



**MWIGNITIONS.COM**

# **PRO-10R**

## **RELUCTOR TRIGGER CAPACITOR DISCHARGE IGNITION**

PLEASE REPORT ANY ERRORS  
SALES@MWIGNITIONS.COM

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# **CAUTION**

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

**44xxxx**

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

**CHECK WEB SITE FOR RECENT CHANGES  
AND UP TO DATE WIRING INFORMATION  
[WWW.MWIGNITIONS.COM/TECH2.HTML](http://WWW.MWIGNITIONS.COM/TECH2.HTML)**

# **IMPORTANT** **INSTALLATION NOTES**

## **MOUNTING**

Do not mount the unit where it will be exposed to water and ensure the two bottom drain slots are unobstructed. If you have an earlier unit without drain slots mount with connector end low.

Select a location away from excessive heat and provide a cooling air supply where necessary.

If there is a likelihood of strong vibration or the vehicle is stiffly suspended use soft rubber (40 duro) mounts on all four corners to isolate against the vibration.

## **IGNITION LEADS & SPARKPLUGS**

Do not use straight metal wire ignition leads as these will cause electrical interference which may effect the ignition or other electronic devices in the vehicle.

Do not use carbon suppressed ignition leads as the carbon core is not capable of conducting the cdi energy and will quickly become damaged.

For best performance use ignition leads with a spiral wound inductively suppressed metal core such as the Magnecor brand.

Be aware that not all brands of carbon resistor spark plugs are suitable for cdi use and the resistive element may become damaged from the cdi energy. NGK (Q series) and Champion (Z series) manufacture inductively suppressed sparkplugs specifically for high energy applications.

## **WIRING & POWER SUPPLY**

The M&W CDI ignition systems are designed to operate directly from 13.8V. Although the 115mJ Pro series will tolerate small voltage

fluctuations it is vitally important that the 250mJ and larger Pro-Drag ignitions have a stable supply which does not drop below 12.5V.

Do not use a power supply above 18V as this may activate the internal over voltage protection.

Do not use a 'voltage booster' as most of them are unable to provide the instantaneous current required by the CDI to recharge correctly.

Connect the unit directly to the battery with the recommended gauge wire.

Twisted pair wire must be used for all ignition coil and battery connections. Coil negative wires must all be returned to the connector pin and not joined in the harness. To comply with Australian EMC standards and for ultimate noise suppression it is necessary to use shielded twisted pair wire with the shield connected to ground at one end only.

It is very important to have a correctly sized fuse installed in the power supply wiring at all times as this will prevent damage due to over voltage and reversed polarity wiring. If the external fuse blows while the vehicle is running check battery voltage and alternator operation.

Where possible crimp the connector terminals and do not solder them as this will make the wire prone to break at the terminal.

## **TRIGGER EDGE**

(NOT APPLICABLE TO RELUCTOR TRIGGER OR AUTRONIC MULTIPLEXER IGNITIONS)

The cdi defaults to falling edge ignition, to select rising edge ignition it is necessary to connect the 'Trigger Edge' pin to the 'Signal Ground' pin. The level of the trigger edge input is only sampled when the cdi is initially powered up and therefore can not be changed during operation.

Where the ecu contains an in built igniter or there is an igniter in the trigger circuit between the ecu and cdi it may be necessary to select rising edge ignition as the igniter will invert the trigger signal from the ecu.

If the incorrect timing edge is selected the ignition timing observed with a timing light will not match that commanded by the ecu and the difference will increase with rpm.

**IT IS MOST IMPORTANT TO MAKE SURE THE TRIGGER EDGE ON THE IGNITION SYSTEM IS SET THE SAME AS ON THE ECU.**

### **LED INDICATOR**

Once the unit has been switched on the LED on the end of the box will illuminate for approximately 1 second and then extinguish. This indicates that the generator voltage has initialised correctly.

Each consecutive trigger input received, after powering up the unit, will be indicated by a single brief flash.

A repeated double flash of the LED indicates the generator has been unable to reach correct operating voltage. This may be due to faulty wiring, low supply voltage or an internal failure.

### **TESTING**

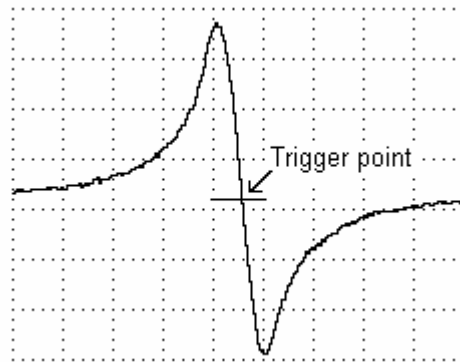
A simple way to test the cdi is to install a set of sparkplugs into the high tension leads (or directly into the coil if COP) and lay the plugs against the engine block or an earthed surface. Power up the cdi and ground the cdi input triggers momentarily one at a time. Each time an input is grounded the appropriate ignition coil will spark.

### **CAUTION**

Do not fire the ignition without the spark plug being grounded.  
Do not force the spark to jump an gap larger than 2mm.

**CHECK IGNITION TIMING AFTER INSTALLATION  
IS COMPLETE**

# RELUCTOR IGNITION INSTALLATION



The diagram above shows the oscilloscope trace of a typical reluctor sensor with correct polarity. Triggering occurs on the negative going zero crossing point.

A simple polarity test can be made with a strobe light. Observe the timing while the engine is running then stop and reverse the reluctor connections. The correct polarity will show the most advanced timing. The correct polarity should also show the most stable timing reading.

For MSD reluctor distributors use the Violet wire as R+ and the Orange wire as R- (Note! This is opposite to the MSD documentation).

Always use twisted pair wire for the reluctor connections. For electrically noisy environments it may be necessary to use twisted shielded cable.

Do not route the reluctor wires near any high voltage or high current carrying conductors.

# IGNITION COILS

## CAUTION!

IGNITION COILS WILL BE DAMAGED INTERNALLY IF FIRED WITHOUT A HIGH VOLTAGE RETURN PATH.

If your engine develops a misfire which can not be eliminated by other means try replacing the ignition coil on the suspect cylinder with one that is known to be good.

COP (coil on plug) coils with in built ignition drivers are not suitable for cdi applications. Small COP ignition coils may overheat when used with a cdi system unless wired in parallel for wasted spark applications. COP coils may not have sufficient insulation for use with our high energy Pro-Drag ignition systems

High voltage leakage from the ignition coil secondary to the primary will permanently damage an ignition system. Be aware that large sparkplug gaps, high manifold pressure and high cylinder pressure will significantly increase the coil stress and may cause insulation breakdown.

Most inductive ignition coils will work with CDI system however for best ignition power select one with very low primary resistance and inductance and a turns ration between 75 and 100 to 1 such as the Bosch MEC717.

For best ignition power use a cdi specific ignition coil such as our Ferrite CDI coils. Alternate high quality cdi coils such as the Crane PS92 or MSD HVC2 may also be used.

## FERRITE COILS

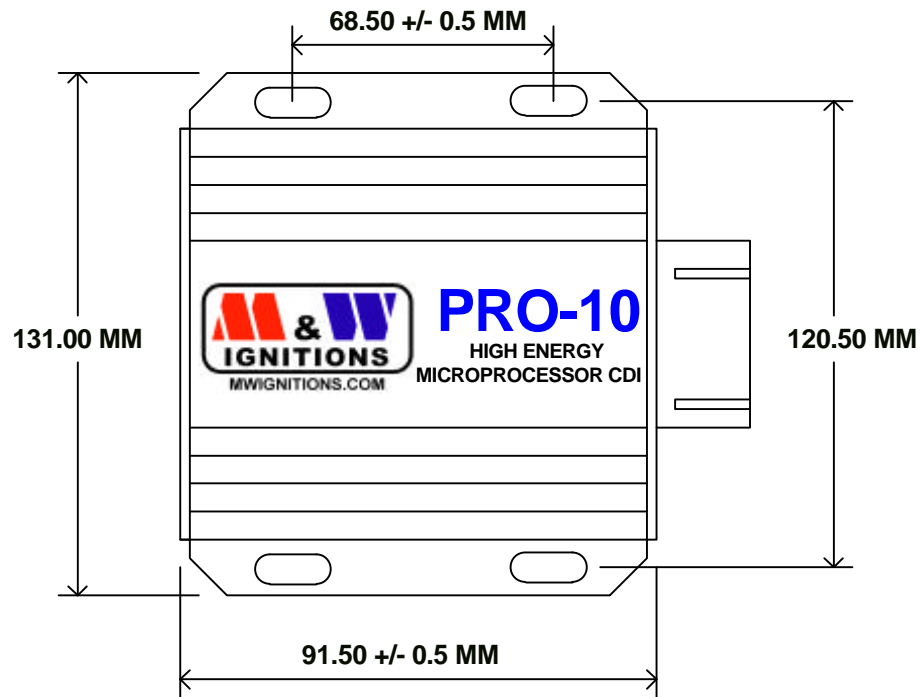
Be aware when buying ferrite coils from other suppliers as not all companies have the knowledge to correctly prepare them for automotive use. Due to their fragile nature and poor quality control during manufacture it is easy to experience prema ture ignition coil failure and engine misfiring unless correctly assembled. All coils prepared by M&W are individually tested before assembly and sale.

Note! Ferrite coils are only for direct fire applications and must not be used with a distributor.

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



**DISCONNECT POWER BEFORE  
WORKING ON UNIT**



**Slot dimensions - 5mm \* 10mm**

|       |                                      |            |     |                            |  |
|-------|--------------------------------------|------------|-----|----------------------------|--|
| Title |                                      |            |     | <b>MOUNTING DIMENSIONS</b> |  |
| Size  | Number                               | Revision   |     |                            |  |
| A4    | <b>PRO-10 SERIES 3</b>               | 1.0        |     |                            |  |
| Date: | 16-Oct-2007                          | Sheet 1 of | 1   |                            |  |
| File: | E:\M&W\Pro10r_S3_Mounting dimensions | Drawn By:  | M&W |                            |  |

**CAUTION!  
HIGH VOLTAGE**



**DISCONNECT POWER BEFORE  
WORKING ON UNIT**

**M & W IGNITIONS**

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**VIEWED FROM BACK OF CONNECTOR**



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

|                  |                    |                    |
|------------------|--------------------|--------------------|
| 1 +12V (Battery) | 7 Ground (Battery) | 13 Power level (P) |
| 2 +12V (Battery) | 8 Ground (Battery) | 14 Reluctor -      |
| 3 Two spark (M)  | 9                  | 15 Reluctor +      |
| 4 Tacho          | 10 Shield          | 16 Ignition switch |
| 5                | 11                 | 17                 |
| 6 Coil +         | 12                 | 18 Coil -          |

**POWER LEVEL & TWO SPARK**

Leave twin spark pin disconnected for single spark 1kHz mode or connected to pin 10 for twin spark 400Hz mode.

Caution! Reluctor triggered ignition systems are inherently susceptible to interference. In some vehicles using twin spark mode may cause unwanted ignition events or misfiring with unknown consequences.

Leave power level pin disconnected for 105mJ mode or connected to pin 10 for 150mJ mode.

Note! It is not possible to have both high power and twin spark active at the same time.

**SPECIFICATIONS**

Supply voltage = 13.8V DC negative ground  
 Operating voltage = +6V to +16V (restrictions apply)  
 Maximum supply current = 6.0A  
 Standby current < 650uA (pin 16 open)  
 Maximum ignition frequency = 1kHz (400Hz in MS mode)  
 Coil primary voltage = 460V/540V  
 Spark energy = 105mJ/150mJ  
 Trigger = +/- 120V max  
 Fires on negative going, zero crossing point  
 Tacho = 12V, 25mA symmetric square wave  
 Maximum allowable case temperature = 105°C  
 Dimensions = 91L \* 110W \* 40H  
 Weight = 500gm

**SINGLE CHANNEL RELUCTOR IGNITION**

|                              |                              |                 |
|------------------------------|------------------------------|-----------------|
| Size<br>A4                   | Number<br><b>PRO-10/R S3</b> | Revision<br>1.2 |
| Date: 2-Nov-2007             | Sheet 1 of 1                 |                 |
| File: E:\M&W\Pro10R_S3_1.sch | Drawn By: M&W                |                 |

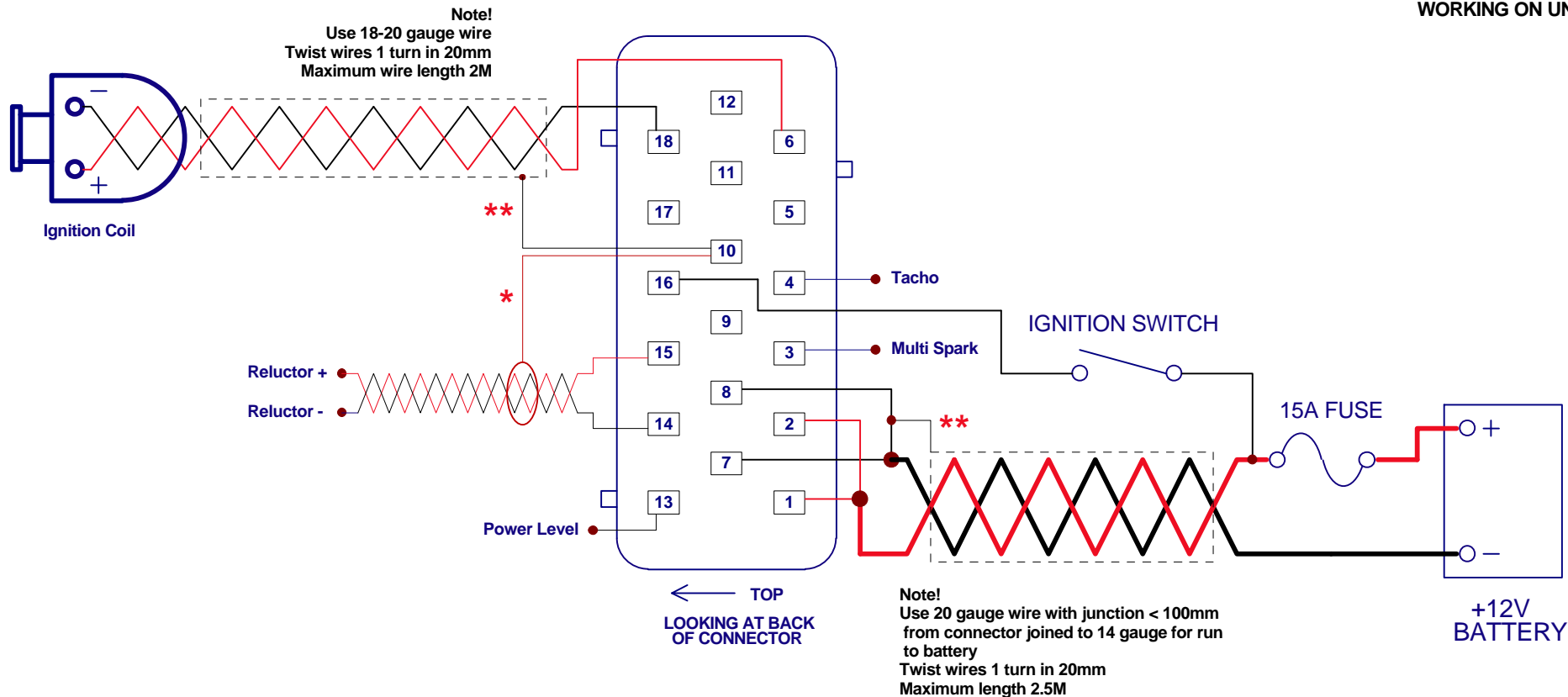
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**CAUTION!**  
**HIGH VOLTAGE**



**DISCONNECT POWER BEFORE  
WORKING ON UNIT**



- \* Shielded cable may be required for noisy environments
- \*\* Shielded cables required for Australian EMC compliance

|       |                        |            |                           |
|-------|------------------------|------------|---------------------------|
| Title |                        |            | RELUCTOR TRIGGER IGNITION |
| Size  | Number                 | Revision   |                           |
| A4    | PRO-10R S3             | 1.1        |                           |
| Date: | 2-Nov-2007             | Sheet 1 of | 1                         |
| File: | E:\M&W\Pro10R_S3_2.sch | Drawn By:  | M&W                       |

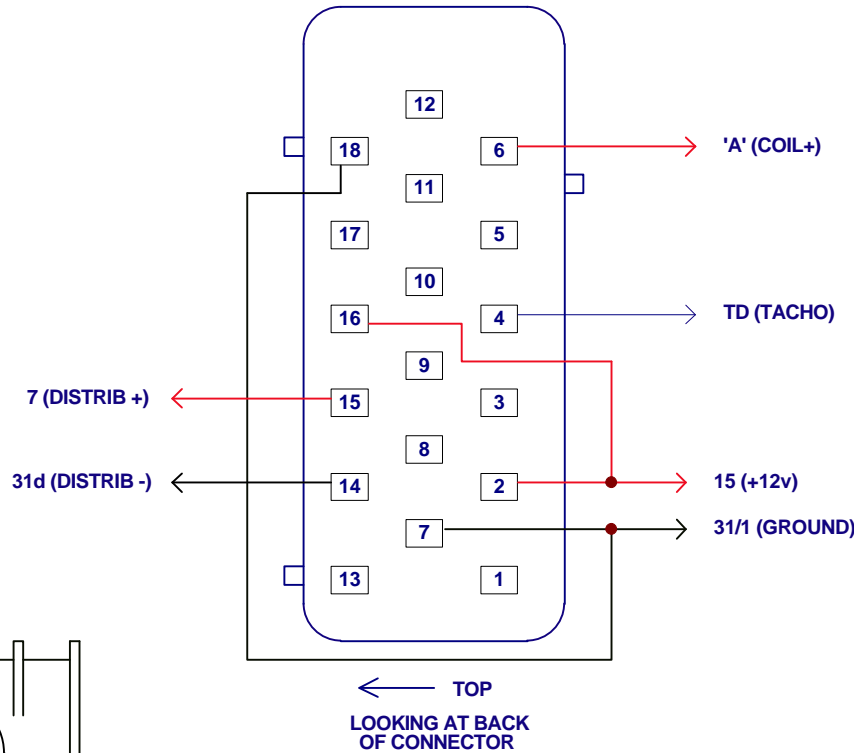
**CAUTION!  
HIGH VOLTAGE**



**DISCONNECT POWER BEFORE  
WORKING ON UNIT**

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## IMPORTANT INSTALLATION NOTES!

### MOUNTING

For best reliability it is suggested the unit be mounted under the rear seat where it will not be exposed to water or extremes of temperature.

### IGNITION LEADS

The standard plain wire ignition leads **MUST** be replaced with a set of premium quality spiral wound metal conductor ignition leads.

### IGNITION COIL

For best results use either the factory CDI coil, a Bosch MEC717 transformer style coil or a Crane LX92 coil.

### SPARK PLUGS

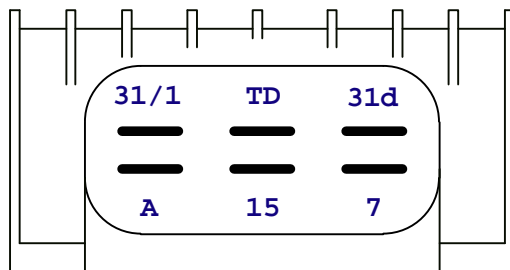
Start with factory recommended spark plug gapped, this may be increased by experimentation up to 1.5mm (0.060"). If misfiring is evident reduce the gap accordingly.

### TACHO

The vehicle may be fitted with either a low voltage or high voltage tacho. The M&W CDI tacho output provides a 12 square wave signal which will activate most OEM and aftermarket tacho's. If the tacho fails to function seek the advice of a competent auto electrician or automotive instrument maker. If it is suspected that a high voltage tacho is fitted, **AT YOUR OWN RISK**, you may try connecting it to the coil+ terminal.

**REFER TO MAIN INSTALLATION INSTRUCTIONS AT FRONT OF DOCUMENT FOR FURTHER INFORMATION.**

### FACTORY CONNECTIONS



### NOTE!

**The factory wire ignition leads must be replaced - see installation notes.**

|                                            |                             |                        |
|--------------------------------------------|-----------------------------|------------------------|
| Title<br><b>6 PIN BOSCH CDI CONNECTION</b> |                             |                        |
| Size<br>A4                                 | Number<br><b>PRO-10R S3</b> | Revision<br><b>1.2</b> |
| Date:<br>2-Nov-2007                        | Sheet 1 of<br>1             | Drawn By:<br>WAG       |
| File:<br>E:\M&W\...\Pro10R_S3_B6.sch       |                             |                        |

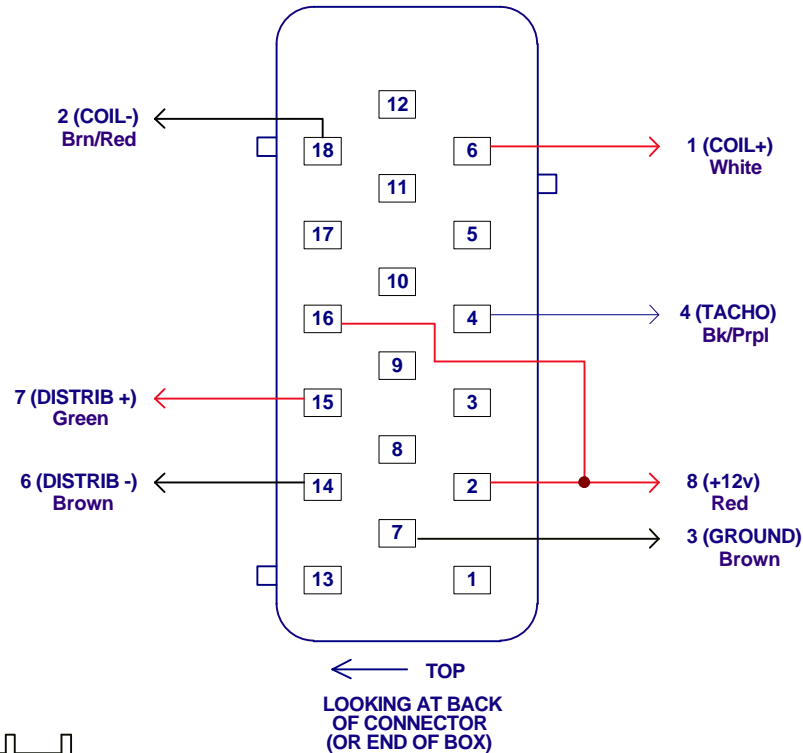
**CAUTION!  
HIGH VOLTAGE**



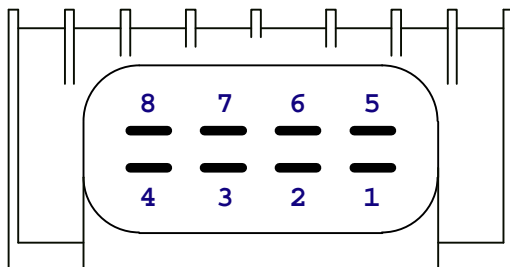
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|       |                             |            |                            |  |  |
|-------|-----------------------------|------------|----------------------------|--|--|
| Title |                             |            | 8 PIN BOSCH CDI CONNECTION |  |  |
| Size  | Number                      | Revision   |                            |  |  |
| A4    | PRO-10R S3                  | 1.1        |                            |  |  |
| Date: | 2-Nov-2007                  | Sheet 1 of | 1                          |  |  |
| File: | E:\M&W\...\Pro10R_S3_B8.sch | Drawn By:  | WAG                        |  |  |