



Parts Manual

PB30X

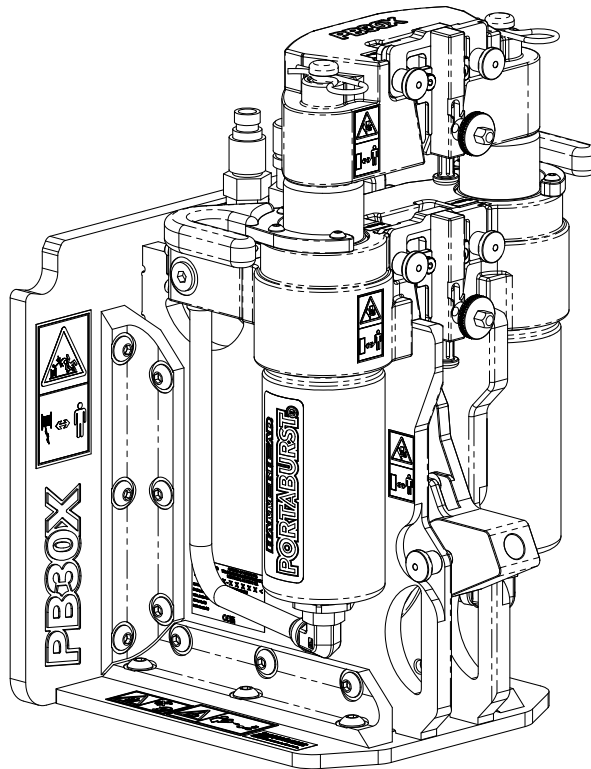


Table of Contents

Preface	4	Jaw Kits	24
PB30X	9	Hydraulics	27
Main Assembly	10	Double Cylinder Assy	28
Decals	13	Seal Kit	30
Decal Locations	14	Appendix	33
Frame	17	Torque Standards - Hydraulic Fittings	34
Sheave Assembly	18	Torque Values - SAE Fasteners	36
Jaw Assembly	21	Torque Values - Metric Fasteners	38
Jaw Carrier Assy	22		

Preface



PB30X

For replacement copy order P/N 960-1120
Update 11/15/2024

Descriptions and specifications were current at the time of publication. However, The Charles Machine Works, Inc. (HammerHead Trenchless) reserves the right to make changes in engineering, design and specifications; add improvements; or discontinue manufacturing at any time without notice or obligation. This manual may not reflect the most current version of your machine. Please visit www.hammerheadtrenchless.com for the most recent and up to date version.



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Welcome

HOW TO USE THIS MANUAL

This manual contains illustrations and parts list of components and assemblies which make up various HammerHead® models. Each page consists of the name of the assembly or component, a figure number, reference numbers, part numbers, part names, and the quantities of the parts used.

Assembly or component names help identify the illustration and parts for each figure. This name also helps locate the general area of the machine where the assembly or component can be located.

Figure numbers are used to identify each assembly or component and to group these assemblies or components into major categories.

Reference numbers shown in a column refers to the numbered parts in the illustration. This ties the part in the illustration to the part number and description in the parts list. Part numbers are used to identify individual parts or part assemblies.

Part descriptions provide the name of the part, plus additional information such as dimensional specifications and what parts are grouped together to form part assemblies, which helps you identify the part(s).

Quantities listed for each figure are only for that assembly or component and not the total used per machine unless stated so in the "Remarks" column.

This parts manual is not intended to be a complete guide for machine service or repairs. Contact your HammerHead dealer for any of your service or technical requirements.

ORDERING PARTS

Parts for repair or replacement are available through the worldwide network of authorized HammerHead dealers. The use of aftermarket replacement parts in your HammerHead equipment reduces performance and overall equipment life and may also void or interfere with the factory warranty.

Use only genuine HammerHead parts from your authorized dealer for repair or replacement. Always give the serial number and model number of the machine for which parts are being ordered. When ordering parts for component(s), which are not manufactured by HammerHead Trenchless Equipment, also give the serial number of that component(s). Order all parts by part number, part name, and quantity needed. Do not order parts by illustration reference numbers.

UPDATING AND REORDERING MANUALS

The parts lists, illustrations, and specifications in this manual are based on the latest information available at the time of publication. Your machine may have product improvements and options not yet contained in this manual. Please check the web site www.hammerheadtrenchless.com for any updates.

The Charles Machine Works, Inc. reserves the right to make changes at any time without notice or obligation to you. Your dealer will receive notice of these changes and can assist you with accurate parts identification when ordering.

A copy of this manual is supplied with each machine. Additional copies are available through your dealer. When ordering additional manuals, use the reorder number listed on the front cover and the quantity needed. Electronic copies of this manual are also available on the web at www.hammerheadtrenchless.com.

OPERATING INSTRUCTIONS

Instructions on recommended equipment use and maintenance can be found in the Operator's Manual shipped with your equipment. Operator's Manuals are also available on the web at www.hammerheadtrenchless.com.

Thank you for buying and using Genuine HammerHead® Trenchless Equipment, parts and accessories.

HammerHead Trenchless® Limited Warranty

The Charles Machine Works, Inc. dba HammerHead Trenchless ("HammerHead") warrants that all new products it manufactures (with the exception of cured in place pipe consumable materials, which are covered by a separate warranty) will be free from defects in materials, under normal use and service, for one year after delivery to the purchaser (or such other party as the purchaser may direct) or 1000 operating hours, whichever occurs first. The warranty period for any item repaired or replaced pursuant to this warranty shall be the remainder, if any, of the original, defective Product's warranty period.

For any covered issue during the warranty period, Buyer must timely notify HammerHead in writing of such defect, and HammerHead shall, at its option, supply a functionally equivalent replacement product or request the return of the product to its plant in Lake Mills, Wisconsin so that HammerHead may repair it, each without charge. Such repair or replacement is the purchaser's sole and exclusive remedy against Hammerhead, whether in contract or arising out of warranties, representations, or defects. Hammerhead reserves the right to use remanufactured replacement parts under this warranty as it deems appropriate.

No item may be returned without prior written authorization from HammerHead.

This warranty does not cover:

- CIPP Consumables
- Defects other than those in materials (including but not limited to workmanship and design defects)
- Transportation expenses in connection with the repair or replacement of covered products
- Failures caused due to a product that has been installed or used in a manner inconsistent with written warnings, instructions, or recommendations by HammerHead, including but not limited to in product decals or in the owner's guide/user manual; or installed in a manner inconsistent with applicable law or standard industry practices
- Any product that has been neglected, altered, misused, abused, or used in any way which, in HammerHead's opinion, adversely affects its performance
- Failures caused by improper storage; handling installation or maintenance; use of non-HammerHead approved parts or materials; unapproved modifications or alterations; or use of unapproved accessories
- Failures caused by outside influence, including but not limited to Acts of God, fire, or other accident
- Wear items or components failing due to normal wear
- Items that are not manufactured by us (which are warranted only to the extent of the original manufacturer's warranty and subject to their allowance to us, if found defective by them)
- Any additional training or consulting services which may be provided by HammerHead or its representatives or agents (nor shall such training or services extend any product warranty period)
- Damages that arose in whole or in part due to HammerHead's reliance upon drawings, specifications, samples, descriptions, documentation, requirements, requests, or instructions received from the customer, the installer, or either of their agents
- Charges for labor and/or parts beyond those needed to complete the warranted repair or replacement

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DURING PERIODS OF NONUSE. IN NO EVENT SHALL HAMMERHEAD'S LIABILITY EXCEED THE PURCHASE PRICE OF THE PRODUCT.

NO ACTION AGAINST HAMMERHEAD ARISING OUT OF OR RELATED TO THIS WARRANTY MAY BE FILED NO MORE THAN ONE (1) YEAR AFTER THE CLAIM ARISES.

**HAMMERHEAD TRENCHLESS®
LAKE MILLS, WISCONSIN**

Notes:

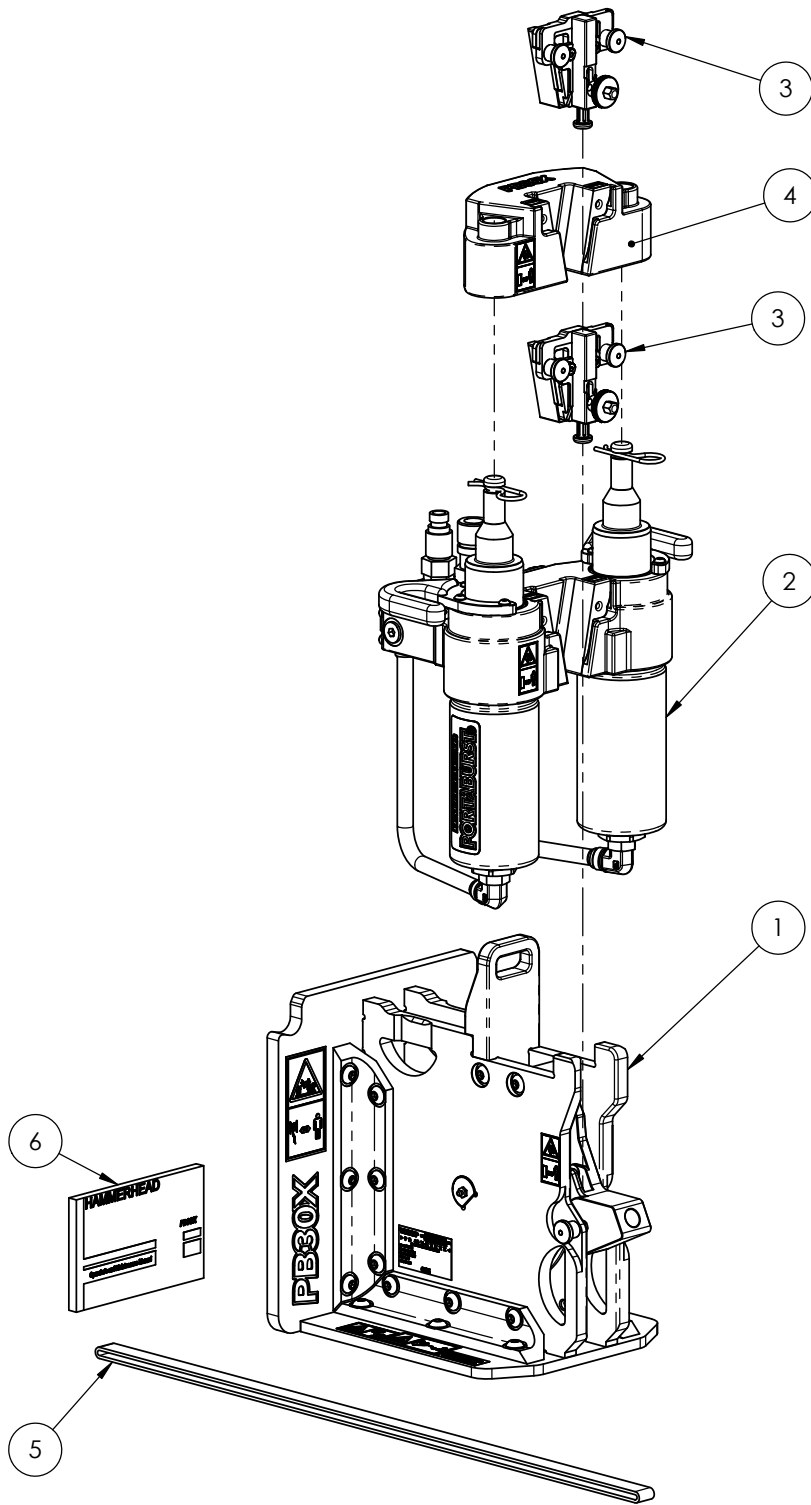
PB30X

Table of Contents

Main Assembly	10
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Main Assembly

934-7500



Main Assembly

934-7500 — PARTS LIST

REF NO.	PART NUMBER	DESCRIPTION	QTY	REMARKS
1	912-7501	SHEAVE ASSEMBLY	1	
2	912-7502	DOUBLE CYLINDER ASSEMBLY	1	SEE NOTES
3	912-7597	JAW CARRIER ASSEMBLY	2	SEE NOTES
4	912-7528	PULLING JAW BLOCK	1	SEE NOTES
5	912-7580	SLING, LIFT - PB30X	1	
6	960-1020	OPERATOR'S MANUAL, PB30X	1	

NOT SHOWN:

7	912-7607	SYNTHETIC GEAR LUBE, 75W-90	1	
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NOTES:

1. Apply a light coating of ⑦ Synthetic Gear Lube to the sliding surfaces of ② Cylinder Assembly, ③ Jaw Carrier Assembly and ④ Pulling Jaw Block before installing each ③ Jaw Carrier Assembly.
2. Re-apply ⑦ Synthetic Gear Lube to the sliding surfaces noted above before each project.

FOOTNOTES:

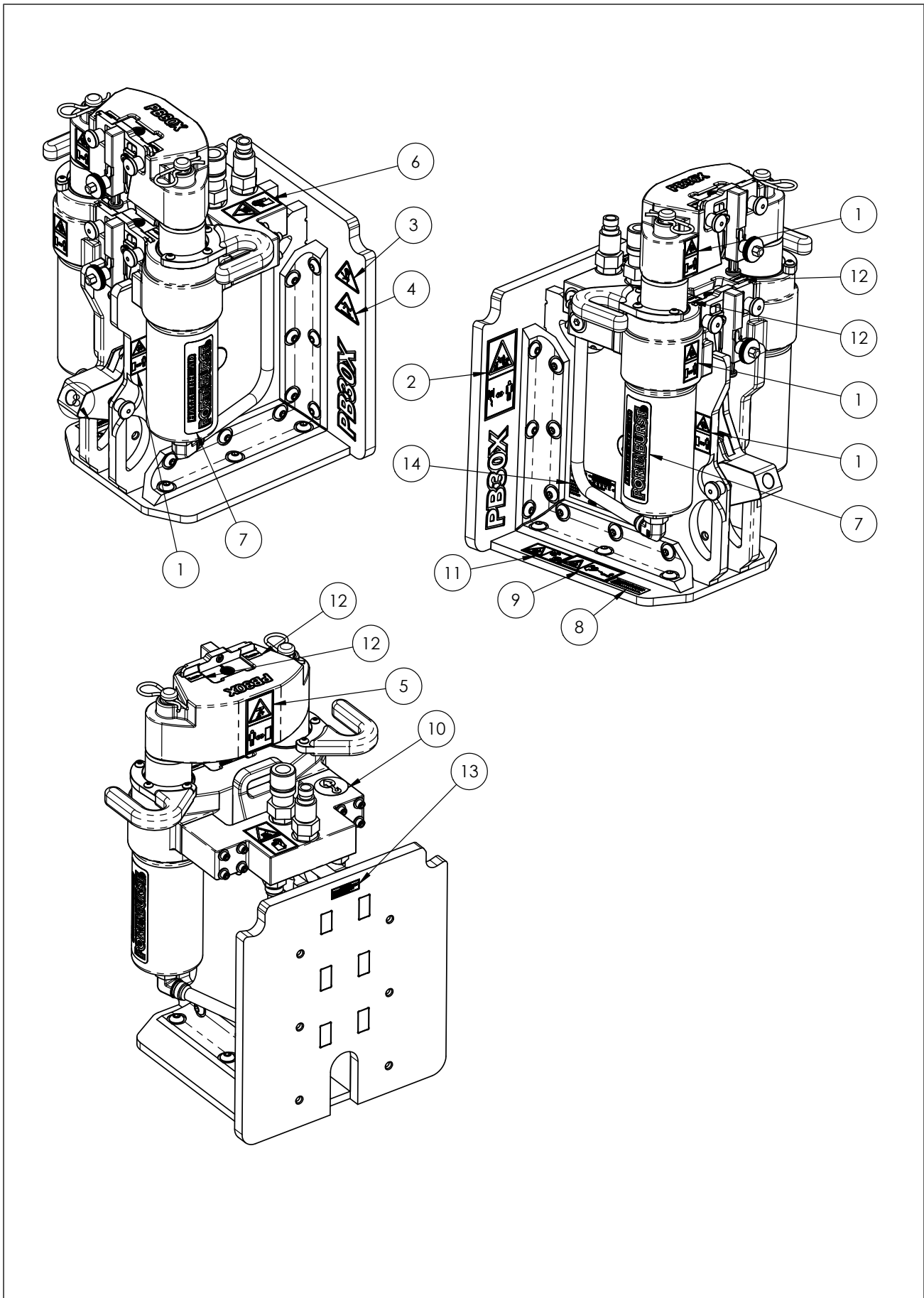
Notes:

Decals

Table of Contents

Decal Locations	14
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Decal Locations



Decal Locations

PARTS LIST

REF NO.	PART NUMBER	DESCRIPTION	QTY	REMARKS
1	912-7582	DECAL, HAND CRUSH (INT) - SMALL	4	
2	923-2222	DECAL, CABLE STRIKE (INT)	1	
3	912-4765	DECAL, ENTANGLEMENT HAZARD	1	
4	912-3342	DECAL, ENTANGLEMENT HAZARD (INT)	1	
5	923-2209	DECAL, FALLING LOAD (INT)	1	
6	923-2235	DECAL, HOT (INT)	1	
7	912-7581	DECAL, HH/PB - PB30X	2	
8	270-6773	PATENT	1	
9	700-143	WARNING READ MANUAL ISO	1	
10	909-8194	DECAL, -LIFT POINT(SMALL)	1	
11	923-2232	DECAL, ONE CALL (INT)	1	
12	270-10058	DECAL, LUBRICATE GREASE	4	
13	270-7952	CALIFORNIA PROP 65 WARNING - PARTS	1	
14	912-7579	SERIAL PLATE, PB30X	1	

NOT SHOWN:

NOTES:

FOOTNOTES:

Notes:

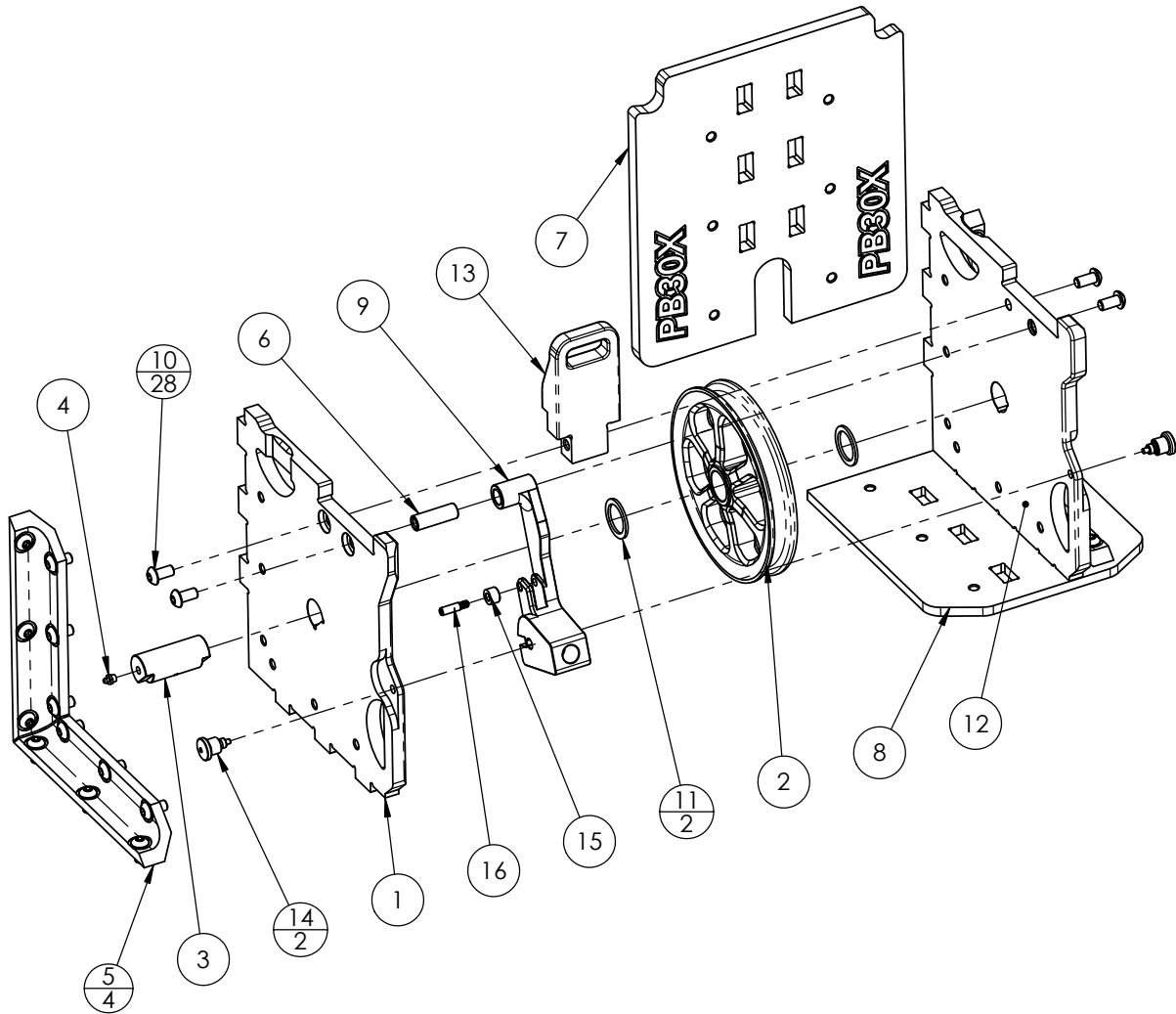
Frame

Table of Contents

Sheave Assembly 18

Sheave Assembly

912-7501



Sheave Assembly

912-7501 — PARTS LIST

REF NO.	PART NUMBER	DESCRIPTION	QTY	REMARKS
1	912-7507	SHEAVE SUPPORT PLATE - LEFT	1	SEE NOTES
2	912-7508	SHEAVE, 3/4 X 10	1	SEE NOTES
3	912-7571	PIN, 1.50	1	SEE NOTES
4	912-1149	FITTING, GREASE	1	SEE NOTES
5	912-7509	SUPPORT, SIDE PLATE	4	
6	912-7511	PIVOT TUBE, CABLE KEEPER	1	SEE NOTES
7	912-7512	FACE PLATE	1	
8	912-7513	PLATE, FOOT	1	
9	912-7514	CABLE KEEPER ARM	1	SEE NOTES
10	08BH16	SCREW, 1/2-13x1 BHSC	28	SEE NOTES
11	912-7572	THRUST BEARING, SHEAVE	2	
12	912-7570	SHEAVE SUPPORT PLATE - RIGHT	1	SEE NOTES
13	912-7576	LIFT EYE REAR TALL	1	
14	912-7568	PLUNGER, INDEXING - W/ LOCKOUT	2	SEE NOTES
15	912-7605	ROLLER, .375 ID X .75 OD X .50 LG.	1	SEE NOTES
16	912-7604	SCREW, 3/8 X 1 HEADLESS SHOULDER	1	SEE NOTES

NOT SHOWN:

17	923-2115	CARTRIDGE, MOLY ANTI-SEIZE	1	
18	923-0818	GREASE, EXTREME PRESSURE (RED)	1	

NOTES:

- Apply (17) Moly Anti-seize to (6) Pivot Tube before installing (9) Cable Keeper.
- Apply (17) Moly Anti-seize to shoulder of (16) Headless Shoulder Screw before installing (15) Roller.
- Apply ample (18) Grease to (3) Pin after assembly. Use enough (18) Grease that it can be seen between (1) Left Sheave Support Plate and (2) Sheave or (12) Right Sheave Support Plate and (2) Sheave.
- Apply (Blue) Loctite® 242™ to threads of (16) Headless Shoulder Screw and torque to 10 ft-lb.
- Apply (Blue) Loctite® 242™ to (10) Screw and torque to 69 ft-lb.
- Apply (Blue) Loctite® 242™ to (14) Indexing Plunger and torque to 20 ft-lb.
- Tighten (4) Grease Fitting 1/2 turn past hand-tight. The (4) Grease Fitting cannot leak after installation.

FOOTNOTES:

Notes:

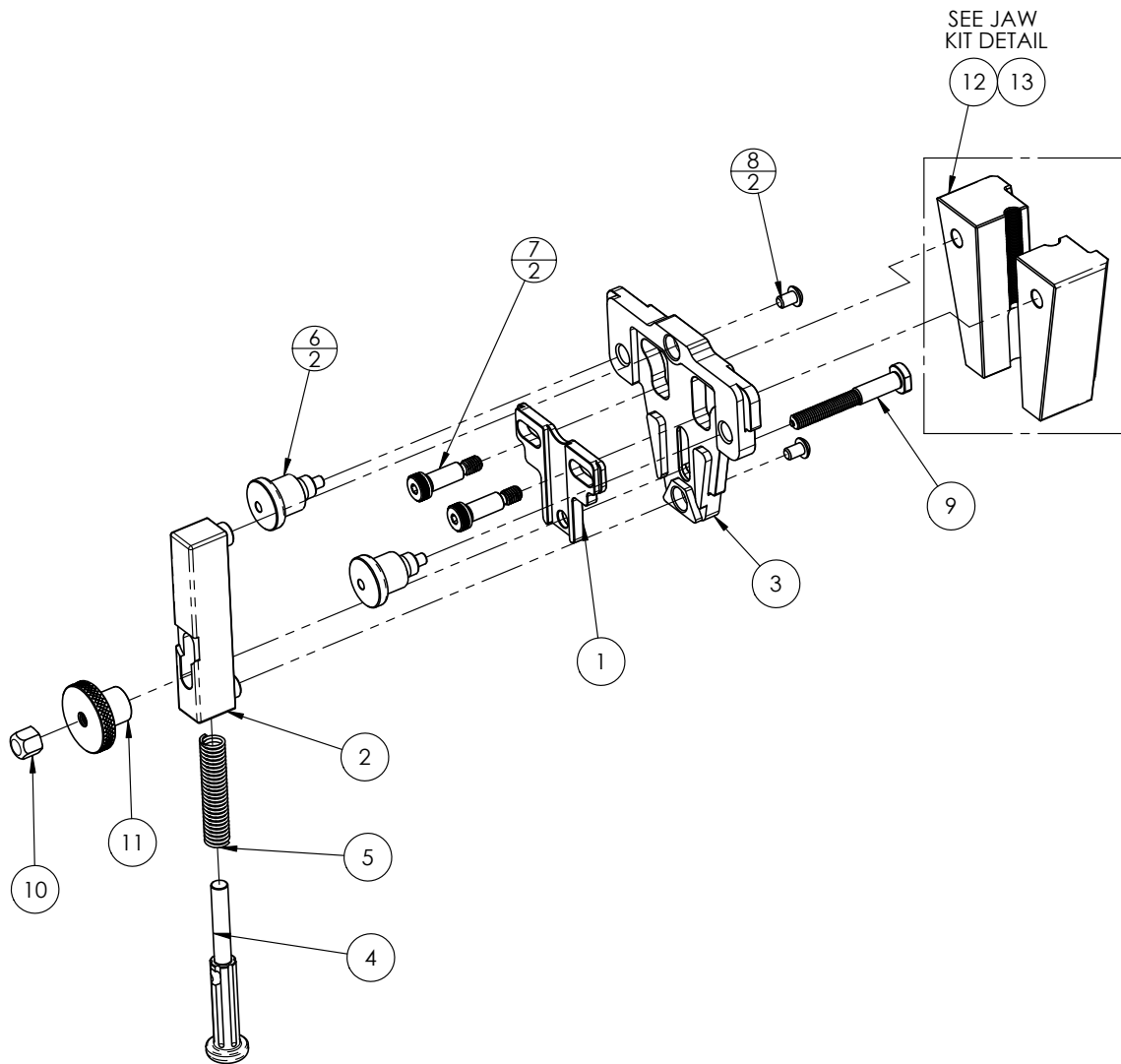
Jaw Assembly_____

Table of Contents

Jaw Carrier Assy	22	Jaw Kits	24
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Jaw Carrier Assy

912-7597



Jaw Carrier Assy

912-7597 — PARTS LIST

REF NO.	PART NUMBER	DESCRIPTION	QTY	REMARKS
1	912-7594	PLATE, TOGGLE	1	
2	912-7595	SPRING TOWER	1	
3	912-7596	PLATE, JAW CARRIER	1	
4	912-7573	PISTON, SPRING	1	
5	912-7569	SPRING, ACTUATION	1	
6	912-7568	PLUNGER, INDEXING - W/ LOCKOUT	2	SEE NOTES
7	06SS14	SCREW, 3/8 X .875 SHOULDER	2	SEE NOTES
8	04BH06	SCREW, 1/4-20x0.375 BHSC	2	SEE NOTES
9	912-7602	SCREW, SHOULDER, SPRING TOWER	1	SEE NOTES
10	912-7603	NUT, CAP, M8-1.25	1	SEE NOTES
11	912-7567	KNOB	1	
12	912-7608	JAW KIT, 3/4"	1	SEE NEXT PAGE
13	912-7609	JAW KIT, 3/8"	1	SEE NEXT PAGE

NOT SHOWN:

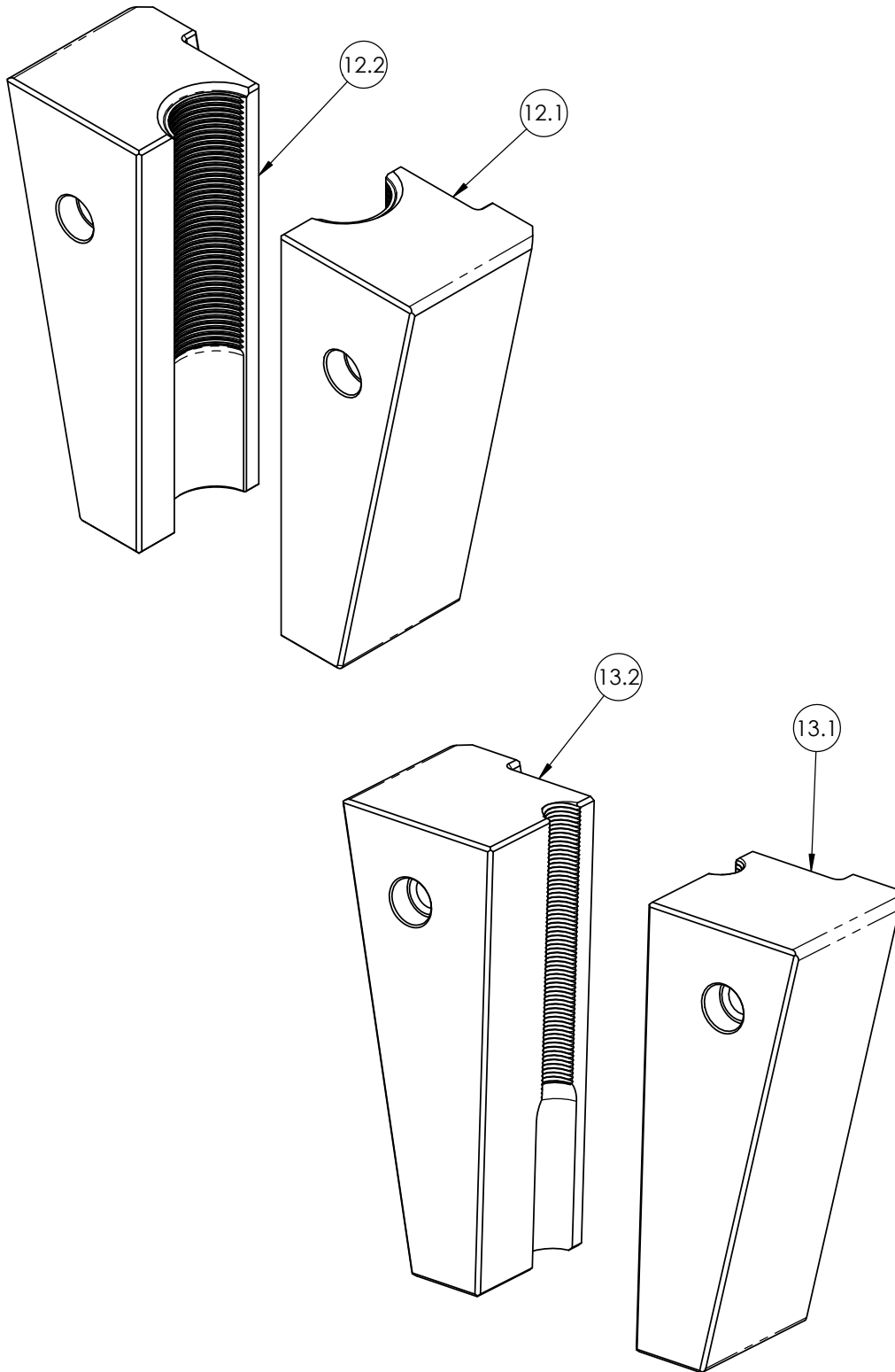
NOTES:

1. Apply (Blue) Loctite® 242™ to fasteners (except locknuts) and torque per applicable specifications noted in the appendix, unless noted otherwise.
2. Apply (Blue) Loctite® 242™ to ⑩ Nut Cap and torque to 5 ft-lb.
3. Apply (Blue) Loctite® 242™ to ⑥ Indexing Plunger and torque to 20 ft-lb

FOOTNOTES:

Jaw Kits

912-7508, 912-7509



Jaw Kits

912-7508, 912-7509 — PARTS LIST

REF NO.	PART NUMBER	DESCRIPTION	QTY	REMARKS
12.1	912-7598	JAW, RIGHT - 3/4"	1	IN JAW KIT 912-7508
12.2	912-7599	JAW, LEFT - 3/4"	1	IN JAW KIT 912-7508
13.1	912-7601	JAW, RIGHT - 3/8"	1	IN JAW KIT 912-7509
13.2	912-7600	JAW, LEFT - 3/8"	1	IN JAW KIT 912-7509

NOT SHOWN:

NOTE:

FOOTNOTES:

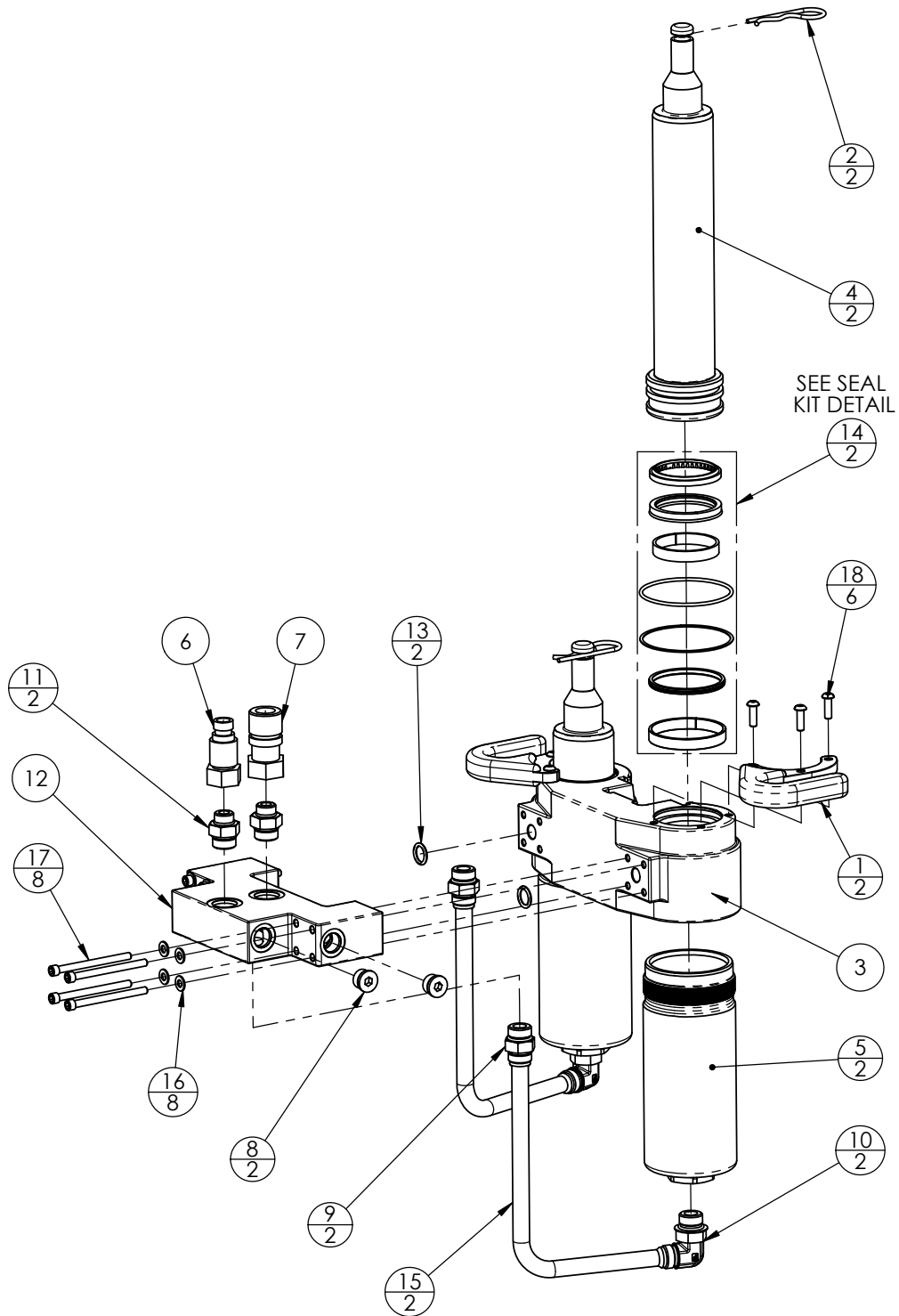
Hydraulics

Table of Contents

Double Cylinder Assy.....	28	Seal Kit	30
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Double Cylinder Assy

912-7502



Double Cylinder Assy

912-7502 — PARTS LIST

REF NO.	PART NUMBER	DESCRIPTION	QTY	REMARKS
1	912-7518	HANDLE, DOUBLE CYLINDER	2	
2	912-1101	PIN, BRIDGE 1"	2	
3	912-7515	HEAD, DOUBLE CYLINDER	1	SEE NOTES
4	912-7516	ROD, 2.75 DIA	2	SEE NOTES
5	912-7577	CYLINDER BODY, 3.5 x 7.5	2	SEE NOTES
6	912-3038	NIPPLE	1	SEE NOTES
7	912-3039	COUPLER 1/2"	1	SEE NOTES
8	926-5503	PLUG, 10MB HOLLOW HEX	2	SEE NOTES
9	926-4322	ADAPTER, 12MJ X 12MB	2	SEE NOTES
10	926-5116	ELBOW, 12MJ X 12MB 90°	2	SEE NOTES
11	926-4007	ADAPTER, 12MB X 10MB	2	SEE NOTES
12	912-7517	MANIFOLD, DOUBLE CYLINDER	1	SEE NOTES
13	902-0006	O-Ring 1" stem /1.25" jaw	2	SEE NOTES
14	912-4550	SEAL KIT, DOUBLE CYLINDER	2	SEE NEXT PAGE
15	912-7578	TUBE 1	2	
16	05FW-SAE	WASHER, 5/16"	8	
17	05SH64	SCREW, 5/16-18 x 4.00" SHC	8	SEE NOTES
18	05BH16	SCREW, 5/16-18x1 BHSC	6	SEE NOTES

NOT SHOWN:

19	912-3158	HYDRAULIC OIL, ONE GALLON	1	
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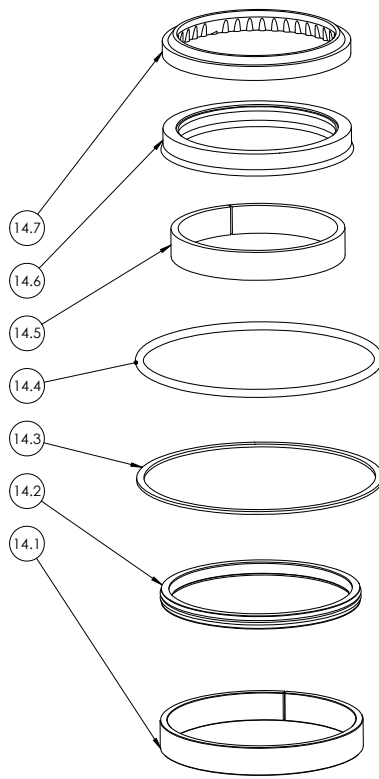
NOTES:

1. Apply a light coating of (19) Hydraulic Oil to (13) O-ring before installing between (3) Cylinder Head and (12) Manifold.
2. Apply (Blue) Loctite® 242™ to fasteners (except locknuts) and torque per applicable specifications noted in the appendix.
3. Seal any pipe threads with Loctite® 545™ Hydraulic Sealant.

FOOTNOTES:

Seal Kit

912-4550



Seal Kit

912-4550 — PARTS LIST

REF NO.	PART NUMBER	DESCRIPTION	QTY	REMARKS
14.1	912-4552	WEAR RING, 2-3/4" PISTON"	1	
14.2	912-4551	SEAL, 2-3/4" PISTON"	1	
14.3	912-4554	BACK-UP RING -242	1	
14.4	912-4553	O-RING 2-242	1	
14.5	912-4555	WEAR RING, 2-3/4" ROD"	1	
14.6	912-4556	SEAL, 2-3/4" ROD"	1	
14.7	912-4557	WIPER, 2-3/4" ROD	1	

NOT SHOWN:

19	912-3158	HYDRAULIC OIL, ONE GALLON	1	
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NOTES:

1. Apply a light coat of (19) Hydraulic Oil to (14).1 Wear Ring and (14).2 Seal, then install into (4) Rod.
2. Apply a light coat of (19) Hydraulic Oil to (14).3 O-ring, (14).4 Back-up Ring, (14).5 Wear Ring, (14).6 Rod Seal and (14).7 Rod Wiper, then install into (3) Cylinder Head.
3. Apply a light coat of (19) Hydraulic Oil to Piston of (4) Rod, then install into (5) Cylinder Body. Make sure to seat (4) Rod at the bottom of (5) Cylinder Body¹.
4. Apply a light coat of (19) Hydraulic Oil to the installed (14).3 O-ring, (14).4 Back-up Ring, (14).5 Wear Ring, (14).6 Rod Seal and (14).7, located in (3) Cylinder Head.
5. Install (5) Cylinder Body into (3) Cylinder Head, until threads of (5) Cylinder Body contact threads of (3) Cylinder Head¹.
6. Thread (5) Cylinder Body into (3) Cylinder Head until it stops, then torque to 300 ft-lb.

FOOTNOTES:

¹A dead blow hammer may be necessary to overcome seals.

Appendix

Table of Contents

Torque Standards - Hydraulic Fittings.....	34	Torque Values - Metric Fasteners	38
Torque Values - SAE Fasteners	36		

Torque Standards - Hydraulic Fittings

O—RING BOSS FITTINGS

Assembly Torque (+10% —0)													
Dash Size	Nom. Size (Inch)	SAE Size	Female Thread	Male Thread	O-Ring	O-Ring Boss		O-Ring Boss		Hollow Hex		Hex Head	
						Non-Adjustable		Adjustable		Plugs			
			I.D. (IN)	O.D. (IN)	I.D. (IN)	ft-lbs. (in-lbs.)	N-m	ft-lbs. (in-lbs.)	N-m	ft-lbs. (in-lbs.)	N-m	ft-lbs. (in-lbs.)	N-m
-2	1/8	5/16-24	17/64	5/16	17/64	-	-	-	-	(30)	4	(85)	10
-3	3/16	3/8-24	21/64	3/8	21/64	-	-	-	-	(55)	6	(155)	18
-4	1/4	7/16-20	25/64	7/16	25/64	26	35	(180)	20	(120)	14	22	29
-5	5/16	1/2-20	29/64	1/2	29/64	30	40	30	40	(170)	19	23	32
-6	3/8	9/16-18	1/2	9/16	1/2	35	46	35	46	34	46	29	40
-8	1/2	3/4-16	11/16	3/4	11/16	60	80	60	80	60	80	52	70
-10	5/8	7/8-14	13/16	7/8	13/16	100	135	100	135	100	135	85	115
-12	3/4	1-1/16-12	31/32	1-1/16	31/32	135	185	135	185	135	185	135	183
-14	7/8	1-3/16-12	1-7/64	1-3/16	1-7/64	175	235	175	235	175	235	175	237
-16	1	1-5/16-12	1-15/64	1-5/16	1-15/64	200	270	200	270	200	270	200	271
-20	1-1/4	1-5/8-12	1-35/64	1-5/8	1-35/64	250	340	250	340	250	340	250	339
-24	1-1/2	1-7/8-12	1-51/64	1-7/8	1-51/64	305	415	305	415	305	415	305	414
-32	2	2-1/2-12	2-27/64	2-1/2	2-27/64	375	510	375	510	375	510	375	509

NOTE:

Ensure the threads and sealing surfaces are free from nicks, burrs, scratches or any foreign material. Lubricate the o-ring with a light coat of oil. To tighten adjustable o-ring fittings, hold the fitting and tighten the nut. To tighten non-adjustable o-ring fittings, tighten the fitting. When tightening together fittings with dissimilar coatings, torque to 115% of maximum recommended torque value for a given size.

O—RING FACE SEAL FITTINGS

Dash Size	Nom. Size (Inch)	Thread Size	Female Thread	Male Thread	Assembly Torque (+10% —0) (Primary Method)		Flats from Wrench Resistance (FFWR) (Secondary Method)		O-Ring
					ft-lbs. (in-lbs.)	N-m	Tube Nuts	Swivel & Hose	
			I.D. (IN)	O.D. (IN)					I.D. (Inch)
-4	1/4	9/16-18	1/2	9/16	18	25	1/2	3/4	5/16
-6	3/8	11/16-16	11/16	11/16	30	40	1/2	3/4	3/8
-8	1/2	13/16-16	3/4	13/16	40	55	1/2	3/4	1/2
-10	5/8	1-14	13/16	1	60	80	1/2	3/4	5/8
-12	3/4	1-3/16-12	1-7/64	1-3/16	85	115	1/2	1/2	3/4
-16	1	1-7/16-12	1-23/64	1-7/16	110	150	1/2	1/2	15/16
-20	1-1/4	1-11/16-12	1-19/32	1-11/16	150	205	1/2	1/2	1-3/16
-24	1-1/2	2-12	1-59/64	2	230	315	1/2	1/2	1-1/2

PIPE FITTINGS

Nom. SAE Dash Size	Fractional Size	Threads Per Inch	Turns from Finger Tight
2	1/8	27	2-3
4	1/4	18	2-3
6	3/8	18	2-3
8	1/2	14	2-3
12	3/4	14	2-3
16	1	11-1/2	1.5-2.5
20	1-1/4	11-1/2	1.5-2.5
24	1-1/2	11-1/2	1.5-2.5
32	2	11-1/2	1.5-2.5

NOTE:

Ensure the threads and sealing surfaces are free from nicks, burrs, scratches or any foreign material. Lubricate the o-ring with a light coat of oil. To tighten adjustable o-ring fittings, hold the fitting and tighten the nut. To tighten non-adjustable o-ring fittings, tighten the fitting. When tightening together fittings with dissimilar coatings, torque to 115% of maximum recommended torque value for a given size.

Torque Values - SAE Fasteners

GRADE 5: UNC OR UNF THREAD

Size	Coarse Thread		Fine Thread	
	ft-lbs	N-m	ft-lbs	N-m
1/4	6	8.5	8	11
5/16	13	18	15	20.5
3/8	25	35	30	40
7/16	40	55	45	60
1/2	60	80	70	95
9/16	90	120	95	130
5/8	120	165	145	200
3/4	210	285	240	325
7/8	320	435	350	475
1	480	650	560	760
1-1/8	700	950	780	1060
1-1/4	1020	1385	1100	1545

NOTE:

Do not use these values if a different torque value or tightening procedure is given for specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class fasteners.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to strength of original.

Make sure fastener threads are clean and that the threads are properly started. This will prevent them from cross threading or galling when tightened.

Tighten plastic insert or crimped type steel locknuts to approximately 50% of dry torque indicated on chart. Apply torque to the nut – not the bolt head. Tighten toothed or serrated type locknuts to full torque value.

LUBRICATED means coated with lubricant. DRY means plain or zinc plated without any type of lubricant.

GRADE 8: UNC OR UNF THREAD

Size	Coarse Thread		Fine Thread	
	ft-lbs	N-m	ft-lbs	N-m
1/4	10	13	11	15
5/16	20	27	22	29.5
3/8	35	47	40	55
7/16	55	75	65	88
1/2	90	120	95	130
9/16	120	165	135	185
5/8	180	245	195	265
3/4	300	405	340	460
7/8	500	680	560	760
1	800	1085	920	1250
1-1/8	1180	1600	1340	1815
1-1/4	1720	2330	1900	2575

NOTE:

Do not use these values if a different torque value or tightening procedure is given for specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class fasteners.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to strength of original.

Make sure fastener threads are clean and that the threads are properly started. This will prevent them from cross threading or galling when tightened.

Tighten plastic insert or crimped type steel locknuts to approximately 50% of dry torque indicated on chart. Apply torque to the nut – not the bolt head. Tighten toothed or serrated type locknuts to full torque value.

LUBRICATED means coated with lubricant. DRY means plain or zinc plated without any type of lubricant.

Torque Values - Metric Fasteners

Size	Class 4.8				Class 8.8 and 9.8				Class 10.9				Class 12.9			
	Lubricated		Dry		Lubricated		Dry		Lubricated		Dry		Lubricated		Dry	
	N-m	ft-lbs.	N-m	ft-lbs.	N-m	ft-lbs.	N-m	ft-lbs.	N-m	ft-lbs.	N-m	ft-lbs.	N-m	ft-lbs.	N-m	ft-lbs.
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1600	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

NOTE:

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Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class fasteners.

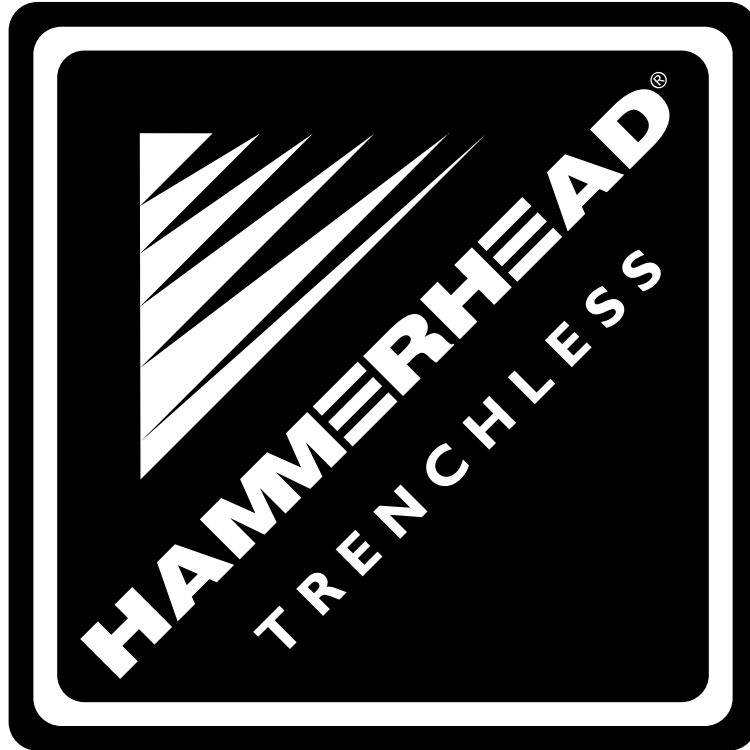
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Notes:



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