

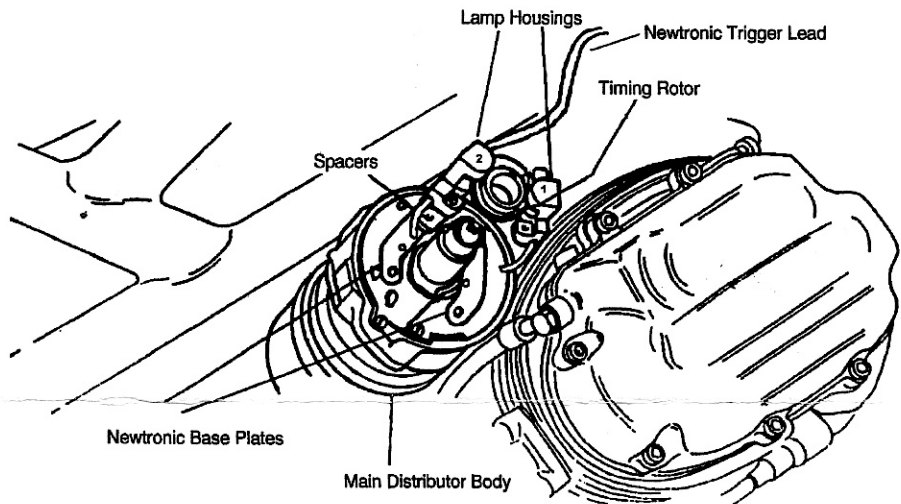
## FITTING INSTRUCTIONS

Thank you for choosing a Newtronic contactless optical ignition system. For a speedy and successful installation, it is recommended that you first read all the way through the fitting instructions and familiarise yourself with the parts provided in the kit.

### ON MODELS WHERE COILS ARE FITTED UNDER THE LEFT-HAND SIDE COVER THE FOLLOWING APPLIES

The Basic Fitting Instructions remain the same with the following exceptions.

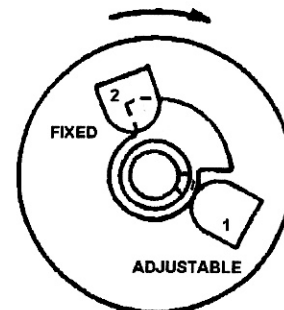
1. Switching Unit to be fitted under Right-hand side cover, or in front of battery.
2. The red and green leads from switching unit to be connected to corresponding colours on main wiring loom previously occupied by wires from points.
3. The white feed wire should still be connected to spare feed terminal on coil as in instructions.



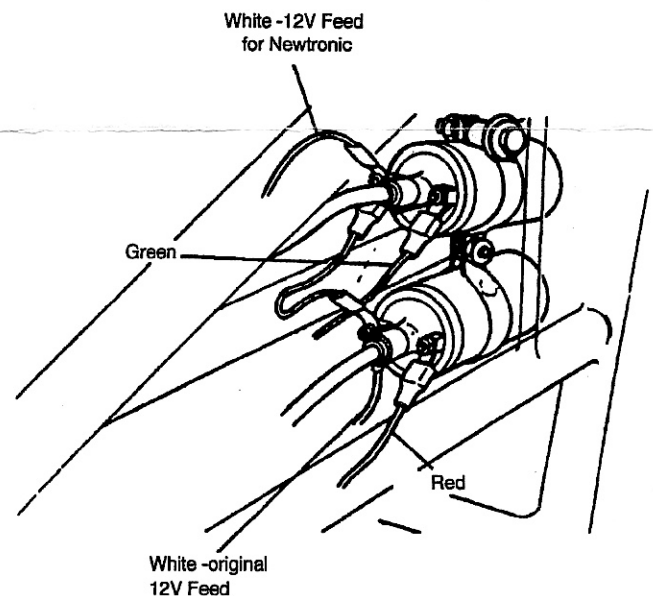
### General Instruction

1. Raise the seat and disconnect the battery earth.
2. Remove the petrol tank.
3. Remove the cover from the distributor.
4. Remove both contact breaker assemblies together with the clips holding the connecting wire grommets. Trace the wires back to the coils noting that the green lead corresponds to the LH cylinder, the red to the RH cylinder and disconnect. The condensers may be left screwed to the distributor body but it should be noted that these will not be required in the installation.
5. Line up mark on the rotor with the slot in the end of cam. Press the rotor gently into engagement assuring it is fully down. Do not exert undue force. If play is detected between rotor and cam form, apply a drop of "Loctite" or similar adhesive.
6. Fit the Newtronic baseplates using the original contact breaker mounting holes. The end lamp (1) is fitted in the adjustable contact breaker position with the second lamp (2) in the fixed location. (See image for correct orientation). The wire will usually exit towards the **front** of the engine.
7. The adaptor plate mounting holes are elongated to allow some adjustment. It is recommended that the initial position is such that the lamps are pushed towards the wire exit side of the distributor before the screws are tightened.
8. Thread the lamp cable through the supplied grommet and distributor cover gasket.
9. Remove the LH side cover (near side) and carefully thread the Newtronic trigger lead through the frame past the air cleaner box to appear under the LH side cover. Ensure that the cable is kept away from the cylinder heads and other sources of heat.
10. Connect the trigger lead to the switching unit as shown in the diagram and seal the plug with the waterproof sealant provided.
11. Run the coil connecting harness along the LH top frame tube to the coils and secure to the frame with the ty-raps provided. Connect the green lead to the -ve terminal on the LH coil, the red lead to the -ve terminal on the RH coil and the white lead (the 12V supply for the Newtronic) to the one spare +ve terminal.

### Direction of Rotation



### Showing Firing Point at LH Cylinder



### COIL CONNECTIONS

12. Earth the blue lead on the Newtronic to the battery -ve terminal.
13. Wipe clean the inside of the cover, remove the protective backing from the self-adhesive panel on the back of the Newtronic switching unit and affix to the side cover.
14. Re-fit the petrol tank and the side cover.

All the necessary components are now fitted and a check should be made to ensure that the rotor does not foul the lamp housings before proceeding.

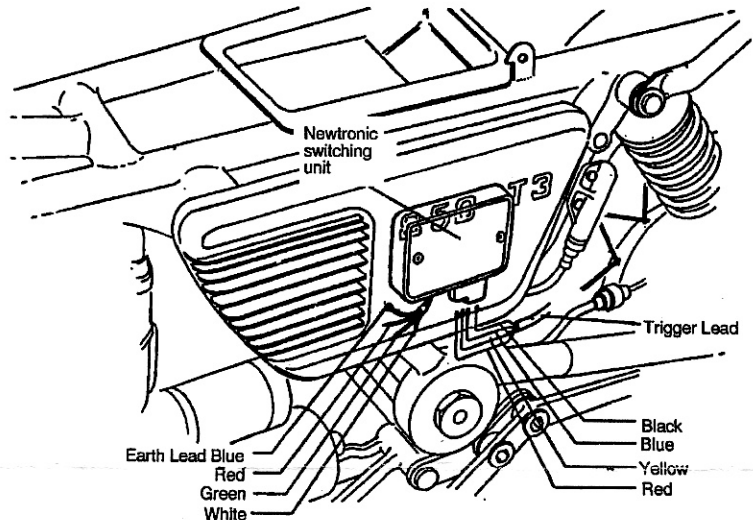
**TIMING THE ENGINE**

This should NOT be done in bright sunlight or the timing may be affected. It is recommended that a stroboscope timing light is used. It should be remembered that the engine fires as the timing rotor leaves the lamp housing (i.e., immediately the beam of light is re-made).

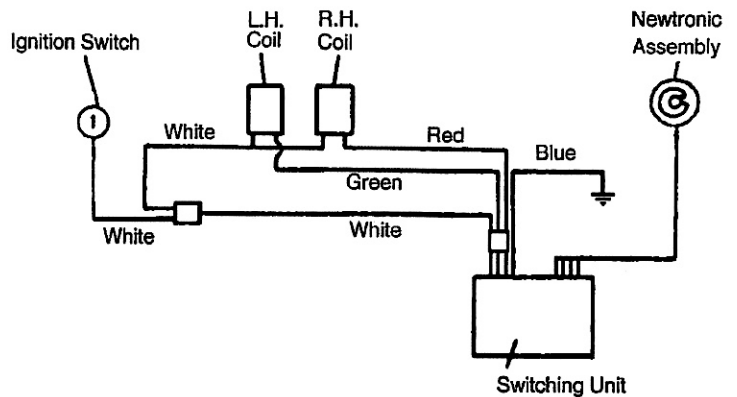
Static timing can be performed using the switching unit indicators. Care must be taken as leaving the ignition on, without running the engine, for a prolonged period can cause irreversible damage to the switching unit and/or coils.

**NOTE:** The design of the Newtronic system means that the manufacturers timing procedure should not be used. Initial position must be set on the LH cylinder with the final adjustment carried out on the RH cylinder.

1. Remove the rubber plug in the crankcase covering the timing marks. Connect the stroboscopic timing light to the LH (nearside or "S") cylinder and start the engine. Allow the engine to warm up for a few minutes and then align the fully advanced timing mark centrally in the hole by moving the whole distributor body at an engine speed of 5000 r.p.m. The fully advanced timing mark is a faint line scribed on the flywheel some 39° BTDC. It may be found advantageous to lightly paint this in with some white paint.
2. Repeat the above procedure for the RH (offside or "D") cylinder but adjusting the moveable baseplate inside the distributor.
3. It may be necessary to adjust the position of the lamps and their adaptor plates to achieve the correct timing on each cylinder. This can be done by loosening the screws mounting the plates and sliding the lamp and plate.
4. Check that all the screws and the distributor locking clamp are tight and replace the original distributor cover using the thick gasket, screws and washers provided.
5. Finally, replace the rubber plug in the crankcase.



NEWTRONIC SWITCHING UNIT IN L.H. SIDE PANEL



SCHEMATIC WIRING DIAGRAM

**A. ENGINE DOES NOT START**

*Incorrect wiring*

- Check connections to the coils and that the 12V feed from the ignition switch is connected to the coils.
- Check that the earth connection is sound.
- Check that the wiring to the switching unit is correct, especially in the moulded plug.

*Engine backfires on cranking*

- Timing rotor 180° out.
- Check coil connections for correct colour coding.
- Check that the condensers have been disconnected.

*Flat battery*

Charge battery.

*Lack of fuel*

Check that the fuel tap is on and that there is fuel in the tank.

*Timing rotor not covering lamps properly*

Slacken adjusting screws and move plates carrying the lamps inwards.

*Timing rotor has severed the lamp lead*

Send assembly back to Newtronic Systems.

*Faulty system*

Follow assembly check procedure.

**B. ENGINE STARTS BUT RUNS POORLY**

*Engine does not advance properly*

- Auto advance mechanism binding.
- Engine timed on T mark instead of F mark.
- Auto advance mechanism not engaged properly in end of crankshaft.

*Engine misfires at low revs*

- Loose electrical connections, especially earth.
- Rotor not covering lamps.
- Incorrect ignition timing.
- Faulty ignition system.

*Engine runs on only half number of cylinders*

- Check all electrical connections.
- Rotor not covering lamps.
- Faulty ignition system.

*Engine misfires at high revs*

- Faulty electrical connections.
- Water in HT connection.
- Spark plugs breaking down.
- Cracked spark plug caps.
- Faulty ignition system.

**C. SYSTEM CHECK PROCEDURE**

1. *To check the Switching Unit*

Disconnect lamp leads from the switching unit. Remove the HT leads from the plugs and connect spare spark plugs into the caps. Place the plugs on top of the engine or similar earthed structure.

Switch on the ignition and all LEDs (1, 2 or 3) should be ON.

Using a short length of wire connect Pin 1 to Pin 3 repeatedly and sparks should occur at one of the plugs. (Two plugs in the case of a 4 cylinder engine). The left hand LED1 will go OFF each time the connection is made. Continue by connecting Pin 1 to Pin 5 and sparks should occur at another plug or plugs. The right hand LED2 will show operation.

If available, connecting Pin 1 to Pin 4 repeatedly will give sparks at the remaining plug(s) and LED3 will show operation.

Care should be taken NOT TO SHORT PIN1 TO EARTH.

If sparks appear at relevant plug (or plugs) when the connections are made the unit is satisfactory.

2. *To check the lamp assembly*

To be done after checking the switching unit. Re-connect the lamps with the coil HT leads still connected to the plugs on top of the engine. Move a piece of card or plastic through each lamp sensor in turn and a spark should be visible at each plug (or plugs) in turn. The LEDs should initially be OFF if the lamp sensor beam is open. When the beam is obstructed the LED will come ON and the coil charged ready to fire. The coil will fire when the lamp sensor becomes clear again.

If this occurs both the unit and the lamps are satisfactory.

**D. PROBLEMS IN TIMING ENGINE**

- A xenon stroboscope is easier to use than a neon one. This has a brilliant white light not an orange-red one.
- Check for free movement of Auto advance mechanism.
- For additional accuracy check the position of the manufacturer's timing marks using a dial gauge.

**WARNING: Ignition must not be left on or coils charging for periods in excess of a few minutes at a time as over-heating and damage may occur to either the coils and/or the Newtronic Switching Unit.**

## A. CHANNEL NUMBERING

The Newtronic switching unit may have 1, 2 or 3 ignition channels depending upon the application.

A Single lamp is always connected to channel 1 of the switching unit with a blue wire on pin 3. This will trigger LED1 on the left of the switching unit.

A Double lamp will generally have lamp 1 (blue) at the end of the sensor assembly run with lamp 2 (black) closer to the connector.

Lamp 1 connected to pin 3 will trigger LED1 on the left of the switching unit.

Lamp 2 connected to pin 5 will trigger LED2 on the right of the switching unit.

A Triple lamp assembly will usually have lamp 3 (white) at the end of the sensor run with Lamp 2 (black) in the centre and Lamp 1 (blue) nearest the switching unit.

Lamp 1 connected to pin 3 will trigger LED1 on the left of the switching unit.

Lamp 2 connected to pin 5 will trigger LED2 on the right of the switching unit.

Lamp 3 connected to pin 4 will trigger LED3 in the centre.

In some cases the general connection rules above are changed to suit a particular installation. In this case refer to the instructions provided with the kit for the Lamp to switching unit pin assignment.

## B. SWITCHING OPERATION

It is possible to static time the ignition using the LED indicators on the switching unit. When an LED is ON it shows that the coil connected to that channel will be charging. When the LED changes from ON to OFF the ignition coil will fire on that channel.

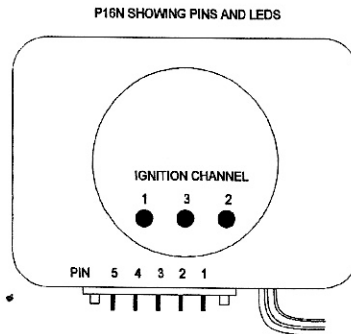
Remember, if the coils are connected they will be drawing current all the time that the LEDs are ON. It is recommended that the static timing is done initially with the coils disconnected to avoid possible damage by overheating of the ignition parts.

On single lamp units LED1 on the left will show the operation of the coil connected to the yellow wire out from the switching unit.

On double lamp units, LED1 on the left will show the operation of the coil connected to the yellow wire out from the switching unit. LED2 on the right will show the

operation of the coil connected to the violet wire.

On triple lamp units, LED1 on the left will show the operation of the coil connected to the orange wire out from the unit. LED2 on the right shows for the coil connected to the violet wire. LED3 in the centre shows operation for the coil connected to the yellow wire.



## C. STATIC TIMING PROCEDURE

Refer to previous information or fitting instructions to identify the correct sensors and channels for your engine. Ignition must be on but it is recommended to remove the power from the coils or their connection to the Newtronic unit.

1. Set your engine to the static timing position for the first cylinder or cylinder pair.
2. The trailing edge of the rotor blade should be close to the centre of the lamp sensor for that cylinder.
3. If the LED for the firing coil is initially OFF, rotate the sensor baseplate in the direction of engine rotation until the LED is ON.
4. If the LED for the firing coil is ON, rotate the sensor baseplate in the opposite direction to the engine until the LED just goes OFF.
5. Tighten the screws on that baseplate to fix the firing position.
6. Set the engine to the static timing position for each cylinder or cylinder pair in turn.
7. Carry out the same procedure 2 to 5 observing the LED for the appropriate firing coil and moving the baseplate for the relevant sensor.
8. The static ignition positions should now be set for all cylinders.
9. Reconnect the coils and start the engine. Check ignition timing with the engine running using a strobe light.

**WARNING: Ignition must not be left on or coils charging for periods in excess of a few minutes at a time as over-heating and damage may occur to either the coils and/or the Newtronic Switching Unit.**