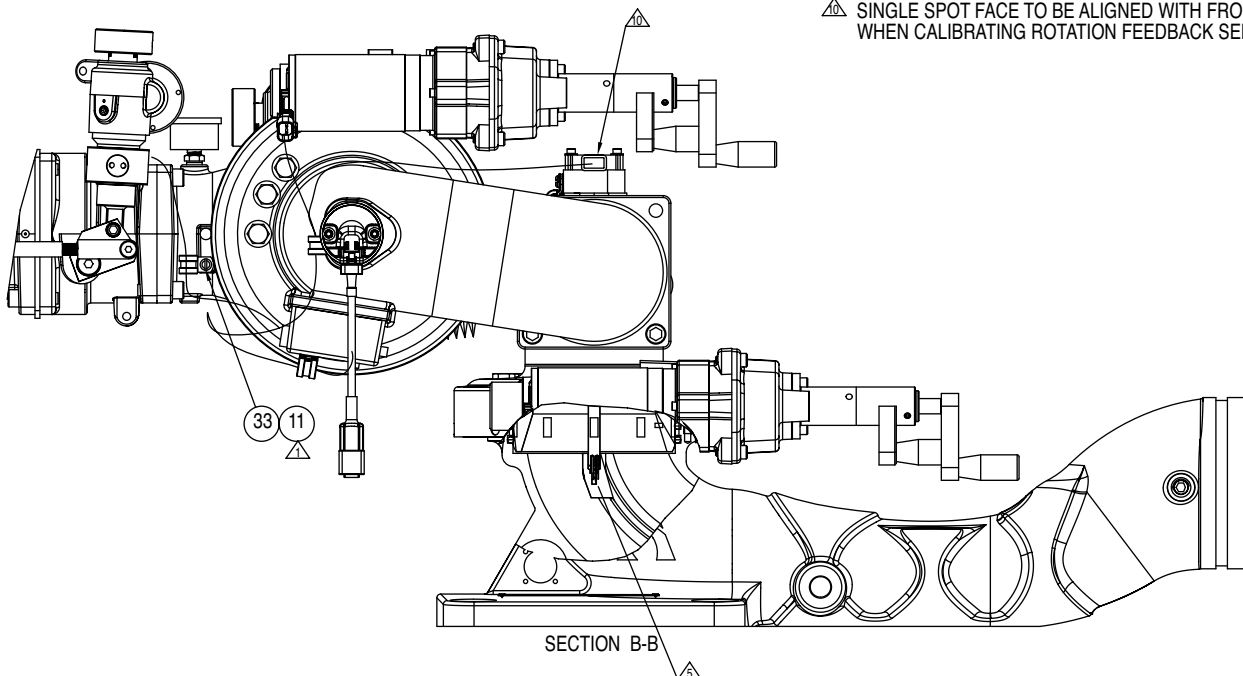
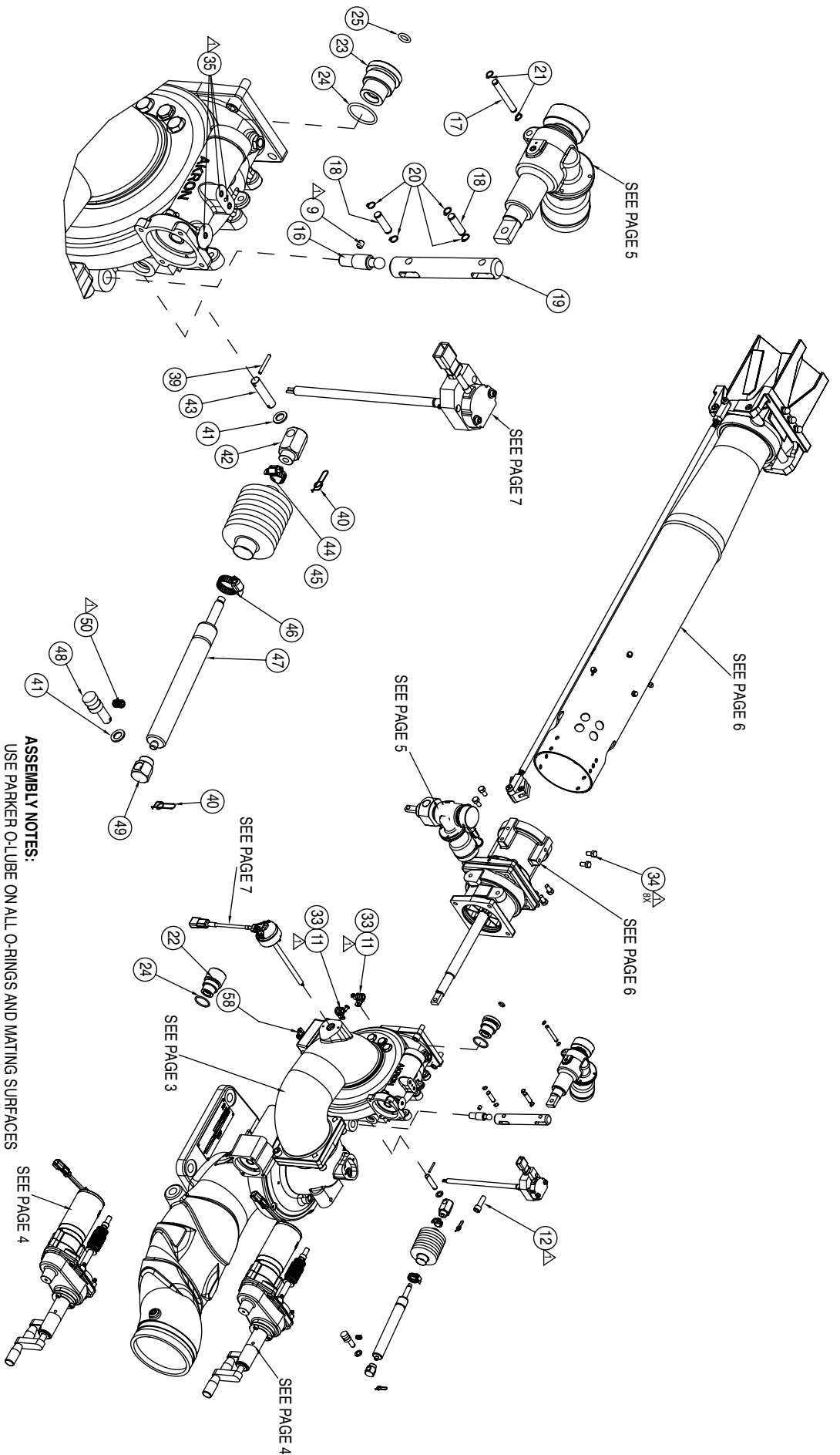


ASSEMBLY NOTES:

USE PARKER O-LUBE ON ALL O-RINGS AND MATING SURFACES UNLESS OTHERWISE NOTED.

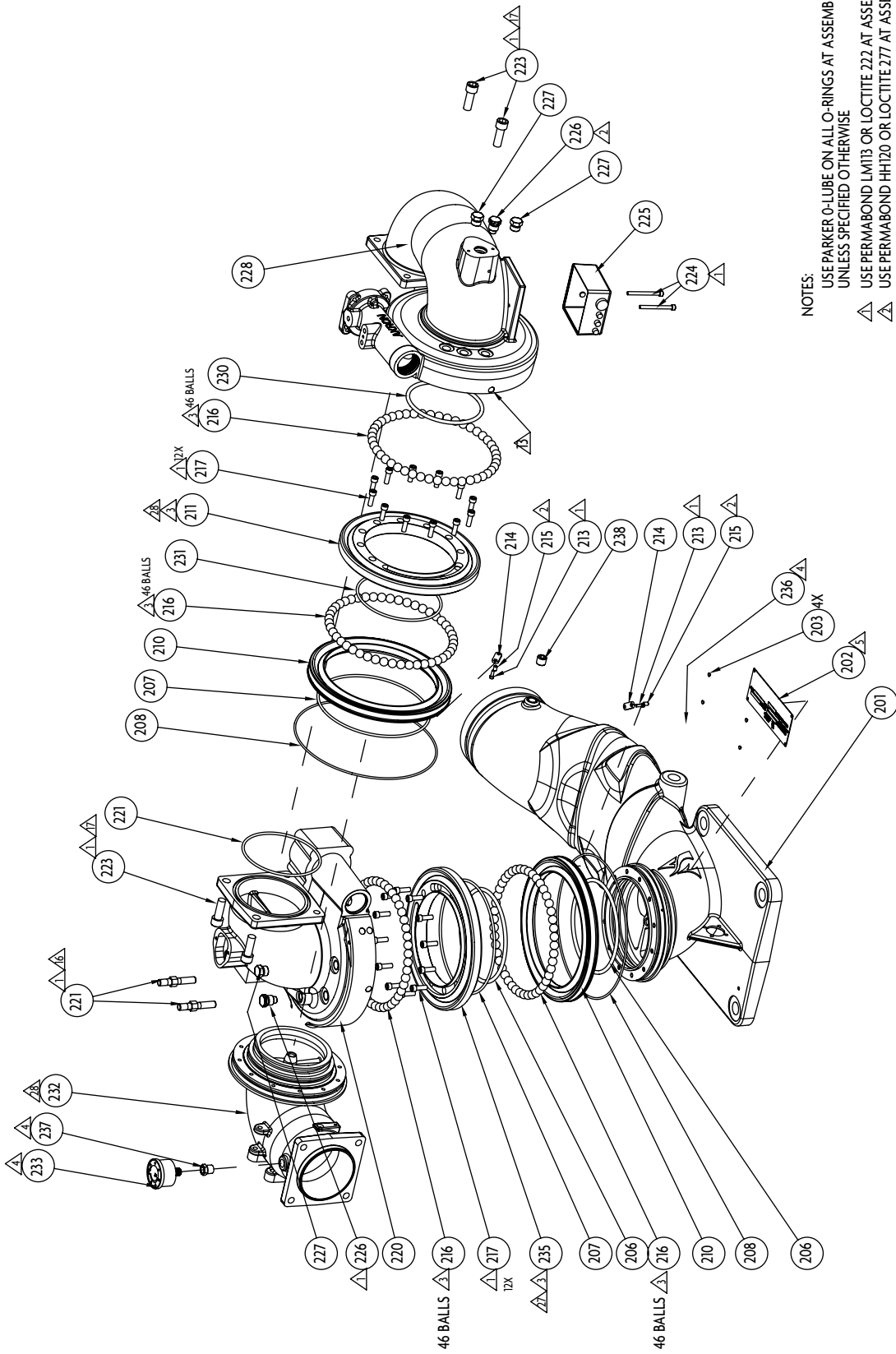
- △ USE PERMABOND LM113 OR LOCTITE 222.
- △ USE PRIMER T AND PERMABOND HH120 OR LOCTITE 277.
- △ USE LOW-TEMP LUBRIPLATE.
- △ DIMPLE AT ASSEMBLY.
- △ THOROUGHLY COAT WITH NEVER SEEZ MARINERS CHOICE.
- △ USE PERMABOND LH050 OR LOCTITE 592.
- △ USE LOCTITE 290.
- △ GENERAL DEPICTION SEE BILL OF MATERIAL.
- △ ALIGN BALL IN HOLE. TIGHTEN PLUG UNTIL TOUCHES BALL. THEN BACK OUT PLUG 1/4-1/2 TURN.
- △ SINGLE SPOT FACE TO BE ALIGNED WITH FRONT WEB WHEN CALIBRATING ROTATION FEEDBACK SENSOR.





ASSEMBLY NOTES:

- ▲ USE PARKER O-LUBE ON ALL O-RINGS AND MATING SURFACES UNLESS OTHERWISE NOTED.
- ▲ USE PERMABOND LM113 OR LOCTITE 222.
- ▲ USE PRIMER T AND PERMABOND HH120 OR LOCTITE 277.
- ▲ USE LOW-TEMP LUBRIPLATE.
- ▲ DIMPLE AT ASSEMBLY.
- ▲ THOROUGHLY COAT WITH NEVER SEEZ MARINERS CHOICE.
- ▲ USE PERMABOND LH050 OR LOCTITE 592.
- ▲ USE LOCTITE 290.
- ▲ GENERAL DEPICTION SEE BILL OF MATERIAL.
- ▲ ALIGN BALL IN HOLE. TIGHTEN PLUG UNTIL TOUCHES BALL. THEN BACK OUT PLUG 1/4-1/2 TURN.
- ▲ SINGLE SPOT FACE TO BE ALIGNED WITH FRONT WEB WHEN CALIBRATING ROTATION FEEDBACK SENSOR.



- NOTES:
- △ USE PARKER O-LUBE ON ALL O-RINGS AT ASSEMBLY UNLESS SPECIFIED OTHERWISE
 - △ USE PERMABOND LM13 OR LOCTITE 222 AT ASSEMBLY
 - △ USE PERMABOND HH120 OR LOCTITE 277 AT ASSEMBLY
 - △ USE LUBRIPATE LOW-TEMP GREASE AT ASSEMBLY
 - △ USE PERMALOCK LH050 OR LOCTITE 592 PIPE SEALANT
 - △ POSITION PARALLEL TO EDGE OF BASE. DO NOT COVER COUNTERBORE.
 - △ ALIGN TIMING DIMPLE ON BOTH JOINTS PRIOR TO INSTALLING POSITION SENSORS. ADJUST SENSOR OUTPUT TO $2.50 \pm 0.01V$.
 - △ TIGHTEN 22-28 FT LBS AT ASSEMBLY
 - △ TIGHTEN 32-38 FT LBS AT ASSEMBLY
 - △ ALIGN BOLT HOLE NOT IN GROOVE TO TIMING DIMPLE ON ITEM 201
 - △ ALIGN ELEVATION OF THE OUTLET ELBOW CENTER LINE WITH THE TIMING DIMPLE ON THE RING GEAR
 - △ THOROUGHLY COAT SOCKETS FOR FEEDBACK SHAFTS WITH NEVER SEEZ. MARINERS CHOICE

ASSEMBLY NOTES:

USE PARKER O-LUBE ON ALL O-RINGS AT ASSEMBLY UNLESS SPECIFIED OTHERWISE 222.

1 USE PERMABOND LM113 OR LOCTITE

2 USE PRIMER T AND LOCTITE 277.

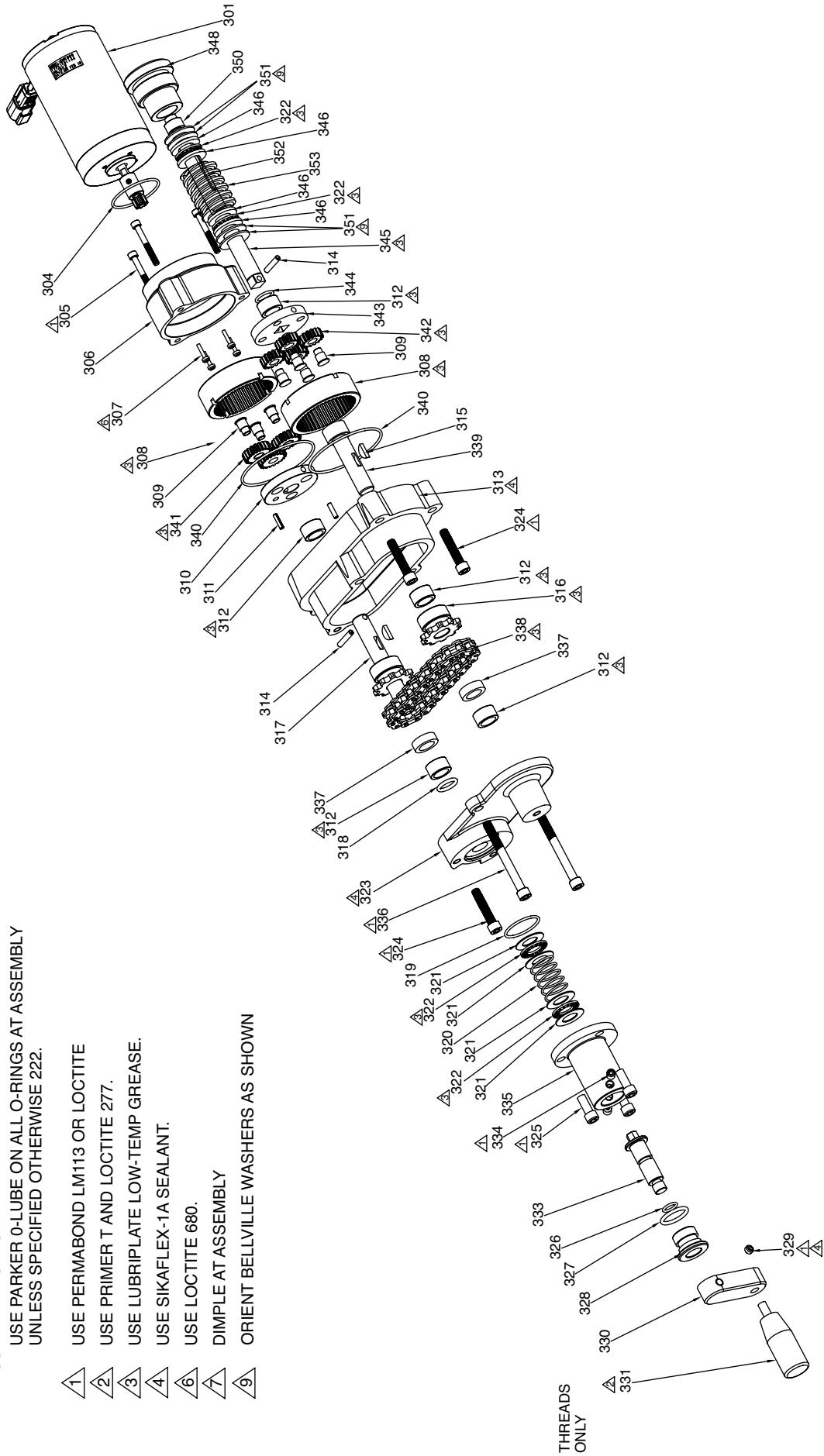
3 USE LUBRIPLATE LOW-TEMP GREASE.

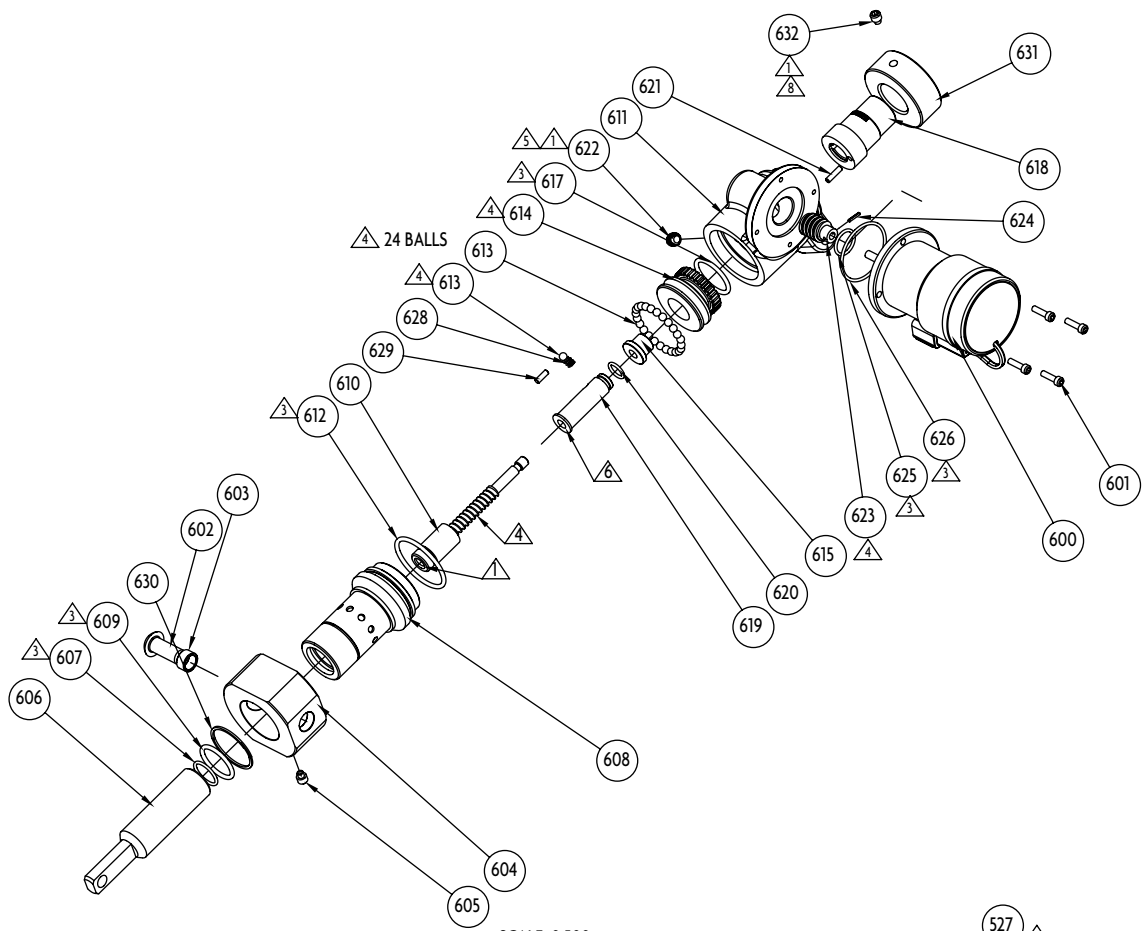
4 USE SIKAFLEX-1A SEALANT.

6 USE LOCTITE 680.

7 DIMPLE AT ASSEMBLY

9 ORIENT BELLVILLE WASHERS AS SHOWN

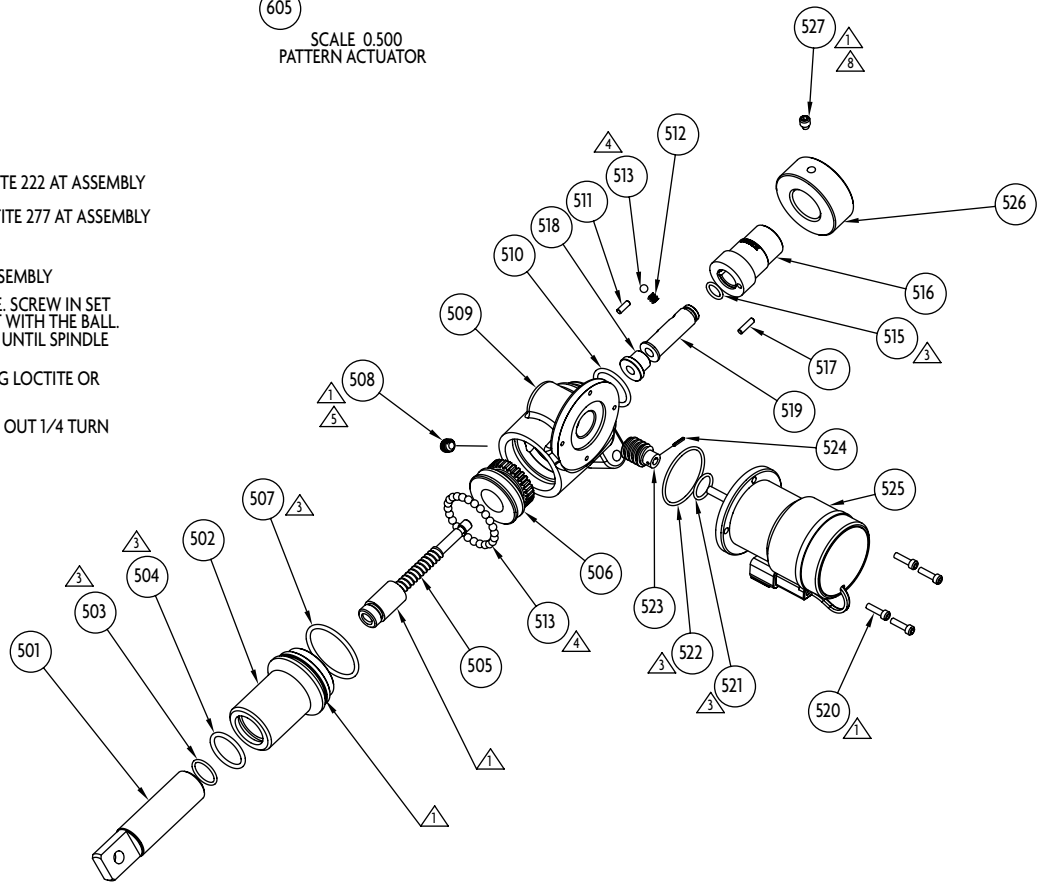




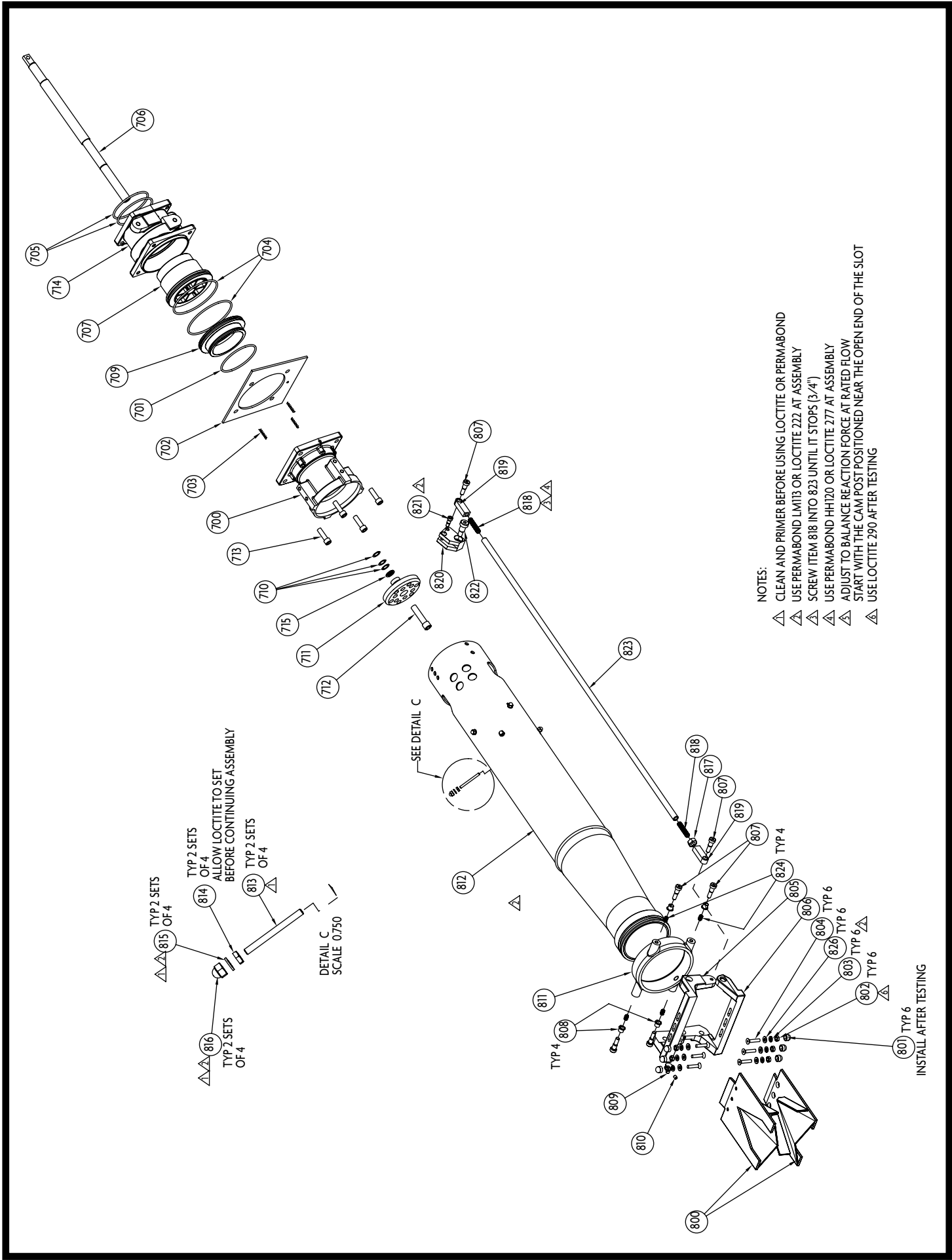
SCALE 0.500
PATTERN ACTUATOR

NOTES

- ① USE PERMABOND LM113 OR LOCTITE 222 AT ASSEMBLY
- ② USE PERMABOND HH120 OR LOCTITE 277 AT ASSEMBLY
- ③ USE PARKER O-LUBE
- ④ USE LOW TEMP LUBRIPLATE AT ASSEMBLY
- ⑤ CENTER A BALL IN LOADING HOLE. SCREW IN SET SCREW UNTIL IT MAKES CONTACT WITH THE BALL. BACK SET SCREW OUT "SLIGHTLY" UNTIL SPINDLE STARTS MOVING FREELY
- ⑥ CLEAN AND PRIMER BEFORE USING LOCTITE OR PERMABOND
- ⑦ SCREW IN TIGHT AND THEN BACK OUT 1/4 TURN
- ⑧ DIMPLE AT ASSEMBLY



SCALE 0.500
GALLONAGE ACTUATOR



- NOTES:
- △ CLEAN AND PRIMER BEFORE USING LOCTITE OR PERMABOND
 - △ USE PERMABOND LM113 OR LOCTITE 222 AT ASSEMBLY
 - △ SCREW ITEM 818 INTO 823 UNTIL IT STOPS (3/4")
 - △ USE PERMABOND HH120 OR LOCTITE 277 AT ASSEMBLY
 - △ ADJUST TO BALANCE REACTION FORCE AT RATED FLOW
 - △ START WITH THE CAM POST POSITIONED NEAR THE OPEN END OF THE SLOT
 - △ USE LOCTITE 290 AFTER TESTING

TYP 2 SETS OF 4
 △△ 815
 TYP 2 SETS OF 4
 △△ 814
 ALLOW LOCTITE TO SET BEFORE CONTINUING ASSEMBLY
 TYP 2 SETS OF 4
 △△ 813
 TYP 2 SETS OF 4
 △△ 816
 TYP 2 SETS OF 4
 △△ 816
 TYP 2 SETS OF 4
 △△ 816

DETAIL C
 SCALE 0.750

SEE DETAIL C

(801) TYP 6
 INSTALL AFTER TESTING

NOTES:

USE PARKER O-LUBE ON ALL O-RINGS UNLESS SPECIFIED OTHERWISE.

1 USE PERMABOND LM113 OR LOCTITE 222.

2 USE PERMABOND HH120 OR LOCTITE 277.

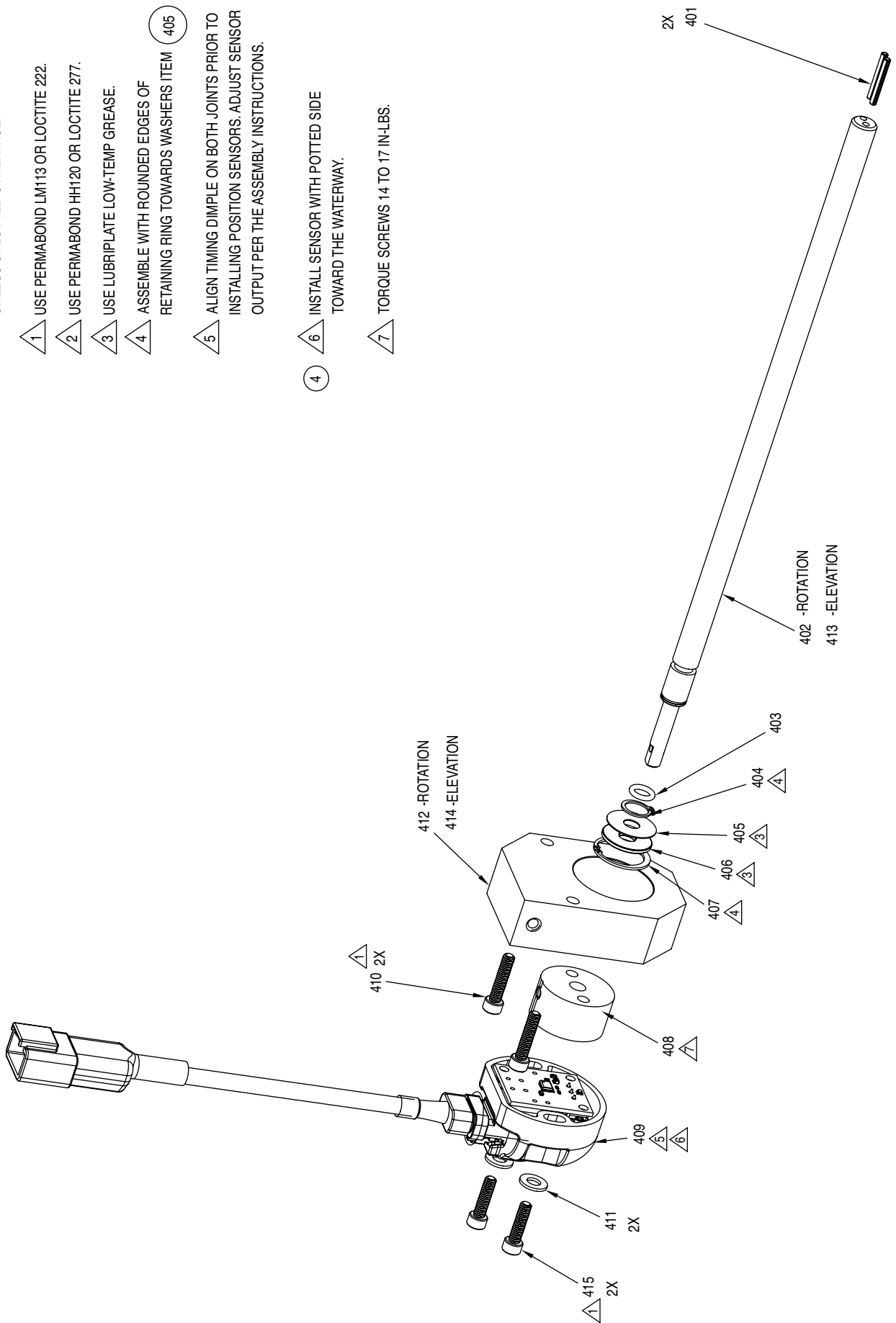
3 USE LUBRIPLATE LOW-TEMP GREASE.

4 ASSEMBLE WITH ROUNDED EDGES OF RETAINING RING TOWARDS WASHERS ITEM 405

5 ALIGN TIMING DIMPLE ON BOTH JOINTS PRIOR TO INSTALLING POSITION SENSORS. ADJUST SENSOR OUTPUT PER THE ASSEMBLY INSTRUCTIONS.

6 INSTALL SENSOR WITH POTTED SIDE TOWARD THE WATERWAY.

7 TORQUE SCREWS 14 TO 17 IN-LBS.



ITEM NO.	DESCRIPTION	PART NUMBER	QTY
351	SPRING BELLEVILLE STSTL AS# B1000-050S	769276	8
352	KEY SPECIAL 1018 STEEL 3440	727044	2
353	GEAR WORM	718273	2
401	PIN ROLL ST STL	744078	4
402	SHAFT ELEVATION FEEDBACK STSTL	770346	1
403	O-RING 2-010	757005	2
404	RING ST STL	758247	2
405	SHIM	769887	2
406	WASHER STSTL	784192	2
407	RING RETAINING STSTL	758127	2
408	MARKER POSITION MAGNET	731127	2
409	SENSOR MAGNETIC	60430006	2
410	SCREW SOC HD CAP 8-32 X 3/4"ST STL	765178	8
411	WASHER #8	784123	4
412	ADPT ELEV FDBCK	122129	1
413	ELEVATION SHAFT	770345	1
414	ADPT ELEVATION FDBCK	122129	1
415	SCREW SOC HD CAP 8-32X5/8" ST STL	765360	4
501	HOUSING SCREW	121936	1
502	TUBE GUIDE	118253	1
503	O-RING-016	757055	1
504	O-RING 2-118	757293	1
505	SCREW FREEWHEELING BALL	767136	1
506	GEAR OVERRIDE ACTUATOR	718292	1
507	O-RING 2-127	757048	1
508	SCREW SOCHD FLAT POINTS/16-24X1/4 18-8	765134	1
509	HOUSING ACTUATOR	121932	1
510	O-RING 2-119	757330	1
511	KEY SPECIAL STSTL COMP W/OVERRIDE	727050	1
512	SPRING DETENT ST STL	768283	1
513	BALL ST STL 3/16"	704018	25
514	VERRIDE HUB	721547	1
516	COLLAR OVRD	119500	1
517	PIN SOLID 1/8 X 1/2 STSTL	744288	1
518	O-RING 2-012	757282	1
519	SHAFT OVERRIDE STSTL	770343	1
520	SCREW SOC HD CAP 6-32 X 1/2" ST STL	765150	4
521	O-RING 2-015	757112	1
522	O-RING2-029	757056	1
523	WORM PATT ACTUATOR STSTL	785021	1
524	PIN ROLL ST STL .0625 X .375 LG	744341	1
525	MOTOR W/CONN S/A 24V 3356 FLOW/PATT.ACT.	33560010	1
600	MOTOR W/CONN 24V 3356 FLOW/PATT.ACT.	33560010	1
601	SCREW SOC HD CAP 6-32 X 1/2" ST STL	765150	4
602	SCREW SOC HD BUTTON 18-8 3/8-16X7/8	767162	1
603	BRACKET SPACER STSTL	768381	1
604	ACTUATOR BRACKET	120649	1
605	SCREWSOC HDSET DOGPT STSTL1/4 -20X5/16"V	765070	2
606	HOUSING SCREW	120653	1
607	O-RING 2-016	757055	1
608	GUIDE TUBE	120650	1
609	O-RING 2-118	757293	1
610	SCREW FREEWHEELING BALL 5078	767149	1
611	HOUSING ACTUATOR	121932	1
612	O-RING 2-127	757048	1
613	BALL ST STL 3/16"	704018	25
614	GEAR OVERRIDE ACTUATOR BRONZE COMP	718292	1
616	HUB OVERRIDE STSTL	721547	1
617	O-RING 2-119	757330	1
618	COLLAR OVRD	119500	1
619	SHAFT OVERRIDE STSTL	770343	1
620	O-RING 2-012	757282	1
621	PIN SOLID 1/8 X 1/2 STSTL	744288	1
622	SCREW SOCHD FLAT POINTS/16-24X1/4 18-8	765134	1
623	WORM PATT ACTUATOR STSTL	785021	1
624	PIN ROLL ST STL	744341	1
625	O-RING 2-015	757112	1
626	O-RING 2-029	757056	1
628	SPRING DETENT	768283	1
629	KEY SPECIAL STSTL COMP W/OVERRIDE	727050	1
630	RING RETAINING	758058	1
700	BODY NOZ	121930	1

ITEM NO.	DESCRIPTION	PART NUMBER	QTY
701	O-RING 2-238	757036	1
702	SPACE PLATE	121941	1
703	SPRING THROAT ST STL REPAIR	768231	3
704	O-RING 4-3/8"X4 5/8X.1392-245 BUNA N70	757225	3
705	O-RING PARKER 2-239 N-818-70 IMPREG	757429	2
706	STEM BAFFLE 606IT6 HC .31SF	121938	1
707	SHAPER STREAM MCH 606IT6 HC 1.065F	121935	1
708	RING RETAINING 3/4" STSTL TRUARC	756182	1
709	PISTON WATER EXCLUSION MCH/HC .33SF	121931	1
710	SHIM PLASTIC .003 THK GREEN .750 DIA	768095	1
710	SHIM PLASTIC .005 THK BLUE .750 DIA	768096	1
710	SHIM PLASTIC .015 THK PINK .750 DIA	768098	1
711	HEAD BAFFLE	121990	1
712	SCREW SOC HD CAP 1/2 -13 X 2"LG ST STL	767117	1
713	SCREW SOC HD CAP (18-8)3/8 -16X1 1/4"	765154	6
714	INLET DUAL FLOW NOZ	121934	1
715	BAFFLE SPACER	768299	1
800	DEFLECTOR	120681	2
801	COVER NUT POP ON F/1/4"NUT BLK PLASTIC	707401	6
802	NUT HEX 303-304 ST STL 1/4-20	734061	6
803	WASHER SPLIT LOCK ID ST STL 1/4 ID	784106	6
804	SCREW FLAT HD 1/4-20 X 1-1/4"LG ST STL	767146	6
805	BLADE LOWER 1200&1500	116826	1
806	BLADE DRIVEN	121000	1
807	SCREW SOC HD SHLDR SS 3/8DX1/2.5/16-1	765181	6
808	BEARING NYLINER 3/8"ID6L6-F 3340	704235	4
809	CAM ADJUSTMENT STSTL	707539	1
810	SCREWSOCHD SETCUP PT 1/4 -20X1/4"SS	765002	1
811	COLLAR 1200&1500 AFFF	116828	1
812	TUBE & RING WELDMENT	121940	1
813	STUD FOAM STSTL	770314	8
814	NUT HEX 10-32 STSTL	735081	8
815	93781A011 WSR PRS SEAL ZNCPLT.045-.055TK	784165	8
816	NUT ACORN 10-32 LOW CROWN STSTL	735082	8
817	NUT HEX ST STL 3/8-24UNF	734096	1
818	ROD INSERT ST STL 3/8-24UNF-2A	753047	2
819	ROD THREADED END	121984	2
820	BLOCK PIVOT 606IT6	120654	1
821	SCREW HEX SOC SHLDR SS 5/16X3/8-1/4-20	767131	1
822	SCREW SHLDR 1/2DX5/8LG 3/8-16 STSTL	765258	1
823	ROD PATT CNTRL	121939	1
824	SCREW SOC HD SET CUP PTS/16-18 X 1/2" SS	765268	4
826	WASHER STSTL 1/4 ID X 9/16 OD X 1/16	784094	6

ITEM NO.	DESCRIPTION	PART NUMBER	QTY
9	SCREW SET CUP PT ST STL 1/4-20 X 5/16"	765047	9
10	SCREW BTTN HD 10-24 X 3/8 ST STL	765143	4
11	SCREW SLT'D PN HD #10-24 X 3/8 ST STL	766049	8
12	SCREW SOC HD CAP 18-8 3/8-16X 1-1/8" SS	767173	4
13	SHIM PLASTIC PINK	767173	1
14	SPACER	768248	1
15	BAFFLE SPACER	768299	1
16	FULCRUM GALLONAGE ACT 316SS COMP	713229	1
16	TAG METTERING DSCH INST ORFICE	773244	1
17	PIN PIVOT ACTUATOR STSTL	745200	1
18	PIN LEVER	745199	2
19	LEVER GALL ACTUATOR 6061T6 HC .145F	122459	1
20	RING RET EXTERNAL 5/16" STSTL	756181	4
21	RING RET EXTERNAL 1/4" STSTL	756180	2
22	CAP BEARING	121985	1
23	CAP BEARING	121607	1
24	O-RING 1 3/8" X 1 3/16" 2-123 BUNA N70	757054	2
25	O-RING 9/16OD X 3/8 ID PARKER 2-110 BUNA	757295	1
26	CABLE TIE	773106	1
33	CLAMP CABLE 5/16" SS	707548	3
34	SCREW HEX HD 5/16-18X5/8" STSTL	767174	8
39	PIN ROLL	744056	1
40	CLIP HAIRPIN ST STL #RUE-16 3436	744222	2
41	WASHER FLAT 18-8 ST STL 5/8 X 3/8 X 1/16	784064	2
42	END CLEVIS MCH COMP STSTL	710145	1
43	PIN GAS SPRING STSTL	742175	1
44	CLAMP7/32-5/8 316STSTL5/16"	707524	1
45	BELLOWS GAS SPRING	704951	1
46	CLAMP WORM DRIVE 11/16 TO1 1/4" MURRAY G	706017	1
47	CYLINDER GAS SUSPA	707515	1
48	CAM ADJUSTOR	707154	1
49	CLEVIS END	707155	1
50	SCREW SOC HD SET CUP PT5/16-18 X 1/2" SS	765268	5
201	PIPE INLET	123078	1
202	PLATE ID	744515	1
203	NAIL GRIP AMTAK FAST CAT # 3326 3/16 DIA	736052	4
206	O-RING 2-355 BUNA-N 70 DUROMETER	757453	2
207	O-RING 6 3/4 X 6 1/2 2-260 BUNA-N70	757386	2
208	O-RING 3/32 X 8"ID 2-171 BUNA N 70	757435	2
210	RING BALL RETAINER MCH 3588 HC .575F	120095	2
211	GEAR ELEVATION 6061T6 HC 1.295F	121593	1
213	SCREW SOC HD CAP 6-32 X 3/8"ST STL	765175	2
214	KEEPER 6061T6 HC .0165F 3588	120137	2
215	SCREW SOC HD SET CUP PT 10-24 X 5/16"	765040	2
216	BALL BRONZE 1/2" (+/- .001 TOLERANCE)	703383	184
217	SCREW SOC HD CAP 1/4 -20 X 3/4"ST STL	765030	27
220	JOINT ROTATION MCH/HC 2.145F	123384	1
222	O-RING 4-3/8"X4 5/8X.1392-245 BUNA N70	757225	1
223	SCREW SOC HD CAP 7/16-14X1-1/4 ST STL	765207	4
224	SCREW SOC HD CAP 10-24X2 18-8 ST STL	763077	2
225	HARNNESS WIRING U2 HFM,POS FDBCK ZIEGLER	721628	1
226	STOP 9/16 - 12 UNC STSTL COMP	769843	2
227	PLUG BLACK CELCON MCH COMP	745187	3
228	ELBOW MIDDLE W/JOINT MCH/HC 4.955F	121592	1
230	O-RING 3/16 X 4 1/4 ID 2-347 BUNA N 70	757446	1
231	O-RING 5 1/8"X 5"2-249 BUNA N70	757075	1
232	ELBOW OUTLET MCH/HC 3.095F	121933	1
233	GAUGE PRES 0-21 bars 1.5"DIAL	718134	1
234	O-RING 15/16"X 3/4"2-116	718323	1
235	GEAR ROTATION 6061T6 315DEG HC .785F	123077	1

ITEM NO.	DESCRIPTION	PART NUMBER	QTY
236	PLUG BSPT THD'D 304SS MCMSTR 4810T184	742229	1
237	BUSHING HEX TYPE BRASS 1/8 NPT F X 1/4 N	703344	1
238	PLUG PIPE SOCKET HEAD 1/4 TIPBRASS W/VIB	744011	1
249	BEARING NEEDLE	704395	12
250	O-RING 2-014	757041	4
248	SCREW SOC HD SET CUP PT 5/16-18X1/4"SS	765071	8
301	MOTOR GEAR,CONN S/A,7:1 24V DEUTSCH L/PT	33560031	2
304	O-RING 1 5/8"X 1 1/2"2-029 BUNA N70	757056	2
305	SCREW SOC HD CAP 8-32 X 1 3/8 STSTL	765278	6
306	GEARBOX PLANETARY MCH/HC .255F	121589	2
307	SCREW SOC HD CAP W/PATCH 6-32X1/2" SS	765052	8
308	GEAR INTERNAL STEEL 0627	718192	2
309	SCREW SHLDR 1/4DX5/16X10-32 SLOTTED SS	754052	6
310	SHAFT OUTPUT 7:1 CARRIER STSTL COMP	707564	2
311	PIN ROLL 1/8 X 1/2 ST STL	744288	4
312	BEARING ROLLER NEEDLE 1/2ID #NASCE86	704395	8
313	HOUSING GEARBOX A356T6 MCH/HC .445F	121588	2
314	WASHER 1.32 X .76 X .06 UHMW-PE	744118	6
315	KEY WOODRUFF 1/8 X 1/2 #404 ST STL	727025	4
316	SPROCKET 10 TEETH X 1/2 BORE X # 35	769499	2
317	SPROCKET 16TTH #35 MARTIN # 35B516	768405	2
318	O-RING 4.489 X 4.629 2-047 BUNA N70	757313	2
319	O-RING N674-70 2-023	757345	2
320	SPRING COMPRESSION 316STSTL COMP	768403	2
321	WASHER THRUST TORRINGTON TRA-815	784111	8
322	BEARING NEEDLE TORRINGTON NTA-815 1/2ID	703453	8
323	COVER GEARBOX A356T6 MCH/HC .585F	121882	2
324	SCREW HEX SOC SHLDR SS 5/16X3/8-1/4-20	765277	6
325	SCREW SOC HD CAP 1/4 -20 X 5/8"ST STL	765029	6
326	O-RING PARKER N674-70 2-012 BUNA-N	757282	2
327	O-RING 15/16"X 3/4"2-116	757113	2
328	BUSHING HANDWHEEL ROTATION	123080	1
328	BUSHING HANDWHEEL ELEVATION	121871	1
329	SCREW ALLEN HD ST STEEL 1/4 -20X3/16"	765008	2
330	CRANK HANDLE ROTATION	807002	2
331	SPINNER PHENOLIC STSTL COMP	770384	2
333	SHAFT HANDWHEEL ROTATION	769928	1
333	SHAFT HANDWHEEL ELEVATION	769929	1
334	SCREW SET CUP PT ST STL 1/4-20 X 5/16"	765047	4
335	EXTENSION HANDWHL ROTATION	123073	1
335	EXTENSION HANDWHL ELEVATION	121872	1
336	RING RETAINING TRUARC ST STL # 5108-50H	765276	4
337	SPACER ACETAL	769495	4
339	SPROCKET SHAFT	768395	2
338	CHAIN ROLLER#35 ST STL 3340 OCM see note	706923	24
340	O-RING 2-036 BUNA N	757312	4
341	GEAR PLANET 7:1 RATIO STL XT STRMMSTR	718262	6
342	BUSHING IGUS# GFI-0405-04	718136	6
343	O-RING 7/16"X 5/16"2-011 MIL P-25732	707476	8
344	O-RING 5/8"X 1/2"2-014 BUNA N70	757041	2
345	WORM SHAFT	768393	1
346	WASHER THRUST .094 TRC-815 3571	784121	8
350	BEARING 3/8"ID 3578 #SCE65	704393	2



Tested.. Proven.. Trusted.

ISO 9001 REGISTERED COMPANY

PHONE: 330.264.5678 or 800.228.1161 | FAX: 330.264.2944 or 800.531.7335 | akronbrass.com

REVISED: 10/18

WARRANTY AND DISCLAIMER: We warrant Akron Brass products for a period of five (5) years after purchase against defects in materials or workmanship. Akron Brass will repair or replace product which fails to satisfy this warranty. Repair or replacement shall be at the discretion of Akron Brass. Products must be promptly returned to Akron Brass for warranty service.

We will not be responsible for: wear and tear; any improper installation, use, maintenance or storage; negligence of the owner or user; repair or modification after delivery; damage; failure to follow our instructions or recommendations; or anything else beyond our control. WE MAKE NO WARRANTIES, EXPRESS OR IMPLIED, OTHER THAN THOSE INCLUDED IN THIS WARRANTY STATEMENT, AND WE DISCLAIM ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. Further, we will not be responsible for any consequential, incidental or indirect damages (including, but not limited to, any loss of profits) from any cause whatsoever. No person has authority to change this warranty.

© Akron Brass Company, 2018 All rights reserved. No portion of this can be reproduced without the express written consent of Akron Brass Company.