



BRAMMO

PARTS MANUAL 2011-2012 ENERTIA BASIC US/UK/EU



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INSTRUCTIONS FOR USE OF PARTS LIST

This parts list is to be used when ordering replacement parts; it contains all parts for model 2011-2012 US/EU/UK ENERTIA BASIC.

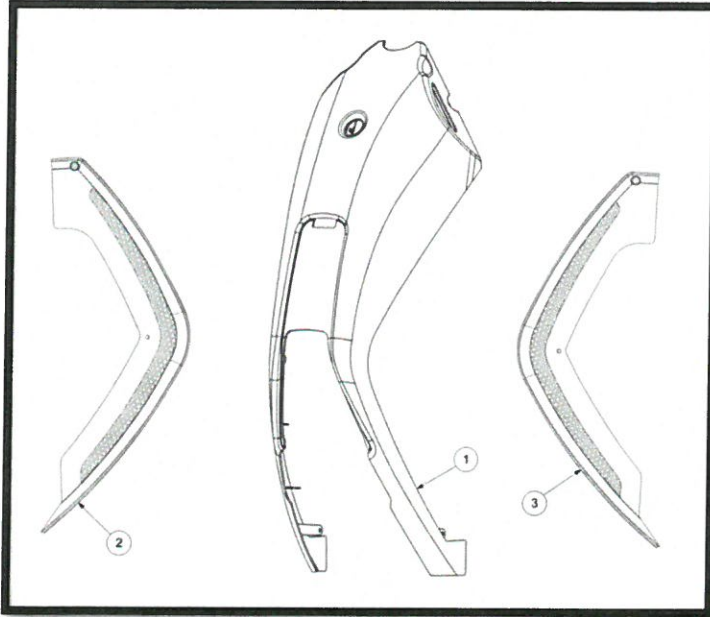
All replacement parts for the 2011-2012 US/EU/UK ENERTIA BASIC are available for purchase through the DEALER PORTAL by logging in at support.brammo.com. Additionally, you may order service parts by emailing service@brammo.com or by contacting BRAMMO Service at (541) 482-9555.

Should you have any questions please feel to contact Brammo.

Thanks,
Brammo Service

Description

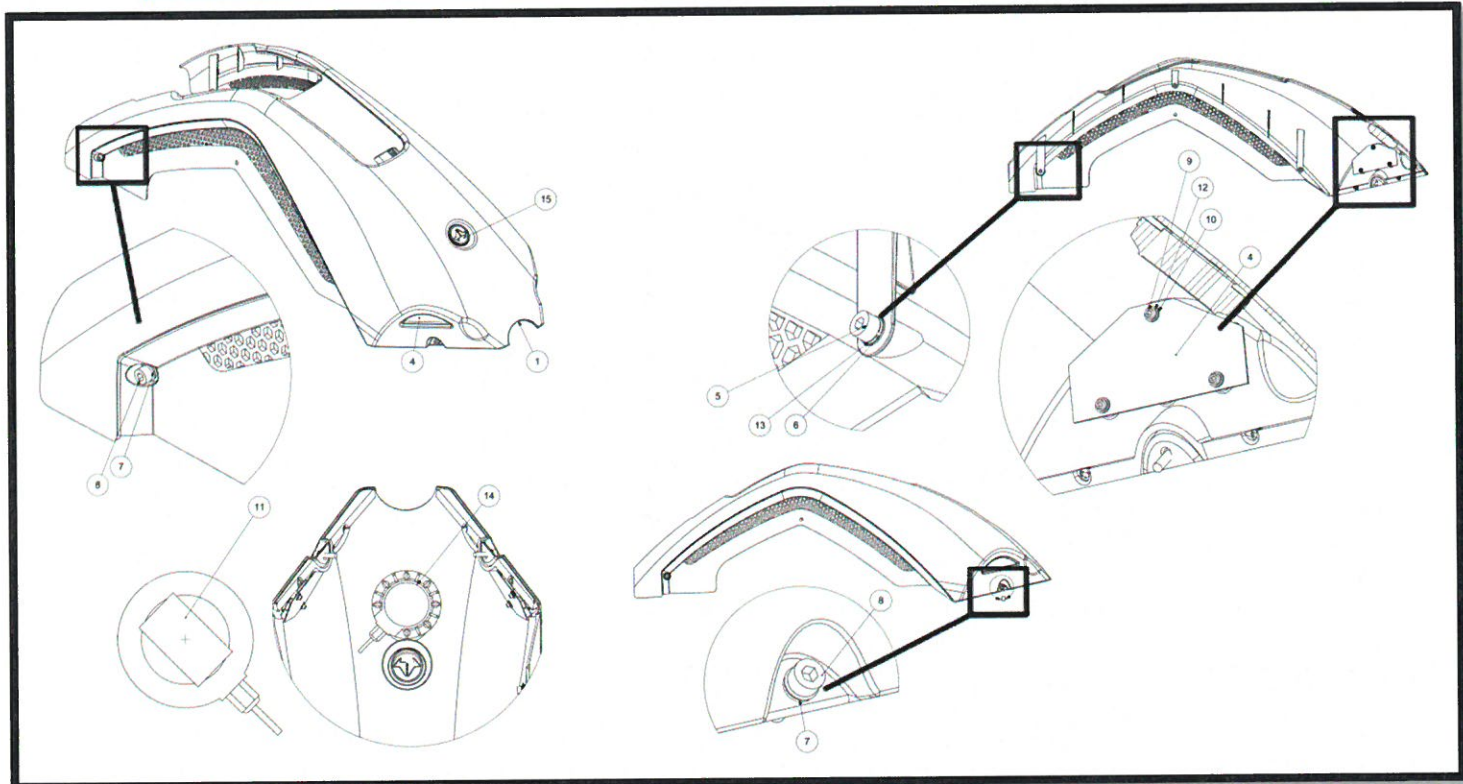
PAINTED BODY PANELS (US/UK/EU)



Item	P/N	Description	Color	Dealer	MSRP
1	26650656	BODY, UPPER, PAINTED, WHT	White Noise	\$306.06	\$459.10
1	99037843	BODY, UPPER, PAINTED, BLU	Glacial Blue	\$306.06	\$459.10
1	97666072	BODY, UPPER, PAINTED, ORG	Sunburnt Orange	\$306.06	\$459.10
1	23162002	BODY, UPPER, PAINTED, GRN	Subliminal Green	\$306.06	\$459.10
1	76282370	BODY, UPPER, PAINTED, SIL	Limited Silver	\$306.06	\$459.10
1	46846801	BODY, UPPER, PAINTED, PBLU	Peacekeeping Blue	\$306.06	\$459.10
1	89126896	BODY, UPPER, PAINTED, RED	True Blood Red	\$306.06	\$459.10
1	69116443	BODY, UPPER, PAINTED, ASIL	Aluminium Silver	\$306.06	\$459.10
1	02408302	BODY, UPPER, PAINTED, BLK	Eclipsed Black	\$306.06	\$459.10
2	04753840	FRAME, UPR, L, INJ, WHT	White Noise	\$59.40	\$89.10
2	74030047	FRAME, UPR, L, INJ, BLU	Glacial Blue	\$59.40	\$89.10
2	69784188	FRAME, UPR, L, INJ, ORG	Sunburnt Orange	\$59.40	\$89.10
2	40523476	FRAME, UPR, L, INJ, GRN	Subliminal Green	\$59.40	\$89.10
2	48050487	FRAME, UPR, L, INJ, SIL	Limited Silver	\$59.40	\$89.10
2	84984833	FRAME, UPR, L, INJ, PBLU	Peacekeeping Blue	\$59.40	\$89.10
2	39385653	FRAME, UPR, L, INJ, RED	True Blood Red	\$59.40	\$89.10
2	49321622	FRAME, UPR, L, INJ, ASIL	Aluminium Silver	\$59.40	\$89.10
2	93848431	FRAME, UPR, L, INJ, BLK	Eclipsed Black	\$59.40	\$89.10
3	51066923	FRAME, UPR, R, INJ, WHT	White Noise	\$59.40	\$89.10
3	30586404	FRAME, UPR, R, INJ, BLU	Glacial Blue	\$59.40	\$89.10
3	01128304	FRAME, UPR, R, INJ, ORG	Sunburnt Orange	\$59.40	\$89.10
3	80951577	FRAME, UPR, R, INJ, GRN	Subliminal Green	\$59.40	\$89.10
3	10884834	FRAME, UPR, R, INJ, SIL	Limited Silver	\$59.40	\$89.10
3	81625837	FRAME, UPR, R, INJ, PBLU	Peacekeeping Blue	\$59.40	\$89.10
3	81530511	FRAME, UPR, R, INJ, RED	True Blood Red	\$59.40	\$89.10
3	64183432	FRAME, UPR, R, INJ, ASIL	Aluminium Silver	\$59.40	\$89.10
3	12873841	FRAME, UPR, R, INJ, BLK	Eclipsed Black	\$59.40	\$89.10

Description

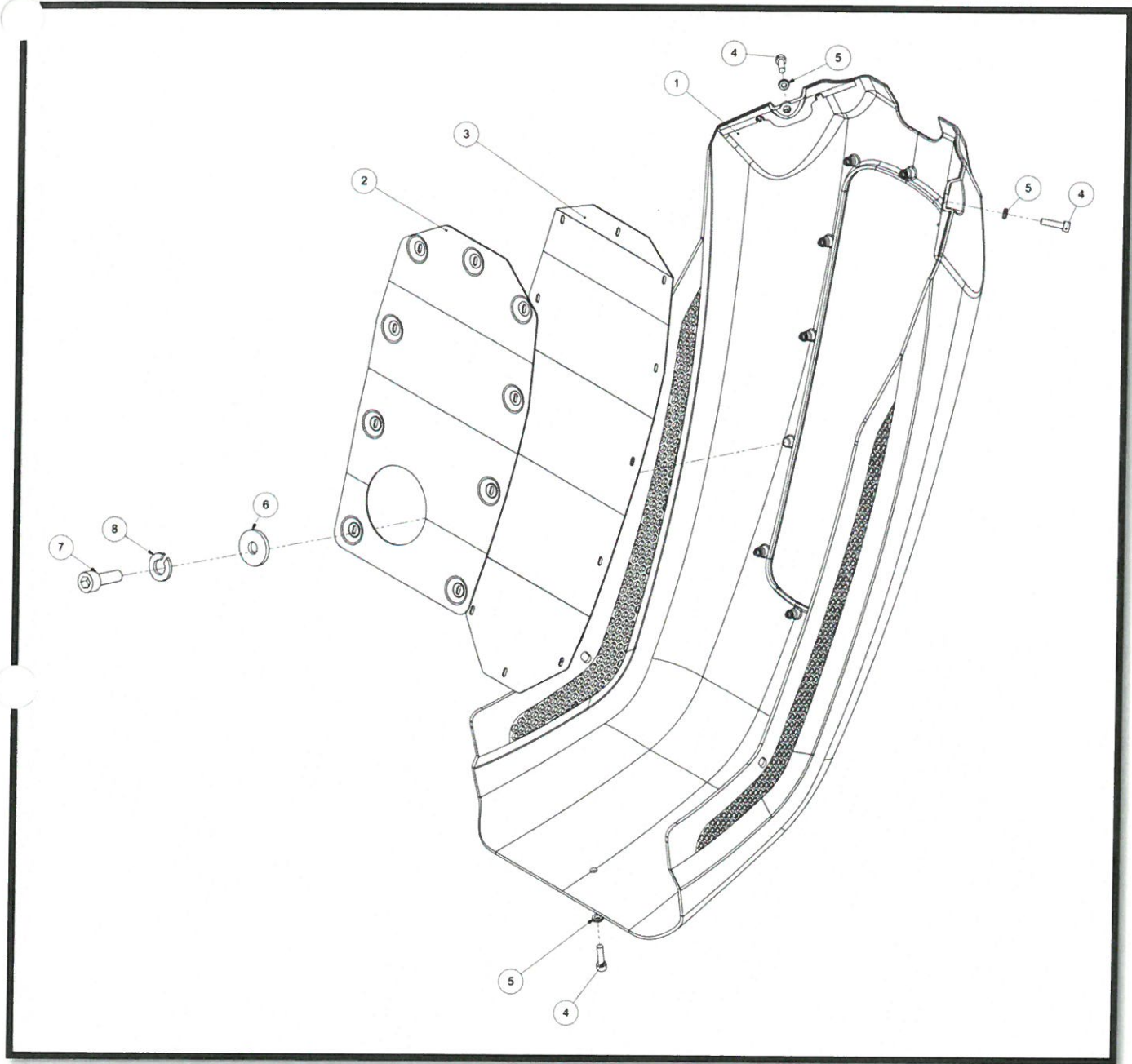
UPPER BODY (US/UK/EU)



Item	Part Number	Description	Qty	Dealer	MSRP
1	81490600	BODY, UPR, PAINTED	1	\$86.06	\$129.10
2	83350980	FRAME, UPPER, L, INJ	1	\$12.69	\$19.04
3	28577608	FRAME, UPPER, R, INJ	1	\$12.69	\$19.04
4	28031981	MESH, BODY, UPPER	2	\$13.11	\$19.67
5	12012351	M4X0.7X5, SH, 8.8, ZC	4	\$0.11	\$0.16
6	89661663	M4, WS, 8, ZC	4	\$0.02	\$0.03
7	77083277	M5, WR, 8, ZC	4	\$0.01	\$0.01
8	68081939	M5X0.8X20, SH, 8.8, ZC	4	\$0.07	\$0.11
9	39921695	M2.5X0.45X8, SH, 304	6	\$0.05	\$0.08
10	88906121	M2.5, WO, 8, ZC	6	\$0.01	\$0.01
11	44443888	TAPE, DS, EXCITER	2	\$0.44	\$0.66
12	32536435	M3, WL, 8, ZC	6	\$0.02	\$0.03
13	46533632	M4, WL, 8, ZC	4	\$0.02	\$0.03
14	48851836	EXCITER, AUDIO, CONN	1	\$22.00	\$33.00
15	41342580	EMBLEM, BRAMMO	1	\$1.61	\$2.41

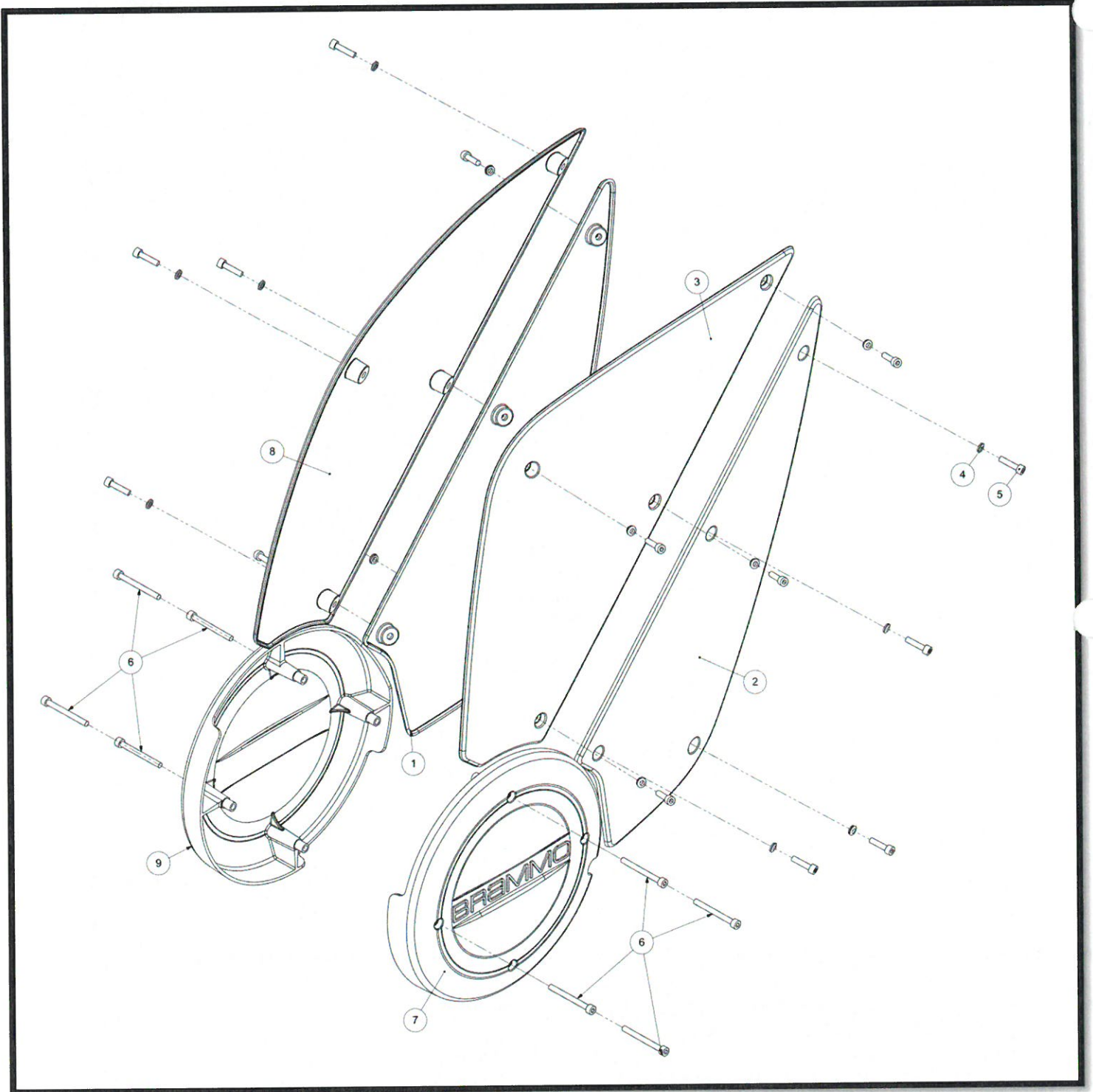
Description

LOWER BODY (US/UK/EU)



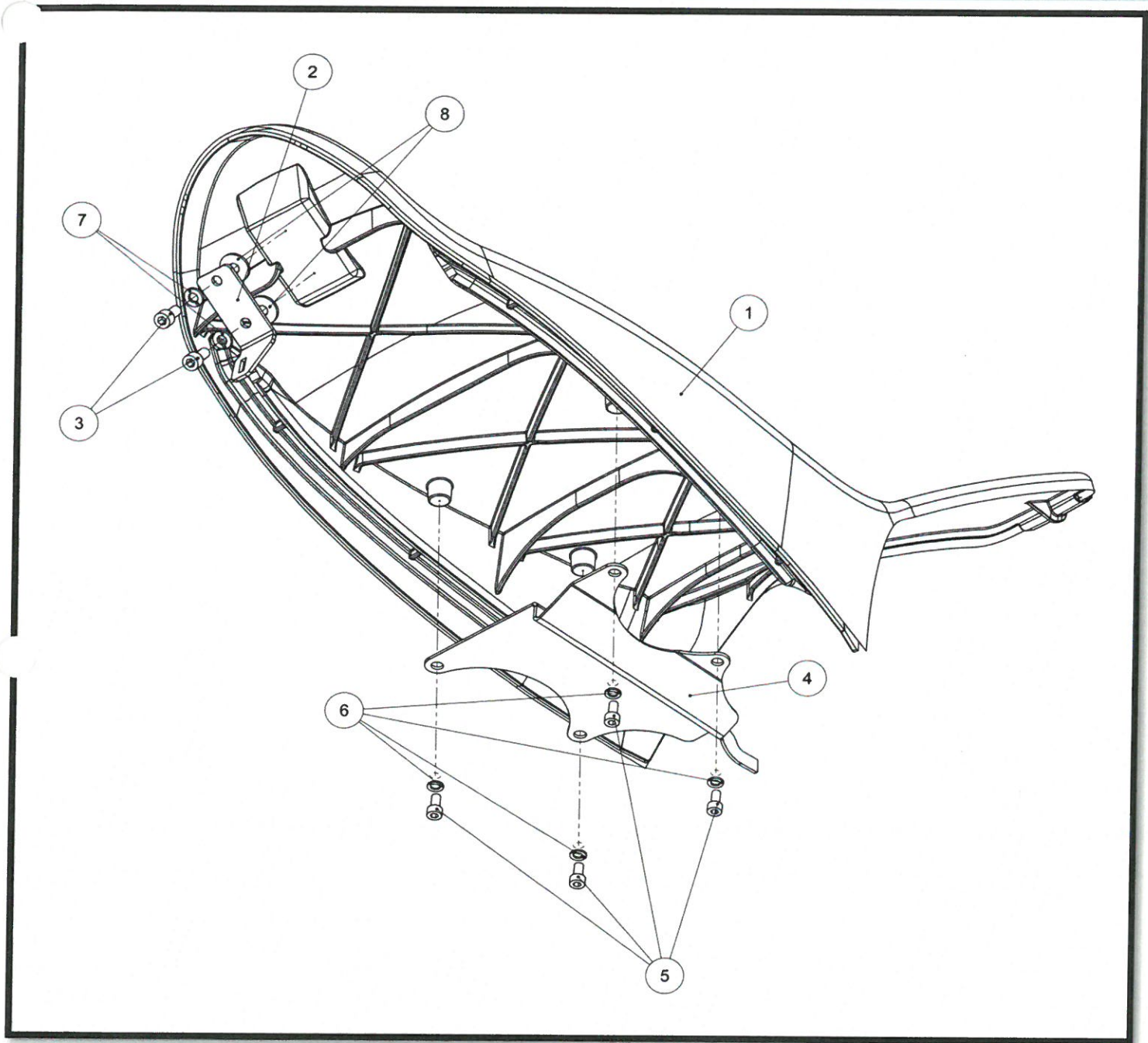
Item	Part Number	Description	Qty	Dealer	MSRP
1	18479050	BODY, LOWER, PAINTED, WHT	White Noise	\$225.94	\$338.91
1	75359303	BODY, LOWER, PAINTED, BLU	Glacial Blue	\$225.94	\$338.91
1	63281774	BODY, LOWER, PAINTED, ORG	Sunburnt Orange	\$225.94	\$338.91
1	92574662	BODY, LOWER, PAINTED, GRN	Subliminal Green	\$225.94	\$338.91
1	19265092	BODY, LOWER, PAINTED, SIL	Limited Silver	\$225.94	\$338.91
1	14236528	BODY, LOWER, PAINTED, PBLU	Peacekeeping Blue	\$225.94	\$338.91
1	47944045	BODY, LOWER, PAINTED, RED	True Blood Red	\$225.94	\$338.91
1	59706014	BODY, LOWER, PAINTED, ASIL	Aluminium Silver	\$225.94	\$338.91
2	16044152	GUARD, SPLASH, FRONT	1	\$27.83	\$41.75
3	15566308	MESH, FRONT	1	\$42.53	\$63.79
4	68081939	M5X0.8X20, SH, 8.8, ZC	3	\$0.07	\$0.11
5	77083277	M5, WR, 8, ZC	3	\$0.01	\$0.01
6	88906121	M2.5, WO, 8, ZC	12	\$0.01	\$0.01
7	39921695	M2.5X0.45X8, SH, 304	12	\$0.05	\$0.08
8	32536435	M3, WL, 8, ZC	12	\$0.02	\$0.03

SIDE BODY PANELS (US/UK/EU)



Item	Part Number	Description	Qty	Dealer	MSRP
1	58610016	PANEL, LOWER, L, INJ	1	\$23.87	\$35.81
2	60487926	PANEL, LOWER, R, INJ	1	\$23.87	\$35.81
3	20124460	PANEL, UPPER, R, INJ	1	\$26.88	\$40.33
4	77083277	M5, WR, 8, ZC	16	\$0.01	\$0.01
5	68081939	M5X0.8X20, SH, 8.8, ZC	16	\$0.07	\$0.11
6	49053270	M5X0.8X50, SH, 8.8, ZC	8	\$0.13	\$0.20
7	20030988	COVER, MOTOR, CAST, RIGHT	1	\$20.11	\$30.16
8	12940163	PANEL, UPPER, L, INJ	1	\$26.88	\$40.33
9	63403684	COVER, MOTOR, CAST, LEFT	1	\$20.11	\$30.16

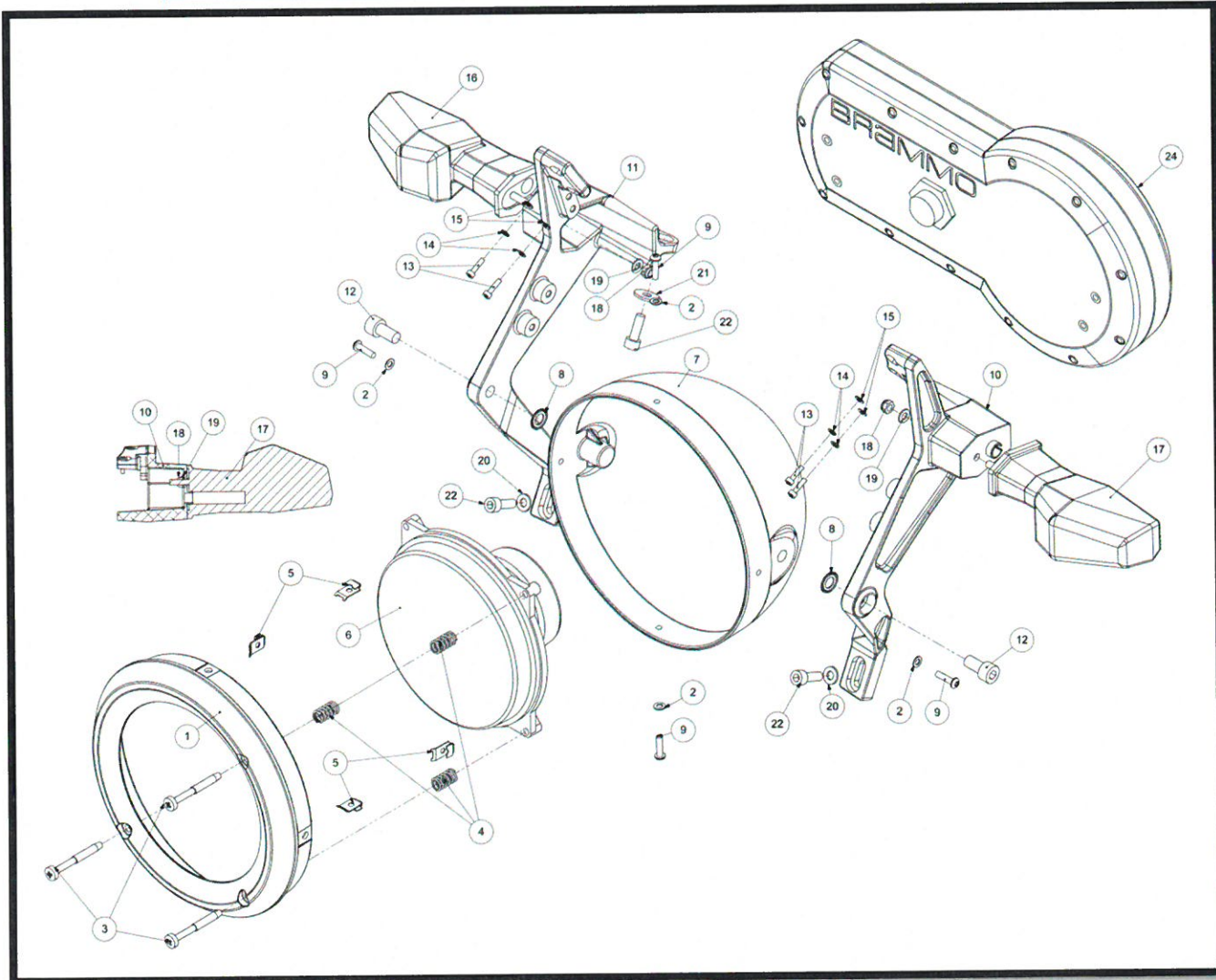
Description
SEAT (US/UK/EU)



Item	Part Number	Description	Qty	Dealer	MSRP
1	49437672	SEAT, UPHOLSTERED	1	\$114.77	\$172.16
2	14706803	LATCH, SEAT	1	\$6.12	\$9.17
3	69448530	M6X1X12, SH, 8.8, ZC	2	\$0.08	\$0.13
4	69873875	TONGUE, SEAT, FRONT	1	\$27.17	\$40.76
5	44558179	M5X0.8X10, SH, 8.8, ZC	4	\$0.06	\$0.09
6	64434248	M5, WL, 8, ZC	4	\$0.02	\$0.03
7	17350060	M6, WL, 8, ZC	2	\$0.03	\$0.05
8	25852663	M6, WO, 8, ZC	2	\$0.04	\$0.06

Description

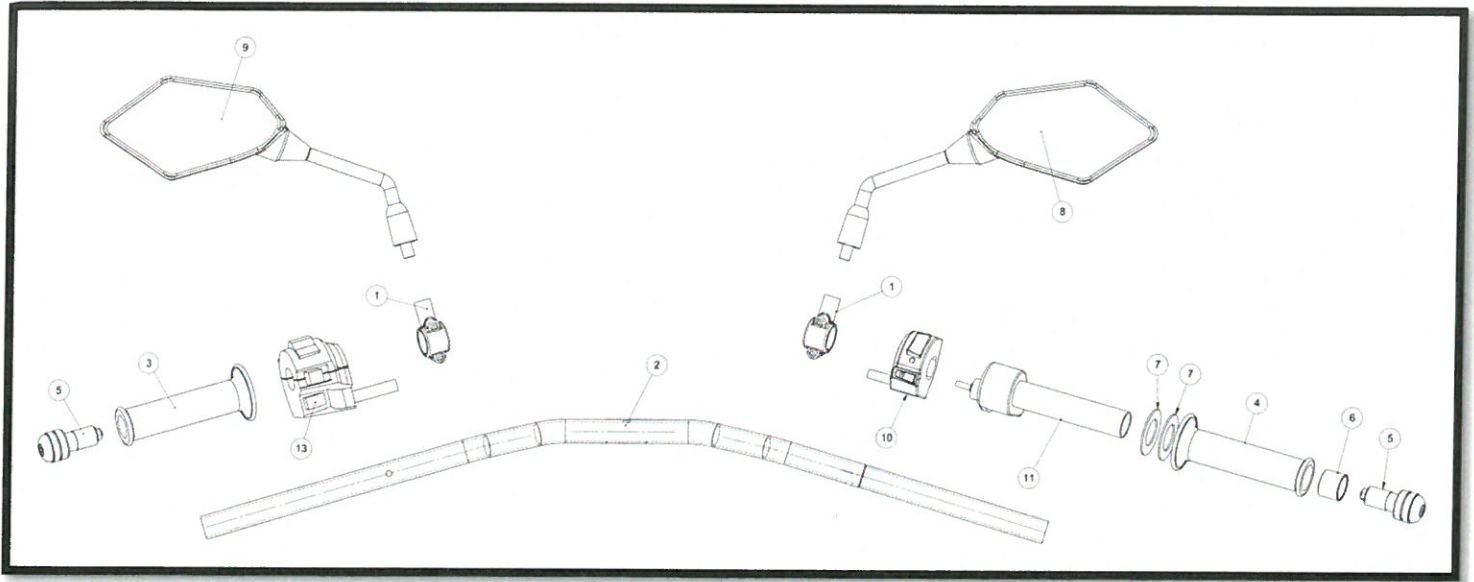
DASH HEADLAMP (US/EU/UK)



Item	Part Number	Description	Qty	Dealer	MSRP	Item	Part Number	Description	Qty	Dealer	MSRP
1	98794943	BEZEL, LAMP	1	\$12.96	\$19.44	1	64771968	BEZEL, LAMP, EU/UK	1	\$12.96	\$19.44
2	89661663	M4, WS, 8, ZC	4	\$0.02	\$0.03						
3	10754335	M5X45, PH, HEADLAMP	3	\$0.00	\$0.00						
4	39468461	SPRING, HEADLAMP	3	\$0.00	\$0.00						
5	17746973	NUT, J, M4	4	\$0.68	\$1.02						
6	17377341	LAMP, HEAD, (US) 12V	1	\$45.47	\$68.21	6	58301347	LAMP, HEAD, (EU)	1	\$55.00	\$82.50
						6	00039137	LAMP, HEAD, (UK)	1	\$55.00	\$82.50
7	26226807	HOUSING, LAMP, INJ	1	\$15.07	\$22.61						
8	68690806	M8, WL, SERRATED	2	\$0.08	\$0.12						
9	12717820	M4X0.7X16, BH, 304	4	\$0.07	\$0.10						
10	67432511	BRKT, HEADLAMP, LH, CAST	1	\$33.00	\$49.50						
11	68171769	BRKT, HEADLAMP, RH, CAST	1	\$33.00	\$49.50						
12	85861480	M8X1.25X16, SH, 8.8, ZC	2	\$0.16	\$0.24						
13	34727597	M3X0.5X12, SH, 8.8, ZC	4	\$0.07	\$0.10						
14	32536435	M3, WL, 8, ZC	4	\$0.02	\$0.03						
15	40517181	M3, WS, 8, ZC	4	\$0.02	\$0.02						
16	43285829	LAMP, TURN-A, CONN	1	\$39.18	\$58.77						
17	15443534	LAMP, TURN-B, CONN	1	\$39.18	\$58.77						
18	74178070	M5X0.8, NY, 10, ZC	2	\$0.07	\$0.11						
19	75702953	M5, WS, 8, ZC	2	\$0.02	\$0.03						
20	75772929	M6, WS, 8, ZC	2	\$0.01	\$0.02						
21	25852663	M6, WO, 8, ZC	2	\$0.04	\$0.06						
22	64214897	M6X1X18, SH, 8.8, ZC	4	\$0.11	\$0.16						
24	54567617	DASH, FRU, MPH	1	\$814.00	\$1,221.00	24	81226545	DASH, FRU, KPH	1	\$814.00	\$1,221.00

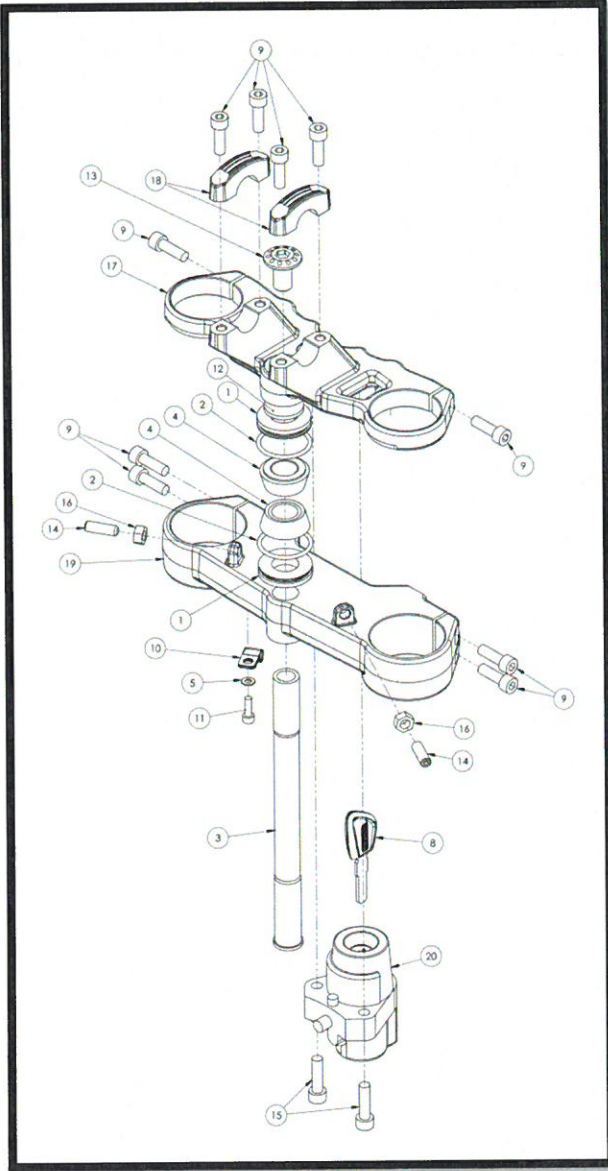
Description

HANDLEBAR CONTROLS (US/UK/EU)



Item	Part Number	Description	Qty	Dealer	MSRP
1	22730476	MOUNT, MIRROR	2	\$3.43	\$5.15
2	24384517	HANDLEBAR	1	\$26.62	\$39.93
3	53789061	GRIP, L, KNURL	1	\$6.93	\$10.40
4	61806011	GRIP, R, KNURL	1	\$6.93	\$10.40
5	38235510	PLUG, BAR, BLACK, AL	2	\$8.58	\$12.87
7	40511090	TUBE, EXTENSION, THROTTLE	1	\$3.59	\$5.38
7	07894600	WASHER, THROTTLE	2	\$1.50	\$2.24
8	45921123	MIRROR, RH, EU	1	\$17.91	\$26.86
9	98785346	MIRROR, LH, EU	1	\$17.91	\$26.86
10	29743475	CONTROLS, RH, CONN	1	\$22.00	\$33.00
11	56513536	THROTTLE, MAGURA, CONN	1	\$77.00	\$115.50
13	09654868	CONTROL, LIGHTING, EU	1	\$97.31	\$145.96

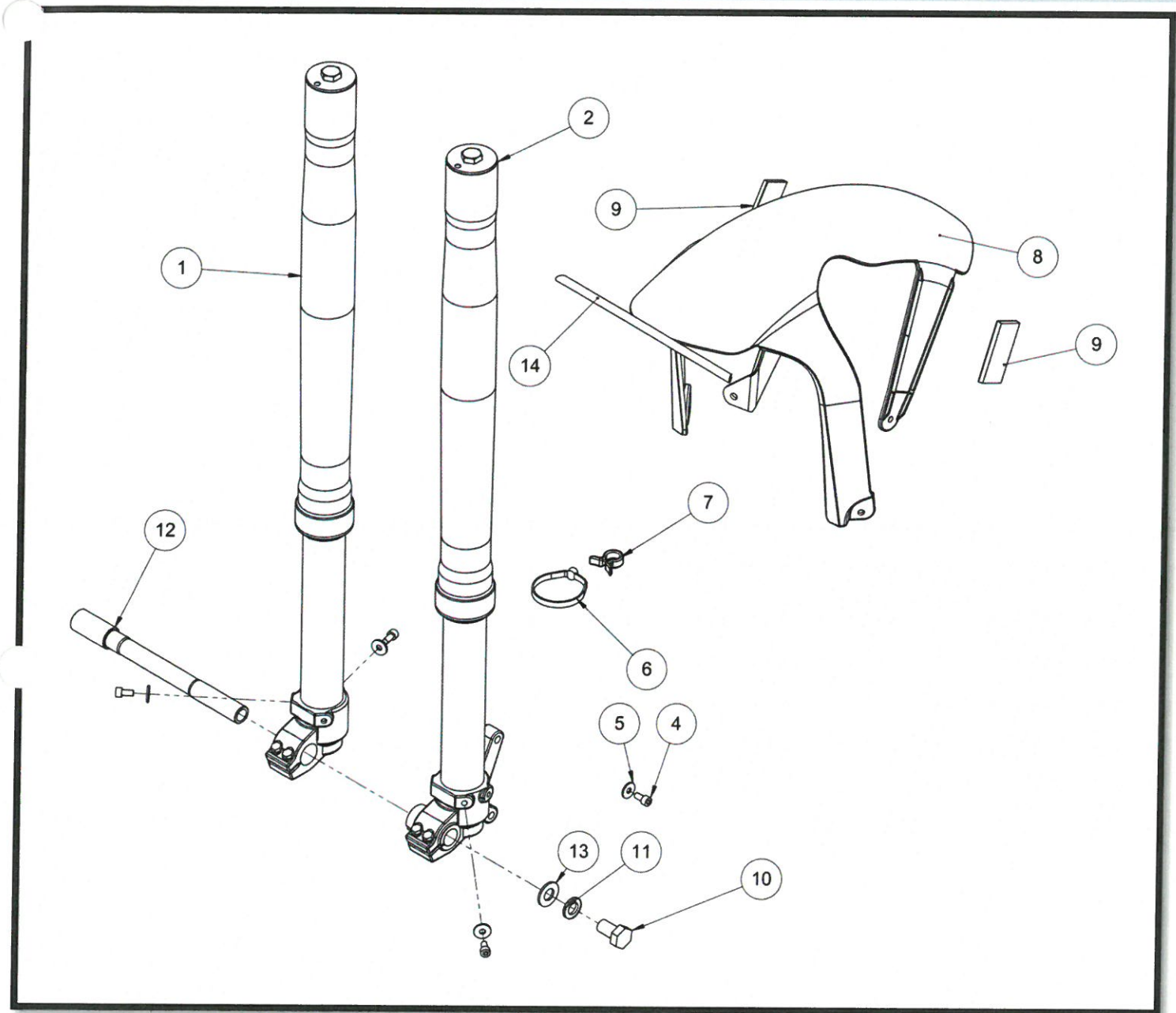
TRIPLE CLAMP (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	46187437	RING, SEAL, HEADSET	2	\$7.94	\$11.91
2	46298003	ORING, HEADSET	2	\$0.46	\$0.69
3	45964080	TUBE, STEER, FORK	1	\$30.71	\$46.07
4	87144583	ANB, 20X42X15	2	\$4.66	\$7.00
5	75702953	M5, WS, 8, ZC	1	\$0.02	\$0.03
8	84076064	KEY, IGNITION	2	\$66.66	\$99.99
9	69511550	M8X1.25X25, SH, 8.8, ZC	10	\$0.26	\$0.38
10	36514020	CLAMP, P, 1/4, COATED	1	\$0.39	\$0.59
11	16994959	M5X0.8X16, SH, 8.8, ZC	1	\$0.06	\$0.09
12	60138065	RING, CONE, SPLIT	1	\$13.20	\$19.80
13	54819542	BOLT, CLAMP, UPPER, EU	1	\$13.20	\$19.80
14	93837153	M8X1.25X25, SET, ST, BK	2	\$0.22	\$0.33
15	28672761	M8X1.25X30, SH, 8.8, ZC	2	\$0.25	\$0.37
16	75999057	M8X1.25, NU, 10, ZC	2	\$0.22	\$0.33
17	49075653	CLAMP, FORK, UPPER, FORG	1	\$44.00	\$66.00
18	93051356	CLAMP, HBAR, 875, FORG	2	\$22.00	\$33.00
19	56998640	CLAMP, FORK, LOWER, FORG	1	\$66.00	\$99.00
20	24116856	IGNITION, CONN	1	\$133.28	\$199.91

Description

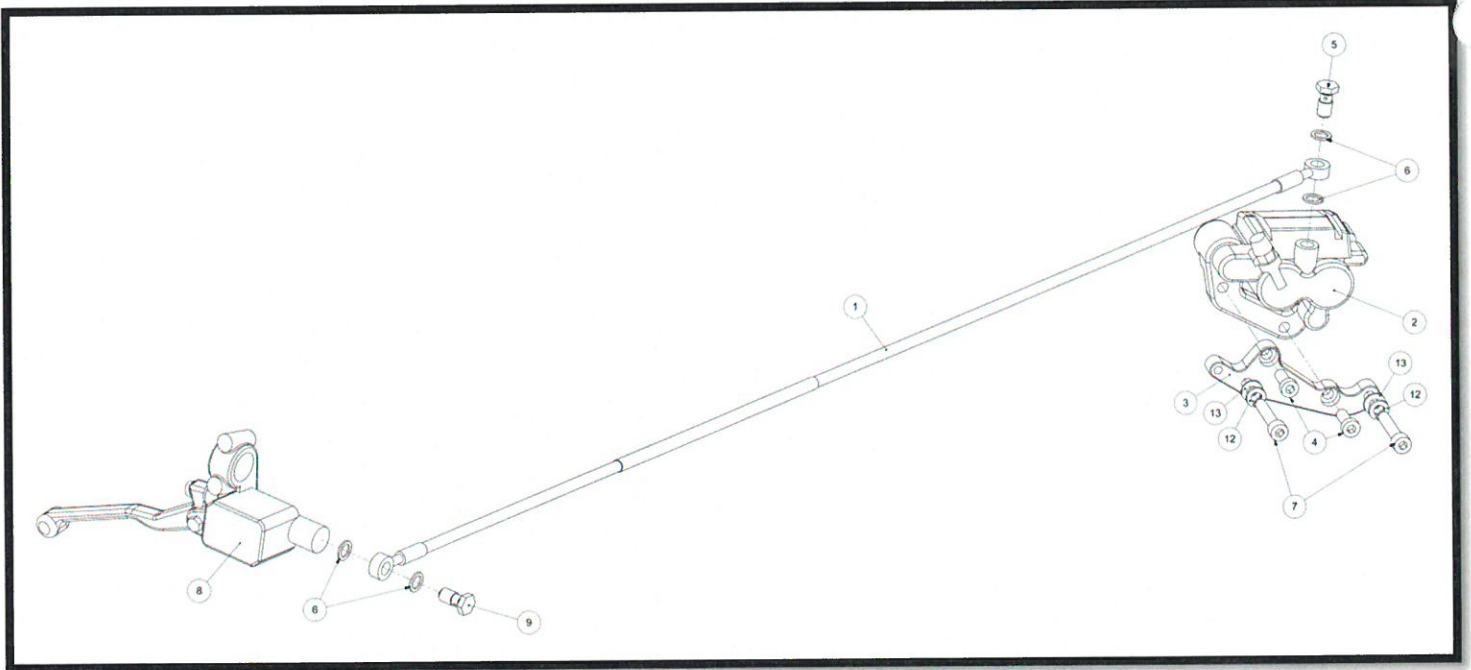
FRONT FORKS (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	44386250	LEG, FORK, RIGHT	1	\$336.27	\$504.41
2	44699323	LEG, FORK, LEFT	1	\$336.27	\$504.41
4	69448530	M6X1X12, SH, 8.8, ZC	4	\$0.08	\$0.13
5	25852663	M6, WO, 8, ZC	4	\$0.04	\$0.06
6	38753927	TIE, CABLE, .27X13.4, BLACK	1	\$1.10	\$1.65
7	90867114	CLAMP, GUIDE, HOSE	1	\$7.68	\$11.52
8	34305537	FENDER, FRONT, INJ	1	\$20.55	\$30.82
9	79319757	REFLECTOR, AMBER	2	\$1.74	\$2.61
10	86058926	M14X2X25, HB, 8.8, ZC	1	\$0.50	\$0.75
11	76950681	M14, WS, 8, ZC	1	\$0.18	\$0.28
12	10302264	AXLE, WHEEL, FRONT	1	\$25.23	\$37.85
13	66906971	M14, WL, 8, ZC	1	\$0.18	\$0.27
14	53146809	TRIM, EDGE, FENDER, EU	1	\$1.39	\$2.08

Description

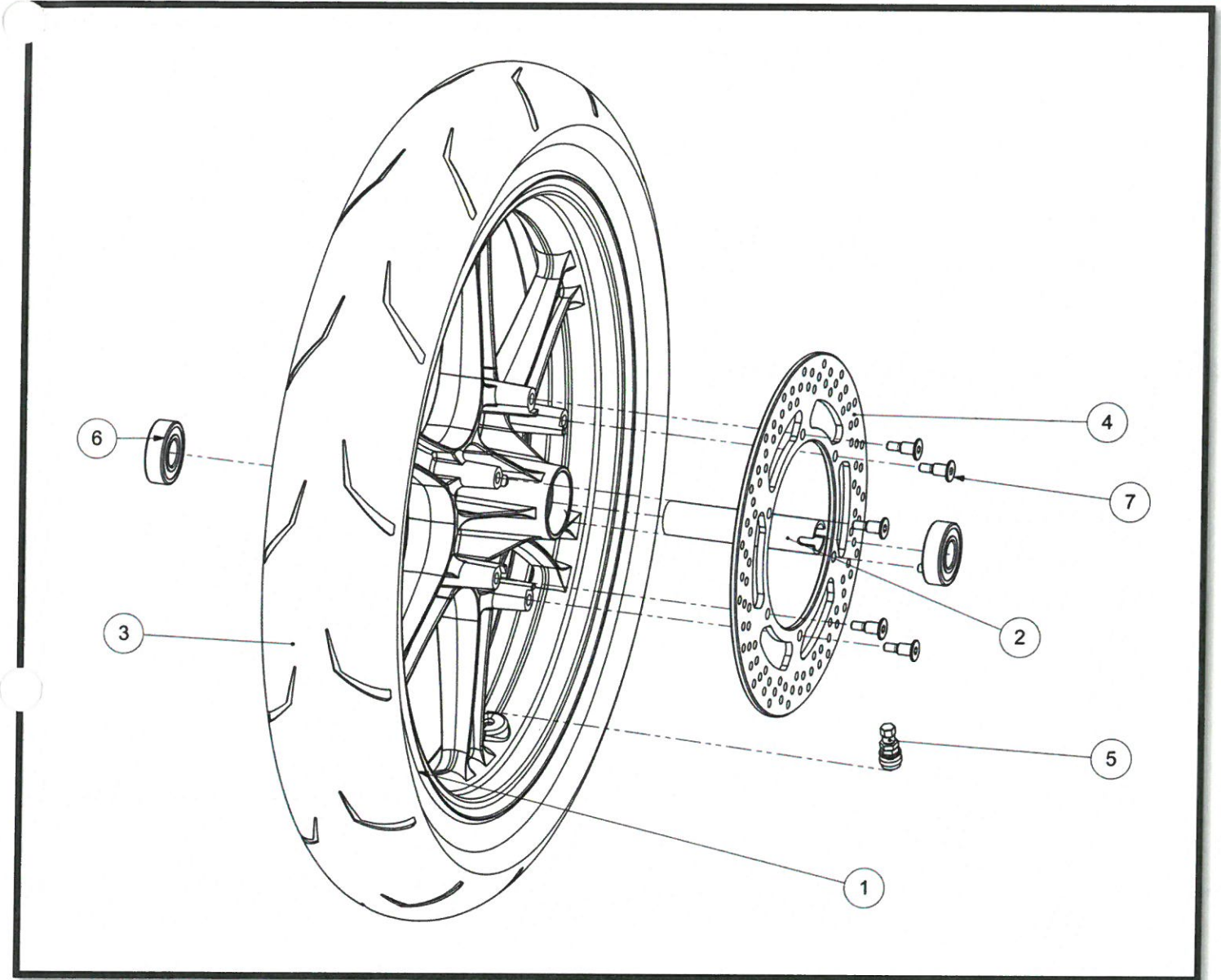
FRONT BRAKE (US/UK/EU)



Item	Part Number	Description	Qty	Dealer	MSRP
1	56100929	LINE, BRAKE, FRONT	1	\$64.28	\$96.43
2	58117640	CALIPER, FRONT	1	\$118.80	\$178.20
3	46870011	ADAPTOR, CALIPER, FRONT	1	\$38.24	\$57.35
4	60021531	M8X1.25X20, LS, 304	2	\$0.28	\$0.41
5	32023412	BOLT, BANJO, M10X1.0	1	\$12.10	\$18.15
6	77795785	WASHER, CRUSH, M10, CU	4	\$0.52	\$0.79
7	37890059	M8X1.25X40, SH, 8.8, ZC	2	\$0.25	\$0.37
8	44242138	MC, FRONT, CONN	1	\$89.78	\$134.67
9	84915423	BOLT, BANJO, M10X1.25	1	\$12.10	\$18.15
12	93657159	M8, WL, 8, ZC	2	\$0.04	\$0.07
13	75997901	M8, WS, 8, ZC	2	\$0.03	\$0.04

Description

FRONT WHEEL (US/UK/EU)

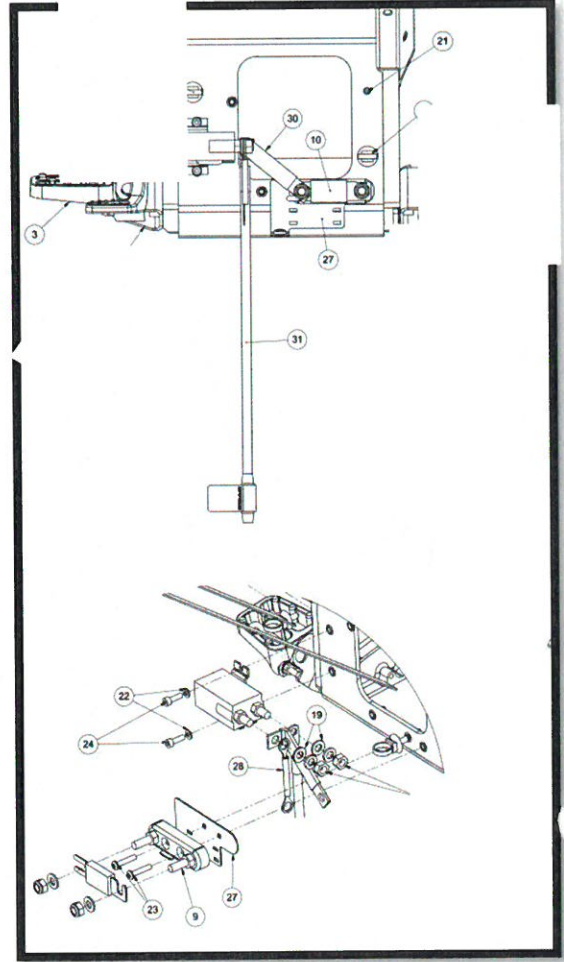


Item	P/N	Description	Qty	Dealer	MSRP
1	19063342	WHEEL, FRONT	1	\$129.65	\$194.47
2	40198261	SPACER, WHEEL, FRONT	1	\$13.75	\$20.63
3	14998108	TIRE, FRONT, ROADRIDER	1	\$165.33	\$248.00
4	18540252	ROTOR, BRAKE, FRONT	1	\$46.66	\$69.99
5	82260024	VALVE, AIR, SCHRADER	1	\$11.88	\$17.82
6	14924574	BB, 20X47X14, DS	2	\$2.16	\$3.23
7	80581885	SCREW, ROTOR	6	\$4.95	\$7.43

Description

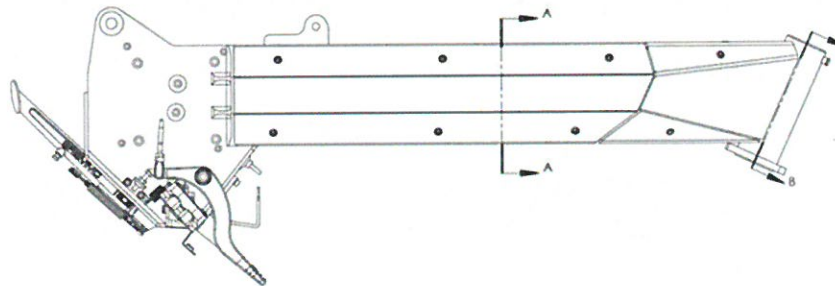
CONTACTOR AND MAIN FUSE (US/UK/EU)

Item	P/N	Description	Qty	Dealer	MSRP
9	41998053	BLOCK, FUSE, ANN	1	\$14.63	\$21.95
10	99394577	FUSE, ANN, MAIN	1	\$17.80	\$26.70
21	99398612	TIE, CURVE, FIRTREE, 7MM	3	\$0.22	\$0.33
22	75702953	M5, WS, 8, ZC	2	\$0.02	\$0.03
23	70903790	M5X0.8X25, BH, 304	2	\$0.14	\$0.21
24	16994959	M5X0.8X16, SH, 8.8, ZC	2	\$0.06	\$0.09
27	44400567	BRACKET, BODY, LOWER	1	\$15.40	\$23.10
28	24968559	DIODE, EU	1	\$0.00	\$0.00
29	42375076	CONTACTOR, ALBRIGHT	1	\$53.90	\$80.85
30	07350159	BUSBAR, FUSE, CONTACTOR	1	\$11.00	\$16.50
31	28389007	CABLE, CONTACTOR, CONTROLLER, EU	1	\$11.00	\$16.50



Description

CHASSIS (US/UK/EU)

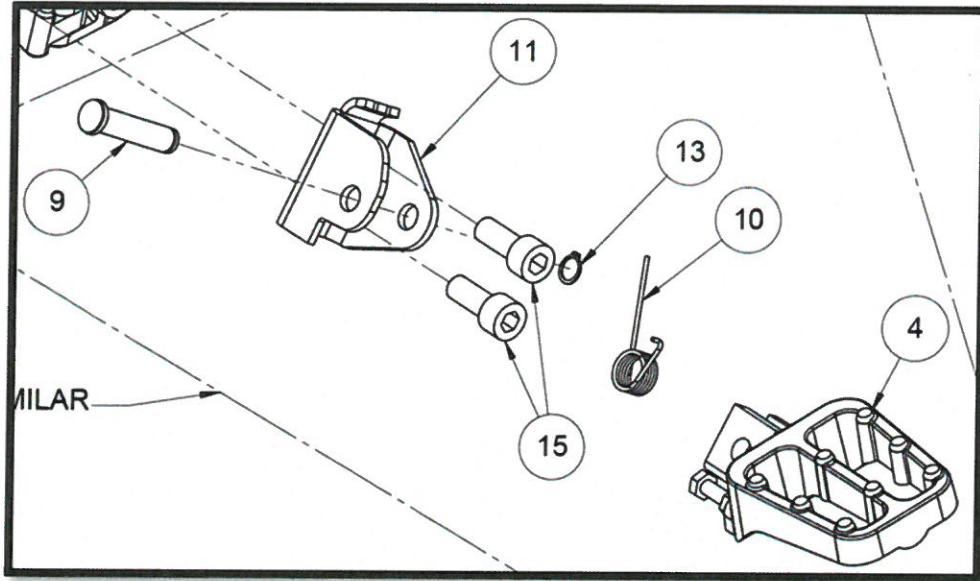


Item	Part Number	Description	Qty	Dealer	MSRP
1	43882638	CHASSIS, AL	1	\$1,707.55	\$2,561.33

PART DOES NOT INCLUDE KICKSTAND or FOOTPEGS

Description

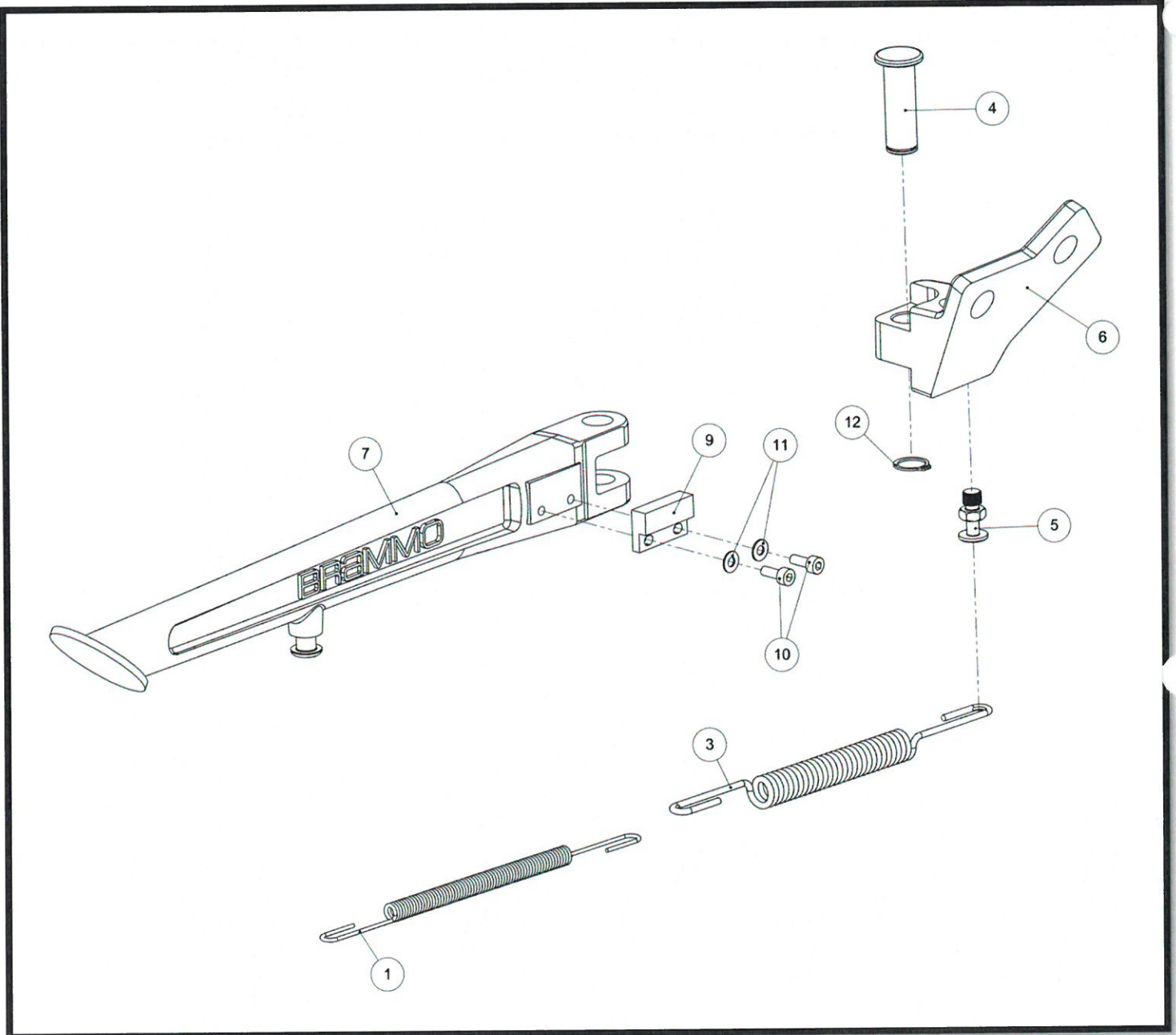
RIGHT FOOTPEG (US/UK/EU)



Item	Part Number	Description	Qty	Dealer	MSRP
4	58485556	FOOTPEG, CAST, R	1	\$5.87	\$8.81
		Note: Includes set nut and screw			
5	78911167	FOOTPEG, CAST, L	1	\$5.87	\$8.81
		Note: Includes set nut and screw			
9	66918802	PIN, CLEVIS, M10X40, ZC	2	\$2.18	\$3.27
10	03670490	SPRING, FOOTPEG, ZC	2	\$0.72	\$1.08
11	78038162	BRACKET, FOOTPEG, L	1	\$8.89	\$13.33
12	05261064	BRACKET, FOOTPEG, R	1	\$8.89	\$13.33
13	41994470	RING, SNAP, EXT, 13/32	2	\$0.11	\$0.17
15	18952149	M10X1.5X25, SH, 8.8, ZC	4	\$0.40	\$0.59

Description

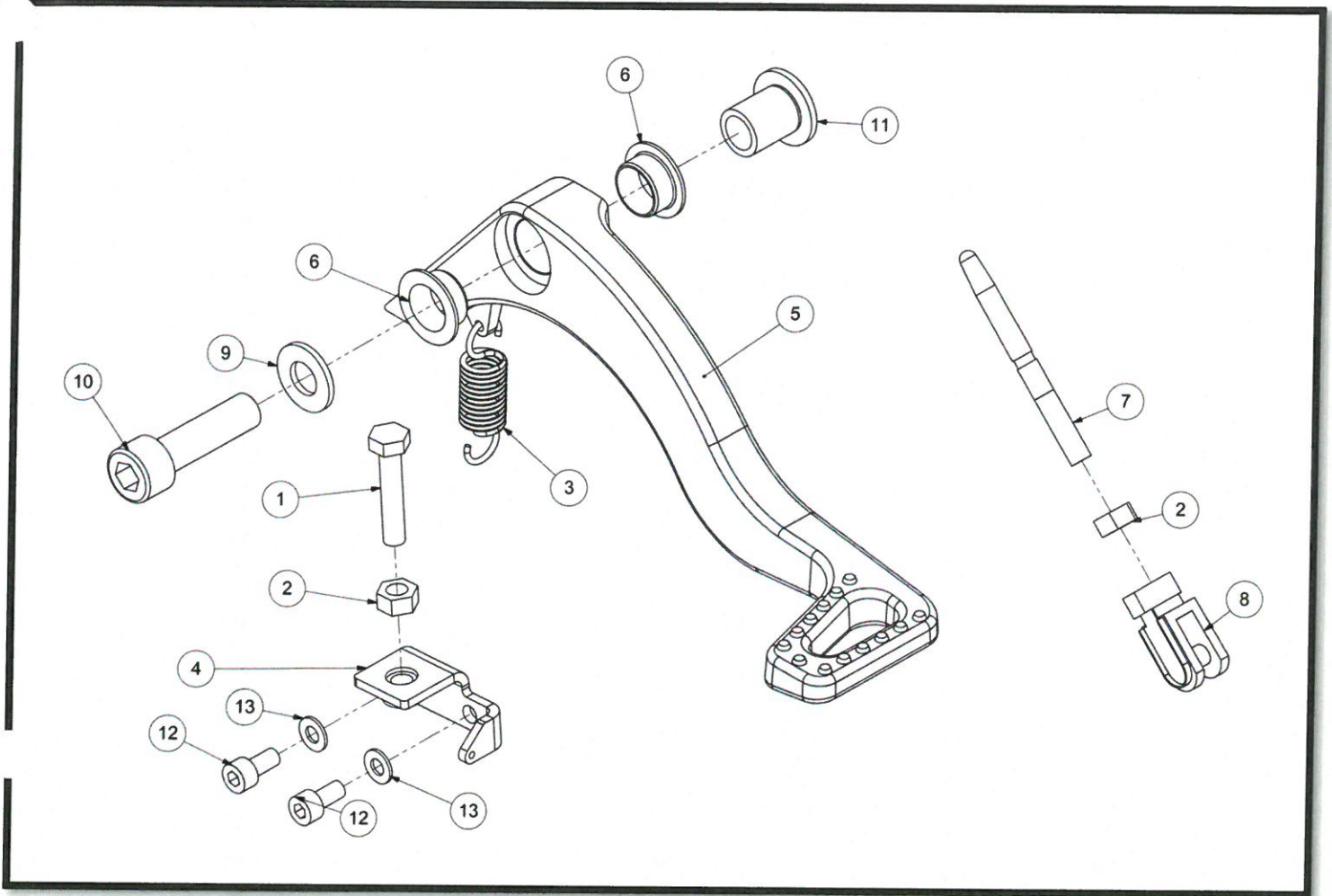
KICKSTAND (US/UK/EU)



Item	Part Number	Description	Qty	Dealer	MSRP
1	11843735	SPRING, KICKSTAND, INNER	1	\$2.12	\$3.18
3	43574572	SPRING, KICKSTAND, OUTER	1	\$2.22	\$3.33
4	82457989	PIN, PIVOT, KICKSTAND	1	\$2.73	\$4.09
5	57329953	PIN, SPRING, KICKSTAND	1	\$3.41	\$5.12
6	42379326	MOUNT, KICKSTAND, FORGED	1	\$15.18	\$22.77
7	74123561	KICKSTAND, LEG, FORGED	1	\$21.56	\$32.34
9	76897412	MAGNET, KICKSTAND	1	\$3.81	\$5.71
10	25591880	M3X0.5X8, SH, 316	2	\$0.96	\$1.44
11	40517181	M3, WS, 8, ZC	2	\$0.02	\$0.02
12	41994470	RING, SNAP, EXT, 13/32	1	\$0.11	\$0.17

Description

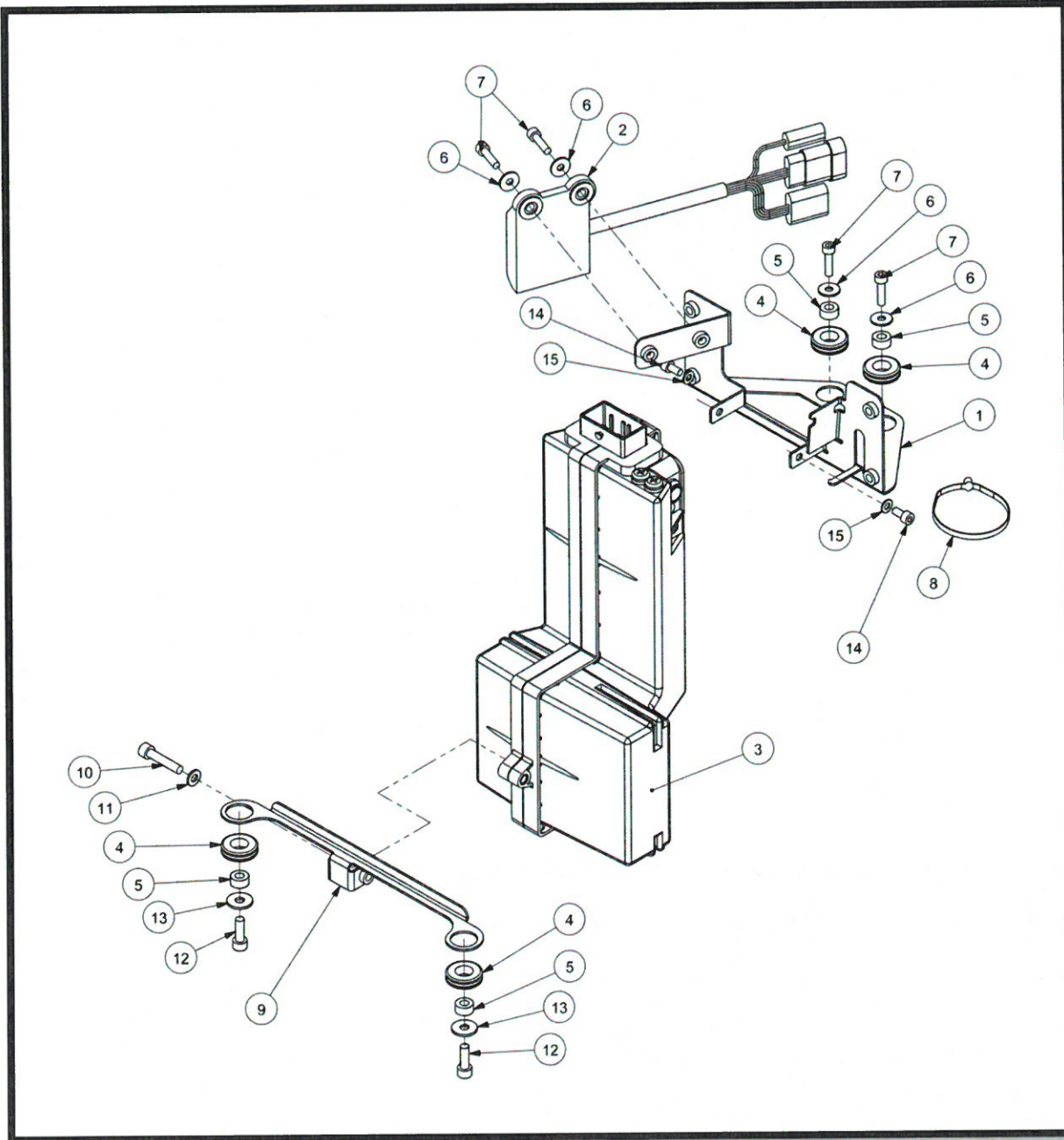
BRAKE PEDAL (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	50615305	M6X1X30, HB, 8.8, ZC	1	\$0.24	\$0.36
2	71170950	M6X1, NU, 10, ZC	2	\$0.04	\$0.05
3	35658628	SPRING, BRAKEPEDAL	1	\$1.63	\$2.45
4	35347265	BRACKET, SPRING, BRAKE	1	\$9.00	\$13.50
5	58324194	BRAKEPEDAL, CAST	1	\$6.56	\$9.83
6	84021866	PBF, 14X16X8X22, IGUSG300	2	\$2.16	\$3.23
7	64990878	PIN, MC, REAR	1	\$0.00	\$0.00
8	29940969	CLEVIS, MC, REAR	1	\$0.00	\$0.00
9	76072359	M10, WS, 8, ZC	1	\$0.04	\$0.05
10	84224903	M10X1.5X35, SH, 8.8, ZC	1	\$0.46	\$0.68
11	05884904	SLEEVE, BUSH, BRAKEPEDAL	1	\$5.48	\$8.22
12	44558179	M5X0.8X10, SH, 8.8, ZC	2	\$0.06	\$0.09
13	75702953	M5, WS, 8, ZC	2	\$0.02	\$0.03

Description

VCU IMMOBILIZER (US/UK/EU)

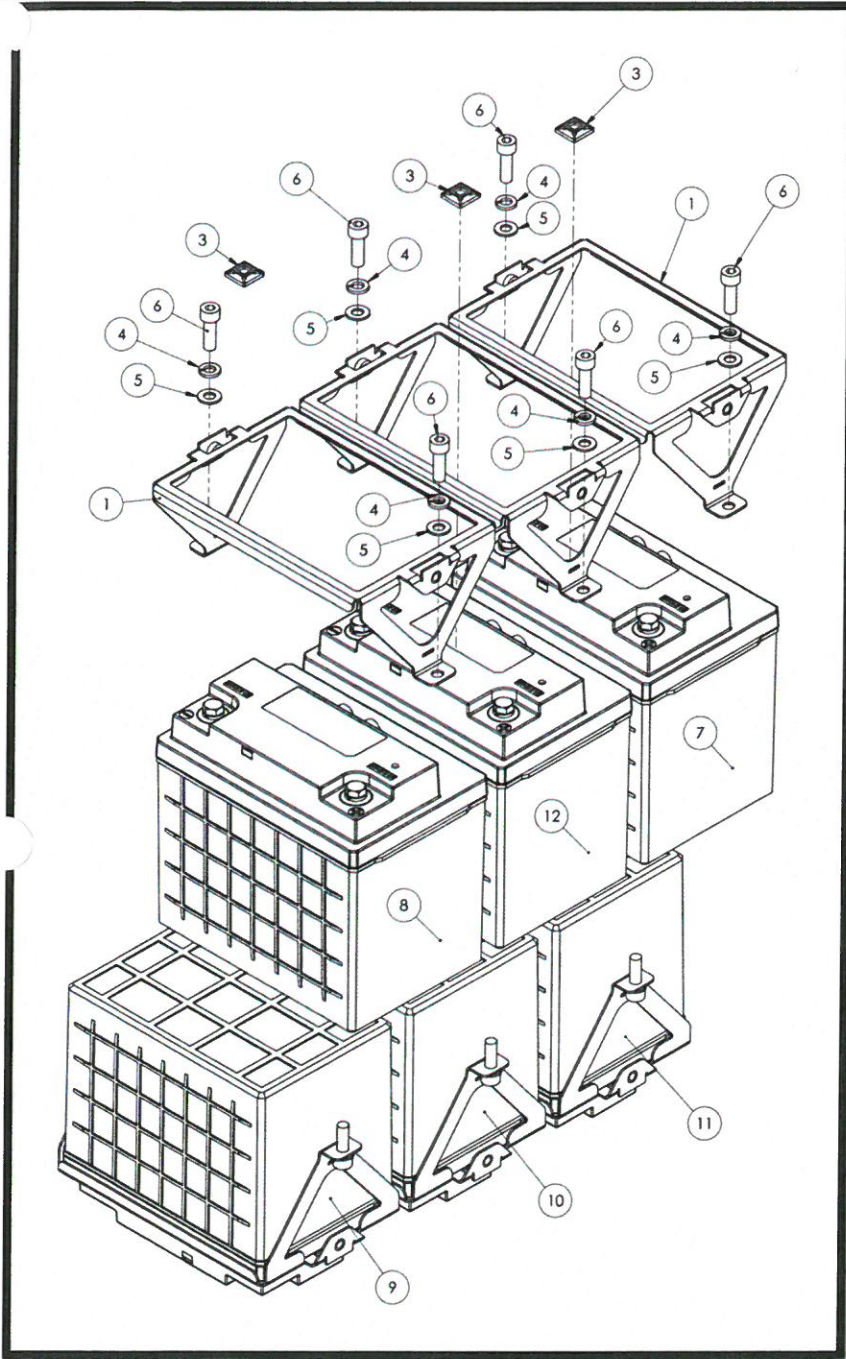


Item	Part Number	Description	Qty	Dealer	MSRP
1	40437919	BRACKET, VCU, DCDC	1	\$22.00	\$33.00
2	67332274	IMMOBILIZER, IGNITION	1	\$63.36	\$95.04
3	99751424	VCU, FRU	1	\$1,522.40	\$2,283.60
4	32219976	GROMMET, BRACKET, DASH	4	\$0.17	\$0.26
5	01767517	SP, 1/4X1/2X1/4, AL	4	\$0.53	\$0.79
6	85275739	M5, WO, 8, ZC	4	\$0.02	\$0.03
7	68081939	M5X0.8X20, SH, 8.8, ZC	4	\$0.07	\$0.11
8	77430504	TIE, CABLE, .18X14, BLACK	1	\$0.22	\$0.33
9	64915138	BRACKET, VCU, LOWER	1	\$13.11	\$19.67
10	75010413	M6X1X30, SH, 8.8, ZC	1	\$0.16	\$0.24
11	75772929	M6, WS, 8, ZC	1	\$0.01	\$0.02
12	64214897	M6X1X18, SH, 8.8, ZC	2	\$0.11	\$0.16
13	25852663	M6, WO, 8, ZC	2	\$0.04	\$0.06
14	44558179	M5X0.8X10, SH, 8.8, ZC	2	\$0.06	\$0.09
15	75702953	M5, WS, 8, ZC	2	\$0.02	\$0.03

DMC - VCU - 50445908

Description

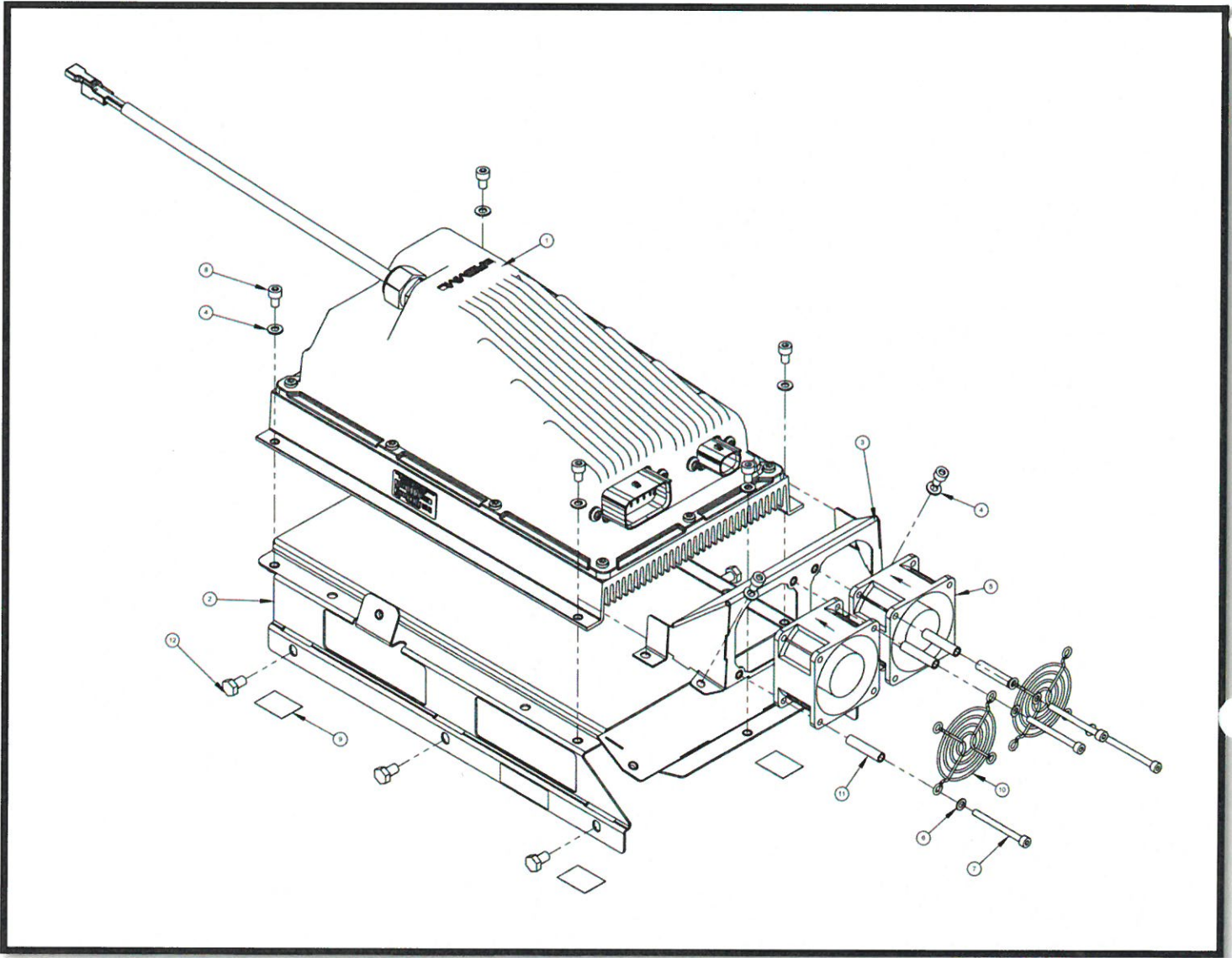
BATTERIES (US/UK/EU)



Item	Part Number	Description	Qty	Dealer	MSRP
1	37353617	STRAP, BATTERY	6	\$34.30	\$51.45
3	54494137	GUIDE, ZIPTIE, ADHESIVE	6	\$0.18	\$0.26
4	93657159	M8, WL, 8, ZC	12	\$0.04	\$0.07
5	75997901	M8, WS, 8, ZC	12	\$0.03	\$0.04
6	69511550	M8X1.25X25, SH, 8.8, ZC	12	\$0.26	\$0.38
7	89729411	BATTERY, U1, 12V, #1	1	\$557.00	\$584.85
8	89729412	BATTERY, U1, 12V, #2	1	\$557.00	\$584.85
9	89729413	BATTERY, U1, 12V, #3	1	\$557.00	\$584.85
10	89729414	BATTERY, U1, 12V, #4	1	\$557.00	\$584.85
11	89729415	BATTERY, U1, 12V, #5	1	\$557.00	\$584.85
12	89729416	BATTERY, U1, 12V, #6	1	\$557.00	\$584.85

Description

CHARGER (US/UK/EU)



Item	Part Number	Description	Qty	Dealer	MSRP
1	41767967	CHARGER, FRU	1	\$774.40	\$1,161.60
2	16308505	BRACKET, CHARGER	1	\$54.82	\$82.24
3	43510342	BRACKET, FAN, CHARGER	1	\$31.83	\$47.75
4	75702953	M5, WS, 8, ZC	7	\$0.02	\$0.03
5	52617156	FAN, CHARGER, CONN	2	\$29.26	\$43.89
6	89661663	M4, WS, 8, ZC	4	\$0.02	\$0.03
7	77862149	M4X0.7X45, SH, 8.8, ZC	4	\$0.21	\$0.32
8	65992749	M5X0.8X8, SH, 8.8, ZC	7	\$0.21	\$0.32
9	61298174	TAPE, PTFE, CHARGER	4	\$0.08	\$0.13
10	36534470	GUARD, FAN, WIRE	2	\$1.02	\$1.53
11	43229753	SPACER, FAN, CHARGER	4	\$2.95	\$4.42
12	75026870	M6X1X10, HB, 8.8, ZC	6	\$0.04	\$0.06
14	44062877	TIE, CABLE, .12X4, BLACK	2	\$0.22	\$0.33

6' Charge cord = \$
 20' Charge cord = \$

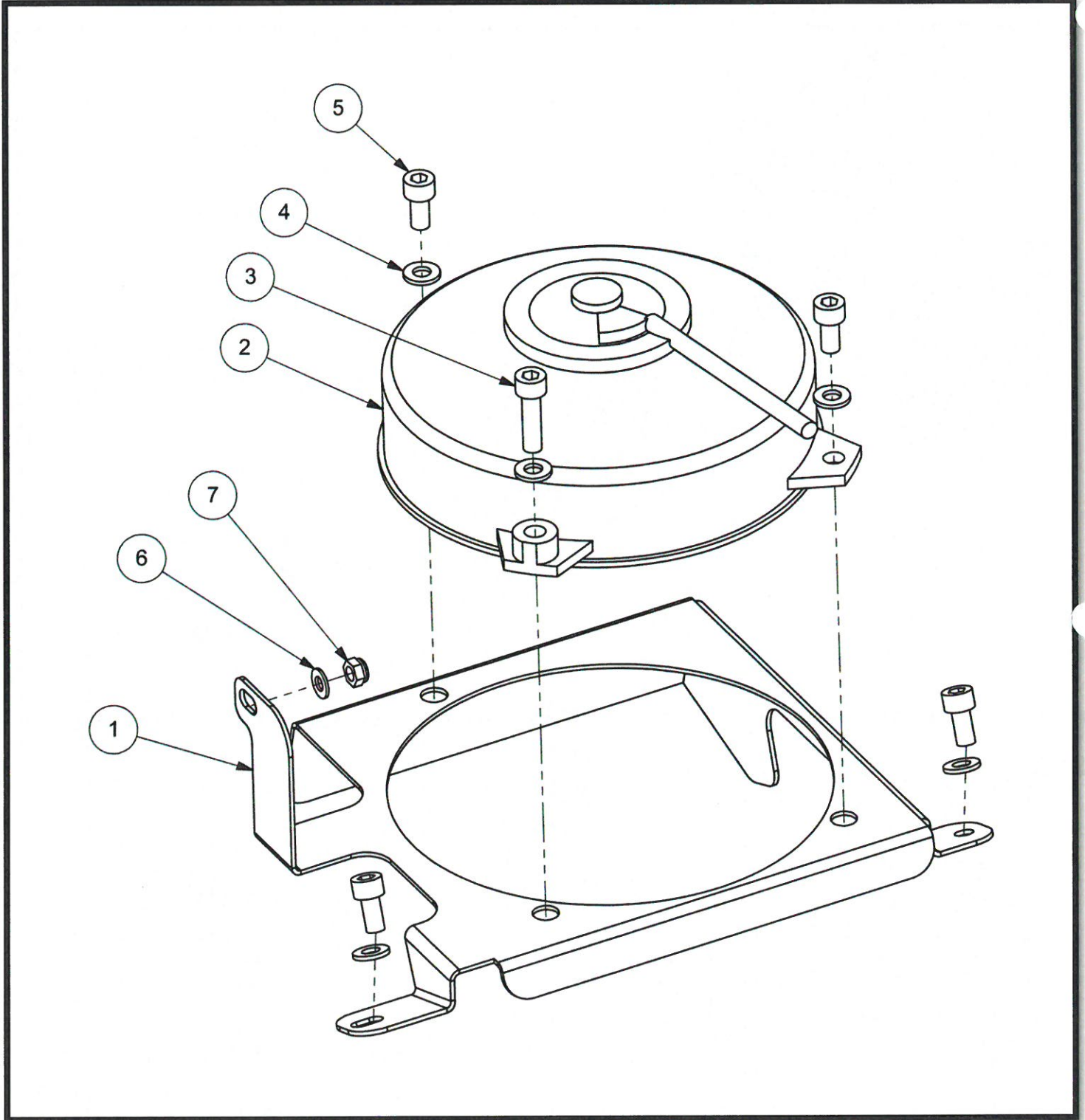
Description

WIRING HARNESS (US/UK/EU)

Item	P/N	Description	Qty	Dealer	MSRP
1	88640952	HARNESS, HEAD	1	\$30.25	\$45.38
2	33473599	CABLE, BATTERY, BOTTOM	1	\$30.25	\$45.38
3	19744677	CABLE, BATTERY, BOTTOM, EU	1	\$30.25	\$45.38
4	47867298	CABLE, BATTERY, COMM	1	\$30.25	\$45.38
5	22799552	CABLE, BATTERY, NEGATIVE, EU	1	\$30.25	\$45.38
6	77811914	CABLE, BATTERY, POSITIVE	1	\$30.25	\$45.38
7	77378076	CABLE, BATTERY, RS485	4	\$30.25	\$45.38
8	50566357	CABLE, BATTERY, TOP	2	\$30.25	\$45.38
9	28389007	CABLE, CONTACTOR, CONTROLLER, EU	1	\$30.25	\$45.38
10	63125300	CABLE, DISCONNECT, BOTTO	1	\$30.25	\$45.38
11	07060224	CABLE, DISCONNECT, TOP	1	\$30.25	\$45.38
12	85149687	CAP, USB FLASH DRIVE	1	\$0.11	\$0.17
13	65154552	FLASH, DRIVE, USB	1	\$21.12	\$31.68
15	54494137	GUIDE, ZIPTIE, ADHESIVE	1	\$0.18	\$0.26
16	77581972	HARNESS, EU, LOWER	1	\$331.58	\$497.38
17	72161174	HARNESS, EU, UPPER	1	\$784.89	\$1,177.34
18	10664612	LABEL, WARNING, VOLTAGE	1	\$1.10	\$1.65
19	84554040	TAPE, BATTERIES, 88T	1	\$0.55	\$0.83
20	44062877	TIE, CABLE, .12X4, BLACK	8	\$0.31	\$0.46
21	77430504	TIE, CABLE, .18X14, BLACK	24	\$0.22	\$0.33

Description

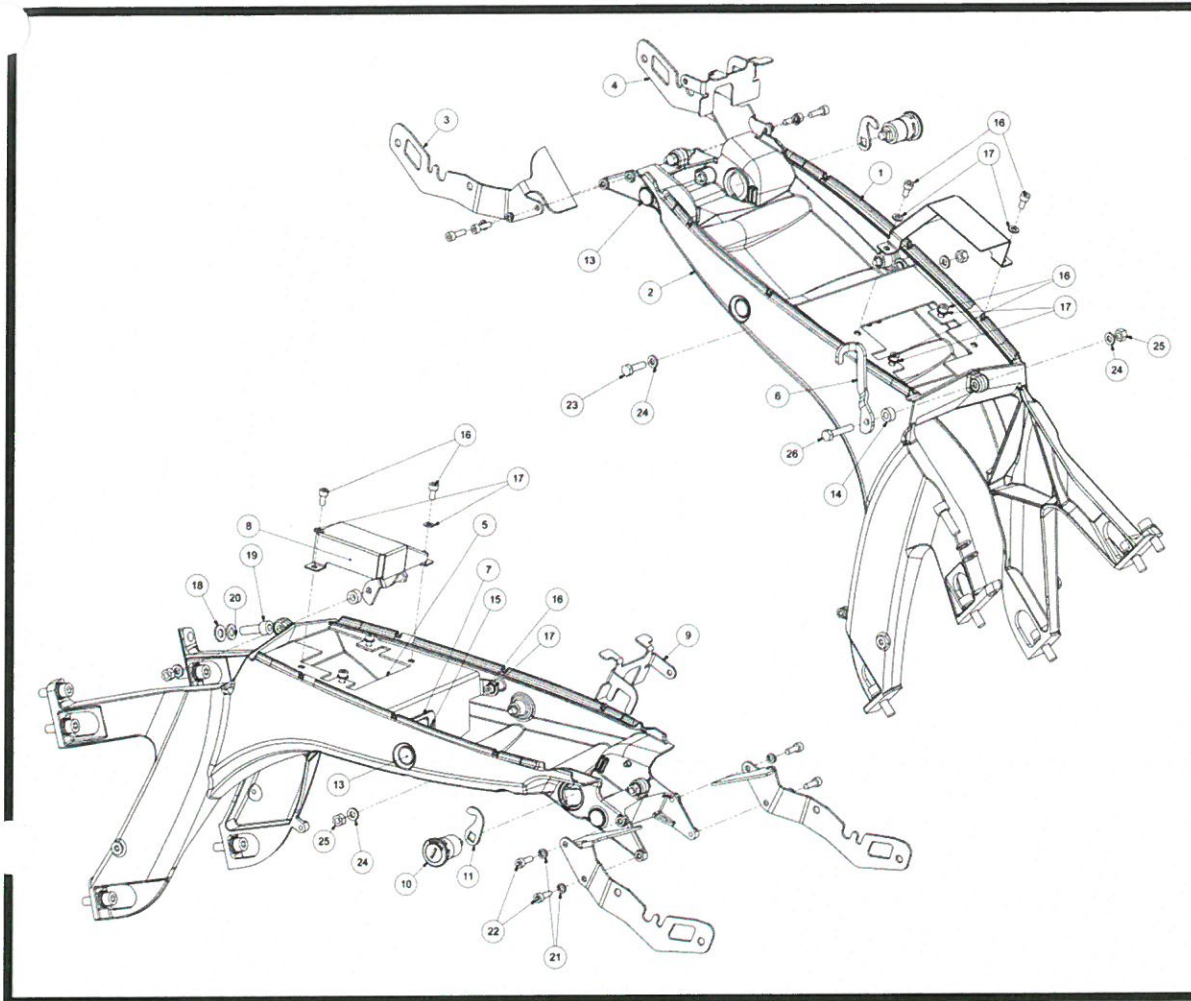
MOTOR FAN (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	64222389	BRACKET, FAN, MOTOR	1	\$26.71	\$40.06
2	80896216	FAN, 130MM, CONN	1	\$59.40	\$89.10
3	68406230	M6X1X22, SH, 8.8, ZC	1	\$0.14	\$0.21
4	75772929	M6, WS, 8, ZC	5	\$0.01	\$0.02
5	69448530	M6X1X12, SH, 8.8, ZC	4	\$0.08	\$0.13
6	75702953	M5, WS, 8, ZC	1	\$0.02	\$0.03
7	74178070	M5X0.8, NY, 10, ZC	1	\$0.07	\$0.11

Description

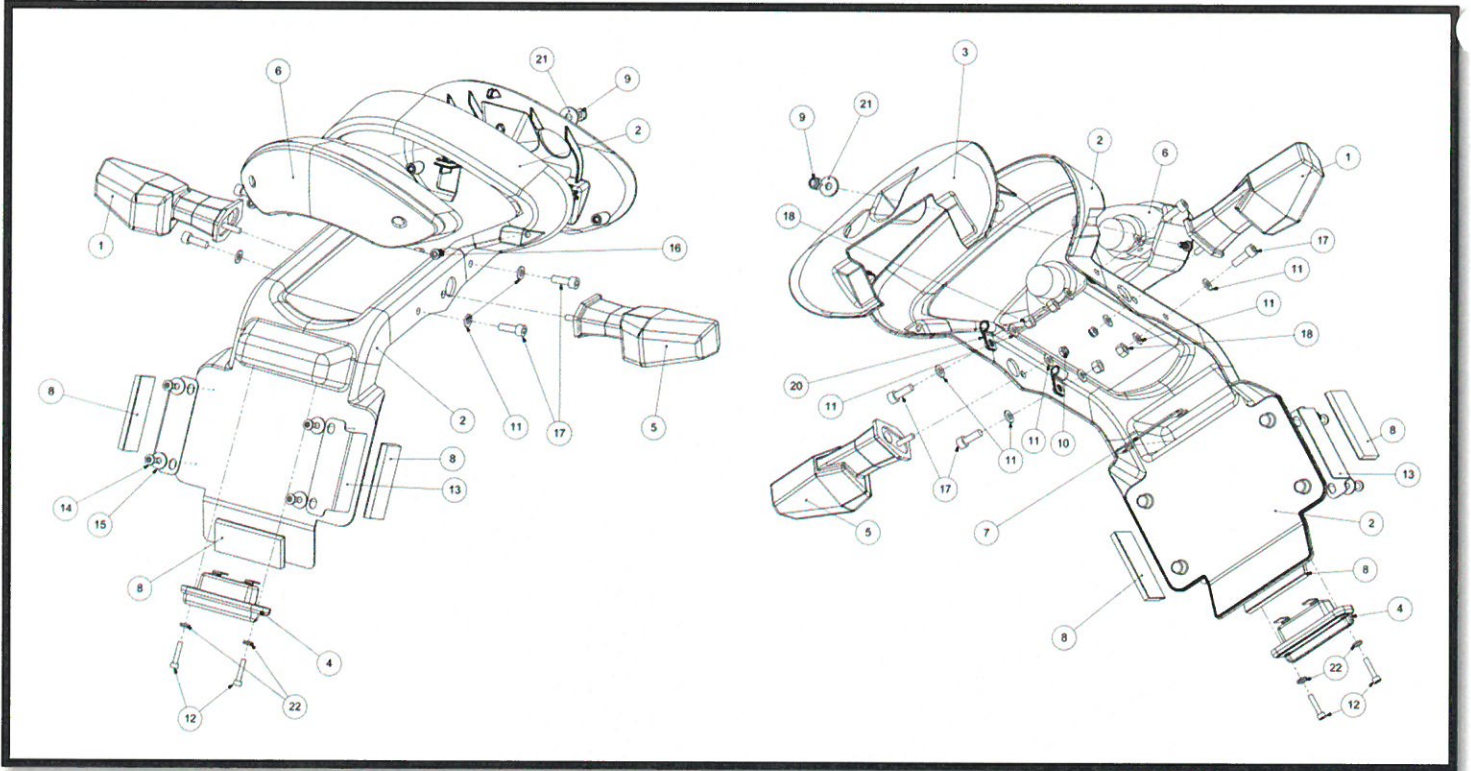
SEAT STRUT (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	04447443	STRUT, SEAT, L, CAST	1	\$59.03	\$88.54
2	55405724	STRUT, SEAT, R, CAST	1	\$59.03	\$88.54
3	54564035	BRACKET, SHROUD, RIGHT	1	\$14.08	\$21.12
4	37660986	BRACKET, SHROUD, LEFT	1	\$14.54	\$21.81
5	81412863	BRACKET, FUSEBLOCK	1	\$18.72	\$28.08
6	12359465	HOOK, SEAT, FRONT	1	\$7.83	\$11.75
7	23001844	RECEPTAL, ELECTRIC	1	\$3.06	\$4.59
8	78127765	BRACKET, FUSEBLOCK, COVER	1	\$11.92	\$17.89
9	46994871	CLIP, LOCK, SEAT	1	\$8.95	\$13.43
10	89728701	LOCK, SEAT	1	\$0.02	\$0.03
11	73309344	HOOK, LOCK, SEAT	1	\$3.43	\$5.15
13	22171587	M10, CLIP, TREE	4	\$0.29	\$0.44
14	01767517	SP, 1/4X1/2X1/4, AL	1	\$0.05	\$0.08
15	71302795	M3X0.5X20, FH, 304	2	\$0.07	\$0.10
16	44558179	M5X0.8X10, SH, 8.8, ZC	6	\$0.06	\$0.09
17	75702953	M5, WS, 8, ZC	6	\$0.02	\$0.03
18	75997901	M8, WS, 8, ZC	6	\$0.03	\$0.04
19	69511550	M8X1.25X25, SH, 8.8, ZC	6	\$0.26	\$0.38
20	93657159	M8, WL, 8, ZC	6	\$0.04	\$0.07
21	64434248	M5, WL, 8, ZC	4	\$0.02	\$0.03
22	16994959	M5X0.8X16, SH, 8.8, ZC	4	\$0.06	\$0.09
23	15524960	M6X1X20, HB, 8.8, ZC	4	\$0.07	\$0.11
24	75772929	M6, WS, 8, ZC	10	\$0.01	\$0.02
25	75490832	M6X1, NL, 10, ZC	5	\$0.03	\$0.05
26	50615305	M6X1X30, HB, 8.8, ZC	1	\$0.24	\$0.37

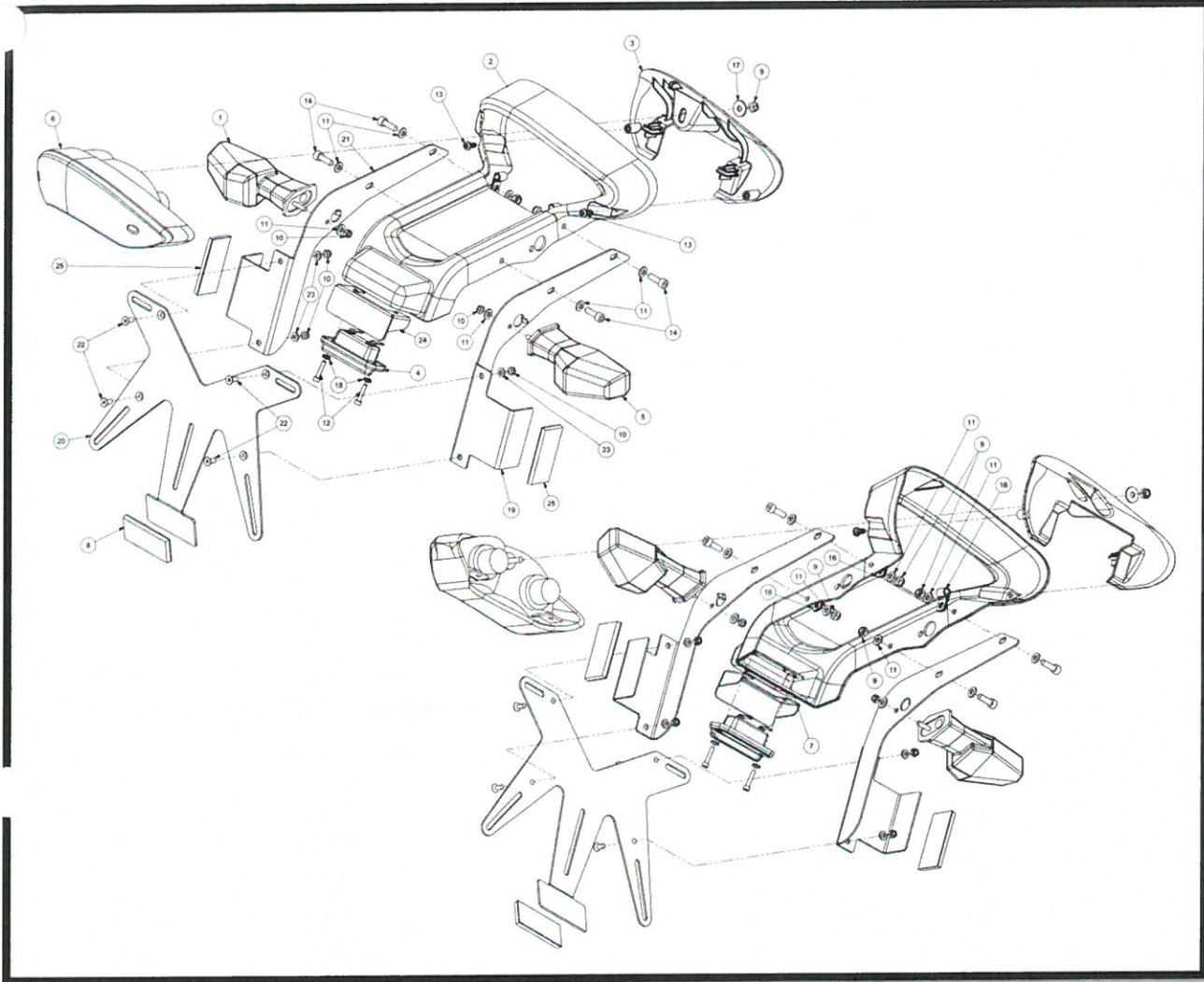
Description

REAR FENDER (US)



Item	P/N	Description	Qty	Dealer	MSRP
1	15443534	LAMP, TURN-B, CONN	1	\$39.18	\$58.77
2	08823270	SHROUD, LAMP, TAIL, INJ	1	\$37.40	\$56.10
3	46048045	BACK, LAMP, TAIL, INJ	1	\$11.04	\$16.57
4	63302290	LAMP, PLATE, REAR	1	\$19.69	\$29.54
5	43285829	LAMP, TURN-A, CONN	1	\$39.18	\$58.77
6	85515272	LAMP, TAIL, CONN	1	\$82.48	\$123.72
7	21098763	BRACKET, NUT, LICENSE	1	\$20.79	\$31.19
8	79729730	REFLECTOR, RED	3	\$1.74	\$2.61
9	74234205	M6X1, NY, 10, ZC	5	\$0.06	\$0.09
10	74178070	M5X0.8, NY, 10, ZC	2	\$0.07	\$0.11
11	75772929	M6, WS, 8, ZC	10	\$0.01	\$0.02
12	87597465	M4X0.7X20, SH, 8.8, ZC	2	\$0.07	\$0.10
13	20217848	BRACKET, REFLECTOR	2	\$11.00	\$16.50
14	70297015	M5X0.8X10, BH, 304	4	\$0.22	\$0.33
15	85275739	M5, WO, 8, ZC	4	\$0.02	\$0.03
16	06901372	10-14X1/2, PH, TORX, PLASTITE	2	\$0.18	\$0.26
17	64214897	M6X1X18, SH, 8.8, ZC	4	\$0.11	\$0.16
18	75490832	M6X1, NL, 10, ZC	4	\$0.01	\$0.01
20	36514020	CLAMP, P, 1/4, COATED	3	\$0.39	\$0.59
21	25852663	M6, WO, 8, ZC	1	\$0.04	\$0.06
22	77083277	M5, WR, 8, ZC	2	\$0.01	\$0.01

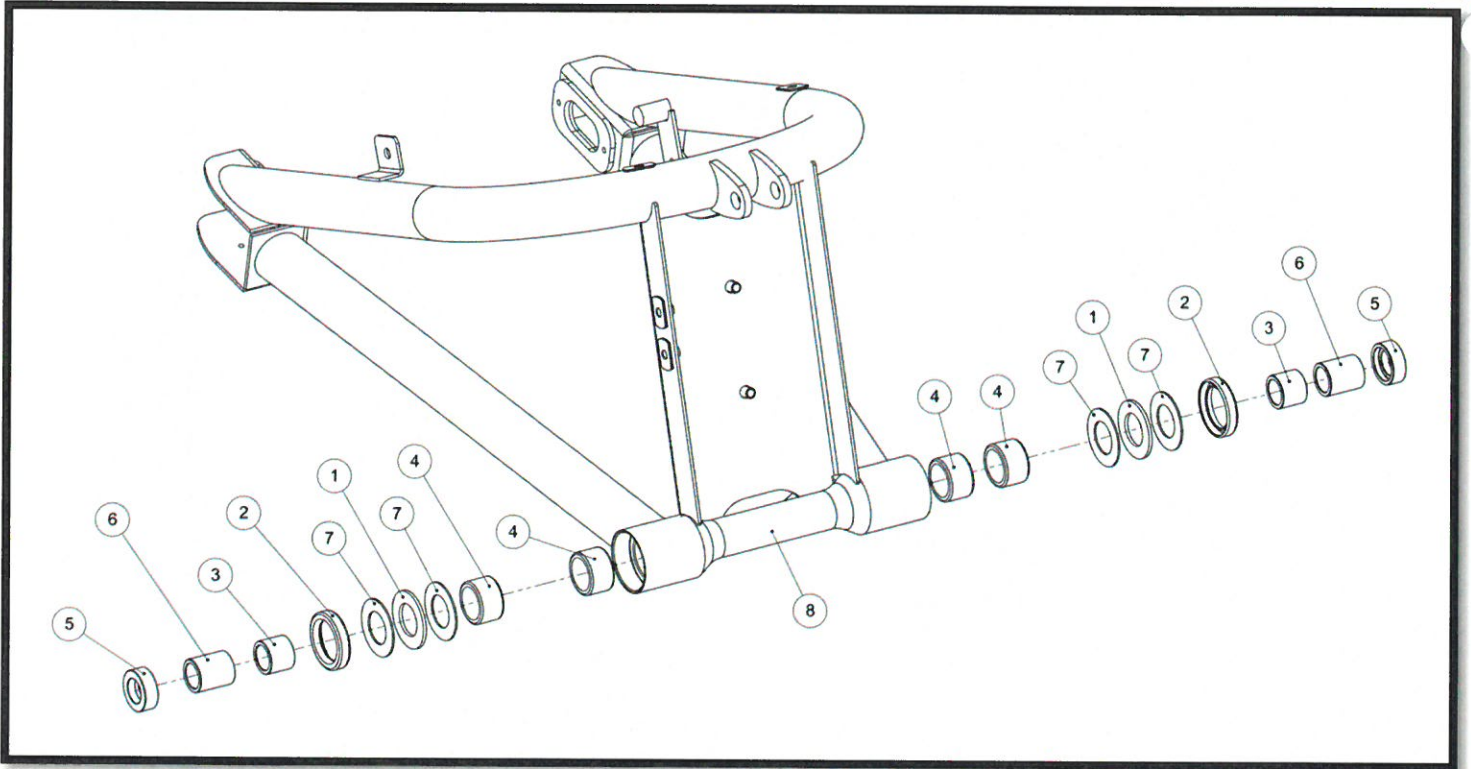
Description REAR FENDER (UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	43285829	LAMP, TURN-A, CONN	1	\$39.18	\$58.77
2	62631202	SHROUD, LAMP, TAIL, EU	1	\$37.40	\$56.10
3	46048045	BACK, LAMP, TAIL, INJ	1	\$11.04	\$16.57
4	63302290	LAMP, PLATE, REAR	1	\$19.69	\$29.54
5	15443534	LAMP, TURN-B, CONN	1	\$39.18	\$58.77
6	85515272	LAMP, TAIL, CONN	1	\$82.48	\$123.72
7	21098763	BRACKET, NUT, LICENSE	1	\$20.79	\$31.19
8	79729730	REFLECTOR, RED	1	\$1.74	\$2.61
9	74234205	M6X1, NY, 10, ZC	5	\$0.07	\$0.11
10	74178070	M5X0.8, NY, 10, ZC	6	\$0.07	\$0.10
11	75772929	M6, WS, 8, ZC	10	\$0.01	\$0.02
12	87597465	M4X0.7X20, SH, 8.8, ZC	2	\$0.07	\$0.10
13	06901372	10-14X1/2, PH, TORX, PLASTITE	2	\$0.18	\$0.26
14	64214897	M6X1X18, SH, 8.8, ZC	4	\$0.11	\$0.16
16	36514020	CLAMP, P, 1/4, COATED	3	\$0.39	\$0.59
17	25852663	M6, WO, 8, ZC	1	\$0.04	\$0.06
18	77083277	M5, WR, 8, ZC	2	\$0.01	\$0.01
19	25827629	BRACKET, REGISTRATION, RIGHT	1	\$77.00	\$115.50
20	09637773	BRACKET, REGISTRATION, REAR	1	\$77.00	\$115.50
21	85733312	BRACKET, REGISTRATION, LEFT	1	\$77.00	\$115.50
22	87703079	M5X0.8X12, FH, 304	4	\$0.06	\$0.08
23	75702953	M5, WS, 8, ZC	4	\$0.02	\$0.03
24	05509043	DEFLECTOR, LIGHT, REAR	1	\$8.80	\$13.20
25	79319757	REFLECTOR, AMBER	2	\$1.74	\$2.61

Description

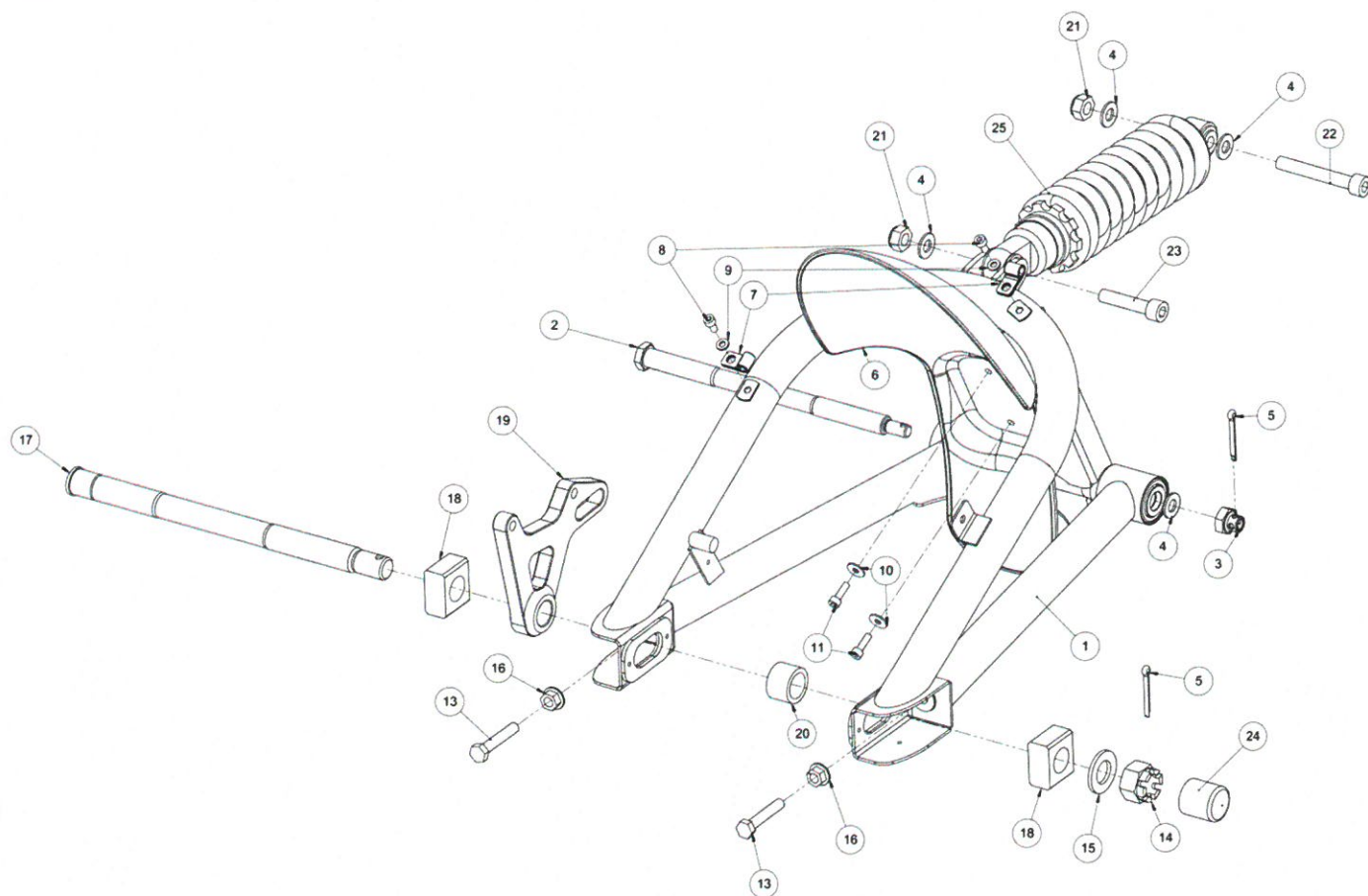
SWINGARM (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	21036864	TNB, 20X35X2	2	KIT	KIT
2	20969898	SEAL, 25X35X7	2	KIT	KIT
3	21800036	RNB, 15X20X16	2	KIT	KIT
4	21779985	NB, 20X26X16	4	KIT	KIT
5	22326178	CUP, SEAL, SWINGARM	2	KIT	KIT
6	21940911	RNB, 15X20X23	2	KIT	KIT
7	21673352	WT, 20X35X1	4	KIT	KIT
8	52486843	SWINGARM, STEEL	1	\$197.96	\$296.93

NOTE: SWINGARM IS PRE PRESSED WITH BEARINGS, ITEMS 1-7

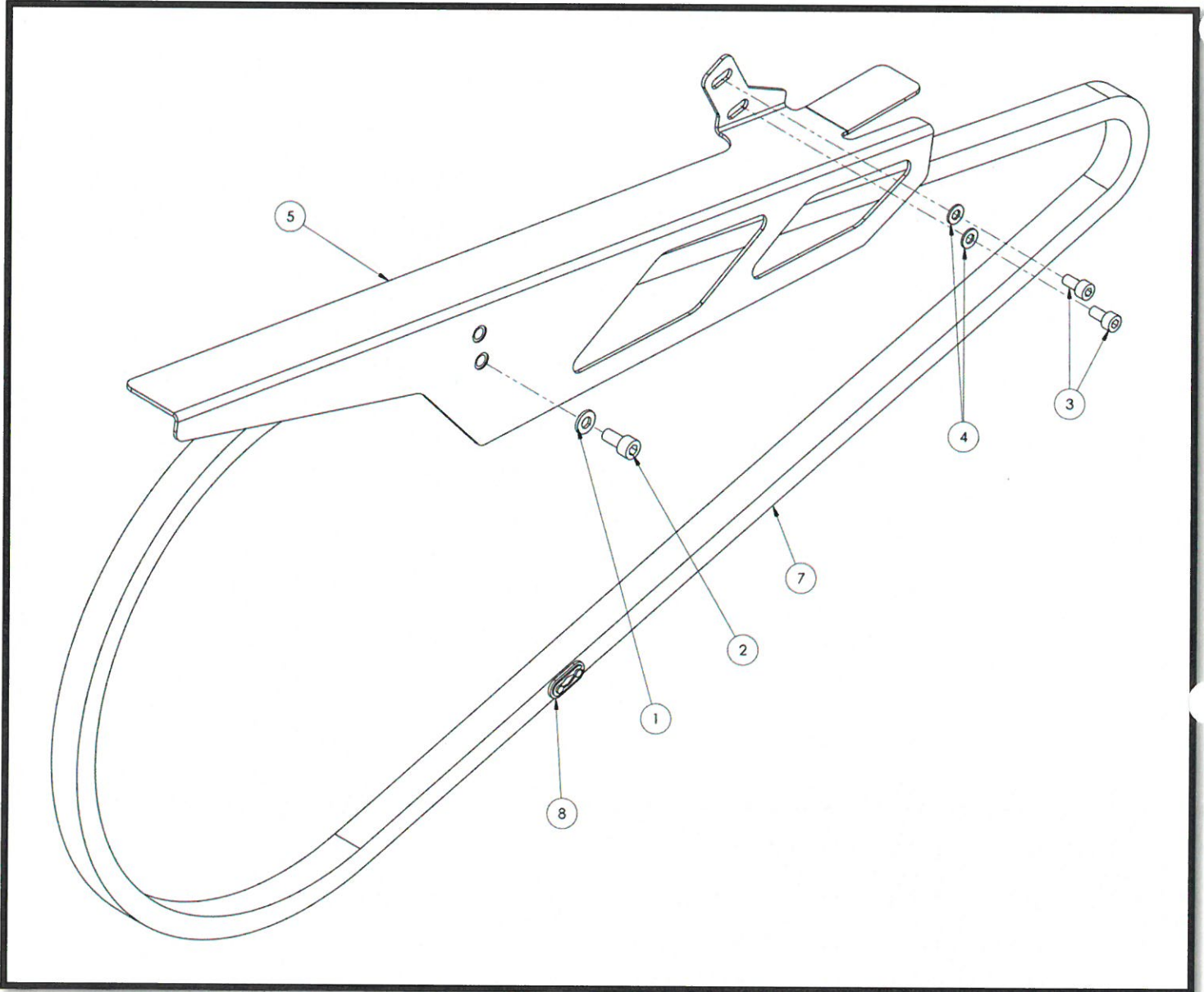
SWINGARM COMPONENTS (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	22602141	SWINGARM, BEARINGS	1	\$197.96	\$296.93
2	20762730	AXLE, PIVOT, SWINGARM	1	\$34.76	\$52.14
3	61793417	M10X1.5, NUT, DRILLED	1	\$7.44	\$11.15
4	76072359	M10, WS, 8, ZC	4	\$0.04	\$0.05
5	46536720	PIN, COTTER, M4X32	2	\$0.10	\$0.16
6	90305841	FENDER, REAR, INJ	1	\$15.16	\$22.74
7	36514020	CLAMP, P, 1/4, COATED	2	\$0.39	\$0.59
8	44558179	M5X0.8X10, SH, 8.8, ZC	2	\$0.06	\$0.09
9	75702953	M5, WS, 8, ZC	2	\$0.02	\$0.03
10	85275739	M5, WO, 8, ZC	2	\$0.02	\$0.03
11	16994959	M5X0.8X16, SH, 8.8, ZC	2	\$0.06	\$0.09
13	75857198	M8X1.25X45, HB, 8.8, ZC	2	\$0.24	\$0.37
14	56615978	M18X2.5, NC, 8, ZC	1	\$3.12	\$4.69
15	76711166	M18, WS, 8, ZC	1	\$0.35	\$0.52
16	75368809	M8X1.25, NF, 10, ZC	2	\$0.10	\$0.15
17	10545266	AXLE, WHEEL, REAR	1	\$28.20	\$42.31
18	10613376	BLOCK, AXLE, REAR	2	\$18.92	\$28.38
19	57951862	ADAPTOR, CALIPER, REAR	1	\$61.71	\$92.57
20	75254249	SP, 20X28X19, AL, AN	1	\$10.34	\$15.51
21	74635476	M10X1.5, NY, 10, ZC	2	\$0.25	\$0.37
22	94429504	M10X1.5X70, SH, 8.8, ZC	1	\$0.55	\$0.83
23	69610077	M10X1.5X45, SH, 8.8, ZC	1	\$0.31	\$0.46
24	03695047	CAP, AXLE, REAR, EU	1	\$0.19	\$0.28
25	87415564	SHOCK, REAR, WORKS	1	\$209.00	\$313.50

Description

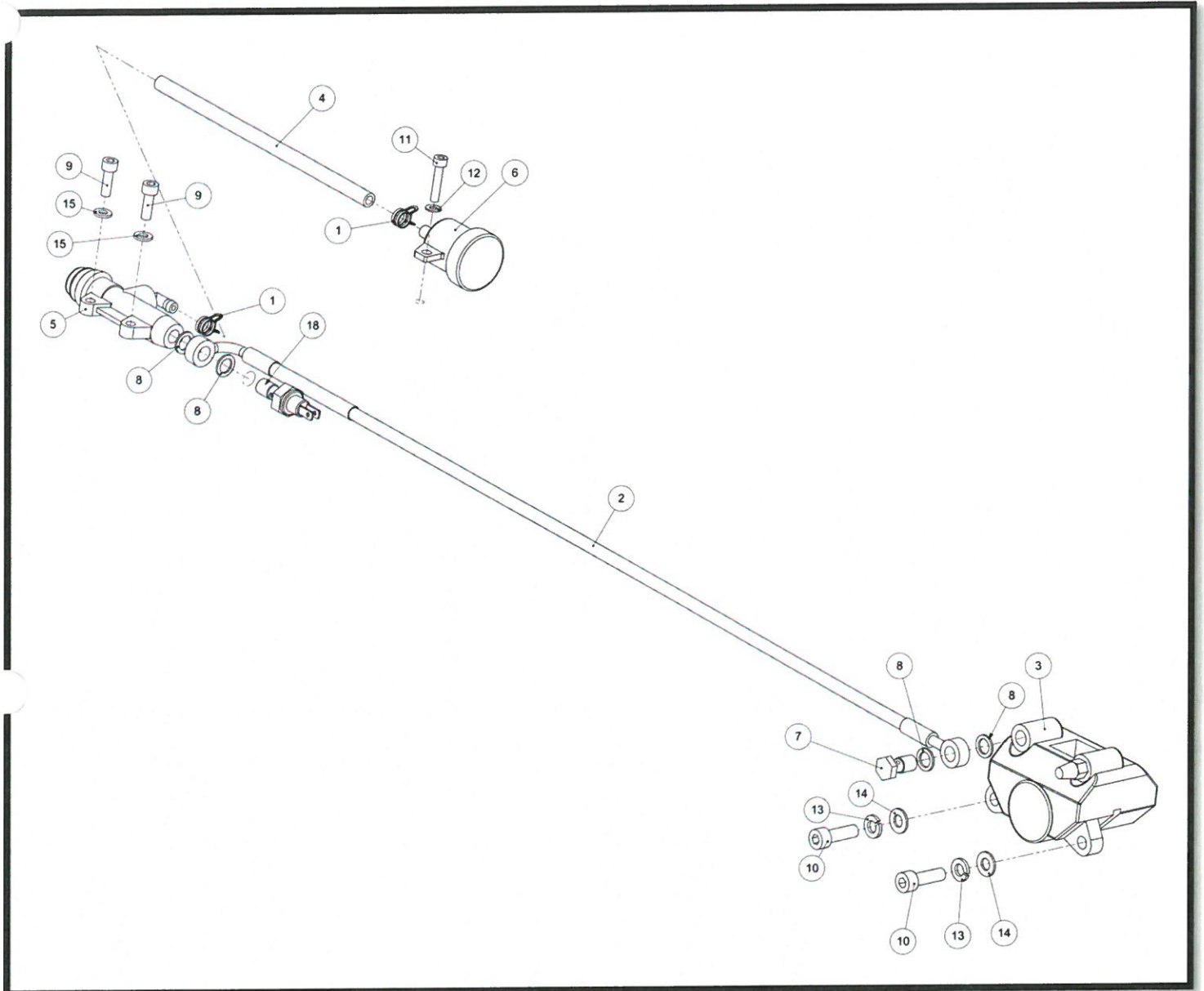
CHAIN (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	75772929	M6, WS, 8, ZC	1	\$0.01	\$0.02
2	69448530	M6X1X12, SH, 8.8, ZC	1	\$0.08	\$0.13
3	44558179	M5X0.8X10, SH, 8.8, ZC	2	\$0.06	\$0.09
4	75702953	M5, WS, 8, ZC	2	\$0.02	\$0.03
5	49521130	GUARD, CHAIN	1	\$25.30	\$37.95
7	22230727	CHAIN, 420X128L, ORING	1	\$44.00	\$66.00
8	50472313	LINK, CHAIN, ORING, 420	1	\$0.00	\$0.00

Description

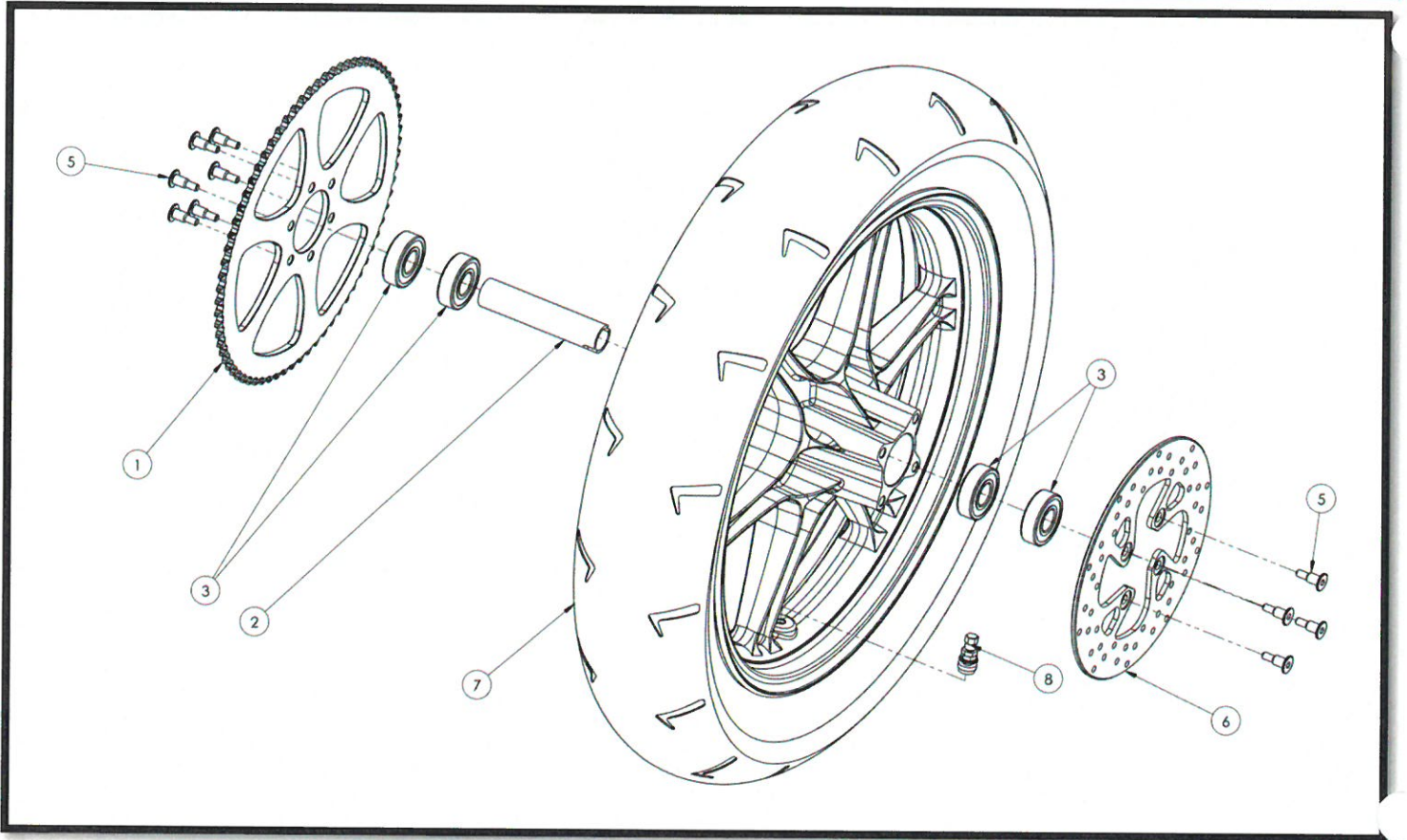
REAR BRAKE (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	79022640	CLAMP, HOSE, RESERVOIR	2	\$0.31	\$0.46
2	54336059	LINE, BRAKE, REAR	1	\$53.53	\$80.29
3	57518381	CALIPER, REAR	1	\$152.06	\$228.10
4	59245825	HOSE, RESERVOIR	1	\$6.12	\$9.17
5	58335900	MC, REAR	1	\$81.97	\$122.96
6	58916300	RESERVOIR, MC, REAR	1	\$10.43	\$15.64
7	32023412	BOLT, BANJO, M10X1.0	1	\$12.10	\$18.15
8	77795785	WASHER, CRUSH, M10, CU	4	\$0.52	\$0.79
9	64214897	M6X1X18, SH, 8.8, ZC	2	\$0.11	\$0.16
10	69511550	M8X1.25X25, SH, 8.8, ZC	2	\$0.26	\$0.38
11	28755665	M5X0.8X25, SH, 8.8, ZC	1	\$0.13	\$0.20
12	75702953	M5, WS, 8, ZC	1	\$0.02	\$0.03
13	93657159	M8, WL, 8, ZC	2	\$0.04	\$0.07
14	75997901	M8, WS, 8, ZC	2	\$0.03	\$0.04
15	75772929	M6, WS, 8, ZC	2	\$0.01	\$0.02
18	13747365	SWITCH, BRAKE, HONEYWELL	1	\$3.54	\$5.31

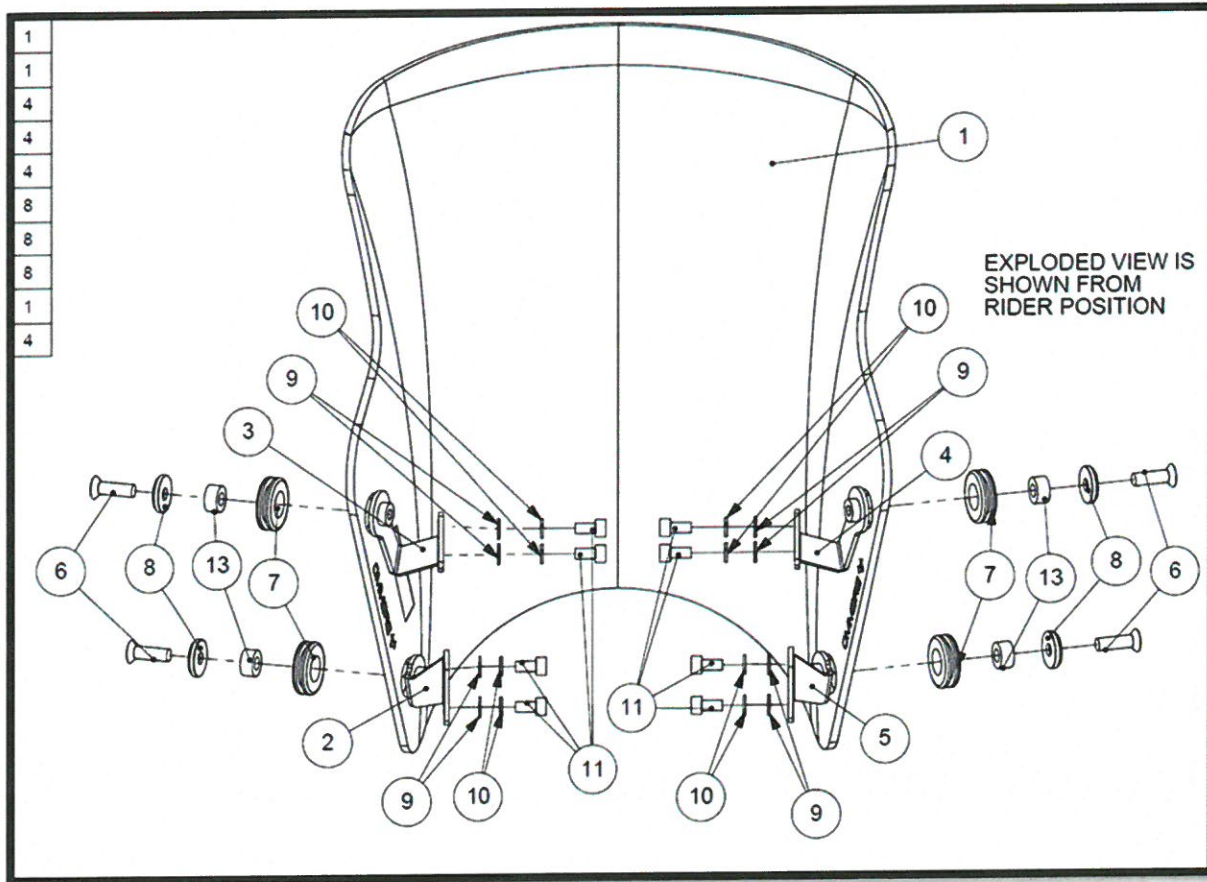
Description

REAR WHEEL (US/UK/EU)



Item	P/N	Description	Qty	Dealer	MSRP
1	33570773	SPROCKET, REAR, 72T	1	\$75.90	\$113.85
2	10443229	SPACER, WHEEL, REAR	1	\$13.75	\$20.63
3	14924574	BB, 20X47X14, DS	4	\$2.16	\$3.23
4	18777514	WHEEL, REAR	1	\$144.47	\$216.71
5	80581885	SCREW, ROTOR	10	\$4.95	\$7.43
6	17908931	ROTOR, BRAKE, REAR	1	\$29.70	\$44.55
7	15175623	TIRE, REAR, ROADRIDER	1	\$185.17	\$277.76
8	82260024	VALVE, AIR, SCHRADER	1	\$11.88	\$17.82
11	33260220	WEIGHT, STEEL, ADHESIVE	1	\$2.20	\$3.30

Part Number	Description	Dealer	MSRP
36419207	WINDSCREEN KIT *2012 MODELS ONLY* (US/UK/EU)	\$102.34	\$153.51



Item	P/N	Description	Qty	Dealer	MSRP
1	55278039	WINDSCREEN, TALL, CLEAR	1	\$ 71.97	\$107.95
2	16998190	BRKT, WINDSCREEN, LH, FRNT	1	\$ 5.37	\$8.05
3	90825820	BRKT, WINDSCREEN, LH, REAR	1	\$ 5.37	\$8.05
4	67000007	BRKT, WINDSCREEN, RH, REAR	1	\$ 5.37	\$8.05
5	74046916	BRKT, WINDSCREEN, LH, FRNT	1	\$ 5.37	\$8.05
6	56060409	M6X1X20, FH, 316	4	\$ 0.85	\$1.27
7	32219976	GROMMET, BRACKET, DASH	4	\$ 0.10	\$0.15
8	99583908	M6, WS, CS, ST, ZC	4	\$ 1.71	\$2.56
9	75702953	M5, WS, 8 ZC	8	\$0.05	\$0.08
10	64434248	M5, WL, 8, ZC	8	\$0.05	\$0.08
11	44558179	M5X0.8X10, SH, 8.8, ZC	8	\$0.05	\$0.08
13	01767517	SP, 1/4X1/2X1/4, AL	4	\$0.84	\$1.26

Part Number

Description

Dealer

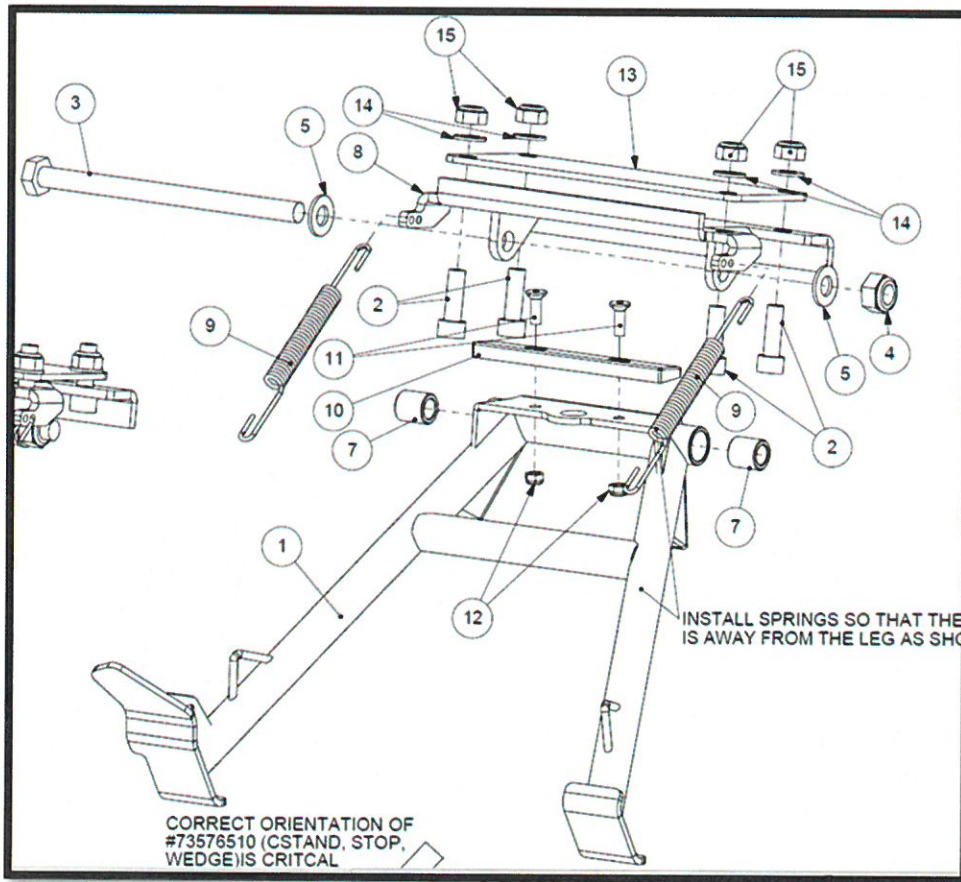
MSRP

.45077467

CENTER STAND KIT (US/UK/EU)

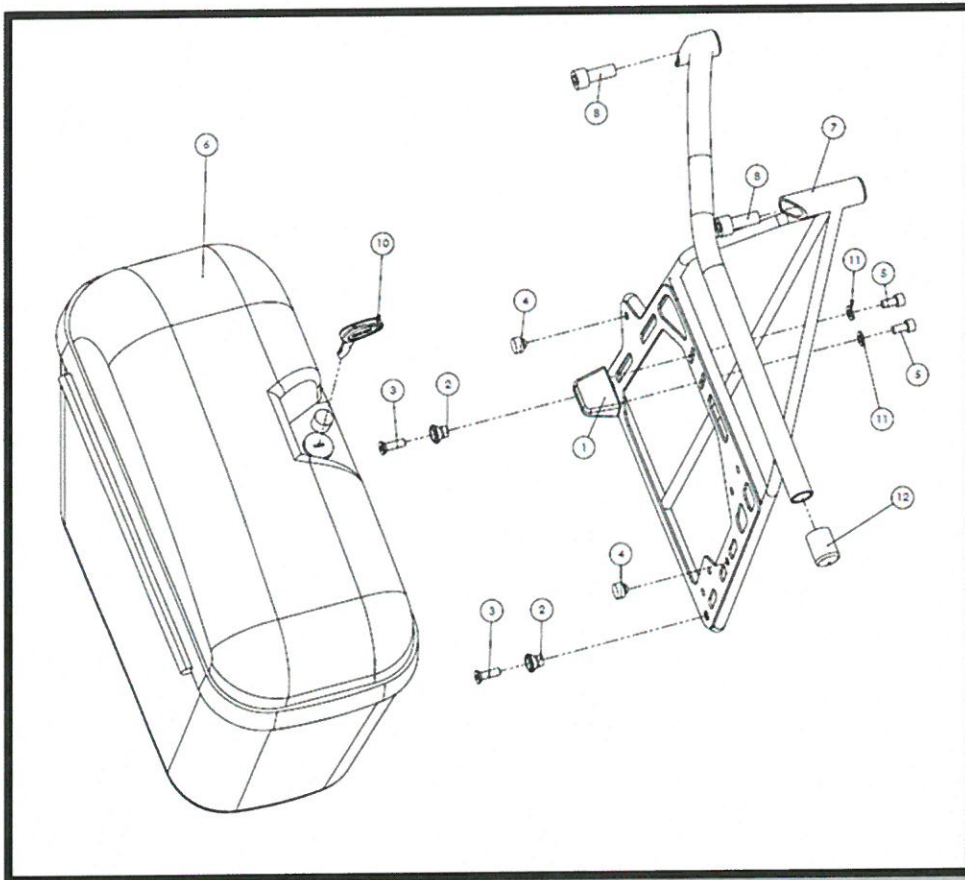
\$158.28

\$237.43



Item	Part Number	Description	Qty	Dealer	MSRP
1	37334091	ASSY, CENTERSTAND, FAB	1	\$62.50	\$93.75
2	69511550	M8X1.25X25, SH, 8.8, ZC	4	\$0.35	\$0.52
3	58079612	M8X1.25X25, SH, 8.8, ZC	1	\$4.60	\$6.90
4	74635476	M10X1.5, NY, 10, ZC	1	\$0.92	\$1.38
5	76072359	M10, WS, 8, ZC	2	\$0.10	\$0.15
7	81848758	BUSHING, C STAND	2	\$22.30	\$33.45
8	86871552	MOUNT, CENTERSTAND	1	\$30.00	\$45.00
9	43574572	SPRING, KICKSTAND, OUTER	2	\$2.52	\$3.78
10	73576510	CSTAND, STOP, WEDGE	1	\$Call	\$Call
11	27363997	M5X0.8X16, FH, ZC	2	\$Call	\$Call
12	74178070	M5X0.8, NY, 10, ZC	2	\$0.05	\$0.08
13	33597320	BACKPLATE, CENTERSTAND	1	\$12.50	\$18.75
14	75997901	M8, WS, 8, ZC	4	\$0.10	\$0.15
15	74600690	M8X1.25, NY, 10, ZC	4	\$0.40	\$0.60

Part Number	Description	Dealer	MSRP
41632044	GIVI HARD BAGS KIT – MATTE BLACK (US/UK/EU)	\$305.28	\$336.28
89176684	GIVI HARD BAGS KIT – SILVER TOP (US/UK/EU)	\$350.73	\$381.46



Item	Part Number	Description	Qty	Dealer	MSRP
1*	38571805	TONGUE, LOCK, GIVI	1	KIT	KIT
2*	48026520	SPOOL, LATCH, GIVI	2	KIT	KIT
3	51763580	M6X1X20,FH, ZC	2	\$0.25	\$0.37
4*	88208955	BUMPER, RUBBER, RACK, GIVI	2	KIT	KIT
5	69448530	M6X1X12, SH, 8.8, ZC	2	\$0.10	\$0.15
6*	67111641	CASE, HARD, SIDE, LH&RH (SET), GIVI, BLACK	1	\$63.00	\$78.00
6*	47000527	CASE, HARD, SIDE, LH&RH (SET), GIVI, SILVER	1	\$108.00	\$142.00
7	92376810	ASSY, RACK, LH, GIVI	1	\$60.00	\$90.00
7	19853324	ASSY, RACK, RH, GIVI	1	\$60.00	\$90.00
8	18952149	M10X1.5X25, SH, 8.8, ZC	2	\$0.55	\$0.82
10*	70091384	KEY, CASE, GIVI	1	KIT	KIT
11	75772929	M6, WS, 8, ZC	2	\$0.05	\$0.08
12	79948091	CAP, TUBING, .75, VINYL	1	\$0.10	\$0.15

NOTE: GIVI bags are only sold in pairs and include all hardware.



Parts Manual
2009-2010 Enertia Legacy



Part Info				Usage
Part #	Description	Dealer Cost	MSRP	/Bike
08710307	HARNESS: CABLES: LOOSE	231.82	347.73	1
20504719	ASSY: HARNESS: UPPER	591.98	887.96	1
69251776	ASSY: HARNESS: LOWER	312.46	468.69	1
99416905	CONNECTED: BUTTON: BODY	11.77	17.65	1
68712228	CONNECTED: CONTACTOR: MAIN	8.96	13.43	1
38923681	CONNECTED: THROTTLE	18.11	27.17	1
68672442	CONNECTED: ASSY: LOCK	15.50	23.25	1
93508350	CONNECTED: CNTRL: LIGHT	38.77	58.15	1
34340656	CONNECTED: SWITCH: BRAKE	3.49	5.23	1
27872139	CONNECTED: LAMP: TAIL	4.82	7.22	1
05450297	CONNECTED: SIGNAL: LEFT	7.45	11.17	2
66948002	CONNECTED: SIGNAL: RIGHT	7.45	11.17	2
11564774	CONNECTED: MC: FRONT	4.64	6.95	1
05568928	CABLE: MOTOR: ENCODER	54.70	82.05	1
92660445	FAN: CHARGER: EXTERNAL	29.93	44.89	2
54567617	ASSY: DASH	893.25	1,339.88	1
50445908	ASSY: VCU: MAIN	1,557.00	2,335.50	1
60124630	ASSY: MEIS: MAIN	225.00	337.50	1
58916300	RESERVOIR: MC: REAR	10.67	16.00	1
79022640	CLAMP: HOSE: RESERVOIR	0.32	0.47	2
58593792	MC: FRONT	87.19	130.78	1
59245825	HOSE: RESERVOIR	6.26	9.38	1
58117640	CALIPER: FRONT	121.50	182.25	1
18540252	ROTOR: BRAKE: FRONT	47.72	71.58	1
17908931	ROTOR: BRAKE: REAR	30.38	45.56	1
57518381	CALIPER: REAR	155.52	233.28	1
58335900	MC: REAR	83.84	125.75	1
16044152	GUARD: SPLASH: FRONT	14.85	22.28	1
17688686	BRACKET: HEADLAMP: RIGHT	18.05	27.07	1
28031981	MESH: BODY: UPPER	9.05	13.57	2
37353617	STRAP: BATTERY	30.51	45.77	6
20217848	BRACKET: REFLECTOR	8.44	12.66	2
45924932	BRACKET: CONTROLLER	46.22	69.32	1
35347265	BRACKET: SPRING: BRAKE	16.63	24.94	1
49355400	FAN: MOTOR	17.55	26.33	1
37660986	BRACKET: SHROUD: LEFT	15.80	23.69	1
54564035	BRACKET: SHROUD: RIGHT	15.80	23.69	1
78127765	BRACKET: FUSEBLOCK: COVER	19.42	29.13	1
81412863	BRACKET: FUSEBLOCK	32.69	49.04	1
14832926	BRACKET: CONTACTOR: MAIN	25.29	37.94	1
64222389	BRACKET: FAN: MOTOR	44.62	66.93	1
43510342	BRACKET: FAN: CHARGER	29.99	44.99	1
14706803	LATCH: SEAT	11.43	17.15	1
49521130	GUARD: CHAIN	28.01	42.02	1
08885254	BRACKET: VCU: UPPER	24.14	36.21	1
69873875	TONGUE: SEAT: FRONT	17.33	25.99	1
05261064	BRACKET: FOOTPEG: R	15.86	23.79	1
46994871	CLIP: LOCK: SEAT	11.14	16.71	1
16308505	BRACKET: CHARGER	56.27	84.41	1

Part Info				Usage
Part #	Description	Dealer Cost	MSRP	/Bike
78038162	BRACKET: FOOTPEG: L	15.86	23.79	1
10878587	BRACKET: HEADLAMP: LEFT	18.05	27.07	1
39047146	BRACKET: DASH: LOWER	25.20	37.80	1
21098763	BRACKET: NUT: LICENSE	11.21	16.81	1
39584428	BRACKET: DASH: UPPER	13.34	20.01	1
64915138	BRACKET: VCU: LOWER	14.56	21.84	1
73309344	HOOK: LOCK: SEAT	2.75	4.12	1
12359465	HOOK: SEAT: FRONT	12.13	18.19	1
61324531	GUIDE: HARNESS: FORK	19.96	29.94	4
91852259	CLAMP: AUDIO	17.44	26.16	1
36499542	SPROCKET: REAR: 64T	31.07	46.61	1
44864333	LINK: MASTER: 420: RIVETED	-	-	1
37860620	CHAIN: 420	-	-	1
15566308	MESH: FRONT	43.49	65.24	1
52875996	TAPE: DOUBLESIDED: FOAM	1.10	1.65	1
23709166	CONTROLLER: MOTOR: DMC	591.80	887.70	1
50245392	SHOCK: REAR	492.75	739.13	1
22730476	MOUNT: MIRROR	3.51	5.27	2
46912175	BOLT: LOCKING: SPROCKET	10.94	16.40	1
54202926	MOTOR: PMS120	999.00	1,498.50	1
63302290	LAMP: PLATE: REAR	20.14	30.21	1
17377341	LAMP: HEAD: 12V	46.51	69.76	1
79319757	REFLECTOR: AMBER	1.78	2.67	2
79729730	REFLECTOR: RED	1.78	2.67	3
01532895	LABEL: EPA	2.34	3.51	1
77143812	LABEL: EPA: COVER	1.13	1.69	1
92987042	LABEL: CHASSIS: CERTIFICATION	1.69	2.53	1
46425360	STICKER: FUSEBLOCK	1.80	2.70	1
12546981	STICKER: CABLE	1.80	2.70	1
46113676	LABEL: BODY: BUTTON	2.21	3.31	1
77900248	COVER: LABEL: CHASSIS	0.74	1.11	1
10664612	LABEL: WARNING: HV: SM	0.50	0.74	5
46496195	PAD: THERMAL: HEATSINK	5.65	8.47	1
61270344	WASHER: LOCKING: SPROCKET	3.94	5.91	1
52379870	HEATSINK: CONTROLLER	32.27	48.40	1
65154552	USB FLASH DRIVE	21.60	32.40	1
54336059	LINE: BRAKE: REAR	54.74	82.11	1
56100929	LINE: BRAKE: FRONT	61.02	91.53	1
87144583	ANB: 20X42X15	9.27	13.91	2
87254685	RAN: 20X42X15	9.27	13.91	2
14924574	BB: 20X47X14: DS	2.21	3.31	6
61298174	TAPE: TEFLON: .75X1X.0065	0.09	0.13	1
84572327	LOOM: SPLIT: 1/2IN	1.96	2.94	1
24384517	HANDLEBAR	27.23	40.84	1
95187532	ASSY: RACK: REAR: RHS	-	-	1
84955531	ASSY: RACK: REAR: LHS	-	-	1
22602141	ASSY: SWINGARM: MFG	202.46	303.68	1
10443229	SPACER: WHEEL: REAR	14.06	21.09	1
40198261	SPACER: WHEEL: FRONT	14.06	21.09	1

Part Info				Usage
Part #	Description	Dealer Cost	MSRP	/Bike
46870011	ADAPTOR: CALIPER: FRONT	39.11	58.66	1
75254249	SP: 20X28X19: AL: AN	10.58	15.86	1
57951862	ADAPTOR: CALIPER: REAR	63.11	94.67	1
23001844	RECEPTICAL: ELECTRIC	3.13	4.69	1
36534470	GUARD: FAN: WIRE	1.19	1.79	2
97707974	SWITCH: MAGNETIC: KICKSTAND: M	3.62	5.43	1
58114487	TUBE: HEAT: SHRINK	0.13	0.19	5
50249201	BOOT: BATTERYTERMINAL	1.94	2.90	12
35658628	SPRING: BRAKEPEDAL	1.67	2.50	1
43874572	SPRING: KICKSTAND: OUTER	2.27	3.41	1
11843735	SPRING: KICKSTAND: INNER	2.16	3.24	1
03670490	SPRING: FOOTPEG: ZC	0.74	1.11	2
82652765	EXCITER: AUDIO	45.00	67.50	1
32267493	TAPE: DOUBLESIDED: DISK	0.23	0.34	1
80581885	SCREW: ROTOR	4.95	7.43	16
79164946	MOUNT: MOTOR: CAST	18.41	27.61	1
74123561	KICKSTAND: LEG: FORGED	18.77	28.15	1
42379326	MOUNT: KICKSTAND: FORGED	15.53	23.29	1
58324194	BRAKEPEDAL: CAST	6.71	10.06	1
58485556	ASSY: FOOTPEG: RIGHT	5.96	8.94	1
78911167	ASSY: FOOTPEG: LEFT	5.96	8.94	1
55405724	STRUT: SEAT: R: CAST	60.37	90.55	1
04447443	STRUT: SEAT: L: CAST	60.37	90.55	1
20030988	COVER: MOTOR: CAST: RIGHT	20.57	30.85	1
63403684	COVER: MOTOR: CAST: LEFT	20.93	31.39	1
18777514	WHEEL: REAR	147.76	221.64	1
19063342	WHEEL: FRONT	132.59	198.89	1
15175623	TIRE: REAR	189.68	284.51	1
14998108	TIRE: FRONT	161.17	241.75	1
32316613	SWITCH: BRAKELIGHT: M10X1	31.05	46.58	1
82260024	VALVE: STEM: WHEEL	12.15	18.23	2
38235510	PLUG: BAR: BLACK: AL	17.55	26.33	2
25460190	GRIP: R	7.20	10.80	1
25662893	GRIP: L	7.20	10.80	1
86995160	SWITCH: ON/OFF: BAR (Magura	22.50	33.75	1
24567884	CONTROL: LIGHTING	60.75	91.13	1
75692820	HORN: DELUXE: COMPACT	7.09	10.63	1
34695715	LAMP: TAIL	101.25	151.88	1
09748245	SIGNAL: TURN: LEFT	32.63	48.94	2
58553207	SIGNAL: TURN: RIGHT	32.63	48.94	2
35236091	RELAY: FLASHER: SIGNAL	16.65	24.98	1
16680563	MIRROR: LEFT: GT	36.00	54.00	1
69573122	MIRROR: RIGHT: GT	36.00	54.00	1
90953630	BUSBAR: CONTROLLER: M1	11.39	17.08	1
91297632	BUSBAR: CONTROLLER: M3	11.39	17.08	1
66785145	BUSBAR: CONTROLLER: B+	10.85	16.27	1
78109473	BUSBAR: CONTROLLER: B-	11.90	17.85	1
13019789	BUSBAR: CONTROLLER: M2	11.39	17.08	1
58423906	TERMINAL: FLAG: BATTERY	2.81	4.22	11

Part Info				Usage
Part #	Description	Dealer Cost	MSRP	/Bike
52312607	PANNIER: STANDARD: PAIR	-	-	1
22491634	ASSY: SEAT: UPGRAGE	-	-	1
49437672	ASSY: SEAT: UPHOLSTERED	105.64	158.46	1
43882638	ASSY: CHASSIS: AL	1,701.29	2,551.94	1
03268826	ASSY: CHASSIS: ETCHED	45.00	67.50	1
26973158	BUTTON: BODY: UPPER	85.03	127.54	1
41767967	ASSY: CHARGER: MAIN	792.00	1,188.00	1
33235127	CONVERTER: DCDC: SEVCON:	144.00	216.00	1
93369281	PAD: BATTERY: PLASTIC	3.75	5.63	4
57329953	PIN: SPRING: KICKSTAND	3.49	5.23	1
82457989	PIN: PIVOT: KICKSTAND	2.79	4.19	1
05884904	SLEEVE: BUSH: BRAKEPEDAL	5.60	8.40	1
61793417	M10X1.5: NUT: DRILLED	8.73	13.10	1
66918802	PIN: CLEVIS: M10X40: ZC	2.23	3.34	2
73763412	FAN: 130MM	51.64	77.46	1
85149687	CAP: USB FLASH DRIVE	0.11	0.16	1
10545266	AXLE: WHEEL: REAR	28.85	43.27	1
45797145	CLAMP: FORK: LOWER	128.86	193.29	1
20762730	AXLE: PIVOT: SWINGARM	35.55	53.33	1
10302264	AXLE: WHEEL: FRONT	25.81	38.71	1
45420784	CLAMP: FORK: UPPER	117.90	176.85	1
45964080	TUBE: STEER: FORK	31.41	47.12	1
46187437	RING: SEAL: HEADSET	8.12	12.18	2
10613376	BLOCK: AXLE: REAR	19.35	29.03	2
23602778	CLAMP: LOWER: HANDLEBAR	14.00	20.99	2
24314785	CLAMP: UPPER: HANDLEBAR	15.05	22.58	2
40511090	TUBE: EXTENSION: THROTTLE	3.67	5.50	1
93564921	SPACER: STOP: STEERING	21.94	32.91	1
24525893	SEPERATOR: CONTROLLER: PLASTIC	25.20	37.80	1
44699323	LEG: FORK: LEFT	241.88	362.81	1
44386250	LEG: FORK: RIGHT	241.88	362.81	1
98794GRH	BEZEL: LAMP: INJ	17.89	26.83	1
81490XXX	ASSY: BODY: UPPER: FILLER	88.43	132.64	1
16402XXX	ASSY: BODY: LOWER: FILLER	64.91	97.37	1
83350XXX	FRAME: UPPER: L: INJ	36.56	54.84	1
28577XXX	FRAME: UPPER: R: INJ	36.56	54.84	1
58610BLK	PANEL: LOWER: L: INJ	8.66	12.99	1
60487BLK	PANEL: LOWER: R: INJ	8.66	12.99	1
12940BLK	PANEL: UPPER: L: INJ	8.66	12.99	1
20124BLK	PANEL: UPPER: R: INJ	8.66	12.99	1
80112618	THROTTLE: MAGURA	90.00	135.00	1
16282159	CONTACTOR: MAIN	231.75	347.63	1
08823270	SHROUD: LAMP: TAIL: INJ	36.83	55.25	1
34305537	FENDER: FRONT: INJ	21.02	31.52	1
90305841	FENDER: REAR: INJ	15.50	23.25	1
46048045	BACK: LAMP: TAIL: INJ	11.30	16.94	1
26226807	HOUSING: LAMP: INJ	15.41	23.12	1
05263228	SEAT: SHELL: INJ	11.75	17.62	1
98794943	BEZEL: LAMP: INJ	13.25	19.88	1

Part Info				Usage
Part #	Description	Dealer Cost	MSRP	/Bike
81490600	ASSY: BODY: UPPER: FILLER	88.02	132.03	1
16402775	ASSY: BODY: LOWER: FILLER	96.08	144.11	1
28577608	FRAME: UPPER: R: INJ	12.98	19.47	1
83350980	FRAME: UPPER: L: INJ	12.98	19.47	1
58610016	PANEL: LOWER: L: INJ	23.81	35.71	1
60487926	PANEL: LOWER: R: INJ	15.59	23.39	1
12940163	PANEL: UPPER: L: INJ	27.50	41.24	1
20124460	PANEL: UPPER: R: INJ	17.55	26.33	1
89729411	BATTERY: U1: 12V #1	557.00	584.85	1
89729414	BATTERY: U1: 12V #4	557.00	584.85	1
89729413	BATTERY: U1: 12V #3	557.00	584.85	1
89729416	BATTERY: U1: 12V #6	557.00	584.85	1
89729412	BATTERY: U1: 12V #2	557.00	584.85	1
89729415	BATTERY: U1: 12V #5	557.00	584.85	1
99398612	TIE: CURVE: FIRTREE: 7MM	0.23	0.34	3
41998053	BLOCK: FUSE: ANN	13.73	20.59	1
22171587	M10: CLIP: TREE	0.29	0.44	4
03978658	DRIVE: SPROCKET: CLUTCH	118.10	177.15	1
34734756	SPROCKET: CLUTCH: 13T	41.45	62.17	1
90867114	CLAMP: GUIDE: HOSE	7.85	11.78	1
84076064	KEY: IGNITION (blanks)	-	-	1
95056343	ASSY: LOCK: SYSTEM: KEYS	70.20	105.30	1
67332274	IMMOBILIZER: IGNITION	64.80	97.20	1

1. PURPOSE & SCOPE

This BRAMMO SERVICE BULLETIN outlines the necessary steps to update the firmware and configuration settings of the SEVCON 720W Charger of the 2010 BRAMMO Enertia to version UK324_07.

There are 2 issues with the previous UK324_05 SEVCON 720W Charger firmware.

- a) When AC power is connected to and then removed from an Enertia that is NOT power up in charger mode, the charger enters a mode that places approximately 50mA load on the Enertia's batteries. Normal off state loading is <5mA (typically I measure <2mA). Assuming the off state loading is 5mA, (40Ahr/5mA)/24hrs, the bikes will hold a charge for 333 days. Based on typical loading numbers, (40Ahr/2mA)/24hrs, the bikes will hold a charge for just over 2 years...833 days. However, when the charger is in the 50mA discharge mode, (40Ahr/50mA)/24hrs, the bikes will hold a charge for a dramatically lower 33days. Bikes crated in this mode or bikes setting in the garage in this mode will be completely dead in just over a month.
- b) If the above issue critically discharges the Enertia's batteries, the charger cannot charge the Enertia's batteries because the bike cannot turn on to enable the charger.

This updated version of charger firmware corrects the 50mA loading issue if AC power is applied to and then removed from the charger while the Enertia is off. Additionally, this version of firmware will automatically charge critically discharged batteries up to approximately 60V which is high enough to allow the Enertia to turn on.

2. RESPONSIBILITY

BRAMMO Service Technicians will ensure that, when serviced, all 2010 BRAMMO Enertias have their SEVCON 720W Charger updated to this version of firmware and setting change.

3. REQUIRED TOOLS

1. 4mm Hex Driver
2. FTDI USB to TTL Serial Adapter with 12 Position MX150L Female Charger Connector Installed
3. PC

4. PROCESS

The 2010 Brammo Enertia has a SEVCON 720W Charger onboard. Programming and setup of the charger is done using a PC and a USB to TTL Serial Cable. Brammo uses a FTDI - TTL-232R-3V3-WE USB to TTL Serial Adapter. The USB to TTL Serial Adapter comes with no connector on the serial end and BRAMMO must install a 12 Position MX150L Female Charger Connector before it can be connected to the Sevcon Charger. There are no drivers to install on your PC. This procedure used 1 SEVCON application to update and setup the charger, Battpak V0_01B.exe. All of these things will be covered in the below procedure.

4.1. PC Setup

4.1.1. Download the following:

<http://www.brammo.com/downloads/SERVICE/files/SevconChargerSoftware.zip>

4.1.2. Unzip the file to your PC. The Sevcon Charger Software should be copied to a permanent location on your hard drive.

4.1.3. Connect the FTDI USB to TTL Serial Adapter to your PC.

4.1.4. Now we need to determine what COM PORT the FTDI USB to TTL Serial Adapter is using. Open the DEVICE MANAGER by running devmgmt.msc (START->RUN->type devmgmt.msc ->OK). DEVICE MANAGER opens. Click the + symbol next to Ports (COM & LPT) and you will see "USB Serial Port (COM#)". This is the COM PORT that the FTDI USB to TTL Serial Adapter is using. Remember this COM PORT as you will need it when you run the Battpak application later (see figure 1).

4.1.5. ***NOTE*** If the COM Port is set really high, i.e. COM19, we'll need to change

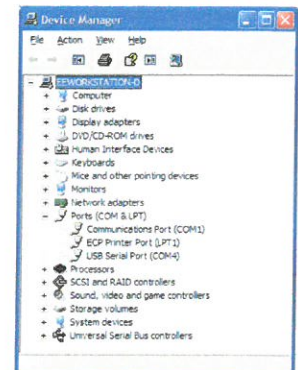


Figure 1

your PC's COM Port settings because the Battpak doesn't support extremely high COM PORT numbers. Contact Brammo Ashland if you need assistance.

4.2. Disassembly of the EnerTia

4.2.1. Using a 4mm driver, remove the 6 screws that secure the Upper Body Panel. Lift the Upper Body Panel enough to unplug the Tank Switch and the Exciter. Remove the Upper Body Panel.

4.3. Connecting the PC to the Sevcon Charger

4.3.1. Unplug the 12 position harness charger I/O connector from the Sevcon Charger (see figure 2).

4.3.2. Connect the FTDI USB to TTL Serial Adapter to the Sevcon Charger.

4.3.3. Connect A/C power to the Sevcon Charger.

4.3.4. Locate and run:

\SevconChargerSoftware\Battpak_V0_01B.exe.

4.3.5. In the upper left hand corner of the Battpak application, select the COM PORT that the FTDI USB to TTL Serial Adapter is using on your PC. Refer to step 4.1.4 (also see figure 1). Now hit the "Open Port".

Figure 2



4.3.6. Hit the "Connect" button to connect to the Sevcon Charger.

4.3.7. In the upper right hand corner of the Battpak application you will see "Application Version", this is the current version of installed Sevcon Charger Firmware. (see figure 3)

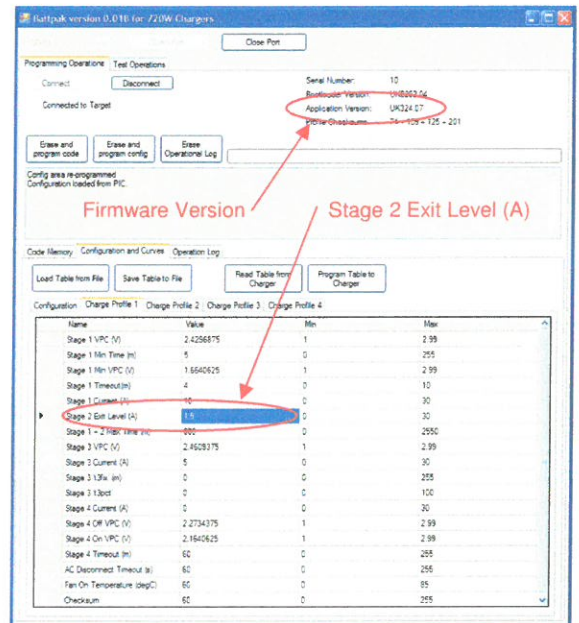


Figure 3

4.4. Updating the Sevcon Charger Firmware

4.4.1. Hit the "Erase and program code" button on the Battpak application

4.4.2. Select \SevconChargerSoftware\UK324_07.hex (this file is the version UK324_07 firmware) and then hit the "OPEN" button.

4.4.3. *****ATTENTION***** Before the Sevcon Charger will function properly after a new firmware update, you **MUST** hit the "Disconnect" button.

4.4.4. Hit the "Disconnect" button.

4.4.5. Hit the "Connect" button and verify that the Sevcon Charger Firmware is now UK324_07.

4.5. Updating the Sevcon Charger Settings

4.5.1. Select the "Configuration and Curves" tab and then select the "Charger Profile 1" tab.

4.5.2. Locate "Stage 2 Exit Level (A)" value setting (see figure 3). Change the value to 1.5 by highlighting the cell and typing 1.5.

4.5.3. To save the new setting, hit the "Program Table to Charger" button.

4.5.4. *****ATTENTION***** Before the Sevcon Charger will function properly after a new setting change, you **MUST** hit the "Disconnect" button.

4.5.5. Hit the "Disconnect" button.

4.5.6. Hit the "Connect" button and verify the "Stage 2 Exit Level (A)" value setting.

4.6. Disconnecting from the Sevcon Charger

4.6.1. ***ATTENTION*** Before the Sevcon Charger will function properly after the firmware is updated and a new setting change, you MUST hit the "Disconnect" button prior to unplugging the FTDI USB to TTL Serial Adapter and disconnecting A/C power from the Sevcon Charger.

4.6.2. Hit the "Disconnect" button.

4.6.3. Hit the "Close Port" button.

4.6.4. Disconnect the FTDI USB to TTL Serial Adapter from the PC.

4.6.5. Disconnect the FTDI USB to TTL Serial Adapter from the Sevcon Charger.

4.6.6. Disconnect A/C power from the Sevcon Charger.

4.7. Reassemble the Enertia

4.7.1. Connect the 12 position charger I/O harness connector back up to the Sevcon Charger.

4.7.2. Before reassembling the Enertia, you should test the bike in charge mode to ensure everything is functioning properly.

4.7.3. Position the Upper Body Panel so that the Tank Switch and Exciter can be reconnected. Reconnect the Tank Switch and Exciter. Using a 4mm driver replace the 6 screws that secure the Upper Body Panel.

5. Conclusion

Now that the Sevcon Charger is updated with version UK324_07 firmware, the 50mA loading issue will not happen if A/C power is applied and then removed from the Sevcon Charger while the Enertia is off. Also in the unlikely event that the Enertia batteries become critically discharged, the Sevcon Charger will automatically charge the batteries up enough to allow the Enertia to power up normally.

This concludes the Service Bulletin - Sevcon Charger Firmware Update.

BRAMMO™ SERVICE

Title: SERVICE BULLETIN - SEVCON CHARGER FIRMWARE (UK324_07) UPDATE

Document No: SB-SCFU01

Revision No: A.01

Issue Date: 2/17/2010

DOCUMENT REVISION TABLE

Revision	Date	Change Description	Initiator
A.00	2/15/2010	Initial Release	DRW
A.01	2/17/2010	Added 4.3.3 Connect A/C power to charger (can't program charger if it's not power up)	DRW

REFERENCES:

<http://www.ftdichip.com/Products/EvaluationKits/TTL-232R-3V3-WE.htm>

APPENDIX I

Drawing for FTDI USB to TTL Serial Adapter with 12 Position MX150L Female Charger Connector Installed (WIP will add later)

COMMUNICATING WITH VALENCE BATTERIES

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Table of Contents:

- 1) Required Service Tools pg. 3
- 2) Valence Battery – Connecting Diagnostic Cable pg. 4
- 3) Valence Battery – Communicating with batteries pg. 5
- 4) Valence Battery – Installing new firmware pg. 7

TOOLS AND SOFTWARE REQUIRED FOR VALENCE BATTERY COMMUNICATION:

1. Valence Battery Diagnostic cable



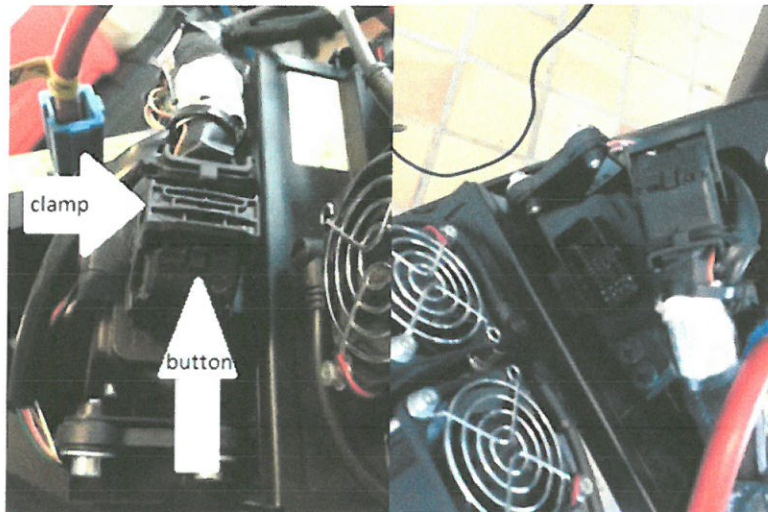
2. "DIAG" Battery communication software
3. "FWupdate" Battery firmware update software
4. 4mm hex wrench
5. 3mm hex wrench

VALENCE BATTERY – CONNECTING DIAGNOSTIC CABLE

1. Remove upper body panel and upper right side panel to expose the VCU, charger and wiring harness.



2. Remove the wiring harness from the VCU by pressing the button down and pushing the clamp forward until it clicks.



3. Loosed the two screws holding on the right side cooling fan and place it out of the way.

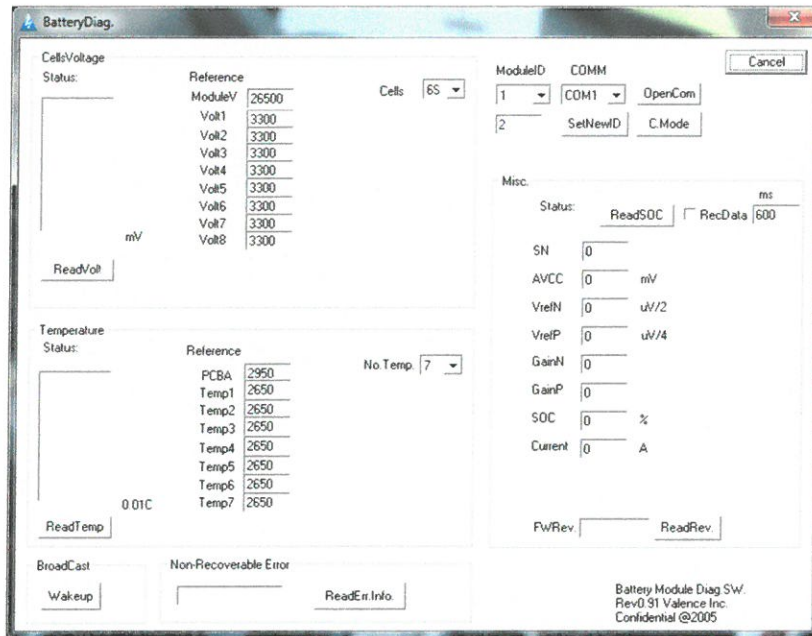


4. Unscrew the right side battery communication cable and connect the Battery Diagnostic cable in its place.



VALENCE BATTERY – COMMUNICATING WITH BATTERIES

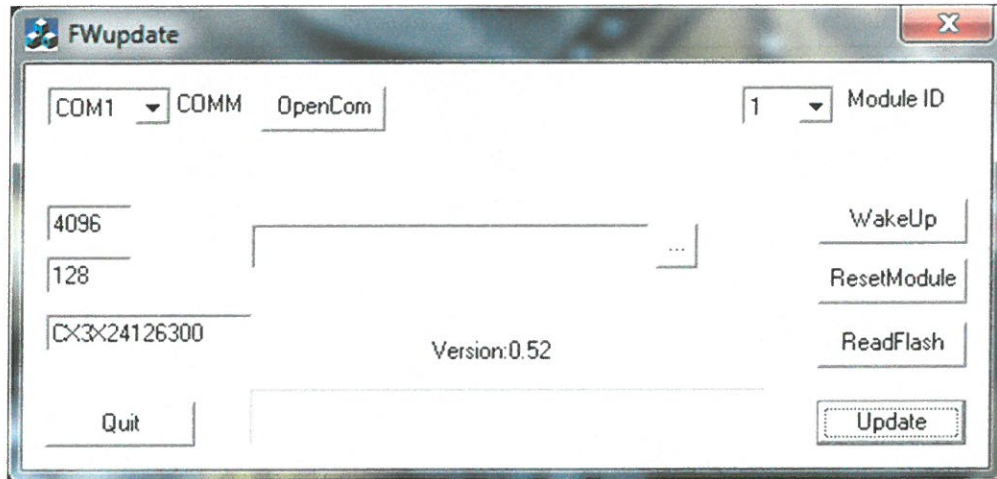
5. Connect USB cable from diagnostic cable to computer.
6. Open START menu and in search type in “device manager”. Open Device Manager.
7. On the menu will be a listing called “Ports”. Open the menu which should show which comm the device is using. Make note of this.
8. Open the program called “DIAG”.



9. Under the COMM menu, set it to the same comm port that you found in the device manager. Click “OpenCom”.
10. In the bottom left corner click “Wakeup”. This essentially makes all the battery information available to read.
11. Using “ModuleID” you can switch between the 6 battery modules on the Enertia Legacy and Enertia Basic.
12. The main two boxes you will need are the “CellsVoltage” and the “Misc.” box.
13. Misc. Box - Clicking on the button “ReadSOC” you can see the State of Charge (SOC) of each module and the firmware installed (shown in the box next to ReadRev.).
14. CellsVoltage Box – Set the “Cells” box to 4S. By switching through the 6 modules you can see the voltage of each cell in each module.
15. When closing out of this program press the button labeled “Sleep” in the bottom left corner. Then press CloseCom in the upper right corner.

VALENCE BATTERY – INSTALLING NEW FIRMWARE

1. Follow instructions to connect battery diagnostic cable.
2. Open program called “FWupdate”.



3. Set the COMM to the same one used during communicating with batteries.
4. Click “OpenCom” then click “Wakeup”
5. Click the button “...”, this will let you choose the firmware version to upload.
6. Make sure the Module ID is set to module 1. Press “ResetModule” button. After the window opens saying “Module is reset” press the “Update” button.
7. After update is finished change the Module ID to number 2 and perform step 6 again. Repeat for all modules.
8. When finished remember to click “Sleep” then “CloseCom” buttons before you press Quit.



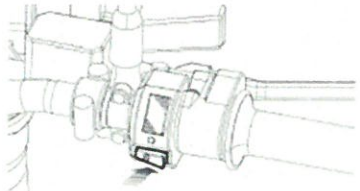
Quick steps to diagnosing Valence Battery issues on the following models:

- 2009-2010 Enertia Legacy
- 2011-2012 Enertia Basic

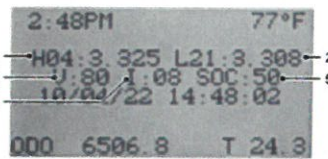
1) Will the bike turn on in DRIVE mode?	<p>YES: Take bike on a test ride. Check log files for any errors.</p> <p>NO: Go to step 2.</p>
2) Will the bike turn on in CHARGE mode?	<p>YES: Leave in CHARGE mode and press tank button for 7 seconds to put dash into detailed charging screen (SHOWN BELOW).</p> <p>NO: Go to step 3.</p>

Charging Information

DETAILED CHARGING INFORMATION



While your Enertia is charging, press and hold the Start button for seven seconds. The LCD will display the detailed charging information screen.



The following information will be displayed:

1. High cell stack voltage (cell stack 4 measuring 3.325 volts in the example)
2. Low cell stack voltage (cell stack 21 measuring 3.308 volts in the example)
3. Total battery stack voltage (80 volts in the example)
4. Charge current in amps (charging at 8 amps in the example)
5. State of Charge (50% SoC in the example)

A complete and balanced charge for the Enertia Basic can be defined as:

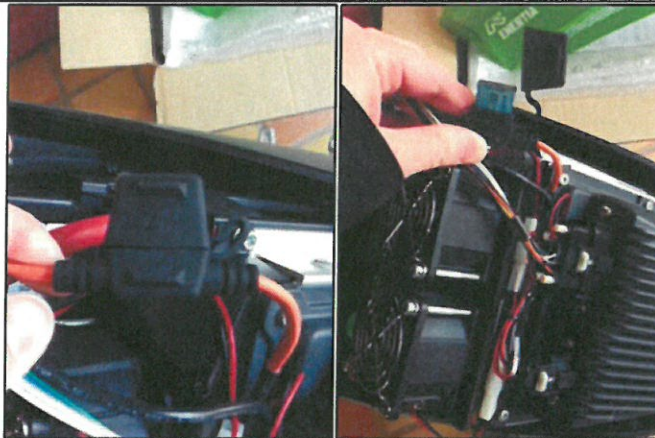
- High cell stack voltage = 3.750V - 3.800V
- Low cell stack voltage = 3.650V (or higher)
- SoC toggling between 99% and 100%

A complete and balanced charge for the Enertia Plus can be defined as:

- Cell voltage = 4.130V - 4.170V

The voltage difference between the high cell stack and low cell stack is the cell stack imbalance. If, during charging, the imbalance is greater than 100mV (0.1V), leave the bike on charge. The charge system will slowly correct the imbalance. Contact your Brammo Authorized Service Agent if the cell stack imbalance is not being corrected.

3) Remove the upper body panel (<i>carefully disconnect the audio connector while removing panel</i>). Disconnect main battery power – THE BIG BLUE Connector. Check the main charger fuse (shown below). Is charger fuse blown?	<p>YES: Replace Fuse. Check to see if bike will go into CHARGE mode.</p> <p>NO: Go to step 4.</p>
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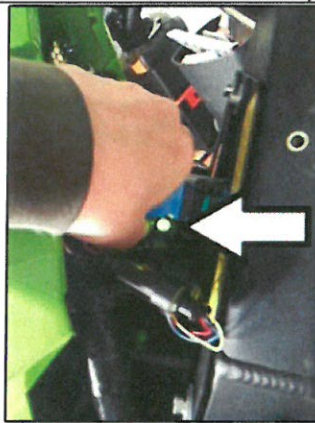


4) Reconnect main battery power (blue connector). Press the button on the side of the VCU to determine LED color (shown below).

GREEN LED: Batteries are good, if bike still will not charge contact Brammo Service.

RED LED: Batteries are low. Go to Step 5.

NO LED: Go to Step 7.



5) Leave key in either the OFF or CHARGE position. Plug charging cord into the bike and in to a power supply (this will slow charge the batteries). Check the VCU button every 5-10 minutes until the LED turns GREEN. Once the LED turns GREEN, place the bike into CHARGE mode and leave on charger for at least 24 hours.

6) See "Charging Information" sheet above.

7) Perform "Instructions to Jump Valence Batteries". Will Enertia go into Charge mode?

YES: Charge Enertia for at least 24 hours.

NO: Go to Step 8.

8) Check LED lights one each of the six (6) Valence Battery modules.

Flashing GREEN: Batteries are not the problem. Charger might be the issue.

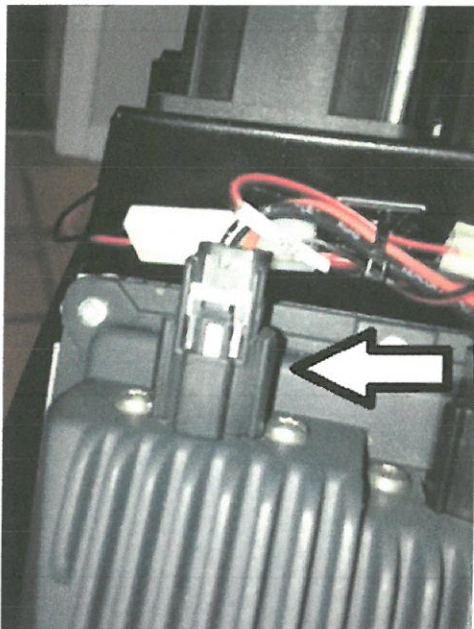
Flashing RED: Batteries need to be reset. See "Instructions to Communicate with Valence Batteries".

Steps to determine what is might be wrong with an Enertia containing Valence batteries

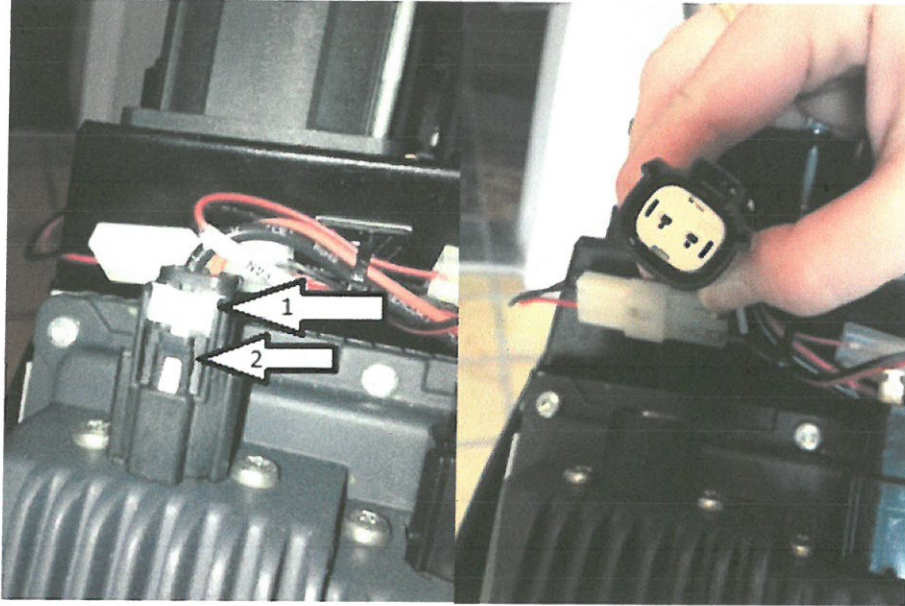
1. Will the bike turn on in Drive mode? **Yes:** Take for a quick test ride. Check log files for errors. **No:** Go to step 2.
2. Will the bike turn on in Charge mode? **Yes:** Charge bike up to 100%. Check for battery imbalance issue. **No:** Go to step 3.
3. Remove upper body panel. Press button on right side of VCU. **Lights Green:** batteries not causing issue. **Lights Red:** batteries are low might need jump charge or slow deep charge. Go to step 4.
4. Check stack voltage at Module 6 if less than 20V then batteries will need jump charge. Use procedure below:

Instructions to jump Valence batteries

1. For this procedure two bikes are needed Bike 1 will be the good bike and Bike 2 will be the bike needing to be jumped.
2. Have the top body panels removed from both bikes.
3. Locate the charger to battery connector on both bikes.



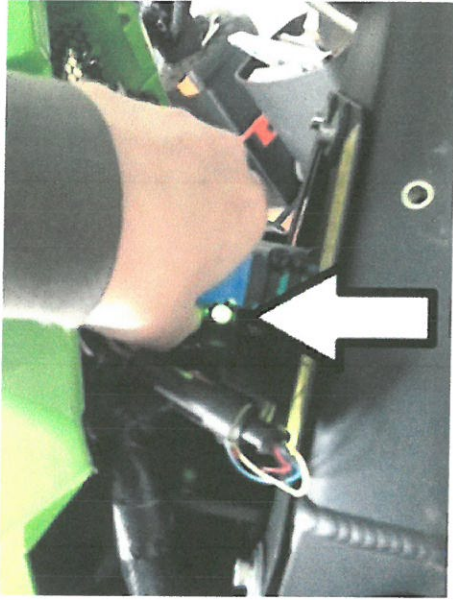
4. Pull up on white plastic lock (1) to release lock. Then press release button (2) and pull connector off of charger. Perform this on both bikes.



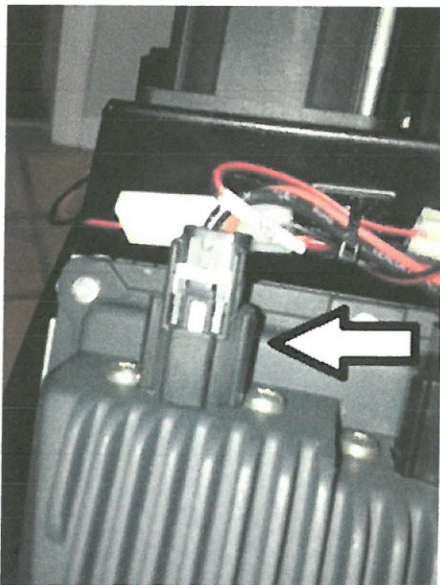
5. Note: the jumper cable I sent you has a male end and a female end.
6. Attach the female end of the jumper cable to Bike 1. Attach the male end to the connector which you pulled off the charger on Bike 2. This is connecting the charger of Bike 1 to the batteries of Bike 2.
7. Reattach the top body panel onto Bike 1 just enough that you can reattach the tank button.



8. Turn Bike 1 on in charge mode. This will charge the batteries of Bike 2.
9. After about 3 minutes check the color of the LED located on the VCU after pressing the button.



10. If the button turns green as shown here, the batteries have charged up enough to have Bike 2 use its own charger, go on to step 11. If the button turns red wait a few more minutes and press the button again. If no light appears then something else is going on, please let me know.
11. Disconnect the jumper cord from both bikes.
12. Reconnect the connector to the charger on Bike 2. Press down on the white lock after putting connector back into place. Reattach the top body panel and start Bike 2 charging. Don't forget to reattach the small white connector attached to the Excitor. Otherwise the start up noise will not perform. Charge Bike 2 for at least 24 hours. Check the log files to determine if batteries balanced properly and all modules are ok.



13. Reconnect the connector to the charger on Bike 1. Reattach the top body panel. . Don't forget to reattach the small white connector attached to the Excitor. Otherwise the start up noise will not perform.

* Valence = 77V System \rightarrow ^{100%} SoC

* 14.4 V = 100% SoC

* 4 cells per module. = 24 per Bike

BM \rightarrow BR

BC



Title: TECHNICAL SERVICE BULLETIN – Enertia Plus Firmware Update

Document No: TSB-1229 - 10/02/13

Issue Date: October 2nd 2013

1. **PURPOSE & SCOPE**

The purpose of this service bulletin is to update ALL Enertia Plus models with the eight (8) new firmware and configuration files listed below.

2012/2013 Enertia Plus

Firmware Type	Filename	Label in "Enertia Diagnostics" or "DVT"	Version or Checksum Displayed	New with this release
Dash	43222582_2_06_FIRMWARE_DASH_ICU.BIN	DASH	01.02.06	✓
VCU F130	14301489_VCUV1m79.BIN	VCU F130	02.01.79	✓
VCU CPI 506	89210795_CPIV1_21.BIN	CPI F506	01.01.21	
VCU F930	16362369_SNDV0_16.BIN	Audio F930	01.00.16	
BMS	72857726_82_00m47_FIRMWARE_BMS.BIN	Brammo BMS	82.00.47	✓
Motor Controller	53988154_SN0058-04_0x2fe1.dld		SN0058.04 ROM checksum:0x2fe1	✓
M.C. Config	63934807_C_00_SCFG_SN0058-04_0x395e.dcf		Config checksum: 0x395e	✓

Brammo Power Module 4470

File Type	Filename	As shown in "Diagnostics Details"	Version or Checksum	New in this release
BCP Firmware	52475191_P4SV0M92.BIN	Firmware version	04.00.92	✓
BMP Firmware	35151414_FW_0002_0200_6000_0803.enc.brm.xml	Firmware CRC	0x12e4	✓
BMP Configuration	64342962_C_05_BPM4470_2013-02-15_0803enc_bqW3_4_0_Chem9245_Qmax7000_CDBalOn.xml	Manufacturer Data:	64342962 C.05	✓

2. **RESPONSIBILITY**

All Authorized Brammo Service Department will ensure that all available Enertia Plus models, in stock, or when serviced will receive the Firmware update(s).

**If you have any questions or require a VIN check,
please contact your Regional Dealer Support Representative.**

3. **BILLABLE LABOR TIME**

1 hours or 60 min. is the billable labor time allowed for this Firmware update (8 files). Please fill out a warranty claim from for each unit serviced. Be sure to reference the Service Bulletin Document number TSB-1255 – 09/16/13. Fully completed Warranty Claim Forms (WCF) can be submitted to Brammo via email at Warranty@Brammo.com or by fax at 541-552-0414 Attn: Adam Lukoic.

The new Brammo Dealer Portal can also be utilized for Warranty Submission

<http://dealerportal.brammo.com>

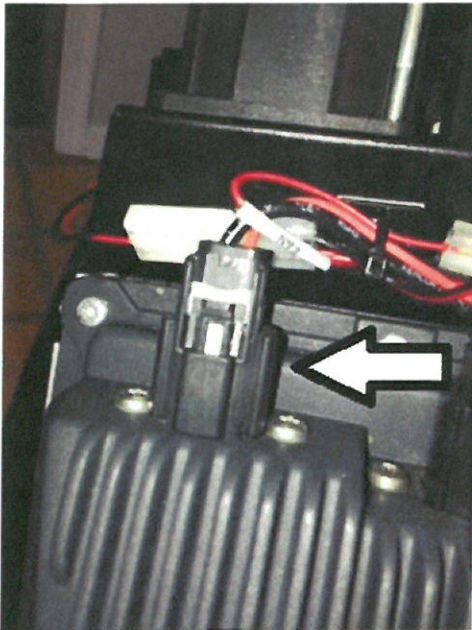
4. PROCESS:

- Reference the following Documents for each required update:
 - **Brammo Diagnostics V2.15 Users Guide.**
 - File located on the Dealer Portal.
 - **Brammo / Sevcon® DVT Users Guide.**
 - File located on the Dealer Portal.
 - **Brammo Battery Diagnostics Users Guide.**
 - File located on the Dealer Portal.

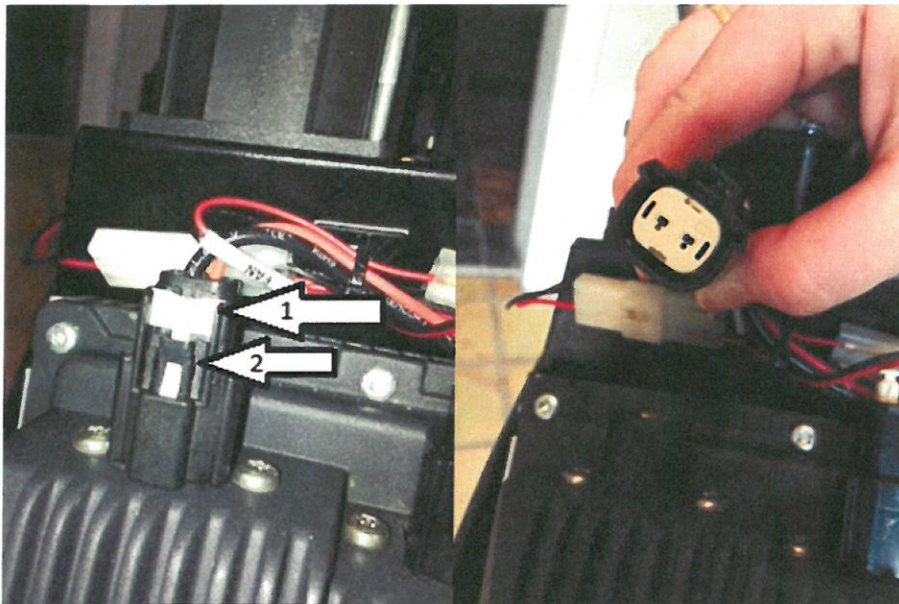
Contact Brammo Service or your Regional Dealer Support Representative with any Technical Questions.

Instructions to jump Valence batteries (Wall Power Supply)

1. Remove the top body panel.
2. Locate the charger to battery connector on the bike.



3. Pull up on white plastic lock (1) to release lock. Then press release button (2) and pull connector off of charger.

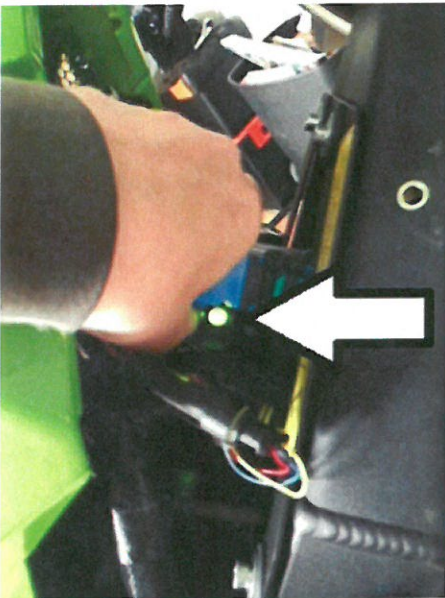


4. Note: the power supply male end.
5. Attach the male end of the power supply to the Enertia.

6. Reattach the top body panel onto the Enertia just enough that you can reattach the tank button.

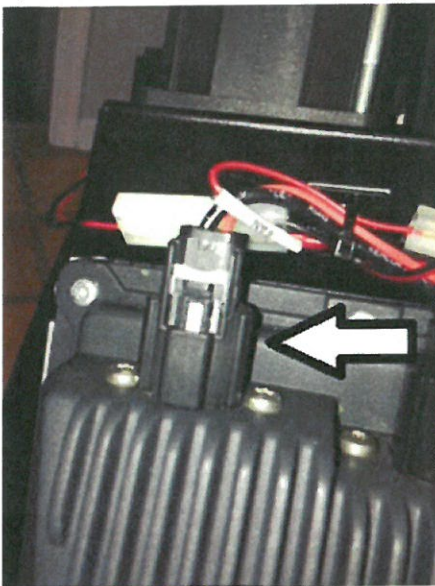


7. Plug the power supply into a wall socket.
8. After about 3 minutes check the color of the LED located on the VCU after pressing the button.



9. If the button turns green as shown here, the batteries have charged up enough to have the Enertia use its own charger, go on to step 10. If the button turns red wait a few more minutes and press the button again. If no light appears then something else is going on, please let me know.
10. Disconnect the power supply from the wall.
11. Reconnect the connector to the charger on the Enertia. Press down on the white lock after putting connector back into place. Reattach the top body panel and start the Enertia charging.

Don't forget to reattach the small white connector attached to the Excitor. Otherwise the start up noise will not perform.



1. PURPOSE & SCOPE

This BRAMMO SERVICE BULLETIN outlines the necessary steps to update the firmware of the Valence batteries of the 2010 BRAMMO Enertia to revision 1005038A00 Brammo U1 Code. This updated version of firmware improves the SoC (State of Charge) reporting algorithm of the Valence batteries. Previous versions of Valence battery firmware would report a SoC to the Enertia that was much lower than what the batteries actually were. This was resulting in greatly decreased range and performance of the BRAMMO Enertia.

2. RESPONSIBILITY

BRAMMO Service Technicians will ensure that, when serviced, all 2010 BRAMMO Enertias have their six (6) Valence batteries updated to this version of firmware.

3. REQUIRED TOOLS

4mm Hex Driver

3mm Hex Driver

EasySync USB to RS485 Adapter with DB9 to RS485 Cable attached

PC

4. PROCESS

The 2010 BRAMMO Enertia has 6 Valence batteries onboard. Each is preprogrammed at the factory with an ID number ranging from 1 to 6. Batteries 1 thru 3 are located upright on the top of the frame, #1 being towards the rear, #2 in the middle and #3 towards the front. Batteries 4 thru 6 are located upside down on the bottom of the frame, #4 being located towards the front, #5 in the middle and #6 towards the rear. The firmware update and diagnostic software address each battery logically 1-6, so knowing the physical location of each battery address is important for this process (see figure 1). Programming and setup of the Valence batteries is done using a PC and a USB to RS485 adapter. BRAMMO uses an EasySync USA - ES-U-2001: Single Port USB-RS422/RS485 Adapter to communicate with a 6 Valence batteries. The PC will need to have the EasySync drivers installed prior to connecting the USB to RS485 adapter to the PC. This procedure will use 2 Valence applications to update the batteries, [FWupdate.exe](#) (this application is used to update the Valence battery firmware) and [Diag.exe](#) (this application is used to verify the installed Valence battery firmware). Before either application will communicate with the Valence batteries, the PC's COM Port of the USB to RS485 adapter must be known. All of these things will be covered in the below procedure.

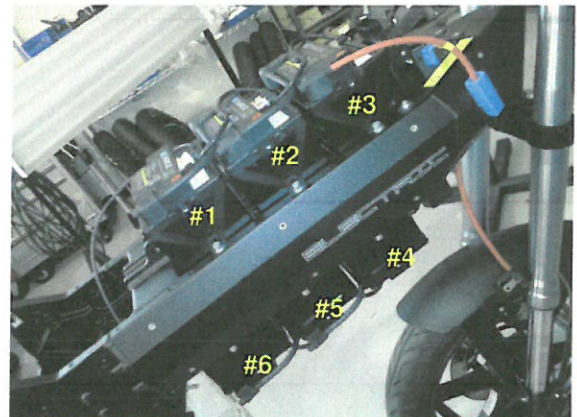


Figure 1

4.1. PC Setup

4.1.1. Download the following:

<http://www.brammo.com/downloads/SERVICE/files/EasySync.zip>

<http://www.brammo.com/downloads/SERVICE/files/ValenceBatterySoftware.zip>

4.1.2. Unzip the 2 files to your PC. EasySync is a onetime install and can be deleted after the USB to RS485 drivers are installed. The Valence Battery Software should be copied to a permanent location on your hard drive.

4.1.3. Make sure the EasySync USB to RS485 adapter is NOT connected to the PC.

4.1.4. Open the EasySync folder and run EasySync.exe. Hit the "INSTALL DRIVERS" button. This will install the proper drivers for the EasySync USB to RS485 adapter (see figure 2).

4.1.5. Close the EasySync install application.



Figure 2

4.1.6. Connect the EasySync USB to RS485 adapter to your PC.

4.1.7. Now we need to determine what COM PORT the EasySync USB to RS485 Adapter is using. Open the DEVICE MANAGER by running devmgmt.msc (START->RUN->type devmgmt.msc ->OK). DEVICE MANAGER opens. Click the + symbol next to Ports (COM & LPT) and you will see "USB Serial Port (COM#)". This is the COM PORT that the EasySync USB to RS485 is using. Remember this COM PORT as you will need it when you run the BatteryDiag and FWupdate applications later (see figure 3).

4.1.8. *****NOTE***** If the COM Port is set really high, i.e. COM19, we'll need to change your PC's COM Port settings because the BatteryDiag and the FWupdate don't support extremely high COM PORT numbers. Contact Brammo Ashland if you need assistance.

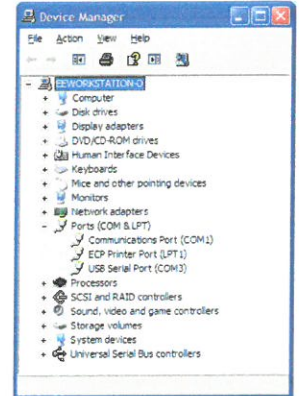


Figure 3

4.2. Disassembly of the Evertia

4.2.1. Using a 4mm driver, remove the 6 screws that secure the Upper Body Panel. Lift the Upper Body Panel enough to unplug the Tank Switch and the Exciter. Remove the Upper Body Panel.

4.2.2. Disconnect the "Blue Battery Safety Disconnect" Connector.

4.2.3. Disconnect the Top VCU Connector.

4.2.4. Using a 3mm driver remove the right side Charger Fan.

4.2.5. Disconnect the RS485 cable from the #3 Valence Battery (see figure 4).

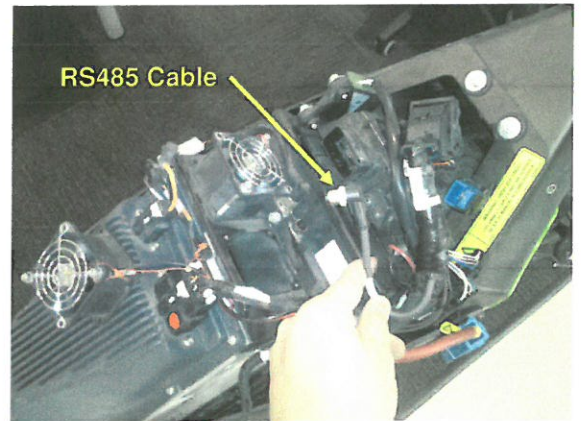


Figure 4

4.3. Connecting the PC to the Valence Batteries

4.3.1. Connect the EasySync USB to RS485 Adapter to the #3 Valence Battery. The connectors are keyed and will only install one way.

4.3.2. Now we're ready to verify that the PC can communicate with the Valence Batteries.

4.3.3. Locate and run:

\ValenceBatterySoftware\Valence RS-485 Diagnostic Software\Diag.exe.

4.3.4. In the upper right hand corner of the BatteryDiag application, select the COM PORT that the EasySync USB to RS485 Adapter is using on your PC. Refer to step 4.1.7 (also see figure 3). Now hit the "OpenCOM" button to connect to the Valence Batteries.

4.3.5. *****IMPORTANT***** Before you can do anything with this BatteryDiag application you must WAKEUP the Valence Batteries. To WAKEUP the batteries, hit the "WAKEUP" button located in the lower left hand corner.

4.3.6. After the Valence Batteries are awake, you can now use the BatteryDiag application to look at all sorts of real-time battery information. The BatteryDiag application has 3 sections, CellsVolts, Temperature and Misc. Within each of those sections there is a "ReadVolts", "ReadTemp" and "ReadSOC" buttons. One thing to remember is BatteryDiag can only update data in one section at a time, i.e. it can't display both real-time CellsVolts and Temperature simultaneously. So to switch sections you must hit the "STOPREAD" button in

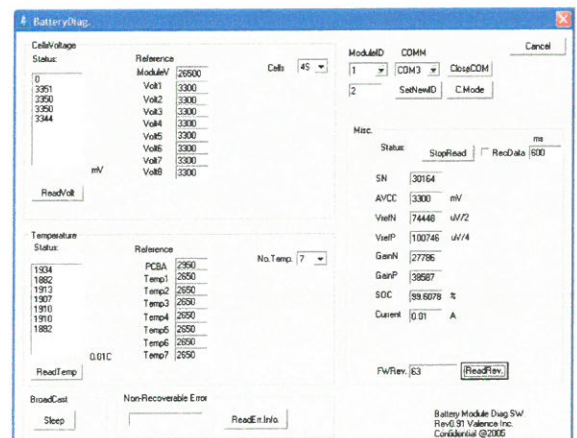


Figure 5

the section that is active before switching to another section. The “ReadRev.” Button will display the current loaded Valence Battery firmware date. Select the 1-6 using the “ModuleID” pulldown menu to look at information from any of the 6 Valence Batteries.

- 4.3.7. ***Warning*** Hitting the “SetNewID” button will change the Valence Battery ID number. Doing this without knowing what you’re doing can result in a communication failure between the EnerTia and the Valence Batteries. Please use caution with this feature of the BatteryDiag application.
- 4.3.8. Make sure you can talk to ALL 6 of the Valence Batteries. Select 1 in the “ModuleID” pull down menu to talk to Valence Battery module #1. In the Misc. section, hit the “ReadSOC” button. You’ll see all of the Misc. fields load, SN, SOC, Current...etc. Hit the “ReadRev.” button and make a note of the installed firmware date that is briefly displayed.
- 4.3.8.1. Select 2 in the “ModuleID” pull down menu to talk to Valence Battery #2. Verify battery talks.
 - 4.3.8.2. Select 3 in the “ModuleID” pull down menu to talk to Valence Battery #3. Verify battery talks.
 - 4.3.8.3. Select 4 in the “ModuleID” pull down menu to talk to Valence Battery #4. Verify battery talks.
 - 4.3.8.4. Select 5 in the “ModuleID” pull down menu to talk to Valence Battery #5. Verify battery talks.
 - 4.3.8.5. Select 6 in the “ModuleID” pull down menu to talk to Valence Battery #6. Verify battery talks.
- 4.3.9. Now that you’ve verified that all of the Valence Batteries are talking, we’re ready to move on to updating the Valence Battery Firmware. Hit the “CloseCOM” button to release the COM PORT.

4.4. Updating the Valence Batteries Firmware

4.4.1. Locate and run:

\\ValenceBatterySoftware\FWupdate.exe

4.4.2. In the upper left hand corner of the FWupdate application, select the COM PORT that the EasySync USB to RS485 Adapter is using on your PC. Refer to step 4.1.7 (also see figure 3). Now hit the “OpenCOM” button to connect to the Valence Batteries.

4.4.3. Hit the “...” button. Select \\ValenceBatterySoftware\1005038A00 Brammo U1 Code.txt (this file is the version A.00 firmware) and then hit the “OPEN” button.

4.4.4. Hit the “Wakeup” button.

4.4.5. Select 1 in the “Module ID” pull down menu, hit the “ResetModule” button and finally hit the “Update” button. Valence Battery Module #1 is reprogrammed.

4.4.6. Select 2 in the “Module ID” pull down menu, hit the “ResetModule” button and finally hit the “Update” button. Valence Battery Module #2 is reprogrammed.

4.4.7. Select 3 in the “Module ID” pull down menu, hit the “ResetModule” button and finally hit the “Update” button. Valence Battery Module #3 is reprogrammed.

4.4.8. Select 4 in the “Module ID” pull down menu, hit the “ResetModule” button and finally hit the “Update” button. Valence Battery Module #4 is reprogrammed.

4.4.9. Select 5 in the “Module ID” pull down menu, hit the “ResetModule” button and finally hit the “Update” button. Valence Battery Module #5 is reprogrammed.

4.4.10. Select 6 in the “Module ID” pull down menu, hit the “ResetModule” button and finally hit the “Update” button. Valence Battery Module #6 is reprogrammed.

4.4.11. You may see “Synchronization error!!!” after hitting the “update button. If this happens simply hit the “Update” button again, the new firmware should load. Make sure that after updating the firmware of each battery you receive a “Firmware Update Complete!!!” message.

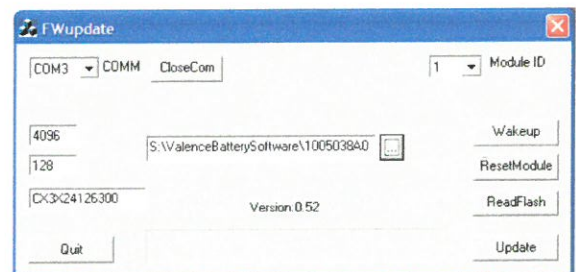


Figure 6

4.4.12. Once all of the Valence Batteries are updated, hit the "CloseCom" button to release the COM PORT.

4.5. Verifying the Valence Batteries Firmware

4.5.1. In the upper right hand corner of the BatteryDiag application, hit the "OpenCOM" button to connect to the Valence Batteries.

4.5.2. In the lower left hand corner hit the "Wakeup" button.

4.5.3. Select 1 on the ModuleID pull down menu. Hit the "ReadRev." Button and verify that the firmware date is 0828_2009.

4.5.4. Select 2 on the ModuleID pull down menu. Hit the "ReadRev." Button and verify that the firmware date is 0828_2009.

4.5.5. Select 3 on the ModuleID pull down menu. Hit the "ReadRev." Button and verify that the firmware date is 0828_2009.

4.5.6. Select 4 on the ModuleID pull down menu. Hit the "ReadRev." Button and verify that the firmware date is 0828_2009.

4.5.7. Select 5 on the ModuleID pull down menu. Hit the "ReadRev." Button and verify that the firmware date is 0828_2009.

4.5.8. Select 6 on the ModuleID pull down menu. Hit the "ReadRev." Button and verify that the firmware date is 0828_2009.

4.5.9. Once all Valence Batteries are verified updated, hit the "CloseCOM" button. Close both PC applications and disconnect the EasySync USB to RS485 Adapter from the PC.

4.5.10. Disconnect the EasySync USB to RS485 Adapter from the #3 Valence Battery.

4.6. Reassemble the Enertia

4.6.1. Reconnect the RS485 cable to the #3 Valence Battery. Make sure the connector is fully tightened.

4.6.2. Using a 3mm driver reinstall the right side Charger Fan.

4.6.3. Reconnect the Top VCU Connector.

4.6.4. Reconnect the Blue "Battery Safety Disconnect" Connector.

4.6.5. Before reassembling the Enertia, you should test the bike in both charge and drive modes to ensure everything is functioning properly.

4.6.6. Position the Upper Body Panel so that the Tank Switch and Exciter can be reconnected. Reconnect the Tank Switch and Exciter. Using a 4mm driver replace the 6 screws that secure the Upper Body Panel.

5. Conclusion

Now that the Valence Battery Firmware has been updated, the Enertia will now display a much more accurate battery SoC.

This concludes the Service Bulletin - Valence Battery Firmware Update.

BRAMMO™ SERVICE

Title: SERVICE BULLETIN - VALENCE BATTERY FIRMWARE (1005038A00) UPDATE

Document No: SB-VBFU01

Revision No: A.00

Issue Date: 2/11/2010

DOCUMENT REVISION TABLE

Revision	Date	Change Description	Initiator
A.00	2/11/2010	Initial Release	DRW

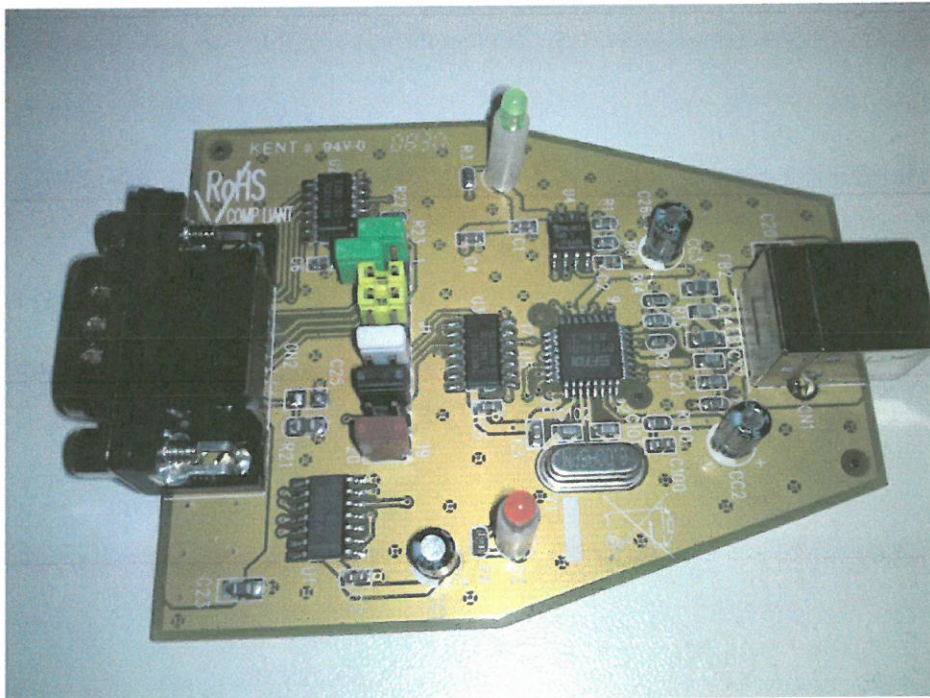
REFERENCES:

<http://www.easysync-ltd.com/index.html?lang=en-uk&target=d14.html>

APPENDIX I

Drawing for DB9 to RS485 (WIP will add later)

EasySync USB to RS485 Adapter Jumper Settings



ENERTIA PLUS Software Configuration Worksheet

ENERTIA PLUS VIN#

DASH FIRMWARE:

43222582_1_44_FIRMWARE_DASH_ICU.BIN (01.01.44)

CONFIRM:

VCU FIRMWARE:

F130: 14301489_VCUV1m60.BIN (02.01.60)

F506: 89210795_CPIV1_20.BIN (01.01.20)

CONFIRM:

CONFIRM:

F930: 16362369_SNDV0_16.BIN (01.00.16)

CONFIRM:

CHARGER FIRMWARE: (AS VERIFIED BY SEVCON CHARGER FIRMWARE UPDATER)

FIRMWARE: 76206089_CRG_850W_100V.hex (1604.001, CHECKSUM: 8B05)

CONFIGURATION: 21689551_CCFG_850W_100V.xml (CHECKSUM: 219+50+50+50)

(Cannot be confirmed once bike is assembled)

BMS FIRMWARE:

FIRMWARE: 72857726_8x_00m39_FIRMWARE_BMS.BIN (82.00.39)

CONFIRM:

BATTERY FIRMWARE: (AS VERIFIED BY BRAMMO BMS Simulator)

PMS 506 FIRMWARE: 52475191_P4SV0M80.BIN

(Cannot be confirmed once bike is assembled)

BATTERY BQ116 FIRMWARE AND CONFIGURATION: (AS VERIFIED BY BRAMMO BPM DIAGNOSTICS)

BQ116 FIRMWARE: 35151414_FW_0002_0000_9992_9991.enc.brm.xml

BQ116 Configuration: 64342962_A_00_BPM4470_2012-05-30_9991enc_bqW3_3_6.xml

(Cannot be confirmed once bike is assembled)

SEVCON FIRMWARE:

FIRMWARE: 53988154_UK0319_59.dld (UK0319.59, ROM CHECKSUM: 5766)

CONFIRM FIRMWARE REV:

CONFIRM CHECKSUM:

SEVCON CONFIGURATION FILE:

CONFIGURATION: 63934807_A_01_SCFG_59.dcf (CHECKSUM: 87CD)

CONFIRM CHECKSUM:

ENERTIA BASIC Software Configuration Worksheet

ENERTIA Basic VIN#

◆-----◆

DASH FIRMWARE:

43222582_1_44_FIRMWARE_DASH_ICU.BIN (01.01.44)

CONFIRM:

◆-----◆

VCU FIRMWARE:

F130: 07799745_VCUV1m46.BIN (01.01.46)

F506: 38781494_CPIV1_10.BIN (01.01.10)

CONFIRM:

CONFIRM:

F930: 16362369_SNDV0_16.BIN (01.00.16)

CONFIRM:

◆-----◆

CHARGER FIRMWARE: (AS VERIFIED BY SEVCON CHARGER FIRMWARE UPDATER)

FIRMWARE: 86664503_CRGVUK329_08_850W.hex (UK329.08)

CONFIGURATION: 37337363_CCFGV1_00_850W.xml

(Cannot be confirmed once bike is assembled)

◆-----◆

BMS FIRMWARE:

FIRMWARE: 26118037_86_00m27_FIRMWARE_BMS.BIN (86.00.27)

CONFIRM:

◆-----◆

BATTERY FIRMWARE: (AS VERIFIED BY VALENCE FIRMWARE UPDATER)

FIRMWARE: 92759358_BATV1005038A00.TXT

(Cannot be confirmed once bike is assembled)

◆-----◆

SEVCON FIRMWARE:

FIRMWARE: 63282657_UK0319L44.dld (UK0319L44, ROM CHECKSUM: D05D)

CONFIRM FIRMWARE REV:

CONFIRM CHECKSUM:

◆-----◆

SEVCON CONFIGURATION FILE:

CONFIGURATION: 34490961_C_00_SCFG_L44.dcf (CHECKSUM: 5FB8)

CONFIRM CHECKSUM:

Enertia+ Hong Kong Police Bike Firmware Update Procedure

Updated June 10, 2012 by J. Keto

- 1) Connect IXXAT CAN Adapter to the Motor Controller CAN connector.
- 2) Start DVT (C:\c6944\DVT_Customer\program\dvt.tcl).
- 3) Turn on bike and Motor Controller. If it isn't communicating with DVT, you might have to click the 100kHz baud rate button.
- 4) Click the Helper ("H" button). If you get a warning message about there not being a .eds file for this version of firmware, click "yes" and wait for it to be created.
- 5) Click on the "Tree" tab, then "Configuration", "Encoder Setup". Cut and paste the following 5 numbers into a file for later use:
 - a. Encoder Offset
 - b. Sin input minimum
 - c. Sin input maximum
 - d. Cos input minimum
 - e. Cos input maximum
- 6) Close the DVT Helper and close DVT.
- 7) Start the Simple Configurator (c:\c6944\Simple Configurator\simple_ac_configurator.tcl).
- 8) Click the "Enter Configuration Mode" button.
- 9) Click the "Program the unit and Clear Configuration" button. Select the file "UK0319.59.dld" when asked for the firmware file.
- 10) Click the "Configure Node 1" button. Select the file "Enertia+_4900RPM_Regen_-250Aim_min_NoPassword.dcf" configuration file. Check that the Configuration Checksum is 0x5b56 when done.
- 11) Click the "Exit Configuration Mode" button.
- 12) Close the Simple AC Configurator.
- 13) Cycle power on the bike and Motor Controller.
- 14) Start DVT and click the Helper button. If you get a warning message about there not being a .eds file for this version of firmware, click "yes" and wait for it to be created.
- 15) Click on the "Tree" tab, then "Configuration", "Encoder Setup". Copy and paste the following 5 numbers from your file into the DVT window:
 - a. Encoder Offset
 - b. Sin input minimum
 - c. Sin input maximum
 - d. Cos input minimum
 - e. Cos input maximum
- 16) Click the "Load Values" button. If you get any error messages, just click the "Read Values" button and make sure your settings were accepted.
- 17) Close DVT, cycle power on the bike, and test.

2.5 ENERTIA PLUS Software Configuration Worksheet

ENERTIA PLUS VIN#

◆
DASH FIRMWARE:

43222582_1_44_FIRMWARE_DASH_ICU.BIN (01.01.44)

CONFIRM:

◆
VCU FIRMWARE:

F130: 14301489_VCUV1m63.BIN (02.01.63)

F506: 89210795_CPIV1_21.BIN (01.01.21)

CONFIRM:

CONFIRM:

F930: 16362369_SNDV0_16.BIN (01.00.16)

CONFIRM:

◆
CHARGER FIRMWARE: (AS VERIFIED BY SEVCON CHARGER FIRMWARE UPDATER)

FIRMWARE: 76206089_CRG_850W_100V.hex (1604.001, CHECKSUM: 8B05)

CONFIGURATION: 21689551_CCFG_850W_100V.xml (CHECKSUM: 219+50+50+50)

(Cannot be confirmed once bike is assembled)

◆
BMS FIRMWARE:

FIRMWARE: 72857726_8X_00m42_FIRMWARE_BMS.BIN (82.00.42)

CONFIRM:

◆
BATTERY FIRMWARE: (AS VERIFIED BY BRAMMO BMS Diagnostics)

PMS 506 FIRMWARE: 52475191_P4SV0M84.BIN (04.00.84)

(Cannot be confirmed once bike is assembled)

◆
BATTERY BQ116 FIRMWARE AND CONFIGURATION: (AS VERIFIED BY BRAMMO BPM Diagnostics)

BQ116 FIRMWARE: 35151414_FW_0002_0000_9992_9991.enc.brm.xml

BQ116 Configuration: 64342962_B_00_BPM4470_2012-07-30_9991enc_bqW3_3_6.xml

(Cannot be confirmed once bike is assembled)

◆
SEVCON FIRMWARE:

FIRMWARE: 53988154_UK0319_59.dld (UK0319.59, ROM CHECKSUM: 5766)

CONFIRM FIRMWARE REV:

CONFIRM CHECKSUM:

◆
SEVCON CONFIGURATION FILE:

CONFIGURATION: 63934807_B_00_SCFG_59.dcf (CHECKSUM: DC0D)

CONFIRM CHECKSUM:

◆
FIELD UPGRADE CONFIGURATION: 31379483_B_00_SCFG_59_FIELD_UPGRADE_ONLY.dcf

Bramm & W|F|

Software Block Release Document
for
The Enertia Basic and Enertia Plus
with
Software Configuration Worksheet

P/N 07203448, Revision F.00

Prepared by: George Alter

Brammo, Inc.

2012-08-16

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Revision History

Name	Date	Reason For Changes	Version
George Alter	2011-06-06	Initial Release for Enertia Basic	B.02
George Alter	2011-10-05	Reflects Change of Sevcon Configuration File to Rev. B.	C.00
George Alter	2012-01-25	New document formatting Reflects new firmware releases: VCU Ver. 01.01.45 to 01.01.46 BMS Ver. 86.00.21 to 86.00.27 Sevcon Ver. UK0319B44 to UK0319L44 Sevcon Config Ver. B.00 to C.00	D.01
George Alter	2012-04-12	Added Enertia Plus Firmware names	E.00
George Alter	2012-06-12	Official release; corrected plus release versions	E.01
George Alter	2012-08-27	Official Release, updating several firmwares and two configurations on the enertia Plus; one firmware on the Enertia Basic	F.00

1. Introduction

1.1 Purpose

This document is intended to accompany the release of new software for the Enertia Basic and/or Enertia Plus Motorcycles, with release notes, version check procedures and a worksheet for recording the firmware versions of each vehicle, verifying that all firmware installed is at the latest released revision.

1.2 Scope

Applies to the Enertia Basic and Enertia Plus motorcycles.

1.3 Intended Audience

This Document is intended for Brammo, Inc. internal engineering, Brammo service personnel and service personnel of Brammo certified dealers, and Brammo, Inc. manufacturing partners who have been asked to participate in the BPM development, validation and manufacturing efforts.

1.4 Equipment and Software Required

Title	Manufacturer	Part Number
1.4.1 Enertia Diagnostics Software, Version 1.70 or later	Brammo Inc.	61610577
1.4.2 Simple Configurator Software	Sevcon Inc.	N/A
1.4.3 Windows PC with at least one USB port and a 32 bit operating system (the software will not run properly on a 64 bit system)	Various	N/A
1.4.4 National Instruments USB-CAN Adapter, P/N USB-8473	National Instruments	USB-8473
1.4.5 Enertia Diagnostic Interface Adapter	Brammo Inc.	45689813
1.4.6 IXXAT USB-CAN adapter	IXXAT Automation GmbH	1.01.0087.10200
1.4.7 Motor Controller service port adapter	Brammo Inc.	35470819

1.5 Release Notes Version F.00

Only releasing one new piece of firmware for the Enertia Basic (CPI), but several for the Enertia Plus (VCU, BMS, CPI, and BPM). Also in this release are two updated configuration files for the Motor Controller and the Battery Management Processor inside the BPM.

Issue as reported by end user, technician or test engineer	Issue Evaluation and fix description	Modules affected
SYSTEM FAULT B6, D4, V3, V4	Caused by a bug in the CPI firmware. Fixed.	CPI+ and CPI Basic
Need to prevent charging at low temperature and high temperature. This includes regen, which is a form of charge.	Changed MC Configuration to allow remote control of max battery regen current. Changed VCU to control regen current as well as charge current based on temperature. Change BMS to signal extreme temperatures and to disable charge or discharge as necessary.	VCU+, BMS+, MCconfig+
Sometimes during firmware upload the VCU is damaged if F130 and BMS firmware are loaded together	Sometimes on reset during programming the VCU lost track of the kind of BMS installed (on board / off board) and programmed the wrong chip.	VCU+
The bike doesn't drive when BPM Interlock is open, and sometimes SYSTEM FAULT C3 is not even displayed.	Changed software to only disable charge; raised priority of C3 fault so that it's not covered by a minor fault on the dash	VCU+
Sometimes an unreasonable high "miles remaining" value is shown on the Dash	Limit max range displayed to 100 miles	VCU+
The motor fan comes on much sooner than it used to	A remnant of test code that turned on the fan at 35C. Changed back to turn on at 65C	VCU+
Fan comes on when activating the "hidden" software version screen	Only happened when the motor temperature was within the hysteresis range of 55-65C. Still a bug; fixed.	VCU+
The SOC reading on the Dash and on the Diagnostic software don't match.	Another test code remnant that got through – SOC was transmitted in a non-standard data byte.	BPM44/70, BMS+, VCU+
SYSTEM FAULT V58 - VCU +12V Out of Spec	Any glitch in the power supply would set this "sticky" fault and require a power cycle. Made the fault "un-sticky" (if the voltage returns to good value, fault disappears) and reduced likelihood of glitches by waiting for the supply to settle on power up	VCU+
Battery temperatures and battery firmware version not displayed	Added multiple debug screens to Drive mode. Activate by holding the Start button down for seven seconds. De-activate by pressing the Start button again. Cycle through screens by pressing and holding the Dash Select (Green) button.	VCU+
Bikes never stop passive balancing	Due to some chargers putting out higher than 99.6Vdc; Fixed by raising the passive balance trigger	BMS+
LOW BATTERY warning comes on too soon	Changed SOC trigger to 15% from 20%.	VCU+, BMS+
The various charge stages are not shown in the diagnostic application	This was not supported by software until now. Shows Main, Float and Balancing modes	BMS+
Some BPM battery faults are not	Added additional fault support	VCU+, BMS+

Issue as reported by end user, technician or test engineer	Issue Evaluation and fix description	Modules affected
displayed on the dash		
SOC stays at 100% for a long time; SERVICE REQ'D B55 may result as well	Coulomb counter allowed count past 100%, then displayed with a 100% limit. Now the count itself is limited to 100%	BPM44/70
SOC never goes to 100%	The firmware was waiting for a current taper to signal full charge. This taper never happens on the Sevcon charger, so a compromise transition was implemented that uses a voltage threshold during charge	BPM44/70
When the firmware is first loaded to replace firmware older than V0.80, an SOC of zero is displayed no matter how charged the module is.	No Brammo coulomb counting before V80. New version guesses at a state of charge based on voltage when the new firmware is first loaded	BPM44/70
Humidity sensor never reads past 75%	The input scaling was wrong. Fixed	BPM44/70
Interlock open events occur too frequently, requiring technician intervention to get the bike working properly again.	Too many of the BPM's Battery Management Processors safety flags were enabled, even though they offer no real protection. Disabled most; left in place the critical charge protect flags	BPM44/70
Field upgrade of motor controller firmware requires encoder recommit and re-align, or an error prone documentation step	Decided to generate two separate Motor Control configuration files. One for manufacturing, so that their workflow remains the same, and one for service. The service configuration does not upload encoder values – it leaves the existing values in place.	MCconfig+

1.6 Release Notes Version E.01

Released version of the previous (E.00 Preliminary) document. Finalized the version numbers of the Enertia Plus released firmware. Added the BPM based Texas Instruments BQ116's firmware and configuration files.

1.7 Release Notes Version E.00

This block release of software addresses the differences between the Enertia Plus and Enertia Basic. The VCU and the BMS software is different between the two bikes. Since the Enertia plus uses the higher voltage BPM 4470 battery modules, the Charger firmware and configuration as well as the Battery firmware is different. Finally, the plus has a different motor controller configuration because of the higher battery voltage and the different motor (PMS 126 vs PMS 120) used.

1.8 Release Notes Version D.01

This block release of software addresses several issues where the program features were not working as intended. No new features were added on this release, therefore no update to the user's manual is required.

Issue as reported by end user or technician	Issue Evaluation and fix description	Modules affected
SERVICE REQ'D B55	Caused by a bug in the SOC imbalance calculation. Now looks for 20% SOC difference (e.g. Module 1 is at 30% SOC – there is imbalance if Module 2 reports less than 10% SOC)	BMS
SERVICE REQ'D B6 when plugging-in AC in park mode; Erroneous BMS firmware programming when doing batch upload	The BMS PCB did not notice when the VCU F130 processor reset, therefore it did not know to reset itself. Reworked VCU firmware to cycle power on the BMS enable line, and changed the BMS to notice this change on the enable line, as short as 20 msec.	VCU, BMS
SERVICE REQ'D D4	The Sevcon Motor Controller puts the CAN bus in a fault mode every time it starts, so the VCU software sometimes could not communicate. Refined the turn on timing to remedy this problem. The issue is not fully fixed, but the occurrence should be greatly reduced.	VCU
SERVICE REQ'D S86 (motor overcurrent)	Sevcon provided a new version of their firmware which provides better motor control along with many other improvements. This, along with the encoder alignment procedure should greatly reduce the occurrence of this fault.	Sevcon MC
SERVICE REQ'D B40	This is a necessary safety feature, however, since this is a latching fault (does not clear until power cycle), care was taken to make it filter glitches and only happen when absolutely necessary.	BMS
Rear Wheel turns if motor controller is turned on with throttle at 100%. If properly operating, the wheel should not move at all.	Due to a change in behavior from our previous motor controller – the Sevcon reports throttle value as 0% until the bike is fully in drive mode, no matter what the throttle is really at. Changed software to accommodate this anomaly, holding the bike at 0 torque until throttle position can be verified.	VCU, Sevcon Configuration
Unable to upload CPI firmware	Programming error in the firmware upload algorithm. Changed the code, thereby eliminating the greatest cause of upload failures	VCU, Zala test fixture
Motor controller temperature reporting too low at room temperature	The equation given was based on an out of spec sample device. Changed the equation, the temperature is reported more accurately	Sevcon Configuration

2. Firmware Version Check Procedure

2.1 Charger and battery firmware versions

Charger and battery firmware versions cannot be accessed once the bike is completely assembled. Battery firmware is checked during battery conditioning, and charger firmware is checked prior to its installation into the bike. The procedure for checking these firmware versions is not covered in this document.

2.2 VCU, BMS, Dash and Motor Controller firmware versions

These can be checked with the bike fully assembled, using one of two methods detailed below.

2.2.1 Using Enertia Diagnostics Software

2.2.1.1 Disconnect the connector at the back of the Dash.

2.2.1.2 Connect the Y-cable between the Dash and the Dash cable.

2.2.1.3 Connect the other end of the Y-Cable to the National Instruments USB-CAN adapter's DB-9 connector.

2.2.1.4 Connect the NI adapter to the PC.

2.2.1.5 Turn on the Enertia in Drive Mode.

2.2.1.6 Turn on the Motor Controller by turning on the kill-switch then holding the start button for at least one second

2.2.1.7 Launch Enertia Diagnostics, Click "Connect" and view the firmware versions in the upper left section, as shown below:

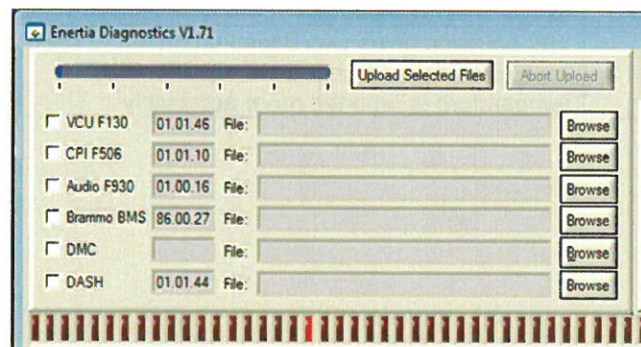


Figure 2-1 -- Software Version display in the Enertia Diagnostics Application

2.2.2 Using the Enertia Firmware display screen

2.2.2.1 Disconnect the connector at the back of the Dash.

2.2.2.2 Connect the Y-cable between the Dash and the Dash cable.

2.2.2.3 Connect the other end of the Y-Cable to the National Instruments USB-CAN adapter's DB-9 connector.

2.2.2.4 Connect the NI adapter to the PC.

2.2.2.5 Turn on the Enertia in Drive mode.

2.2.2.6 Turn on the Motor Controller by turning on the kill-switch then holding the start button for at least one second

2.2.2.7 Press and hold the Start button for 8 seconds, the firmware display screen will appear. Each firmware version number is preceded by a letter denoting which firmware the number belongs to, as follows:

Letter Designation	Module
V	VCU F130 processor
C	VCU CPI processor
A	VCU Audio Processor
D	Dash
B	BMS
M	Motor Controller, only shows if Motor Controller is turned on.

Table 2-1 -- Firmware Module Letter Designations



Figure 2-2 -- Enertia Basic Dash Display in Firmware List Mode

2.3 Sevcon Motor Controller Checksums

To verify the Motor Controller Firmware and Motor Controller configuration checksums, access needs to be gained to the Motor Controller service port.

2.3.1 Using Sevcon's Simple Configurator Software

2.3.1.1 Remove the lower right side panel from the bike and connect the IXXAT interface as shown:

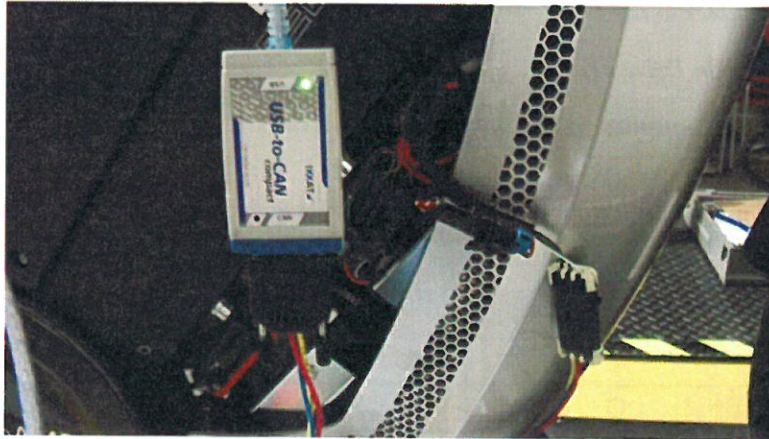


Figure 2-3 -- Motor Controller Service Connection

2.3.1.2 Turn on the Enertia in Drive Mode.

2.3.1.3 Turn on the Motor Controller by turning on the kill-switch then holding the start button for at least one second

2.3.1.4 Launch the Simple Configurator Utility. After completing the Autobaud detection process the software will display the checksums as shown:

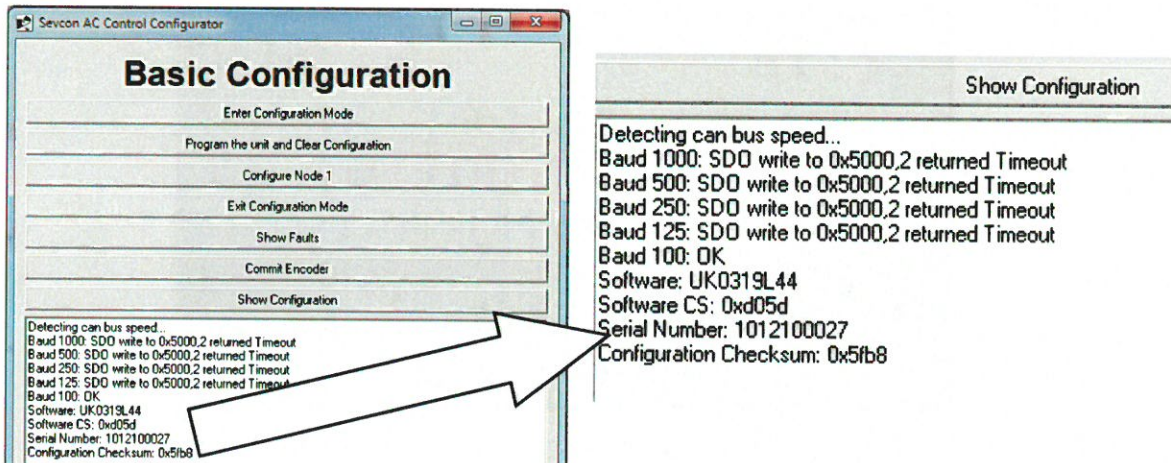


Figure 2-4 -- Simple Configurator Checksum Display

2.4 ENERTIA BASIC Software Configuration Worksheet

ENERTIA Basic VIN#

DASH FIRMWARE:

43222582_1_44_FIRMWARE_DASH_ICU.BIN (01.01.44)

CONFIRM:

VCU FIRMWARE:

F130: 07799745_VCUV1m46.BIN (01.01.46)

F506: 89210795_CPIV1_21.BIN (01.01.21)

CONFIRM:

CONFIRM:

F930: 16362369_SNDV0_16.BIN (01.00.16)

CONFIRM:

CHARGER FIRMWARE: (AS VERIFIED BY SEVCON CHARGER FIRMWARE UPDATER)

FIRMWARE: 86664503_CRGVUK329_08_850W.hex (UK329.08)

CONFIGURATION: 37337363_CCFGV1_00_850W.xml

(Cannot be confirmed once bike is assembled)

BMS FIRMWARE:

FIRMWARE: 26118037_86_00m27_FIRMWARE_BMS.BIN (86.00.27)

CONFIRM:

BATTERY FIRMWARE: (AS VERIFIED BY VALENCE FIRMWARE UPDATER)

FIRMWARE: 92759358_BATV1005038A00.TXT

(Cannot be confirmed once bike is assembled)

SEVCON FIRMWARE:

FIRMWARE: 63282657_UK0319L44.dld (UK0319L44, ROM CHECKSUM: D05D)

CONFIRM FIRMWARE REV:

CONFIRM CHECKSUM:

SEVCON CONFIGURATION FILE:

CONFIGURATION: 34490961_C_00_SCFG_L44.dcf (CHECKSUM: 5FB8)

CONFIRM CHECKSUM:

2.5 ENERTIA PLUS Software Configuration Worksheet

ENERTIA PLUS VIN#

DASH FIRMWARE:

43222582_1_44_FIRMWARE_DASH_ICU.BIN (01.01.44)

CONFIRM:

VCU FIRMWARE:

F130: 14301489_VCUV1m63.BIN (02.01.63)

F506: 89210795_CPIV1_21.BIN (01.01.21)

CONFIRM:

CONFIRM:

F930: 16362369_SNDV0_16.BIN (01.00.16)

CONFIRM:

CHARGER FIRMWARE: (AS VERIFIED BY SEVCON CHARGER FIRMWARE UPDATER)

FIRMWARE: 76206089_CRG_850W_100V.hex (1604.001, CHECKSUM: 8B05)

CONFIGURATION: 21689551_CCFG_850W_100V.xml (CHECKSUM: 219+50+50+50)

(Cannot be confirmed once bike is assembled)

BMS FIRMWARE:

FIRMWARE: 72857726_8X_00m42_FIRMWARE_BMS.BIN (82.00.42)

CONFIRM:

BATTERY FIRMWARE: (AS VERIFIED BY BRAMMO BMS Diagnostics)

PMS 506 FIRMWARE: 52475191_P4SV0M84.BIN (04.00.84)

(Cannot be confirmed once bike is assembled)

BATTERY BQ116 FIRMWARE AND CONFIGURATION: (AS VERIFIED BY BRAMMO BPM Diagnostics)

BQ116 FIRMWARE: 35151414_FW_0002_0000_9992_9991.enc.brm.xml

BQ116 Configuration: 64342962_B_00_BPM4470_2012-07-30_9991enc_bqW3_3_6.xml

(Cannot be confirmed once bike is assembled)

SEVCON FIRMWARE:

FIRMWARE: 53988154_UK0319_59.dld (UK0319.59, ROM CHECKSUM: 5766)

CONFIRM FIRMWARE REV:


CONFIRM CHECKSUM:

SEVCON CONFIGURATION FILE:

CONFIGURATION: 63934807_B_00_SCFG_59.dcf (CHECKSUM: DC0D)

CONFIRM CHECKSUM:

FIELD UPGRADE CONFIGURATION: 31379483_B_00_SCFG_59_FIELD_UPGRADE_ONLY.dcf

	Title: SERVICE BULLETIN – 2012 ENERTIA PLUS SOFTWARE HIGH PRIORITY SOFTWARE PATCH	
	Document No: SB-BMS-HPSP	
	Revision No: A.00	Issue Date: 10/03/2012

1. PURPOSE & SCOPE


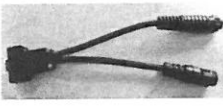

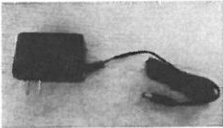

This SERVICE BULLETIN outlines the necessary steps to update the BMS software on the 2012 Enertia Plus and to also reset a parameter that is in the wrong state.

The reason for this update is a bug in the BMS software that prevents module 2 from properly balancing its cells. This might result in a reduction of range over time.

2. RESPONSIBILITY

BRAMMO Service Technicians will ensure that, when serviced, all 2012 BRAMMO Enertia Plus models have this current software version uploaded to all available components.

3. REQUIRED TOOLS

	<ul style="list-style-type: none"> National Instruments USB-to-CAN Adapter.
	<ul style="list-style-type: none"> Brammo Enertia Diagnostic Interface "Y" Adaptor.
	<ul style="list-style-type: none"> Brammo Battery communication cable.
	<ul style="list-style-type: none"> 12v Power Supply. Used with the above battery communication cable for the BPM4470.
	<ul style="list-style-type: none"> EasySYNC RS485, Brammo Battery communication.

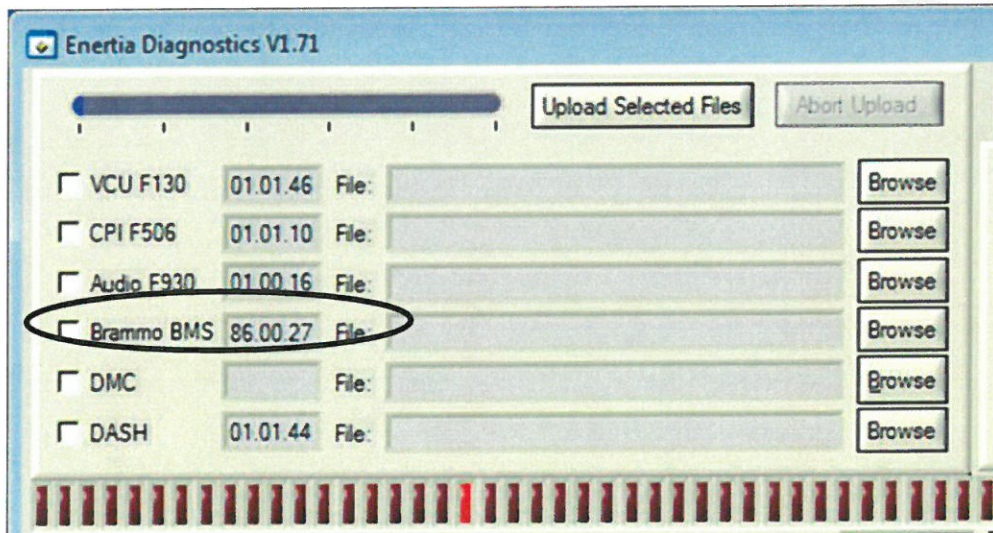
4. PROCESS

For this Service Bulletin you will need to update one parameter on the battery modules, and the BMS firmware in the VCU.

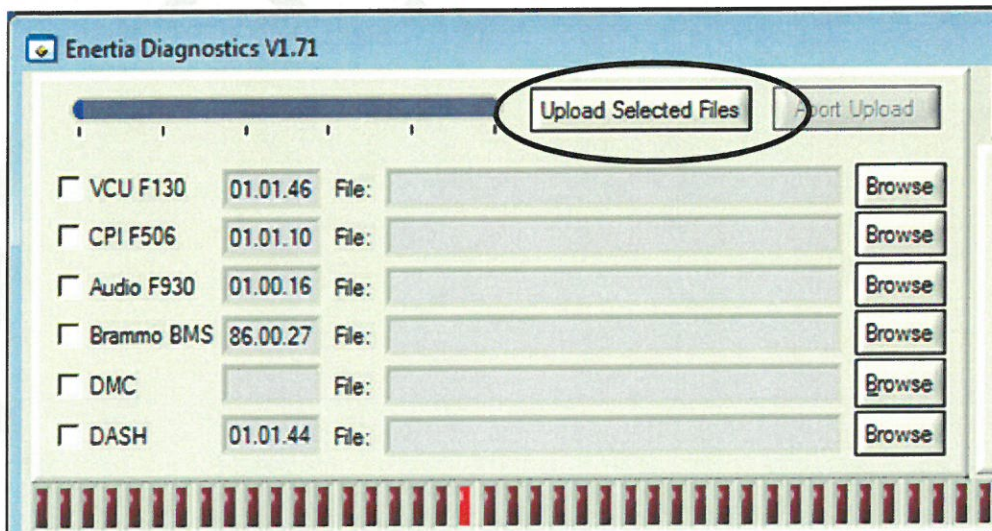
Performing the steps in the order presented is crucial!

- 1) Updating the BMS firmware to Version 82.00.43.
- 2) Step one will be updating the BPM4470 battery module firmware. This can be done by accessing the Enertia Diagnostic software and connecting to the back of the dash using the "Y" cable.

- a. Disconnect the connector at the back of the Dash.
- b. Connect the Y-cable between the Dash and the Dash cable.
- c. Connect the other end of the Y-Cable to the National Instruments USB-CAN adapter's DB-9 connector.
- d. Connect the NI adapter to the PC.
- e. Turn on the Enertia in Drive Mode.
- f. Launch Enertia Diagnostics, Click "Connect" and view the firmware versions in the upper left section,



- g. If BMS version is lower than xx.xx.43, it needs to be updated to **82.00.43** (72857726_8X_00m43_FIRMWARE_BMS.BIN)
 - i. Click "Browse" and select (find) the file 72857726_8X_00m43_FIRMWARE_BMS.BIN which should have been saved to your desktop or hard drive.
- h. Once you have selected the correct file to upload, select "Upload Selected Files".

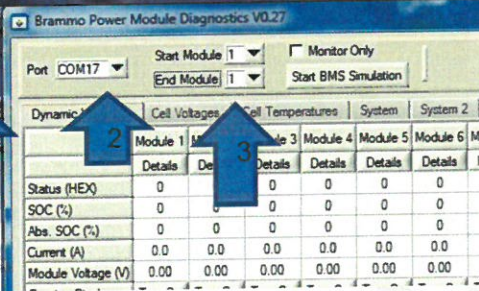


3) TI configuration change on the BPM 4470 modules (Instructions assume that the batteries are in a bike)



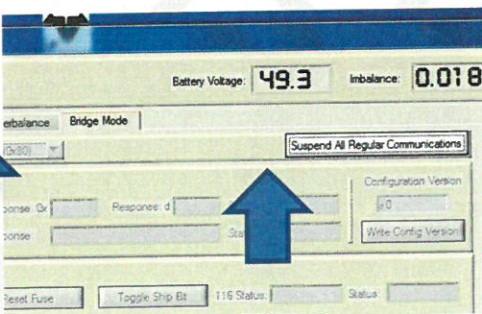
1) Connect to bike

- Disconnect the battery communication cable that runs between the VCU and the top battery (of the two connectors on the top battery, this is closer to the outside)
- Connect the diagnostic cable to the top battery.



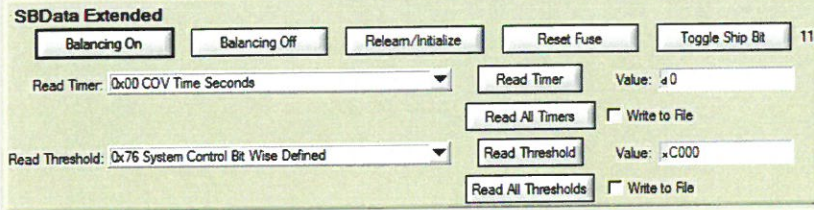
2) Start simulation

- If the port number dropdown box is empty, shut down and restart program.
- ensure start module and end module are both set to 1 for updating module one, or both set to 2 for updating module 2.
- Press *Start BMS Simulation* button



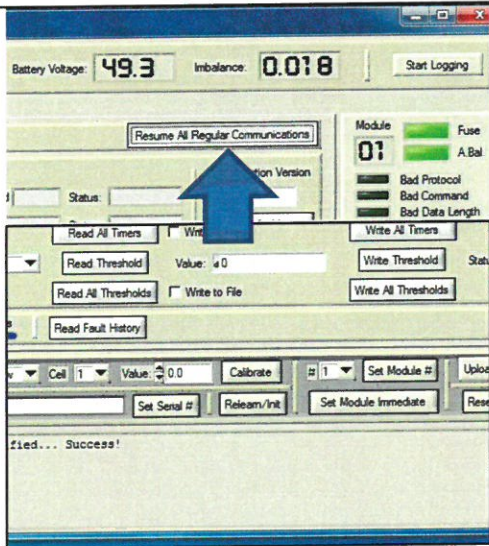
3) Suspend regular communication

- Select the *Bridge Mode* tab.
- Press the *Suspend All Regular Communications* button.



4) Check Whether Active Balancing is enabled

- In the "SBDData Extended" section, "Read Threshold" Pulldown, select "0x76 System Control Bit Wise Defined"
- Click on the "Value" field to the right of this pulldown, until the radix shows a small 'x'.
- Click "Read Threshold"
- If the reading is $x4000$, there is nothing to correct.
- Otherwise, click the "Balancing On" button, then click "read Threshold" again and verify that the reading is now $x4000$



5) Resume and disconnect

- Under the *Bridge Mode* tab, press the *Resume All Regular Communications* button
- Click Stop BMS Simulation to disconnect from the module

6) Repeat above steps for second battery

5. Conclusion

Run motorcycle on rear wheel stand to ensure everything functions and runs properly. Plug motorcycle in to charge to ensure everything functions and runs properly. Should you have any questions please contact Brammo Service at 541-482-9555 x337 or Service@Brammo.com



Title: SERVICE BULLETIN - 2012 ENERTIA PLUS SOFTWARE HIGH PRIORITY SOFTWARE PATCH

Document No: SB-BMS-HPSP

Revision No: A.00


Issue Date: 10/03/2012

DOCUMENT REVISION TABLE

Revision	Date	Change Description	Initiator
A.00	10/03/2012	2012 ENERTIA PLUS SOFTWARE HIGH PRIORITY SOFTWARE PATCH	George Alter

PRELIMINARY

(OK)

	Title: SERVICE BULLETIN – 2012 ENERTIA PLUS SOFTWARE UPDATE	
	Document No: SB-EPSU	
	Revision No: A.00	Issue Date: 09/04/2012

1. PURPOSE & SCOPE

This SERVICE BULLETIN outlines the necessary steps to update the software on the 2012 Enertia Plus. These updates included the BPM4470 battery modules, VCU, BMS and the Sevcon motor controller.

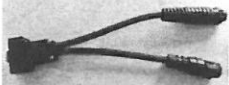
- BPM4470 – update to; file # 52475191 – Battery Firmware MPS 506 (04.00.84)
64342962 – Battery BQ116 Configuration
- VCU – update to; file # 14301489 – VCU Firmware F130 (02.01.63)
89210795 – VCU Firmware F506 (01.01.21)
- BMS – update to; file # 72857726 – BMS firmware (82.00.42)
- Sevcon Motor Controller – update to; file # 31379483 – Sevcon Configuration File: Field Upgrade Configuration

The files listed above need to be saved to your computer or desktop. You will need to upload them in the steps listed below.

2. RESPONSIBILITY

BRAMMO Service Technicians will ensure that, when serviced, all 2012 BRAMMO Enertia Plus models have this current software version uploaded to all available components.

3. REQUIRED TOOLS

	<ul style="list-style-type: none"> • National Instruments USB-to-CAN Adapter.
	<ul style="list-style-type: none"> • Brammo Enertia Diagnostic Interface "Y" Adaptor.
	<ul style="list-style-type: none"> • IXXAT USB-to-CAN.
	<ul style="list-style-type: none"> • Brammo Motor Controller Service Port Adaptor.
	<ul style="list-style-type: none"> • Brammo Battery communication cable.

	Title: SERVICE BULLETIN – 2012 ENERTIA PLUS SOFTWARE UPDATE	
	Document No: SB-EPSU	
	Revision No: A.00	Issue Date: 09/04/2012

	<ul style="list-style-type: none"> • 12v Power Supply. Used with the above battery communication cable for the BPM4470.
	<ul style="list-style-type: none"> • EasySYNC RS485, Brammo Battery communication.

4. PROCESS

For this Service Bulletin you will need to update the firmware on battery modules, the VCU and the Sevcon motor controller.

- 1) Step one will be updating the BPM4470 battery module firmware.

** Remove upper body panel **

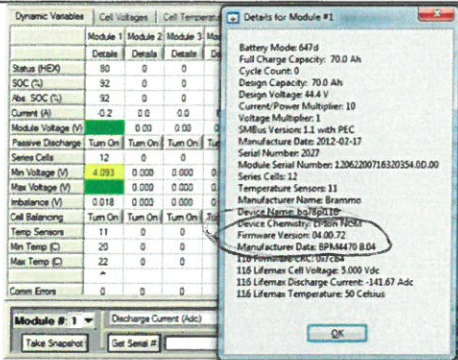
TI configuration and Brammo firmware upload instructions

Specific to this eco release: #1106

Instructions assume that the batteries are in a bike

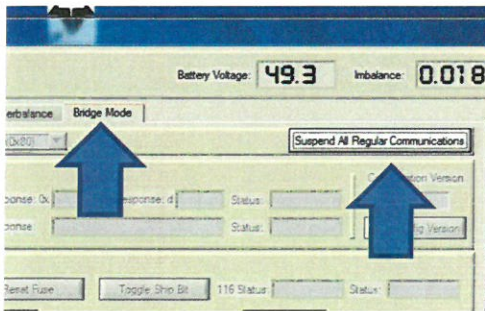
	<p>1) Connect to bike</p> <ul style="list-style-type: none"> - Disconnect the battery communication cable that runs between the VCU and the top battery (of the two connectors on the top battery, this is closer to the outside) - Connect the diagnostic cable to the top battery. <p><i>- explain how to connect cables -</i></p> <p><i>- circle this one</i></p>
	<p>2) Start simulation</p> <ul style="list-style-type: none"> - If the port number dropdown box is empty, shut down and restart program. - ensure start module and end module are both set to 1 for updating module one, or both set to 2 for updating module 2. - Press <i>Start BMS Simulation</i> button

*Device Manager
update driver.
goto mfg web
4 download driver for conn port.
VCU - Driver*



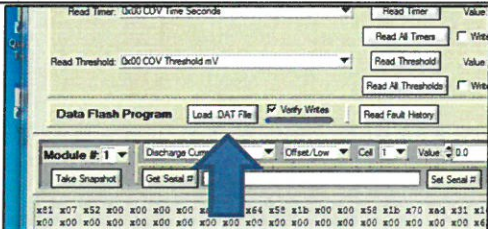
3) Check if update is needed.

- Under the *Dynamic Variables* tab, press *Details* button
- TI Configuration does NOT need updating if the following fields are labeled as shown
Firmware version: 04.00.84
Manufacture data: 64342962 B.00
- If no update needed, stop here



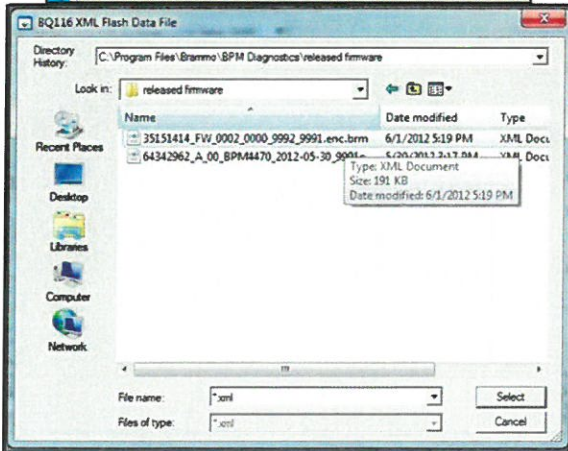
4) Suspend regular communication

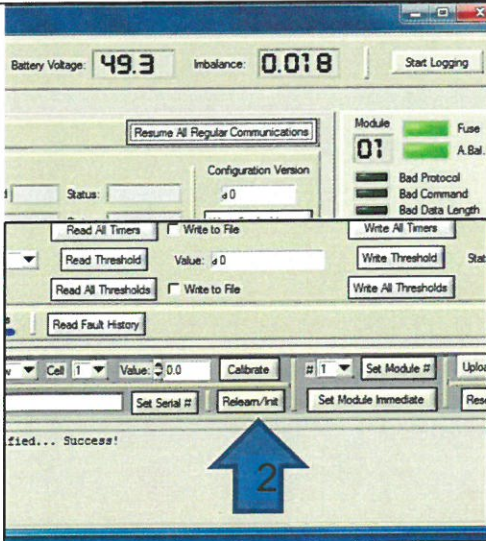
- Select the *Bridge Mode* tab.
- Press the *Suspend All Regular Communications* button.



5) Load the firmware DAT file

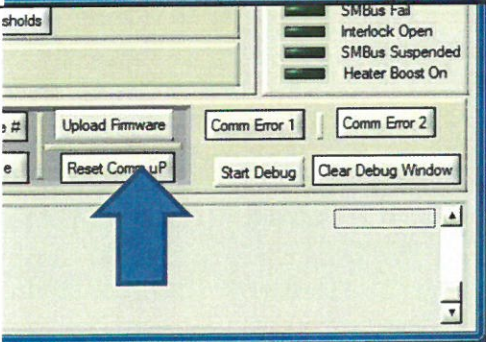
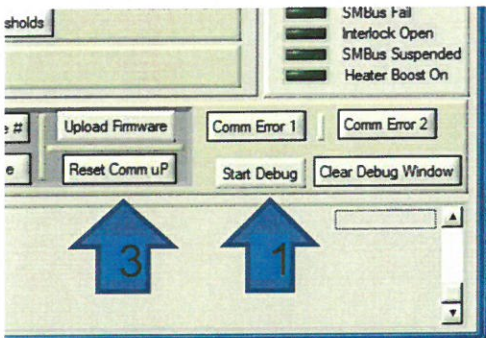
- Select the *Load DAT File* button.
- Select the file stating in *64342962_B_00*
- Wait for the timer bar and debugging text to inform you that the file upload is complete





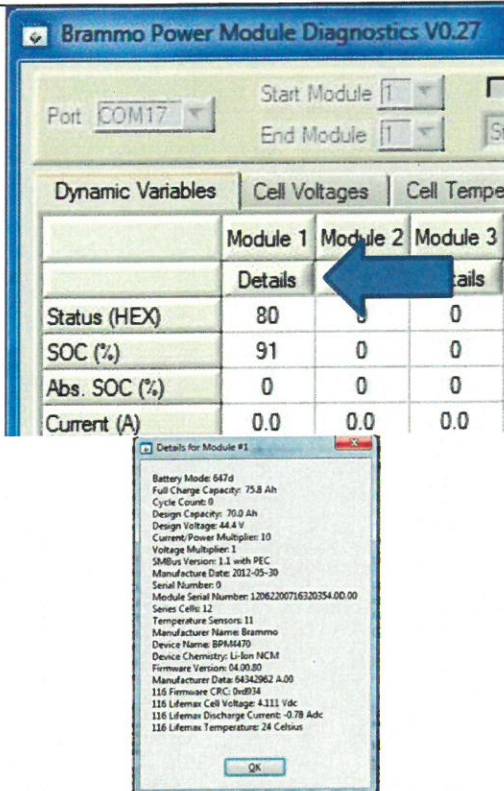
6) Resume and reinitialize

- Under the *Bridge Mode* tab, press the *Resume All Regular Communications* button
- Press the *Start Debug* button to restart debugging.
- Press the *Relearn/Init* button and wait 5 seconds
- Press the *Reset Comm uP* button and wait 2 seconds
- Select the *Dynamic Variables* Tab.



7) Upload Brammo Firmware file

- Select the *Upload Firmware* button
- Select the file *52475191_P4SV0M84.BIN*
- The *Upload Firmware* button will become *Abort Upload* while the program loads
- Wait for the button to return to *Upload Firmware* before continuing



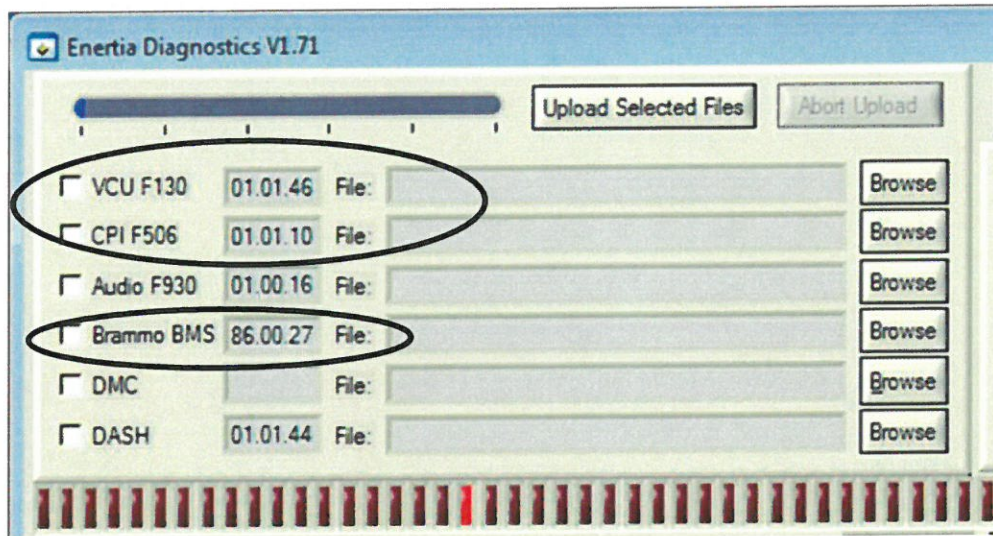
8) Check to ensure firmware is updated

- Under the *Dynamic Variables* tab, press the module 1 *Details* button
- Firmware is properly updated if the following fields are labeled as shown
Firmware version: 04.00.84
Manufacture data: 64342962 B.00
- Stop BMS Simulation before unplugging battery

9) Repeat above steps for second battery

- 2) Step two is to update the VCU and the BMS. This can be done by accessing the Enertia Diagnostic software and connecting to the back of the dash using the "Y" cable.
- a. Using Enertia Diagnostics Software
 - b. Disconnect the connector at the back of the Dash.
 - c. Connect the Y-cable between the Dash and the Dash cable.
 - d. Connect the other end of the Y-Cable to the National Instruments USB-CAN adapter's DB-9 connector.
 - e. Connect the NI adapter to the PC.
 - f. Turn on the Enertia in Drive Mode.
 - g. Turn on the Motor Controller by turning on the kill-switch then holding the start button for at least one second
 - h. Launch Enertia Diagnostics, Click "Connect" and view the firmware versions in the upper left section,

Pictures



i.VCU F130 needs to be updated to **02.01.63** (14301489_VCUV1m63.BIN)

- i. Click "Browse" in the VCU F130 section and select (find) the file 14301489_VCUV1m63.BIN which should have been saved to your desktop or hard drive.

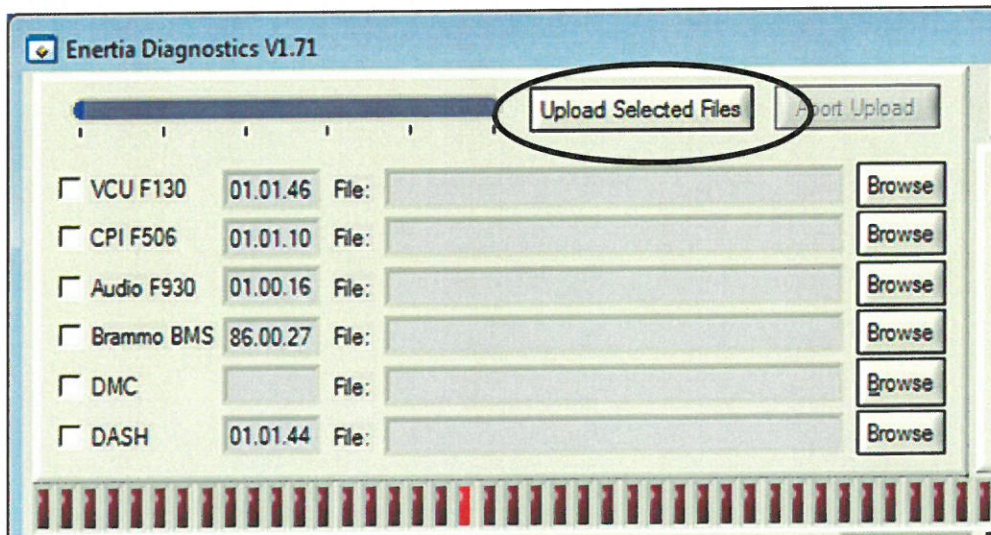
j.VCU (CPI) F506 needs to be updated to **01.01.21** (89210795_CPIV1_21.BIN)

- i. Click "Browse" in the VCU (CPI) F506 sections and select (find) the file 89210795_CPIV1_21.BIN which should have been saved to your desktop or hard drive.

k. BMS needs to be updated to **82.00.42** (72857726_8X_00m42_FIRMWARE_BMS.BIN)

- i. Click "Browse" in the Brammo BMS section and select (find) the file 72857726_8X_00m42_FIRMWARE_BMS.BIN which should have been saved to your desktop or hard drive.

l. Once you have all three (3) sections selected with the correct files to upload, select "Upload Selected Files".



m.

- 3) Step three is to update the Sevcon Motor controller software using the IXXAT and the Motor Controller Service Port Adaptor.


Remove the Lower R/H body panel to access the Sevcon Motor Controller Service Ports. Connect the Motor Controller Service Port Adaptor to the motor controller service port on the bike. Then connect the M/C Service Port adaptor to the IXXAT and then plug that into your laptop as shown below.



- Using Sevcon's Simple Configurator Software:
 - Turn on the Enertia in Drive Mode.
 - Turn on the Motor Controller by turning on the kill-switch then holding the start button for at least one second
 - Launch the Simple Configurator Utility. After completing the Autobaud detection process the software will display the checksums as shown: *Add pictures of "Basic Config"*
 - Make sure the kickstand is down
 - Click Enter Configuration Mode
 - Click Configure Node 1. When prompted for a filename, find 31379483_B_00_SCFG_59_FIELD_UPGRADE_ONLY.dcf which should have been saved to your desktop or hard drive.
 - Select "ok"
 - You will be prompted to cycle the power off then back on.
 - Click Exit Configuration mode. No need to do Encoder commit or Encoder alignment.
 - With the bike on a rear stand, turn on the bike and spin the wheel to assure that the configuration completed correctly.
 - **ONLY USE THE FIELD UPGRADE VERSION FOR THIS STEP OTHERWISE THE ENCODER INFO WILL BE DELETED!**

5. Conclusion

Now all software versions should be up to date. Run motorcycle on rear wheel stand to ensure everything functions and runs properly. Should you have any questions please contact Brammo Service at 541-482-9555 x337 or Service@Brammo.com

	Title: SERVICE BULLETIN – 2012 ENERTIA PLUS SOFTWARE UPDATE	
	Document No: SB-EPSU	
	Revision No: A.00	Issue Date: 09/04/2012

DOCUMENT REVISION TABLE

Revision	Date	Change Description	Initiator
A.00	09/04/2012	Enertia Plus Software Update	ALL



Title: TECHNICAL SERVICE BULLETIN - Enertia Plus Firmware Update

Document No: TSB-1229 - 10/02/13

Issue Date: October 2nd 2013

1. PURPOSE & SCOPE

The purpose of this service bulletin is to update ALL Enertia Plus models with the eight (8) new firmware and configuration files listed below.

2012/2013 Enertia Plus

Firmware Type	Filename	Label in "Enertia Diagnostics" or "DVT"	Version or Checksum Displayed	New with this release
Dash	43222582_2_06_FIRMWARE_DASH_ICU.BIN	DASH	01.02.06	✓
VCU F130	14301489_VCUV1m79.BIN	VCU F130	02.01.79	✓
VCU CPI 506	89210795_CPIV1_21.BIN	CPI F506	01.01.21	
VCU F930	16362369_SNDV0_16.BIN	Audio F930	01.00.16	
BMS	72857726_82_00m47_FIRMWARE_BMS.BIN	Brammo BMS	82.00.47	✓
Motor Controller	53988154_SN0058-04_0x2fe1.dld		SN0058.04 ROM checksum:0x2fe1	✓
M.C. Config	63934807_C_00_SCFG_SN0058-04_0x395e.dcf		Config checksum: 0x395e	✓

Brammo Power Module 4470

File Type	Filename	As shown in "Diagnostics Details"	Version or Checksum	New in this release
BCP Firmware	52475191_P4SV0M92.BIN	Firmware version	04.00.92	✓
BMP Firmware	35151414_FW_0002_0200_6000_0803.enc.brm.xml	Firmware CRC	0x12e4	✓
BMP Configuration	64342962_C_05_BPM4470_2013-02-15_0803enc_bqW3_4_0_Chem9245_Qmax7000_CDBalOn.xml	Manufacturer Data:	64342962 C.05	✓

2. RESPONSIBILITY

All Authorized Brammo Service Department will ensure that all available Enertia Plus models, in stock, or when serviced will receive the Firmware update(s).

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COMMUNICATING WITH VALENCE BATTERIES

BRAMMO™

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- 2) Valence Battery – Connecting Diagnostic Cable pg. 4
- 3) Valence Battery – Communicating with batteries pg. 5
- 4) Valence Battery – Installing new firmware pg. 7

**TOOLS AND SOFTWARE REQUIRED FOR VALENCE BATTERY
COMMUNICATION:**

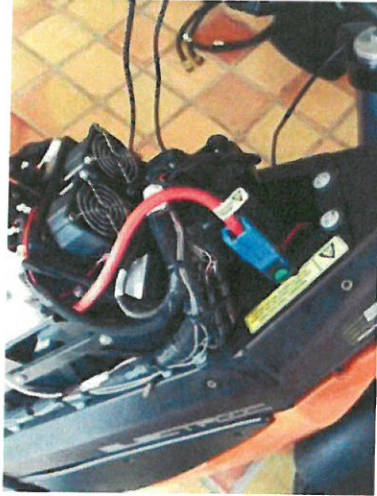
1. Valence Battery Diagnostic cable



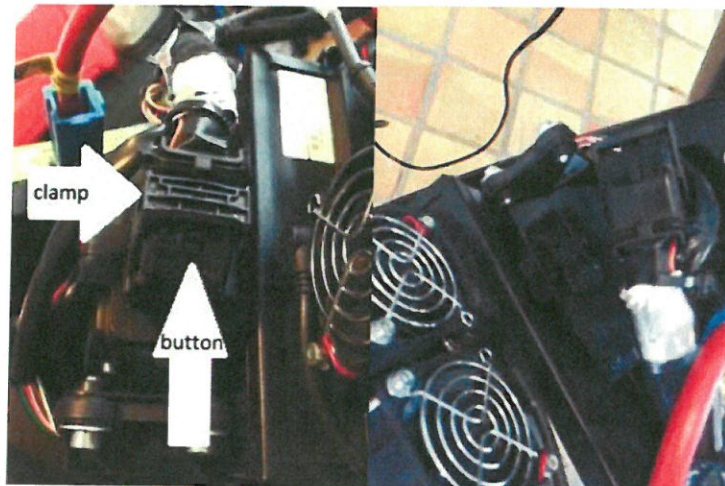
2. "DIAG" Battery communication software
3. "FWupdate" Battery firmware update software
4. 4mm hex wrench
5. 3mm hex wrench

VALENCE BATTERY – CONNECTING DIAGNOSTIC CABLE

1. Remove upper body panel and upper right side panel to expose the VCU, charger and wiring harness.



2. Remove the wiring harness from the VCU by pressing the button down and pushing the clamp forward until it clicks.



3. Loosed the two screws holding on the right side cooling fan and place it out of the way.

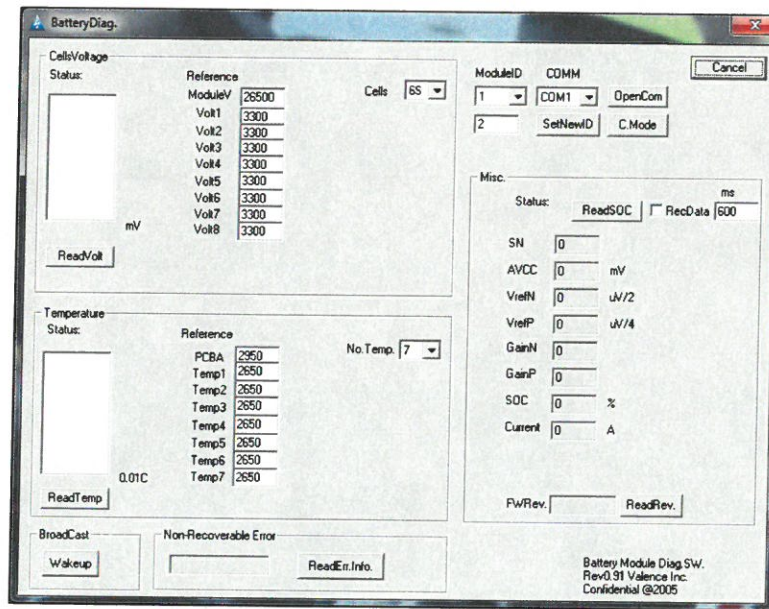


4. Unscrew the right side battery communication cable and connect the Battery Diagnostic cable in its place.



VALENCE BATTERY – COMMUNICATING WITH BATTERIES

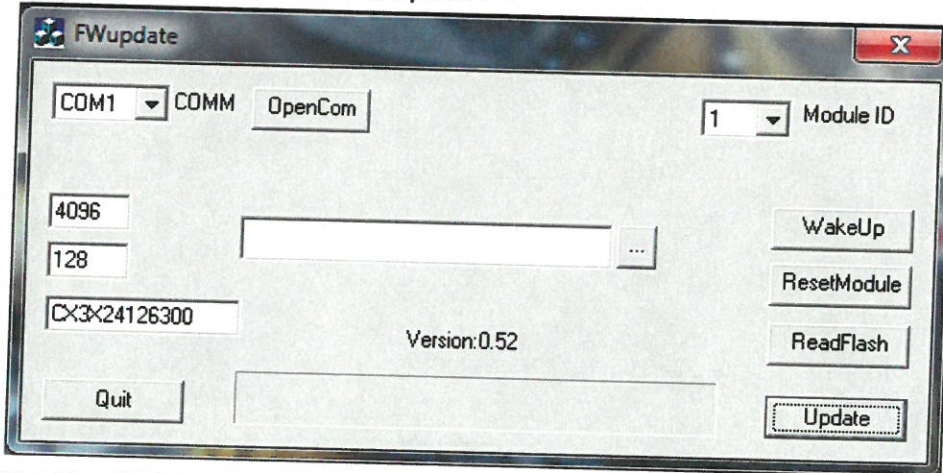
5. Connect USB cable from diagnostic cable to computer.
6. Open START menu and in search type in “device manager”. Open Device Manager.
7. On the menu will be a listing called “Ports”. Open the menu which should show which comm the device is using. Make note of this.
8. Open the program called “DIAG”.



9. Under the COMM menu, set it to the same comm port that you found in the device manager. Click "OpenCom".
10. In the bottom left corner click "Wakeup". This essentially makes all the battery information available to read.
11. Using "ModuleID" you can switch between the 6 battery modules on the Enertia Legacy and Enertia Basic.
12. The main two boxes you will need are the "CellsVoltage" and the "Misc." box.
13. Misc. Box - Clicking on the button "ReadSOC" you can see the State of Charge (SOC) of each module and the firmware installed (shown in the box next to ReadRev.).
14. CellsVoltage Box – Set the "Cells" box to 4S. By switching through the 6 modules you can see the voltage of each cell in each module.
15. When closing out of this program press the button labeled "Sleep" in the bottom left corner. Then press CloseCom in the upper right corner.

VALENCE BATTERY – INSTALLING NEW FIRMWARE

1. Follow instructions to connect battery diagnostic cable.
2. Open program called “FWupdate”.



3. Set the COMM to the same one used during communicating with batteries.
4. Click “OpenCom” then click “Wakeup”
5. Click the button “...”, this will let you choose the firmware version to upload.
6. Make sure the Module ID is set to module 1. Press “ResetModule” button. After the window opens saying “Module is reset” press the “Update” button.
7. After update is finished change the Module ID to number 2 and perform step 6 again. Repeat for all modules.
8. When finished remember to click “Sleep” then “CloseCom” buttons before you press Quit.