Brammo VIN Format

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Revision:

Author	Reviewer	Date	Reason For Changes	Rev
Charles Lee	Aaron Bland	12/14/10	Initial Document	A.00
Charles Lee	Aaron Bland	02/23/11	Added VIN Frame Stamping section	B.00
Charles Lee	Aaron Bland	03/24/11	Corrected error in Step 2 for VIN position 8	C.00
Charles Lee	Aaron Bland	08/08/11	Updated to include Flextronics WMI code.	D.00
Charles Lee	(not released)	10/18/11	Clarification on Battery Voltage assignment	E.00
Charles Lee	(not released)	01/25/11	Added Empulse to format – re-added Brammo Ashland Factory to VIN	F.00
Charles Lee	(not released)	3/21/11	Two typos fixed in Table 3, and two typos fixed for US Empulse VIN format.	F.02
Charles Lee	Roger Gerson	4/24/11	Added Variant 02 for Enertia Plus	G.00
Charles Lee	Roger Gerson	06/26/11	Definition of “Model Year” update starts with model upgrade instead of calendar.	H.00
Charles Lee	(not released)	09/10/12	Changed VIN Position 6 (Engine Type for US) from 108V to 104V. This reflects the true nominal Empulse voltage, and recent update request submitted to NHTSA. Was not released, as the submitted document was not approved by NHTSA.	I.00
Charles Lee	Aaron Bland and Roger Gerson	08/26/13	Added Talent to list of Factory Locations. Refined VIN positions 4-8 to meet NHTSA requirements. Re-submitted to NHTSA.	11
Charles Lee		02/12/14	EU VIN format update to Empulse Motor Power (20 for Empulse/ 22 for Empulse R), and added “*” for US VIN stamp on frame.	12
Charles Lee	Dustin Hall	10/10/14	Fixed small error on Brammo US Empulse VIN example on Page 8.	13

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1. Introduction

This document defines Brammo VIN format for both North America and Europe.

1.1 Project Scope

All Brammo vehicles must have a VIN number stamped on the frame. This document shows the correct formatting – and in the case of the North American VIN format, the correct calculation of the check digit that exists within the VIN.

This document applies to all motorcycles manufactured after September 30, 2013. For vehicles manufactured before this date, please refer to Document #48314226 Rev H.

1.2 Definitions, Acronyms, and Abbreviations

EU – European Union

HP – Horsepower

kW – Kilowatts

VIN – Vehicle Identification Number

WMI – World Manufacturer Identifier

1.3 Intended Audience and Reading Suggestions

- Brammo Engineering / Management / Marketing
- Brammo approved manufacturing facilities

1.4 Associated Documents & References

Title	Source	Document Number
Assy., Chassis – Enertia Chassis Assembly Drawing	Brammo, Inc.	15854425
Assy., Chassis – Enertia Chassis Assembly Drawing	Brammo, Inc.	57540668
Assy., Chassis 2013 Empulse Chassis Assembly Drawing	Brammo, Inc.	75925034
Assy., Chassis 2014 Empulse Chassis Assembly Drawing	Brammo, Inc.	96030954

2. VIN Overview

There are two formats with VIN that are to be considered: the North American VIN and the EU (or in actuality the rest of the world) VIN. Unfortunately the two are not compatible with each other.

Both VIN formats do have some common characteristics. Both formats contain 17 alpha-numeric characters. Both formats start off with the WMI assignment, and end with the Serial Number (production number) of the unit. However, the characters in-between these two fields are different for the North American and EU VINs.

2.1 VIN Format

The WMI (World Manufacturer Identifier) value of "51R" is assigned to Brammo, and occupies Positions 1-3 of the VIN for both EU and North American VIN formats. This identifier is unique to Brammo, and will encompass the start of all VINs for all vehicles manufactured by Brammo. Flextronics will use its own WMI ("TSJ") in place of Brammo's WMI, but only for US model bikes (even though produced by Flextronics).

Both VIN formats use the remaining alpha-numeric characters to describe the vehicle in similar fashion, but have different formats…

2.1.1 US VIN Details *(note positions 4-8 are designed to be backwards compatible with earlier VIN format – also the US VIN makes no distinction between Empulse and Empulse R models)***:**

- **Position 1-3:** WMI (as described above). "51R" for bikes produced by Brammo in the US. "TSJ" for US bikes produced by Flextronics in Hungary (EU and HK bikes will use Brammo's "51R" code).
- **Position 4:** Motorcycle Make. For Brammo, it will be "U" to signify Brammo, USA.
- **Position 5:** Line or Model – current products will be "B" for Brammo Street Bikes (Empulse, Enertia). Non street bikes designation has not been defined yet.
- **Position 6:** Type of Motorcycle - this defines the subset of Model.
  - 2 = Standard (Enertia Basic / Legacy)
  - 3 = Standard with Extended Range (Enertia Plus)
  - 5 = Sport Bike (Empulse or Empulse R)
- **Position 7:** Engine Type – For electric vehicles, the engine type is defined by the nominal battery voltage that supplies energy to the engine:
  - 1 = 72V (Enertia Basic / Legacy)
  - 2 = 88V (Enertia Plus)
  - 5 = 104V (Empulse or Empulse R)
- **Position 8:** "Net HP" (or specifically Net Brake HP):
  - 0 = 20 HP (Enertia Plus)
  - 3 = 13 HP (Enertia Basic / Legacy)
  - 6 = 56 HP (Empulse or Empulse R)
- **Position 9:** Check Digit – a single digit derived by a mathematical formula to prevent manipulation of the VIN stamp on the vehicle. See Section 2.2 for details on how it's calculated.

- **Position 10:** Model year of the vehicle. This is a sequential alpha-numeric sequence to describe the full year of the unit's model year. Model year means the year used to designate a discrete vehicle model, irrespective of the calendar year in which the vehicle was actually produced, provided that the production period does not exceed 24 months.

2009	=	"9"	2020	=	"L"	2031	=	"1"
2010	=	"A"	2021	=	"M"	2032	=	"2"
2011	=	"B"	2022	=	"N"	2033	=	"3"
2012	=	"C"	2023	=	"P"	2034	=	"4"
2013	=	"D"	2024	=	"R"	2035	=	"5"
2014	=	"E"	2025	=	"S"	2036	=	"6"
2015	=	"F"	2026	=	"T"	2037	=	"7"
2016	=	"G"	2027	=	"V"	2038	=	"8"
2017	=	"H"	2028	=	"W"	2039	=	"9"
2018	=	"J"	2029	=	"X"			
2019	=	"K"	2030	=	"Y"			

- **Position 11:** Location of manufacturing…
  - Ashland = "A"
  - Hungary = "H"
  - Talent = "T"

- **Position 12-17:** Sequential Production Number (must be numeric).

2.1.2 EU VIN Details *(note there is a distinction between Empulse and Empulse R in the EU format below)***:**

- **Position 1-3:** WMI (as described on previous page). "51R" for all bikes manufactured by Brammo in Ashland Oregon. "51R" is also used for all bikes produced by Flextronics – with the exception of bikes built for the US / Canadian market where "TSJ" will be used instead.

- **Position 4-5:** Type of Vehicle – for the Enertia, this will be "B1" (Brammo Platform #1). For the Empulse this will be "B2" (Brammo Platform #2).

- **Position 6-7:** Variant – for Enertias produced, this will either be "00" which signifies the "Base" or "02" for "Plus". The other option currently defined is "01" for Dual Sport configuration (this has not been implemented as of yet).

- **Positions 8-9:** Version – in this case Brammo opted to define the rated power of the motor to describe this category. For the Enertia, the motor is rated at 5.8 kW continuous power, which is rounded up to "06". For the Empulse (20kW for SMRE and 22kW for Parker continuous power), this number will be either "20" for the Empulse (E1) or "22" for the Empulse R.

  This 2-character field can also go above 100 kW by employing alpha characters to substitute for numeric ones… A = 10… B = 11… C = 12 and so on (i.e. "A0" = 100, "A1" = 101, etc).

- **Position 10-17:** Serial Numbers (can be alpha-numeric). The first three positions in this field (10-12) are self-defined by Brammo.

- Position 10: Will be the model year (identical to the US VIN – Position 10).
- Position 11: Plant Location (identical to the US VIN – Position 11).
- Position 12: Target Market. Identifies the build of the bike for a particular market. The two most common will be “E” for Europe, and “A” for Asia (note that there is no “N” for North America as all vehicles targeted for North America will use the US VIN format instead).
- Position 13-17: Sequential Production Number (must be numeric).

2.1.3 Stamped Format on Vehicles:

An asterisk (*) musk be present at the beginning and end of the VIN number with no spaces when placed on a vehicle. An example is as follows:

51RB20022ETE00001 (EU VIN: 2014 Empulse R, made in Talent, target market Europe)

becomes….

*****51RB20022ETE00001***** when stamped on the frame.

The asterisks are not mandatory for the VIN when printed on the Manufacturer’s Label, but is recommended for consistency with the stamped VIN.

2.2 Check Digit Calculation

In the US VIN format, the alpha-numeric character in the 9th position is used as a means to determine whether the VIN sequence is correct as a whole. This is done by following a few mathematical steps using all the VIN characters – with the exception of the check digit itself.

Step 1: Translating the original numbers

This step involves translating all the alpha characters to numeric values for the calculations. This is a simple translation table shown below (note that I, O and Q are not used). Characters in the VIN that are already numeric are unchanged:

VIN Letter:	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z
New Value:	1	2	3	4	5	6	7	8	1	2	3	4	5	7	9	2	3	4	5	6	7	8	9

Replace the original VIN characters with the numbers derived from above.

Step 2: Assign a weight value to each VIN position

A repeating weight value is assigned to all the characters (the check digit is assigned zero).

VIN Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Weight Value:	8	7	6	5	4	3	2	10	0	9	8	7	6	5	4	3	2

Step 3: Calculate the Checksum

Multiply the translated VIN (Step 1) with the Weight Value shown in Step 2. In other words, multiply the first translated VIN number by 8… the second translated VIN number by 7, and so on.

Sum all the products. Then divide the sum by 11 to determine the remainder. The remainder is the correct check digit (if the remainder is 10 – then substitute the character "X" for the answer).

An example of the calculation is shown below…

Original VIN: 51RUB21349A000006

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
VIN Input	5	1	R	U	B	2	1	3	x	9	A	0	0	0	0	0	6
Convert to number	5	1	9	4	2	2	1	3	0	9	1	0	0	0	0	0	6
Multiplier	8	7	6	5	4	3	2	10	0	9	8	7	6	5	4	3	2
Result of Multiply	40	7	54	20	8	6	2	30	0	81	8	0	0	0	0	0	12
Correct VIN	5	1	R	U	B	2	1	3	4	9	A	0	0	0	0	0	6

Table 1 – Calculation of Check Digit for US VIN

The Sum is: 40 + 7 + 54 + 20 + 8 + 6 + 2 + 30 + 0 + 81 + 8 + 0 + 0 + 0 + 0 + 0 + 12 = 268

Take the Sum (268) and divide by 11 = 24 with a remainder of 4.

The remainder of 4 is the correct check digit and was properly used in the original VIN sequence above.

2.3 VIN Format Summary

Flextronics Factory:

US Enertia VIN format on top half

WMI			Make	Line	Type	Engine	HP	CD	Year	Loc	Serial Number					
T	S	J	U	B	2	1	3	0-9, X	C	H	x	x	x	x	x	x
5	1	R	B	1	0	0	0	6	C	H	E	x	x	x	x	x
WMI			Type		Variant		Version		Serial Number							

EU Enertia VIN format on bottom half

US Empulse VIN format on top half

WMI			Make	Line	Type	Engine	HP	CD	Year	Loc	Serial Number					
T	S	J	U	B	5	5	6	0-9, X	E	H	x	x	x	x	x	x
5	1	R	B	2	0	0	2	0, 2	E	H	E	x	x	x	x	x
WMI			Type		Variant		Version		Serial Number							

EU Empulse VIN format on bottom half

Examples:
Flextronics US Empulse example: TSJUB5564EH000001 (US 2014 model Empulse or Empulse R built in Hungary)
Flextronics EU Empulse example: 51RB20022EHE00001 (EU 2014 model Empulse R built in Hungary)

Brammo Factory:

US Enertia VIN format on top half

WMI			Make	Line	Type	Engine	HP	CD	Year	Loc	Serial Number					
5	1	R	U	B	2	1	3	0-9, X	C	A	x	x	x	x	x	x
5	1	R	B	1	0	0	0	6	C	A	E	x	x	x	x	x
WMI			Type		Variant		Version		Serial Number							

EU Enertia VIN format on bottom half

US Empulse VIN format on top half

WMI			Make	Line	Type	Engine	HP	CD	Year	Loc	Serial Number					
5	1	R	U	B	5	5	6	0-9, X	E	T	x	x	x	x	x	x
5	1	R	B	2	0	0	2	0, 2	E	T	E	x	x	x	x	x
WMI			Type		Variant		Version		Serial Number							

EU Empulse VIN format on bottom half

Examples:
Brammo US Empulse example: 51RUB556XET000001 (US 2014 model Empulse or Empulse R built in Talent in 2014)
Brammo EU Empulse example: 51RB20020ETE00001 (European 2014 model Empulse built in Talent)

For bikes built by Flextronics:

North America	Europe (EU) / Hong Kong (HK)
VIN Position 1 – 3 WMI = TSJ for Flextronics 4 Make: U = Brammo USA 5 Line or Model: B = Brammo Street Bikes (Enertia, Empulse) 6 Type of Motorcycle 2 = Standard (Enertia Basic / Legacy) 3 = Standard with Extended Range (Enertia Plus) 5 = Sport Bike (Empulse or Empulse R) 7 Engine Type: 1 = 72V (Enertia Basic / Legacy) 2 = 88V (Enertia Plus) 5 = 104V (Empulse or Empulse R) 8 Net Brake HP: 0 = 20 HP (Enertia Plus) 3 = 13 HP (Enertia Basic / Legacy) 6 = 56 HP (Empulse or Empulse R) 9 Check Digit: (described in Section 2.2) 10 Model Year: 9 = 2009; A = 2010; B = 2011, C=2012, D=2013, E=2014, etc. 11 Plant Location: A = Ashland; H = Hungary; T = Talent 12-17 Sequential Production Number (numeric only)	VIN Position 1 – 3 WMI = 51R for Brammo 4, 5 Type of Vehicle: B1 = Brammo Platform #1 (Enertia) B2 = Brammo Platform #2 (Empulse) 6, 7 Variant (i.e. bodywork) 00 = Base (incl. Police Enertia Basic) 01 = Dual Sport 02 = Plus (incl. Police Enertia Plus) 8, 9 Version (Rated Power in kW) – round to nearest whole number if necessary. Enertia: 5.8kW –> use 06 instead Empulse: 20kW -> 20 Empulse R: 22kW -> 22 10-17 Serial Number (manufacturer must supply starting number) Position 10 is Model Year: 9 = 2009; A = 2010; B = 2011, C=2012, D=2013, E=2014, etc. Position 11 is Plant Location: A = Ashland; H = Hungary; T = Talent Position 12 identifies Target Market • E = Europe • A = Asia • D = Australia (“Down Under”) • F = Africa • S = South America Examples: BHExxxxx = manufactured in Hungary in 2011 with EU as the Target Market. CHAxxxxx =manufactured in Hungary in 2012 with Asia as the Target Market…

Table 2 – VIN formats (for bikes built by Flextronics) for North America, Europe and Hong Kong

For Bikes built by Brammo:

North America	Europe (EU) / Hong Kong (HK)
VIN Position 1 – 3 WMI = 51R 4 Make: U = Brammo USA 5 Line or Model: B = Brammo Street Bikes (Enertia, Empulse) 6 Type of Motorcycle 2 = Standard (Enertia Basic / Legacy) 3 = Standard with Extended Range (Enertia Plus) 5 = Sport Bike (Empulse or Empulse R) 7 Engine Type: 1 = 72V (Enertia Basic / Legacy) 2 = 88V (Enertia Plus) 5 = 104V (Empulse or Empulse R) 8 Net Brake HP: 0 = 20 HP (Enertia Plus) 3 = 13 HP (Enertia Basic / Legacy) 6 = 56 HP (Empulse or Empulse R) 9 Check Digit: (described in Section 2.2) 10 Model Year: 9 = 2009; A = 2010; B = 2011, C=2012, D=2013, E=2014, etc. 11 Plant Location: A = Ashland; H = Hungary; T = Talent 12-17 Sequential Production Number (numeric only)	VIN Position 1 – 3 WMI = 51R for Brammo 4, 5 Type of Vehicle: B1 = Brammo Platform #1 (Enertia) B2 = Brammo Platform #2 (Empulse) 6, 7 Variant (i.e. bodywork) 00 = Base (incl. Police Enertia Basic) 01 = Dual Sport 02 = Plus (incl. Police Enertia Plus) 8, 9 Version (Rated Power in kW) – round to nearest whole number if necessary. Enertia: 5.8kW –> use 06 instead Empulse: 20kW -> 20 Empulse R: 22kW -> 22 10-17 Serial Number (manufacturer must supply starting number) Position 10 is Model Year: 9 = 2009; A = 2010; B = 2011, C=2012, D=2013, E=2014, etc. Position 11 is Plant Location: A = Ashland; H = Hungary; T = Talent Position 12 identifies Target Market • E = Europe • A = Asia • D = Australia (“Down Under”) • F = Africa • S = South America Examples: BAExxxxx = manufactured in Ashland in 2011 with EU as the Target Market. CAAxxxxx =manufactured in Ashland in 2012 with Asia as the Target Market…

Table 3 - VIN formats (for bikes built by Brammo) for North America, Europe and Hong Kong

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