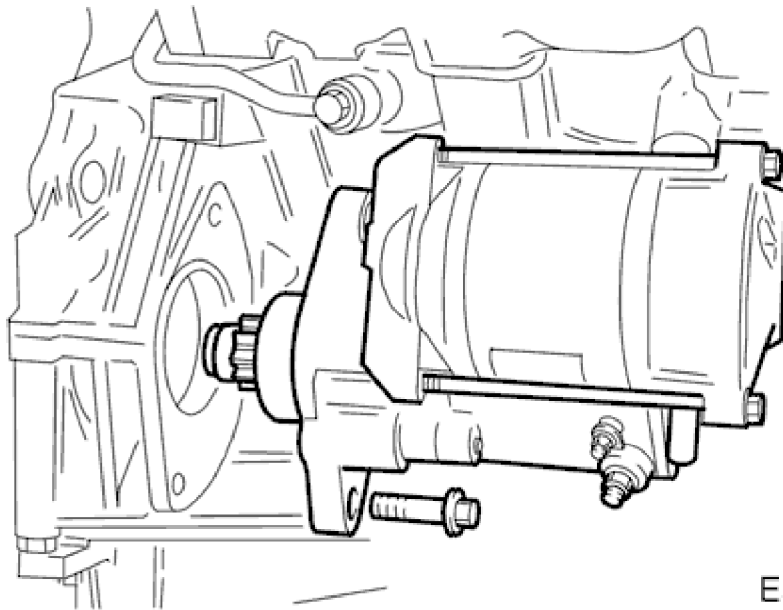


# 1998 XJ RANGE - Starting System - 303-06

## Starting System



E32729

Manufacturer - NipponDenso

Type - RA1.4.

Weight - 3.75 kg (8.27 lb)

Output - 1.4 kW

Rated Time - 30 seconds

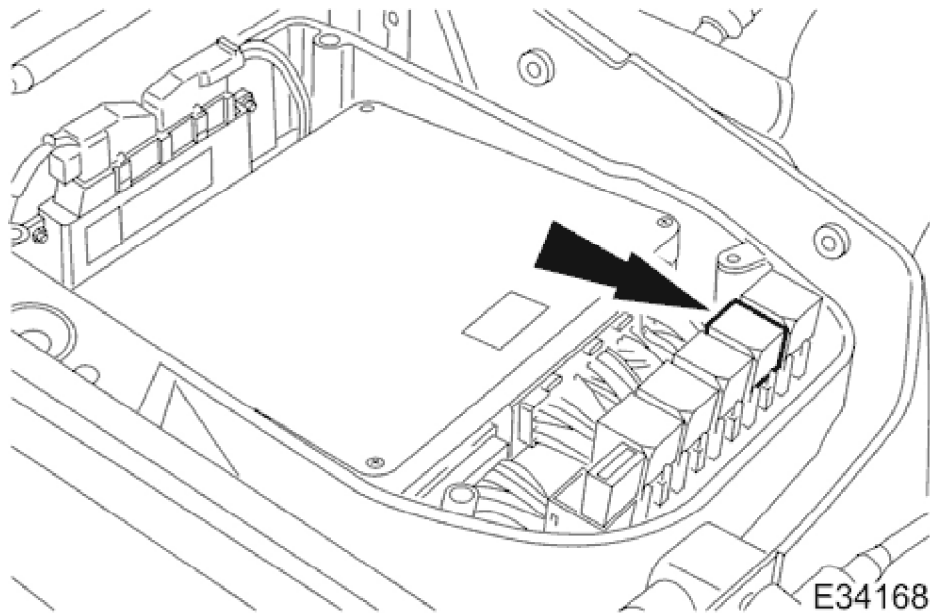
Rotation - Clockwise, viewed from pinion end

The starter is of the pre-engaged type; located at the rear left-side of the engine.

When the starter is operated from the key-switch, the engagement lever moves the pinion into mesh with the engine ring gear teeth, the electrical contacts within the solenoid complete the high power circuit and the starter motor operates to turn the engine.

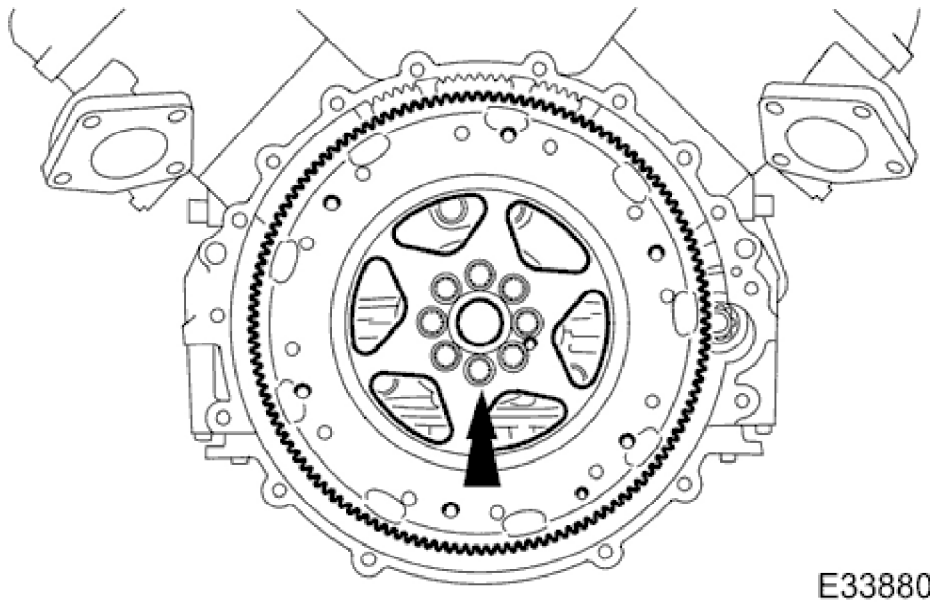
## Starter Relay

# 1998 XJ RANGE - Starting System - 303-06



The starter motor control relay is, relay number 5, located inside the engine compartment enclosure (left side of vehicle RHD and right side of vehicle on LHD).

## Starter Drive Plate



The starter drive plate is attached to the rear of the crankshaft by eight bolts.

## Timing Disc



## 1998 XJ RANGE - Starting System - 303-06

Item	Description
1	Battery
2	To Rear Fusebox
3	High Power Protection Module
4	To Front Fuseboxes
5	Starter Relay
6	Body Processor Module (BPM)
7	Engine Control Module (ECM)
8	Ignition Switch
9	CRANK Signal
10	Ignition ON Signal
11	Inertia Switch
12	Starter Motor and Solenoid

The illustration above is a simplified explanation of how the starting system operates in conjunction with the Body Processor Module (BPM) and the Engine Control Module (ECM).

Refer to the Starting Circuit Diagram in the Electrical Guide.

### Ignition Switch to ON Position

When the ignition key is set to the normal run position, the following sequence occurs:

- The isolation relay in each fusebox is energised to supply battery power to the fuses and associated circuits.
- The BPM 'IGN ON' terminal is taken to 0V by the ignition switch.
- The BPM checks that various parameters are correct e.g. - inertia switch is in the active condition - transmission is in PARK - security system has been correctly disabled.

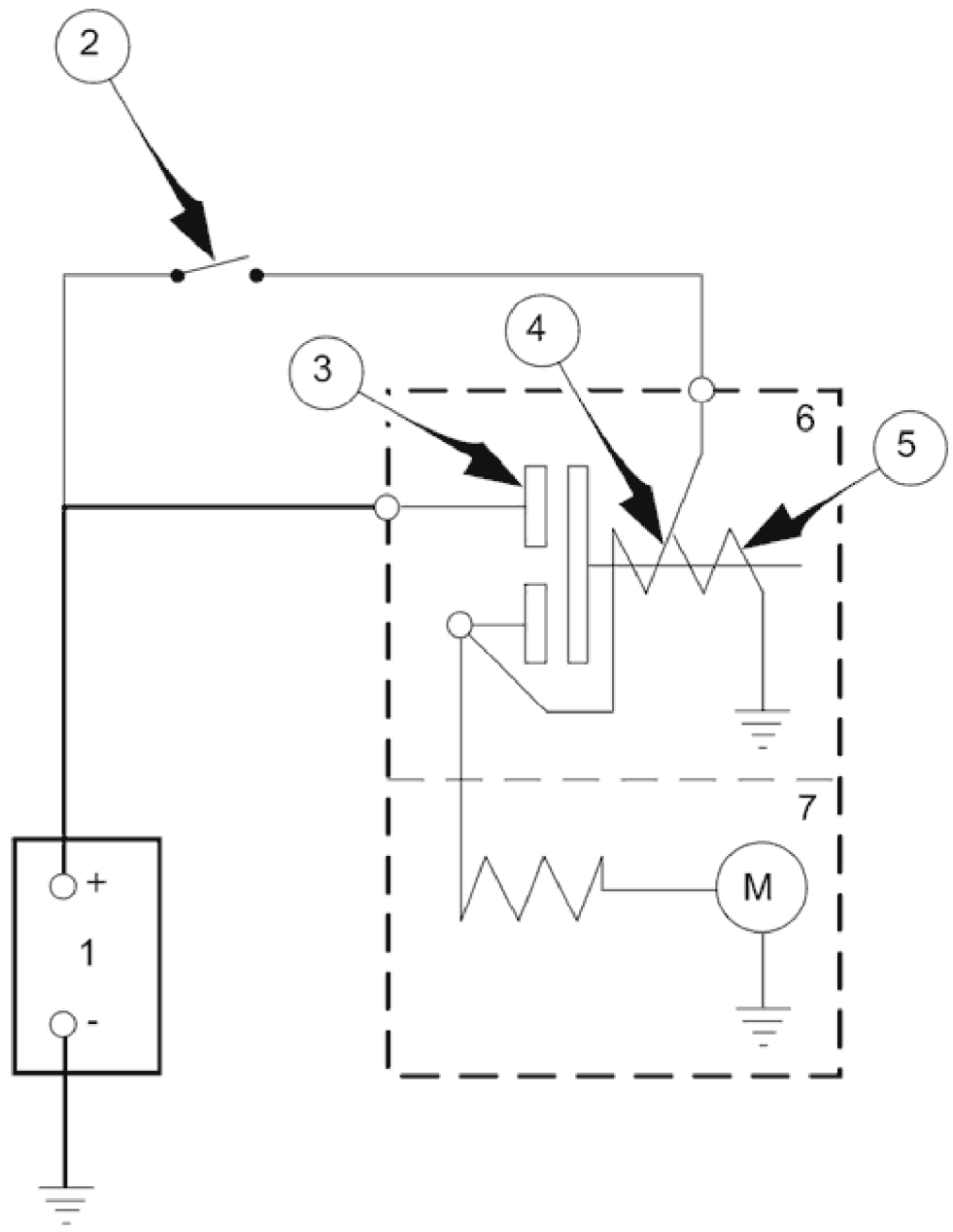
### Ignition Switch at CRANK Position

When the ignition key is set to the crank position, the following sequence occurs:

- The BPM 'CRANK SELECTED' terminal is taken to 0V by the ignition switch.
- The BPM 'O/P ENGINE CRANK' terminal provides a path to ground for the starter relay coil, via Fuse 5 (10A) located in the engine compartment front fusebox. This path to ground also indicates to the ECM 'I/P ENGINE CRANK' terminal, by taking it to 0V, that the engine has been requested to crank.
- With the starter relay contacts closed, power via Fuse 3 (25A) in the engine compartment rear fusebox, is supplied to the pull-in winding of the starter solenoid.
- The solenoid main contacts close and are held closed by the solenoid hold-in winding.
- Battery power is supplied to the starter motor through the solenoid main contacts, direct from the battery and the High Power Protection Module.

### Starter Motor Internal Connections

1998 XJ RANGE - Starting System - 303-06



E32768

# 1998 XJ RANGE - Starting System - 303-06

Item	Description
1	Battery
2	Ignition Switch
3	Solenoid Contacts
4	Solenoid Pull-In Winding
5	Solenoid Hold-In Winding
6	Solenoid
7	Starter Motor Main Body

Refer to the Starting Circuit Diagram in the Electrical Guide for the actual layout and connection details.

The starter motor and solenoid in the previous figure are shown diagrammatically to indicate simply, the electrical circuit and various connections.