STK-970 Villiers Trials 9E-36A Engines

HT Cap

Fitting Kit

HT Bracket

HT-CDI

Ignition Stator

Outer Flywheel

Inner Flywheel
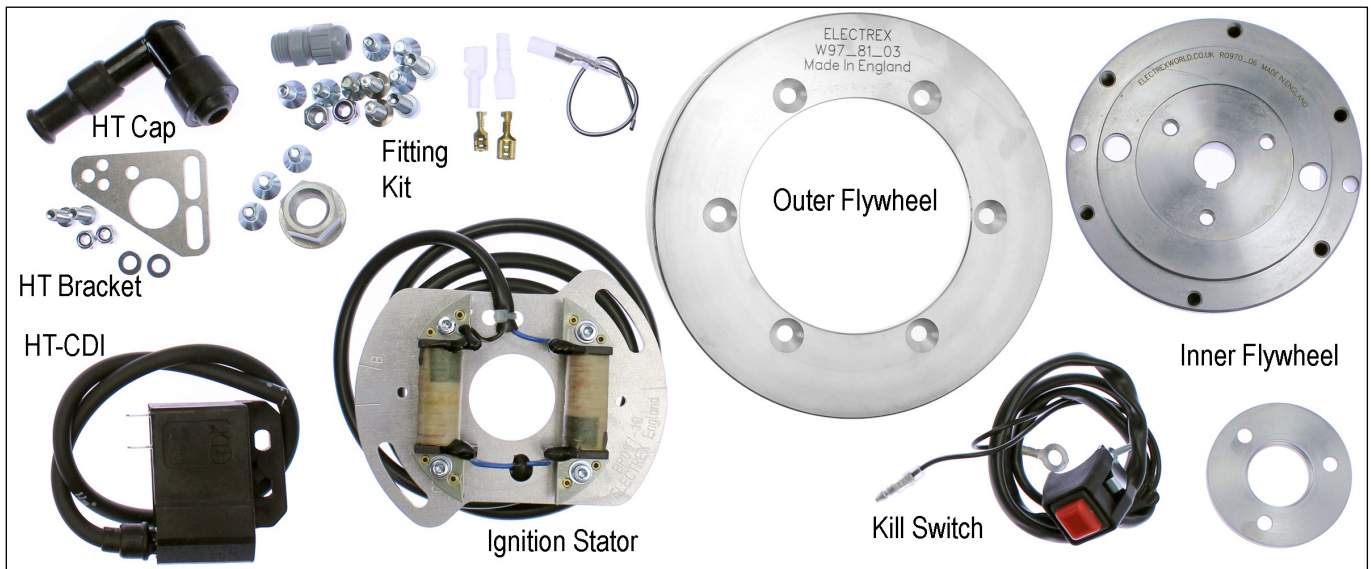
Kill Switch

PRODUCT FEATURES

- CDI ignition system for strong spark starting at only 150 rpm.

- Automatic variable advance curve specifically for the Villiers 2 stroke engine.

- Flywheel is a 2 piece solid alloy steel construction + magnet ring with perfect balance 'by design'. It has a self extracting/retaining nut as per the Villiers original. With the outer flywheel removed initial timing set up and adjustment is easily achieved.

Graph showing Ignition Advance Curve for STK-970

Ignition angle before top dead centre — RPM

- The outer flywheel ring can be changed for a lighter or heavier version depending on rider preference.

- Lighter version is available with total weights of 2.85kg.

- Note original standard brass flywheel is 2.65kg and 'heavy' original for trials is 3.5kg.

- High quality electroplating and stainless steel fittings are used for maximum corrosion protection.
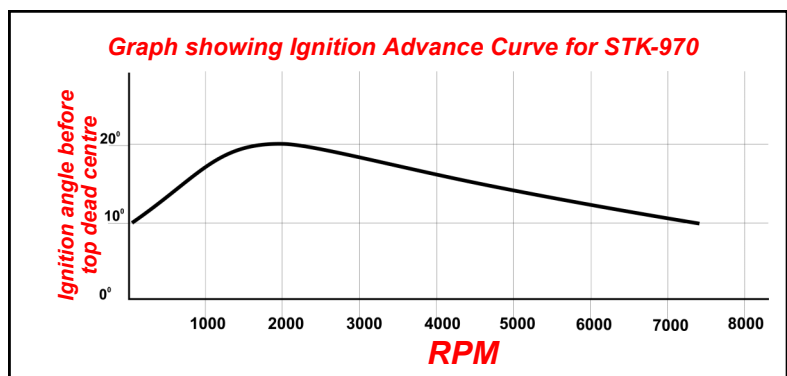
STK-970 - Villiers Trials 9E/36A Engine

Fitting Instructions

Step 1:   The base plate is retained by tapping the 2 holes indicated, thread size M6 see fig. 1 (overleaf). These were used for the original stator coils, the hole size should already be correct at about 5.2mm.

Step 2:   Fit the base plate using the x2 domed head screws see fig. 2 (overleaf)
Note: it is important to use the spring washers provided - do not fully tighten yet.

Step 3:   Feed cables through the original HT cable hole at the front of the engine. Feed cables through gland seal ensuring that it is the correct way round see fig 3 (overleaf). Slide on clear insulation cover on both the short black/white cable and the blue cable, crimp/solder large ¼" terminal. Crimp/solder the small 3/16" terminal on to the black cable, then heatshrink the black sleeve over the terminal.

Important notes regarding fitting of the inner flywheel

The captive nut is normally retained by the steel plate with x3 counter-sunk screws, but for the purpose if initial fitting leave the plate detached, this ensures the flywheel fits on the taper and woodruff key correctly. When located the nut and plate can be attached, apply some grease to the nut and use loctite on the 3 screws, the captive nut and plate can then be left in place.

TIP: If the original woodruff key is not firmly in place on the crankshaft refit using Loctite and allow to set, apply some heat from a hot air gun to speed this up. This helps prevent it being dislodged when the rotor is fitted.
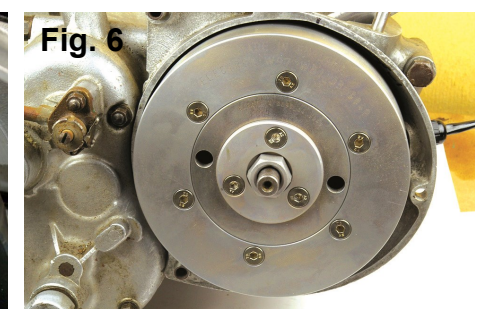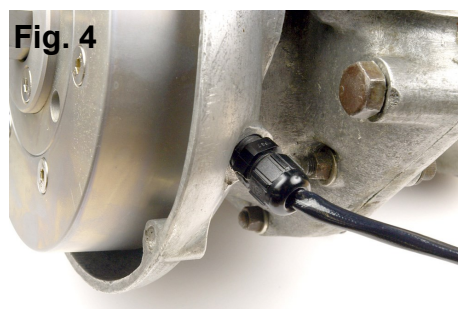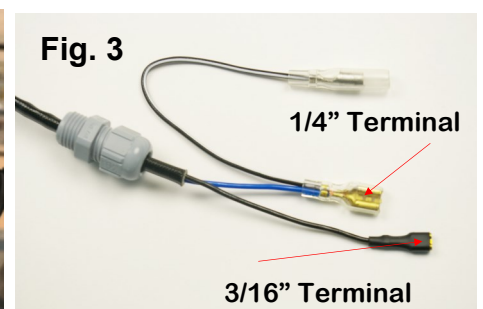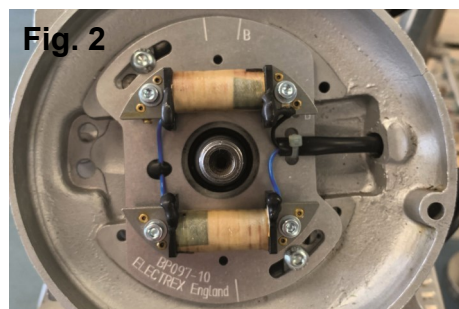
NOTE: A woodruff key is not supplied with this kit but can be supplied by Villers Services.

Step 4   Fit the inner flywheel, taking care that the Woodruff key is correctly seated in the keyway. We recommend you fit a new one, especially if the original is in poor condition.

Step 5   (See fig. 5) To set the timing, remove the spark plug and with a dial gauge or timing disc (if available) set the piston to 'TDC', then, without moving the flywheel rotate the base plate so that the unmarked line (not line B) on the base plate is in alignment with the 'T' mark on the flywheel. The timing is then set at 10^0 'BTDC'. If you are having problems setting the timing please see bottom of the page for more detailed instructions
NOTE: The base plate can then be adjusted/tightened using a 4mm allen key through either of the holes in the flywheel.

Step 6   See wiring diagram on next page: Fit the combined HT-CDI unit, plug in the 2 terminals from the stator, the larger terminal has a black/white lead connected; if this terminal is connected to earth or the engine or chassis, this will cut the ignition so a kill switch can be fitted if required.

Step 7   Fit the HT cap on the lead after cutting to the length required.

Step 8   (See fig. 6) When fitting the outer flywheel it is recommended that you use Locktite Threadlock or similar to re-tain the 6 countersunk screws (don't use Locktite stud retainer if you wish to remove the screws in the future).

Fig. 1 — Tapped holes

Fig. 2

Fig. 3 — 1/4" Terminal, 3/16" Terminal

Fig. 4

Fig. 5 — 4mm Allen key for adjustment. Align T mark on rotor with line on stator

Fig. 6
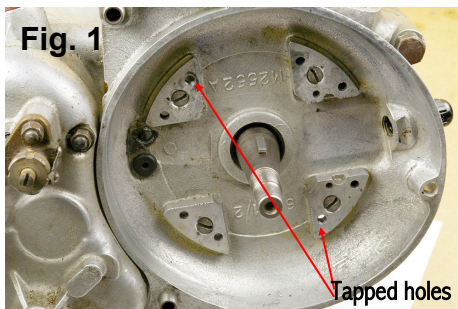
Setting Timing

To check the timing use a strobe light, the 'FA' mark on the flywheel will align with the timing line (not line B) on the stator at maximum advance position at approx. 3000rpm.
You can also accurately set the timing with the 'FA' mark. Example: set piston with a dial guage to 23^0 BTDC (4.36mm). Move plate so timing mark is in alignment with 'FA' mark on the flywheel.

NOTE: If you are unable to set the timing as in step 5, with the piston set to TDC because there is insufficient movement on the stator slots, it will be necessary to reposition the stator coil on the plate to position B (these may be difficult to see, please look carefully under the coil and where the cable is screwed down). To do this unscrew the stator coil from the plate (you may have to heat up the plate first with a hot air gun, as loctite has been used, to release screws) and reposition using the other set of tapped holes marked with a B on the plate, then line up the timing line with the B against it on the stator plate with the T on the flywheel. (The repositioning of the stator coil to position B is required on engines derived from invalid cars.)

STK-970 (ignition only) Wiring Diagram

HT-CDI

Kill switch

Link all earth
connections together
with a cable