ACCEL DFI ENGINE MANAGEMENT SYSTEMS

INSTALLATION INSTRUCTIONS

DIGITAL NITROUS PROCESSOR
PART NO. 74186

TABLE OF CONTENTS **PAGE**

INTRODUCTION

Congratulations on the purchase of your new Accel Digital Nitrous Master Mind Processor. With over 20 years in designing and producing state of the art EFI & Ignition systems, we are confident that this NO2 Mastermind will be a great addition to your car. It is designed with you, the end user, in mind to make it easy for you to program and use.

State of the Art Technology: This system uses the latest available technology to offer unparalleled accuracy, repeatability, and reliability.

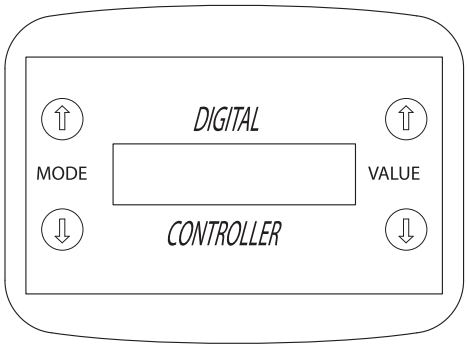
Easy to Read LCD Display with Touch Button Programming: Included with the Digital Nitrous Processor is a user friendly interface that provides quick and accurate programming of Nitrous system directly from the driver's seat.

Data Memory: There is no need to re-program the controller after the battery is disconnected. All data is stored in flash memory and will be retained with no power applied to the controller.

NO2/Fuel Solenoids Outputs: The Processor provides separate NO2/Fuel Solenoid outputs. This allows you to have total control over the flow time of the fuel solenoid.

(PROGRAM THE NO2/FUEL OFFSET TO GIVE THE FUEL A CHANCE TO START FLOWING BEFORE THE NO2 HITS, THUS AVOIDING A BACK FIRE.)

HANDHELD PROGRAMMER QUICK MENU FLOW



- Engine RPM
- NO2 Delivery
- 100% ON
  - NO2 Start RPM ↔ 1000 - 12700
- RPM Control
  - NO2 Start RPM ↔ 1000 - 12700
  - NO2 Start % ↔ 5 - 90%
  - 100% RPM ↔ 1000 - 12700
- Time Control
  - NO2 Start RPM ↔ 1000 - 12700
  - NO2 Start % ↔ 5 - 90%
  - Launch Time ↔ 1 - 20 Seconds
- RPM & Time
  - NO2 Start RPM ↔ 1000 - 12700
  - NO2 Start % ↔ 5 - 90%
  - Launch Time ↔ 1 - 20 Seconds
  - 100% RPM ↔ 1000 - 12700

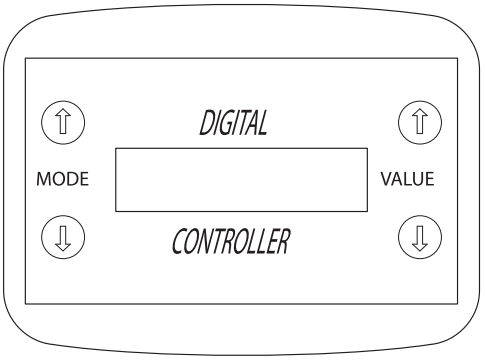
- NO2 Delay ↔ 1 - 20 Seconds
- H/S Retard ↔ 0 - 25 Deg
- RPM Switch ↔ 1000 - 12700
- Main RPM Limit ↔ 1000 - 12700
- AUX RPM Limit ↔ 1000 - 12700
- Safety RPM Limit ↔ 1000 - 12700
- PWM Frequency ↔ 5 - 30 Hz
- Trigger Volts ↔ 0 - 20v
- Number of CyL ↔ 4 - 5 - 6 - 8 - 10 -12
- Fuel NO2 Offset ↔ 1 - 64 Ms

HANDHELD CONTROLLER INSTRUCTIONS

The controller has a 9-pin DSUB socket which plugs into the end panel. It does not need to be plugged in for the ignition to run, only to change the settings.

The control "modes' are listed below. To set the modes, plug the controller in and turn on the ignition. After a brief pause, the controller display will light up. Use the "MODE" keys to select the desired mode, and then use the up/down "VALUE" keys on the right side to change the values.

Once you have finished with your settings, you can either turn the power off and unplug the controller, or just leave it plugged in.



PROGRAMMING USING HANDHELD PROGRAMMER

Display	Range/Resolution	Explanation
Engine RPM NO2/Status	**10 RPM**	Actual Engine RPM and NO2 Status
NO2 Delivery		Four choices of No2 Delivery. 1st 100% On (No time or RPM PWM) 2nd RPM Control 3rd Time Control 4th RPM & Time Control
100% ON		NO2 turns on full with any pulse width modulations on the programmed thresholds are met.
NO2 Settings Start RPM	**1000-12700 RPM/100 RPM**	RPM where the nitrous system starts working. Lowering the value until the display says "OFF" disables this function.
RPM Control	**1000-12700 RPM/100 RPM**	The software linearly increases the duty cycle percentage as a function of RPM between the two (N2O Start and N2O 100%) values. This RPM setting should be 1000 RPM above the activation RPM. ***NOTE:*** Regardless of the nitrous settings, the nitrous system is shut off 300 RPM before the main RPM limiter**.**
Time Control	**.0 to 20.0 seconds/ .1 second increments**	Launch time modulates the pulse width as a function of time. This is useful when traction becomes a problem. Once the arming and triggering conditions are met, the launch timer modulates the solenoids to help with tire spin. For example: If Launch time is set at 5 seconds and when the NO2 activates, the pulsing of the solenoids will increase as the time set decreases. (.1second 1% Flow 5 second 100% Flow)
RPM & Time Control	**1000-12700/ .1 – 20 Seconds**	This mode is useful for a car with a loose converter or a weak clutch. It prevents the user from driving through the converter with the NO2 full on. It allows the user to have complete control over ramping the power in, so that when the NO2 is at 100%, the full power of the Nitrous hit is well past the converter RPM threshold. (Example of this is on page 18)

PROGRAMMING USING HANDHELD PROGRAMMER CONT'D

Display	Range/Resolution	Explanation
NO2 Delay	**0 – 20 Seconds**	The delay timer is used to delay the nitrous system from engaging once the arming and triggering thresholds are met. For example: if the system is armed (12v on the arming input) and the Micro Switch/TPS and RPM input thresholds are met, the system will wait for the amount shown in Delay Time before activating the nitrous system. This delay only occurs after the initial start of the process. If the Micro Switch/TPS voltage falls below the set threshold, the nitrous will shut off, but if it goes back above the set threshold, the nitrous will start again immediately, with no delay. The arming input is the reset for this function.
NO2/High Speed Timing Retard	**0 – 25 Deg in 1 deg increments**	This is the ignition retard setting that is used when the NO2 is activated. Timing is pulled out to avoid detonation that can cause engine failure. This feature offers a High Speed Retard that can also be used to pull timing out when NO2 is disabled. By applying 12V+ to Pin C Yellow Wire on the 8 pin connector, the processor will retard the timing by amount set.
RPM Switch	**1000-12700 RPM/100 RPM**	When the set RPM is reached, the output wire will be pulled to ground (5 amps max) PIN G Orange Wire. When the RPM drops 500 below the RPM switch setting, the switch will be shut off. This prevents "chattering" when the RPM is not stable. **(Can be used to trigger a shift light, secondary fuel pump, Data acquisition system, etc.)**
Main RPM Limit	**1000-12700 RPM/100 RPM**	This is a fast-acting pulse-by-pulse RPM limiter. It does not average the incoming period, so it will be rough when the engine is unloaded, but will control RPM very accurately.
Auxiliary RPM Limit (Two Step)	**1000-12700 RPM/100 RPM**	Activated by applying 12v on the Pin D Green/White wire of the 4 wire connector marked "AUX" input. Same operation as the Main RPM Limit. (Used mainly as a 2 Step).
Safety RPM	**1000-12700**	This is used as a NO2 shutoff RPM set point on deceleration. (Example: If the NO2 Trigger relay or micro switch fails to disengage the NO2 after you are off the throttle, the Safety RPM will shutoff the NO2 once below the set RPM.
PWM frequency	**5 – 30 Hz / 1 Hz steps**	This function is how often per second the solenoids are cycled. Lower numbers are easier on the solenoids, but can result in "shuddering", especially at lower speeds and low duty cycles. Higher PWM frequency is better for smooth delivery, but is much harder on the solenoids. **NOTE:** Accel/DFI is not responsible for solenoid damage.
Trigger Volts	**0 to 20V /.1 volts**	After arming the system, this is used as a "start" input from a Micro switch – Push Button or TPS. **NOTE:** If the value is set to zero, the system will start delivering nitrous when the arming input and RPM setting is reached. (We recommend that you use a Micro switch with this system)
Number Of Cyl Selection	**4, 5,6,8,10,12 Cyl.**	Pick the number of cylinders for your application.
Fuel/N2O offset	**1 to 64 Ms / 1 Ms**	This is the amount of time that the system delays the activation of the N2O solenoid after the fuel solenoid, to give the fuel a chance to start flowing before the nitrous hits, thus avoiding a lean spike.

INSTALLATION

WHAT YOU SHOULD KNOW

Please read these instructions carefully before installing your Digital Nitrous Processor.

Important Tips

- Do not use solid core spark plug wires with this unit. It contains digital electronics and will NOT function correctly with solid core wires.
- Do not install harness or run Points Input / Output wires near spark plug wire or ignition coil. Mount the Processor as far away from secondary ignition components (coil, ignition wires, etc.) as physically possible.
- This unit is not water resistant or water proof, we suggest that it is mounted in the passenger compartment so as not to get wet from rain, car washing or a liquid of any type!
- The Handheld programmer buttons are very delicate and can be damaged by misuse and/or carelessness. Programmers that have been determined to be damaged due to neglect will NOT be covered under warranty.

Safety Tips, Please Read

- It is the responsibility of the purchaser to follow all guidelines and safety procedures supplied with this product and any other manufacturer's product used with this product.
- Follow all recommended safety guidelines from this and other manufacturer's installation guides.
- It is also the responsibility of the purchaser to determine compatibility of this device with the vehicle and other components.
- ACCEL DFI Corporation assumes no responsibility for damages resulting from accident, improper installation, misuse, abuse, improper operation, lack of reasonable care, or all previously stated reasons due to incompatibility with other manufacturer's products.
- ACCEL DFI Corporation assumes no responsibility or liability for damages incurred from the use of products manufactured or sold by Accel DFI Corporation on vehicles used for competition racing.
- ACCEL DFI Corporation neither recommends nor approves the use of its products on vehicles which may be driven on public highways or roads, and assumes no responsibility for damages incurred from such use.
- It is the purchaser's responsibility to check the state and local laws pertaining to the use of Nitrous Oxide for racing applications. ACCEL DFI Corporation does not recommend nor condone the use of its products for illegal street racing.

INSTALLATION OF THIS PRODUCT SIGNIFIES THAT YOU HAVE READ THIS DOCUMENT AND AGREE TO THE TERMS STATED WITHIN.

Due to the technical nature of ACCEL DFI products, we are unable to answer technical questions via the Internet. If you have any questions, Please call the ACCEL DFI Technical Support hotline. Tech Line: 1-248-380-2780 from 8:30 am – 6 pm, Monday-Friday, Eastern Standard Time.

Please fill out and mail your warranty card.

WARRANTY

FACTORY DIRECT LIMITED WARRANTY. ALL ACCEL/DFI PRODUCTS* ARE WARRANTED AGAINST DEFECTS IN MATERIALS OR WORKMANSHIP. ACCEL/DFI LIABILITY UNDER THIS WARRANTY SHALL BE LIMITED TO THE PROMPT REPAIR CORRECTION OR REPLACEMENT OF ANY DEFECTIVE PART OF THE PRODUCT WHICH ACCEL/DFI DETERMINES TO BE NECESSARY. THIS LIMITED WARRANTY IS TO THE ORIGINAL PURCHASER FOR AS LONG AS HE OR SHE OWNS THE VEHICLE ON WHICH THE PRODUCT IS ORIGINALLY INSTALLED, PROVIDING ALL THE INFORMATION REQUESTED IS FURNISHED. YOU MUST RETAIN A COPY OF YOUR ORIGINAL SALES INVOICE OR RECEIPT. WITHOUT PROPER DOCUMENTATION, THIS WARRANTY IS VOID.

RESOLD UNITS ARE NOT COVERED UNDER THIS WARRANTY.

CAUTIONS AND WARNINGS

1. Always follow safety & installation guidelines and precautions when installing this and any other related component.
2. Always remove both battery cables when installing new electrical components and/or wiring.
3. Always use Circuit protection (Fuses) where required.
4. Wire in all your connections with the Processor disconnected.
5. Connect ground wires directly to battery negative terminal or at battery negative cable end.
6. Test system for proper operation after completing installation.

PARTS INCLUDED

1 ACCEL/DFI Digital Nitrous Processor

1 Handheld Programmer

1 Handheld Programmer Cable

1 8-way Processor Control Harness

1 4-way Processor Power Harness

1 Magnetic Pickup Harness

1 NO2 Solenoid Harness

RECOMMENDED PARTS NOT SUPPLIED

Parts	Part #
1 NO2 Single Stage System	
1 Accel/DFI 6A or PRO 7 CD Ignition Box	DFI 6A 75606 - DFI Pro 7 75609
1 Accel DFI "E" Core or Pro 7 Coil	DFI "E" Core 75607 - DFI Pro 7 75608
1 Micro Switch	
1 Lighted Toggle Switch	
1 Firewall Rubber Grommet (To keep wires from chafing on metal edge)	

INSTALLATION – HOW TO

Start by locating a spot in the passenger compartment (Recommended) to mount the NO2 Processor. Keep it away from any moisture spots and from any area where it can be damaged by the passengers. DO NOT install it in an area where it can get very hot, the internal components require good ventilation.

1. Mount Processor
2. Drill hole through fire wall (Check Grommet Center OD for correct drill size) directly behind engine. Install rubber grommet. (Keep hole away from exhaust headers)
3. Pull harness through fire wall, (Do Not Plug Harness in processor at This Time).
4. Run the wires to their components in the engine compartment, (Example: NO2 Solenoid Wires, 6A CD Box, Battery + -, MAG Trigger.)
5. Using wire chart on page 8 and figure 1 through 9 on pages 09 -17, hook up processor to vehicle components.
6. After all wiring and installations are done; plug all connectors together at the Processor.

SINGLE STAGE INPUT/OUTPUT DIAGRAM FOR ACCEL/DFI DIGITAL NO2 PROCESSOR

NO2 Acc. Harness		
8 Pin Connector	**Wire Color**	
Pin A = RPM input (Points)	White	Trigger Signal Input
Pin B = NOT Used		
Pin C = High Speed Retard	Yellow	Requires 12V+ Input
Pin D = Spark Trigger RPM Out	DK Blue	To CD Box (Accel/DFI 6A)
Pin E = NO2 Enable (0-20 Volt+)	Gray	To Micro Switch or TPS
Pin F = Sensor Return (TPS)	Gray/Red	To TPS Sensor Return
Pin G = RPM Switch Out (Ground)	Orange	Example: Shift Light ground
Pin H = Master Arm Input 12V+	Blue/Pink	NO2 Arming Switch 12V+
NO2 Power Harness		
4 Pin Connector		
Pin A = Ignition 12 Volt Batt+	Red	To + 12 Battery
Pin B = Ground	Black	To - Battery
Pin C = Tach Output	LT Green	To Tach Input
Pin D = AUX RPM Input 12V+	Green/White	To trans brake +12 button
NO2 MAG Pickup Harness		
2 Pin Connector		
Pin 1 = MAG + Pickup	Purple	Distributor IPU +
Pin 2 = MAG – Pickup	Green	Distributor IPU -
NO2 Stage 1		
2 Pin Black Connector	**(Note: 25 AMPS MAX Rating per Solenoid)**	
Pin A = Stage 1 Fuel Out (Ground)	White/Red	To Fuel Solenoid Ground
Pin B = Stage 1 NO2 Out (Ground)	White/Blue	To Nitrous Solenoid Ground

SYSTEM VOLTAGE SPECS

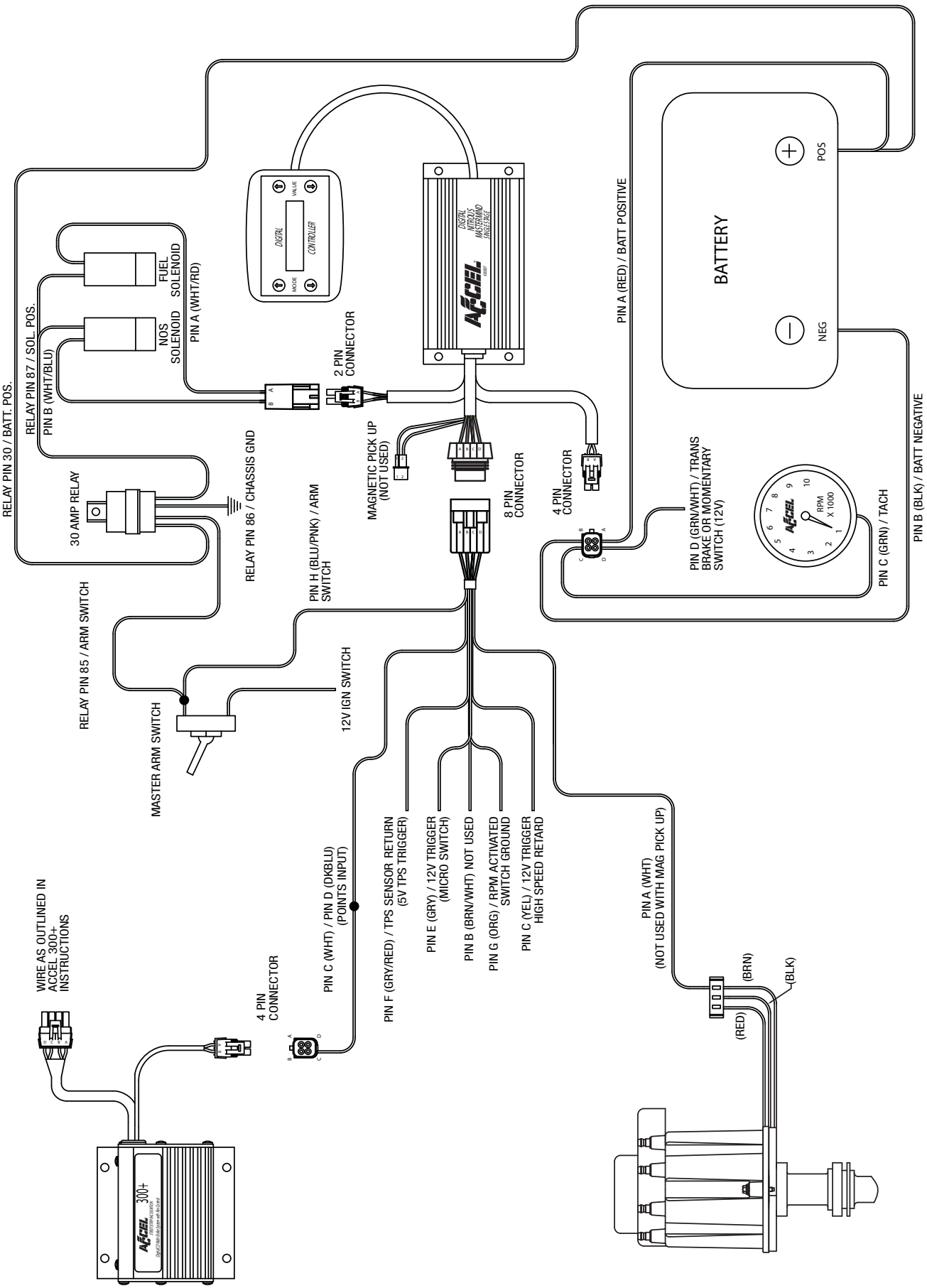
Voltage Operating Range: 12 to 16 Volts

Nitrous Solenoid Grounds: 25 AMPS Maximum for 15 Seconds

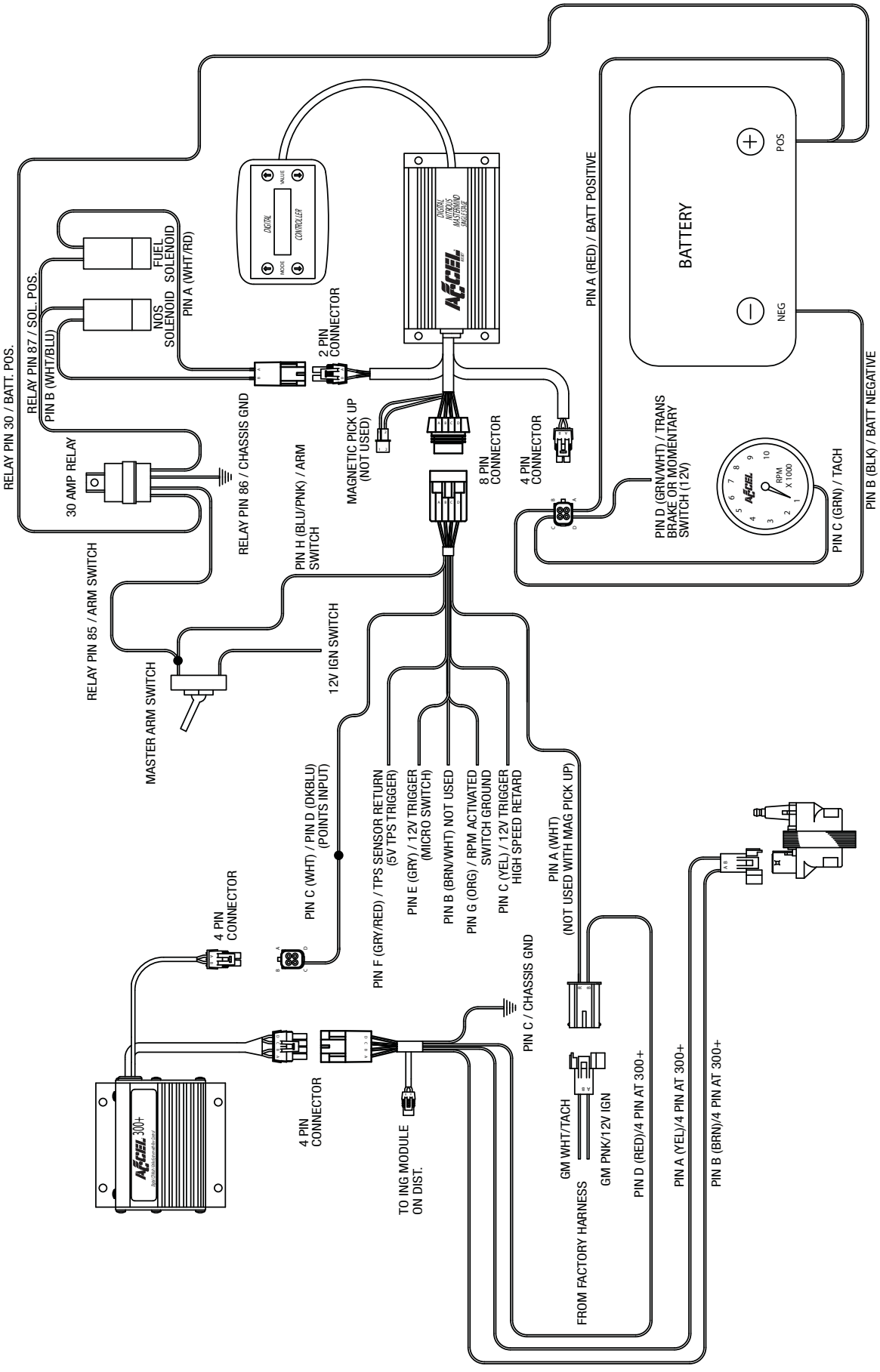
Fuel Solenoid Grounds: 25 AMPS Maximum for 15 Seconds

Systems enable inputs: 12 Volts

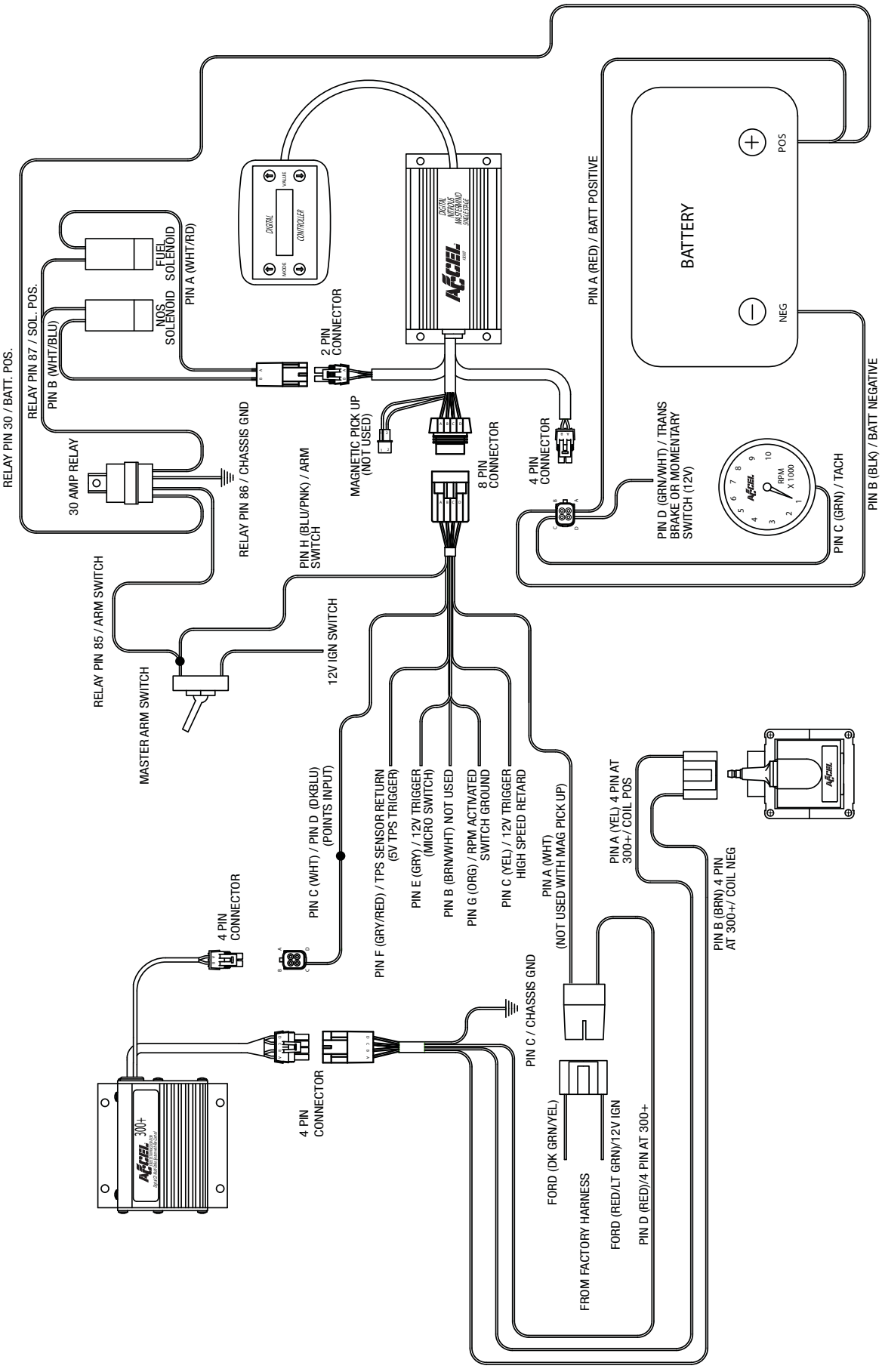
INSTALLATION – WITH HEI IGNITION



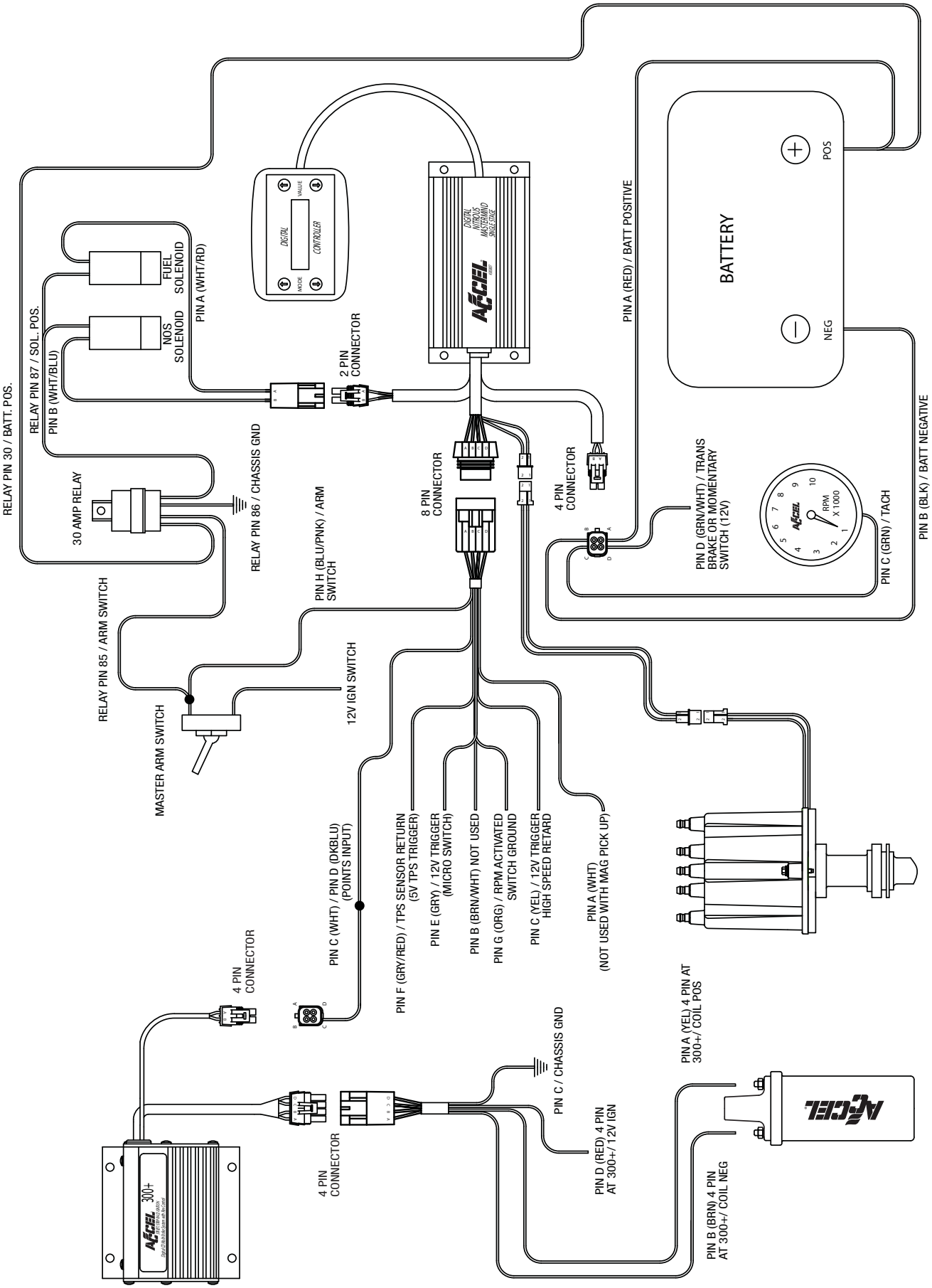
INSTALLATION – WITH L98 & LT1



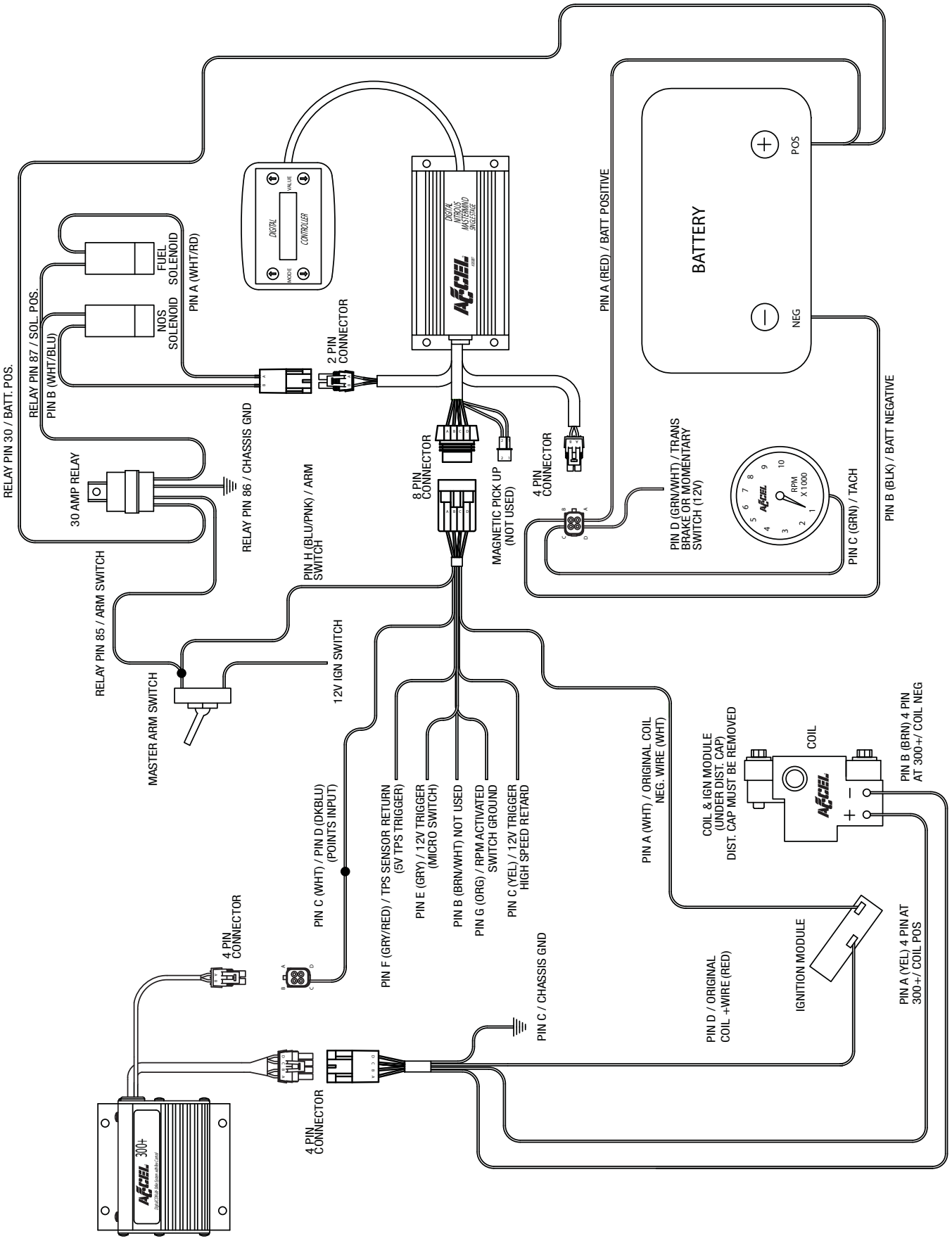
INSTALLATION – WITH FORD TFI



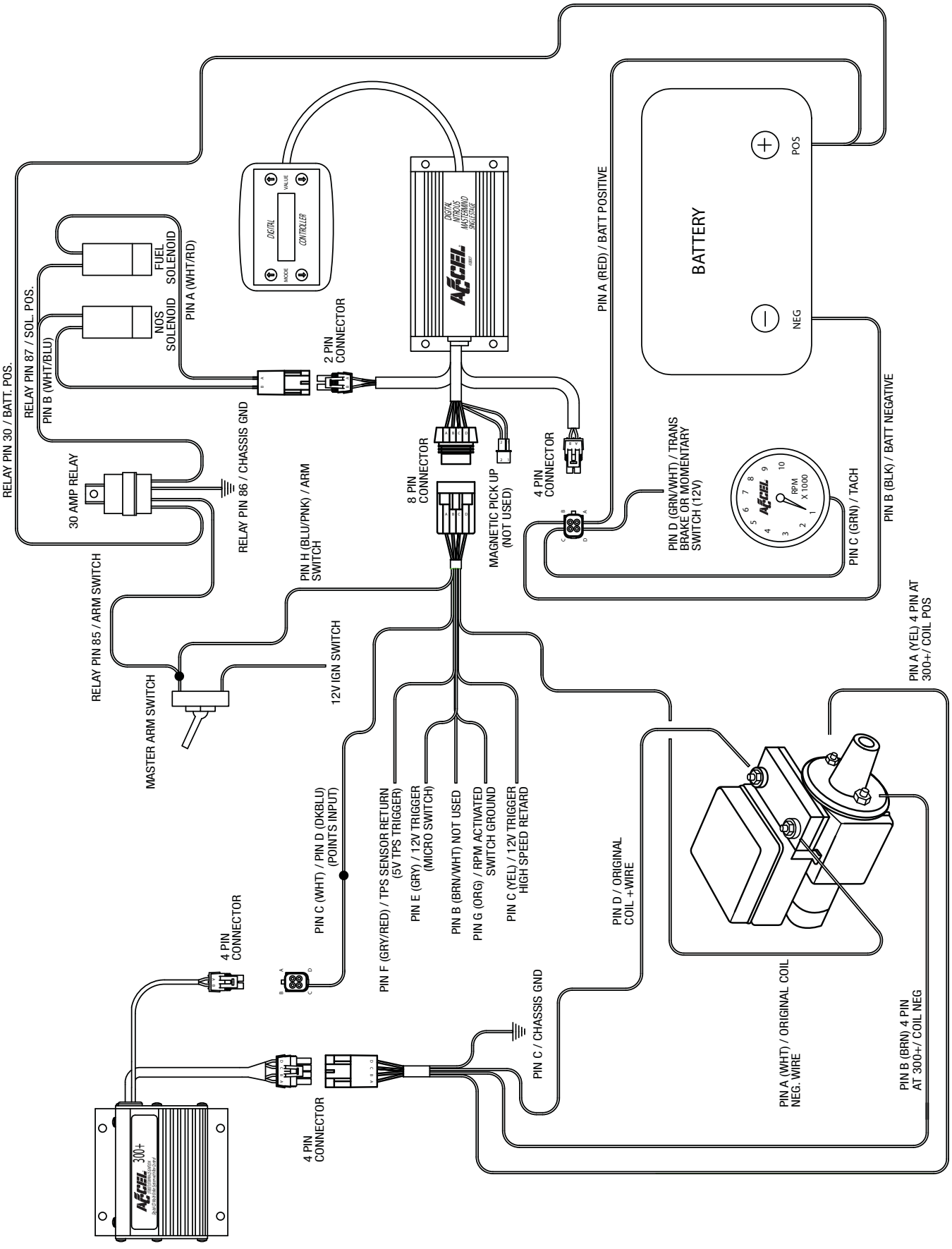
INSTALLATION – WITH IPU IGNITION



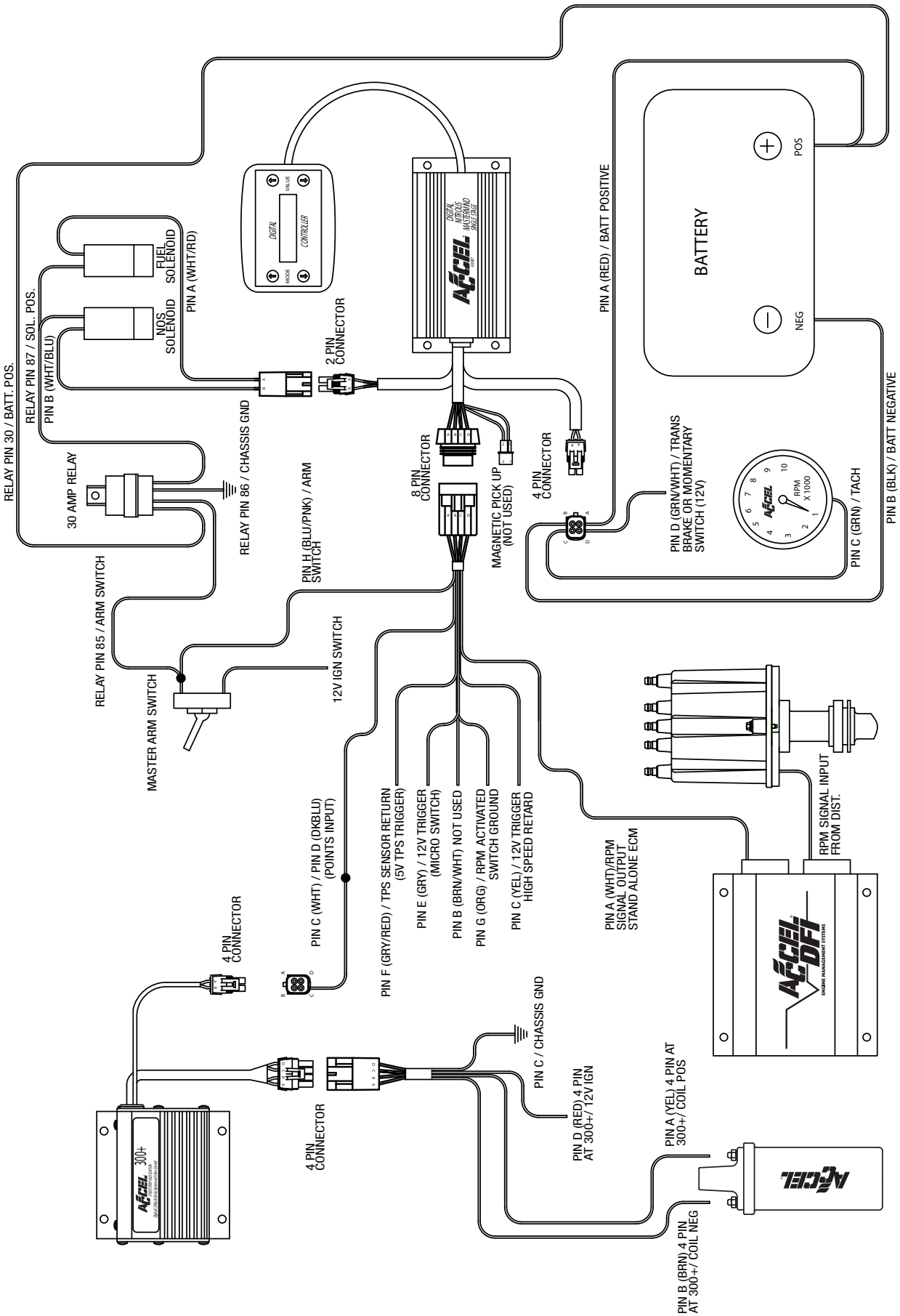
INSTALLATION – WITH HONDA INTERNAL COIL



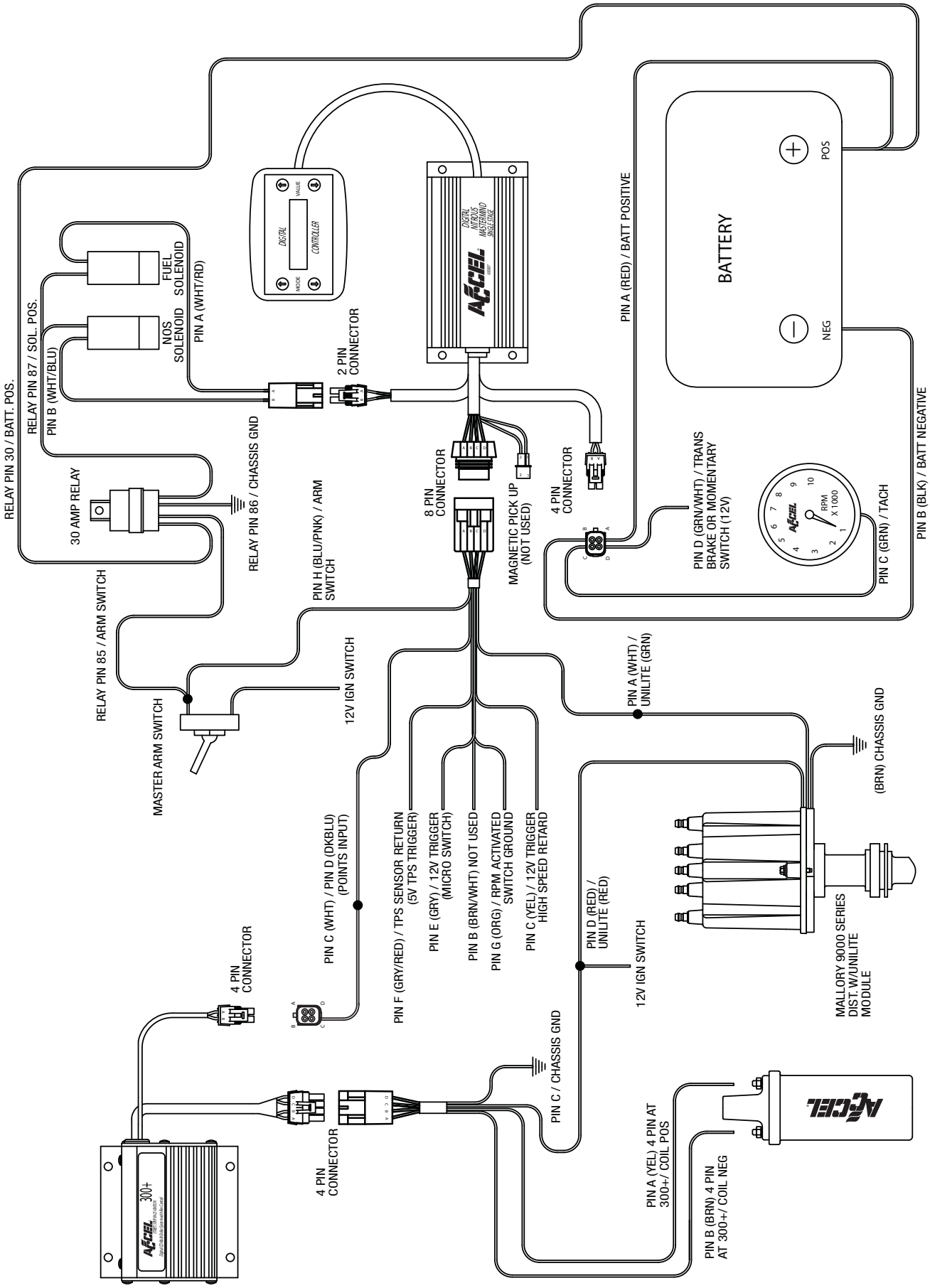
INSTALLATION – WITH UNIVERSAL IMPORT



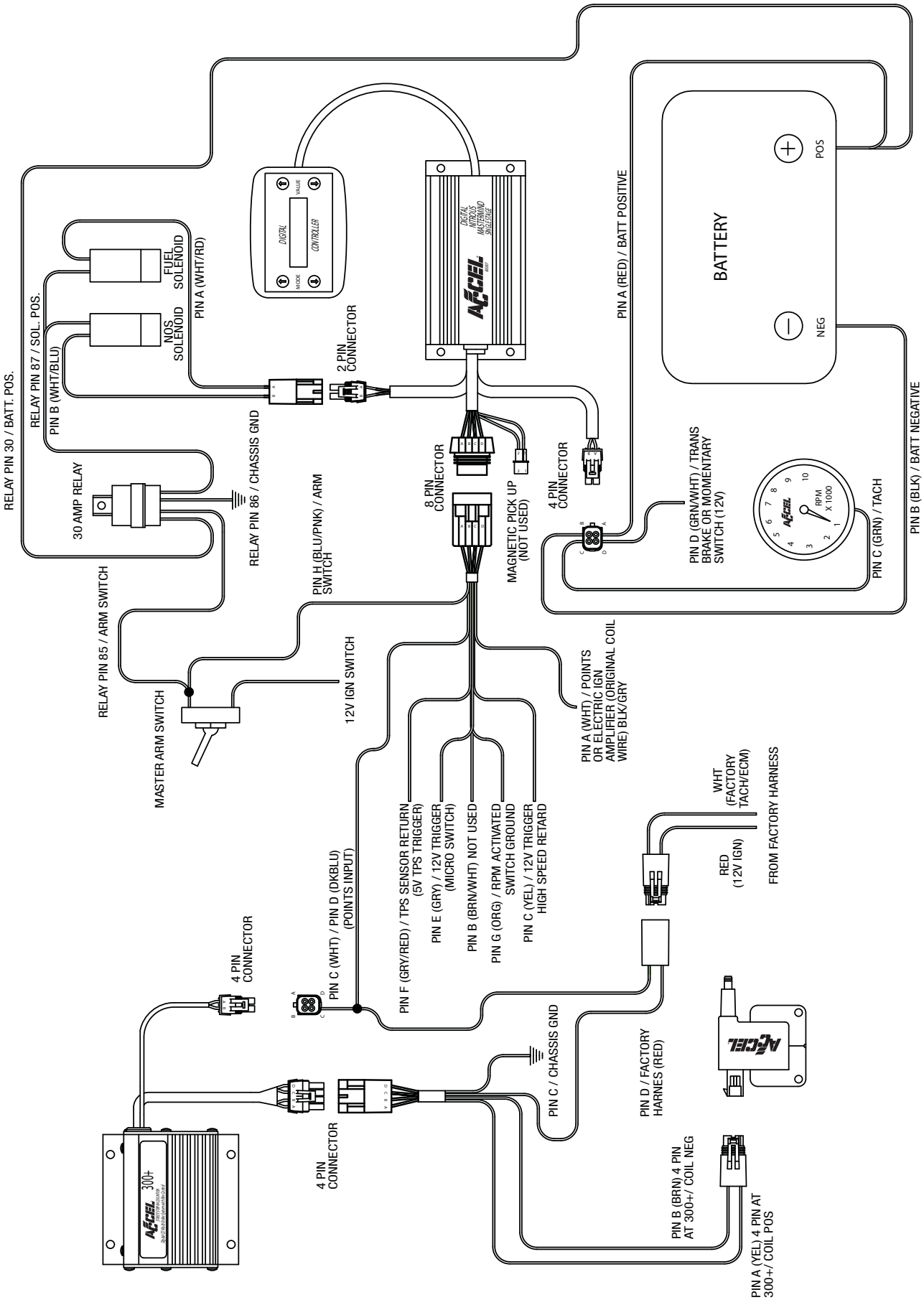
INSTALLATION – WITH AFTERMARKET EFI SYSTEMS



INSTALLATION – WITH MALLORY HALL EFFECT DIST

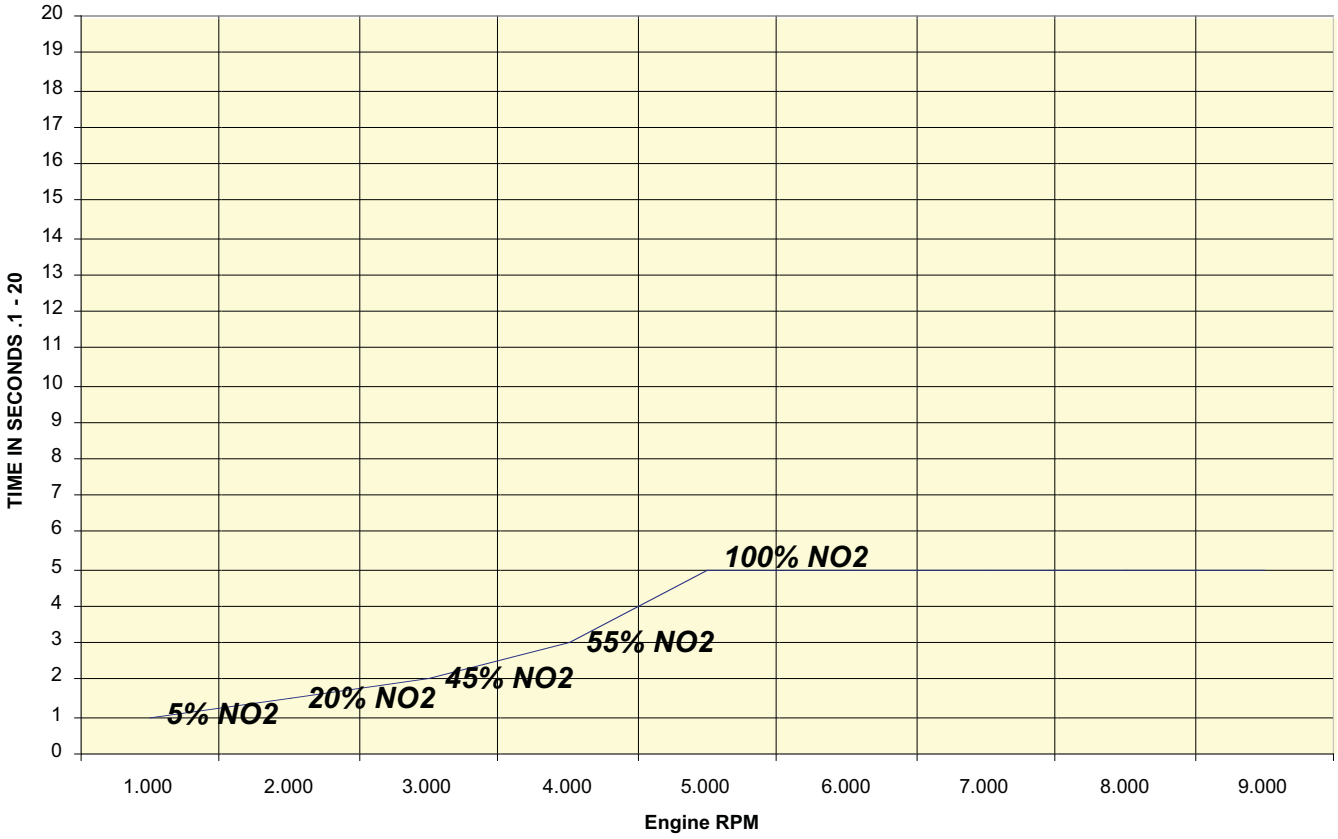


INSTALLATION – WITH DODGE LATE MODEL IGNITION



Example: NO2 RPM/Time Control

(RPM Control Set @ 4000 RPM - Time Control Set @ 5 Seconds)



USING THE NITROUS PROCESSOR

STEP 1: PROGRAM PROCESSOR

A. Turn ignition on, have handheld controller plugged into the Processor.

B. Press top Mode key and NO2 Delivery (RPM & TIME) will appear.

C. Using the top Value key, select from (100% ON –RPM Control – Time Control – RPM & Time Control)

D. After selecting the type of control, use the mode key to go the threshold tables then use the value keys to set your parameters.

E. The next mode is NO2 Delay, use your value key to set or leave at .1 for instant operation.

F. Set NO2 H/S Retard to the amount of degrees you want to pull from timing by using the value keys.

G. Set the RPM Switch to turn on secondary fuel pumps, shift lights, ETC. Use the value keys to input the desired #

H. AUX/Two Step RPM Limit (Use the value keys to set the RPM limit for your Two Step)

I. Safety RPM (Use the value keys to set this RPM as a safety margin to shut the NOS off on deceleration, in case the micro switch sticks in the on position.)

J. PWM Frequency (Refer to page 5 section 7)

K. Trigger Volts, using the value keys, set to 12 if you are using a Micro Switch or Push Button. 2 to 4 volts if you are using a TPS to trigger the NO2.

L. Number of Cylinders; use the value keys to set # of Cylinders (4-5-6-8-10-12)

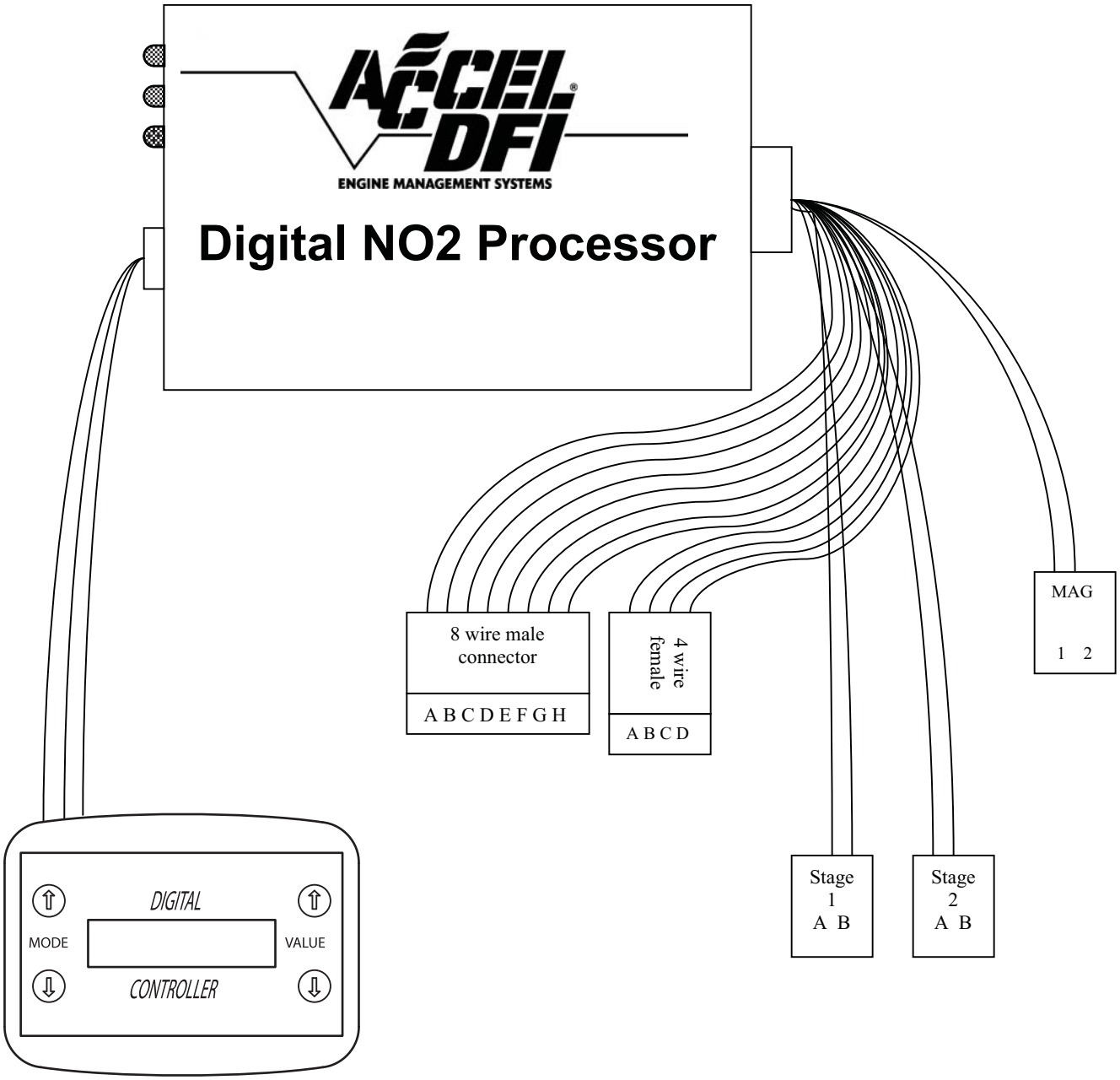
M. Fuel NO2 Offset. Refer to page 7 section 10.

1. The Digital Nitrous Processor is designed to automatically control the nitrous system.

2. When the Processor is armed, via +12 volt switch. It will start delivering nitrous when the enable/trigger set RPM and or delay settings are reached.

3. We prefer you add a manual trigger (Micro Switch, Trigger Button, TPS) to trigger the system.

Harness Schematic Overview



HARNESS SCHEMATIC OVERVIEW CONT'D

NO2 ACC. HARNESS

8 Pin Connector	Wire Color
Pin A = RPM INPUT (Points)	White
Pin B = Not Used	
Pin C = High Speed Retard	Yellow
Pin D = Spark Trigger RPM Out	DK Blue
Pin E = Stage 1 Enable	Grey
Pin F = Sensor Return (TPS)	Grey/Red
Pin G = RPM Switch Out	Orange
Pin H = Master Arm Input 12V+	Blue/Pink

NO2 POWER HARNESS

4 Pin Connector	Wire Color
Pin A = Ignition 12 Volt Battery+	Red
Pin B = Ground	Black
Pin C = Tach Output	LT Green
Pin D = AUX RPM Input 12V+	Green/White

NO2 STAGE 1

2 Pin Connector	Wire Color
Pin A = Stage 1 Fuel Out	White/Red
Pin B = Stage 1 NO2 Out	White/Blue

NO2 MAG PICKUP HARNESS

2 Pin Connector	Wire Color
Pin 1 = MAG + Pickup	Purple
Pin 2 = MAG – Pickup	Green

NO2 STAGE 2

2 Pin Connector	Wire Color
Pin A = Stage 2 Fuel Out	Yellow/Red
Pin B = Stage 2 NO2 Out	Yellow/Blue

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11/09
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