



**VORTEX**

**SUBSEA SOLUTIONS**

**STAINLESS STEEL  
HEAVY DUTY  
SURVEY WINCH**

**OPERATIONS MANUAL**

VERSION	SECTION	ISSUE DATE	AUTHOR	DESCRIPTION OF UPDATE
1.0		9 June 2020	JG	First Edition
2.0		27 Oct 2023	JG	Updates

Document name:

VOR-SSHDSW-MAN: VER 2.0

Vortex Stainless Steel Heavy Duty Survey winch manual version 2.0

VORTEX-DREDGE-SSHD-Stainless-Steel-Heavy Duty-Survey-Winch-[English]

**VORTEX INTERNATIONAL LIMITED 27 Parrs Road,**

**RD1, New Plymouth 4371 New Zealand**

**Ph/Fax + 64 6 7538102**

**Mobile + 64 (0) 276 88 53 72**

**vortexdredge.com**

All information correct as October 2023 and subject to changes without notification.

# Contents

## **1.0 INTRODUCTION**

1.1 Reference Documents	2
-------------------------	---

## **2.0 SAFETY**

2.1 Overview	3
2.2 Risk Assessment	3
2.3 Mechanical	3

## **3.0 TECHNICAL SPECIFICATIONS**

3.1 Description	4
3.2 Technical specifications	5
3.4 Drum pull and drum capacity	6
3.5 Base mounting bolts	7

## **4.0 OPERATIONAL PROCEDURES**

4.1 Pre-dive Checks tool visual check	8
4.2 Level wind – cable installation	9
4.3 Hydraulic connections	10-11
4.4 Winch disassembly	12-15
4.5 Rust Preventative & Lubrication	16-17
4.6 Parts List	18

## **5.0 MAINTENANCE & STORAGE**

5.1 Standard Procedures	19
5.2 Replacement Procedures	19

## **6.0 SPARES**

6.1 Spares List	20
6.2 Spares Photos	21

## **7.0 APPENDIX AND REFERENCES**

7.1 Tool dimensions & weight	22
Appendix 1-5	23-28

<b>CONTACTS</b>	29
-----------------	----

# 1.0 Introduction

The Vortex heavy duty camera winch is designed to carry nominal 9mm diameter cable (cable size can be changed) to operate cameras or sensors.

## 1.1 REFERENCE DOCUMENTS

See Appendix and references section at the end of this document for certificates and manufacturers data.

## 1.2 CONTACTS

For Technical queries, Comments and Feedback contact Vortex Dredge: [goodinjoe@gmail.com](mailto:goodinjoe@gmail.com).

Other contacts can be found at the rear of this documentation.

# 2.0 Safety

## 2.1 OVERVIEW

All local HSE procedures must be followed. Use of PPE should follow guidelines outlined with handling of potential sample. For example hazardous gas samples should have PPE appropriate to mitigate dangers associated with that gas. Safety glasses should be considered minimum requirement irrespective of potential sample. Your safety is your responsibility. Think and plan ahead accordingly.

## 2.2 RISK ASSESSMENT

Consult with local HSE and installation operators to identify best practice steps needed for safe operations. Identify if the task been done and implement lessons learned. JHA, permitting and toolbox talks should preclude all operations.

## 2.3 MECHANICAL

Ensure all fittings and fasteners are secure. Check general condition of tool against images in manual for anything which may indicate potential operational issues.

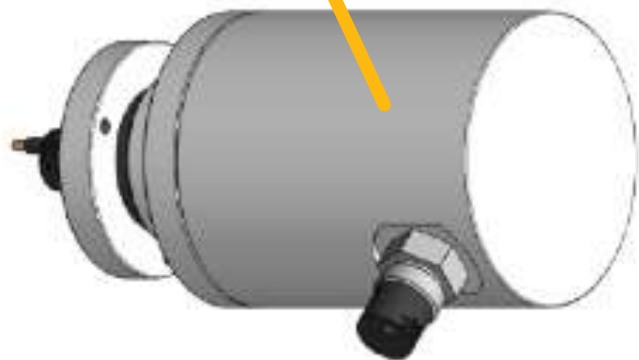
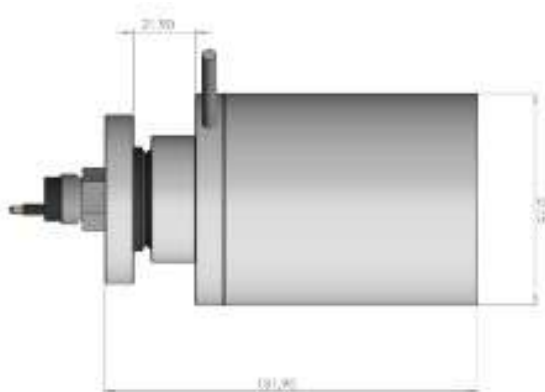
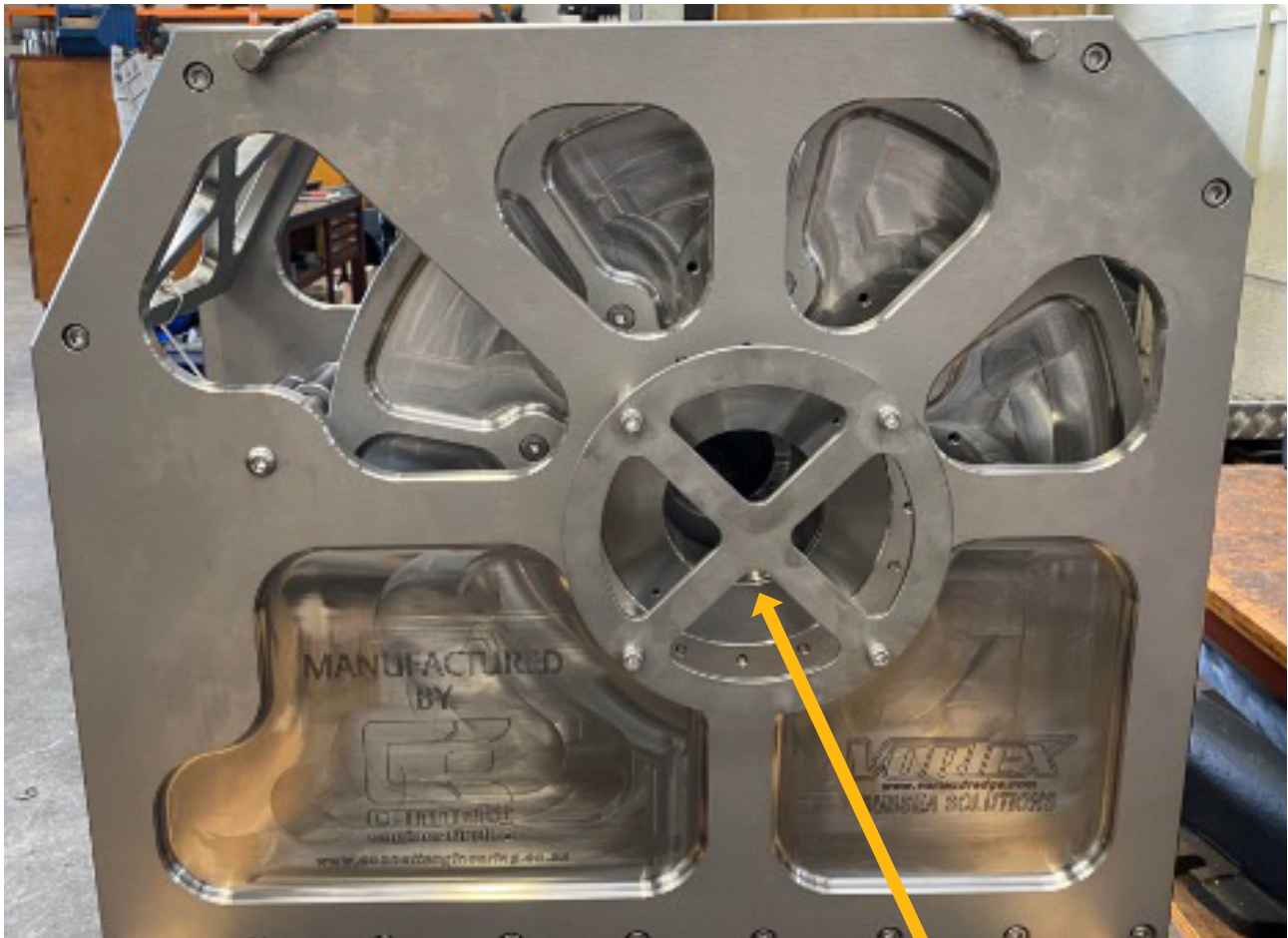
**Remember, your safety is your responsibility.**

**Think and plan ahead accordingly. If in doubt, please ask.**

# 3.0 TECHNICAL SPECIFICATIONS

## 3.1 DESCRIPTION

Hydraulic driven winch with up to 12 path slip rings.



N38A00 – NSUWSR slip rings shown.

# 3.0 TECHNICAL SPECIFICATIONS

## 3.2 FEATURES INCLUDE

- ROV or topside hydraulics compatible.
- OMM32, 1.93 in<sup>3</sup> / rev powerful and constant operating torque motor with 180kg capacity.
- Heavy duty worm gearbox with 60:1 gear ratio and 42mm output shaft provides smooth line speed.
- Stainless steel and Acetal construction.
- Oil filled Gearbox for operation at depth.
- load holding via worm gearbox provides controlled lowering and full load holding - no brake needed.
- Recommended for tooling packages and down hole cameras.
- Depth rating 3000mtr
- Roller fairlead

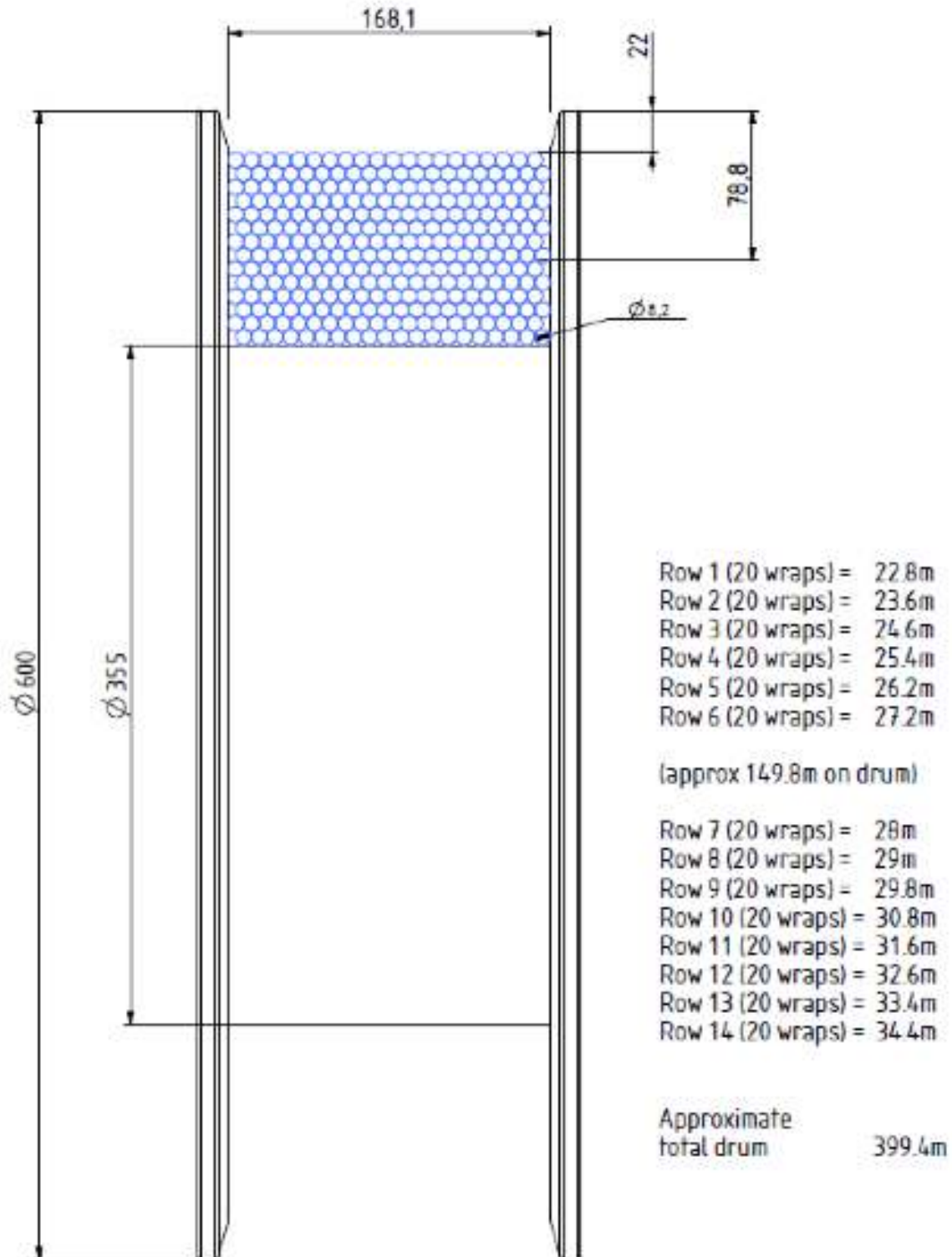
## 3.3 SPECIFICATIONS:

The rated line pull shown is based on the first layer of cable on the drum.

- Rated Line Pull: 200 kg / 535 lb at 1st layer of cable with 1100psi at motor.
- Line Speed in: @ 16 LPM oil flow = 10 mtr/min at fourth layer of cable @ 200kg lift
- Minimum hydraulic flow = 16 LPM
- Maximum hydraulic flow = 16 LPM
- Minimum operation Pressure: 70 bar/ 1000 psi
- Maximum operation Pressure: 103 bar/ 1500 psi
- Hydraulic Motor: Parker PGM315 Part#PGM315A993RTEB17-66RBSPP9A
- Gear Train: Worm drive gearbox to stainless chains and sprockets
- Gear Ratio: 60:1 NMRV-P110 60 to1 WORM GEARBOX
- Winch Construction: Stainless steel and Acetal
- Brake: N/A. Winch uses worm drive gearbox for load holding
- Rotation of Winch: Under-wound orientation only
- Drum Barrel Diameter: 355 mm
- Drum Flange Diameter: 600 mm
- Distance Between Flanges: 168.1 mm
- Cable size Recommended: 8.2mm +/- 0.1mm
- Cable length potential with 9mm drum : 399.4m
- Level wind: Stainless diamond bar with integral fairlead
- Slip rings: NSUWSR. 80m working depth.
- Weight in air: 334kg no cable
- Weight in water: 320 KG no cable
- Dimensions: 800mm L x 670mm high x 630mm wide

# 3.0 TECHNICAL SPECIFICATIONS

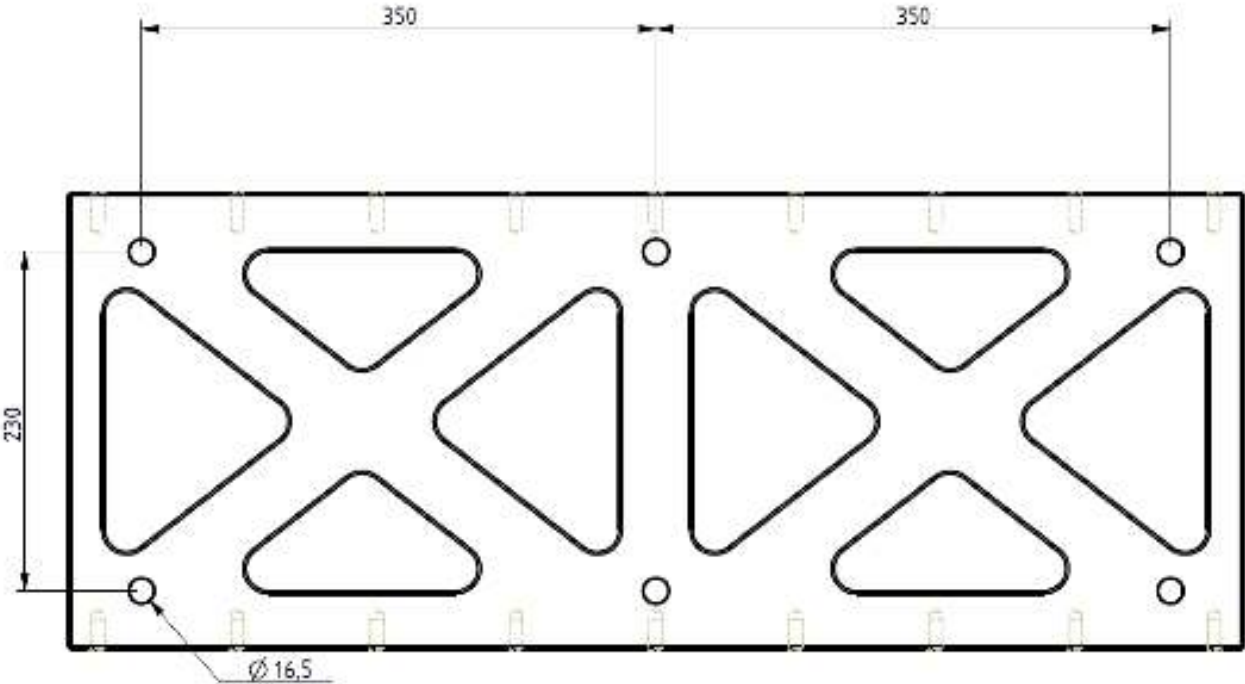
## 3.4 SPECIFICATIONS: DRUM PULL AND DRUM CAPACITY





# 3.0 TECHNICAL SPECIFICATIONS

## 3.5 SPECIFICATIONS: BASE MOUNTING HOLES



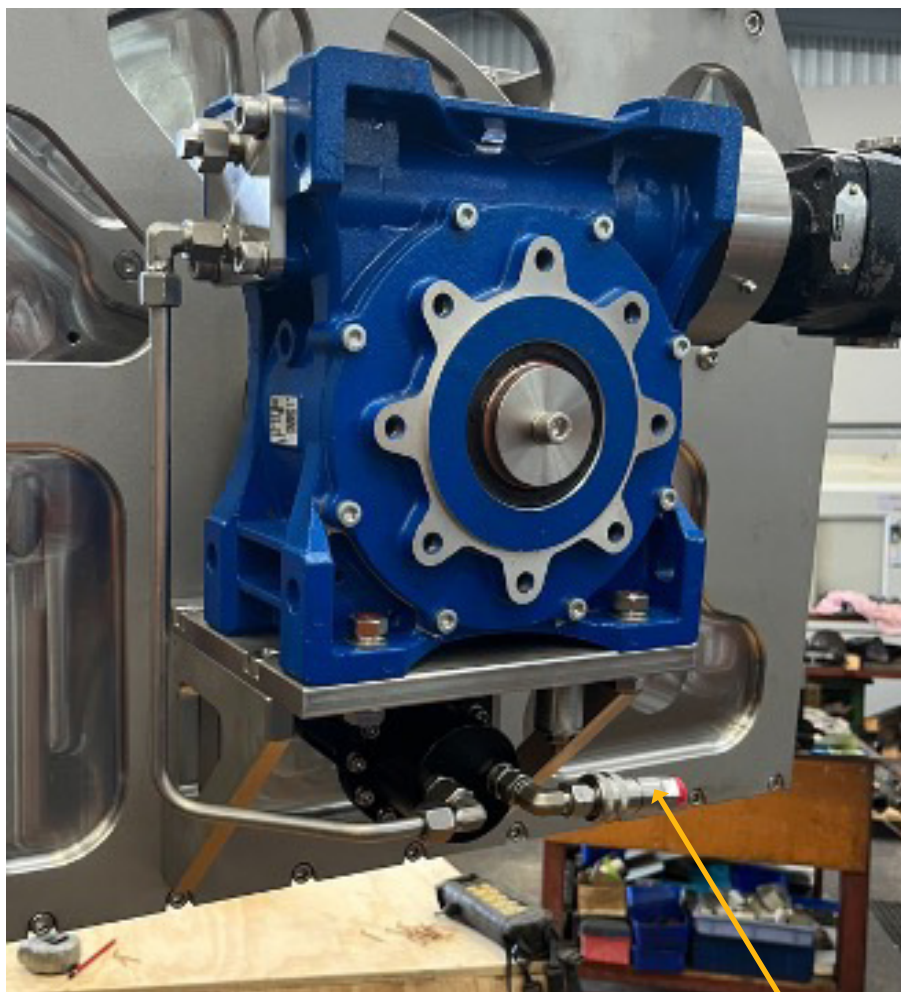
# 4.0 OPERATION PROCEDURES

## 4.1 PRE DIVE CHECKS TOOL VISUAL CHECK

Ensure no damage to slip ring pins. Pin out from slip ring pins to cable end prior to and after deployment.

Ensure slip ring is near full of Dow Corning 200 100 CST Oil.

C: Ensure gearbox comp tube is near full of OMALA S4 WE 320 or SHELL TIVELA S 320 oil. A small air bubble is ok to allow for expansion.



# 4.0 OPERATION PROCEDURES

## 4.2 LEVEL WIND SETTING AT START OF CABLE LAY.

### CABLE INSTALLATION

Set up drum with M5 bolt horizontal as shown.

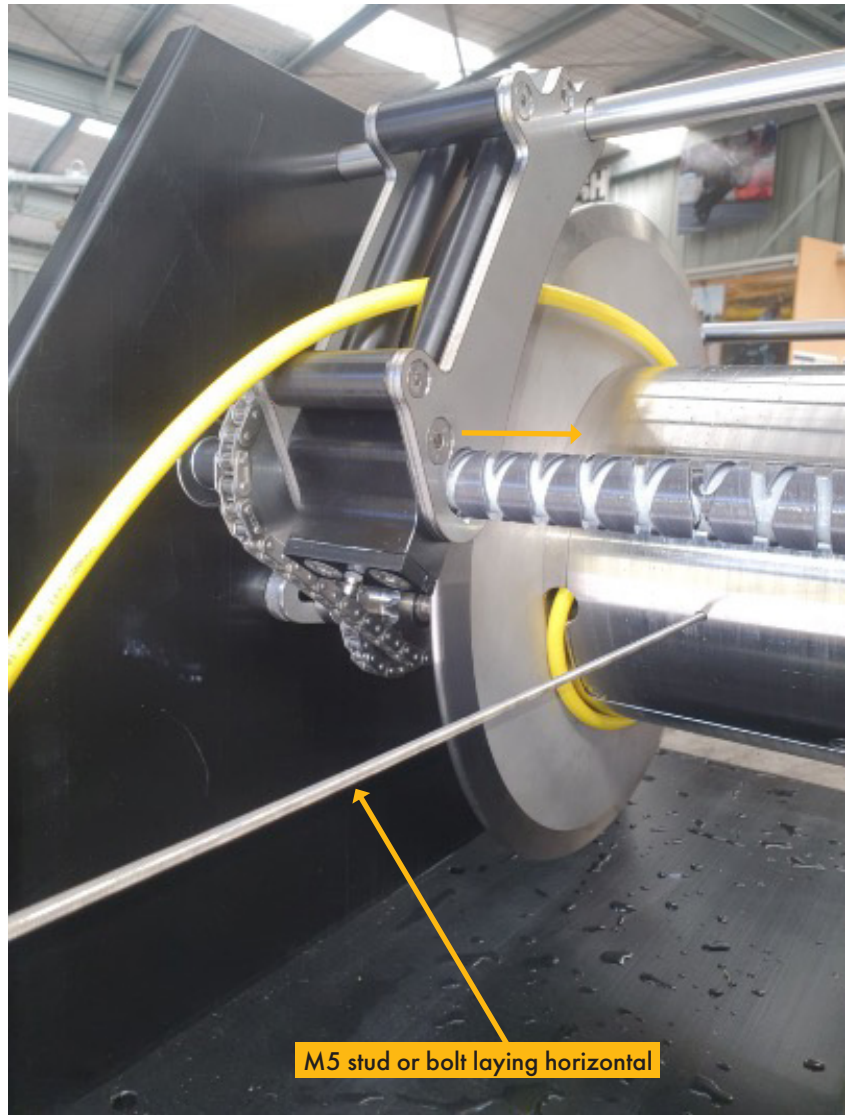
Level wind should just be starting to travel away from sprockets with drum hauling in.

Rotate sprockets and jump the chains until this all occurs.

Load cable into drum lid, connect to slip ring, secure slip ring with excess of cable inside drum, secure cable to Stauff cable clamp.

Slowly rotate drum holding cable on drum as it rotates until at least 4 wraps are on drum. Keep tension on cable to ensure cable is tightly wrapped on drum.

Cable should be wrapped on drum under tension until full length of cable is installed.

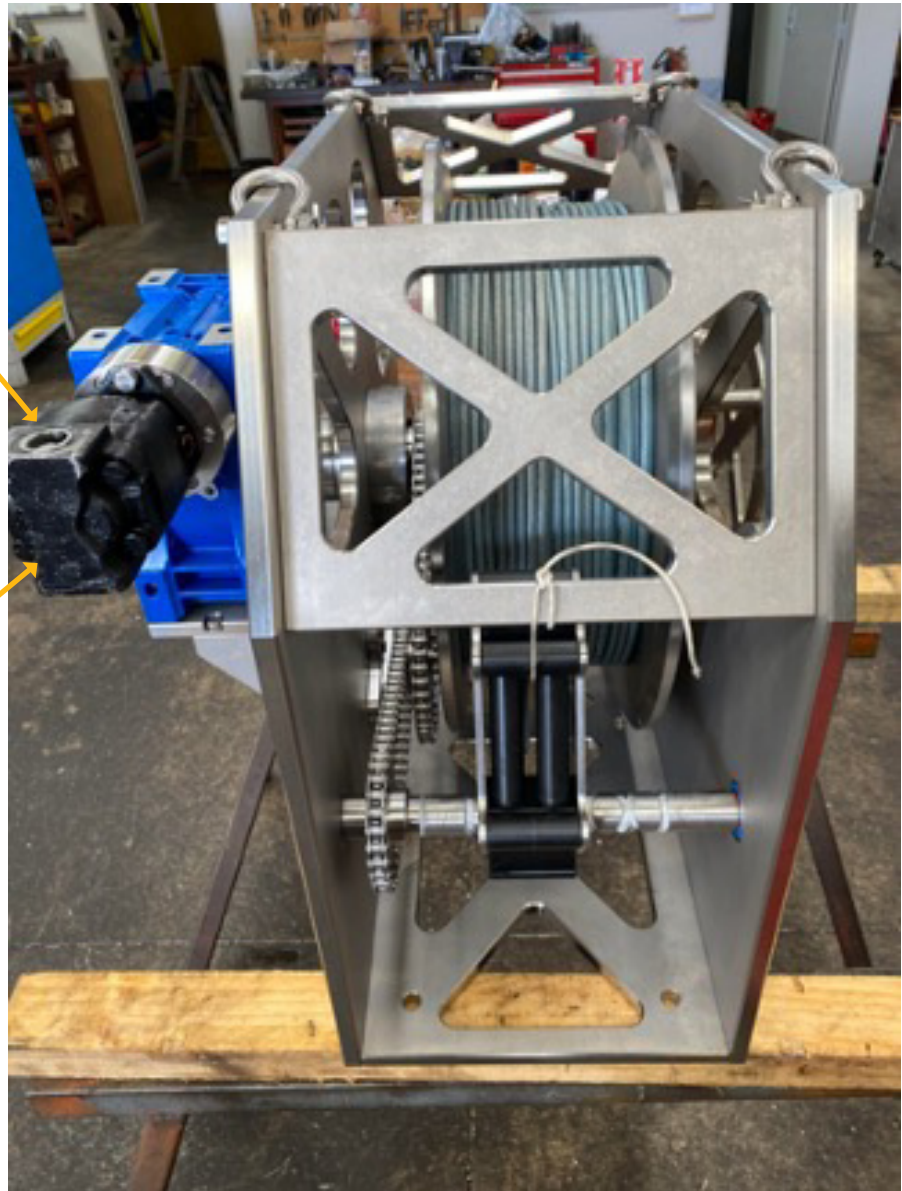


**ALWAYS KEEP AT LEAST 6 WRAPS ON DRUM AT ALL TIMES.**

# 4.0 OPERATION PROCEDURES

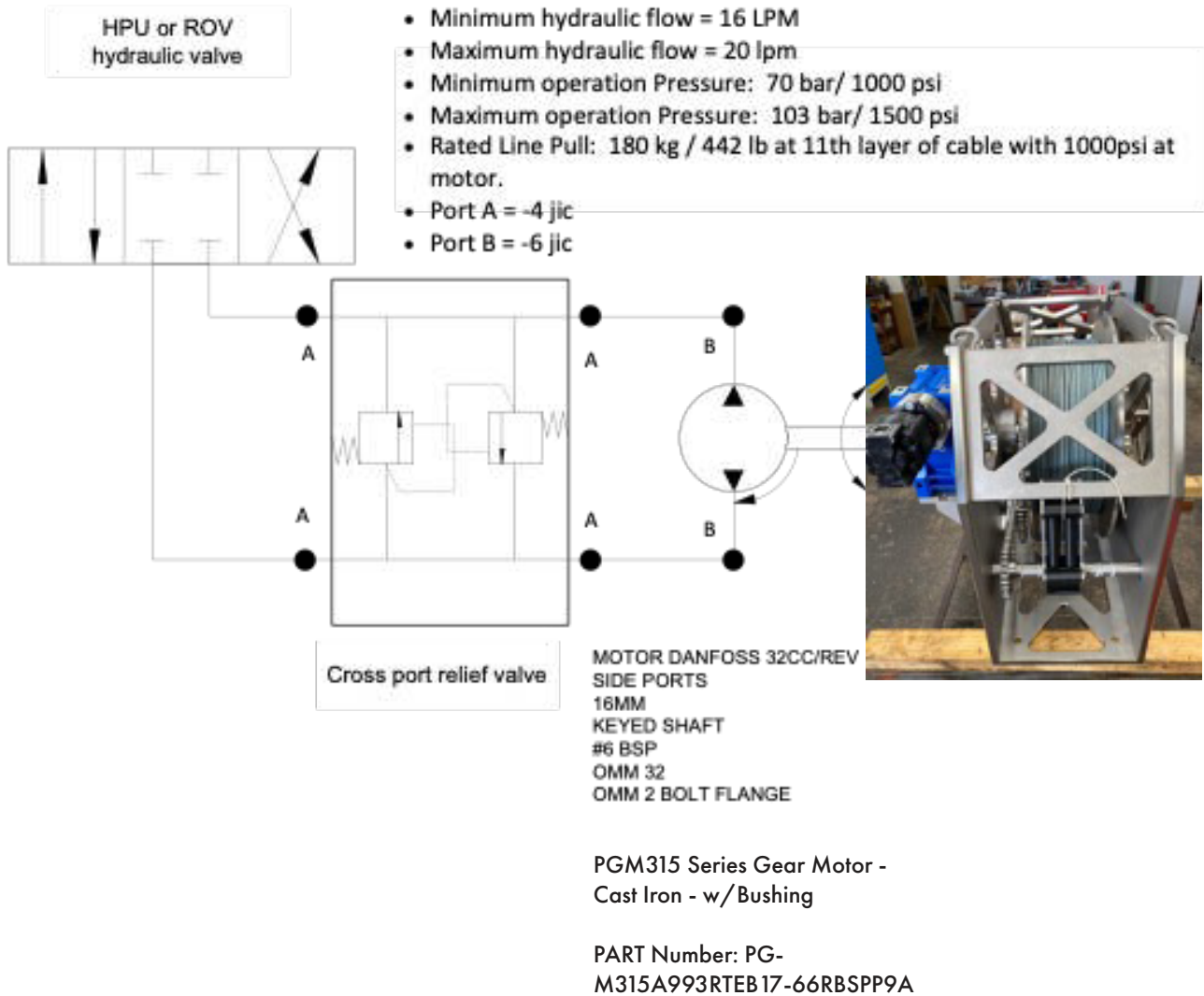
## 4.3 HYDRAULIC CONNECTION

PGM315 Series Gear Motor  
- Cast Iron - w/Bushing  
PART Number: PG-  
M315A993RTEB17-66RB-  
SPP9A



# 4.0 OPERATION PROCEDURES

## 4.3 HYDRAULIC CONNECTION

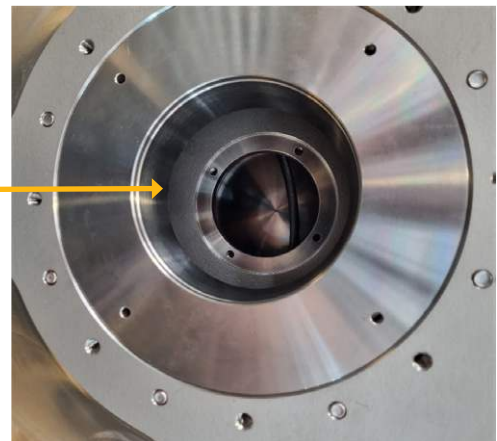


# 4.0 OPERATION PROCEDURES

## 4.4 SERVICING: WINCH DISASSEMBLY



Remove drum lid to uncover Stauff cable clamp and remove clamp.

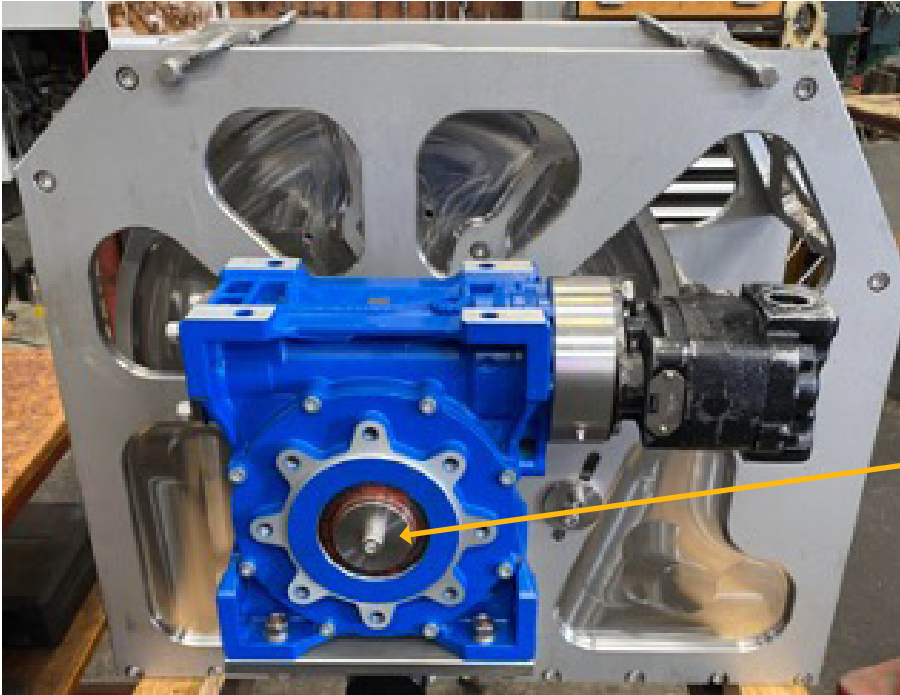


Remove slip ring adapter from drum.

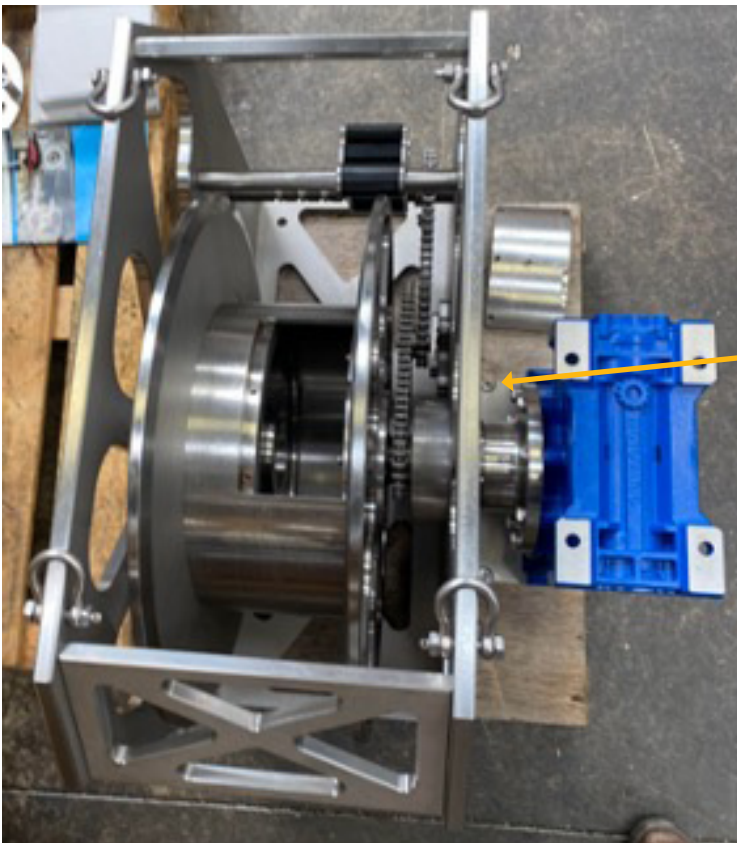
Remove slip ring rotation retaining plate, remove cable from slip rings and remove slip rings.

# 4.0 OPERATION PROCEDURES

## 4.4 SERVICING: WINCH DISASSEMBLY



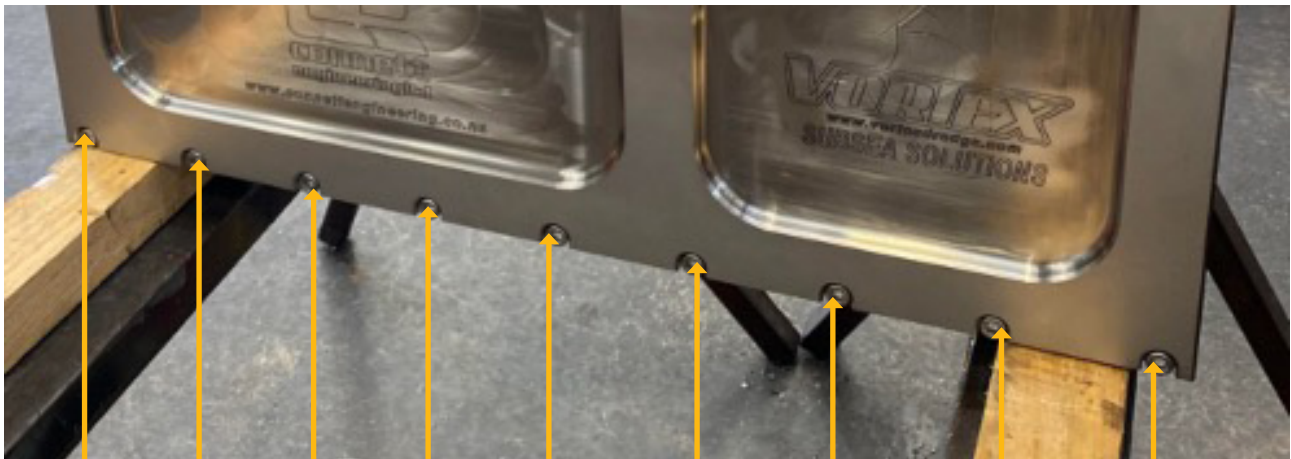
Remove this bolt.



Remove these bolts to  
remove gearbox from  
winch.

# 4.0 OPERATION PROCEDURES

## 4.4 SERVICING: WINCH DISASSEMBLY



Remove these cap screws  
to unmount gearbox side  
cheek plate



# 4.0 OPERATION PROCEDURES

## 4.4 SERVICING: WINCH DISASSEMBLY



Remove chains then remove gearbox side cheek plate to expose primary drive sprocket as shown.

# 4.0 OPERATION PROCEDURES

## 4.5 SERVICING: RUST PREVENTATIVE AND LUBRICATION

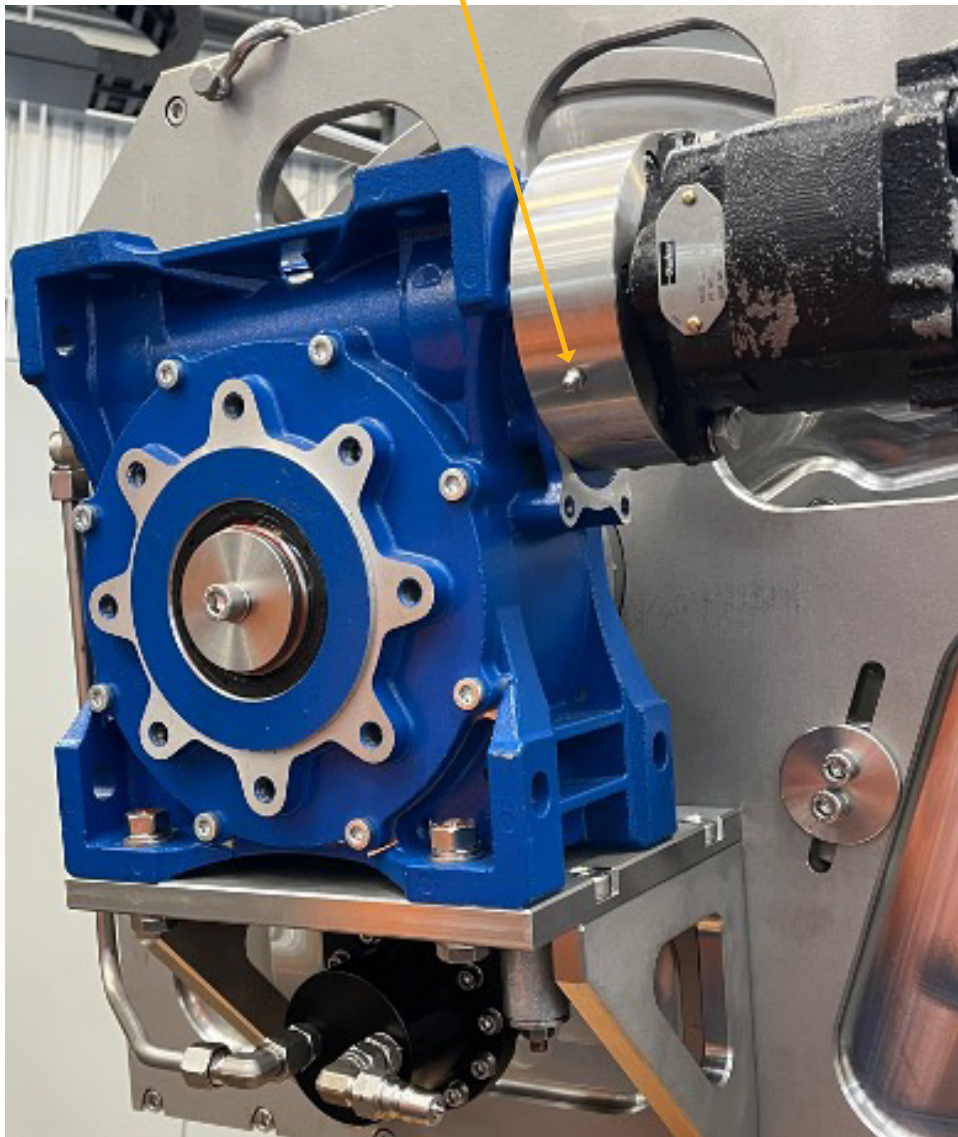
After 3 to 5 dives, remove hydraulic motor, wash out with fresh water any debris, dry thoroughly and liberally spray a lot of rust preventative such as shown to protect carbon steel parts of gearbox. Spray the same on all areas of motor before bolting on gearbox. Spray gearbox with same product to prevent corrosion.



# 4.0 OPERATION PROCEDURES

## 4.5 SERVICING: RUST PREVENTATIVE AND LUBRICATION

Before and after each deployment, pump grease in top to fill voids with grease and push water out. This is to protect carbon steel parts of drive system.



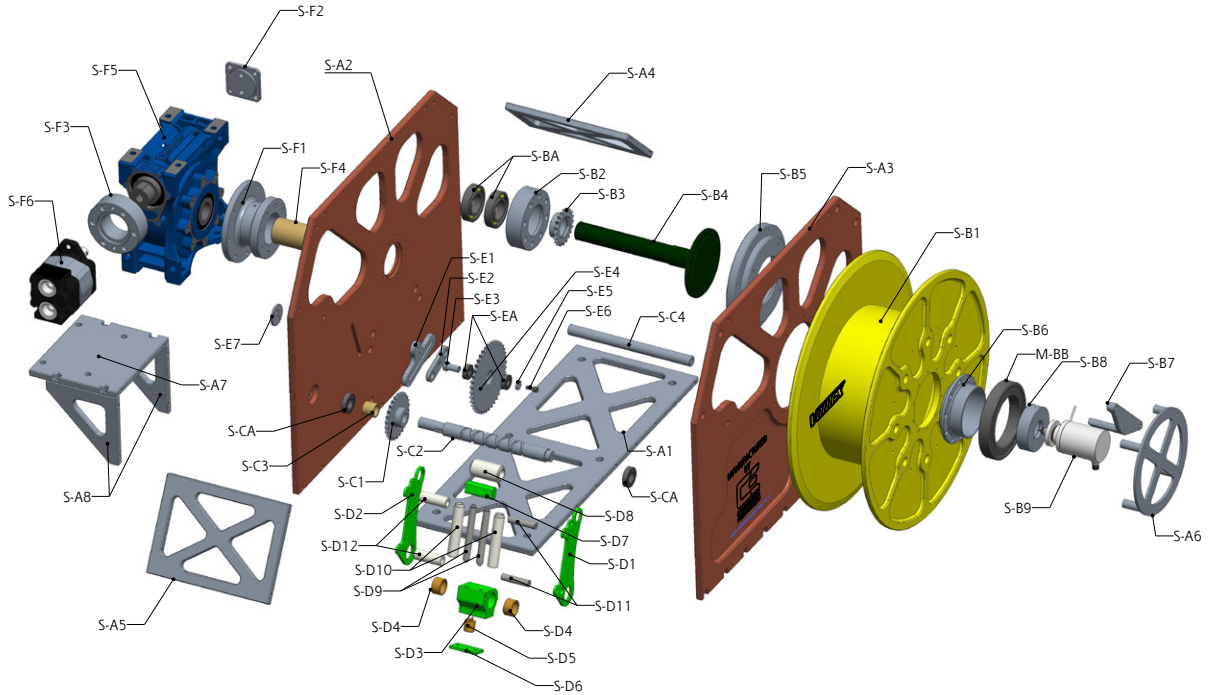
Hydraulic Motor: Parker PGM315 Part#PGM315A993RTEB17-66RBSPP9A

Gear box: 60:1 NMRV-P110 60 to1 WORM GEARBOX

**REMOVE ALL PRESSURE FROM TOOL BEFORE SERVICING**

# 4.0 OPERATION PROCEDURES

## 4.6 PARTS LIST



### Super Heavy Duty Winch Parts Guide



Part No.	Item	Qty	Material
<b>HOUSING</b>			
S-A1	BASE PLATE	1	Stainless Steel
S-A2	SIDE PLATE - DRIVE	1	Stainless Steel
S-A3	SIDE PLATE - NON DRIVE	1	Stainless Steel
S-A4	SPACER PLATE - SMALL	1	Stainless Steel
S-A5	SPACER PLATE - LARGE	1	Stainless Steel
S-A6	BASH GUARD	1	Stainless Steel
S-A7	GEARBOX MOUNTING PLATE	1	Stainless Steel
S-A8	MOUNTING PLATE BRACE	2	Stainless Steel
<b>DRUM LINE</b>			
S-B1	DRUM - 4 PIECE	1	Stainless Steel
S-B2	BEARING HOUSING A	1	Stainless Steel
S-B3	20 TOOTH - DRIVE GEAR	1	Stainless Steel
S-B4	DRIVE SHAFT	1	Stainless Steel
S-B5	BEARING HOUSING B	1	Stainless Steel
S-B6	NON DRIVE SHAFT	1	Stainless Steel
S-B7	SLIP RING ANTI-ROTATION PLATE	1	Acetal
S-B8	SLIP RING ADAPTOR	1	Acetal
S-B9	SLIP RING - NSUWSR	1	
S-BA	BEARING - 6209	2	Stainless Steel
M-BB	BEARING - 6024	1	Stainless Steel
<b>LEAD SCREW</b>			
S-C1	26 TOOTH DRIVE GEAR	1	Stainless Steel
S-C2	LEAD SCREW	1	Stainless Steel
S-C3	LEAD SCREW SPACER	1	Stainless Steel
S-C4	GUIDE BAR	1	Stainless Steel
S-CA	BEARING - 6005	2	Stainless Steel
<b>CHAIN</b>			
S-ZA	DRUM TO IDLER - 835mm	1	Stainless Steel
S-ZB	IDLER TO LEVEL WIND - 685mm	1	Stainless Steel

Part No.	Item	Qty	Material
<b>LEVEL WIND</b>			
S-D1	SIDE PLATE A	1	Stainless Steel
S-D2	SIDE PLATE B	1	Stainless Steel
S-D3	BOTTOM HUB	1	Acetal
S-D4	BOTTOM HUB BUSH	2	Bronze
S-D5	PAWL	1	Bronze
S-D6	COVER PLATE	1	Stainless Steel
S-D7	SUPPORT BLOCK	1	Acetal
S-D8	GUIDE BUSH	1	Acetal
S-D9	VERTICAL ROLLER SHAFT	2	Stainless Steel
S-D10	VERTICAL ROLLER	2	Acetal
S-D11	HORIZONTAL ROLLER SHAFT	2	Stainless Steel
S-D12	HORIZONTAL ROLLER	2	Acetal
<b>TENSIONER</b>			
S-E1	FIXED BRACKET	1	Stainless Steel
S-E2	SLIDE BRACKET	1	Stainless Steel
S-E3	SHAFT	1	Stainless Steel
S-E4	14/40 TOOTH IDLER GEAR	1	Stainless Steel
S-E5	BEARING RETAINER	1	Stainless Steel
S-E6	M8x20 CAP SCREW	1	Stainless Steel
S-E7	CLAMP WASHER	1	Stainless Steel
S-EA	BEARING - 6202	2	Stainless Steel
<b>AUXILIARY</b>			
S-F1	GEARBOX ADAPTOR	1	Stainless Steel
S-F2	GEARBOX PRESSURE CAP	1	Stainless Steel
S-F3	MOTOR SPACER	1	Stainless Steel
S-F4	GEARBOX SPACER	1	Stainless Steel
S-F5	GEARBOX - NMRVP110/060	1	
S-F6	HYDRAULIC MOTOR - PARKER PGM3	1	

# 5.0 MAINTENANCE & STORAGE

## 5.1 STANDARD PROCEDURES

- Tool should be flushed with hot soapy water after each dive.
- Allow to dry fully.
- Spray rust preventative over aluminum and carbon steel parts.
- Check and replace anodes as required.
- Grease all points until full.
- Check operational condition of slip rings.
- Visual check of tool for anything which could prohibit future operation of the tool.

## 5.2 REPLACEMENT PROCEDURES

- Contact Ashtead Technology representatives with reports of any damaged or unserviceable items

# 6.0 Spares

## 6.1 SPARES LIST



### Super Heavy Duty Winch Spare Parts

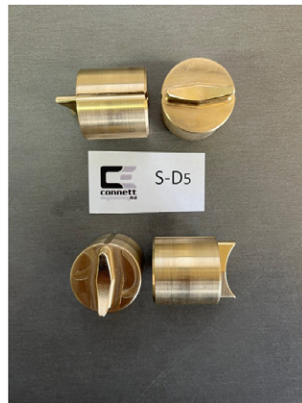


### Super Heavy Duty Winch Spare Parts

Part No.	Item	Qty	Material
S-BA	BEARING - 6209	2	Stainless Steel
M-BB	BEARING - 6024	1	Stainless Steel
S-CA	BEARING - 6005	2	Stainless Steel
S-C2	LEAD SCREW	1	Stainless Steel
S-D5	PAWL	4	Bronze
S-D10	VERTICAL ROLLER	2	Acetal
S-D12	HORIZONTAL ROLLER	2	Acetal
S-EA	BEARING - 6202	2	Stainless Steel
S-ZA	DRUM TO IDLER	1	Stainless Steel
S-ZB	IDLER TO LEVEL WIND	1	Stainless Steel

# 6.0 Spares

## 6.2 SPARES PHOTOS



# 7.0 APPENDIX AND REFERENCES

## 7.1 TOOL DIMENSIONS AND WEIGHTS



800mm L x 630mm W x 670mm H





# 7.0 APPENDIX AND REFERENCES

## APPENDIX 1

OMALA S4 WE 320 or SHELL TIVELA S 320  
[www.mil-specproducts.com/products/SHELL-TIVELA-S-320](http://www.mil-specproducts.com/products/SHELL-TIVELA-S-320)

## APPENDIX 2

Rust preventative spray  
[valvoline.com/en-nz/our-products/sds](http://valvoline.com/en-nz/our-products/sds)

**Safety Data Sheet**

Hazardous, Dangerous Goods



---

**1. MATERIAL AND SUPPLY COMPANY IDENTIFICATION**

Product name: **Tectyl 506 - Aerosol**

Synonyms: Tectyl 506 - Aerosol Product Code: 6174

Recommended use: Corrosion inhibitor.

Supplier:	Valvoline (Australia) Pty Ltd	Valvoline New Zealand Limited
ABN:	00 000 440 885	521039
Street Address:	Level 6, 2 Burtens Place Baulkham Hills, NSW 2153 Australia	4 Stoney Place Ellerslie Auckland New Zealand
Telephone:	+61 2 9639 7000	06 320 4206
Facsimile:	+61 2 9604 2127	06 320 4206

For emergency product information contact Valvoline Technical Hotline for Australia - 1800 504 686 or New Zealand - 0801 2 9883 2300. Hours of operations are Monday to Friday, 8:30 am - 4:30 pm Australian EST.

---

**2. HAZARD IDENTIFICATION**

This material is hazardous according to health criteria of Safe Work Australia.

Signal Word:  
Danger

Hazard Classifications:  
Flammable Aerosol - Category 1  
Aspiration Hazard - Category 1  
Skin Corrosion/Irritation - Category 2  
Specific Target Organ Toxicity (Single Exposure) - Category 3 Narcotic Effects

Hazard Statements:  
H222 Extremely flammable aerosol.  
H304 May be fatal if inhaled and enters airways.  
H315 Causes skin irritation.  
H336 May cause drowsiness or dizziness.

Prevention Precautionary Statements:  
P103 Keep out of reach of children.  
P105 Read label before use.  
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
P211 Do not spray on an open flame or other ignition source.  
P251 Do not pump or burn, even after use.

---

Product Name: Tectyl 506 - Aerosol Reference No: VAL983001  
Issued: 2025-05-21 Version: 3.8 Page 1 of 8

# 7.0 APPENDIX AND REFERENCES

## APPENDIX 3: SPROCKETS AND DRIVE CHAINS

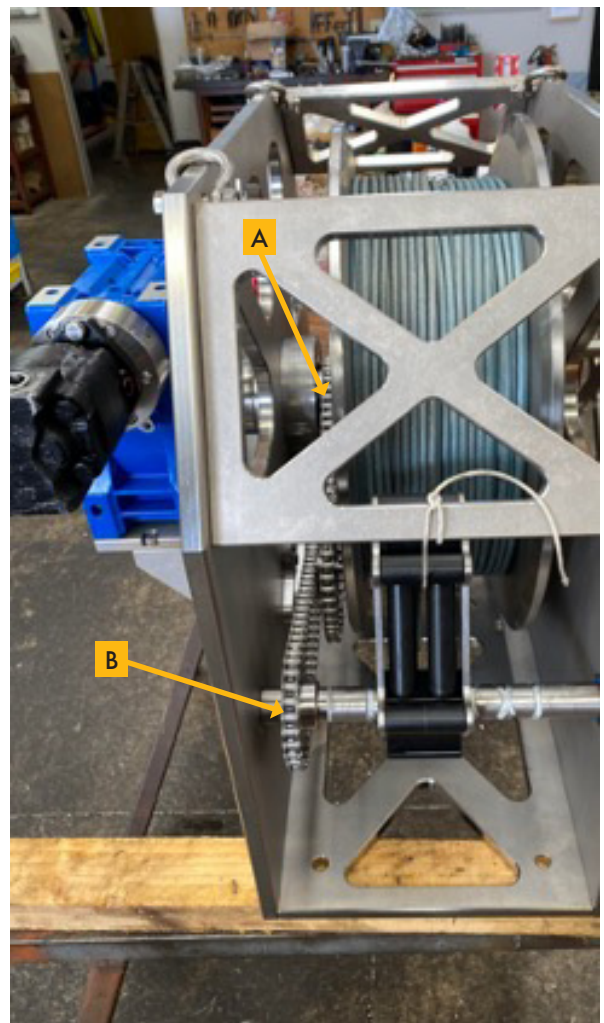
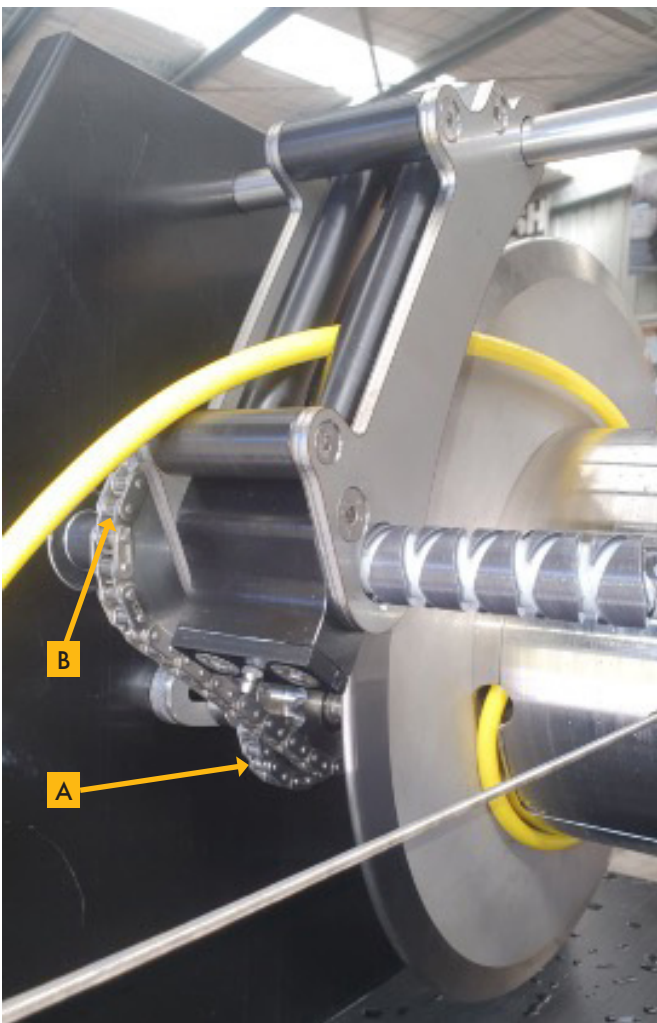
Sprockets: 1/2" BS SIMPLEX S

Chain: 08B-1-SS-KANA BS 1/2" SIMPLEX S/S CHAIN

Chain link: 08B-1-SS-CL-KANA BS 1/2" SIMPLEX S/S CONN L

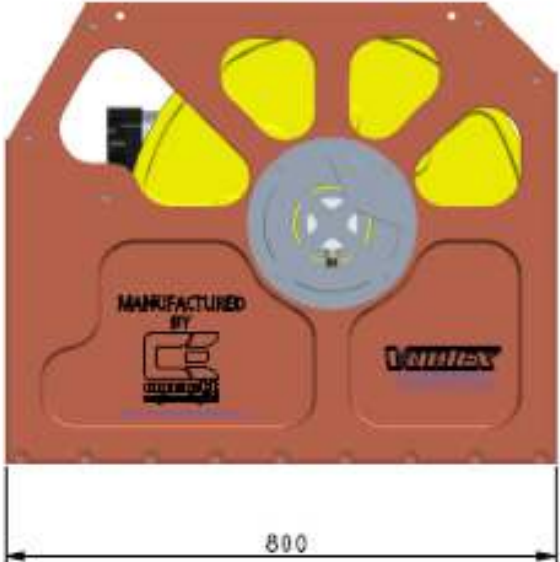
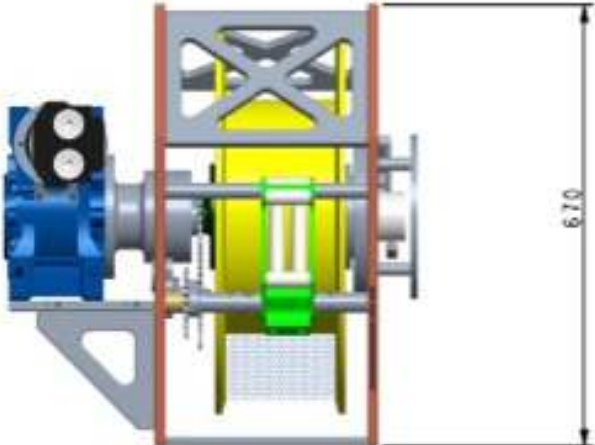
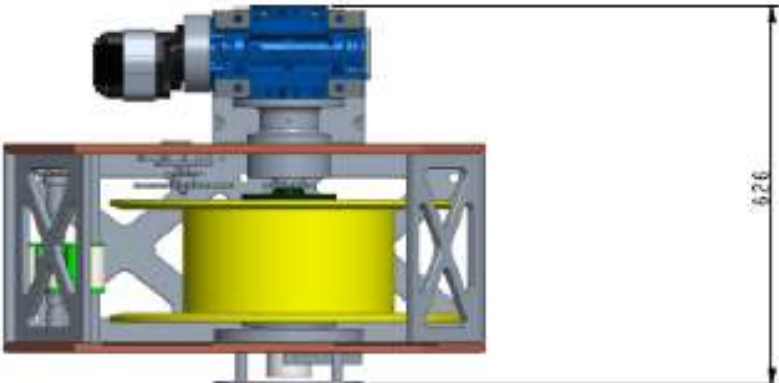
**A** Drum to idler chain: 835 mm (66 actual rollers) part #S-ZA

**B** Idler to level wind chain: 685 mm (54 actual rollers) part #S-ZB



# 7.0 APPENDIX AND REFERENCES

## APPENDIX 4: WINCH DIMENSIONS



# 7.0 APPENDIX AND REFERENCES

## APPENDIX 5: SLIP RINGS

### SLIP RINGS – MAY DIFFER DEPENDING ON WORK SCOPE WINCH IS ORDERED FOR.

The NSUWSR is an underwater slip ring contact that uses brushes on stationary contacts to transfer electrical connections. The slip ring consists of a stator and a rotor. There are two different configurations available; up to 12 connections or up to 21 connections.

<b>General</b>	
Working Depth	80m
Material	S/S 316
Contacts	0-12 & 13-21
Max Speed	300 Rpm
Lifetime	100 Million revolutions
<b>Electrical</b>	
Rating voltage	240VAC
Rating current	2A/ring, 5A, 10A by parallel
Insulation resistance	1000MΩ@500VDC
Dielectric strength	600VDC@50Hz
Electrical noise	10mΩ@6VDC, 50m
Contact material	Gold-Gold
Lead wire	12 color AWG#28 Teflon wire
<b>Connectors</b>	
Rotor	MCBHxM (Depends on number of contacts)
Stator	MCBHxM (Depends on number of contacts)
<b>Size</b>	
Width	Ø 75 mm
Height	100/125 mm
Weight	2,5 kg (in air), 2,2 kg (in water)

# 7.0 APPENDIX AND REFERENCES

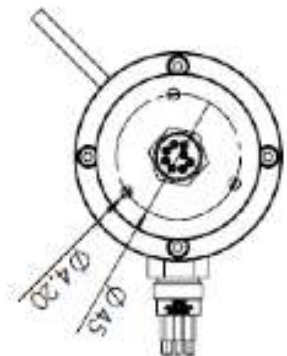
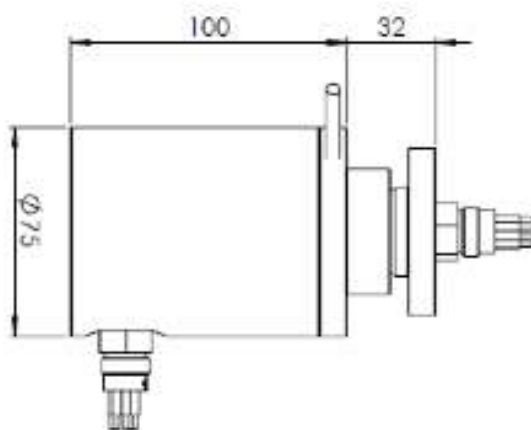
## APPENDIX 5.1: SLIP RINGS

**MAY DIFFER DEPENDING ON WORK SCOPE WINCH IS ORDERED FOR.**

NSUWSR | Stainless Steel Underwater Slip Ring Contact. The NSUWSR is an underwater slip ring contact that uses brushes on stationary contacts to transfer electrical connections. The slip ring is consisting of a stator and a rotor. There are two different configurations available; up to 12 connections or up to 21 connections.

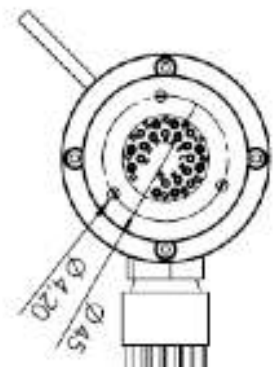
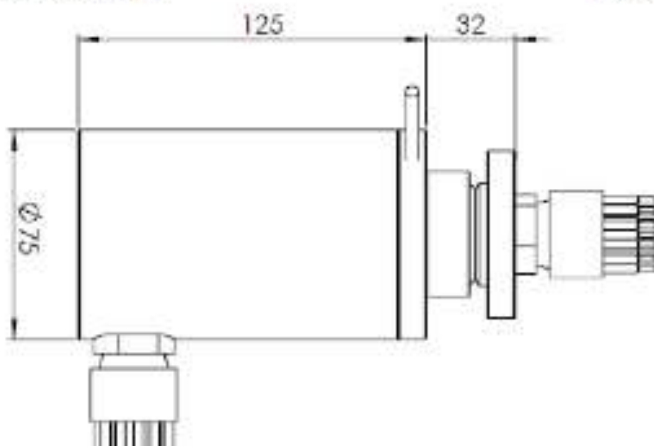
NSUWSR-6-12

Dimensions ( mm )



NSUWSR-13-21

Dimensions ( mm )



# 7.0 APPENDIX AND REFERENCES

## APPENDIX 6: HYDRAULIC MOTOR

PGM315 Series Gear Motor - Cast Iron - w/Bushing

PART Number: PGM315A993RTEB17-66RBSPP9A

PN (Part No.)	PGM315A993RTEB17-66
SERIES (Series)	PGM315
UNIT (Unit)	A = Single Unit
STUDS (Extended Studs)	No
SECOB (Shaft End Cover / Outboard Bearing)	9 = No OutBoard Bearing - 1/4 ODT Drain
SECMF (Shaft End Cover / Mounting Flange)	93 = SAE 2-BOLT A
PECPL (Port End Cover / Port Location)	R = Rear Ports
PECTYPE (Port End Cover - Porting)	BSPP
PORTS (Ports)	RT - 1 x 1
GH (Gear Housing)	FR = Motor
OS (Operating Speed)	900 RPM
OP (Operating Pressure)	2500psi (172 bar)
GW (Gear Width)	17 = 1.750" / 2.17 cu in / 35.5 cc
SHAFT (Shaft)	-66 = SAE B Key

# Contacts



## JOE GOODIN

MANAGING DIRECTOR

VORTEX International Ltd

27 Parris Road, RD1, New Plymouth, New Zealand

Tel/Fax: +64 (6) 753 8102, Mobile: + 64 (0) 27 688 5372

Email: [joe@vortextdredge.com](mailto:joe@vortextdredge.com)

Website: [vortextdredge.com](http://vortextdredge.com)



IN ASSOCIATION WITH ASHTEAD TECHNOLOGY:

## ABERDEEN

Ashtead Technology Ltd

Ashtead House, Discovery Drive, Arnhall Business Park,  
Westhill, Aberdeenshire AB32 6FG

Tel: +44 (0) 1224 771888,

Email: [aberdeen@ashtead-technology.com](mailto:aberdeen@ashtead-technology.com)

## SINGAPORE

Ashtead Technology (S.E.A) Pte Ltd

Loyang Offshore Supply Base, 25 Loyang Crescent,  
Block 302, Unit 02-12 TOPS Ave 3, PO Box 5157,  
SINGAPORE 508988

Tel: +65 6545 9350,

Email: [singapore@ashtead-technology.com](mailto:singapore@ashtead-technology.com)

## HOUSTON

Ashtead Technology Offshore Inc

19407 Park Row, Suite 170, Houston, TX 77084, U.S.A

Tel: +1 281 398 9533,

Email: [houston@ashtead-technology.com](mailto:houston@ashtead-technology.com)

## SCOPE ENGINEERING

(Ashtead Technology Agent)

Scope Engineering (WA) Pty Ltd

35 Stuart Drive, Henderson, Western Australia 6166

T: +61 8 6498 9642 F: +61 8 6498 9584,

Email: [Perth@ashtead-technology.com](mailto:Perth@ashtead-technology.com)

## INNOVA AS

P.O. Box 390 Forus, 4067 Stavanger

Phone: +47 51 96 17 00

Fax: +47 51 96 17 01

Email: [post@innova.no](mailto:post@innova.no)

## TES SURVEY EQUIPMENT SERVICES LLC

PO Box 128256

Abu Dhabi, UAE

Tel: + 971 2 650 7710

Fax: +971 2 650 7200

Email: [info@tesme.com](mailto:info@tesme.com)





**VORTEX**  
**SUBSEA SOLUTIONS**

[vortexdredge.com](http://vortexdredge.com)