

# 12 VOLT IGNITION - TWIN CYLINDER MODELS

POSITIVE OR NEGATIVE GROUND WITH POINTS IN THE SIDE CASING

## GENERAL DATA

This unit can work with positive or negative earth as long as the coils are fed from a positive supply. The working voltage is 10-16 volts. The maximum current through the unit must not exceed 5 amps. For road applications two 12 volt coils in series are satisfactory and for race applications a double ended coil with primary resistance of 3-4.5 ohms will give best results. Any short circuit on the ignition coils will damage the unit. The coil current should drop to zero after 2 seconds without triggering. The resistance of the stator coils should be 73 ohms each and the magnetic rotor should have south poles facing outwards.

This unit can be adapted for use on engines firing at 180 degrees camshaft or 360 crankshaft degrees. This unit will operate two coils to 10,000 sparks per minute. The typical working advance is 10 degrees at 2500RPM. This unit must be operated with the frame chassis acting as an electrical return, whether positive or negative polarity. If the engine is rubber mounted a good engine earth strap must be fitted. This unit will operate from an alternator, rectifier, zenor diode and capacitor battery-less system but starting may be more difficult. If the zenor diode disconnects when the engine is running the unit may be damaged. Both spark plugs are fired at the same time thus, if the engine only runs on one cylinder, the fault can be traced to a mechanical/spark plug/ignition coil/ht lead and not the transistor pack or stator plate.

## IGNITION TIMING FOR BRITISH TWINS

TRIUMPH TWIN	CLOCKWISE	38 degrees fully advanced
BSA TWIN	ANTI CLOCKWISE	34 degrees fully advanced
NORTON COMMANDO	ANTI CLOCKWISE	28/31 degrees fully advanced
NORTON ATLAS	CLOCKWISE	28/31 degrees fully advanced

## RECOMMENDED IGNITION COILS

Wassell part number **WW19375** (x2). 6 VOLT SINGLE OUTPUT COIL

Wassell part number **WW19371** (x1). 12 VOLT DUAL OUTPUT COIL

## HT LEADS & SPARK PLUG CAPS

We recommend fitting a good quality 5k resistor type plug cap

Non-resistor caps can also be fitted

# INSTALLATION INSTRUCTIONS - TWIN CYLINDER

**Warning:** This unit can produce high voltages.

**Always disconnect the battery before working on the system!**

- 1 Disconnect the battery
- 2 Remove the petrol tank and/or seat for access to the ignition coils & condensers
- 3 Remove the contact breaker plate and automatic advance unit
- 4 Trace the two contact breaker wires (normally black, white/black or yellow) up to the condenser pack/ignition coils and disconnect. These are no longer required
- 5 Remove the other wires from the ignition coil terminal's. These will be negative feed wires from the ignition switch
- 6 Link the coils using the black link wire. The negative of one coil to the positive of the other. Cut the link wire to the correct length and ensure female lucar connectors are crimped/soldered
- 7 Using the red positive earth wire, connect the positive of the first coil to a good frame earth or positive battery terminal on positive earth models (via the ignition switch feed on negative earth models). See the appropriate wiring diagram for your model
- 8 Find a position for the transistor box near the ignition coils and mount using cable ties. Ensure both wiring block connectors can be accessed to attach the wiring
- 9 Connect the black wire from the transistor box to the negative on the second coil (see wiring diagram). Remove the outer protective sleeve and cut the wire to required length. Re-fit sleeve as required
- 10 Connect the red wire from the transistor box to the positive terminal of the first coil (same point as the earth wire. See wiring diagram)
- 11 Connect the white wire from the transistor box to the ignition switch feed on **POSITIVE** ground models and to a suitable earth on **NEGATIVE** ground models (see wiring diagrams). Remove outer protective sleeve and cut wire to the required length. Re-fit sleeve as required
- 12 Connect the black/yellow from the transistor box to the black/yellow from the stator plate. Both black/yellow and black/white share a common sleeve. Cut the sleeve to desired length
- 13 Connect the black/white from the transistor box to the black/white from the stator plate
- 14 Insulate the ends of any unused wires and check all connections are good and tight fitting
- 15 Remove the timing inspection cover from the alternator side of the engine
- 16 Set the engine at the fully advanced timing mark on the compression stroke
- 17 Fit the magnetic rotor in to the end of the camshaft in the contact housing using one of the bolts supplied (either BSF or UNF depending on model). Check that the bolt does not bottom on the thread. If it is too long, cut off a small amount of the thread

## INSTALLATION INSTRUCTIONS (cont)

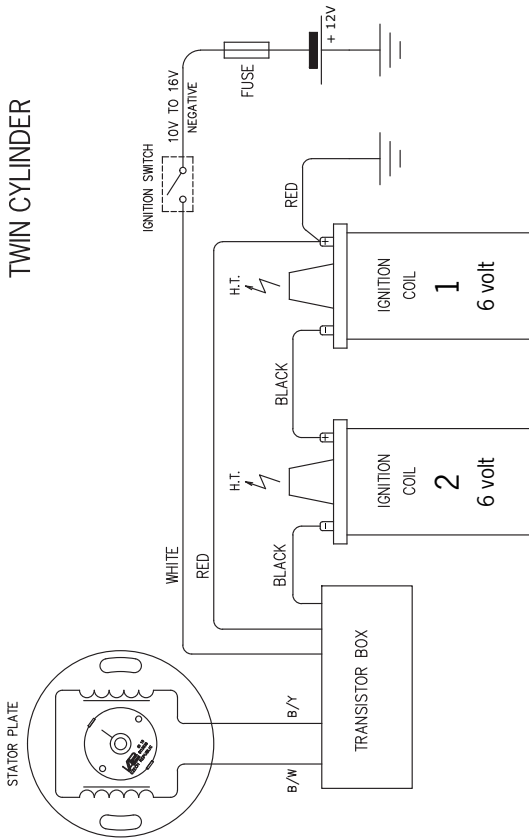
- 18** Hold the stator plate in the contact breaker housing. Centralise the adjustment slots and turn the magnetic rotor on its taper until the timing mark lines up with the appropriate timing mark. Anti-clock **A** or clock **C**, depending on model. This must be done without moving the engine setting. A rotor spanner is provided to move the rotor (good tip: mark the stator timing position on to the engine case with a marker pen and align the rotor timing mark to it).  
The stator plate should be central on the adjustment slots, with the rotor timing mark central in the timing position hole
- 19** Tighten the rotor locating bolt and check the engine position has not moved
- 20** Fit the stator plate with pillar bolts and connect the black/white & black/yellow wires to the stator plate using male bullet connectors

**WIRING: All connections must be of the highest quality crimped and/or soldered. Twisted wires will not give satisfactory operation. Also, avoid coiling up any surplus wiring. Cut to length and make new connections where required**

- 21** Refit the tank seat and re-connect the battery
- 22** Start the engine and warm it up to normal working temperature for 4-5 minutes. Connect a strobe lamp and time with the engine running at 4000-5000 RPM. This is adjusted by sliding the stator plate on its slotted holes. If timing marks cannot be aligned before the end of the adjustment slots then the magnetic rotor must be re-positioned
- 23** Re-fit the contact breaker cover and alternator timing cover. The timing is now set and should require no further adjustment

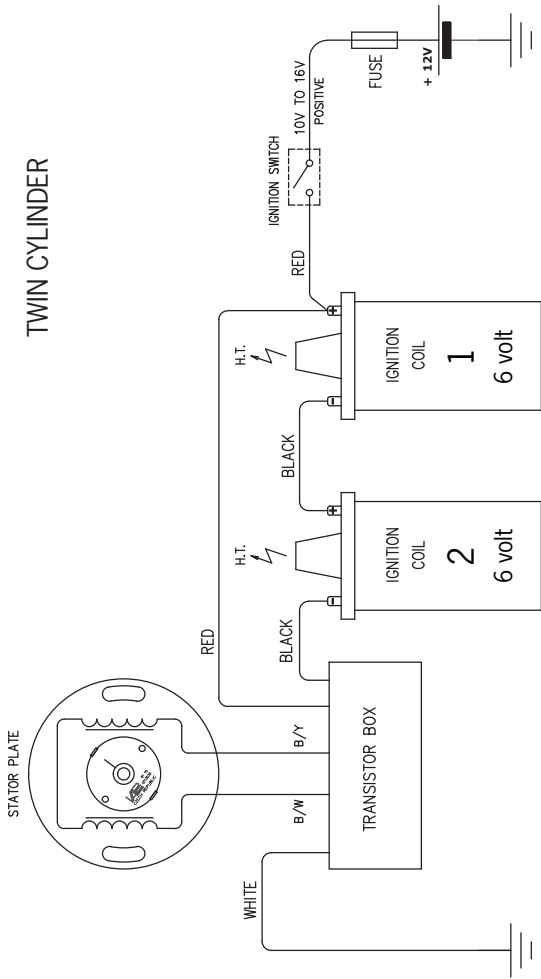
# POSITIVE GROUND MODELS

## TWIN CYLINDER



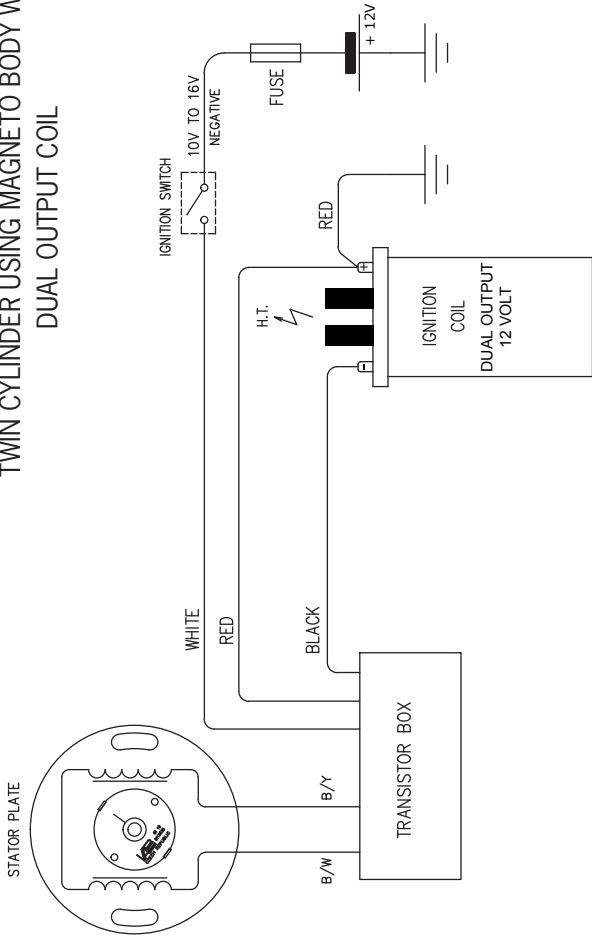
# NEGATIVE GROUND MODELS

## TWIN CYLINDER



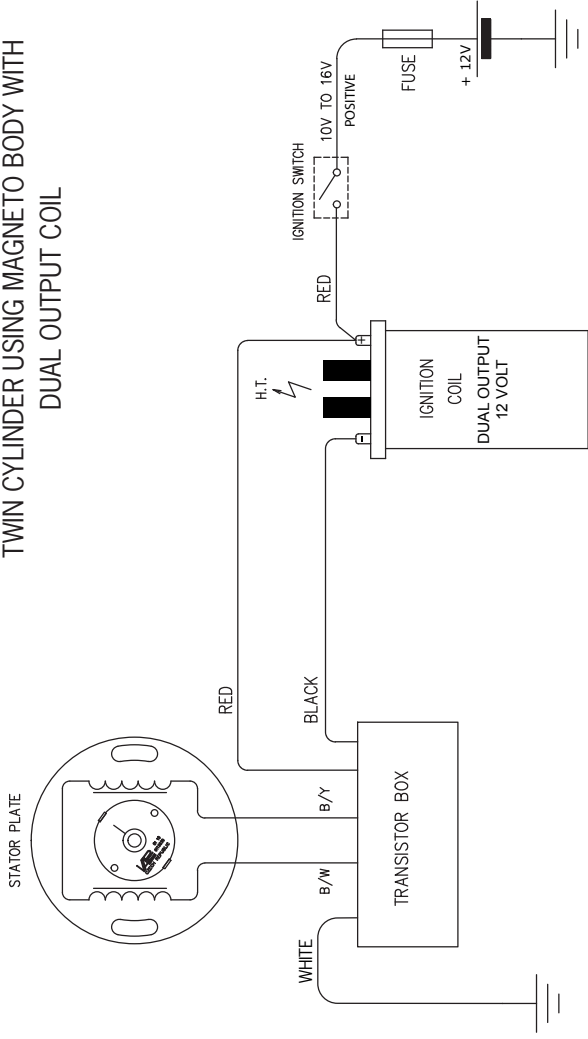
# POSITIVE GROUND MODELS

## TWIN CYLINDER USING MAGNETO BODY WITH DUAL OUTPUT COIL



# NEGATIVE GROUND MODELS

## TWIN CYLINDER USING MAGNETO BODY WITH DUAL OUTPUT COIL



# 12 VOLT IGNITION - SINGLE CYLINDER MODELS

POSITIVE OR NEGATIVE GROUND WITH POINTS IN THE SIDE CASING

## GENERAL DATA

This unit can work with positive or negative earth as long as the coil is fed from a positive supply. The working voltage is 10-16 volts. The maximum current through the unit must not exceed 5 amps. For road application a Wassell 12 volt coil is recommended. Any short circuit on the ignition coil will damage the unit. The coil current should drop to zero after 2 seconds without triggering. The resistance of the stator coils should be 73 ohms each and the magnetic rotor should have south poles facing outwards.

This unit can be adapted for use on engines firing at 180 degrees camshaft or 360 crankshaft degrees. This unit will operate two coils to 10,000 sparks per minute. Typical working advance is 10 degrees at 2500RPM. This unit must be operated with the frame chassis acting as an electrical return, whether positive or negative polarity. If the engine is rubber mounted a good engine earth strap must be fitted. This unit will operate from an alternator, rectifier, zenor diode and capacitor battery-less system but starting may be more difficult. If the zenor diode disconnects when the engine is running the unit may be damaged. Both spark plugs are fired at the same time thus, if the engine only runs on one cylinder, the fault can be traced to a mechanical/ spark plug/ignition coil/ht lead and not the transistor pack or stator plate

## IGNITION TIMING FOR BRITISH SINGLES

BSA C15/B40	ANTI CLOCKWISE	33.5° BTDC full advance
BSA B25	ANTI CLOCKWISE	37° BTDC full advance
BSA B44	ANTI CLOCKWISE	28° BTDC full advance
BSA B50	ANTI CLOCKWISE	34° BTDC full advance
T20 CUB -67	ANTI CLOCKWISE	36° BTDC full advance
T20 CUB 67-	ANTI CLOCKWISE	32° BTDC full advance

## RECOMMENDED IGNITION COILS

Wassell part number **WW19376**. 12 VOLT SINGLE OUTPUT COIL



# INSTALLATION INSTRUCTIONS - SINGLE CYLINDER

**Warning:** This unit can produce high voltages.

**Always disconnect the battery before working on the system!**

- 1 Disconnect the battery
- 2 Remove the petrol tank and/or seat for access to the ignition coils & condensers
- 3 Remove the alternator rotor cover if fitted
- 4 Loosen the automatic advance unit centre bolt
- 5 Rotate the engine to the correct full advance timing position (see additional timing information). These rotor marks should be checked for correct alignment and should line up with the engine set in the full advance position. If in doubt, check with a timing disc and dial gauge in the spark plug hole, then re-mark the rotor as required. Models produced after 1969 have a timing plug on the left hand crankcase
- 6 Remove the kick start and gear lever and remove the outer timing cover
- 7 Remove the contact breaker plate and lead
- 8 Remove the automatic unit centre bolt and remove the auto advance unit. This can be done by using the extractor bolt supplied, or a light tap sideways will remove it from the taper
- 9 Fit the magnetic rotor in place of the automatic unit using one of the bolts supplied, either BSF on pre 1968 engines or UNF on later models. Check the bolt does not bottom on the thread. Shorten the bolt if required. **Do not tighten the bolt** as adjustment will be required
- 10 Hold the stator plate in the contact breaker housing. Centralise the adjustment slots and turn the magnetic rotor on its taper to align it with the appropriate timing mark (anti-clock **A** clock **C** depending on model). This must be done without moving the engine static setting (mark the stator timing mark position on to the engine case with a marker pen and align the rotor to it). The stator plate should be central on the adjuster slots with the rotor timing mark central in the timing position hole
- 11 Check the engine has not moved and tighten the rotor fixing bolt
- 12 Fit the stator plate with pillar bolts and connect the black/yellow & black/white wires to the stator plate. Bullet connection ensure wires are connected the right way round as this will affect ignition timing. Route the wires through the appropriate grommet clips on the inner timing cover and secure them to the front frame tube with cable ties
- 13 Re-fit the outer timing cover and kick start/gear levers
- 14 Remove all wires from the ignition coil terminals. These will be the original CB lead and feed from the ignition switch and the external condenser if fitted
- 15 Find a position for the transistor box near the ignition coil and mount using cable ties. Ensure both wiring block connectors can be accessed to attach the wiring

## INSTALLATION INSTRUCTIONS (cont)

### NEGATIVE GROUND ELECTRICS

- 16 For **NEGATIVE** ground electrics take the black lead from the transistor box. Cut to length and connect to the negative coil terminal using an insulated spade terminal
- 17 Take the red wire from the transistor box, cut to length and connect to the positive ignition coil terminal with an insulated spade terminal
- 18 Connect the ignition switch feed wire to the positive terminal of the ignition coil
- 19 Take the white wire from the transistor box, cut to length and connect to a good grounding point (negative [-] battery terminal recommended)

### POSITIVE GROUND ELECTRICS

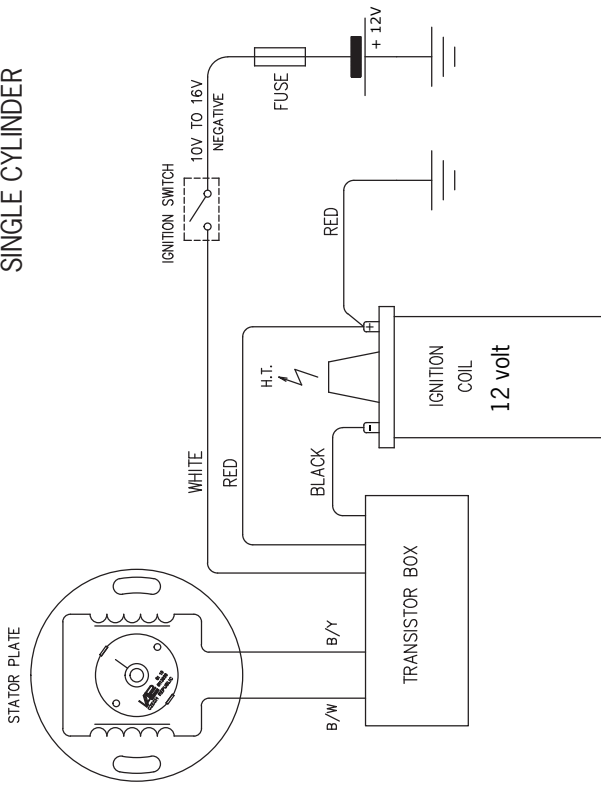
- 20 For **POSITIVE** ground electrics take the white wire from the transistor box, cut to length and connect to the ignition switch feed wire previously connected to the ignition coil
- 21 Take the red wire from the transistor box and connect to the ignition coil positive terminal
- 22 Take a separate ground wire from the positive coil terminal to a good grounding point (positive [+] battery terminal recommended)
- 23 Take the black wire from the transistor box, cut to length and connect to the negative ignition coil terminal

**WIRING: All connections must be of the highest quality crimped and/or soldered. Twisted wires will not give satisfactory operation. Also, avoid coiling up any surplus wiring. Cut to length and make new connections where required**

- 24 Re-fit the tank seat and re-connect battery
- 25 Start the engine and warm it up to normal working temperature for 4-5 minutes. Connect a strobe lamp and time with the engine running at 4000-5000RPM. This is adjusted by sliding the stator plate on its slotted holes. If the timing marks cannot be aligned before the end of the adjustment slots, then the magnetic rotor must be re-positioned
- 26 Re-fit the contact breaker cover and alternator timing cover. The timing is now set and should require no further adjustment
- 27 **EARLY C15 / B40 / T20 MODELS DO NOT HAVE PROVISION FOR STROBE TIMING** so road testing will be required for optimum performance. Adjust the stator plate as later models. **NOTE:** As the camshaft rotates at half the engine speed, 20 degrees crank movement is equal to 10 degree camshaft movement

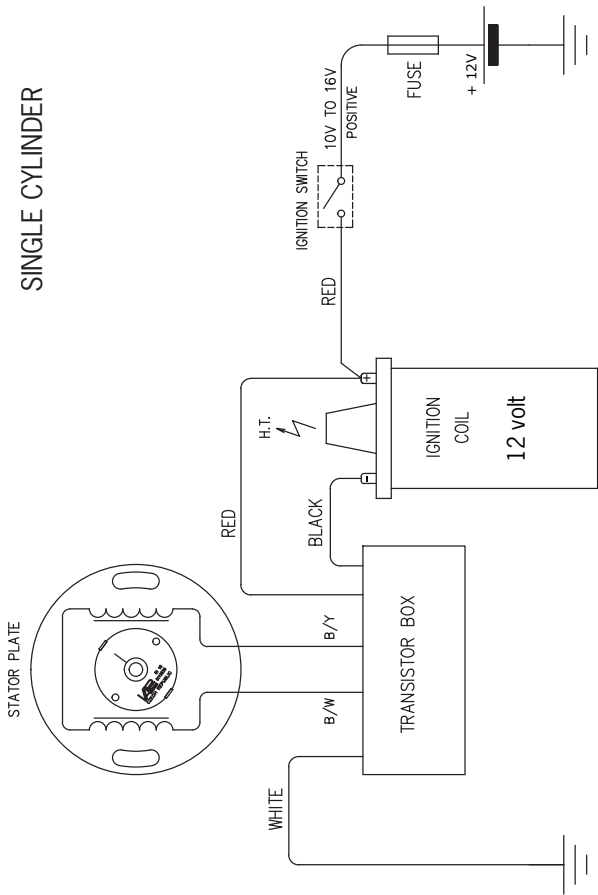
# POSITIVE GROUND MODELS

## SINGLE CYLINDER



# NEGATIVE GROUND MODELS

## SINGLE CYLINDER



# TROUBLE SHOOTING

## NO SPARK

- 1 Check the battery has power
- 2 Using a test bulb or voltmeter/multimeter check for a power feed to the ignition module from the ignition switch. Measure between the ignition feed wire and ground with ignition switch on
- 3 The voltage reading here should be the same as the voltage on the motorcycle battery (12volts). If a significantly lower voltage is detected then this can indicate a faulty ignition switch or a bad connection in the ignition circuit/wiring loom. A simple test is to take a direct feed from the battery to the ignition pack, bypassing the normal feed from the ignition switch

## STATOR PLATE

- 1 Check wiring connections on black/white / black /yellow wires. Check for any visible signs of damage on the stator plate and ensure the rotor is correctly located in taper seating
- 2 Using a multi meter check continuity through the stator plate. Set the meter to ohms. The resistance reading for each coil should be 73 ohms. Connect the meter to the black/white & black/yellow leads and the combined resistance should be 146 ohms

## SPARKS ON CRANKING BUT ENGINE WILL NOT RUN

- 1 Check polarity of wires from the ignition module to stator (y/b to y/b & w/b to w/b). If these wires are connected incorrectly ignition will produce a spark but the timing will be retarded

## CONTINUOUS SPARKING WITHOUT CRANKING ENGINE

- 1 This indicates a poor supply to the ignition. Check battery for a bad cell. A bad battery with charger connected can cause this problem
- 2 Check for good engine earth connection and battery earth point
- 3 Wrong type of ignition coil fitted with low primary resistance