



Infinity Series 3 Flying Lead Harness System User Manual 30-3707

**THIS PRODUCT IS LEGAL IN CALIFORNIA FOR RACING VEHICLES ONLY
AND SHOULD NEVER BE USED ON PUBLIC HIGHWAYS.**

WARNING:



WARNING:

This installation is not for the tuning novice! Use this system with **EXTREME** caution! If you are not well versed in engine dynamics and the tuning of engine management systems **DO NOT** attempt the installation. Refer the installation to an AEM trained tuning shop. A list of AEM trained tuning shops is available at www.aemelectronics.com/dealer_locator.php or by calling 800-423-0046.

NOTE: All supplied AEM calibrations, Wizards and other tuning information are offered as potential starting points only. IT IS THE RESPONSIBILITY OF THE ENGINE TUNER TO ULTIMATELY CONFIRM THE CALIBRATION IS SAFE FOR ITS INTENDED USE. AEM holds no responsibility for any engine damage that results from the misuse or mistuning of this product!

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Introduction

Some harness user manuals contain active hyperlinks that point to specific sections or even launch additional documents such as wiring diagrams. Recommend viewing this document electronically to take advantage of all features.

Several universal wiring harness options are available for Infinity products. They range in complexity from simple plug and pin kits to complete engine harness assemblies that include power distribution centers. Custom wiring harness projects should only be undertaken by experienced harness builders. If in doubt, please contact AEM for recommendations.

30-3805 Universal V8 harness system for Infinity Series 7

The Infinity Universal V8 Harness system consists of a universal core harness and optional application specific extensions. It was designed with flexibility in mind. The harness system includes many features and it can be used in many different applications.

30-3809 Universal V8 harness system for Infinity Series 5

The Infinity Universal V8 Harness system consists of a universal core harness and optional application specific extensions. It was designed with flexibility in mind. It includes throttle body and pedal interfaces for DBW applications. The harness system includes many features and it can be used in many different applications.

30-3705 Universal Mini Harness for Infinity Series 5

This harness is intended to be used as a starting point by experienced harness builders. It saves time by including basic power distribution features that can be expanded to suit many application requirements. It allows the harness builder to populate the ECU connector with only the features needed by the application.

30-3706 Mini Flying Lead Harness for Infinity Series 5

This harness is intended to be used as a starting point by experienced harness builders. It saves time by including flying leads that can be terminated by the harness builder at the sensor and actuator connectors.

30-3707 Mini Flying Lead Harness for Infinity Series 3

This harness is intended to be used as a starting point by experienced harness builders. It saves time by including flying leads that can be terminated by the harness builder at the sensor and actuator connectors.

30-3702 Infinity Series 7 Mini-harness

This harness is intended to be used as a starting point by experienced harness builders. It saves time by including basic power distribution features that can be expanded to suit many application requirements. It allows the harness builder to populate the ECU connector with only the features needed by the application. Includes 100 96" pre-terminated leads.

30-3703 Infinity Series 7 Mini-harness

This harness is intended to be used as a starting point by experienced harness builders. It saves time by including basic power distribution features that can be expanded to suit many application requirements. It allows the harness builder to populate the ECU connector with only the features needed by the application.

30-3701 Infinity Series 7 Plug & Pin Kit

Bare necessities to begin a custom wire harness design. Includes 73 and 56 pin Molex MX123 harness connectors, terminals and sealing plugs, main relay and relay socket.

Bare necessities to begin a custom wire harness design. Includes 80 pin Molex MX123 harness connector, terminals and sealing plugs, main relay and relay socket.

Bare necessities to begin a custom wire harness design. Includes 73 pin Molex MX123 harness connector, terminals and sealing plugs, main relay and relay socket.

Please read the entire User Manual prior to beginning any installation.

Kit Contents

AEM P/N	Description	Qty
36-3707	Mini Flying Lead Harness	1
35-2060	Micro Relay	1
3706-001	22ga Wire with Molex Terminal, 96"	10
3706-002	Cable 2-Pair Twisted/Shielded, 96"	2
4-2000	Terminal, Molex 22ga	40



ECU Connectors

The Infinity ECUs use the MX123 Sealed Connection System from Molex. AEM strongly recommends that users become familiar with the proper tools and procedures before attempting any modifications or additions to these connector housings. The entire Molex user manual can be downloaded direct from Molex at http://www.molex.com/mx_upload/family/MX123UserManual.pdf

Harness Pinout

Infinity Connector C1				73 Way F Receptacle 0.64 2.8 Series Sealed (GY)	
Pin	Wire Color	Gauge	Destination	Function	Installer Notes
C1-1	BLU	22	Coil Bundle	COIL 5	
C1-2	BLU	22	Coil Bundle	COIL 3	
C1-3				STEPPER 1A	
C1-4				STEPPER 2A	
C1-5				STEPPER 2B	
C1-6				STEPPER 1B	
C1-7	RED	22	R-85	RELAY CONTROL OUT	
C1-8				CRANK POSITION VR+	
C1-9				CRANK POSITION VR-	
C1-10				CAM POSITION VR-	
C1-11				CAM POSITION VR+	
C1-12				CANH A	
C1-13				CANL A	
C1-14	BLU	22	Coil Bundle	COIL 1	
C1-15	BLU	22	Coil Bundle	COIL 4	
C1-16	BLU	22	Coil Bundle	COIL 6	
C1-17	BLU	22	Coil Bundle	COIL 7	
C1-18	RED	22	Ignition Switch Lead	IGN SWITCH IN	
C1-19	RED	22	R-87	RELAY POWER IN 12V	
C1-20				KNOCK SENSOR 2	
C1-21				KNOCK SENSOR 1	
C1-22	BLK	22	Main I/O Bundle	SIG GND (ANALOG SENSOR GROUND)	
C1-23				SIG GND (ANALOG SENSOR GROUND)	

C1-24				CRANKSHAFT POSITION SENSOR HALL	
C1-25				CAMSHAFT POSITION SENSOR HALL	
C1-26				DIGITAL 2	
C1-27				DIGITAL 3	
C1-28				DIGITAL 4	
C1-29	TAN	22	Main I/O Bundle	2 STEP (Digital 5)	
C1-30				DIGITAL 6	
C1-31				DIGITAL 7	
C1-32	BLU	22	Coil Bundle	COIL 8	
C1-33	BLU	22	Coil Bundle	COIL 2	
C1-34	RED	18	PWR-3	PERM BATTERY PWR	
C1-35	RED	22	R-87	RELAY POWER IN 12V	
C1-36				FLASH ENABLE	
C1-37	WHT	22	Main I/O Bundle	CLT TEMP	
C1-38	WHT	22	Main I/O Bundle	AIR TEMP	
C1-39				OIL TEMP (ANALOG TEMP 3)	
C1-40	WHT	22	Main I/O Bundle	TPS	
C1-41	WHT	22	Main I/O Bundle	MAP	
C1-42				FUEL PRESS (ANALOG 9)	
C1-43				ANALOG 10	
C1-44	RED	22	Main I/O Bundle	VCC (ANALOG SENSOR POWER +5V)	
C1-45				VCC (ANALOG SENSOR POWER +5V)	
C1-46				ANALOG 11	
C1-47				ANALOG 13	
C1-48				ANALOG 16	
C1-49				ANALOG 18	
C1-50				ANALOG 19	
C1-51	BLK	18	GND-1	BATTERY GROUND	
C1-52				COIL 1 HO	
C1-53				LOWSIDE 9	
C1-54				LOWSIDE 8	
C1-55				LOWSIDE 7	
C1-56				LOWSIDE 6	
C1-57				LOWSIDE 5	

C1-58	ORG	22	Injector Bundle	INJECTOR 8	
C1-59	ORG	22	Injector Bundle	INJECTOR 6	
C1-60	ORG	22	Injector Bundle	INJECTOR 4	
C1-61	ORG	22	Injector Bundle	INJECTOR 2	
C1-62				INJECTOR 2 (PEAK AND HOLD)	
C1-63				INJECTOR 1 (PEAK AND HOLD)	
C1-64	ORG	22	Injector Bundle	INJECTOR 1	
C1-65	ORG	22	Injector Bundle	INJECTOR 3	
C1-66	ORG	22	Injector Bundle	INJECTOR 5	
C1-67	ORG	22	Injector Bundle	INJECTOR 7	
C1-68	PNK	22	Main I/O Bundle	TACH (Lowside 4)	
C1-69				LOWSIDE 3	
C1-70	PNK	22	Main I/O Bundle	FAN (Lowside 2)	
C1-71				LOWSIDE 1	
C1-72	PNK	22	Main I/O Bundle	FUEL PUMP (Lowside 0)	
C1-73	BLK	18	GND-2	BATTERY GROUND	

Injector Bundle						
	Wire Color	Gauge	Destination	Wire Marking	Connection	Installer Notes
	ORG	22	C1-64	INJ1	Cylinder 1 Injector Signal	
	ORG	22	C1-61	INJ2	Cylinder 2 Injector Signal	
	ORG	22	C1-65	INJ3	Cylinder 3 Injector Signal	
	ORG	22	C1-60	INJ4	Cylinder 4 Injector Signal	
	ORG	22	C1-66	INJ5	Cylinder 5 Injector Signal	
	ORG	22	C1-59	INJ6	Cylinder 6 Injector Signal	
	ORG	22	C1-67	INJ7	Cylinder 7 Injector Signal	
	ORG	22	C1-58	INJ8	Cylinder 8 Injector Signal	

Coil Bundle	
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	Wire Color	Gauge	Destination	Wire Marking	Connection	Installer Notes
	BLU	22	C1-14	COIL 1	Cylinder 1 Coil Signal	
	BLU	22	C1-33	COIL 2	Cylinder 2 Coil Signal	
	BLU	22	C1-2	COIL 3	Cylinder 3 Coil Signal	
	BLU	22	C1-15	COIL 4	Cylinder 4 Coil Signal	
	BLU	22	C1-1	COIL 5	Cylinder 5 Coil Signal	
	BLU	22	C1-16	COIL 6	Cylinder 6 Coil Signal	
	BLU	22	C1-17	COIL 7	Cylinder 7 Coil Signal	
	BLU	22	C1-32	COIL 8	Cylinder 8 Coil Signal	

Ignition Switch Lead						
	Wire Color	Gauge	Destination	Wire Marking	Connection	Installer Notes
	RED	22	C1-18	IGN SW	Connect to single terminal on the ignition switch that provides +12V when the key is in both the 'Start' (cranking) and 'Run' position.	

Main I/O Bundle						
	Wire Color	Gauge	Destination	Wire Marking	Connection	Installer Notes
	WHT	22	C1-40	TPS	Throttle Position signal	
	WHT	22	C1-41	MAP	Manifold Absolute Pressure signal	
	WHT	22	C1-37	CLT TEMP	Coolant Temp Sensor signal	
	WHT	22	C1-38	AIR TEMP	Air Temp Sensor signal	

	RED	22	C1-44	VCC	+5V Supply for 0-5V Analog Sensors (TPS, MAP)	
	BLK	22	C1-22	SIG GND	Sensor Ground Reference for Analog and Temperature Sensors (TPS, MAP, CLT, IAT)	
	PNK	22	C1-70	FAN	Lowside (Ground) trigger for cooling fan relay	
	PNK	22	C1-57	TACH	12V square wave signal for tachometer	
	PNK	22	C1-72	FUEL PUMP	Lowside (Ground) trigger for fuel pump relay	
	TAN	22	C1-29	2 STEP	Switched input to trigger 2-Step rev limiter or other function. Ground this wire to trigger input.	

Power/Ground Bundle						
	Wire Color	Gauge	Destination	Wire Marking	Connection	Installer Notes
	RED	18	R-30	BATT+	Connect to battery positive (+) terminal.	
	RED	18	R-86	BATT+		
	RED	18	C1-34	PERM		
	BLK	18	C1-51	PWR GND	Connect to chassis ground. Remove paint or plating at the attachment point. In general, the the resistance from the battery ground to this chassis location should be less than 0.1 Ohm.	
	BLK	18	C1-73	PWR GND2		

ECU Relay					
Pin	Wire Color	Gauge	Destination	Description	
R-85	BLK	22	C1-7	ECU RELAY CONTROL SIGNAL	
R-86	RED	22	Power/Ground Bundle BATT+	BATT+	

R-87	RED	22	C1-19	+12V RELAY POWER TO ECU	
R-87A					
R-30	RED	18	Power/Ground Bundle BATT+	BATT+	

Harness Installation Tips

Wiring Conventions and EMI

Some wire harness assemblies come pre-wired with all connectors, fuses, and relays needed to operate an engine. Harnesses that include a PDC generally require extension/termination of the flying leads to their appropriate devices, and additional sensors and other devices can be wired into the harness as needed for the specific application. The following guidelines should be adhered to while completing the required wiring.

A proper wiring job includes proper termination of the wire at the sensor. The wire terminal end must be moisture tight where it plugs into the sensor and it must have strong, electrically sound terminals. The preferred method of securing a wire to a terminal is to use a crimp terminal with NO solder. It is important to use the proper crimping tool for sound terminal construction. Plastic terminal plugs must have moisture tight seals. Inspect each plug to make sure the seals are in place. Di-electric grease can be added in the terminal slots to further aid in corrosion resistance.

If a splice into a wire must be made and no solder-less terminals are available, then you must properly solder the splice.

Noise can be a serious problem and can cause intermittent misfiring of the engine. Every precaution should be taken to prevent interference to the ECU's operation. Resistive plug leads are REQUIRED.

To eliminate or reduce the chance of EMI, wires that carry high current must run in twisted pairs. An example of this would be the power leads from a multiple spark ignition system. These ignition systems can carry up to 100 amps for a couple milliseconds at the time of discharge, which induces a strong magnetic field in close proximity of the wires.

The routing of the wire loom is critical to EFI system performance and safety. The following safety considerations should be made when installing the wire loom:

- Heat protection: the loom should be placed away from or insulated from sources of heat. The obvious item(s) that should be avoided are the exhaust manifolds, EGR delivery tubes, and turbochargers. If it is absolutely necessary to route a wire in close proximity to any of these items, then a suitable insulator must be used. Reflective foil insulators should be used on all harness lengths that are routed in close proximity to extreme sources of heat.
- Noise suppression: do not route wires near HT (High Tension) leads such as ignition wires from a distributor or a CNP (Coil Near Plug) ignition system. For coil-on-plug ignition systems this is not as critical.
- Shielding of important signal input wires such as Crank Sensor input, Cam Sensor input, and Knock Sensor input should be addressed when assembling a harness. VR (Variable Reluctance) sensors, also known as MAG sensors, are 2 wire sensors that generate a voltage as the

frequency increases of the trigger wheel. These wires **MUST** be wired in a twisted pair configuration with a shield. The shield should be terminated to chassis ground at **ONE END** of the lead while the other end is left unterminated. Failure to shield these wires with proper shield termination will result in noise on the signal and subsequent errors in the Infinity ECU. Hall Sensors (3 Wire) are not as susceptible to noise, but care should be taken into account when routing these wires.

- Moving component protection: route wires away from moving components such as fans, the blower belt, or the throttle linkage. Also, make sure the wires are not under any strain when the engine is at full deflection on the motor mounts. This may be hard to test, ensure that there is at least a few inches of slack in harnessing between engine-mounted and chassis-mounted components. The use of Zip Ties is an acceptable method of securing a harness from moving components.
- Never have the wires in exposed bundles throughout the engine compartment. All wires should be covered in a protective sheathing, at minimum, plastic corrugated loom to protect harness from abrasion. Ideally, a harness should be covered in a fire-resistant sheathing rated to a minimum of 125C, or 257F.
- When utilizing CAN Bus communication devices in the harness, it is important that the CAN Hi/Lo wires are twisted at a minimum of 1 twist per inch. When terminating these wires, ensure that there is a 120 ohm terminating resistor installed between the two CAN wires at each end of the CAN Bus. If a connected device has an internal CAN terminating resistor, no external resistor is needed.
- All additional controlled devices wired into the vehicle need to be wired with appropriately sized wiring. When considering wire size requirements, the following factors should be considered: Amperage of device, length of wire, heat source near wire and component. Both positive and ground circuits require equal attention to this detail and care should be taken to choose the appropriate wire gauge. Always use a larger wire gauge if unsure of power requirements of device.
- Ensure that ground loops are completed correctly in the vehicle including: engine to chassis, chassis to battery, ECU to chassis, etc.
- Ensure that when installing any additional +12v components, all power (+12v) leads should be fused with an appropriately sized fuse. Ensure that the fuse selected does not exceed the current carrying capacity of the wire used to control the component.
- Relays should be selected so that they are capable of carrying the load of the controlled device. Ensure that the relay has enough current carrying capacity and that the fuse in the circuit does not exceed the rating of relay. Failure to address this will result in the relay becoming the fuse, rather than the fuse in the circuit.

Determining ECU Location

- It is recommended that the ECU be placed in an environment that does not expose it to temperatures above 85° Celsius (160F).
- In cases where the Infinity is to be used in place of the stock ECU, the location that the stock ECU occupied is suitable.

- On applications where the ECU is to be located in a different position than stock, the interior of the vehicle is best.
- The Infinity should be located in a place that reduces the length of extension wires from the PDC while maintaining an environmentally sound location.
- The ECU location must permit the PDC to be mounted in a serviceable location.

Power Distribution Center

PDCs included in the harness assemblies generally include all relays and fuses necessary for proper function and should be mounted in a location which permits serviceability. Ideally the PDC should be located in the passenger compartment, or if necessary within the engine compartment as far away from heat sources as can be achieved. Some PDCs contain flying lead bundles which must be wired to the battery, fuel pump and radiator fan(s), switched ignition and possibly other interfaces. Routing of this flying lead bundle should also be taken into account when determining the mounting location of the PDC.

The 3707 Mini Flying Lead Harness comes bundled into several groups for ease of location and identification. Each wire within a bundle is printed with the wire's function 6" from the end.

Refer to ECU pinout documentation for details. Any unused wires should either be removed from the harness, or insulated and secured out of the way.

A Micro Relay is included in this harness kit to control power to the ECU. The relay needs to be installed into the holder located next to the main ECU connector on the wire harness. The relay will only fit in the holder in one direction.



Infinity Series 3 ECU Pinout, 30-7113

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-1	Coil 5	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-2	Coil 3	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-3	Stepper 1A	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-4	Stepper 2A	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-5	Stepper 2B	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-6	Stepper 1B	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-7	EFI Main Relay Switched Ground Output	0.7A max ground sink for external relay control	Will activate at key on and at key off according to the configuration settings.
C1-8	Crankshaft Position Sensor VR+	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-9	Crankshaft Position Sensor VR-		See Setup Wizard page Cam/Crank for options.
C1-10	Camshaft Position Sensor 1 VR-	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-11	Camshaft Position Sensor 1 VR+		See Setup Wizard page Cam/Crank for options.

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-12	CANH A	Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-13	CANL A	Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-14	Coil 1	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-15	Coil 4	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-16	Coil 6	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-17	Coil 7	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-18	Ignition Switch	10K pulldown	Full time battery power must be available at C1-34 before this input is triggered.
C1-19	Main Relay Power Input	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-7 above.
C1-20	Knock Sensor 2	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-21	Knock Sensor 1	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-22	Analog Sensor Ground	Dedicated analog ground	Analog 0-5V sensor ground
C1-23	Analog Sensor Ground	Dedicated analog ground	Analog 0-5V sensor ground
C1-24	Crankshaft Position Sensor Hall	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.

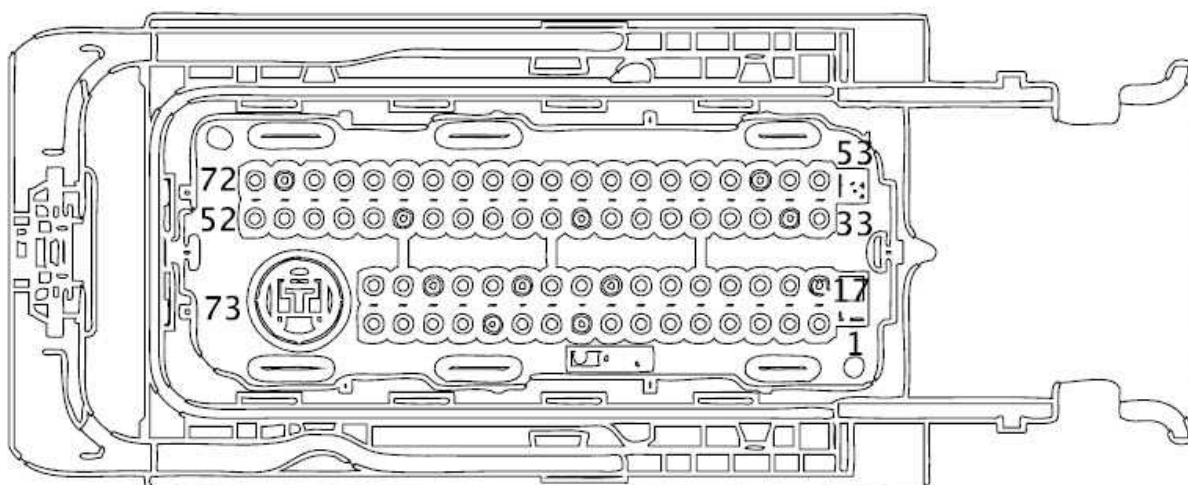
Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-25	Camshaft Position Sensor 1 Hall	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-26	Digital 2	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-27	Dig3 [Hz] / Dig3 Duty	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-28	Dig4 [Hz] / Dig4 Duty	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-29	Digital 5	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-30	Dig6 [Hz] / Dig6_Duty	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-31	Digital 7	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-32	Coil 8	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-33	Coil 2	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-34	Battery Perm Power	Dedicated power management CPU	Full time battery power. MUST be powered before the ignition switch input is triggered (See C1-18).
C1-35	Main Relay Power Input	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-7 above.
C1-36	Flash Enable	10K pulldown	Not usually needed for automatic firmware updates through Infinity Tuner. If connection errors occur during update, connect 12 volts to this pin before proceeding with upgrade. Disconnect the 12 volts signal after the update.
C1-37	Analog Temp 1	12 bit A/D, 2.49K pullup to 5V	Default Coolant Temperature Input

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-38	Analog Temp 2	12 bit A/D, 2.49K pullup to 5V	Default Air Temperature Input
C1-39	Analog Temp 3	12 bit A/D, 2.49K pullup to 5V	Default Oil Temperature Input. See Setup Wizard page "Input Function Assignments" for setup options.
C1-40	Analog 7	12 bit A/D, 100K pullup to 5V	Default primary Throttle Position sensor input. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard Set Throttle Range page for automatic min/max calibration. Monitor the Throttle [%] channel.
C1-41	Analog 8	12 bit A/D, 100K pullup to 5V	Default Manifold Pressure Sensor input. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.
C1-42	Analog 9	12 bit A/D, 100K pullup to 5V	Default Fuel Pressure Sensor Input. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.
C1-43	Analog 10	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard page "Input Function Assignments" for setup options.
C1-44	+5V Sensor Power	Regulated, fused +5V supply for sensor power	Analog sensor power
C1-45	+5V Sensor Power	Regulated, fused +5V supply for sensor power	Analog sensor power

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-46	Analog 11	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard page "Input Function Assignments" for setup options.
C1-47	Analog 13	12 bit A/D, 100K pullup to 5V	Default Oil Pressure Sensor input. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.
C1-48	Analog 16	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard page "Input Function Assignments" for setup options.
C1-49	Analog 18	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard page "Input Function Assignments" for setup options.
C1-50	Analog 19	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard "Input Function Assignments" page for options.
C1-51	Battery Ground	Battery Ground	Connect directly to battery ground
C1-52	Coil 1 HO	IGBT Ignition Driver	
C1-53	Lowside 9	Lowside switch, 2A max with internal flyback diode.	See Setup Wizard Page "Output Function Assignment" for setup

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
		Inductive load should NOT have full time power. No pullup	options.
C1-54	Lowside 8	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-55	Lowside 7	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-56	Lowside 6	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-57	Lowside 5	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-58	Injector 8	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 8
C1-59	Injector 6	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 6
C1-60	Injector 4	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 4
C1-61	Injector 2	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 2
C1-62	Injector 2 Peak and Hold	Peak and hold, 3A max continuous	Injector 2 Peak and Hold - for use with typical throttle body injection systems
C1-63	Injector 1 Peak and	Peak and hold, 3A max	Injector 1 Peak and Hold - for use

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
	Hold	continuous	with typical throttle body injection systems
C1-64	Injector 1	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 1
C1-65	Injector 3	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 3
C1-66	Injector 5	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 5
C1-67	Injector 7	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 7
C1-68	Lowside 4	Lowside switch, 2A max, NO internal flyback diode. 12V pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-69	Lowside 3	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-70	Lowside 2	Lowside switch, 1.7A max, NO internal flyback diode. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-71	Lowside 1	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-72	Lowside 0	Lowside switch, 2A max, NO internal flyback diode. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-73	Battery Ground	Battery Ground	Connect directly to battery ground



**MOLEX MX123 SERIES
73 WAY FEMALE
SEALED B KEY
GRAY TPA**

Infinity Series 3 ECU Pinout, 30-7114

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-1	Coil 5	IGBT Ignition Driver	Connect directly to coil primary negative. Coil power should be provided by a source switched by the ECU controlled EFI main relay.
C1-2	Coil 3	IGBT Ignition Driver	Connect directly to coil primary negative. Coil power should be provided by a source switched by the ECU controlled EFI main relay.
C1-3	Stepper 1A	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-4	Stepper 2A	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-5	Stepper 2B	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-6	Stepper 1B	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-7	EFI Main Relay Switched Ground Output	0.7A max ground sink for external relay control	Will activate at key on and at key off according to the configuration settings.
C1-8	Crankshaft Position Sensor VR+	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-9	Crankshaft Position Sensor VR-		See Setup Wizard page Cam/Crank for options.
C1-10	Camshaft Position Sensor 1 VR-	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-11	Camshaft Position Sensor 1 VR+		See Setup Wizard page Cam/Crank for options.
C1-12	CANH A	Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-13	CANL A	Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-14	Coil 1	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-15	Coil 4	IGBT Ignition Driver	Connect directly to coil primary negative. Coil power should be provided by a source switched by the ECU controlled EFI main relay.
C1-16	Coil 6	IGBT Ignition Driver	Connect directly to coil primary negative. Coil power should be provided by a source switched by the ECU controlled EFI main relay.
C1-17	Coil 7	IGBT Ignition Driver	Connect directly to coil primary negative. Coil power should be provided by a source switched by the

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
			ECU controlled EFI main relay.
C1-18	Ignition Switch	10K pulldown	Full time battery power must be available at C1-34 before this input is triggered.
C1-19	Main Relay Power Input	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-7 above.
C1-20	Knock Sensor 2	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-21	Knock Sensor 1	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-22	Analog Sensor Ground	Dedicated analog ground	Analog 0-5V sensor ground
C1-23	Analog Sensor Ground	Dedicated analog ground	Analog 0-5V sensor ground
C1-24	Crankshaft Position Sensor Hall	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-25	Camshaft Position Sensor 1 Hall	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-26	Digital 2	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-27	Dig3 [Hz] / Dig3 Duty	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-28	Dig4 [Hz] / Dig4 Duty	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-29	Digital 5	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-30	Dig6 [Hz] / Dig6_Duty	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-31	Digital 7	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page "Input Function Assignments" for setup options.
C1-32	Coil 8	IGBT Ignition Driver	Connect directly to coil primary negative. Coil power should be

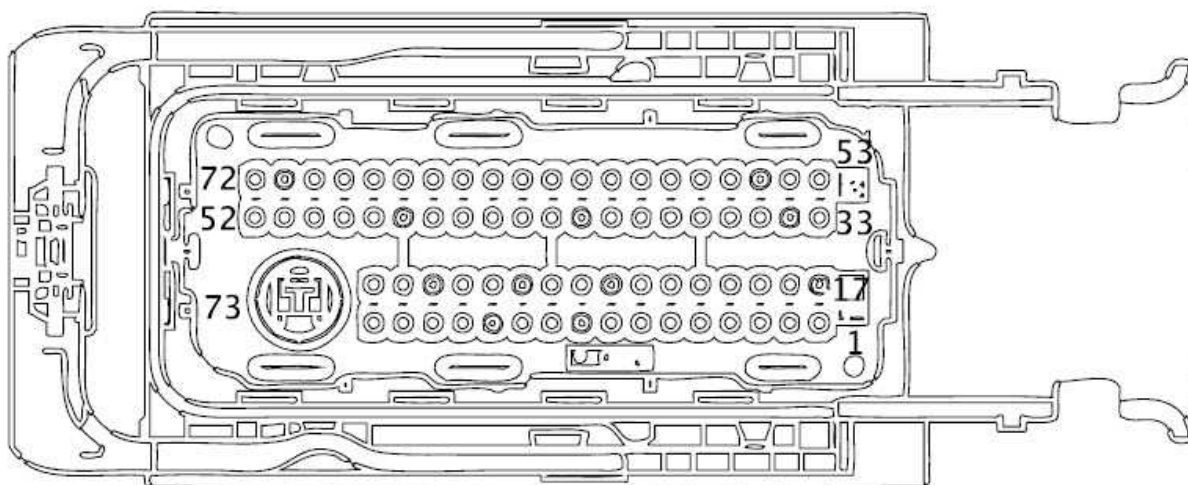
Infinity Pin	Hardware Ref.	Hardware Specification	Notes
			provided by a source switched by the ECU controlled EFI main relay.
C1-33	Coil 2	IGBT Ignition Driver	Connect directly to coil primary negative. Coil power should be provided by a source switched by the ECU controlled EFI main relay.
C1-34	Battery Perm Power	Dedicated power management CPU	Full time battery power. MUST be powered before the ignition switch input is triggered (See C1-18).
C1-35	Main Relay Power Input	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-7 above.
C1-36	Flash Enable	10K pulldown	Not usually needed for automatic firmware updates through Infinity Tuner. If connection errors occur during update, connect 12 volts to this pin before proceeding with upgrade. Disconnect the 12 volts signal after the update.
C1-37	Analog Temp 1	12 bit A/D, 2.49K pullup to 5V	Default Coolant Temperature Input
C1-38	Analog Temp 2	12 bit A/D, 2.49K pullup to 5V	Default Air Temperature Input
C1-39	Analog Temp 3	12 bit A/D, 2.49K pullup to 5V	Default Oil Temperature Input. See Setup Wizard page "Input Function Assignments" for setup options.
C1-40	Analog 7	12 bit A/D, 100K pullup to 5V	Default primary Throttle Position sensor input. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard Set Throttle Range page for automatic min/max calibration. Monitor the Throttle [%] channel.
C1-41	Analog 8	12 bit A/D, 100K pullup to 5V	Default Manifold Pressure Sensor input. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-42	Analog 9	12 bit A/D, 100K pullup to 5V	Default Fuel Pressure Sensor Input. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.
C1-43	Analog 10	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard page "Input Function Assignments" for setup options.
C1-44	+5V Sensor Power	Regulated, fused +5V supply for sensor power	Analog sensor power
C1-45	+5V Sensor Power	Regulated, fused +5V supply for sensor power	Analog sensor power
C1-46	Analog 11	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard page "Input Function Assignments" for setup options.
C1-47	Analog 13	12 bit A/D, 100K pullup to 5V	Default Oil Pressure Sensor input. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.
C1-48	Analog 16	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard page "Input Function Assignments" for setup options.
C1-49	Analog 18	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
			pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard page "Input Function Assignments" for setup options.
C1-50	Analog 19	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard "Input Function Assignments" page for options.
C1-51	Battery Ground	Battery Ground	Connect directly to battery ground
C1-52	Coil 1 HO	IGBT Ignition Driver	Connect directly to coil primary negative. Coil power should be provided by a source switched by the ECU controlled EFI main relay.
C1-53	Lowside 9	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-54	Lowside 8	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-55	Lowside 7	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-56	Lowside 6	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-57	Lowside 5	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-58	Injector 8	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 8
C1-59	Injector 6	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 6
C1-60	Injector 4	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 4
C1-61	Injector 2	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 2
C1-62	Not used		
C1-63	Not used		
C1-64	Injector 1	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 1
C1-65	Injector 3	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 3
C1-66	Injector 5	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 5
C1-67	Injector 7	For use with high impedance (10-15 ohms) injectors only, 1.7A max.	Injector 7
C1-68	Lowside 4	Lowside switch, 2A max, NO internal flyback diode. 12V pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-69	Lowside 3	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.

Infinity Pin	Hardware Ref.	Hardware Specification	Notes
C1-70	Lowside 2	Lowside switch, 1.7A max, NO internal flyback diode. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-71	Lowside 1	Lowside switch, 2A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-72	Lowside 0	Lowside switch, 2A max, NO internal flyback diode. No pullup	See Setup Wizard Page "Output Function Assignment" for setup options.
C1-73	Battery Ground	Battery Ground	Connect directly to battery ground

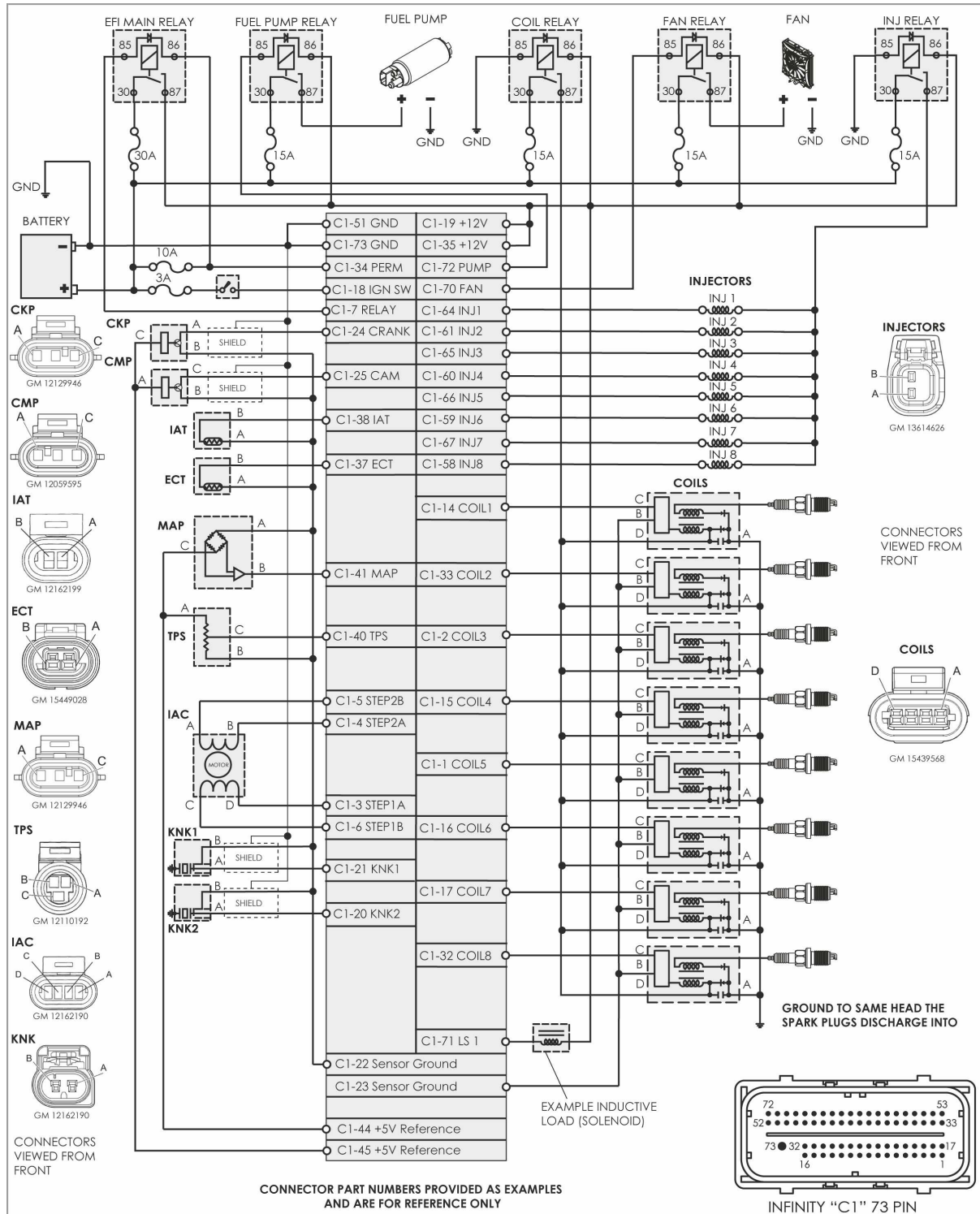


MOLEX MX123 SERIES
73 WAY FEMALE
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Application Wiring Examples

The following schematics can be used as examples for building a custom, application specific harness. Note the recommendations for power distribution using individual relays, specifically how the EFI Main Relay should be used to provide power to all other accessory relays and inductive loads downstream. Using permanent battery power for these devices can cause inconsistent operation and other problems that can be very difficult to diagnose.

Infinity Series 3 - GM LS Schematic



Drawing: GM LS

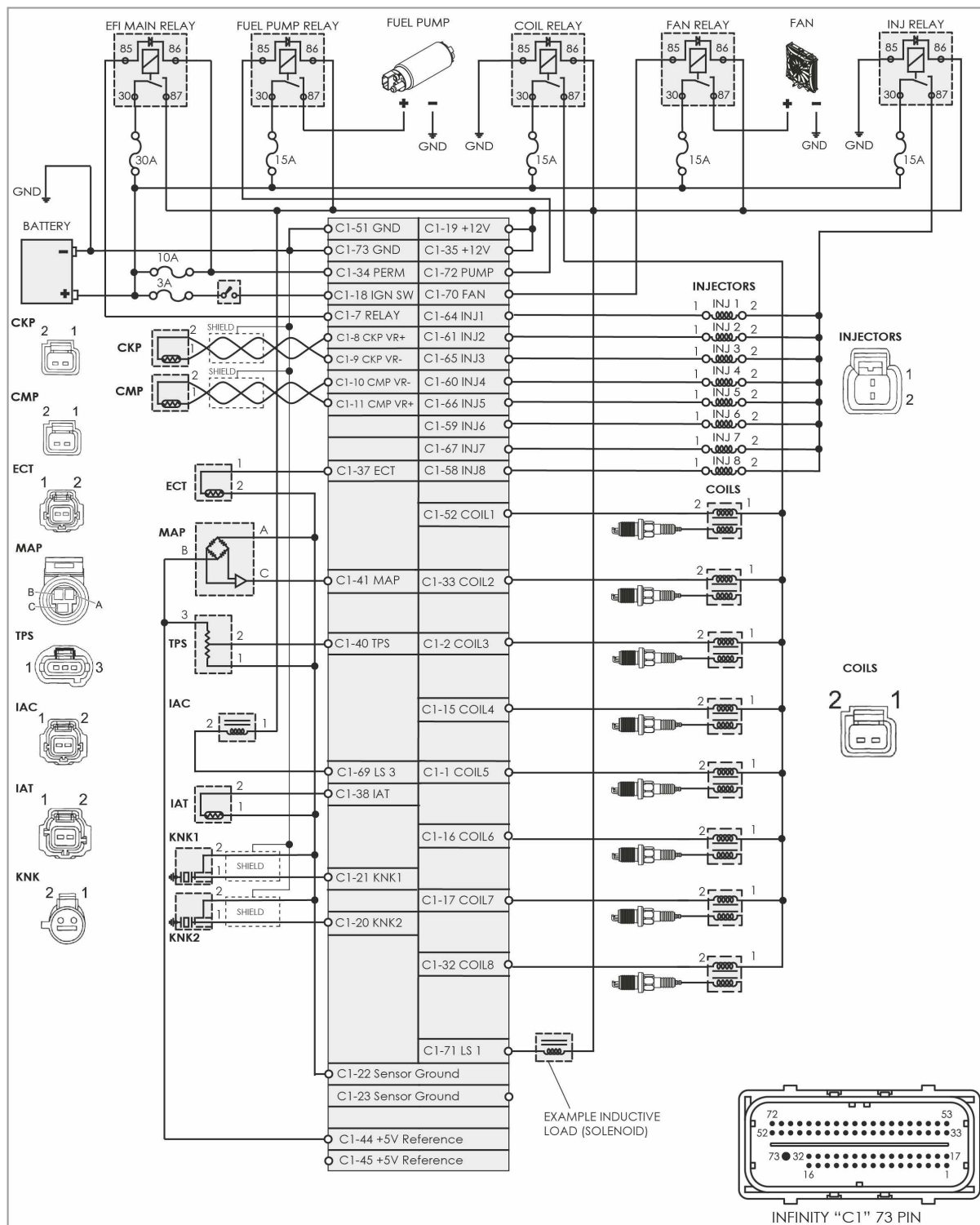
ECU: INFINITY 308

Date: 3/24/16

Rev: A

Engineer: Armish

Infinity Series 3 - Ford 4.6L SOHC



Drawing: 1999-2005 FORD 4.6L SOHC

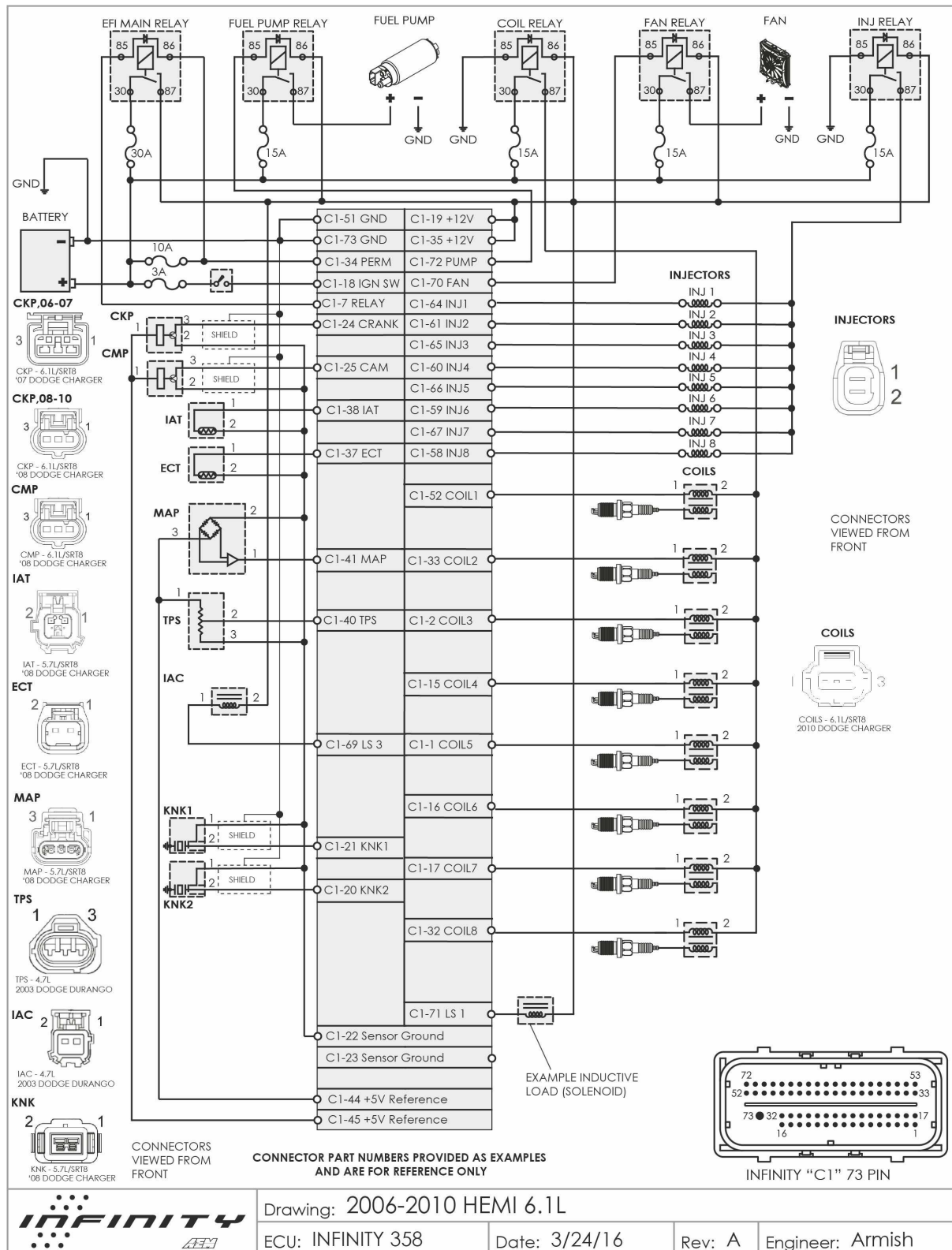
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Date: 3/24/16

Rev: A

Engineer: Armish

Infinity Series 3 - Dodge Hemi 6.1L



Drawing: 2006-2010 HEMI 6.1L

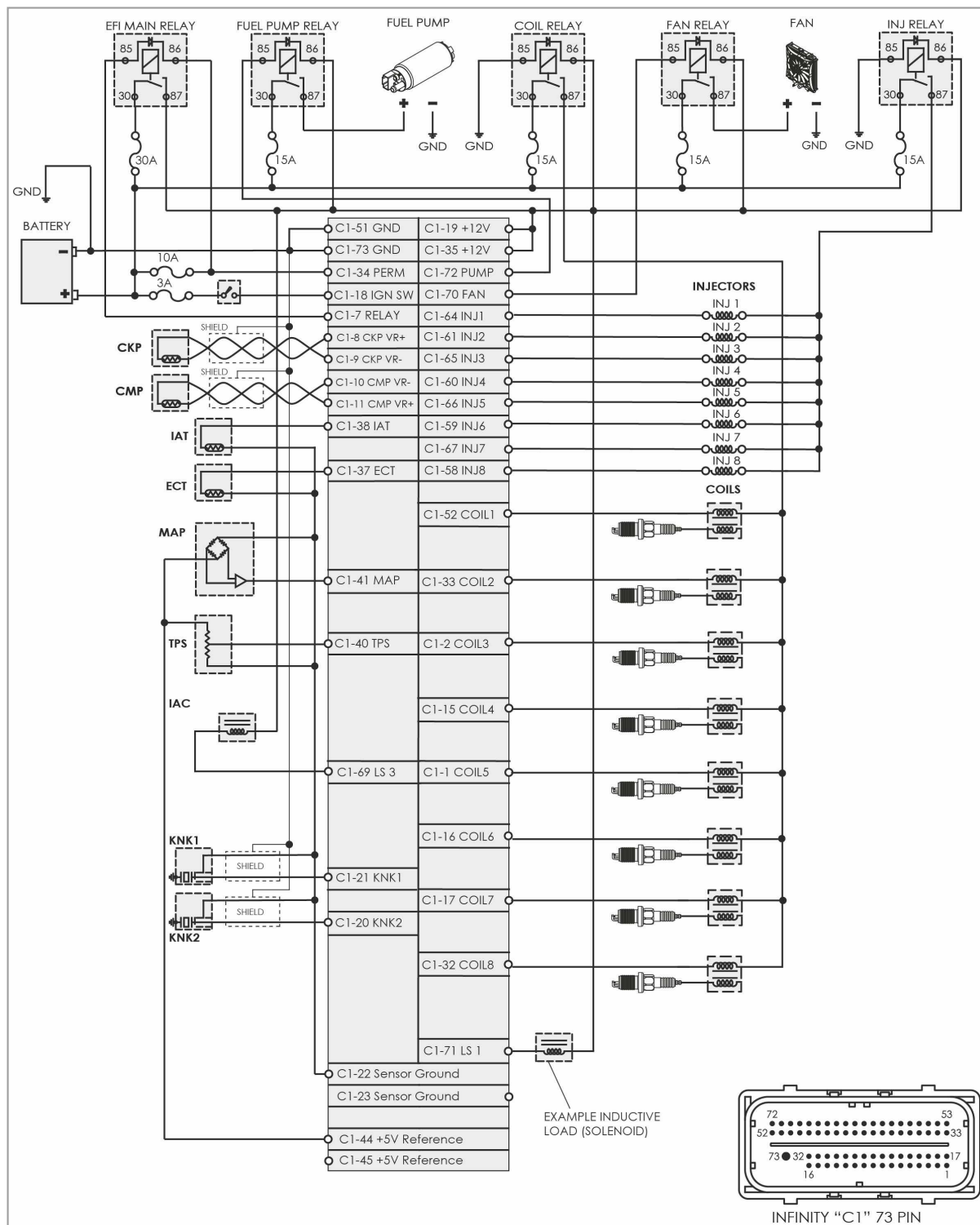
ECU: INFINITY 358

Date: 3/24/16

Rev: A

Engineer: Armish

Infinity Series 3 - Generic V8, Direct Drive Coils, Mag



Drawing: Generic V8, Direct Coil Drive, Mag CKP/CMP

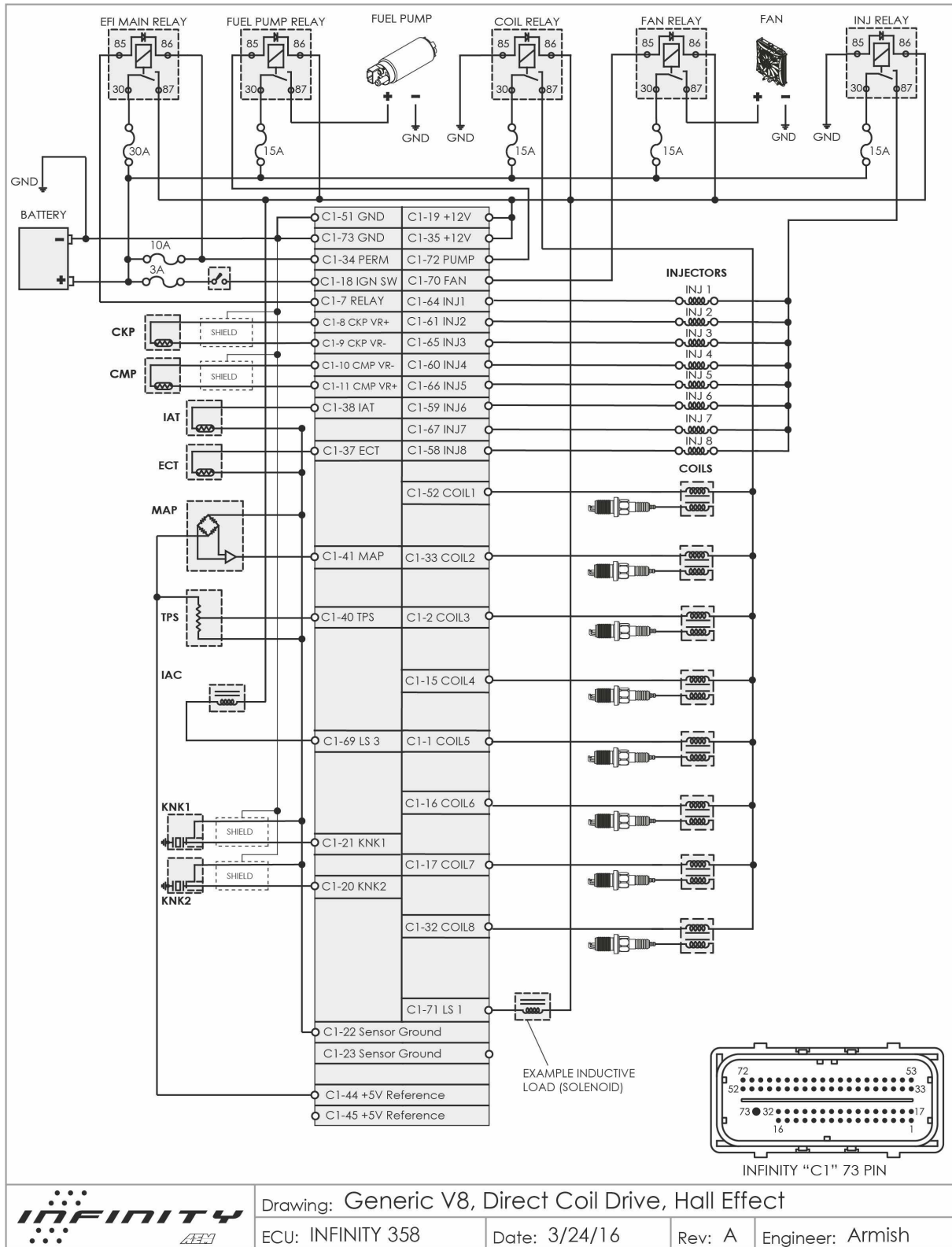
ECU: INFINITY 358

Date: 3/24/16

Rev: A

Engineer: Armish

Infinity Series 3 - Generic V8, Direct Drive Coils, Hall Effect



12 Month Limited Warranty

Advanced Engine Management Inc. warrants to the consumer that all AEM High Performance products will be free from defects in material and workmanship for a period of twelve (12) months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced at AEM's option, when determined by AEM that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of the AEM part. In no event shall this warranty exceed the original purchase price of the AEM part nor shall AEM be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product. Warranty claims to AEM must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12-month warranty period. Improper use or installation, accident, abuse, unauthorized repairs or alterations voids this warranty. AEM disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by AEM. Warranty returns will only be accepted by AEM when accompanied by a valid Return Merchandise Authorization (RMA) number. Product must be received by AEM within 30 days of the date the RMA is issued.

UEGO oxygen sensors are considered wear items and are not covered under warranty.

Please note that before AEM can issue an RMA for any electronic product, it is first necessary for the installer or end user to contact the EMS tech line at 1-800-423-0046 to discuss the problem. Most issues can be resolved over the phone. Under no circumstances should a system be returned or a RMA requested before the above process transpires.

AEM will not be responsible for electronic products that are installed incorrectly, installed in a non-approved application, misused, or tampered with.

Any AEM electronics product can be returned for repair if it is out of the warranty period. There is a minimum charge of \$50.00 for inspection and diagnosis of AEM electronic parts. Parts used in the repair of AEM electronic components will be extra. AEM will provide an estimate of repairs and receive written or electronic authorization before repairs are made to the product.