

MAGNA SPARK

CRANK TRIGGER

WITH BOOST CONTROL
Installation Manual & Software Guide



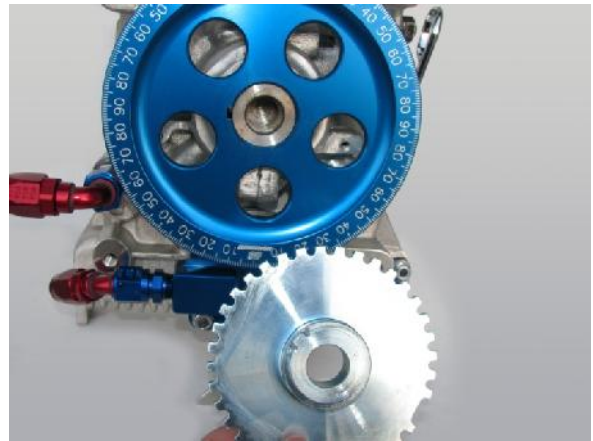
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Crank Trigger Hardware Installation

Step 1 - Bring the engine up to TDC and remove the crank pulley bolt.



Step 2 - Install trigger wheel making sure to line up the keyway. You may need to use the bolt supplied to help draw the wheel into the pulley.



Step 3 - Remove the two upper case nuts behind the crank pulley. Make sure to remove all washers so mount can sit flush against engine case.

Step 4 - Install the provided bracket with shouldered nuts provided. Torque to 18 ft. lbs



Step 5 - Install extension bracket, leave bolts loose enough to allow the extension to slide.

Step 6 - Install Crank sensor into extension bracket. Line up sensor over 8th tooth counter clockwise from the missing tooth on the trigger wheel.





Step 7 - Use provided shims if necessary to shim sensor .020" from trigger wheel. Tighten everything down making sure the sensor is centered over the 8th tooth.

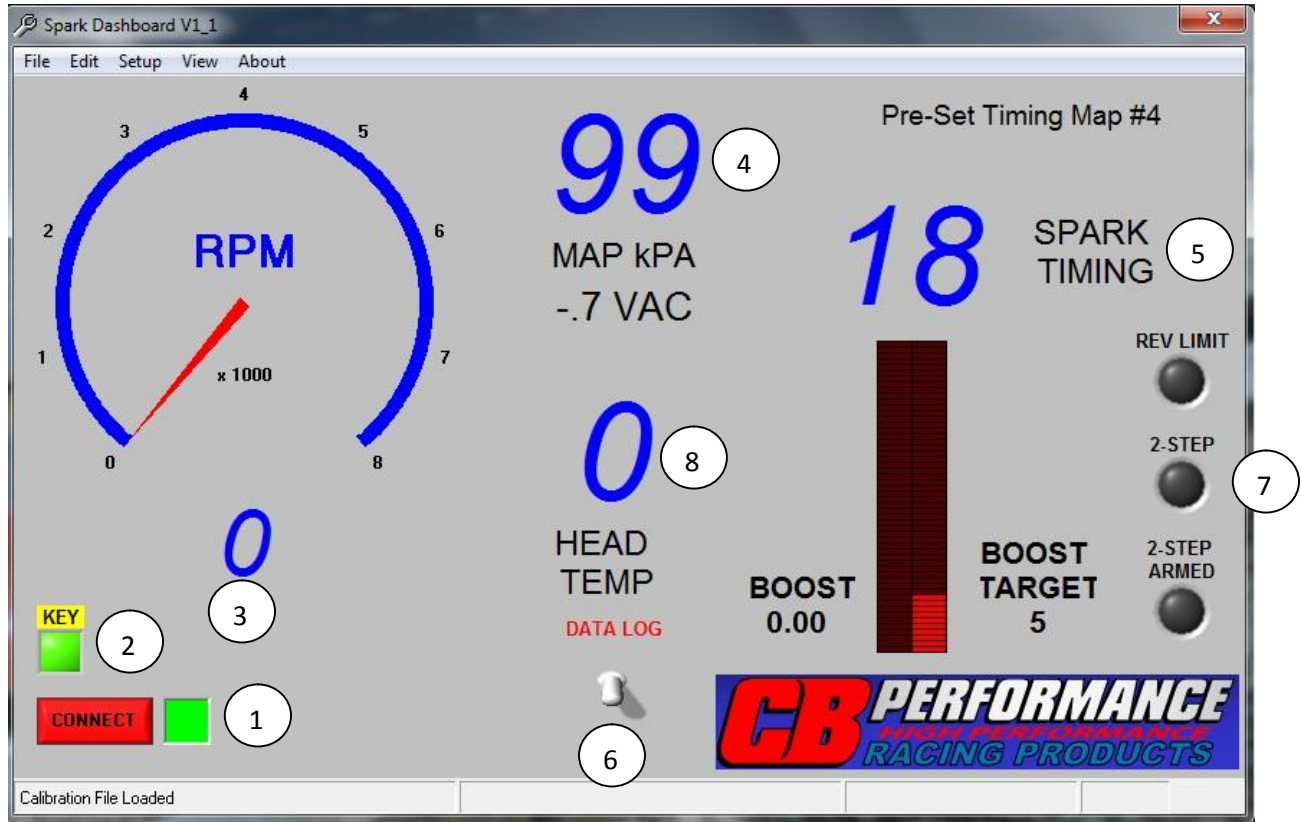
Mount coil pack on firewall or fan shroud. The poles on the coil are marked cylinder 1 through 4.

For distributor hole plug installation, refer to install instructions included with the plug.

Cam-Sync – For sequential ignition systems, it is required to install a cam-sync. Rotate engine so that the crank sensor is directly over the 8th tooth clockwise from the missing tooth. Remove old distributor and place aside. Remove cap from cam-sync and install into distributor hole. Make sure the cam-sync is fully seated and attach large ring terminal to clamp stud and tighten nut. Rotate the cam-sync until the reluctor lines up with the pick-up. Clamp everything down making sure reluctor is still lined up.



Dashboard Overview



- 1. Connect Button** – Click to connect to ECU
Green=Connected to ECU
Yellow=Trying to Connect
Red=Disconnected
- 2. Key Light** – Green when ignition is on
- 3. Tach/RPM Gauge** – Displays current engine RPM
- 4. Manifold Air Pressure Gauge** – Displays in kPA on top and in/hg-PSI on bottom
- 5. Spark Timing** – Displays current timing value in Degrees
- 6. Data Log Switch** – Click switch to enable data log (Laptop must be connected) Click again to stop recording
Grey = Not Recording
Red = Recording
- 7. Rev Limiter/2-Step Rev Limiter Lights** – Lights will illuminate when activated
- 8. Cylinder Head Temp** – Will display current cylinder head temp when sensor is connected

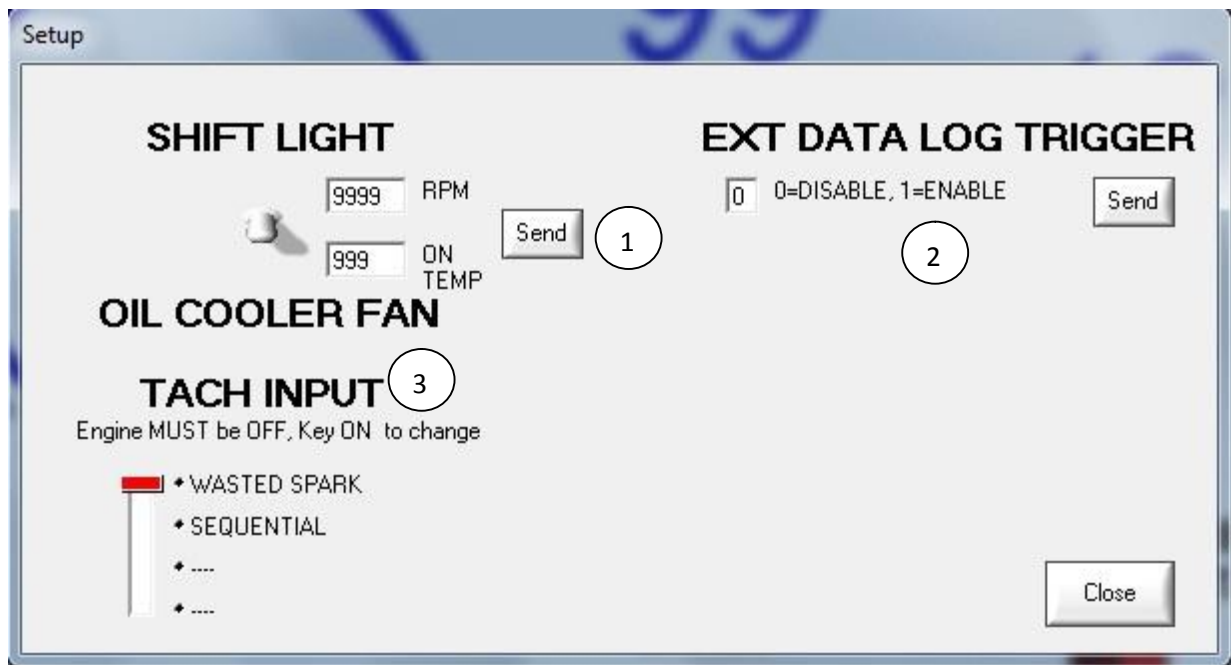
Spark Setup Overview

The screenshot shows the 'Spark Setup' window. At the top, there are two rows of values for 'SPARK MAP' and 'SPARK RPM'. The 'SPARK MAP' row has values from 45 to 226, and the 'SPARK RPM' row has values from 400 to 7325. Below these are several control panels: 'TIMING OFFSET' (value 0), 'PICKUP INPUT DELAY' (value 450), 'MAP/TPS MODE' (switched to MAP), 'REV LIMIT' (value 7500), 'MISSED SPARKS' (value 3), 'MISSED VR INPUTS' (value 7), 'TWO-STEP REV LIMIT' (value 4500), 'MISSED SPARKS' (value 3), 'MISSED VR INPUTS' (value 7), 'SEQ./WASTED DWELL' (value 0), and 'TIMING ADV/RET.' (values 0 for all cylinders). There are 'Send' and 'Close' buttons at the bottom right. Numbered callouts 1 through 10 are placed around the interface to highlight specific features.

1. **Spark MAP** – Load Boundaries setup in kPA. Adjust load boundaries here to set resolution in spark table. 100 kPA is threshold between in/hg and boost PSI. In/hg and Boost PSI are displayed above for easy reference.
2. **Spark RPM** – RPM Boundaries setup. Adjust RPM boundaries here to set resolution in spark table. First box is cranking RPM and should not be adjusted.
3. **Timing Offset** – Add value here to compensate for timing mismatch at idle. Example, a value of 2 would advance the timing by two degrees, a value of -3 would retard the timing by three degrees.
4. **Pickup Input Delay** – Value represents upper RPM timing delay. Has range of 450 to 550, change in increments of 25. Example, if timing on engine displays 35 degrees when spark table shows 33 degrees, a lower value will need to be entered into this box to get the engine to match the spark table.
5. **MAP/TPS Mode** – Selection switch for Load Boundaries. Keep set to MAP unless TPS is installed
6. **Send/Close Buttons** – Click send to enable changes made in this window. Click close to close window.

7. **Rev Limiter Setup** – Rev Limit RPM for desired high end rev limit. Missed Sparks and Missed VR inputs is combination of value to adjust the rev limiter. Odd number values can be entered here to adjust how hard or soft the rev limiter functions while engaged. If these values are too low then the engine will not reach the desired limit, too high and the RPM can exceed the RPM Limit.
8. **Two-Step Rev Limit** – 2-Step arm can be either a ground or 12 v signal. When 12v is used, it must be 12v all the time and then the connection broken to activate. Spark MAP or Forced, Spark uses timing value in current spark map cell. Forced uses the parameters set below. Rev Limit is desired 2 step rev limit.
9. **Seq./Wasted Dwell** – Adjusts dwell time delivered to coil.
10. **Timing Adv/Ret** – Give user ability to trim individual cylinder timing. Only active in Sequential mode. Use of Cam Sync is required.

Main Setup Overview



1. **Shift Light/ Oil Cooler Fan Setup** –This give user an adjustable shift light or oil cooler output. Can only be used when relay is connected to Pin 25 Red/White Wire. Output from ECU is a ground to the relay. Cylinder Head Temp sensor must be connected for oil cooler signal to work. Click send after changes are made.
2. **External Data Log Trigger** – Allows user to enable an external data log trigger. Laptop must be connected. Ground Pin 1 Blue/Black Wire to enable.
3. **Tach Input** – Change between Wasted Spark and Sequential. For Sequential, must use Optional Cam Sync.

Spark Table Overview

1	45	51	57	63	70	76	82	88	94	100	106	115	125	136	148	160	174	187	200	213	226	2
400	15	15	15	15	15	15	16	18	18	18	19	19	19	19	19	18	18	18	18	18	18	18
700	15	15	15	15	15	15	16	18	18	18	19	19	19	19	19	18	18	18	18	18	18	18
1000	15	15	15	15	15	15	16	18	18	18	19	19	19	19	19	18	18	18	18	18	18	18
1150	17	17	17	17	17	17	17	18	18	18	19	19	19	19	19	18	18	18	18	18	18	18
1450	20	20	20	20	20	20	21	21	21	21	20	20	19	19	19	18	18	18	18	18	18	18
1750	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22	22
2100	26	26	26	26	26	26	26	26	26	28	28	27	27	26	25	25	24	24	23	22	22	22
2450	29	29	29	29	29	29	29	29	29	30	28	27	27	26	25	25	24	24	23	22	22	22
2850	32	32	32	32	32	32	32	32	30	30	28	27	27	26	25	25	24	24	23	22	22	22
3200	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
3575	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
3950	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
4325	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
4600	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
4975	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
5350	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
5725	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
6100	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
6475	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
6950	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22
7325	32	32	32	32	32	32	32	32	32	30	28	27	27	26	25	25	24	24	23	22	22	22

3

4

5

6

7

Tracer - OFF

Close

- RPM Boundaries** – Set in Spark Setup
- Load Boundaries** – Set in Spark Setup
- Selection Box** – Allows user to use function keys to the right.
- Add, Subtract, Multiply, Divide** – Allows user to apply change to selected cell/cells in spark table above with selection box. Example, value of 15 in spark table is selected and a value of 3 is in selection box. When add is clicked, it adds 3 to 15 making the selection above change to 18.
- Fill, Blend, Undo** –
 Fill; fills selected cells above with value entered in selection box.
 Blend; blends multipliable selected cell together to create a smooth curve.
 Undo; Undo's all changes since last send.
- Send Button** – Click send to send all changes made to ECU.
- Tracer Button** – Applies a red overlay to spark table to follow curve.

Boost/General Purpose Output Overview

BOOST/GP OUTPUT

BOOST SETUP

SWITCH SELECT 1 2 3 4

SPOOL PSI	5	7	10	15
BOOST D/C	10	15	20	25
OVER BOOST PSI	7	9	12	17
OVER BOOST D/C	10	13	18	23

Send

GP OUTPUTS

OUTPUT	1	2	3	4
RPM ON	0	0	0	0
RPM OFF	0	0	0	0
TEMP ON	0	0	0	0
TEMP OFF	0	0	0	0
TPS ON	0	0	0	0
TPS OFF	0	0	0	0

Send Close

Enter [0] to disable any feature

- Boost Setup** – Setup for different selections on the Select-a-Boost (Sold Separately)

Spool PSI – Set this to the desired boost pressure.

Boost Duty Cycle – This is the rate the boost solenoid pulses to achieve boost. Start low, and add 5 points until boost pressure is achieved.

Over Boost PSI – Pressure to activate over boost Duty Cycle. Set a slightly above desired Spool PSI so as not to over boost the engine.

Over Boost Duty Cycle – Set a few points below Boost Duty Cycle for over boost protection.
- General Purpose Outputs** – Ground signals that can be triggered with different variables.

Relays must be used or damage can occur.

RPM On/RPM off – Triggers output with RPM signal

Temp On/Temp Off – Triggers output with Cylinder Head temp (Sensor Required)

TPS On/TPS Off – Triggers output with Throttle position. (TPS Sensor required)

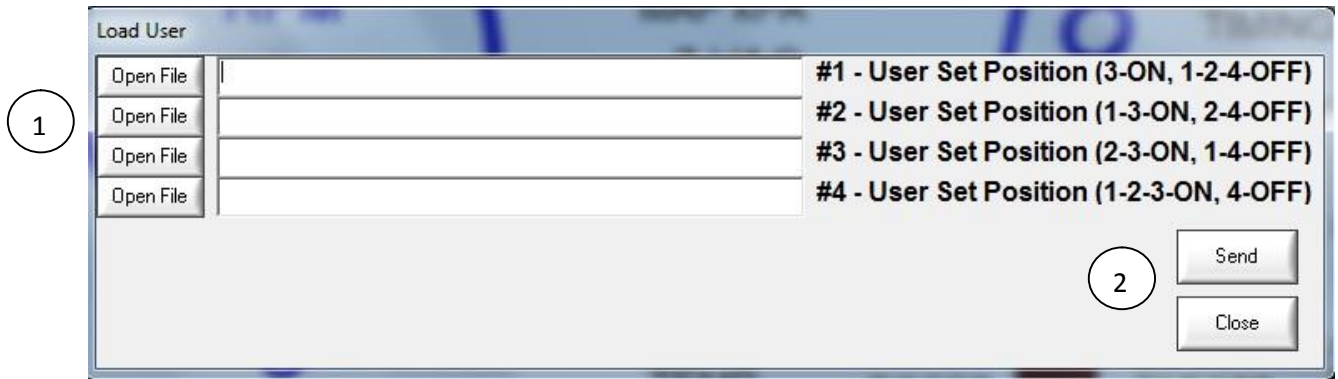
Output 1 – Pin 11 Blue Wire

Output 2 – Pin 12 Green/Black Stripe Wire

Output 3 – Pin 31 Purple Wire

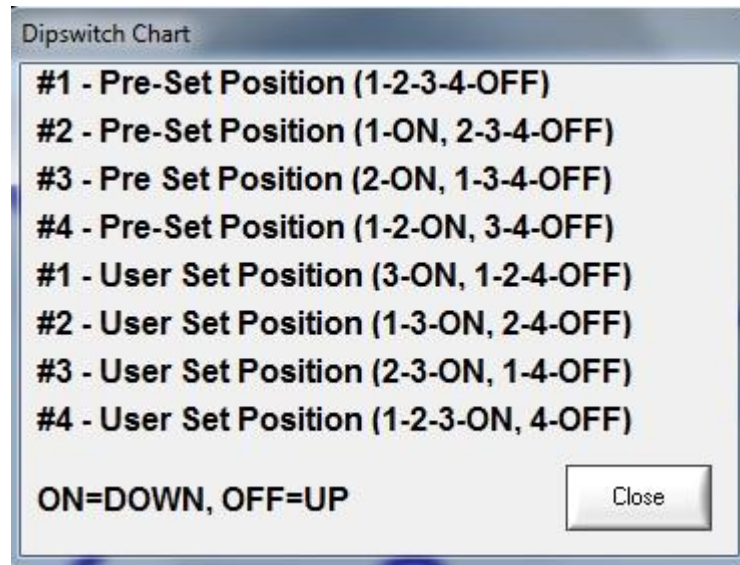
Output 4 – Pin 32 White Wire

Loading Spark MAPs Overview



1. **Open File** – Allows user to import custom spark maps into crank trigger ECU. Each position represents a dip switch location.
2. **Send Button** – When all desired spark maps have been loaded into the different positions, clicking send will send these to the ECU. Multiple files can be sent at a time. Make sure not to interrupt files being loaded, as corruption of the file can happen.

Dip Switch Position Chart



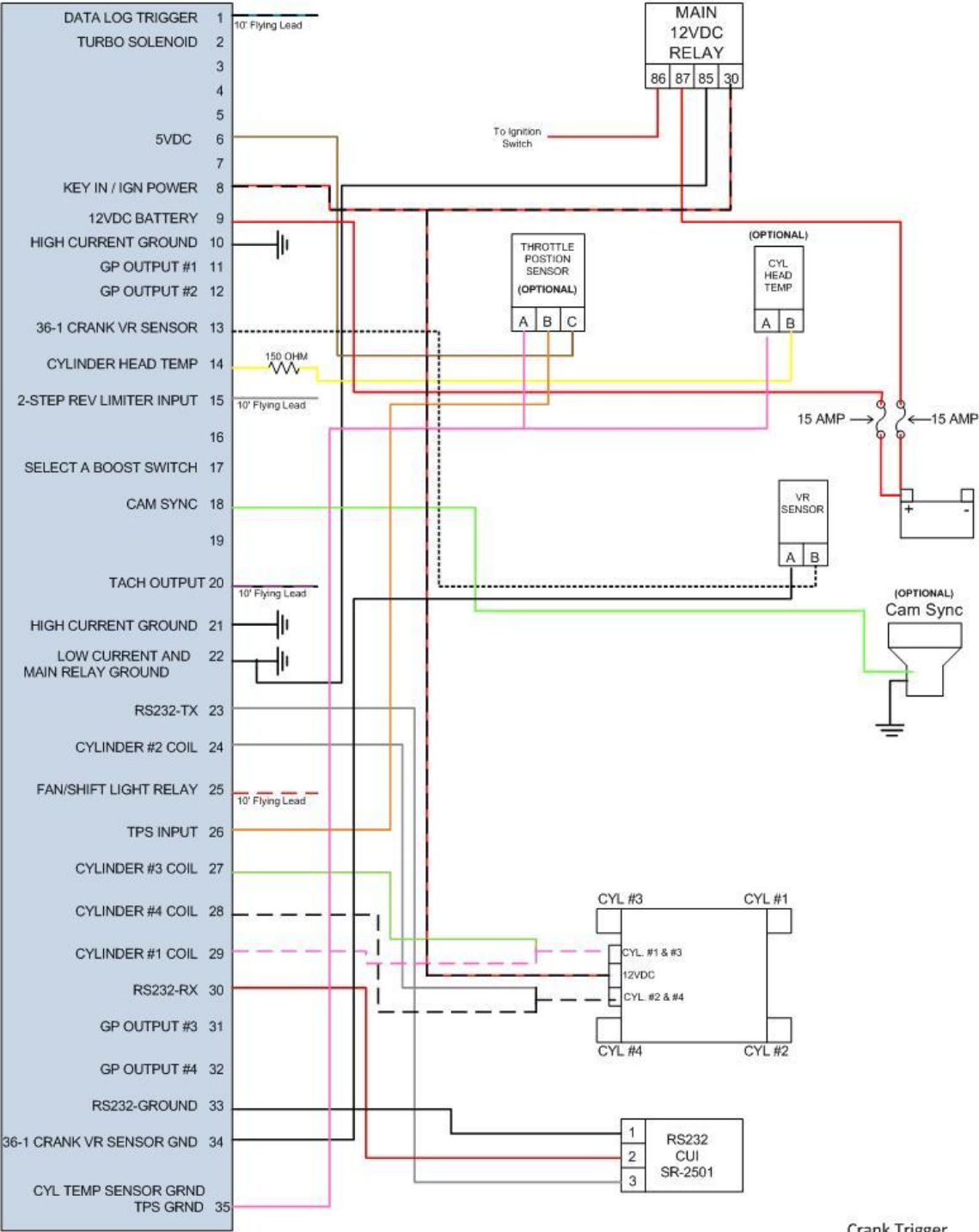
1. **Pre-set Position #1** – Single Carb Spark Map
2. **Pre-Set Position #2** – Dual Carb. Spark Map
3. **Pre-Set Position #3** – 10PSI Turbo Spark Map
4. **Pre-Set Position #4** – 18PSI Turbo Spark Map

ECU Pin-Out

ECU HARNESS PINOUT

PIN	DESCRIPTION	WIRE COLOR
1	DATA LOG TRIGGER	BLUE W/ BLACK STRIPE
2	TURBO SOLENOID	WHITE W/BLACK STRIPE
3		
4		
5		
6	TPS - 5VDC	BROWN
7		
8	KEY IN	RED W/ BLACK STRIPE
9	12 BATTERY	RED
10	HIGH-CURRENT GROUND	BLACK
11	GP OUTPUT 1	BLUE
		GREEN W/ BLACK STRIPE
12	GP OUTPUT 2	STRIPE
13	36-1 CRANK WHEEL PICKUP	WHITE-SHIELDED
14	CHT SENSOR	YELLOW
15	2-STEP REV LIMIT	GREY
16		
		BLACK W/ GREEN STRIPE
17	SELECT A BOOST SWITCH	STRIPE
18	CAM SENSOR PICKUP	DK. GREEN
19		
20	TACH OUTPUT	PINK W/ GREEN STRIPE
21	HIGH-CURRENT GROUND	BLACK
22	GROUND	BLACK
23	RS232-TX	Sm-Grey
24	COIL #2 (CONNECT TO CYL #2)	GREY
25	FAN/SHIFT LIGHT OUTPUT	RED W/ WHITE STRIPE
26	TPS INPUT	ORANGE
27	COIL #3 (CONNECT TO CYL #3)	LT. GREEN
		BLACK W/ WHITE STRIPE
28	COIL #4 (CONNECT TO CYL #4)	WHITE W/ GREEN STRIPE
		STRIPE
29	COIL #1 (CONNECT TO CYL #1)	WHITE W/ GREEN STRIPE
30	RS232-RX	Sm-Red
31	GP OUTPUT 3	PURPLE
32	GP OUTPUT 4	WHITE
33	GROUND	Sm-Black
34	36-1 CRANK WHEEL PICKUP	BLACK-SHIELDED
35	SENSOR GROUNDS	PINK

Wiring Diagram



Crank Trigger
Diagram
6/14/2012

Optional Accessories

available at cbperformance.com

#7132 Cylinder Head Temp Sensor

#7159 Throttle Position Sensor

#2095 Select-a-Boost

#2091 Single Boost

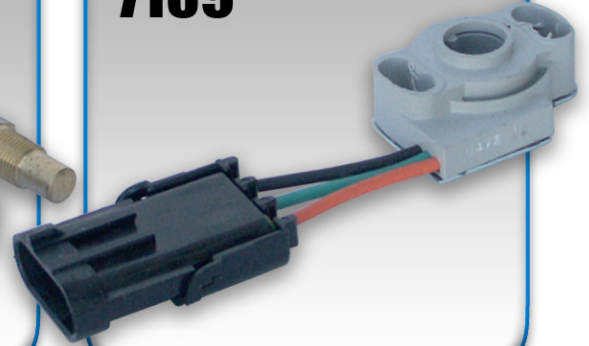
#6697 20/30 AMP Relay

7132



Cylinder Head Temp Sensor

7159



Throttle Position Sensor - TPS

2095



CB Select-A-Boost

2091



CB Single Boost

6697



Power Relay - 20/30 AMP

Tech Support

For Technical Support on this product, please contact a tech representative at CB Performance.

M-F 8:00am to 4:00pm PST

Phone: (559) 733-8222

24 Hrs/7 Days

Email: techdept@cbperformance.com