Serving Rescue Hoist Users Worldwide

When the right tool for the job is needed

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Part # ZRG-7000-1 DarkLight G2G
(For use with most Goodrich Style Hooks; not for use with the EC145 or EC135 and Lakota Installations)

Part # ZRG-6000-1 DarkLight G2B
(For use with Breeze Style Hooks)

Part # ZL-1000-1 AxelCut™
NSN# 5110-01-521-1998

ZGS-15000-3
Magnetic Rescue Hoist Wire Rope Inspection System (MagSens™)
NSN# 3950-01-580-1775

ZGS-10000-5 Hydraulic RHGSE
NSN# 1730-01-573-2486

ZGS-10300-1 Electric RHGSE

ZGS-11000-2 v2 Manual RHGSE
NSN# 3950-01-580-0783

Customized Fixed Rescue Hoist Ground Support Equipment Test Facility
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Part # ZL-1000-1 AxelCut™ NSN# 5110-01-521-1998
True one handed cutting capability for airborne hoist cables. Light weight, cuts clean, fast and easy. Allows for repeated cutting capability. Reduces life cycle costs, less expensive than hoist squib and refire kits. Permits hoist installed squib to be used as the backup cable cutter. Solves the reliability problem with existing cutters, eliminating inadvertent releases, and no-fire possibility. Unaffected by EMI, lightning or any other possible hoist system failures. Qualified to +160°F, -40°F, Salt Fog, and Endurance.

Part # ZL-6000-3 QuickSplice™ with Slide Lock Hook
Allows a fast and safe method of attaching a rescue hook when all else fails allowing the mission to be completed!
The intended use for the QuickSplice is to replace the rescue hook, if the wire rope becomes entangled and must be cut or breaks, in circumstances where there are no other options available.
The QuickSplice has been tested to hold loads up to 2500lbs.

Part # ZL-6024-1 QuickSplice Mounting Assembly
For use with the ZL-6000-3 QuickSplice.

Part # ZL-1100-1 E-Kit™ NSN# 1560-01-543-3257
The E-Kit contains the AxelCut™, QuickSplice™, and a mounting plate, which allows for the equipment to be mounted on the aircraft for easy access when needed.
The DarkLight G2 is an LED device used to illuminate the hook assembly to enhance your rescue hoist mission during low visibility or night operations. It is equipped with green and red LED’s to be used for increased hook visibility and signaling, as well as NVG compatible infrared LED’s to be used in covert operations. **No airworthiness certification is required.**

The DarkLight G2 is designed for easy installation and maintenance. The device hinges open and utilizes a captured spring loaded latch pin, and can be installed and removed in just seconds with **no hook disassembly.**

The body of the DarkLight G2 is constructed of impact resistant polycarbonate and constructed to be dust and water resistant. The device is operated by a single push button design making operating the device simple. The button is located on the bottom of the device and is powered by a single CR123A lithium battery providing 30+ hours of battery life.

Regardless of weather conditions, the DarkLight G2 is ideal for improving your visibility during your rescue hoist missions. Providing a simple and effective method of signaling between ground crew and hoist operators and also providing you with NVG Compatible infrared LED’s for covert operations.

**ZRG-7000-1 DarkLight G2G**
(For use with most Goodrich Style Hooks; not for use with the EC145 or EC135 and Lakota Installations)

- **Weight:** 1.1 lbs.
- **Height:** 1.25 in.
- **Width:** 6.6 in.

**ZRG-6000-1 DarkLight G2B**
(For use with Breeze Style Hooks)

- **Weight:** 1 lb.
- **Height:** 1.25 in.
- **Width:** 5.2 in.

**Infrared Lights:**
- **While OFF** – Hold button 3 seconds for ON (BLUE LED will fade up to indicate IR is ON).
- **While ON** – Hold button 3 seconds for OFF (BLUE LED will fade down to indicate IR OFF).

**Visible Lights:**
- **While OFF** – Hold button until RED light illuminates Dark Light G2.
- **While ON** – Press Button to cycle between RED and GREEN lights.
- **While ON** – Hold Button until Visible Lights turn OFF.

Easy to install on hook and to change battery.
Detailed and Technical Information for
Zephyr International Rescue Hoist Ground Support Equipment
United States Patent # US 7,429,031 B1

Zephyr International LLC offers several different types of Rescue Ground Support Equipment (RHGSE) for rescue hoists with or without our Magnetic Rescue Hoist Inspection System (MagSens). These systems are in use servicing rescue hoists worldwide.

The RHGSE has demonstrated itself to the customer to be cost effective and also a good safety tool when tensioning, cleaning, lubricating, drying and examining the hoist cable after each mission and/or at hoist and cable maintenance times. The primary reasons on why to use the RHGSE are enhancement of mission performance, decreased costs, and increased safety.

While doing these maintenance tasks human hands do not need to touch the cable while it is wound inside a tub to be cleaned; thus, protecting the maintainers hands and avoiding any possibility of getting the hands entangled in the cable. All our models of the RHGSE all work with either Breeze-Eastern and/or Goodrich Style Hoists.

Hydraulic Powered Versions
- ZGS-10000-5 Hydraulic RHGSE includes the onboard Magnetic Inspection System (MagSens)  
  NSN# 1730-01-573-2486 (Was prior to Dec 2013 NSN#1680-01-573-2486)
- ZGS-10000-5-1 Hydraulic RHGSE **Does not include the Magnetic Inspection System**  
  NSN# 4920-01-577-1794

Manually Powered Versions
- ZGS-11000-4 Manual RHGSE includes the onboard Magnetic Inspection System (MagSens)
- ZGS-11000-2 v2 Manual RHGSE **Does not include the Magnetic Inspection System**
  NSN# 3950-01-580-0783

Electric Powered Version
- ZGS-11300-1 Electric Rescue Hoist Ground Support Equipment  
  **Does not include the Magnetic Inspection System**
- ZGS-11300-2 Electric Rescue Hoist Ground Support Equipment
  Includes the onboard Magnetic Inspection System (MagSens)

Magnetic Inspection System
- ZGS-15000-3 Standalone Magnetic Rescue Hoist Wire Rope Inspection System  
  NSN# 3950-01-580-1775 can be purchased separately as a standalone.

Rescue Hoist Test Facilities (Customized to meet the customer’s requirements)
- ZGS-12000-X Rescue Hoist Test Facility (Intermediate or Depot Level)
- ZGS-16000-X Complete Rescue Hoist Ground Support Test Facility  
  (Intermediate or Depot Level)
**Hydraulic Powered Version:**

- ZGS-10000-5 includes MagSens
- ZGS-10000-5-1 without MagSens

Maximum load retracting 600 lbs / 272.7 kg
Minimum load retracting 10 lbs / 4.5 kg
Maximum load extending 200/ 90.9 kg
Maximum speed extending and retracting 350 FPM
Maximum length wire rope – 300 ft / 91.44 m
- Load Indication standard
- Length Indication standard
- Wire rope cleaning and desalination system standard
- Wire rope inspection system standard
- Onboard compressor for drying the wire rope
- Fully automatic onboard battery charging system
- Fully sealed Advanced Glass Mat lead acid battery system- air transportable
- 24 Volts Electro-hydraulic drive
- Mil-H-5606 or Mil-H-83282 hydraulic fluid
- *Dedicated standalone computer now supplied in the ZGS-10000-5*

**Dimensional data:**

- Length - 48 in / 121.9 cm
- Width – 36 in / 91.4 cm
- Height – 60 in / 152.4 cm (can be configured to 48 in/ 121.9 cm for transport inside the helicopter)
- Weight – 700 lbs / 318 kg easily transported by one person, forklift or tug.

ZGS-10000-5 is shown above

ZGS-10000-5 is shown above with MagSens
Manually Powered Version:
- ZGS-11000-4 includes MagSens
- ZGS-11000-2 v2 without MagSens

Maximum load retracting 600 lbs / 272.7 kg
Minimum load retracting 10 lbs / 4.5 kg
Maximum load extending 20 lbs / 9.1 kg
Maximum speed- unlimited
Maximum length wire rope- 300 ft / 91.44 m

- Load indication- standard
- Wire rope cleaning and desalination system standard
- Wire rope inspection system - optional

Dimensional Data:
- Length - 28 in / 71.1 cm
- Width – 33 in / 83.8 cm
- Height – 52 in / 132.1 cm
- Weight - 580 lbs / 263.6 kg easily transported by one person, forklift or tug.

ZGS-11000-4 is shown above
**Electric Powered Version:**

- ZGS-11300-1 without MagSens
- ZGS-11300-2 includes MagSens

Zephyr introduces the latest version of its patented rescue hoist ground support equipment. Building on the manual rescue hoist ground support tool, the new design incorporates an electrical motor to extend the cable instead of requiring the operator to crank the handle to extend the cable. The design is such that the manual crank handle is retained so that the tool can be used on the flight line in the manual mode. This version provides great versatility and simplicity to the user.

The Electrical RHGSE will extend the rescue hoist cable at loads in excess of 25 lbs / 11.4 kg, and allows the retracting of the cable with loads up to the rated load of the rescue hoist.

The electrical power required is 110 VAC up to 10 amps or 220 VAC up to 5 amps. The operator attaches the rescue hoist cable and then just actuates the switch and the system is ready to extend the entire length of cable, then the operator engages the clutch system and the cable can be retracted while the load is displayed on the digital readout. The system includes the ability to wash dry, and lubricate the cable and is compatible with the MagSens™ rescue hoist cable inspection system.

Maximum load retracting 600 lbs / 272.7 kg  
Minimum load retracting 10 lbs / 4.5 kg  
Maximum load extending 50 lbs / 22.7 kg  
Maximum speed- unlimited  
Maximum length wire rope- 300 ft / 91.44 m

- Load indication- standard  
- Wire rope cleaning and desalination system standard

Input Power

- 110 VAC  6 amps  
- 220 VAC 3 amps

Dimensional Data:

- Length - 28 in / 71.1cm  
- Width – 33 in / 83.8 cm  
- Height – 52 in / 132.1 cm  
- Weight - 600 lbs / 272.7 kg easily transported by one person, forklift or tug.
Magnetic Wire Rope Inspection System (MagSens™)
Can be purchased onboard with the above RHGSE systems or can be purchased separately as a standalone unit to work with RHGSE.

Magnetic flux leakage wire rope inspection can identify defects such as broken wires, severe abrasion, necking down, heat damage, corrosion and internal damage in the wire rope quickly and efficiently by one person in a confined space.

- Included onboard with the ZGS-10000-5 Hydraulic RHGSE.
- Included onboard with the ZGS-11000-4 Manual RHGSE.
- Included onboard with the ZGS-11300-2 Electric RHGSE.
- Available as a standalone system: ZGS-15000-3 Magnetic Wire Rope Inspection System.

Zephyr International LLC has developed and sells the only inspection system for rescue hoist wire ropes. The MagSens™ system provides the rescue hoist maintainer the capability to measure and record locations of defects in the rescue hoist cable and to provide a permanent record of the cables structural integrity.

The system provides the rescue hoist user organization many benefits as follows:

a) Detect damage that may occur as a result of the rescue hoist usage in a minimum amount of time.

b) Eliminate unnecessary replacement of the wire rope until required.

c) Provide objective evidence that the wire rope was in an acceptable condition before the mission.

d) Track the effects of the helicopter and hoist operation and maintenance techniques upon the rescue hoist cable physical condition over time.

The dedicated laptop computer records the results of the inspections. The software records the rescue hoist identification, the date of the test, the results of the test, the amount of wire rope that was run, and the magnetic signature of the wire rope for future references. The MagSens inspection system provides a baseline of the wire rope when it is installed and then can compare the wire rope condition during future inspections. The data files are small so this information can be downloaded to a central location via the internet for users with remote bases.
**Intermediate and Depot Level Test Equipment** *(part number unique to customer)*

For use with any Hydraulic Hoist, Electric Hoist, Clevis or Post Mount.

Adaptable to any hoist in use in the world

**Maximum Loads**

600 lbs / 272.7 kg extending and retracting at any speed

1800 lbs / 818.2 kg static load

Input power display
- Flow and Pressure
- Voltage and Current

Output power display
- Speed and Load
Introduction:

Helicopter rescue hoists use tension rollers to keep their wire rope tight on the drum. The tension rollers are driven to keep the wire rope under tension on the drum with a scrub roller or positive contact roller. The tensioning device relies on physical contact with the wire rope.

Historically hoist failures occur when the hoist is run under no load and the wire rope gets loose on the drum and fouls the rescue hoist mechanism. Because the tensioning systems that are in use today only provide approximately 7 to 20 lbs of force on the wire rope, the cable tensioning system can easily be overcome and the wire rope loosens up on the drum. This normally will not happen in flight but happens with regularity when the hoist is operated on the ground during inspections, maintenance etc.

When a hoist wire rope loosens and fouls the hoist. The damage that results can cost thousands of dollars to repair and significant time with the OEM. In addition if the wire rope mis-wraps on the lower layers when winding and the operator does not see the mis-wrap the wire rope can foul in flight putting the crew and the mission in jeopardy.

For these reasons the hoist cable should be stored tight on the drum at all times. The OEMs require reseating the cable at regular intervals, before the Zephyr International LLC Rescue Hoist Ground Support Equipments introduction this could only be performed by flying the helicopter while slinging a heavy load.

Zephyr International LLC provides a series of Rescue Hoist Ground Support Equipment that solves these problems for hoist maintainers. The RHGSE provides these benefits:

(See above for a technical description for available RHGSE models.)

- Maintains positive tension on the wire rope at all times.
- Applies load over the entire length of wire rope on the rescue hoist drum as it retracts the wire rope with the aircraft on the ground. The full load tension is easily adjustable.
- Keeps the wire rope off the ground and in a protective enclosure during hoist maintenance.
- Allows one person to perform all inspections and maintenance operations in a minimum amount of time.
- Allows the inspections to be performed with the hook and bearing attached to the wire rope.
- Measures and provides a record of the wire ropes physical condition over its installed life.
- Installs new wire ropes and conditions them
- Reseats the cable without having to fly the helicopter
Technical Description: (varies depending on model)

The Zephyr Hydraulic RHGSE utilizes a hydrostatic drive to power dual capstans; using three revolutions of wire rope on the system to provide enough traction to apply 600 lbs to the rescue hoist. The hydrostatic power system is fully integrated on the RHGSE frame and consists of the frame, hydrostatic drive, onboard batteries, charging system, capstan tensioning devices, cable washing, dryer/lubricator, wire rope take up device, wire rope inspection system (optional), wire rope length and load indication.

The Zephyr Manual RHGSE utilizes human power to drive the dual capstans, and is capable of providing a steady cable extraction force of up to 20 lbs and can apply a full 600 lbs tension when retracting. The basic system includes systems to perform tensioning, cable washing, drying and lubricating, wire rope length and load indication. The system can be supplied with an optional onboard Magnetic Wire Rope Inspection System (MagSens)™ which measures the wire rope structural condition and documents the inspection.

Both the Zephyr Hydraulic and Manual RHGSE units are integrated onto a mobile platform that is forklift able, flight line tug compatible and man portable. Also keeps the wire rope off the ground and in a protective enclosure, allows one person to perform all inspections and maintenance with the hook attached to the wire rope, install new wire ropes and condition them.

Theory of Operation:

The Zephyr RHGSE uses a dual capstan tensioning system to maintain tension in the wire rope when extending and applies loads adjustable to 600 lbs on the wire rope as it is retracted back into the rescue hoist. The dual capstan drive is timed to match the rotation of a take up drum.

The load is adjustable via two simple adjustments; the wire rope is always under tension when it is extending or sitting idle, and can be subjected to full rated load when the rescue hoist retracts it on to the drum.

The wire rope is collected in a powered rotating drum. The rotating drum allows the wire rope to spool in a manner so that no twist is induced. This storage method does not put any external forces into the wire rope as it is stored in the drum. In the event the hoist has been used over the sea or a dusty environment, the drum is filled with water to clean off the salt deposits, dirt and dust. This eliminates the need for multiple personnel to hold the wire rope off the ground during inspections. The rotating drum also insures the wire rope is not kinked or otherwise damaged during rewind onto the hoist on the aircraft.
The RHGSE will accommodate any installed rescue hook, hand wheel, crushable bumper or all three if they are attached to the end of the wire rope. The picture above shows the EC-145 hook installed into the take up drum spooler.

The RHGSE cleans, dries and lubricates the wire rope as it is reeled back onto the helicopter hoist drum. The Lubridryer is not filled with oil for hoists that use a degreased wire rope, but for other hoists the Lubridryer applies oil as specified by the manufacturer. To desalinate the wire rope, the dryer blows air over the wire rope as it comes out of the rotating drum filled with water, thus drying the wire rope. This will help prevent corrosion on the non lubricated wire rope hoists. By keeping the cable dry and clean, hoist corrosion problems can be controlled.

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The 302 stainless steel wire rope is paramagnetic as a result of cold working when it is formed into wire rope. Using magnetic sensors the Zephyr RHGSE with the MagSens can detect flaws in the wire rope quickly and record their location. This information is stored on a dedicated laptop computer supplied with the system.

The wire rope can be inspected upon the first extension of the hoist. If defects are found, the wire rope can be replaced without lost time or effort. If a fault is detected, the operator can reverse the direction of wire rope travel and make a closer visual inspection. Training is provided at the user’s locations. A large database has been collected, and a use and interpretation guide is provided with each system.

The laptop computer records the results of the inspections. The software records the rescue hoist identification, the date of the test, the results of the test, the amount of wire rope that was run, and the magnetic signature of the wire rope for future references. The MagSens inspection system provides a baseline of the wire rope when it is installed and then can compare the wire rope condition during future inspections.

The data files are small so this information can be downloaded to a central location via the internet for users with remote bases.

Trace shows a broken wire

Comparison of two tests
**Conclusion:**

The RHGSE saves the users money and time and prevents costly damage during ground inspections and maintenance.

The RHGSE saves the users money on replacement wire ropes that may not need replacement, or alternatively identifies wire rope defects quickly and efficiently to prevent failure of the wire rope in flight.

The RHGSE maintains the wire rope and hoist mechanism in good working order by drying and lubricating the wire rope; thus preventing corrosion problems.

The RHGSE provides a cost efficient Quality Control tool that documents the condition of the wire rope before the rescue hoist leaves the factory, leaves the hanger, or leaves the ground.

The RHGSE pays for itself quickly in savings from maintenance time, helicopter flight time and hoist and wire rope costs.

Shown above is the ZGS-10000-5 with MagSens
OPTIONAL ACCESSORIES

ZGS-10487-2 Zephyr Hydraulic RHGSE Protective Cover (Top Only)

ZGS-11380-2 Zephyr Manual & Electric RHGSE Protective Cover (Top Only)

The one piece top protective cover is designed to protect asset from moisture based corrosion; from sand, dust and microbe contaminates; from salt and sulfur based pollutants; from Ultra Violet light degradation; and from the creation of micro climates under a cover that amplifies corrosion. Cover is soldier friendly to assure use and protection. This is defined as lightweight, packable, easily installed and removed in all weather extremes, field repairable and cleanable with soap and water. The cover textile passes the following tests.

1.0 Waterproof ISO 811 Greater than 10 meter column of water
1.2 Air Permeability ASTM D737 0.14cfm/sq ft/min
1.3 Moisture Vapor Transmission Rate ISO 15496 5000 g/m2/24 hours
1.4 Filtration Efficiency ASHRAE 52.2 Greater than 99.97 rejection of particles 0.3 microns or larger H-12 at 10.5 ft/min face velocity (MPPS 0.8 micron)
1.6 Dry Weight ASTM D3776 Less than 10 oz/sq.yd.
1.7 Wet Weight ASTM D3776 Less than 11 oz/sq. yd when completely saturated with water
1.8 Flexibility ASTM F392-93 (2000 cycled Gelbro flex at room temp and -40 degrees C) Achieve pass
1.9 Holdout Rating on Oil AATCC118 Min of 6

2.0 Cleaning Performance ASTM D2960-05 Achieve Pass
2.1 Accelerated U.V. Radiation Endurance Test ASTM G154 - PASS at 1000 hrs.

Core Performance after 1000 hr:

Waterproof greater than 8 meter column
MVTR greater than 3500g/m2/24 hr
Abrasion test pass at 150,000 cycles
Maintain 50% of all "strength characteristics

2.3 Martindale Abrasion ASTM D4966 200,000 Cycle Pass with no defect formation on surface.
2.4 Tensile Strength MD ASTM D5035 Min 120 lb./in.
2.5 Tensile Strength XD ASTM D5035 min 100 lb./in.
2.6 Tensile Test Elongation ASTM 5035 25%
2.7 Trouser Tear MD ASTM D2261 10 lb. ft
2.8 Trouser Tear XD ASTM D2261 15 lb. ft
2.9 Wash test (5 cycles) ISO 811 Pass 10
NEW as of November 2016

ZGS-11468-1 Zephyr Weight Stack with Trolley

The weight stack is used to apply a 600 lbs. load to the hoist via the cable to meet the Hoist OEMs requirement for checking the hoist and allowing all the twist to work its way out of the cable.

It has a shock absorbing cable attachment point to protect the cable from shock loads inherent in the process required by the Hoist OEMs. It also has a trolley that can be used on the tarmac or other rough surfaces and can be disassembled and moved by hand one weight at a time for transportation or shipboard use.
The purpose of the ZMT-100-1 RHGSE Maintenance Kit is to readily have on hand the special tools needed to perform the tasks of measuring the capstans and adjusting the clutch drum to the Zephyr RHGSE. These two maintenance tasks, when performed correctly, will keep the RHGSE running in good working condition along with the other maintenance tasks instructed in the RHGSE manuals. Following the recommendations of preventative maintenance to the Zephyr RHGSE will keep the RHGSE in the best operating condition possible and will extend the life of the Zephyr RHGSE. The Zephyr RHGSE is the perfect equipment for you to use when maintaining your hoist cable and giving you the capability to perform preventative maintenance of your hoist easily and cost effectively.
ZGS-10457-1 Work Platform

Description: The work platform is for use only with the Hydraulic RHGSE and was designed after it was observed that many hoist maintainers were standing on the hydraulic oil tank of the RHGSE, in order to reach the rescue hoist. The work platform was developed to allow the RHGSE to double as a working platform to work on the rescue hoist. It is a retrofitable kit that only requires match drilling four holes and the assembling of the platform to the RHGSE. The height of the platform allows easy access to external hoists on medium-lift helicopters such as the Black Hawk, NH90, or Bell-412.

Thank you for your interest in our Zephyr Products!