



ELECTRIC DRIVE CAMERA WINCH E DRIVE – 150

OPERATIONS MANUAL

VERSION 1.0

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VOR-ECW-MAN: VER 1.0

Vortex electric drive camera winch manual version 1.0

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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

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.

Technical Specifications

3.1 DESCRIPTION

Electric driven winch with electrical 8 path slip rings. 4 path also available.



Technical Specifications

3.2 FEATURES INCLUDE:

- Powerful and constant operating torque using electric motor.
- 180kg plus pulling capacity.
- Heavy duty worm gearbox with 50:1 gear ratio 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.

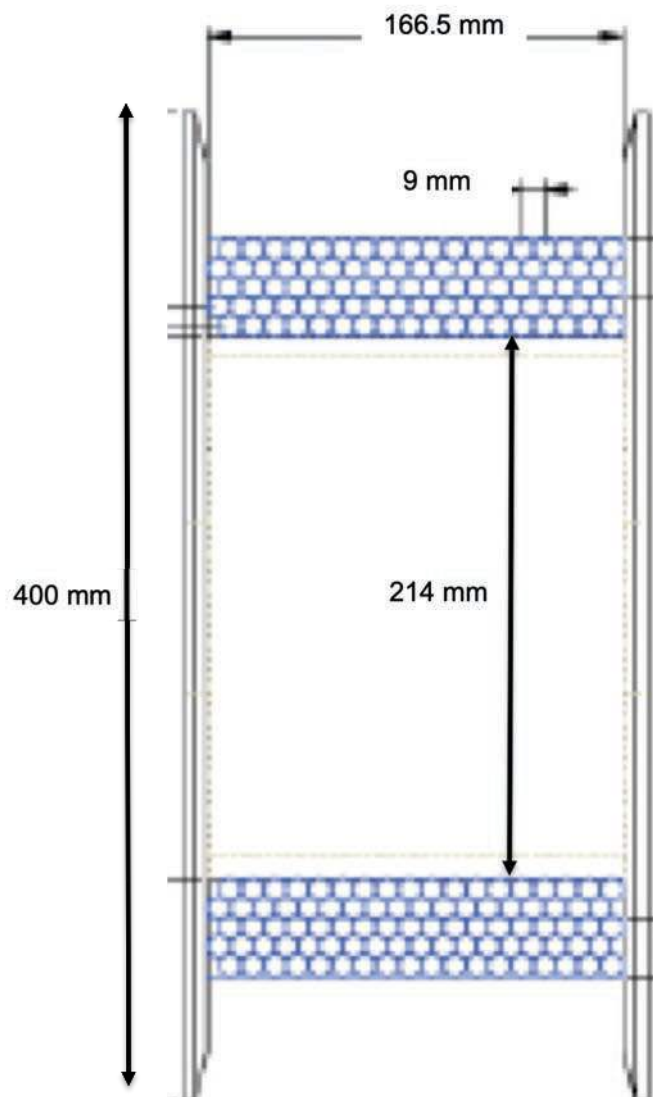
- Rated Line Pull: 180 kg / 442 lb at 11th layer of cable
- Line Speed in: 6.8 mtr/min at first layer of cable @ 180kg lift
- Gear Train: Worm drive gearbox to stainless chains and sprockets
- Gear Ratio: 50:1 NMRV-P063 50 to 1 WORM GEARBOX
- Winch Construction: Stainless steel and Acetal
- Brake: N/A. Winch uses worm drive gearbox for load holding
- Rotation of Winch: Over-wound orientation only
- Drum Barrel Diameter: 214 mm
- Drum Flange Diameter: 400 mm
- Distance Between Flanges: 166 mm
- Cable size Recommended: 9mm +/- 0.1mm
- Cable length potential with 9mm drum :
- Level wind: Stainless diamond bar with integral fairlead
- Slip rings: IEC corporation. FMO-8-MC8M-MC8F Oil filled
- Drum capacity using 9mm diameter cable: Theoretical wrapping of 18 wraps per lay to the maximum diameter would achieve approximately 146m. Actual wrapping of 17 wraps per lay gives approximately 137m. This gives a maximum of 9 lays on a full drum. Approximately 70 mtrs would need 5 lays.
- Weight in air: 178 kg
- Weight in water: 118 kg
- Dimensions: 650mm L x 550mm high x 528mm wide
- Total Including 6 Pre-Wraps = 148m
- Electric supply: 14 Amps at 200kg pull
- Electric supply: 120 VAC @ 50Hz
- Electric supply no load: 11 Amps
- 4 pole, 5Hp, 3 phase, 1440 RPM, FIA 28.
- Water sensor in motor.

Technical Specifications

3.4 SPECIFICATIONS: DRUM PULL AND DRUM CAPACITY

Layer of Wire Rope	Test pull weight kg / lb	Total cable on Drum - mtr	Line speed pulling in at 16 lpm Minimum (mtr/min)	Line speed Paying out at 16 lpm Minimum (mtr/min)	Hydraulic pressure Required Bar / Psi
1st	180 / 442	8.2	6.8	9.3	39.9 / 580
11th	180 / 442	70.1	10	12.1	55.1 / 800

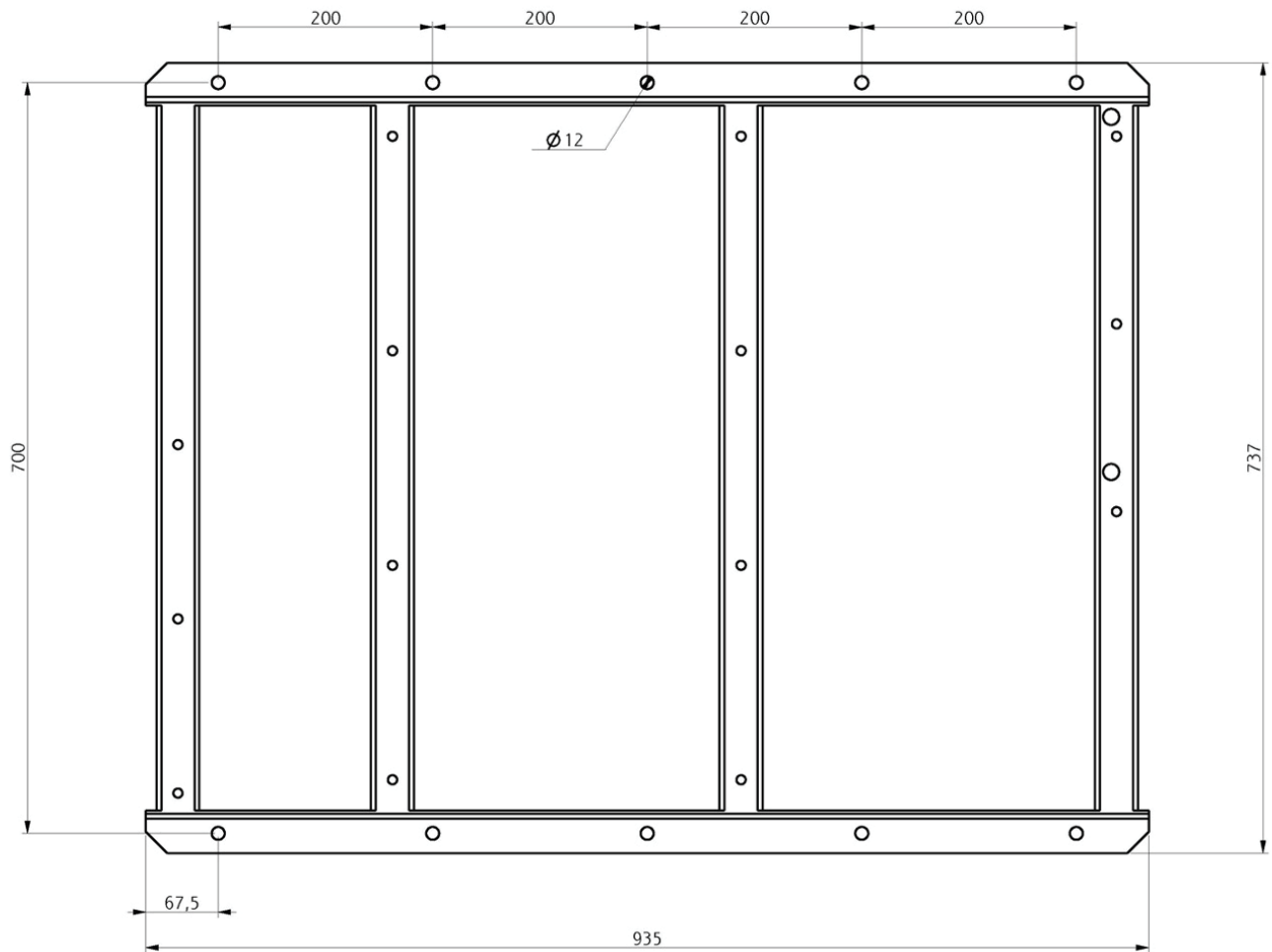
- Row 1 (6 Pre-Wraps) = 4.128m @ ID 219 Row 1 (12 Wraps) = 8.257m @ ID 219
- Total Of 6 Pre-Wraps = 4.13m Total After 6 Pre-Wraps = 66.38m
- Total Including 6 Pre-Wraps = 70.5m



Technical Specifications

3.5 SPECIFICATIONS

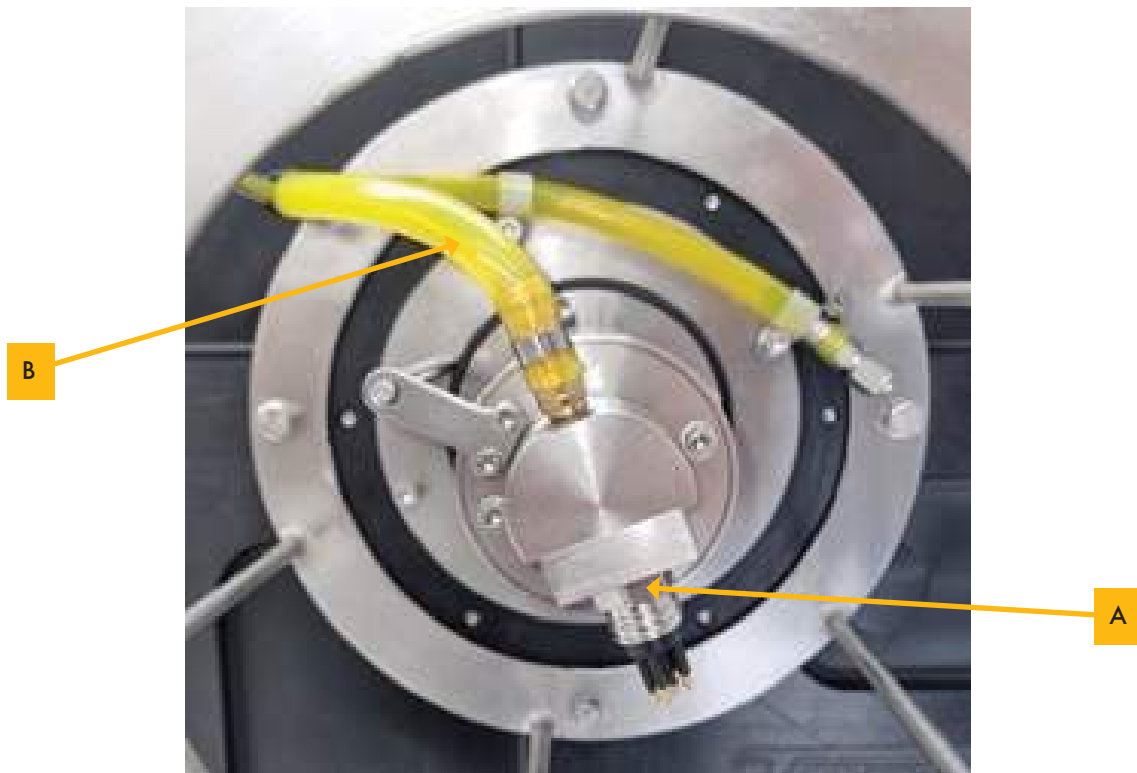
Base mounting holes



Operation Procedures

4.1 PRE DIVE CHECKS TOOL VISUAL CHECK

- A:** Ensure no damage to slip ring pins. Pin out from slip ring pins to cable end prior to and after deployment.
- B:** Ensure slip ring is bled of air with transformer oil.
- C:** Ensure motor and slip ring comp is half full of transformer oil
- D:** Ensure gearbox comp is half full of **OMALA S4 WE 320** or **SHELL TIVELA S 320** oil. A small air bubble is ok to allow for expansion. Ensure gearbox is bled of air.



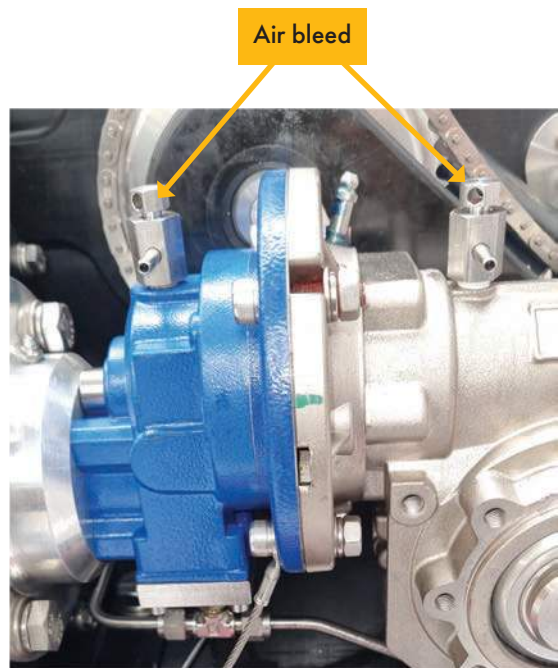
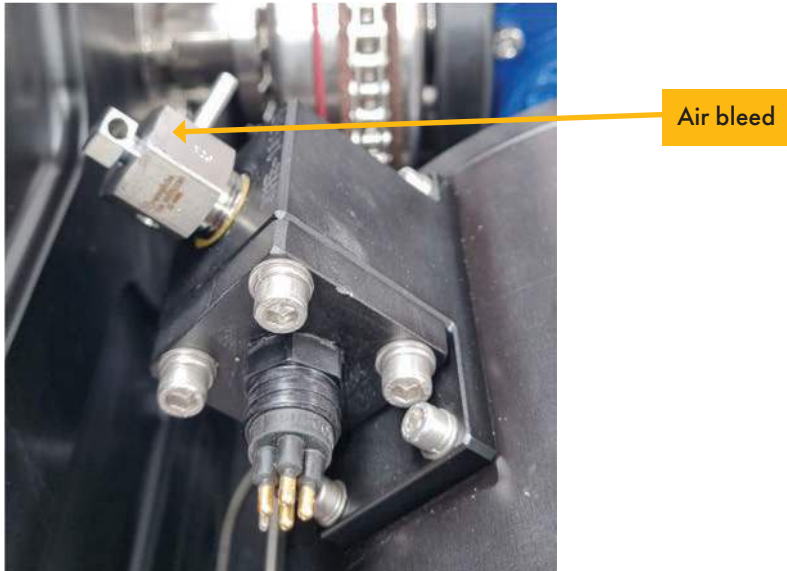
Operation Procedures

4.2 ELECTRICAL CONNECTION



Operation Procedures

4.3 AIR BLEED



Operation Procedures

4.4 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.

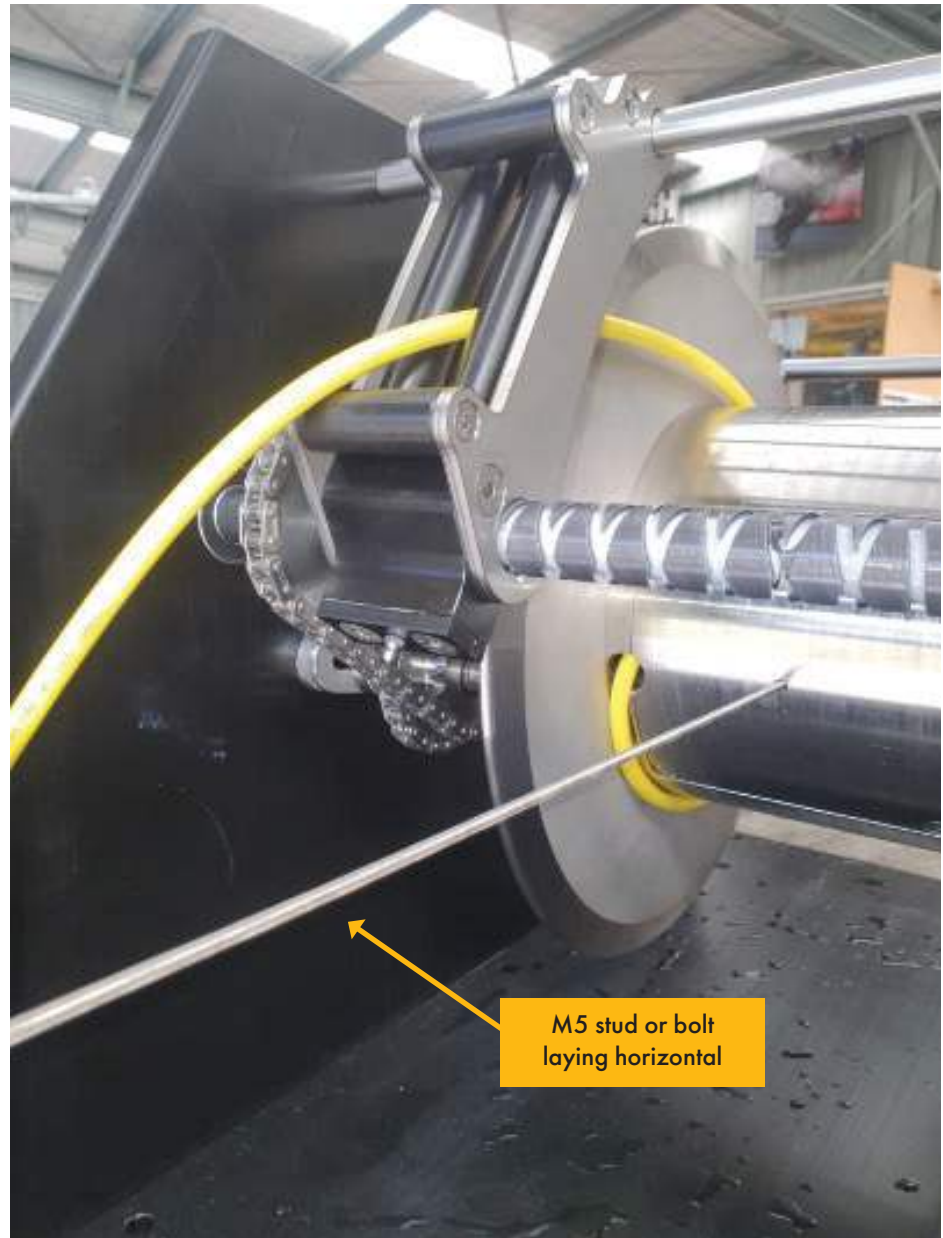
Rotate sprockets and jump the chains until this all occurs.

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.



Operation Procedures

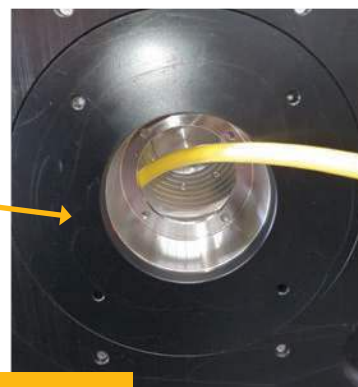
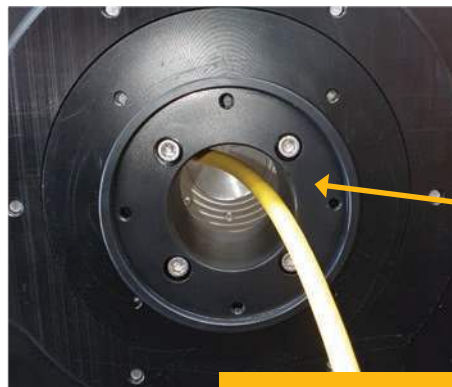
4.5 SERVICING: WINCH DISASSEMBLY



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



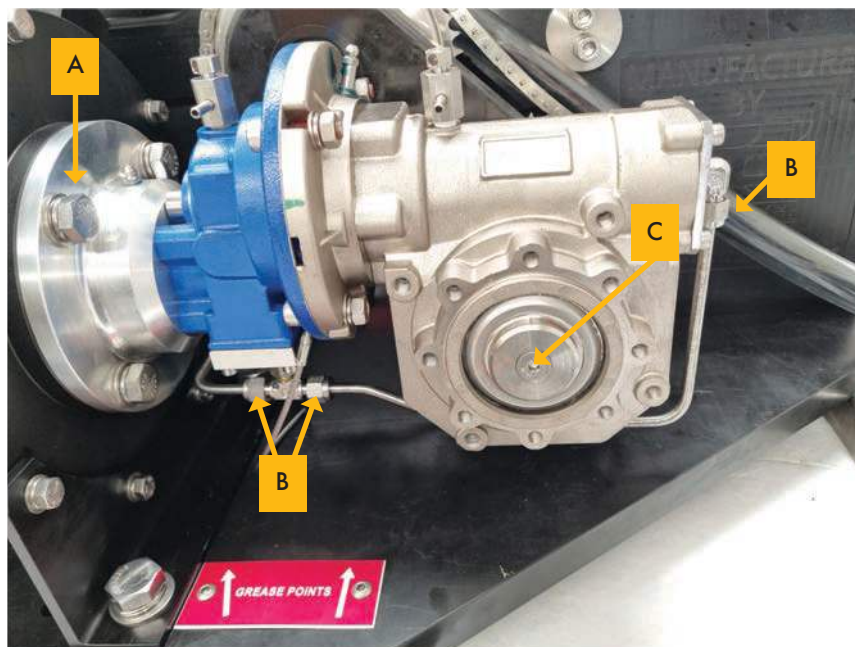
Remove slip ring rotation retaining plate, remove cable from slip rings and remove slip rings.



Remove slip ring adapter from drum

Operation Procedures

4.5 SERVICING: WINCH DISASSEMBLY



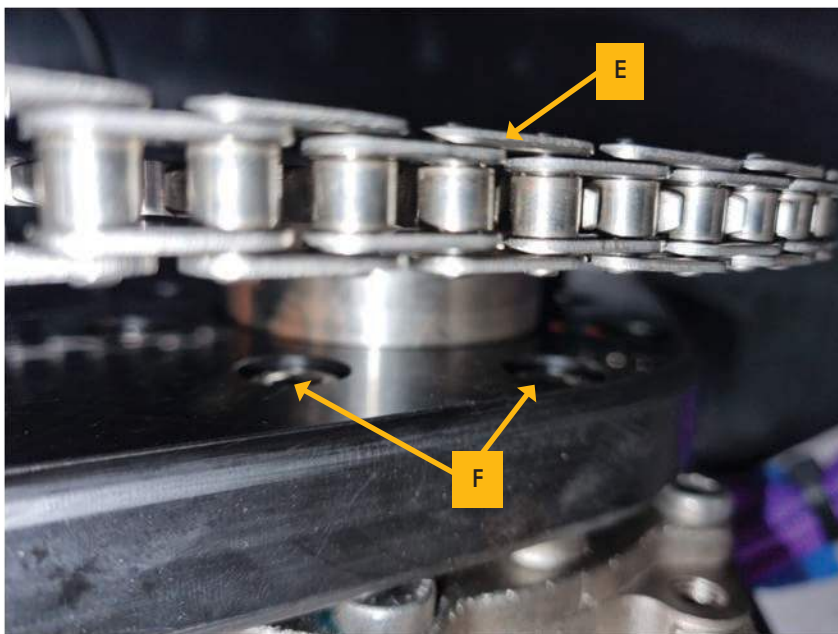
- A) Remove four M8 bolts.
- B) Remove comp lines.
- C) Remove this bolt.



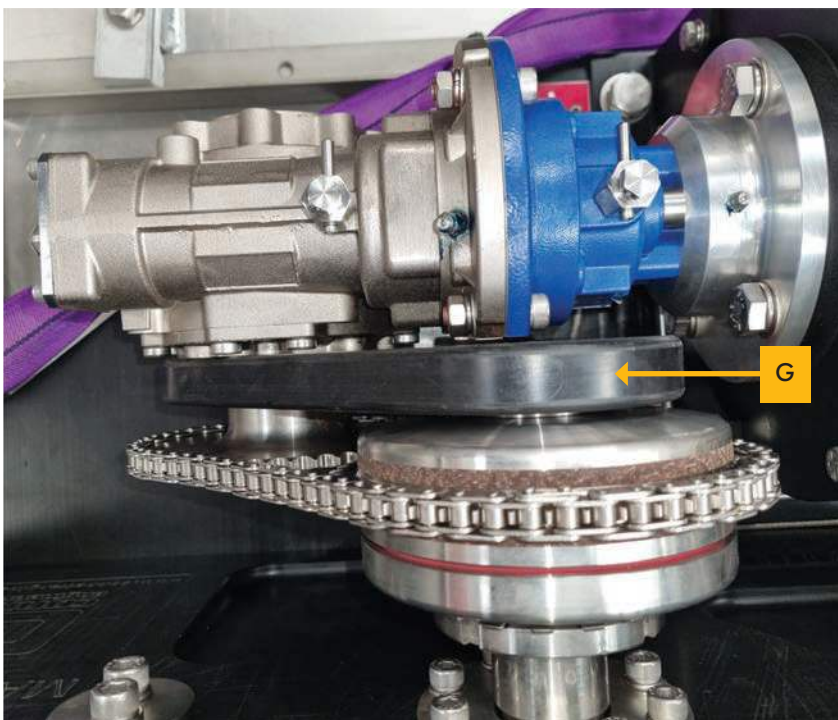
- D) Remove these bolts to remove gearbox from winch.

Operation Procedures

4.5 SERVICING: WINCH DISASSEMBLY



E) Remove the chain.
F) Remove these M8 bolts.



G) Pull gearbox away from acetal support block.

Operation Procedures

4.5 SERVICING: WINCH DISASSEMBLY



Operation Procedures

4.5 SERVICING: WINCH DISASSEMBLY

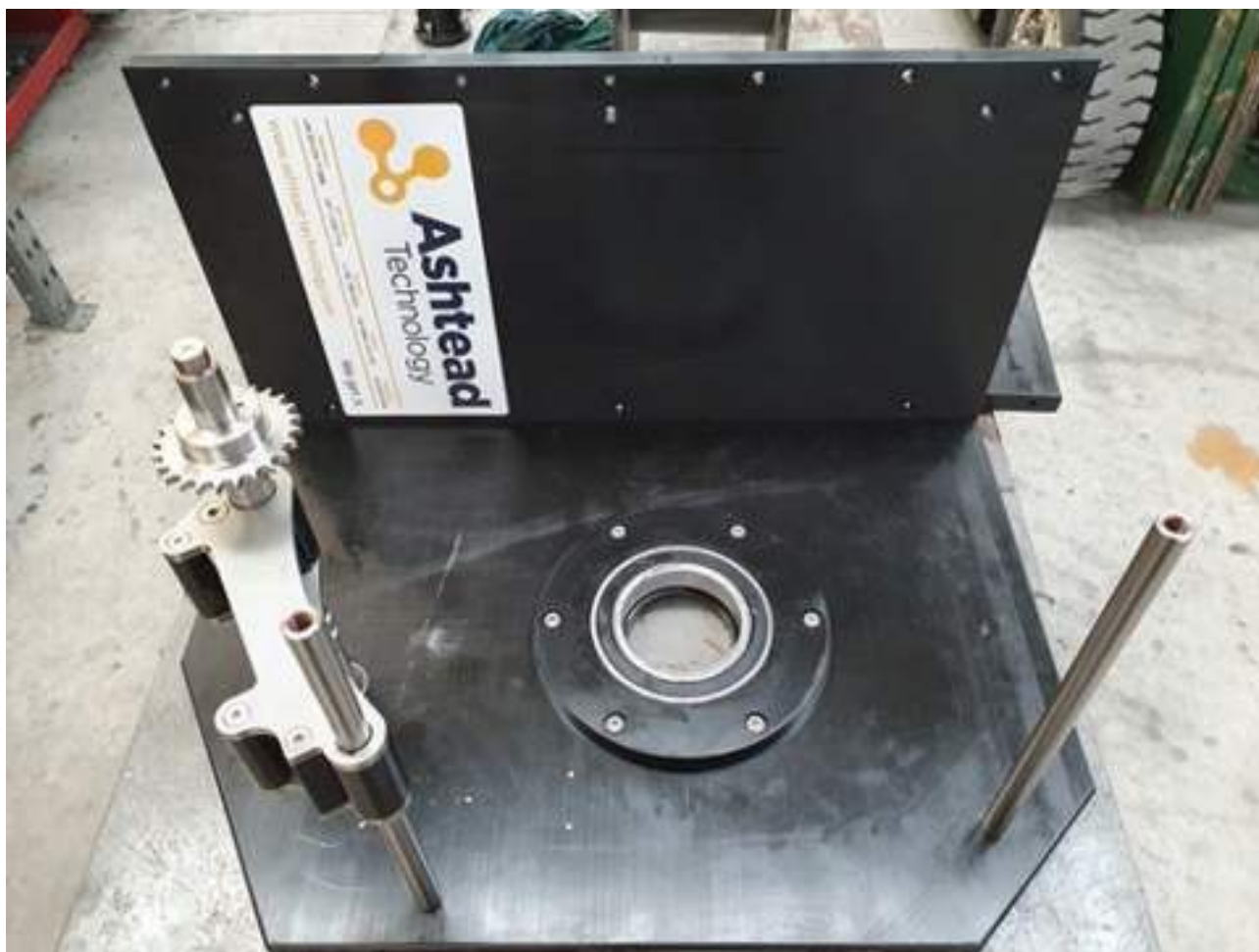


Remove chains then remove gearbox side cheek plate to expose primary drive sprocket as shown.

Operation Procedures

4.5 SERVICING: WINCH DISASSEMBLY

Remove drum from main bearing to expose slip ring side cheek plate as shown.



REASSEMBLY OF WINCH IS THE REVERSE OF DISASSEMBLY.

Operation Procedures

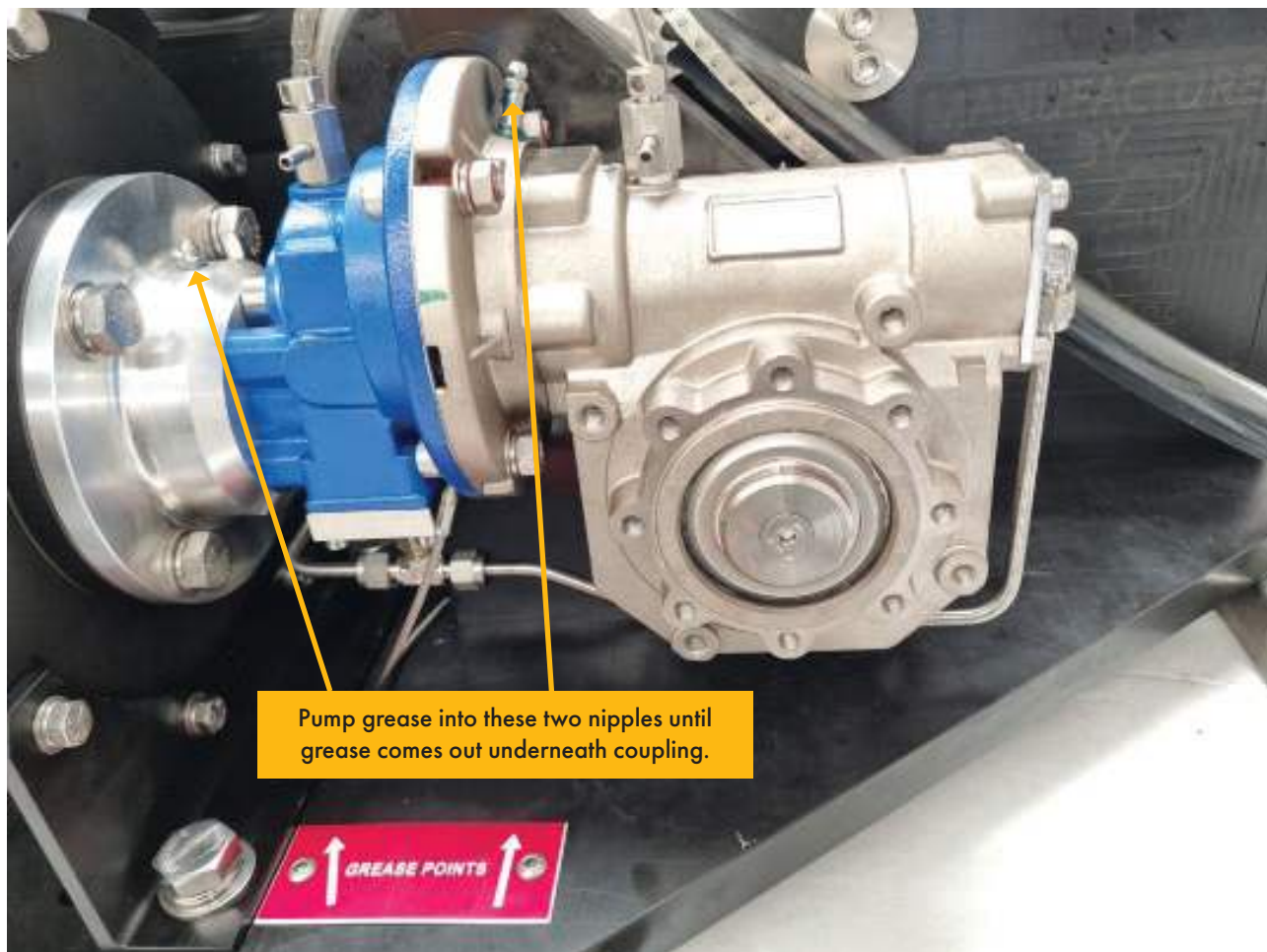
4.6 SERVICING: RUST PREVENTATIVE AND LUBRICATION

After 3 to 5 dives, remove electric 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.



Operation Procedures

4.6 SERVICING: RUST PREVENTATIVE AND LUBRICATION

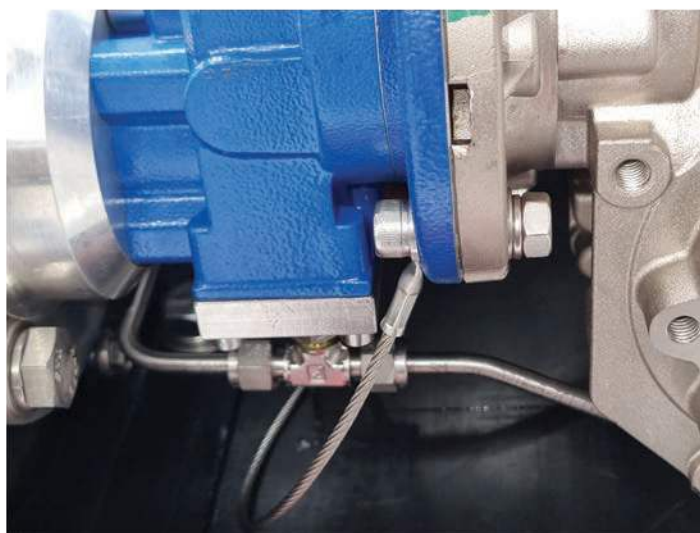
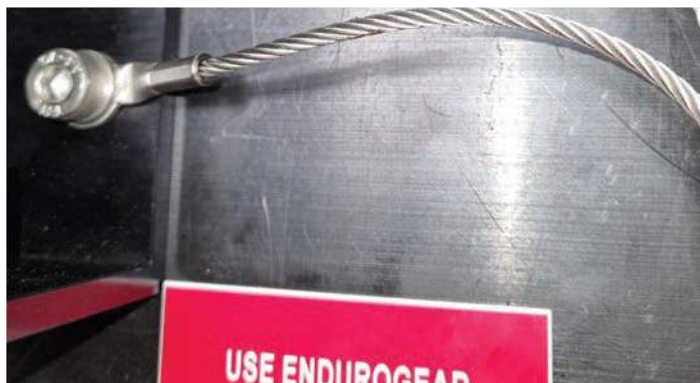


REMOVE ALL PRESSURE FROM TOOL BEFORE SERVICING

Operation Procedures

4.6 SERVICING: RUST PREVENTATIVE AND LUBRICATION

Ensure anode is in good condition, working and connected at all points.



Maintenance, Storage & Inventory

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.

REPLACEMENT PROCEDURES

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



SHIPPING BOX

Width: 100 mm

Height: 640 mm

Length: 200 mm

Weight: 238 kg

Maintenance, Storage & Inventory



Maintenance, Storage & Inventory



Shipping Box Storage

Wash winch and hoses with fresh water, dry and place in box as shown below.

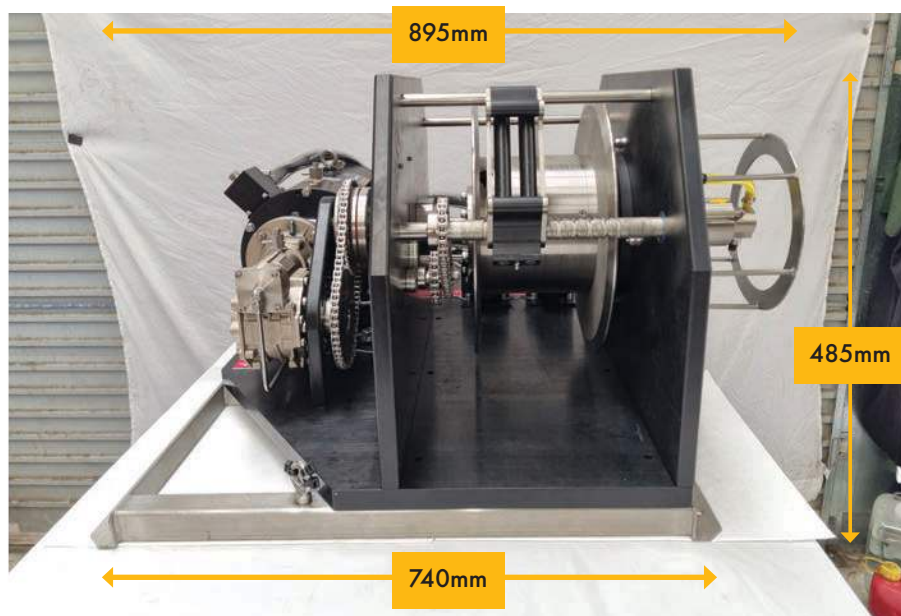
Tighten four bolts **A** on hold down plates prior to shipping.



- A** Hold down bolt and block
- B** Compensator fill bottle – TRANSFORMER OIL ONLY
- C** Spares box
- D** Lifting strop x 3

Appendix & References

6.1 TOOL DIMENSIONS AND WEIGHTS



Weight in air: 178 kg

Weight in water: 118 kg

Appendix & References

APPENDIX 1

Gearbox oil: **OMALA S4 WE 320** or **SHELL TIVELA S 320**

www.mil-specproducts.com/products/SHELL-TIVELA-S-320

APPENDIX 2

Rust preventative spray

www.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: 6014	
Recommended use: Corrosion inhibitor		
Supplier: A/NZ: Street address: Telephone: Facsimile:	Valvoline (Australia) Pty Ltd 88-000 440 800 Level 8, 3 Burbank Place Baulkham Hills, NSW 2153 Australia +61 2 9650 7000 +61 2 9650 5127	Valvoline New Zealand Limited 521039 4 Stansbury Place Mile End Auckland New Zealand 09 630 4000 09 630 4004
For emergency product information contact Valvoline Technical Hotline for Australia - 1800 096 600 or New Zealand - 0800 3 8865 3333. Hours of operation 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 Aerosols - Category 1 Aspiration Hazard - Category 1 Skin Corrosion/Irritation - Category 2 Specific Target Organ Toxicity (Single Exposure) - Category 3 Narcotic Effects		
Hazard Statements H332 Extremely flammable aerosol. H334 May be fatal if inhaled and asphyxiates. H315 Causes skin irritation. H336 May cause drowsiness or dizziness.		
Prevention/Precautionary Statements P103 Keep out of reach of children. P108 Read label before use. P210 Keep away from heat/sparks/open flame/hot surfaces. No smoking. P231 Do not spray on an open flame or other ignition sources. P232 Do not breathe or spray, even after use.		
Product Name: Tectyl 506 - Aerosol		Reference No: VAL 00 0006
Issued: 2008-05-21		Version: 3.2 Page 1 of 1

Appendix & References

APPENDIX 3

Gearbox

NMRVP063/050

NMRV-P063 50:1 Worm Gearbox

Motor to gearbox drive bush

NMRVP063 Bush14mm

NMRV-P063 Input bush 14mm

	Motor size up to	Motor power up to	Nominal torque Nm	Ratios
NMRV063 power	090	2,2 kW	170	5,00 to 100,00

	Motor size up to	Motor power up to	Nominal torque Nm	Ratios
PC+NMRV063 power	080	0,92 kW	280	7,25 to 788,00

Appendix & References

APPENDIX 4

Slip rings: IEC corporation.

FMO-8-MC8M-MC8F. Oil filled

FILL WITH Dow Corning 200 100 CST Oil.

Slip ring connectors: Subconn connector

MCBH8F Subconn Connector on rotating section.

MC8F MC8M Subconn Connector on stationary section.



Appendix & References

APPENDIX 5

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

Drum to idler chain: 505 mm (54 actual rollers)

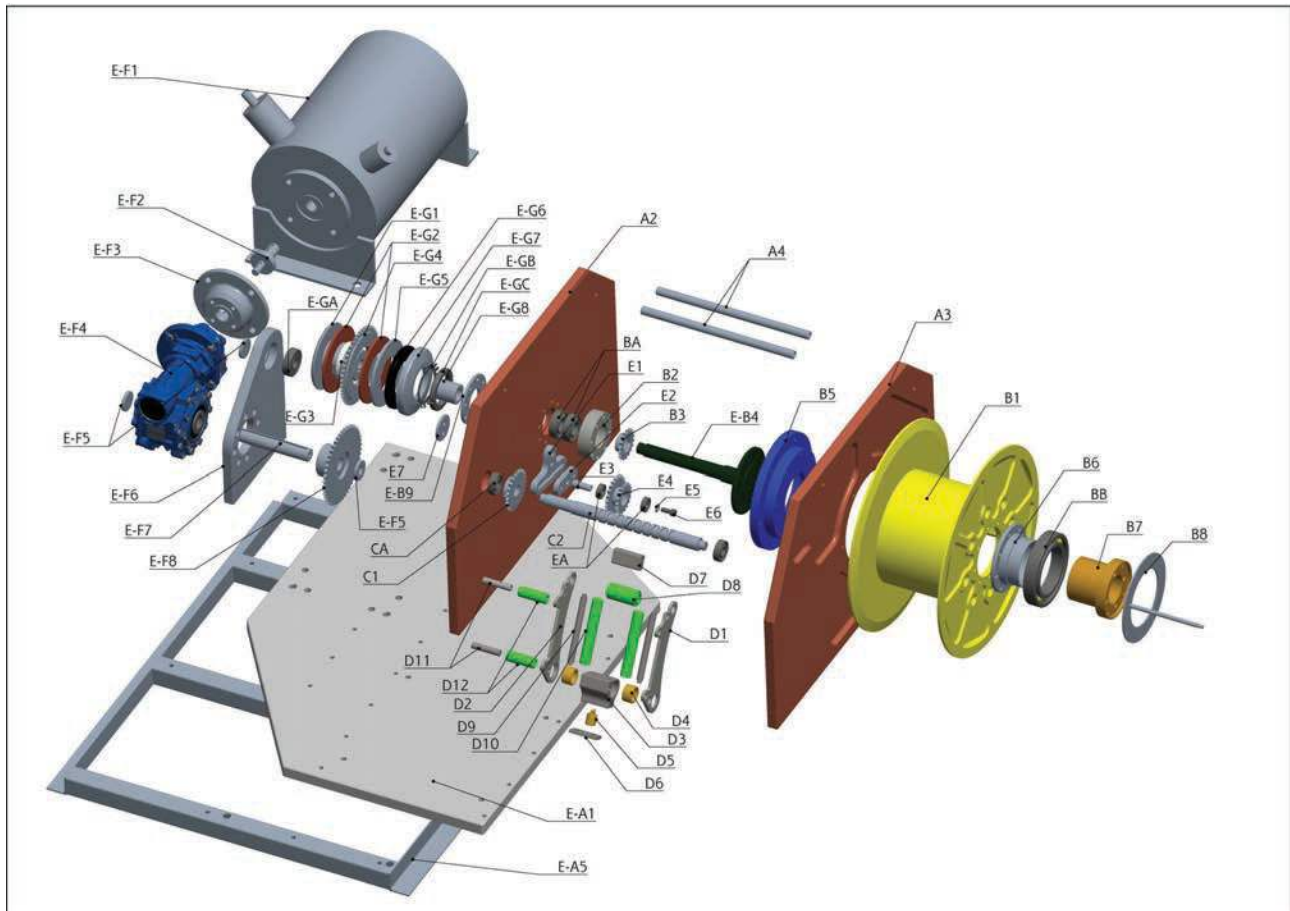
Idler to level wind chain: 445 mm (46 actual rollers)



Appendix & References

APPENDIX 6

Winch exploded view



Appendix & References

APPENDIX 7

Parts Guide



HEAVY DUTY WINCH - PARTS GUIDE

Part No.	ITEM - Housing	Qty	Material
E-A1	BASE PLATE	1	Acetal
A2	SIDE PLATE - DRIVE	1	Acetal
A3	SIDE PLATE - NON DRIVE	1	Acetal
A4	TIE RODS	2	Stainless Steel
E-A5	BASE PLATE FRAME	1	Stainless Steel

Part No.	ITEM - Drum Line	Qty	Material
B1	DRUM - 3 PIECE	1	Stainless Steel
B2	BEARING HOUSING A	1	Stainless Steel
B3	18 TOOTH - DRIVE GEAR	1	Stainless Steel
E-B4	DRIVE SHAFT	1	Stainless Steel
B5	BEARING HOUSING B	1	Acetal
B6	NON DRIVE SHAFT	1	Stainless Steel
B7	SLIP RING MOUNT	1	Acetal
B8	SLIP RING ANTI-ROTATION PLATE	1	Stainless Steel
E-B9	BEARING HOUSING A - CLAMP WASHER	1	Stainless Steel
BA	BEARING - 6205	2	Stainless Steel
BB	BEARING - 6018	1	Stainless Steel

Part No.	ITEM - Lead Screw	Qty	Material
C1	24 TOOTH DRIVE GEAR	1	Stainless Steel
C2	LEAD SCREW	1	Stainless Steel
CA	BEARING - 6203	2	Stainless Steel

Appendix & References

APPENDIX 7

Parts Guide

Part No.	ITEM - Level Wind	Qty	Material
D1	SIDE PLATE A	1	Stainless Steel
D2	SIDE PLATE B	1	Stainless Steel
D3	BOTTOM HUB	1	Acetal
D4	BOTTOM HUB BUSH	2	Bronze
D5	PAWL	1	Bronze
D6	COVER PLATE	1	Stainless Steel
D7	SUPPORT BLOCK	1	Acetal
D8	GUIDE BUSH	1	Acetal
D9	VERTICAL ROLLER SHAFT	2	Stainless Steel
D10	VERTICAL ROLLER	2	Acetal
D11	HORIZONTAL ROLLER SHAFT	2	Stainless Steel
D12	HORIZONTAL ROLLER	2	Acetal

Part No.	ITEM - Tensioner	Qty	Material
E1	FIXED BRACKET	1	Stainless Steel
E2	SLIDE BRACKET	1	Stainless Steel
E3	SHAFT	1	Stainless Steel
E4	18/24 TOOTH IDLER GEAR	1	Stainless Steel
E5	BEARING RETAINER	1	Stainless Steel
E6	M8x20 CAP SCREW	1	Stainless Steel
E7	CLAMP WASHER	1	Stainless Steel
EA	BEARING - 6001	2	Stainless Steel

Appendix & References

APPENDIX 7

Parts Guide

Part No.	ITEM - Drive Chain	Qty	Material
E-F1	ELECTRIC MOTOR	1	
E-F2	ADAPTOR SHAFT - MOTOR TO GEARBOX	1	Stainless Steel
E-F3	GEARBOX SPACER	1	Aluminium
E-F4	GEARBOX	1	Aluminium
E-F5	CLAMP WASHER	3	Stainless Steel
E-F6	GEARBOX MOUNT PLATE	1	Acetal
E-F7	GEARBOX DRIVE SHAFT	1	Stainless Steel
E-F8	SPROCKET	1	Stainless Steel

Part No.	ITEM - Torque Clutch Assembly	Qty	Material
E-G1	CLUTCH BODY	1	Stainless Steel
E-G2	CLUTCH PLATES	2	
E-G3	SPROCKET BUSH	1	Acetal
E-G4	SLIP SPROCKET	1	Stainless Steel
E-G5	PUSH PLATE	1	Stainless Steel
E-G6	SPRING	1	Lurethane
E-G7	CLAMP PLATE	1	Stainless Steel
E-G8	SPACER	1	Stainless Steel
E-GA	BEARING - 6304	1	Stainless Steel
E-GB	MB12 TAB WASHER	1	Stainless Steel
E-GC	KM12 LOCK NUT	1	Stainless Steel

Part No.	ITEM - Chain	Qty	Material
ZA	DRUM TO IDLER	1	Stainless Steel
ZB	IDLER TO LEVEL WIND	1	Stainless Steel
E-ZC	CLUTCH ASSEMBLY	1	Stainless Steel

Appendix & References

APPENDIX 7

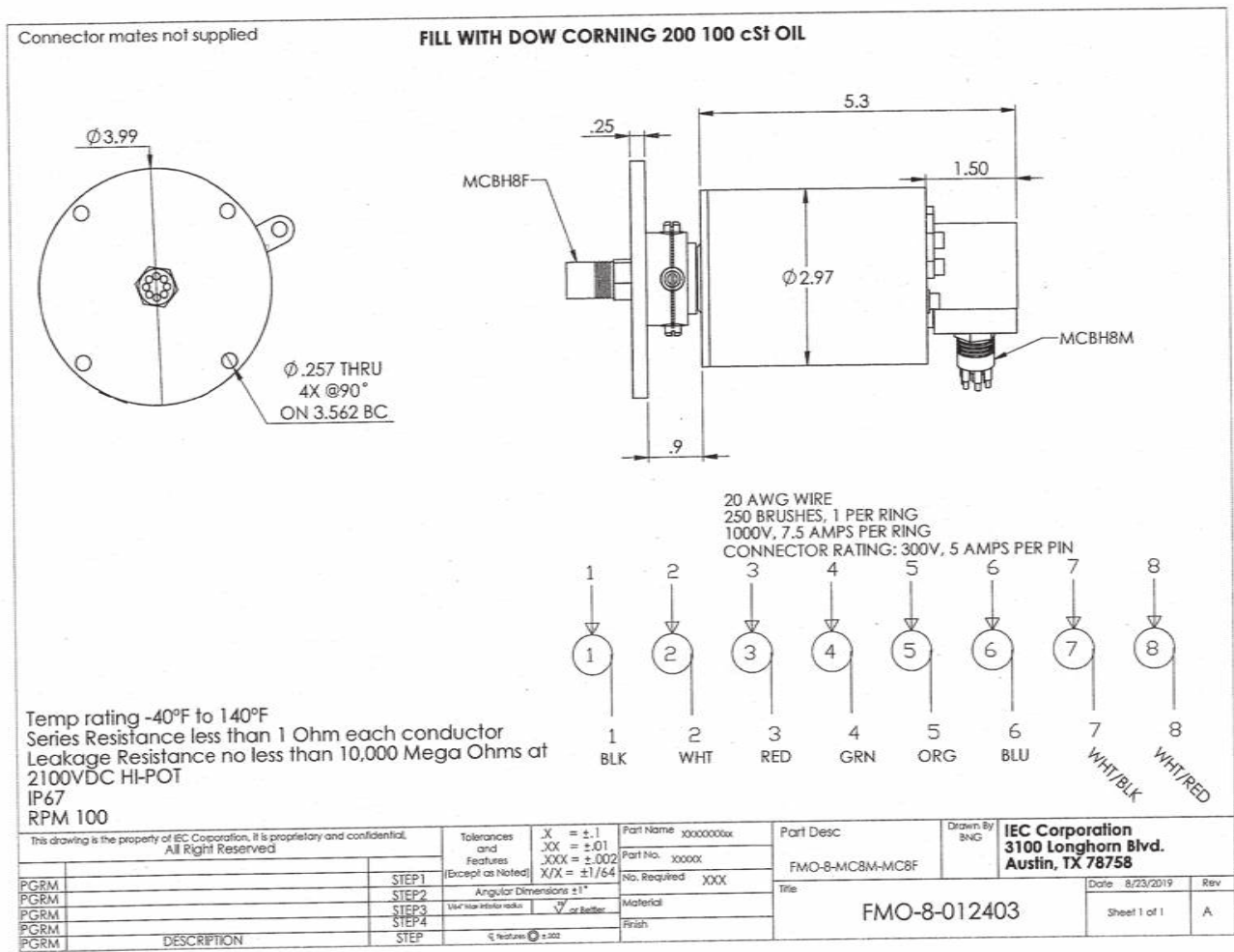
Spare Parts

Part No.	ITEM - Spare Parts	Qty	Material
BA	BEARING - 6205	2	Stainless Steel
BB	BEARING - 6024	1	Stainless Steel
CA	BEARING - 6203	2	Stainless Steel
D5	PAWL	1	Bronze
EA	BEARING - 6001	2	Stainless Steel
E-G2	CLUTCH PLATES	2	
E-G6	SPRING	1	Lurethane
E-GA	BEARING - 6304	1	Stainless Steel
E-GB	MB12 TAB WASHER	1	Stainless Steel
E-GC	KM12 LOCK NUT	1	Stainless Steel
ZA	DRUM TO IDLER	1	Stainless Steel
ZB	IDLER TO LEVEL WIND	1	Stainless Steel
E-ZC	CLUTCH ASSEMBLY	1	Stainless Steel

Appendix & References

APPENDIX 8

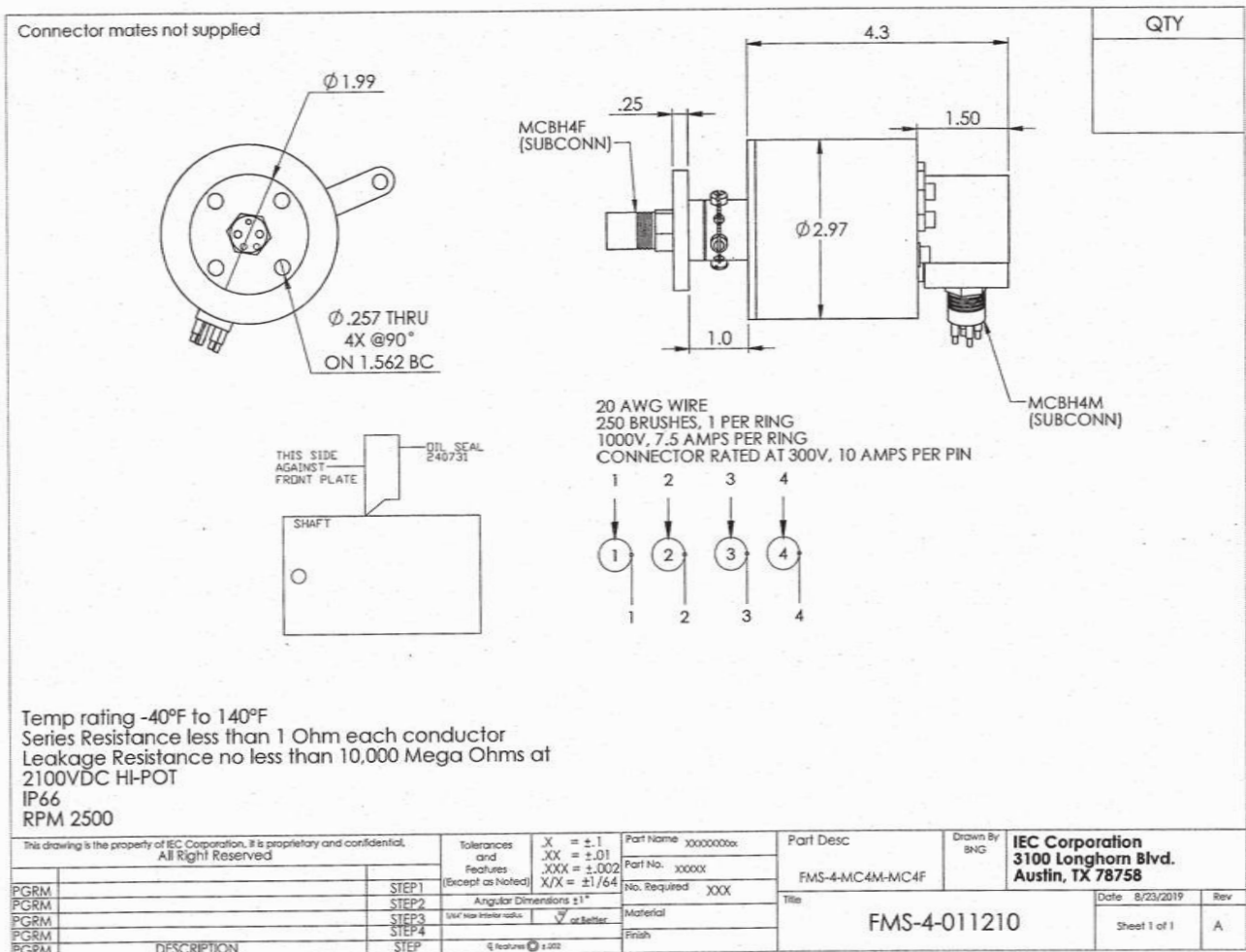
Slip Ring Dimensions



Appendix & References

APPENDIX 8

Slip Ring Dimensions



Appendix & References

APPENDIX 9

Electric Motor

SUBMERSIBLE MOTOR ENGINEERING											
FINAL INSPECTION REPORT - ROV MOTORS											
JOB #:	10438	ORDER #:	WINCH	CUSTOMER:	VORTEX INTERNATIONAL				DATE:	11/02/2022	
MAKE:	SME	FRAME:	ROV10	HP/KW:	5HP	VOLTS:	120	HERTZ:	50		
MODEL:	ALUMINIUM	POLE:	4P	RPM:	1440	FLA:	28	PHASE:	3		
S/N:	2202DP6415			SEAL TYPE/NUMBER:				MECHANICAL			
A: ASSEMBLED MOTOR TESTS:											
1)	INSULATION RESISTANCE		1000+ MΩ	@	250	VDC		CK BY	AS	DATE:	11/02/2022
2)	PRESSURE TEST		10	PSI				CK BY	AS	DATE:	11/02/2022
3)	MOTOR FLUID FULL		OIL					CK BY	AS	DATE:	11/02/2022
4)	WINDING RESISTANCE		0.238	OHMS	0.238	OHMS	0.238	OHMS			
								CK BY	AS	DATE:	11/02/2022
5)	PT100 RESISTANCE							CK BY	JSO	DATE:	11/02/2022
	COLOURS		PIN 1 TO PIN 2			PIN 3 TO PIN 4					
	RESISTANCE		111.4			W/D OPEN CIRCUIT					OHMS
	COLOURS										
	RESISTANCE										OHMS
	COLOURS										
	RESISTANCE										OHMS
	COLOURS										
	RESISTANCE										OHMS
	COLOURS										
	RESISTANCE										OHMS
	COLOURS										
	RESISTANCE										OHMS
6)	TEST RUN	-	NO LOAD	10.4	AMPS	11.1	AMPS	10.9	AMPS		
		@	120	VAC	50	Hz		CK BY	TO	DATE:	11/02/2022
7)	COAST DOWN TIME		3	SEC				CK BY	TO	DATE:	11/02/2022
B: FINAL CHECK:											
1)	NAME PLATE		YES					CK BY	RS	DATE:	11/02/2022
2)	FILL STICKER		YES					CK BY	RS	DATE:	11/02/2022
3)	PAINT		ANODISE					CK BY	RS	DATE:	11/02/2022
4)	ACCESSORIES		NO					CK BY	RS	DATE:	11/02/2022
5)	PREPARED FOR AIRFREIGHT		N/A					CK BY	RS	DATE:	11/02/2022
6)	READY FOR CRATING		YES					CK BY	RS	DATE:	11/02/2022
7)	LEAD CABLE TYPE		6mmsq SIEMENS					CK BY	RS	DATE:	11/02/2022
8)	LEAD CABLE LENGTH		5m					CK BY	RS	DATE:	11/02/2022
9)	RTD FITTED		YES	LENGTH	SUBCON			CK BY	RS	DATE:	11/02/2022
10)	EARTH LEAD FITTED		NO	LENGTH				CK BY	RS	DATE:	11/02/2022
11)	CABLE SPICE		NO	LENGTH				CK BY	RS	DATE:	11/02/2022
12)	WEIGHT OF MOTOR			Kg				CK BY	RS	DATE:	11/02/2022

Contacts



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