

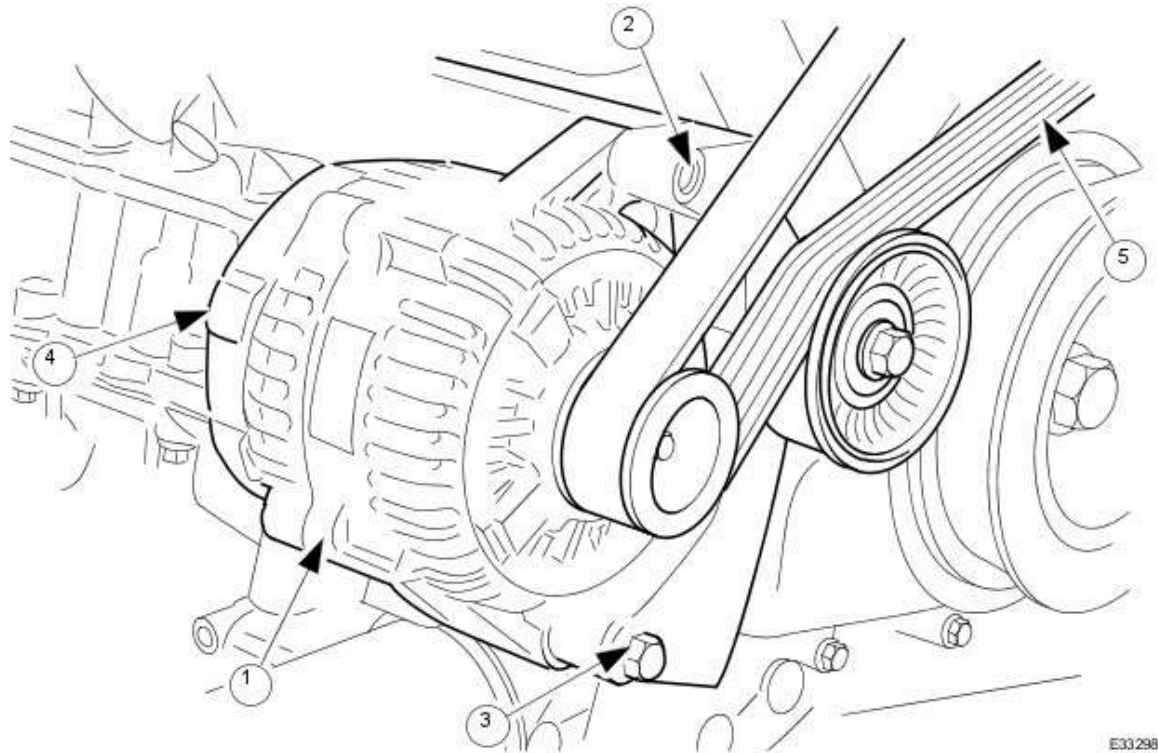
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 2001.0 XK RANGE (X100), 414-02

## GENERATOR AND REGULATOR

# GENERATOR [G222943]

### DESCRIPTION AND OPERATION

#### Generator - General View



ITEM	DESCRIPTION
1	Generator
2	Bolt - Mounting Upper
3	Bolt - Mounting Lower
4	Voltage Regulator (Internal component)
5	Drive Belt - Multi-Ribbed

### FEATURES

- Manufacturer - Denso

- Type - L3B-HE
- Drive Ratio - 3.04:1
- Output - 120amps @ 5000 rpm (generator speed) at 25° C

The generator is fitted at the front right hand side of the engine, to a separate mounting bracket, which in turn is bolted to the cylinder block. Two bolts secure the generator to the mounting bracket; one is reached from above and one from below the vehicle.

The voltage regulator is integral with the generator body. Battery charging capability has been optimised for charging a battery which is located remotely, in the luggage compartment. The design of the generator and regulator has been finely matched, to generate charging current with very low ripple. This provides the best electrical refinement to the system.

The generator is driven by a single, multi-ribbed belt which also drives all other front-end accessories.

No special service tools are required to remove the generator from the vehicle.

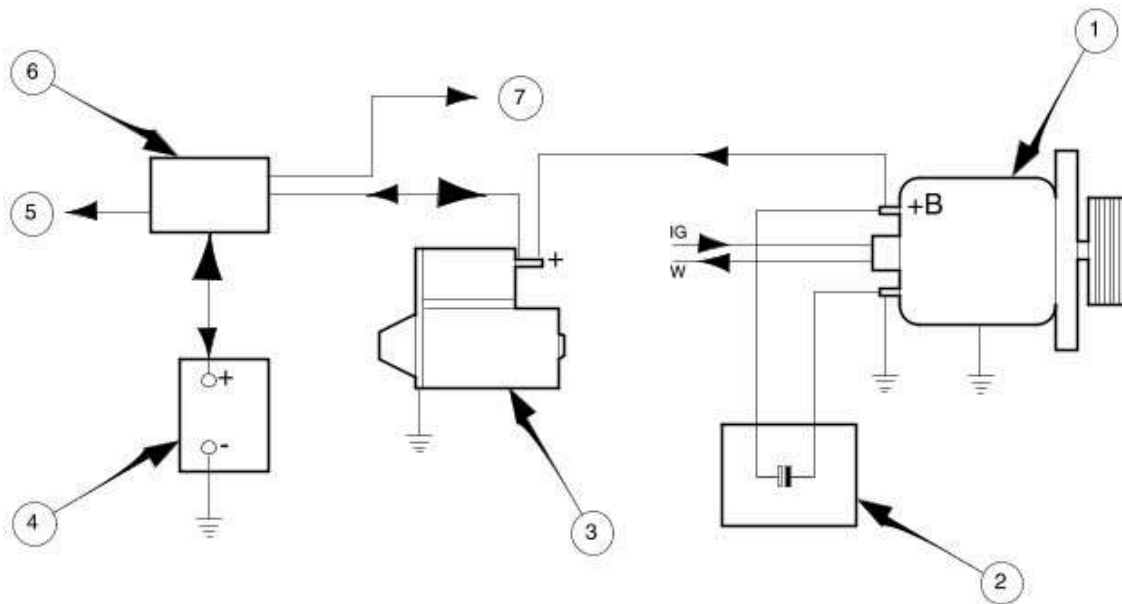
Belt tension is achieved by an automatic tensioner; neither the belt nor the tensioner require service apart from checking the belt wear indicators at each normal service interval.

The minimum service life of the drive belt is 100,000 miles.

Never apply oil to the belt or to the belt tensioner.

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#### GENERATOR - CHARGING CIRCUIT



E33308

ITEM	DESCRIPTION
1	Generator
2	Suppression Module
3	Starter Motor
4	Battery
5	Power Cable to Rear Fuse Box
6	High Power Protection Module
7	Power Cable to Front Fuse Boxes

The main components of the charging system are shown above.

The output from the generator 'B+' main terminal passes to the battery via the main terminal on the starter motor and then the power cable to the high power protection module located in the luggage compartment. From this module, a short main power cable supplies the battery positive terminal.

The return circuit is through the vehicle body and supplementary ground cables.

The high power protection module comprises four fuses, each rated at 250amps.

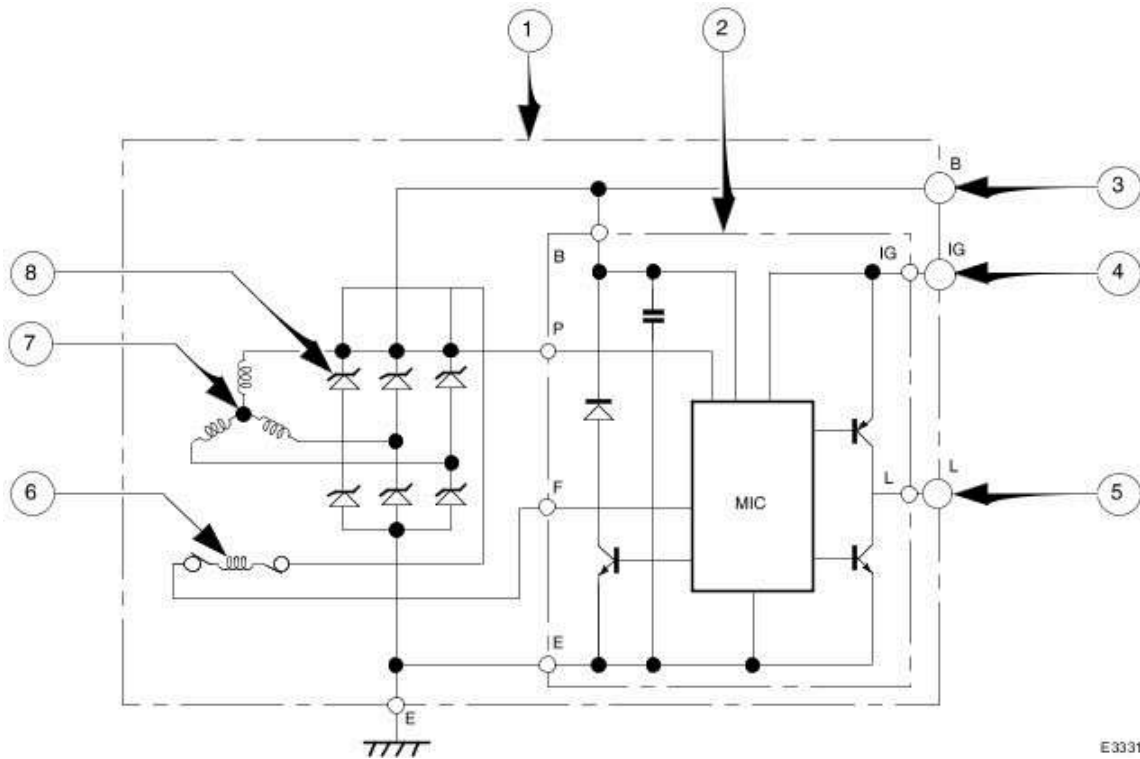
Battery output uses the same power cable as the charging circuit, to the high power protection module and to the starter motor main terminal. Two similar cables, but not such a high rating, supply battery power from the high power protection module to the fuse box in the luggage compartment and to the fuse boxes at the front of the vehicle.

The interference suppression module (where fitted) connects to the generator main terminal 'B+' and a ground stud on the rear face of the generator.

A multi-plug (3 pin) is connected to the rear of the generator.

- Pin #1 not connected.
- Pin #2 ignition supply to the regulator.
- Pin #3 output to the charge warning lamp.

GENERATOR - INTERNAL CIRCUIT DIAGRAM



E33311

ITEM	DESCRIPTION
1	Generator Assembly
2	Voltage Regulator
3	Main Terminal 'B+'
4	Ignition Supply Terminal 'IG' to Rotor
5	Output Terminal L to Charge Lamp
6	Rotor
7	Stator
8	Rectifier Pack

As with most vehicle ac generators, there is only minimal residual magnetism in the field (rotor) windings. To compensate for this and to achieve high current output at low engine speed, the field is excited by battery voltage supplied to the generator at the 'IG' terminal.

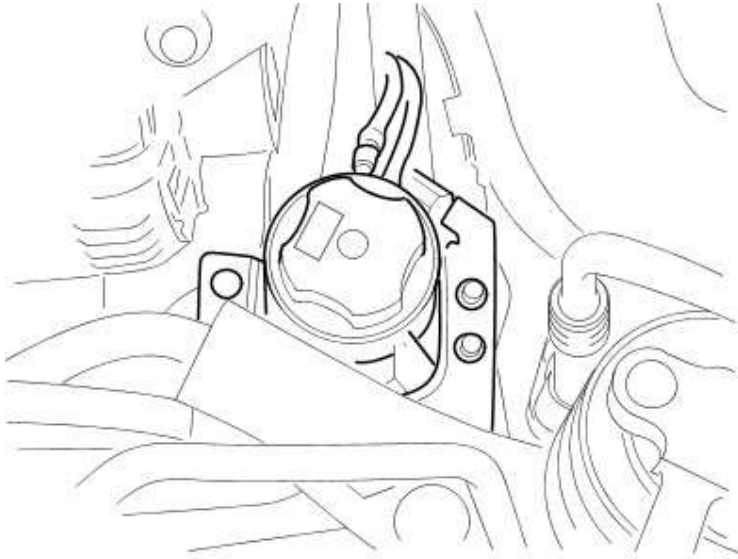
To control the level of field excitation and ultimately, generator output, the voltage supplied to the field (rotor) is controlled by the voltage regulator.

The voltage regulator senses (at the 'B' terminal) battery terminal voltage, which within limits is proportional to the state of charge of the battery. The regulator then adjusts the supplied voltage between the 'IG' terminal and the regulator 'F' terminal (a continuously variable process) to maintain the 'B+' output at a constant level.

If the field were not controlled, the 'B+' output would rise to a level which could damage bulbs and ECMs. The regulator compares the output voltage to an internal voltage reference circuit to achieve the controlled output of the generator.

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## SUPPRESSION MODULE



E34352

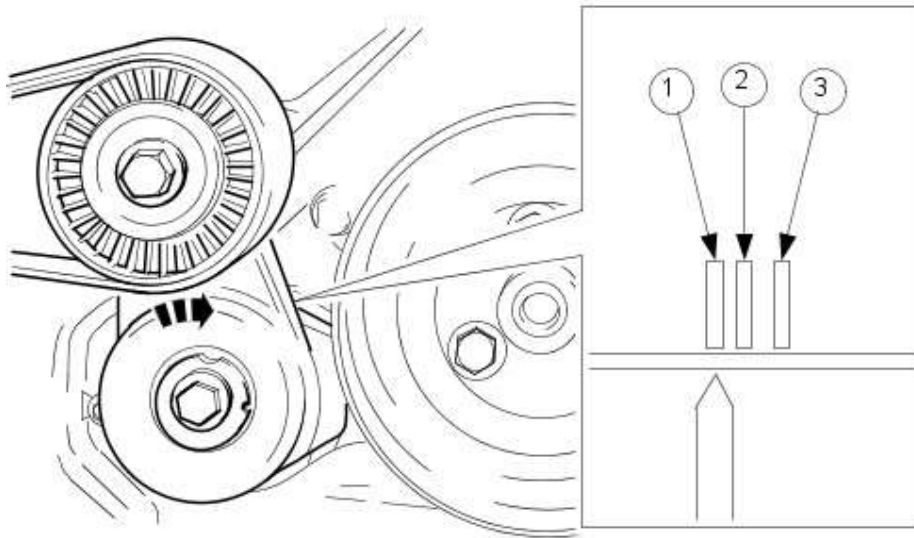
Although the output from the generator is finely controlled and relatively smooth, it is still a pulsed DC output at a varying frequency proportional to engine speed.

The suppression module damps out any ripple which may be sensed on the main output of the generator. This prevents possible interference via the power supply, affecting the radio reception or, where fitted, the telephone.

The module is located on the right hand side of the engine compartment adjacent to the generator. It is secured to a mounting bracket by three bolts. The mounting bracket is bolted to the inner panel, just above the chassis leg. The illustration shows the suppression module viewed from below the vehicle.

A fuse is fitted internally to the suppression module to protect the generator output in the event of a short circuit within the suppression module.

DRIVE BELT AUTOMATIC TENSIONER



E32620

ITEM	DESCRIPTION
1	New Belt - Minimum Length
2	New Belt - Maximum Length
3	Replace the Belt

Belt tension is achieved by an automatic tensioner; neither the belt nor the tensioner require service apart from checking the belt wear indicators at each normal service interval.

The minimum service life of the drive belt is 100,000 miles.

Never apply oil to the belt or to the belt tensioner.

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