without dismantling the assembly.
<b>Examination</b>	A careful and critical assessment of the components carried out by a competent person. This should include dismantling the assembly and performing a visual assessment of the condition of each component, supplemented by other means such as measurement and non-destructive testing as considered necessary. For lifting assemblies this should include a visual inspection of the wire rope assembly.
<b>Post Load Test Inspection</b>	A careful and critical assessment of the components following a proof load test. Carried out by a competent person without dismantling the assembly.

All inspections should be:

- i. Performed by a competent person
- ii. Carried out as per the frequency indicated in the usage table
- iii. Formally recorded

## 4.4 Frequency

The recommended frequency and type of inspection, test and maintenance is shown in Table 6. Please note:

- i. If any doubt exists regarding the usage, then the maintenance strategy should revert to a more conservative higher usage category. This should also be considered if there is any concern over heavy impacts or overloads.
- ii. This recommendation applies to the change out of component parts only and does not replace or alter the inspection intervals as prescribed by the relevant legislation.
- iii. The inspection and test routine as detailed in this document should always be carried out on schedule.
- iv. Where the carrier has experienced heavy vertical or lateral impacts, or sustained substantial damage, a detailed examination should be carried out to ensure integrity before conducting any further lifts. Details of all damage should be recorded in a damage report. Details of the cause of the damage should also be recorded, if known. If damage to the frame has occurred, welds should be examined for cracks using dye penetrant.

- v. Details of all repairs or modifications carried out should be recorded and copies of damage and repair / modifications reports should be sent to the party controlling the use of the carrier.
- vi. Lifting assembly covers should be removed if the wire rope lifting assembly is removed from service.
- vii. Contact RML or one of our approved partners for technical advice on inspection, testing, or maintenance. It is always helpful to provide detailed photos and reports along with any query to [support@reflexmarine.com](mailto:support@reflexmarine.com).

## 4.5 Supporting Documentation

### Customer drawing pack

All FROG-XT2 units are accompanied by a drawing pack that contains all of the relevant drawings to aid in its maintenance. This pack contains the following:

- i. Assembly Drawings
- ii. Replacement parts, kit drawings
- iii. Torque settings
- iv. Operational stickers
- v. Bill of materials

### Certification pack

Every FROG-XT2 comes complete with a certification package, which includes, but not limited to, manufacturer's declaration of conformity, all of the critical parts certificates, load test certificates and the 3rd party release note and checklist.

If any further certification is required, please contact RML.

### Component certification

RML retains copies of the certification for all units and components involved in their manufacture. Replacement copies are available on request.

## 4.6 FROG-XT2 Inspection and Maintenance Schedules

Table 6 FROG-XT2 Inspection and Maintenance Recommendation

FROG-XT2 RECOMMENDED INSPECTION AND MAINTENANCE SCHEDULES							
Usage Category No. of Transfer Lifts per year	Pre-Use Check	Visual Inspection	Examination	Wire Rope Lifting Assembly Replacement	Critical Parts Replacement <sup>2</sup>	Suspension System Replacement	Unit Replacement <sup>1</sup>
					Load Test Post Load Test Visual Inspection		
<b>Low</b> <100	<b>Conducted Prior To Every Use</b>	6 months	12 months	12 months	36 months	4 Years	12 years
<b>Medium</b> 100 - 500		6 months	12 months	12 months	24 months	3 Years	8 years
<b>High</b> 500 - 2000		3 months	12 months	6 months	12 months	2 Years	6 years
<b>Very High</b> 2000 - 5000 <sup>3</sup>		3 months	6 months	3 months	6 months	1 years	4 years
<p><sup>1</sup>This may be extended subject to a 'condition &amp; service assessment' carried out by Reflex Marine or an Approved Partner</p> <p><sup>2</sup>Only applies to critical parts marked "consumable"</p> <p><sup>3</sup>When exceeding 5000 lifts, please refer to the Ultra High section (4.7) for further inspection guidance</p>							

## Ultra-High Usage

For any units exceeding 5000 lifts per year, this section provides additional inspection criteria.

### Pre-use checks

- i. Check load plates for wear, cracks, nicks, gouges, corrosion, and distortion of plate or lift point bolts.
- ii. Check the seat support assembly, seat mounting subframe, and sliding sleeve weldment for cracks or distortion, paying particular attention to the welds.
- iii. Check shock absorbers for leaks and that all fastening points are secure.

### Visual inspection

- i. In addition to the inspection checklist item 9, the foot mounting plate should be visually inspected for cracks and distortion.
- ii. In addition to the inspection checklist item 8, the floor grating should be visually inspected for sign of distortion, cracking or damage.

### Examination

- i. In addition to the examination checklist item 6, all the welds on the seat base assembly, sliding carriage should be visually inspected.
- ii. In addition to the examination checklist item 9, the welds on the bottom cross beam where it joins the base frame should be inspected using the dye penetrant technique for cracks. Buoyancy panels should be removed to visually inspect the base frame weldments. The floor grating should be visually inspected for sign of distortion, cracking, or damage.



## 4.7 Load Test Procedure

Table 7 Load Test Requirements

Question	Response
<b>When should a Proof Load Test be conducted?</b>	<ul style="list-style-type: none"> <li>i. After replacement of any critical parts. Does not apply to replacement of lifting assemblies.</li> <li>ii. After any suspected damage arising from overloading or impact.</li> <li>iii. If the history of the unit is uncertain.</li> <li>iv. If the inspection data plate is missing, illegible or out of date.</li> </ul>
<b>Who should conduct this test?</b>	<ul style="list-style-type: none"> <li>i. Independent 3rd party.</li> <li>ii. A competent and certified test person.</li> </ul>
<b>Does this test require a formal record?</b>	Yes.
<b>What equipment is required to perform this test?</b>	<ul style="list-style-type: none"> <li>i. Loading weights or sandbags (742 kg (1,636 lb)).</li> <li>ii. Certified weighing scale or load cell.</li> <li>iii. Lifting equipment certified for &gt; 1.5 tonnes SWL.</li> <li>iv. A ladder or top access platform.</li> <li>v. An inspection frame or floor matting.</li> <li>vi. Good lighting.</li> </ul>

Table 8 Load Test Instructions

Item	Instruction
<b>Components Under Test</b>	<ul style="list-style-type: none"> <li>i. Main Lift Point</li> <li>ii. Central Column Load Bearing Assembly.</li> <li>iii. Seats and Floor Structure.</li> </ul>
<b>Test Proof Load</b>	742 kg (1,636 lb)
<b>Test Proof Load Distribution</b>	<p>At the discretion of the competent person the proof load may be applied to the FROG-XT2 either solely on the floor or split between the floor and seats. For the latter, the recommended distribution is:</p> <ul style="list-style-type: none"> <li>i. 260 kg (574 lb) on seats spread equally between them. Seats and harnesses should be protected prior to loading with weight. If solid test weights are used, use wooden boards placed on seats with one sandbag underneath, or similar, to accommodate to the seat shape. This will provide a flat surface to place weights on to and will prevent damage to the seat.</li> <li>ii. 482 kg (1,062 lb) placed on the floor and distributed evenly.</li> </ul>
<b>Basis of Test Proof Load</b>	Twice Maximum Gross Weight, less Tare Weight = 2 x 500 kg (1,103 lb) – 258 kg (569 lb) = 742 kg (1,636 lb)
<b>Crane Hook Load</b>	1,000 kg (2,205 lb)
<b>Test Method</b>	Lift the unit and hold static for 3 minutes.

\* **Note: The tare weight of the FROG-XT2 is approximately 258 kg (569 lb) but may vary slightly. Each FROG-XT2 must be weighed prior to load test**

## 4.8 Data plates

### Inspection Data Plate

An inspection data plate will be issued and attached by the test house, which should show:

- i. Tare Weight (kg)
- ii. Pay load / SWL (kg)
- iii. Maximum gross load (kg)
- iv. The load test date (DD/MMM/YYYY)
- v. Test load (kg)
- vi. The serial number: XT2-XXXX (where XXXX is unit I.D. No)
- vii. The model number: XT2
- viii. Entry into service date (DD/MMM/YYYY)

### Marker Plate

- i. Model number: XT2
- ii. Serial number: XT2-XXXX (where XXX is unit I.D. No)
- iii. Date of manufacture (DD/MM/YYYY)
- iv. Tare weight (kg)
- v. Pay load / SWL (kg)
- vi. Maximum gross load (kg)
- vii. Maximum number of passengers (standard & stretcher mode)

## 4.9 Pre-Use Check

# PRE-OPERATIONAL VISUAL CHECK

<b>1</b>	Check the <b>LIFT BOLT</b> is secure and nuts, split pin and tamper-proof seals are in position.
<b>2</b>	Check <b>LOAD PLATES</b> are fully engaged and secure.
<b>3</b>	Check the <b>LOAD PLATE SAFETY BOLTS</b> are secure and nuts, split pins and tamper-proof seals are in position.
<b>4</b>	Check the <b>CENTRAL COLUMN SAFETY BOLTS</b> are secure and nuts, split pins and tamper-proof seals are in position.
<b>5</b>	Check all <b>FITTINGS, FRAME, and BUOYANCY</b> are in good order.
<b>6</b>	Check <b>SEAT HARNESES</b> operate properly, and attachment points are secure.
<b>7</b>	Check <b>SUSPENSION SYSTEM</b> operates properly. <b>SLIDING SLEEVE</b> must be in contact with the rubber bump stops.
<b>8</b>	Check <b>INSPECTION DATA PLATE</b> and all <b>CERTIFICATION</b> are in order.
<b>9</b>	Check <b>WIRE ROPE LIFTING ASSEMBLY</b> is correctly attached and in good order. Check <b>HOOK</b> is fitted and latched.

Drawing No: RP1151  
Revision: A

ECN-00618  
Issued: 28/08/2020

#### 4.10 Visual Inspection Checklist Form

FROG-XT2 Visual Inspection Checklist (Page 1 of 3)					
Unit Serial Number		This Inspection Date		Inspected by	
Usage Category		Last Visual Inspection		Position/ Company	
Installation / Vessel		Last Examination		Signature	
Avg. No of Transfers / Year		Last Load Test		Original Inspection record filed in	
Item No	Description	Comment / Serial Number/ Colour Code	Pass / Fail	Verified By	
1.	<p><b>Wire Rope Lifting Assembly (Critical Part) (Consumable)</b>                      The wire rope lifting assembly (including attachments) must be visually inspected by a Competent Person.                      Note: This may be as frequently as every 3 months. Irrespective of apparent condition the lifting assembly should be replaced at least every 12 months.</p>				
2.	<p><b>Lift Point Bolt (Critical Part) (Consumable)</b>                      Visually inspect the 1 x M16 lift bolt, nut, split pin, and tamper proof seal, that connect both Load Plates, for wear or damage.</p>				
3.	<p><b>Load Plates Safety Bolts (Critical Part) (Consumable)</b>                      Visually inspect the 4 x M16 load plate safety bolts, nuts, split pins and tamper proof seals that connect the Load Plates to the central columns for wear or damage.</p>				
4.	<p><b>Load Plates (Critical Part)</b>                      Visually inspect in situ for any signs of wear, cracks, deformation, or other damage.</p>				
5.	<p><b>Central Column Safety Bolts (Critical Part) (Consumable)</b>                      Visually inspect the 4 x M12 column safety bolts, located at the bottom and connect columns to base frame, checking nuts, split pins, and tamper proof seals for wear or damage.</p>				
6.	<p><b>Seat Base Assembly</b>                      Visually inspect for any wear or damage and ensure that all bolts are fully secure.</p>				

FROG-XT2 Visual Inspection Checklist continued... (Page 2 of 3)												
Item No	Description	Comment / Serial No./ Colour Code	Pass / Fail	Verified By								
7.	<p><b>Suspension</b> Check the condition and operation of the shock absorber. If the shock absorbers show excessive corrosion or have started to compress, then they should be changed out.</p> <p>Visually inspect for any wear or damage and ensure that all bolts, and rod ends are fully secure. Check to ensure that there is no sign of any fluid leaking at the base of the shock absorbers.</p> <p>The FROG-XT2 shock absorbers can be susceptible to yield over time. This can be verified by measuring the deflection of the seat base in-situ. The following check is recommended:</p> <p><b>1. In-situ check</b> The top of the sliding sleeve should rest against the compression stop. If a space exists between the top of the sliding sleeve and the compression stops greater than 10 mm, then the shock absorbers should be replaced.</p> <p>Check the support brackets for any signs of deformation.</p>											
8.	<p><b>Frame and Buoyancy</b> Visually inspect for any damage and ensure that all bolts and fasteners are tight and fully secure.</p>											
9.	<p><b>Landing Feet</b> Examine the feet to ensure that they are in good condition and that they are properly secured to the capsule. Do not go underneath an active lift.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li><i>i. Measure height of foot and replace if under 100 mm in height</i></li> <li><i>ii. Small (20 mm in length) cuts are acceptable but feet should be replaced when damage larger than 20mm is present.</i></li> </ul>	<p><b>Foot</b></p> <table border="1"> <tr><td>1</td><td></td></tr> <tr><td>2</td><td></td></tr> <tr><td>3</td><td></td></tr> <tr><td>4</td><td></td></tr> </table>	1		2		3		4			
1												
2												
3												
4												
10.	<p><b>Seat Harness Security</b> Visually inspect the seat harness attachment points and the harness webbing for any signs of wear, fraying or damage. Check that attachment points are secure.</p>											
11.	<p><b>Seat Harnesses (sit-in)</b> Sit in each seat and check fastening and unfastening of each harness, to ensure correct operation.</p>	<table border="1"> <tr><td>A</td><td></td></tr> <tr><td>B</td><td></td></tr> </table>	A		B							
A												
B												

FROG-XT2 Visual Inspection Checklist continued... (Page 3 of 3)				
Item No	Description	Comment / Serial No./ Colour Code	Pass / Fail	Verified By
12.	<b>Stickers</b> - Check that all of the stickers on the unit are in good condition and that none are missing or damaged. The sticker location drawing can be found in the drawing pack.			
13	<b>Inspection data plate</b> Check the date of the last examination/ inspection to ensure the unit will remain in compliance with requirements for at least 6 months. Update data plate to show visual examination has been done.			
<b>Storage</b>				
14.	<b>Storage of FROG-XT2</b> - Check the storage cover is in good condition and not showing any signs of UV or wind degradation. Storage off the ground, use of spacer chocks whilst not in use.			
15.	<b>Replacement Parts Stock</b> - Check condition of all associated replacement parts and accessories. Lifting assembly should be stored in an appropriate dry place.			
<b>Reports</b>			Complete Y/N	
16.	<b>Documentation / Report including Photographic Report</b>			
NOTES:				

When exceeding 5000 lifts, please refer to the Ultra High section (4.7) of the User Manual for further inspection guidance

#### 4.11 Examination Checklist Form

FROG-XT2 Examination Checklist (Page 1 of 3)					
<b>Unit Serial Number</b>		<b>This Inspection Date</b>		<b>Inspected by</b>	
<b>Usage Category</b>		<b>Last Visual Inspection</b>		<b>Position/ Company</b>	
<b>Installation / Vessel</b>		<b>Last Examination</b>		<b>Signature</b>	
<b>Avg. No of Transfers / Year</b>		<b>Last Load Test</b>		<b>Original Inspection record filed in</b>	
Item No	Description	Comment / Serial Number/ Colour Code	Pass / Fail	Verified By	
1.	<b>Wire Rope Lifting Assembly (Critical Part) (Consumable)</b> Replace the wire rope lifting assembly according to the usage of the unit. This may be as frequently as every 3 months. Irrespective of apparent condition the lifting assembly should be replaced at least every 12 months.				
2.	<b>Lift Point Bolt (Critical Part) (Consumable)</b> Remove and visually inspect the lift bolt for any signs of damage or strain. Visually inspect the 2 holes in the 2 load plates for signs of damage or strain. Replace appropriate parts according to the usage of the FROG-XT2 or on the recommendation of a Competent Person / Inspector.				
3.	<b>Load Plate Safety Bolts (Critical Part) (Consumable)</b> Remove and visually inspect the 4 safety bolts for any signs of damage or strain. Visually inspect the 4 holes in the 2 central columns for signs of damage or strain. Replace appropriate parts according to the usage of the FROG-XT2 or on the recommendation of a Competent Person / Inspector.				
4.	<b>Load Plate (Critical Part)</b> Remove and visually inspect the Load plates for any signs of damage or strain. Replace on the recommendation of a Competent Person / Inspector.				
5.	<b>Central Column Safety Bolts (Critical Part) (Consumable)</b> Remove and visually inspect the 4 safety bolts for any signs of damage or strain. Visually inspect the 4 holes in the base cross beam for signs of damage or strain. Replace appropriate parts according to the usage of the FROG-XT2 or on the recommendation of a Competent Person / Inspector.				
6.	<b>Seat Base Assembly</b> Visually inspect and test all fixings for any wear or damage and ensure that all fasteners are fully secure.				

FROG-XT2 Examination Checklist continued... (Page 2 of 3)												
Item No	Description	Comment / Serial No./ Colour Code	Pass / Fail	Verified By								
7.	<p><b>Suspension</b> Check and test the condition and operation of the shock absorbers. If shock absorbers show excessive corrosion or have started to yield, then they should be changed out.</p> <p>The shock absorbers can be susceptible to yield over time. The following check is recommended:</p> <p><b>In-situ check</b>                      The top of the Sliding Sleeve should rest against the compression stop. If a space exists between the top of the sliding sleeve and the compression stops greater than 10mm, then the shock absorbers should be replaced.</p> <p>Check the support brackets for any signs of deformation.</p>											
8.	<p><b>Landing Feet</b> - Examine the feet to ensure that they are in good condition and that they are properly secured to the capsule. Do not go underneath an active lift.</p> <p><b>Notes:</b></p> <p><i>i. Measure height of foot and replace if under 100 mm in height</i></p> <p><i>ii. Small (20 mm in length) cuts are acceptable but feet should be replaced when damage greater than 20mm is present.</i></p>	<p><b>Foot</b></p> <table border="1"> <tr><td>1</td><td></td></tr> <tr><td>2</td><td></td></tr> <tr><td>3</td><td></td></tr> <tr><td>4</td><td></td></tr> </table>	1		2		3		4			
1												
2												
3												
4												
9.	<p><b>Frame and Buoyancy</b> - Visually inspect for any damage and ensure that all bolts and fasteners are tight and fully secure.</p>											
10.	<p><b>Seat Harness Security</b> - Visually inspect the seat harness attachment points and the harness webbing for any signs of wear, fraying or damage. Check that attachment points are secure.</p>											
11.	<p><b>Seat Harnesses (sit-in)</b> Sit in each seat and check fastening and unfastening of each harness, to ensure correct operation.</p>	<table border="1"> <tr><td>A</td><td></td></tr> <tr><td>B</td><td></td></tr> </table>	A		B							
A												
B												



FROG-XT2 Examination Checklist continued... (Page 3 of 3)				
Item No	Description	Comment / Serial No./ Colour Code	Pass / Fail	Verified By
12.	<b>Stickers</b> - Check that all the stickers on the unit are in good condition and that none are missing or damaged. The sticker location drawing can be found in the drawing pack.			
13.	<b>Load Test</b> - On critical parts replacement, a load test must be conducted. This is to be done by an independent test house company, nationally recognised and in accordance with ILO 152.			
14.	<b>Inspection data plate</b> - Update the inspection data plate after completion of approved examination/inspection			
15.	<b>Post Load Test Visual Inspection</b> – If a load test is done, conduct and report a post load test visual inspection.			
<b>Storage</b>				
16.	<b>Storage of FROG-XT2</b> - Check the storage cover is in good condition and not showing any signs of UV or wind degradation. Storage off the ground, use of spacer chocks whilst not in use.			
17.	<b>Replacement Parts Stock</b> - Check condition of all associated replacement parts and accessories. Lifting assembly should be stored in an appropriate dry place.			
<b>Reports</b>			Complete Y/N	
18.	<b>Documentation / Report including Photographic Report</b>			
NOTES:				

When exceeding 5000 lifts, please refer to the Ultra High section (4.7) of the User Manual for further inspection guidance

#### 4.12 Post Load Test Inspection Checklist Form

FROG-XT2 Post Load Test Inspection Checklist					
<b>Unit Serial Number</b>		<b>This Inspection Date</b>		<b>Inspected by</b>	
<b>Usage Category</b>		<b>Last Visual Inspection</b>		<b>Position/ Company</b>	
<b>Installation / Vessel</b>		<b>Last Examination</b>		<b>Signature</b>	
<b>Avg. No of Transfers / Year</b>		<b>Last Load Test</b>		<b>Original Inspection record filed in</b>	
Item No	Description	Comment	Pass / Fail	Verified By	
1.	<b>Load Plates (Critical Part)</b> - Visually inspect in situ for any signs of wear, cracks, deformation, or other damage.				
2.	<b>Lift point bolt (Critical Part)</b> - Visually inspect the M16 lift point safety bolt, nut, split pin and tamper proof seal. Ensure it remains fully secure.				
2.	<b>Load Plate Safety Bolts (Critical Part) (Consumable)</b> - Visually inspect the 4 x M16 safety bolts, nuts, split pins and tamper proof seals that connect the load plate to the central columns for wear or damage.				
3.	<b>Central column Safety Bolts (Critical Part) (Consumable)</b> - Visually inspect the 4 x M12 safety bolts, nuts, split pins and tamper proof seals that connect the central columns to the base frame.				
4.	<b>Shock absorbers</b> Visually inspect for any wear or damage and ensure that all bolts and nuts are fully secure. Ensure that rod ends are tight and secure.				
5.	<b>Seat Base Assembly</b> - Visually inspect for any wear or damage and ensure that all fasteners are fully secure.				
6.	<b>Landing Feet</b> - Examine the feet to ensure that they are in good condition after the load test. The feet will normally recover full height sometime after the load test weight is removed.				
7.	<b>Frame and Buoyancy</b> - Visually inspect for any damage and ensure that all bolts and fasteners are tight and fully secure.				
8.	<b>Inspection data plate</b> - Check the date of the last load test has been correctly inserted and is indelibly legible.				
	<b>Reports</b>		Complete Y/N		
11.	<b>Documentation / Report including Photographic Report</b>				
<b>NOTES:</b>					

## 5 Handling & Storage

### 5.1 Stock Inspections

These guidelines are for the stocking of new units and parts before they are put into service. These guidelines are **NOT** applicable to units and parts that have already been put into service.

Table 9 Stock inspections

Type	In Stock Inspection	Release Inspection	Additional Certification	Shelf Life	Actions
<b>Transfer capsules</b>	Annual visual inspection	Less than 2 years old visual inspection Older than two years visual inspection, load test and post load test inspection	1. New inspection date to be stamped on inspection data plate 2. Visual inspection checklist to be completed 3. For units older than two years the new load test date should be stamped onto the inspection data plate and a new load test certificate issued.	5 Years	<ol style="list-style-type: none"> <li>1. Remove lifting assembly</li> <li>2. Place lifting assembly into dry storage</li> <li>3. Ensure the unit is chocked up off its feet, stored in a secure area away from the risk of damage and protected from exposure to the elements</li> <li>4. Update certification pack with new lifting assembly information if original lifting assembly is not being used.</li> <li>5. Update the certificate pack with all new certification documents, including load test and examination certificates.</li> </ol>
<b>Wire Rope Lifting Assembly</b>	Visual – Every 6 months	Thorough Examination	<ol style="list-style-type: none"> <li>1. Re-validated Certificate, indicating next inspection date</li> <li>2. Certificate of thorough examination should be issued.</li> </ol>	2 Years	<ol style="list-style-type: none"> <li>1. Keep off the ground in dry and ventilated storage area with the lifting assembly cover removed.</li> </ol>
<b>Other replacement Parts (not lifting assemblies)</b>	None	Visual Inspection	Not Required	Unit Lifetime	<ol style="list-style-type: none"> <li>1. Keep in clean dry storage</li> </ol>

**Note:** When a carrier first enters service, this date must be stamped onto the unit data plate.

## 5.2 Forklift

Care should be taken when handling the FROG-XT2 with a forklift truck to avoid damage the underside (landing feet, cross beams, or base of the central lifting column). Alternatively, the capsule may be secured to a pallet specifically designed for use with forks.

## 5.3 Crane

When lifting the FROG-XT2 with short chain or strop, a temporary shackle should be fixed to the lifting point and lifting assembly removed. Care must be taken not to damage the lifting assembly. **A Shackle should not be fitted through the thimble of the lifting assembly eyes.**

## 5.4 Securing

For deck fastening, use the peripheral braces around the floor grating.

## 5.5 Inspection

Before and after transportation the FROG-XT2 must be inspected to check for damage sustained in transit. The unit must not be used if any structural damage is observed. If any damage has been observed, please complete a visual inspection to determine the extent of the damage.

## 5.6 Preparation for Road Transport

Prior to shipping, the seat harnesses should be stowed by securing the buckle together and then tightening the harness straps. This will prevent seat harnesses flapping and damaging the seating area. It is recommended that the FROG-XT2 is covered for shipping either with a FROG-XT2 weatherproof protective cover or other heavy-duty tarpaulin material.

## 5.7 Shipping

The FROG-XT2 will fit in a standard or high-cube container.

If the FROG-XT2 is transported on flat rack it must be secured. Recommended securing points are base frame beams. To protect it from excess loading, the lift point must not be used as a securing point. Feet must be supported to prevent collapse; this can be done by placing suitable chocks or props under the base frame.

## 5.8 Storage

The FROG-XT2 has been designed to cope with the harsh conditions on an offshore installation or vessel; however, it is important to protect the unit as much as possible from any hazardous elements and UV degradation. It is recommended that a FROG-XT2 weatherproof cover is used whilst not in use.

## 5.9 Feet Deformation during Storage

Prolonged periods of exposure to hot decks and self-weight can cause permanent set deformation of the feet. It is advised that if the FROG-XT2 is to be stored for prolonged periods of inactivity then the user should consider a set of chocks to lift the feet away from the deck. Any chocks used should fit properly underneath the main base frame to ensure that any exposed bolt heads are not impinged. The chocks should be pre-laid on the deck ready for landing the Frog directly to the storage position.

## 5.10 Replacement Parts

Replacement parts should be stored in dry clean environments and be suitably labelled and tagged.

## 6 Replacement Parts

### 6.1 Introduction

Replacement parts can be supplied as individual items or as appropriate kits. Prior to ordering any replacement parts or kits, establish the FROG-XT2 serial number which is stamped on the data plate. The serial number is XT2-XXXX, where XXXX represents a four-digit number.

Reflex Marine Ltd holds replacement parts and accessories in stock. We are able to supply most individual components. A full list of FROG-XT2 parts (latest version) is contained in the customer drawing pack, which is issued with every unit.

It may be advisable to hold an inventory of frequently replaced parts. This will help to ensure the continued safe operation of the FROG-XT2 unit. Minimum stock quantities shall be influenced by:

- i. Remoteness of location
- ii. Downtime implications
- iii. Criticality of maintaining crew access
- iv. Usage
- v. Customs processing time
- vi. Delivery cost for small parts

Reflex Marine can recommend stock items and quantities for your operation.

### 6.2 Kits

The following kits are available for routine and non-routine maintenance. Ordering an appropriate kit is more economical than replacing individual parts.

Kit Name	Part Number	Contents
Lifting Assembly Kit	RA0998	Wire Rope Lifting Assembly
Replacement Parts Kit	RA1176	Critical Parts Minus The Wire Rope Lifting Assembly
Critical Part Kit	RA1177	Critical Parts
Harness Kit	RA1181	2 x Harnesses plus Associated Fixings
Landing Foot Kit	RA1179	4 x Feet plus Associated Fixings
Full-Service Kit	RA1180	1x Lifting Assembly Kit 1 x Replacement Parts Kit 1 x Harness Kit 1 x Landing Foot Kit 1 x Suspension Kit
Suspension Kit	RA1182	2 x Shock absorbers Associated Fixings

### 6.3 Parts identification

Each assembly or part is assigned a part number which provides the unique identification of the part /assembly.

Where material grades and material traceability are deemed to be safety critical these components will be allocated unique component numbers which will be stamped or etched as required.

Components that require unique identification are referenced in the parts list.

For bolts, where etching is impractical, batches of bolts will be colour coded and a note added to the mill certificate to identify the colour used.

### 6.4 Accessories

The following accessories are available from Reflex Marine to maximise operational effectiveness. They can be supplied with the FROG-XT2 or ordered separately.



#### Strobe Light

Provides greater visibility at night and in poor weather conditions. High-intensity: light weight, waterproof to 300 m, Flash Rate 50 per min and it also provides six-mile visibility, fitted to the top cross beam of the FROG-XT2.

**Note: This strobe is not certified for use in hazardous areas. A zoned strobe light is available on request.**

#### Protective Cover

The cover protects against degradation from UV light and the weather elements as well as worksite debris.

The standard protective cover has a silver reflective cover, which is made of flame-resistant fabric (BS3408).

**For a complete list of accessories please contact RML**







## 8 Contact Details

**Address:**

Head Office  
Reflex Marine,  
Old School House  
School Hill  
Shortlanesend  
Truro  
TR4 9DU  
UK

**Telephone:**

+44 (0)1872 321155

**Email Addresses:**

General enquiries – [info@reflexmarine.com](mailto:info@reflexmarine.com)

Order enquiries (sales & replacement parts) – [support@reflexmarine.com](mailto:support@reflexmarine.com)

Accounts Department – [accounts@reflexmarine.com](mailto:accounts@reflexmarine.com)