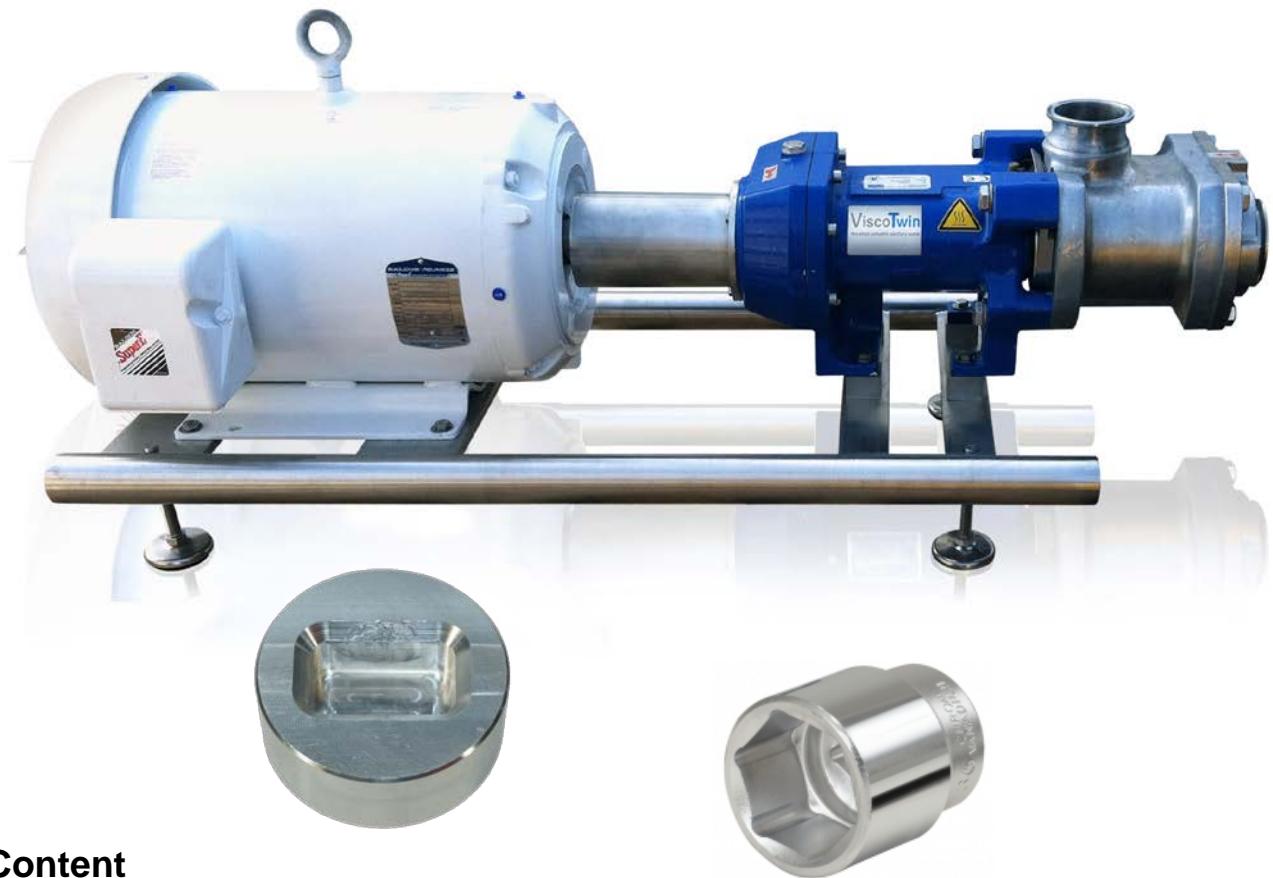


Tools, expendables and lubricants required for maintenance and servicing of ViscoTwin 104



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Release: May 7, 2017

Tools and expendables required for maintenance and servicing

Maintenance and servicing of ViscoTwin 70 requires US standard, metric as well as specific tools as listed in tables below.

Definition of maintenance levels

All tools required are categorized by maintenance levels ranging from 1 to 3, whereas maintenance levels are defined as follows:

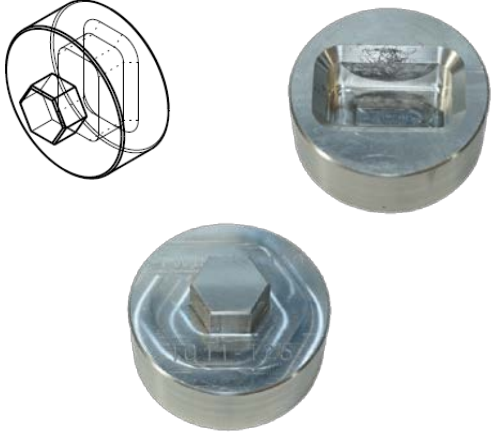
- Maintenance level 1 tools are required for standard operation and other procedures as follows:
 - Sanitary inspection
 - Removal and assembly of pump cover (position 1012) and pump casing (position 1033)
 - Maintenance and exchange of mechanical seals
 - Gear oil filling level adjustment and gear oil exchange

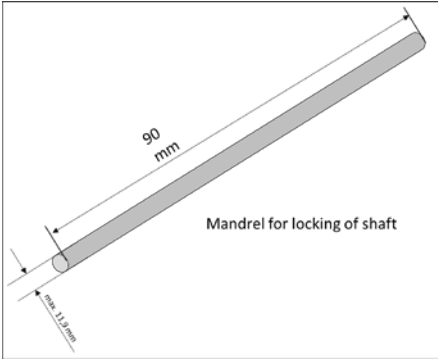

→ **Maintenance level 1 tools must be available on site for proper work conditions**
- Maintenance level 2 tools are required for:
 - All processes requiring removal or mounting of gear housing (position 2172)
 - Adjustment of spindles (positions 2200 and 2201)



→ **It is highly recommended to have maintenance level 2 tools available on site.**
- Maintenance level 3 tools are required for maintenance of bearing housing


→ *It is not necessary to have maintenance level 3 tools on site. Maintenance level 3 tasks are supposed to be processed in ViscoTec shop.*




Maintenance level 1 tools and expendables




Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
Spindle bolt socket 	2180 / Spindle bolt	1	12567	Aluminium






Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
<p>Locking rod to block drive shaft</p>  <p>Note: identical rod for all ViscoTwin types</p>	1000 / Drive shaft	1	18793	AISI: 304
<p>Torque wrench <u>small</u> for metric sockets to tighten bolts and screws torque controlled</p> <p>Requirements:</p> <ul style="list-style-type: none"> - Min. torque: $\leq 3.68 \text{ lb-ft} \mid 5 \text{ Nm}^*$ - Max. torque: \geq min. torque of 'torque wrench 'BIG'' - Compatible with all sockets (hexagon or Allen key) as specified by related positions  <p>Helpful notice:</p> <ol style="list-style-type: none"> *) In case a torque screw driver (see below) is available on site, lowest torque value to handle by means of the <u>small</u> torque wrench is increased accordingly No second wrench is required if whole torque range can be handled by means of 1 torque wrench 	<p>2259 1303-BC (Dual Acting Mechanical Seals)</p> <p>2258 , 2186 1008</p>	<p>1</p> <p>1</p> <p>2</p> <p>3</p>	-	-





Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
<p>Torque wrench BIG for metric sockets to tighten bolts and screws torque controlled</p> <p>Requirements:</p> <ul style="list-style-type: none"> - Min. torque: \leq max torque of 'torque wrench BIG' - Max. torque: 110.6 lb-ft 150 Nm - Compatible with all sockets (hexagon or Allen key) as specified by related positions <p>(torque wrench big continued)</p>  <p>Helpful notice:</p> <p>1. No second wrench is required if complete torque range can be handled by means of 1 wrench</p>	<p>2180, 1016, 1041</p> <p>2205, 2279, 1526</p> <p>2177</p>	<p>1</p> <p>2</p> <p>2</p>	-	-
<p>Best practise for dual acting mechanical seals: <u>Torque screw driver</u> (see also 'For dual acting mechanical seals only' Allen key solutions 1 and 2 below)</p> <p>Requirements:</p> <ul style="list-style-type: none"> - Torque min: \leq 3.68 lb-ft 5 Nm - Torque max: see 'helpful notice' below - Compatible to Allen key solution 1 or solution 2 as defined below (see For dual acting mechanical seals only: below)  <p>Helpful notice1:</p> <p>1. 'Torque max': in case torque screw driver shall be made available on site, it might be sensible to select a torque screw driver for torque values of up to 5.9 lb-ft (8 Nm) or even up to 8.85 lb-ft (12 Nm) and being suitable for hexagon nut sockets (consider wrench drive).</p>	<p>1303-BC</p> <p>Anga positions 6,11,14,15</p> <p>2186</p> <p>2259</p>	<p>1</p> <p>1</p> <p>2</p> <p>1</p>	-	-


Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
2. In case torque screw driver meeting requirements as defined by point 1 or 2 are available on site, min. torque value to handle by means of the <u>small</u> torque wrench is increased accordingly.				
Hexagon nut sockets for Bolts M8 Socket size: 13 mm Bolts M16 Socket size: 24 mm Bolts M18 Socket size: 27 mm - Compatible with torque wrench drive	2259 1016 , 1041 2180	1 1 1	-	-
				

Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
<p><u>For dual acting mechanical seals only:</u> Allen key to tighten hexagon socket screws of outboard rotor holder of double acting mechanical seals.</p> <p>3 different solutions:</p> <p>1. Best practise solution Allen key bit (size 2.5 mm) compatible to torque screw driver:</p>  <p>Allen key bit with hexagon drive</p> <p>2. Good practice solution Allen key socket (size 2.5 mm) compatible to torque screw driver (possibly adaptor required) or small torque wrench (extension and adaptor required)</p>  <p>3. Minimum solution Allen key (size 2.5 mm)</p> 	<p>1304 Anga positions 6,11,14,15</p>	<p>1</p>	<p>-</p>	<p>-</p>
<p>Various hooks to remove O-rings gently from grooves. Applicable to all ViscoTwin types.</p>	<p>1303 2261</p>	<p>1 1</p>	<p>-</p>	<p>-</p>




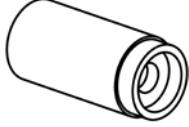
Description, Purpose 3rd party solution	Related position	Maintenance level	eData-ID	Material
 <p><i>3rd party solution:</i> Brand: Craftsman Name: 4PC Hook and Pick Set Item #: 00904981000P Model: 4981</p>				
<p>Metric feeler gage to measure clearance between spindles</p> <ul style="list-style-type: none"> - Min. : 0.04 mm - Max.: 0.30 mm or more  <p><i>3rd party solution:</i> Brand: Eastern Industries Type: MFG-25-T-76 GC SERIES</p>	2200 , 2201	1	-	Steel
<p>Quick and second but best solution to loosen spindles from shaft: rubber mallet (rubber hammer).</p> 	2200 , 2201	1	-	rubber

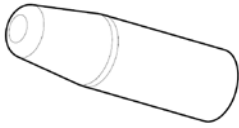

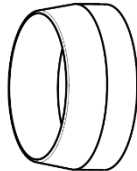
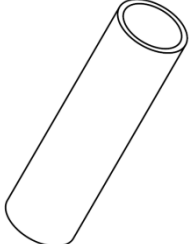
Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
Best practise to loosen spindles from shaft: gear wheel puller with 2 clamps. Minimum nominal size: 5" 	2200 , 2201	1	-	-
Support for gear wheel puller to loosen spindle from shaft: hexagon bolts M12 specifically modified 	2200 , 2201	1	18988	Stainless or steel
Protection of spindle when loosening spindle from shaft by means of a gear wheel puller 	2200, 2201	1	-	Rubber plastic
Tap to remove Loctite from threaded hole of shafts. ISO M16 metric standard thread. 	1000 , 2170	1	-	
Tap wrench to drive tap to remove Loctite from threaded hole of shafts 	1000 , 2170	1	-	


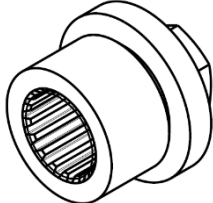
Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
Wet or Dry Sandpaper CAMI grit 800 or Emery cloth grit > 220 to polish shafts before mounting spindles 	2200 , 2201	1	-	-
3M Scotch Brite to polish surface of spindles and shafts 	2200 , 2201 1000 , 2171	1 1		
Paper towels free of lint to clean seal faces of mechanical seals 	2327 , 2328	1	-	Paper
Regular paper towels for cleaning 	general	1,2,3	-	paper
Acetone to clean seal faces, shafts and spindles	2327 , 2328 1000 , 2171 2200 , 2201	1 1 1	-	Acetone

Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
<p>Thread-locking fluid Loctite blue 242</p>  <p>(or any other thread-locking fluid with identical properties)</p>	<p>2180 1008</p>	<p>1 3</p>	<p>-</p>	<p>-</p>

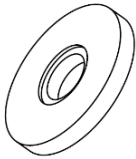
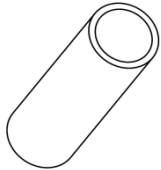
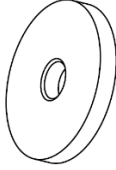
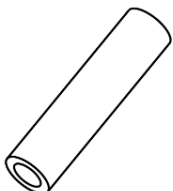
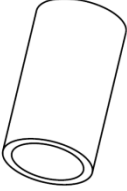
Maintenance level 2 tools

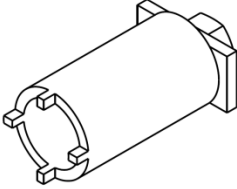
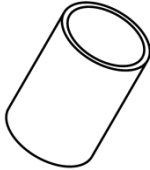
Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
End cutting pliers to remove key 1183 	1183	2	-	-
Hexagon sockets drive for Bolts M12 Socket size: 18 mm - Compatible with torque wrench drive 	2177	2	-	-
Allen key sockets for Hexagon socket screw M5 Allen key size: 4 mm Hexagon socket screw M8 Allen key size: 6 mm 	2186 2258 1008	2 2 3		
Mandrel to press shaft sealing ring 1010 into <u>cast iron</u> gearing housing 	1010	2	12556	AISI: 304 EN: 1.4301
Mandrel to mount shaft sealing ring 1010 in <u>stainless</u> gear housing	1010	2	18776	AISI: 304 EN: 1.4301

Description, Purpose 3rd party solution	Related position	Maintenance level	eData-ID	Material
Sleeve to protect shaft seal ring 1010 when mounting gear cover 	1010	2	12587	AISI: 304 EN: 1.4301
Sealing ring extractor Removal of shaft sealing rings / position 1111  <i>Solution:</i> <i>Manufacturer or brand: Kukko</i> <i>Name: Seal pulling set (gasket) in case</i> <i>Part no: K-222-1/7</i>	1111	2		
Mounting sleeve for mounting shaft sealing ring 1111 on shaft 	1111	2	12569	AISI: 304 EN: 1.4301
Installation pipe to press shaft sealing ring 1111 into bearing housing 	1111	2	12562	Aluminium

Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
Gear wheel puller 	2184	2	12575	AISI: 304 EN: 1.4301
Socket to lock shaft to tighten or loose bolt 2177 or groove nut 1526 	2177, 1526	2	12580	AISI: 304 EN: 1.4301

Maintenance level 3 tools

Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
Pressure plate for needle bearing inner ring 1003 	1003	3	12544	AISI: 304 EN: 1.4301
Installation pipe for needle bearing outer ring 1529 	1529	3	12559	AISI: 304 EN: 1.4301
Pressure plate to mount ball bearing 2181 on shaft 	2181	3	12547	AISI: 304 EN: 1.4301
Installation pipe to mount ball bearing 2181 on shaft (pressure on inner ring) 	2181	3	12550	AISI: 304 EN: 1.4301
Installation pipe to press shafts into bearing housing (pressure on outer ring of ball bearing 2181) 	2181, 1000, 2171	3	12553	AISI: 304 EN: 1.4301

Description, Purpose <i>3rd party solution</i>	Related position	Maintenance level	eData-ID	Material
Socket spanner for groove nut 1526 	1526	3	12577	AISI: 304 EN: 1.4301
Installation pipe for inner race retaining ring needle roller bearing 	1009	3	12583	AISI: 304 EN: 1.4301

Lubricants

Gear oil

Since shipment of gear oil is related to high transportation costs (for safety reasons), ViscoTec, Inc. recommends that customer procures gear oil at a local representative / distributor for appropriate gear oils.

ViscoTwin requires gear oil meeting following requirements:

1. Complying with FDA guideline NSF-H1
2. Complying with ISO VG 220 viscosity specifications
3. 100 % synthetic. NO MINERAL OIL (neither 100 % nor partly)! Mineral oil may reduce interval time between oil change significantly.

Following products meet requirements specified above:

- Castrol Optileb Hy 68 (procurement information see below)
- Avia Food Gear 220
- Mobil DTE FM 220

Product numbers of Castrol Optileb Hy 68

Packaging	Castrol product numbers	eData-ID*
5 gal / 36.8 lb pail	68949-AGPO CASTROL OPTILEB HY 68 36.8 LB PAIL	18548
55 gal / 383 lb drum	68949-AGDR CASTROL OPTILEB HY 68 383 LB DRUM	18549

*) www.edata-id.com

Grease to lubricate shafts prior to mount spindles

Following grease is recommended by ViscoTec:

Basic requirement: Food grade NSF-H1
 Brand: CASSIDA GREASE RLS 2
 Manufacturer: Fuchs Lubritech GmbH
 67661 Kaiserslautern / Germany
 Contact, ordering: Fuchs Lubritech Co
 17050 Lathrop Avenue
 Harvey, Illinois 60426
 Phone: +1 708-333-8900
 Fax: +1 708-333-9180
<http://www.fuchsus.com>
cassida.lubricants@fuchsus.com

Product numbers of Cassida Grease RLS 2

Packaging	MPN	Designation	eData-ID*
Case of 12 cartridges of 13.4oz (380g) each	80142500085	CASSIDA GREASE RLS 2	19017
41.8 lb (19 kg) pail	80142500035	CASSIDA GREASE RLS 2	19018

*) www.edata-id.com

Tightening torque values ViscoTwin 104

