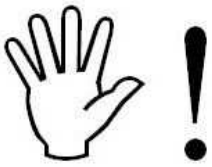
Instruction Manual

30-71XX Infinity Hardware Specification



STOP!

THIS PRODUCT HAS LEGAL RESTRICTIONS. READ THIS BEFORE INSTALLING/USING!

THIS PRODUCT MAY BE USED SOLELY ON VEHICLES USED IN SANCTIONED COMPETITION WHICH MAY NEVER BE USED UPON A PUBLIC ROAD OR HIGHWAY, UNLESS PERMITTED BY SPECIFIC REGULATORY EXEMPTION. (VISIT THE "EMISSIONS" PAGE AT HTTP://WWW.SEMASAN.COM/EMISSIONS FOR STATE BY STATE DETAILS.)

IT IS THE RESPONSIBILITY OF THE INSTALLER AND/OR USER OF THIS PRODUCT TO ENSURE THAT IT IS USED IN COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. IF THIS PRODUCT WAS PURCHASED IN ERROR, DO NOT INSTALL AND/OR USE IT. THE PURCHASER MUST ARRANGE TO RETURN THE PRODUCT FOR A FULL REFUND.

THIS POLICY ONLY APPLIES TO INSTALLERS AND/OR USERS WHO ARE LOCATED IN THE UNITED STATES; HOWEVER CUSTOMERS WHO RESIDE IN OTHER COUNTRIES SHOULD ACT IN ACCORDANCE WITH THEIR LOCAL LAWS AND REGULATIONS.

WARNING: This installation is not for the tuning novice! Use this system with EXTREME caution! The AEM Infinity Programmable EMS allows for total flexibility in engine tuning. Misuse or improper tuning of this product can destroy your engine! 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 or call 800-423-0046 for technical assistance.

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 IF 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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Instruction Part Number: 10-71XX-Hardware
Document Build 1/6/2015

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Hardware

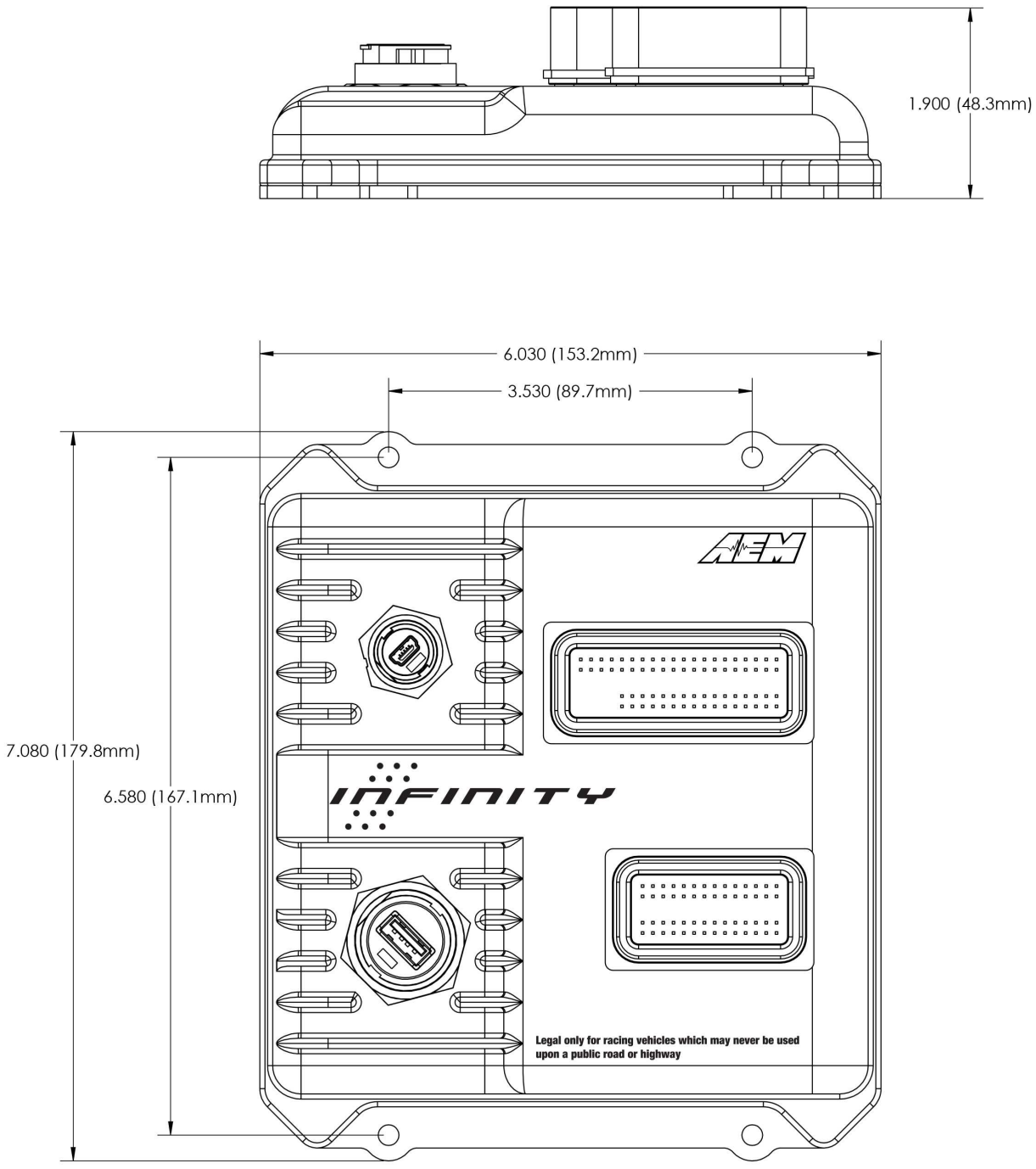
Infinity Hardware Specifications

Specifications	Infinity-6	Infinity-8h	Infinity-8	Infinity-10	Infinity-12
Cylinders	Up to 6	Up to 8	Up to 8	Up to 10	Up to 12
Injectors, Low Impedance (Sequential)	6	N/A	8	10	12
Injectors High Impedance (Sequential)	Up to 6	Up to 8	8	10	12
Coils – 0–5V Falling Edge	6	8	8	10	12
Connector Pins	80	80	129	129	129
Drive-by-Wire	Single	Single	Dual	Dual	Dual
H-Bridge Channels	1	1	2	2	2
RS232 Channels*	1	1	1	1	1
CAN Channels	2	2	2	2	2
2-Stroke Engines	Yes	Yes	Yes	Yes	Yes
4-Stroke Engines	Yes	Yes	Yes	Yes	Yes
Knock Control	2-Channel	2-Channel	2-Channel	2-Channel	2-Channel
Analog Voltage Inputs	Up to 9	Up to 9	Up to 17	Up to 17	Up to 17
Analog Temp Inputs	Up to 3	Up to 3	Up to 6	Up to 6	Up to 6
VR/Mag Inputs	Up to 4	Up to 4	Up to 6	Up to 6	Up to 6
Digital Inputs	Up to 8	Up to 6	Up to 8	Up to 8	Up to 8
Internal Wideband UEGO Controller	1	1	2	2	2
High Side Outputs	1	1	Up to 2	Up to 2	Up to 2
Low Side Outputs	8	6	10	10	10

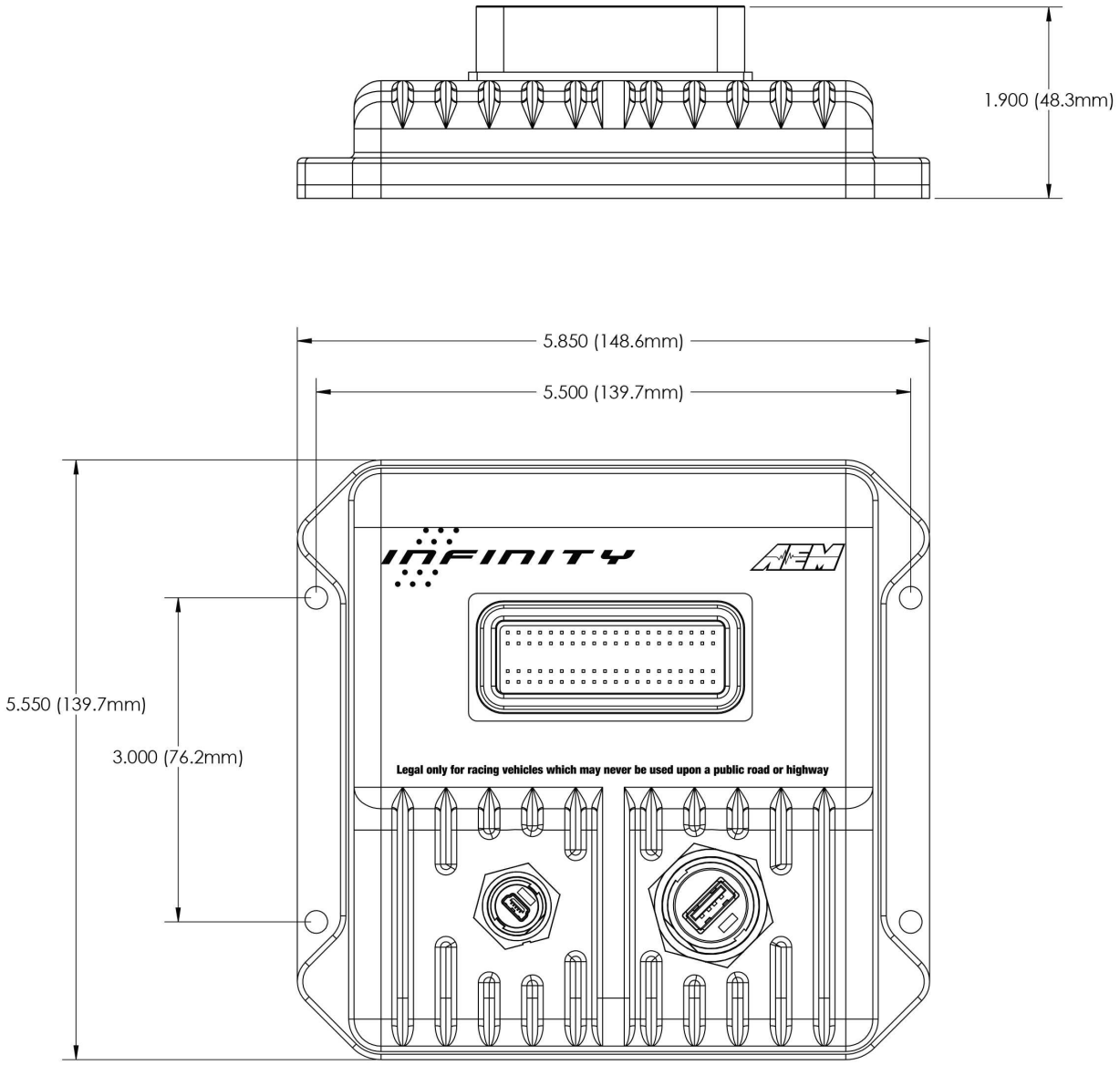
Specifications	Infinity-6	Infinity-8h	Infinity-8	Infinity-10	Infinity-12
4-Wire Stepper Motor Control	Yes	Yes	Yes	Yes	Yes
Boost Control (RPM, Time, Gear, VSS, Switch Input, Flex Fuel Content	Yes	Yes	Yes	Yes	Yes
Engine Protection	Yes	Yes	Yes	Yes	Yes
Variable Cam Control	Up to 2	Up to 2	Up to 4	Up to 4	Up to 4
Launch Control	Yes	Yes	Yes	Yes	Yes
Nitrous Control	Single Stage	Single Stage	Single Stage	Single Stage	Single Stage
Data Logging	Up to 64 GB	Up to 64 GB	Up to 64 GB	Up to 64 GB	Up to 64 GB
Traction Control	Up to 2-Wheel Speed	Up to 2-Wheel Speed	Up to 4-Wheel Speed	Up to 4-Wheel Speed	Up to 4-Wheel Speed
Weather Resistance	Yes, Sealed Enclosure with IP67 Connectors	Yes, Sealed Enclosure with IP67 Connectors	Yes, Sealed Enclosure with IP67 Connectors	Yes, Sealed Enclosure with IP67 Connectors	Yes, Sealed Enclosure with IP67 Connectors
Enclosure Dims	5.855"x5.55"x1.8"	5.855"x5.55"x1.8"	6.75"x6.00"x1.8"	6.75"x6.00"x1.8"	6.75"x6.00"x1.8"
Weight	18.8 oz/476.27g	18.8 oz/476.27g	24oz/680g	24oz/680g	24oz/680g

**Dual use pins. Tx and Rx shared with 2 digital inputs.

ECU Installation Dimensions



INFINITY AEM	Drawing: Infinity-8/10/12 Dimensions			
	ECU: Infinity-8/10/12	Date: 07/23/2014	Rev: A	Engineer: Nakano



INFINITY AEM	Drawing: Infinity-6/8h Dimensions			
	ECU: Infinity-6/8h	Date: 07/23/2014	Rev: A	Engineer: Nakano

Wiring, Pinouts and Schematics

Wiring

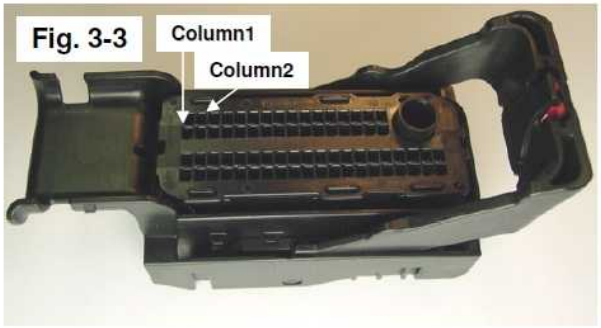
Wire Harness Options

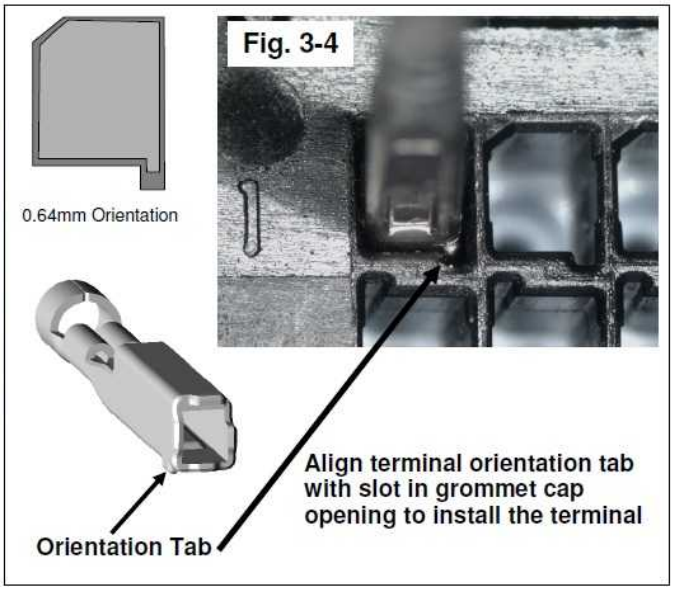
General

The Infinity-10 uses the MX123 Sealed Connection System from Molex. The following sections include excerpts from the Molex MX123 User Manual illustrating the basic procedures for working with these high density connectors. AEM strongly recommends that users become familiar with the proper tools and procedures before attempting any modifications. The entire user manual can be downloaded direct from Molex at http://www.molex.com/mx_upload/family//MX123UserManual.pdf

Terminal Installation

- **For ease of assembly, it is recommended that when populating the connector, wires be populated in the following manner (see Fig 3-3): 1) Fully populate down Column 1 and then 2) continue on to Column 2 and so forth until the entire connector is populated. Refer to Fig 3-4 for proper terminal orientation.**





Terminal Installation (continued)

- With TPA still in pre-lock position, orient terminal to rear of connector.
- Grip the wire (Fig. 3-5) and insert terminal through appropriate circuit opening (Fig. 3-6). If resistance is encountered, retract the terminal and adjust the angle of insertion. Continue inserting the terminal until it stops and locks up on the lock finger with an audible click. Tug slightly on wire to ensure terminal is locked.

Fig. 3-5

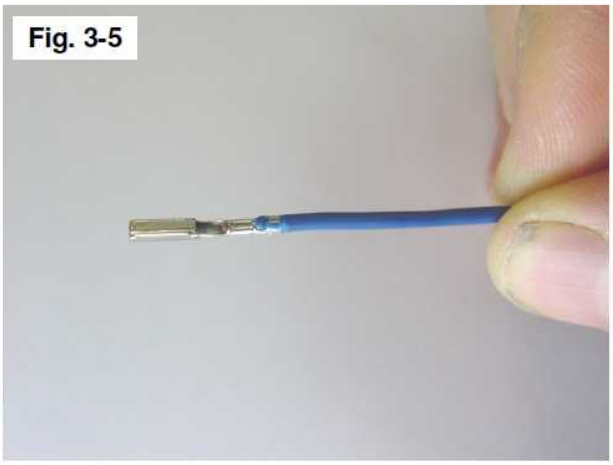
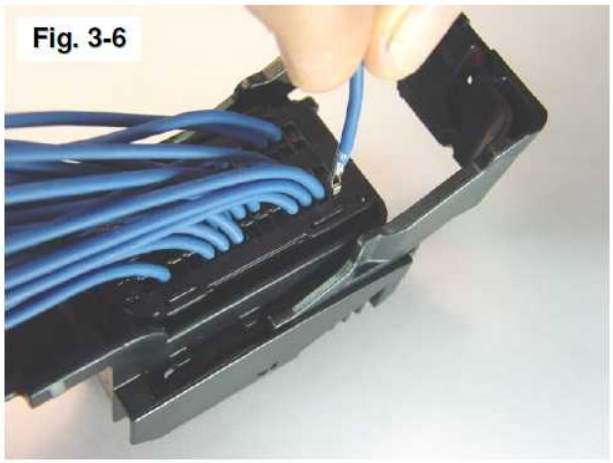


Fig. 3-6



TPA - Seating

- With the terminals fully installed, the TPA can be seated into its final lock position by applying an even force to both ends (Fig. 3-7) until it comes to a stop (Fig. 3-8). If the TPA resists, it may be detecting a partially installed terminal. Pull the TPA back into its pre-lock position and make sure all terminals are fully seated. Upon completion, the TPA can be seated.

Fig. 3-7

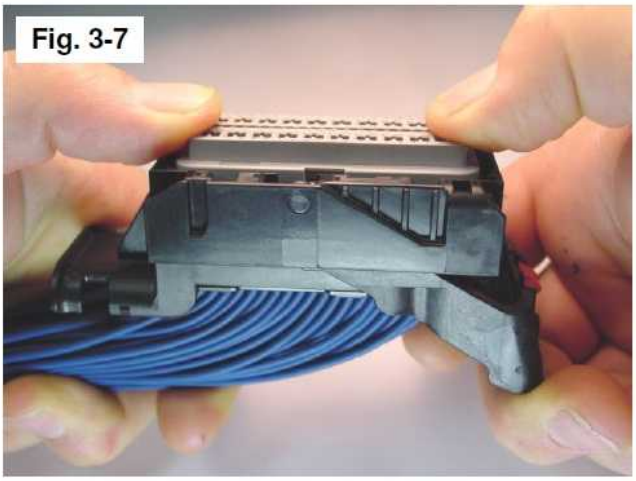
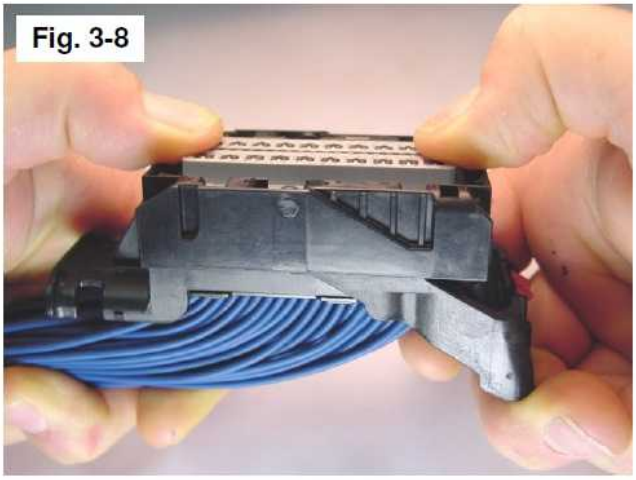


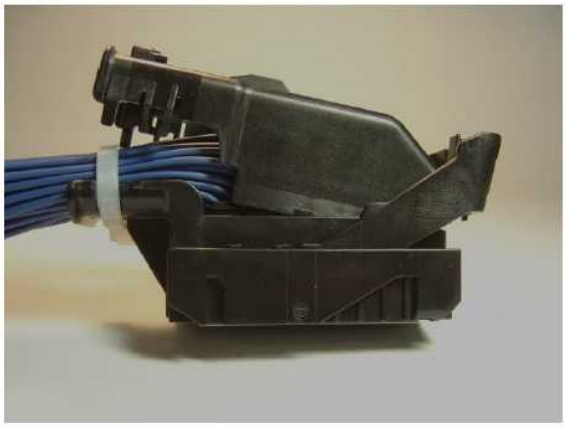
Fig. 3-8



Dress Cover Installation

- After tie-wrapping the wire bundle, install dress cover by inserting the front of the dress cover into the connector housing (Fig. 3-13) and pushing the opposite end (Fig. 3-14) until it snaps into position. Fully seated dress cover and TPA can be verified by ensuring MAX. height dimension (Fig. 3-14).

Fig. 3-13



Step 1: Insert front end into housing.

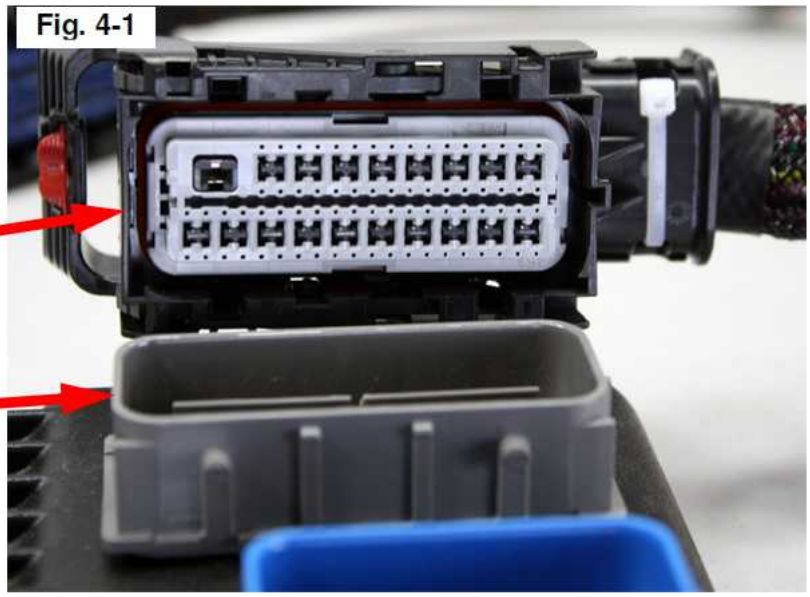
Fig. 3-14

Step 2: Press down to lock position.

Harness Connector To Header/Controller Color Identification

- The harness connector TPA will be color-coded to match the appropriate controller header (Fig. 4-1)

Fig. 4-1



Harness Connector to Header/Controller Installation Into Pre-Lock

- Correctly orient the harness connector (align keying features) onto the controller connector (Fig. 4-2). Grip the top of the harness connector and evenly push the connector downward until the lever moves slightly forward (Fig. 4-3).

Fig. 4-2

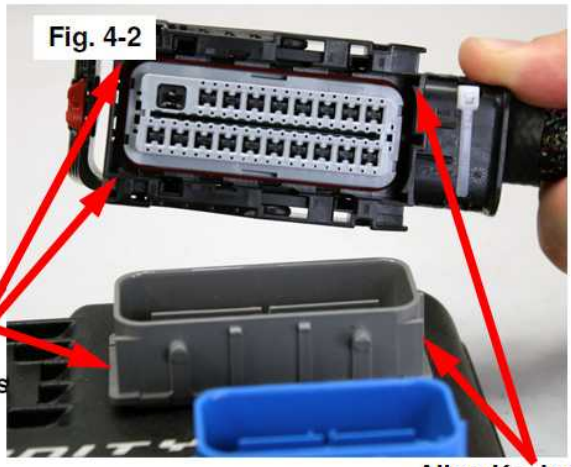


Fig. 4-3

Align Keying Features

- Caution!
- Installing the harness connector at an extreme angle (see fig 4- 4) may result in seal "scooping" creating an environment for fluid ingress.
- Damage to the header, or connector is possible if excessive force is used.

Fig. 4- 4

Harness Connector to Header/Controller Mating To Final Lock

- To begin mating the harness connector to the header/controller, place the palm of your hand on the face of the lever. Push back the connector lever towards the wire bundle to engage the harness connector to the controller header (Fig. 4- 5). Mating force should be smooth and continuous. If not, remove the connector and repeat step B.
- Continue to rotate the lever arm (Fig. 4- 6).

Fig. 4-5

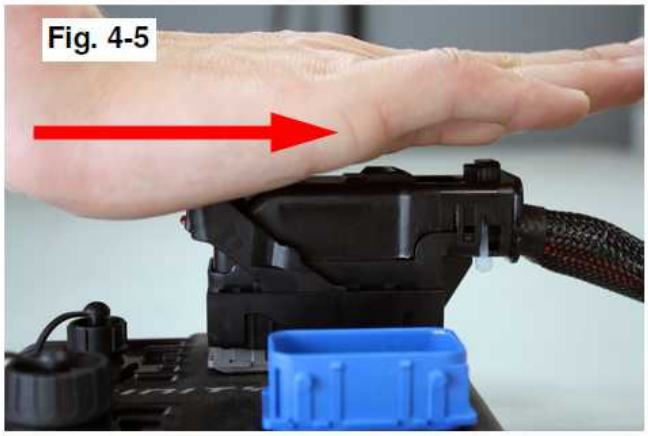
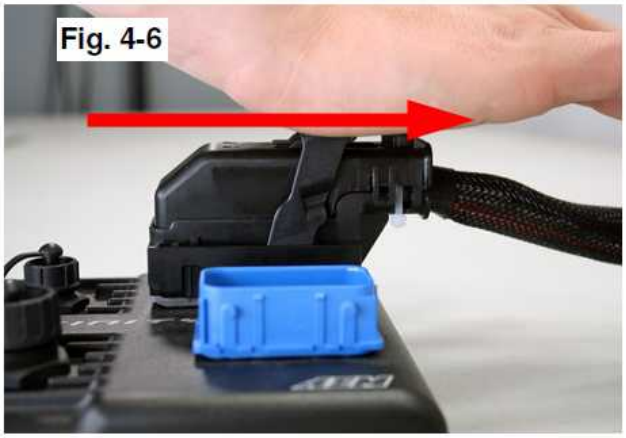


Fig. 4-6



Harness Connector to Header/Controller Mating To Final Lock (continued)

- Continue to rotate the lever until you hear the primary latch click into final lock over dress cover primary latch (Fig. 4-7a and 4-7b).

Fig. 4-7a

Fig. 4-7b

Connector Position Assurance (CPA)

- With the harness connector lever arm in its latched position, the CPA can now be engaged. Push the CPA toward the wire bundle (Fig. 4- 8) until it clicks into its final locked position (Fig. 4-9).

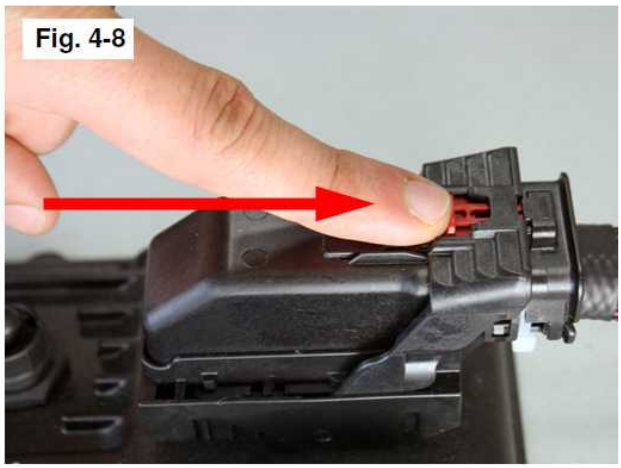


Fig. 4-8

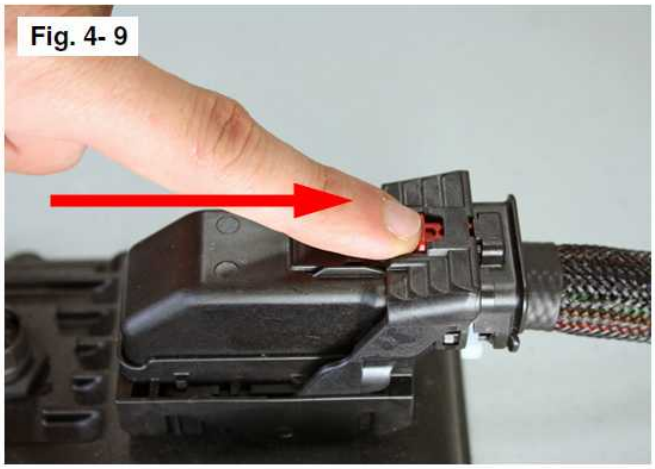


Fig. 4- 9

Harness Connector Removal From Module

- To un-mate the harness connector from the header/controller, push the CPA away from the wire bundle. Depress the primary latch on the top of the harness connector so the lever arm releases from the harness connector (Fig. 5-1).

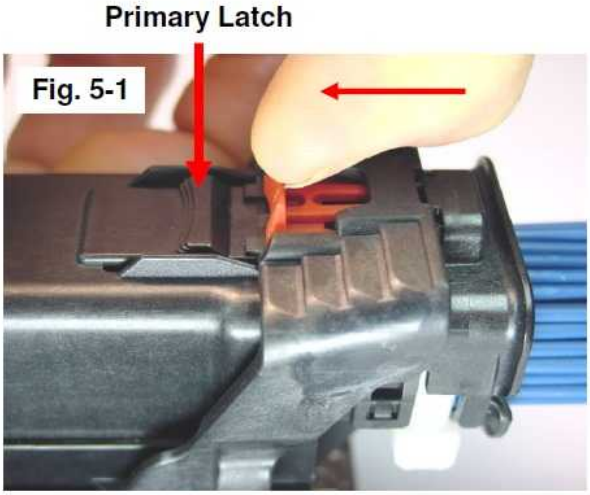


Fig. 5-1

Harness Connector Removal From Module (continued)

- Push the top of the mate lever arm away from wire bundle using the palm of your hand (Fig. 5-2).
- Continue to rotate the lever until the connector lifts into pre-lock (Fig. 5-3). The lever MUST be in the pre-lock position or the connector can not be easily removed from the module. The lever must be fully forward for the harness connector to be in pre-lock position.

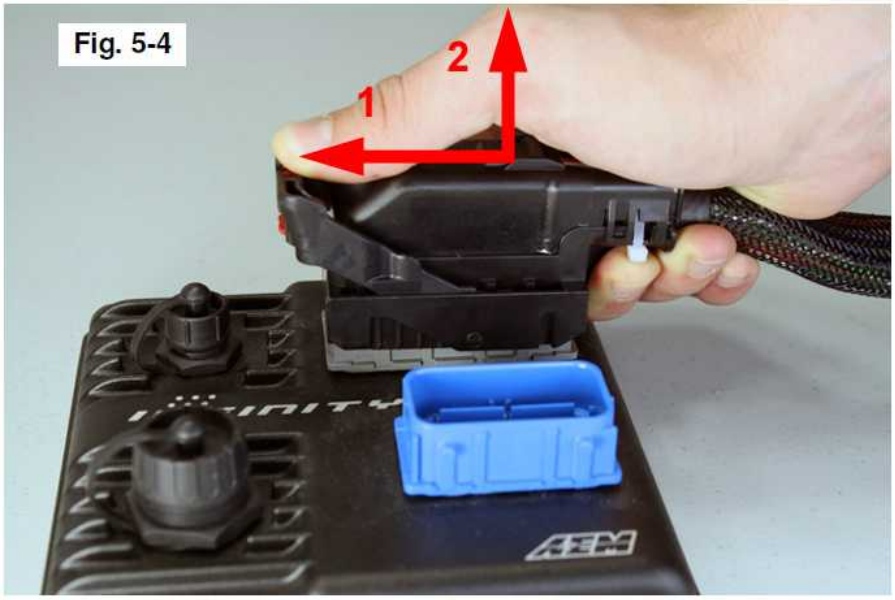
Fig. 5-2

Fig. 5-3

Harness Connector Removal From Module (continued)

- While pushing forward on the lever, grip the back of the harness and evenly pull straight upwards and away from the module (Fig. 5-4).

Fig. 5-4



Dress Cover Removal

- With the harness connector removed from header/controller (Fig. 5-5), unlatch the dress cover latch features on each side of the dress cover guide (Fig. 5-6). A small screwdriver or similar tool can be used to release the latches.

Fig. 5-5

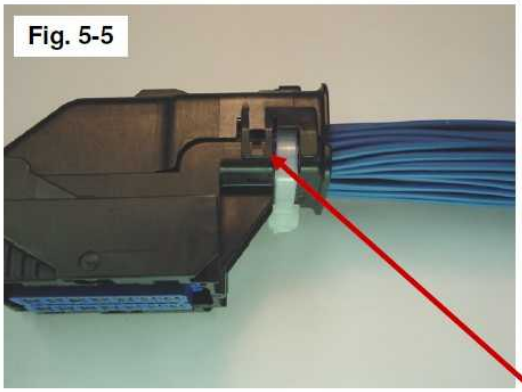
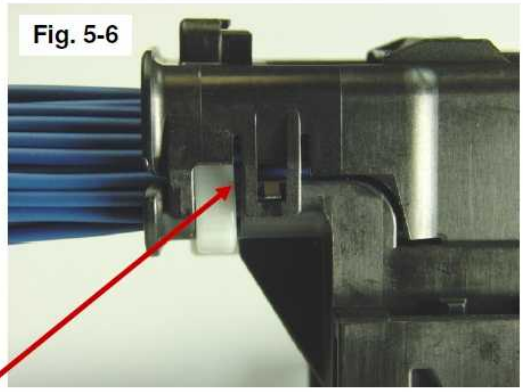


Fig. 5-6



Latch Feature on each side

Dress Cover Removal (continued)

- With the dress cover latch features unlatched, insert your finger into dress cover (Fig. 5-7) and pull up and away from the wire bundle. The dress cover can be completely removed at this point (Fig. 5-8).

Fig. 5-7

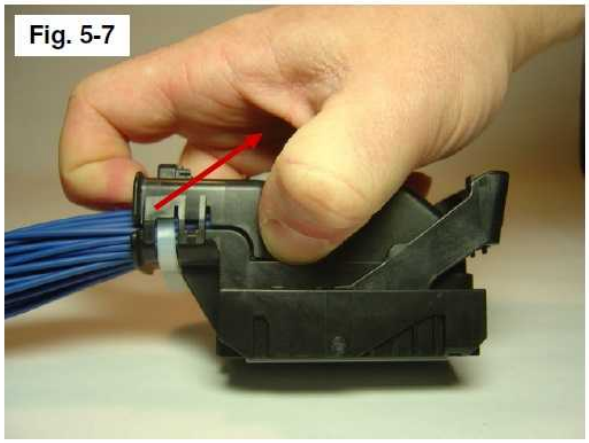
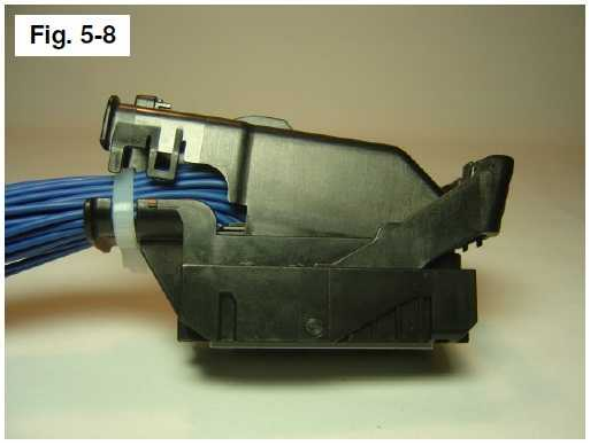


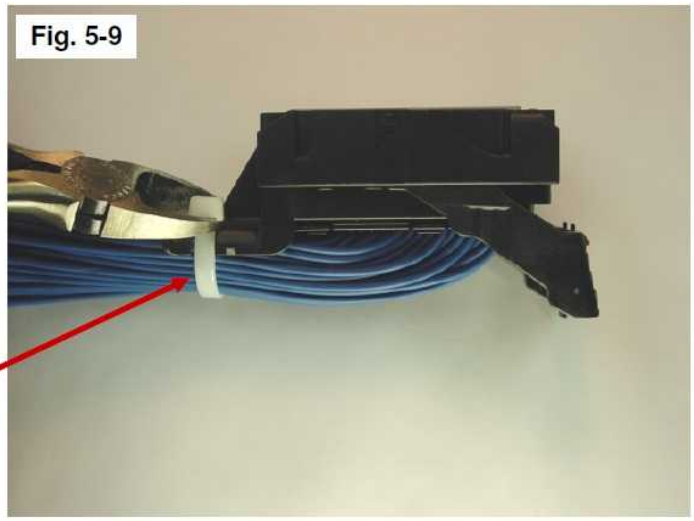
Fig. 5-8



Tie-Wrap Removal

- The tie-wrap can now be removed from the wire bundle (Fig. 5-9) for easier access to the wire to be serviced. The tie-wrap MUST be cut under the wire dress tab to prevent damage to the wires!

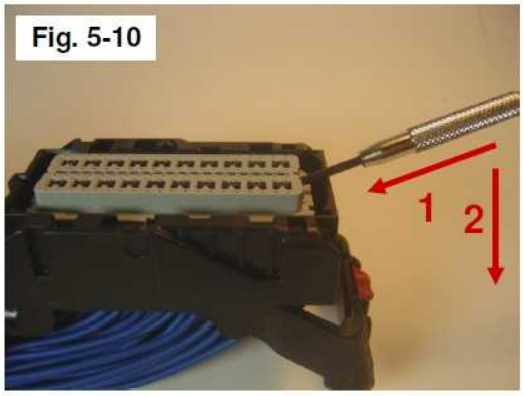
Fig. 5-9



TPA Servicing

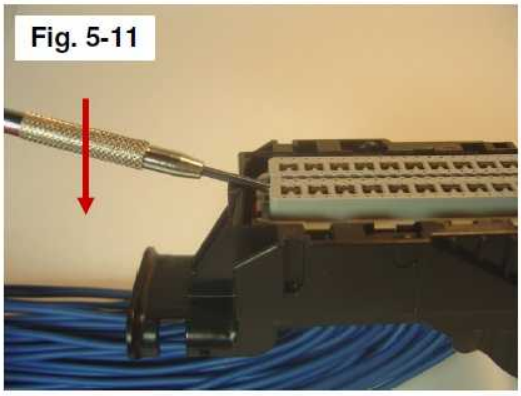
- TPA should never be removed from the connector.
- Step 1: Insert a small (2.0mm maximum) flat blade screwdriver into the TPA service hole at one end of the connector (Fig. 5-10) and pry up. The TPA will stop when it reaches its pre-lock position for terminal servicing.
- Step 2: On the other end of the TPA, repeat Step 1 (Fig. 5-11) until the TPA reaches its pre-lock position at both ends of the harness connector.
- Approximate TPA travel will be 5.0mm (See Figs. 5-12 and 5-13 on next page).

Fig. 5-10



Step 1: Pry up TPA

Fig. 5-11



Step 2: Pry up opposite end of TPA

MX64 Receptacle Terminal Removal

- **Ensure TPA is in pre-lock position!**
- Holding the 0.64mm service tool (Fig. 14: Molex part no. 63813-1400 or alternate GM part no. J-38125-213) between middle finger and thumb, with index finger on top of the tool, insert the tip of the tool into the terminal service hole adjacent to the terminal to be serviced (Fig. 5-15).
- After first pushing the wire/terminal forward, use your index finger to push the service tool (Fig. 5-15) until a large amount of resistance is felt. This wedges the service tool between the terminal and the lock finger, therefore deflecting the lock finger. (Fig. 5-16).

Fig. 5-14

Fig. 5-15

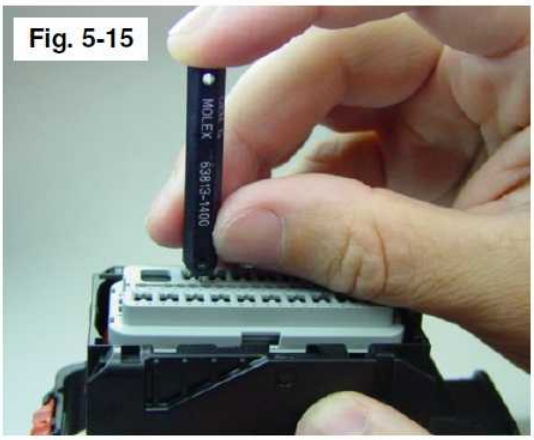
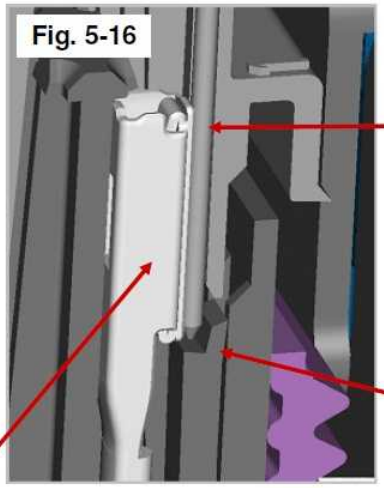


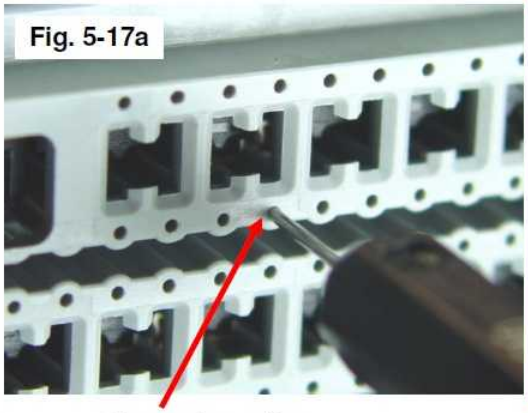
Fig. 5-16



MX64 Receptacle Terminal Removal (continued)

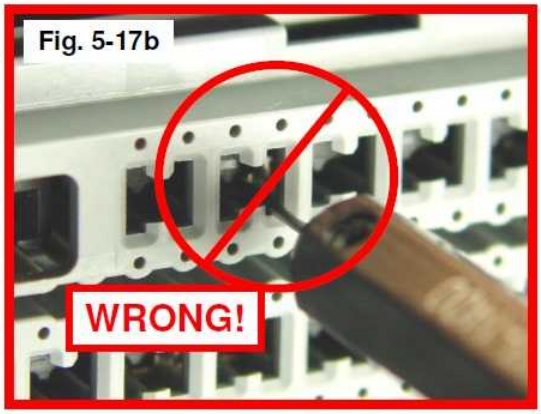
- Fig. 5-17a shows proper insertion of the service tool. Avoid inserting the service tool into the terminal opening (Fig. 5-17b) as this may damage the terminal.

Fig. 5-17a



Proper Insertion

Fig. 5-17b

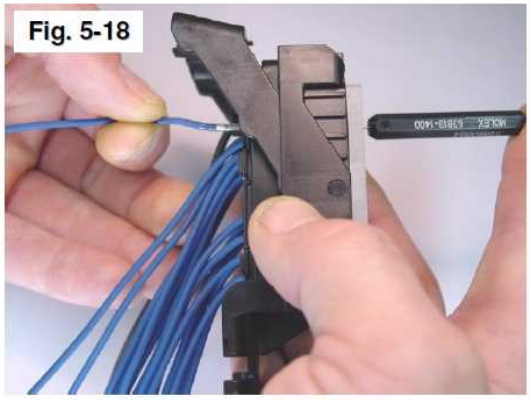


Incorrect Insertion

MX64 Receptacle Terminal Removal (continued)

- Once the terminal lock finger has been disengaged, transfer middle finger and thumb to connector housing, while maintaining index finger pressure on the tool. Pull on the wire to remove the terminal (Fig. 5-18). If the terminal resists, the service tool may not be fully engaged. Repeat the servicing instructions, starting at page 33.
- Do not use excessive force. Excessive force can damage the lock finger. Do not apply any lateral force. The lock finger is displaced by linear insertion alone.

Fig. 5-18

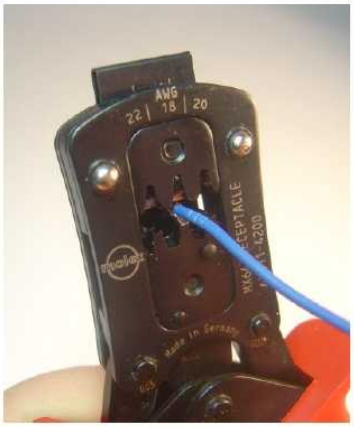


Terminal Crimping

- If the 0.64mm receptacle terminal needs to be replaced, a new one can be hand crimped using GM Crimp Tool #XX019825 or Molex Crimp Tool #63811-4200.

1.) Identify the wire gauge you need to crimp. Notice the rectangular shape of the terminal cavity.

2.) Insert the correct terminal and press the wire-stop down.



3.) Insert the wire until the wire hits the wire stop. Squeeze the handles through the last "click" until they release.

Terminal Crimping (continued)

- Contact Molex for terminal sales drawings. Hand crimp instructions, strip length recommendations, and crimp height requirements are available in the Molex Spec. Sheet for Tool #63811-4200.
- If the Yazaki 2.80mm receptacle terminal needs to be replaced, a new one can be hand crimped with the appropriate cable seal using crimp tools #J-38125-6 and #J-38125-7. These tools can be ordered from SPX Kent-Moore (1-800-345-2233).

Universal Pinout, Infinity-8/10/12

Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C1-1	LowsideSwitch_4_Out	Lowside switch, 4A max, NO internal flyback diode. No pullup	Normally used as A/C Relay Control output.
C1-2	LowsideSwitch_5_Out	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "LowSide Assignment Tables" for output assignment and 2D table "LS5_Duty [%]" for activation.
C1-3	LowsideSwitch_6_Out	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard Page "LowSide Assignment Tables" for output assignment and 2D table "LS6_Duty [%]" for activation.
C1-4	UEGO 1 Heat_Out	Bosch UEGO controller	Lowside switch for UEGO heater control. Connect to pin 4 of Bosch UEGO sensor. NOTE that pin 3 of the Sensor is heater (+) and must be power by a fused/switched 12V supply.
C1-5	UEGO 1 IA_In		Trim Current signal. Connect to pin 2 of Bosch UEGO sensor
C1-6	UEGO 1 IP_In		Pumping Current signal. Connect to pin 6 of Bosch UEGO sensor
C1-7	UEGO 1 UN_In		Nernst Voltage signal. Connect to pin 1 of Bosch UEGO sensor
C1-8	UEGO 1 VM_In		Virtual Ground signal. Connect to pin 5 of Bosch UEGO sensor.
C1-9	Flash_Enable_In	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.
C1-10	+12V_R8C_CPU_In	Dedicated power management CPU	Full time battery power. MUST be powered before the ignition switch input is triggered (See C1-65).
C1-11	Coil 4_Out	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.
C1-12	Coil 3_Out	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.

Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C1-13	Coil 2_Out	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.
C1-14	Coil 1_Out	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 6_Out	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 5_Out	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	LowsideSwitch_2_Out	Lowside switch, 4A max, NO internal flyback diode. No pullup	See Setup Wizard Pages "User GPOs" for activation criteria and "LowSide Assignment Tables" for output assignment
C1-18	LowsideSwitch_3_Out	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	Normally used as MIL output. 'See Wizard page "LowSide Assignment Tables" for output assignment.
C1-19	AGND_1_Out	Dedicated analog ground	Analog 0-5V sensor ground
C1-20	AGND_1_Out	Dedicated analog ground	Analog 0-5V sensor ground
C1-21	Crankshaft Position Sensor Hall_In	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-22	Camshaft Position Sensor 1 Hall_In	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-23	Digital_In_2	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-24	Digital_In_3	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Turbo Speed for calibration constant.

Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C1-25	Digital_In_4	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Vehicle Speed for calibration constant.
C1-26	Digital_In_5	10K pullup to 12V. Will work with ground or floating switches.	See channel FlexDigitalIn [Hz] for raw frequency input data.
C1-27	Knock Sensor 1_In	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-28	Knock Sensor 2_In	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-29	+12V_Relay_Control_Out	0.7A max ground sink for external relay control	Will activate at key on and at key off according to the configuration settings.
C1-30	Power Ground_In	Power Ground	Connect directly to battery ground
C1-31	CANL_A_Out	Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-32	CANH_A_Out	Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-33	LowsideSwitch_1_Out	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	See Setup Wizard page Boost Control for options. Monitor BoostControl [%] channel for output state.
C1-34	LowsideSwitch_0_Out	Lowside switch, 4A max, NO internal flyback diode. No pullup	Switched ground. Will prime for 2 seconds at key on and activate if RPM > 0.
C1-35	Analog_In_7	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 Set Throttle Range page for automatic min/max calibration.
C1-36	Analog_In_8	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 Set Manifold Pressure page for setup and calibration.

Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C1-37	Analog_In_9	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 Fuel Pressure page for setup and calibration.
C1-38	Analog_In_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 the Setup Wizard Barometric Pressure page for setup and calibration.
C1-39	Analog_In_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. Normally used as Shift Switch input.
C1-40	Analog_In_12	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. Normally used as Mode Switch input.
C1-41	+5V_Out_1	Regulated, fused +5V supply for sensor power	Analog sensor power
C1-42	+5V_Out_1	Regulated, fused +5V supply for sensor power	Analog sensor power
C1-43	HighsideSwitch_1_Out	0.7A max, High Side Solid State Relay	See Setup Wizard page 'HighSide Assigment Tables' for configuration options.
C1-44	HighsideSwitch_0_Out	0.7A max, High Side Solid State Relay	See Setup Wizard page 'HighSide Assigment Tables' for configuration options.
C1-45	Crankshaft Position Sensor VR+_In	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-46	Crankshaft Position Sensor VR-_In		See Setup Wizard page Cam/Crank for options.
C1-47	Camshaft Position Sensor 1 VR-_In	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-48	Camshaft Position Sensor 1 VR+_In		See Setup Wizard page Cam/Crank for options.

Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C1-49	VR+_In_2	Differential Variable Reluctance Zero Cross Detection	See Non Driven Wheel Speed Calibration in the Setup Wizard Vehicle Speed page.
C1-50	VR-_In_2		
C1-51	VR-_In_3	Differential Variable Reluctance Zero Cross Detection	See Driven Wheel Speed Calibration in the Setup Wizard Vehicle Speed page.
C1-52	VR+_In_3		
C1-53	DBW1 Motor -_Out	5.0A max Throttle Control Hbridge Drive	+12V to close.
C1-54	DBW1 Motor +_Out	5.0A max Throttle Control Hbridge Drive	+12V to open.
C1-55	Power Ground_In	Power Ground	Connect directly to battery ground
C1-56	Injector 6_Out	Saturated or peak and hold, 3A max continuous	Injector 6
C1-57	Injector 5_Out	Saturated or peak and hold, 3A max continuous	Injector 5
C1-58	Injector 4_Out	Saturated or peak and hold, 3A max continuous	Injector 4
C1-59	Injector 3_Out	Saturated or peak and hold, 3A max continuous	Injector 3
C1-60	Power Ground_In	Power Ground	Connect directly to battery ground
C1-61	+12V_In	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-29 above.
C1-62	Injector 2_Out	Saturated or peak and hold, 3A max continuous	Injector 2
C1-63	Injector 1_Out	Saturated or peak and hold, 3A max continuous	Injector 1
C1-64	+12V_In	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal pin C1-29 above.
C1-65	+12V_SW_In	10K pulldown	Full time battery power must be available at C1-10 before this input is triggered.
C1-66	Analog_In_Temp_1	12 bit A/D, 2.49K pullup to 5V	See "Coolant Temperature" Setup Wizard for selection.

Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C1-67	Analog_In_Temp_2	12 bit A/D, 2.49K pullup to 5V	See "Air Temperature" Setup Wizard for selection.
C1-68	Analog_In_Temp_3	12 bit A/D, 2.49K pullup to 5V	Normally used for Oil Temp input.
C1-69	Stepper_2A_Out	Automotive, Programmable Stepper Driver, up to 28V and ±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.
C1-70	Stepper_1A_Out	Automotive, Programmable Stepper Driver, up to 28V and ±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.
C1-71	Stepper_2B_Out	Automotive, Programmable Stepper Driver, up to 28V and ±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.
C1-72	Stepper_1B	Automotive, Programmable Stepper Driver, up to 28V and ±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.
C1-73	Power Ground_In	Power Ground	Connect directly to battery ground
C2-1	DBW2 Motor +_Out	5.0A max Throttle Control Hbridge Drive	+12V to open.
C2-2	DBW2 Motor -_Out	5.0A max Throttle Control Hbridge Drive	+12V to close.
C2-3	Power Ground_In	Power Ground	Connect directly to battery ground
C2-4	Injector 7_Out	Saturated or peak and hold, 3A max continuous	Injector 7
C2-5	Injector 8_Out	Saturated or peak and hold, 3A max continuous	Injector 8
C2-6	Injector 9_Out	Saturated or peak and hold, 3A max continuous	Injector 9.
C2-7	Injector 10_Out	Saturated or peak and hold, 3A max continuous	Injector 10.
C2-8	Power Ground_In	Power Ground	Connect directly to battery ground.
C2-9	+12V_In	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-29 above.
C2-10	Injector 11_Out	Saturated or peak and hold, 3A max continuous	Not used

Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C2-11	Injector 12_Out	Saturated or peak and hold, 3A max continuous	Not used
C2-12	Analog_In_17	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. Normally used as A/C Analog Request input.
C2-13	Analog_In_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. Normally used as DBW APP1.
C2-14	Analog_In_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. Normally used as DBW APP2.
C2-15	Analog_In_Temp_4	12 bit A/D, 2.49K pullup to 5V	Normally used as Charge Out Temperature input.
C2-16	Analog_In_Temp_5	12 bit A/D, 2.49K pullup to 5V	Normally used as Airbox Temperature input.
C2-17	Analog_In_Temp_6	12 bit A/D, 2.49K pullup to 5V	Normally used as Fuel Temperature input.
C2-18	Analog_In_13	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 Oil Pressure page for setup options. See OilPressure [psig] for channel data.
C2-19	Analog_In_14	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.

Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C2-20	Analog_In_15	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. Normally used as Exhaust Back Pressure input.
C2-21	Analog_In_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. Normally used as DBW1_TPSB input.
C2-22	+5V_Out_2	Regulated, fused +5V supply for sensor power	Analog sensor power
C2-23	+5V_Out_2	Regulated, fused +5V supply for sensor power	Analog sensor power
C2-24	+5V_Out_2	Regulated, fused +5V supply for sensor power	Analog sensor power
C2-25	VR+_In_5	Differential Variable Reluctance Zero Cross Detection	See Driven Wheel Speed Calibration in the Setup Wizard Vehicle Speed page.
C2-26	VR-_In_5		
C2-27	VR-_In_4	Differential Variable Reluctance Zero Cross Detection	See Non Driven Wheel Speed Calibration in the Setup Wizard Vehicle Speed page.
C2-28	VR+_In_4		
C2-29	LowsideSwitch_9_Out	Lowside switch, 4A max with internal flyback diode, 2.2K 12V pullup. Inductive load should NOT have full time power. 12V pullup	See Setup Wizard page Tacho for configuration options.
C2-30	AGND_2_Out	Dedicated analog ground	Analog 0-5V sensor ground
C2-31	AGND_2_Out	Dedicated analog ground	Analog 0-5V sensor ground

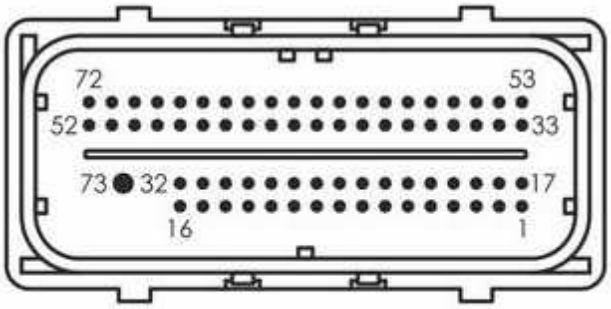
Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C2-32	AGND_2_Out	Dedicated analog ground	Analog 0-5V sensor ground
C2-33	Analog_In_20	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.
C2-34	Analog_In_21	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. Normally used as 3 Step Enable Switch input.
C2-35	Analog_In_22	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. Normally used as USB Logging Request input.
C2-36	Analog_In_23	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. Normally used as Charge Out Pressure input.
C2-37	Digital_In_6	No pullup. Will work with TTL signals.	Input can be assigned to different pins. See Setup Wizard page Input Function Assignments for input mapping options.
C2-38	Digital_In_7	No pullup. Will work with TTL signals.	See ClutchSwitch 1-axis table for setup options. Input can be assigned to different pins. See Setup Wizard page Input Function Assignments for input mapping options.
C2-39	Power Ground_In	Power Ground	Connect directly to battery ground
C2-40	Power Ground_In	Power Ground	Connect directly to battery ground
C2-41	CanH_B_Out	Dedicated High Speed CAN Transceiver	Not used
C2-42	CanL_B_Out	Dedicated High Speed CAN Transceiver	Not used

Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C2-43	LowsideSwitch_8_Out	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power. 12V pullup	Activates if any of the following flags are true: OilPressProtectOut, LeanProtectOut, CoolantProtect. Output can be assigned to other functions. See Setup Wizard page LowSide Assignment Tables for additional options.
C2-44	LowsideSwitch_7_Out	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power. No pullup	Normally used as Spare GPO1 output.
C2-45	UEGO 2 VM_In	Bosch UEGO Controller	Virtual Ground signal. Connect to pin 5 of Bosch UEGO sensor.
C2-46	UEGO 2 UN_In		Nernst Voltage signal. Connect to pin 1 of Bosch UEGO sensor
C2-47	UEGO 2 IP_In		Pumping Current signal. Connect to pin 6 of Bosch UEGO sensor
C2-48	UEGO 2 IA_In		Trim Current signal. Connect to pin 2 of Bosch UEGO sensor
C2-49	UEGO 2 HEAT_Out		Lowside switch for UEGO heater control. Connect to pin 4 of Bosch UEGO sensor. NOTE that pin 3 of the Sensor is heater (+) and must be power by a fused/switched 12V supply.
C2-50	+12V_R8C_CPU_In	Dedicated power management CPU	Full time battery power. MUST be powered before the ignition switch input is triggered (See C1-65).
C2-51	Coil 7_Out	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.
C2-52	Coil 8_Out	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.
C2-53	Coil 9_Out	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.
C2-54	Coil 10_Out	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.

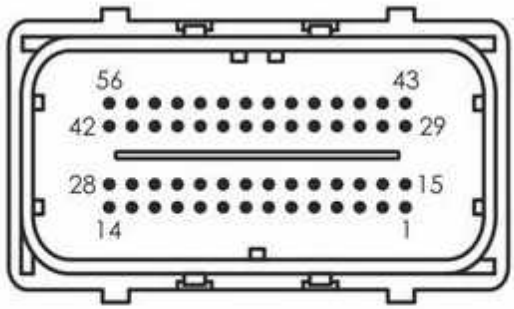
Infinity Pin	Hrdwr Ref.	Hardware Specification	Notes
C2-55	Highside Fuel Pump Switch_Out	Highside switch, 0.7A max, Solid State Relay, NO internal flyback diode.	+12V High Side Drive. Will prime for 2 seconds at key on and activate if RPM > 0.
C2-56	Not used	Not used	Not used

Connector Views

Infinity-8/10/12 ECU Connectors

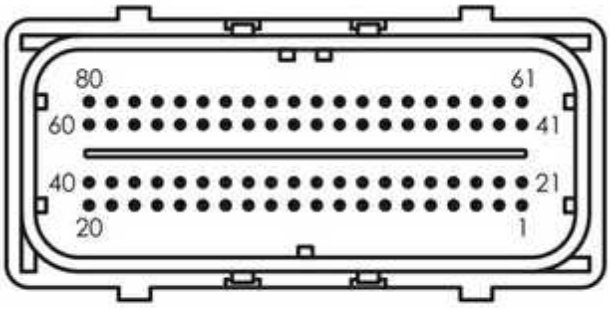


INFINITY "C1" 73 PIN



INFINITY "C2" 56 PIN

Infinity-6/8h ECU Connector



INFINITY "C1" 80 PIN

Example System Schematics

Custom wiring harness projects should only be undertaken by experienced harness builders. If in doubt, please contact AEM for recommendations.

For users wishing to build their own wiring harnesses from scratch, the following kits are available to help.

30-3701 Infinity-8/10/12 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.

30-3702 Infinity-8/10/12 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-8/10/12 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.

30-3704 Infinity-6/8h Plug & Pin Kit
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.

30-3805 Universal modular V8 harness system for Infinity-8/10 systems
The Infinity Universal Modular 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 modular V8 harness system for Infinity-6/8h systems
The Infinity Universal Modular 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.

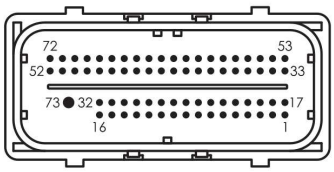
30-3705 Universal Mini Harness for Infinity-6/8h systems
This harness is intended to be used as a starting point by experienced harness builders. It saves time by including basic power distribution features that can be expanded to suit many application requirements. It allows the harness builder to populate the ECU connector with only the features needed by the application.

The following schematics show examples for wiring a basic Infinity system. Examples are included for both Infinity-6/8h and Infinity-8/10/12 hardware platforms. ***The power, ground and accessory relay sections of the following schematics must be strictly followed to avoid***

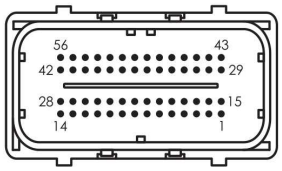
inconsistent power sequencing and possible ECU damage.

Power Distribution, Infinity-8/10/12

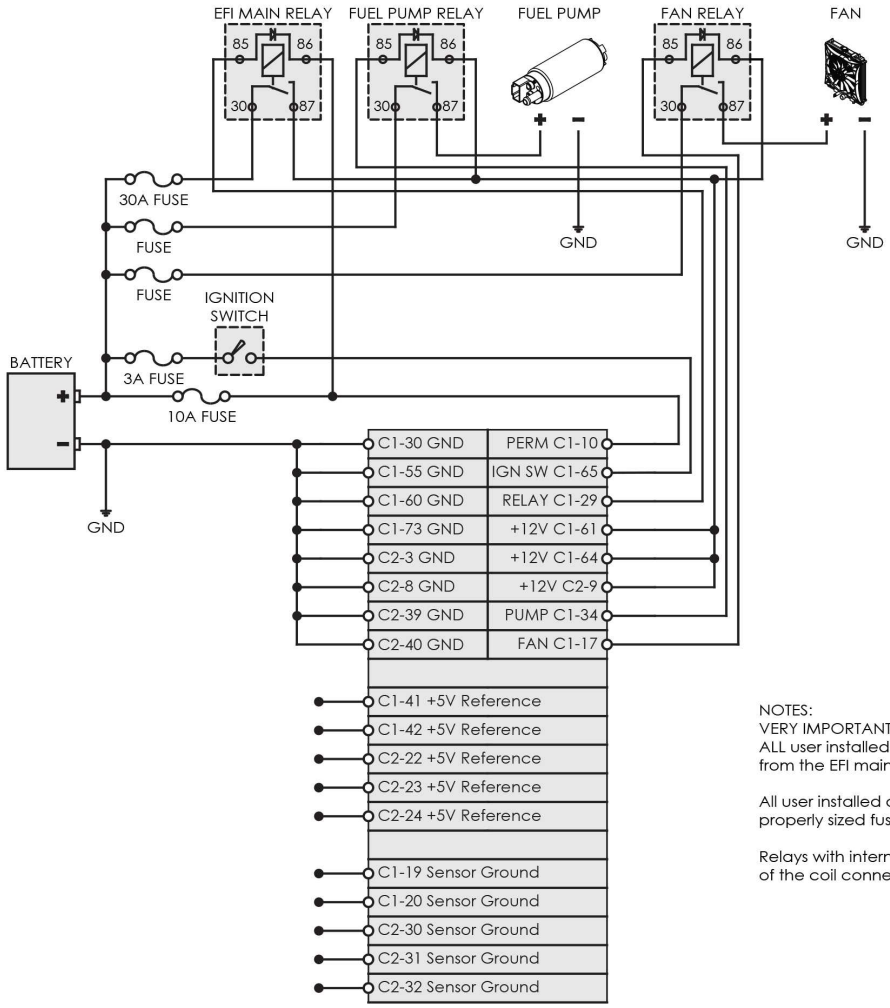
NAME	FUNCTION
GND	Battery ground
PERM	Fused connection to battery positive terminal (+12V, always hot)
IGN SW	Fused connection to vehicle ignition switch (+12V in RUN/CRANK only)
RELAY	Switched ground from ECU connected to relay coil primary negative
+12V	Relay driven +12V power source for ECU power and auxiliary outputs
+5V Reference	+5V supplied by ECU
Sensor Ground	Analog ground used as ground point for sensors



INFINITY "C1" 73 PIN



INFINITY "C2" 56 PIN



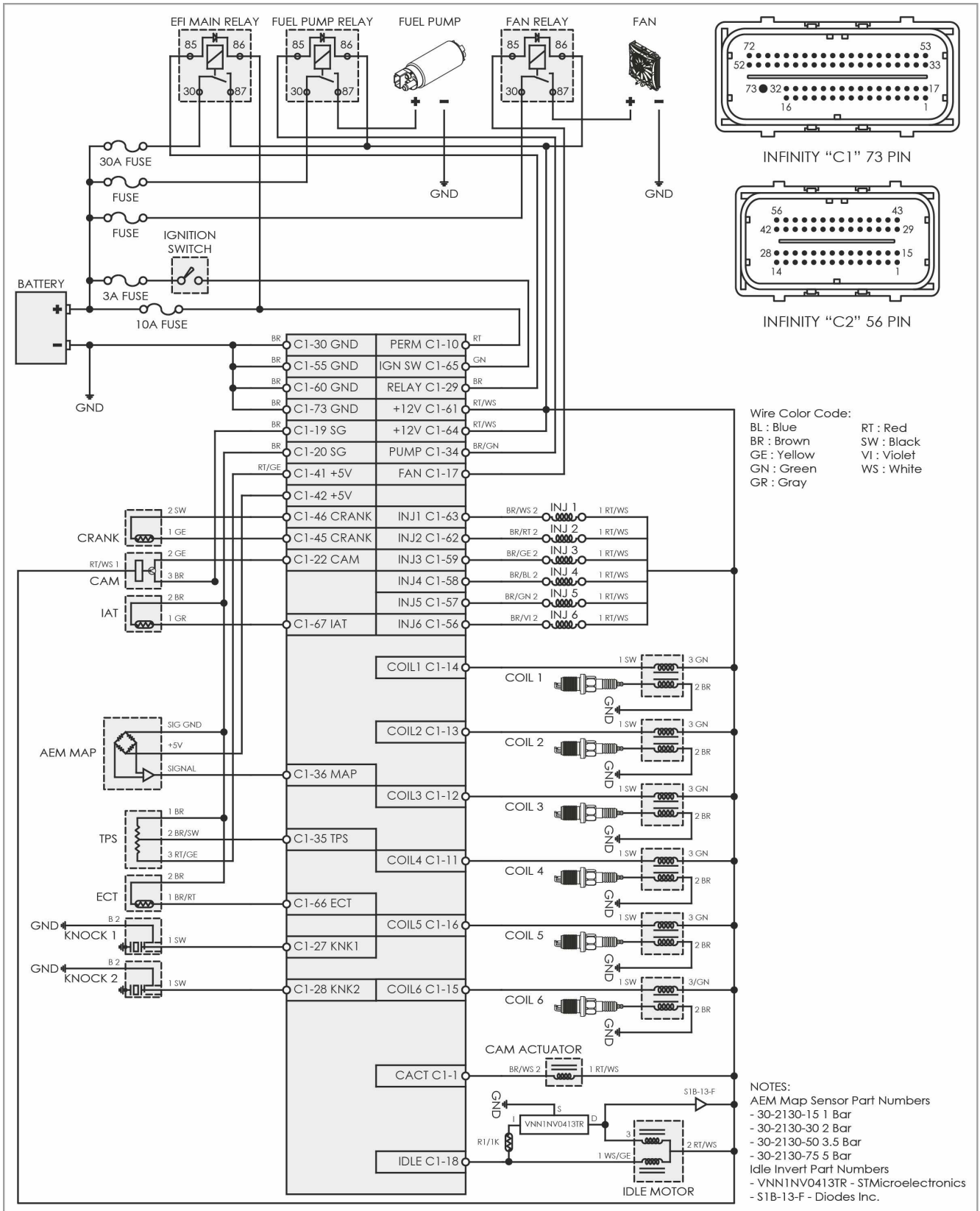
NOTES:
VERY IMPORTANT
ALL user installed auziliary relays must be powered by the output from the EFI main relay.

All user installed auxiliary circuits should be protected with a properly sized fuse as shown.

Relays with internal diodes must have the anode side of the coil connected to the ECU.

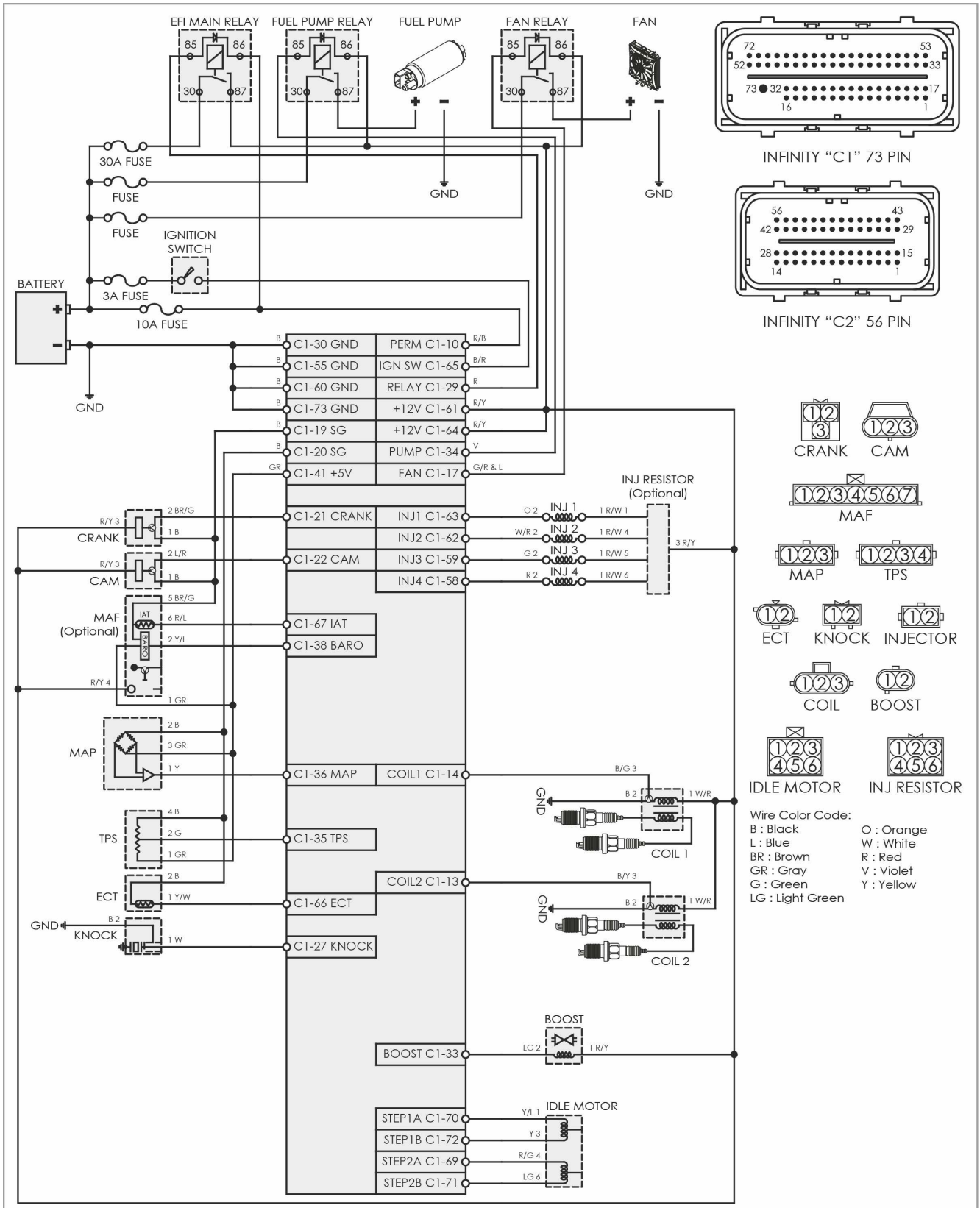
INFINITY AEM	Drawing: Power Distribution			
	ECU: Infinity-8/10/12	Date: 08/05/2014	Rev: A	Engineer: Nakano

95 BMW E36 M3, Infinity-8/10/12



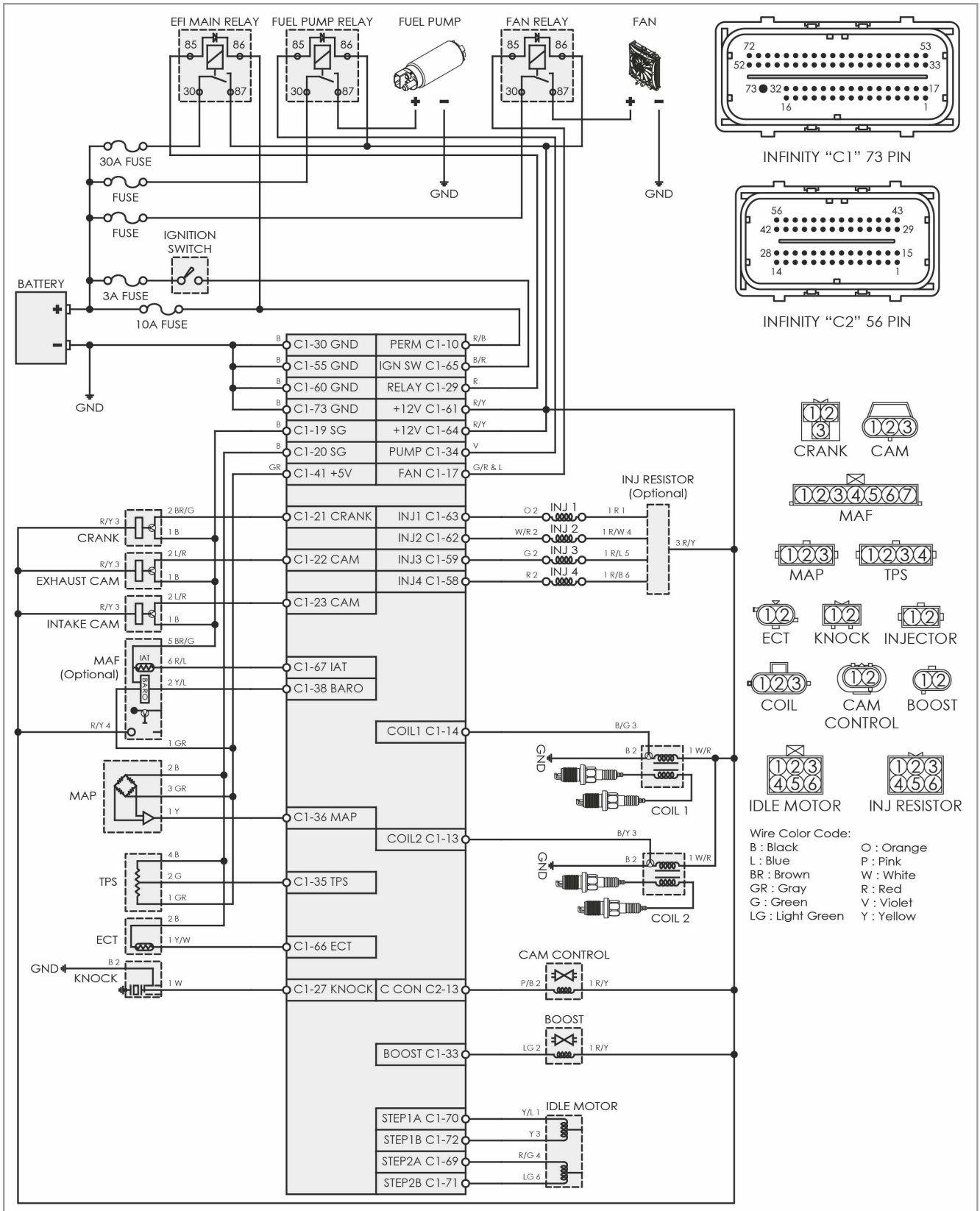
INFINITY AEM	Drawing: 1995 BMW M3 E36 M50			
	ECU: Infinity-8/10/12	Date: 02/20/2014	Rev: A	Engineer: Nakano

EVO VIII, Infinity-8/10/12



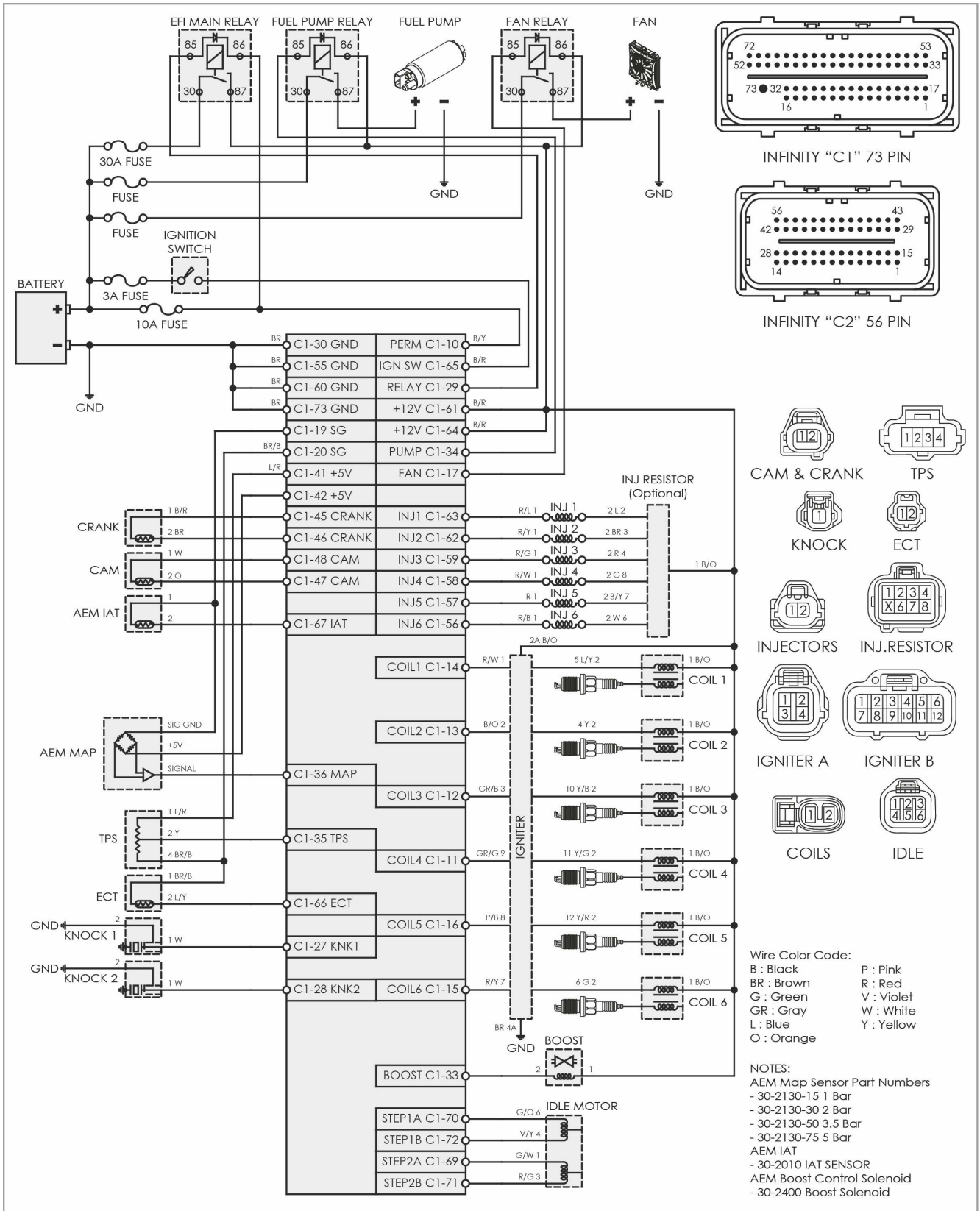
INFINITY AEM	Drawing: 2003-05 Mitsubishi EVO VIII			
	ECU: Infinity-8/10/12	Date: 02/19/2014	Rev: A	Engineer: Nakano

EVO IX Pinout, Infinity-8/10/12



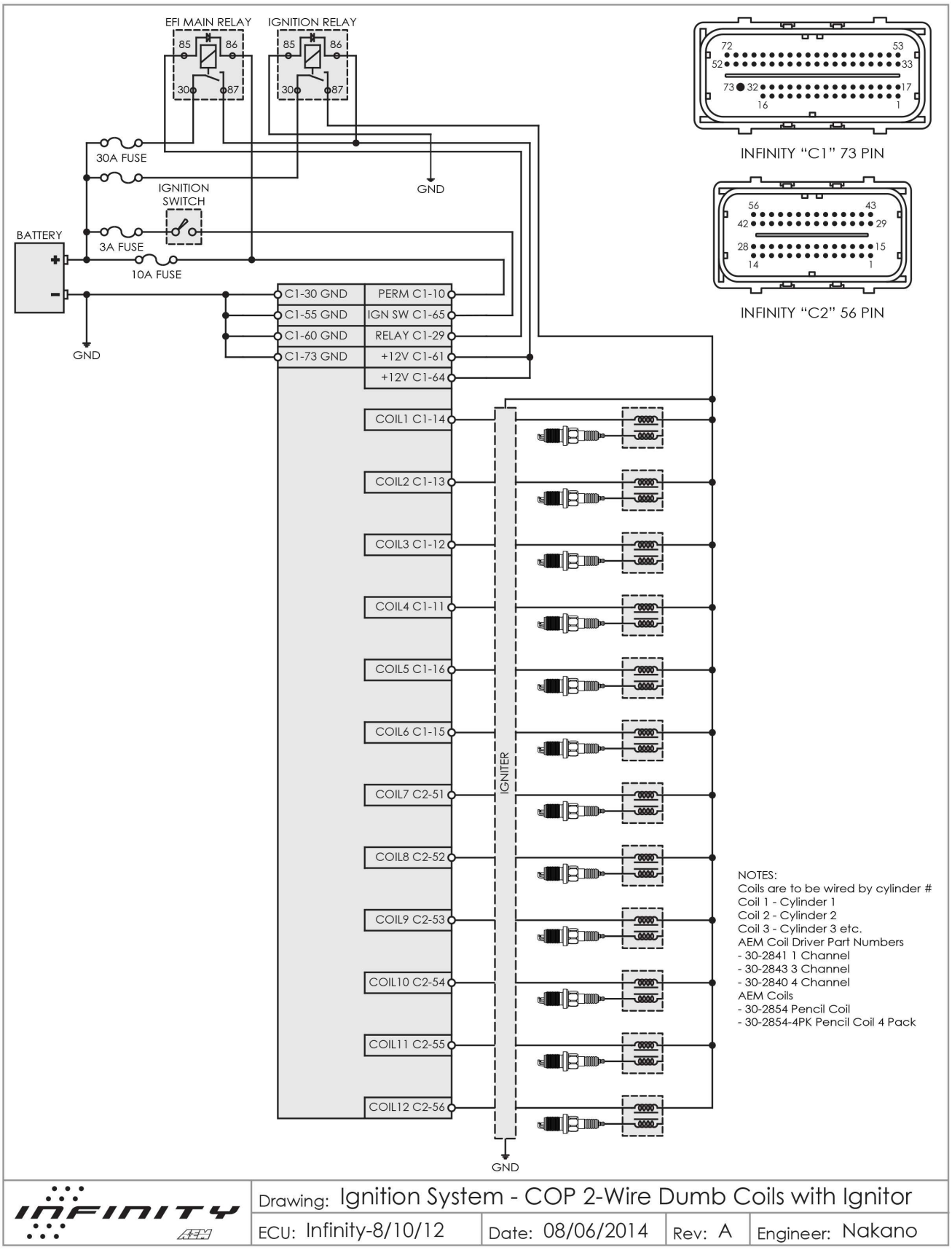
INFINITY AEM	Drawing: 2006 Mitsubishi EVO IX			
	ECU: Infinity-8/10/12	Date: 02/20/2014	Rev: A	Engineer: Nakano

93–98 Toyota Supra 2JZGTE, Infinity-8/10/12



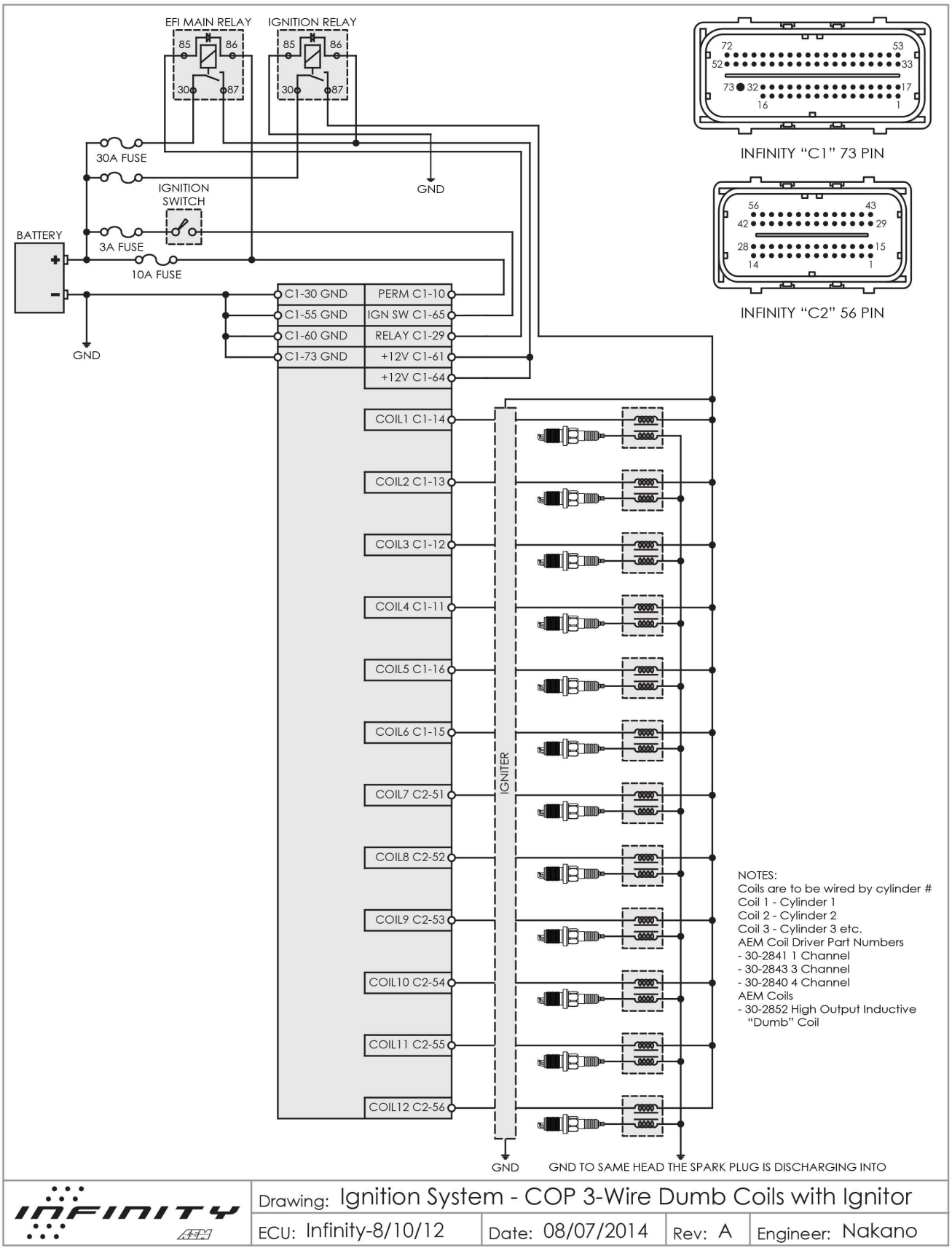
INFINITY AEM	Drawing: 1993-98 Toyota Supra 2JZGTE			
	ECU: Infinity-8/10/12	Date: 02/24/2014	Rev: A	Engineer: Nakano

Ignition System – COP 2 Wire "Dumb" Coils with Ignitor, Infinity-8/10/12



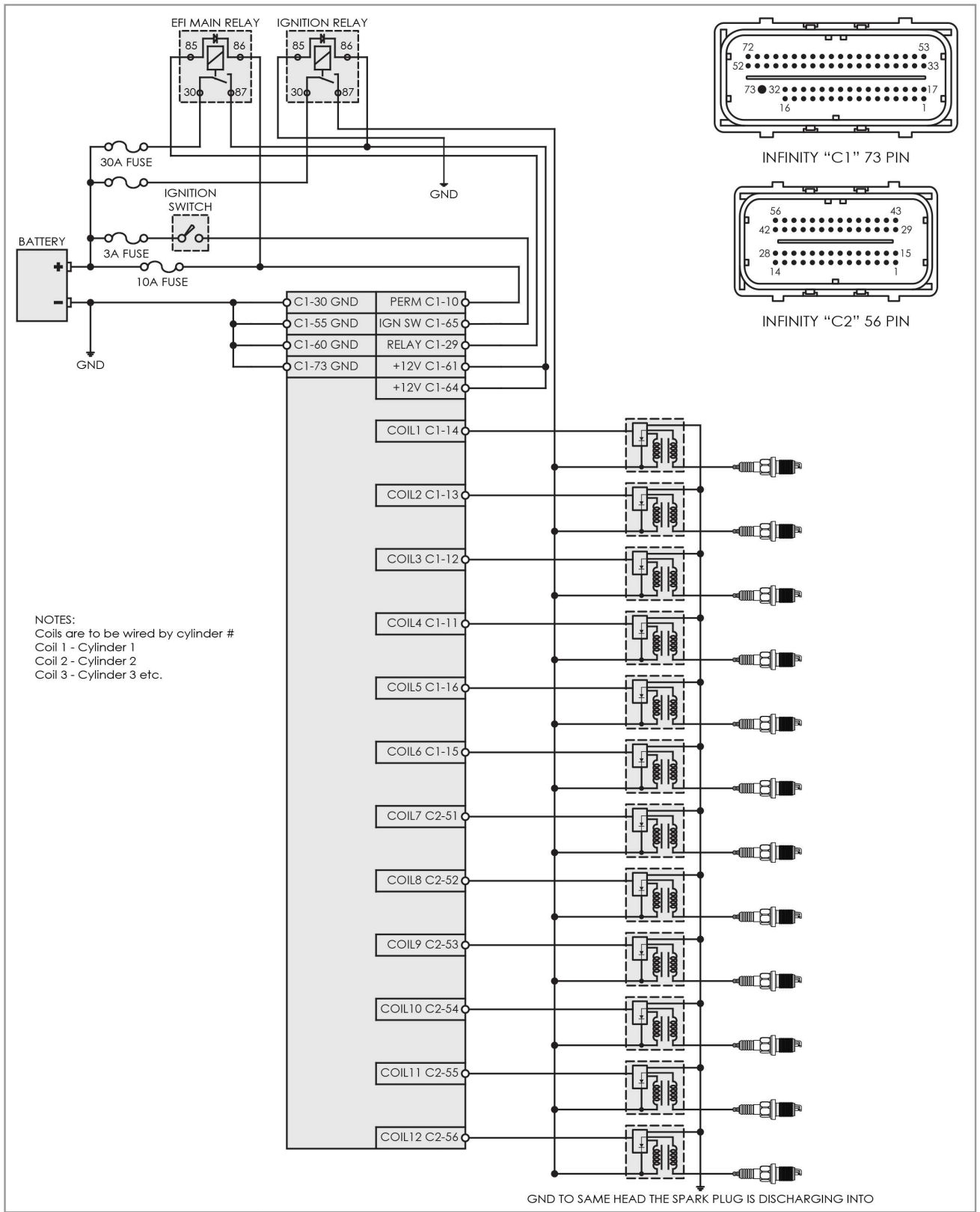
INFINITY AEM	Drawing: Ignition System - COP 2-Wire Dumb Coils with Ignitor			
	ECU: Infinity-8/10/12	Date: 08/06/2014	Rev: A	Engineer: Nakano

Ignition System – COP 3 Wire "Dumb" Coils with Ignitor, Infinity-8/10/12



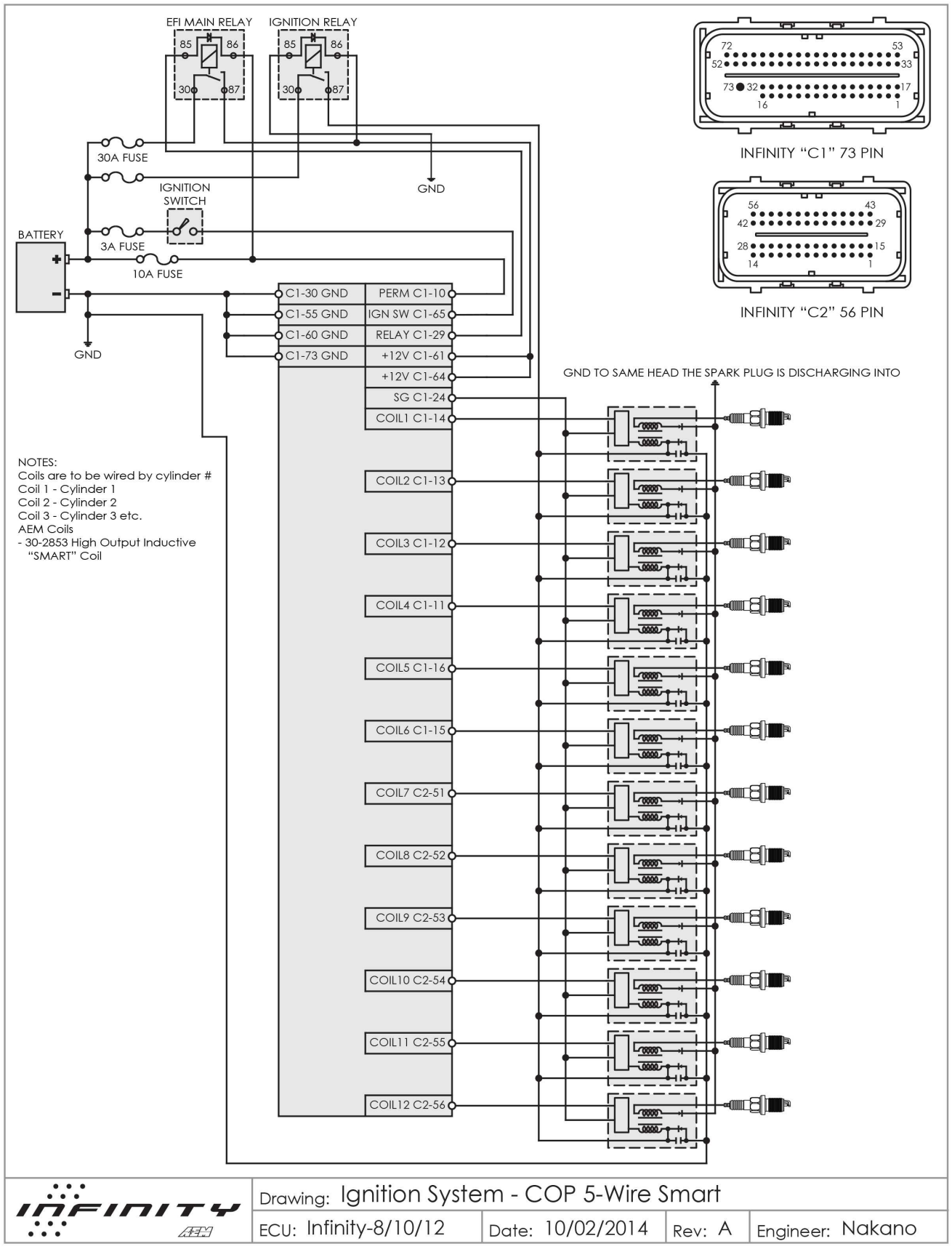
INFINITY AEM	Drawing: Ignition System - COP 3-Wire Dumb Coils with Ignitor			
	ECU: Infinity-8/10/12	Date: 08/07/2014	Rev: A	Engineer: Nakano

Ignition System – COP 3 Wire "Smart" Coils, Infinity-8/10/12



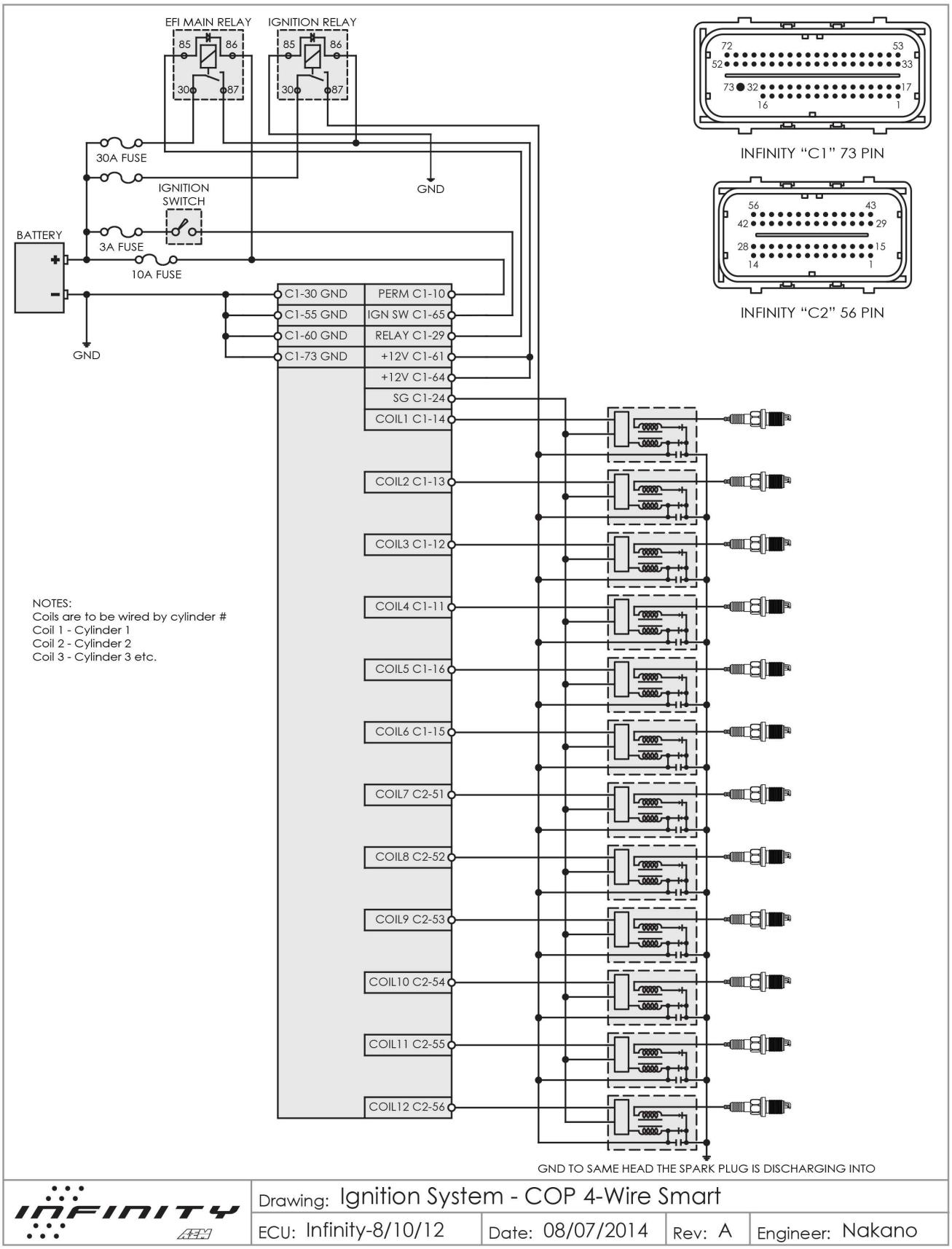
INFINITY AEM	Drawing: Ignition System - COP 3-Wire Smart			
	ECU: Infinity-8/10/12	Date: 08/06/2014	Rev: A	Engineer: Nakano

Ignition System – COP 5 Wire "Smart" Coils, Infinity-8/10/12



INFINITY AEM	Drawing: Ignition System - COP 5-Wire Smart			
	ECU: Infinity-8/10/12	Date: 10/02/2014	Rev: A	Engineer: Nakano

Ignition System – COP 4 Wire "Smart" Coils, Infinity-8/10/12



INFINITY AEM	Drawing: Ignition System - COP 4-Wire Smart			
	ECU: Infinity-8/10/12	Date: 08/07/2014	Rev: A	Engineer: Nakano

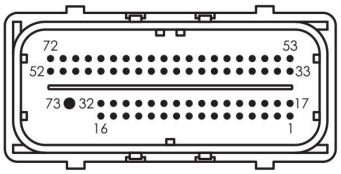
GM LS3 DBW Wiring, Infinity-8/10/12

ACCELERATOR PEDAL POSITION (APP) SENSOR

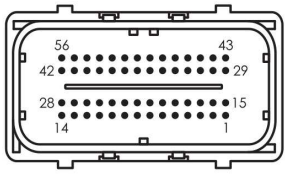
GM PIN	INFINITY PIN	WIRE COLOR	FUNCTION
A	C1-19	Purple	Sensor Ground
B	C2-14	Light Blue	Accelerator Pedal Position (APP) Sensor 2 Signal
C	C1-42	Tan	+5 Volt Reference
D	C1-20	Brown	Sensor Ground
E	C2-13	Dark Blue	Accelerator Pedal Position (APP) Sensor 1 Signal
F	C2-22	White/Black	+5 Volt Reference

THROTTLE BODY

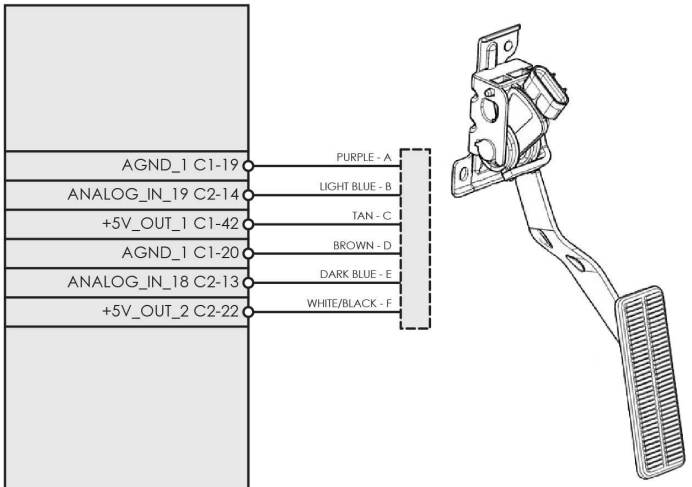
GM PIN	INFINITY PIN	WIRE COLOR	FUNCTION
A	C1-53	Brown	Throttle Acuator Control (TAC) Motor Control - 2
B	C1-54	Yellow	Throttle Acuator Control (TAC) Motor Control - 1
C	C2-30	Tan/White	Sensor Ground
D	C1-35	Dark Green	Throttle Position Sensor 1 Signal
E	C2-23	Light Blue/Black	+5 Volt Reference
F	C2-21	Purple	Throttle Position Sensor 2 Signal

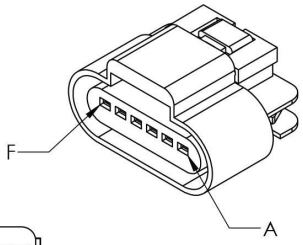


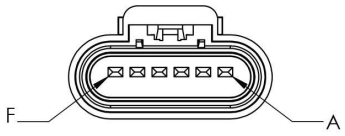
INFINITY "C1" 73 PIN



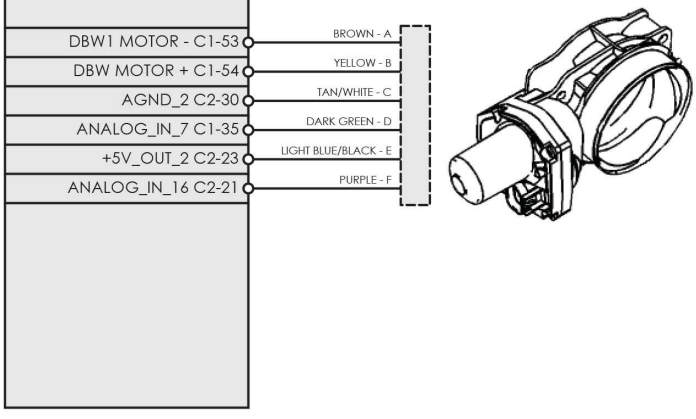
INFINITY "C2" 56 PIN

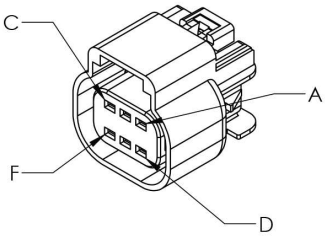


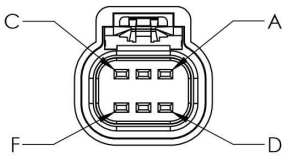




ACCELERATOR PEDAL POSITION (APP) SENSOR







THROTTLE BODY

INFINITY AEM	Drawing: GM LS3 ACCELERATOR PEDAL & DBW THROTTLE BODY			
	ECU: Infinity-8/10/12	Date: 08/04/2014	Rev: A	Engineer: Nakano