

SWIFT SURVIVOR RECOVERY SYSTEM

Maintenance Manual

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Version 2.0

ZELIM

MANAGEMENT CONTROL

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PERMANENT REVISION LIST

Revisions or amendments embodied in this manual, that are certified by an approved organisation, other than that applicable to this initial certification must be recorded on separate record sheets.

LIST OF SERVICE BULLETINS

On receipt of a Service Bulletin (SB) that is associated with this manual, maintenance personnel may hand amend this list to record the receipt of the SB. Once the contents of the SB are incorporated into the manual it will be permanently added to this list.

LIST OF SERVICE NEWSLETTERS

On receipt of a Service Newsletter (SN) that is associated with this manual, maintenance personnel may hand amend this list to record the receipt of the SN. Once the contents of the SN are incorporated into the manual it will be permanently added to this list.

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**THIS DOCUMENT SHOULD BE READ IN CONJUNCTION WITH
THE SWIFT OPERATIONS AND TRAINING MANUAL**

Do we need this bottom message?

1 INTRODUCTION

This chapter defines the purpose and structure of the SWIFT Maintenance Manual.

1.1 General

- A This manual contains instructions for the SWIFT product and is intended for individuals responsible for performing regular maintenance on this type of equipment.
- B Details of disassembly, cleaning, testing, repair, assembly, storage, disposal, and spare parts are included in this manual.
- C Maintenance procedures shall only be carried out by Zelim and/or an endorsed maintenance organisation.
- D A record of all maintenance activities shall be maintained by the maintenance personnel and retained for the specified period by Zelim and/or the endorsed maintenance organisation.
- E Zelim is the Design Authority for the SWIFT. The Company has developed this equipment and its associated regulatory procedures to ensure reliable operation under all climates, weather conditions, and circumstances. While comments intended to improve the efficiency of maintenance procedures are always welcome, no changes to these procedures may be made without Zelim's prior approval. Unauthorised modifications may cause the equipment to malfunction and may also void the equipment's approval.
- F This manual is the copyright of Zelim Limited. It is supplied in confidence and must not be used for any purpose other than that for which it is provided. It must not be reproduced, in whole or in part, without the prior permission of Zelim Limited.

1.2 Structure of the manual

A Chapters and page numbers

- 1 Chapters are assigned to each main topic within this manual.
- 2 Auxiliary sections, such as the Appendix, are also included.

B Record of revisions

- 1 All issues of the manual are recorded in the permanent revision list.
- 2 Any changes from the previous issue will be shown in **red text**. The start and end of a change will be marked by red pointers > <. Text deleted from the previous issue will also be indicated by start and end red pointers.
- 3 All amendments are summarised in Section 1.7 – List of Changes.

1.3 Warnings, cautions and notes

WARNING A warning calls attention to a procedure which if incorrectly performed is liable to cause injury or death to personnel.

CAUTION A caution calls attention to a procedure which if incorrectly performed is liable to cause damage to the equipment or its components.

NOTE A note calls attention to methods.

1.4 Health and safety

- A** Personnel responsible for the maintenance of the SWIFT are required to ensure that adequate safety precautions are observed during all maintenance and related activities.
- B** Zelim shall not, by virtue of these instructions, be deemed to have assumed any responsibilities of the Service Agent or Operator under the Health and Safety at Work etc. Act 1974 or any related legislation.
- C** Materials used during the maintenance of this product may be hazardous. Food, beverages, cups, and other eating or drinking utensils must not be stored in areas where such materials are handled or stored. Hands must be washed thoroughly with soap and water immediately after maintenance work and before eating or drinking.

1.5 List of associated documents

- A** The following manuals are associated with the maintenance of SWIFT and any ancillary equipment:

Installation Guide

Document number PN/SWI/010-00

Operations and Training Manual

Document number PN/SWI/002-00

Operators Maintenance Manual

Document number PN/SWI/003-00

Maintenance Manual

Document number PN/SWI/011-00

As these are all SWIFT
manuals, why is
the numbering not
consistent?

E.g. 001-00, 002-00,
003-00, 004-00

1.6 Acronyms and abbreviations

AC. / ABRV.	MEANING	AC. / ABRV.	MEANING
A/R	As required	LM	Locally manufactured
Approx	Approximately	LP	Locally purchased
cm	Centimetre	mm	Millimetre
EP	Extreme pressure	MOB	Man overboard
Fig	Figure	m/s	Metres per second
IAW	In accordance with	No	Number
In situ	In situation	Qty	Quantity
Intro	Introduction	Rev	Revision
IP	Ingress Protection rating	SB	Service bulletin
kg	Kilogram	SN	Service newsletter

1.7 List of changes

2 DESCRIPTION AND OPERATION

This chapter defines the purpose, configuration, and operating principles of the SWIFT Survivor Recovery System.

2.1 Description

- A The SWIFT Survivor Recovery System is a powered, vessel-mounted recovery device designed to recover personnel from the water in a safe and controlled manner.
- B The system comprises a lightweight, corrosion-resistant chassis supporting a conveyor-style belt assembly, flotation moulds, and a drive system consisting of a motor, gearbox, and tensioning shaft.
- C The conveyor belt assembly forms the primary recovery surface. It is constructed from modular polymer sections that provide a non-slip, buoyant surface suitable for marine environments.
- D The drive motor and gearbox deliver controlled motion to the belt via the drive and tension shafts. The conveyor can operate in both forward and reverse directions to support recovery and system testing.
- E The drive and tension shafts are supported by sealed bearing assemblies mounted to the chassis, ensuring smooth belt operation and alignment under load.
- F Flotation foam moulds are positioned along both sides of the chassis to maintain buoyancy, stability, and impact protection when deployed in water.
- G A winch and rope assembly is integrated to allow controlled deployment and retrieval of the SWIFT from the vessel's hinge-mounting system.
- H A tape switch is mounted along the recovery surface to provide a safety interlock. Activation of the tape switch immediately isolates motor power to stop the conveyor and prevent injury or damage.
- I An electrical control box provides power management and operator control of belt direction and speed. The control box also features an emergency-stop button for immediate system isolation.
- J The SWIFT is designed for minimal maintenance, with all components accessible for inspection, cleaning, and lubrication.
- K Typical system configurations and components are illustrated in Figures 1 to 4. A summary of the principal assemblies and their functions is provided in Table 1, System components.



▲ Fig 1 SWIFT front view



▲ Fig 2 SWIFT side view (motor side)



▲ Fig 3 SWIFT side view (non-motor side)



▲ Fig 4 SWIFT rear view

V Table 1 System components

COMPONENT	FUNCTION
Chassis	Structural frame supporting all assemblies
Drive shaft	Transmits drive from the motor and gearbox to the conveyor belt
Tension shaft	Maintains correct conveyor belt tension during operation
Bearing assemblies	Support and align drive and tension shafts
Motor and gearbox	Provide controlled drive to the conveyor belt
Conveyor belt	Primary recovery surface for lifting personnel
3-push-button control box	Controls forward, reverse and stop
Control box	Controls power, speed, and direction of operation
Emergency stop button	Stops conveyor belt when activated for safety
Tape switch	Stops conveyor belt when activated for safety
Foam moulds	Provide buoyancy, stability, and impact protection
Winch and rope	Allow controlled deployment and retrieval
Hinge mounting assembly	Attaches SWIFT to vessel and enables pivoting

2.2 Operation

- A The SWIFT is deployed over the vessel's side using the hinge and winch assembly. Once deployed, the flotation moulds maintain the system's operational position and stability in the water.
- B When deployed, the SWIFT operates at angles of up to $\leq 40^\circ$ relative to the vessel deck.
- C When activated, the conveyor belt moves in the forward direction, drawing the survivor onto the recovery surface and lifting them smoothly towards the vessel.
- D Belt speed and direction are controlled through the electrical control box
- E Recovered personnel are conveyed onto the deck or recovery platform with minimal manual handling required.
- F The conveyor can be reversed for testing, cleaning, or clearing obstructions after recovery operations.
- G An emergency-stop control is fitted to isolate electrical power and halt co if required.
- H Following use, the SWIFT should be rinsed with fresh water, inspected for damage or debris, and stowed in accordance with the SWIFT Survivor Recovery System Operators Maintenance Manual (PN/SWI/003-00).
- I All post-operation findings and maintenance observations shall be recorded in the Post-Use / Monthly Maintenance Checklist, in accordance with the SWIFT Survivor Recovery System Operators Maintenance Manual (PN/SWI/003-00).

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3 LEADING PARTICULARS

This chapter provides the principal specifications and key identifying information for the SWIFT. It details the main dimensions, weights, performance characteristics, and other data required for reference during maintenance and operation.

3.1 SWIFT recovery system

Dimensions

Length	1986 mm
Width	1739 mm
Height	420 mm

Weight

SWIFT	≈ 175 kg
SWIFT packed in shipping crate	≈ 227 kg

Inputs

Power supply	230 V, 50 Hz, AC, 0.75 kW
IP rating	IP68 ¹

Other

Working load limit	275 kg
Conveyor belt speed	0.4 m/s
Recovery angle	≤ 40°

¹ Tested at 3 m depth for 30 minutes under IEC 60529 IP68 conditions.

3.2 Manual winch

A SWK-LB-250-4-20M

Hand operated stainless steel winch with automatic ratchet stop in both directions.

Dimensions

Length	XXX mm
Width	XXX mm
Height	XXX mm

Weight	≈25 kg
--------	--------

Other

Rope supplied	6 m of 5 mm Dyneema®
Working load limit	250 kg

B SWK-LB-650-6-20M

Hand operated stainless steel winch with automatic ratchet stop in both directions.

Dimensions

Length	XXX mm
Width	XXX mm
Height	XXX mm

Weight	≈25 kg
--------	--------

Other

Rope supplied	19 m of 6 mm Dyneema®
Working load limit	650 kg

4 SCHEDULED MAINTENANCE

This chapter defines the scheduled maintenance requirements for the SWIFT, including planning responsibilities, maintenance intervals, and certification following inspection. All maintenance must be performed in accordance with the instructions contained in this manual.

- A** Annual and 30-month maintenance planning is the responsibility of the client. The client must pre-book maintenance directly with Zelim. Any use of the equipment with outstanding maintenance is at the client's risk and will invalidate the product warranty.
- B** This activity is the responsibility of Zelim and/or an endorsed maintenance organisation and may require the SWIFT to be removed.
- C** Once satisfied that the SWIFT is safe and operational, Zelim will issue a Commissioning Fit-for-Use Certificate.

4.1 Maintenance matrix

The SWIFT is to be maintained in accordance with the outline scheduled maintenance matrix (Table 2)

▼ **Table 2** Maintenance matrix

MAINTENANCE ACTIVITY	CONDUCTED BY	IN SITU OR REMOVED	PAPERWORK
Annual maintenance	Zelim/ endorsed maintenance organisation	In situ or removed	Annual maintenance report completed, and certificate issued by Zelim
30-month depth maintenance	Zelim/ endorsed maintenance organisation	Removed	30-month depth maintenance report completed, and certificate issued by Zelim

5 DISASSEMBLY

This chapter provides the procedures for disassembling the SWIFT and its components for inspection, maintenance, or repair. All disassembly operations must be carried out in accordance with these instructions to prevent damage and ensure safe reassembly.

5.1 Equipment

We advise that the disassembly of the SWIFT be carried out using the equipment specified in Table 3.

▼ **Table 3** Disassembly equipment

NOMENCLATURE	PART NUMBER
Mechanical lifting winch	Locally manufactured / locally purchased
Flat work bench	Locally manufactured / locally purchased

5.2 Removal of SWIFT from vessel

- 1 Remove the SWIFT from the vessel in accordance with the SWIFT Survivor Recovery System Installation Guide (PN/SWI/010-00).

5.3 Removal of SWIFT from shipping crate

- 1 Attach the mechanical lifting equipment to 2 × lifting eyes.
- 2 Lift out from its shipping crate.
- 3 Place on a clean, flat, cushioned surface.

5.4 Pre-disassembly

- 1 Refer to the 30-month depth maintenance checklist (Appendix B).
- 2 Photograph and log the condition of the SWIFT using the Pre-Disassembly Inspection Form (Appendix C).
- 3 Conduct a functional test of the SWIFT to confirm its condition, in accordance with Chapter 8.1 – Functional testing.
- 4 Clean the SWIFT thoroughly prior to maintenance, in accordance with Chapter 6 – Cleaning.

5.5 Disassembly

5.5.1 Hinge mounting bracket

A Hinge bracket removal

- 1 If the hinge mounting bracket (Fig 5) is found attached to the SWIFT, remove it by loosening the 4 × M16 stainless steel bolts (Fig 6) connecting the hinge bearings (Fig 7) between the brackets and stub axles on the chassis.



▲ Fig 5 Hinge mounting bracket



▲ Fig 6 M16 bolts



▲ Fig 7 Hinge bearing

5.5.2 Floatation foam moulds

A Floatation foam moulds removal

- 1 Using mechanical lifting equipment, attach suitable slings to the detachable lifting eyes.

NOTE To prevent damage to the foam moulds from the chains/slings, use sacrificial pieces of foam.

- 2 Raise the SWIFT, resting on the motor and gearbox end (Fig 7).



▲ Fig 7 SWIFT raised, resting on motor and gearbox end

- 3 Remove bolts, washers and clamp plates from both sides (Fig 8).



▲ Fig 8 Clamp plates

- 4 Remove the 2 × foam moulds No. 1 from each side of the chassis (Fig 9).



We've taken a photo pre removal - do we want to add it do we can show both figures?

▲ Fig 9 Foam moulds No. 1 removed

- 5 Lower the SWIFT onto a flat surface and remove the chains/slings.
- 6 Remove foam mould No. 4 or No. 5 from the end of the chassis (Fig 10).



▲ Fig 10 Foam mould No. 4 at the end of the chassis

- 7 Remove the 2 x tie bars and 12 x black and yellow foam moulds (8) (Fig 11).



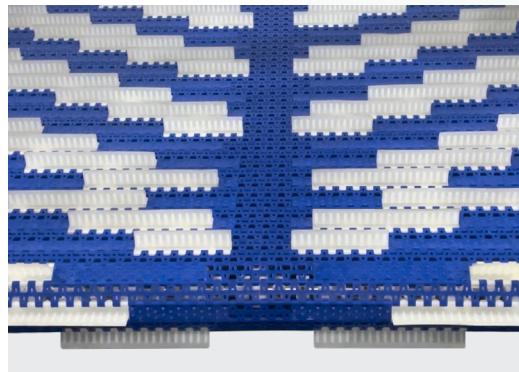
▲ **Fig 11** Black and yellow foam moulds

- 8 Remove the other foam mould 4 or 5 and 2 tie bars.
- 9 Attach chains/slings to the two lifting eyes on the motor end and raise the SWIFT using mechanical lifting equipment.
- 10 Remove foam mould (3).
- 11 Carefully remove foam mould (2) from around the drive motor and gearbox and 2 x tie bars.
- 12 The tie bars and 12 x pieces of undercarriage black foam mould (6) will detach and remain on the flat surface.
- 13 Separate the tie bars from the undercarriage black foam moulds.
- 14 Lower the chassis onto the flat surface.

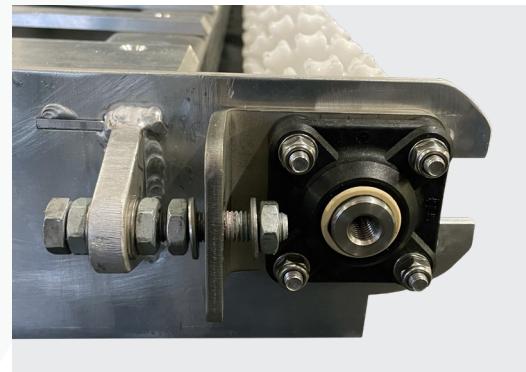
5.5.3 Conveyor belt

A Conveyor belt removal

- 1 Loosen the 4 × galvanised M12 half nuts from both sides of the chassis (Figs 12 and 13).



▲ Fig 12 Conveyor belt



▲ Fig 13 Galvanised half nut

- 2 Loosen the 4 × M8 Nyloc nuts securing the tension shaft bearing on both sides of the chassis (Fig 14).



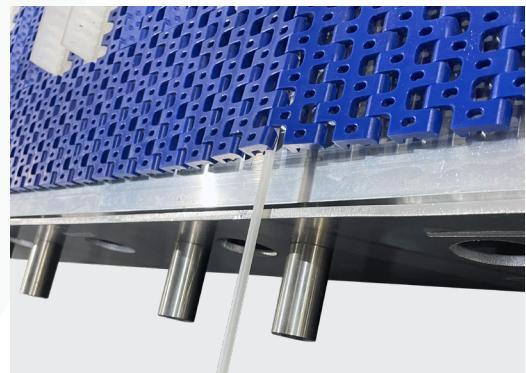
▲ Fig 14 Nyloc nuts

- 3 To split the conveyor belt, lift the edge and identify a single white 5 mm diameter plastic rod connecting the modular system. Remove the white plastic rod by gripping with long nose pliers, (Fig 15) and pull out as per (Fig 16).

NOTE To make life easier for yourself, pull our the plastic rod from as close to the motor as you can.



▲ Fig 15 Identify single white plastic rod



▲ Fig 16 White plastic rod removal

- 4 Remove the conveyor belt by using a ratchet spanner with a 24 mm socket on the drive nut at the end opposite the motor (Fig 17) and manually turning anticlockwise. Roll up the conveyor as you go along until it becomes free.

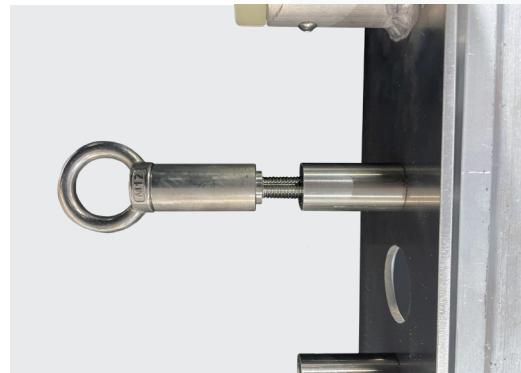


▲ Fig 17 Ratchet spanner with 24 mm socket

5.5.4 Detachable lifting eyes

A Detachable lifting eyes removal

- 1 To remove the 2 × detachable lifting eyes (Fig 18) from the chassis, unscrew counter-clockwise.



▲ **Fig 18** Detachable lifting eyes

6 CLEANING

This chapter details the procedures and equipment required to clean the SWIFT and its components. All cleaning must be performed using the specified materials and methods to prevent damage and ensure continued operational reliability.

6.1 Equipment

We advise the disassembly of the SWIFT should be cleaned using the equipment specified in Table 4.

▼ **Table 4** Cleaning equipment

NOMENCLATURE	PART NUMBER
Mild detergent suitable for marine environment	Locally purchased
Lint free cloth	Locally purchased
Sponge	Locally purchased
Soft brush	Locally purchased

6.2 Maintenance and storage

The following cleaning process is to be used for cleaning the SWIFT and its components when removed from a vessel for maintenance or storage.

- 1 Rinse with clean water.
- 2 Using a mixture of clean water and mild detergent, brush down the whole assembly to remove any debris and contamination.
- 3 Rinse off with clean water and allow to dry naturally.

CAUTION Pressure washers must not be used when cleaning the SWIFT.
Damage may be caused to the foam parts, motor and the electrical system.

CAUTION Bleach must not be used when cleaning SWIFT. Damage may be caused to the foam parts and the conveyor belt.

6.3 30-month depth maintenance cleaning

The following cleaning process is to be used for cleaning the SWIFT and its components during 30-month depth maintenance.

6.3.1 Hinge mounting bracket

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.2 Floatation foam moulds

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.3 Conveyor belt

- 1 Hand wash using a sponge / soft brush and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.4 Tension shaft assembly

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.5 Motor and gearbox

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.6 Drive shaft assembly

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.7 Bearing mounting brackets and drive shaft bearings

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.8 Stub pivot axles

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.9 Tape switch

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.10 Chassis

- 1 Hand wash using a sponge / soft brush and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.11 Nylon fairlead

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.12 Winch (if returned)

- 1 Hand wash using a sponge and water mixed with a mild detergent.
- 2 Rinse off with clean water and allow to dry naturally.

6.3.13 Electrical box, 3-push-button control box and emergency stop button

- 1 Clean outer casing and electrical cables using a damp lint free cloth.
- 2 Allow to dry naturally.

7 INSPECTION

This chapter describes the inspection requirements for the SWIFT, including both annual and 30-month depth maintenance intervals. All inspections must be carried out by Zelim or an endorsed maintenance organisation in accordance with this manual.

7.1 Annual maintenance (12 months)

7.1.1 Overview

- A The SWIFT is to be inspected at the intervals described in described in this chapter.
- B Annual maintenance of the SWIFT is the responsibility of Zelim and/or an endorsed maintenance organisation and may be conducted in situ. The SWIFT may be removed from the vessel if required.
- C Any components found to be unserviceable must be repaired or replaced in accordance with Chapter 9 – Repair and Replacement, or cleaned in accordance with Chapter 6 – Cleaning.
- D When conducting annual maintenance, follow Section 7.1.2 – Annual maintenance process, noting any observations in Appendix A – Annual Maintenance Checklist.
- E As part of the annual maintenance, it is the responsibility of Zelim and/or an endorsed maintenance organisation to review the customer's monthly maintenance records.
- F Any discrepancies between the records and the state of the product which may affect the products warranty are to be reported to Zelim immediately.
- G Once satisfied that the SWIFT is safe and operational, Zelim and/or the endorsed maintenance organisation will issue a SWIFT Recovery System Annual Maintenance Certificate, valid for 12 months.

7.1.2 Annual maintenance process

- 1 Conduct a visual inspection of the SWIFT and accessories, noting any corrosion build-up, debris accumulation, or encrustation by marine growth.
- 2 Remove and examine the mounting feet hinge pins (if fitted) and lubricate with Lithium EP2 grease.
- 3 Using a grease gun with Lithium EP2 grease, lubricate the mounting bracket bearings via the grease nipples.
- 4 Operate the motor and gearbox in both forward and reverse directions for approximately **5 minutes each way**, noting uniform speed, smoothness, and any signs of abnormal noise, vibration, or heat build-up.

- 5 Inspect the motor and gearbox for lubrication leaks or signs of oil contamination.
- 5 Check that the sprockets on the drive and tension shafts are correctly aligned with the conveyor belt.
- 6 With the conveyor belt running, confirm smooth operation and ensure there are no squeaks, rubbing, or signs of heat build-up at the shaft bearings.
- 7 Visually verify conveyor belt tracking and tension while running. Ensure the belt runs centrally on the sprockets without deflection, flutter, or vibration. Adjust belt tension only if visible slackness or misalignment is observed.
- 8 Conduct an operational speed check on the conveyor in both forward and reverse directions by marking a point on the belt and recording the time for a complete rotation to confirm consistent drive speed. (Why do we need to do this? What's the importance of this? What are we checking for? Speedometer?)
- 9 Check the torque of all accessible structural and mechanical fasteners against the specified values in Table 5 – Bolt torques and spanner sizes (Section 9.3 – Bolt and nut torque requirements). Re-torque where required.
- 10 Deploy the SWIFT and observe winch behaviour.
- 11 With the SWIFT supported by buoyancy, fully unspool the remaining rope from the winch.
- 12 Inspect the rope for fraying, furring, thinning, glassing (heat damage), dirt, or oil contamination.
- 13 Ensure the winch rope is securely retained by both clamping screws and torque the M8×12 rope clamp screws to 16 N·m (dry, no Loctite).
- 14 Check for zinc plating loss on the winch drum side cheeks where the rope makes contact.
- 15 Ensure the winch is adequately lubricated and operates smoothly and uniformly when spooling in and out. Apply Lithium EP2 grease to the handle pivot, drum bearings, and any exposed gear or pawl interfaces as required. Avoid contaminating the winch drum or rope with grease.
- 16 Inspect the fairleads for signs of wear where the rope passes through the SWIFT chassis.
- 17 Conduct a trial recovery of an adult MOB manikin, recording current draw under load (How?). Log all readings.

7.2 30-month depth maintenance

7.2.1 Overview

- A The SWIFT is to be inspected at the intervals described in this chapter.
- B Depth maintenance of the SWIFT is the responsibility of Zelim and/or an endorsed maintenance organisation, and shall require the SWIFT to be removed from the vessel.
- C When conducting 30-month depth maintenance inspections, follow components inspection 7.5 noting any observations in the checklist Appendix B 30-Month Depth Maintenance.
- D This maintenance activity shall be carried out at a suitable facility.
- E The objective is to provide a full system inspection, incorporating checks, repairs, adjustments, or part replacements to maintain reliable operation and optimum performance of the safety equipment.
- F Chapters 5–10 provide guidance on disassembly, cleaning, inspection, testing, repair and replacement, and assembly procedures to enable full component assessment and replacement as required. Each component must be examined for both condition and performance.

7.1.2 30-month depth maintenance process

- 1 Remove the SWIFT from the vessel using suitable lifting equipment and secure it on a stable working platform.
- 2 Carry out a full condition review, including:
 - A Verification of customer maintenance records and service history.
 - B Visual inspection of the SWIFT exterior for corrosion, coating breakdown, marine growth, or damage.
 - C Functional test of the SWIFT prior to disassembly to confirm baseline operation.
- 3 Disassemble the SWIFT in accordance with Chapter 5 – Disassembly, removing all major sub-assemblies (foam moulds, chassis components, conveyor, winch, electrical enclosure, and control box).
- 4 Clean all components in accordance with Chapter 6 – Cleaning.
- 5 Conduct a detailed inspection of each component for:
 - A Corrosion, wear, or distortion of metallic components.
 - B Degradation, delamination, or water ingress in foam moulds.
 - C Condition of drive shafts, bearings, sprockets, and tension assemblies.

- D Integrity of welds, fasteners, and chassis mounting points.
 - E Condition and routing of electrical wiring, connectors, and seals.
 - F Condition of Dyneema® rope and termination hardware.
- 6 Replace all consumables and service items, including:
- A Dyneema® rope if showing any fraying, thinning, or glazing.
 - B Bearings, seals, and fasteners identified as worn or corroded.
 - C Lubricants and grease (Lithium EP2) as required.
- 7 Inspect and test the winch assembly:
- A Confirm smooth operation of the winch drum.
 - B Verify correct rope routing from beneath the winch drum and over the wheel.
 - C Check zinc-plated components for coating loss or corrosion.
 - D Check that the M8×12 clamping screws are secure and correctly torqued.
- 8 Reassemble the SWIFT in accordance with Chapter 10 – Assembly, applying specified torque values and Loctite 243 to all threaded fasteners.
- 9 Perform post-assembly functional testing:
- A Operate the motor and gearbox in both forward and reverse directions for approximately **5 minutes each way**, confirming smooth and uniform operation.
 - B Verify correct conveyor tracking and belt tension.
 - C Confirm smooth and uniform operation of the winch mechanism.
 - D Check the operation of the Emergency Stop controller to ensure it isolates power correctly.
 - E Verify correct operation of all buttons on the 3-push-button control box (Forward, Reverse, and Stop), ensuring the Stop button halts operation correctly.
 - F Confirm the tape switch activates correctly to stop the SWIFT.
 - G Record current draw and note any anomalies.
 - H Isolate the power supply to the control box.
 - I Remove the cover of the motor cable termination box and conduct a winding resistance balance check and a winding insulation check. Refer to Chapter 8.1.4 – Motor and gearbox.
- 10 Reinstall the SWIFT on the vessel in accordance with the SWIFT Survivor Recovery System Installation Guide (PN/SWI/010-00).
- 11 Conduct an on-vessel operational test to verify full system performance.
- 12 Complete maintenance documentation and issue a SWIFT Recovery System 30-Month Depth Maintenance Certificate upon satisfactory completion.

7.3 SWIFT removal and transportation

7.3.1 Overview

- 1 The SWIFT is to be removed from the vessel and transported to a suitable location for 30-month depth maintenance. Refer to the SWIFT Survivor Recovery System Installation Guide (PN/SWI/010-00).
- 2 The maintenance facility is to note the condition of the transportation crate and assess whether any damage has occurred during transit.
- 3 The transportation crate for a new SWIFT supplied by Zelim contains the following:
 - A SWIFT unit
 - B Electrical control box, 3-push-button control box, and emergency stop button
 - C Winch and rope
 - D Vessel hinge mounting bracket assembly
 - E Ratchet spanner with 24 mm socket
 - F 2 × securing pins (if not attached to the SWIFT)

7.4 SWIFT condition review

7.4.1 Overview

- 1 The maintenance organisation is to review all customer maintenance paperwork for its history and any existing faults on the SWIFT since the last external maintenance.
- 2 Any immediate concerns should be raised with Zelim as required and /or if the product warranty is in question.
- 3 The SWIFT must be cleaned prior to maintenance. Handle and clean with care, as components may be damaged or corroded. Cleaning shall be carried out in accordance with Chapter 6 – Cleaning.
- 4 Prior to disassembly, the SWIFT shall be functionally tested and photographed to document its condition. Functional testing shall be carried out in accordance with Chapter 8 – Testing.
- 5 The maintenance organisation shall ensure that all manuals and relevant documentation are maintained at the current revision level.
- 6 The maintenance organisation shall record all elements of maintenance, including the condition review, in the 30-month depth maintenance checklist (Appendix B – 30-month Depth Maintenance Checklist).

NOTE The serial number of the SWIFT is located on the data plate at the end of the chassis, adjacent to the motor.

7.5 Component inspection

The following process is to be used for inspecting the SWIFT and its components during 30-month depth maintenance.

NOTE If any operational issues were observed during the pre-maintenance functional checks and/or within the customer maintenance records, these may indicate distortion or misalignment of the chassis frame.

7.5.1 Hinge mounting bracket

- 1 Examine for any wear, damage, or corrosion.
- 2 Check all nuts and bolts are secure.
- 3 Examine both bearings for free rotation and lubricate using Lithium EP2 grease via the grease nipples.
- 4 If fitted, examine the mounting feet hinge pins and lubricate with Lithium EP2 grease.

7.5.2 Floatation foam moulds and clamps

- 1 Examine for damage.
- 2 Check that the adhesive used to join the floatation foam moulds is intact.
- 3 Inspect reflective tapes for security and adhesion.

7.5.3 Conveyor belt

- 1 Examine for any wear, cracks, or damage.
- 2 Check that all white 5 mm diameter plastic rods are correctly located and secure.

7.5.4 Tension shaft

- 1 Examine for distortion, damage, and corrosion.
- 2 Examine each white toothed sprocket and spacer for positioning, wear, cracking, or damage, and ensure all grub screws are secure.

7.5.5 Motor and gearbox

- 1 Inspect for any damage or corrosion.
- 2 Check for oil leaks.
- 3 Examine electrical cables and sockets for any damage to outer casings.

7.5.6 Drive shaft assembly

- 1 Examine for any distortion, damage, or corrosion.
- 2 Examine each white toothed sprocket and spacer for correct positioning, wear, cracking, or damage, and ensure all grub screws are secure.

7.5.7 Bearing mounting brackets and drive shaft bearings

- 1 Examine for any wear, cracks, damage, or corrosion.

7.5.8 Stub pivot axles

- 1 Examine for any damage, distortion, or corrosion.

7.5.9 Tape switch

- 1 Check that the tape switch is securely fitted within its track.
- 2 Examine for any damage or cracking.
- 3 Examine electrical cables and sockets for any damage to their outer casings.

7.5.10 Chassis

- 1** Examine the chassis on a flat, level surface for any distortion, damage, or cracking.
CAUTION Check for any weld deterioration.
- 2** Examine for any wear, damage, or corrosion. Pay particular attention to the mating surfaces where components are fitted or welded.
- 3** Examine each foam mounting stub for thread damage or corrosion. Remove any thread-locking adhesive from the inner threads.
- 4** Examine tensioner brackets for any damage or corrosion.
- 5** Examine hinge lugs for any damage or corrosion.
- 6** Examine lifting eyes for any damage or corrosion, and clean threads as required.
- 7** Check that all support bar countersunk-head cap screws are secure.
- 8** Examine tie bars for any damage or distortion. Remove any thread-locking adhesive from the inner threads.
- 9** Examine clamp plates for any damage or corrosion.

7.5.11 Nylon fairlead and temporary rope

- 1** Examine for any wear, cracks, or damage.
- 2** Ensure the temporary rope is correctly threaded through the fairlead and secured in place.

8 TESTING

This chapter outlines the requirements for functional testing of the SWIFT. All testing shall be carried out in accordance with the procedures detailed in this chapter.

8.1 Functional testing

8.1.1 Conveyor belt

A Conveyor belt testing

- 1 Operate the motor and gearbox in both forward and reverse directions for approximately **5 minutes each way**, confirming smooth and uniform operation.
- 2 Note uniform speed and smoothness.
- 2 Check for any grating noise, change in pitch or excessive heat build-up.
- 3 Check motor and gearbox for oil leaks.
- 4 Check for any tracking issues or any asymmetry in tension.
- 5 Observe the conveyor belt engaging with the sprockets on the drive shaft and tension shaft. Listen for squeaks/rubbing or a build-up of heat at the shaft bearing.
- 6 With the conveyor belt running, press the middle stop button on the 3-push-button control box. Ensure the conveyor belt stops instantly.
- 7 Operate the forward and then reverse buttons on the 3-push-button control box to check the conveyor belt can still operate. Press the middle stop button. Ensure the conveyor belt stops instantly.

8.1.2 Emergency stop button

A Emergency stop button testing

- 1 With the conveyor belt running, operate the red emergency stop button, ensure the conveyor belt stops instantly.

8.1.3 Tape switch

A Tape switch testing

- 1 With the conveyor belt running, carefully operate the tape switch, ensure the conveyor belt stops instantly.

8.1.4 Motor and gearbox

A Motor and gearbox testing

- 1** Verify the electrical integrity of the motor by conducting a winding resistance balance test and an insulation resistance test between windings and earth¹.
- 2** Record all readings and observations in the maintenance checklist (Appendix A / B as applicable).

8.1.5 Electrical control box

A Electrical control box testing

- 1** Visually inspect the control box for any damage, loose fittings, or signs of moisture ingress.
- 2** Verify the operation of the residual current device (RCD) by pressing the test button. Confirm that power is immediately isolated.
- 3** Reset the RCD and confirm that power is restored to the system.
- 4** Check all indicator lamps and cable terminations for correct function and secure connection.
- 5** Ensure all control box labels are legible and intact.
- 6** Record RCD trip test results in the Post-Use / Monthly Maintenance Checklist (Appendix X).

¹ Refer to manufacturer's specifications or technical data sheet for test parameters and acceptable resistance tolerances.

9 REPAIR AND REPLACEMENT

This chapter outlines the procedures for repairing or replacing SWIFT components found to be damaged, worn, or unserviceable. All work must be performed in accordance with these instructions to maintain safety, reliability, and compliance.

9.1 Repair

- 1 Repairs are only allowed on components listed below:
 - A Conveyor belt
 - B Electrical control box and components
 - C Manual winch
- 2 Any components found unserviceable are to be removed and replaced with serviceable items as listed above.
- 3 If the chassis is found to be damaged, distorted or suffering from excessive corrosion, the chassis must be replaced.

9.1.1 Conveyor belt

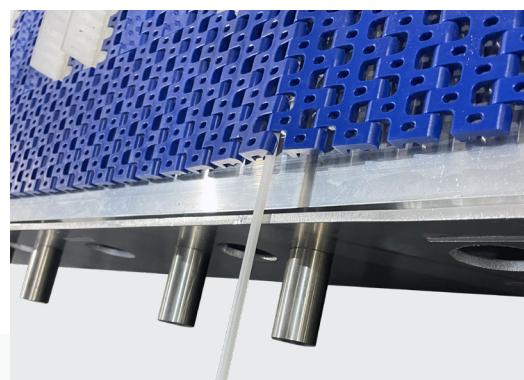
A Conveyor belt repair

- 1 Lay the conveyor belt on a flat surface and remove the 5 mm white plastic rods from either side of the damaged area by gripping them with long-nose pliers and pulling them out just past the last damaged part (Fig 19 and Fig 20).

NOTE If the conveyor belt is not already in two halves, please see Section 5.4.3.

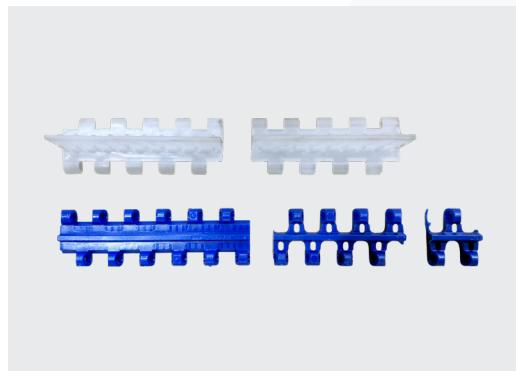


▲ **Fig 19** Identify single white plastic rod



▲ **Fig 20** White plastic rod removal

- 2 Identify the like-for-like replacement parts (Fig 21). Remove the damaged section by carefully lifting it out with a flat-head screwdriver, then fit the new section in place, ensuring correct alignment with the adjoining parts.



▲ Fig 21 Conveyor belt spare parts

- 3 Slide both partially removed 5 mm white plastic rods back through the replaced section and the remaining interlocking parts until they reach the end of the belt.

9.1.2 Electrical control box

A 3-push-button control box repair

- 1 Any damage must be repaired/replaced by a suitably qualified electrician.

B Emergency stop controller repair

- 1 Any damage must be repaired/replaced by a suitably qualified electrician.

C Quick connectors repair

- 1 Any damage must be repaired/replaced by a suitably qualified electrician.

D Motor and gearbox electrical cable repair

- 1 Any damage must be repaired/replaced by a suitably qualified electrician.

9.1.3 Manual winch

A Manual winch repair

- 1 If the manual winch is damaged or unserviceable and you believe it can be repaired, please contact swift.support@zelim.com for guidance.

9.2 Replacement

- 1 Replacements of components are limited to the following:
 - A Chassis
 - B Motor and gearbox
 - C Stub pivot axle
 - D Foam mounting stubs
 - E Floatation foam moulds
 - F Clamp plates
 - G Conveyor belt 5 mm plastic rods
 - H Tension shaft, white toothed sprocket and spacers
 - I Drive shaft assembly, white toothed sprocket and spacers
 - J Tape switch
 - K Lifting eyes
 - L Securing pins
 - M Hinge mounting bracket assembly
 - N Vessel mounting bracket
 - O Nylon fairlead and rope
 - P Manual winch
 - Q Manual winch rope
 - R Ratchet spanner with 24 mm socket

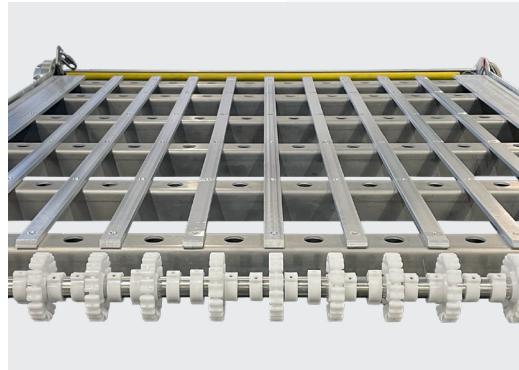
NOTE Damaged components may only be removed and replaced in accordance with this chapter and Chapter 5 – Disassembly.

NOTE The SWIFT may have to be removed from the vessel and returned to a Zelim and/or an endorsed maintenance organisation for replacements.

9.2.1 Chassis

A Chassis replacement

- 1 If the chassis (Fig 22) is found unserviceable it cannot be repaired, it must be replaced with a new item.

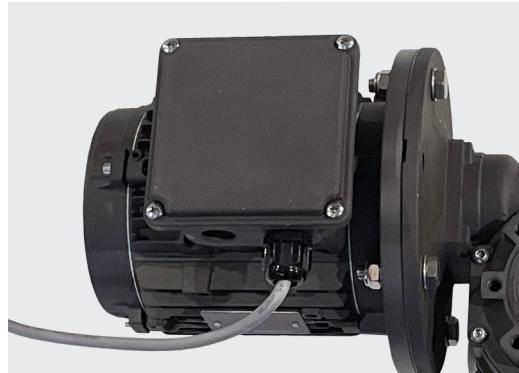


▲ Fig 22 Chassis

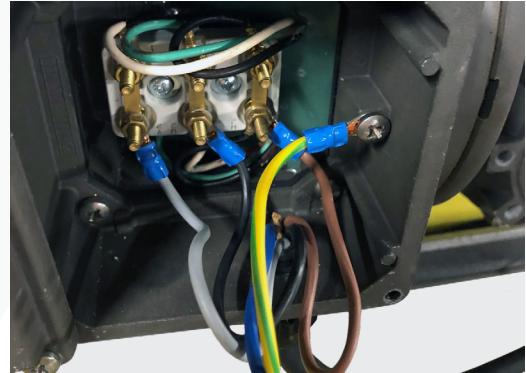
9.2.2 Motor and gearbox

A Motor and gearbox removal

WARNING Prior to removing the motor and gearbox (Fig 23), ensure the motor is isolated from the power supply.



▲ Fig 23 Motor and gearbox



▲ Fig 24 Power supply terminal box

- 1 Remove the four screws securing the cover on the power supply terminal box (Fig 23 and Fig 24).
- 2 Unscrew the cable gland nut, disconnect supply wires from the terminals and remove by gently pulling the cable through the gland.
- 3 Temporarily replace the gland nut and power supply terminal box cover.

NOTE Some motor and gearboxes have a quick disconnect socket so there is no requirement to disconnect the supply wires from the motor terminal box (Fig 25).



▲ Fig 25 Quick disconnect socket

- 4 Remove the 4 x bolts securing the drive shaft cover from the gearbox (Fig 26).



▲ Fig 26 Drive shaft cover

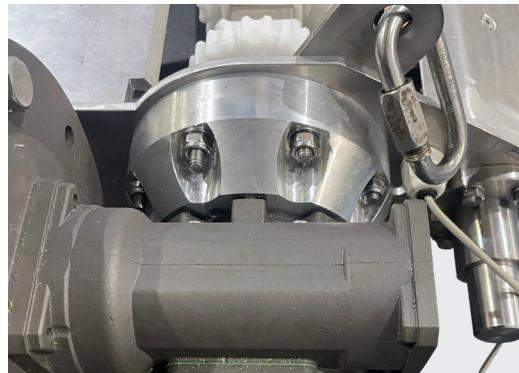
- 5 Prior to removing the motor and gearbox, remove the key bar securing the final drive shaft. The key bar prevents the formation of a partial vacuum between the close-fitting shaft and the final drive. To aid removal, temporarily screw an M6 threaded bolt into the key bar (Fig 27).



▲ Fig 27 Key bar removal

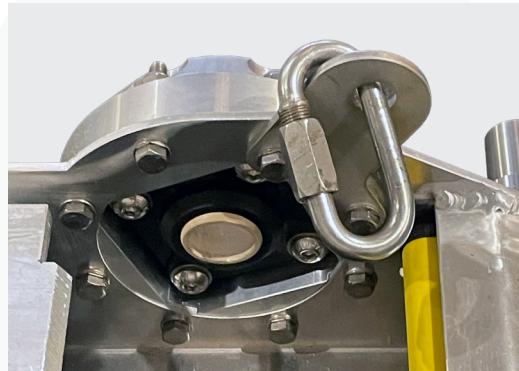
- 6 The motor and gearbox are attached to the chassis via the bearing mounting brackets and drive shaft bearings.

- 7 To disconnect the motor and gearbox, remove the 8 × bearing mounting bracket Nyloc nuts (Fig 28).



▲ Fig 28 Isolated motor and gearbox

- 8 The lifting eye bracket/hinge lug is retained by the bearing mounting bracket bolts (Fig 29).



▲ Fig 29 Lifting eye bolts

- 9 The motor and gearbox can now slide off the bearing drive bracket. If the fit is tight, use a soft plastic mallet to aid removal.

NOTE At this point the whole drive shaft may pull out of the chassis when attempting to remove the motor and gearbox. If this happens, continue to remove the motor and gearbox.

B Motor and gearbox replacement

- 1 Attach the bearing mounting bracket and drive shaft bearing to the motor and gearbox.
- 2 Locate the drive shaft assembly in the chassis and secure with 4 × M10 plain washers, 4 × M10 hexagonal bolt and replacement 4 × hexagonal M10 Nyloc nuts.
- 3 Line up the drive shaft gearbox final drive and drive shaft and insert key bar. Ensure key bar is coated with lithium EP 2 grease (Fig 27).
- 4 Fit the drive shaft cover to the gearbox, coating each M8 hexagonal bolt and plain washer with thread-locking adhesive (Loctite 243), and secure the cover (Fig 26).
- 5 Unscrew the cable gland nut, pass all cables through, and connect the supply wires to the motor terminals, if required.
- 6 Fit the cover to the power supply terminal box, coating each of the 4 × screws with thread-locking adhesive (Loctite 243), and secure the cover, if required (Fig 23).
- 7 Replace the gland nut and cover, if required.

9.2.3 Stub pivot axle

A Stub pivot axle removal

- 1 Remove the 6 × M8 hexagonal head bolts, 12 × M8 plain washers, and 6 × M8 hexagonal Nyloc nuts.
- 2 Lift off from the chassis (Fig 30).



▲ Fig 30 Stub pivot axle

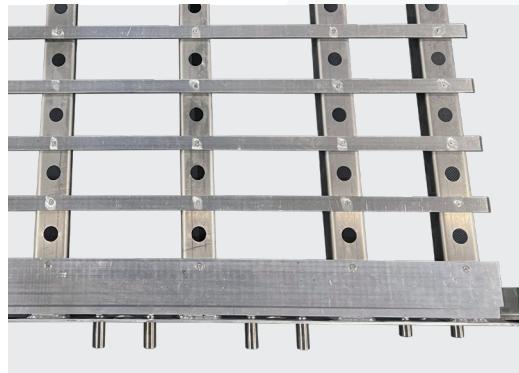
B Stub pivot axle replacement

- 1 Attach replacement to the chassis and secure with 6 × M8 hexagonal head bolts, 12 × M8 plain washers and replacement 6 × M8 hexagonal Nyloc nuts.

9.2.4 Foam mounting stubs

A Foam mounting stubs removal

- 1 Each chassis has 16 × standard size foam mounted stubs (Fig 31) and 2 × short foam mounted stubs across both sides of the chassis.



▲ Fig 31 Foam mounting stubs

- 2 The 2 × short foam mounted stubs are located directly behind the motor body.
- 3 To replace a foam mounted stub, undo the Nyloc nut and washer, access is from inside the chassis.
- 4 Some foam mounting stubs may require gripping to loosen the fixing. If required, ensure the surface of the stub is protected from tooling, marks.

B Foam mounting stubs replacement

- 1 Apply thread locking adhesive (Loctite 243) to each foam mounting stub and pass through the chassis.
- 2 Attach the foam mounting stubs to the chassis with 1 × M12 plain washer and replacement M12 hexagonal Nyloc nut.

Check gaps from A/B to next line is 6.25mm

9.2.5 Flotation foam moulds

A Flotation foam mould removal

- 1 To remove a flotation foam mould, refer to Section 5.5.2 – Flotation foam moulds removal.

B Flotation foam moulds replacement

- 1 To replace a flotation foam mould, refer to Section 10.1.3 – Flotation foam assembly.

9.2.6 Clamp plates

A Clamp plates removal

There are 10 clamp plates: six of type 1, two of type 2, and two of type 3 (Fig 32).



▲ **Fig 32** Clamp plates

- 1 Remove the M12 hexagonal bolts and plain washers from the chassis foam mounted stubs and lift away (Fig 33).



▲ **Fig 33** Foam clamp plate removed

B Foam clamp plate replacement

- 1 Fit the replacement foam clamp plate to the foam mould and secure it to the chassis foam mounting stub using M12 plain washers and M12 hexagonal bolts. Apply thread-locking adhesive (Loctite 243) and **torque each bolt to 70 N·m**.

9.2.7 Conveyor belt 5 mm plastic rods

A Conveyor belt 5 mm plastic rods removal

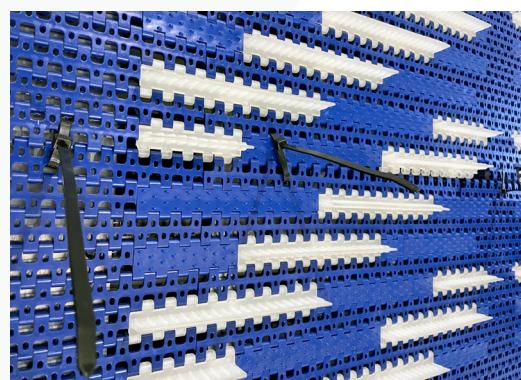
- 1 To replace a conveyor belt plastic rod, lift the edge of the conveyor belt to reveal the underside, identify a single white 5 mm diameter plastic rod connecting the modular system together, remove white plastic rod by gripping with long nose pliers and pull out (Fig 34).



▲ Fig 34 Identify single white plastic rod

B Conveyor belt plastic rods replacement

- 1 To replace a white plastic rod, temporarily secure the conveyor belt together with cable ties (Fig 35).



▲ Fig 35 Conveyor belt temporary cable ties

- 2** Lift the edge of the belt and feed the white plastic rod through all sections of the conveyor belt until it becomes one piece (Fig 36).



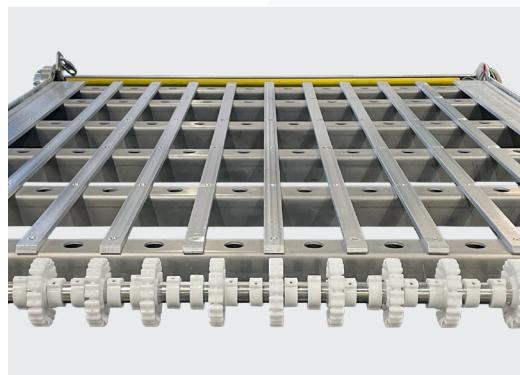
 **Fig 36** Single white plastic rod

- 3** Remove all temporary cable ties.

9.2.8 Tension shaft assembly

A Tension shaft assembly removal

- 1 With the conveyor belt removed from the chassis (Fig 37), release the 4 × M8 hexagonal Nyloc nuts and plain washers (Fig 38) securing the tensioner bracket and tension shaft bearing (Fig 39).



▲ Fig 37 Chassis



▲ Fig 38 Nyloc nut removal

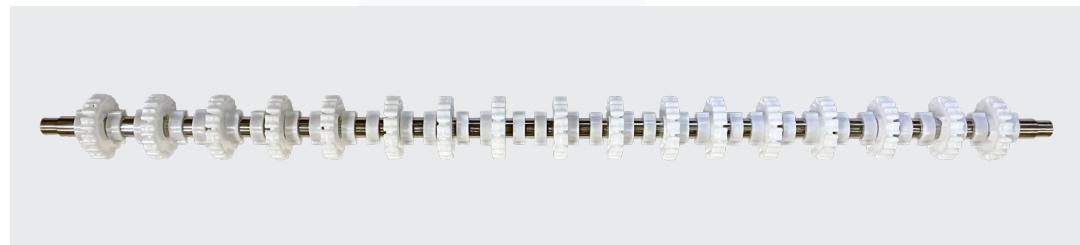


▲ Fig 39 Tensioner bracket and tension shaft bearing

- 2 With the tension bracket and tension shaft bearing removed, the tension shaft can now be removed from the chassis.

WARNING This is a two-person lift due to the weight of the tension shaft.

- 3 To remove white toothed sprockets and spacers from the tensions shaft (Fig 40), undo small screws from the spacers (Fig 41) and slide off.



▲ Fig 40 Tension shaft



▲ Fig 41 White toothed sprockets and spacers

B Tension shaft replacement

- 1 Fit the white toothed sprockets to the tension shaft, spacing them equally, and secure them in place with M5 hexagonal socket grub screws.
 - 2 Carefully fit the tension shaft into the chassis frame.
- WARNING** This is a two-person lift due to the weight of the tension shaft.
- 3 Refit the tension bracket and tension shaft bearing over the tension shaft, and fit 4 × replacement M8 hexagonal Nyloc nuts and 4 × plain washers.

9.2.9 Drive shaft assembly

A Drive shaft assembly removal

- 1 Remove the motor and gearbox in accordance with Section 9.2.2 A – Motor and gearbox removal.
- 2 Remove Nyloc nuts, plain washers, and M10 hexagonal socket head cap screws from the bearing mounting bracket and hinge lug (Fig 42).

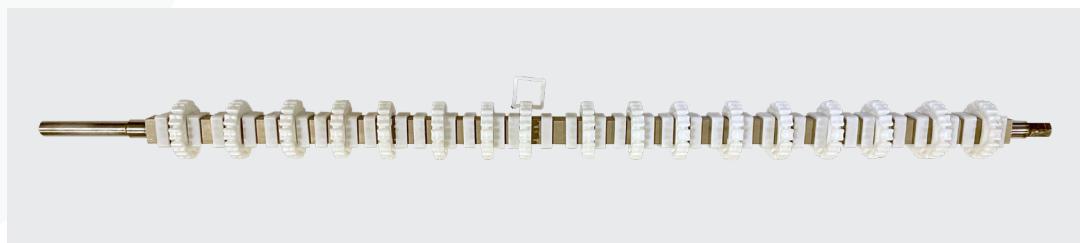
NOTE The use of a 13 mm S spanner will be required for the removal of the Nyloc nuts.



▲ Fig 42 Bearing mounting bracket

- 3 The drive shaft can now be removed from the chassis (Fig 43).

WARNING This is a two-person lift due to the weight of the drive shaft.

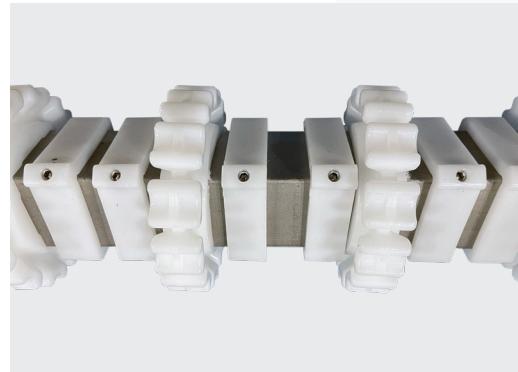


▲ Fig 43 Drive shaft

- 4 To remove white toothed sprockets and spacers, undo small screw and remove from the drive shaft.

B Drive shaft replacement

- 1 Fit the replacement white toothed sprockets to the drive shaft, spacing them evenly, and secure in place with the small screws (Fig 44).



▲ Fig 44 White toothed sprockets and spacers

- 2 Refit the bearing mounting bracket and hinge lug to the chassis, and secure using plain washers, M10 hexagonal socket head cap screws, and new M8 hexagonal Nyloc nuts.
- 3 Carefully fit the drive shaft into the worm drive mounting bracket and bearing.

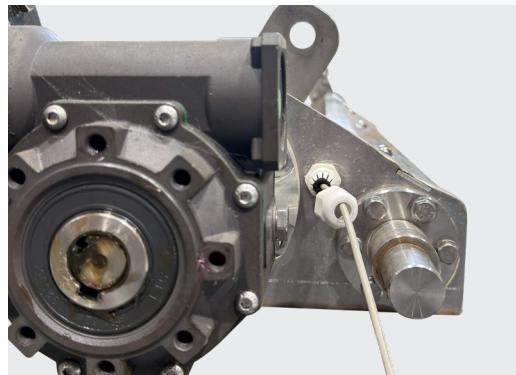
WARNING This is a two-person lift due to the weight of the drive shaft.

- 4 Refit the motor and gearbox in accordance with Section 9.2.2 B – Motor and gearbox installation.

9.2.10 Tape switch

A Tape switch removal

- 1 Unfasten the gland nut from the chassis, adjacent to the gearbox (Fig 45).

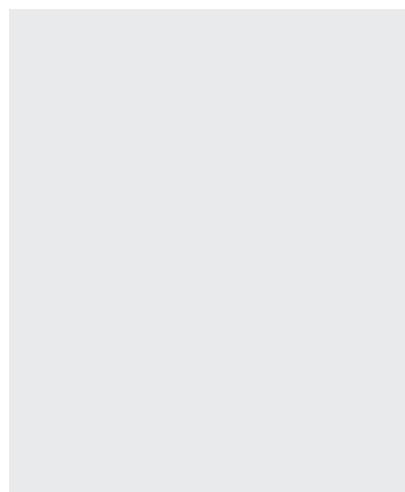


▲ Fig 45 Gland nut

- 2 Release the connection plug from the control box wiring harness (Fig 46), unscrew the plug cap and release the wires from the terminals, as required.



▲ Fig 46 Control box



▲ Fig X Control box

- 3 Later SWIFTS have a quick disconnect socket so there is no requirement to disconnect the supply wires from control box (Fig 47).



▲ **Fig 47** Quick disconnect socket

- 4 Starting at the end of the tape switch furthest away from the cable, gently peel out the tape switch from the mounting track (Fig 48).



▲ **Fig 48** Tape switch

- 5 When fully released, pull the cable through the gland.

B Tape switch replacement

- 1 Starting at the end of the tape switch, furthest away from the cable, gently fit the tape switch into the mounting track.
- 2 Re-attach the connection plug to the control box wiring harness (if required) and secure wires to the terminals **as per wiring diagram Chap / Appendix**.

9.2.11 Lifting eye

A Lifting eye replacement

- 1 If a lifting eye is found unserviceable it cannot be repaired, it must be replaced with a new item (Fig 49).



▲ Fig 49 Lifting eye

9.2.12 Securing pins

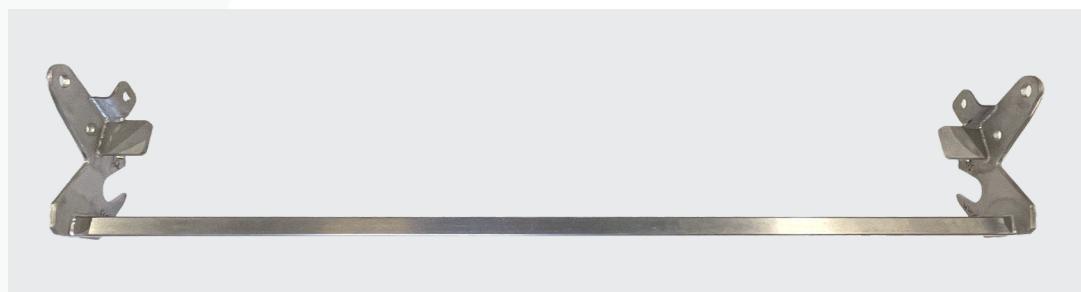
A Securing pin replacement

- 1 If a securing pin is found unserviceable it cannot be repaired, it must be replaced with a new item.

9.2.13 Hinge mounting bracket assembly

A Hinge mounting bracket replacement

- 1 If a hinge mounting bracket is found to be unserviceable it cannot be repaired, only replaced with a new item Fig 50.



▲ Fig 50 Hinge mounting bracket

9.2.14 Vessel mounting bracket

A Vessel mounting bracket replacement

- 1 If a vessel mounting bracket (Fig 51) is found to be unserviceable it cannot be repaired, only replaced with a new item.

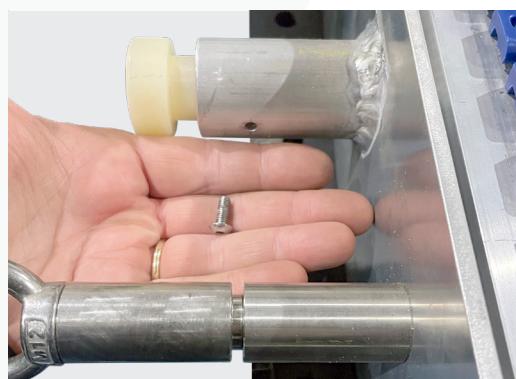


▲ Fig 51 Vessel mounting bracket

9.2.15 Nylon fairlead and rope

A Nylon fairlead and rope removal

- 1 If a nylon fairlead is found to be unserviceable, undo dome head cap screws and pull rope out (Fig 52).



▲ Fig 52 Nylon fairlead

- 2 Pull the rope out through the chassis.

B Nylon fairlead and rope replacement

- 1 Attach nylon fairlead to the chassis, apply thread locking adhesive (Loctite 243) to the dome head cap screws and secure.
- 2 Thread the nylon rope through each of the nylon fairleads and secure both ends with a overhand stop knot (Fig 53).

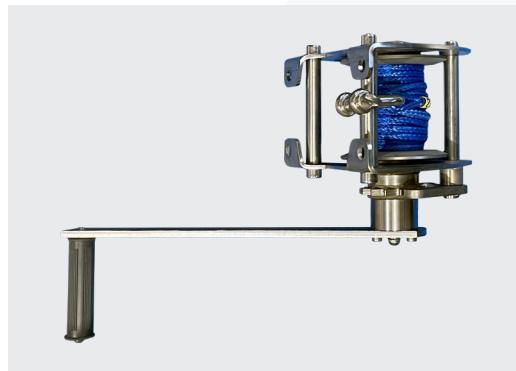


▲ Fig 53 Overhand stop knot

9.2.16 Manual winch

A Manual winch replacement

- 1 If the manual winch is found unserviceable and beyond repair (Fig 54), it must be replaced.

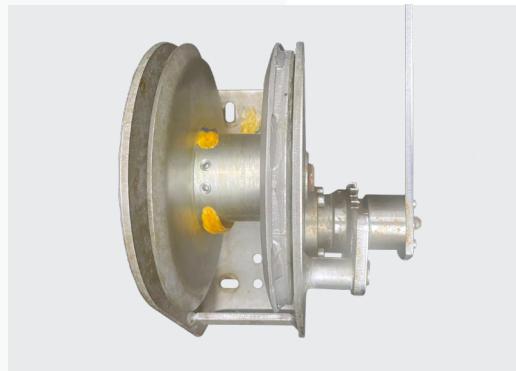


▲ Fig 54 Manual winch

9.2.17 Manual winch rope

A Manual winch rope removal

- 1 Unspool all the Dyneema® rope from the winch drum.
- 2 Undo both M8×12 clamping screws (Fix 55) and remove rope from the winch.



▲ Fig 55 M8×12 clamping screws

B Manual winch rope replacement

- 1 Feed the replacement Dyneema® rope into the rope termination hole and secure it with both M8×12 clamping screws. Torque to 16 N·m (dry, no Loctite).

WARNING When attaching the Dyneema® rope (Fig 56), ensure it feeds beneath the winch drum and over the wheel. Incorrect routing will prevent correct operation.



A Fig 56 Correctly routed Dyneema® rope

- 2 Wind the remaining rope onto the drum, ensuring it is evenly distributed across the drum surface.

CAUTION Ensure at least five full turns of rope remain on the drum when the SWIFT is in the lowest load position.

- 3 Check that the winch operates smoothly and uniformly when spooling in and out.

9.2.18 Ratchet spanner and 24 mm socket

A Ratchet spanner and 24 mm socket replacement

- 1 If the ratchet spanner and 24 mm socket are found to be unserviceable, they must be replaced with new items rather than repaired (Fig 57).



 **Fig 57** Ratchet spanner and 24 mm socket

9.3 Bolt and nut torque requirements

- Table 5 below lists the required bolt and nut torque values for maintenance and installation activities.

CAUTION Loctite 243 must not be applied when tightening bolts fitted with Nyloc nuts.

The torque values listed cover all standard SWIFT fasteners and installation fixings, including those used for vessel mounting.

▼ **Table 5** Bolt torques and spanner sizes²

BOLT DIAMETER	MATERIAL	TIGHTENING TORQUE	SPANNER / SOCKET SIZE
M6	Stainless steel A4-70	8.5 N·m	10 mm
M8	Stainless steel A4-70	20 N·m	13 mm
M10	Stainless steel A4-70	40 N·m	17 mm
M12	Stainless steel A4-70	70 N·m	19 mm
M14	Stainless steel A4-70	115 N·m	22 mm
M16	Stainless steel A4-70	180 N·m	24 mm
M20	Stainless steel A4-70	370 N·m	30 mm

² All torque values apply to lubricated threads assembled with Loctite 243 unless otherwise stated. When using Nyloc nuts, Loctite 243 must not be applied; torque values may be used as a guide, but actual preload will be lower due to increased friction. If tightening dry (no lubricant or threadlocker), increase torque by approximately 10–15 % to achieve equivalent preload.

10 ASSEMBLY

This chapter details the procedures required to assemble the SWIFT following maintenance or component replacement. All assembly operations must be performed in accordance with the instructions provided in this chapter to ensure correct function and safety of the equipment.

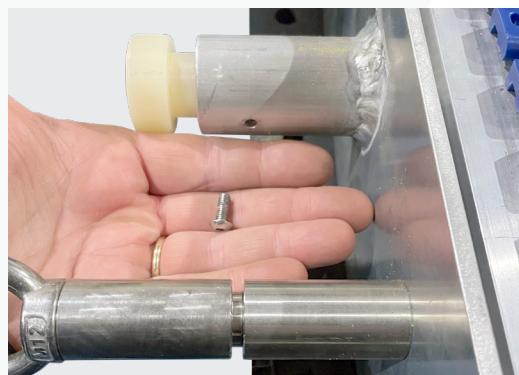
NOTE Any Nyloc nuts that have been loosened or removed during maintenance must be discarded and replaced with new ones.

10.1 General

10.1.1 Nylon fairlead

A Nylon fairlead assembly

- 1 Thread the nylon rope through the chassis.
- 2 Attach each nylon fairlead to the chassis, apply thread locking adhesive (Loctite 243) to the dome head cap screws and secure (Fig 58).



▲ Fig 58 Nylon fairlead

- 3 Thread the nylon rope through each of the nylon fairleads and secure both ends with a overhand stop knot (Fig 59).

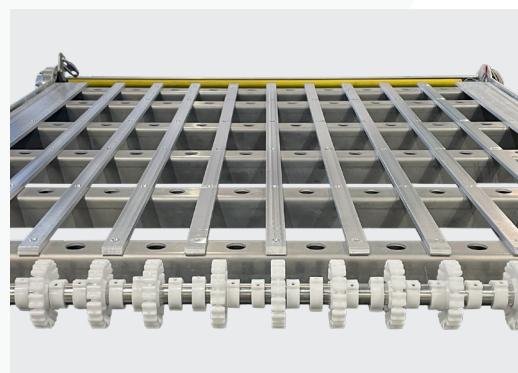


▲ Fig 59 Overhand stop knot

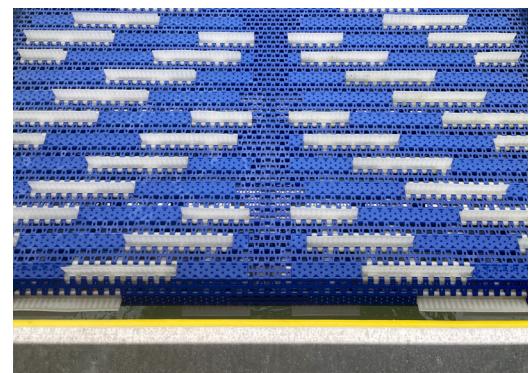
10.1.2 Conveyor belt

A Conveyor belt assembly

- 1 Place the chassis on a flat surface (Fig 60).



▲ Fig 60 Chassis



▲ Fig 61 Correctly positioned conveyor belt on chassis

- 2 With assistance from a second person, slowly feed the conveyor belt under the chassis.

NOTE Ensure the conveyor belt is facing the correct direction and the correct way up, with the white fins uppermost in a V-shape arrow, pointing away from the tape switch (Fig 61).

- 3 Position the conveyor belt over the white plastic drive shaft sprockets and align both ends of the belt, ensuring the conveyor belt is centred over the drive and tensioner shaft sprockets.
- 4 Connect a 24 mm socket and ratchet to the drive and crank clockwise, feeding approximately 300 mm of belt onto the upper chassis.
- 5 The 5 mm white nylon rod running along the underside of the belt must sit correctly in the grooves of the sprockets on both drive shaft and tension shaft.

CAUTION If you proceed to tension before the 5mm white nylon rod is correctly seated in the white sprockets, it will cause belt distortion (Figs 62 and 63) and will require the tension to be released and the belt reset.

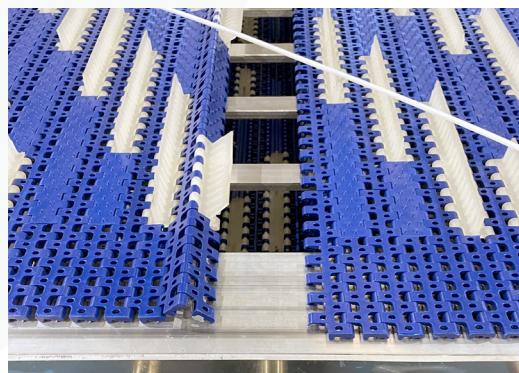


▲ **Fig 62** Belt distortion seen next to white fins on outer curve



▲ **Fig 63** Close up of belt distortion

- 6 Pull in both ends and temporarily secure the conveyor belt with a number of cable ties (Figs 64 and 65) to allow the 5 mm diameter plastic rod to pass through.



▲ **Fig 64** Conveyor belt alignment prior to cable tie installation



Fig 65 Cable tie temporary securing conveyor belt

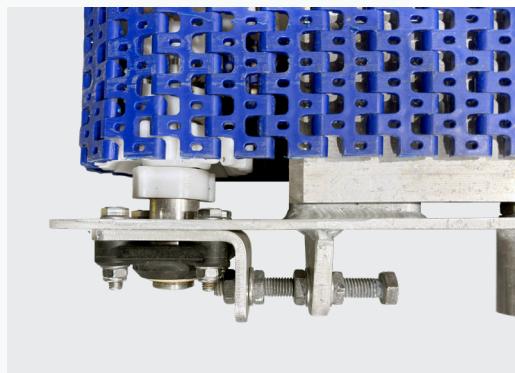
- 7 Lift the edge of the belt and insert a new 5 mm diameter plastic rod through all belt sections until it forms a single continuous loop.

NOTE Check that both white nylon rods are still correctly seated in the grooves of the sprockets on both the drive shaft and tension shaft.

- 8 Remove all temporary cable ties.
- 9 Check and confirm there is equal clearance between the conveyor belt edges and the chassis (approximately 27 mm on each side).
- 10 Using a 24 mm socket and ratchet, manually rotate the conveyor belt via the M16 drive nut on the drive shaft to make sure the belt is moving freely.
- 11 The sprockets feature a raised profile that engages with a corresponding groove on the underside of the conveyor belt to maintain correct lateral tracking.

NOTE The spacing between the clamps allows the drive shaft sprockets to self-align with the conveyor belt.

- 12 Adjust the conveyor belt tension evenly via both tensioner brackets until 10 threads are visible between the chassis and the tensioner bracket (Fig 66). Ensure a minimum of one and a maximum of three full threads are visible beyond each nut after tightening.



▲ Fig 66 10 threads visible

- 13 Tighten 1 × M12 hexagonal bolt, 4 × M12 hexagonal half nuts, and 4 × M12 plain washers on each side.
- 14 Using a 13 mm spanner and a torque wrench fitted with a 13 mm socket, tighten the tension shaft bearing using 4 × M8 Nyloc nuts to a torque of 28 N·m.

10.1.3 Floatation foam

A Floatation foam assembly

- 1 Refit the 2 x lifting eyes.
- 2 Using a mechanical winch, position the chassis with the motor and gearbox located at the bottom (Fig 67).



▲ Fig 67 Chassis position

- 3 Carefully position and fit foam mould No. 2 over the motor and gearbox (Fig 68), then fit foam mould No. 3 (Fig 69) on the opposite side.

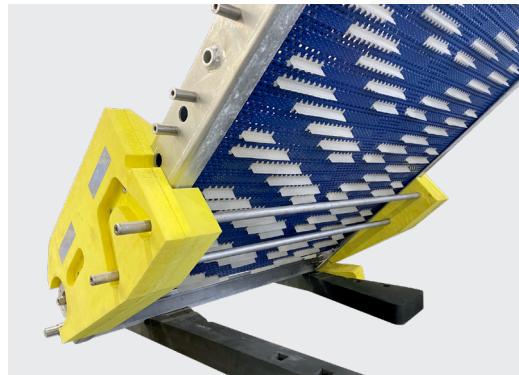


▲ Fig 68 Foam mould No. 2



▲ Fig 69 Foam mould No. 3

- 4 Insert 2 × tie bars through foam mould No. 2 and into foam mould No. 3, aligning them as shown in Fig 70.



Is there a second small clamp plate that we've not mentioned here?

▲ Fig 70 Tie bars

- 5 Using a torque wrench fitted with a 19 mm socket, secure clamp plates Nos. 1 and 3 to both sides of the chassis foam-mounting stubs and tie bars using M12 plain washers and M12 hexagonal bolts. Apply thread-locking adhesive (Loctite 243) and tighten each bolt to a torque of 70 N·m.
- 6 Fit 4 × foam moulds No. 1 to the chassis.
- 7 Locate 12 × foam moulds No. 6.
- 8 Partially insert a tie bar into the lower position of either foam mould No. 1, then fit the 12 × black foam moulds No. 6. Locate the opposite-side foam mould No. 1.

NOTE Ensure they are fitted in the correct orientation, with the edge having the smaller gap (40 mm) from the holes positioned closest to the conveyor belt (Fig 71).



▲ Fig 71 Foam mould

- 9 Insert a further 3 × tie bars through foam moulds No. 1 and No. 6 and through the chassis, aligning them with the opposite-side foam mould No. 1.
- 10 Using a torque wrench fitted with a 19 mm socket, secure clamp plates Nos. 1 to both sides of the chassis foam-mounting stubs and tie bars using M12 plain washers and M12 hexagonal bolts. Apply thread-locking adhesive (Loctite 243) and tighten each bolt to a torque of 70 N·m.
- 11 Lower the chassis onto a flat surface using the mechanical winch. Use sacrificial pieces of foam to protect the foam moulds from chains or slings as required.
- 12 Fit foam mould No. 5 (non-motor side) to the chassis, and insert the 12 × black/yellow foam moulds No. 8 together with the tie bars. Fit foam mould No. 4 (motor side) to the chassis.
- 13 Fit the remaining 2 × tie bars through foam moulds No. 4 and No. 5.
- 14 Using a torque wrench fitted with a 19 mm socket, secure clamp plates Nos. 2 and 4 to the chassis foam-mounting stubs and tie bars using M12 plain washers and M12 hexagonal bolts. Apply thread-locking adhesive (Loctite 243) and tighten each bolt to a torque of 70 N·m.

10.1.5 Hinge mounting

A Hinge bracket

- 1 If the hinge mounting bracket was returned with the SWIFT and removed during disassembly, it must now be refitted.
- 2 Position the hinge mounting bracket on the chassis and align it with the hinge bearings and stub axles. Insert the 4 × M16 stainless steel bolts, fit the corresponding plain washers and nuts, and finger-tighten loosely.

10.2 Post assembly checks

10.1.1 Tension check

A Post assembly tension check

- 1 Conduct a general static tension check by gripping the conveyor fins halfway along the conveyor belt and pulling at 90° to the SWIFT longitudinal axis.
- 2 Note the distance and force required, and compare these with the pre-maintenance conveyor belt tension.

10.3 Documentation

A Post assembly documentation

- 1 Record all steps and findings of the maintenance process, including the condition review, on the 30-Month Maintenance checklist (Appendix B).
- 2 Record any parts replaced and clearly state any advisory notes.
- 3 Raise any product warranty concerns with Zelim at swift.support@zelim.com.

11 **STORAGE AND DISPOSAL**

This chapter outlines the correct procedures for storing and disposing of the SWIFT and its components. Proper storage protects the equipment from environmental damage and contamination, while disposal must be carried out responsibly and in accordance with local regulations.

11.1 **Storage**

- 1 If the SWIFT is to be removed from the vessel for an extended period, it must be cleaned in accordance with Chapter 6 – Cleaning.
- 2 The SWIFT should be stored in a dry, clean area, away from acids, oils, and greases.

11.2 **Disposal**

- 1 SWIFT metal and plastic components should be sent for recycling where possible.
- 2 All other components should be disposed of IAW local procedures.

12 TOOLS, EQUIPMENT AND MATERIALS

This chapter lists the tools, equipment, and materials required for the maintenance, repair, assembly, and installation of the SWIFT. Only the items specified in this chapter are approved for use to ensure safety, reliability, and compliance with maintenance standards.

12.1 Tools

- 1 Tools required for SWIFT maintenance and installation. See Table 6.

▼ **Table 6** Tools required for maintenance and reassembly.

REF	ITEM	NOTES / SPECIFICATION
A	Spanner 8 mm (M5)	
B	Spanner 10 mm (M6)	
C	Spanner 13 mm (M8)	
D	Spanner 13 mm (M8, S-shape)	For restricted-access areas.
E	Spanner 17 mm (M10)	
F	Spanner 19 mm (M12)	
G	Spanner 24 mm (M16)	
H	Spanner 30 mm (M20)	For hinge-bracket and deck-mount installation bolts
I	Torque wrench (0 – 100 N·m)	For M6–M10 fasteners
J	Torque wrench (40 – 200 N·m)	For M12–M16 maintenance fasteners
K	Torque wrench (100 – 400 N·m)	For M20 installation bolts only
L	Allen key 4 mm	
M	Long-nose pliers	For gripping and wire access
N	Locking-grip pliers	For holding or freeing seized components
O	Tape measure	For dimensional checks and alignment
P	Soft-face mallet	For seating bearings and components without damage
Q	Grease gun	For applying Lithium EP2 grease

REF	ITEM	NOTES / SPECIFICATION
R	Screwdriver (flat-blade)	For control-box screws
S	Screwdriver (Phillips)	For control box and motor / gearbox terminal covers
T	Multimeter	For electrical continuity and control-circuit checks

12.2 Equipment and materials

- 1 Equipment and materials required for SWIFT maintenance, cleaning, and reassembly.
See Table 7.

✓ **Table 7** Approved equipment and materials for maintenance and reassembly.

REF	ITEM	NOTES / SPECIFICATION
A	Thread-locking adhesive — Loctite 243 (Blue)	For stainless-steel fasteners; not to be used with Nyloc nuts
B	Lithium EP2 grease	For general lubrication of bearings, shafts, winch gearbox, and moving parts
C	Cable ties	For securing wiring and conveyor belt
D	Nylon fairlead rope	Temporary handling line for maintenance operations
E	Lifting slings (rated \geq 1000 kg)	For controlled lifting of the SWIFT assembly
F	5 mm Dyneema® winch rope	For manual winch SWK-LB-250-4-20M
G	6 mm Dyneema® winch rope	For manual winch SWK-LB-650-6-20M
H	Soft cleaning brushes	For removing debris and corrosion during cleaning
I	Non-abrasive cloths	For drying and surface finishing after washdown
J	Mild detergent suitable for marine environment	For cleaning in accordance with Chapter 6 – Cleaning
K	Fresh water supply (hose / bucket)	For rinsing during post-cleaning
L	Adult MOB manikin	For functional testing and recovery simulation

13 COMPONENT PARTS AND MATERIALS

This chapter lists the component parts, assemblies, and materials used in the manufacture and maintenance of the SWIFT. Each item is identified by part number, quantity, and description to support correct replacement, ordering, and traceability.

13.1 SWIFT

▼ **Table 8** SWIFT part numbers and descriptions.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	WI-000	Chassis assembly (SW2-003-000, SW2-004000, SW2-005-000, SW2-006-000, SW2-009-000)
2	4	SWI-025-000	Foam mould 1
3	2	SWI-033-000	Tensioner bracket — stainless steel 316
4	2	SWI-037-000	Tension shaft bearing (IGUS EFSM-30, 103A0166)
5	56	M12 x 1.75 x 25 mm	Hexagonal head bolt (stainless steel A4)
6	1	SWI-020-000	Worm drive mounting bracket
7	2	SWI-019-000	Drive shaft bearing (IGUS EFSM-25, 103A0165)
8	1	SWI-022-000	Drive gear box
9	8	M8 x 1.25 x 25 mm	Hexagonal socket head cap screw (stainless steel A4)
10	67	M8 (Form A)	Plain washer (stainless steel A4)
11	8	M10 x 1.5 x 35 mm	Hexagonal socket head cap screw (stainless steel A4)
12	16	M10 (Form A)	Plain washer (stainless steel A4)
13	39	M8 x 1.25	Hexagonal Nyloc nut (stainless steel A4)
14	55	M5 (Form A)	Plain washer (stainless steel A4)
15	55	M5 x 0.8 H	Hexagonal Nyloc nut (stainless steel A4)
16	55	M5 x 0.8 x 25 mm	Hexagonal socket flat-head countersunk screw
17	1	SWI-021-000	Bearing mounting bracket

ITEM	QTY	PART NUMBER	DESCRIPTION
18	2	M12 x 1.75 x 80 mm	Hexagonal head bolt (galvanised steel grade 8.8)
19	1	SWI-023-000	Drive motor
20	1	SWI-032-000	Tensioner shaft assembly
21	1	SWI-016-000	Drive shaft assembly
22	9	SWI-012-000	SWIFT 2 support bar
23	2	SWI-015-000	Pivot axle
24	10	SWI-038-000	Tie bar
25	12	M8 x 1.25 x 35 mm	Hexagonal head bolt (stainless steel A4)
26	2	SWI-036-000	Clamp plate 3
27	82	M12 (Form A)	Plain washer (stainless steel A4)
28	6	M12 x 1.75	Hexagonal half-nut — galvanised steel, grade 8.8
29	12	SWI-031-000	Foam mould 8
30	1	SWI-040-000	Belt 3.6 m x S.25-801 SL PE / Blue, 1340 mm wide
31	1	SWI-013-000	Support bar 2
32	1	SWI-014-000	Support bar 3
33	8	M8 x 1.25 x 40 mm	Hexagonal head bolt (stainless steel A4)
34	16	M8 x 1.25 x 25 mm	Hexagonal head bolt (stainless steel A4)
35	2	SWI-041-000	SWI-041-000
36	1	SWI-029-000	Foam mould 5
37	1	SWI-024-000 (TEDG-TS26)	Tape switch
38	6	SWI-034-000	Clamp plate 1
39	1	SWI-026-000	Foam mould 2
40	12	SWI-030-000	Foam mould 6
41	1	SWI-028-000	Foam mould 4
42	1	SWI-035-000	Clamp plate 2
43	1	SWI-043-000	Tape switch mounting angle
44	18	SWI-044-000	Chassis foam mounting stub

ITEM	QTY	PART NUMBER	DESCRIPTION
45	3	M8 x 1.25 x 20 mm	Hexagonal socket flat-head countersunk screw (stainless steel A4)
46	4	M10 x 1.5 H	Hexagonal Nyloc nut (stainless steel A4)
47	4	M10 x 1.5 x 40 mm	Hexagonal head bolt (stainless steel A4)
48	20	M12 x 1.75	Hexagonal Nyloc nut (stainless steel A4)
49	2	SWI-045-000	Chassis foam mounting stub short
50	1	SWI-046-000	Clamp plate 4
51	1	SWI-027-000	Foam mould 3
52	2	SWI-042-000	Nylon fairlead
53	18	TBC	Belt-drive sprocket, 40 x 40
54	18	TBC	Belt-tension sprocket, 30 ID
55	36	TBC	Belt sprocket spacers, 40 x 40
56	36	TBC	Belt sprocket spacers, 30 ID
57	1	TBC	Drive shaft key
58	1	T-STK-PSSR/2	Relay for tape switch
59	1	ATV12H075M2	Inverter
60	1	ZB4BVB1	White illuminated pilot light
61	1	NSYPLM43G	GRP enclosure, grey, 430 x 330 x 220 mm, IP66
62	1	NSTMM43	Enclosure back plate
63	1	XB4BD912R10K	Potentiometer XB4
64	1	A9A15151	Device holder for potentiometer
65	1	NSYTRAL22	2-way plug-in bridge
66	5	NSYTRAABV35	DIN rail, 35 mm, end bracket, screw-in type
67	5	UB28BK	TCA black base, 28 x 28 mm, adhesive-backed
68	8	UB100ABL	TCA black cable tie, 100 x 2.5 mm (pack of 100)
69	1	XALK178F	Emergency stop (E-stop)
70	?		
71	1	ZB4BV043	Light block, red (window only)

ITEM	QTY	PART NUMBER	DESCRIPTION
72	1	RSLV2A1	Relay
73	1	XALD03	3-push-button control box
74	2	ZENL1111	Contact block — normally open
75	2	ZENL1121	Contact block — normally closed
76	1	ZB5AA334	Push-button head — white
77	1	ZB5AL432	Push-button head — red
78	1	ZB5AA335	Push-button head — black
79	1	TDR235/7.5/M6SL	Terminal rail, 2 m, M6 slot
80	8	NSYTRV22	Linergy screw terminal, 2.5 mm, grey
81	1	NSYTRAC22	Terminal end
82	10	1900M20	20 mm pop-in gland
83	10	1143M20	20 mm locknut gland
84	1	0.75 BLK tri rated	Tri-rated cable (100 m reel; 5 m required)
85	40	4 C 1.5YY (40 m)	4-core YY 1.5 cable?
86	10	3 C 1.5 YY (10 m)	3-core YY 1.5 cable (DRW blue earth)
87	10		Red spade crimp connector
88	10		Red crimp eyelet
89	30		1.5 mm double ferrule
90	30		1.5 mm single ferrule
91	30		1 mm double ferrule
92	30		1 mm single ferrule
93	2	DG16LG	16 mm plastic gland with locking nut (pack of 100)
94	?		
95	10		M5 Nyloc nut (stainless steel A4)
96	10		M5 Allen? cap head screw (stainless steel A4)
97	1	TBC	Electrical full assembly (Craig)
98	1	C01620D00310010	4-pin IP67 male cable mount plug (5401896)
99	1	C01620H00310010	4-pin IP67 female cable mount socket (5401868)

ITEM	QTY	PART NUMBER	DESCRIPTION
100	1	AD-02BMMB-QL8APO	Amphenol circular connector — 2-contact, cable-mount, male plug, IP67 X-Lok series (2101958)
101	1	AD-02BFFB-QL8APO	Amphenol circular connector — 2-contact, cable-mount, female plug, IP67 X-Lok series (2101957)
102			Winch (1) What about the other?
103			Winch rope (Dyneema® , 5 mm)

APPENDICES

A — ANNUAL MAINTENANCE CHECKLIST

Annual maintenance must be carried out by Zelim and/or an approved maintenance organisation.

This checklist is provided for guidance only. The SWIFT Survivor Recovery System Maintenance Manual (PN/SWI/011-00, Version 2.0) must be used when carrying out the annual maintenance.

COMPANY		LOCATION	
MODEL		SERIAL	
			DATE

NO	ITEM	OBSERVATIONS
1	Monthly inspection checklists	
2	Cleanliness	
3	Mounting feet hinge pins (if fitted)	
4	Functional test IAW Chapter 8.1	
5	Conveyor belt and sprockets	
6	Conveyor belt speed test	
7	Conveyor belt tension check	
8	Visual inspection	
9	Deploy SWIFT	

NO	ITEM	OBSERVATIONS
10	Unspool winch rope	
11	Winch rope	
12	Winch	
13	Nylon fairlead	
14	Conduct MOB trial	
15	Isolate electrical control box	
16	Electrical check	

ADDITIONAL COMMENTS

SIGNED (ZELIM)

SIGNED (COMPANY)

NAME

NAME

B — 30-MONTH DEPTH MAINTENANCE CHECKLIST

Depth maintenance must be carried out by Zelim and/or an approved maintenance organisation.

The SWIFT Survivor Recovery System Maintenance Manual (PN/SWI/011-00, Version 2.0) and SWIFT Survivor Recovery System Installation Guide (PN/SWI/010-00, **Version 2.0**) must be used when carrying out depth maintenance and reinstallation on the vessel.

COMPANY		LOCATION	
MODEL		SERIAL	
			DATE

NO	ITEM	OBSERVATIONS
1	Condition review	
2	Disassembly	
3	Inspection	
4	Assembly	
5	Reinstallation	

SIGNED (ZELIM)	SIGNED (COMPANY)
NAME	NAME

C — PRE-DISASSEMBLY INSPECTION CHECKLIST

The Pre-Disassembly Inspection Checklist must be completed by Zelim and/or an approved maintenance organisation prior to commencing disassembly of the SWIFT.

This form is provided for guidance only. Chapter 5.4 – Pre-disassembly must be used when carrying out the pre-disassembly inspection.

COMPANY		LOCATION	
MODEL		SERIAL	
			DATE

NO	ITEM	EQUIPMENT RETURNED?		CONDITION ON RECEIPT		
		Yes	No	GOOD	FAIR	POOR
1	SWIFT	Yes	No	✓	✗	✗
2	Vessel hinge mounting bracket	Yes	No	✓	✗	✗
3	Winch (including rope)	Yes	No	✓	✗	✗
4	Control box	Yes	No	✓	✗	✗
5	3-push-button control box	Yes	No	✓	✗	✗
6	Emergency stop button	Yes	No	✓	✗	✗
7	Electrical cabling	Yes	No	✓	✗	✗
8	Securing pins (x2)	Yes	No	✓	✗	✗
9	Ratchet spanner and 24 mm socket	Yes	No	✓	✗	✗
10	Packing crate	Yes	No	✓	✗	✗

CONDUCTED BY	
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