12 – ELECTRICAL

505 V6 SALOON

IGNITION SYSTEM

The ZN3J (154) engine is fitted with a BOSCH EZ 115K integral electronic ignition system (AEI), with knock (pinking) detector and high tension distributor.

The electronic unit (calculator), which controls this ignition system, contains a micro-processor with an associated memory in which are stored advance co-ordinates defined to obtain optimum engine performance.

These various co-ordinates constitute the advance map.

The three principal parameters used to determine the degree of advance are :

– engine speed

– engine load

– whether or not there is knocking (pinking)

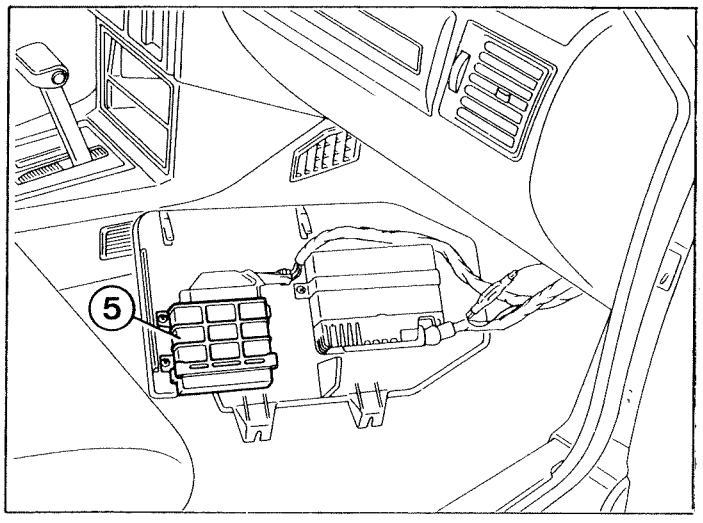
This ignition system has NO ADJUSTMENT.

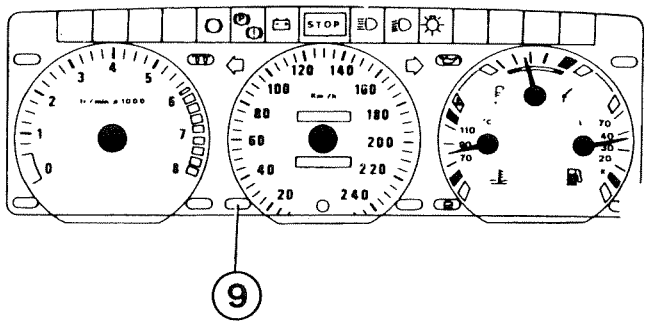
For part numbers of the component parts and for checking the ignition system, refer to the ZN3J engine "Checks – Repair operations – Adjustments" brochure Ref. 3621E which will be distributed later.

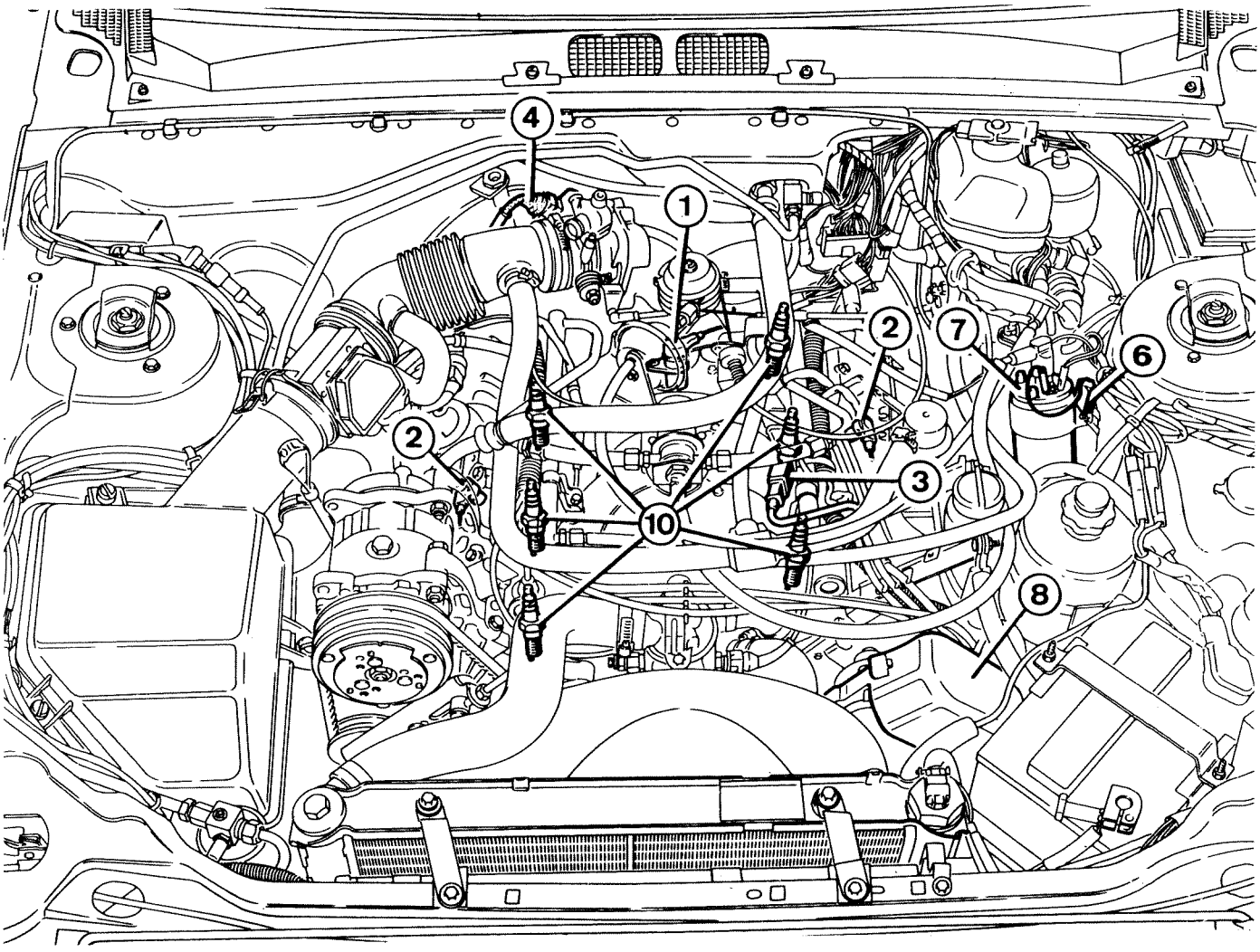
DESCRIPTION – INSTALLATION

The BOSCH EZ 115K integral electronic ignition system includes the following components :

1. Pick-up, mounted on the clutch housing, to detect the position of the flywheel and measure engine speed.
2. Knock detectors, fitted to each bank of cylinders, on the inside of the vee.
3. Current measuring pick-up, on No. 1 cylinder plug lead, to identify the cylinder bank on which knocking is occurring.
4. Throttle switch unit, mounted on the throttle unit, to determine the butterfly idling position.
5. Electronic ignition control unit (calculator), fitted behind the passenger's foot rest, to develop the defined advance co-ordinates.
6. Amplifier module and
7. Ignition coil — These two components are mounted on an aluminium plate attached to the left-hand front wing valance.
8. High tension distributor on the left-hand cylinder head, driven by the camshaft.
9. Knock and ignition system fault warning lamp incorporated in the instrument panel.
10. Spark plugs: BOSCH HR5DC for vehicles without a catalytic converter
    BOSCH HR6DC for vehicles with a catalytic converter







PRINCIPLE OF OPERATION

Information received by the various sensors is transmitted to the electronic control unit.

As a function of these parameters, it determines the ignition advance and controls the amplifier module which releases the high tension in the coil.

This high tension is directed by the distributor in the order 1 – 6 – 3 – 5 – 2 – 4.

Knock detection

To effectively detect knocking on each cylinder, two sensors are necessary.

A current-measuring pick-up makes it possible to identify on which bank of cylinders the knock is occurring.

When knocking occurs, the electronic unit reduces the advance in steps of 3° up to a maximum of 14°, and this only on the cylinder in which knocking has been detected.

Crankshaft reference points and determination of ignition advance.

The flywheel has on its periphery three 120° zones, each containing a series of holes.

Flats (1) (areas without holes) separate the three zones. When the first holes (2) located immediately after the flats (1) are opposite the pick-up (3), the crankshaft will be in a position 60° before **top dead centre** of cylinders 1.5 – 6.2 and 3.4.

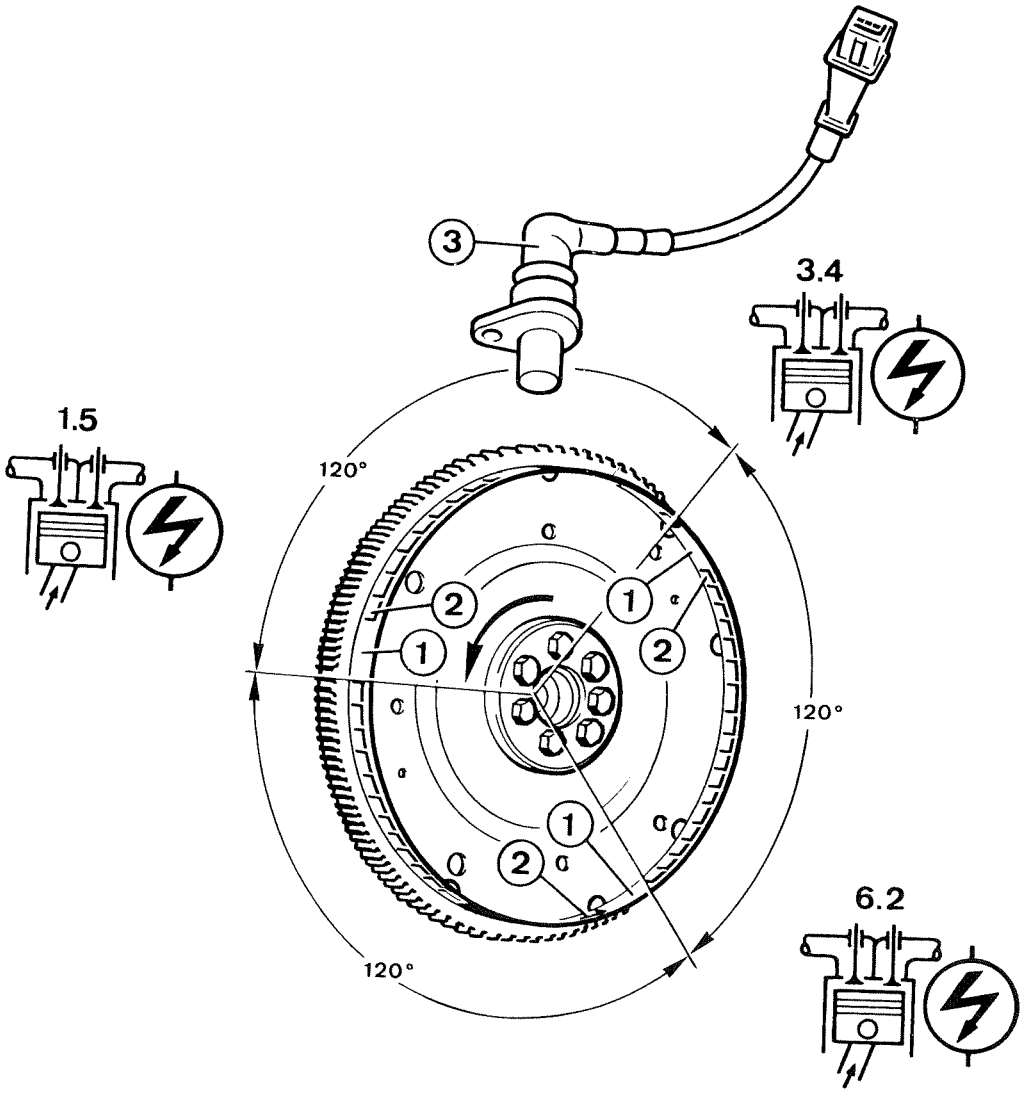
At this precise moment, the pick-up transmits a signal which informs the calculator of this position.

Simultaneously, the calculator, as a function of engine speed, engine load (information from the electronic injection control unit) and if necessary the presence of knocking, determines an advance point.

The electronic unit having calculated the point of advance, it works out from the reference point (60° **BTDC**) the number of holes after which a spark should be produced.

Determination of engine speed

The calculation of engine speed is performed by the electronic unit which determines, through the medium of the pick-up, the **time** taken to pass over the flats (1).



Electronic unit

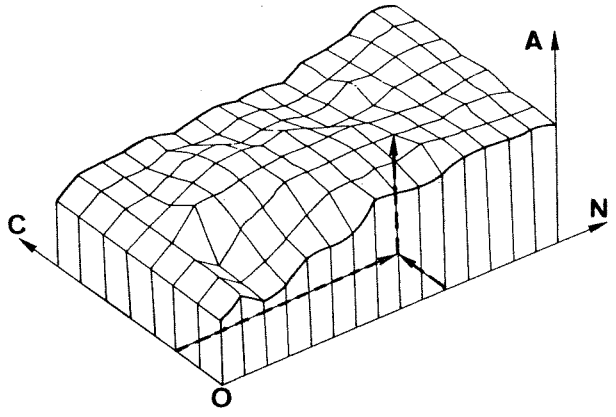
This processes the information supplied by the various sensors, and from it calculates :

– the engine speed

– the ignition advance co-ordinates

The advance map is a collection of advance co-ordinates stored in a memory. It is made up of 128 advance points obtained from a combination of 16 speed units and 8 load units.

N = engine speed
C = engine load
A = advance co-ordinate



It then controls :

– **the amplifier module (M598) whose transistor makes and breaks the coil primary circuit.**

– the full load enrichment of the injection control unit (H58) (used only on vehicles with catalytic converter).

– the knock detector and ignition fault warning lamp (L32).

– the tachometer.

Self-diagnosis

The integral electronic ignition system (AEI) is equipped with a self-diagnosis device.

The knock detector warning lamp (orange light-emitting diode) indicates visually, by flashing, the various faulty components.

Number of warning lamp flashes	Faulty component
2	Engine temperature sensor (on vehicles fitted with a catalytic converter)
4	Knock detector or electronic unit
5	False load signal from electronic injection unit
6	Current-measuring pick-up

Note – *The knock detection warning lamp lights during knocking and when the maximum advance correction is attained; it extinguishes when knocking ceases.*

Schematic wiring diagram

Key

H75 – Control unit, ignition
H58 – Control unit, injection
H229 – Switch, ignition/steering lock
L32 – Warning lamp, knock detector
M45 – Battery
M50 – Ignition coil
M132 – Knock detector
M133 – Sensor, engine speed
M143 – Sensor, No. 1 cylinder
M598 – Amplifier module
M782 – Relay, ignition supply
+AC – Ignition-controlled supply