

RoboScrub 20

Parts Manual



PREFACE

Thank you for your purchase of the new industry standard for scrubbers. Minuteman International takes great pride in offering the most dependable, reliable and best value in industrial power sweepers and sweeper / scrubbers. We set the standard.

Our Customer Service Department would like to hear from you. If you see any errors, omissions or something that needs clarification in this Parts Catalog please let us know. We are working hard towards continually improving our processes to bring you the best you deserve. Please copy the form below, fill out and comment on how you found our catalog.

Thank you!
The Minuteman International Team

Name: _____

Title: _____

Company Name: _____

Address: _____

Country: _____

Type of equipment or model number: _____

Comments: _____

Please return to:
Customer Service Manager
Minuteman International, Inc.
14N845 U.S. Route 20
Pingree Grove, Illinois 60140 USA

Phone: (800) 323-9420
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Technical Specifications

Model **RoboScrub 20**
 All Models beginning with: MR20-AI

MODEL	AUTONOMOUS MAX RIDE 20 (MR20-AI SERIES)
DIMENSIONS WITH SQUEEGEE	56 IN LENGTH X 29 IN WIDTH X 45 IN HEIGHT (142.24 CM X 73.66 CM X 114.3 CM)
WEIGHT	342 LBS (155.13 KG)
WEIGHT WITH BATTERIES AND FULL SOLUTION	691 LBS (313.43 KG)
SOLUTION TANK CAPACITY	16 GAL (60 L)
CLEANING PATH WIDTH	20 IN (50.8 CM)
SQUEEGEE WIDTH	25 IN (63.5 CM)
MINIMUM TURN AROUND AISLE WIDTH	54 IN (137.16 CM)
MAXIMUM MANUAL PRODUCTIVITY RATE	24,500 FT ² \HR (2276 M ² \HR)
MAXIMUM AUTONOMOUS PRODUCTIVITY RATE	20,400 FT ² \HR (1895 M ² \HR)
MAXIMUM MANUAL SPEED	3 MPH (4.8 KPH)
MAXIMUM AUTONOMOUS SPEED	1.5 MPH (2.4 KPH)
SCRUB HEAD TYPE	DISC
BRUSH PRESSURE	FLOATING - LOCKED
BRUSH MOTOR	400-600 WATTS
BRUSH SPEED	180 RPM
SOLUTION FLOW (LOW TO HIGH)	0-0.4 GPM (0-1.5 LPM)
VACUUM MOTOR	550 WATTS
VACUUM AIRFLOW	69 CFM (32.56 L\SEC)
VACUUM WATERLIFT	68 IN H ₂ O (172.72 CM H ₂ O)
SOUND PRESSURE\DECIBEL RATING	68 DBA
BATTERIES	(2) 12V 234Ah AGM SEALED, MAINTENANCE-FREE
BATTERY CHARGER	OFFBOARD/SHELF
MAXIMUM RUN TIME	3.30 - 4 HOURS
MACHINE VOLTAGE	24 VDC
MAXIMUM INCLINE/DECLINE GRADE LEVEL	0% ROBOTIC, 2% MANUAL
APPROVALS	NONE
IP PROTECTION CLASS	IPX4

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Brush Options / Home Location Pack

BRUSH OPTIONS	
PART NO.	DESCRIPTION
172520-1	BRUSH-DISC, 20" NYLON, BLACK
172520-3	BRUSH-DISC, 20" NYLO-GRIT 80GR, BLACK
172520-6	BRUSH-DISC, 20" SCRUB GRIT 2, 120GR RED
172588	PAD DRIVER, ASSY, 20"
762370	PAD RETAINER, REMOVABLE-NOT SHOWN
762394	PAD RETAINER, FIXED - NOT SHOWN

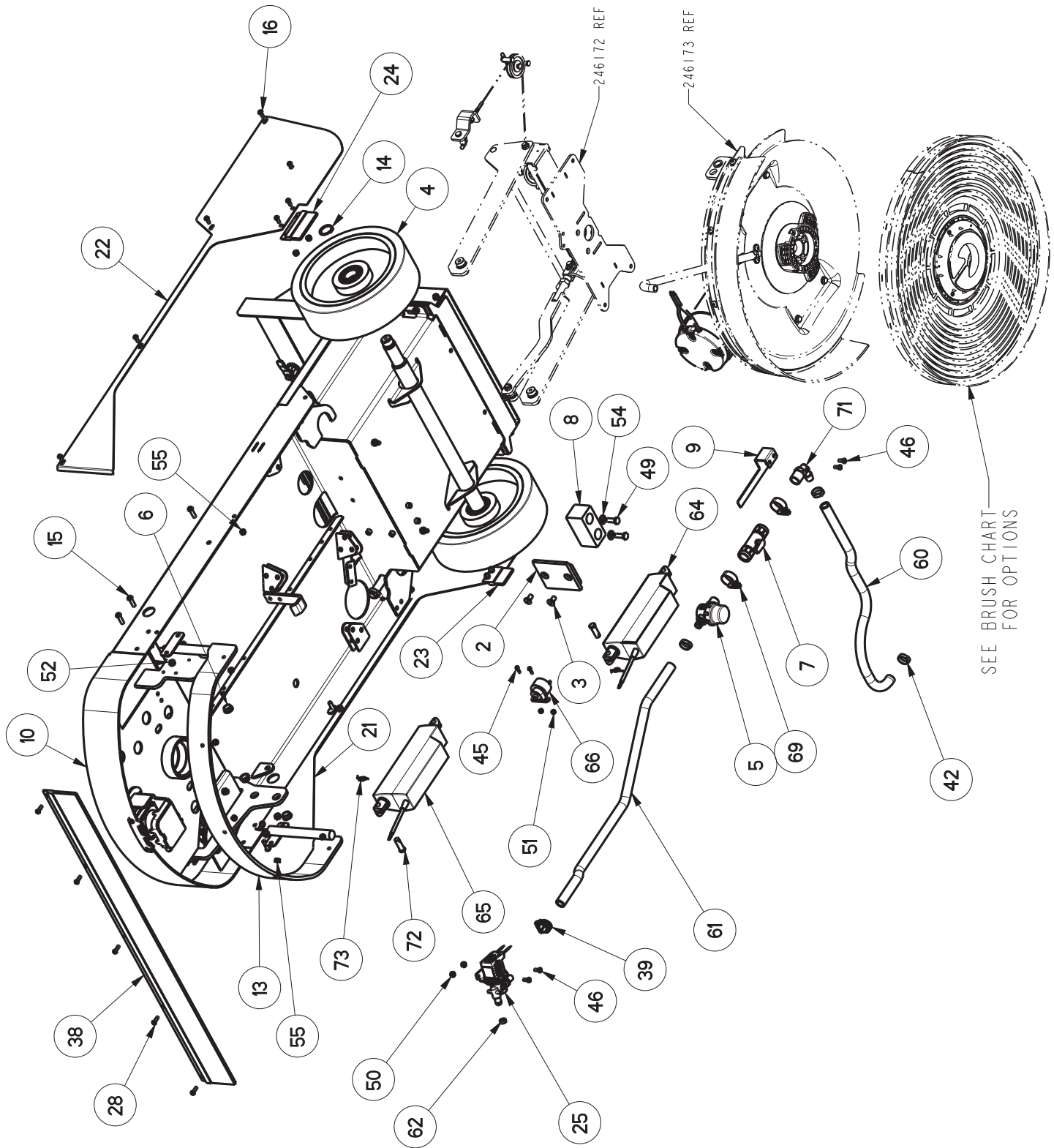
AQUA STOP BRUSHES	
PART NO.	DESCRIPTION
7951-01	BRUSH, 20" LIGHT-MED PP.5 A/S, WHITE
7951-02	BRUSH, 20" LIGHT-MEDIUM A/S, K901, BLACK (<i>STANDARD</i>)
7951-03	BRUSH, 20" MEDIUM NYLON 600GR, A/S, GREY
7951-04	BRUSH, 20" MEDIUM-HEAVY PP.8 A/S, WHITE
7951-05	BRUSH, 20" HEAVY NYLON 180GR. A/S, GREY
7951-06	BRUSH, 20" HEAVY-2 NYL 120GR, A/S, GREEN

STANDARD HOME LOCATION PACK	
PART NO.	DESCRIPTION
246831	STANDARD HOME LOCATION PACK

Battery/Charger/Cables/Cords

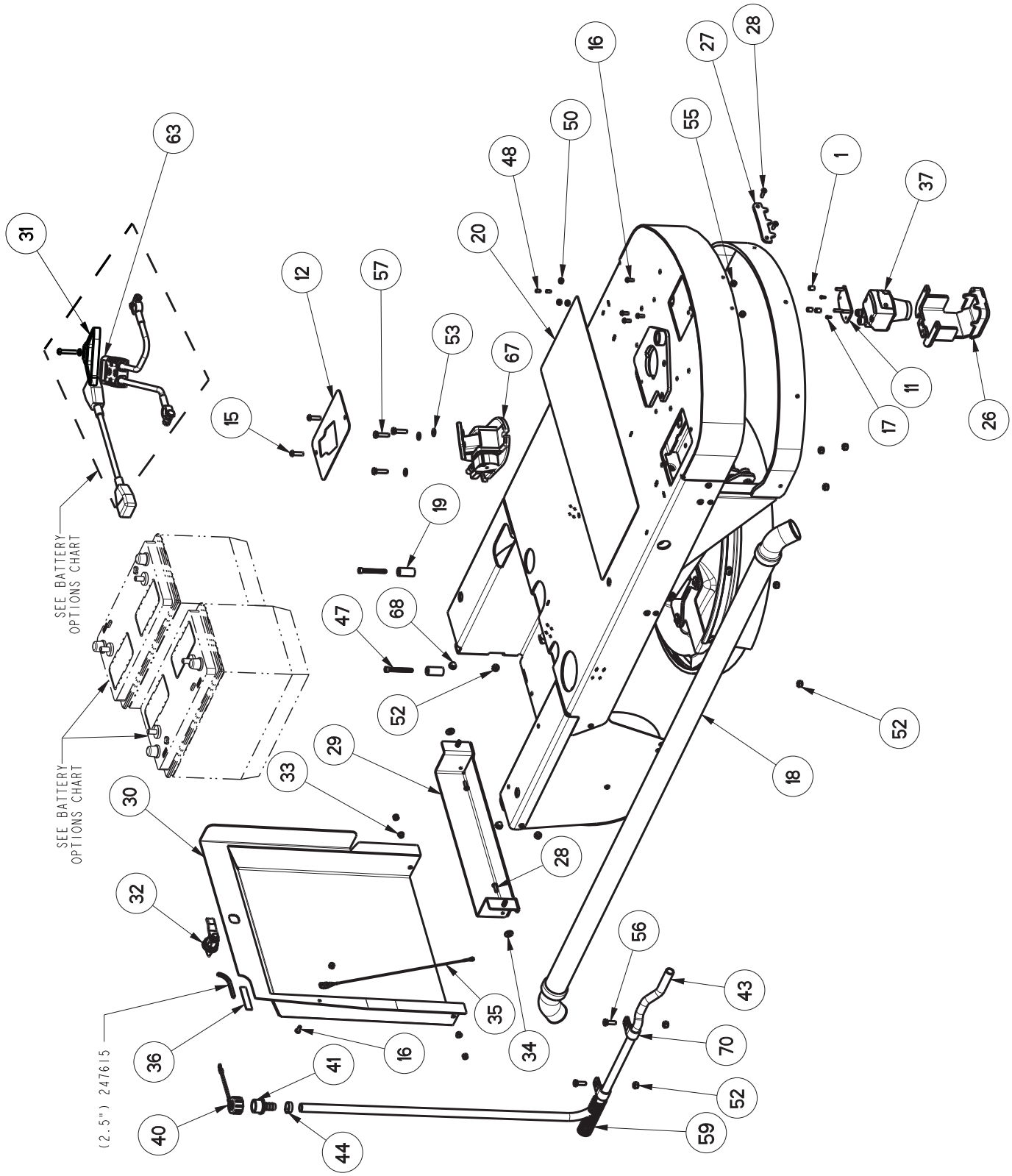
BATTERY/CHARGER/CABLES/CORDS	
PART NO.	DESCRIPTION
956748	BATTERY, 12V 234AH AGM
957756-1	CHR, 24VDC 25A UNIV V (DRY/AGM-DISCOVER)
956009	BATTERY, 24V, 105 AMP, LIO
957009	CHARGER, 24V, 30 AMP, LIO
247117	BATTERY CABLE, RED, 4 AWG
247118	BATTERY CABLE, BLACK, 4 AWG
247119	BATTERY CABLE, JUMPER, 4 AWG
748680CE	CHARGER CORD (<i>CE MODEL ONLY</i>)
748680	CHARGER CORD (<i>CEUK MODEL ONLY</i>)

Frame Group (Pg 1 of 2)



Rev U

**Frame Group
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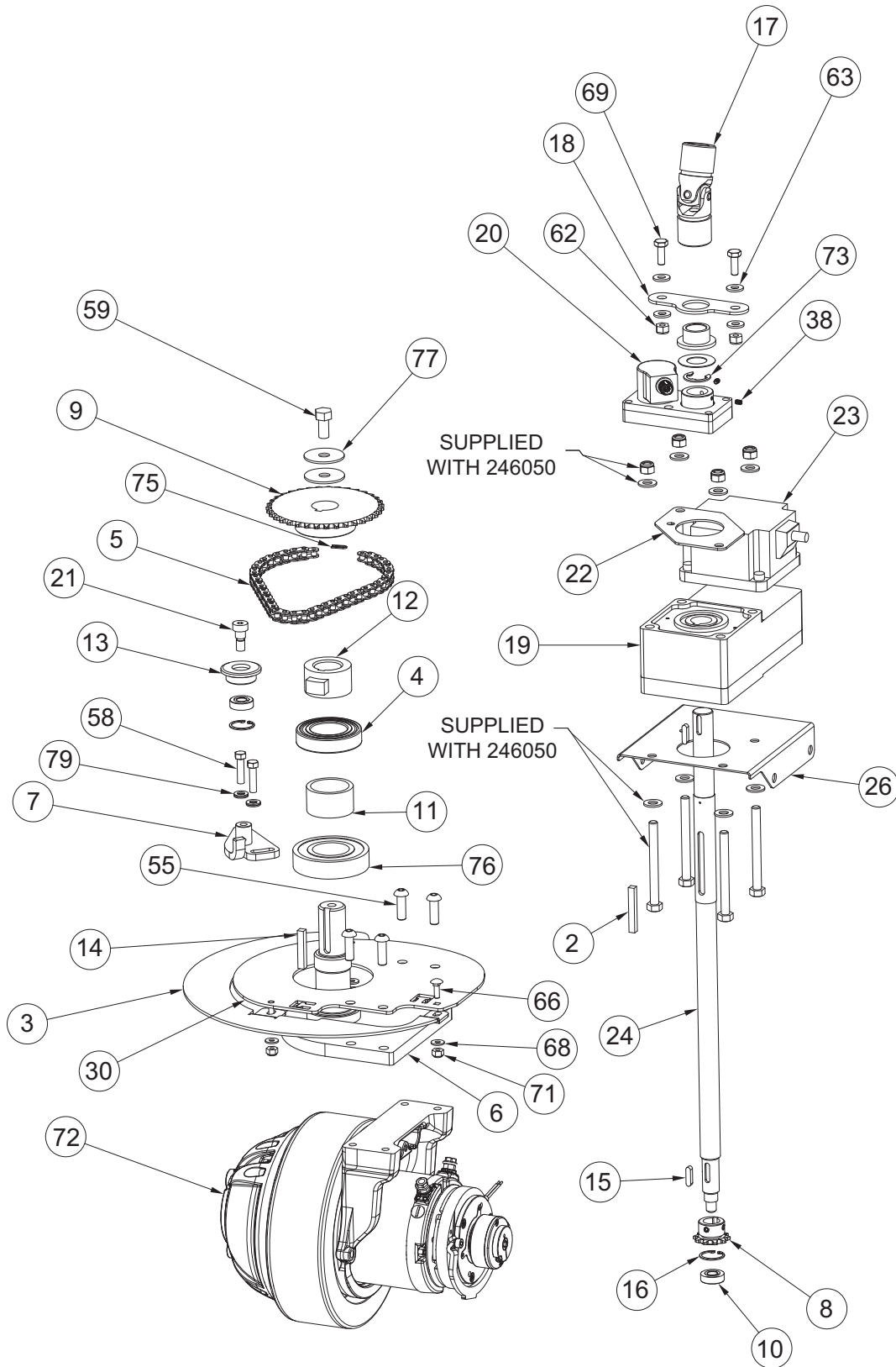
Frame Group BOM (Pg 1 of 2)

BILL OF MATERIAL - 246171			
ITEM	PART NO.	QTY	DESCRIPTION
1	133214	3	SPRING-COMP .300 X .025 X .375
2	245304	1	BLOCK, SLIDE
3	245338	2	SCR-FHSCS 5/16-18 X 5/8 SS
4	245461	2	WHEEL - ASSY, IDLER, 254 x 80 W/BRGS
5	245781	1	FILTER - 1/2 NPT X 1/2 HB
6	245806	3	BUSHING-FLG, .50 x .62 x .31 LGOILITE
7	245845	1	VALVE - BALL 1/2 FPT X 1/2 FPT
8	246053	1	BLOCK, PIVOT
9	246073	1	PLATE - MTG - BALL VALVE AND FILTER
10	246098	1	WELDMENT, FRAME, 20 AUTO
11	246103	1	PLATE, LIDAR ADJUSTMENT
12	246105	1	PLATE, THROTTLE COVER
13	246230	1	WELDMENT, FRONT GUARD
14	246252	2	RING, EXT RETAINING, 25 MM STL
15	246256	8	SCR-BHSCS 1/4-20 X .88 SS BLK-OX
16	246257	19	SCR-BHSCS 10-24 X .50 SS BLK-OX
17	246258	2	SCR-BHSCS M3-.5 X 8 SS NYL PATCH
18	246937	1	HOSE-VAC, CLEAR 1.50" ID X 52 LONG
19	246938	2	SPACER, .252 X .625 X 1.25, NYL
20	246944	1	TREAD, ANTI-SKID
21	246945	1	SIDE GUARD, RIGHT
22	246954	1	SIDE GUARD, LEFT
23	246955	1	BRUSH STRIP, RIGHT GUARD
24	246956	1	BRUSH STRIP, LEFT GUARD
25	247103-2	1	VALVE-WATER 24VDC
26	247120	1	LOWER LIDAR GUARD
27	247121	1	UPPER LIDAR GUARD
28	247602	9	SCR-BHSCS 10-24 X .63 SS BLK-OX
29	247606	1	BRKT, BATTERY
30	247607	1	REAR COVER
31	247609	1	SB175 HANDLE KIT, RED
32	247610	1	LATCH, QUARTER TURN
33	247611	2	BUSHING-FLG .188 X .31 X .25 OILITE
34	247612	2	BEARING-THRUST .313 ID X .63 OD
35	247614	1	LANYARD, NYLON COATED 12"
36	247616	1	DECAL, CABLE PASS THROUGH
37	247628	1	LIDAR MODULE, HORIZONTAL
38	247636	1	FRONT BRUSH

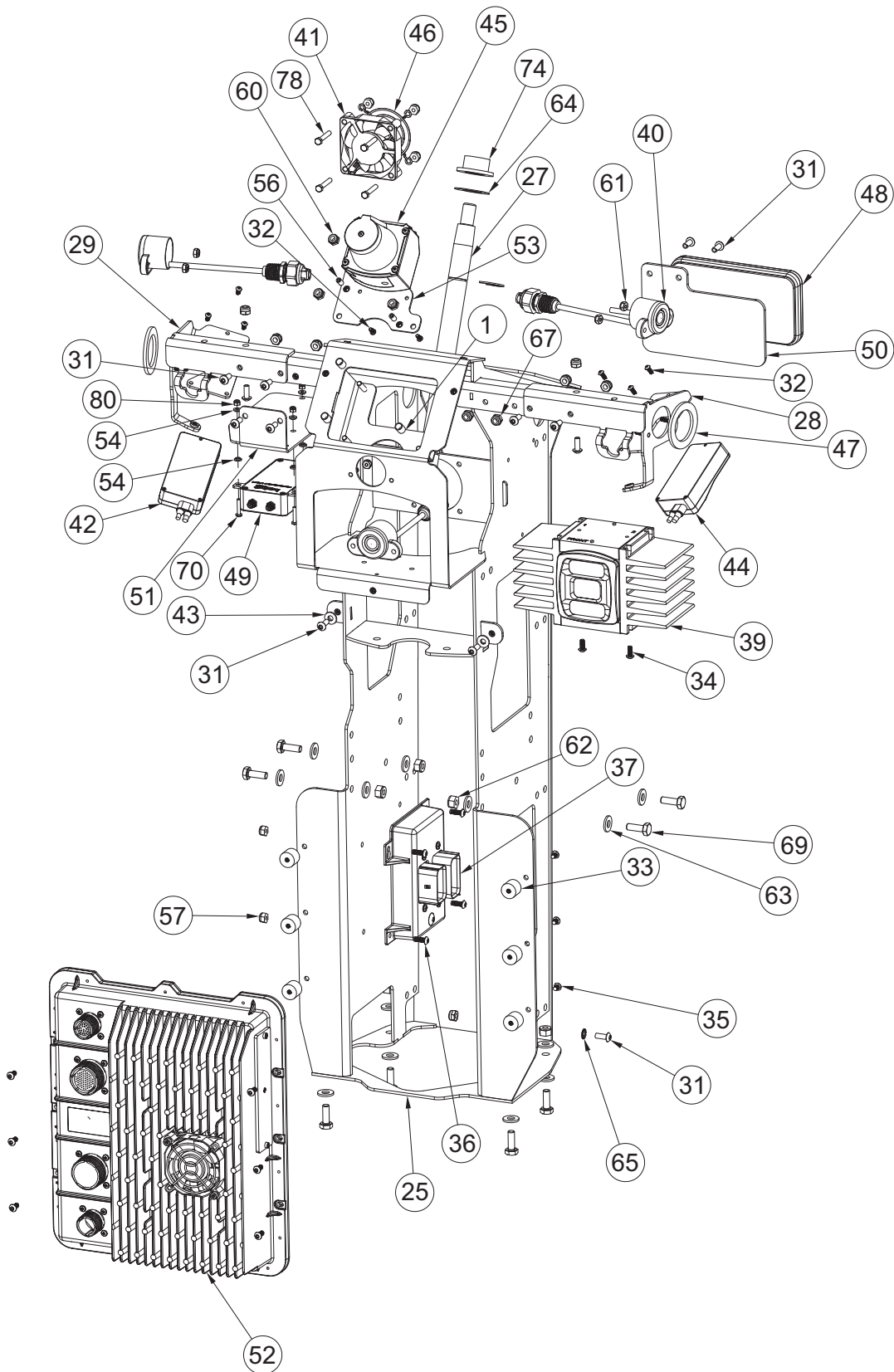
Frame Group BOM (Pg 2 of 2)

BILL OF MATERIAL - 246171			
ITEM	PART NO.	QTY	DESCRIPTION
39	247693	1	CLAMP, HOSE, WORM .5 TO .906 DIA
40	283690	1	ASSY, BREATHER CAP W LANYARD
41	342445	1	FTG-GARDEN ST 1/2 HB PP
42	383347	4	CRIMP CLAMP 1/2 HOSE SS 185R
43	430231	1	HOSE, 1/2 ID X 45", CLEAR
44	450076	1	CLAMP-CRIMP 185R SS
45	710204	2	SCR-PHMS 6-32 X .50 ZP
46	710355	4	SCR-MC RD HD 10-32 X .50 STL PL
47	710387	2	SCR-MC BH 1/4-20 X 1.75 ZINC
48	711018	2	SCR-SK 10-32 x .375
49	711229	2	SCR-HH 5/16-18 X .87 ZP GR 5
50	711350	5	NUT-NYLOC 10-32
51	711371	2	NUT-NYLOC 6-32 ZP
52	711373	13	NUT-NYLOC 1/4-20
53	711504	5	WSR-FLAT 1/4 ID SS
54	711506	2	WSR-FLT .344 X .690 X .062, STEEL
55	712638	22	NUT, HEX 10-24 SS NYLOC
56	713002	2	SCR-HH 1/4-20 X .75 ZP 5
57	713003	3	BLT-HH 1/4-20 X 1 #5
58	715502	1	DECAL-CONNECT TO CHARGE
59	718371	1	SPRING, COMPRESS, .845OD .067W 4.00L SS
60	730971	1	TUBING, .50 ID X .13 WAL BRA VIN18.5 IN
61	731544	1	TUBING, .50 ID X .13 WAL BRA VIN22 IN
62	731569	1	SPACER, .150 ID, .500 OD, .210 THK
63	740159	1	CB 175 RED HOUSING
64	740822-1	1	ACTUATOR-100MM STROKE-750N FORCE
65	740827-1	1	ACTUATOR -40MM STROKE, 750N FORCE
66	748200	1	HORN / BACK UP ALARM, SCV 24/26
67	748507	1	PEDAL ASSY, THROTTLE, FLOOR MTG25°, IEC
68	3300526	2	BUMPER - 1/4 ID X 1/8 THK
69	3300535	2	CLAMP-HOSE 1/2
70	3301158	2	CLAMP-CABLE 3/4
71	3315535	1	FTG-90 DEG 1/2 ID X 1/2 MPT
72	3400117	2	PIN-CLEVIS 3/8 x 1.125 ZP
73	3400125	2	PIN-COTTER 3/8 RUE RING

Tower Group
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Tower Group
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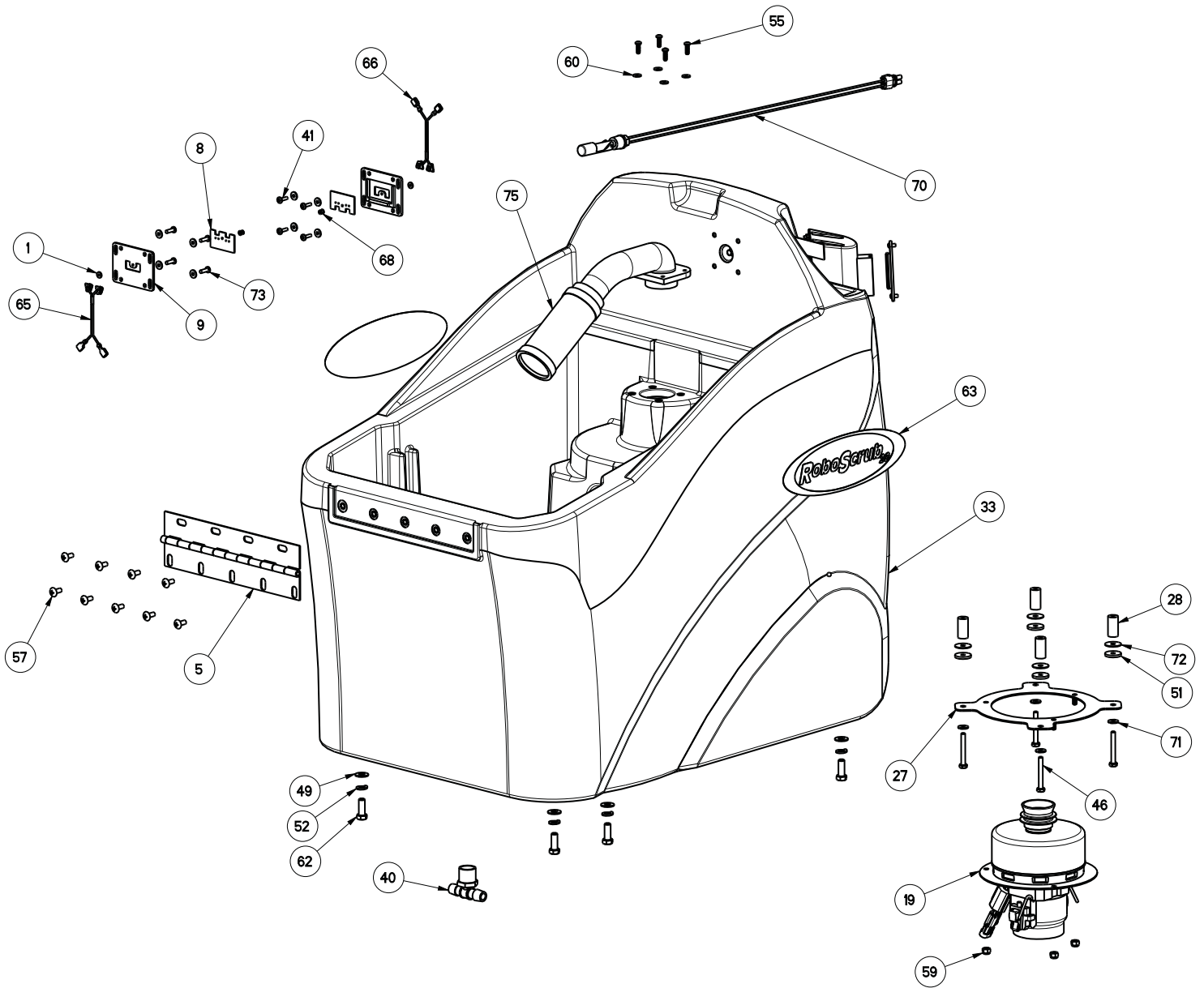
Tower Group BOM (Pg 1 of 2)

BILL OF MATERIAL - 246169			
ITEM	PART NO.	QTY	DESCRIPTION
1	133214	3	SPRING-COMP .300 X .025 X .375
2	172519	1	KEY-SQUARE, 6MM X 45MM
3	172636	1	PLATE, DRIVE WIRING (SUPPLEMENTAL)
4	245416	1	SKF BALL BRG 35mm x 62 OD x 14 W
5	245445-1	1	CHAIN - ROLLER #35
6	246022	1	SPINDLE WLDT, STEERING
7	246025	1	BRACKET WLDT, CHAIN TENSIONER
8	246028	1	SPROCKET, ANSI 35, 10 TOOTH, 0.375P, 0.62B
9	246029	1	SPROCKET, ANSI 35, 35 TOOTH, 0.375P, 1.00B
10	246030	2	BEARING, BALL, 0.375B, 0.875D, SEALED
11	246031	1	SPACER, 1.75D 1.44B .96L, STL
12	246032	1	PIVOT, STEERING STOP
13	246034	1	GUIDE, CHAIN TENSIONER
14	246035	1	KEY, SQ, 0.25 X 0.25 X 1.50
15	246036	3	KEY, SQ, 0.18 X 0.18 X 0.75
16	246038	2	RING, RTNR, FOR .875 BORE, STL
17	246039	1	U-JOINT, 25DEG, 0.75B 1.06D 3.75L
18	246042	1	PLATE, BEARING, STEERING
19	246050	1	GEARBOX, HOLLOW SHAFT
20	246051	1	ENCODER, POSITION, SHAFT
21	246067	1	BLT-SHOULDER .375 X .312 LG BLK OX
22	246072	1	PLATE, STEERING ENCODER
23	246091-1	1	MOTOR, STEERING
24	246099	1	SHAFT, STEERING LOWER, AUTO
25	246102	1	WELDMENT, TOWER, MR20 AUTO
26	246107	1	MOUNT, STEERING MOTOR
27	246114	1	SHAFT, STEERING UPPER, AUTO
28	246236	1	WELDMENT, UPPER LT TOWER
29	246237	1	WELDMENT, UPPER RT TOWER
30	246253	1	PLATE, DRIVE WIRING
31	246257	13	SCR-BHSCS 10-24 X .50 SS BLK-OX
32	246258	8	SCR-BHSCS M3-.5 X 8 SS NYL PATCH
33	246260	6	ISOLATOR, M4, NEOPRENE
34	246261	8	SCR-BHSCS M4-.7 X 10 SS NYL PATCH
35	246262	6	SCR-BHSCS M4-.7 X 6 SS NYL PATCH
36	246265	4	SCR-BHSCS 8-32 X .50 SS BLK-OX
37	246266	1	MOTOR AMP MODULE
38	246268	2	SCR-SET M4-.7 X 6MM CP BLK-OX NYL PATCH
39	246269	1	IFM MODULE
40	246800	3	2D CAMERA MODULE

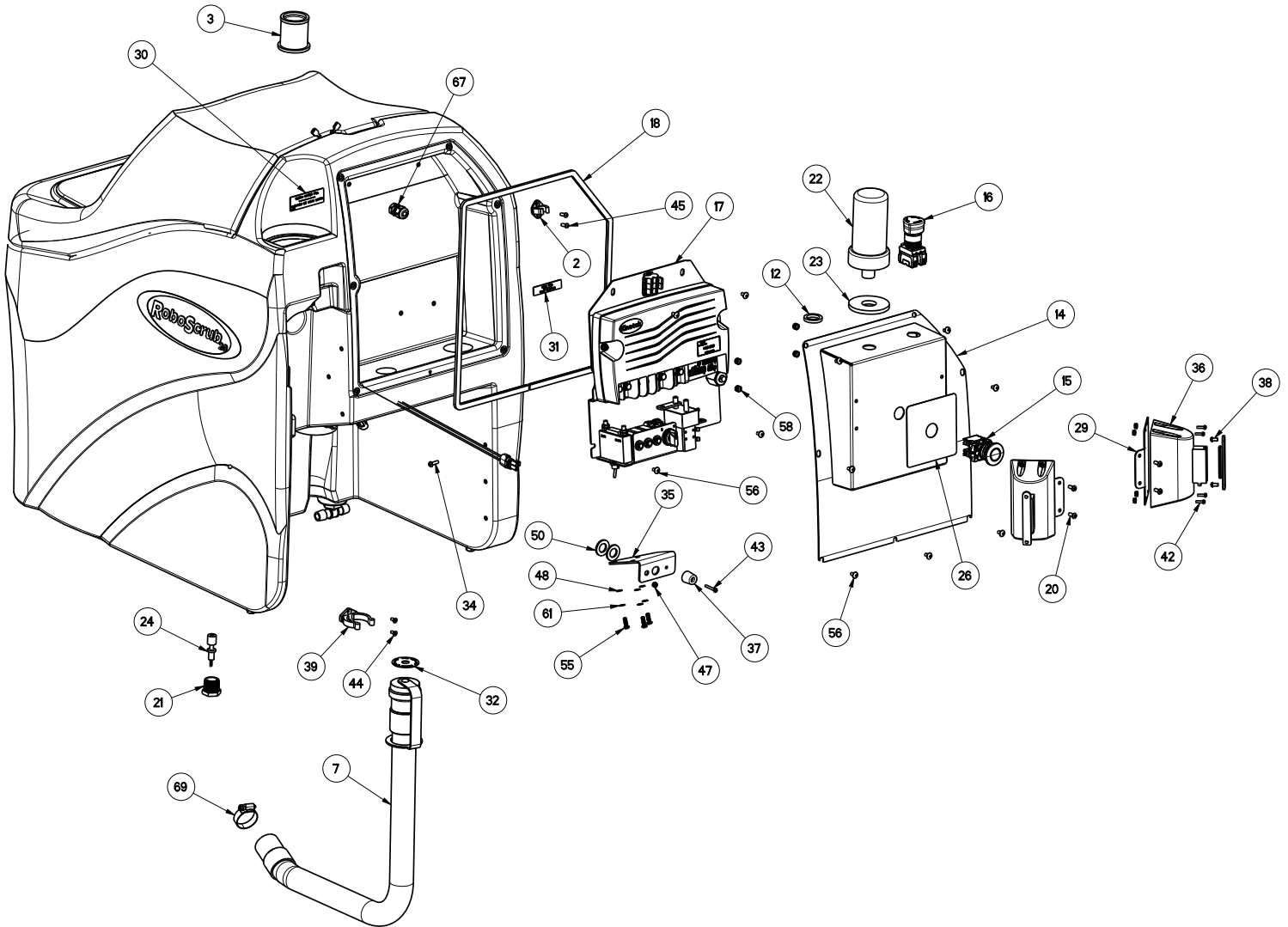
Tower Group BOM (Pg 2 of 2)

BILL OF MATERIAL - 246169			
ITEM	PART NO.	QTY	DESCRIPTION
41	246804	1	FAN MODULE
42	246811	1	IFM O3X MODULE, RIGHT
43	246823	2	WASHER-FLAT .22 X .50 X .05 SS BLK
44	246825	1	IFM O3X MODULE, LEFT
45	246827	1	LIDAR MODULE, SLANTED
46	246839	1	FINGER GUARD, 60MM
47	246846	2	GASKET, CAMERA
48	246949	1	ANTENNA 4G
49	246952	1	COMMUNICATION MODULE
50	246953	1	ANTENNA MOUNT
51	247104	1	LTE BRACKET
52	247534	1	BRAIN CONTROL MODULE
53	247638	1	PLATE, LIDAR MOUNT
54	247704	6	WASHER-SHOULDER, #4
55	600917	4	SCR-BHSCS M8-1.25 X 25 SS
56	711018	2	SCR-SK 10-32 x .375
57	711026	8	NUT, HEX 8-32 NYLOC SS
58	711207	2	BLT-HH 1/4-20 X 1.00 STPL
59	711241	1	SCR-HEX 3/8 -16X .75" ZP
60	711350	3	NUT-NYLOC 10-32
61	711371	6	NUT-NYLOC 6-32 ZP
62	711373	10	NUT-NYLOC 1/4-20
63	711505	20	WASHER-FLAT 1/4 ZP
64	711517	2	WSR- FLAT .75X1.375X.09 SS
65	711534	1	WSR-EXTERNAL LOCK #10
66	711606	1	BLT-CARR 10-32 X .625 SS
67	712638	9	NUT, HEX 10-24 SS NYLOC
68	712764	3	WASHER-FLAT #10 SS
69	713002	10	SCR-HH 1/4-20 X .75 ZP 5
70	718255	3	SCR-PHMS M3-0.5 X 16 ZP
71	731242	3	NUT-NYLOC 10-32 18-8 SS
72	748525	1	WHEEL DRIVE, 24V 300W
73	809148	2	RET RING-E TYPE .75
74	832554	2	BUSHING-FLG .7505 X 1.437 X .625 BRNZ
75	833292	1	CHAIN MASTER LINK #35
76	3305667	1	BEARING-MAIN BROOM
77	3400092	2	WASHER-FENDER 3/8 ZP 1.5 OD X .07 THK
78	3400243	4	SCR-HEX,#08-32X1.00 ZP
79	3401570-7W	2	WASHER-NORD-LOCK, 1/4, 0.53 OD, ZP
80	12040374	3	NUT-HEXAGON-DIN 985-M3-A2

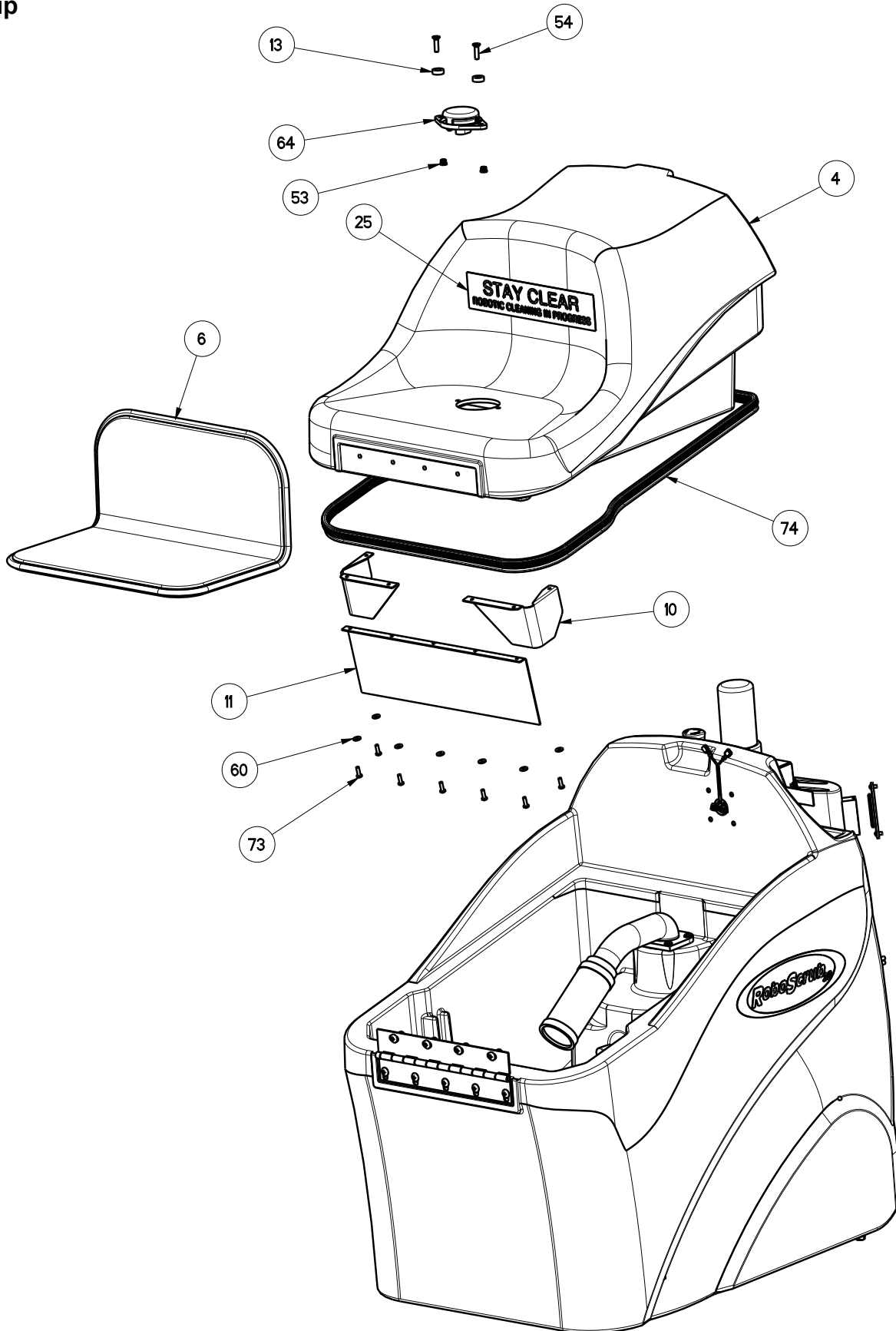
Tank Group (Pg 1 of 3)



**Tank Group
(Pg 2 of 3)**



Tank Group (Pg 3 of 3)



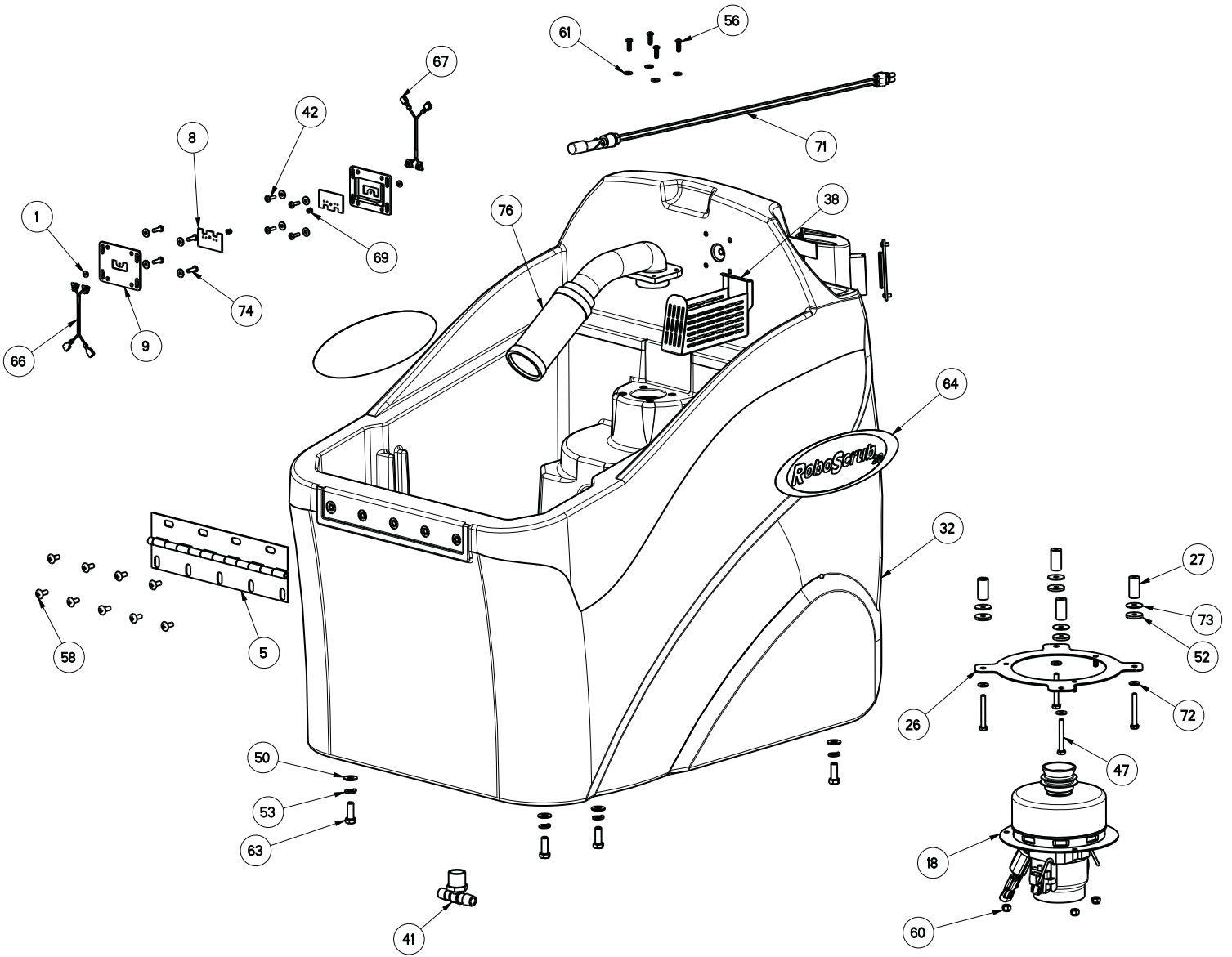
Tank Group BOM (Pg 1 of 2)

BILL OF MATERIAL - 246174			
ITEM	PART NO.	QTY	DESCRIPTION
1	950-4-S	2	BACKUP PLATE - RIVET
2	172065	1	CLIP, FOR 1/2" ID HOSE
3	172159	1	FILTER, FILL PORT, ES1720
4	245002	1	LID W/ SEAT, TANK, ER 20-V
5	245422	1	HINGE, STEEL, 11.38" LONG
6	245444	1	SEAT-CUSHIONED, SEWN SEAT & BACK
7	245452	1	HOSE-DRAIN W/ TWIST VALVE 1.50" ID
8	245453	2	PLATE - INSERT, INTERCONNECT
9	245456	2	PLATE - BASE, INTERCONNECT
10	245766	2	SKIRT-DRIP, LID, END PIECE
11	245767	1	SKIRT-DRIP, LID,CENTER 20"
12	245802	1	SPACER, PVC, KEY SWITCH
13	245817	2	SPACER, .39 ID X .75 OD X .25 T, PVC
14	246113	1	COVER, ELECTRICAL, AUTO
15	246121	1	PUSHBUTTON, 40MM CLEAR
16	246123-1	1	ESTOP SWITCH ASSEMBLY
17	246175	1	ASSY, ELECTRICAL PANEL, AUTO
18	246184	1	GASKET, ELECTRICAL PANEL
19	246189	1	ASSY, 2-STAGE VACUUM
20	246257	4	SCR-BHSCS 10-24 X .50 SS BLK-OX
21	246273	1	FITTING 3/4"MNPT X 3/8"-16
22	246801-1	1	BEACON, AMBER
23	246802	1	GASKET, BEACON
24	246805-1	1	FLOAT SWITCH ASSEMBLY
25	246806	1	DECAL, CAUTION, AUTONOMOUS
26	246829	1	DECAL, BRAIN CORP REAR
27	246936	1	BRACKET, VACUUM
28	246938	4	SPACER, .252 X .625 X 1.25, NYL
29	247125	2	BARRIER MOUNT
30	247128	1	DECAL, CLEAN WATER FILL
31	247129	1	DECAL, MAX FILL
32	247130	1	DECAL, DRAIN
33	247180	1	TANK, SOLUTION & RECOVERY AUTO
34	247602	1	SCR-BHSCS 10-24 X .63 SS BLK-OX
35	247605	1	BRACKET, REAR COVER LATCH
36	247608	2	RETRACTABLE BARRIER
37	247613	1	BUMPER, .80 OD X .78 H RUBBER
38	247617	4	SCR-HI/LO #10-16 X 3/8

Tank Group BOM (Pg 2 of 2)

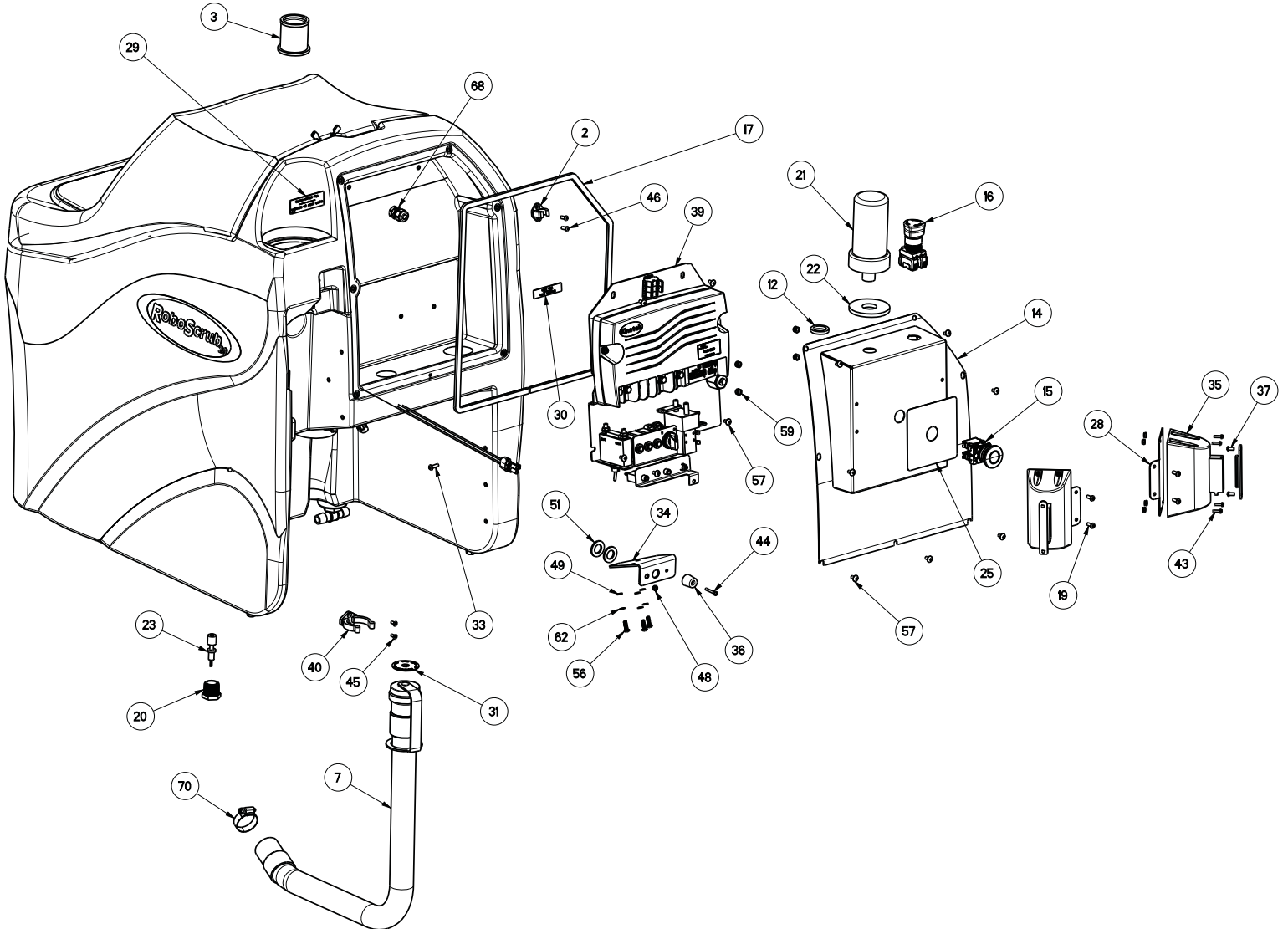
BILL OF MATERIAL - 246174			
ITEM	PART NO.	QTY	DESCRIPTION
39	260579	1	TOOL CLIP, 1.5" HOSE
40	342440	1	FITTING, TEE 3/4MPT 1/2BARB
41	710130	4	SCR-MC 8-32 X .62 NICKEL
42	710303	8	SCR-MC RD HD 6-32 X .50 STL ZINC
43	710307	1	SCR-MC 6-32 X 1.0 ST PL PAN HD
44	710528	2	SCR-MC 8-32 X .37 FH - BR
45	711163	2	SCR-HI/LO #10-16 X 1/2
46	711214	4	BLT-HH 1/4-20 X 2.00
47	711371	9	NUT-NYLOC 6-32 ZP
48	711502	3	WASHER-FLAT #8 ZP
49	711515	4	WSR-FLAT .406 X .812 X .0625
50	711527	2	WSR-FLAT .63 X 1.12 X .09
51	711529	4	WASHER-RUBBER .25 X 1.00 X .110
52	711546	4	WSR-HELICAL 3/8
53	711962	2	NUT, 1/4-20, HIGH-TORQUE 12 POINT FLANGE
54	712153	2	SC-SHCS, 1/4-20 x 1.00 IN SS
55	712536	7	SCR-MC 10-24 X .62 TH SS
56	712540	12	SCR-MC TR HD 10-24 X .37 SS
57	712565	9	SCR-MC 1/4-20X.63 SS TR HD
58	712638	4	NUT, HEX 10-24 SS NYLOC
59	712667	3	NUT-NYLOC 1/4-20 SS
60	712764	19	WASHER-FLAT #10 SS
61	712770	3	WSR INT LOCK #10A SS
62	713042	4	BLT-HH 3/8-16 X 1 #5
63	715986	2	DECAL, MAIN OVAL, ROBO SCRUB
64	740601	1	SWITCH, SEAT, BOLT MOUNT
65	747213	1	WIRE ASSY, TANK SWITCH CONN
66	747349	1	WIRE ASSY, SEAT SWITCH
67	747689	1	STRAIN RELIEF, CABLE DIA. .181-.312 #3210
68	827666	2	RIVET-POP 1/8 DOME HD, BLK ALUM BODY
69	3303255	1	CLAMP-HOSE 1 3/4 NOM.
70	3344443	1	SWITCH - FLOAT FULL TSS/CSS 82
71	3400089	4	WASHER 1/4 ID .63 OD X .065 THK
72	3401052	4	WASHER 1/4 ID X 1 OD X .049 THK SS
73	3401449	11	SCR-HI/LO SS 10-16X3/4 PAN HD PHL.
74	25510512	1	GASKET, RUBBER BLADE, PRESS IN
75	97118731	1	FILTER UNIT, SCREENED FLOAT

Tank Group - CE (Pg 1 of 3)

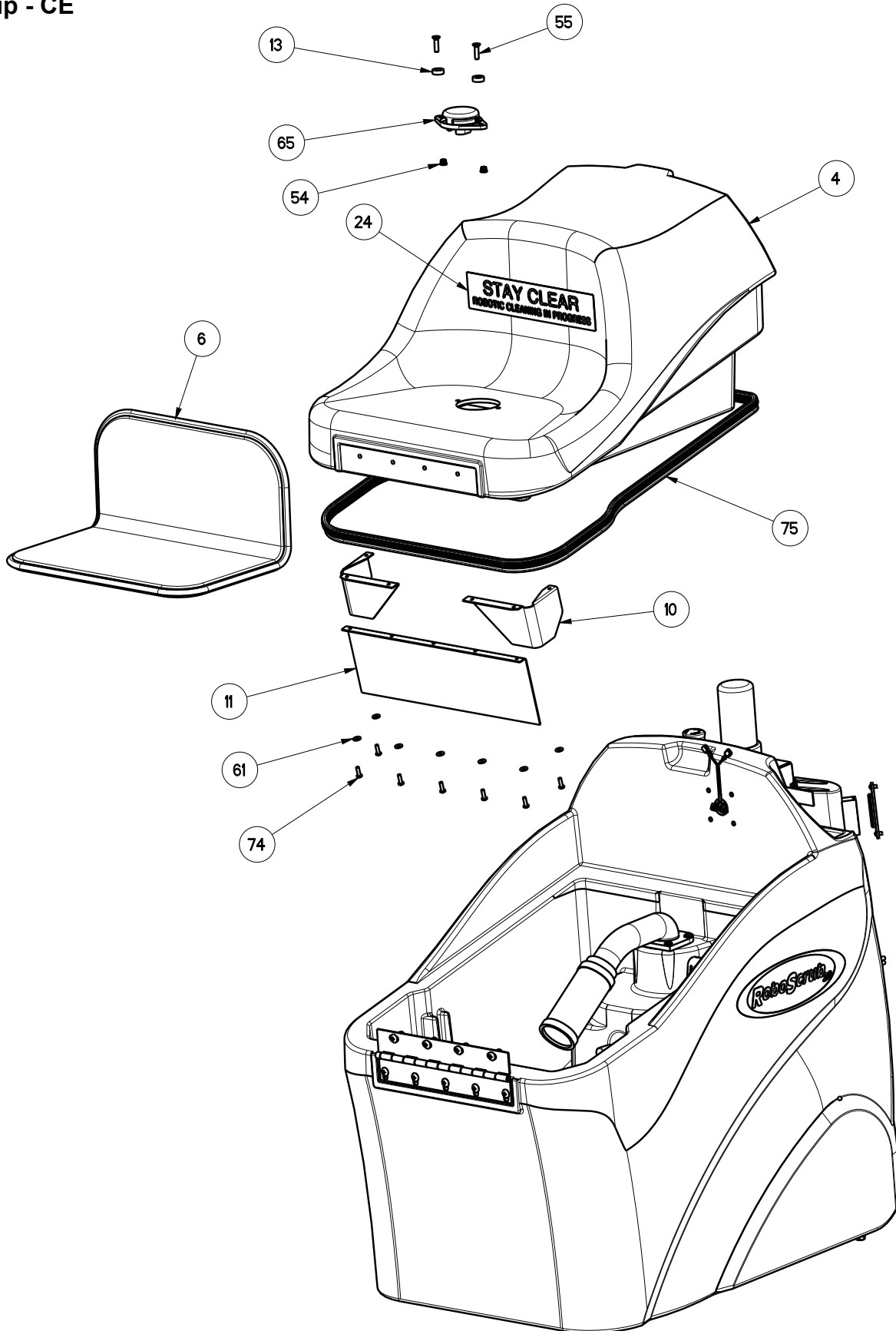


Rev F

Tank Group - CE
(Pg 2 of 3)



Tank Group - CE
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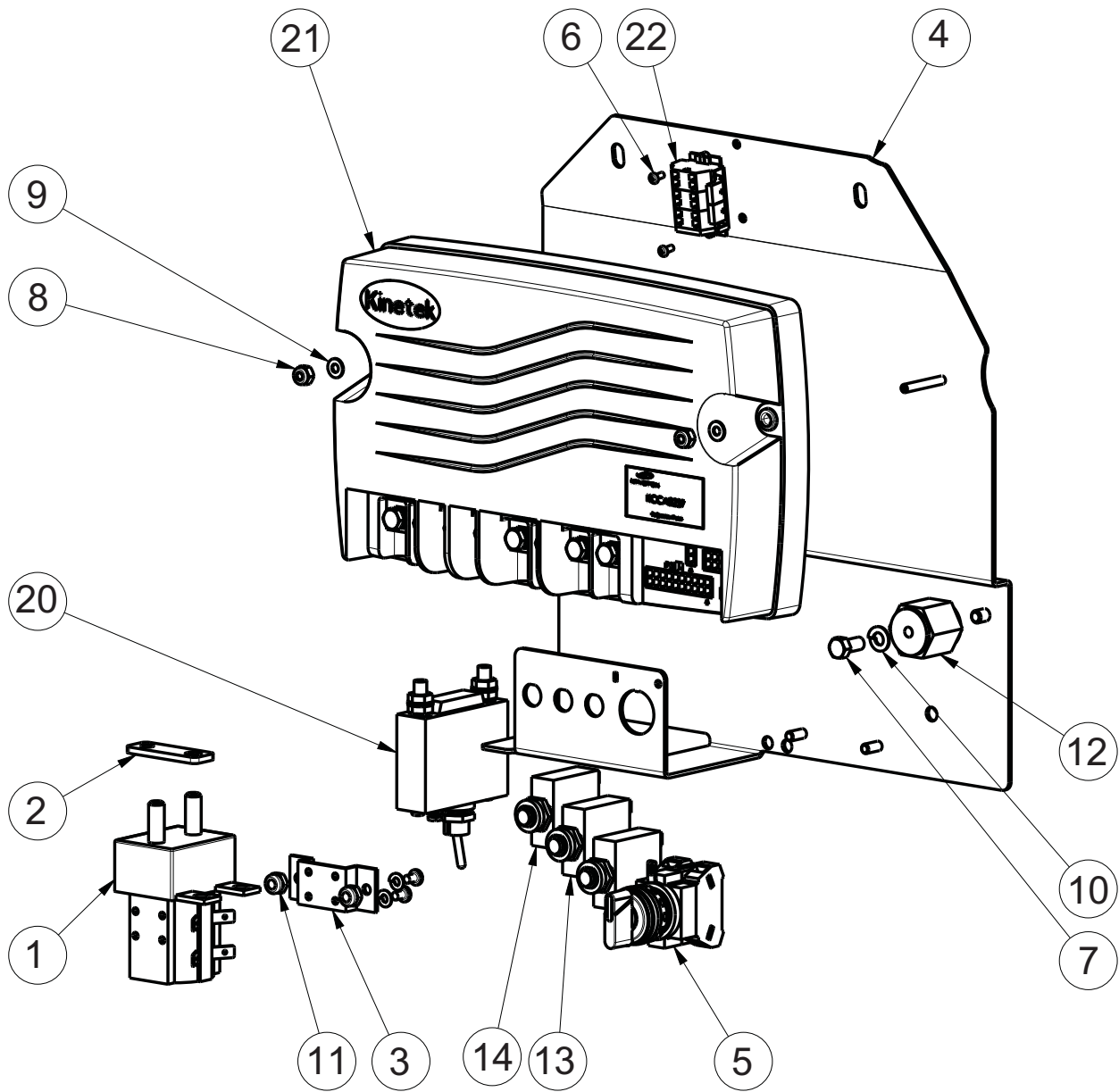
Tank Group BOM - CE (Pg 1 of 2)

BILL OF MATERIAL - 247650			
ITEM	PART NO.	QTY	DESCRIPTION
1	950-4-S	2	BACKUP PLATE - RIVET
2	172065	1	CLIP, FOR 1/2" ID HOSE
3	172159	1	FILTER, FILL PORT, ES1720
4	245002	1	LID W/ SEAT, TANK, ER 20-V
5	245422	1	HINGE, STEEL, 11.38" LONG
6	245444	1	SEAT-CUSHIONED, SEWN SEAT & BACK
7	245452	1	HOSE-DRAIN W/ TWIST VALVE 1.50" ID
8	245453	2	PLATE - INSERT, INTERCONNECT
9	245456	2	PLATE - BASE, INTERCONNECT
10	245766	2	SKIRT-DRIP, LID, END PIECE
11	245767	1	SKIRT-DRIP, LID,CENTER 20"
12	245802	1	SPACER, PVC, KEY SWITCH
13	245817	2	SPACER, .39 ID X .75 OD X .25 T, PVC
14	246113	1	COVER, ELECTRICAL, AUTO
15	246121	1	PUSHBUTTON, 40MM CLEAR
16	246123-1	1	ESTOP SWITCH ASSEMBLY
17	246184	1	GASKET, ELECTRICAL PANEL
18	246189	1	ASSY, 2-STAGE VACUUM
19	246257	4	SCR-BHSCS 10-24 X .50 SS BLK-OX
20	246273	1	FITTING 3/4"MNPT X 3/8"-16
21	246801-1	1	BEACON, AMBER
22	246802	1	GASKET, BEACON
23	246805-1	1	FLOAT SWITCH ASSEMBLY
24	246806	1	DECAL, CAUTION, AUTONOMOUS
25	246829	1	DECAL, BRAIN CORP REAR
26	246936	1	BRACKET, VACUUM
27	246938	4	SPACER, .252 X .625 X 1.25, NYL
28	247125	2	BARRIER MOUNT
29	247128	1	DECAL, CLEAN WATER FILL
30	247129	1	DECAL, MAX FILL
31	247130	1	DECAL, DRAIN
32	247180	1	TANK, SOLUTION & RECOVERY AUTO
33	247602	1	SCR-BHSCS 10-24 X .63 SS BLK-OX
34	247605	1	BRACKET, REAR COVER LATCH
35	247608	2	RETRACTABLE BARRIER
36	247613	1	BUMPER, .80 OD X .78 H RUBBER
37	247617	4	SCR-HI/LO #10-16 X 3/8
38	247621	1	RECOVERY FILTER, MR20

Tank Group BOM - CE (Pg 2 of 2)

BILL OF MATERIAL - 247650			
ITEM	PART NO.	QTY	DESCRIPTION
39	247651	1	ASSY, ELECTRICAL PANEL, AUTO CE
40	260579	1	TOOL CLIP, 1.5" HOSE
41	342440	1	FITTING, TEE 3/4MPT 1/2BARB
42	710130	4	SCR-MC 8-32 X .62 NICKEL
43	710303	8	SCR-MC RD HD 6-32 X .50 STL ZINC
44	710307	1	SCR-MC 6-32 X 1.0 ST PL PAN HD
45	710528	2	SCR-MC 8-32 X .37 FH - BR
46	711163	2	SCR-HI/LO #10-16 X 1/2
47	711214	4	BLT-HH 1/4-20 X 2.00
48	711371	9	NUT-NYLOC 6-32 ZP
49	711502	3	WASHER-FLAT #8 ZP
50	711515	4	WSR-FLAT .406 X .812 X .0625
51	711527	2	WSR-FLAT .63 X 1.12 X .09
52	711529	4	WASHER-RUBBER .25 X 1.00 X .110
53	711546	4	WSR-HELICAL 3/8
54	711962	2	NUT, 1/4-20, HIGH-TORQUE 12 POINT FLANGE
55	712153	2	SC-SHCS, 1/4-20 x 1.00 IN SS
56	712536	7	SCR-MC 10-24 X .62 TH SS
57	712540	12	SCR-MC TR HD 10-24 X .37 SS
58	712565	9	SCR-MC 1/4-20X.63 SS TR HD
59	712638	4	NUT, HEX 10-24 SS NYLOC
60	712667	3	NUT-NYLOC 1/4-20 SS
61	712764	19	WASHER-FLAT #10 SS
62	712770	3	WSR INT LOCK #10A SS
63	713042	4	BLT-HH 3/8-16 X 1 #5
64	715986	2	DECAL, MAIN OVAL, ROBO SCRUB
65	740601	1	SWITCH, SEAT, BOLT MOUNT
66	747213	1	WIRE ASSY, TANK SWITCH CONN
67	747349	1	WIRE ASSY, SEAT SWITCH
68	747689	1	STRAIN RELIEF, CABLE DIA. .181-.312 #3210
69	827666	2	RIVET-POP 1/8 DOME HD, BLK ALUM BODY
70	3303255	1	CLAMP-HOSE 1 3/4 NOM.
71	3344443	1	SWITCH - FLOAT FULL TSS/CSS 82
72	3400089	4	WASHER 1/4 ID .63 OD X .065 THK
73	3401052	4	WASHER 1/4 ID X 1 OD X .049 THK SS
74	3401449	11	SCR-HI/LO SS 10-16X3/4 PAN HD PHL.
75	25510512	1	GASKET, RUBBER BLADE, PRESS IN
76	97118731	1	FILTER UNIT, SCREENED FLOAT

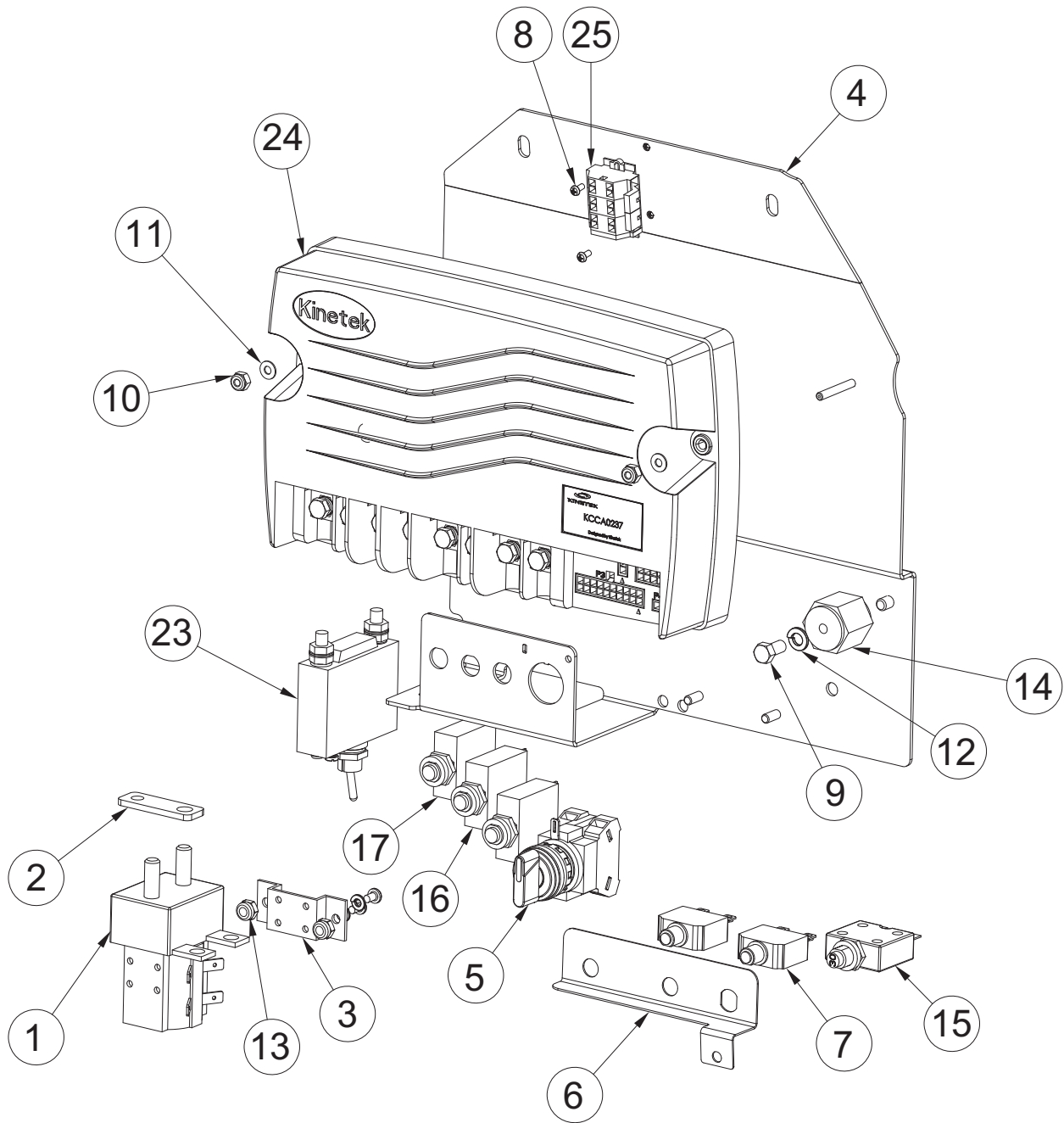
Electrical Panel Assembly



Electrical Panel Assembly BOM

BILL OF MATERIAL - 246175 / 246175LI			
ITEM	PART NO.	QTY	DESCRIPTION
1	246838	1	RELAY, 24VDC SPDT 100A
2	246841	1	BRACKET, TERMINAL
3	246845	1	BRACKET, 246838 RELAY
4	247101	1	PANEL, ELECTRICAL, AUTO
5	247102	1	MODE SWITCH
6	710491	2	SCR-MC 4-40 x .25 ROUND HD PHILLIPS
7	711202	1	BLT-HH 1/4-20 X 0.50 STPL
8	711372	2	NUT-NYLOC 8-32 ZP
9	711502	2	WASHER-FLAT #8 ZP
10	711544	1	WSR-HELICAL 1/4
11	712638	2	NUT, HEX 10-24 SS NYLOC
12	740132	1	INSULATOR, PLASTIC
13	741400	2	CIRCUIT BREAKER - 10A
14	746035	1	CIRCUIT BREAKER - 2.0A
15	747258	1	ELECTRICAL COMMON PARTS
16	747273	1	HARN, DRIVE MOTOR MR ROBOT
17	747274	1	HARN, CONTROL MR ROBOT
18	747275	1	HARN, BRUSH MOTOR MR ROBOT
19	747276	1	HARN, MODULE MR ROBOT
20	748012	1	CIRCUIT BREAKER ASSY - 100A
21	748526	1	CONTROLLER, MR20, AGM BATTERY
	748576		CONTROLLER, MR20, LITHIUM ION BATTERY

Electrical Panel Assembly CE



Rev A

Electrical Panel Assembly CE BOM

BILL OF MATERIAL - 247651 / 247651LI			
ITEM	PART NO.	QTY	DESCRIPTION
1	246838	1	RELAY, 24VDC SPDT 100A
2	246841	1	BRACKET, TERMINAL
3	246845	1	BRACKET, 246838 RELAY
4	247101	1	PANEL, ELECTRICAL, AUTO
5	247102	1	MODE SWITCH
6	247122	1	CIRCUIT BREAKER MOUNT
7	247604	2	CIRCUIT BREAKER-40A PUSH BUTTON
8	710491	2	SCR-RHMS 4-40 X .25 ZP
9	711202	1	SCR-HH 1/4-20 X .50 ZP
10	711372	2	NUT-NYLOC 8-32 ZP
11	711502	2	WASHER-FLAT #8 ZP
12	711544	1	WASHER-LOCK 1/4 SPLIT ZP
13	712638	2	NUT-NYLOC 10-24 SS
14	740132	1	INSULATOR (ELECTRICAL)- 1/4-20 INSERT
15	740247	1	CIRCUIT BREAKER-30AMP PUSH BUTTON
16	741400	2	CIRCUIT BREAKER 10A PUSH BUTTON
17	746035	1	CIRCUIT BREAKER-2.0AMP PUSH BUTTON
18	747258CE	1	ELECT COMMON PARTS ROBOT
19	747279	1	HARN, DRIVE MOTOR MR ROBOT, CE
20	747274	1	HARN, CONTROL MR ROBOT
21	747278	1	HARN, BRUSH MOTOR MR ROBOT, CE
22	747276	1	HARN, MODULE MR ROBOT
23	748012	1	CIRCUIT BREAKER- 100A
24	748526	1	CONTROLLER, MR20, AGM BATTERY
	748576		CONTROLLER, MR20, LITHIUM ION BATTERY
25	748628	1	TERMINAL BLOCK, ASSY, 3 SECTION

Electrical Components List

BILL OF MATERIAL - 747258			
ITEM	PART NO.	QTY	DESCRIPTION
1	247609	1	RED HANDLE SB175 & SBE160
2	740159	1	CONNECTOR-SB175 RED HOUSING
3	747214	1	WIRE ASSY, BEACON
4	747215	3	WIRE ASSY, RED, 14 AWG
5	747216	1	WIRE ASSY, RED, 14 AWG
6	747259	1	HARNESS, VACUUM MOTOR
7	747260	1	WIRE ASSY, RED, 14 AWG
8	747261	1	WIRE ASSY, BLACK, 14 AWG
9	747262	1	BATT CABLE ASSY, RED, 4 AWG
10	747263	1	BATT CABLE ASSY, BLACK, 4 AWG
11	747264	2	BATT CABLE ASSY, RED, 4 AWG
12	747266	1	WIRE ASSY, RED, 10 AWG
13	747267	1	WIRE ASSY, BLACK, 10 AWG
14	747271	1	WIRE ASSY, BLACK, 18 AWG

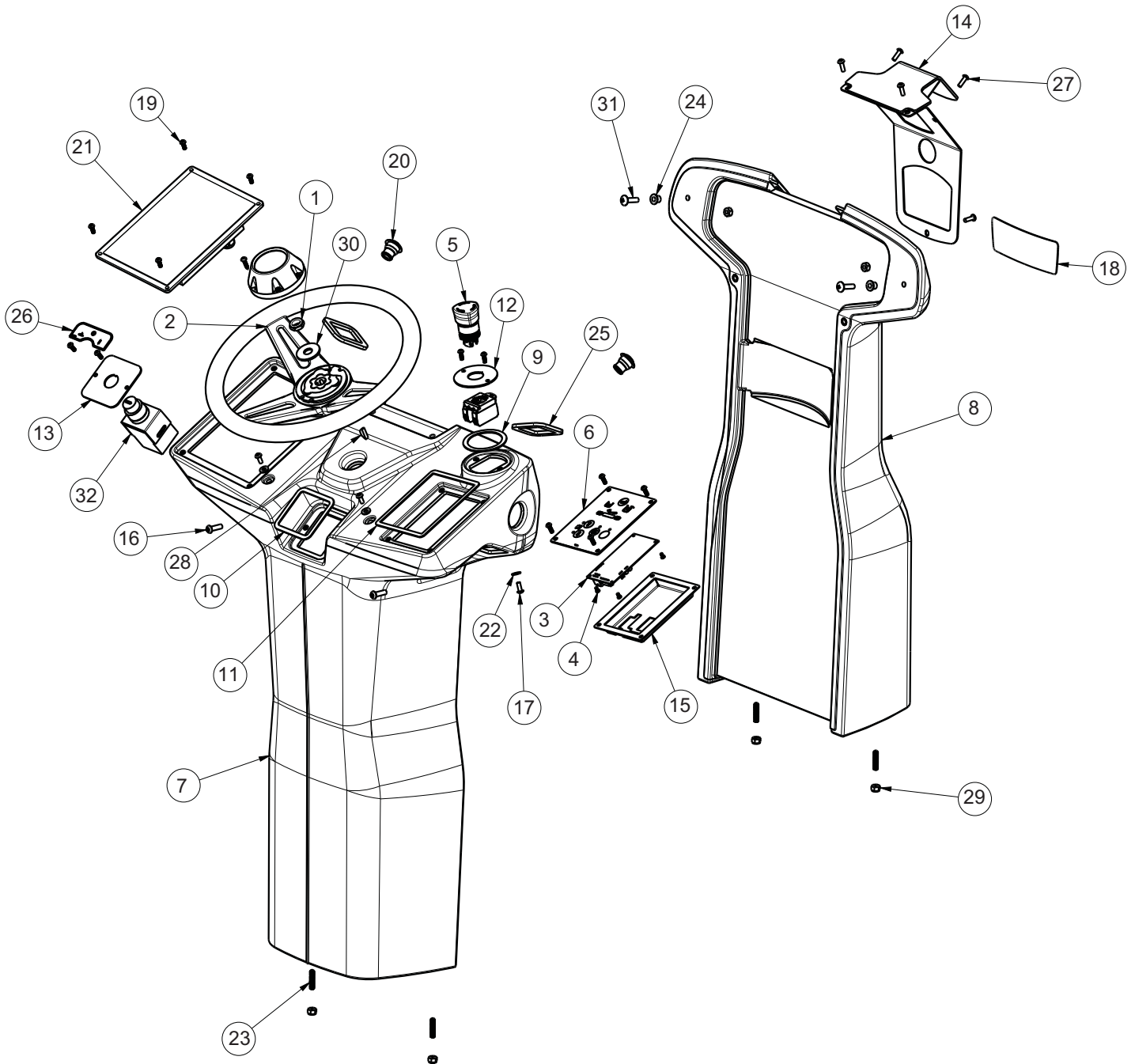
Electrical Components List CE

BILL OF MATERIAL - 747258CE			
ITEM	PART NO.	QTY	DESCRIPTION
1	247609	1	RED HANDLE SB175 & SBE160
2	740159	1	CONNECTOR-SB175 RED HOUSING
3	747214	1	WIRE ASSY, BEACON
4	747215	3	WIRE ASSY, RED, 14 AWG
5	747216	1	WIRE ASSY, RED, 14 AWG
6	747260	1	WIRE ASSY, RED, 14 AWG
7	747261	1	WIRE ASSY, BLACK, 14 AWG
8	747262	1	BATT CABLE ASSY, RED, 4 AWG
9	747263	1	BATT CABLE ASSY, BLACK, 4 AWG
10	747264	2	BATT CABLE ASSY, RED, 4 AWG
11	747266	1	WIRE ASSY, RED, 10 AWG
12	747267	1	WIRE ASSY, BLACK, 10 AWG
13	747271	1	WIRE ASSY, BLACK, 18 AWG
14	747277	1	HARNESS, VACUUM MOTOR
15	747280	1	WIRE ASSY, RED, 8 AWG
16	747281	1	WIRE ASSY, BLACK, 10 AWG
17	747329	1	WIRE ASSY, RED, 12 AWG
18	800875	2	RING TERMINAL-10-12G #10 NON INSULATED
19	830529-1	2	HEAT SHRINK-1/4 VERSAFIT, 1" LENGTH

Autonomous Components List

BILL OF MATERIAL			
ITEM	PART NO.	QTY	DESCRIPTION
1	246118	1	PCB ASSEMBLY, AUTO
2	246121	1	PUSHBUTTON, 40MM CLEAR INCLUDED IN 24684
3	246264	1	DECAL, BRAIN FRONT INCLUDED IN 246840
4	246266	1	MOTOR AMP MODULE
5	246269	1	IFM MODULE
6	246800	3	2D CAMERA MODULE
7	246804	1	FAN MODULE INCLUDED IN 246840
8	246811	1	IFM O3X MODULE, RIGHT
9	246812	2	TURN INDICATOR
10	246813	1	TOUCH SCREEN MODULE
11	246825	1	IFM O3X MODULE, LEFT
12	246827	1	LIDAR MODULE, SLANTED
13	246829	1	DECAL, BRAIN CORP REAR INCLUDED IN 24684
14	246831	1	STANDARD HOME LOCATION PACK
15	246833	1	HARNESS, DOWN TRUNK
16	246835	1	CABLE, TRACTION ENCODER
17	246836	1	CABLE, SERVICE PORT INCLUDED IN 246840
18	246839	1	FINGER GUARD, 60MM INCLUDED IN 246840
19	246949	1	ANTENNA 4G
20	246952	1	COMMUNICATION MODULE
21	247102	1	MODE SWITCH INCLUDED IN 246840
22	247108	1	HARNESS, POWER TRUNK
23	247109	1	DECAL, PIN CODE AND SERVICE SUPPORT MR20
24	247110	1	DECAL, ROBOT ID NUMBER (RIN) MR20
25	247111	1	DECAL, SIERRA COMPLIANCE MR20
26	247534	1	BRAIN CONTROL MODULE
27	247628	1	LIDAR MODULE, HORIZONTAL
28	247629	1	HARNESS, UPPER TRUNK

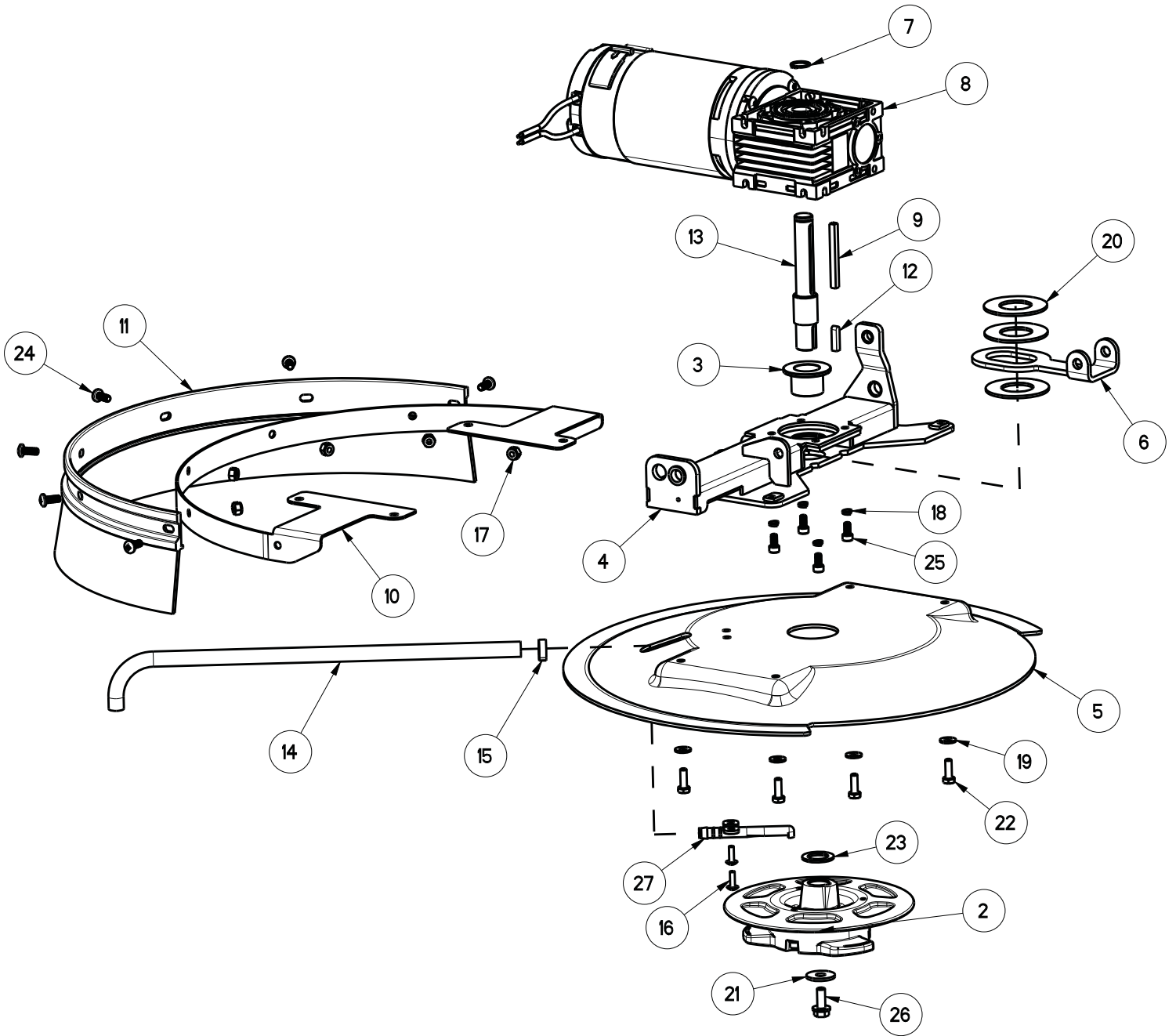
Console Group



Console Group BOM

BILL OF MATERIAL - 246179			
ITEM	PART NO.	QTY	DESCRIPTION
1	368-816	1	HALF NUT NYLOC 1/2-20
2	245345	1	STEERING WHEEL
3	246118	1	VEHICLE INTERFACE PCB
4	246122	4	SCR-PHMS M3 X 6 ZP
5	246123	1	ESTOP SWITCH ASSEMBLY
6	246176	1	MEMBRANE, PCB, ASSEMBLY
7	246177	1	CONSOLE, REAR, MR20 AUTO
8	246178	1	CONSOLE, FRONT, MR20 AUTO
9	246185	1	GASKET, ESTOP
10	246186	1	GASKET, KEYSWITCH
11	246188	1	GASKET, VEHICLE CONTROL
12	246233	1	PLATE, ESTOP MOUNT
13	246234	1	PLATE, SWITCH MOUNT
14	246235	1	WELDMENT, FRONT COVER
15	246238	1	WELDMENT, MEMBRANE COVER
16	246256	2	SCR-BHSCS 1/4-20 X .88 SS BLK-OX
17	246257	4	SCR-BHSCS 10-24 X .50 SS BLK-OX
18	246264	1	DECAL, BRAIN CORP FRONT
19	246265	12	SCR-BHSCS 8-32 X .50 SS BLK-OX
20	246812	2	TURN INDICATOR
21	246813	1	TOUCH SCREEN MODULE
22	246823	4	WASHER-FLAT .22 X .50 X .05 SS BLK
23	246843	4	SCR-SET 1/4-20 X 1.12 BLK OX CP
24	246844	2	BUSHING-FLG, .252 X .375 X .375 NYL
25	246847	2	GASKET, SIDE SENSOR
26	247126	1	DECAL, KEY SWITCH
27	247602	5	SCR-BHSCS 10-24 X .63 SS BLK-OX
28	383277	1	KEY WOODRUFF 3/16 X 3/4
29	711373	6	NUT-NYLOC 1/4-20
30	711510	1	WSR FLAT .5 X 1.37 X .100
31	712541	2	SCR-MC 1/4-20 X 1.00 TH SS
32	747399	1	SWITCH, ROTARY CAM, ON/OFF/ON

Scrub Head Group

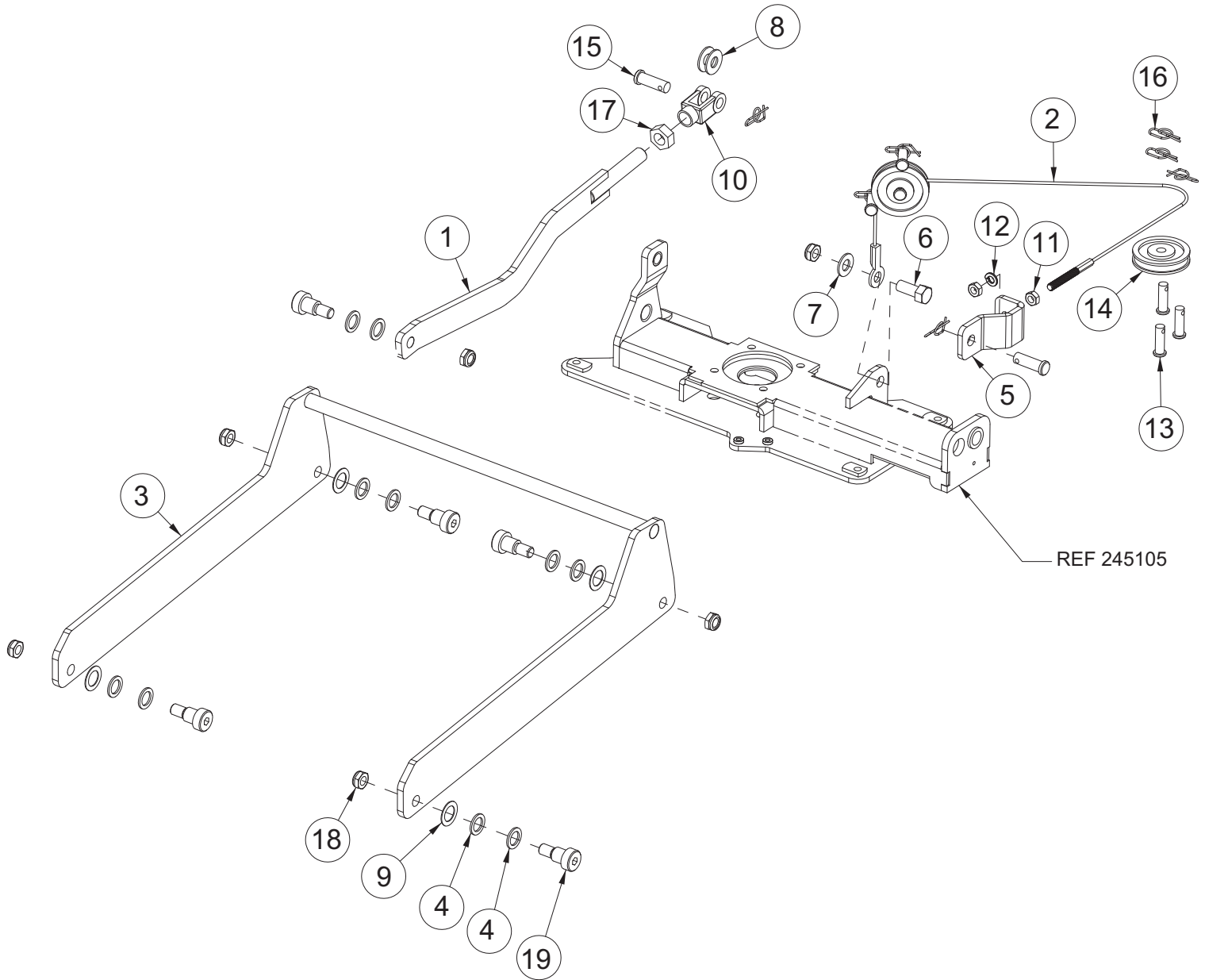


Rev B

Scrub Head Group BOM

BILL OF MATERIAL - 246173			
ITEM	PART NO.	QTY	DESCRIPTION
1	712	1	LOCTITE-243 50ML BLUE
2	172510	1	HUB ASSEMBLY, DISC DECK
3	245042	1	BUSHING-FLG, 1.0 x 1.25 x 1.0"LG OILITE
4	245105	1	FRAME, SCRUBDECK, 20", WELD
5	245300	1	SCRUB HEAD COVER 20"
6	245312	1	RING, PIVOT
7	245468	1	EXTERNAL RETAINING RING, 11/16" SHAFT, STEEL
8	245808	1	GEAR-MOTOR, BRUSH, 24VDC 400W, AMER
9	245812	1	KEY-6MM X 6MM X 2.625
10	246095	1	BRACKET, DECK SKIRT
11	246104	1	DECK BRUSH SKIRT
12	246946	1	KEY, 6MM X 6MM
	245811		KEY, 6MM X 6MM (<i>PRIOR TO S/N 18110267</i>)
13	246947	1	SHAFT-STUB, RT-ANGLE DRIVE, DISK
	245107		SHAFT-STUB, RT-ANGLE (<i>PRIOR TO S/N 18110267</i>)
14	283153	1	HOSE 3/8" ID X 16.5"
15	452037	1	CLAMP-CRIMP 170R SS
16	710154	2	SCR-THMS 10-32 X .625 SS
17	711373	6	NUT-NYLOC 1/4-20
18	711421	4	WASHER-LOCK 1/4 SPLIT, HIGH-COLLAR, SS
19	711505	4	WASHER-FLAT 1/4 ZP
20	711687	3	WASHER-FLAT, 2.50 OD X 1.28 ID X .095 ZP
21	711855	1	WSR-FLT .37 X 1.12 X .10 STL Z HARD
22	713002	4	SCR-HH 1/4-20 X .75 ZP 5
23	717025	1	WASHER-FLAT .812 X 1.25 X .08 ZP
24	3400232	6	SCR-PHMS 1/4-20 X 0.62 ZP
25	3402054	4	SCR-SHCS M6-1.0 X 12 ZP
26	11717203	1	BLT-HH FLG M8X1.25X20 PRECOTE, ZD 10.9
27	90311663	1	FITTING, WATER NOZZLE W/ MOUNT HOLES

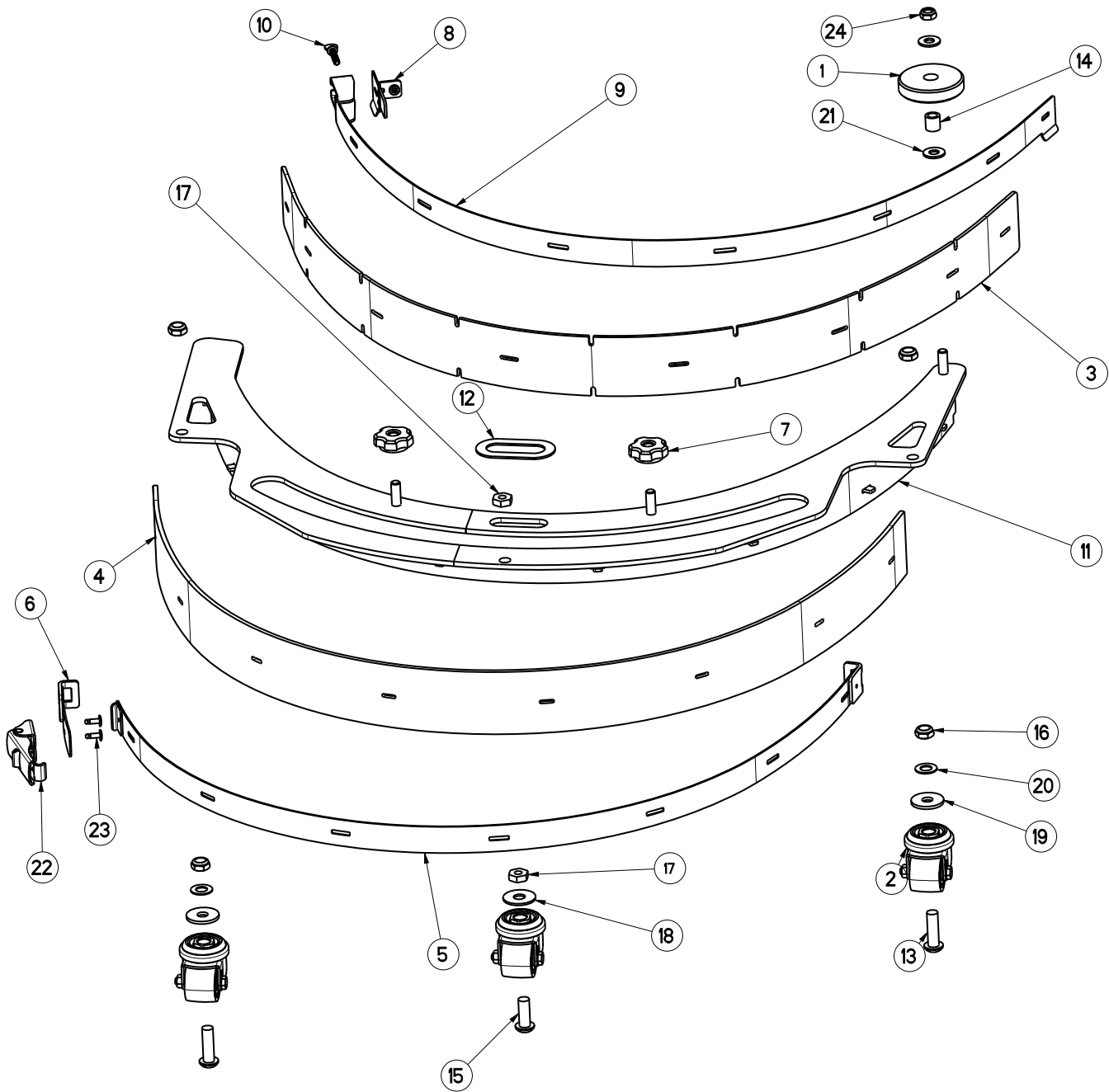
Scrub Head Lift Group



Scrub Head Lift Group BOM

BILL OF MATERIAL - 246172			
ITEM	PART NO.	QTY	DESCRIPTION
1	245138	1	ARM, DECK LIFT ADJUSTMENT, WELD
2	245843	1	CABLE- SCRUB DECK MR20, 21.9
3	246055	1	WELDMENT, SCRUBHEAD ARM 20"
4	246064	10	WASHER 1/2 X .75 X .062 NYLON
5	246070	1	LINK, CABLE
6	711246	1	BLT-HH 3/8-16 X .87 STL Z
7	711515	1	WSR-FLAT .406 X .812 X .0625
8	711569	2	WASHER-FLAT .390 X .880 X .062 NYL
9	711594	4	WSR-FLAT .56 X .88 X .03
10	712265	1	CLEVIS-YOKE, 1/2-20 WITH .375 PIN
11	712665	2	NUT-HEX 1/4-20 SS
12	712758	1	WSR-HELICAL 1/4 SS
13	881002	6	PIN-CLEVIS 5/16 X 1.00 ZINC
14	3300368	2	PULLEY-PLASTIC 2" x .25" GROOVE
15	3400117	2	PIN-CLEVIS 3/8 x 1.125 ZP
16	3400125	8	PIN-COTTER 3/8 RUE RING
17	3400449	1	NUT-JAM 1/2-20 ZP
18	3401028	6	NUT, 3/8-16 ELASTIC STOP (ES)
19	712099PLT	5	BLT-SHOULDER 1/2 X 1/2 RAW

Squeegee Group

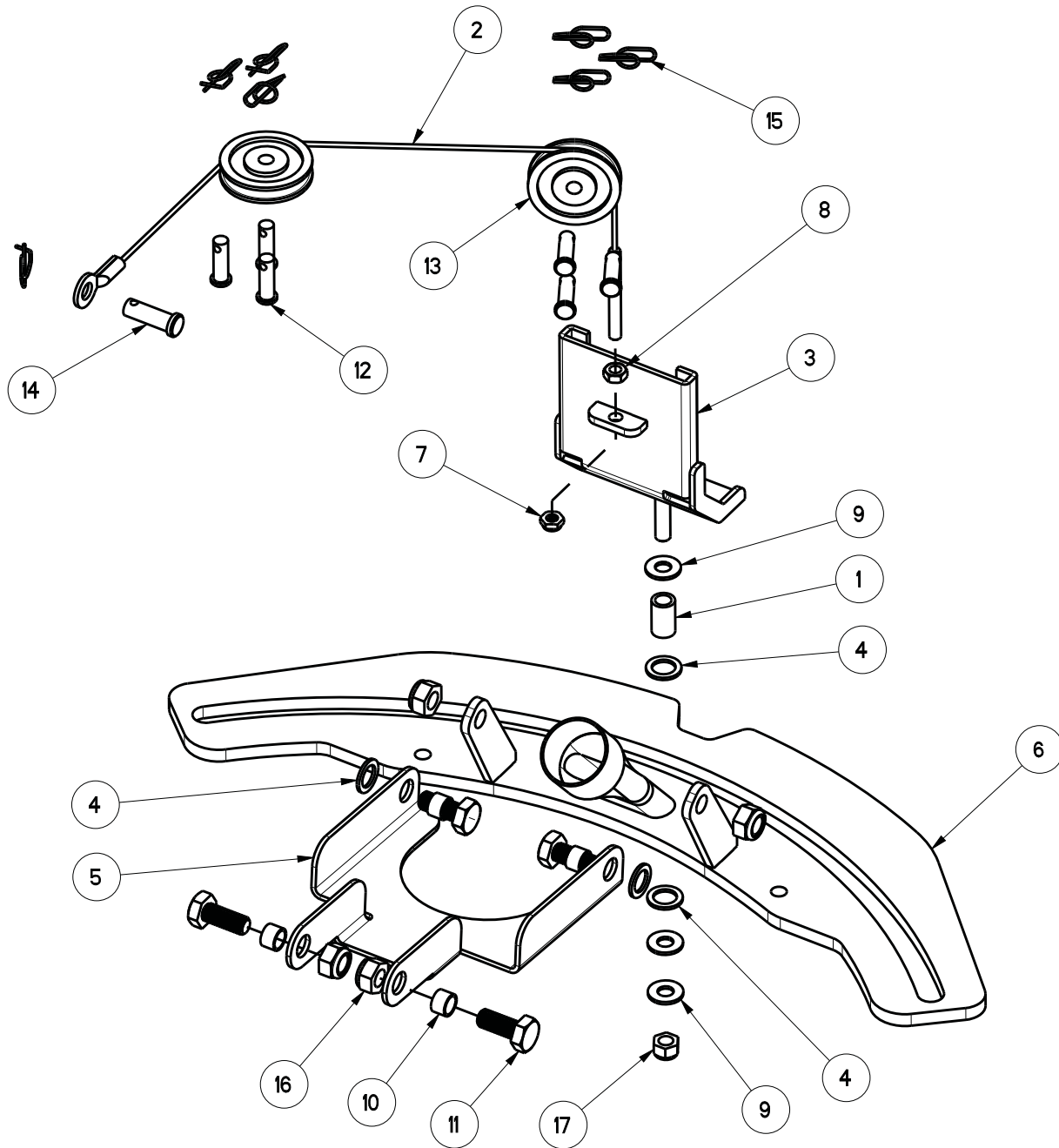


Rev J

Squeegee Group BOM

BILL OF MATERIAL - 246165			
ITEM	PART NO.	QTY	DESCRIPTION
1	245339	1	ROLLER- SQUEEGEE
2	245563	3	CASTER
3	246083	1	SQUEEGEE BLADE INNER 20
4	246084	1	SQUEEGEE BLADE OUTER 20
5	246087	1	WELDMENT, OUTER BAND, RT
6	246088	1	WELDMENT, OUTER BAND, LT
7	246942	2	KNOB-FLUTED, 5/16-18 SS
8	247626	1	WELDMENT, INNER BAND, LT
9	247627	1	WELDMENT, INNER BAND, RT
10	247631	1	SCREW, 10-24X1.00 FLANGED THUMB
11	247633	1	WELDMENT, 20 IN SQUEEGEE
12	247634	1	GASKET, SQUEEGEE
13	247635	2	SCR-SC 3/8-16 X 1.25 ZN STL
14	600114	1	SPACER, .328 B .498 OD .500, SS
15	710986	1	SCR-SC 3/8-16 X 1.0 ST PL
16	711375	4	NUT- NYLON LOCK, 3/8-16 HALF NUT
17	711391	2	NUT-JAM 3/8-16 ZP
18	711507	1	WSR-FLAT .37 X 1.12 X .06
19	711855	2	WSR-FLT .37 X 1.12 X .10 STL Z HARD
20	712767	2	FLAT WASHER .406 ID X .75 OD X
21	712772	2	WSR-FLAT .344 x .75 x .06 SS
22	730652	1	LATCH, UNDER CENTER
23	730654	2	RIVET-BLIND 5/32 .125 GRIP SS
24	3401098	1	NUT-HEX JAM 5/16-18 ES ZP

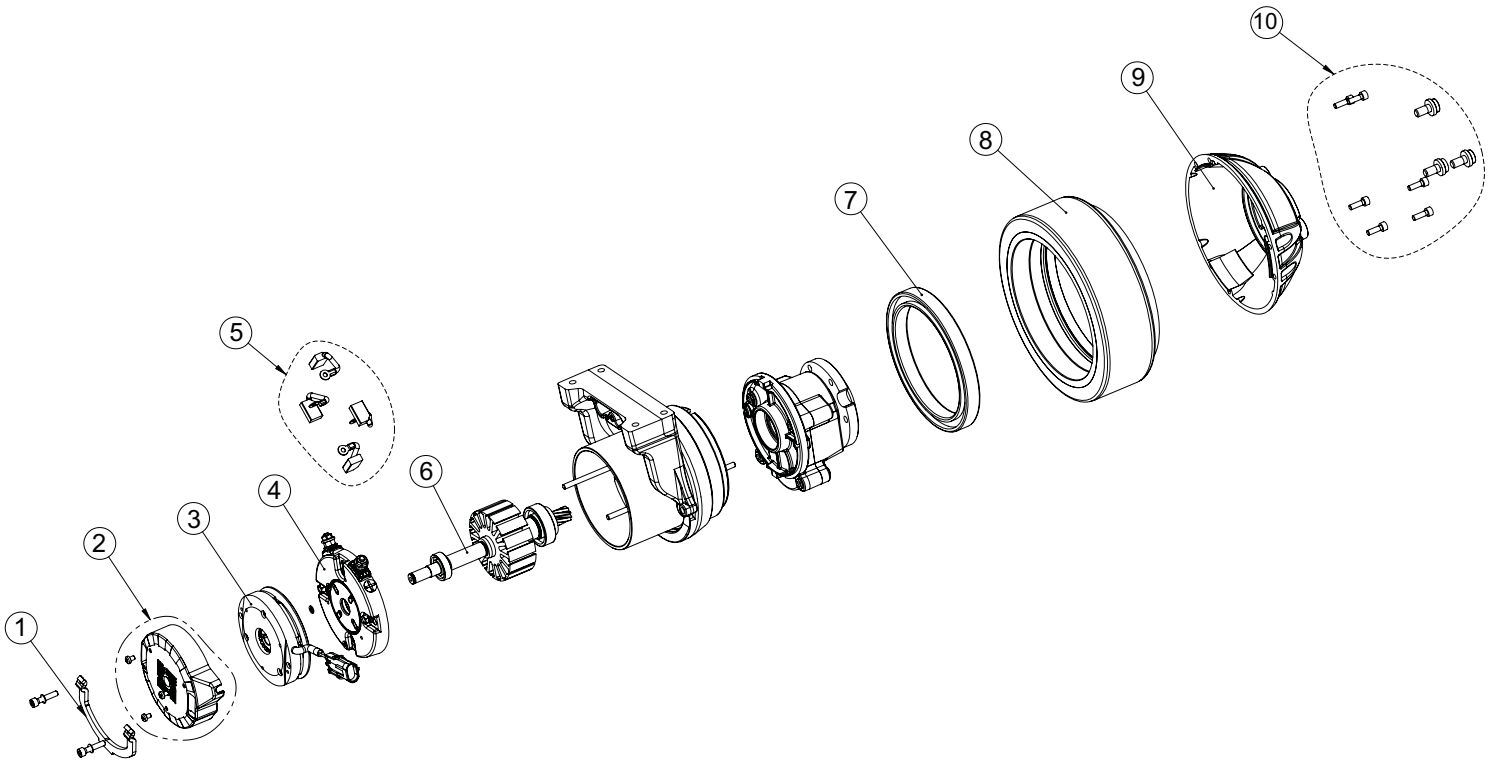
Squeegee Lift Group



Squeegee Lift Group BOM

BILL OF MATERIAL - 246163			
ITEM	PART NO.	QTY	DESCRIPTION
1	245309	1	SPACER, NYLON,0.344B .500 OD .813 T
2	245842	1	CABLE-SQUEEGEEMR20
3	246058	1	WELDMENT, SLIDER
4	246064	4	WASHER 1/2 X .75 X.062 NYLON
5	246939	1	LINK, SQUEEGEE PIVOT 20"
	246057		LINK, SQUEEGEE PIVOT 20" (PRIOR TO S/N 18110267)
6	247625	1	WELDMENT, SQUEEGEE MOUNT 20"
	246940		WELDMENT, SQUEEGEE MOUNT 20" (PRIOR TO S/N 20030124)
	246074		WELDMENT, SQUEEGEE MOUNT 20" (PRIOR TO S/N 18110267)
7	711688	1	NUT-JAM 1/4-20SS NYLOC
8	712665	1	NUT-HEX 1/4-20SS
9	712772	3	WSR-FLAT .344x .75x .06 SS
10	730873	4	SPACER, .406 B0.498OD .325 T
11	730958	4	SCR-HH M10-1.50 X 25 SS FULL THREAD
12	881002	6	PIN-CLEVIS 5/16 X 1.00 ZINC
13	3300368	2	PULLEY-PLASTIC2" x.25" GROOVE
14	3400117	1	PIN-CLEVIS 3/8x 1.125 ZP
15	3400125	7	PIN-COTTER 3/8RUERING
16	12040069	4	NUT-HEX NYLOCM10 ZDICH
17	12040259	1	NUT-NYLOC M8 X1.25SS

Chassis Drive Motor Replacement Parts

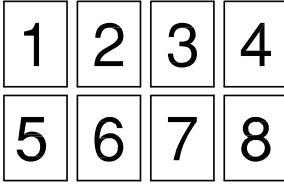


BILL OF MATERIAL			
ITEM	PART NO.	QTY	DESCRIPTION
1	2721029	1	BRAKE RELEASE LEVER
2	5000221	1	KIT FOR SPARE BRAKE COVER AND SCREWS
3	247106	1	ELECTRIC BRAKE
4	6020412	1	CARBON BRUSH HOLDER (INCLUDES BRUSHES AND CAPS)
5	2538004	1	KIT SPARE BRUSHES (SET OF 4)
6	6362284	1	ROTOR
7	2800759	1	WHEEL BEARING
8	4093466	1	POLYURETHANE WHEEL
9	4080935	1	ALUMINUM HUB
10	2538075	1	KIT SPARE SCREWS FOR HUB AND WHEEL
***	247107	1	ENCODER (NOT SHOWN)

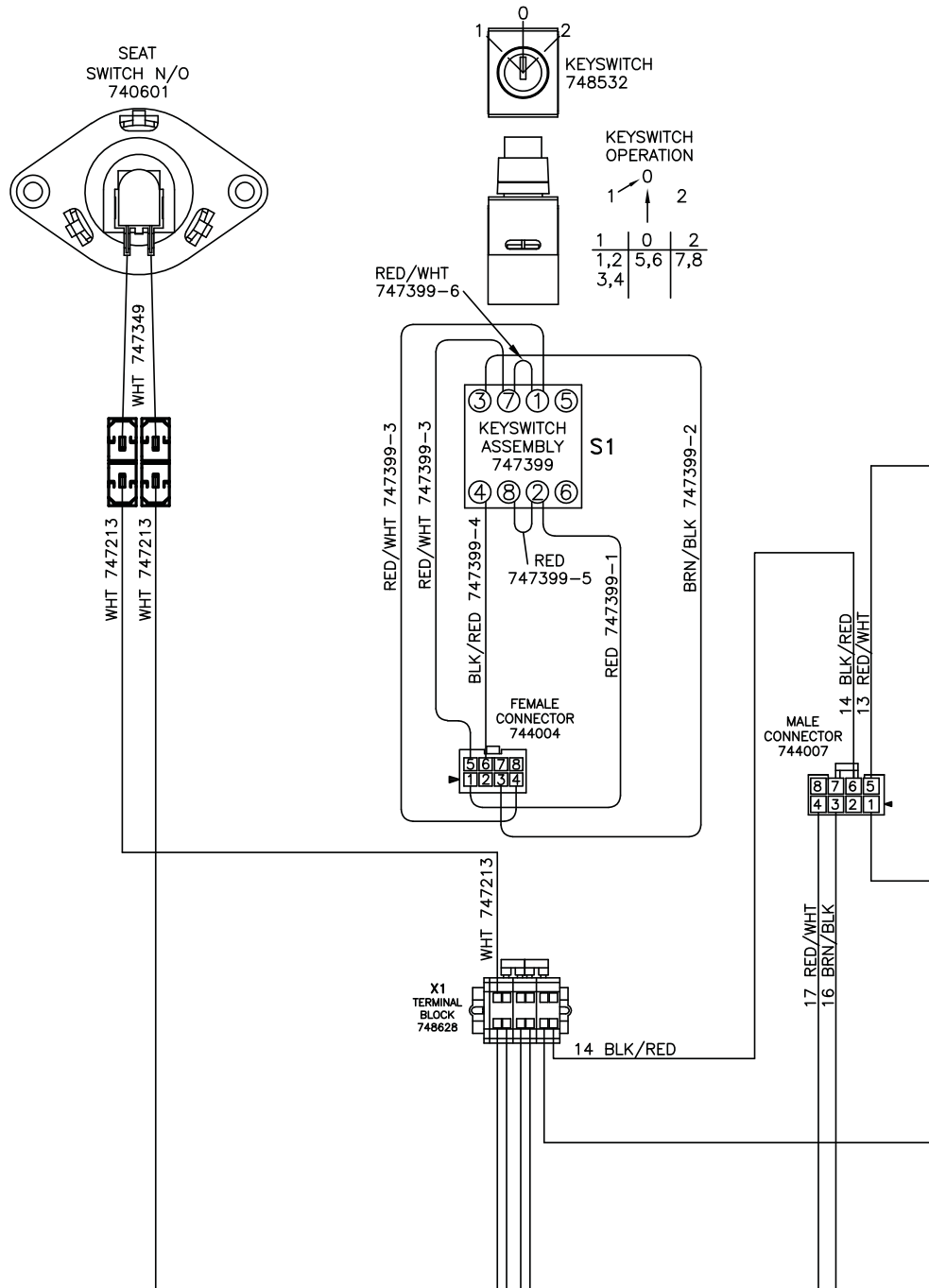
Electrical Schematics

1

PAGE LAYOUT



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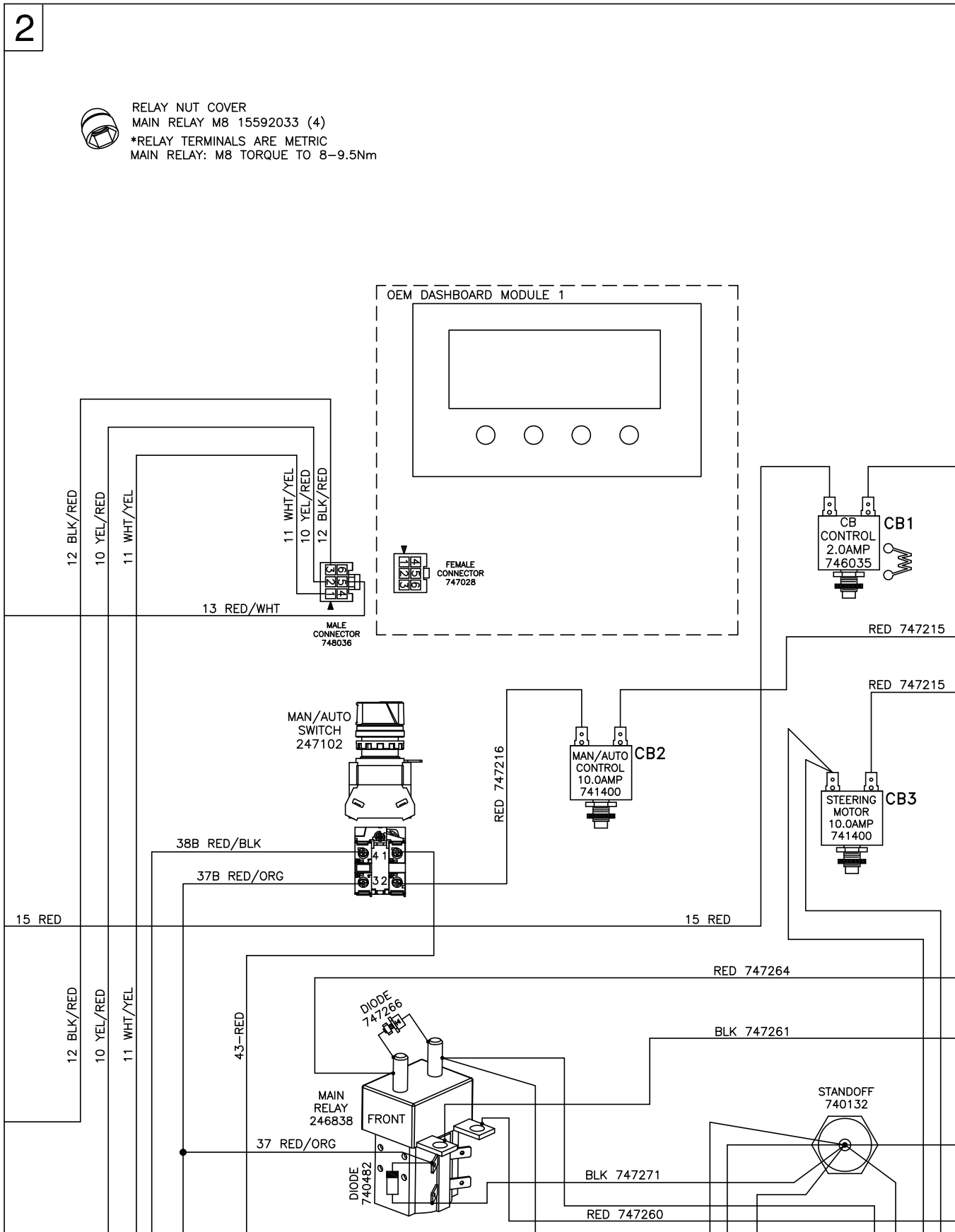


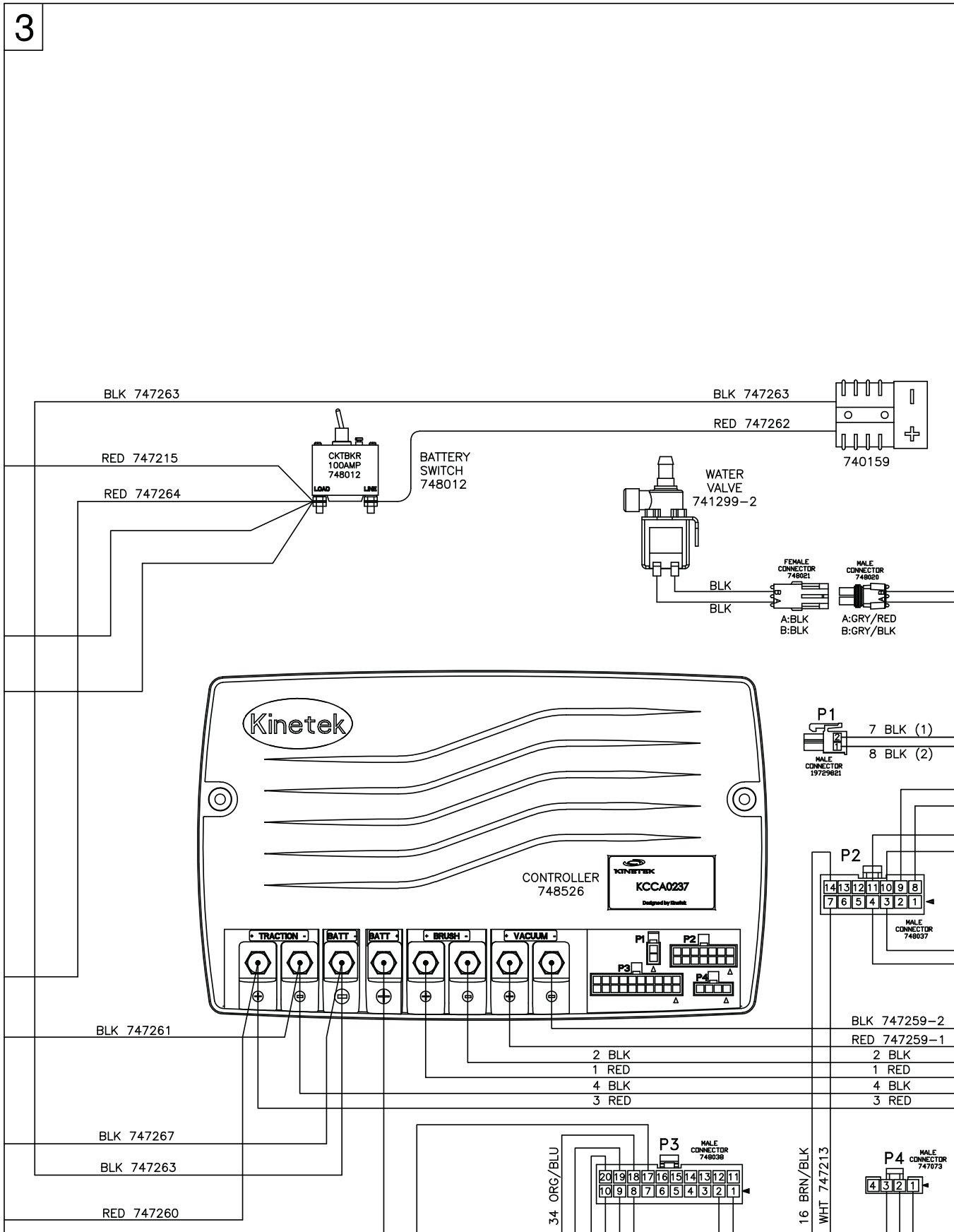
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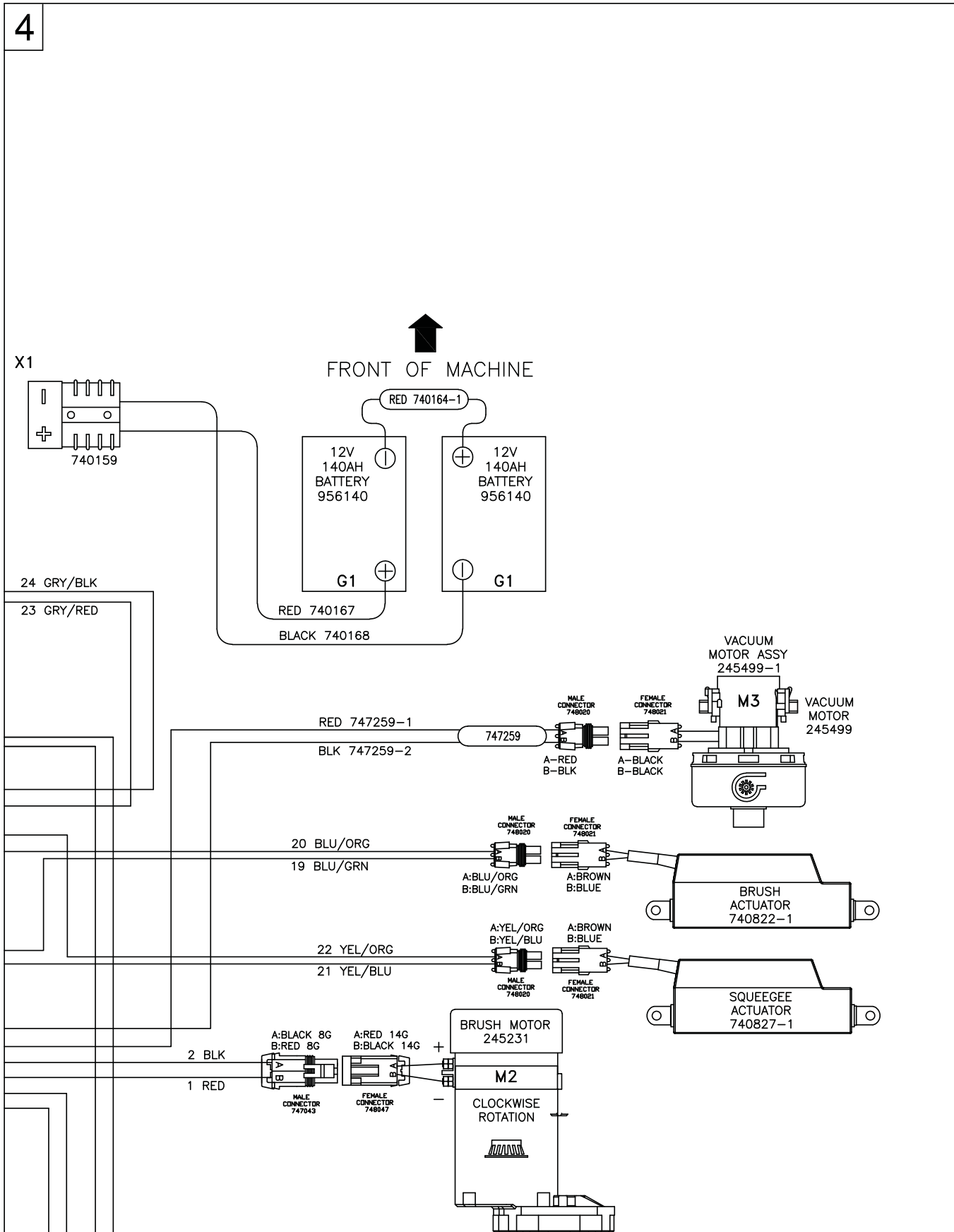
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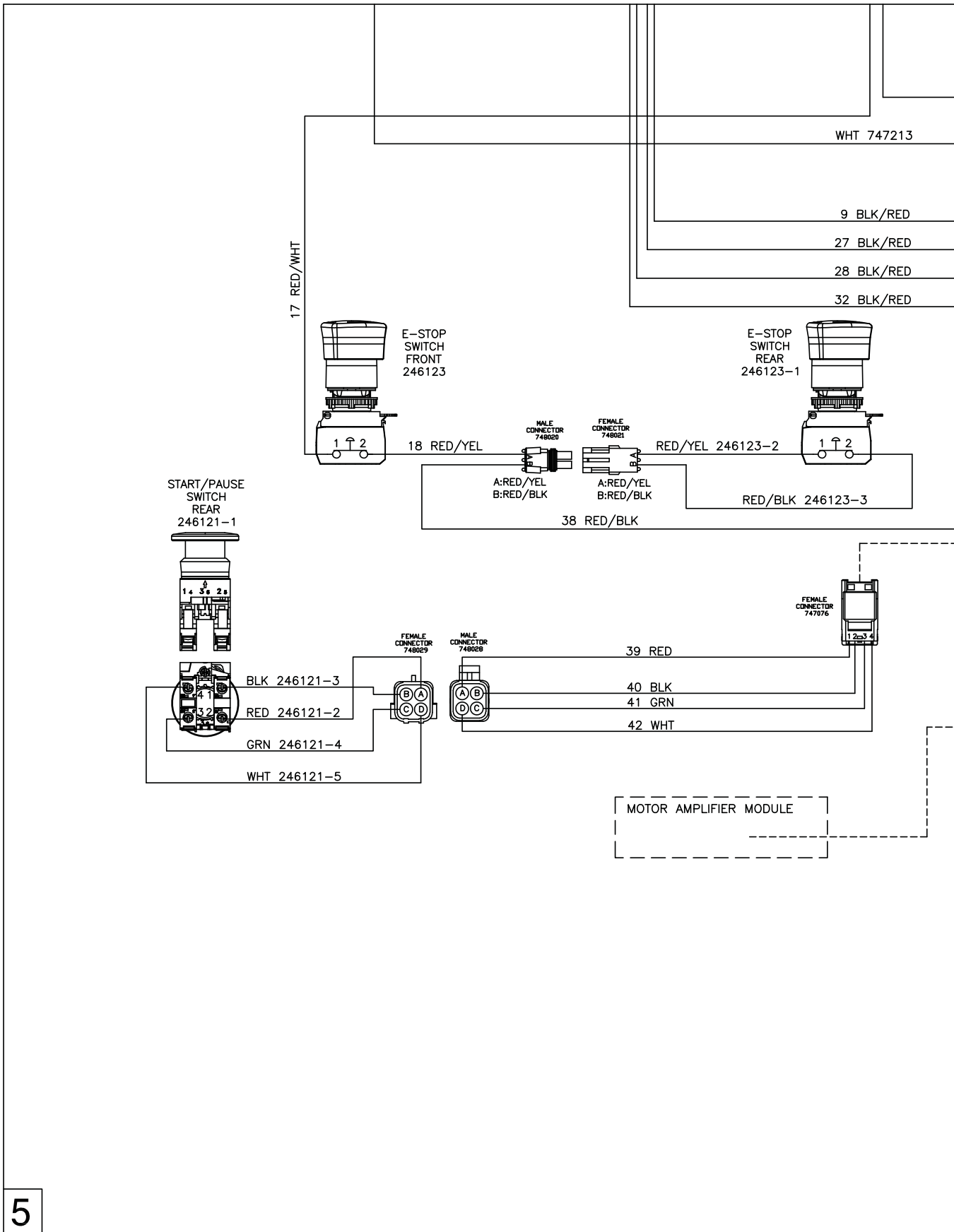


RELAY NUT COVER
MAIN RELAY M8 15592033 (4)
*RELAY TERMINALS ARE METRIC
MAIN RELAY: M8 TORQUE TO 8–9.5Nm

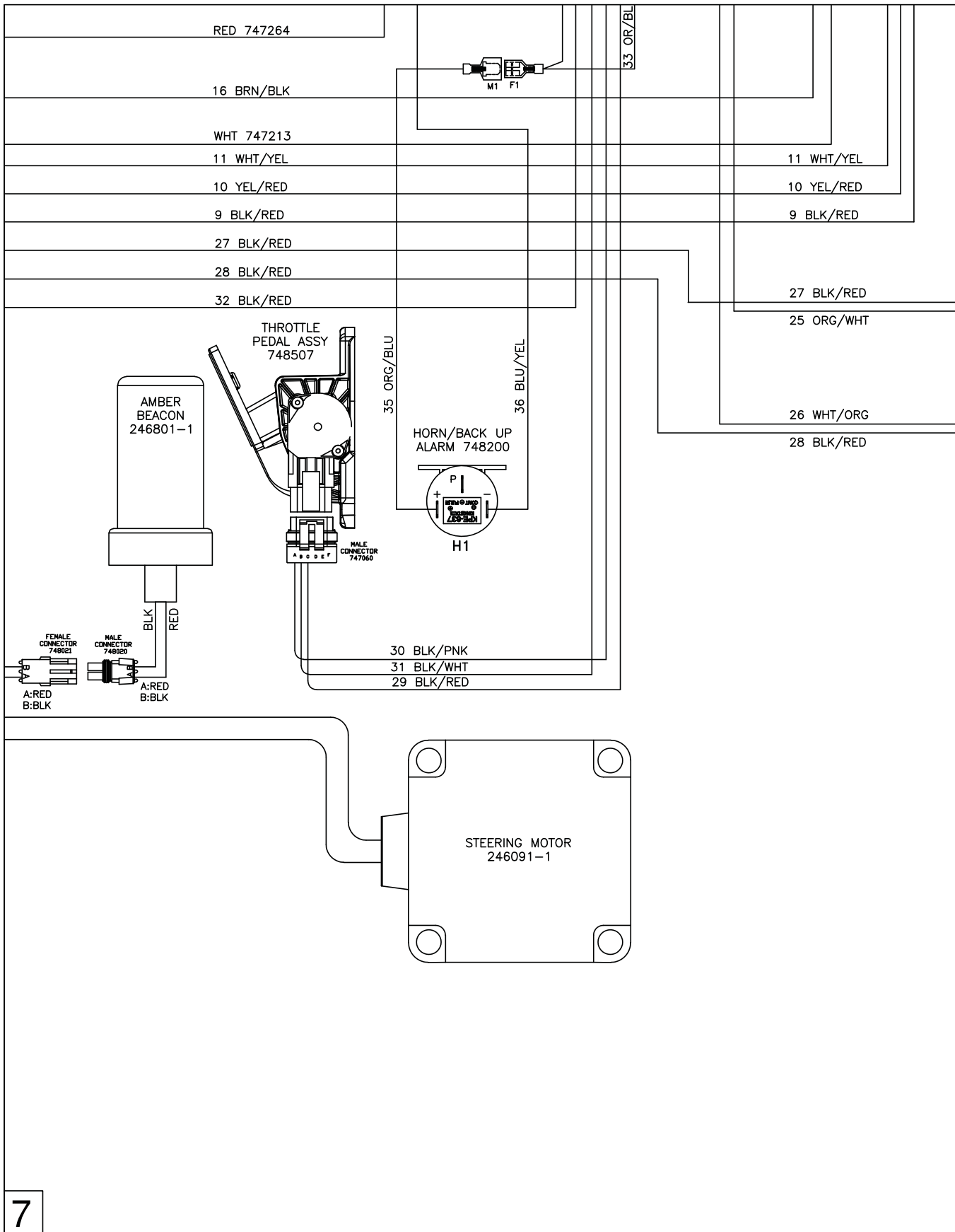


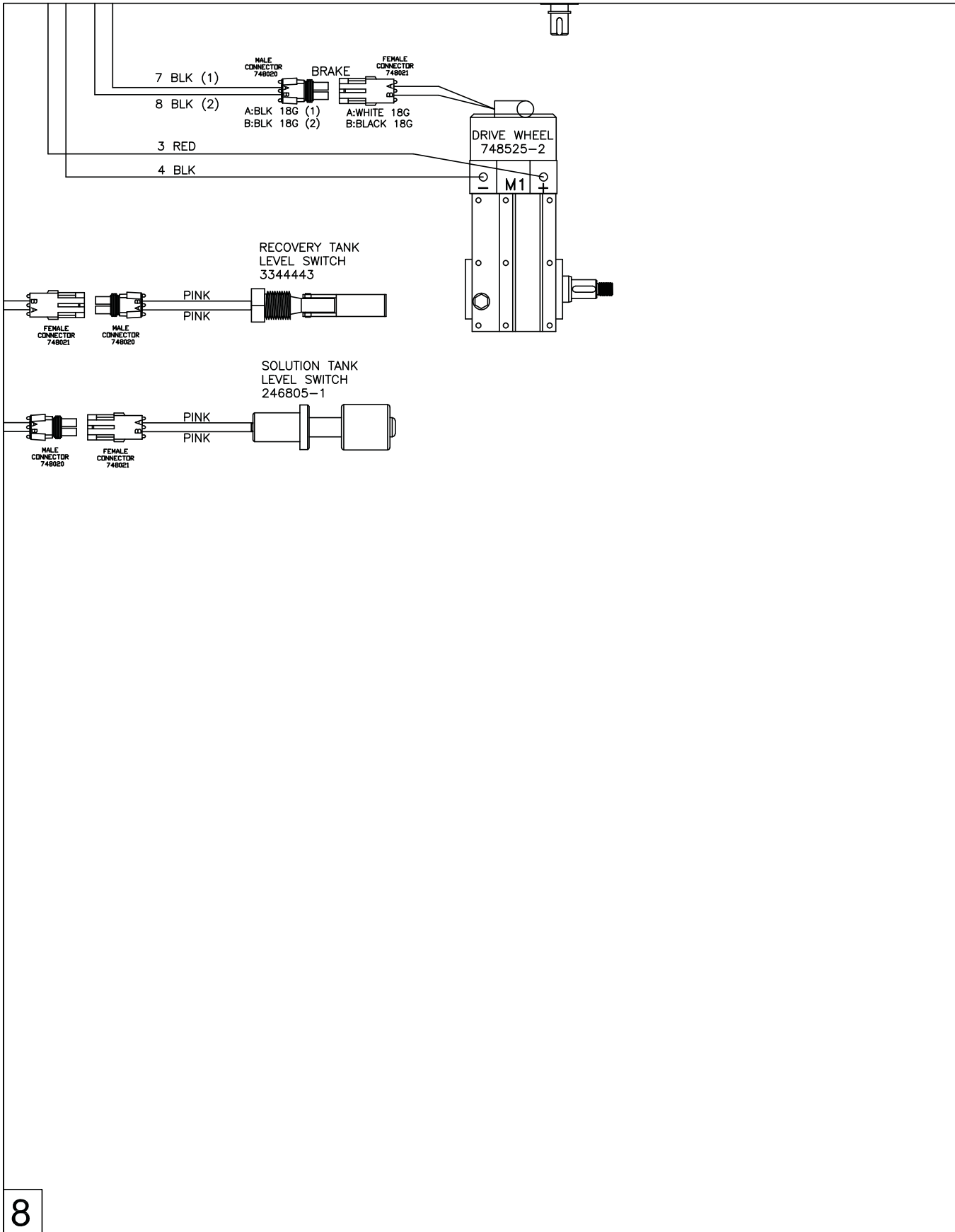






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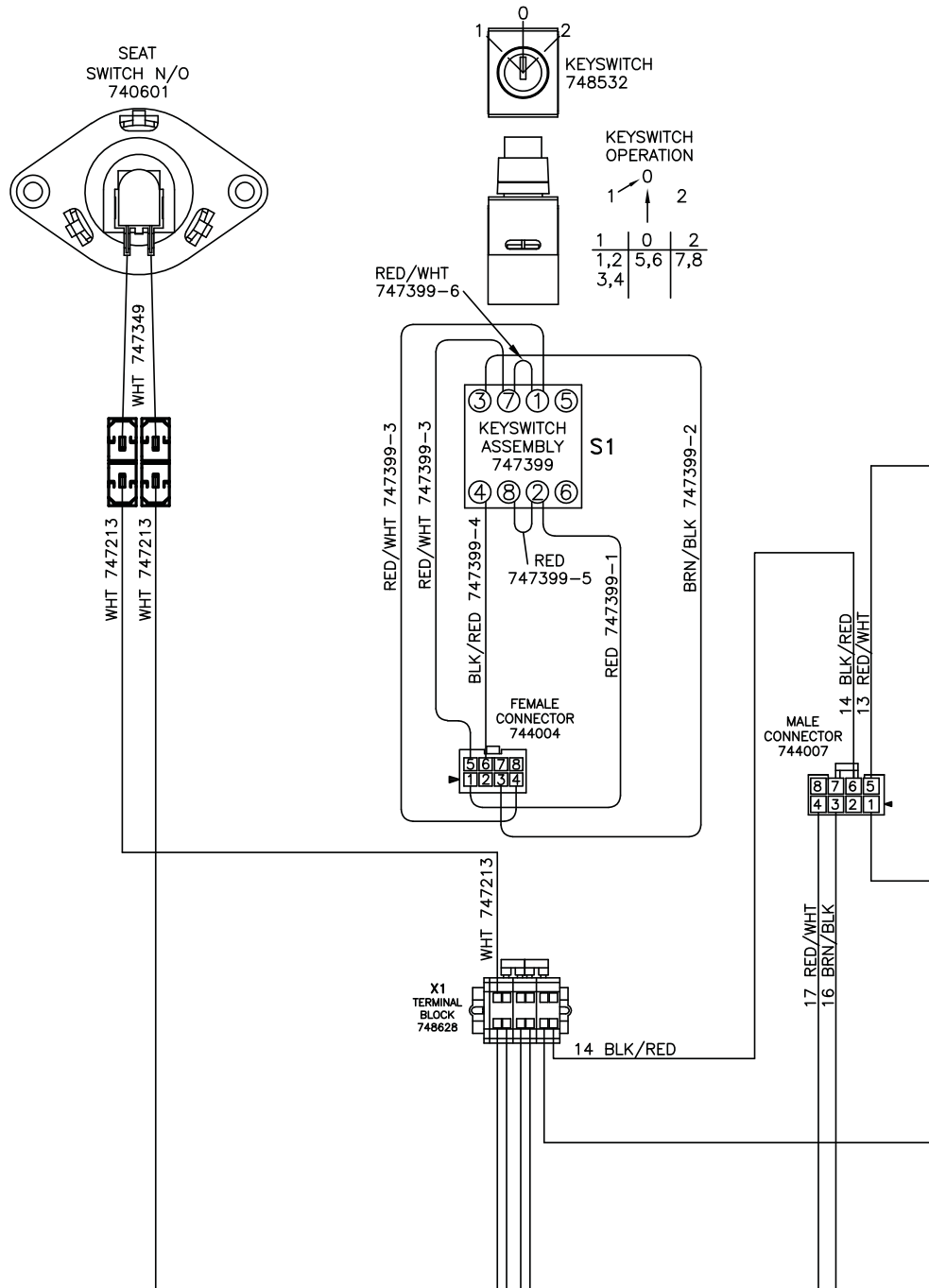
Electrical Schematics-CE

1

PAGE LAYOUT

1	2	3	4
5	6	7	8

PAGES GO TOGETHER AS SHOWN TO SEE THE ENTIRE SCHEMATIC AS ONE.

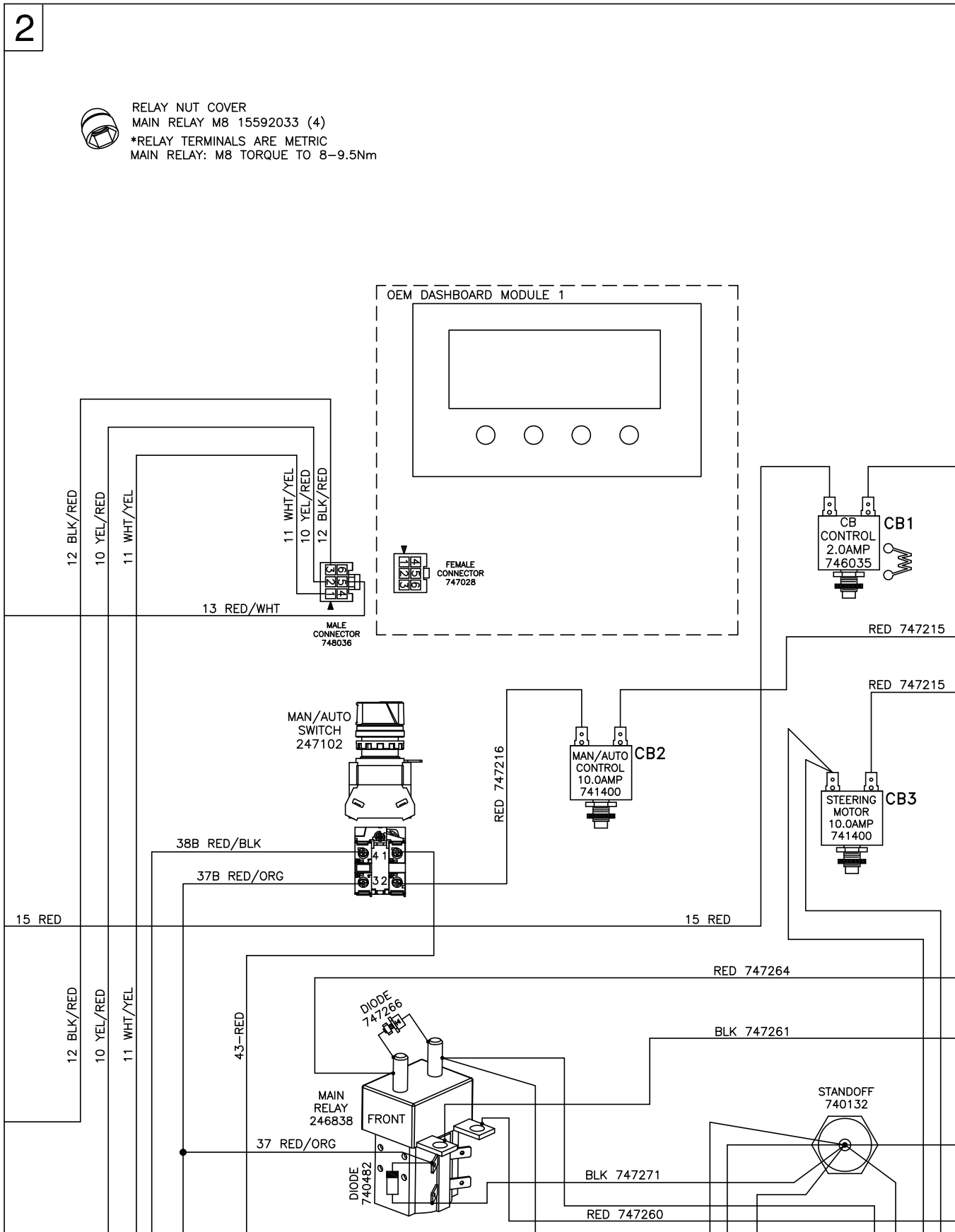


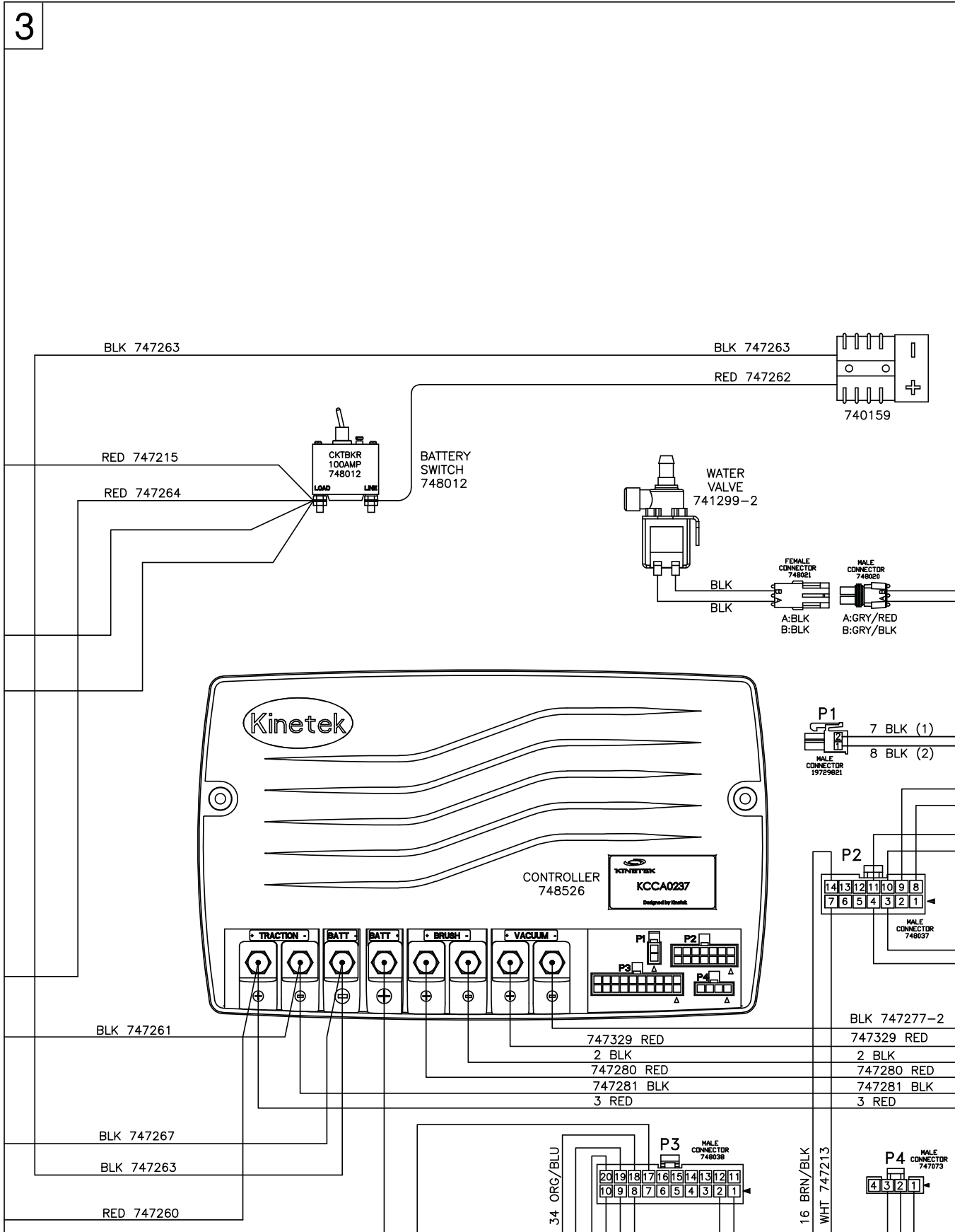
745130CE REV B

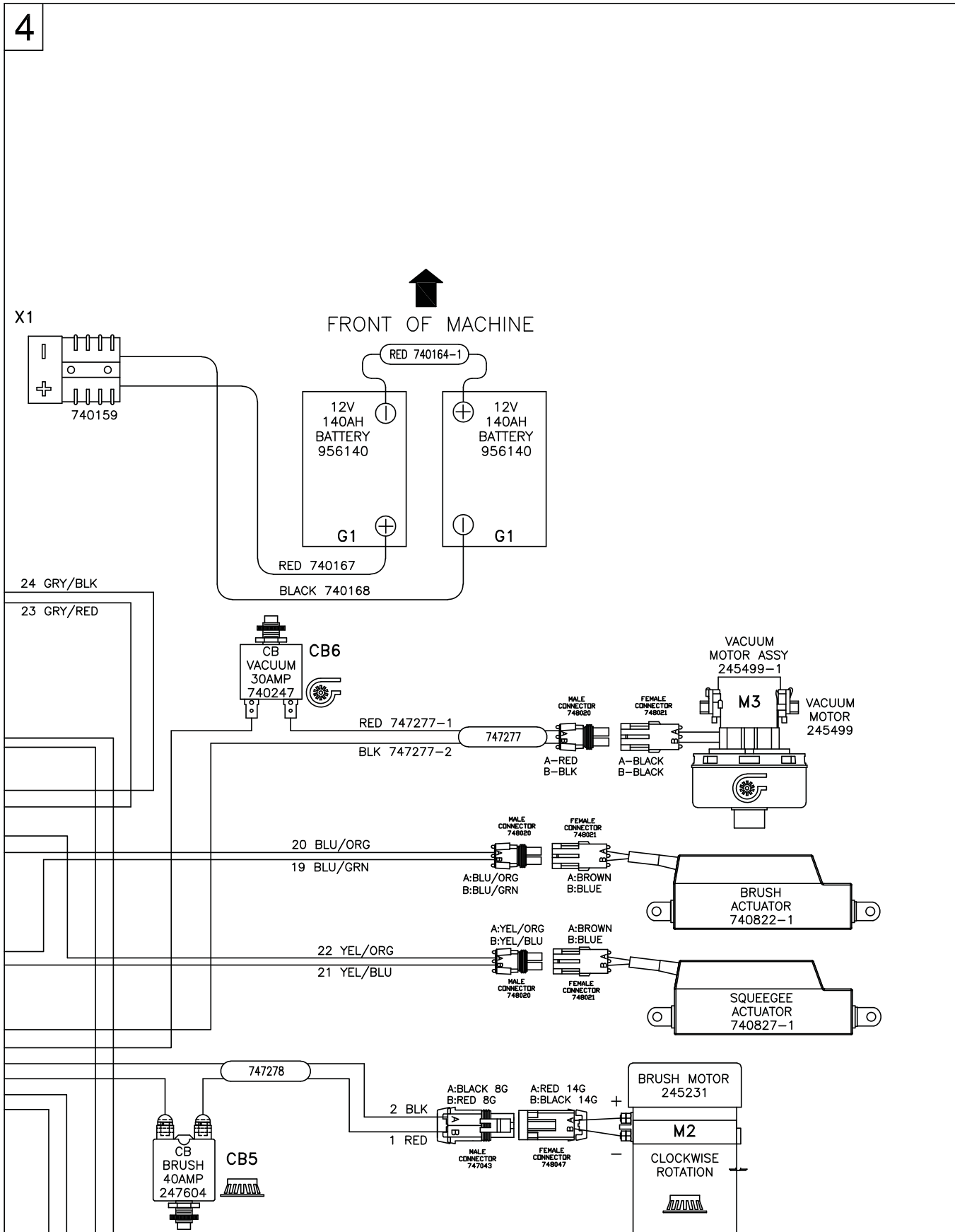
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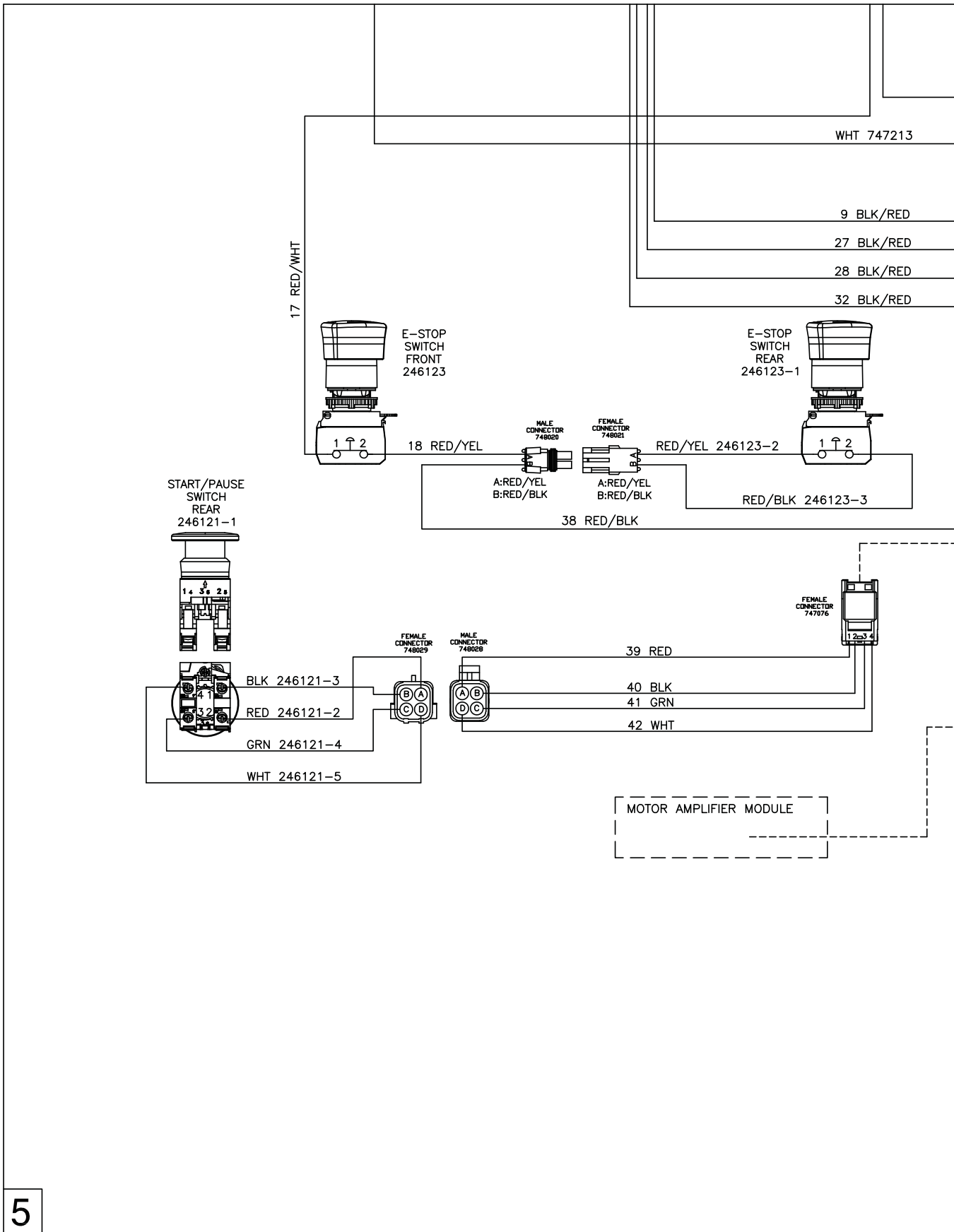


RELAY NUT COVER
MAIN RELAY M8 15592033 (4)
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MAIN RELAY: M8 TORQUE TO 8–9.5Nm

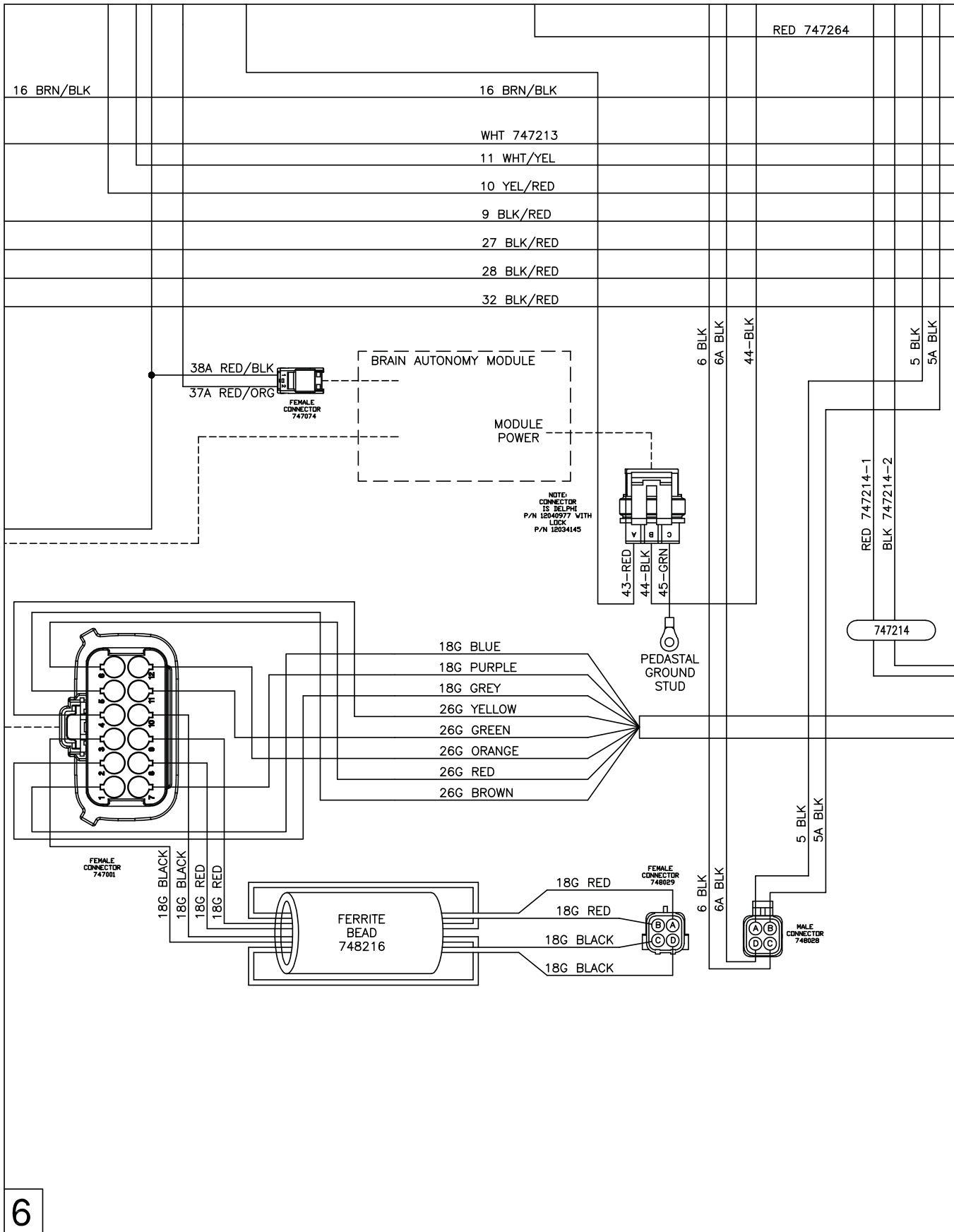


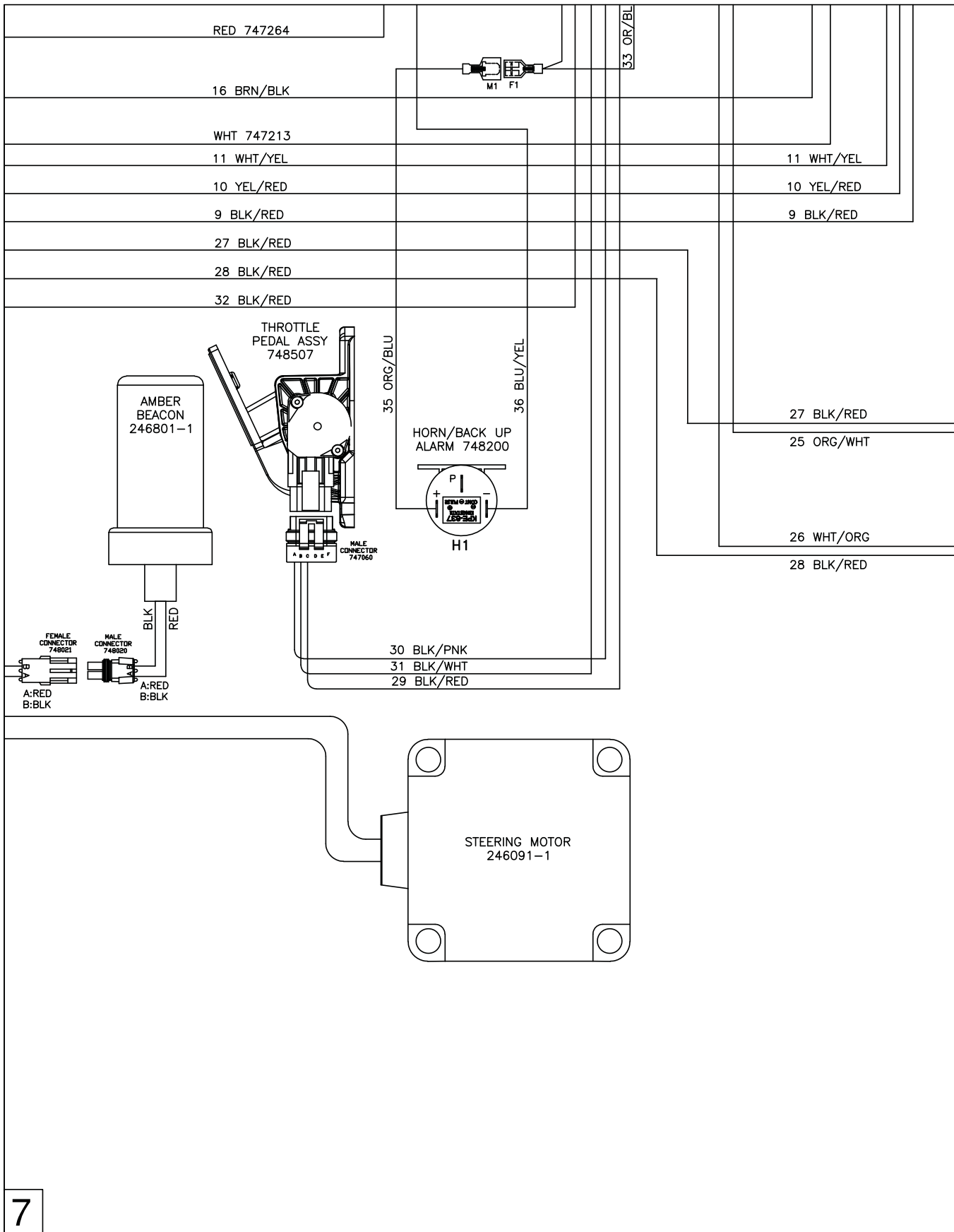


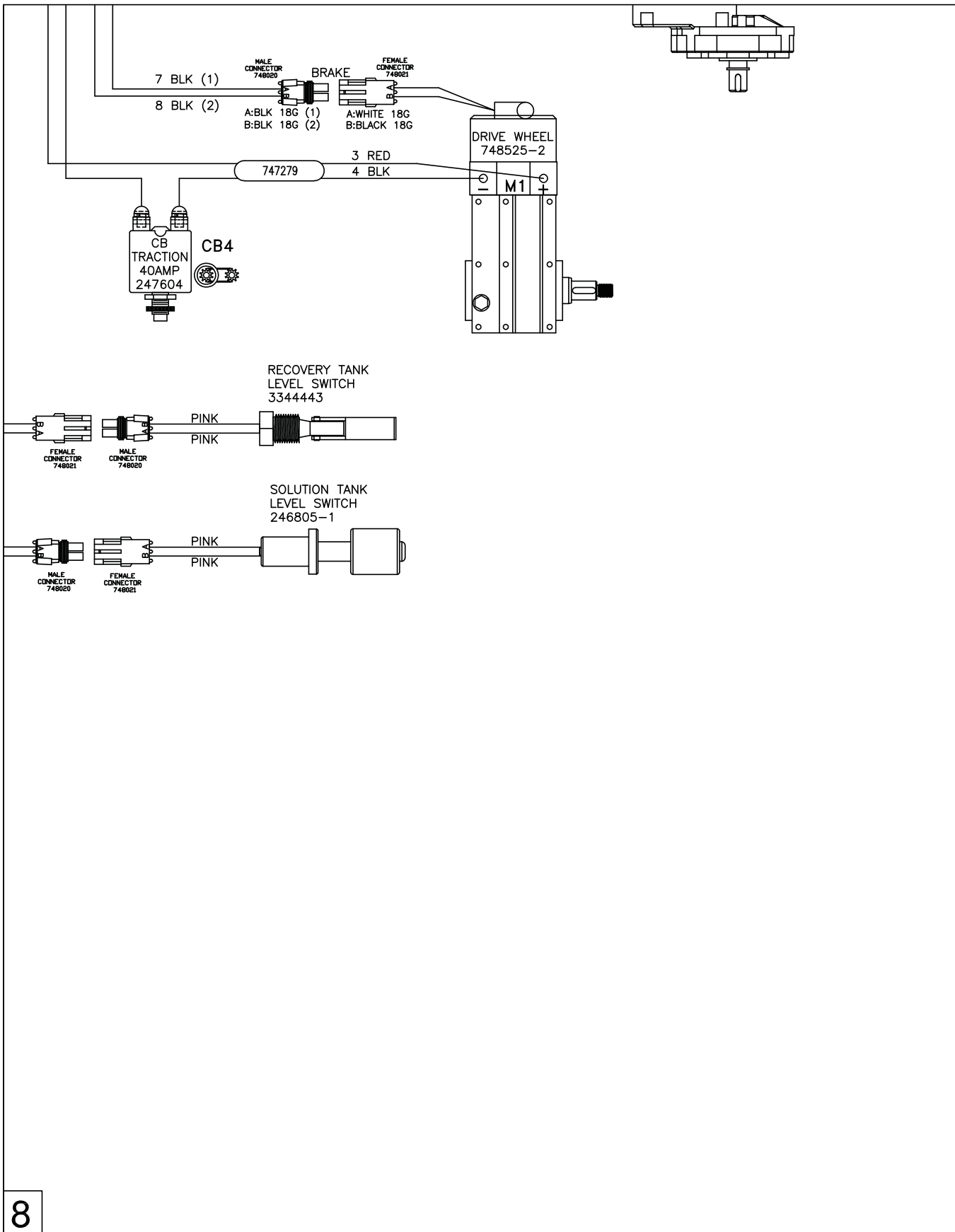




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8

Minuteman International Made Simple Commercial Limited Warranty

REVISION Q EFFECTIVE 4/10/18

Minuteman International, Inc. warrants to the original purchaser/user that the product is free from defects in workmanship and materials under normal use. Minuteman will, at its option, repair or replace without charge, parts that fail under normal use and service when operated and maintained in accordance with the applicable operation and instruction manuals. All warranty claims must be submitted through and approved by factory authorized repair stations.

This warranty does not apply to normal wear, or to items whose life is dependent on their use and care, such as belts, cords, switches, hoses, rubber parts, brushes, electrical motor components or adjustments. Parts manufactured by Minuteman are covered by and subject to the warranties and/or guarantees of their manufacturers. Please contact Minuteman for procedures in warranty claims against these manufacturers.

Special warning to purchaser -- Use of replacement filters and/or pre-filters not manufactured by Minuteman or its designated licensees, will void all warranties expressed or implied. A potential health hazard exists without original equipment replacement.

All warranted items become the sole property of Minuteman or its original manufacturer, whichever the case may be.

Minuteman disclaims any implied warranty, including the warranty of merchantability and the warranty of fitness for a particular purpose. Minuteman assumes no responsibility for any special, incidental or consequential damages.

This limited warranty is applicable only in the U.S.A. and Canada, and is extended only to the original user/purchaser of this product. Customers outside the U.S.A. and Canada should contact their local distributor for export warranty policies. Minuteman is not responsible for costs or repairs performed by persons other than those specifically authorized by Minuteman. This warranty does not apply to damage from transportation, alterations by unauthorized persons, misuse or abuse of the equipment, use of non-compatible chemicals, or damage to property, or loss of income due to malfunctions of the product.

If a difficulty develops with this machine, you should contact the dealer from whom it was purchased.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state. Some states do not allow the exclusion or limitation of special, incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

Model	Parts	Labor	Poly	Travel**
Cord Electric Group	5yrs	3yrs	12yrs	90 days
Battery Auto Scrubbers (incl. on board charger)	5yrs	3yrs	12yrs	90 days
Battery and Manual Sweepers	3yrs	3yrs	12yrs	90 days

Exceptions.....

Model	Parts	Labor	Poly	Travel**
Port A Scrub, all models (incl. on board charger)	1yr	6months	12yrs	90 days
A3S Blower	1yr	1yr	0	0
Phenom Dual Motor Upright Vacuums	2yrs	2yrs	0	0
Explosion Proof Vacuum	1yr	1yr	0	0
Propane Burnisher	1yr	1yr	0	90 days
E14BQP and E14115 scrubber	1yr	1yr	12yrs	90 days
EZ-Mop	1yr	1yr	0	90 days
ROS-17	1yr	1yr	0	90 days
**Travel, 2 hours max				

<i>Stand-alone Battery Chargers:</i>	One year
<i>Replacement Parts:</i>	Ninety days
<i>Batteries:</i>	0-3 months full replacement, 4-12 months pro-rate
<i>Polypropylene Plastic Tanks:</i>	12yr warranty, no additional labor

“Cleaning Excellence Powered by BrainOS”

**Minuteman is a Full Line Manufacturer of Sweepers and Scrubbers,
for Industrial Facilities.**

