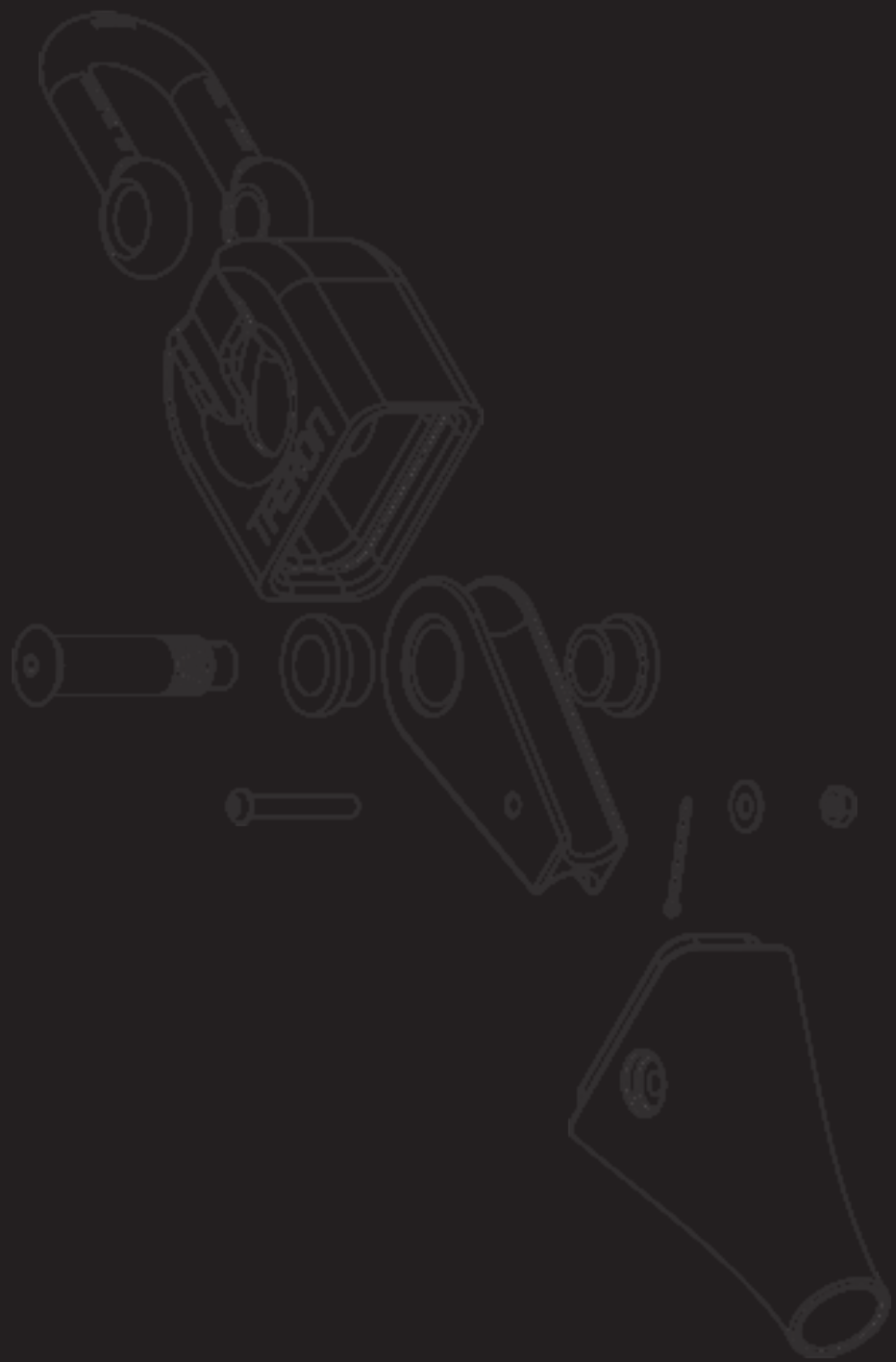


TRACER XLINE



HELICOPTER LONGLINE
Product Manual Rev 4

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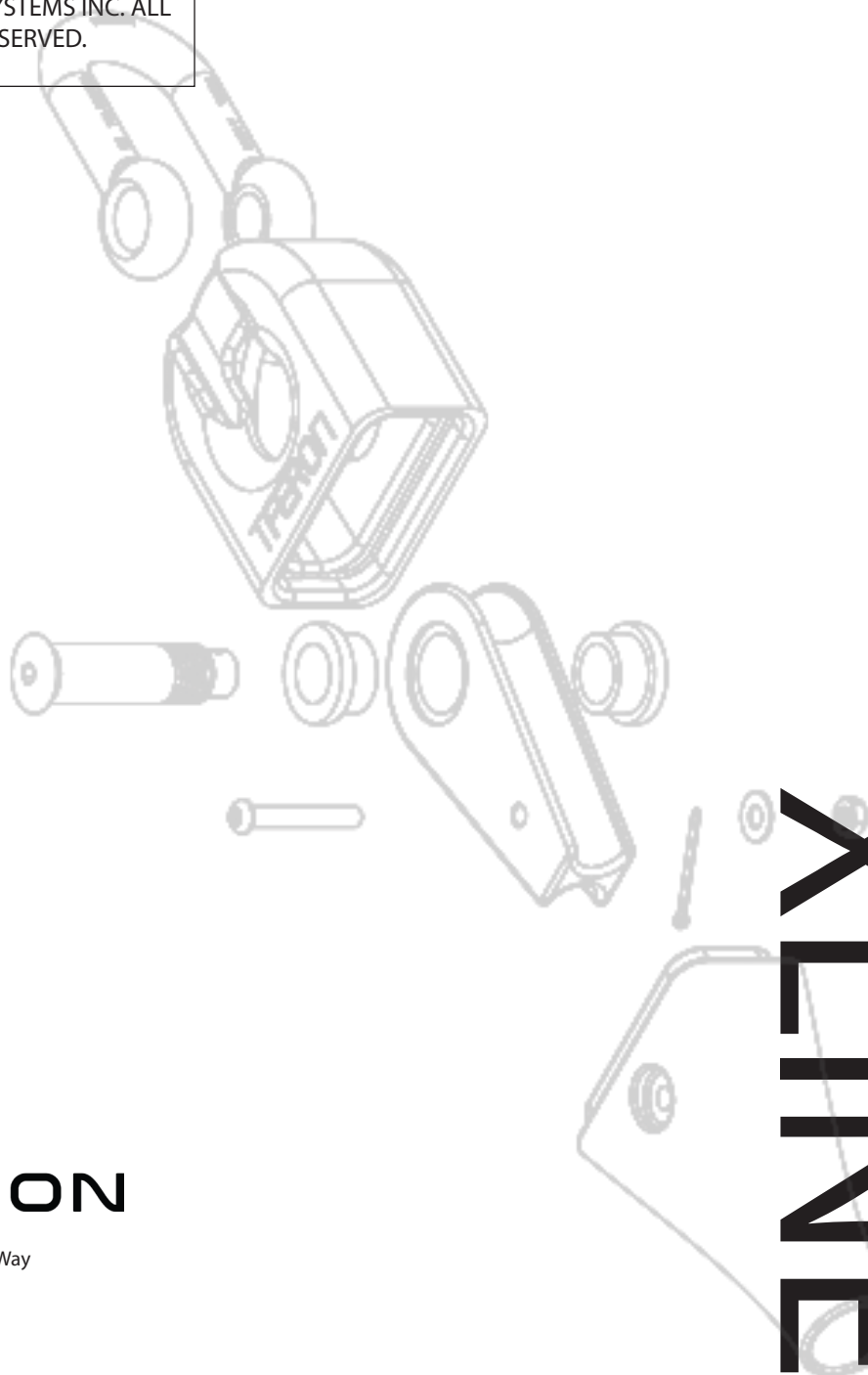
HELICOPTER LONGLINE

Product Manual Rev 4

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XLINER

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LOG OF REVISIONS

REV #	REVISION DATE	REASON FOR REVISION	AFFECTED PAGES	APPROVED BY
0	2018-05-08	Orig Issue	All	CO
1	2018-05-31	Assembly procedure revisions	12, 13, 21, App. A	CO
2	2022-01-12	Addition of Heavy XLine info, minor edits	All	CO
3	2023-09-07	Contact info update, minor changes	All	CO
4	2025-10-30	Life limit updated to 10 years, minor changes	All	PA

WARNINGS, CAUTIONS, & NOTES

The information in this manual is critical to the safe use, maintenance, and care of this equipment. Particular attention must be paid to Warnings, Cautions, and Notes presented as follows:

WARNING

AN OPERATIONAL PROCEDURE, INSTRUCTION, PRACTICE, ETC., WHICH, IF NOT CORRECTLY OBSERVED, COULD RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

CAUTION

AN OPERATIONAL PROCEDURE, INSTRUCTION, PRACTICE, INFORMATION, ETC., WHICH IF NOT OBSERVED, COULD RESULT IN INJURY, DAMAGE TO OR DESTRUCTION OF EQUIPMENT, OR ENVIRONMENTAL DAMAGE.



Note: An operational procedure, instruction, practice, information, etc., which is important to emphasize or highlight. Notes will be accompanied by an “eye” icon in the left margin.



DISCLAIMER

Helicopter lifting operations inherently carry elevated risk of equipment damage, personal injury, or loss of life. It is the USER'S responsibility to ensure that the equipment used is appropriate for the operation, aircraft, and load being carried.

All personnel involved in helicopter lifting operations should be trained in helicopter operations and general rigging procedures, and must be familiar with the information in this manual.

This manual has been provided as a manufacturer's guidance for selection, use, inspection, and maintenance for Taeron XLine helicopter longlines. It is not intended to be used as guidance for helicopter longlines from other manufacturers. Any operational comments are specific to Taeron Equipment and do not supersede any procedure, recommendation, or information in an approved Rotorcraft Flight Manual or Rotorcraft Flight Manual Supplement, regulation, or company operating procedure.

REFERENCES

The following references are provided for informational purposes. Taeron Systems assumes no liability for omissions or incorrect information in this section.

Regulatory References - Canada:

- Canada Occupational Health and Safety Regulations (SOR/86-304) - Part XIV – 14.42, 14.43
- Chapter 10 - Accident Prevention Manual for Business and Industry, 10th edition, published by the National Safety Council of the United States (1992)

Regulatory References - USA:

- OSHA Part No. 1910 "Occupational Safety and Health Standards"
- OSHA Standard No. 1910.183 "Helicopters"
- OSHA Part No: 1926 "Safety and health Regulations for Construction"
- OSHA Standard No. 1926.251 "Rigging equipment for material handling"
- OSHA Standard No. 1926.551 "Helicopters"

Regulatory References - Europe:

- EC Directive 2006/42/EC, Annex I, Part 6 (Machinery Directive)

3rd Party References & Specifications:

- ASME B30.12 – 2011 - Handling Loads Suspended from Rotorcraft
- ISO 18264:2016(E) - Textile slings — Lifting slings for general purpose lifting operations made from fibre ropes — High modulus polyethylene (HMPE)

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SECTION 1 - GENERAL INFORMATION

1.1 - Overview

Thank you for purchasing your Taeron Systems XLine helicopter longline. XLine longlines were developed with the following goals:

1. LONGER LIFE - Extend life while maintaining safety margins over lifetime
2. REDUCE COSTS - Lower costs of replacing high-wear components (e.g. cover)
3. REUSABILITY - Long-term reuse of high cost components (rope terminations)
4. FIELD SERVICEABLE - Repair, service and change components in the field
5. FULL TRACEABILITY - Built with full traceability on all components
6. DOCUMENTATION - Full product documentation (COC, inspection guidance, etc)
7. BUILT TO ISO SPEC - Designed to meet ISO 18264:2016(E)

Taeron XLine helicopter longlines are constructed of industry standard Ultra High Molecular Weight Polyethylene (UHMWPE), also known as High Modulus Polyethylene or HMPE, 12-strand single braid rope with an extruded polyurethane jacket to protect the load-bearing fibre from abrasive particulate ingress and UV radiation, two of the primary causes of strength loss.

The XLine uses a modular design which allows easy changeout of all components in the field, including the HEET™ termination, optional braided flex cover, electrical conductor (if equipped), and primary load line. These design choices make the Taeron XLine the most versatile, low maintenance, and cost effective helicopter longline on the market.

1.2 - Key Figures

8:1	Design Safety Factor (Textile)
4:1	Minimum Safety Ratio (Hardware)
10 Years	Maximum Service Life (Primary Load Line)
On Condition	HEET Terminations & Other Components

1.3 - Types of Operations

Taeron XLine helicopter longlines are intended for use as helicopter lifting longlines during Class B and C external load operations only. The XLine should only be attached to an approved belly hook or other approved jettisonable fixture suitable for external load operations.

WARNING

Taeron XLine helicopter longlines are NOT authorized for use for helicopter Human External Cargo (HEC Class D or Class B) operations. Use in this type of operation could result in serious injury or death.

1.4 - XLine Features & Components

1.4.1 - XLine Features

XLine has been designed and engineered to meet the stringent requirements of helicopter operators, combining the highest levels of safety, the latest technologies, and thoughtful design to create a line that performs in the harshest environmental conditions over the longest service life offered in the industry.

- Excellent flight characteristics
- 8:1 Design Safety Factor
- Built to meet ISO 18264:2016(E)
- Completely modular and field serviceable
- Covered by Taeron Systems' product liability insurance for aviation operations
- Load bearing rope fibre sealed from environment
- RFID enabled ID labels
- Rope Critical Temperature Indicators
- On condition HEET™ terminations

1.4.2 - XLine Components

The Taeron XLine is made up of the following main components:

1. Primary Load Line
2. HEET™ Termination
3. Lifting Ring
4. Braided Flex Cover (optional)
5. Electrical Conductor (optional)

A more detailed description of each main component is provided below.

1.4.3 - Primary Load Line

The Primary Load Line is the load bearing textile component of the XLine assembly. It is constructed of industry standard Plasma® Ultra High Molecular Weight Polyethylene (UHMWPE), also known as High Modulus Polyethylene or HMPE, 12-strand single braid rope with an extruded polyurethane jacket to protect the load-bearing fibre from abrasive particulate ingress and UV radiation.

The rope eyes are sized to fit over the HEET™ Eye Insert and coated with a polymer for abrasion resistance. The rope splice is covered with heavy duty adhesive-lined polyolefin heat shrink tubing, or in later generation lines, a hand coated or molded polyurethane rubber. With these elements, no area of the Primary Load Line fibre is exposed to the environment, ensuring maximum safety margins over the service life of the line.



Note: The Primary Load Line is the only part of the XLine that has a finite service life and must be replaced on calendar life. The HEET™ terminations, protective cover, electrical, and lifting ring are on-condition and may be reused through multiple lifecycles if the condition meets the inspection and retirement criteria established in Section 5.

Table 1-1 - Nominal XLine Rope Sizes and Breaking Strength

Rope Diameter		Working Load Limit		Minimum Breaking Strength	
in.	mm	lbs	kg	lbs	kg
1/2"	13	3,500	1,585	30,000	13,640
5/8"	16	6,250	2,835	51,000	23,200
7/8"	22	11,000	5,000	94,000	42,700

Table 1-2 - UHMWPE Chemical Resistance

UWMWPE FIBER CHEMICAL RESISTANCE*	
Substance	Resistance
Seawater	Excellent
Hydraulic Fluid	Excellent
Kerosene	Excellent
10% Detergent Solution	Excellent
Gasoline	Excellent
Resistance to Acids	Excellent
Resistance to most chemicals	Excellent
*Source: Honeywell Spectra Fact Sheet June 2013	



Some evidence exists showing that UHMWPE fibre can be significantly degraded by the chemical d'Limonene (found in citrus based cleaners). Avoid contact with this chemical.

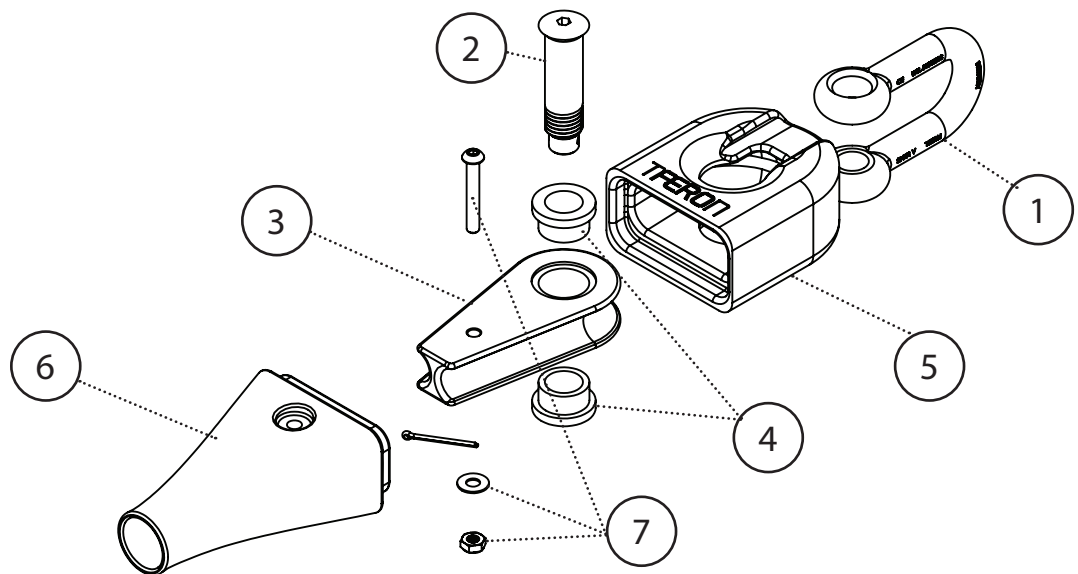


1.4.4 - HEET™ Terminations

The HEET™ (High Endurance Enclosed Thimble) termination is a proprietary design made specifically for helicopter longline operations. It is designed to allow for easy removal for changeout of the Primary Load Line and end hardware. See Fig 1-1 below for a diagram of the subcomponents of the HEET™ termination.

The standard HEET™ is interoperable with 1/2" (3500 lb / 1585 kg WLL) or 5/8" (6250 lb / 2835 kg) XLine assemblies. HEET™ XL are for use with 7/8" (11,000 lb / 5000 kg) class XLine.

Fig 1-1 - HEET Termination (Standard and XL) (note - actual part appearance may differ from diagram)



1,2. Stainless D-Shackle (Replacement P/N XLN-01110 (standard) or XLN-01120 (extended), or T001-20 (machined), or XLN-01510 (HEET XL), or T001-30 (machined XL))

The D-Shackle is constructed from high strength steel alloy with a min 5:1 safety factor.

3. Eye Insert (Replacement P/N XLN-01130 or XLN-01530 (HEET XL))

The eye insert is constructed of anodized aluminum and is used to hold the correct shape in the rope eye.

4. Flange Bushings (Replacement P/N XLN-01107 or XLN-01507 (HEET XL))

Each HEET assembly incorporates 2 flange bushings pressed into the Eye Insert. The flange bushings interface with the D-Shackle Load Pin and provide a durable bearing surface to prevent wear on the aluminum Eye Insert.



Do not use longline or HEET assembly without BOTH flange bushings securely in place.

5. D-Boot (Replacement P/N XLN-01101-XX or XLN-01501-XX (HEET XL))

The D-Boot is one half of the 2 part Heavy Duty protective rubber cover of the HEET assembly. The D-Boot presses over the Primary Load Line eye and locks in place on the Flange Bushings. The D-Boot protects the outer radius of the Primary Load Line eye and prevents the Lifting Ring from damaging or hanging up the Primary Load Line.

6. Y-Boot (Replacement P/N XLN-01710-BK or XLN-01502-XX (HEET XL))

The Y-Boot is the second half of the 2 part Heavy Duty protective rubber cover of the HEET assembly. The Y-Boot is installed onto the Primary Load Line prior to HEET assembly and is held in place by the Boot Retainer Bolt assembly. The Y-Boot protects the converging part of the rope eye and upper splice.

7. Boot Retainer Bolt Assembly

The Boot Retainer Bolt assembly is installed through the Y-Boot and the Eye Insert hole and holds the Y-Boot in place, in turn restricting movement of the D-Boot through a seated fit. The Boot Retainer Bolt assembly comprises a flange-head bolt, washer, and low profile nyloc nut.

8. (Not Shown) Fly Disc (P/N XLN-01750-XX or XLN-01575-XX (HEET XL))

The Fly Disc is an optional replacement for the lower Y-Boot, and provides additional weight and a bumper for the bottom of the line. Install/remove in the same manner as the Y-Boot. Only use Fly Discs on the bottom of the line. The Fly Disc can only be installed in Xlines with cast ends (lines manufactured after 2021).

1.4.5 - Braided Flex Cover (BFC)

The Braided Flex Cover is an optional secondary cover for the longline, providing a protective sheath at low cost. It serves two primary functions:

- 1. Adding a secondary layer of abrasion protection to the Primary Load Line.
- 2. Enclosing the electrical conductor (if fitted)

The braided flex cover comes in different sizes to support different combinations of Primary Load Line and electrical conductor sizes.

Note: A proper fit of the Braided Flex Cover is critical to the ground handling and flight characteristics of the XLine. Please see Section 3 for instructions to install/re-install the Braided Flex Cover while ensuring proper fit.

The Braided Flex Cover is made of Polyethylene Terephthalate (PET), a recyclable plastic. Please contact your local recycling depot for recycling options.

Note: The XLine may be used without the Braided Flex Cover safely. It is a field re-moveable component and may be removed at the operator’s discretion.

1.4.6 - Electrical Conductor

Because XLine assemblies are built with field serviceability as a priority, standard SJOOW electrical cord is used for the electrical conductor. This type of conductor is easily sourceable, inexpensive, and durable in harsh environmental conditions.

Standard conductor configurations are:

Line Size	Standard Supplied	Other Common Sizes*
1/2" - 3500 lb / 1585 kg	16 AWG - 3 Conductor	14-3
5/8" - 6250 lb / 2835 kg	14 AWG - 3 Conductor	12-3, 14-4, 12-4
>5/8"	Built to Order	-

*Note: A variety of specialty sizes & wire types are available. Please call to discuss specialized requirements.

The type of wire supplied new with your XLine will be shown on the manufacturer’s Certificate of Conformance.

Electrical conductor may be installed on the XLine at the operator’s discretion by any means the operator deems secure and will not damage the XLine. It is the operator’s responsibility to ensure electrical conductor is secured in a safe manner prior to use.

1.5 - Documentation & Tracking

1.5.1 - ID Label

XLine longlines include an RFID compatible ID label attached to each end of the longline under a protective heat shrink cover. The ID Label shows important information about the XLine Primary Load Line for quick reference and traceability.

The load bearing components of the HEET™ termination are designed to be interchangeable between longlines and so is traced by lot number instead of individual serial numbers. This meets best practice for rigging equipment and requires minimal operational overhead when switching a HEET™ assembly between lines. All HEET™ components are built with margins for long life and are retired based on condition.

A technical record form is provided in Appendix B for tracking changes, component replacement, abnormal events, etc.

The XLine is built within a formal quality assurance process to ensure full traceability for all components. If you have technical questions regarding your XLine please provide the serial number of the line with your inquiry.

The ID label also contains quick reference information on line characteristics (P/N, diameter, Working Load Limit, etc.) as well as the date of manufacture.

ID labels also contain a passive RFID tag. This RFID tag contains a unique identifier which allows traceability within existing or future tracking systems.

Please check the ID Label prior to the first use of the longline. If the information on the ID Label does not match what is expected/observed please remove the line from service and contact Taeron Systems.

If the ID label becomes damaged, goes missing, or has illegible information please contact Taeron Systems to arrange a replacement label.

Fig. 1-2 - Example ID Label



1.5.2 - Documentation

All XLine longlines are serialized for traceability purposes. Taeron Systems recommends maintaining a detailed history of each line through the date of purchase until retirement from service.

This record may be maintained using paper records such as that shown in Appendix B, or through a 3rd party electronic asset tracking system which maintains suitable electronic records attached to a specific asset.

At minimum, the following should be recorded as part of the XLine technical record:

- Manufacture Date
- Date Put Into Service
- Serial Number
- Date of Inspection
- Inspection Remarks/Problems
- Inspector Signature/Initial
- Replacement of Components
- Manufacturer's Servicing

Examples of items to note in the remarks/problems section of the technical record could include the following:

- Shock loading observed by the pilot or crew,
- Exposure to chemicals or excessive abrasive material,
- Anomalies (e.g. longline is landed on by the helicopter skid, or wrapped around a sharp edge under load)
- Any irregularities found during inspection.
- Lift cycles (if tracked)

1.6 - Configurations

1.6.1 - Weight Classes

To ensure the XLine remains as cost-effective as possible, Taeron Systems has streamlined the available options.

The XLine is currently offered in 3 standard weight classes:

Intermediate Lift: 1/2" Rope Diameter (30,000 lb / 13,640 kg MBS)

3500 lb / 1585 kg WLL (8:1 Design Factor)

Medium Lift: 5/8" Rope Diameter (51,000 lbs / 23,200 kg MBS)

6250 lb / 2835 kg WLL (8:1 Design Factor)

Heavy Lift: 7/8" Rope Diameter (94,000 lbs / 42,700 kg MBS)

11,000 lb / 5000 kg WLL (8:1 Design Factor)

1.6.2 - Lengths

Taeron Systems endeavours to maintain stock of the following lengths of XLine:

Length	1/2"	5/8"
50 ft / 15 m	x	
100 ft / 30 m	x	x
150 ft / 46 m	x	x

Other sizes are available on request but may require additional lead time to prepare.

Note: Line lengths as noted on sales orders and documentation are nominal only. Final lengths may vary by up to 2% due to manufacturing tolerances, stretch, etc.



WARNING

Some combinations of longline length & configuration, aircraft type, and operating environment may present a safety hazard. Always refer to the aircraft manufacturer's external load procedures, company standard operating procedures, and applicable regulations prior to selecting a line length.

SECTION 2 - LIMITATIONS

2.1 - Working Load Limit

The Working Load Limit is the rated load for your XLine and allows the line to have adequate safety margin to account for inflight stresses, material degradation, or minor unknown damage to the line.

The Working Load Limit can be found on the ID Label permanently attached to the line, as well as the manufacturer's Certificate of Conformance.

Never lift more than the Working Load Limit of the line. The Working Load Limit is based on a straight vertical lift only.



Never lift with your XLine in a choker, basket or other lifting configuration besides a vertical pick. Doing so may result in equipment damage or failure.

2.2 - Types of Operations

Taeron XLine helicopter longlines are intended for use as helicopter lifting longlines during Class B and C external load operations only.

The XLine is NOT approved for HEC operations or any other type of ground or marine lifting, towing, yarding, etc.

2.3 - Operating Temperature

All UHMWPE/HMPE longlines experience some degradation of breaking strength at higher temperatures. It is critical that users are aware of this characteristic and do not exceed the rope fibre's critical temperature. The XLine incorporates a temperature indicator at the bottom end of the line to alert users if temperature limits have been exceeded.

The XLine may be continuously operated in temperatures between -40°C - +65°C.

If the line is being operated in proximity to heat or flame (e.g. wildfire suppression, drip torching) do not allow the XLine to be exposed to prolonged high temperature. The user should periodically check the temperature indicator sticker to ensure limits have not been exceeded. If temperature limits have been exceeded please contact Taeron Systems for instructions.

2.4 - Airspeed

The XLine is lightweight and can pose a risk of entanglement with the tail rotor if flown too fast. Always use great care when flying an unloaded line as the safe transit speed may be less than the helicopter's V_{NE} .

The safe transit speed for a longline can vary based on line length, conductor type, cover fit, remote hook, weight, helicopter type, etc.

WARNING

IT IS THE PILOT'S RESPONSIBILITY TO ENSURE THE HELICOPTER IS FLOWN AT A SPEED APPROPRIATE FOR THE LONGLINE USED AND OTHER VARIABLES. EXTREME CAUTION IS RECOMMENDED WHEN FLYING A NEW LINE CONFIGURATION FOR THE FIRST TIME.



SECTION 3 - NORMAL PROCEDURES

3.1 - HEET Removal & Installation

Tools Required:

- 3/16" and 6mm Hex Keys (standard) or 2 x crescent wrenches (XL)
- Pliers
- Side Cutters
- 7/16" Socket/Wrench
- Sharp knife

Materials Required:

- Cotter Pin (MS24665-207 or -384 or similar)

3.1.1 - HEET Removal

1. Remove cotter pin from shackle Load pin. Unthread shackle load pin using hex key or wrenches. Remove shackle from D-boot by working it up over the rubber boot.
2. Remove D-boot by working it over thimble eye.
3. Remove Y-Boot Retainer Bolt Assembly using allen key and socket. Cut Y-Boot retainer tie wrap (Heavy HEET)
4. Push Eye Insert out of rope eye (on lines with non-coated splices).
5. Slide Y-Boot off line over splice.

3.1.2 - HEET Installation

1. Slide Y-Boot over splice onto rope end and work down splice so it does not interfere with installation of other components.
2. Install Flange Bushings into Eye Insert. Ensure they are fully seated into their cutouts.
3. Push Eye Insert into rope eye if required.
4. Install D-Boot in place over soft eye/Eye Insert. Ensure holes line up with Flange Bushings.

3.1.2 - HEET Installation (cont'd)

5. Install Lifting Ring or Locking Hook onto D-Shackle as required.
6. Work D-Shackle & Load Ring/Locking Hook into place with shackle eyes over D-Boot holes.
7. Install D-Shackle Load Pin and tighten until snug.
8. Install cotter pin into load pin hole.
9. Slide Y-Boot to mate with D-Boot and install Y-Boot Retainer Bolt Assembly.

3.1.3 - Braided Flex Cover (BFC) Removal (if installed)



Tools Required:

- Tools required for HEET Removal/Install
- Sharp knife

Materials Required:

Note: If removing cover temporarily for inspection, you do not need to remove the braided flex cover from the longline. Simply push the braided cover to one end, tape it back, and inspect the exposed section of line. Push the cover to the other end of the line and repeat the inspection for the remaining portion of the longline.



1. Remove bottom HEET assembly from line. Refer to Section 3.1.1.
2. Carefully cut BFC retainer heat shrink at both ends of line - take care not to damage rope underneath.
3. Snip the cable ties securing the BFC down the line.
4. Starting at the top of the line, work Braided Flex Cover down line, over splice, and off the end of the longline (Note: Pushing from the top works best as it expands the cover and introduces slack into the assembly).
5. If changing electrical conductor, cut retainer tape or cable ties and remove from line.

3.1.4 - Braided Flex Cover Installation (if installed)

Tools Required:

- Tools required for HEET Removal/Install
- Fish Tape/Rod (at least as long as longest line) - OPTIONAL
- Heat gun
- Hot Knife (if cutting bulk material roll)

Materials Required:

- XLine Cover Kit for line length; or
 - Bulk Braided Flex Cover material of appropriate size; and,
 - 2 x Cover Adhesive Heat Shrink Retainers
 - Cold weather vinyl electrical tape, cable ties, or similar
1. Roll out cut cover kit Braided Flex Cover segment, or cut bulk material with hot knife to match removed cover length and stretch out.
 2. If installing new electrical, lay the Primary Load Line out and apply tension until line is taut. ENSURE ALL TWISTS ARE REMOVED FROM LINE.
 3. Secure new conductor to Primary Load Line with cable ties included in Xline cover kit, or cold weather vinyl tape every 36 inches, ensuring conductor runs parallel to rope for entire length.
 4. Starting at the top of the line, work Braided Flex Cover over the splice, and down the longline (Note: compressing the BFC expands the cover and allows it to pass over the eye at the top of the longline).
 5. Install cable ties over the braided flex cover every 36 inches (in the spaces between the cable ties installed on the electrical wire) down the length of the line.
 6. If there is excess BFC, carefully cut it to length with a hot knife.
 7. When cover is fully onto line, secure TOP end in place using HD adhesive heat shrink retainer and heat gun.
 8. install TOP and Bottom HEET assembly.

3.2 - Pre-Flight Inspection

The XLine should be inspected with a visual and tactile inspection before each use to ensure it is fit for lifting. Please see Section 5 for Pre-Flight (Type I) inspection criteria.

3.3 - Cleaning

Because the XLine rope fibre is sealed from the environment and the Braided Flex Cover allows airflow to pass through, the XLine should not require regular cleaning.

Note: Prolonged exposure to Jet Fuel or other chemicals may reduce the integrity of the Polyurethane Jacket on the XLine, reducing its long-term effectiveness for protection. It is recommended that the line be rinsed with water and a mild detergent after any exposure to chemicals to ensure integrity of the jacket.

3.4 - Storage

Store the XLine away from sources of high heat, chemicals, batteries, and in areas where it may be subject to physical damage.

3.5 - Safety

Personnel should always use appropriate PPE when performing helicopter external load operations using Taeron Systems external load equipment. Please refer to company safety manuals and/or jurisdictional occupational health and safety guidelines for minimum PPE requirements.

Taeron Systems recommends hearing protection, safety glasses, gloves, and steel toed boots when performing external load operations.

All personnel using helicopter external load equipment shall be properly trained in helicopter operations, external load safety, rigging techniques, and equipment specific requirements contained in this manual.



3.6 - Cold Weather Operations

The XLine extruded polyurethane jacket will become stiff when used in extreme cold. The line will maintain full strength down to the minimum temperature noted in Section 2.3; however its handling characteristics may change. The jacket may exhibit some level of “memory” when it is subjected to extreme cold weather when coiled.

To ensure the maximum ease of handling in extreme low temperatures, it is recommended that the line be heated to room temperature prior to uncoiling.

Note: Avoid subjecting the line to sharp radius bends when in an extreme cold conditions.



SECTION 4 - ANOMALIES & ABNORMAL OCCURRENCES

The following are examples of anomalies and abnormal occurrences that could damage the XLine. If any of the following occur, perform a detailed inspection as per inspection criteria in Section 5.

4.1 - Mechanical Damage

Mechanical damage may occur in many ways, including:

- Helicopter landing on line
- Vehicle driving over line
- Line snagging on load/obstacle during lift
- Sharp objects
- Improper use

If any of the above occur, note in the Equipment Technical Record, remove from service, and perform an Anomaly Inspection as per Section 5.4.

4.2 - High Temperature

High temperature environments (e.g. wildfire suppression, drip torching) can expose the XLine to temperatures that may exceed the critical temperature of the rope fibre.

XLines include a temperature indicating sticker near the bottom end of the line. If you suspect that your line has been exposed to high temperatures, check the temperature indicating sticker and perform corrective actions as below:



NO ACTION REQUIRED. NOTE INDICATOR CHANGE IN TECHNICAL RECORD AND OVER-HEAT CAUSE IF KNOWN.



PERFORM ANOMALY INSPECTION AND RETURN TO SERVICE IF PASSED. REPLACE INDICATOR.



RETURN TO MANUFACTURER FOR INSPECTION, PROOF LOAD TEST, AND RECERTIFICATION.



CRITICAL TEMPERATURE EXCEEDED. REMOVE FROM SERVICE & CONTACT MANUFACTURER.

4.3 - Shock Loading

Shock loading occurs when the load on the line suddenly changes from no load or low load to high load. Shock loading may result from pilot action, a load falling, or a number of other factors.

The effects of shock loading may permanently damage the rope fibre and in severe cases may cause failure at a later date while working within the Working Load Limit. Shock loading noticed by the pilot or crew should be recorded in the longline technical record, and in severe cases the line should be removed from service.

4.4 - Torque Buildup

Spinning loads can cause torque buildup in the line leading to internal failure of the rope fibers. This type of damage is difficult to detect during inspections and can cause premature failure of the line at low loads. The only way to completely avoid torque buildup is to use a working swivel at all times when flying loads.



To avoid torque buildup and the risk of premature failure and load loss, always use a swivel with your XLine.

4.5 - High Voltage Environment



The XLine is not tested or rated as a dielectric longline. Always use extreme caution when using the XLine near high-voltage electrical lines as arcing or discharge may occur. Dielectric longlines should be used when operating in extreme proximity to high voltage lines. Consult with personnel trained in high-voltage work procedures prior to operating in a high-voltage environment to ensure work procedures will be safe.

SECTION 5 - INSPECTIONS, LIFE LIMITS & RECERTIFICATION

5.1 - Personnel Qualifications

All personnel tasked to perform inspections on external load equipment should be:

- Trained in Helicopter External Load operations
- Trained in rigging techniques
- Familiar with the applicable references provided at the front of this manual
- Familiar with the information in this manual

5.2 - Inspection Forms

An inspection form is provided in Appendix A. This form should be used to document at minimum all Type II and Type III inspections (see Types of Inspections below). All inspections should be noted in the longline technical record or equivalent. Refer to Inspection Form for specific Type I, Type II, and Type III inspection requirements.

5.3 - Types of Inspections

Inspection Type	Minimum Frequency	Performed
Type I	As required	• Line Acceptance • Preflight • Postflight
Type II	12 Months	• Annually
Type III	24 Months	• Every 2 years • Failed criteria in Type II • Abnormal Occurrence

5.4 - Inspection & Retirement Criteria

Component(s)	Criteria	Signs	Retirement/Repair Criteria
Braided Flex Cover (if installed)	Abrasion	Monofilament fibres worn through	Full wear through of fibre bundle. If localized repair with HS patch; if more than 1 patch per 10ft average, cover replacement recommended
	Torque	Cover obviously twisted, tight around localized sections	Inspect Primary Load Line for signs of excessive torque. Reset cover if top/bottom retainer HS has been pulled.
	Heat	Melted monofilament	Check Primary Load Line for heat damage. If PLL undamaged patch/replace cover.
	Chemical	Disintegration or discoloration	Inspect Primary Load Line for chemical damage. If PLL undamaged patch/replace cover.
	Mechanical Damage	Cuts, tears, pulled monofilament	Inspect Primary Load Line for mechanical damage. If PLL undamaged patch/replace cover.

5.4 - Inspection & Retirement Criteria (cont'd)

Component(s)	Criteria	Signs	Retirement/Repair Criteria
Primary Load Line	Abrasion	Extruded Jacket / Soft Eye Coating Wear	Full wear through of extruded jacket and/or soft eye coating. If rope fibres visible please contact Taeron for evaluation.
	Torque	Flattened rope areas, torque wrinkles in extruded jacket.	Remove from service and contact Taeron if rope exhibits signs of torque loading.
	Heat	Melted extruded jacket, temperature indicator turned	Check temperature indicator and extruded jacket for heat damage. If no heat damage on extruded jacket, follow procedures in Section 4.2 based on temperature indicator reading.
	Chemical	Disintegration of extruded jacket	Extruded jacket degraded or disintegrated. If any rope fibre visible or chemical damage to extruded jacket visible, remove from service and contact Taeron.
	Mechanical Damage	Extruded jacket cut	Inspect Primary Load Line for mechanical damage. Patch/replace flex cover as necessary.
	Splice Slippage	Soft eye loose on HEET, exposed rope fibre around base of coated soft eye	Remove from service and contact Taeron if >1" slippage evident
	Inconsistent Diameter	Localized areas of smaller/larger diameter, bumps	Remove from service if localized areas show diameter differences of +/- 20%, or display any evidence of thinning or soft texture through extruded jacket
	Knots	Knots in primary load line	Remove from service if line has been loaded with knots
HEET	Missing Components	Missing Cotter Pin, Y-Boot Retainer Hardware, etc.	Replace any hardware missing
	Cracking, dents, and corrosion	Damage or corrosion on D-Shackle, Load Pin, Eye Insert, or Flange Bushings	Any cracking, dents/corrosion pits deeper than 1/16" (1.5mm)
	Rope Eye	Soft-Eye loose on Eye Insert	Ensure looseness is not due to splice slippage. If eye is loose apply whipping so eye is snug.
	General Condition	Boot damage, etc.	Replace torn or degraded boot components if hazardous to flight or ground personnel
Electrical	Continuity	Ensure continuity in all circuits	Replace conductor if no continuity
	Plugs	Broken/cracked/no continuity	Replace if damaged
	General Condition	Cuts/abrasion of conductor jacket	Examine areas where flex cover is damaged to see if conductor damaged as well.

5.5 - Service Life Limit

The XLine is designed for a service life of 10 years, while retaining more strength over its service life than other lines.

It is important to note that many factors can affect the line that may reduce its service life (damage, heat, etc.). In all cases regular inspections must be performed in accordance with the Inspection Form in Appendix A and passed to remain in service. A conservative approach to retirement is strongly recommended - if in doubt about the condition of the XLine, tag and remove from service and consult Taeron Systems.

5.6 - Recertification

The XLine is designed to last for its entire service life without recertification with proper use and care and if no abnormal events occur.

There are a limited number of circumstances following an anomaly in which a recertification may be performed by Taeron. Taeron Systems reserves the right to refuse to recertify a line based on our analysis of the condition, anomaly, or other factors.

5.7 - Repairs & Servicing

The XLine is designed to allow changeout of any primary component in the field. This may be performed by the user with proper documentation in the equipment Technical Record.

Any repairs or servicing beyond component change (e.g. resplice, etc.) must be performed by Taeron Systems or an authorized representative.

SECTION 6 - LIMITED EQUIPMENT WARRANTY

Taeron Systems Inc. ("Taeron Systems") warrants that all Taeron Systems' manufactured equipment will be free of any defect in materials or workmanship for the period of (1) year. Warranty begins from the date of shipment from a Taeron Systems facility. The warranty is extended to the Buyer and applies to all Taeron Systems manufactured equipment purchased, installed, and used for the purpose for which such equipment was originally designed. For products made by other manufacturers and sold by Taeron Systems, only the manufacturer's warranty shall apply. The above warranties cover only defects arising under normal use and do not include malfunctions or failures resulting from misuse, abuse, neglect, alteration, improper storage and/or care, usage not in accordance with product instructions, acts of nature, or improper installation or repairs made by anyone other than Taeron Systems or an authorized third-party service provider. This warranty does not cover parts and/or items that are subject to wear and tear in normal use, or those items for which special warranty terms are included as part of the sale. Taeron Systems reserves the right to substitute functionally equivalent new or serviceable used parts.

Buyer understands and acknowledges that the use of the goods purchased from Taeron Systems (ether manufactured or distributed) may present a safety risk, result in injury or death, and/or present a risk of damage to property if used incorrectly. It is the responsibility of the Buyer to ensure that all products purchased from Taeron Systems or combinations thereof are suitable in condition and type for intended use. Consequently, Buyer shall comply with all applicable rules and regulations and with all use specifications and other requirements provided by Taeron Systems in any form including documents included with goods, on Taeron Systems' website, in manuals, specification sheets, Terms & Conditions, sales documentation, labels, or any other form before using the equipment or allowing use by a third party.

The Buyer shall hold harmless, indemnify and defend Taeron Systems from and against any and all claims, demands, causes of action, suits or judgments (including costs, expenses and reasonable attorney fees incurred in connection therewith) for the death or injury to any person or for loss of or damage to property arising out of or in connection with the improper use of the goods caused by Buyer's negligence and for any default hereunder. This provision shall survive the termination of this purchase. IN THE EVENT THAT THIS DISCLAIMER OF LIABILITY IS HELD BY A COURT OF COMPETENT JURISDICTION NOT TO APPLY TO BUYER, SELLER'S MAXIMUM LIABILITY TO BUYER ON ANY CLAIM IN ANY WAY CONNECTED WITH THE SALE OR USE OF ANY OF THE PRODUCTS, WHETHER LIABILITY ARISES IN CONTRACT, FROM BREACH OF WARRANTY, IN TORT OR OTHERWISE, SHALL BE LIMITED TO THE PRODUCT'S INVOICE PRICE.

WARRANTY CLAIMS AND PROCEDURES

During the applicable Limited Equipment Warranty Period outlined above, Buyer's sole and exclusive remedy for any breach of the Limited Equipment Warranty will be, at Taeron Systems' sole discretion and option, the repair or replacement of the defective product, with all transportation costs at Buyer's expense. Components that Buyer claims to be defective must be available to Taeron Systems' for inspection and evaluation. To be entitled to rights under the Limited Equipment Warranty, the customer must notify Taeron Systems in writing within thirty (30) days after discov-

ering a suspected defect in any product, but in any event prior to the expiration of the applicable Limited Equipment Warranty Period. Following its receipt of any such customer notice, Taeron Systems will determine whether the reported problem is covered by this Limited Equipment Warranty. If Taeron Systems determines that the problem is covered, Taeron Systems will authorize repair or replacement of the defective product, as deemed appropriate by Taeron Systems in its sole discretion.

EQUIPMENT WARRANTY EXCLUSIONS

Taeron Systems does not warrant or guarantee, and is not responsible for:

1. Defects, failures, damage or restrictions caused in whole or in part by (A) fires, floods, snow, ice, lightning, excessive heat or cold, highly corrosive environments, accidents, actions of third parties, or other events outside of Taeron Systems' control, or (B) Buyer or 3rd party abuse, mishandling, misuse, negligence, improper storage, servicing or operation, or unauthorized attempts to repair or alter the equipment in any way.
2. Alterations and/or Modifications to any part of the equipment, without Taeron Systems' written authorization unconditionally VOIDS the Taeron Systems Limited Equipment Warranty.
3. Equipment built to Buyer specifications that are later found not to meet Buyer needs or expectations.
4. The performance of the equipment when used in combination with equipment not purchased, specified, or approved by Taeron Systems.

LIMITATION OF LIABILITY: OTHER THAN THE LIMITED WARRANTY STATED ABOVE, TO THE EXTENT PERMITTED BY LAW, TAERON SYSTEMS DISCLAIMS ALL OTHER IMPLIED OR EXPRESS WARRANTIES, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY IS YOUR SOLE REMEDY AND TAERON SYSTEMS SHALL NOT BE LIABLE FOR ANY DAMAGES, WHETHER DIRECT, INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL, EXEMPLARY, OR OTHERWISE, INCLUDING LOST REVENUES AND LOST PROFITS, ARISING OUT OF ANY THEORY OR RECOVERY, INCLUDING STATUTORY, CONTRACT OR TORT. NOTWITHSTANDING THE TERM OF ANY LIMITED OR IMPLIED WARRANTY, OR IN THE EVENT THAT ANY LIMITED WARRANTY FAILS OF ITS ESSENTIAL PURPOSE, IN NO EVENT WILL TAERON SYSTEMS' ENTIRE LIABILITY EXCEED THE PURCHASE PRICE OF THIS PRODUCT.

SECTION 7 - ANOMALY REPORTING & PRODUCT FEEDBACK

7.1 - Anomaly Reporting

If any Taeron Systems external load equipment is involved, or suspected to be involved, in any accident, incident or near miss please contact Taeron Systems immediately at +1-778-802-9944 or info@taeron.ca.

Please provide the following information when reporting an anomaly:

1. Occurrence Date
2. Equipment Type
3. Equipment Serial Number
4. Nature / Weight of Load
5. Type of Activity
6. Aircraft Type
7. Operating Environment
8. Equipment Purchase Date
9. Equipment History (Technical Record)
10. Pictures showing issue (if possible)

If appropriate, Taeron Systems will perform an investigation and analysis of equipment contributing factors and communicate any relevant findings, bulletins, or recalls to affected customers.

7.2 - Product Feedback

Please submit any complaints, comments, suggestions, or testimonials via e-mail to:

info@taeron.ca¹

Section 1 - Company Information

Company Name:	
Inspection Location:	
Inspected By:	

Section 2 - Equipment Information

Length:		S/N:	
DOM:		WLL:	
Top HEET Batch #:		Bottom HEET Batch #:	
Primary Ring:		Bottom HW:	

Section 3 - Initial Review

Y

N

Remarks

1. Has the equipment exceeded its service life (if applicable)?			
2. Are up-to-date manufacturer's User Manuals and/or documentation available?			
3. Is a complete and up-to-date Equipment Technical Record or equivalent usage history log available?			
4. Has the equipment been removed from service for any reason?			
5. Have there been any major repairs, modifications, or alterations to the equipment by anyone other than the manufacturer?			

Section 4 - Inspection Procedures

PASS

FAIL

Remarks

Type I	ID Label	Check to ensure ID label is present, legible, and information correct			
	Braided Flex Cover (BFC) (if installed)	Perform quick visual and tactile inspection for major damage as per Section 5.4. Pay particular attention for signs of torque buildup.			
	Primary Load Line (PLL)	Perform tactile inspection along entire length through Braided Flex Cover. If BFC has damage, perform detailed through-cover check of PLL. If any damage visible on PLL extruded cover, perform Type III inspection.			
	HEET Terminations	Exterior visual general condition inspection. Ensure cotter pin in place and Primary Ring/Bottom Hardware appropriate for belly hook/WLL and in good condition.			
	Electrical	Ensure continuity with hook release check, inspect plugs for damage.			

Section 4 - Inspection Procedures (cont'd)

PASS

FAIL

Remarks

PERFORM ALL INSPECTION STEPS IN TYPE I INSPECTION PLUS THE FOLLOWING:					
Type II	Braided Flex Cover (BFC)(if installed)	Perform detailed visual and tactile inspection for damage as per Section 5.4. Repair or replace cover as necessary. Note any signs of twisting/torque buildup.			
	Primary Load Line (PLL)	Perform tactile and visual inspection along entire length through BFC. If BFC has damage, perform detailed through-cover check of PLL. If any damage or torque signs visible on PLL extruded cover, perform Type III inspection. Inspect for Splice Slip-page after HEET Disassembly.			
	HEET Terminations	Disassemble HEET and perform visual inspection as per Section 5.4. Check rope eye/whipping and re-whip eye if loose.			
PERFORM ALL INSPECTION STEPS IN TYPE I & TYPE II INSPECTIONS PLUS THE FOLLOWING:					
Type III	Braided Flex Cover (BFC)(if installed)	Detailed visual and tactile BFC inspection. Remove BFC retainer heat shrink. Remove BFC as per Section 3.1.3 for full inspection of PLL.			
	Primary Load Line (PLL)	Disassemble HEET and remove Eye Insert as per Section 3.1.1. Remove BFC as above. Perform detailed inspection of PLL as per Section 5.4.			
	Electrical	Ensure electrical retainer tape is secure and replace as necessary. Remove electrical plugs and inspect/clean. Inspect full length of electrical cord/conductor for cuts, twists. Check continuity after reassembly.			

Section 5 - Sign Off

Inspector Name:		Signature:	
Inspection Date:		Result:	☐ RETURNED TO SERVICE ☐ REPAIRED/COMPONENT CHANGE (note below) ☐ REMOVED FROM SERVICE
Notes:			

