1. System description

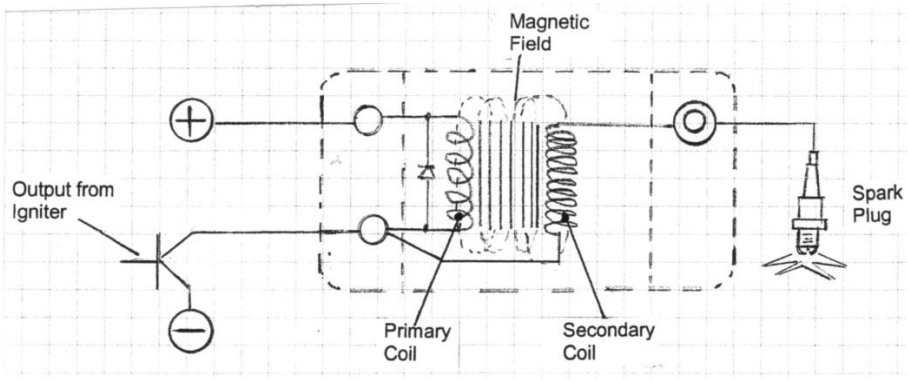
The standard GILL ignition system incorporates:

a) A microprocessor based electronic control module (the Igniter), either preprogrammed, or fully field programmable.
b) A number of high tension coils, equal to the number of cylinders
c) A timing disc, running at half engine speed (other options available)
d) A magnetic pickup, reading the timing disc.
e) A wiring harness to connect all components together, and with a connector to the lap top for programming and diagnostic.
f) A graphical user interface software (for igniter programming) in case of the field programmable igniter version.

2. Operating Principle

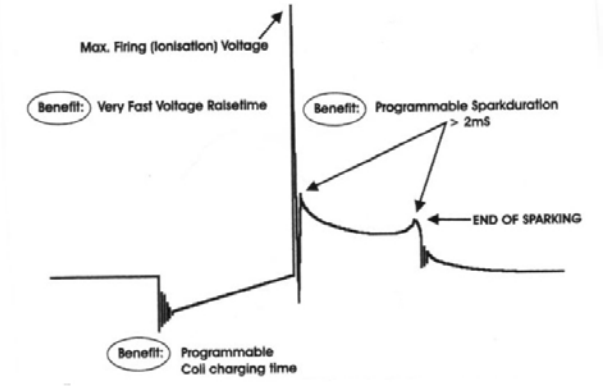
The wiring of the system must be done as per attached wiring diagram GP6LB showing a 6 Cyl System.

The timing disc must be correctly indexed with reference to top dead center of Cyl. No.1
The magnetic pickup then signals the igniter module when to start to energise the primary side of the high tension coil. One unique feature in the GILL system is the possibility to program the charging time (dwell time) of the primary coil, to store more or less energy.



Then, having been pre-programmed, the igniter abruptly dumps the primary energy at the most optimum time to ground, i.e.the magnetic field collapses, and generates in the very high number of windings in the secondary coil a high tension voltage of over 25 Kilovolts, which creates at the spark plug a spark of a determined duration, resulting in optimum combustion and performance at lowest possible emission.

Typical Primary- and Secondary Voltage waveforms of the GILL Ignition



(2)

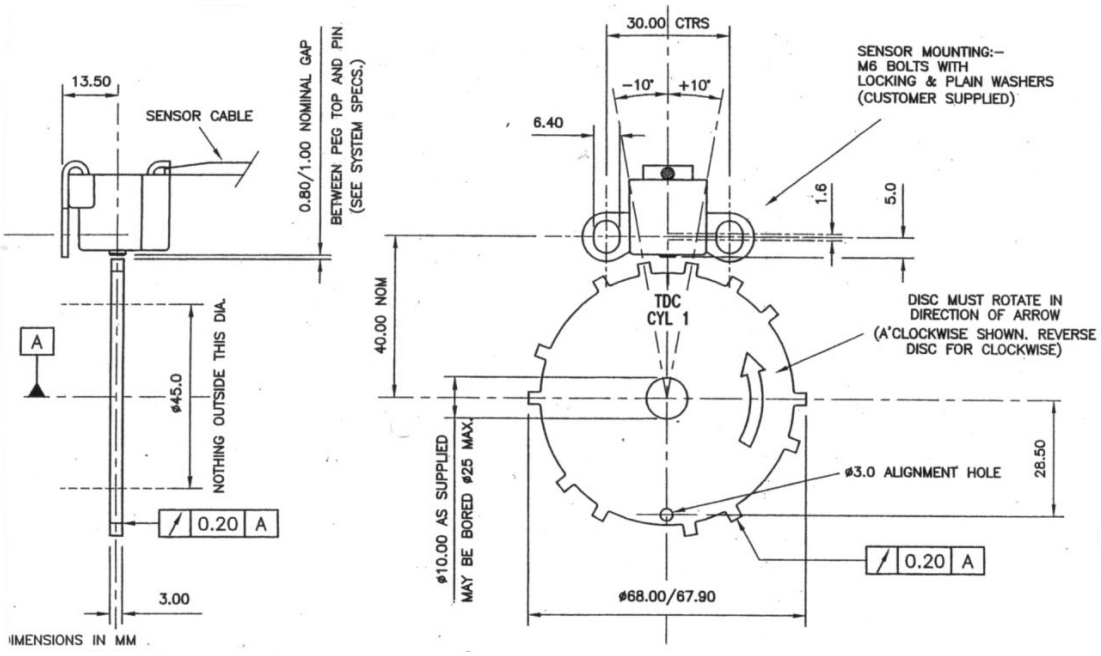
3. Typical advantages of the GILL System

3.1 It is based on non wasted spark.
Each cylinder has its own ignition coil and provides a spark of optimised (programmable) duration **at the compression stroke only.** This way, less wear at the spark plug occurs. It also prevents dangerous blow back into the manifold which systems with wasted spark, firing also at the exhaust stroke, can cause.

3.2 As an inductive ignition system, sparks with more energy can be provided, resulting in more intensive combustion of the mixture.
Yet, the raise time of the secondary voltage is still extremely rapid, allowing to fire even contaminated plugs.

4. A few considerations

4.1 **Timing accuracy**
In order to obtain the best possible efficiency, and avoiding engine over heating and also harmful engine knocking, it is important that the spark occurs at the correct time for a given load, speed and air/fuel ration condition.
The high precision of the GILL timing disc geometry will provide very accurate, consistent spark timing. However only under the condition that:



a) the timing disc runs true within ±0.2mm and its supporting shaft has not more than 0.1mm lateral play.

b) there is no differential movement between the magnet pickup and the timing disc, i.e. the pickup must be firmly fixed on a non vibrating bracket.

(3)

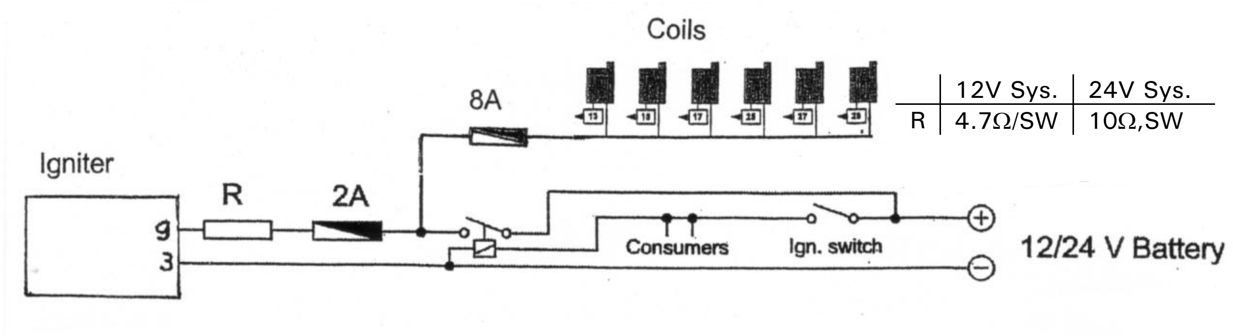
4.2 **High tension coils**

The H.T. coils with fast raise voltage characteristic are energised by the Igniter module only during a very brief time, approx. 1.5 Milliseconds.
If someone therefore tries to energise the coil externally for a longer time, the primary windings will be damaged.
For testing H.T. coils, refer to the trouble shooting section.

4.3 **Electronic Igniter module**

When operated normally, this will last for the life of the engine.
Every electronic control device will safely work within a certain voltage range.

The GILL Igniter module automatically adapts itself to 12VDC and 24 VDC battery supply.
The maximum continuous supply voltage is 31VDC. It is also protected against reversed polarity.
It incorporates a protection against Surge/Load dump and spikes of 7.2 Joule energy.
For loss of battery supply situations or excessive surge voltages, caused when inductive devices are switched, we strongly recommend to add two inexpensive external protecting components like shown in the wiring diagram. Here an enlargement



	12V Sys.	24V Sys.
R	4.7Ω/SW	10Ω,SW

Furthermore, please avoid locations with ambient temperatures above +70°C.