

# Assembly and Operations Manual



## VIPER MID MK 2 for Unitor™ WIRE ROPE LUBRICATOR Product no. 620010

Product technology and expertise by:



# Contents

|       |                                                       |    |
|-------|-------------------------------------------------------|----|
| 1.    | Introduction                                          | 3  |
| 2.    | Viper Mid MK 2 Kit Components Inclusions              | 4  |
| 3.    | Viper Mid MK 2 Components Assembled Kits & Components | 5  |
| 3.1.1 | Viper Mid MK 2 Standard Kit Complete 25kg             | 5  |
| 3.1.2 | Viper Mid MK 2 Complete Collar                        | 6  |
| 3.1.3 | Viper Mid MK 2 Standard Complete Pump Kit 25kg        | 7  |
| 3.1.4 | Viper Mid MK 2 Standard Complete Hose 25              | 8  |
| 4.    | Assembly Instructions Viper Mid MK 2 Standard         | 9  |
| 5.    | Ratchet Strap Buckle Assemblies – Ref: AW107          | 12 |
| 6.    | Operating Instructions Viper Mid MK 2 Standard        | 13 |
| 7.    | Lubrication Penetration                               | 15 |
| 8.    | Equipment Specifications                              | 16 |
| 9.    | Trouble Shooting                                      | 17 |
| 10.   | Safety Recommendations – Caution Level Rating         | 18 |
| 11.   | Viper Mid MK 2 Assembly & Use                         | 19 |
| 12.   | Guarantee                                             | 20 |

# 1. Introduction

The Viper Mid MK 2 Wire Rope Lubricator is an Australian designed and manufactured lubricator for wire rope sizes from 6mm to 67mm. It provides fast and effective single pass lubrication of wire ropes, eliminating the slow and arduous task of manual lubrication. Lubrication of wire ropes with the Viper system provides superior protection against corrosion and fretting wear by forcing lubricant into the core of the wire rope while also coating the outer strands. The use of the Viper Mid MK 2 WRL improves operator safety and reduces the environmental impact of wire rope lubrication for any size operation.

1. Key Features of the Viper Mid MK 2 WRL Include:
2. The Collar is constructed from high grade aluminum with a high visibility corrosion resistant coating.
3. The Viper Collar is 32% lighter than the original Viper and incorporates cast carry handles for easier handling.
4. Unique polyurethane Seal design provides the largest pressure contact area to ensure maximum lubrication penetration.
5. Durable and wear resistant polyurethane Seals last thousands of meters in normal service.
6. Seal and scraper range to cater for rope sizes 6mm to 67mm.
7. High pressure high flow 45:1 grease pump delivers lubricant at 4,500 grams per minute and pressures up to 5,500 psi.
8. Global distribution network which provides local customer support.

Viper Mid MK 2 Collar with Seals Inserted



## 2. Viper Mid MK 2 Kit Component Inclusions:

1. Viper lubricator Collar, cast aluminum with inbuilt handles, includes a lubricant delivery line quick connect coupling and excess lubricant fitting.
2. High-pressure high flow customized Viper 45:1grease pump to suit 25kg/50kg/180kg drum sizes which come preassembled with:
3. Air control valve
4. Air regulator with gauge
5. High-pressure grease flow control valve
6. Male quick connect fitting Note: Refer to drawings
7. Four (4) meter, high pressure ½" hydraulic hose complete with female quick connect couplings on each end.
8. One (1) meter clear hose for excess lubricant discharge.
9. Two (2) x 2-metre ratchet straps rated to 500kg.
10. Four (4) x "Bow" shackles.
11. Viper Collar shoulder carry strap.
12. Heavy-duty aluminum storage case with stainless steel fixtures.
13. Polyurethane Seals & Aluminum Scraper Plates (ordered separately)
14. Sized to suit specific size ropes 6mm to 67mm
15. Refer to Seal & Scraper Selection Guide
16. Viper Wire Cleaners (optional accessory)
17. Available to suit a variety of ropes – refer to Selection Guide when ordering



Note: Seals, Scrapers and Cleaners sold separately

3. Viper Mid MK 2 Assembled Kits & Components

3.1.1 Viper Mid MK 3 Standard Kit Complete  
25kg

The diagram illustrates the Viper Mid MK3 Standard Kit assembly. It features a central green hydraulic pump unit (1) connected to a red drum (11) via a hose (5). A yellow scraper arm (2) is attached to the pump unit. A black scraper arm (4) is also shown. Various hoses and connectors are labeled with numbers 3, 6, 7, 8, 9, 10, 12, 13, and 14. A red cap (15) is shown on the drum. The assembly is mounted on a base (13).

| ITEM NO. | PART NUMBER                | DESCRIPTION                                                   | QTY.  |
|----------|----------------------------|---------------------------------------------------------------|-------|
| 1        | VIPERMIDMK3COLLAR-COMplete | VIPER MID MKII COMPLETE WITH FITTINGS, MALE COUPLER AND PLUGS | 1     |
| 2        | ---                        | WIRE ROPE                                                     | ---   |
| 3        | VIPER-D5-A5242310          | 50M SHACKLE                                                   | 4     |
| 4        | VIPER-HDRTW25              | 4MTRS 17/32" WIRE WITH QUICK CONNECTS AT EACH END             | 2     |
| 5        | VIP-28704                  | HOSE CLEARFLEX1/2                                             | 1     |
| 6        | VIP-4021TWD5               | VIPER GREASE PUMP 45:1, 4,500 GRAMS/MIN                       | 1     |
| 7        | VIP-DV12V                  | GREASE FLOW CONTROL VALVE                                     | 1     |
| 8        | VIP-1823391911             | AIR FLOW CONTROL VALVE                                        | 1     |
| 9        | VIP-PP3-03G                | AIR PRESSURE REGULATOR WITH GAUGE                             | 1     |
| 10       | VIP-4300S                  | 25KG DRUM COVER                                               | 1     |
| 11       | VIP-4312S                  | 25KG FOLLOWER PLATE                                           | 1     |
| 12       | ---                        | VIPER LUBRICANT PAIL                                          | 1     |
| 13       | **REF1**                   | PORTURETHANE SEAL                                             | 1 SET |
| 14       | **REF2**                   | VIPER SCRAPPER PLATE                                          | OF 4  |

\*\*\*Viper\*\*\*

Viper Mid MKII  
Complete 25KG Kit  
VIP-00125

\*\*REF1\*\* : VIPER SEALS REFER TO THE VIPER SEAL AND SCRAPER SELECTION GUIDE  
\*\*REF2\*\* : VIPER SCRAPER PLATES REFER TO THE VIPER SEAL AND SCRAPER SELECTION GUIDE

3.1.2 Viper Mid MK 2 Standard Complete Collar

| ITEM NO. | PART NUMBER                 | DESCRIPTION                                                                | QTY.       |
|----------|-----------------------------|----------------------------------------------------------------------------|------------|
| 1        | VIPERMIDMKIIA-TOP           | VIPER COLLAR MID MK II TOP HALF                                            | 1          |
| 2        | VIPERMIDMKIIB-BOTTOM        | VIPER COLLAR MID MK II BOTTOM HALF                                         | 1          |
| 3        | VIPER-HOSETAIL              | HOSE TAIL FOR VIPER COLLAR                                                 | 1          |
| 4        | VIPERMIDMKIIM-B1/2PL BSP    | MALE 1/2\"/>                                                               |            |
| 5        | VIP-A-A-0608                | 3/8\"/>                                                                    |            |
| 6        | ---REF1---                  | SCRAPER PLATE                                                              | 1 SET OF 4 |
| 7        | VIPER-ENDSCREWS             | M6X12MM FLAT COUNTERSUNK SOCKET SCREW                                      | 20         |
| 8        | VIP-A-A-06                  | 3/8\"/>                                                                    |            |
| 9        | ---REF2---                  | POLYURETHANE SEAL                                                          | 1          |
| 10       | VIPERMIDMKIIL-LOCKMECHANISM | LOCKING MECHANISM MADE OF SWIVEL SCREW, LOCK NUT WITH HANDLE AND 2 WASHERS | 2          |
| 11       | VIPERMIDMKIIL-LOCKPINS      | PINS TO SUPPORT THE VIPERMIDMKIIL-LOCKMECHANISM                            | 2          |
| 12       | VIPERMIDMKIILHINGEPINS      | PINS TO HOLD BOTH HALVES OF THE VIPER MID MKII                             | 2          |

**Viper**

Viper Mid MkII  
Complete Collar  
VP-00125

\*\*REF1\*\* : VIPER SEALS REFER TO THE VIPER SEAL AND SCRAPER SELECTION GUIDE  
\*\*REF2\*\* : VIPER SCRAPER PLATES REFER TO THE VIPER SEAL AND SCRAPER SELECTION GUIDE

3.1.3 Viper Mid MK 2 Standard Complete Pump  
25kg

| ITEM NO. | PART NUMBER            | DESCRIPTION                                                                           | QTY. |
|----------|------------------------|---------------------------------------------------------------------------------------|------|
| 1        | VIP-4021TWDS           | VIPER GREASE PUMP 45:1 4,500 GRAMS/MIN 1/2" BSP MALE X 1/2" BSP FEMALE SWIVEL FITTING | 1    |
| 2        | VIP-A-C-0808           | GREASE FLOW CONTROL VALVE                                                             | 1    |
| 3        | VIP-DV12V              | 1/2" BSP MALE X 1/2" BSP FEMALE FITTING                                               | 1    |
| 4        | VIPER-MID-MK2-12PL-BSP | 25KG DRUM COVER                                                                       | 1    |
| 5        | VIP-A-A-0406           | 25KG FOLLOWER PLATE                                                                   | 1    |
| 6        | VIP-4302S              | 3/8" BSP MALE X 3/8" BSP MALE FITTING                                                 | 1    |
| 7        | VIP-4312S              | AIR FLOW CONTROL VALVE                                                                | 1    |
| 8        | VIP-A-A-0406           | AIR PRESSURE REGULATOR WITH GAUGE                                                     | 1    |
| 9        | VIP-PP3-03G            | 1/4" BSP MALE X 3/8" BSP MALE FITTING                                                 | 1    |
| 10       | VIP-A-A-0406           | VIPER LUBRICANT PAIL                                                                  | 1    |
| 11       |                        |                                                                                       |      |
| 12       |                        |                                                                                       |      |

**\*\*REF1\*\* : VIPER SEALS REFER TO THE VIPER SEAL AND SCRAPER SELECTION GUIDE**

**\*\*REF2\*\* : VIPER SCRAPER PLATES REFER TO THE VIPER SEAL AND SCRAPER SELECTION GUIDE**

**Viper**

Viper Mid MKII  
Complete 25kg Pump Kit  
VP-00125

3.1.4 Viper Mid MK 2 Standard Complete Hose  
25kg



## 4. Viper Mid MK 2 Assembly Instructions (refer assembly video on website)

1. Remove all components from the Viper Aluminum carry case, unpack from packing materials and lay out on a clean flat surface. Check that all items are present as per your purchase order.
2. Remove the grease pump noting the air inlet isolation valve, air regulator and high-pressure needle control valve are preassembled onto the pump.
  - Connect site-specific compressed air connector to the air regulator. (Not supplied)
3. Remove the lid from the lubricant container and place the follower plate onto the top of the lubricant. Press down firmly until the follower plate comes into contact with the lubricant.
  - Note the Viper lubricator should only be used with high-quality wire rope lubricants with a consistency of NLGI#00 to #2.
4. Fit the drum cover over the top of the lubricant container and tighten the three securing screws until they contact the container.
5. Clamp the grease pump handle onto the grease pump body and tighten the two screws.
6. Slide the grease pump shaft into the opening of the drum cover and the follower plate. Push the grease pump down into the grease until it touches the base of the grease container.
7. Connect the high-pressure grease hose to the grease pump outlet via the quick-connect coupling.



## 4. Viper Mid MK 2 Assembly Instructions Cont.

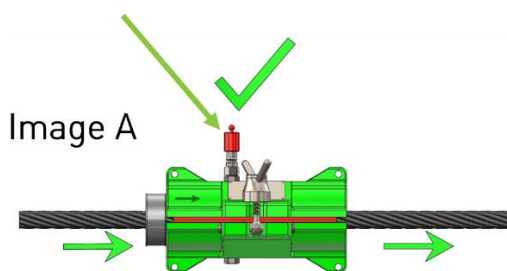
8. Remove the Viper Collar from the packaging materials and loosen the two clamping bolts, allowing the Collar to open.
9. Fit the Scraper Plates to the Viper Mid using the counter sunk screws and the Allen Key provided. NOTE: Scraper Plates are sized to suit the wire rope as per the Seal & Scraper Selection Guide.
10. Fit the Viper Seals into the Viper Mid Collar. Make certain that the grease inlet holes on the Seal and Collar are aligned.

NOTE: Seals are sized to suit the wire rope as per the Seal & Scraper Selection Guide.

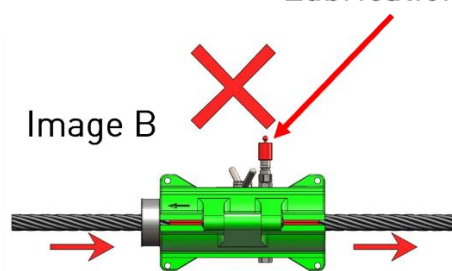
11. Clamp the lubricator Collar fitted with Seals and Scrapers around the wire rope to be lubricated, tightening the two handles.
  - Face the Collar so the lubrication inlet is closest to the rope's entry point- refer to image A below. DO NOT attach the Collar with the lubrication inlet at the furthest point from the rope's entry point – refer to image B below.
  - Locate the Collar so the optimum length of wire rope can be lubricated in a single pass, this is typically close to the winch drum.
12. Attached the clear plastic drain hose to the Viper Mid Collar. This hose is to deliver excess lubricant back to the collection container



Lubrication Inlet



Lubrication Inlet



## 4. Viper Mid MK 2 Assembly Instructions Cont.

13. Connect the high-pressure lubricant delivery hose to the Viper Collar using the quick-connect coupler.

- Standard Kit



14. To secure the Viper lubricator Collar in place, use the nylon ratchet straps and 'Bow' shackles.

15. Secure one end of the ratchet strap to one of the lugs on the wire rope entry end of the lubricator Collar via a bow shackle. Secure the other end to a suitable fixed position to prevent the lubricator Collar from travelling with the wire rope. Replicate this using the second ratchet strap, bow shackle and lug on the lubricator Collar.



16. NOTE: the ratchet strap is in high tension and strain during operation. Please ensure all fittings are tightly secured prior to operation.
17. The lubricator Collar must be able to move laterally during operation to ensure even wire rope spooling on and off the rope drum.
18. Connect the air supply to the air regulator unit fitted to the grease pump. Ensure the air shut-off valve is off, preventing the air from reaching the pump motor.
19. Set the air pressure regulator to 7 bars.



## 5. Ratchet Strap Buckle Assemblies – Ref: AW107

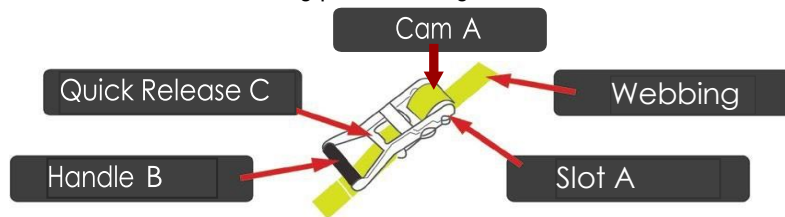
Basic Steps of Operation to Tighten:

1. Secure hooks on either side of the road.
2. Insert the free end of strap through slot A and pull through excess webbing.
3. Push down and pull up Handle B to work the ratchet strap until the strap is as tight as possible.
  - a) Do not over tighten, as the straps are only designed to maintain the position of the Viper Collar.
4. Ensure at least 2 to 3 revolutions of webbing are around center cam A.
5. Push Handle B down to lock your Tie-Down.

To Release:

1. Pull back on quick release C and hold.
2. Pull handle B up and over to fully open flat position.
3. Pull tie-down up to loosen strap and remove from slot A. To be used as a guide only.

Please note: Lubricate all moving parts on a regular basis.



Use and Care Instructions – Webbing Load Resistant Systems Ref: AW116

**Use:** The selected lashing system should be both strong enough and of the correct length for the mode of use. Good lashing practice should always be followed; the fitting and removal operations of the lashings should be planned before starting a journey. The lashing should be suitably pre-tensioned and regularly checked.

**CAUTION: NOT TO BE USED FOR LIFTING**

**INSPECTION:** Web lashings and any fittings or coupling components attached should be subject to frequent visual inspection and regular examination by a competent person. Web lashings shall be withdrawn from service if there is a cause to doubt fitness for use.

**MARKING:** Use only legibly marked and labelled web lashing.

**OVERLOADING:** Lashing systems should not be overloaded. Mechanical aids such as levers or bars should not be used unless they are specifically designed for use with the device.

**PROTECTION:** The webbing and labels should be protected against friction, abrasion and damage from load with edge radii less than twice the webbing material thickness, using protective sleeves or corner protectors.

**SERVICEABILITY:** Normal wear and tear can reduce the strength of the webbing assemblies. If webbing is damaged by more than 10% of its original state due to abrasion, cuts, prolonged exposure to sunlight or chemicals then it should be replaced. Similarly, if tensioning devices such as hand ratchets and end fittings are damaged by wear or corrosion they should be replaced.

**RESPONSIBILITY:** It is the responsibility of the owner, the driver and the person in charge of the loading to ensure that vehicles load restraint and attachments, and the load securing equipment, are serviceable and strong enough for their application.

**NOTE:** The user of this strap assumes all risks and liability for its handling and use.

For further information please refer to the RTA Load Restraint Guide.'

## 6. Operating Instructions Viper Mid MK 2

With the Viper Mid Wire Rope Lubricator assembled and mounted correctly as per Assembly Instructions, you are now ready to operate the system and lubricate the nominated wire rope.

1. Make sure the high-pressure lubricant flow control valve is closed (turn clockwise to close).
2. Open the air supply to the lubricant pump via the air control valve. The pump may start to pump for a short period but will stop as the lubricant reaches the closed lubricant flow control valve. Set the air pressure regulator to 5.5 bar (80 psi) and adjust up to 7 bar (105 psi) if required.
3. Open the high-pressure lubricant flow control valve slowly by turning anti-clockwise and proceed to fill the installed Seal with lubricant. Once a lubricant appears at the wire rope entry point or in the overflow drain line, close the lubricant flow control valve by turning clockwise. **THE VIPER IS NOW CHARGED & READY FOR OPERATION.**
4. Start the wire rope moving through the Viper Mid Collar and then slowly open the lubricant flow control valve. Continue to open until an even coating of grease is visible on the wire rope exiting the collar.
  - Speeds of up to 2,000 meters per hour are possible but this depends on a number of factors, including the rope size, speed and specific lubricant in use.
5. The lubricant flow control valve should be adjusted as required to provide the correct lubricant flow rate into the lubricator Collar and thereby onto and into the wire rope.
  - If the lubricant flow rate is too high lubricant will begin leaking out of the Viper Mid Collar at the rope entry point or from the excess lubricant, clear hose.
  - Reduce the lubricant flow by turning the flow control valve clockwise. Alternatively, increase the wire rope speed through the lubricator Collar until the correct amount of lubricant appears on the wire rope.

## 6. Operating Instructions Viper Mid MK 2 Cont.

7. Visually inspect the wire rope as it exits the Collar to observe if full lubricant coverage is being achieved.
  - If insufficient coverage is achieved, increase lubricant flow rate by adjusting the lubricant metering valve anti clockwise until an even lubricant coating occurs.
  - Alternatively reduce the rope speed until an even lubricant coating occurs.
8. If lubricant leakage occurs around the Collar, check if the Collar is correctly tightened and Seals are fitted correctly.
9. An even balance between lubricant volume and wire rope travel speed is required to achieve an even lubricant film combined with optimum penetration.
10. Once the optimum lubricant coverage is achieved, run the complete rope at a consistent speed through the Viper Mid Collar.
11. Note the Viper Mid Collar with flexible Seals is not a pressure vessel and is not designed to hold pressure. The grease pressure is generated by both the pump and the action of the rope travelling through the lubricant chambers in the Seal. The Viper grease pump should not be operated with the wire ropes stationary.



## 7. Lubricant Penetration

To inspect internal lubricant penetration, use a sharp spike or heavy-duty screwdriver to open the wire rope. Alternatively, two pipe wrenches secured one meter apart, and rotated in opposite directions will allow visual inspection.

Lubricant penetration to the wire rope core is often difficult due to the following:

Wire rope design, particularly anti-spin and locked core wire ropes.

Dirty or contaminated wire ropes. (Using a Viper Wire Rope Cleaner is recommended).

Ropes contaminated with solid used lubricant coatings. (Using a Viper Wire Rope Cleaner is recommended).

During the wire rope operation, the rope movement onto the drum and over sheaves is known to assist with the lubricant penetration.

If an NLGI#2 grade grease is used it may be necessary to pre-heat the lubricant at ambient temperatures below 5°C (41°F) to ensure adequate penetration.

Check with lubricant suppliers for method of pre-heating and individual lubricant specifications. Be sure that the lubricant used will adequately protect your wire rope from corrosion and wear.

## 8. Equipment Specifications

### Drum Pump

|                                |                                  |
|--------------------------------|----------------------------------|
| Maximum operating air pressure | 8 bar/120 psi Pump ratio<br>45:1 |
| Flow rate approximately        | 4,500 gram per min               |
| Volume of compressed air       | 250 L/min at 7 bars              |

Guideline pressures are as follows:

Air pressure for all Wire Rope Diameters 5.5 – 7 bar (80-105 psi).

### Viper Collar

- Cast aluminum construction with enhanced mechanical properties and excellent corrosion resistance, heat treated to T6.
- Lugs tested to withstand 800kg of resistance.
- Coating: 3-coat treatment.
- Salt – Spray Resistance to ASTM B117-73 - 2,000 hours
- Humidity Resistance to ASTM D2247 - 1,000 hours

### Seals

- Estimated average operation life – 10,000 + meters
- Shelf life 2-3 years (based on correct storage)
- Chemically resistant to commercially available mineral wire rope lubricants.
- The lubricator Seals may be washed with mild petroleum cleaner.
- Do not leave the Seals to soak in cleaning fluid which may be detrimental to their composition.
- It is important to store the Seals away from UV light. The Seals will be harmed if left for extended periods in sunlight.
- Seals should be kept in sealed plastic bags as supplied.

### Scrapers

- 5083 Grade Aluminum Alloy has high corrosion resistance and is ideal for marine applications.

NOTE: Wilhelmsen Ships Service AS reserves the right to change specifications as and when required.

## 9. Trouble Shooting

### 1. NO LUBRICANT ON WIRE ROPE AFTER START-UP

- a) Check the lubricant container content.
- b) Check lubricator pump air shut-off valve is open.
- c) Check air pressure on the gauge.

### 2. INADEQUATE LUBRICATION COVERAGE

- a) Utilize lubricant drum heater or change to lighter viscosity if the ambient temperature is 5°C or below.
- b) Increase air pressure and hence lubricant flow, until the correct quantity of lubricant is on wire rope.
- c) Open the lubricant flow control valve fully to increase lube flow.
- d) Reduce wire rope speed to ensure complete coverage.

### 3. TOO MUCH LUBRICANT ON THE WIRE ROPE

- a) Reduce volume of lubricant via the flow control valve (for High-Speed Kits only)
- b) Increase wire rope speed through the lubricator Collar.
- c) Use a combination of both.
- d) Investigate the type of wire rope lubricant used.
- e) Measure rope diameter and ensure correct size Seals in use.

### 4. LEAKING FROM COLLAR

- a) Tighten Collar clamping screws.
- b) Check correct Viper Seal is being used for wire rope size.
- c) Check air pressure and reduce if required.

Adjust the lubricant flow rate from the control valve.

- d) Check condition of Seals for any damage.

## 10. Safety Recommendations

### Caution Level Rating

- Before installation of the wire rope lubricator onto the cable, ensure the work area is clean and safe to work in with adequate space around the cable where the Viper Collar will be attached.
- Ensure buckles and straps, D shackles and attachment points used to anchor the Viper Lubricator are rated for a minimum WWL of 500kg.
- Check hydraulic hose, coupling air lines and fittings for damage or wear, before connecting to the grease pump and Viper lubricator Collar. Carry out a visual inspection of the Viper Collar to ensure it has not been damaged during transport or handling. Damage to the casing that prevents it from sealing correctly will severely reduce the unit's ability to force lubricant into the ropes core and could be a potential safety hazard.
- Always ensure the return grease line feeds to a container of suitable size for receiving the excess grease from the Viper lubricator. Grease allows to flow from the return line without being captured may cause a serious slip or environmental hazard.

**NOTE:** Lubricants vary in their hazard and environmental ratings. Please ensure Safety Data Sheets (SDS) for all lubricants used with the Viper are kept near the kit. Wilhelmsen Ships Service AS recommends a copy of the lubricant in use SDS be kept in the Aluminum carry case for reference as required.

# 11. Safety Recommendations –

## Viper Mid MK 2 Assembly and Use

### DANGER RATING



- Before attaching the Viper lubricator Collar to the cable, you must ensure the cable winch control has been locked out and tagged. Serious injury or death may occur should the cable winching equipment be activated while the Viper Lubricator is being fitted to the cable.



- When the Viper Lubricator has been assembled, attached to the cable and anchored in position, the lubrication system can be activated. While in operation the grease pump can generate up to 5,500 psi grease pressure. Under no circumstances should the Viper Collar be opened, or the grease hose disconnected while under pressure as this can cause serious injury.



- While in operation the Viper Lubricator utilizes both high-pressure air, up to 120 psi max and high-pressure grease up to 5,500 psi. Always wear appropriate PPE (personal protective equipment) suitable for your work environment while carrying out the cable lubrication operation.



- Suggested PPE includes safety glasses, leather gloves, safety boots, long-sleeved shirts, high visibility vest, hard hat and hearing protection.



- Wilhelmsen Ships Service AS recommends only use pumps, fittings, hoses and accessories supplied or recommended by Wilhelmsen Ships Service AS. All our components have been tested to ensure they will work safely and effectively for extended duty cycles. Using non-approved components may lead to unexpected failure of the Viper Lubricator and/or its components causing serious injury to maintenance personnel.

## 12. Viper Mid MK 2 Wire Rope Lubricator - Guarantee

The Viper Mid MK 2 Wire Rope Lubricator Kit and all the components are guaranteed for a period of 12 months from the date of purchase against any fault of manufacture or material failure.

Fair wear and tear are expected of the unit and are not covered by this warranty. Tearing of the Seals due to broken wires or other obstructions is not covered by this warranty.

Any parts to be claimed under warranty must be first returned to Wilhelmsen Ships Service AS for inspection before the warranty is granted.

Commercially available wire rope lubricant NLGI 00-2.

The Viper Mid MK 2 is supplied and supported by:

Wilhelmsen Ships Service AS  
Tel: +4767 58 40 00  
[www.info@wilhelmsen.com](mailto:www.info@wilhelmsen.com)  
[wilhelmsen.com](http://wilhelmsen.com)

Wilhelmsen.com

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