



# **Pro-Drag2**

## **2 CHANNEL 250mJ**

### **CAPACITOR DISCHARGE**

### **IGNITION**

PLEASE REPORT ANY ERRORS  
SALES@MWIGNITIONS.COM

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**ALWAYS CHECK WEBSITE FOR CURRENT INFORMATION &  
ADDITIONAL INSTRUCTIONS**

# **CAUTION**

**THIS WIRING DIAGRAM IS  
APPLICABLE ONLY TO IGNITION  
SYSTEMS WITH SERIAL NUMBER  
PREFIX STARTING**

**37xxxx**

**USE OF INCORRECT DIAGRAM WILL  
VOID WARRANTY AND MAY DAMAGE  
UNIT**

**THE INSTALLATION OF HIGH ENERGY IGNITION  
SYSTEMS MAY REQUIRE ADVANCED  
KNOWLEDGE AND SKILLS.**

**IMPROPER INSTALLATION OR OPERATION OF  
THIS UNIT COULD CAUSE DAMAGE TO IGNITION  
SYSTEM AND IGNITION COIL**

# INSTALLATION NOTES

(Pro-Drag 250mJ systems only)

## MOUNTING

Do not mount the unit where it will be exposed to water or other liquids and ensure the bottom condensation slots are unobstructed and permit gravity draining. Select a location away from intense heat such as turbochargers and exhaust pipes. Provide a source of cooling air to remove any internally generated heat.

**FAILURE TO USE SUPPLIED RUBBER MOUNTS WILL VOID WARRANTY!**

Suitable anti vibration mounts should be no stiffer than 40 Duro such as M&W #MNT002, Paulstra Radiaflex #521128, Farnell Components (Element14) #7107821, Newark #70C1626 or RS Components #254-7444

## IGNITION LEADS

Do not use either straight metal wire ignition leads or carbon core ignition leads.

For best performance use spiral wound inductively suppressed metal core ignition leads such as those produced by [Magnecor®](#).

## SPARK PLUGS

The use of use non resistor spark plugs (where possible) will significantly increase coil to fuel energy transfer.

When using resistor spark plugs ensure they are not damaged internally by regularly measuring resistance value. Open circuit or high resistance may cause failure of spark plug wires, ignition coils and CDI.

Do not use surface discharge or semi surface discharge spark plugs as they contain excessively large non adjustable spark gaps.

## INSULATION PRECAUTIONS

Always degrease spark plug insulators and boots after handling to prevent insulation breakdown through contamination

Use supplied dielectric grease on spark plug insulators and coil boots to significantly improve insulation properties and ease installation and removal. Use in main connector can also help reduce issues due to water ingress.

## WIRING & POWER SUPPLY

### **FAILURE TO INSTALL RECOMMENDED SIZE FUSE WILL VOID WARRANTY!**

M&W CDI systems contain internal protective mechanisms which are designed to blow the fuse under conditions of over voltage or reverse polarity. In the event this does occur fitting a larger size fuse will not solve the problem, will void warranty and may make the unit irreparable.

Faults such as a loose battery terminals, poor wiring or faulty alternator may cause momentary over voltage spikes sufficient to blow the fuse.

Wire ignition system directly to the battery. If wire length exceeds recommendations use larger pair of battery cables (power and ground) to make up distance. Do not rely on chassis to provide ground. If connected to a high impedance supply shared with the ECU or its sensors erratic operation will be experienced.

Do not operate below 13V. If the electrical system has not means of charging use either a 16V or 18V battery to ensure sufficient voltage supply to cdi.

Do not use voltage boosters as voltages above 13.5V provide no additional performance and most can not provide the required instantaneous current required for correct CDI operation.

When using extended voltage batteries disconnect the battery during charging to prevent excessive voltage (>22V) reaching the CDI as this may blow the fuse.

Use twisted shielded pair wire for all coil connections. Twisted pair wire may be used for power and ground however to comply with

Australian EMC 'C Tick' standards twisted shielded pair wire must be used.

All coil negative wires must be joined at or in the cdi connector.

## TRIGGERING

Trigger input & coil output numbers (letters) indicate ignition sequence not cylinder number.

250mJ Pro-Drag systems include a selective trigger edge input which defaults to falling edge ignition when no jumper is installed. To select rising edge ignition install a jumper wire between 'Trigger Edge' and 'Signal Ground' pins.

Where the ECU contains an inbuilt igniter it may be necessary to invert the cdi trigger edge selected.

**Trigger edge on the CDI must be set same as that in the ECU!**

## POWER LEVEL SWITCH

Ignition system have no means of detecting engine load and provide maximum performance whether the engine is being free revved or under full load.

Some 250mJ units include a power level switch to allow for a reduction of ignition energy during low load conditions.

Do not manually activate the power switch. Either install an adjustable 'Hobbs' style pressure witch in the inlet manifold or use a programmable output from the ECU and set activation to occur in either case when the engine starts to come on load.

## IGNITION TIMING

M&W high power CDI ignition systems will typically change the engine combustion characteristics and may require significantly less total timing.

Always re tune both fuel and ignition after installing CDI ignition.

## TACHO OUTPUT

The M&W tacho output provides a 50% duty cycle square wave signal at battery supply voltage. This will work with most aftermarket digital tacho's however earlier types and those designed to trigger from a coil negative signal may not read accurately.

## LED INDICATOR

After initially applying power to the CDI the LED will illuminate for 1 second then extinguish. The LED will then flash briefly with each consecutive trigger event received (it may be necessary to view the LED directly on axis).

A repeated double flash of the LED indicates a possible faulty ignition coil, faulty wiring, low supply voltage or damage to the CDI.

## TESTING

The CDI may be tested by momentarily grounding the trigger inputs which will cause the LED to flash and corresponding ignition coil to spark.

**Do not conduct this test without a grounded spark plugs installed!**

A more comprehensive test procedure may be found on our web site [http://www.mwignitions.com/pg\\_data\\_sheets.php](http://www.mwignitions.com/pg_data_sheets.php)

## SAFETY

Due to the extreme energy and voltage levels developed by M&W 250mJ ignition systems it is strongly recommended certain procedures be followed to ensure safety of mechanics and prevent ignition component damage.

1. Install dummy, grounded, metal spark plugs in the engine bay and transfer the spark plug leads to these between race events or at least when working on engine.
2. Install an aircraft style guarded toggle switch in the CDI ignition switch wire circuit and habitually disable it when not actually running the engine.

For further instructions and cdi information check out the support tab on our web site

<http://www.mwignitions.com>

# IGNITION COILS

(Pro-Drag systems only)

## COIL SELECTION

For ultimate ignition energy and efficiency use coils specifically designed for CDI use. Do not use ignition coils designed for inductive ignition as they will greatly limit the ignition energy.

## COP COILS

COP (coil on plug) coils may not be suitable due to their limited insulation in addition they were not designed for the energy levels produced by our Pro-Drag systems.

Use COP coils at your own risk with 250mJ systems, DO NOT use with 500mJ systems.

Use resistive spark plugs with all COP coils. Keep plug gap < 0.025" (0.6mm) to prevent coil damage.

DO NOT use AEM pencil coils under any circumstances!

## FERRITE CDI COILS

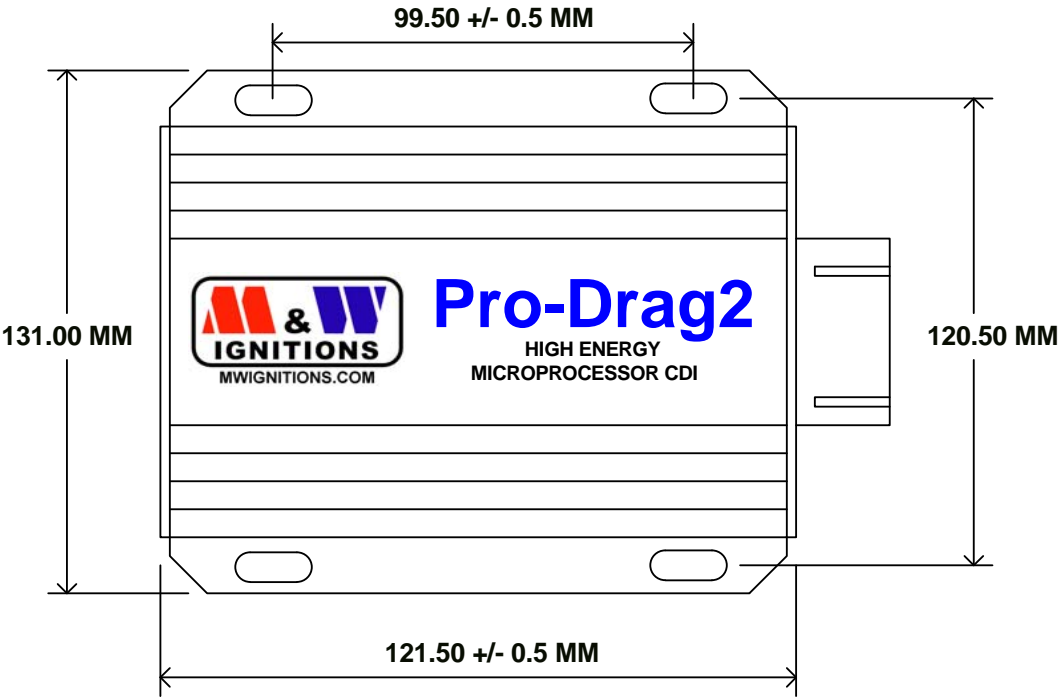
Ferrite core cdi coils provide a lightweight solution for direct fire applications and give high secondary current however they may not be suitable for all applications due to their extremely short arc duration. The high level of EMI emitted by these coils may also require additional shielding to prevent electrical interference with the ECU or CDI.

**CAUTION!**

IGNITION COIL DAMAGE MAY OCCUR IF  
OPERATED WITH AN EXCESSIVE SPARK GAP



DISCONNECT POWER BEFORE  
WORKING ON UNIT



Slot dimensions - 5mm \* 10mm

Title			
MOUNTING DIMENSIONS			
Size	Number	Revision	
A4	Pro-Drag2 S3	1.3	
Date:	20-Apr-2013	Sheet	1 of 1
File:	D:\M&W\Pro-Drag2_S3_Mounting Dimensions.dwg	Drawn By:	M&W



# M & W IGNITIONS

Performance & Quality since 1996

**CAUTION!**  
**HIGH VOLTAGE**



**DISCONNECT POWER BEFORE  
WORKING ON UNIT**

**VIEWED FROM BACK OF CONNECTOR**



## TRIGGER EDGE SELECTION

Falling edge ignition - leave pin #9 disconnected.

Rising edge ignition - connect pin #9 to pin #10.

When triggering this unit of an existing ignition module or an ecu with built in igniters such as the Microtech 'MTX' series it may be necessary to select rising edge trigger.

## SPECIFICATIONS

Supply voltage = 13V -1 18V DC negative ground  
Startup voltage = 11V  
Maximum supply current = 20A  
Shutdown current <700uA  
Maximum ignition frequency = 600Hz  
Coil primary voltage = 500V  
Spark energy = 250 millijoules  
Trigger = 10mA open collector drive  
Trigger edge = adjustable  
Tacho = 12V, 100mA square wave  
Maximum operating temperature = 105°C  
Dimensions = 122L \* 110W \* 40H  
Weight = 800gm

**KEEP ALL INPUTS WELL SEPARATED FROM COIL OUTPUTS**

1 +12V (Battery)	7 Ground (Battery)	13
2 +12V (Battery)	8 Ground (Battery)	14 Trigger B
3	9 Trigger edge	15 Trigger A
4 Tacho	10 Signal ground	16 Ignition switch
5	11	17 Coil B -
6 Coil A +	12 Coil B +	18 Coil A -

Title TWO CHANNEL 250mJ CDI IGNITION		
Size A4	Number Pro-Drag2 S3	Revision 1.3
Date: 20-Apr-2013	Sheet 1 of 1	
File: D:\M&W\...\Pro-Drag2_S3_1.sch	Drawn By: M&W	

# M & W IGNITIONS

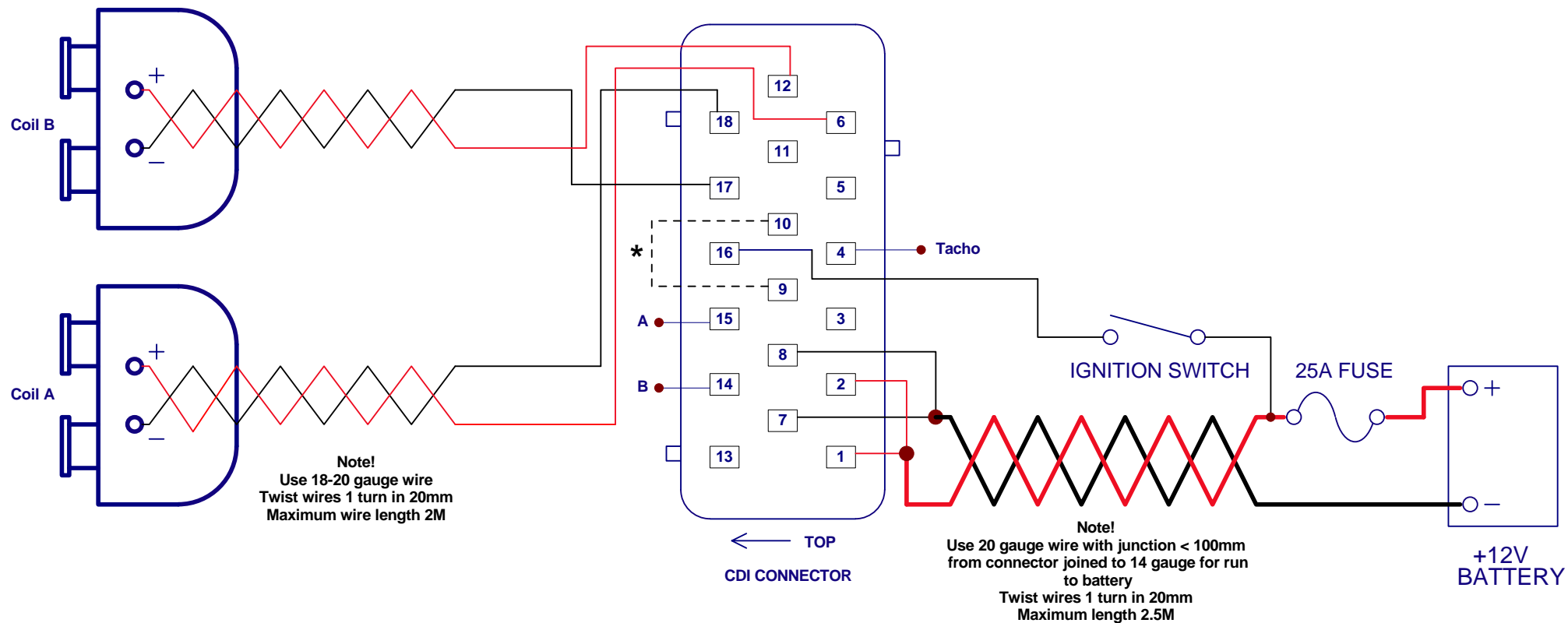
(C)1996 - 2007 M&W IGNITIONS

## FOR DRAG RACING USE ONLY

**CAUTION!**  
**HIGH VOLTAGE**



**DISCONNECT POWER BEFORE  
WORKING ON UNIT**



\* See instructions for trigger edge selection link

Title			TWO COIL WASTED SPARK IGNITION	
Size	Number	Revision		
A4	Pro-Drag2 S3	1.5		
Date:	20-Apr-2013	Sheet1 of	1	
File:	D:\M&W\Pro-Drag2_S3_2.sch	Drawn By:	M&W	

# M & W IGNITIONS

(C)1996 - 2007 M&W IGNITIONS

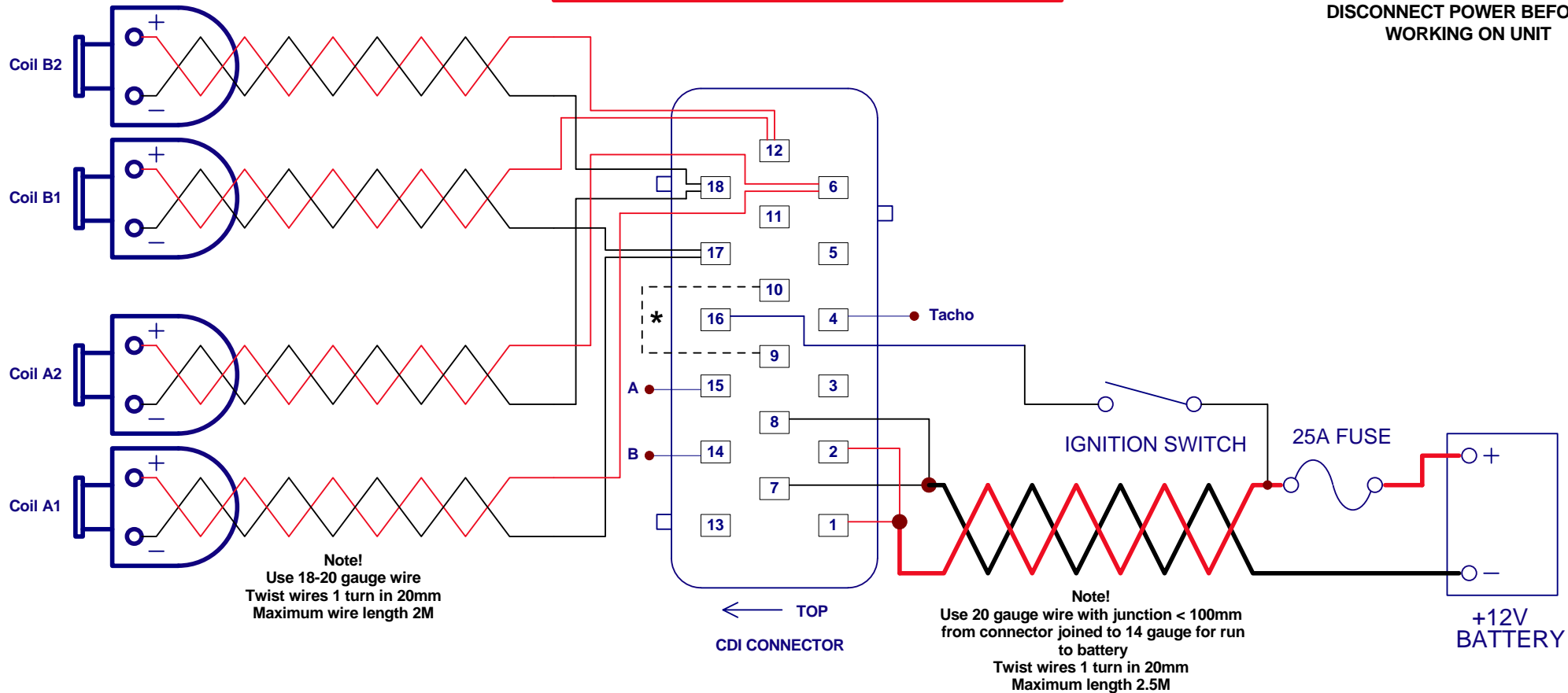
**FOR DRAG RACING USE ONLY**

**CAUTION!**  
**HIGH VOLTAGE**



**DISCONNECT POWER BEFORE  
WORKING ON UNIT**

**FOR OEM COILS ONLY**  
**DO NOT USE FERRITE COILS**



\* See instructions for trigger edge selection link

Title			FOUR COIL WASTED SPARK IGNITION	
Size	Number	Revision		
A4	Pro-Drag2 S3	1.4		
Date:	20-Apr-2013	Sheet1 of	1	
File:	D:\M&W\Pro-Drag2_S3_3.sch	Drawn By:	M&W	

# M & W IGNITIONS

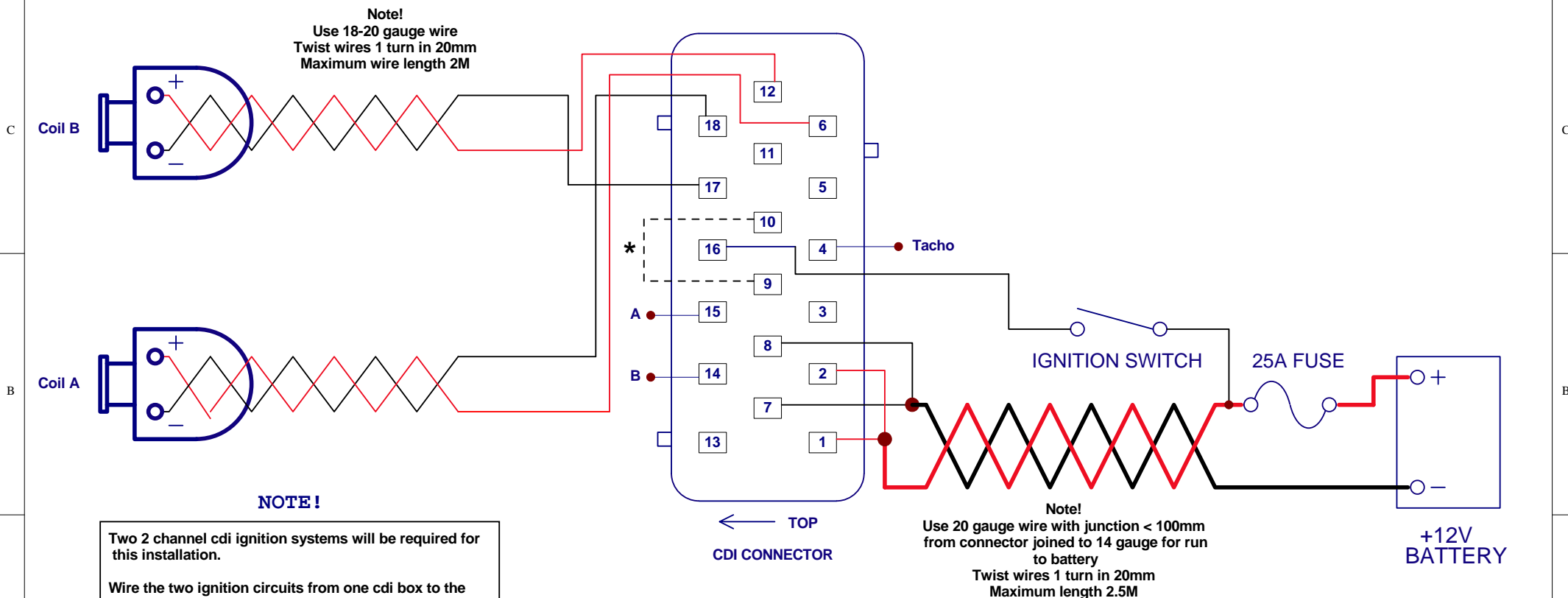
Performance & Quality since 1996

## FOR DRAG RACING USE ONLY

**CAUTION!**  
**HIGH VOLTAGE**



**DISCONNECT POWER BEFORE  
WORKING ON UNIT**



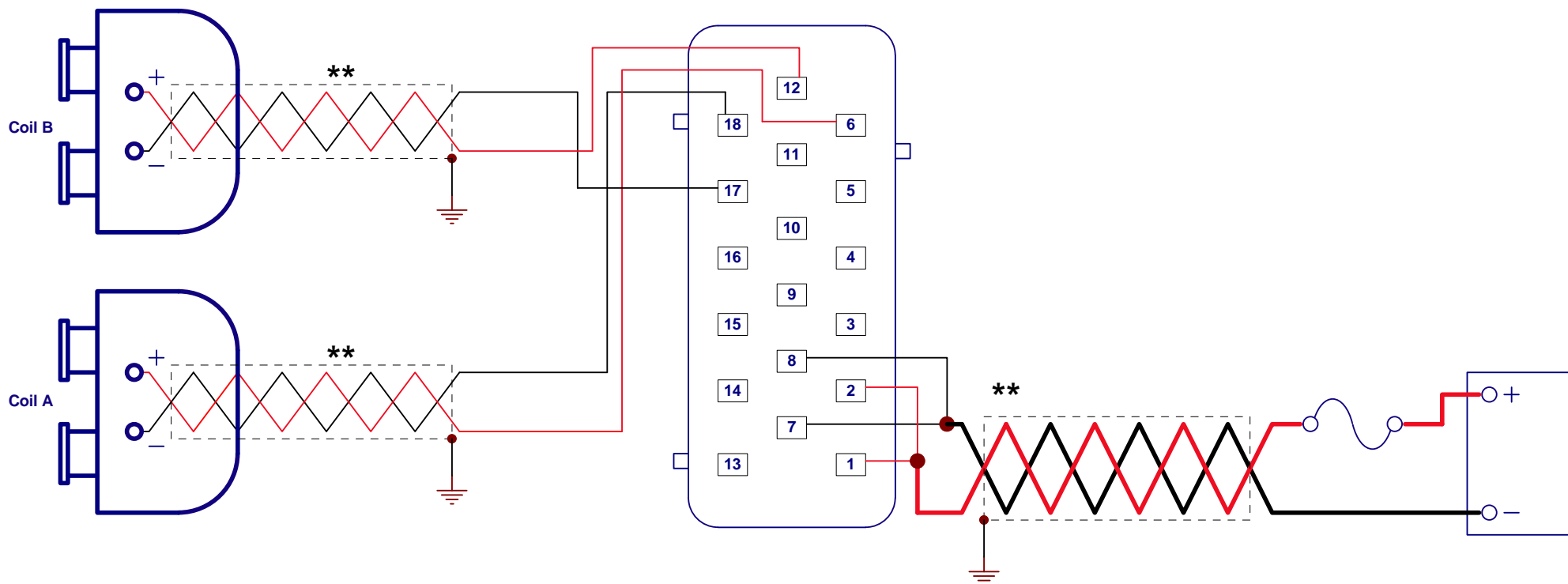
# M & W IGNITIONS

Performance & Quality since 1996

**CAUTION!**  
**HIGH VOLTAGE**



**DISCONNECT POWER BEFORE  
WORKING ON UNIT**



**\*\* Shielded cables required for Australian EMC compliance**

Title				SHELDING & EMC COMPLIANCE			
Size		Number		Revision			
A4		Pro-Drag2 S3				1.2	
Date:		20-Apr-2013		Sheet 1 of		1	
File:		D:\M&W\EMC.sch		Drawn By:		M&W	