FROG-6 User Manual

Original Instructions for Frog Models:
HC6-01 (620) Standard
HC6-01 (640) Arctic

Rev 04.1 | Issued 04-Apr-2013

Reflex Marine

OFFSHORE ACCESS SPECIALISTS

Reflex Marine Ltd

Offshore Access Specialists

Purpose of Manual

This manual contains general instructions for the operation and maintenance of the FROG-6.

Safe and proper use of the FROG-6 is the responsibility of the user after having taken due regard of the information provided in this document.

The user must ensure that all safety measures as required by relevant legislation and by good operational practice are utilised for operations involving the FROG-6.

Adequate training must be provided for all personnel involved in the operation of the FROG-6 before the commencement of operational use.

For the purposes of this manual RML will be deemed to mean Reflex Marine Ltd.

Please retain this manual for future reference. Additional copies may be obtained by contacting Reflex Marine Ltd or by downloading the latest manual revision from www.reflexmarine.com/support.

Revision Approval

Revision	Date Issued	Status	Approved	Name	Signed
02	07 Jan 2008	Revised	RML Operations Manager		
02.1	22 Apr 2008	Revised	RML Operations Manager		
03	15 Jun 2010	Revised	RML Operations Manager	D Brittan	
04	22 May 2012	Revised	RML Lead Production and Quality Engineer	P Onions	
04.1	04-Apr-2013	Working	RML Lead Engineer Operations	P Onions	

Document Revision & Control

To ensure that all changes to any of the documents contained in this manual are carried out and distributed in a controlled and authorised manner:

i. Any proposed change in documentation must be submitted to the Reflex Marine Ltd Lead Production and Quality Engineer in writing for authorisation. This refers to all drawings and documents contained in this manual.
ii. A record must be maintained of all documentation changes.
iii. A list of all revisions and amendments must be included in each controlled copy of this User Manual.
iv. Upon revision of the FROG-6 User Manual, the manual will be distributed to the list of document holders indicated below.
v. The control, revision and distribution of this manual will be the responsibility of the Reflex Marine Ltd Lead Production and Quality Engineer.

Revisions

Rev No	Reason For Revision	Safety Critical Change
02	Section 2 - Update to sections 2.1 and 2.2. Section 3 - Revision to Operating Parameters. Section 6 - General revision to periodic inspection and maintenance. Appendix D - Update. Appendix E - Update.	No Yes Yes No No
02.1	Section 6 - Update to sections 6.2, 6.3 and 6.6. Appendix C - Update. Appendix D - Update.	No No No
03	The Frog 6 User Manual has been reformatted to be consistent with a full revision of the User Manual documentation across the Reflex Marine product range. This manual is more focused on providing User Information in a format consistent with the other Reflex Marine products. The significant changes are listed below. **New Sections added** : Section 5.7 - Luggage Storage. Section 5.8 - Seatbelt Operation. Section 5.9 - Rider instructions added. Section 5.10 - Emergency stop procedure added. **Revised Sections** Section 6 - Inspection, Testing and Maintenance. The whole section has been revised to align recommended inspection and maintenance to the 'degree of use' and provide guidance on unit lifetime and retirement policy. Improved inspection checklist templates are included for a range of recommended inspection points. ISO certification standard updated to ISO 9001 : 2008	 No Yes
04	Updated as per Drawing revision to Frog-6 (620) and (640) 1-00 : New Drawing Numbers affect Inspection diagrams, Parts references, Operating Procedures. Manual also updated to reflect changes to Frog-3 Manual Revision 18: Parts list will now be online access. Revised I&M table.	Yes
04.1	ECN 015;	

	Section 2.1 Payload recommendations updated; Section 3.3 Wind speed updated Section 5.12.1 Diagram 7 updated, Section 6.12 New section	No No No No

Distribution List

Controlled/uncontrolled copies of this manual are issued to the following:

Reflex Marine Ltd				
Ref.	**Status**	**Issued To**	**Date Issued**	**Format**
Master	Controlled	RML Truro J Cryan	22 May 2012	Electronic (Archived)
RML 1	Uncontrolled	RML Newbury P Onions	22 May 2012	Electronic
RML 2	Uncontrolled	RML Aberdeen S Watson	22 May 2012	Electronic

Notification of this manual revision is sent to the following:

Reflex Marine Ltd				
Ref.	**Status**	**Issued To**	**Date Issued**	**Format**
RML 3	Notification	RML Website J Strong	22 May 2012	Electronic
RML 4	Notification	RML Sales Team Coordinator K Twitchen	22 May 2012	Electronic

Table of Contents

1 INTRODUCTION

1.1 Scope

This User Manual is for the standard six passenger capacity FROG-6 - Model HC6-01 (620) Standard, and the low temperature FROG-6 - Model HC6-01 (640) Arctic.

Note: Throughout this manual the use of this symbol "  " denotes safety critical information.

1.2 Introduction

The FROG-6 Personnel Transfer Capsule (PTC) is a personnel transfer device designed to provide increased passenger protection when carrying out the transfer of personnel between vessels and installations.

Crane personnel transfers are carried out for a wide variety of reasons including routine, urgent operational and emergency reasons. The FROG-6 can accommodate a stretcher to transfer injured personnel in a protected environment.

The FROG-6 comprises the following two main assemblies; firstly, the stainless steel outer framework containing polyethylene buoyancy panels, secondly, a spring-dampened seating assembly mounted on a central column. All materials have been selected specifically to minimise corrosion in the marine environment.

The outer framework protects passengers from impacts and contains the buoyant elements which ensure the FROG-6 floats and is self-righting in water. At its base are keel weights which assist in rapid self-righting.

The outer shell lands on three feet that provide shock absorption and ensure that the FROG-6 is stable on uneven surfaces or when landing on a heaving vessel. The outer shell also has three large open accesses that allow rapid unimpeded exit.

During transit passengers are seated and secured with full harnesses to protect them against whiplash and falling. Seating is mounted on a sprung carriage to provide protection against heavy landings.

The sling assembly is of a special design to prevent rotation.

Note: The regulations governing personnel transfer operations vary greatly from country to country and it is imperative that operators of the equipment establish the relevant requirements for the area of operation.

1.3 Safety

Personnel transfer is a safety critical activity. The following items must be observed to properly control safe transfers.

i. Proper planning of the transfer operation is essential. Planning must include a risk assessment and method statement which takes account of all environmental and operational factors. Assessing the impact of these factors on operational risk is best done by Competent Persons (see note below) experienced in use of the equipment and the local conditions.
ii. It is imperative for the safe operation of the FROG-6 that each unit is periodically inspected and tested in accordance with the procedures and schedules set out within this document.
iii. Operating parameters detailed in this document must be adhered to unless modified following on-site risk assessment and method statement by competent, experienced personnel.
iv. The FROG-6 must only be used with properly designed, maintained and appropriately certified lifting equipment. (It should be noted that some national regulations require cranes to be specifically certified for man-riding operations).
v. Supervisory personnel (including Deck Crews and Crane Operators) must be competent and must only operate the equipment following proper instruction in its use. Crane Operators should read the 'Crane Operator Guidance' contained within this document.
vi. Pre-operational checks as detailed in this document must always be performed prior to use of the FROG-6.
vii. Transfer personnel must receive a proper briefing on the FROG-6 and the transfer operation.
viii. Transfer personnel must at all times be seated and properly strapped in using the harnesses supplied.
ix. The FROG-6 must only be used as a personnel transfer device.
x. The FROG-6 must not be used as a work-basket.

Note: 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.

2 SPECIFICATION FROG-6

2.1 Specification Summary

Model No.	HC6-01 (620) Standard, HC6-01 (640) Arctic.
Payload - SWL	SWL = 570 kg = 6 x 95 kg average mass passenger *≈ 1260 lb = 6 x 210 lb* average mass passenger *Or* 1 person in stretcher and 1 accompanying passenger *Note: For Luggage Guidelines see section 5.7*
Dimensions	
Width 1	2410 mm
Width 2	2758 mm
Height	2766 mm
Weight	
Max Gross Weight	1200 kg (2640 lb)
Tare Weight	630 kg (1386 lb)
Manufacture	To ISO 9001:2008
Materials	
Frame	SS 316 and A4 Stainless Steel
Central Column / Lift Eye	Duplex SAF 2205
Lift Eye Connection Bolts	Super Duplex UNS S32760
Other Steel Components	SS 316 and A4 or A2 and Mild steel hot dipped galvanised grating
Buoyancy	Rotationally moulded MDPE shell with PU foam fill.
Seat Base	40 mm Polymer honeycomb composite panel
Seat Back	8mm High pressure compact laminate
Operating Temperatures	
Standard Model HC6-01 (620)	+50 deg C to -20 deg C
Low Temp Model HC6--01 (640)	+50 deg C to -40 deg C
Suspension	
Springs	3 x 8,612 N @ 0.32 m
Dampers	2 x Stainless Steel
	40 mm cylinder / 14 mm Rod
	300 mm Stroke

2.2 Design

Verification	EC Type examination certificate No. 0602/CC1016 ABS Product Design Assessment Certificate No. 12-LD856558-PDA Manufactured to ISO 9001:2008
National Technical Standards	UK, BS449: Part2:1969: The Use of Structural Steel in Building. UK, BS2830:1994: Suspended Chairs and Cradles for the use in the Construction Industry.
Industry European Standards	EC Machinery Directive. EN 14121-1, EN292 Parts 1 & 2. Load Test – ILO152 / LOLER.
National Regulations	UK, PUWER / LOLER.
Impact Behaviour	The seating assembly is suspended on a three spring assembly designed to protect passengers from impacts up to 4 m/s. Spring recoil is handled by two hydraulic dampers. The capsule is designed to withstand a 2 m/s lateral impact.
Other Features	Full height seating. Quick release seat harness buckle. Full harness ensures passengers are secure. Grab handles. Stretcher capability. Secondary back-up slinging. Angle of stability - 35 degrees.

2.3 Certification and Documentation

Each new build of the FROG-6 is supplied with a set of certification and documentation as specified below.

Certification Pack (includes the following)	EC Declaration of conformity.* Manufacturer's certificate of conformance. Manufacturer's BS EN ISO 9001:2008 certificate. Proof load test certificate. Wire rope lifting assembly certification Back-up eye material certificate. Lifting plug material certificate. Lifting plug bolts material certificate. Seat harness certificate of conformance. Unit completion checklist/ Manufacturing checklist. Manufacturer's final inspection checklist. Inspection release note *Note: For CE marked FROGs the EC Declaration of Conformity and the User Manual will be translated into language of the country (EC Member state) in which the machinery is to be used. This manual makes reference to CE marking of the FROG-6, however there are a limited number of FROG-6's previously supplied without CE marking. The FROG-6 units with the CE Declaration of Conformity are identified with a CE marking plate (see Appendix D). For non-CE marked units please disregard all references to CE marking in this manual.
User Manual	1 x User Manual
Additional	Reflex Marine Ltd will retain copies of the above certification and additional certification as specified below. If required, the applicable certification below can be made available for review by clients. Material certification for all critical and non-critical components. Inspection and repair history. Weld procedures / welder qualifications. NDT approval (PCN / NDT Reports) (where applicable). Manufacturing signed checklist and route cards.

3 OPERATING PARAMETERS

3.1 Introduction

The FROG-6 has been designed to ensure passenger safety even when operating in the most demanding conditions.

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

Vertical impacts

Passengers are protected during heavy landings at speeds of up to 4.0 m/s (13.1 ft/s) by the properties of the feet, frame and spring-mounted seat base. These protect passengers up to currently recommended operating limits as detailed in Section 3.2; Table 1.

Lateral impacts

Passengers are also protected from lateral impacts by the framework and seat harnesses. Lateral impacts are only likely to arise due to sway caused by off-lead when lifting and fast slewing. The passengers will be protected up to the 2 m/s (6.5 ft/s) maximum expected impact speed. The central column may deform on lateral impact and there may be damage to other components and therefore the equipment must be inspected after any impact.

Stability

The unit has a low centre of gravity and a tripod base, providing stability on uneven surfaces or on a pitching / rolling vessel. The polyurethane coated landing feet are also a non-skid design keeping grip on deck surfaces. The static angle of stability has been tested to 35 degrees, for a load of 1-6 passengers.

Control of Hoist Line

The FROG-6 is designed to stay firmly on the deck of the transfer vessel whilst passengers are entering or leaving the capsule. The Crane Operator must maintain slack in the line upon landing to allow for the vessel movement. The recommended limits in this section are based on the use of the standard FROG-6 sling length of 30 ft (9 m). For the use of shorter slings an additional risk assessment combined with dry runs should be performed to establish safe operational routines and weather conditions. (See Section 5.4 Crane Operator Guidance).

It is important that all environmental and operational factors are taken into account in the pre-transfer risk assessment. Assessing the impact of these factors on operational risk must be done by Competent Personnel experienced in use of the equipment and the local conditions.

3.2 Operating Parameters - Sea State

The FROG-6 has an inbuilt damping system which prevents passengers from experiencing shock loads up to relative landing and take-off velocities of 4.0 m/s (13.1 ft/s). The maximum recommended sea state, or significant wave height, for the operation of the FROG-6 is determined by the maximum relative velocity between the FROG-6 (or hook) and the landing deck.

The calculation for relative velocity used here is based on the European offshore crane standard, EN 13852-1:2004. Whereby the maximum anticipated relative velocity between a load and a vessel deck, is given by the following;

Relative velocity = Hook velocity* + √ (Vessel deck velocity ^{2} + Boom tip velocity ^{2})

**** Equal to 1.67 m/s (100 m/min, 330 ft/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-6 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 risk of heavy landings and take-off; dry runs without passengers, landing in centre of deck where less vessel movement, transfer of fewer passengers to increase damping, hook speed indicator.

Table 1: Recommended Sea States for FROG-6

Sig. Wave Height (m / ft)	Max. Wave Height (m / ft)	Fixed Platform to Vessel	Semi-Sub to Vessel	FPSO to Vessel	Vessel to Vessel
≤ 1.0 m / 3 ft	≤ 1.9 m / 6 ft	●	●	●	●
≤ 1.5 m / 5 ft	≤ 2.8 m / 9 ft	●	●	●	◆
≤ 2.0 m / 7 ft	≤ 3.7 m / 12 ft	●	●	●	■
≤ 2.5 m / 8 ft	≤ 4.6 m / 15 ft	●	●	◆	■
≤ 3.0 m / 10 ft	≤ 5.6 m / 18 ft	●	●	◆	■
≤ 3.5 m / 11 ft	≤ 6.5 m / 21 ft	●	◆	■	■
≤ 4.0 m / 13 ft	≤ 7.5 m / 24 ft	◆	◆	■	■
≤ 4.5 m / 15 ft	≤ 8.4 m / 28 ft	◆	■	■	■
≤ 5.0 m / 16 ft	≤ 9.3 m / 30 ft	◆	■	■	■
≤ 5.5 m / 18 ft	≤ 10.2 m / 33 ft	■	■	■	■

KEY	
●	Low risk of high landing or take-off velocity and exceeding FROG-6 personnel damping.
◆	Increasing risk of high landing or take-off velocity. Consideration of hook speed and all other factors is recommended to ensure controlled landing and take-off. A dry run to gauge risk (without personnel) is also recommended.
■	High risk of high landing or take-off velocity. Not suitable for routine operations unless a specific hazard analysis can demonstrate otherwise.

In all cases, adequate planning and risk assessment must be performed.

3.2.1 Site Specific Frog Transfer Operating Parameters

The operating parameters recommended above are based on the calculation method extracted from EN 13852 Offshore Crane Standard and uses data representative of the North Sea. The chart also assumes the Frog is loaded with the maximum allowable passenger load (APL). Operators may develop site specific parameters with an evaluation of relative velocity. Such a study should consider the motion behaviour of the offshore installation, the offshore crane and the supply vessel. Further considerations may be given to the effects of shock absorbers, motion compensators and lee-side effect where sea state is reduced. Such localised conditions may also be taken into account.

It is ALWAYS advised that for personnel transfer in marginal sea states, a dry-run without passengers must be performed to verify the parameters are suitable for safe transfer.

In the event an Operator deduces site specific operating parameters, these must be carefully embedded into the operating procedures in use and well communicated to all parties involved in the transfer.

3.3 Operating Parameters - Additional Factors

Note 1: ***It is emphasised that users must not rely on these recommendations alone. Persons best placed to judge the risk of specific transfers are the onsite personnel that have experience of the local conditions and equipment to be used. All factors must be evaluated together in their pre-transfer risk assessment.***

Note 2: ***Crews must conduct dry runs without passengers if there are any concerns about conditions to help assess risk of transfer.***

Table 2: Other Operating Parameters

Parameter	Recommendation
Wind Speed	40 knot (equivalent to 20 m/s). The FROG-6 is very stable in high wind. Limiting factor is usually crane operability or control of load.
Visibility	Crane Operator should have a clear view of the pickup and set down areas.
Vessel Motion / FROG-6 Stability	Pitch 10°, Roll 10°. (FROG-6 stable up to 35° for a load of 1-6 Passengers. In static test).
Vessel Station-Keeping	Able to maintain position within a 5 m (15 ft) radius. If a high risk of the vessel losing position exists, recommend disconnecting FROG-6 for passenger embarkation.
Landing Area	Clear of obstructions, protrusions, trip and fall hazards.
Landing Area – Ice / Spills	Ice and spills must be cleaned from landing area prior to transfer.
Landing Area on Vessel	The FROG is 2410mm x 2758mm and RML recommends keeping ample space around the unit for embarkation/disembarkation (1m entry and exit path). Operators should take into consideration sea state, weather, vessel station keeping. A risk assessment should be carried out by the operator but a clear space of 6.4m x 6.4m (21 ft x 21 ft) is preferable.
Landing Area on Installation	Recommended minimum 4.25 m x 4.25 m clear space (14 ft x 14 ft) based on + 1 m entry and exit path all-round the FROG-6.
Crane Operator Experience	Briefing video within 1 month. Local authority requirements for personnel transfer must be adhered to.
Deck Crew Experience	Briefing video within 1 month.
Passenger Training	Briefing video within 1 month.
Communications	Radio communication must be established between the Crane Operator and the vessel Deck Crew and Master.
Crane Construction	Crane must be certified for lifting personnel and properly maintained.
Operating Temperature	Standard HC6-01 (620) Units: +50 deg C to -20 deg C.
	Low Temperature HC6-01 (640) Units: +50 deg C to -40 deg C

4 TRANSFER PLANNING

The key to safe operations is the familiarisation and participation of all the involved crew in the careful planning of the operation.

The Operating Parameters detailed within this document are generic, therefore safe operating conditions must be determined by onsite supervision with due regard to site specific equipment, vessels and conditions, taking account of any local conditions and equipment.

Safe transfers require careful planning and supervision.

The following are recommended as a means of ensuring safe transfer operations:

4.1 Risk Assessment and Method Statement

A risk assessment and method statement should be completed by the responsible authority on board the installation and by the transfer vessel Captain prior to the first transfer operation for the specific installation and vessel. The risk assessment should be reviewed periodically and the method statement amended in the event of any substantive changes to equipment, procedures or any other factors considered relevant.

4.2 Communications

Communications are an important part of controlling transfer operations. Local communication practice will vary from work group to work group. However, dedicated 3-way radio communication channels must, as a minimum, be provided between the Crane Operator, vessel Master, and Lift Supervisor. A suitable radio protocol must be agreed and adhered to. Contingency communications using a loud speaker or deck tannoy must be available.

Standard hand signals must be used by Crane Banksmen, where required, to supplement the agreed radio communications.

4.3 Information Exchange

The following transfer vessel information must be provided to the installation:

i. General layout including the landing area position.
ii. Limiting environmental parameters for vessel station keeping.
iii. Onboard marine personnel transfer procedures.

The following installation information must be provided to the transfer vessel:

i. Crane position and hoist speed.
ii. General layout including the landing area position.
iii. Limiting environmental parameters for crane operations.
iv. Onboard marine personnel transfer procedures including responsible persons.
v. Communications channels.
vi. Any relevant information regarding local currents, field operations etc.

4.4 Operational Planning

An overall plan must be in place for the proposed personnel transfer operation which details all of the relevant information:

i. Installation name.
ii. Vessel name.
iii. Number of personnel to be transferred - vessel to installation.
iv. Number of personnel to be transferred - installation to vessel.
v. Key personnel on installation.
vi. Key personnel on vessel.
vii. Installation crane to be used.
viii. Crane hoist speed.
ix. Requirements for visual inspections of equipment.
x. Vessel position and station keeping limits.
xi. Environmental limits.
xii. Current and forecast weather conditions.
xiii. Checklists to be used.

4.5 Briefings

Ensure that passengers and crews (both installation and vessel) are fully briefed prior to an operation. It is recommended that video briefings are utilised for briefing transfer passengers supplemented as necessary by verbal briefing on any relevant installation / vessel specific information.

4.6 Supervision

All transfer operations must be properly supervised. All personnel directly involved in the transfer operation should be appropriately qualified and experienced.

4.7 Transfer Log

Operational records must be maintained by both the installation and the vessel. Records must include:

i. Time of vessel in position.
ii. Time of checklists completed.
iii. Time of commencement of transfer operations.
iv. Weather conditions.
v. Vessel motion (roll, pitch and heave).
vi. Any special conditions or circumstances.
vii. Number of passengers transferred to installation.
viii. Number of passengers transferred to vessel.
ix. Time of completion of transfer operation / vessel clear of installation.
x. Name of the Lift Supervisor.

An example transfer log is included in Appendix A of this document.

4.8 Emergency Transfers

If a transfer must be carried out in poor conditions in an emergency then (where time permits) a 'trial run' must be performed without passengers to assess operating conditions and limits.

4.9 Training

Regular transfer drills must be carried out. RML recommend weekly training drills.

4.10 Night Time Operations

With the following controls in place it may be allowable for personnel transfers using the FROG Personnel Transfer Capsule to take place during the hours of darkness:

i. The risk assessment for the task shall be comprehensively reviewed prior to commencing operations. The lifting plan and risk assessment shall be approved in writing by the Offshore Installation Manager or appointed deputy.
ii. The operator should have contingency to immediately rescue the passengers from the water e.g. Fast Rescue Craft. Without fast rescue contingency personnel transfers should not take place.
iii. The crane boom should be fitted with adequate floodlights to illuminate the crane hook and FROG unit. The Crane Operator must maintain a clear line of view with the FROG unit at all times.
iv. The take-off and landing areas should be illuminated to a level of at least 20 lux or greater.
v. The FROG unit should be fitted with a strobe light to allow clear locating by all parties.
vi. The hoisting, transit and landing paths of the FROG unit should be predefined in the lifting plan and are adhered to.
vii. Radio contact should be maintained throughout the entire lifting operation between the Crane Operator and the take-off and landing site.
viii. An unmanned trial run which covers, as a minimum, the take-off, transit and landing paths of the FROG should be conducted prior to commencing personnel transfers. The Crane Operator should confirm readiness to proceed on completion of the trial run.
ix. A non-visual based method of communicating with the lifted personnel should be in place, e.g. radio or loudhailer, in the event of an emergency.

5 OPERATING PROCEDURE

5.1 Pre-Transfer Activity List

Activity No.	Responsible	Activity
1	Supervisor	Conduct pre-transfer risk analysis (See Section 3 and Section 4).
2	Supervisor	Conduct pre-operational 'Visual Check' of equipment (See Section 6.4).
3	Supervisor	Brief all persons; i) Crane Operator, ii) Deck Crew, iii) Passengers, iv) Vessel – Master and Deck Crew.
4	Passengers	Don recommended PPE (Personal Protective Equipment), PFD (Personal Flotation Device) and survival suit (as required and where applicable). ***Note: Send PFD to vessel prior to transfer***

5.2 Lifting

Activity No.	Responsible	Activity
1	Deck Crew	Hook-up masterlink*. Check that harnesses are slackened ready for passengers.
2	Supervisor	Signal to passengers to enter capsule when safe to do so. Ensure even load distribution and that passenger load/ luggage does not exceed 570 kg (See Section 5.6).
3	Passengers	Ensure any loose items are secure.
4	Passengers	Strap-in, do not rush, loosen belt, tighten lower straps, then upper straps.
5	Passengers	Signal to deck crew when seat belt secure by holding hand up / thumbs up.
6	Deck Crew	Ensure passengers are strapped in and hands and feet are correctly positioned.
7	Deck Crew	Ensure taglines (if used) and sling are not snagged.
8	Deck Crew	Stand clear.
9	Supervisor	Signal lift to Crane Operator.

5.3 Landing

Activity No.	Responsible	Activity
1	Crane Operator	All raising and lowering must be over water.
2	Crane Operator	Guide capsule into clear landing area.
3	Deck Crew	Keep safe position if handling unit - do not stand under or between FROG-6 and rail.
4	Deck Crew	If taglines are used beware of specific risks.
5	Crane Operator	Release slack when FROG-6 has landed (See Section 5.4).
6	Crane Operator	Place sling down-wind of unit to prevent hindering access.
7	Deck Crew	Ensure sling slack is not a hazard for exiting passengers.*
8	Supervisor	When FROG-6 is securely on deck, signal "All Clear" to passengers.
9	Passengers	Remain seated until given "All Clear" by the Supervisor.
10	Passengers	Exit capsule and move away towards safe area.

**** Note - If risk of vessel losing position or crane line snatch (e.g. vessel to vessel transfers) the FROG-6 must be disconnected for passenger exit and entry.***

5.4 Crane Operator Guidance

When landing the FROG-6 on the deck of a heaving vessel the Crane Operator must always release and maintain line slack to prevent any snatching. This means the FROG-6 will be secure on the deck and will provide occupants plenty of time to enter and exit the FROG-6. (This landing procedure is different to the rope basket procedure, which requires the Crane Operator to maintain tension on the hoist to keep the soft rope basket upright during entry and exit).

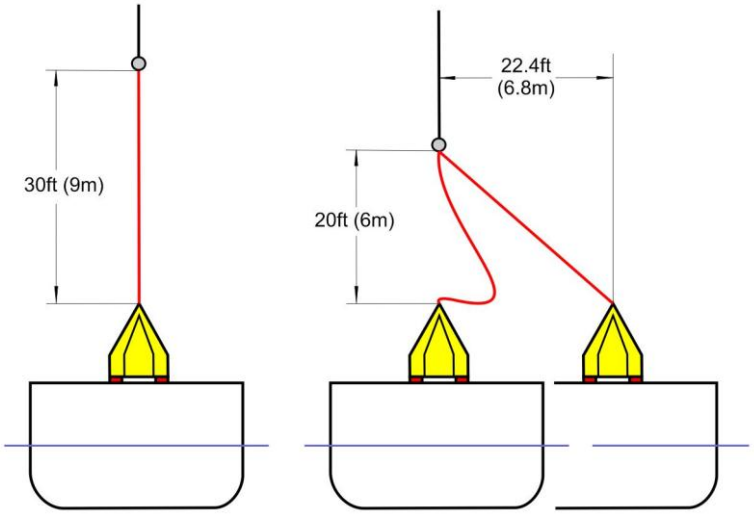


Fig 1: Sling Diagram

For the standard 30 ft / 9 m sling provided with the FROG-6, it is generally recommended that approximately 10 ft / 3 m of slack is paid out once the unit has landed on the vessel. However, the required amount may vary according to sea state and vessel motion response. The Crane Operator must pay out sufficient slack to avoid snatching, although, must avoid paying out more than is necessary as the section of sling hanging could constitute a hazard to crews alighting or entering the capsule.

It is also recommended that the Crane Operator slews the boom 'down weather' from the capsule. This will provide more time for the Crane Operator / crews to react in the event of a failure of the vessel's station keeping.

5.4.1 Use of Shorter Slings

Reflex Marine Ltd recommends the use of a 30 ft / 9 m sling, however for operations where the 30 ft sling is not suitable then a 20 ft / 6 m or 10 ft / 3 m sling can be supplied.

It must be noted that using shorter slings increases the risk of snatching. Using the 20 ft / 6 m sling, 10 ft / 3 m of slack will provide a 17.3 ft / 5.3 m allowable offset before the sling becomes taught from the crane hook weight – this does not however account for vessel heave. For a 10 ft / 3 m sling, 8 ft / 2.4 m of slack will provide 9.8 ft / 2.7 m (allowable offset).

Using a shorter sling set also increases risks associated with the hook block being in close proximity to the passengers alighting.

Note: The operating parameters in Section 3.2 are defined for a FROG-6 with a sling length of 30 ft / 9 m. For transfers using a shorter sling an additional risk assessment combined with dry runs should be performed to establish safe operation routines and weather conditions.

5.4.2 Sling Leg Arrangement and Observed Snagging Issue

The FROG-6 sling arrangement has a shorter PRIMARY leg attached to the main lift eye and a longer SECONDARY leg attached to the back-up eye (as shown in drawing 620 sheet1 and 220-30 in Appendix B).

This arrangement provides lifting redundancy. One issue that has been observed is that on rare occasions the shackle attached to the back-up eye does not always rotate smoothly and can cause an unexpected 'jump' on pick up. This is not a cause for concern and is alleviated in the following way.

Always ensure the shackle insert (p/n 220-10-03) is always installed correctly onto the shackle pin installed on the back up (longer leg) of the lifting assembly. This part assembly is shown in Detail D of drawing 220-03 in Appendix B. The shackle pin insert prevents the shackle from assuming a contorted position which could result in a foreshortening of the beck up leg.

Always ensure the main shackle retaining bracket (p/n 220-10-05) is properly installed when making up the main lift shackle to the lift eye plug. This part assembly is shown in Detail E of drawing 220-03 in Appendix B. The purpose of this retaining bracket is to present the main shackle in an upward and 'ready for lift' orientation. It is possible that this bracket gets distorted in use and can cause subsequent damage to the sling thimble. It is recommended to also keep a few spare brackets available for easy replacement as required.

5.5 Use of Tag Lines

Tag lines (Hand Lines) are not supplied with the FROG. However if users wish to use tag lines for handling the FROG the following should be considered:

Tag lines should be attached to the floor grating and 30 x 30 brace at the edge of the doorway (see below). Reflex Marine Ltd suggest one or two 3 m lines are practicable for handling the FROG, however length of line used is at the discretion of the deck crew.

Be aware of specific risks arising from use of tag lines:

i. Deck Crew using tag lines will be standing closer to frog during landing, which increases the risk of impact or being caught in between.
ii. Ensure tag lines are not tied or caught on any adjacent equipment of structures.
iii. Ensure tag lines are clear of knotting and deck crew have suitable hand and eye protection.

5.6 Seating and Load Distribution

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

i. Organise passengers into groups of 6 (see note*).
ii. Confirm that passenger weight does not exceed the SWL of the FROG-6 unit: 570 kg (or 6 x 95 kg).
iii. Firstly load Group 1 (1, 2 and 3) into the seats as shown.
iv. Next load Group 2 (4, 5 and 6) into the seats as shown.

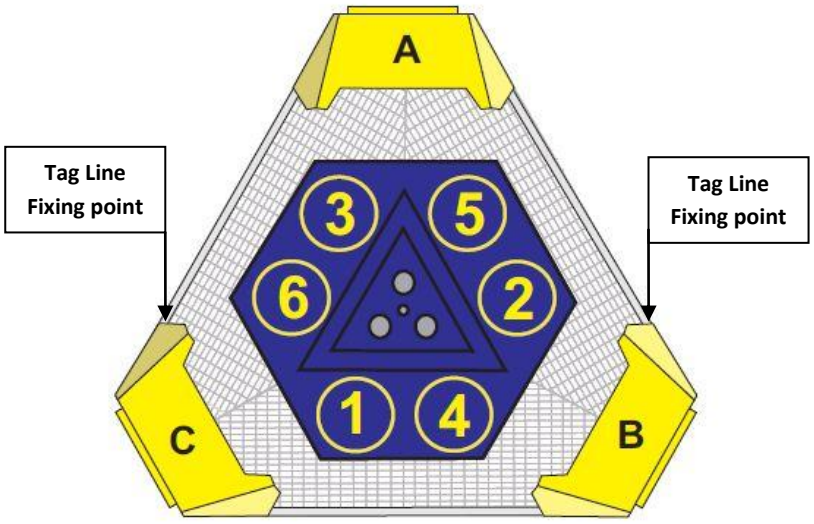


Fig 2: Seat Loading and Tag Line Fixing Points

Note - When the FROG-6 is used for less than 6 passengers, continue to follow the loading procedure above for as many passengers as possible. In this way the unit will always be balanced as far as possible.

5.7 Luggage Storage

In order to increase the speed of transfers and the safety of the operation **for the Frog-6 it is recommended that luggage is transferred separately** particularly when more than four passengers are carried.

Luggage nets are supplied with the unit but these are only intended for small, light-weight, hand-carry items such as laptops, and operators should ensure that the payload does not exceed the maximum permitted weight.

Fig 3: FROG-3 Luggage Storage

5.8 Seatbelt Operation

Take the lap fastener clip and feed through eye. Fold over the clip and the safety belt is secure. Reverse operation for quick release.

Fig 4: Fastening the Belt

Next pull the LOWER straps first, then the UPPER straps to make a tight fit.

Fig 5: Tightening the Belt

5.9 Rider Instructions

i. Keep hands and feet inside the FROG-6.
ii. Hold the grab handles to keep body stabilised.
iii. Keep feet inside the FROG-6 at all times.
iv. Do not hook legs underneath the suspended seats.

Fig 6: Position of Body

5.10 Emergency Stop Procedure

In the event of an emergency situation the Deck Supervisor / Banksman will give the Crane Operator the emergency stop signal.

i. Crane Operator must stop all movements.
ii. The Deck Supervisor / Banksman will shout “OUT OUT OUT”.
iii. Personnel to release seat belt buckles and vacate FROG.
iv. Deck Supervisor / Banksman will direct passengers to a safe area.

UK Emergency STOP signal	**US / API Emergency STOP signal**
Both arms pointing upwards with palms facing forwards	Both arms extended, palms pointing down, move arms rapidly back and forth horizontally

Images sources:

5.11 Personal Protective Equipment (PPE)

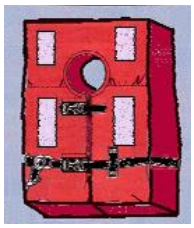
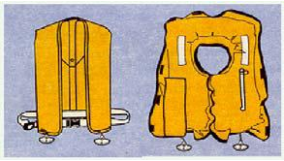
Whilst making the transfer, all personnel must be equipped with appropriate Personal Protective Equipment. Each location and transfer activity will demand a range of differing levels of PPE and RML recommend that PPE requirements are evaluated in recognition of the particular activity and environmental risks that exist at each location. Some items for consideration whilst establishing PPE are:

i. Survival rates in water (summer and winter).
ii. Wind temperature ranges.
iii. Proximity of overboard rescue facility, fast rescue boat (FRB), standby vessels.
iv. Deployment time and personnel capacity of each rescue craft.
v. Drill timings and multiple casualty scenarios.
vi. Routine and non-routine offshore activities that might provide source of risk.

The Operator must decide the recommended minimum standard for personal protective equipment requirement according to local conditions, regulations, standards and individual activity risk assessments.

5.11.1 Personal Flotation Devices (PFD's)

Reflex Marine Ltd has evaluated the 5 most common types of PFD's used in the offshore and marine sector and has the following comments about their suitability for use with the FROG.

Style / Type	Picture	Evaluation	Recommendation
Inherently buoyant work vest buoyancy aid (100 N)		Flat buoyancy panels are unobtrusive and allow passengers easy entry and exit from seat harness.	Acceptable RML recommend that any PFD of this type is tested with seat harness in FROG for compatibility.
Manual inflatable lifejacket (150 N)		Inflation toggles may interfere with seat harness creating risk that PFD may inflate when person is strapped in. Personnel should be informed that PFD should not be inflated when person is strapped in the FROG.	Acceptable (exception basis) RML recommend that passengers are made aware of the specific risk of inflation during Strapping-in.
Inherently buoyant 'yoke' type lifejacket (100-150 N)		This type of PFD is bulky and may prove restrictive when donning seat harness. PFD generally has a poor fit with seat harness, particularly over shoulders. Seat harness buckle release mechanism may become positioned underneath PFD out of line-of-sight of passenger, making exit more difficult.	Not recommended (exception basis) User should perform their own risk assessment for use of such PFD.
Offshore work vest buoyancy aid (50 N)		This PFD may have insufficient buoyancy for passengers with heavy clothing.	Not recommended (exception basis) User should perform their own risk assessment for use of such PFD.
Automatic inflatable lifejacket (Contact with water)		Risk that PFD may inflate when person is strapped in and FROG is immersed which may impede passengers exit for rescue.	Not recommended (exception basis) User should perform their own risk assessment for use of such PFD.

PFD Additional Considerations:

i. Reflex Marine Ltd recommend that a number of PFD's, specifically designated for use with the FROG, are marked as 'FROG USE ONLY' and are kept in a safe, clean storage area near the transfer muster area.
ii. It is recommended that 3 sets (+ 10% spares) of PFD's are made available for the transfer activity:

    1 set for uplift transfers (ready and donned).
    1 set for down lift transfers (ready and donned).
    1 set for in-transit for next uplift transfers.

    Total PFD requirement for FROG-6 = 3 x 6 + 2 = 20 PFD's.

iii. Deck crew should ensure that when passengers are exiting the FROG, the passengers move clear of the landing area to the designated safe area before removing PFD's.
iv. Passengers using the PFDs for the first time should be given assistance by the deck crew. PFD's should be tried by all crew as part of any practical training given.

5.11.2 Immersion Suits

Immersion suits may be required in certain situations. Reflex Marine Ltd recommends that risk assessments are performed to determine whether immersion suits are to be used.

5.12 Stretcher Mode

5.12.1 Converting FROG-6 to Stretcher Mode (Figure 7)

It is recommended that the procedure be conducted by two or three persons. This is to ease handling of the lower buoyancy blocks which weigh approximately 20 kg. The procedure should not be conducted over grated flooring to prevent the risk of small fittings falling through the floor. The procedure should be conducted with a clear area around FROG-6 to provide space for realignment of the buoyancy units.

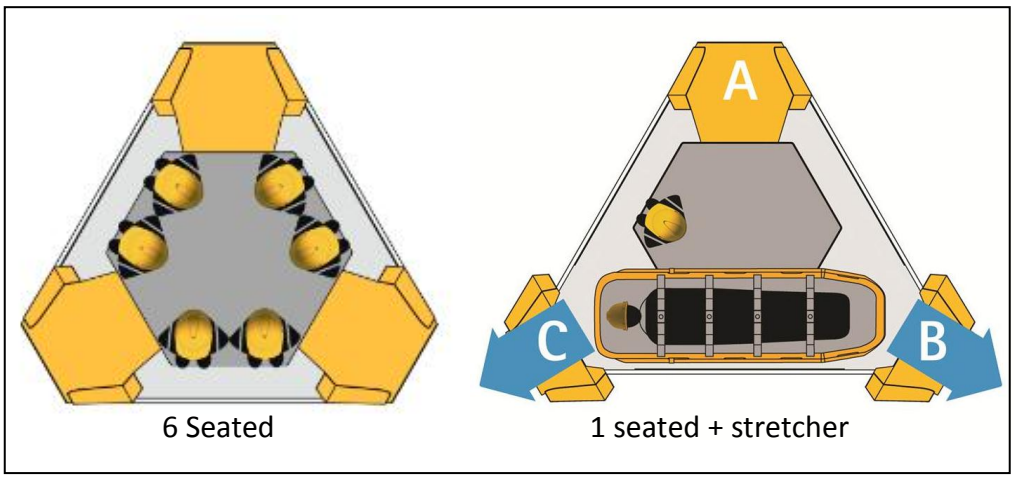


Figure 7: Stretcher Mode Arrangement

Tools Required

i. 8mm Hex Key (for M12 screws - Buoyancy)
ii. FROG-6 Diagrams

5.12.2 Stretcher Mode Conversion Procedure

i. Refer to Figure 8: Buoyancy Reconfiguration Diagram.
ii. Remove 4 x M12 button head cap screws and washers from lower buoyancy blocks B and C.
iii. Fix Lower buoyancy units B and C to outside of unit. Tighten the M12 button head cap screws with washers to hand tight with hex key. (Note: Over-tightening of these bolts can lead to damaged buoyancy.)

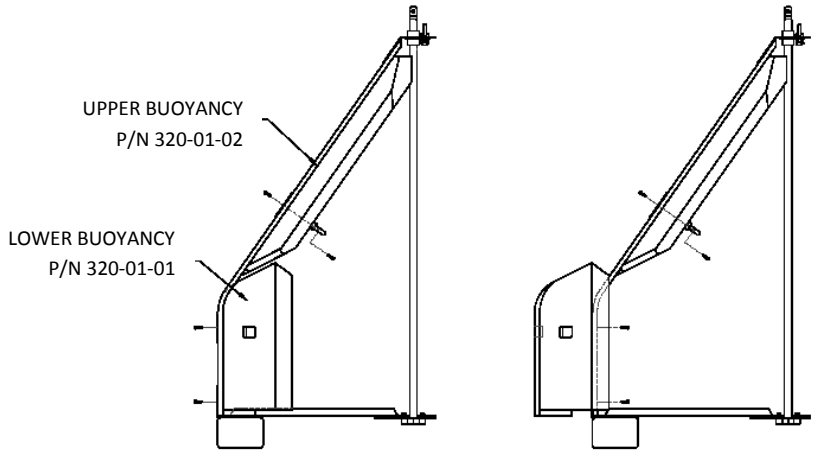


Figure 8: Buoyancy Reconfiguration Diagram

5.12.3 Positioning the Stretcher

i. Ensure the stretcher casualty is securely strapped into the stretcher.
ii. Using three persons to lift the stretcher (two either side at shoulders, one at feet), move stretcher head first through door B-C (door opening with stretcher frame).
Note: Observe safe manual handling practice when lifting the stretcher.
iii. Place the head-end of the stretcher onto the seat base and slide the stretcher into position.
iv. Secure the stretcher in position with the two straps provided as shown in Figure 9 Stretcher Fitting Diagram.
v. Ensure the stretcher is firmly secure.
vi. The casualty should be accompanied during the transfer procedure. A maximum of two supporting passengers are recommended. (See seating arrangement in Figure 7)

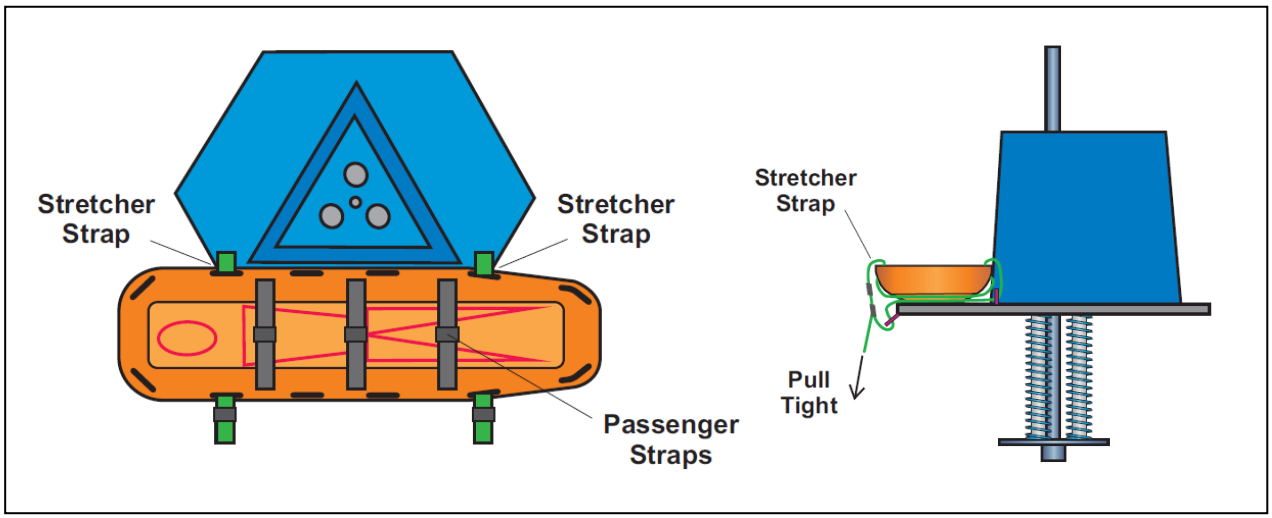


Figure 9: Stretcher Fitting Diagram

5.12.4 6-Seat Mode Conversion Procedure

i. Refitting to seating mode is the reverse of the conversion to stretcher mode.
ii. Tighten the fittings for the lower buoyancy unit to **low torque hand tight only 18Nm**. Over-tightening of these screws can lead to damage to the buoyancy inserts or to the seat.

5.12.5 Stretcher (Optional) Accessory

Reflex Marine provides an optional basket type stretcher part number 300-01-01 as illustrated in Figure 10.

Figure 10: Basket Type Stretcher (Optional)

Specifications

Length	2180 mm	
Width 1	610 mm	
Depth	190 mm	
Weight	10 kg	
Load Limit	275 kg	Includes weight of patient, stretcher and any medical equipment.
Operating Temperature	-40 Deg C to +60 Deg C	

6 PERIODIC INSPECTION, TESTING AND MAINTENANCE

6.1 Introduction

It is imperative for the safe operation of the FROG-6 that each unit is periodically inspected and tested in accordance with procedures and schedules set out in this section.

6.2 Definitions

Visual Check

A Visual Check is a careful and critical assessment of the components, carried out by a Competent Person without dismantling of the assembly. Normally the check itself is not formally recorded although the fact that the check has been performed is registered within a daily event log or tour log.

Visual Inspection

A Visual Inspection is a careful and critical assessment of the components, carried out by a Competent Person without dismantling of the assembly. The inspection is formally recorded.

Examination

An Examination is 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 sling sets this should include a visual inspection of the condition of the sling. In order for end fittings of sling sets to be examined properly, they may need to be dismantled. The examination is formally recorded.

Post Load Test Visual Inspection

A Post Load Test Visual Inspection is a careful and critical assessment of the components, carried out by a Competent Person without dismantling of the assembly post load testing. The post load test visual inspection is formally recorded.

Critical Components

Critical Components are defined as those that are primarily essential to the critical load bearing path.

6.3 Frequency of Inspection, Test and Maintenance

The recommended frequency and type of inspection, test and maintenance is shown in Table 3. (SEE OVER). Please note:

i. If any doubt exists regarding the number of transfer operations performed then the maintenance strategy must revert to a more conservative higher usage category. This must also be considered if there is any concern over heavy impacts or overloads.
ii. This recommendation applies to change out of components parts only and does not replace or alter the inspection intervals as prescribed by the relevant legislation.
iii. The check, inspection, examination and test routine as detailed in this document must always be carried out on schedule.
iv. Where the FROG has sustained substantial damage, a detailed examination of the unit must be carried out to ensure the integrity of the unit 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 must be recorded and copies of damage and repair / modifications reports must be sent to the party controlling the use of the FROG-6.
vi. Reflex Marine Ltd is pleased to provide direct technical advice to support users with any inspection, testing, repair or refurbishment query. It is always helpful if customers provide detailed photos and reports along with their query to support@reflexmarine.com.

Table 3: Inspection and Maintenance Recommendations

(NOTE: RML website www.reflexmarine.com/support should be checked for the latest version of this table)

INSPECTION AND MAINTENANCE RECOMMENDATIONS (FROG-3 & FROG-6 TRANSFER PRODUCTS) Rev 03 - 120501		RECOMMENDED FREQUENCY							
		INSPECTIONS				LOAD TESTS	MAINTENANCE		
		Pre Operational Visual Check	Visual Inspection	Examination	Post Load Test Visual Inspection	Proof Load Test	Sling Replacement	Critical Parts Replacement	Unit Replacement
USAGE CATEGORY		*Section 6.4*	*Section 6.5*	*Section 6.6*	*Section 6.7*	*Section 6.8*	*Section 6.9*	*Section 6.10*	*Section 6.11*
Usage Category	No of Transfer Lifts per year		*not exceeding*	*not exceeding (depending on Visual Inspection) this period may be reduced*			*not exceeding*	*not exceeding*	*not exceeding*
Very Low	<20	before every use	6 months	12 months	After Load Test	On Critical Parts Replacement	12 months	36 months	10* years
Low	<100	before every use	6 months	12 months	After Load Test	On Critical Parts Replacement	12 months	36 months	8 years
Medium	100 to 500	before every use	6 months	12 months	After Load Test	On Critical Parts Replacement	12 months	24 months	7 years
High	500 to 1500	before every use	3 months	12 months	After Load Test	On Critical Parts Replacement	6 months	12 months	6 years
Very High	1500 to 2500	before every use	3 months	12 months	After Load Test	On Critical Parts Replacement	3 months	12 months	4 years
Ultra High	2500 to 5000	before every use	3 months	6 months	After Load Test	On Critical Parts Replacement	3 months	6 months	3 years

*This may be extended subject to a 'condition & service assessment' carried out by RML (Reflex Marine Ltd) or an ASC (Accredited Service Centre).

Link to Index

6.4 Pre-Operational Visual Check

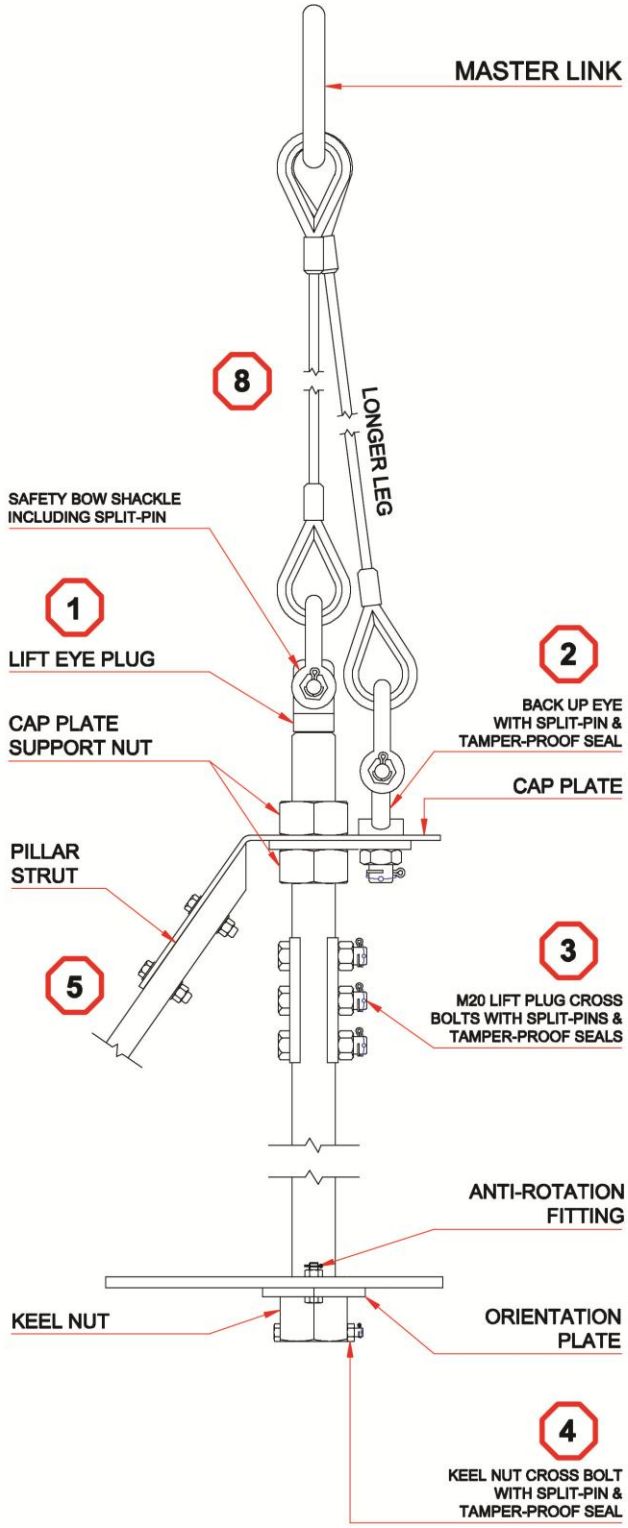
(NOTE: RML website www.reflexmarine.com/support should be checked for the latest version of the tables in this section)

Question	Response
When must a Visual Check be conducted?	A Visual Check must be conducted PRIOR to EVERY use of the equipment (multiple lifts in one series of transfer operations constitute one usage period).
Who must conduct this check?	A person who has been formally trained to perform this Visual Check and is familiar with this equipment, i.e. a Competent Person.
Does this check require a formal record?	Yes, a record that the visual check has been completed should be recorded appropriately, e.g. an entry in the daily tour record stating date the check has been completed, unit number and any relevant comments.
What drawings are required to support this check?	The drawings are available in Appendix B.
What equipment is required to perform this check?	i. A ladder. ii. An inspection frame or floor matting. iii. Good lighting. A suitable means of safely accessing the top and the bottom parts of the FROG-6 is required. When using a step ladder or ladder it must be securely fixed to prevent slippage whilst accessing the top of the FROG. The FROG-6 keel assembly can be visually checked from ground level using a torch. Do not go underneath an active lift. Be aware that in some regions “Working at Height” regulations may apply.

The following checklist is suggested as a suitable list for an 8 POINT PRE-OPERATIONAL CHECK.

Link to Index

Pre-Operational Visual Check – An 8 POINT Check



1. Check **LIFT EYE PLUG** is fully engaged (machined shoulder should rest on the top of the main lifting column).

2. Check **BACK-UP LIFTING EYE**, nut, split pin and tamper-proof seal are fitted and in good order.

3. Check **M20 BOLTS** are secure and nuts, split pins and tamper-proof seals in position.

4. Check **KEEL NUT, CROSS BOLT** is in position with split pin and tamper-proof seal.

5. Check all Frog-6 **FITTINGS, FRAME,** and **BUOYANCY** are in good order.

6. Check **SEAT HARNESSES** operate properly and attachment points are secure.

7. Check **INSPECTION DATA PLATE** and all **CERTIFICATION** are in order.

8. Check **WIRE ROPE LIFTING ASSEMBLY** is correctly attached and in good order. Check shackles are fitted with **SPLIT PINS**. Lifting Assembly should be in the **HIGH VISIBILITY COVER**.

   Check the anti-fouling bracket and the back-up eye shackle insert are in good condition (see Section 5.4.2).

Link to Index

6.5 Visual Inspection

(NOTE: RML website www.reflexmarine.com/support should be checked for the latest version of the tables in this section)

Question	Response
When must a Visual Inspection be conducted?	A Visual Inspection must be conducted at the recommended frequency in Table 3. This frequency may be as long as every 6 months or as short as every 3 months according to usage.
Who must conduct this inspection?	A Competent Person.
Does this inspection require a formal record?	Yes.
What drawings are required to support this inspection?	The drawings are available in Appendix B.
What equipment is required to perform this inspection?	i. A ladder. ii. An inspection frame or floor matting. iii. Good lighting. A suitable means of safely accessing the top and the bottom parts of the FROG-6 is required. When using a step ladder or ladder it must be securely fixed to prevent slippage whilst accessing the top of the FROG. The FROG-6 can be laid on its side on protective matting, or the use of a secure inspection frame assembly to safely access the underside of the FROG-6 is recommended. Do not go underneath an active lift. Be aware that in some regions "Working at Height" regulations may apply.

The following checklist is suggested as a suitable list of required inspection items and a suitable format for recording key inspection data. A 'WORD' copy of this inspection checklist is included on the distributed CD's and is also available on the Reflex Marine Ltd website at www.reflexmarine.com/support.

Visual Inspection Checklist Form

Unit No		**This Inspection Date**		**Inspected by**	
Usage Category		**Last Inspection Date**		**Position/ Company**	
Installation / Vessel				**Signature**	
Avg No of Transfers / Year				**Original Inspection record filed in**	

Item No	Description	Comment	Pass / Fail	Verified By
1.	**Main Lift-Eye Plug (Critical Part)** Visually inspect in situ for any signs of wear, cracks, deformation or other damage.			
2.	**Main Lift-Eye Plug M20 Bolts (Critical Part)** Visually inspect the three M20 lifting eye bolts, nuts, split pins and tamper proof seals that connect the main Lift-Eye plug to the central column for wear or damage.			
3.	**Back-Up Lift-Eye** Visually inspect for any wear or damage and check that the split pin and tamper proof seal are intact.			
4.	**Seat Base Assembly and the Hydraulic Damper and Anti-Tilt Assembly** Visually inspect for any wear or damage and ensure that all bolts, clevis' and other fasteners are fully secure. Ensure that clevis pin threads are not visible on damper rods. (see Technical Bulletin 01-09 at http://www.reflexmarine.com/index.cfm/p/Technical-Safety-Alerts)			
5.	**M48 Keel Boss and M10 Cross Bolt (Critical Part)** At the bottom end of central column, visually inspect the M48 keel boss nut and ensure that the M10 cross bolt is secure c/w split pin and tamperproof seal. Check the presence of anti-rotation fittings and that all bolts are secure. Do not go underneath an active lift.			
6.	**Frame and Buoyancy** Visually inspect for any damage and ensure that all bolts and fasteners are tight and fully secure.			
7.	**Landing Feet** 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. ***Notes:*** ***i. Measure height of foot and replace if under 120 mm in height*** ***ii. Small (20 mm in length) cuts are acceptable but feet should be replaced when the internal foam becomes visible***			
8.	**Seat Harness Security** 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.			
Item	**Description**	**Comment**	**Pass /**	**Verified**

No			Fail	By
9.	**Seat Harnesses (sit-in)** **i.** Check all seat harness buckles to ensure each is functioning correctly. (Inspector to sit in each seat and check fastening and unfastening of each harness).			
10.	**Inspection data plate** Check the date of the last examination/ inspection to ensure the unit will remain in compliance with requirements for at least 6 months.			
11.	**Lifting Sling Set (Critical Part)** The lifting sling set (including attachments) must be visually examined by a Competent Person. Note: High visibility cover must be completely removed to allow inspection of steel wire rope components. Replace the sling set according to the usage of the FROG (see Table 3 in Section 6.3). This may be as frequently as every 3 months. Irrespective of apparent condition the lifting sling set should be replaced at least every 12 months.	Note serial number and test date stamp (specify decision to retain or replace).		
	Storage			
12.	**Storage of FROG -** 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			
13.	**Replacement Parts Stock -** Check condition of all associated replacement parts and accessories. Sling sets should be stored in an appropriate dry place without high visibility cover fitted.			
	Reports		Complete Y/N	
14.	**Photographic Report** As an inspection record aid, the critical elements and condition of the unit may be recorded in photographs; Photographs of each of the 13 points of the check list would provide a concise inspection record. Photographs should be clearly marked pre and post inspection as appropriate.			
15.	**Documentation / Report** Complete an inspection report on the above which must be signed and dated by a Competent Person. Order required spares in time for next inspection. Reflex Marine Ltd offer to keep an archive copy of your inspection records against the unit number. You can submit your completed checklists and photographs on www.reflexmarine.com/support.			
NOTES:				

Link to Index

6.6 Examination

(NOTE: RML website www.reflexmarine.com/support should be checked for the latest version of the tables in this section)

Question	Response
When should an Examination be conducted?	An Examination must be conducted at least EVERY 12 months. According to the findings of any Visual Inspection a more frequent Examination schedule may be warranted according to wear, age of unit and usage conditions. At each Examination it is a good opportunity to replace a small number of critical and other replacement parts and therefore more frequent examinations may be prudent.
Who should conduct this examination?	A Competent Person.
Does this examination require a formal record?	Yes.
What drawings are required to support this examination?	The drawings are available in Appendix B.
What equipment is required to perform this examination?	i. A ladder. ii. An inspection frame or floor matting. iii. Good lighting. iv. Appropriate metric tool kit (socket set, combination spanners, allen keys etc). v. Riveter. vi. Inspection and test plate (with stamps). vii. Proof load equipment (see Section 6.8). A suitable means of safely accessing the top and the bottom parts of the FROG-6 is required. When using a step ladder or ladder it must be securely fixed to prevent slippage whilst accessing the top of the FROG. The FROG-6 can be laid on its side on protective matting, or the use of a secure inspection frame assembly to safely access the underside of the FROG- 6 is recommended. Do not go underneath an active lift. Be aware that in some regions “Working at Height” regulations may apply.

The following checklist is suggested as a suitable list of required Examination items and a suitable format for recording key Examination data. A ‘WORD’ copy of this Examination checklist is included on the distributed CD’s and is also available on the Reflex Marine Ltd website at www.reflexmarine.com/support.

Examination Checklist Form

Unit No		**This Examination Date**		**Examined by**	
Usage Category		**Last Inspection Date**		**Position/ Company**	
Installation / Vessel		**Last Examination Date**		**Signature**	
Avg No of Transfers / Year		**Load test Performed Y/N**		**Original Inspection record filed in**	

Item No	Description	Comment	Pass / Fail	Verified By
1.	**Main Lift-Eye Plug (Critical Part)** Remove and visually inspect the main Lift-Eye plug for any signs of damage or strain. Replace according to the usage of the FROG-6 (see Table 3 in Section 6.3) or on the recommendation of a Competent Person / Inspector. (Note: Although RML do not require it some operators choose to adopt a dye penetrant crack inspection prior to any re-installation of a critical part)			
2.	**Main Lift-Eye Plug M20 Bolts (Critical Part)** Remove and visually inspect the three M20 main Lift-Eye plug securing bolts for any signs of damage or strain. Visually inspect the three M20 holes in the central column tube for signs of damage or strain. Replace appropriate parts according to the usage of the FROG-6 (see Table 3 in Section 6.3) or on the recommendation of a Competent Person / Inspector. Bolt torque to 215 Nm.			
3.	**M48 Keel Boss and M10 Cross Bolt (Critical Parts)** Remove the M48 keel boss nut and visually check that the threads at the bottom of the central column tube are in good condition. Before replacing the keel nut ensure the threads on both the central column and keel nut are thoroughly cleaned so they are free of grime and grit. Both threads should then be coated with either Rocol Anti-Seize Stainless or Swagelok Blue Goop thread lubricant. Replace appropriate parts according to the usage of the FROG-6 (see Table 3 in Section 6.3) or on the recommendation of a Competent Person / Inspector. Do not go underneath an active lift.			
4.	**Lifting Sling Set (Critical Part)** Replace the sling set according to the usage of the FROG (see Table 3 in Section 6.3). This may be as frequently as every 3 months. Irrespective of apparent condition the lifting sling set should be replaced at least every 12 months. Check the main lifting shackle alignment plate and the back-up eye shackle insert are in good condition (see Section 5.4.2). Replace as necessary.	*Note serial number and test date stamp (specify decision to retain or replace).*		
5.	**Sling Anti-Fouling -** Check the lifting assembly anti-fouling bracket and shackle spacer are in good condition (see Section 5.4.2). Replace as necessary.			
6.	**Backup-Eye –**Inspect the back-up eye in situ, nut, split pin and tamper proof seal. Replace on the recommendation of a Competent Person / Inspector. Torque to 125nm			

Item No	Description	Comment	Pass / Fail	Verified By
7.	**Seat Base Assembly and the Hydraulic Damper and Anti-Tilt Assembly** Visually inspect and test all fixings for any wear or damage and ensure that all bolts, clevis' and other fasteners are fully secure. Ensure that the damper rod-end threads are not visible below the clevis pin eye. (see Technical Bulletin 01-09 at http://www.reflexmarine.com/index.cfm/p/Technical-Safety-Alerts).			
8.	**Landing Feet -** 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. Notes: i. Measure height of foot and replace if under 150 mm in height **ii.** Small (20 mm in length) cuts are acceptable but feet should be replaced when the internal foam becomes visible			
9.	**Frame and Buoyancy -** Visually inspect for any damage and ensure that all bolts and fasteners are tight and fully secure.			
10.	**Seat Harness Security (Critical Part) -** 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.			
11.	**Seat Harnesses (sit-in) -C**heck all seat harness buckles to ensure each is functioning correctly. (Inspector to sit in each seat and check fastening and unfastening of each harness).			
12.	**Load Test (see Section 6.8) -** On critical parts replacement, a load test (see Table 3 in Section 6.3) must be conducted. This is to be done by an independent test house company, nationally recognised and in accordance with ILO 152.			
13.	**Inspection data plate-** Update the inspection data plate after completion of approved Examination/inspection			
14	**Post Load Test Visual Inspection (See Section 6.7) –** If test is done, conduct and report a post load test visual inspection.			
	Storage			
15.	**Storage of FROG -** 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			
16.	**Replacement Parts Stock -** Check condition of all associated replacement parts and accessories. Sling sets should be stored in an appropriate dry place without high visibility cover fitted.			

	Reports	Complete Y/N	
17.	**Photographic Report -** Take the standard set of photos as detailed in the recommended inspection report template. As a minimum photos of each of the 16 points in the check list should be taken.		
18.	**Documentation / Report -** Complete a report as recommended in the RML inspection template. Reflex Marine Ltd offer to keep an archive copy of your inspection records against the unit number. You can submit your completed checklists and photographs on www.reflexmarine.com/support.		
NOTES:			

Link to Index

6.7 Post Load Test Visual Inspection

(NOTE: RML website www.reflexmarine.com/support should be checked for the latest version of the tables in this section)

Question	Response
When should a Post Load Test Visual Inspection be conducted?	A post load test visual inspection must be conducted immediately following every load test. The load test exerts additional stress into the FROG and this inspection formally records whether any resulting weakness is observed.
Who should conduct this inspection?	A Competent Person.
Does this inspection require a formal record?	Yes.
What drawings are required to support this inspection?	The drawings are available in Appendix B.
What equipment is required to perform this inspection?	i. A ladder. ii. An inspection frame or floor matting. iii. Good lighting. A suitable means of safely accessing the top and the bottom parts of the FROG-6 is required. When using a step ladder or ladder it should be securely fixed to prevent slippage whilst accessing the top of the FROG. The FROG-6 can be laid on its side on protective matting, or the use of a secure inspection frame assembly to safely access the underside of the FROG-6 is recommended. Do not go underneath an active lift. Be aware that in some regions "Working at Height" regulations may apply.

The following checklist is suggested as a suitable list of required inspection items and a suitable format for recording key inspection data. A 'WORD' copy of this inspection checklist is included on the distributed CD's and is also available on the Reflex Marine Ltd website at www.reflexmarine.com/support.

Post Load Test Visual Inspection Checklist Form

Unit No		**This Inspection Date**		**Inspected by**	
Usage Category		**Load Test Date**		**Position/ Company**	
Installation / Vessel		**Load Test Report/Ref**		**Signature**	
Avg No of Transfers / Year		**Load Test Authority**		**Original Inspection record filed in**	

Item No	Description	Comment	Pass / Fail	Verified By
1.	**Main Lift-Eye Plug (Critical Part)** Visually inspect in situ for any signs of wear, cracks, deformation or other damage			
2.	**Main Lift-Eye Plug M20 Bolts (Critical Part)** Visually inspect the three M20 lifting eye bolts, nuts, split pins and tamper proof seals that connect the main lift-eye plug to the central column for wear or damage.			
3.	**M48 Keel Boss and M10 Cross Bolt (Critical Part)** At the bottom end of central column, visually inspect the M48 keel boss nut and ensure that the M10 cross bolt is secure c/w split pin and tamperproof seal. Check the presence of anti-rotation fittings and that all bolts are secure. Do not go underneath an active lift.			
4.	**Backup-Eye -** Visually inspect for any wear or damage and check that the split pin and tamper proof seal are intact.			
5.	**Seat Base Assembly and Hydraulic Damper and Anti-Tilt Assembly** Visually inspect for any wear or damage and ensure that all bolts, clevis' and other fasteners are fully secure.			
6.	**Landing Feet -** 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 relived.			
7.	**Seat Base Assembly -** Visually inspect for any wear or damage and ensure that all bolts' and other fasteners are fully secure.			
8.	**Frame and Buoyancy -** Visually inspect for any damage and ensure that all bolts and fasteners are tight and fully secure.			
9.	**Inspection data plate-** Check the date of the last examination/ inspection has been correctly inserted and is indelibly legible.			

	Reports	Complete Y/N	
10.	**Photographic Report -** Take the standard set of photos as detailed in the recommended inspection report template, including the ready for dispatch after completion of the post load test inspection.		
11.	**Documentation / Report -** Complete a report as recommended in the RML inspection template. Reflex Marine Ltd offer to keep an archive copy of your inspection records against the unit number. You can submit your completed checklists and photographs on www.reflexmarine.com/support.		
NOTES:			

Link to Index

6.8 Proof Load Testing

(NOTE: RML website www.reflexmarine.com/support should be checked for the latest version of the tables in this section)

Question	Response
When must a Proof Load Test be conducted?	Immediately after any of the following events: i. After replacement of any critical parts. Does not apply to replacement of slin sets. ii. After any suspected damage arising from overloading or impact. iii. If the history of the FROG unit is uncertain. iv. If the inspection data plate is missing, illegible or out of date.
Who must conduct this test?	The Load Test must be carried out by an independent test house company with nationally recognised accreditation in accordance with ILO 152. A competent and certified test person.
Does this test require a formal record?	Yes.
What drawings are required to support this test?	The required drawings are available in Appendix B.
What equipment is required to perform this test?	i. Loading weights or sand bags (1770 kg). ii. Certified weighing scale or load cell. iii. Lifting equipment certified for > 5 Tonnes SWL. iv. A ladder or top access platform. v. An inspection frame or floor matting. vi. Good lighting. A suitable means of safely accessing the top and the bottom parts of the FROG-6 is required. When using a step ladder or ladder it must be securely fixed to prevent slippage whilst accessing the top of the FROG. The FROG-6 can be laid on its side on protective matting, or the use of a secure inspection frame assembly to safely access the underside of the FROG-6 is recommended. Do not go underneath an active lift. Be aware that in some regions “Working at Height” regulations may apply.

6.8.1 Load Test Procedure

Table 4 details the required proof load tests that are applicable to the FROG-6. Following the load tests, a post load test visual inspection should be conducted as recommended in Section 6.7.

Table 4: Proof Load Tests – FROG-6

Load Test Number	1	2
Components Under Test	i. Main Lift-Eye. ii. Central Column Load Bearing Assembly. iii. Seats and Floor Structure.	i. Back-Up Lift-Eye. ii. Central Column Load Bearing Assembly. iii. Seats and Floor Structure.
Test Proof Load	1770 kg (3894 lb)	1770 kg (3894 lb)
Test Proof Load Distribution	1180 kg (2596 lb) on the seats and spread equally between them. 590 kg (1298 lb) placed on the floor and distributed evenly.	1180 kg (2596 lb) on the seats and spread equally between them. 590 kg (1298 lb) placed on the floor and distributed evenly.
Basis of Test Proof Load	Twice Maximum Gross Weight, less Tare Weight* = 2 x 1200 kg – 630 kg = 1770 kg	Twice Maximum Gross Weight, less Tare Weight* = 2 x 1200 kg – 630 kg = 1770 kg
Crane Hook Load	2400 kg	2400 kg
Test Method	Lift the unit and hold static for 3 minutes.	Lift the unit and hold static for 3 minutes.

* ***Note: The Tare Weight of the FROG-6 is approximately 630 kg but may vary slightly. Each FROG-6 must be weighed prior to load test.***

6.8.2 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.
v. Test load (kg).
vi. The serial number of the FROG-6: HC6-XXX (where XXX is unit I.D. No).
vii. The model number of the FROG-6: HC6-01 (620) or HC6-01 (640).

6.9 Sling Replacement and Management

6.9.1 Sling Set (Critical Part) Replacement

Replace the sling set according to the usage of the FROG (see Table 3 in Section 6.3). This may be as frequently as every 3 months for very high use. Irrespective of apparent condition the lifting sling set should be replaced at least every 12 months.

6.9.2 Sling Set Management

The wire rope sling set supplied for use with the FROG-6 capsule is a critical component. Good management of sling sets is essential for ensuring safe personnel transfers.

Do

i. Clearly identify that a sling is still within the current inspection / examination period.
ii. Inspect the sling set prior to use. Open the velcro cover and visually check both legs of the sling set for any signs of mechanical damage or corrosion which may affect the integrity of the sling set.
iii. Ensure that the sling set is thoroughly examined by a Competent Person at intervals as specified in Table 3.
iv. Discard slings that have not passed inspection.
v. Use only OEM (original equipment manufacturer) slings as replacement sling sets.
vi. Replace slings according to usage and inspection results.
vii. Remove the velcro cover if a FROG unit or the sling set is to be removed from service for more than one month.
viii. Store sling sets in dry conditions when not in use.

Do Not

i. Do not use a sling set which has not been visually inspected prior to use.
ii. Do not use a sling set which has not been thoroughly examined by a Competent Person within the time interval as stated in Table 3. Note: for high and very high use, this frequency is every 3 months.
iii. Never use a sling set which has been in service for more than 12 months.
iv. Do not leave a sling set in a position where it is vulnerable to mechanical damage or contamination or where it may come into contact with abrasive or corrosive materials.
v. Do not use a sling set which has incurred mechanical damage - including damaged eyes or ferrules, kinks, crimps, 'birdcages' or broken strands.
vi. Do not secure the high visibility cover along its length with cable ties or similar which will prevent opening of the cover for inspection of the sling set.
vii. Do not allow the sling set to become immersed in water or to be stored where it may be subject to sea water spray or fresh water spray.
viii. Do not use non-OEM (original equipment manufacturer) sling sets.

Link to Index

6.10 Spares Kits and Replacement Parts

Use only genuine parts (including sling sets) provided by Reflex Marine Ltd.

Reflex Marine Ltd can supply critical and non-critical replacement parts as individual items or as appropriate kits. Prior to ordering any replacement parts or part kits, establish the FROG-6 Serial Number which is stamped on the Inspection Data Plate. The Number is typically HC6-XXX where XXX represents a three digit number.

Replace the critical parts (as identified in the Examination Checklist) according to the usage of the FROG (see Table 3 in Section 6.3). This may be as frequently as every time a visual inspection or examination is conducted (this could be every 3 months) up to every 3 years for the units with the lowest usage. All other replacement parts kits and parts should be replaced according to the advice of the Competent Person conducting the Visual and Examination procedure.

Any parts required for a FROG-6 can be ordered through support@reflexmarine.com.

Link to Index

6.10.1 Spares Kits

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

CRITCAL PARTS KITS (including lifting assembly)		
Kit Name	**Kit Number**	**Contents**
Critical Parts Kit with 30ft Lifting Assembly **Standard FROG-6 (620)**	H-CPK-01-30	**For Lift-Eye Assemblies** 1 x Main Lift-Eye Plug 3 x M20 Main Lift-Eye Securing Bolts 3 x M20 Securing Nuts 3 x M3 Split Pins 3 x Tamperproof Seals **And** **For Keel Assemblies** 1 x M48 Fine Thread Keel Plate Boss 1 x M10 x 95 mm Hex Bolt 2 x M10 Plain Washers 1 x M10 Nyloc Nut 1 x M3 Split Pin 1 x Tamperproof Seal **And** 1 x 30 ft (9 m) Sling Set Assembly (220 Version)
Critical Parts Kit with 30ft Lifting Assembly **Arctic FROG-6 (640)**	H-CPK-01-30-M40	**For Lift-Eye Assemblies** 1 x Main Lift-Eye Plug (640 Version) 3 x M20 Main Lift-Eye Securing Bolts (640 Version) 3 x M20 Securing Nuts 3 x M3 Split Pins 3 x Tamperproof Seals **And** **For Keel Assemblies** 1 x M48 Fine Thread Keel Plate Boss (640 Version) 1 x M10 x 95 mm Hex Bolt 2 x M10 Plain Washers 1 x M10 Nyloc Nut 1 x M3 Split Pin 1 x Tamperproof Seal **And** 1 x 30 ft (9 m) Sling Set Assembly (240 Version) 1 x High Visibility Cover (240 Version)

Link to Index

REPLACEMENT PARTS KITS (NOT with lifting assembly)		
Kit Name	**Kit Name**	**Kit Name**
Replacement Parts Kit **Standard FROG-6 (620)**	H-RPK-01	**For Lift-Eye Assemblies** 1 x Main Lift-Eye Plug 3 x M20 Main Lift-Eye Securing Bolts 3 x M20 Securing Nuts 3 x M3 Split Pins 3 x Tamperproof Seals **And** **For Keel Assemblies** 1 x M48 Fine Thread Keel Plate Boss 1 x M10 x 95 mm Hex Bolt 2 x M10 Plain Washers 1 x M10 Nyloc Nut 1 x M3 Split Pin 1 x Tamperproof Seal
Replacement Parts Kit **Arctic FROG-6 (640)**	H-RPK-01-M40	**For Lift-Eye Assemblies** 1 x Main Lift-Eye Plug (640 Version) 3 x M20 Main Lift-Eye Securing Bolts (640 Version) 3 x M20 Securing Nuts 3 x M3 Split Pins 3 x Tamperproof Seals **And** **For Keel Assemblies** 1 x M48 Fine Thread Keel Plate Boss (640 Version) 1 x M10 x 95 mm Hex Bolt 2 x M10 Plain Washers 1 x M10 Nyloc Nut 1 x M3 Split Pin 1 x Tamperproof Seal

LIFTING SLING ASSEMBLY PARTS KITS		
Kit Name	**Kit Number**	**Contents**
Standard FROG-6 (620) – 30ft Lifting Assembly Kit	220-30	1 x 30 ft (9 m) Sling Set Assembly c/w 2 x Shackles 1 x Sling Cover (red) 1 x Anti Fouling Bracket 1 x Shackle Spacer 4 x Heavy Duty Cable Ties
Arctic FROG-6 (640) – 30ft Lifting Assembly Kit	240-30	1 x 30 ft (9 m) Sling Set Assembly c/w 2 x Shackles 1 x Sling Cover (yellow) 1 x Anti Fouling Bracket 1 x Shackle Spacer 4 x Heavy Duty Cable Ties

Link to Index

OTHER SERVICE KITS		
Kit Name	**Kit Number**	**Contents**
Back-Up Lift-Eye Refurbishment Kit	H-BEK-01	1 x Back-Up Lift-Eye 1 x M24 Nut 1 x 3 mm Split Pin 1 x Tamper Proof Seal
Landing Feet Kit	H-LFK-01	3 x Landing Foot Assembly 6 x M10 Hex Screw 6 x M10 Hex Nut 12 x M10 Plain Washer 3 x M16 Socket Head Cap Screw 3 x M16 Hex Nut 6 x M16 Washer
Restraint Harness Kit	H-RHK-01	3 x Red Seat Harness 3 x Yellow Seat Harness Plus Fixings 3 x M10 Socket Head Screws 24 x M10 Washers 12 x M10 Hex Nuts 9 x M10 Socket Head Screws 3 x 10 mm Seat Harness Spacers
Full Service Kit	H-FSK-01-30 H-FSK-01-30-M40	This Kit combines the following Kits: i. Critical Parts Kit with 30ft Sling set ii. Back-Up Lift-Eye Kit iii. Landing Feet Kit iv. Sling Cover

Link to Index

6.10.2 All Other Replacement Parts

Reflex Marine Ltd carries spares and accessories stock and is able to supply most individual components of the FROG-6. Please refer to Appendix B to assist in identifying your requirements, however for the most up to date and accurate identification of parts please contact our operations department at support@reflexmarine.com.

In many cases an Operator is advised to carry a local spare parts stock inventory to ensure the continued safe operation of the FROG unit. Minimum stock quantities shall be influenced by:

i. Remoteness of location and certifying authority.
ii. Criticality of maintaining crew and emergency response (MedEvac) access.
iii. Usage envelope.
iv. Customs processing time.
v. Cost of logistics for small parts.

Reflex Marine Ltd would be pleased to offer the recommended minimum stock items for critical and replacement parts for your operation, please contact support@reflexmarine.com.

6.11 Unit Replacement Recommendation

The FROG design is strong and robust and is able to be refurbished to full working capacity. FROGS work in a very wide range of operating conditions and environments. The work they perform and the way they are maintained and looked after has wide variability.

Reflex Marine Ltd expects all FROGS to provide many years of excellent reliable service with minimal operating costs.

RML do however recommend that after a certain duty cycle, it is time to renew this critical lifting equipment. Based on RML's field observations and usage category, RML has established the recommended unit retirement age as specified in Table 3 in Section 6.3.

RML would be pleased to offer renewal customers attractive quotes for the latest equipment.

6.12 Guidelines for Stocking of new units

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.

Type	In Stock Inspection	Release Inspection	Additional Certification	Shelf Life	Actions
Transfer capsules	Yearly 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 Year	1. Remove Sling 2. Place sling into dry storage 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 4. Update certification pack with new sling information if original sling is not being used. 5. Update the certificate pack with all new certification documents, including load test and examination certificates.
Sling sets	Visual – Every 6 months	Thorough Examination	1. Re-validated Certificate, indicating next inspection date 2. Certificate of thorough examination should be issued.	2 Year	1. Keep off the ground in dry and ventilated storage area with the sling cover removed.
Other replacement Parts (not slings)	None	Visual Inspection	Not Required	Unit Lifetime	1. Keep in clean dry storage

Link to Index

7 UNIT IDENTIFICATION

7.1 Product ID Numbers

There are currently two versions of the FROG-6 the model numbers are as:

HC6-01 (620) Standard: Standard 6 passenger version with the facility to carry a stretcher
HC6-01 (640) Arctic: A low temperature version of Frog-6, certified for use down to -40 deg C

7.2 FROG-6 Serial Numbers

Every FROG-6 built is assigned a build serial number. These serial numbers are allocated sequentially in the order in which FROG-6 units are built. Serial numbers start from HC6-001, and continue in numerical sequence. The serial number for each FROG-6 will be stamped on a plate, which is attached to each unit.

7.3 Component Serial Numbers

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 coded bolts with a particular mill certificate.

Link to Index

8 HANDLING, SHIPPING AND STORAGE

8.1 Dimensions

The FROG-6 overall dimensions are as follows:

In standard 6 seat mode:

Height	2760 mm	(8.4 ft)
Max Width 1	2410 mm	(7.3 ft)
Max Width 2	2760 mm	(8.4 ft)
Tare Weight	630 kg	(1386 lb)

In stretcher mode:

Height	2760 mm	(8.4 ft)
Max Width 1	2610 mm	(8.0 ft)
Max Width 2	3400 mm	(10.4 ft)
Tare Weight	630 kg	(1386 lb)

8.2 Handling & Transportation

8.2.1 Forklift

Handling of the FROG-6 with a Forklift truck may damage the underside of the FROG-6 (landing feet, cross braces or main column). Therefore the unit must be secured to a pallet specifically designed for forks.

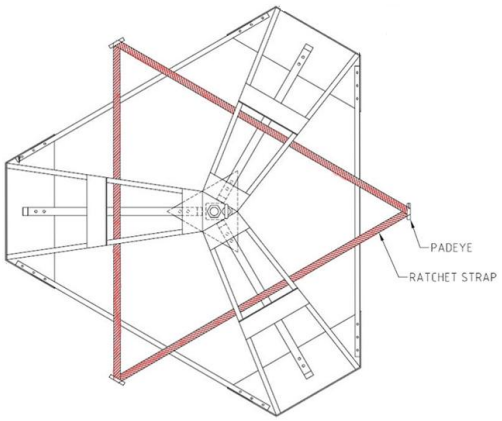
8.2.2 Crane

When lifting the FROG-6 with short chain or strop, a temporary shackle should be fixed to the Back-up eyebolt. Care must be taken not to damage the FROG-6 lifting sling set. **The shackle should not be fitted through the thimble of the sling eye.**

8.2.3 Securing

For deck fastening, Reflex Marine recommends using the peripheral braces around the floor grating. An example showing a deck fastening configuration is shown in Figure 11

Figure 11: Recommended Strapping Method FROG 6



8.2.4 Inspection

Before and after transportation the FROG-6 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 refer to Section 6.3, item iv, for remedial instructions.

8.2.5 Preparation for Road Transport

Prior to shipping, the seat harnesses must be secured by tightening the seat harnesses and tying the buckles together. This will prevent seat harnesses flapping and damaging the seating area. It is recommended that the FROG-6 is covered for shipping either with a FROG-6 weatherproof protective cover or other heavy duty tarpaulin material.

8.2.6 Crating and Shipping

The FROG-6 will not fit in a standard or high-cube container. If the FROG-6 is transported on flat rack it must be secured. Recommended securing points are the radial / peripheral floor braces and the back-up eye. To protect it from excess loading, the main Lift-Eye must not be used as a securing point. Feet must be supported to prevent collapse by placing suitable chocks or props under the unit.

8.2.7 Storage

The FROG-6 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 the FROG-6 is covered with the FROG-6 weatherproof cover whilst not in use. The cover fits the standard FROG-6 in both configurations.

Fig 12: FROG-6 Protective Cover

Link to Index

8.2.8 Feet Deformation During Storage

Prolonged periods of exposure to hot decks and self-weight can cause permanent set deformation of the elastomeric feet. It is advised that if the Frog 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.

Reflex can supply a dedicated set of supporting chocks that are designed to fit properly underneath the main base frame of the Frog-6 without impinging any exposed bolt heads. The chocks are pre-laid on the deck ready for landing the Frog directly to the storage position.

Fig 13: Landing Foot Chocks

Link to Index

9 APPENDIX A – TRANSFER LOG

MARINE PERSONNEL TRANSFER LOG			
Date		**From** (vessel name)	
Transfer Time		**To** (vessel name)	
Unit Type		**Crane** (port / starboard etc)	
Wind Speed		**Sea State**	
Wind Direction		**Visibility**	
Transfer Classification		ROUTINE / EMERGENCY	
Reason for Transfer			
Other Factors Affecting Transfer (vessel position / deck space etc)			

Passenger Details			
Passengers are requested to sign below if they consent to undertaking the transfer detailed above. ***Important note to passengers –*** *Certain National regulations place constraints on the use of personnel transfers. Passengers should ensure they are aware of any local regulations prior to proceeding.*			
Name	**Designation**	**Signed consent**	**Time / Date**

TO BE COMPLETED BY THE LIFT SUPERVISOR			
Have operating instructions in the capsule been read and understood?			YES / NO
Has the condition of the transfer capsule and associated equipment been checked?			YES / NO
Have passengers been fully briefed on the operation?			YES / NO
Hazards Identified			YES / NO
Action Taken to Minimise Hazards			
The transfer was carried out without incident			YES / NO
Name	**Position**	**Signature**	**Time / Date**
ADDITIONAL COMMENTS			

Link to Index

10 APPENDIX B – DRAWINGS

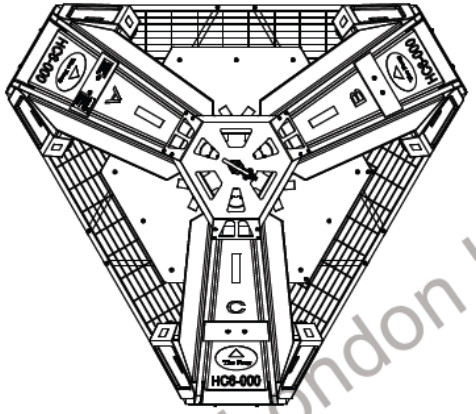
Drawing No	Revision	Description
620 (Sheet 1&2)	C	Frog-6 General Assembly
620-01 (Sheet 1 to 4)	C	Frog-6 General Assembly (Medivac Configuration)
620-02 (Sheet 1 to 3)	A	Frog-6 Spaceframe Assembly
620-03 (Sheet 1&2))	B	Frog-6 Central Column Assembly
620-04	B	Frog-6 Load Path Assembly
620-07 (Sheet1&2)	A	Frog-6 Seat Assembly
220-30	B	30ft Lifting Assembly

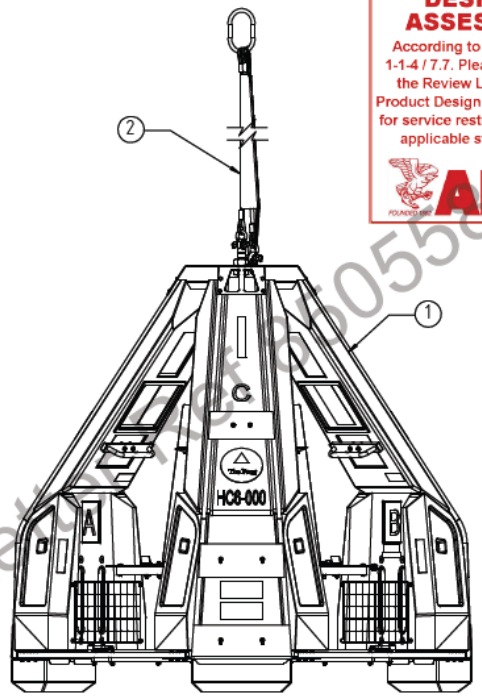
Note: The following drawings are indicative only and only show 620 model. For the most up to date and accurate identification of parts please contact our operations department at support@reflexmarine.com

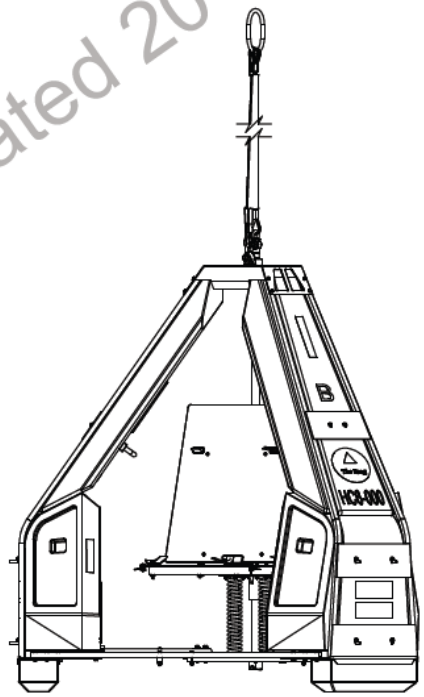
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	Previous Part No.	STANDARD OR AUXILLARY
1	620-01-C	FROG-6 ASSEMBLY	1	H-6X-GA1-A	
2	220-30-B	30FT LIFTING ASSY (-20 TO +50 DEG C)	1	N/A	STD
3	220-20-B	20FT LIFTING ASSY (-20 TO +50 DEG C)	1	N/A	AUX
4	220-15-B	15FT LIFTING ASSY (-20 TO +50 DEG C)	1	N/A	AUX
5	220-10-B	10FT LIFTING ASSY (-20 TO +50 DEG C)	1	N/A	AUX

REVISIONS				
ECNo.	REV	DESCRIPTION		
	A	FIRST ISSUE	01-09-11	DB
	B	SHEET 1 ITEMS 1 TO 5 RAISED IN ISSUE SHEET 2 STRETCHER STRAP REMOVED AS IT IS NOW A STANDARD ITEM	28/09/2011	DB
	C	ITEM 1 RAISED IN ISSUE	24/10/2011	DB

DESIGN ASSESSED
According to ABS Rule 1-1-4 / 7.7. Please refer to the Review Letter and Product Design Assessment for service restrictions and applicable standards.
ABS





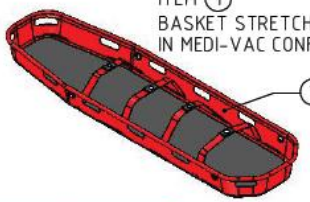


SHEET 2 IDENTIFIES FROG-6 ACCESSORIES

DRAWN	RJ FUDGE 25-08-11	MATERIAL SPECIFICATION SEE DETAILS	WEIGHT: 630 Kg	3rd ANGLE PROJECTION	REFLEX MARINE LTD
			SCALE 1:25 NO. OFF ONE	ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED	SOMAR HOUSE, HERON WAY, TRURO, CORNWALL, UK WWW.REFLEXMARINE.COM
CHECKED	RF 01-09-11	FINISH SEE DETAILS	TOLERANCES UNLESS SPECIFIED 0 DEC PLACE +/- 1, 1 DEC PLACE +/- 0.25, 2 DEC PLACE +/- 0.1, ANGULAR +/- 1/4°	ALL DIAMETERS CONCENTRIC 0.05 T.I.R.	TITLE FROG-6 GENERAL ASSEMBLY
APPROVED	DB 01-09-11	SURFACE TREATMENT REFER TO BUILD MANUAL	DRAWING PREPARED IN ACCORDANCE WITH BS8888-2008	SURFACE FINISH 32 ALL OVER U.O.S.	DRAWING NO. 620-C SHEET 1 OF 2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	STD/AUX	Previous Part No.
1	300-01-01-A	BASKET STRETCHER	1	AUX	F-01-120
2	600-05-A	FROG-6 TROLLEY	1	AUX	H-6X-055-B
3	600-06-A	FROG-6 COVER	1	AUX	F-01-151
4	300-02-01-A	STROBE LIGHT TYPE AQ-4	1	AUX	F-01-122
5	300-03-01-A	STROBE LIGHT - LT131	1	AUX	F-01-250

ITEM (1)
BASKET STRETCHER FOR USE IN MEDI-VAC CONFIGURATION

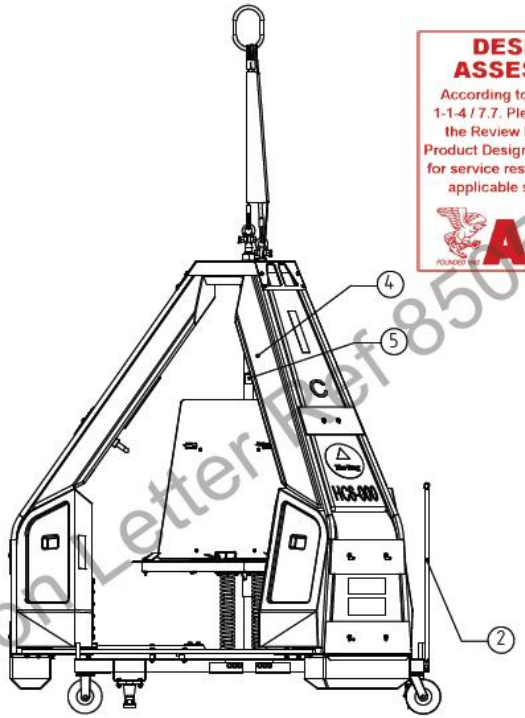


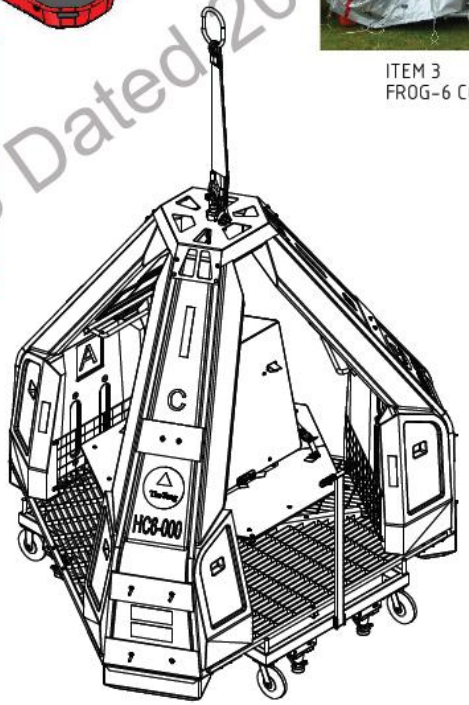
ITEM 3
FROG-6 COVER

DESIGN ASSESSED
According to ABS Rule 1-1-4 / 7.7. Please refer to the Review Letter and Product Design Assessment for service restrictions and applicable standards.
ABS

ITEM (4)
STROBE LIGHT FOR NON-ZONED APPLICATIONS

ITEM (5)
STROBE LIGHT FOR ZONED APPLICATIONS

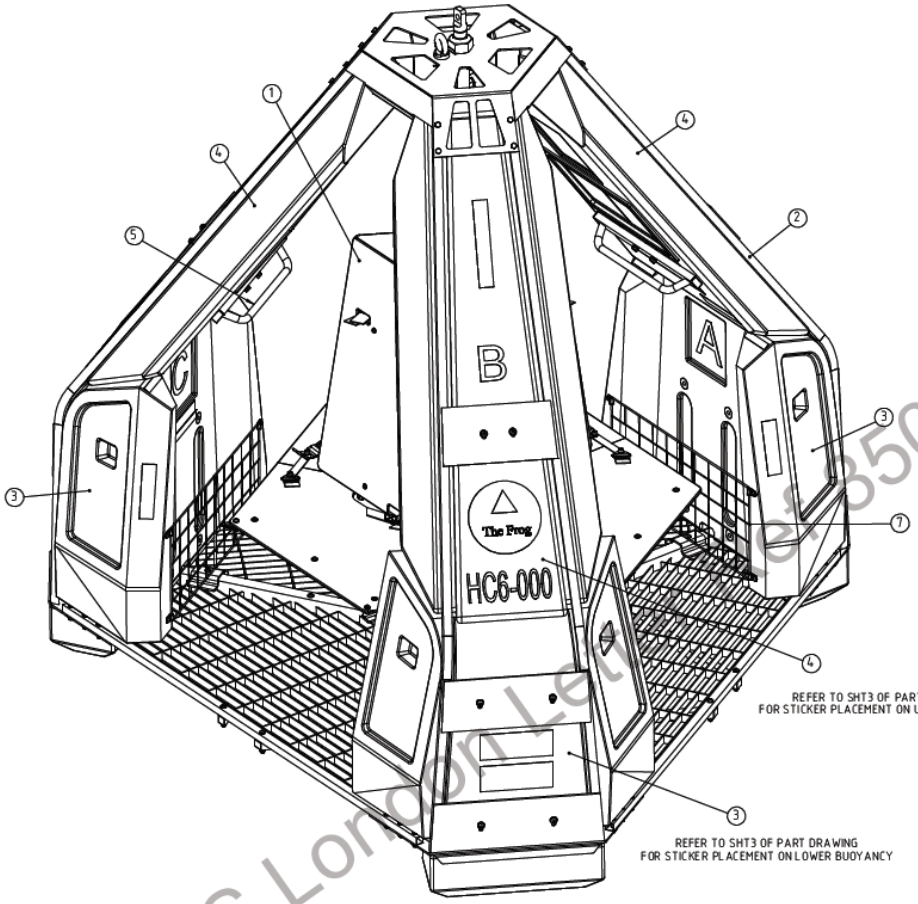




ITEM (2)
FROG-6 TROLLEY

DRAWN	RJ FUDGE 25-08-11	MATERIAL SPECIFICATION SEE DETAILS	WEIGHT: 630 Kg	3rd ANGLE PROJECTION	REFLEX MARINE LTD
			SCALE 1:25 NO. OFF ONE	ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED DEBURR AND BREAK SHARP EDGES	SOMAR HOUSE, HERON WAY, TRURO, CORNWALL, UK WWW.REFLEXMARINE.COM
CHECKED	RF 01-09-11	FINISH SEE DETAILS	TOLERANCES UNLESS OTHERWISE SPECIFIED 0 DEC PLACE +/- 1 1 DEC PLACE +/- 0.25 2 DEC PLACE +/- 0.1 ANGULAR +/- 1/4°	ALL DIAMETERS CONCENTRIC 0.05 T.I.R.	TITLE FROG-6 GENERAL ASSEMBLY
				SURFACE FINISH 3.2 ALL OVER U.O.S.	
APPROVED	DB 01-09-11	SURFACE TREATMENT REFER TO BUILD MANUAL	DRAWING PREPARED IN ACCORDANCE WITH BS8888-2008 THIS DRAWING, DESIGN AND SPECIFICATION ARE THE PROPERTY OF REFLEX MARINE LTD AND MAY NOT BE REPRODUCED OR USED IN WHOLE OR PART AS THE BASIS FOR SALE		DRAWING NO. 620-C SHEET 2 OF 2 A3

REVISIONS				
ECN No.	REV.	DESCRIPTION	DATE	APPD
	A	FIRST ISSUE. PREVIOUS PART NO. H-6X-GA1-A	26-09-11	DB
	B	SHEET 1 GR: 6-G & 7-F NOTES UPDATED FROM SHT2 TO SHT3. ITEMS 3 & 7 RAISED IN ISSUE. FIXINGS FOR THE LUGGAGE NET HAVE BEEN MOVED INTO THE LUGGAGE NET MODEL & THE ITEMS REMOVED FROM THIS BOM. ITEM 13 THE FROG-6 STRETCHER STARP'S PART NUMBER HAS BEEN UPDATED.	03/10/2011	DB
	C	ITEM 1 RAISED IN ISSUE	24/10/2011	DB



DESIGN ASSESSED
According to ABS Rule 1-1-4 / 7.7. Please refer to the Review Letter and Product Design Assessment for service restrictions and applicable standards.
ABS

REFER TO SHT3 OF PART DRAWING FOR STICKER PLACEMENT ON UPPER BUOYANCY

REFER TO SHT3 OF PART DRAWING FOR STICKER PLACEMENT ON LOWER BUOYANCY

SEE SHEET 4 FOR MEDI-VAC CONFIGURATION

ITEM NO.	PART NUMBER	DESCRIPTION	Default/Q.TY.	STD/AUX
1	620-03-B	FROG-6 CENTRAL COLUMN ASSEMBLY	1	
2	620-02-A	FROG-6 SPACEFRAME ASSEMBLY	1	
3	320-01-01-C	FROG-3 LOWER BUOYANCY	3	
4	320-01-02-C	FROG-3 UPPER BUOYANCY	3	
5	320-01-03-A	FROG-3 GRAB HANDLE	3	
6	320-01-04-A	FROG-3 GRAB HANDLE SPACER	6	
7	320-01-05-B	FROG-3 LUGGAGE NET	3	
8	112-060-SB-2	M12x60 SOC BUT SCREW ISO7380 A2	18	
9	112-075-HB-4	M12x75 HEX HD SET SCREW BS 3692 A4	6	
10	112-000-WS-4	M12 SPRING WASHER A4 DIN 7980	24	
11	112-000-WA-4	M12 FLAT WASHER FORM A BS4320 A4	24	
12	300-01-01-A	FROG-3 BASKET STRETCHER	-	AUX
13	620-01-07-A	FROG-6 STRETCHER STRAP	2	STD

DRAWN	R. FUDGE 13/07/2011	MATERIAL SPECIFICATION SEE DETAILS	WEIGHT: 630 Kg	3rd ANGLE PROJECTION
CHECKED	RF 26/09/2011	FINISH SEE DETAILS	SCALE 1:10 NO. OFF ONE	REMOVE ALL BURRS AND BREAK SHARP EDGES
APPROVED	DB 26/09/2011	SURFACE TREATMENT REFER TO BUILD MANUAL FOR WELDED COMPONENTS	TOLERANCES UNLESS OTHERWISE SPECIFIED 0 DEC PLACE +/- 1 1 DEC PLACE +/- 0.25 2 DEC PLACE +/- 0.1 ANGULAR +/- 1/4°	ALL DIAMETERS CONCENTRIC 0.00 T.I.R.
				SURFACE FINISH 12.5 ALL OVER U.O.S.

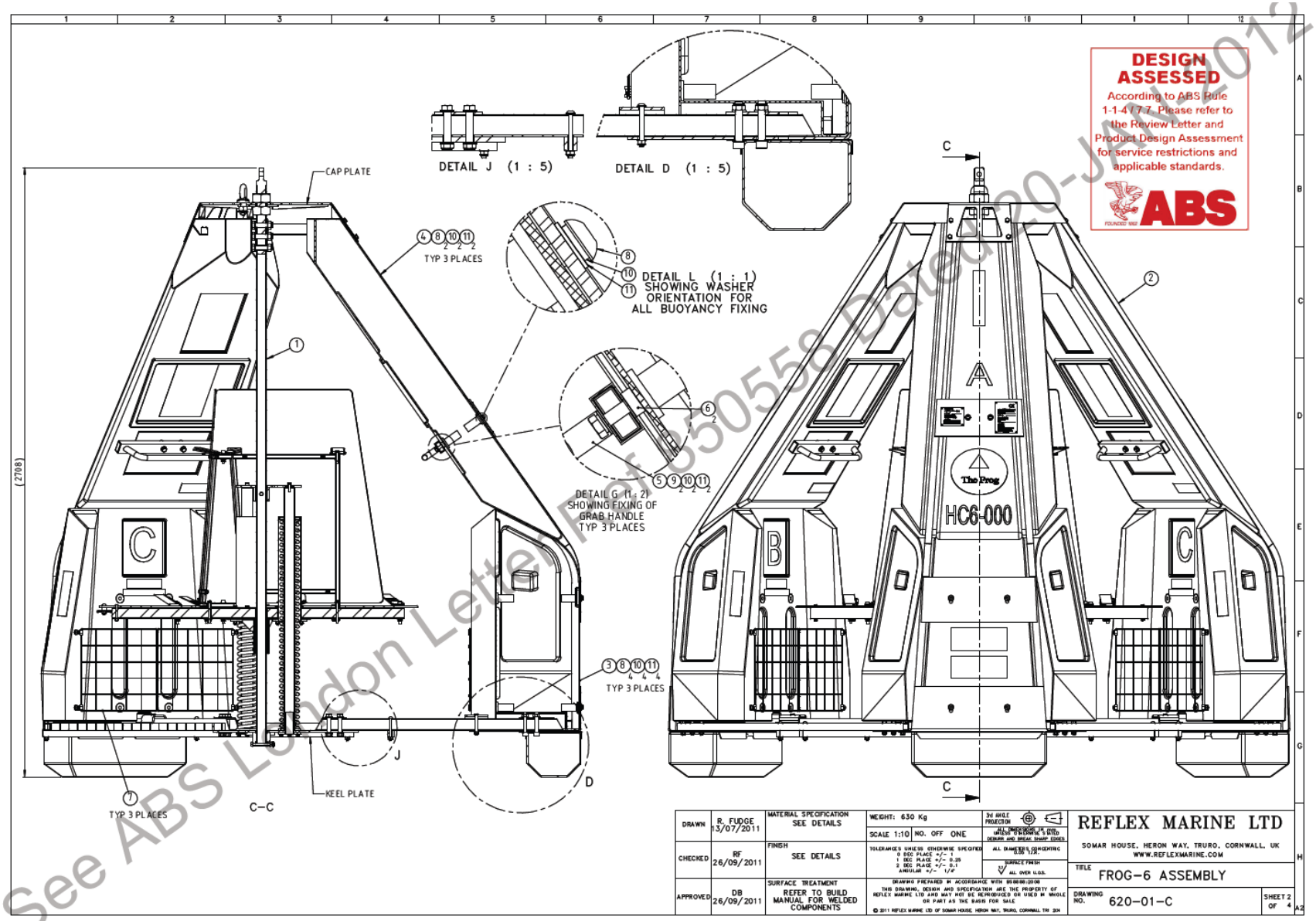
REFLEX MARINE LTD
SOMAR HOUSE, HERON WAY, TRURO, CORNWALL, UK
WWW.REFLEXMARINE.COM

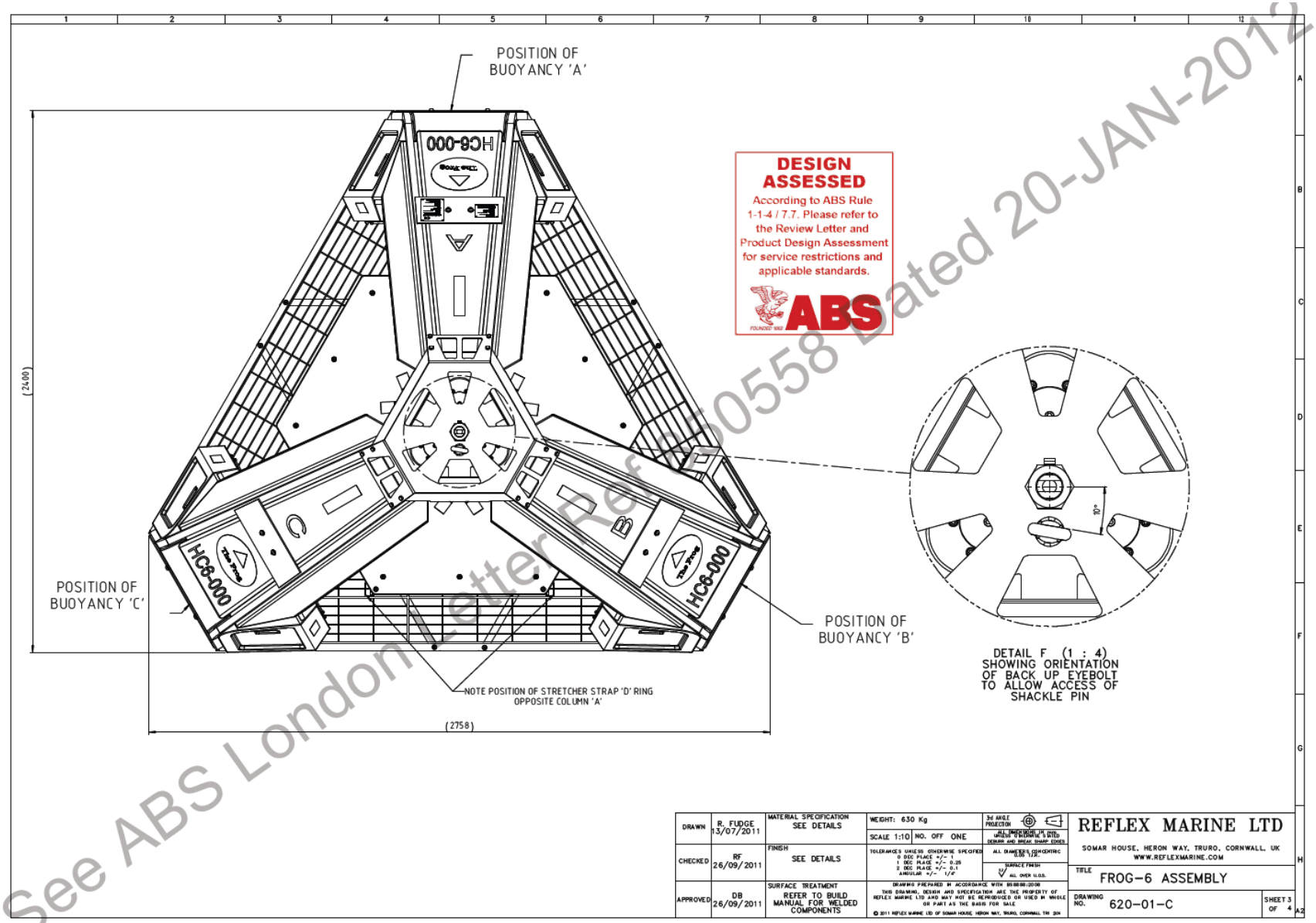
TITLE: FROG-6 ASSEMBLY

DRAWING NO. 620-01-C

SHEET 1 OF 4

A2

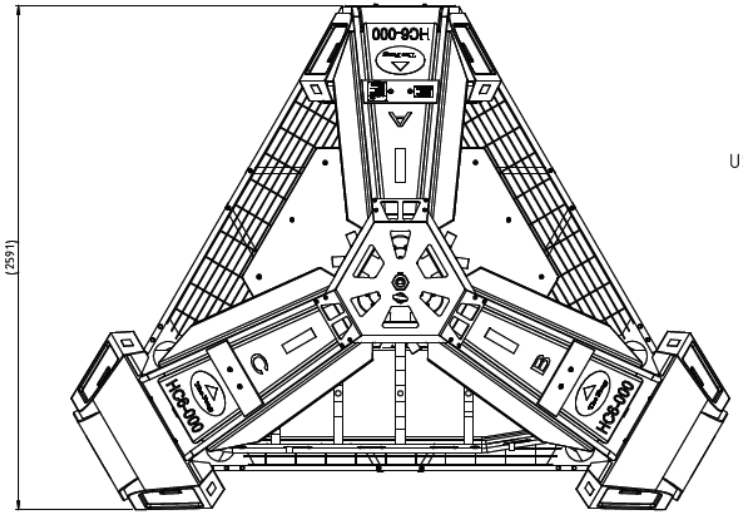


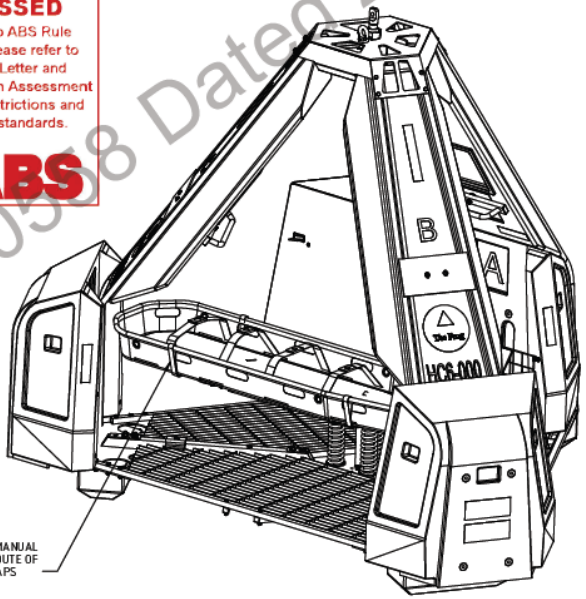


MEDI-VAC CONFIGURATION

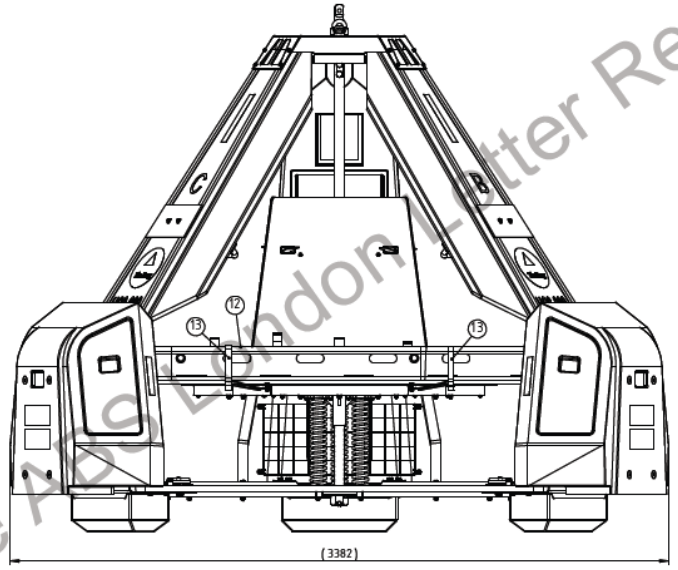
LOWER BUOYANCY UNITS B&C ARE REVERSED AS SHOWN AND SECURED
USING EXISTING SCREWS, SPRING WASHERS AND PLAIN WASHERS ITEMS (8) , (10) & (11)

DESIGN ASSESSED
According to ABS Rule 1-1-4 / 7.7. Please refer to the Review Letter and Product Design Assessment for service restrictions and applicable standards.
ABS

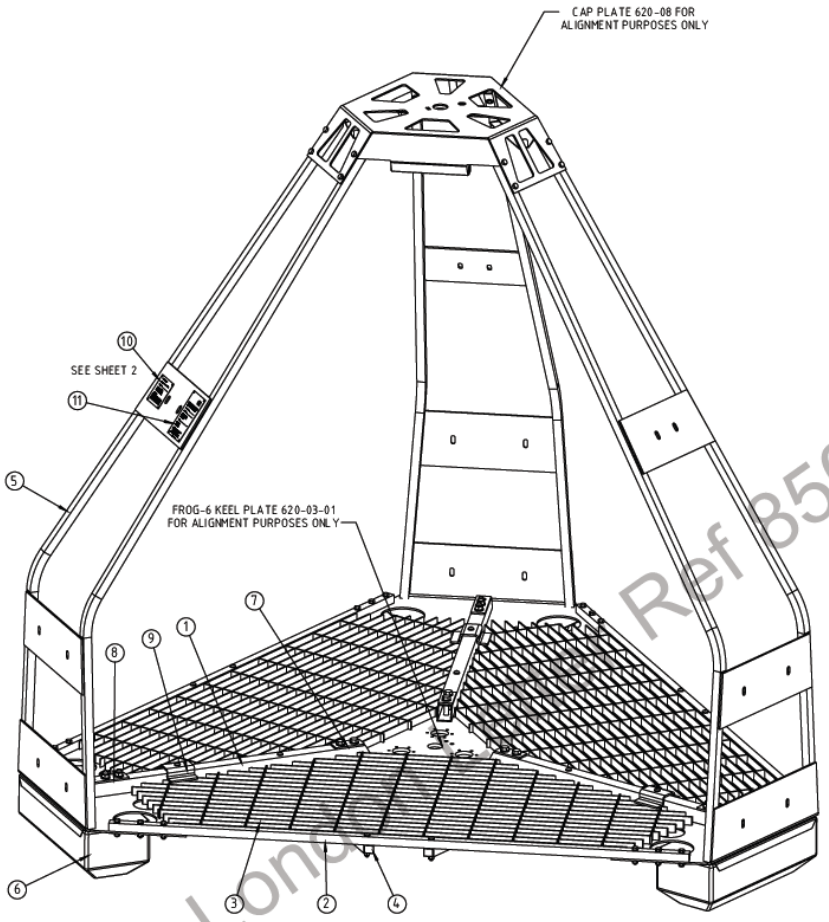




REFER TO USER MANUAL FOR DETAILED ROUTE OF STRETCHER STRAPS



DRAWN	R. FUDGE 13/07/2011	MATERIAL SPECIFICATION SEE DETAILS	WEIGHT: 630 Kg	3rd ANGLE PROJECTION	REFLEX MARINE LTD
			SCALE 1:10 NO. OFF ONE	ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED	SOMAR HOUSE, HERON WAY, TRURO, CORNWALL, UK WWW.REFLEXMARINE.COM
CHECKED	RF 26/09/2011	FINISH SEE DETAILS	TOLERANCES UNLESS OTHERWISE SPECIFIED 0 DEC PLACE +/- 1 1 DEC PLACE +/- 0.25 2 DEC PLACE +/- 0.1 ANGULAR +/- 1/4°	ALL DIAMETERS CONCENTRIC 0.05 T.I.R.	TITLE FROG-6 ASSEMBLY
				SURFACE FINISH ALL OVER U.O.S.	
APPROVED	DB 26/09/2011	SURFACE TREATMENT REFER TO BUILD MANUAL FOR WELDED COMPONENTS	DRAWING PREPARED IN ACCORDANCE WITH BS8888:2008		DRAWING NO. 620-01-C SHEET 4 OF 4



DESIGN ASSESSED

According to ABS Rule 1-1-4 / 7.7. Please refer to the Review Letter and Product Design Assessment for service restrictions and applicable standards.

ABS

FOUNDED 1862

REVISIONS

ECN No.	REV.	DESCRIPTION	DATE	APPD
	A	FIRST ISSUE. PREVIOUS PART No. H-6X-GA2-B	27-7-11	DB

ITEM NO.	PART NUMBER	DESCRIPTION	Q.TY.
1	620-02-01-A	FROG-6 CENTRAL STRUT	3
2	620-02-02-A	FROG-6 PERIPHERAL STRUT	3
3	620-02-03-A	FROG-6 FLOOR GRATING	3
4	620-02-04-A	FROG-6 GRATING CROSS BRACE	3
5	620-05-A	FROG-6 PILLAR STRUT ASSEMBLY	3
6	620-06-A	FROG-6 LANDING FOOT ASSY	3
7	320-02-03-A	CENTRAL STRUT WASHER PLATE - INNER	3
8	320-02-04-A	CENTRAL STRUT WASHER PLATE - OUTER	3
9	320-02-06-A	FROG FLOOR RETAINER	3
10	620-02-09-A	FROG-6 LOAD TEST PLATE	1
11	620-02-10-A	FROG-6 ABS-CE MARKER PLATE	1
12	103-008-SB-4	M3x8 SOC BUT HD SCREW ISO7380 A4	8
13	110-035-HD-4	M10x35 HEX HD SET SCREW BS3692 A4	12
14	110-055-HB-4	M10x55 HEX HD BOLT BS3692 A4	18
15	110-080-SB-4	M10x80 SOC BUT HD SCREW ISO7380 A4	6
16	110-090-SB-4	M10x90 SOC BUT HD SCREW ISO7380 A4	3
17	110-100-SB-4	M10x100 SOC BUT HD SCREW ISO7380 A4	3
18	110-000-NN-4	M10 HEX NYLOC NUT BS4929 A4	30
19	110-000-WA-4	M10 FLAT WASHER FORM A BS4320 A4	60
20	110-000-WS-4	M10 SPRING WASHER A4 DIN 7980	12
21	116-090-SC-4	M16x90 SOC CAP SCREW BS4168 A4	6
22	116-090-HB-4	M16x90 HEX HD BOLT BS3692 A4	6
23	116-000-NN-4	M16 HEX NYLOC NUT BS4929 A4	12
24	116-000-WA-4	M16 FLAT WASHER FORM A BS4320 A4	24

DRAWN	RJ FUDGE 27-7-11	MATERIAL SPECIFICATION SEE DETAILS	WEIGHT: 387.41 Kg	3rd ANGLE PROJECTION
			SCALE 1:10 NO. OFF ONE	ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED DEBURR AND BREAK SHARP EDGES
CHECKED	RF 27-7-11	FINISH NATURAL	TOLERANCES UNLESS OTHERWISE SPECIFIED 0 DEC PLACE +/- 1 1 DEC PLACE +/- 0.25 2 DEC PLACE +/- 0.1 ANGULAR +/- 1/4°	ALL DIAMETERS CONCENTRIC 0.05 T.I.R. SURFACE FINISH ALL OVER U.O.S.
APPROVED	27-7-11	SURFACE TREATMENT REFER TO BUILD MANUAL	DRAWING PREPARED IN ACCORDANCE WITH BS8888:2008	

REFLEX MARINE LTD

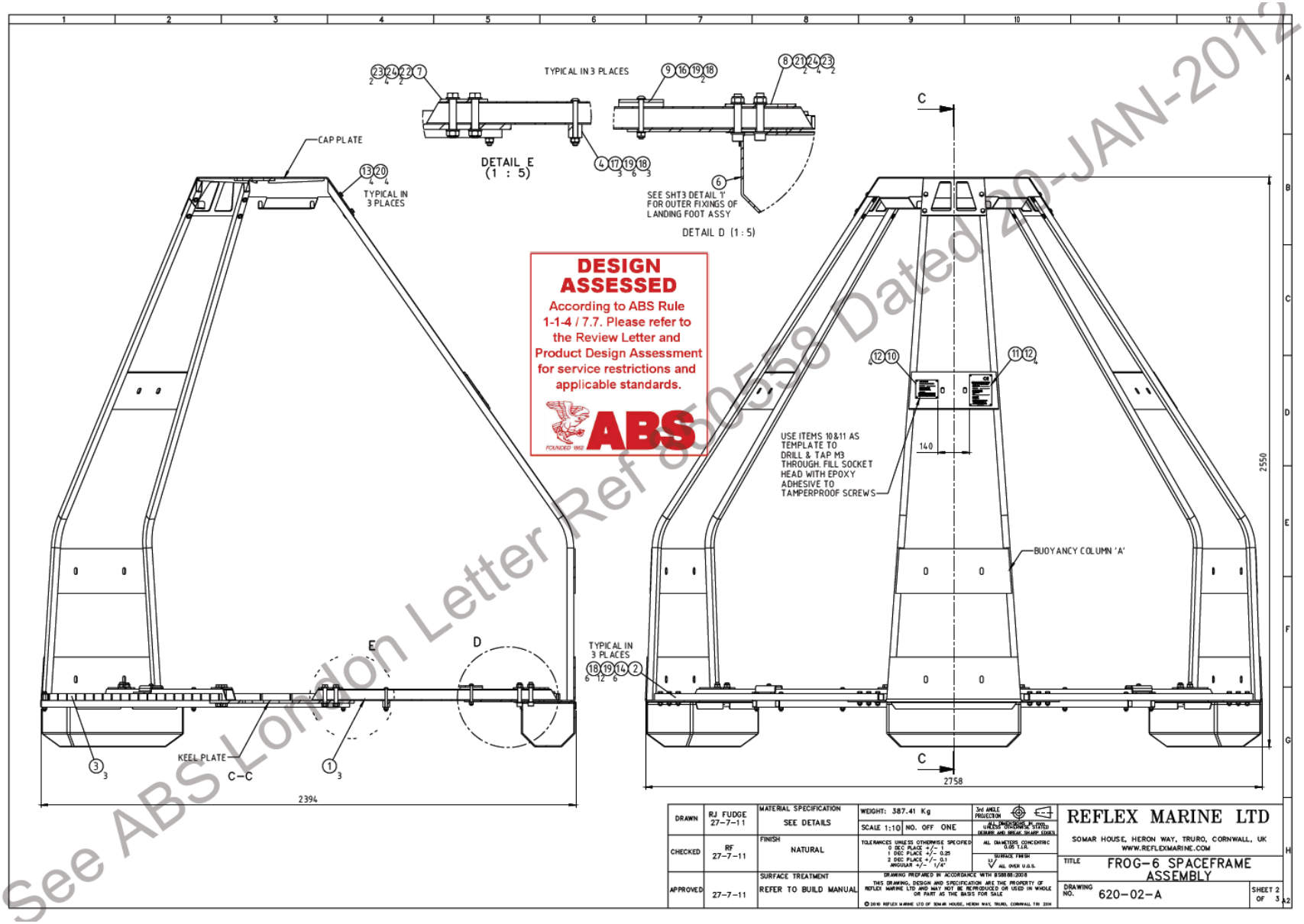
SOMAR HOUSE, HERON WAY, TRURO, CORNWALL, UK
WWW.REFLEXMARINE.COM

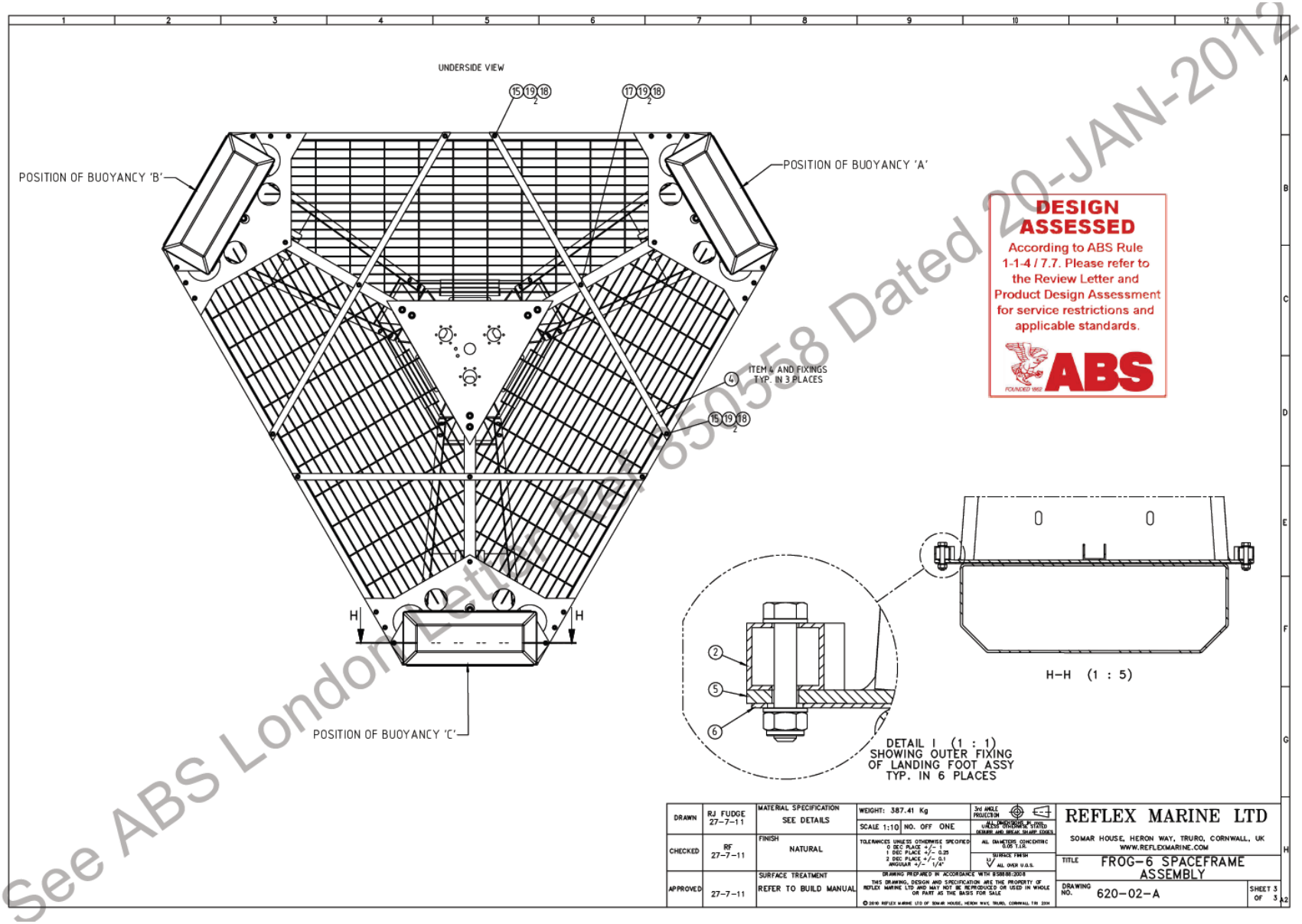
TITLE: FROG-6 SPACEFRAME ASSEMBLY

DRAWING NO. 620-02-A

SHEET 1 OF 3

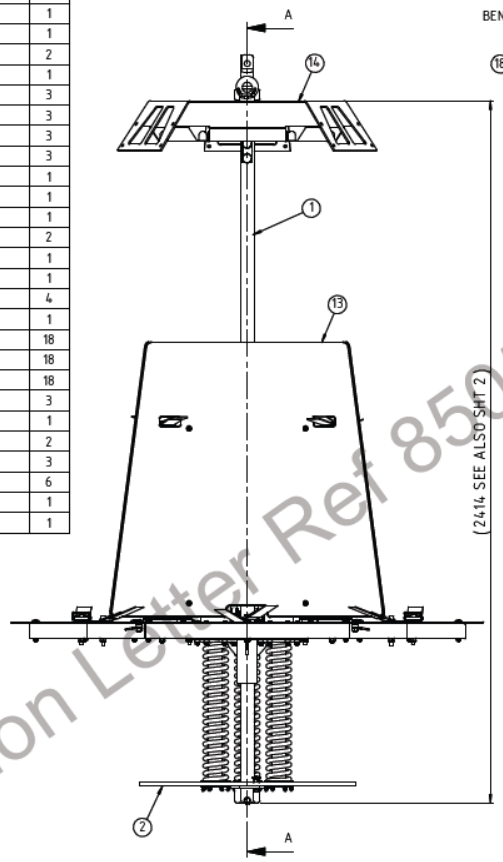
A2

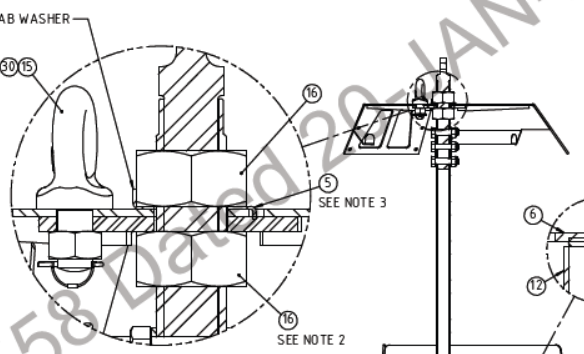


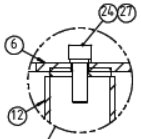


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	620-04-B	FROG-6 LOAD PATH ASSEMBLY	1
2	620-03-01-A	FROG-6 KEEL PLATE	1
3	620-03-02-A	FROG-6 ORIENTATION PLATE, KEEL NUT	1
4	620-03-03-A	FROG-6 HYDRAULIC DAMPER (-40 SPEC)	2
5	620-03-04-A	FROG-6 M48 TAB WASHER	1
6	620-03-05-A	FROG-6 ANTI-ROTATION WELDMENT	1
7	620-03-06-A	FROG-6 CLEVIS PIN, LOWER DAMPER MOUNT	2
8	620-03-07-A	FROG-6 DAMPER TOP MOUNTING BOLT	1
9	620-03-08-A	FROG-6 MOUNT, SPRING SUPPORT TUBE	3
10	620-03-09-A	FROG-6 SPRING	3
11	620-03-10-A	FROG-6 SPRING SPACER	3
12	620-03-11-A	FROG-6 SPRING SUPPORT TUBE	3
13	620-07-A	FROG-6 SEAT ASSEMBLY	1
14	620-08-A	FROG-6 CAP PLATE ASSY	1
15	320-03-04-B	FROG-3 BACK UP EYE BOLT	1
16	320-03-07-A	NUT, HEX M48 x 3.0 FINE THREAD	2
17	320-03-16-A	M10x50 BOLT WITH CROSS HOLE	1
18	100-000-TS-4	TAMPER PROOF SEAL	1
19	103-030-SP-2	SPLIT COTTER PIN Ø2.8x32 DIN 92 A2	4
20	103-050-SP-2	SPLIT COTTER PIN Ø2.8x51 DIN 92 A2	1
21	106-035-SK-A4	M6x35 SOC CSK SCREW BS4168 A4	18
22	106-000-NN-4	M6 NYLOC NUT BS4929 A4	18
23	106-000-WA-4	M6 FLAT WASHER FORM 'A' DIN125 A4	18
24	110-030-SC-4	M10x30 SOC CAP SCREW BS4168 A4	3
25	110-000-NN-4	M10 HEX NYLOC NUT BS4929 A4	1
26	110-000-WA-4	M10 FLAT WASHER FORM A BS4320 A4	2
27	110-000-WS-4	M10 SPRING WASHER A4 DIN 7980	3
28	114-000-WA-4	M14 FLAT WASHER FORM A BS4320 A4	6
29	114-000-NP-A	M14 NUT PLAIN BS3692 A4	1
30	124-000-NP-4	M24 HEX FULL NUT BS3692 A4	1

REVISIONS				
ECN No.	REV.	DESCRIPTION	DATE	APPD
	A	FIRST ISSUE. PREVIOUS PT No. H-6X-GA3-A	01-09-11	DB
	B	ITEM 1 RAISED IN ISSUE	21/10/2011	DB

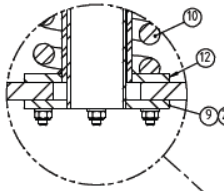






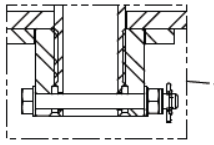
DETAIL K (1 : 2)
TYP 3 PLACES

DETAIL I (1 : 2)



DETAIL J (1 : 2)
TYP 3 PLACES

DETAIL M (1 : 5)
TYP 3 PLACES



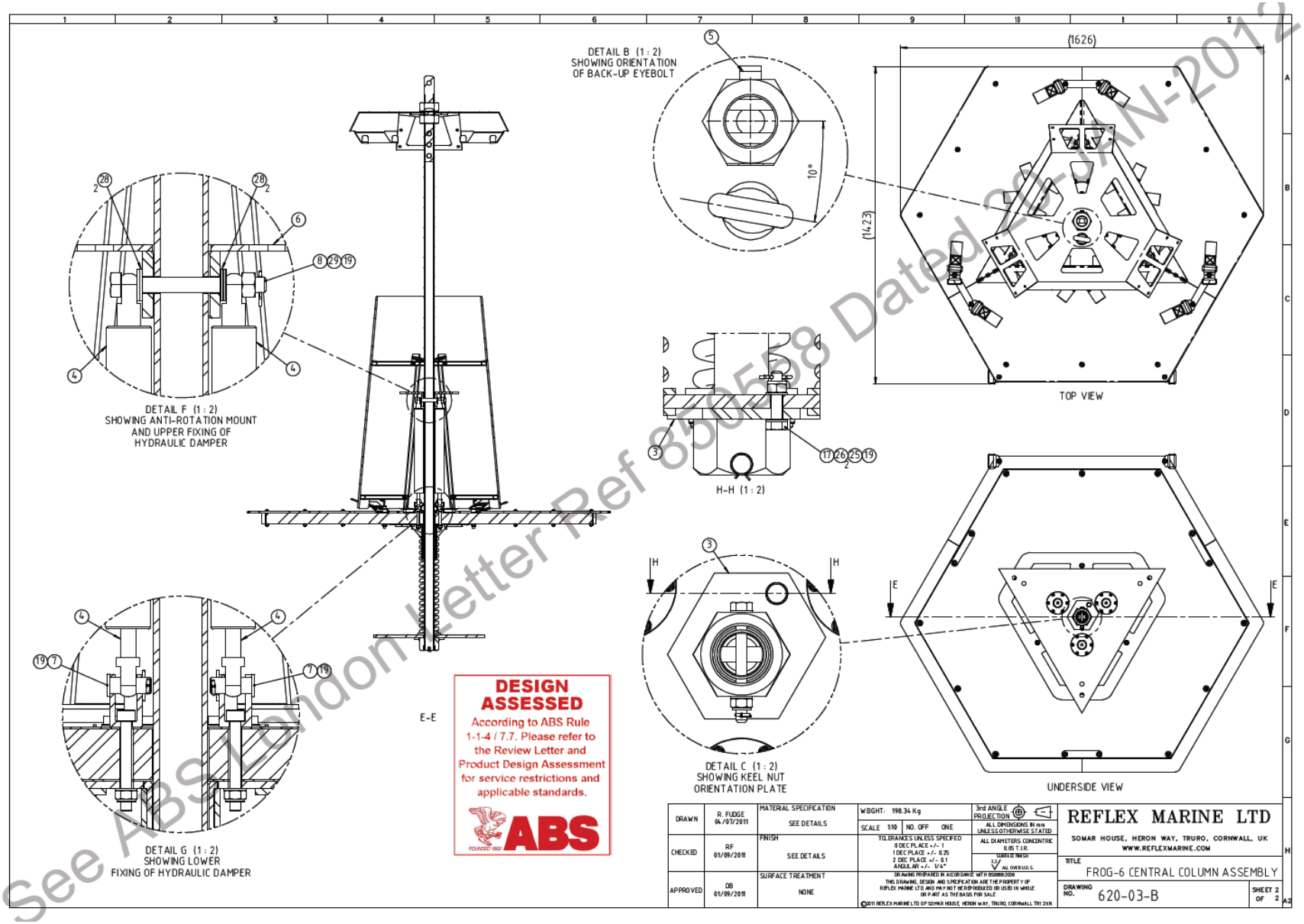
DETAIL L (1 : 2) REFER TO DRAWING
620-04 FOR KEEL NUT AND
CROSS BOLT ASSEMBLY

A-A

DESIGN ASSESSED
According to ABS Rule 1-1-4 / 7.7. Please refer to the Review Letter and Product Design Assessment for service restrictions and applicable standards.
ABS

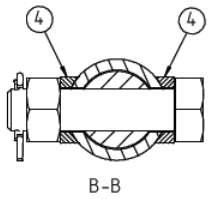
NOTE:
1. TAG WITH DRAWING NUMBER
2. ON ASSEMBLY USE LOCTITE 290 TO SECURE TO ITEM (16), LOWER NUT
3. AFTER ASSEMBLY OF ITEM (16), UPPER NUT, BEND TAB WASHER ITEM (5) TO PREVENT ROTATION.

DRAWN	R. FUDGE 04/07/2011	MATERIAL SPECIFICATION: SEE DETAILS	WEIGHT: 198.34 Kg	3rd ANGLE PROJECTION	REFLEX MARINE LTD
CHECKED	RF 01/09/2011	FINISH: SEE DETAILS	SCALE 1/8 NO. OFF ONE	ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED	SOMAR HOUSE, HERON WAY, TRURO, CORNWALL, UK WWW.REFLEXMARINE.COM
APPROVED	DB 01/09/2011	SURFACE TREATMENT: NONE	TOLERANCES UNLESS SPECIFIED 0 DEC PLACE +/- 1 1 DEC PLACE +/- 0.25 2 DEC PLACE +/- 0.1 ANGULAR +/- 1/4°	ALL DIAMETERS CONCENTRIC 0.05 T.I.R. SURFACE FINISH ALL OVER U.O.S.	TITLE: FROG-6 CENTRAL COLUMN ASSEMBLY
			DRAWING PREPARED IN ACCORDANCE WITH BS8888:2008		DRAWING NO. 620-03-B SHEET 1 OF 2 A2

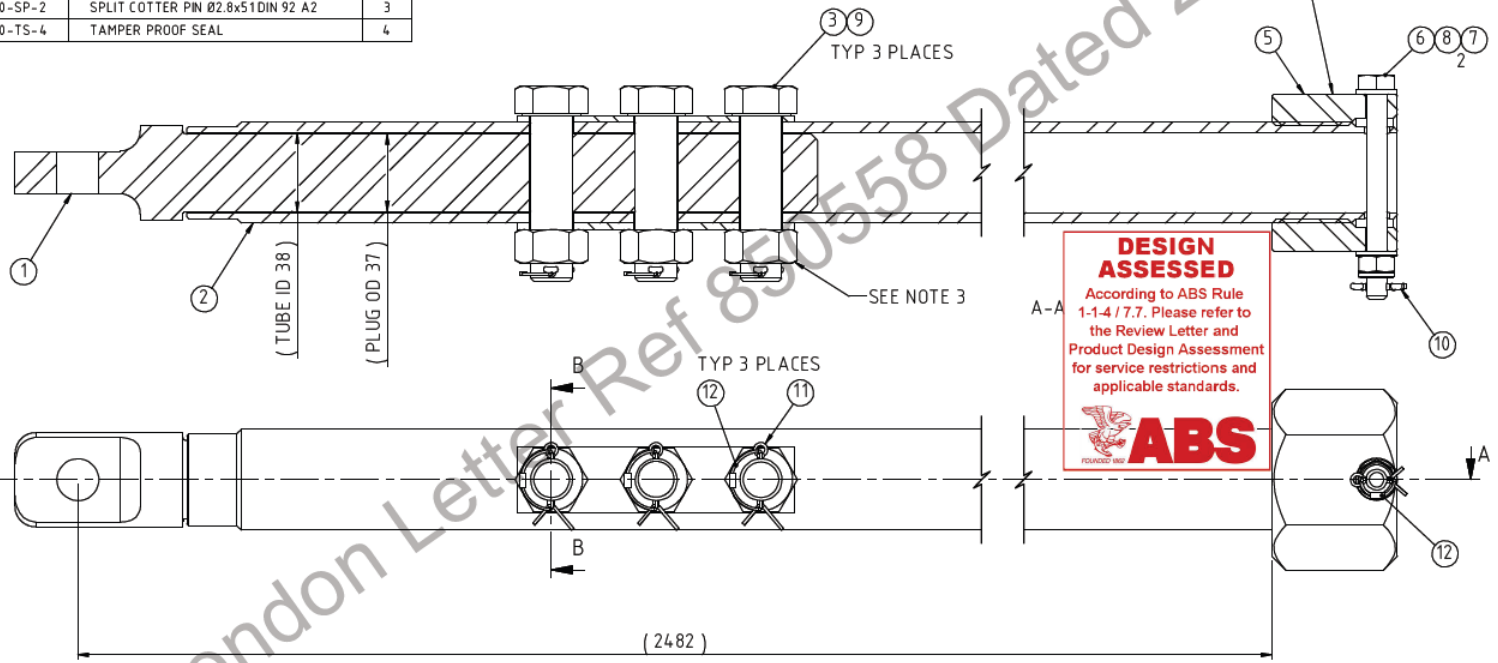


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	
1	620-04-01-B	FROG-6 LIFT EYE PLUG	1	B
2	620-04-02-B	FROG-6 CENTRAL COLUMN	1	B
3	620-04-03-B	FROG-6 LIFT PLUG CROSS BOLT	3	B
4	620-04-04-A	CROSS BOLT CURVED WASHER	2	
5	620-04-05-B	FROG-6 KEEL NUT	1	B
6	620-04-06-A	FROG-6 KEEL NUT CROSS BOLT	1	
7	110-000-NN-4	M10 HEX NYLOC NUT BS4929 A4	1	
8	110-000-WA-4	M10 FLAT WASHER FORM A BS4320 A4	2	
9	120-000-NP-4	M20 PLAIN NUT BS3692 A4	3	
10	103-030-SP-2	SPLIT COTTER PIN Ø2.8x32 DIN 92 A2	1	
11	103-050-SP-2	SPLIT COTTER PIN Ø2.8x51 DIN 92 A2	3	
12	100-000-TS-4	TAMPER PROOF SEAL	4	

REVISIONS				
ECNo.	REV	DESCRIPTION	DATE	APPD
	A	FIRST ISSUE. PREVIOUS PART No. H-6X-GA3-A	01-09-11	DB
	B	ITEMS 1, 2, 3 & 5 RASIED IN ISSUE	21/10/2011	DB



ON ASSEMBLY WITH MAIN FRAME
ADD ITEMS (5), (6), (7), (8), (10) & (12)
ASSEMBLY ITEM 5 WITH ANTI-SEIZE PASTE.
REFER TO BUILD MANUAL APPENDIX D4



DESIGN ASSESSED
According to ABS Rule 1-1-4 / 7.7. Please refer to the Review Letter and Product Design Assessment for service restrictions and applicable standards.
ABS

NOTE:
1. REMOVE ALL BURRS AND SHARP EDGES
2. TAG WITH DRAWING NUMBER
3. FOR CRITICAL BOLT TIGHTENING TORQUE VALUES REFER TO BUILD MANUAL

DRAWN		MATERIAL SPECIFICATION SEE DETAILS	WEIGHT: 19.5 Kg	3rd ANGLE PROJECTION
			SCALE 1:2 NO. OFF ONE	ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED
CHECKED	RF	FINISH SEE DETAILS	TOLERANCES UNLESS SPECIFIED 0 DEC PLACE +/- 1, 1 DEC PLACE +/- 0.25, 2 DEC PLACE +/- 0.1, ANGULAR +/- 1/4°	ALL DIAMETERS CONCENTRIC 0.05 T.I.R.
				SURFACE FINISH 3.2 ALL OVER U.O.S.
APPROVED	DB	SURFACE TREATMENT NONE	DRAWING PREPARED IN ACCORDANCE WITH BS8888-2008	

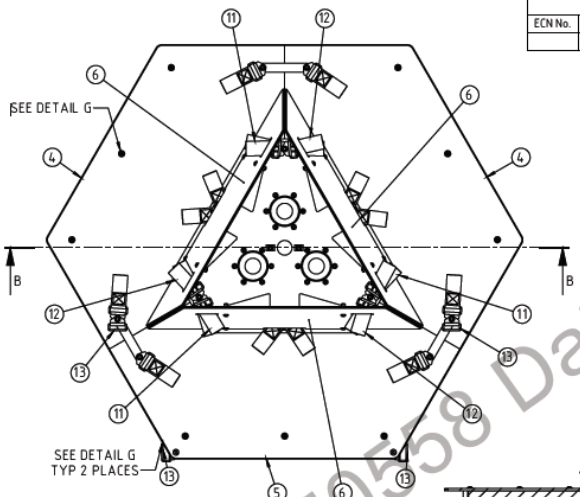
REFLEX MARINE LTD
SOMAR HOUSE, HERON WAY, TRURO, CORNWALL, UK
WWW.REFLEXMARINE.COM

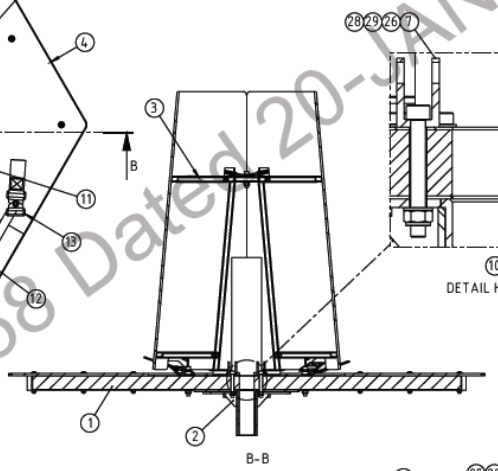
TITLE: FROG-6 LOAD PATH ASSEMBLY

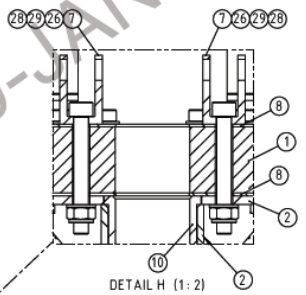
DRAWING NO. 620-04-B | SHEET 1 OF 1 | A3

ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	620-07-01-A	FROG-6 SEAT BASE PANEL	1
2	620-07-02-A	FROG-6 SEAT BASE SUPPORT WELDMENT	1
3	620-07-03-A	FROG-6 SEAT FRAME	1
4	620-07-04-A	FROG-6 SEAT BASE COVER	2
5	620-07-05-A	FROG-6 SEAT COVER WITH STRETCHER HOLES	1
6	620-07-06-A	FROG-6 SEAT BACK PANEL	3
7	620-07-07-A	FROG-6 HYDRAULIC DAMPER MOUNT	2
8	620-07-08-A	FROG-6 SEAT BASE SUPPORT PLATE (2mm)	2
9	620-07-09-A	FROG-6 SET HARNESS ANCHOR PLATE	6
10	620-07-10-A	FROG-6 SEAT SUPPORT NYLON INSERT	1
11	620-07-11-A	RED SEAT HARNESS	3
12	620-07-12-A	YELLOW SEAT HARNESS	3
13	620-07-13-A	FROG-6 STRETCHER MOUNTING 'D' RING	4
14	620-07-14-A	FROG-6 SEAT BASE EDGING	3
15	620-07-15-A	FROG-6 PERIPHERAL SPRING RETAINING SLEEVE	3
16	320-03-14-A	SPACER, SEAT HARNESS	5
17	108-025-WP-4	WASHER, PENNY, M8 x OD25	9
18	108-040-SB-4	M8x40 SOC BUTTON HD ISO7380 A4	12
19	108-070-SB-4	M8x70 SOC BUTTON HD ISO7380 A4	9
20	108-080-SC-4	M8x80 SOC CAP SCREW BS4168 A4	18
21	108-000-NN-A4	M8 HEX NYLOC NUT BS4929 A4	39
22	108-000-WA-4	M8 FLAT WASHER FORM A BS4320 A4	60
23	108-000-WC-4	M8 FLAT WASHER FORM C BS4320 A4	9
24	110-040-SB-4	M10x40 SOC BUT HD SCREW ISO7380 A4	2
25	110-045-SC-4	M10x45 SOC CAP SCREW BS4168 A4	3
26	110-080-SC-4	M10x80 SOC CAP SCREW BS4168 A4	2
27	110-090-SC-4	M10x90 SOC CAP SCREW BS4168 A4	12
28	110-000-NN-4	M10 HEX NYLOC NUT BS4929 A4	19
29	110-000-WA-4	M10 FLAT WASHER FORM A BS4320 A4	36

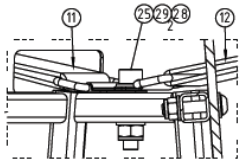
REVISIONS				
ECN No.	REV.	DESCRIPTION	DATE	APPD
	A	FIRST ISSUE. PREVIOUS PT No. H-6X-GA04-B	01-09-11	DB

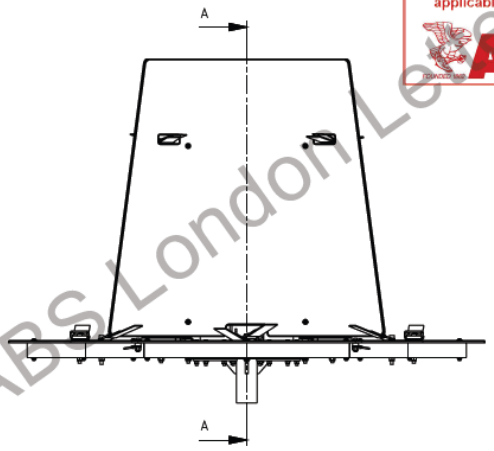


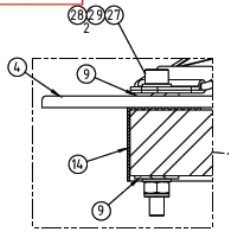


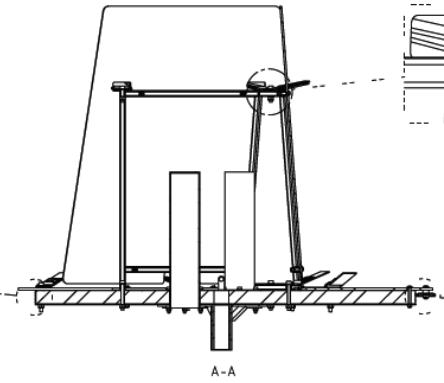


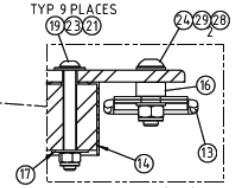
DESIGN ASSESSED
According to ABS Rule 1-1-4 / 7.7. Please refer to the Review Letter and Product Design Assessment for service restrictions and applicable standards.
ABS









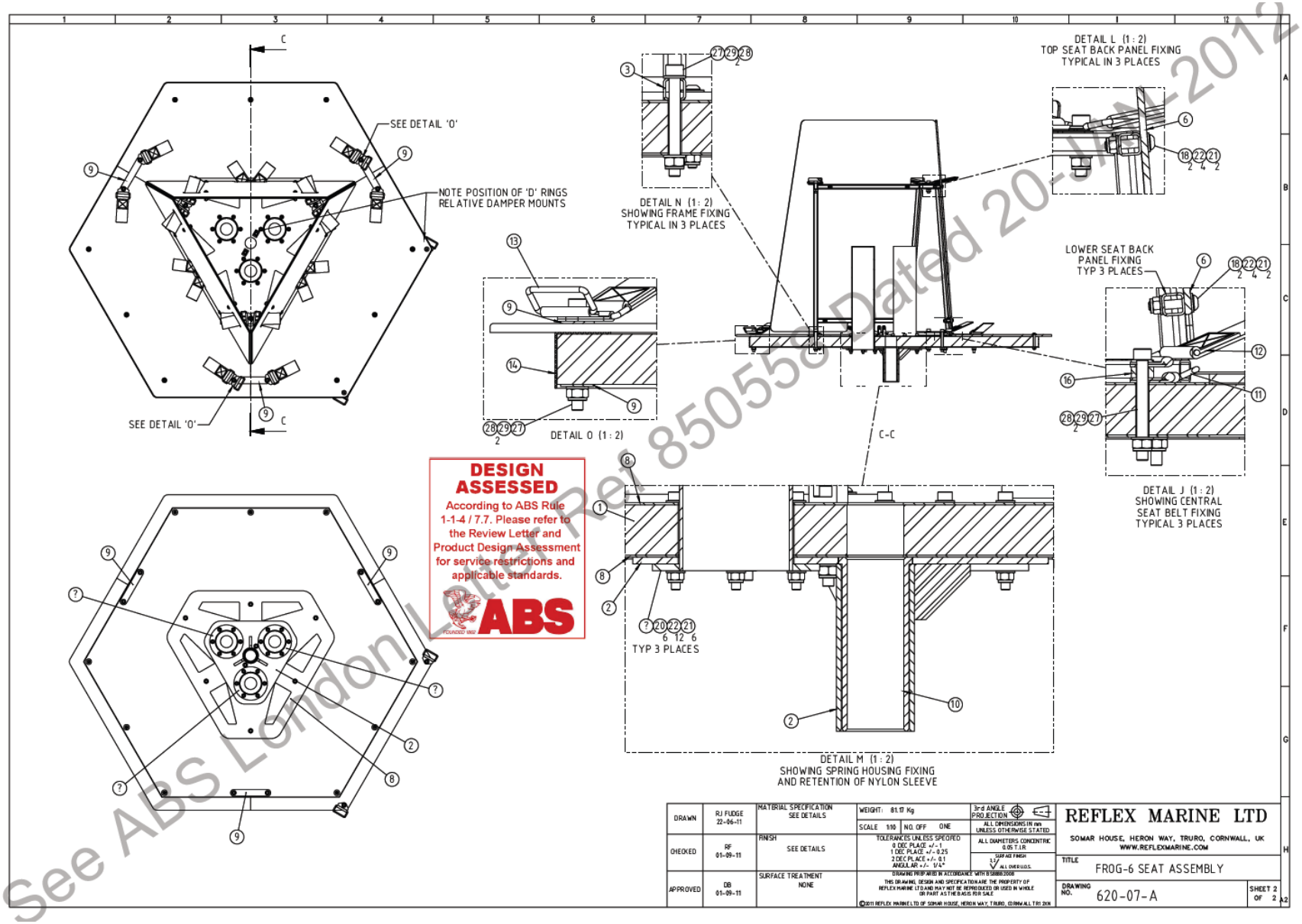


DRAWN	RJ FUDGE 22-06-11	MATERIAL SPECIFICATION SEE DETAILS	WEIGHT: 81.17 Kg	3rd ANGLE PROJECTION
			SCALE 1:10 NO. OFF ONE	ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED
CHECKED	RF 01-09-11	FINISH SEE DETAILS	TOLERANCES UNLESS SPECIFIED 0 DEC PLACE +/- 1 1 DEC PLACE +/- 0.25 2 DEC PLACE +/- 0.1 ANGULAR +/- 1/4°	ALL DIAMETERS CONCENTRIC 0.05 T.I.R
				SURFACE FINISH 3.2 ALL OVER U.O.S.
APPROVED	DB 01-09-11	SURFACE TREATMENT NONE	DRAWING PREPARED IN ACCORDANCE WITH BS8888:2008	

REFLEX MARINE LTD
SOMAR HOUSE, HERON WAY, TRURO, CORNWALL, UK
WWW.REFLEXMARINE.COM

TITLE: FROG-6 SEAT ASSEMBLY

DRAWING NO. 620-07-A | SHEET 1 OF 2 | A2

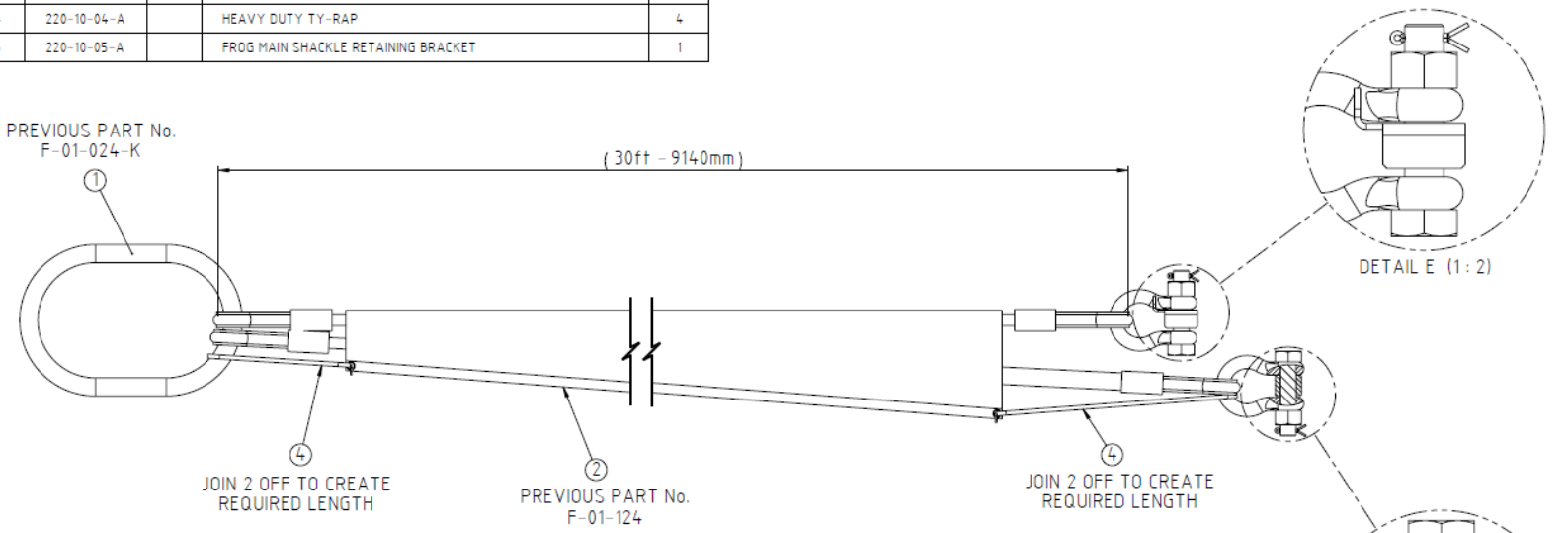


ITEM NO.	PART NUMBER	Revision	DESCRIPTION	Default/ QTY.
1	220-30-01	C	30FT WIRE ROPE LIFTING ASSY (-20 TO +50 DEG C)	1
2	220-30-02-A		30FT HIGH VISIBLITY SLING COVER - RED	1
3	220-10-03-A	A	SHACKLE BUSH Ø32 x Ø20 x 25W	1
4	220-10-04-A		HEAVY DUTY TY-RAP	4
5	220-10-05-A		FROG MAIN SHACKLE RETAINING BRACKET	1

B

REVISIONS

ECNo.	REV	DESCRIPTION	DATE	APPD
	A	FIRST ISSUE	13-01-11	DB
ECN 002	B	ITEM 1 RAISED IN ISSUE AND REVISION REMOVED FROM PART NO. DESCRIPTION CHANGED TO 'WIRE ROPE LIFTING ASSY'	15/02/2012	PO



NOTE

1. FOR ITEM 1 DETAILS REFER TO DRAWING 220-01-TAB-C B

DRAWN	R. FUDGE 13/01/2011	MATERIAL SPECIFICATION SEE DETAILS	WEIGHT: Kg	3rd ANGLE PROJECTION
			SCALE 1:5 NO. OFF	ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED DEBURR AND BREAK SHARP EDGES
CHECKED	RF 13/01/2011	FINISH	TOLERANCES UNLESS OTHERWISE SPECIFIED 0 DEC PLACE +/- 1 1 DEC PLACE +/- 0.25 2 DEC PLACE +/- 0.1 ANGULAR +/- 1/4°	ALL DIAMETERS CONCENTRIC 0.05 T.I.R.
				SURFACE FINISH ALL OVER U.O.S.
APPROVED	DB 13/01/2011	SURFACE TREATMENT	DRAWING PREPARED IN ACCORDANCE WITH BS8888-2008	

REFLEX MARINE LTD
SOMAR HOUSE, HERON WAY, TRURO, CORNWALL, UK
WWW.REFLEXMARINE.COM

TITLE: 30FT LIFTING ASSY (-20 TO +50 DEG C)

DRAWING NO. 220-30-B

SHEET 1 OF 1

A3

11 APPENDIX C – PARTS LIST AND MATERIAL SPECIFICATIONS

11.1 Parts

Due to the number of parts and revisions in the Frog-6 we have decided to omit the most current parts listing from this User Manual. Please refer to Appendix B to assist in identifying your requirements, however for the most up to date and accurate identification of parts please contact our operations department at support@reflexmarine.com.

11.2 Definition According to Criticality

Critical components are those in which, if failure were to occur, there would be a high risk to the safety of the passengers in the FROG-6. The critical components are all connected to the Main Support Tube, which is the prime structural component in the design.

11.3 Fastener Specifications

Because of corrosion considerations, all fasteners on the FROG-6 are supplied in stainless steel suitable for marine use. All nuts and bolts must be Grade A4 or A2. All nuts should be fitted with NYLOC inserts where applicable.

11.4 Certification

Certification Supplied is identified with the following letters:

MC - Material Certificate
CC - Certificate of Conformance
LTC - Load test Certificate
NDE - Non-Destructive Examination Report

Link to Index

12 APPENDIX D – FROG-6 MARKINGS

12.1 Essential Marking Requirements

The FROG-6 should be indelibly marked with the following information:

i. Description of Equipment.
ii. Model.
iii. Serial Number.
iv. Manufacturer's Address.
v. Year of Construction.
vi. Mass of Usual Configuration / Mass without Payload (Tare weight).
vii. Safe Working Load (SWL).
viii. Maximum Gross Mass (MGM).
ix. Maximum Number of Passengers.

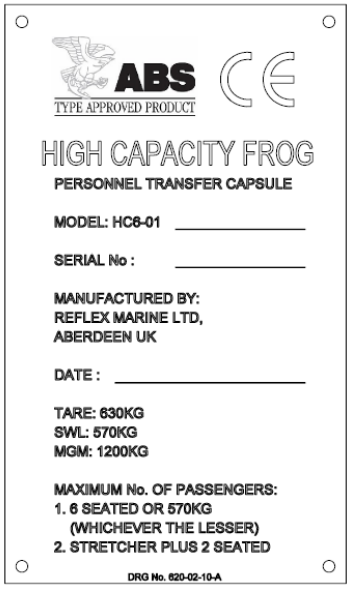
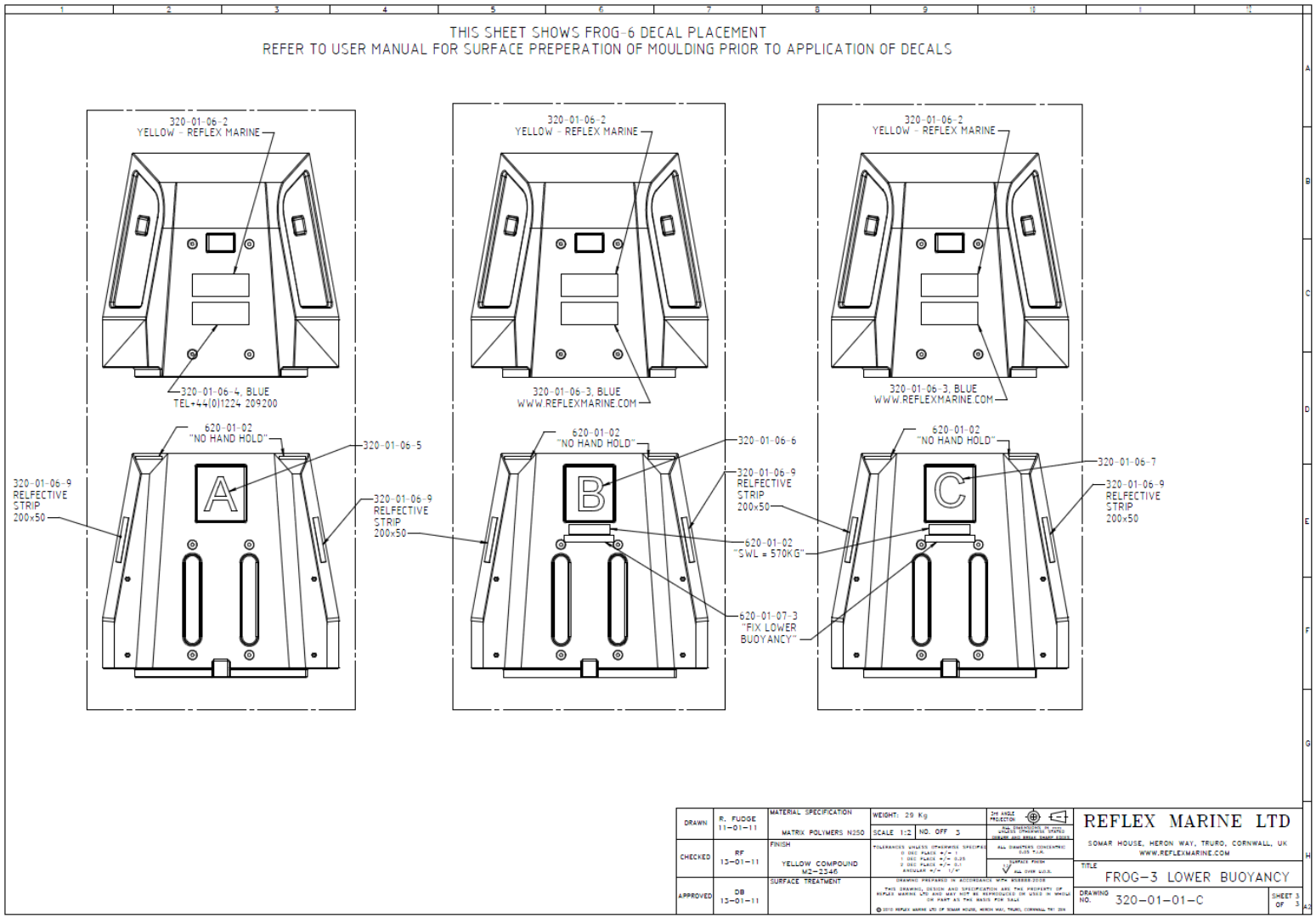


Fig 14: FROG-6 Marking Plate

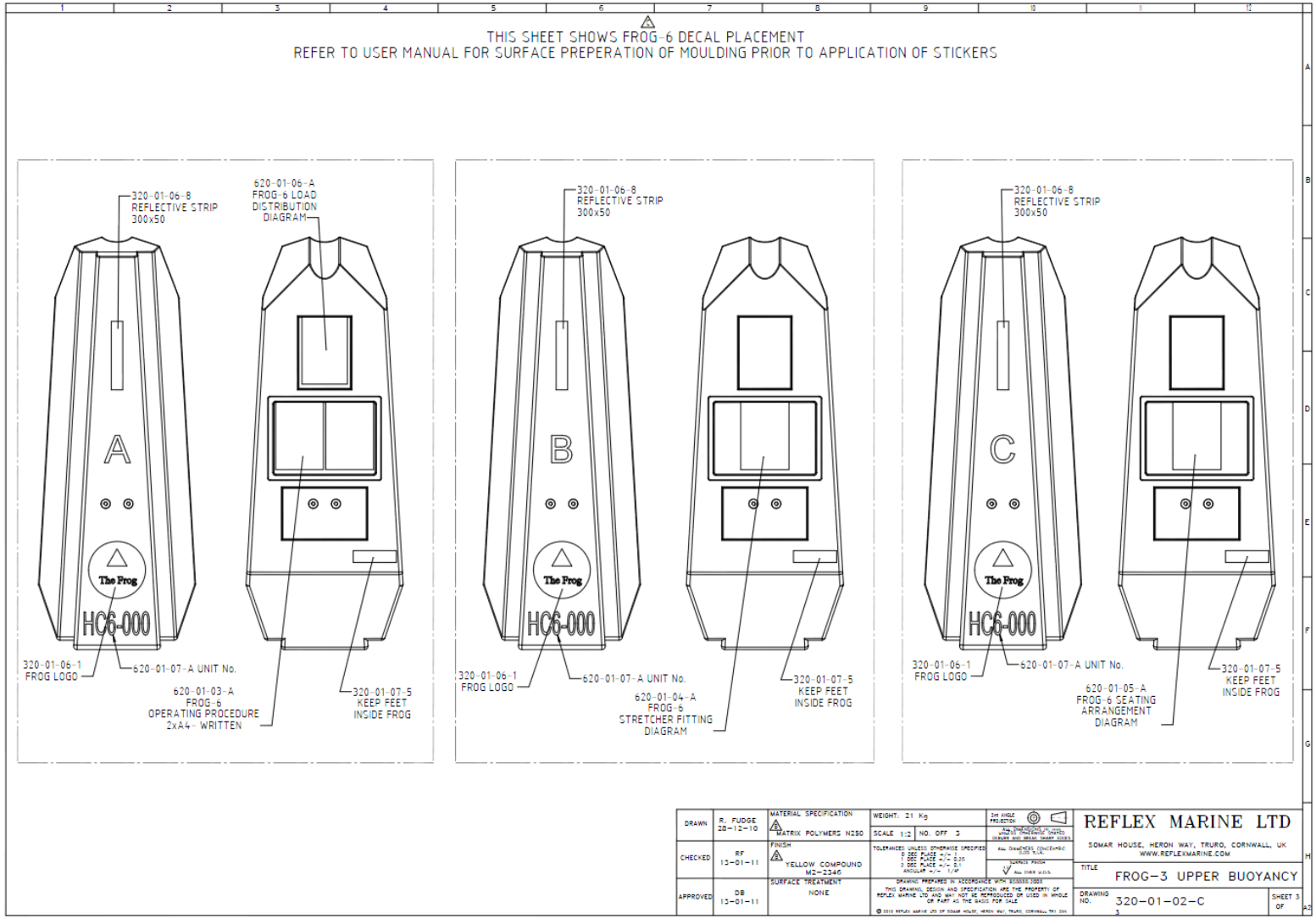
12.2 Decal - Vinyl Stickers Located on Lower Buoyancy Units

Note: MDPE Buoyancy requires preparation of surface for good contact adhesion. Gently heat the contact area until the surface is oxidised and appears shiny.



12.3 Decal - Vinyl Stickers Located on Upper Buoyancy Units

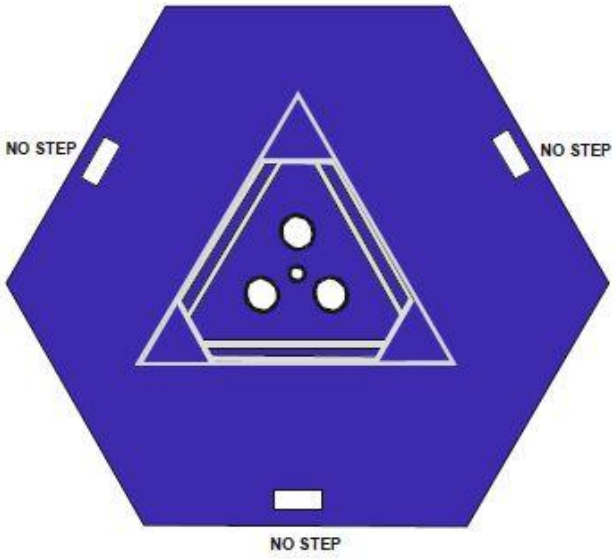
Note: MDPE Buoyancy requires preparation of surface for good contact adhesion. Gently heat the contact area until the surface is oxidised and appears shiny.



Link to Index

12.4 Decal - Operating Instructions - Located on Seat

i. 3 x sticker "No Step”
ii. 3 x sticker “Ensure Belts are properly adjusted.....Lift-off” to top of Seat Back Panels



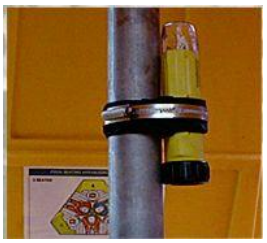
Link to Index

13 APPENDIX E – ACCESSORIES

Reflex Marine Ltd provides a range of flexible accessories to optimise the use of the FROG-6.

Skid Trolley

Specially designed trolley for easy of movement and storage of the FROG – 6 to areas that are undercover or otherwise outside the normal reach of the crane. The skid trolley features caster wheels and a parking brake.



Strobe Light

Provides greater visibility in poor weather conditions. High-intensity: light weight, waterproof to 300 m, Flash Rate 50 per min and also provides 6 mile visibility. C cell battery powered, fitted to central column of FROG-6.

Note: The strobe is not certified for use in hazardous areas.

Stretcher

Essential for conducting emergency medical transfers, Reflex Marine supply rigid stretcher that are compliant to use in FROG-6 emergency stretcher mode.

Protective Cover

The cover protects against degradation from UV light and the weather elements as well as worksite debris. It is adjustable for either standard or emergency configuration of the FROG-6. The silver reflective cover is made of flame resistant fabric (BS3408).

Multi-Lingual Operational Briefing DVD's

The FROG-6 is supplied with Multi-Lingual Operational Briefing DVD's in English, French, Spanish, Portuguese and Italian. Russian Operational Briefing DVD's are also available. Additional copies can be ordered through www.reflexmarine.com/support.

Link to Index

14 APPENDIX F – INDEPENDENT CERTIFICATION

14.1 EC Type examination certificate (unit numbers HC6-110 to 112 and HC6- 118 onwards)

LAIDLER CERTIFICATION

Tel +44 (0) 8700 111375 | Fax +44 (0) 8700 111395 | E-mail enquire@laidler.co.uk | Web www.laidler.co.uk

EC TYPE EXAMINATION CERTIFICATE

EC type-examination requested by:

Manufacturer: **Reflex Marine Ltd**

Address: **Somar House, Heron Way, Truro, TR1 2XN, UK**

Responsible Person: **Andrew Grimes**

Date of submission: **13th September 2011**

Machinery description:

Machine: **Frog 6 Personnel Transfer Capsule (PTC)**

Model: **HC6-01**

Type: **620 + 640**

Serial No. (Inspected item): **HC6-086**

Conclusions of examination
The machinery specified above has been examined and found to comply with the essential safety requirements specified in the EC Machinery Directives 2006/42/EC.

Special Conditions
Special conditions applicable to the issue of this certificate are given in Appendix 1:
None

Conditions of Issue.
This certificate refers to the information examined only. Any modifications made subsequent to the examination of the documentation unless they are submitted to Laidler Certification for approval will nullify this certificate.

Signed: _____ Date: 28th November 2011
Certification Manager/Operations Manager

CE

Notified Body No. 0870 Certificate No: **0602/CC1016**

LAIDLER CERTIFICATION LLP BELASIS BUSINESS CENTRE COXWOLD WAY BILLINGHAM CLEVELAND UK TS23 4EA
Directors: P Laidler, M Smailes, D Coulson. Company Registration no. OC 303165 Notified and Competent Body no. 0870

Ref : Doc.No. 4.3(a)/MD/PL Page 1 of 1 Rev : 01/11.02

Link to Index

14.2 ABS Product Type Approval (unit numbers HC6-110 to 112 and HC6-118 onwards)

Certificate Number: 12-LD850558-PDA-DUP

Confirmation of Product Type Approval 03/MAY/2012

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product.

This is to certify that, pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 12/FEB/2014. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until 19/JAN/2017 subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

WOOLLARD AND HENRY LTD

Model Name(s): 620 (Standard Frog-6) and 640 (Arctic Frog-6)

Presented to:
WOOLLARD AND HENRY LTD
STONEYWOOD PARK
DYCE
ABERDEEN
United Kingdom

Intended Service:	Offshore - Transfer of personnel between installations and vessels
Description:	Personnel transfer device consisting of a stainless steel outer framework which houses the polyethylene buoyancy panels, and, a spring dampened seating assembly mounted on a central column.
Ratings:	SWL = 600 kg (6 persons) with a min. Design Temperature of -20 deg. C. (Model 620) or -40 deg. C. (Model 640)
Service Restrictions:	Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.
Comments:	Not Applicable
Notes / Documentation:	
Term of Validity:	This Product Design Assessment (PDA) Certificate 12-LD850558-PDA-DUP, dated 20/Feb/2012 remains valid until 19/Jan/2017 or until the Rules or specifications used in the assessment are revised (whichever occurs first). This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product. Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA. Use of the Product for non ABS classed vessels, MODUs or facilities is to be

05/03/2012 6:50:07 AM Page 1 of 2

Certificate Number: 12-LD850558-PDA-DUP

to an agreement between the manufacturer and intended client.

ABS Rules: ABS Rules 1-1-Appendix 3, ABS Guide for the Certification of Lifting Appliances, July 2007 (revised 2011)

National Standards:
International Standards: IMO SOLAS Life-Saving Appliances, 2003

Government Authority:
EUMED:
Others:

Model Certificate	Model Certificate No	Issue Date	Expiry Date
PDA-DUP	12-LD850558-PDA-DUP	20/FEB/2012	19/JAN/2017

Robert J. Viereck

ABS Programs

ABS has used due diligence in the preparation of this certificate and it represents the information on the product in the ABS Records as of the date and time the certificate was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.

05/03/2012 6:50:07 AM Page 2 of 2