



Boomslang Emtron KV8  
Toyota 86 / Subaru BRZ / Scion FR-S  
GM LS Swap Harness Kit  
Installation Manual  
Rev 1.3

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## 1.0 Compatibility

### 1.1 Vehicle Compatibility

This harness kit is compatible with all manual transmission, key start and push button start vehicles listed below:

- 2012-2019 Toyota 86/FT86/GT86
- 2012-2019 Subaru BRZ
- 2012-2016 Scion FR-S

### 1.2 Engine Compatibility

This harness kit is for use with Gen IV GM LS engines, such as the GM LS3 crate engine with a 58x crank trigger. It is for use only with a GM compatible TREMEC T56 manual transmission.

### 1.2 Engine Management Compatibility

This harness kit is for use with the Emtron KV8 only.

## 2.0 Component Description

### 2.1 GM LS Engine Harness

The GM LS engine harness plugs into the OEM 54-pin and OEM 8-pin chassis bulkhead connectors. All engine connectors are labeled.



## 2.2 Interior Emtron KV8 Harness

The interior Emtron KV8 harness plugs into the OEM ECU connectors and into the Emtron KV8. The OEM ECU is removed from the car entirely. It is recommended to modify the rear of the glove box to allow the Emtron KV8 to mount inside of it.



## 2.3 Alternator Extension Harness

The alternator extension harness has an M8 ring terminal on each end. One M8 ring terminal bolts to the OEM alternator harness ring terminal using the supplied M8 bolt and nut. The other M8 ring terminal attaches to the M8 stud on the GM LS alternator. The alternator extension harness should be routed under the upper radiator support.



## 2.4 Starter Control Harnesses

Two starter control harness types are included, but only one will be used. The type needed is dependent upon the exact starter type selected for the swap. The first harness type has a 1-pin plastic connector and a male disconnect. The second harness type has an M5 ring terminal and a male disconnect. The male disconnect connects to the OEM black starter control female disconnect connector.



## 2.5 GM TREMEC T56 Transmission Harnesses

Two GM TREMEC T56 transmission harnesses are included. They connect to the OEM 2-pin brown and OEM 2-pin gray transmission connectors in the OEM chassis harness. The harness with 2-pin brown connector connects to the GM TREMEC T56 vehicle speed sensor. The harness with 2-pin gray connector connects to the GM TREMEC T56 back-up light switch.





## 2.6 Engine Block Grounding Harnesses

The RH engine block ground harness bolts to the block ground behind the LS AC compressor and to the OEM lower RH body ground point using the supplied M10 and M6 bolts. The LH engine block ground harness bolts to the block ground near the LH engine mount and to the OEM lower LH body ground point using the supplied M8 and M6 bolts.



## 3.0 Installation Notes

### 3.1 OEM Starter/Battery Ground Harness

The OEM starter/battery ground harness will be reused. Some tape will need to be removed to allow further separation of the ring terminals.



### 3.2 OEM Starter Ring Terminal Modification

The OEM starter ring terminal must have its anti-rotation tabs removed. This is easily accomplished by cutting them off with a wire cutter. With the anti-rotation tabs removed, the OEM starter ring terminal will attach directly to the GM LS M8 starter stud using a nut.



### 3.3 OEM Battery/Engine Ground Ring Terminal Modification

The OEM battery to engine ground ring terminal must be drilled to 10mm to allow attachment to the GM LS rear RH cylinder head using the supplied M10 bolt.



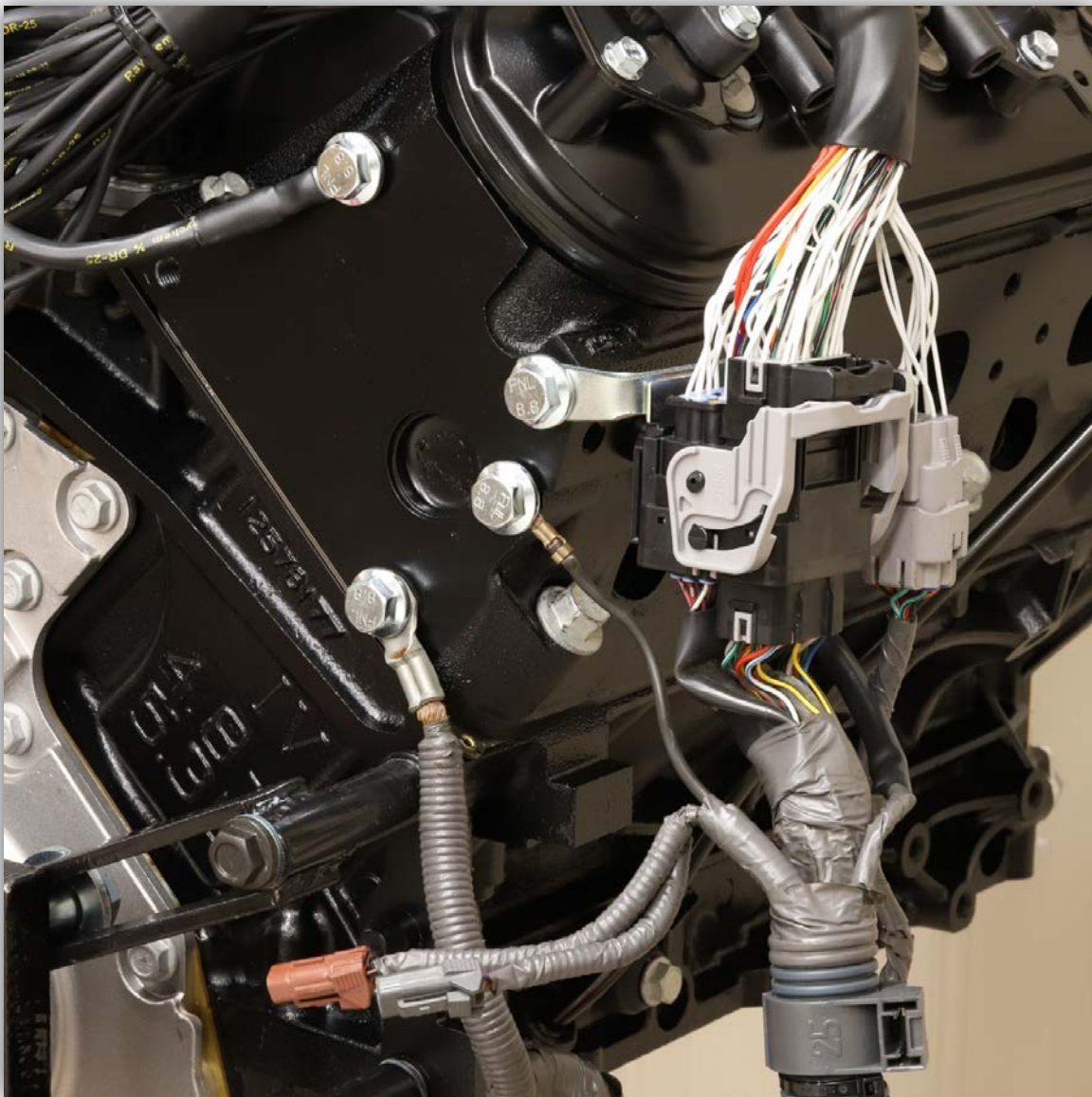
### 3.4 OEM Chassis/Engine Ground Ring Terminal Modification

The OEM chassis to engine ground ring terminal shown below on the right must be drilled to 10mm to allow attachment to the GM LS rear RH cylinder head using the supplied M10 bolt.



### 3.5 GM LS Engine Harness Grounding and Bracket Mounting.

The GM LS engine harness ground ring terminal must be attached to the GM LS rear RH cylinder head. The bulkhead connector mounting bracket also attaches to the GM LS rear RH cylinder head. All GM LS rear RH cylinder head attachments are shown below. All ring terminals must mount to bare metal. All M10 bolts are supplied.



## 4.0 Reference

### 4.1 Emtron KV8 Calibration Diagram

<i><b>KV8</b></i>	<i><b>DESCRIPTION</b></i>	<i><b>USE</b></i>
A1	-	-
A2	-	-
A3	-	-
A4	-	-
A5	-	-
A6	-	-
A7	-	-
A8	-	-
A9	-	-
A10	LAM 1H-	LSU1-3
A11	LAM 2H-	LSU2-3
A12	-	-
A13	-	-
A14	-	-
A15	-	-
A16	LAM 1H+	LSU1-4
A17	LAM 2H+	LSU2-4
A18	LAM 1 NERST	LSU1-6
A19	-	-
A20	LAM 2 CAL R	LSU2-5
A21	LAM 2 NERST	LSU2-6
A22	LAM 2 PUMP	LSU2-1
A23	LAM 2 VGND	LSU2-2
A24	LAM 1 CAL R	LSU1-5
A25	LAM 1 PUMP	LSU1-1
A26	LAM 1 VGND	LSU1-2

<b>KV8</b>	<b>DESCRIPTION</b>	<b>USE</b>
B1	INJ 1	INJECTOR 1
B2	INJ 2	INJECTOR 2
B3	INJ 3	INJECTOR 3
B4	INJ 4	INJECTOR 4
B5	INJ 5	INJECTOR 5
B6	INJ 6	INJECTOR 6
B7	INJ 7	INJECTOR 7
B8	INJ 8	INJECTOR 8
B9	GND	GND
B10	AUX 1	DBW RELAY
B11	AUX 2	FUEL PUMP PWM CONTROL
B12	AUX 3	ALTERNATOR PWM CONTROL
B13	AUX 4	STARTER RELAY
B14	AUX 5	STARTER CUT RELAY (PUSH BUTTON START)
B15	AUX 6	FAN RELAY 1
B16	AUX 7	FAN RELAY 2
B17	AUX 8	AC RELAY
B18	AUX 9	DBW 1 MOTOR +
B19	AUX 10	DBW 1 MOTOR -
B20	AUX 11	REVERSE LOCKOUT SOLENOID T56
B21	AUX 12	DASH OIL LED
B22	AUX 13	SPEED OUTPUT (PUSH BUTTON START)
B23	AUX 14	ACCR (PUSH BUTTON START)
B24	AUX 15	PURGE SOLENOID
B25	AUX 16	-
B26	IGN 1	COIL 1
B27	IGN 2	COIL 2
B28	IGN 3	COIL 3
B29	IGN 4	COIL 4
B30	IGN 5	COIL 5
B31	IGN 6	COIL 6
B32	IGN 7	COIL 7
B33	IGN 8	COIL 8
B34	GND	GND



<b>KV8</b>	<b>DESCRIPTION</b>	<b>USE</b>
C1	GND	GND
C2	AV 1	MAP
C3	AV 2	TPS 1
C4	AV 3	TPS 2
C5	AV 4	FUEL PRESSURE
C6	AV 5	OIL PRESSURE
C7	AV 6	-
C8	AV 7	IAT IN MAF
C9	AV 8	ECT
C10	AV 9	-
C11	AV 10	-
C12	AV 11	-
C13	AV 12	-
C14	AV 13	APP 1
C15	AV 14	APP 2
C16	AV 15	-
C17	SENSOR GND	SENSOR GND
C18	DI 9	CLUTCH SWITCH
C19	DI 10	BRAKE SWITCH 1
C20	DI 11	BRAKE SWITCH 2
C21	DI 12	CRUISE BUTTON
C22	DI 13	AC PRESSURE SWITCH
C23	DI 14	BLOWER POSITION INPUT
C24	AV 16	-
C25	SENSOR GND	DTM2-1
C26	GND	GND, DTM4-1
C27	DI 1	MAF
C28	DI 2	ETHANOL CONTENT
C29	DI 3	VSS T56
C30	DI 4	-
C31	DI 5	-
C32	DI 6	FUEL PUMP DIAGNOSTIC SIGNAL
C33	DI 7	START 2 SIGNAL
C34	DI 8	START 1 SIGNAL (PUSH BUTTON START)

<b>KV8</b>	<b>DESCRIPTION</b>	<b>USE</b>
D1	ECU SUPPLY	ECU SUPPLY, DTM4-4
D2	AUX 13-16 SUPPLY	AUX 13-16 SUPPLY
D3	CAS 8V	-
D4	CRANK INDEX +	CRANK INDEX +
D5	CRANK INDEX -	-
D6	SYNC SENSOR +	CAM SYNC +
D7	SYNC SENSOR -	-
D8	CAN1 1 H	OEM CAN H
D9	EFI RELAY	EFI RELAYS
D10	CAN 2 H	DTM4-3 SPLITTER 120 OHM
D11	KNOCK 1 +	LH KNOCK +
D12	KNOCK 1 -	LH KNOCK -
D13	SHIELD	SHIELDS
D14	CAN 1 L	OEM CAN L
D15	IGN SWITCH	IGN SWITCH
D16	CAN 2 L	DTM4-2 SPLITTER 120 OHM
D17	KNOCK 2 +	RH KNOCK +
D18	KNOCK 2 -	RH KNOCK -
D19	AV OUT 1	-
D20	AUX 9-12 SUPPLY	AUX 9-12 SUPPLY
D21	5V ENG SUPPLY	5V ENG SUPPLY
D22	5V AUX SUPPLY	DTM2-2
D23	ETH TX +	RJ45-1
D24	ETH TX -	RJ45-2
D25	ETH RX +	RJ45-3
D26	ETH RX -	RJ45-6