



Amflow®

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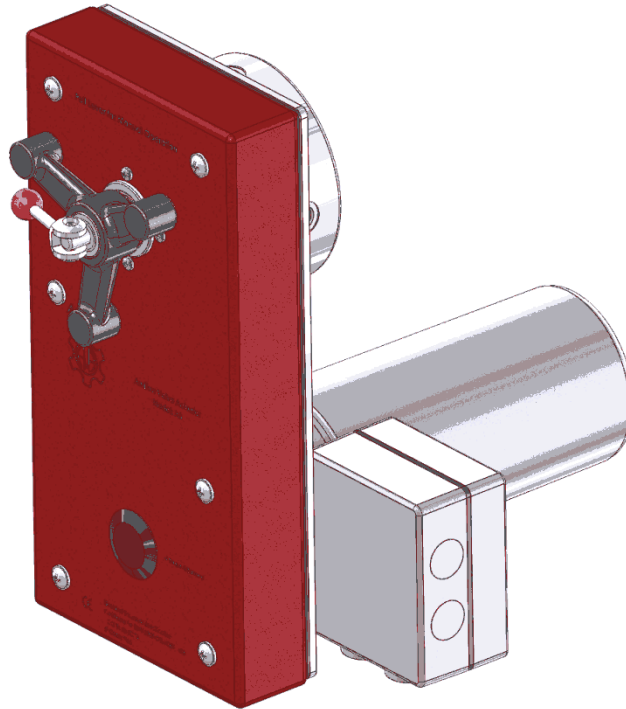
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INSTALLATION & SERVICE MANUAL

AMFLOW® **A3 VALVE ACTUATOR** (BELT DRIVE)



Part Number: 00002300-0501



NOTE:

Reference the "As Built" data sheet supplied with order for specific actuator configuration.

A & H Enterprises, Inc. reserves the right to make modifications and/or improvements to **Amflow®** products without prior notice.

Explanation of Graphic Symbols



DANGER AND/OR WARNING

The exclamation point within an equilateral triangle surrounded by red is intended to alert the user to the presence of important operating and maintenance instructions that may cause personal injury or harm to the system.



CAUTION AND/OR IMPORTANT

The exclamation point within an equilateral triangle that is solid yellow with an exclamation point is intended to alert the user to use caution or contains important information.

TABLE OF CONTENTS

SECTION 1: INFORMATION	4
1.01 DESCRIPTION.....	4
1.02 DESIGN FEATURES.....	4
1.03 MECHANICAL FEATURES	4
1.04 COMMUNICATION PROTOCOLS.....	4
1.05 SAFETY INFORMATION.....	5
1.06 ASSEMBLY VIEW.....	5
1.07 GA DRAWING.....	6
1.07a GA DRAWING: with AM30 Flow Control Valve	6
1.08 FULL VIEW.....	7
1.09 CUT-AWAY VIEW: Main Housing	8
1.09a EXPLODED VIEW: Main Housing.....	9
1.09b BOM: Main Housing.....	10
1.10 ASSEMBLY VIEW: Cover.....	12
1.10a BOM: Cover	12
1.11 ASSEMBLY VIEW: Valve Shaft	13
1.11a BOM: Valve Shaft.....	13
1.12 SUB-ASSEMBLY VIEW: Valve Shaft	14
1.12a BOM: Valve Shaft.....	14
1.13 ASSEMBLY VIEW: 5" Sprocket	14
1.13a BOM: 5" Sprocket.....	14
1.14 SUB-ASSEMBLY VIEW: Clutch.....	15
1.14a BOM: Clutch.....	15
1.15 SUB-ASSEMBLY VIEW: Idler	16
1.15a BOM: Idler.....	16
1.16 SUB-ASSEMBLY VIEW: Tension Arm	17
1.16a BOM: Tension Arm.....	17
1.17 ASSEMBLY VIEW: Baseplate.....	18
1.17a BOM: Baseplate	18
1.18 ASSEMBLY VIEW: Motor Housing Assembly	19
1.18a EXPLODED VIEW: Motor Housing Assembly.....	20
1.18b BOM: Motor Housing Assembly	21
1.19 PANEL MOUNT VIEW:.....	22
1.19a PANEL MOUNT: Cut-out Dimensions.....	23
SECTION 2: TOOLS & SUPPLIES	24
2.01 REQUIRED TOOLS	24
2.02 REQUIRED SUPPLIES	24

TABLE OF CONTENTS

SECTION 3: SERVICE ACCESS – Belt Drive Assembly	25
3.01 HANDLE REMOVAL	25
3.02 COVER REMOVAL	25
3.03 WEDGE & MAIN SHAFT REMOVAL.....	26
3.04 CHAIN REMOVAL.....	27
3.05 BEARING REMOVAL.....	29
3.06 O-RING REMOVAL.....	31
3.07 CLUTCH REMOVAL	33
3.08 BELLEVILLE SPRING CONFIGURATIONS	34
SECTION 4: VALVE INSTALATION & REMOVAL.....	35
4.01 CAM LOCK.....	35
4.02 AUTOMATIC/MANUAL MODE SELECTION.....	36
4.03 STEM ADAPTOR.....	37
4.04 MOUNTING VALVE	37
SECTION 5: CLUTCH LOCATION & TORQUE ADJUSTMENT	39
5.01 CLUTCH LOCATION.....	39
5.02 TORQUE ADJUSTMENT	39
STANDARDS & CERTIFICATIONS.....	41
LIMITED WARRANTY	42

END OF SECTION

SECTION 1: INFORMATION

1.01 DESCRIPTION

The **Amflow®** A3 Actuator is a DC gear driven motor actuator designed to accommodate the **Amflow®** AM30 Flow Control Valve in hazardous area usage.

The **Amflow®** A3 Actuator is designed to be panel mounted, reference Section 1.18 and 1.19.

NOTE: Orientation is not important. Once the **Amflow®** A3 Actuator is installed, the valve can be mounted into the ADAPTOR RING (Item 4) and locked in place by the four CAMS (Item 7). The Inlet and Outlet ports of valve will then need to be connected to the system.

The **Amflow®** A3 Actuator has three different available certified communication protocols: HART / 4-20mA, H1 FOUNDATION fieldbus, or MODBUS-TCP-RTU – 4-20mA. These protocols provide ease of use in the field with their own embedded web pages eliminating third party communication devices.

1.02 DESIGN FEATURES

1. Normal module operation includes valve position, current limit, pressure & flow feedback.
2. Manual over-ride lever.
3. Low maintenance.
 - Environmentally sealed.

1.03 MECHANICAL FEATURES

- Enclosure: 316L Stainless Steel with powder coating
- Adjustable Torque Setting
- ATEX Certification: DNV 2007 OSL ATEX-1498
- Certification Category: **CE II 2G Ex de IIC T4**
- Degree of Protection: IP66
- Weight: 48 lbs. (21.7 Kg)

Amflow® A3 Actuator: Electrical Specifications

	Motor	Watts	Max. Operating Current	Max In-Rush Current	Manual Override	Communication
A3 00000222-0501-014	DC Gear	24 VDC 30 Watts	1.25 amps (continuous)	3.0 amps	Yes	1. Industrial Ethernet 2. Hart / 4-20mA 3. H1 FOUNDATION fieldbus 4. Modbus RTU / RS485 5. Modbus TCP

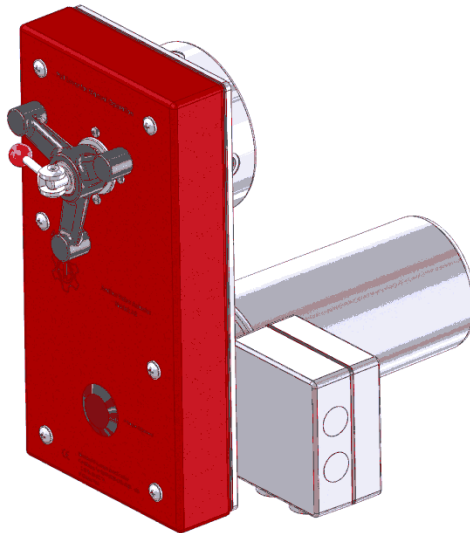
1.04 COMMUNICATION PROTOCOLS

1. Circuit board: Main motherboard with interchangeable daughter boards.
2. Remote access from host computer for control, monitoring, and configuration.
 3. Available Communication Protocols:
 1. INDUSTRIAL ETHERNET
 2. HART/4-20mA
 3. H1 FOUNDATION fieldbus
 4. MODBUS RTU / RS485
 5. MODBUS TCP
 6. Ethernet Protocol: IEEE 802.3 - 10T/100T

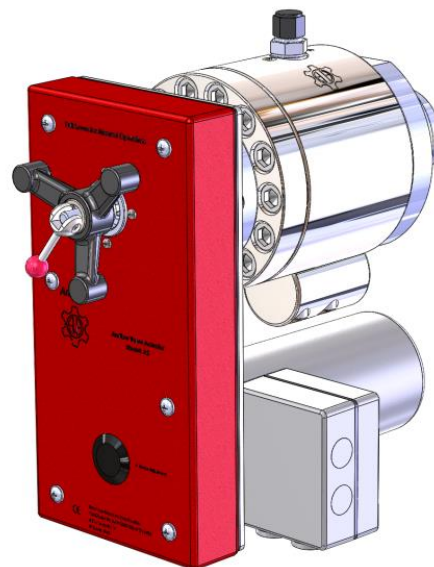
These protocols provide ease of use in the field with their own embedded web pages eliminating third party communication devices. Refer to the Circuit Board Manual provided with order for information and issues regarding communication.

1.05 SAFETY INFORMATION**1. SAFETY INFORMATION**

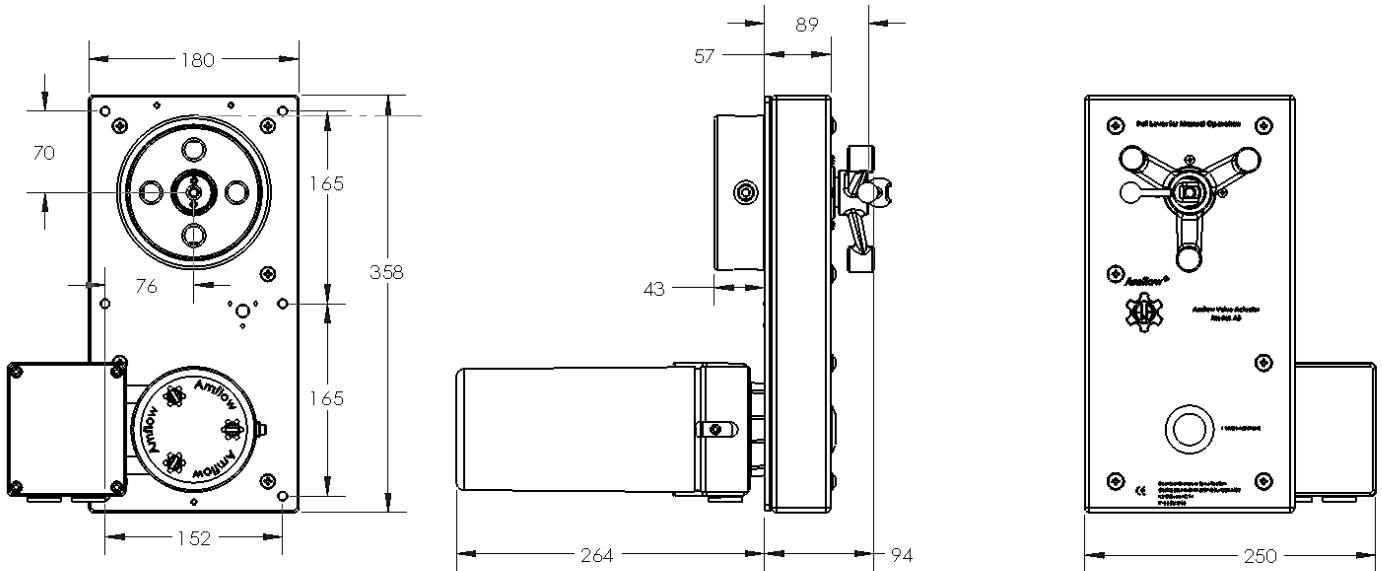
- Follow IEC when working with electrical units.
- When handling product avoid dropping, damaging, or submerging.
- Ensure proper wiring.
- Person(s) handling circuit board should be properly grounded.
- Do not open unit while energized.

1.06 ASSEMBLY VIEW

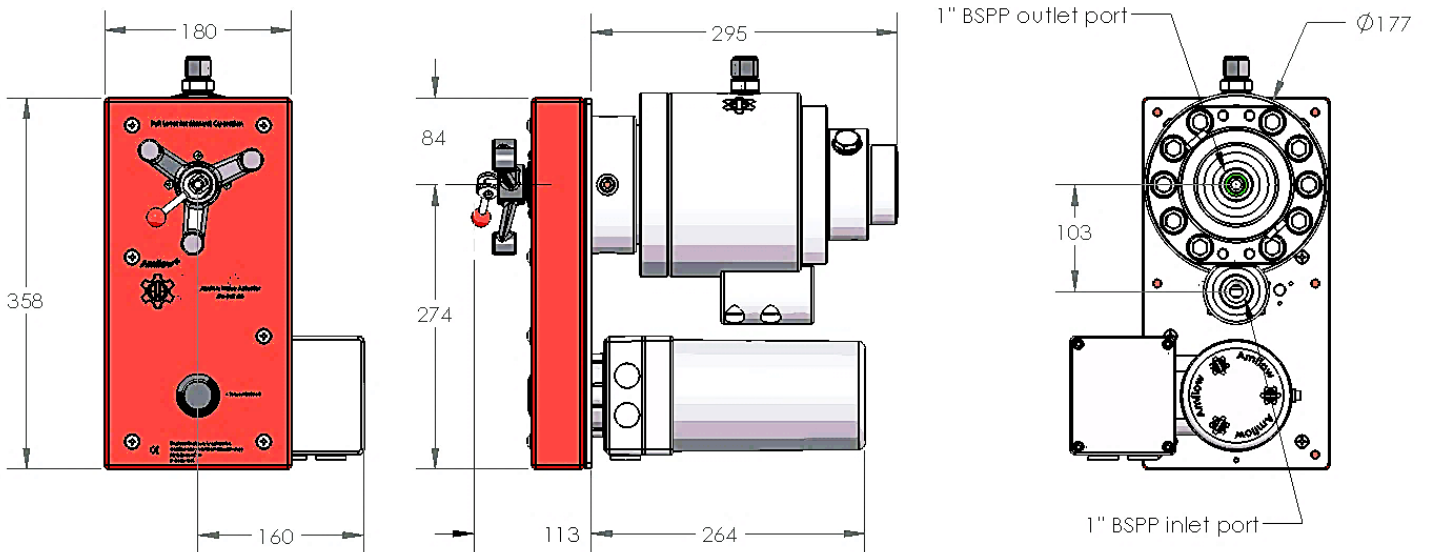
Amflow® A3 Actuator
Shown with
AM30 Flow Control Valve



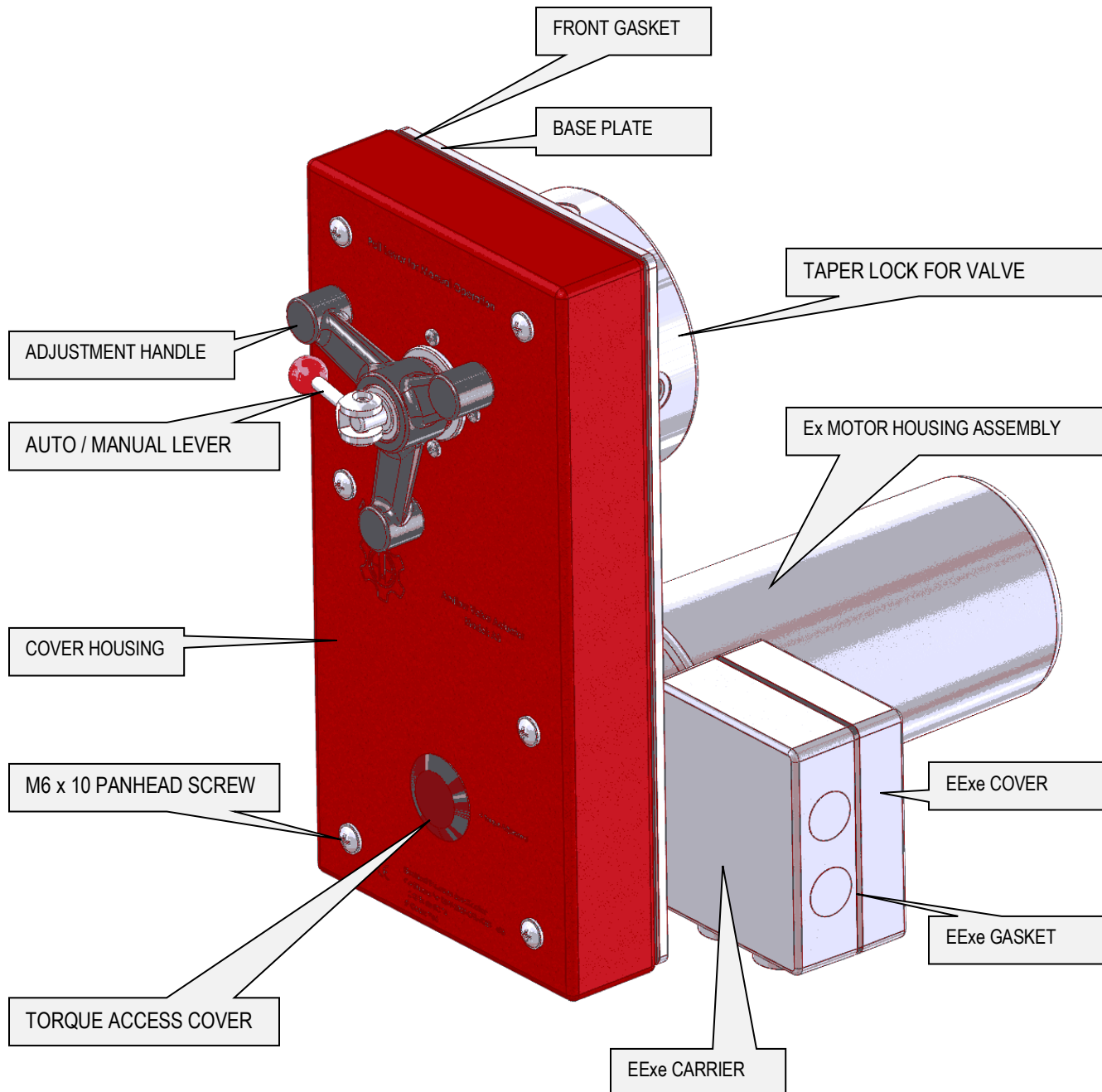
1.07 GA DRAWING

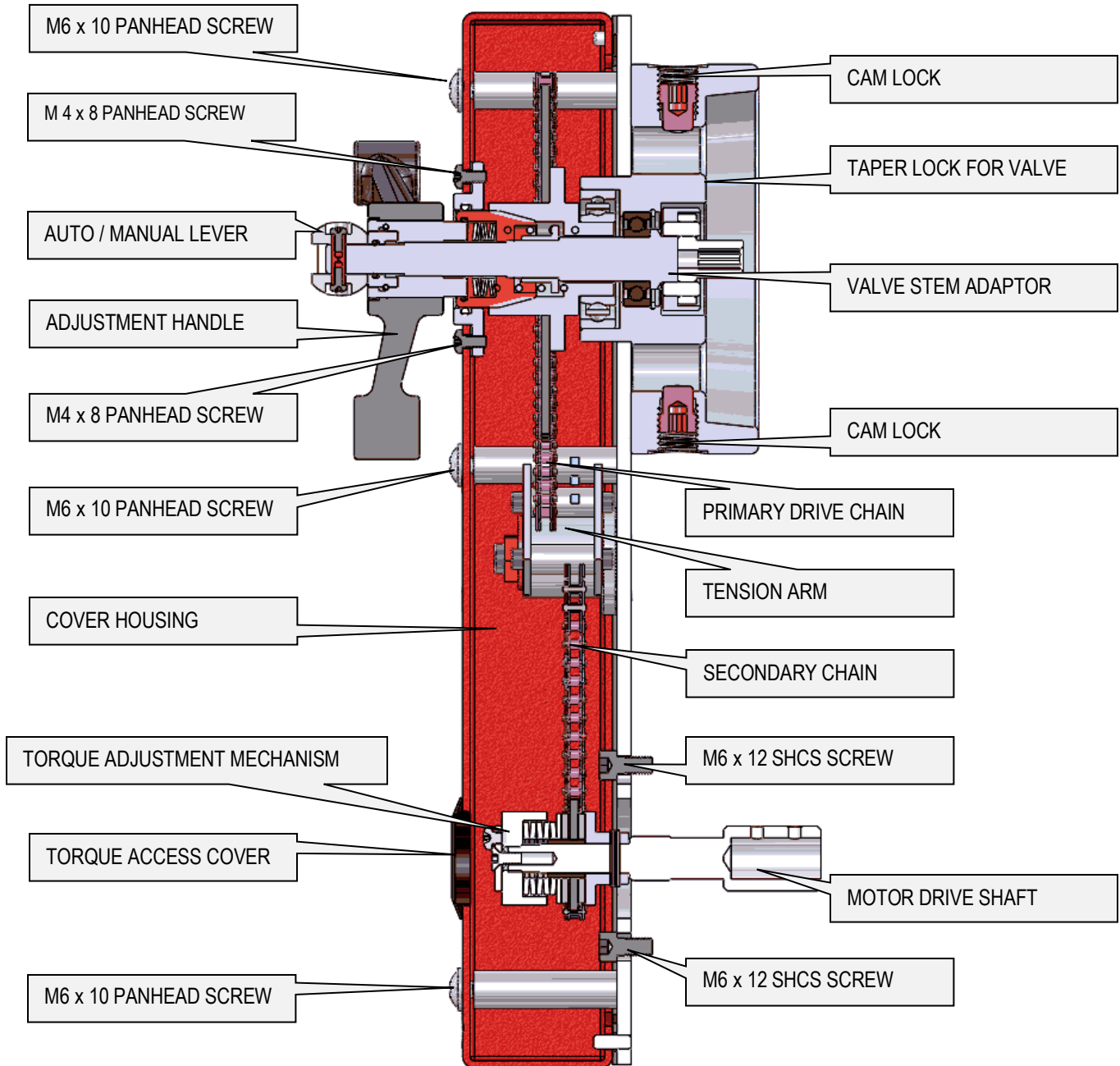


1.07a GA DRAWING: with AM30 Flow Control Valve



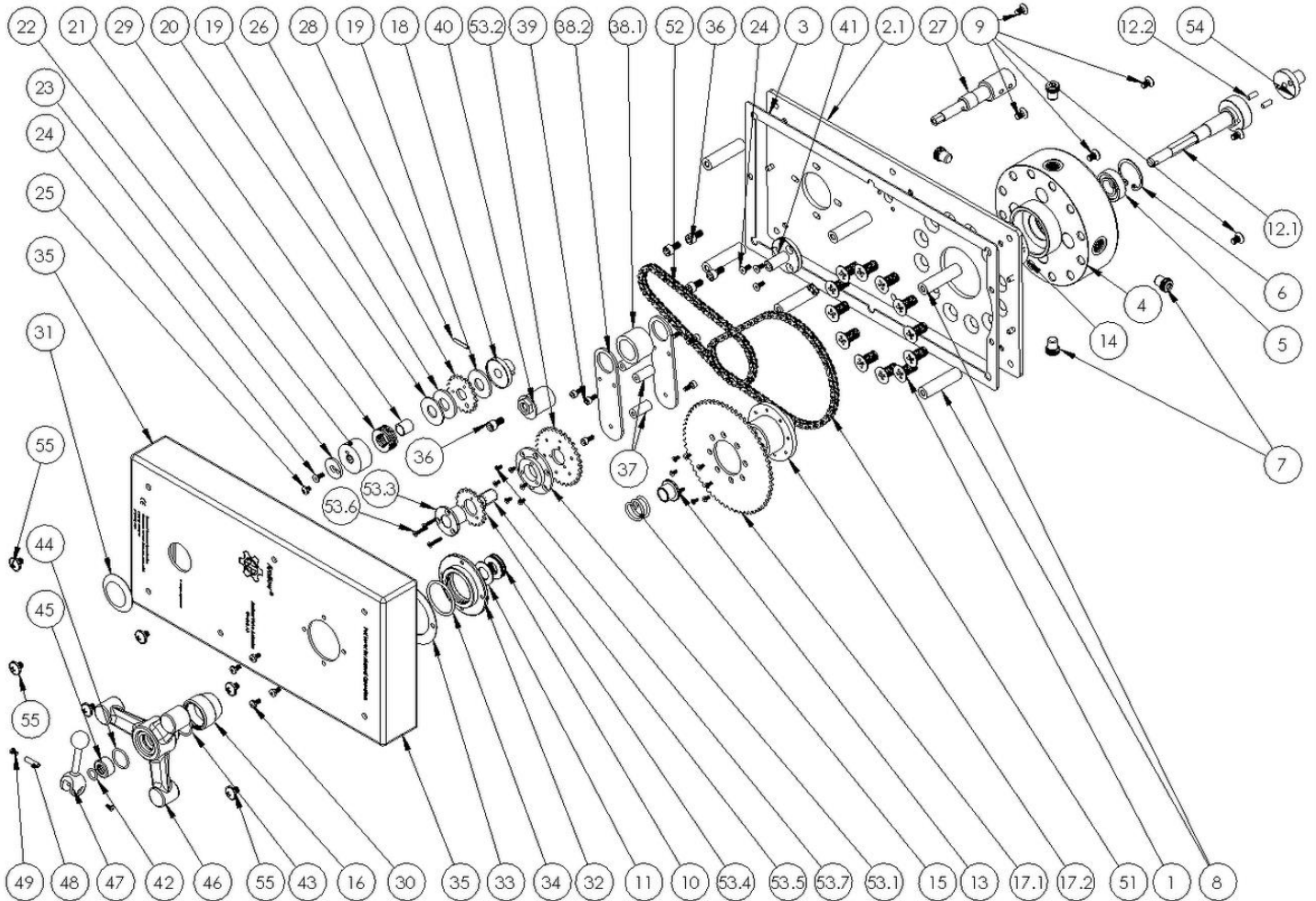
1.08 FULL VIEW



1.09 CUT-AWAY VIEW: Main Housing




1.09a EXPLODED VIEW: Main Housing

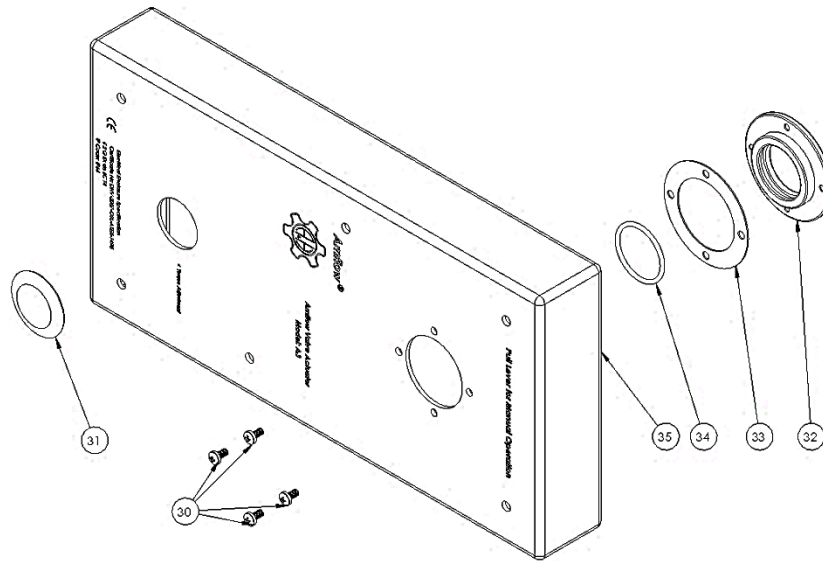


1.09b BOM: Main Housing

ITEM	PART	DESCRIPTION	QTY
1	00001500-7210-020-00	M10 x 20 FH Screw	12
2	00002301-0401-000	Base Plate Sub-Assy	1
2.1	00002301-0301-000	Base Plate	1
2.2	00000276-0301-000	Locating Pin	3
3	00002311-0301-001	Cover Seal	1
4	00002305-0301-000	Adapter Ring	1
5	00000328-0301-000	Bearing	1
6	00000327-0301-000	Circlip	1
7	00002317-0301-000	Cam	4
8	00002327-0301-000	Stand-Off	6
9	00001500-7206-010-00	M6 x1 FH Screw	6
10	00001600-1000-035-00-0505	Belleville Spring	5
11	00001600-1000-050-00-0505	Belleville Spring	1
12	00002310-0401-000	Shaft Sub-Assy	1
12.1	00002310-0301-000	Main Shaft	1
12.2	00000276-0301-000	Locating Pin	2
13	00002319-0301-000	Loader	1
14	00002323-0301-000	Angle Contact Bearing	1
15	00002318-0301-000	Spring	1
16	00002315-0301-000	Wedge	1
17	00002335-0401-000	5" Sprocket Sub-Assy	1
17.1	00002313-0301-000	5" Shaft Sprocket	1
17.2	00002309-0301-000	5" Sprocket Hub	1
17.3	00001500-7203-006-00	M3x6 FH Screw	8
18	00002325-0301-000	Primary Drive Gear Hub	1
19	00000246-0301-000	Clutch Ring Motor	2
20	00000249-0301-000	Clutch Washer	1
21	00001600-1000-073-00-0505	Belleville Spring (Wedge)	1
	00001600-1000-035-00-0505	Belleville Spring (Wedge)	5
	00001600-1000-073-00-0505	Belleville Spring (Clutch)	5
22	00000250-0301-001	Spring Loader	1
23	00000360-0301-000	Spring Loader Retainer	1
24	00001500-7204-010-00	M4 x 10 FH Screw	4
25	00001500-7104-006-00	M4 x 6 PH Screw	1
26	00002303-0301-001	Primary Drive Sprocket	1
27	00000326-0301-001	Motor Shaft	1
28	00000337-0301-000	Roll Pin	1
29	00002336-0301-000	Bushing	1
30	00001500-7104-008-00	M4x8 PH Screw	4

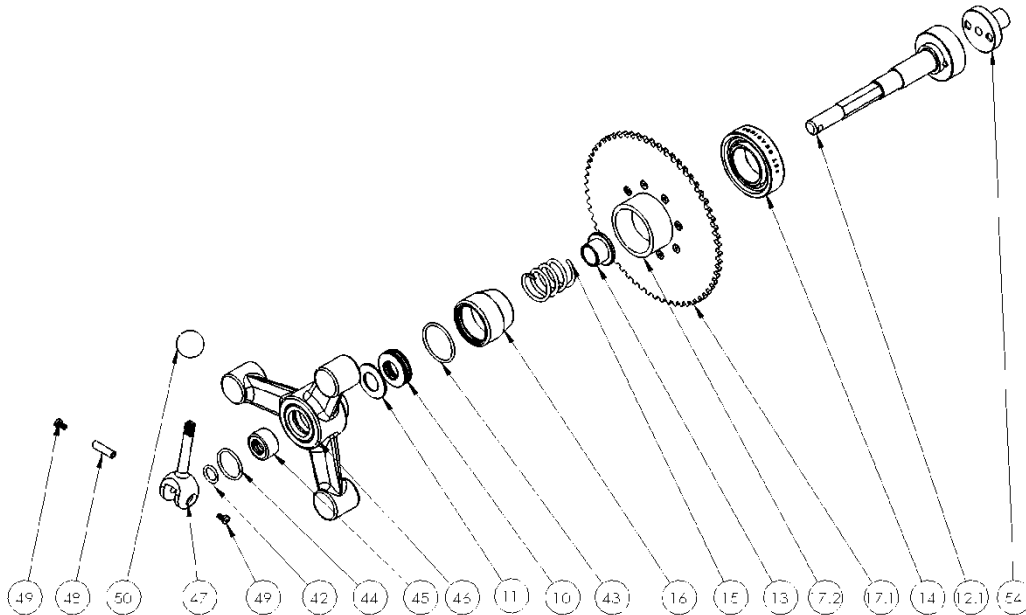
INFORMATION

ITEM	PART	DESCRIPTION	QTY
31	0000256-0301-000	Cover Plug	1
32	00002324-0301-000	Collar Bushing	1
33	00002331-0301-000	Collar Seal	1
34	00001555-2125-103	Collar BushingO-Ring	1
35	00002302-0301-000	Cover Housing	1
36	00001500-7006-012-00	M6x12 SHCS Screw	1
37	00002328-0301-000	Idler Axel	3
38	00002308-0401-000	Idler Arm Assy	1
38.1	00002308-0301-000	Tension Barrel	1
38.2	00002308-0301-001	Tension Arm	2
39	00001500-7004-010-00	M4 x 10 SHCS Screw	6
40	00002330-0301-000	Excentric	1
41	00002308-0301-002	Tension Stage	1
42	00001555-2012-000	Rub Plate O-Ring	1
43	00001555-2022-000	Wedge O-Ring	1
44	00001555-2018-000	Handle O-Ring	1
45	00002332-0301-000	Rub Plate	1
46	00002320-0401-000	Handle Assy	1
47	00002322-00301-001	Lever Cam	1
48	00002339-0301-000	Cam Bushing	1
49	00001500-7103-006-00	M3 x 6 PH Screw	2
50	00002326-0301-000	Knob	1
51	00002334-0401-002	Secondary Chain	1
52	00002334-0401-001	Primary Drive Chain	1
	00002334-0301-003	Connector Link	2
53	00002314-0401-000	Idler Sprocket Sub-Assy	1
53.1	00002314-0301-000	Spacer Idler Gear	1
53.2	00002304-0301-000	Idler Pulley	1
53.3	00002312-0301-000	Idler Drive Gear Hub	1
53.4	00002303-0301-002	Idler Drive Sprocket	1
53.5	00002329-0301-000	Needle Bearing	1
53.6	00001500-7203-016-00	M3x16 FH Screw	3
53.7	00001500-7203-006-00	M3x6 FH Screw	6
54	00002333-0301-000	Valve Adaptor Link	1
55	00001500-7106-010-00	M6 x10 PH Screw Screw	6

1.10 ASSEMBLY VIEW: Cover

1.10a BOM: Cover

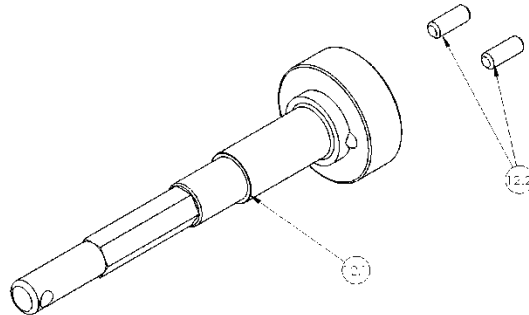
ITEM	PART	DESCRIPTION	QTY
30	00001500-7104-008-00	M4x8 PH Screw	4
31	00000256-0301-001	Cover Plug	1
32	00002324-0301-000	Collar Bushing	1
33	00002331-0301-000	Collar Seal	1
34	00001555-2125-103	Collar Bushing O-Ring	1
35	00002302-0301-000	Cover Housing	1

1.11 ASSEMBLY VIEW: Valve Shaft

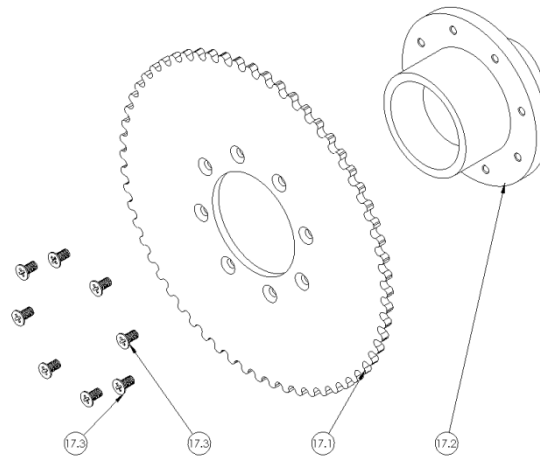


1.11a BOM: Valve Shaft

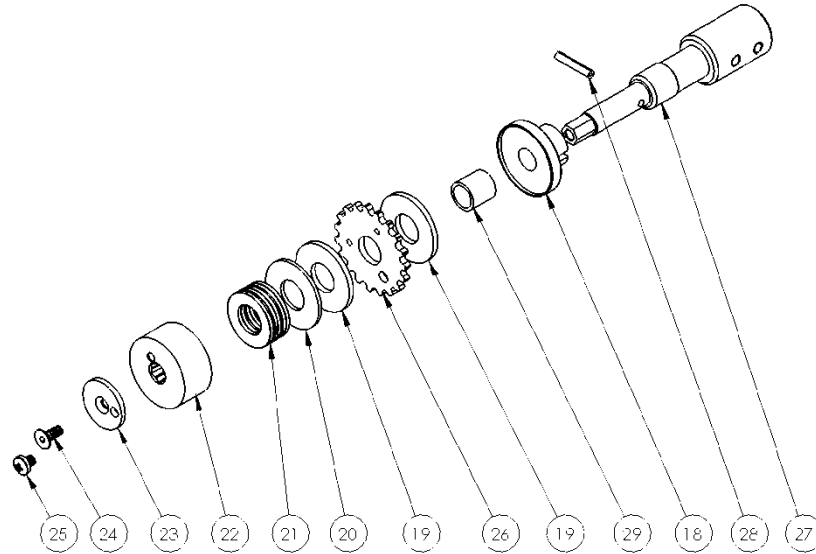
ITEM	PART	DESCRIPTION	QTY
10	00001600-1000-035-00-0505	Belleville Spring	5
11	00001600-1000-050-00-0505	Belleville Spring	1
12.1	00002310-0301-000	Main Shaft	1
13	00002319-0301-000	Loader	1
14	00002323-0301-000	Angle Contact Bearing	1
15	00002318-0301-000	Spring	1
16	00002315-0301-000	Wedge	1
17.1	00002313-0301-000	5" Shaft Sprocket	1
17.2	00002309-0301-000	5" Sprocket Hub	1
42	00001555-2012-000	Rub Plate O-Ring	1
43	00001555-2022-000	Wedge O-Ring	1
44	00001555-2018-000	Handle O-Ring	1
45	00002332-0301-000	Rub Plate	1
46	00002320-0401-000	Handle Assy	1
47	00002322-00301-001	Lever Cam	1
48	00002339-0301-100	Cam Bushing	1
49	00001500-7103-006-00	M3 x 6 PH Screw	2
50	00002326-0301-000	Knob	1
54	00002333-0301-000	Valve Adaptor Link	1

1.12 SUB-ASSEMBLY VIEW: Valve Shaft

1.12a BOM: Valve Shaft

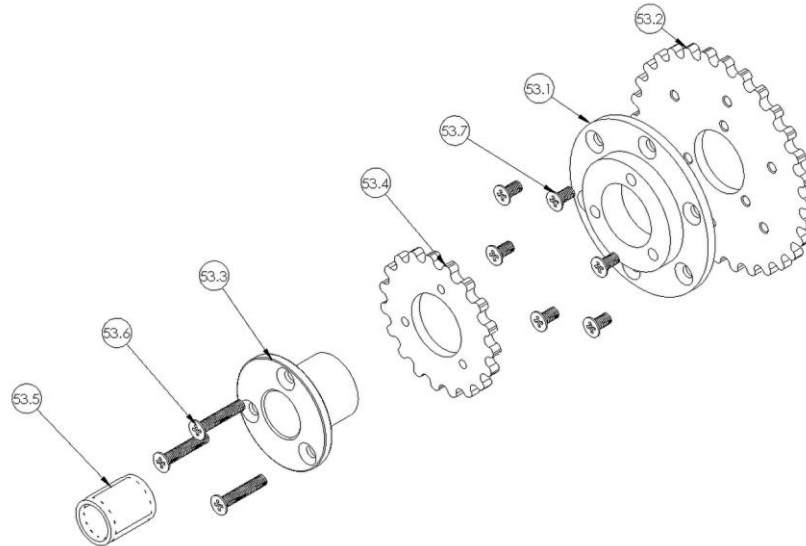
ITEM	PART	DESCRIPTION	QTY
12	00002310-0401-000	Shaft Sub-Assy	1
12.1	00002310-0301-000	Main Shaft	1
12.2	00000276-0301-000	Locating Pin	2

1.13 ASSEMBLY VIEW: 5" Sprocket

1.13a BOM: 5" Sprocket

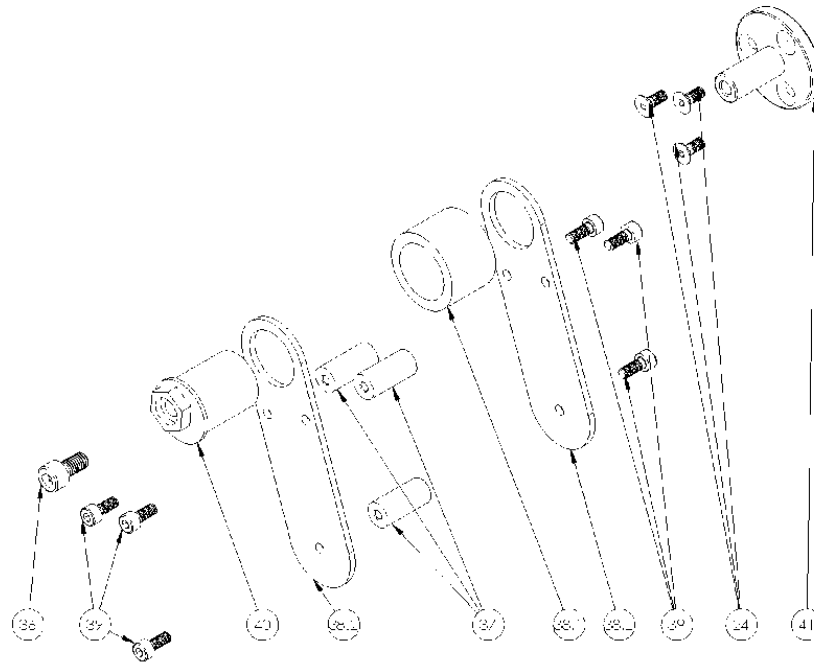
ITEM	PART	DESCRIPTION	QTY
17	00002335-0401-000	5" Sprocket Sub-Assy	1
17.1	00002313-0301-000	5" Shaft Sprocket	1
17.2	00002309-0301-000	5" Sprocket Hub	1
17.3	00001500-7203-006-00	M3x6 FH Screw	8

1.14 SUB-ASSEMBLY VIEW: Clutch

1.14a BOM: Clutch

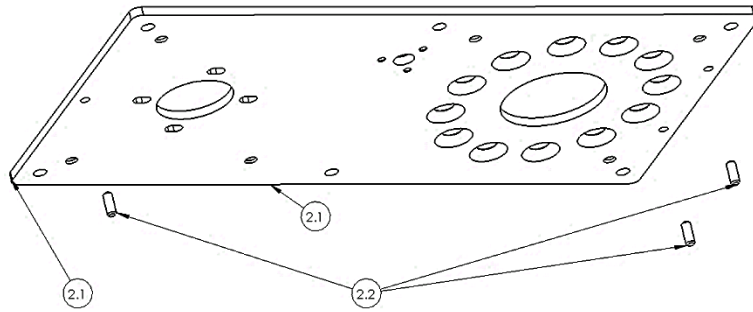
ITEM	PART	DESCRIPTION	QTY
18	00002325-0301-000	Primary Drive Gear Hub	1
19	00000246-0301-000	Clutch Ring Motor	2
20	00000249-0301-000	Clutch Washer	1
21	00001600-1000-073-00-0505	Belleville Spring	5
22	00000250-0301-001	Spring Loader	1
23	00000360-0301-000	Spring Loader Retainer	1
24	00001500-7204-010-00	M4 x 10 FH Screw	4
25	00001500-7104-006-00	M4 x 6 PH Screw	1
26	00002303-0301-001	Primary Drive Sprocket	1
27	00000326-0301-001	Motor Shaft	1
28	00000337-0301-000	Roll Pin	1
29	00002336-0301-000	Bushing	1

1.15 SUB-ASSEMBLY VIEW: Idler

1.15a BOM: Idler

ITEM	PART	DESCRIPTION	QTY
53	00002314-0401-000	Idler Sprocket Sub-Assy	1
53.1	00002314-0301-000	Spacer Idler Gear	1
53.2	00002304-0301-000	Idler Pulley	1
53.3	00002312-0301-000	Idler Drive Gear Hub	1
53.4	00002303-0301-002	Idler Drive Sprocket	1
53.5	00002329-0301-000	Needle Bearing	1
53.6	00001500-7203-0016-00	M3x16 FH Screw	3
53.7	00001500-7203-006-00	M3x6 FH Screw	6

1.16 SUB-ASSEMBLY VIEW: Tension Arm

1.16a BOM: Tension Arm

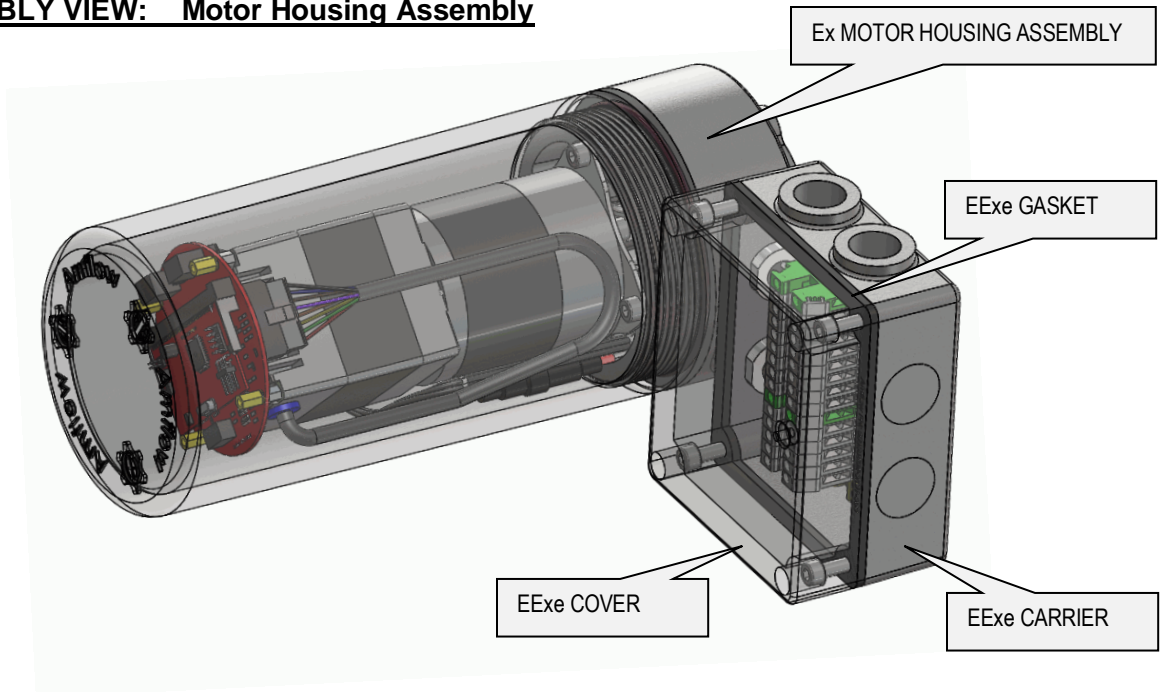
ITEM	PART	DESCRIPTION	QTY
24	00001500-7204-010-00	M4 x 10 FH Screw	4
36	00001500-7006-012-00	M6x12 SHCS Screw	1
37	00002328-0301-000	Idler Axel	3
38	00002308-0401-000	Idler Arm Assy	1
38.1	00002308-0301-000	Tension Barrel	1
38.2	00002308-0301-001	Tension Arm	2
39	00001500-7004-010-00	M4 x 10 SHCS Screw	6
40	00002330-0301-000	Excentric	1
41	00002308-0301-002	Tension Stage	1

1.17 ASSEMBLY VIEW: Baseplate

1.17a BOM: Baseplate

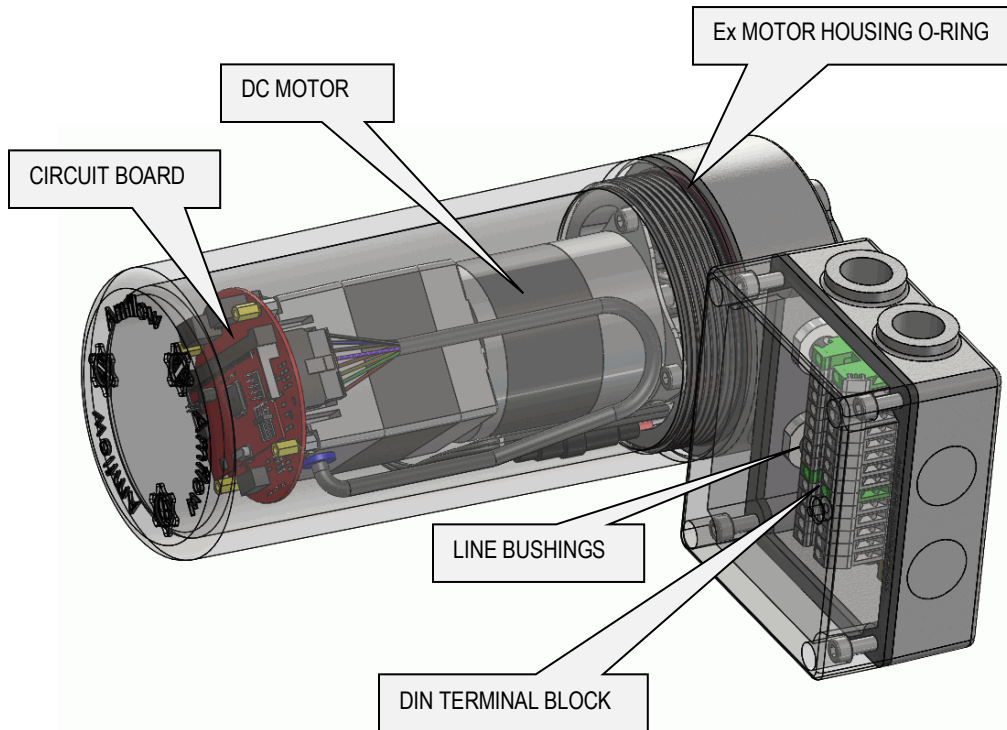
ITEM	PART	DESCRIPTION	QTY
2	00002301-0401-000	Base Plate Sub-Assy	1
2.1	00002301-0301-000	Base Plate	1
2.2	00000276-0301-000	Locating Pin	3

INFORMATION

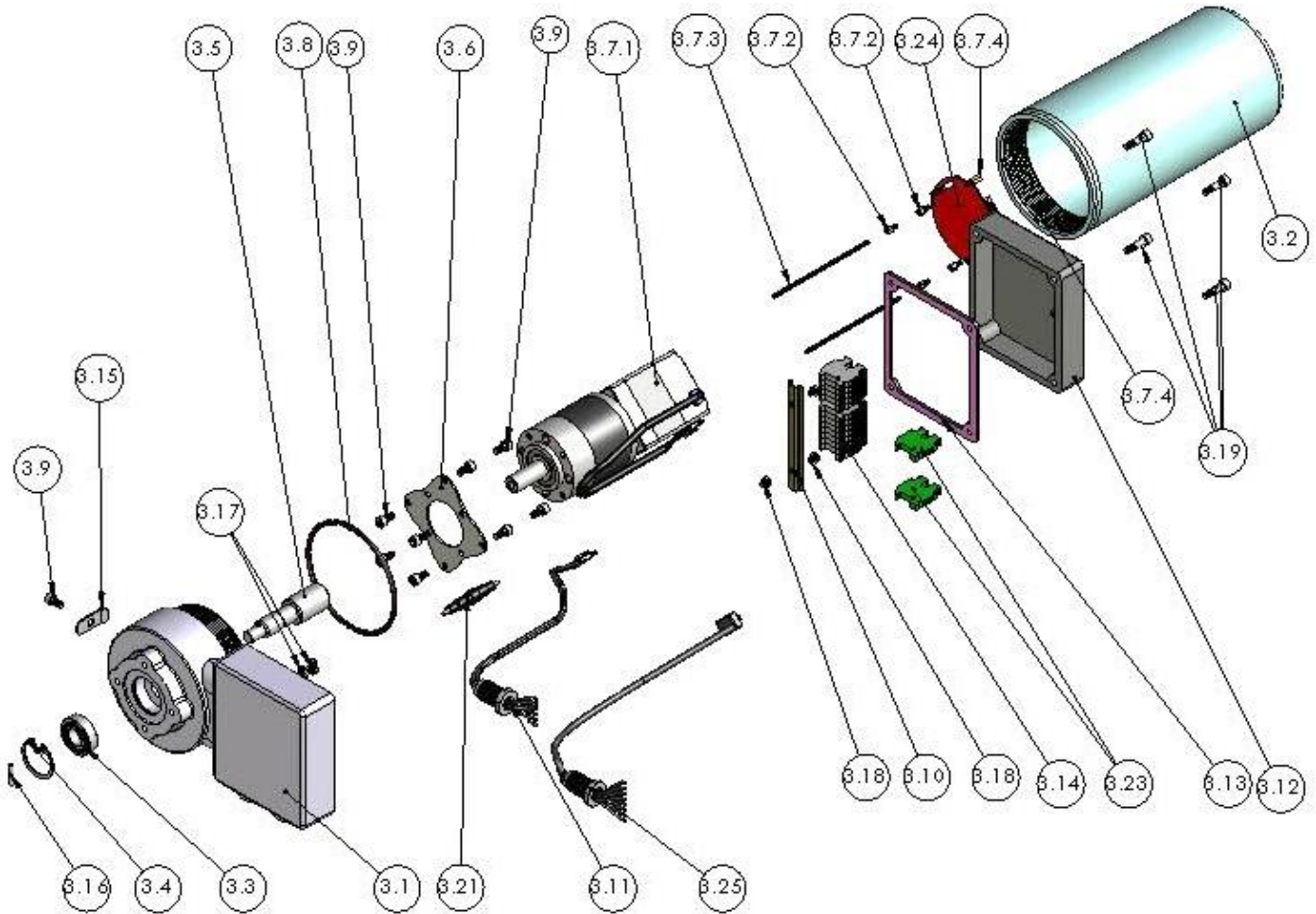
1.18 ASSEMBLY VIEW: Motor Housing Assembly



EXTERIOR



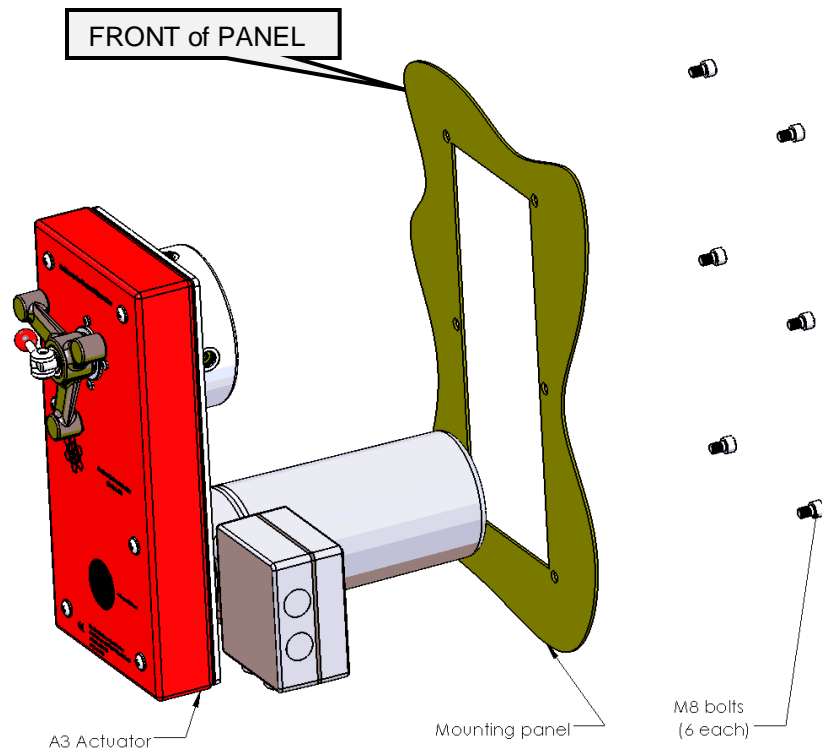
INTERIOR

1.18a EXPLODED VIEW: Motor Housing Assembly


1.18b BOM: Motor Housing Assembly

ITEM	PART	DESCRIPTION	QTY
3	00000471-0401-XXX	EEx de Housing Assy	1
3.1	00000469-0301-000	EEx de Carrier	1
3.2	00000470-0301-000	Bell Housing	1
3.3	00000328-0301-000	Bearing	1
3.4	00000327-0301-000	Circlip	1
3.5	00000326-0301-000	Shaft Adaptor	1
3.6	00000473-0301-000	Motor Plate Adaptor	1
3.7	00001410-0401-001	DC Motor Assy w/Circuit Board	1
3.7.1	00000342-0301-000	DC Motor	1
3.7.2	00001130-0301-000	M3 x 5 M/F Hex Spacer	4
3.7.3	00001133-0301-001	3 mm x 70 mm Stud	4
3.7.4	00001132-0301-000	3 mm x 8 mm OAL Hex Nut	4
3.7.5	00001127-0301-008	8 Pin Molex	1
3.8	00001555-2153-000	EEx de Carrier O-Ring	1
3.9	00001500-7005-010-00	M5 x 10 SHCS	9
3.1	00000498-0301-000	15 mm DIN Rail	1
3.11	00000499-0301-002	Bushing, 7-Line	1
3.12	00000501-0301-000	EEx de Cover	1
3.13	00000502-0301-000	EEx de Gasket	1
3.14	00000503-0301-000	DIN Terminal Block	16
3.15	00000494-0301-000	Safety Clamp	1
3.16	00000337-0301-000	Drive Pin	1
3.17	00001500-7105-008-00	M5 x 8 Panhead Screw	2
3.18	00001500-7104-006-00	M4 x 6 Panhead Screw	3
3.19	00001500-7005-020-00	M5 x 20 SHCS	4
3.2	00001127-0301-007	7 Pin Molex	1
3.21	00001139-0301-000	Fuse Holder	1
	00001140-0301-000	5A Fuse, 125/250V Slow Blow	1
3.22	00001381-0401-000	Circuit Board Assy	1
3.23	00000503-0301-001	DIN Ground Terminal	1
3.24	00001924-0301-010	Circuit Board	1
3.25	00000499-0301-003	Bushing - 9-Line	1

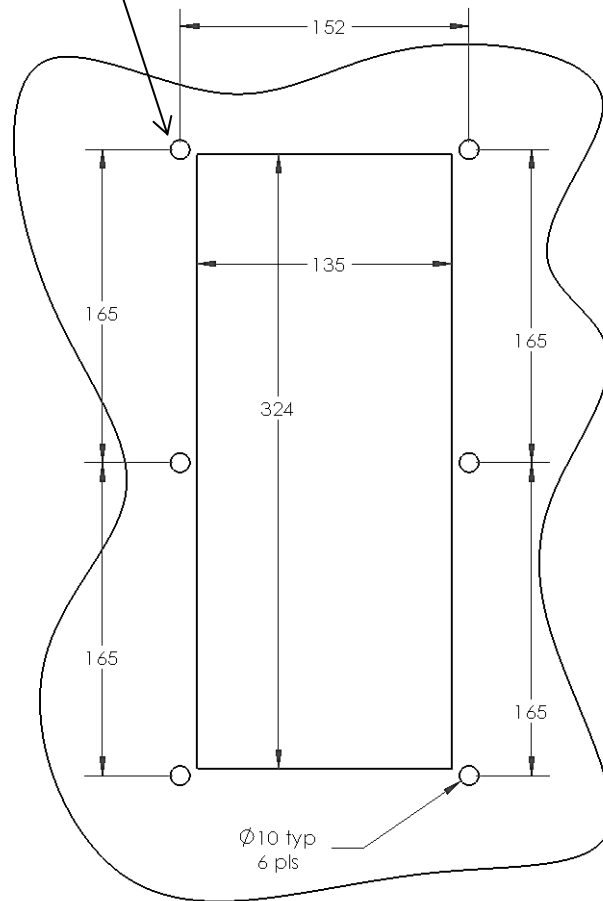
1.19 PANEL MOUNT VIEW:



1.19a PANEL MOUNT: Cut-out Dimensions

- Mount A3 Actuator using the six holes located on BASE PLATE ASSEMBLY (Item 2).

Ref. Diagram 1


DIAGRAM 1: A3 Actuator BASE PLATE ASSEMBLY (Item 2)
END OF SECTION

SECTION 2: TOOLS & SUPPLIES**2.01 REQUIRED TOOLS**

1. 2 – 8MM Allen Head Wrenches
2. Small Flat head Electrical Screwdriver
3. 5.5MM Nut Driver
4. Medium Size Phillips and Flat head Screwdrivers
5. Straight Tip Internal Circlip Pliers (19-60 mm)
6. Needle Nose Pliers
7. Torque Wrench with a 6 mm Allen Head Attachment

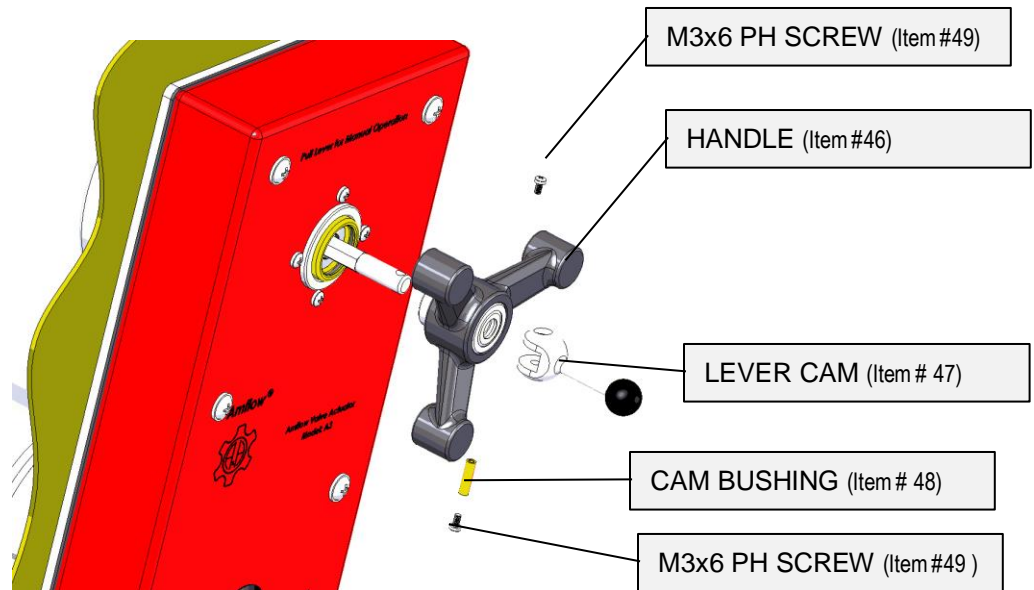
2.02 REQUIRED SUPPLIES

1. Service Removable Loctite®
2. O-Ring Lube
3. Anti-Seize

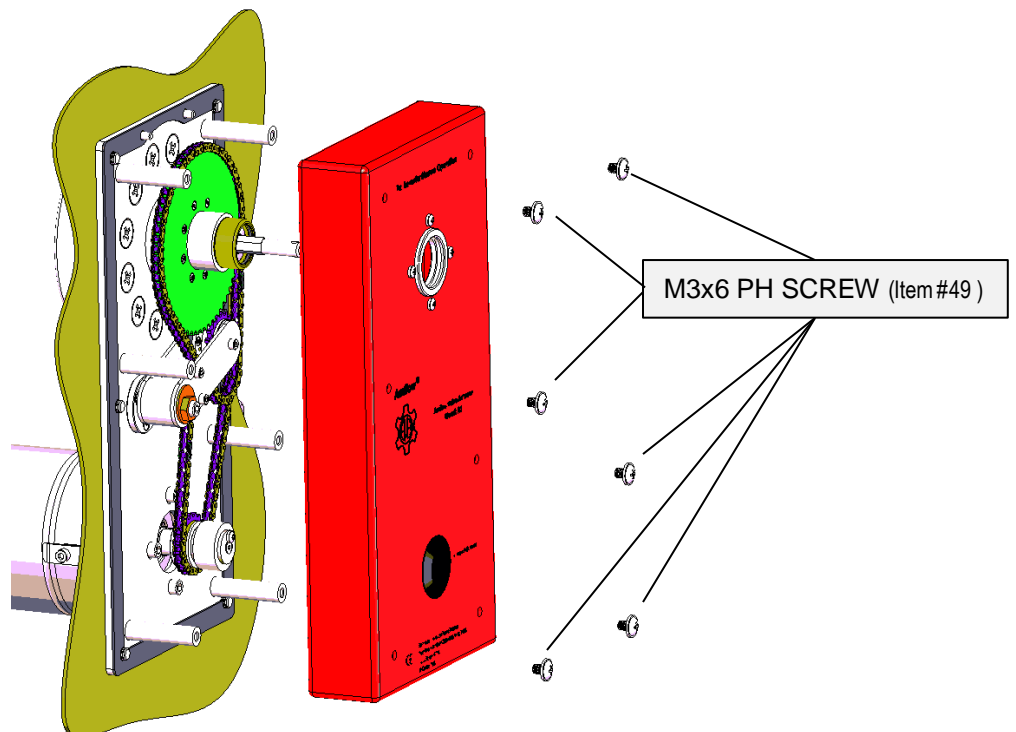
END OF SECTION

SECTION 3: SERVICE ACCESS – Belt Drive Assembly
3.01 HANDLE REMOVAL
Step 1

- Remove one (1) M3x6 PH SCREWS (Item 49) and press CAM BUSHING (Item 48) out to release LEVER CAM (Item 47).

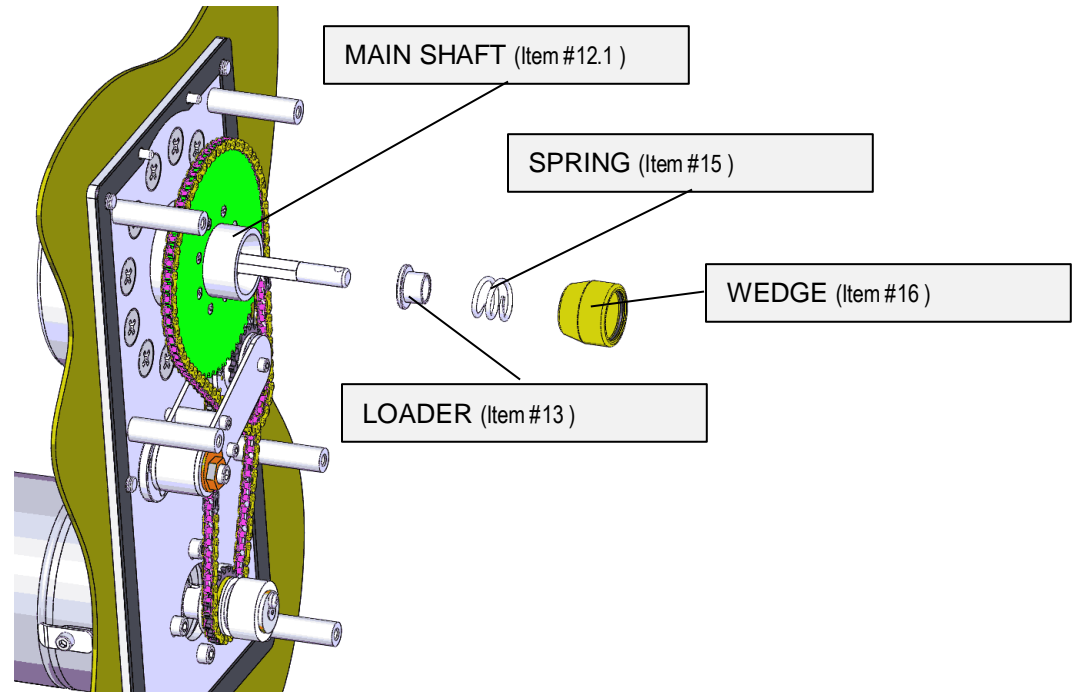

3.02 COVER REMOVAL
Step 1

- Remove all six (6) M6X10 PH SCREWS (Item 55) to remove cover.

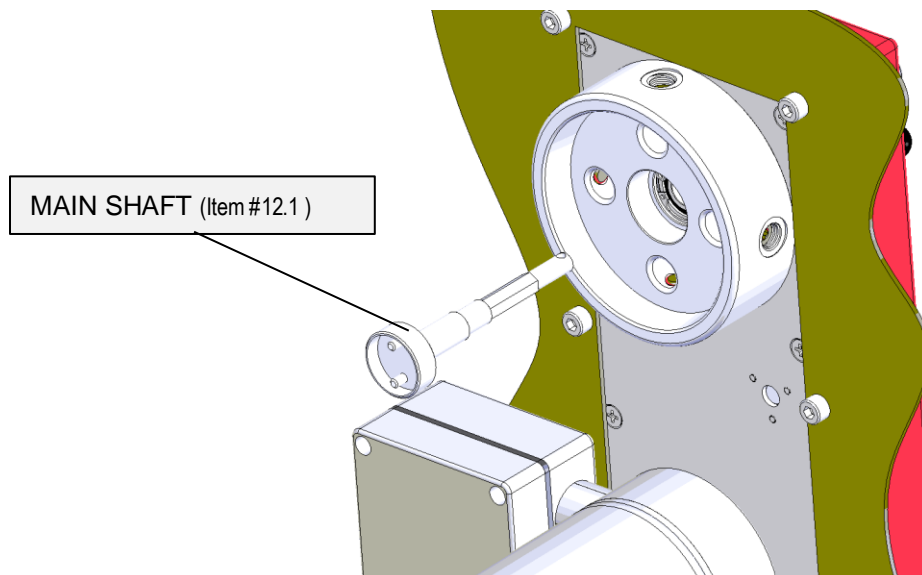


3.03 WEDGE & MAIN SHAFT REMOVAL**Step 1**

1. Remove WEDGE (Item 16), SPRING (Item 15) and LOADER (Item 13).

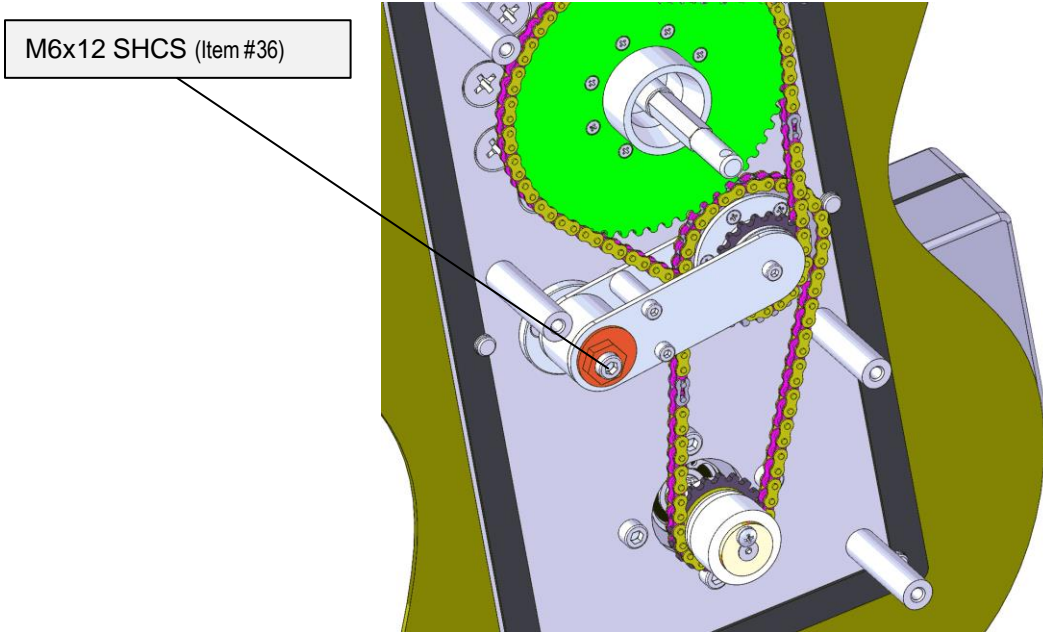
**Step 2**

2. Pull MAIN SHAFT (Item 12.1) out from the back of actuator.

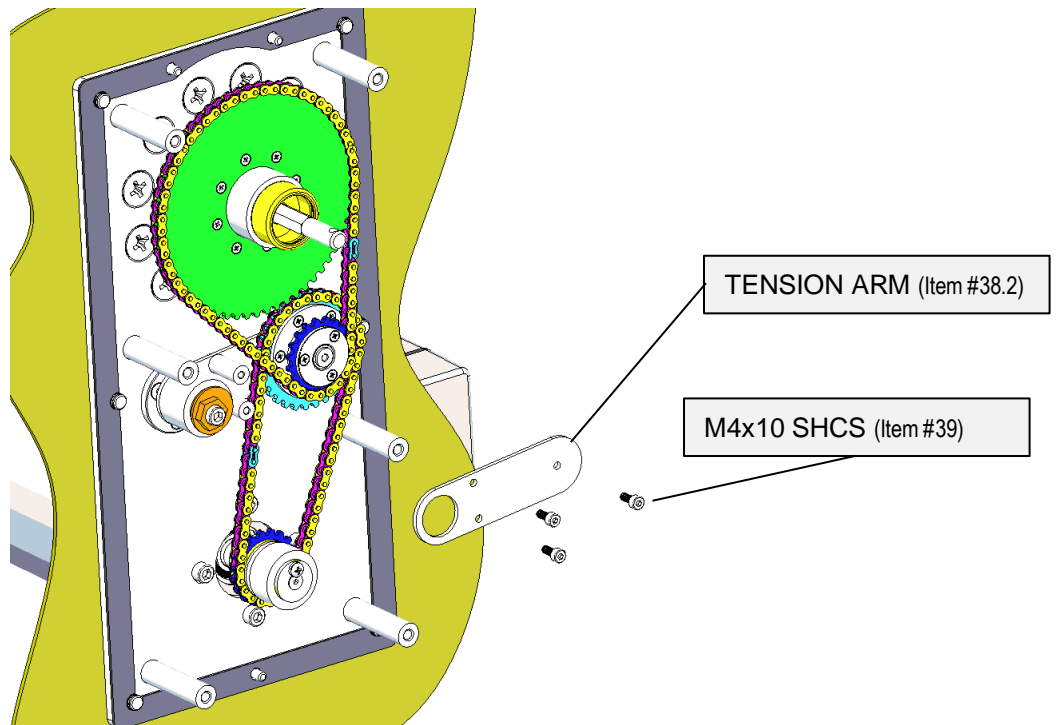


3.04 CHAIN REMOVAL
Step 1

3. Loosen (do not remove) M6X12 SHCS (Item #36) to release chain tension.


Step 2

4. Remove three (3) M4x10 SHCS (Item #39) to allow the top TENSION ARM (Item #38.2) to swing out of the way.

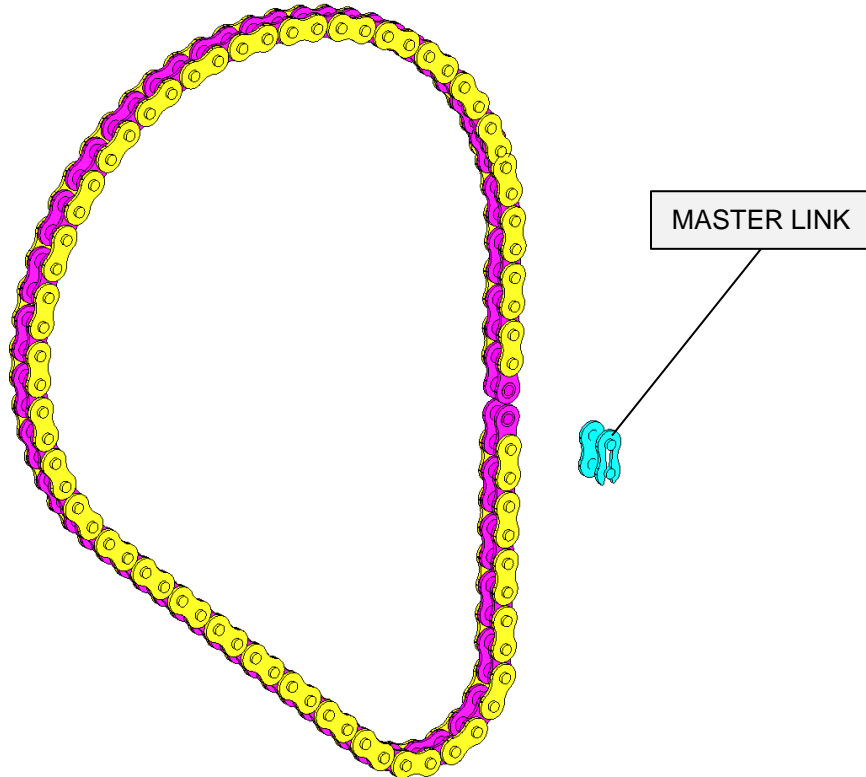




3.04 CHAIN REMOVAL, continued

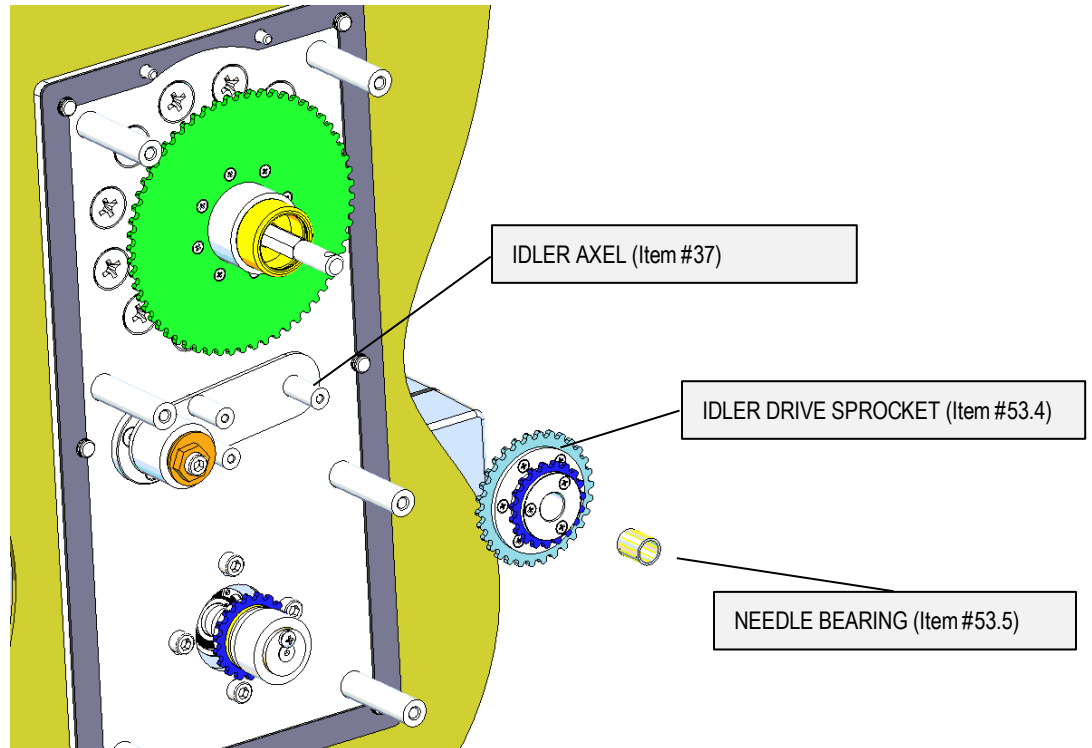
Step 3

5. Take the master link out of SECONDARY CHAIN (Item 51) to remove.
 1. This will allow removal of the PRIMARY DRIVE CHAIN (Item 52).

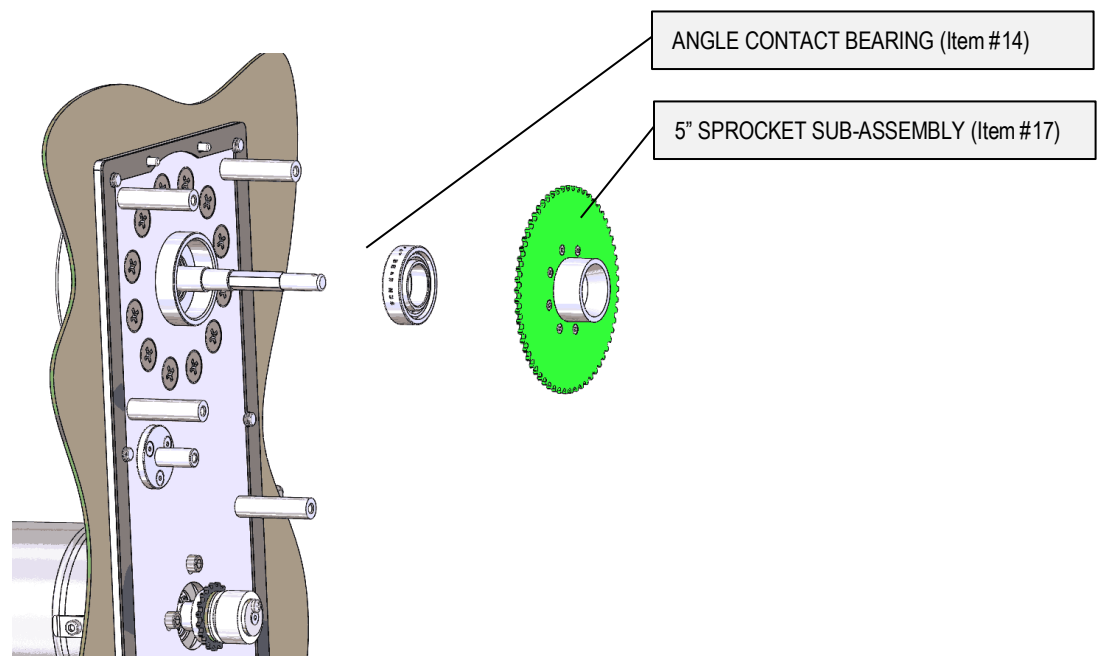


3.05 BEARING REMOVAL
Step 1

2. Lift IDLER SPROCKET SUB-ASSEMBLY (Item 53) off of IDLER AXEL (Item 37) and remove NEEDLE BEARING (Item 53.5).

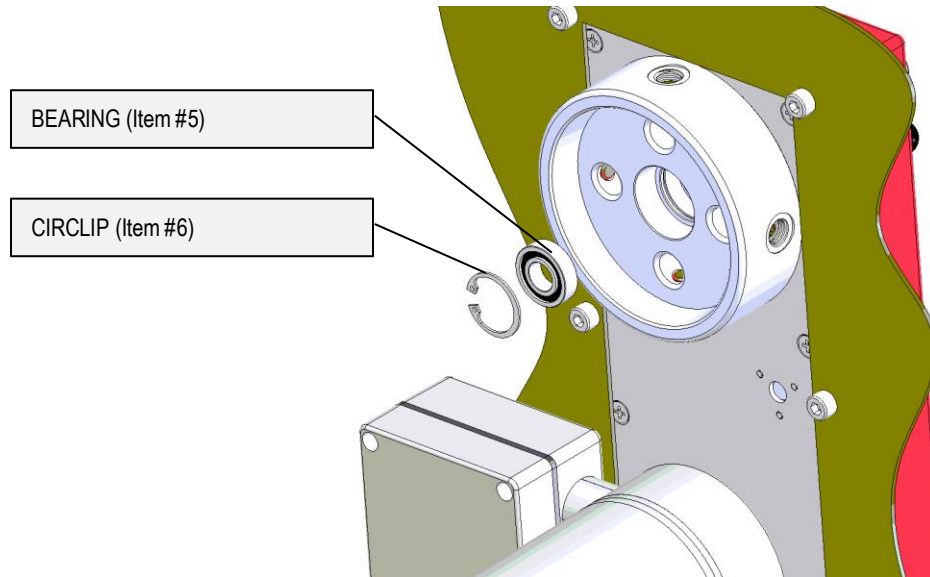

Step 2

3. Pull 5" SPROCKET SUB-ASSEMBLY (Item 17) out of ANGLE CONTACT BEARING (Item 14) then remove bearing.



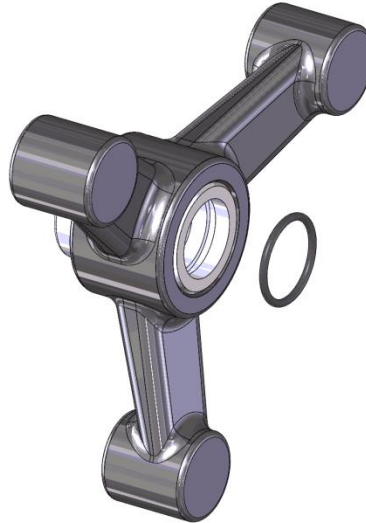
Step 3

4. Using straight tip internal circlip pliers (19-60mm), remove CIRCLIP (Item 6) from the back of actuator then remove BEARING (Item 5).

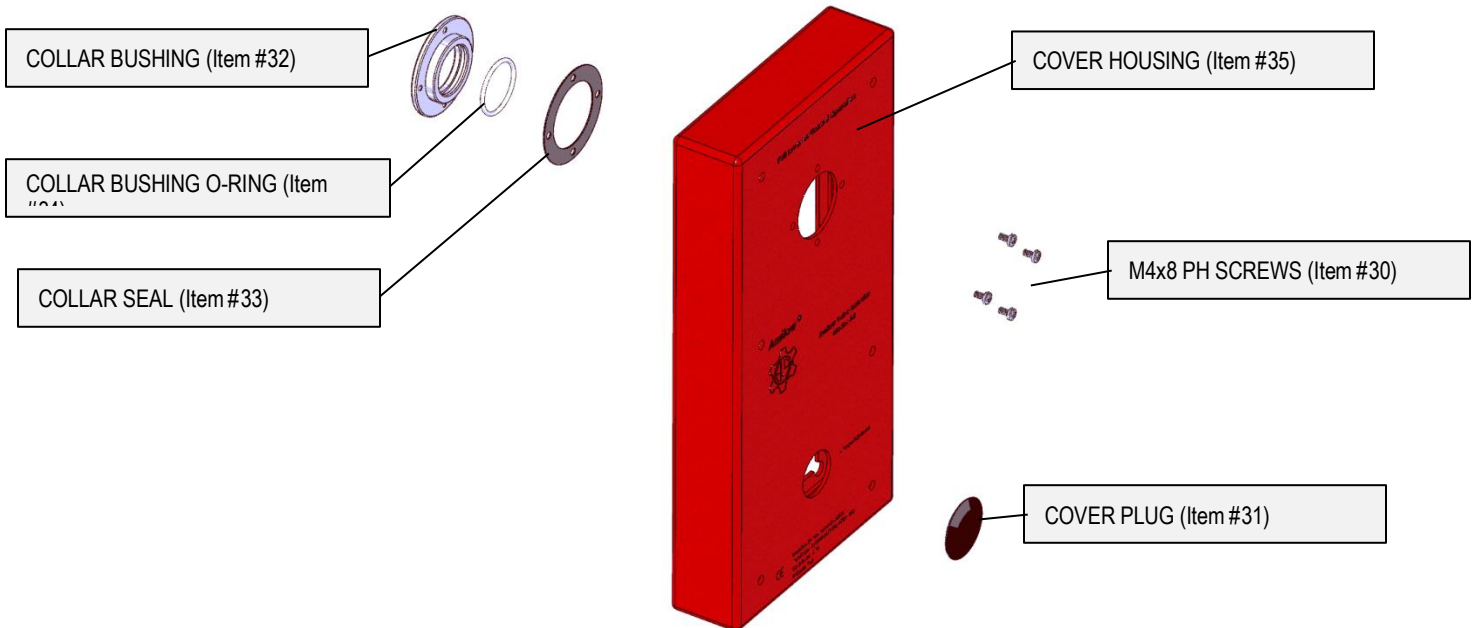


3.06 O-RING REMOVAL
3.06.01 HANDLE O-RING

5. Remove HANDLE O-RING (Item 44) from HANDLE ASSEMBLY (Item 46).


3.06.02 COVER O-RING

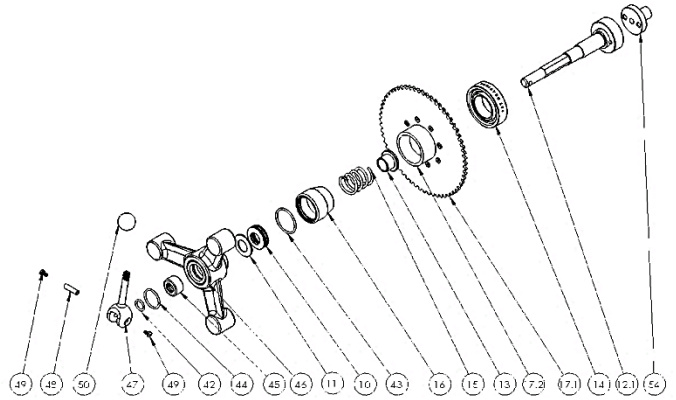
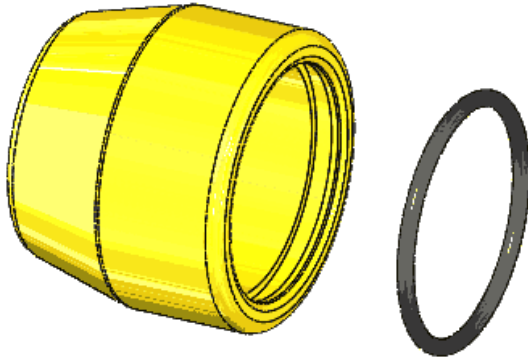
6. Remove COLLAR BUSHING O-RING (Item 34) from COLLAR BUSHING (Item 32).





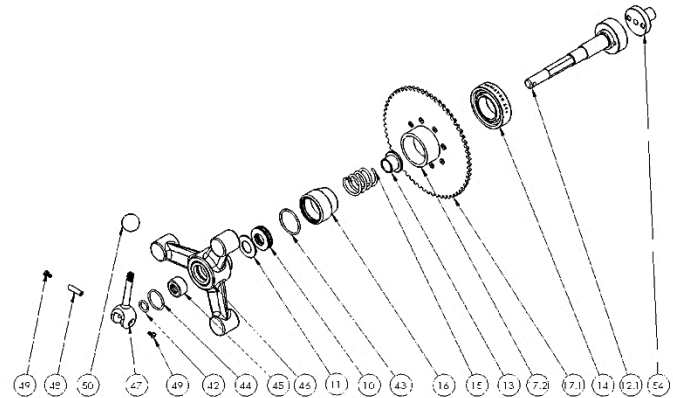
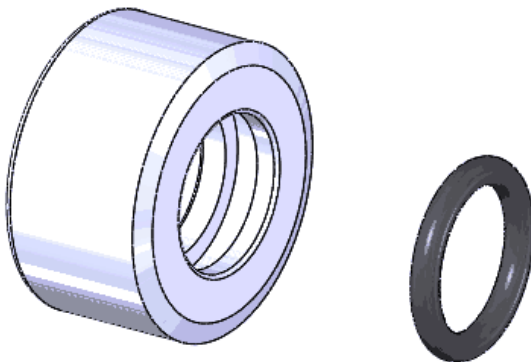
3.06.03 WEDGE O-RING

- 7. Remove WEDGE O-RING (Item 43) from WEDGE (Item 16).



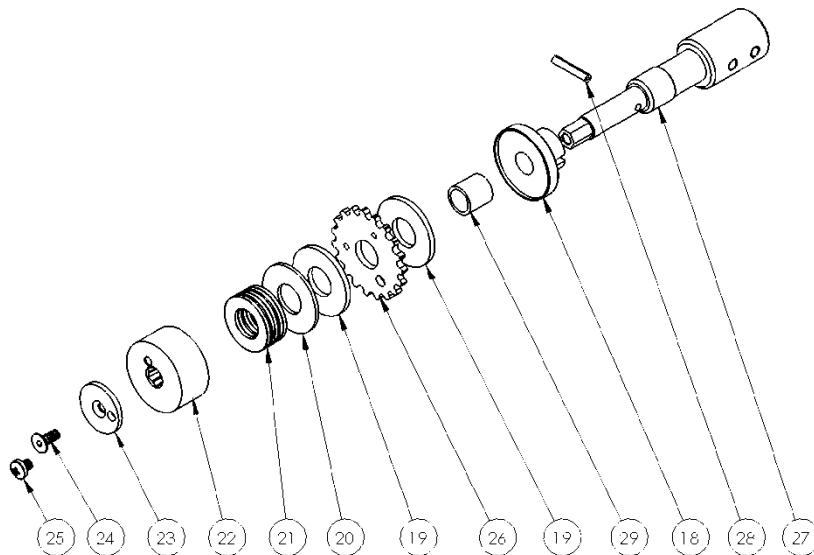
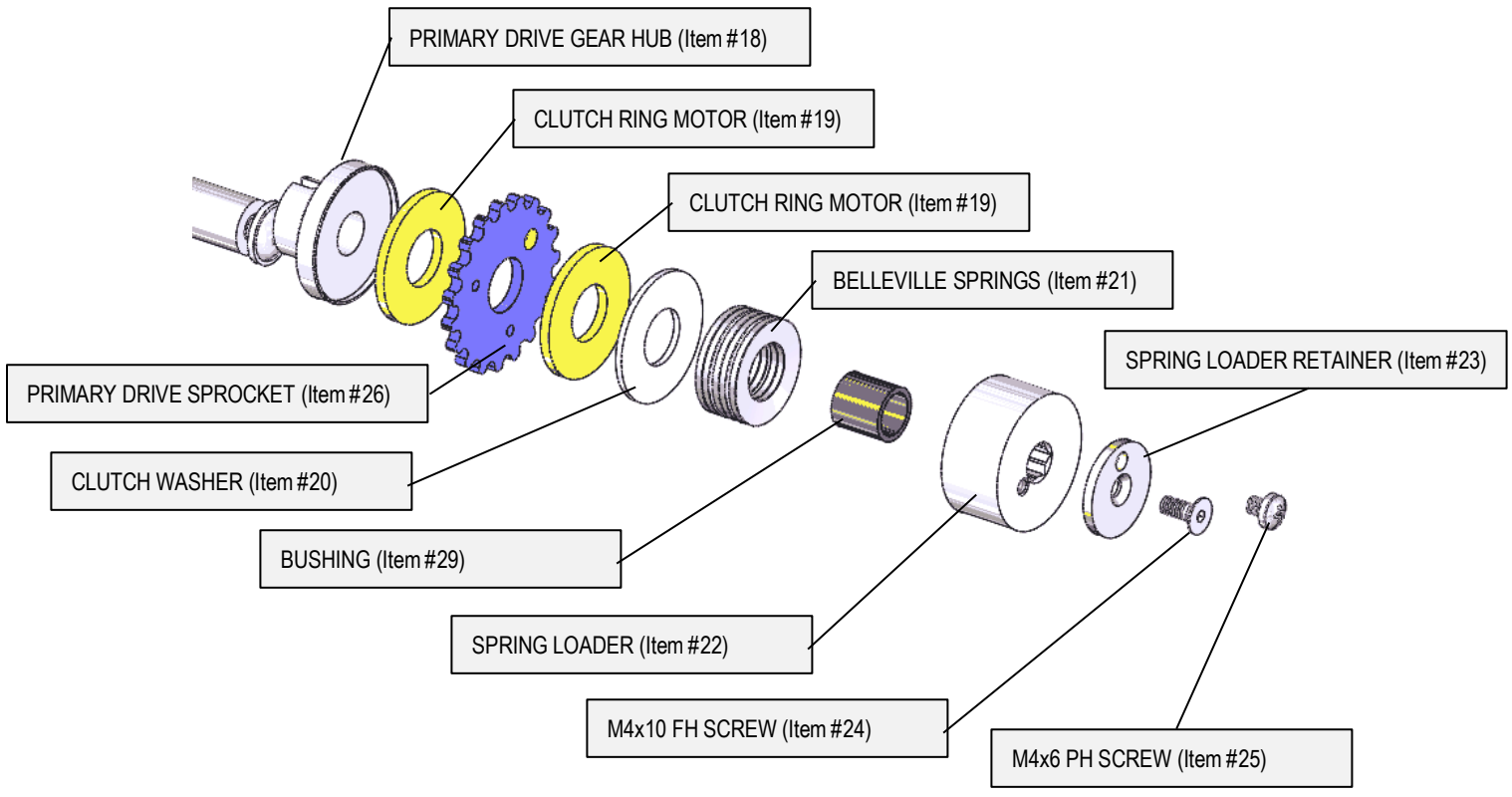
3.06.04 WEDGE O-RING

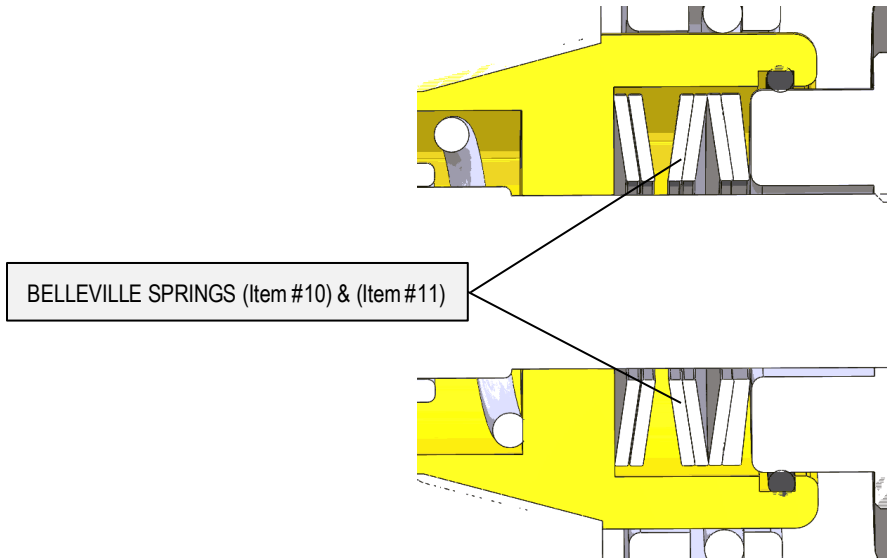
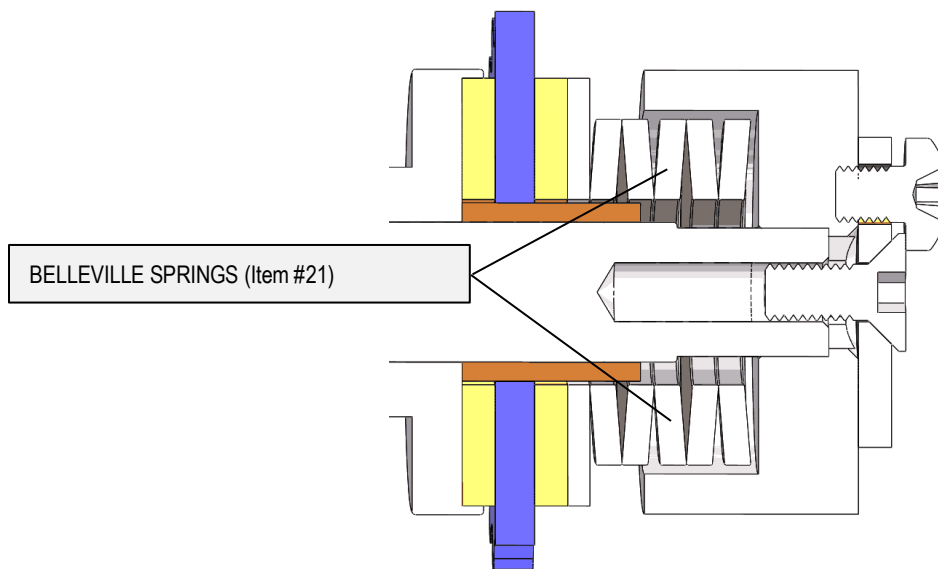
- 8. Remove RUB PLATE O-RING (Item 42) from RUB PLATE (Item 45).



3.07 CLUTCH REMOVAL
Step 1

9. Remove M4X6 PH (Item #25) and M4X10 FH (Item #24) screws to disassemble clutch.

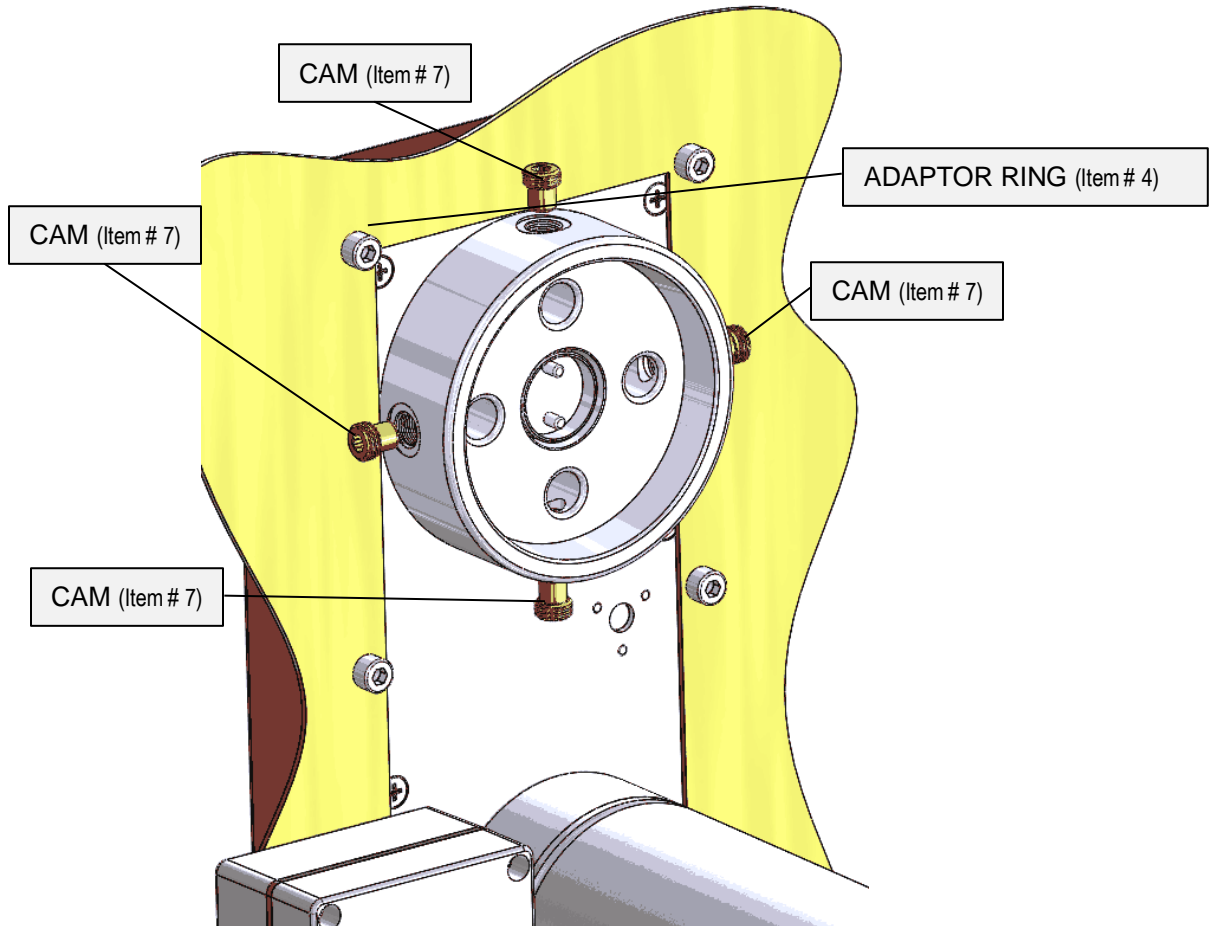


3.08 BELLEVILLE SPRING CONFIGURATIONS**3.08.01 Wedge Configuration****3.08.02 Clutch Configuration (Split View)****END OF SECTION**

SECTION 4: VALVE INSTALATION & REMOVAL**4.01 CAM LOCK**

Step 1

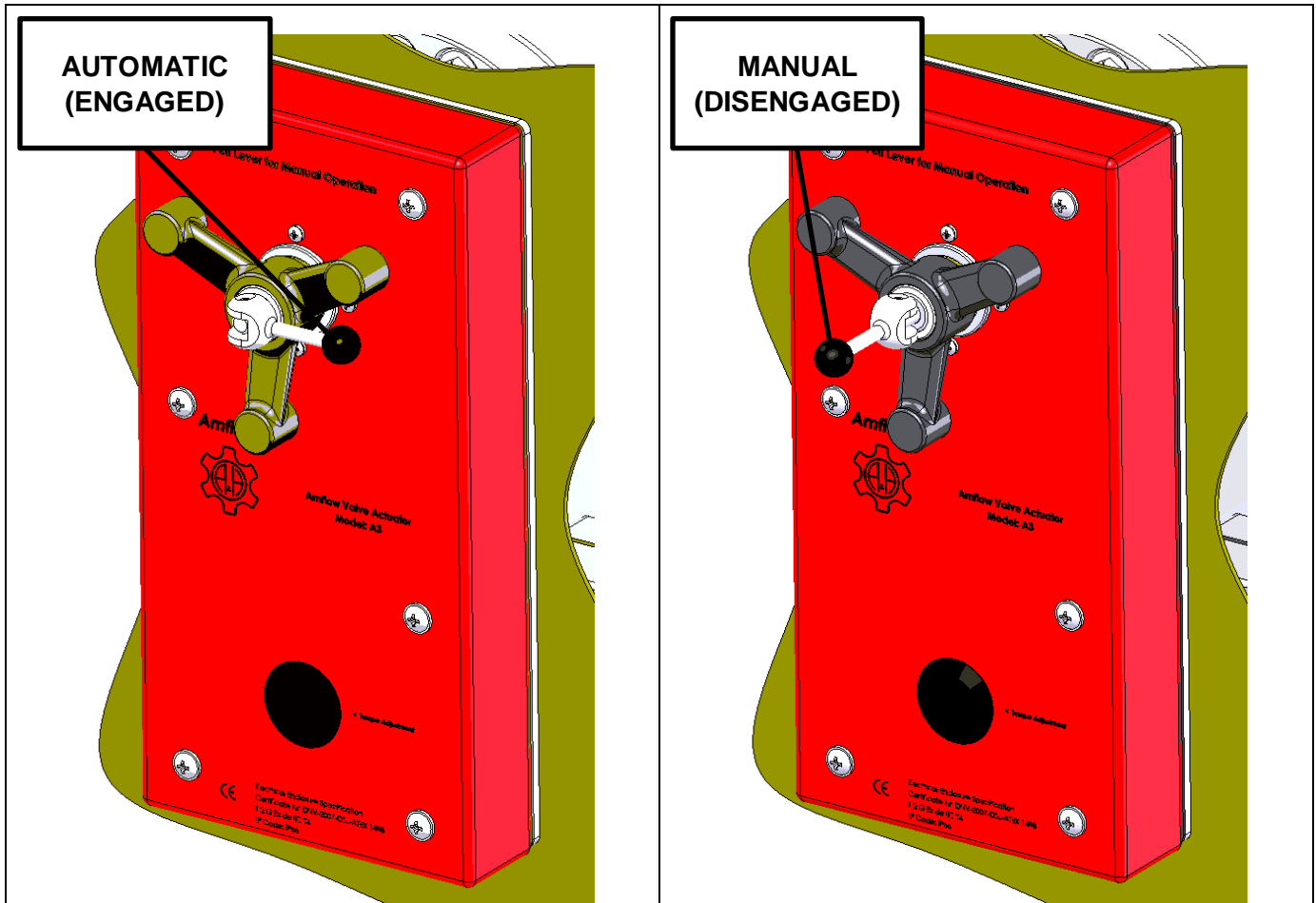
10. Be sure all four (4) CAMS (Item 7) are installed, but not engaged, in ADAPTOR RING (Item 4).



4.02 AUTOMATIC/MANUAL MODE SELECTION

Step 1

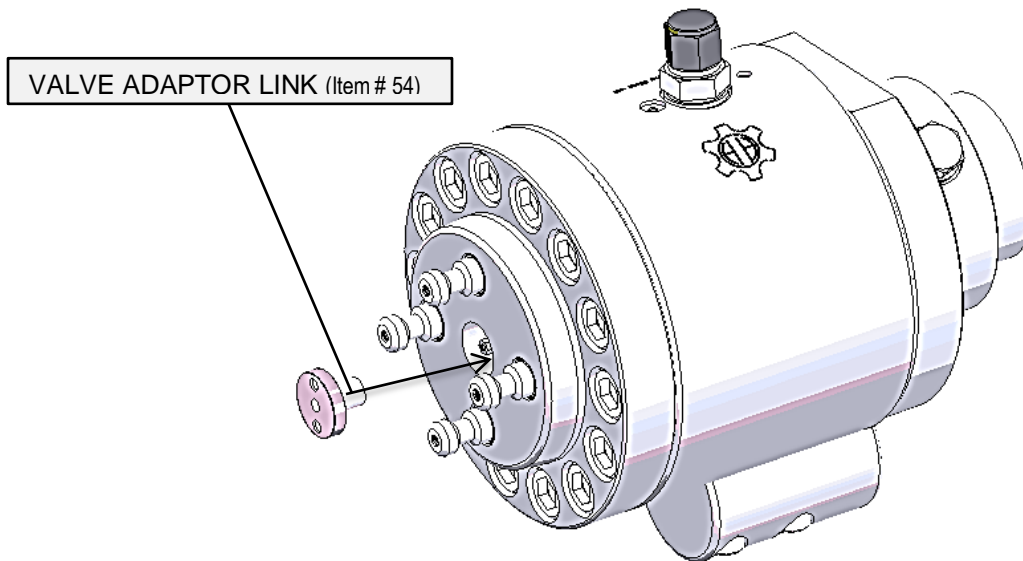
11. Be sure LEVER CAM (Item 47) is disengaged (manual mode).



4.03 STEM ADAPTOR

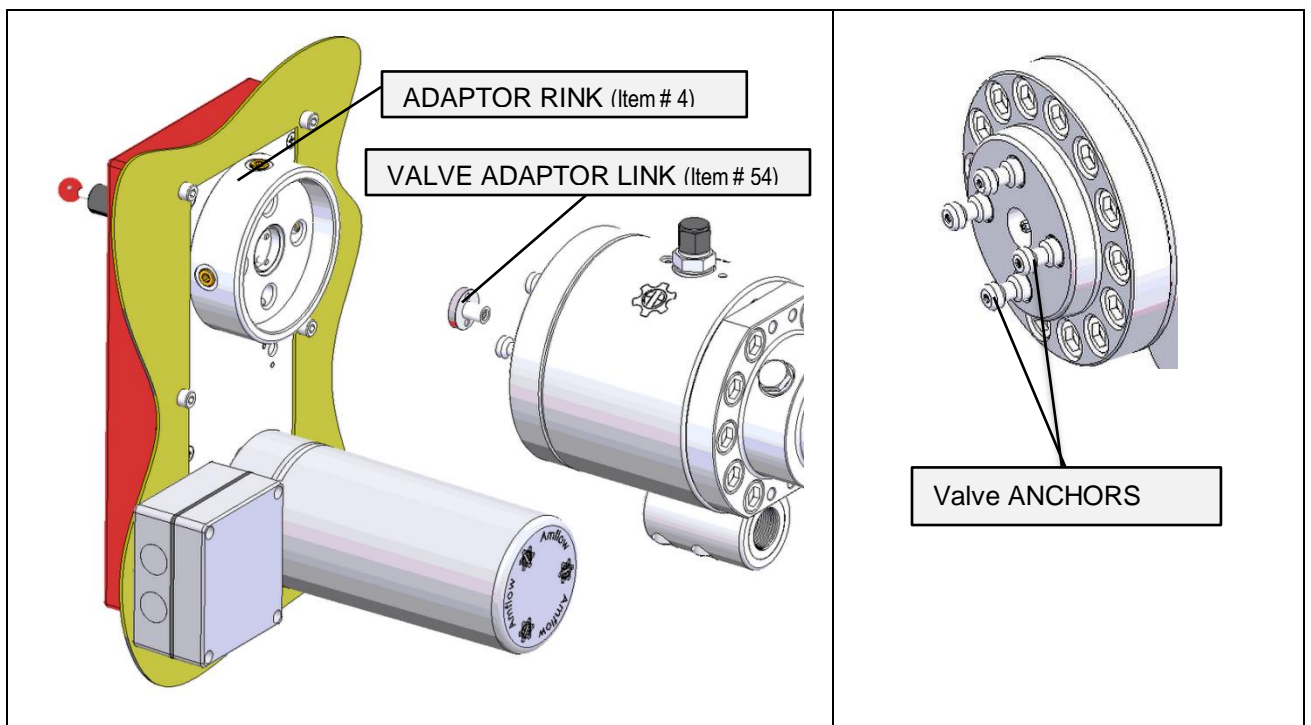
Step 1

12. Place VALVE ADAPTOR LINK (Item 54) onto VALVE STEM prior to installation.


4.04 MOUNTING VALVE

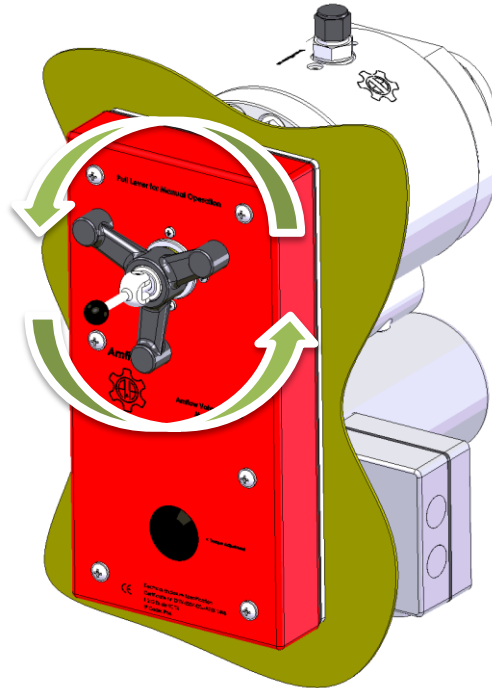
Step 1

13. Insert valve into ADAPTOR RING (Item 4) being sure to align valve ANCHORS



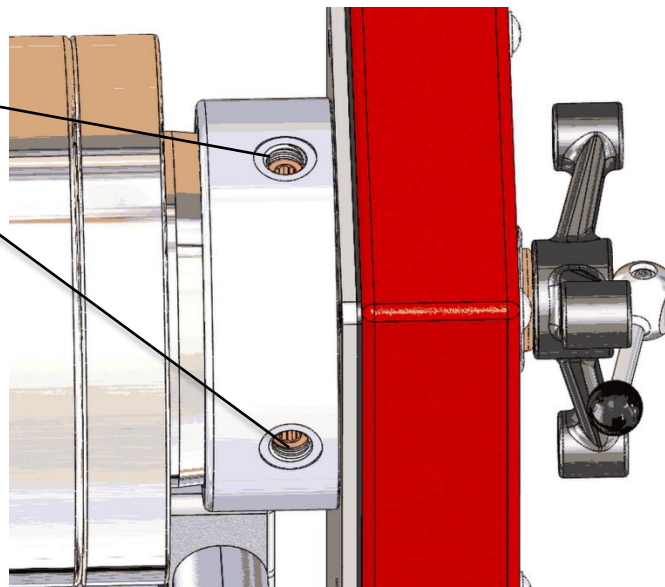
4.04 MOUNTING VALVE, Continued
Step 2

14. While valve is being inserted into ADAPTOR RING (Item 4); rotate HANDLE (Item 46) to align VALVE ADAPTOR LINK (Item 54) with MAIN SHAFT (Item 12.1).


Step 3

15. Once properly aligned and engaged, tighten four (4) CAMS (Item 7) to lock valve in place.

Tighten CAMS (Item # 7)

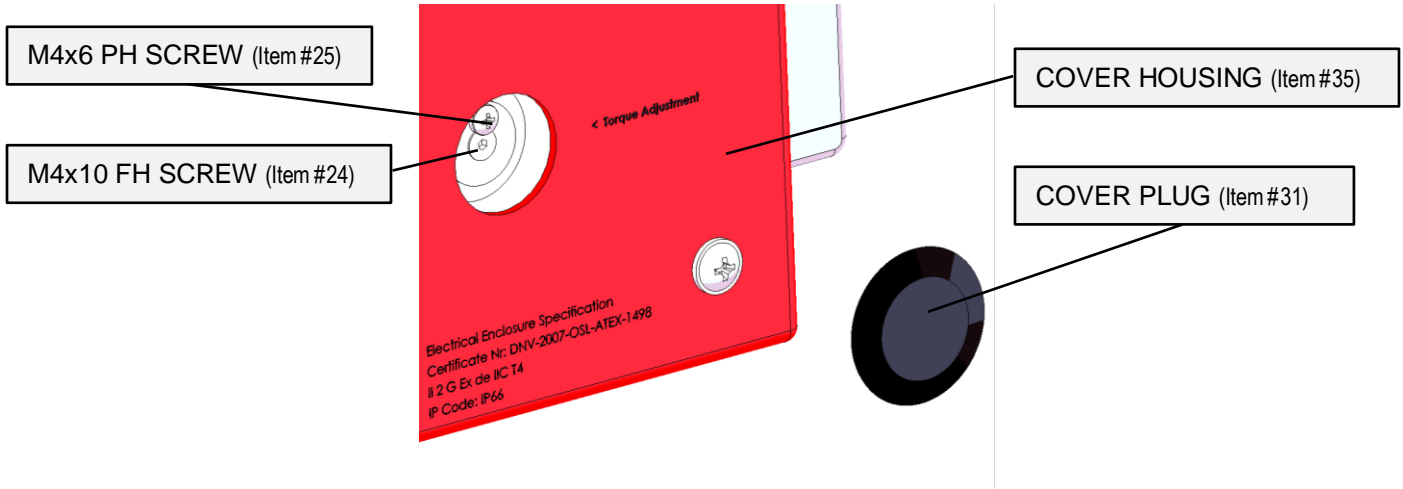


END OF SECTION

SECTION 5: CLUTCH LOCATION & TORQUE ADJUSTMENT
5.01 CLUTCH LOCATION

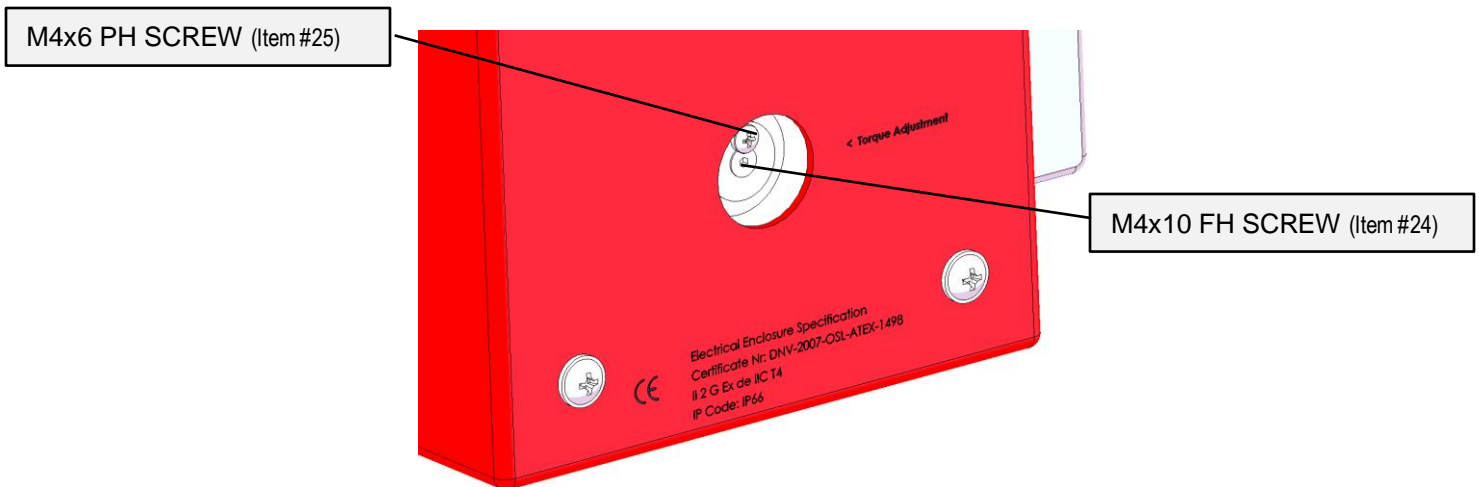
Step 1

16. Find torque adjustment location on the front COVER HOUSING (Item 35) and, remove COVER PLUG (Item 31).


5.02 TORQUE ADJUSTMENT

Step 1

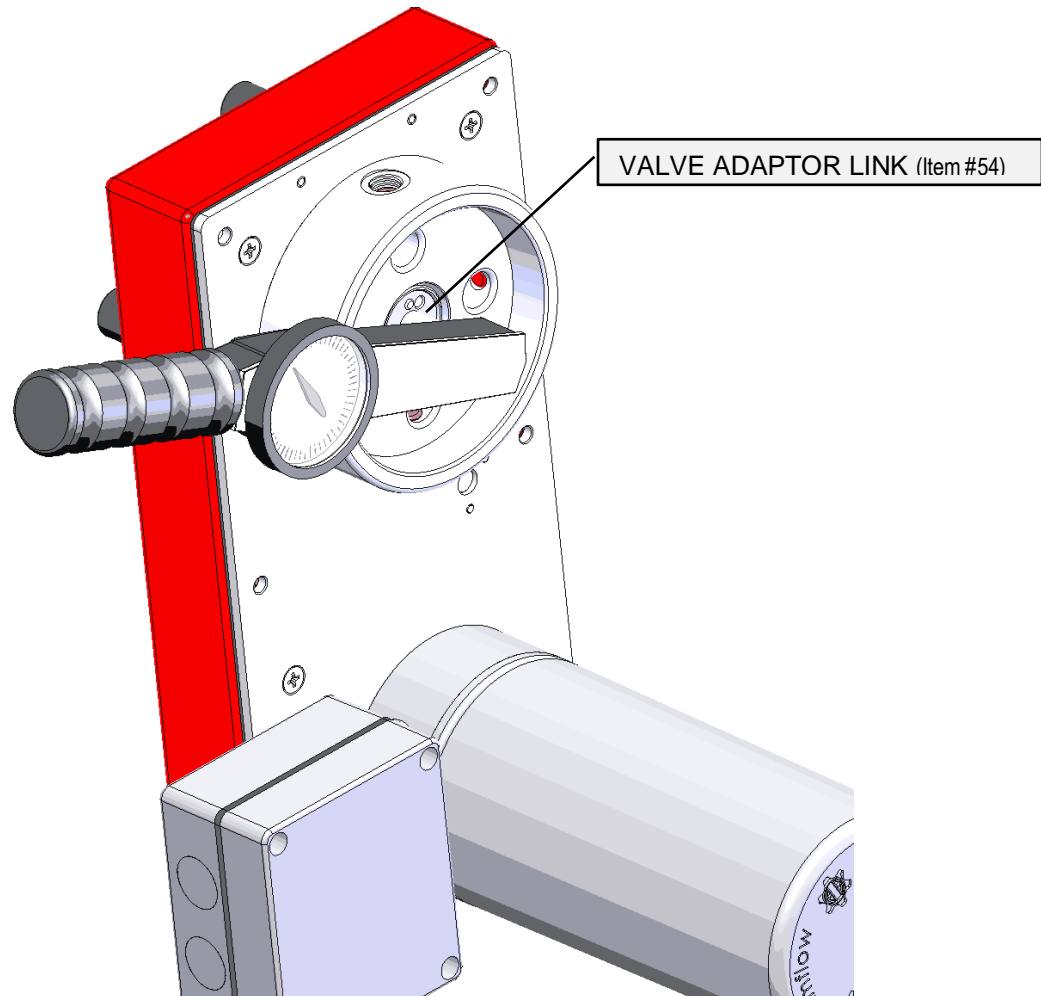
17. Make adjustments by loosening (do not remove) the offset M4x6 PH SCREW (Item 25) on the clutch and tightening or loosening the M4x10 FH SCREW (Item 24) in center of clutch.
 1. Be careful not to over tighten.



5.02 TORQUE ADJUSTMENT, continued

Step 2

1. To check torque setting use VALVE ADAPTOR LINK (Item 54) and a torque wrench with a 6 mm Allen head attachment.
2. Turn up torque limit (2.0) in the alarm settings of the embedded web page to avoid a torque fault.
3. Send a find zero command and using the torque wrench at the attachment point of valve simulate a hard stop. This will force the clutch to slip allowing you to read the torque setting.

**END OF SECTION**

STANDARDS

A&H Enterprises designs its products to meet the applicable **ASME**, and **API** standards for valve design and pressure vessels.

Products are also **CE** marked and **ATEX** approved for Hazardous area installations.

MEMBERSHIP'S



CERTIFICATIONS

ATEX DIRECTIVE (94/9/EC)

In the interest of safety and quality, A&H Enterprises has certified its **Amflow®** series of actuators for use in potentially explosive atmospheres as defined by the ATEX Directive (94/9/EC) as Category 2G.

ATEX
CE Ex II 2 G Ex de IIC T4
US & INTERNATIONAL PATENTS PENDING

To ensure the safety of all parties, only genuine **Amflow®** parts must be installed in accordance with supplied instructions, good engineering, and construction practices. The actuators must not be modified in any way from the original purchased actuators. The actuators must only be operated in the conditions indicated on product data sheet. This equipment is certified for Group 2 Category II. Equipment should not be used in systems requiring a higher level of certification.

LIMITED WARRANTY

Each **Amflow®** product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is three (3) years and begins on the date of original purchase. This warranty extends only to the original buyer and does not apply to any product which, in A & H Enterprises' opinion, has been misused, altered, neglected, contaminated, damaged by accident or abnormal conditions of operation or handling.

At A & H Enterprises' option, the A & H Enterprises' warranty obligation is limited to the replacement or repair of a defective product that is returned to A & H Enterprises within the warranty period. Merchandise returned to A & H Enterprises within the warranty period which, in A & H Enterprises' opinion, is defective by accident, improper operation or improper handling shall be subject to a charge for repair. Merchandise, free from defects, returned to A & H Enterprises shall be subjected to a 20% restocking fee within thirty (30) days of the purchase date. Written authorization is required for all merchandise returned to A & H Enterprises.

To obtain warranty service, contact A & H Enterprises to obtain return authorization information. Then send the product to A & H Enterprises with a description of the difficulty, transportation and insurance prepaid. A & H Enterprises assumes no risk for damage in transit. Following warranty repair, the product will be returned to Buyer, transportation and insurance prepaid. If A & H Enterprises determines that failure was caused by neglect, misuse, contamination, alteration, accident, or abnormal condition of operation or handling, A & H Enterprises will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer, transportation and insurance prepaid, and the Buyer will be billed for the repairs and the return transportation and insurance charges.

THIS WARRANTY IS BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. A & H ENTERPRISES SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY.

Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of the Warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

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