

## DESCRIPTION AND OPERATION

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### IGNITION AND SHIFT INTERLOCK (NAS/JAPAN ONLY)

#### DESCRIPTION

##### General

##### *Shift interlock*

When the transmission gear selector is in the PARK position and the ignition is in the OFF position '0', a shift interlock solenoid is de-energised, locking the transmission gear selector in the PARK position.

The transmission gear selector can only be moved from the PARK position when the ignition is on and the brake pedal is depressed. The brake pedal switch signals the BCU, which in turn signals the Intelligent Driver Module (IDM) to energise the shift interlock relay in the passenger compartment fusebox. This energises the shift interlock solenoid allowing the transmission gear selector to be moved from the PARK position.

##### *Ignition key interlock*

The key interlock solenoid prevents removal of the key when the transmission gear selector is not in the Park position.

##### *Transfer box interlock*

The transfer box interlock prevents the transfer box being shifted from 'H' or 'L' with the key removed from the ignition switch. A transfer gearbox interlock solenoid is controlled by the IDM which energises the solenoid and prevents transfer box lever operation.

#### OPERATION

##### Ignition and Shift Interlock Supply

##### *Circuit supply*

A feed from the battery positive terminal is connected by an R wire to the engine compartment fusebox where it passes through fusible links 3 and 8 and fuse 13.

A feed from fusible link 3 is connected from the engine compartment fusebox on an NR wire to the passenger compartment fusebox. The feed passes to fuses 20 and 21 in the passenger compartment fusebox.

A feed from fuse 13 is connected from the engine compartment fusebox on a PN wire to the passenger compartment fusebox. The feed is connected to the IDM and the coils of the interlock and transfer box relays.

A feed from fusible link 8 is connected on an NW wire to the passenger compartment fusebox and from the fusebox to the ignition switch on an N wire.

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## DESCRIPTION AND OPERATION

### *Ignition switch supply*

With the ignition switch in position II, the feed from fusible link 8 flows through the ignition switch to the passenger compartment fusebox on a Y wire.

The feed continues through fuse 25 in the passenger compartment fusebox and is connected on a GO wire to the brake pedal switch.

### **Ignition and Shift Interlock Operation**

#### *Ignition interlock*

A feed from fuse 20 in the passenger compartment fusebox is connected on a P wire to header C0289 LHD/C0294 RHD. From the header the feed is connected on P wires to the key interlock unit. The feed is connected within the key interlock unit to the ignition switch illumination and the 'ignition key' inserted switch.

When a door is opened or the vehicle is unlocked using the remote handset, the BCU provides an earth path for the ignition switch illumination. The earth path is from the interlock unit on a PU wire to pin C0663-9 on the BCU, via header C0285 LHD/C0294 RHD. The completed earth path allows the feed from fuse 20 in the passenger compartment fusebox to illuminate the bulb.

When the ignition key is inserted in the ignition switch, the 'ignition key inserted' switch is tripped and allows the feed from fuse 20 in the passenger compartment fusebox to flow through the switch contacts. The feed is connected from the key interlock unit on a WP wire to pin C0662-2 on the BCU, via header C0293 LHD/C0289 RHD. This provides a signal to the BCU that the key is inserted.

A feed from fuse 21 in the passenger compartment fusebox is connected on a PB wire to the key interlock unit. The feed is connected within the interlock unit to the 'ignition key in position' switch.

When the key is inserted in the ignition switch, the switch contacts close, allowing the feed from fuse 21 to pass on an OW wire to the interlock solenoid. If the transmission is in a position, other than PARK, the BCU will supply an earth path for the key interlock solenoid on a BLG wire. The solenoid will energise and removal of key from the ignition switch is prevented.

## DESCRIPTION AND OPERATION

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### ***Shift interlock***

The shift interlock solenoid is normally in a de-energised state. When the transmission is to be moved from the PARK position, the ignition must be on and the brake pedal depressed. This energises the solenoid and allows movement of the transmission selector.

When the brake pedal is depressed, the feed from fuse 25 in the passenger compartment fusebox flows through the brake pedal switch contacts and is connected to BCU pin C0661-7 on a GP wire via header C0287 LHD/C0290 RHD.

This feed signals the BCU that the ignition is on and the brake pedal is depressed. The BCU sends a signal, on an SK wire, via header C0293 LHD/C0292 RHD, to the IDM. The IDM in turn provides an earth path for the interlock relay in the passenger compartment fusebox, energising the relay coil and closing the relay contacts.

With the relay contacts closed, a feed from fuse 21 in the passenger compartment fusebox flows through the relay contacts and from the fusebox to the shift interlock solenoid on a LGP wire, energising the solenoid. The shift interlock solenoid is connected to earth header C0552 LHD/C0708 RHD on a B wire.

With the shift interlock solenoid energised, the transmission selector can be moved from the PARK position. When the brake pedal is released, the feed to the BCU is removed and the shift interlock solenoid is de-energised. The locking mechanism controlled by the solenoid will lock the transmission selector once it is returned to the park position.

### ***Automatic transmission selector***

A starter/ inhibitor/ reverse lights switch is located on the gearbox and is used to inform related components of the gear selector position. The connection used on this circuit is on an NP wire from the switch to pin C0663-10 on the BCU and signals the BCU of PARK and NEUTRAL selector positions.

### ***Transmission neutral sensor***

The transmission neutral sensor provides an earth signal to the BCU when the transfer box is in neutral. The earth signal causes the BCU to operate an audible warning to warn of the transfer box in neutral when the ignition is on.

The sensor is connected on a BK wire from pin C0662-15 on the BCU. The sensor is connected on a B wire, via header C1002 to earth header C0552.

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## DESCRIPTION AND OPERATION

### *Transfer gearbox interlock solenoid*

When the BCU senses that the ignition key is removed from the ignition switch, it signals the IDM via the serial data bus. The IDM then grants an earth path for the coil of the transfer box relay in the passenger compartment fusebox, energising the relay coil and closing the relay contacts.

With the contacts closed, a feed from fuse 21 in the passenger compartment fusebox passes through the relay and is connected from the fusebox on an RU wire, via header C0293, to the transfer gearbox interlock solenoid. The solenoid energises and is connected by a B wire to earth header C0552. This prevents neutral being selected locking the transfer gearbox in high or low. A diode is located in the feed to the solenoid from splice joint A77 on an RU wire and from the diode to splice SJ2 on a B wire. The diode prevents residual current causing the solenoid to 'stick' in the energised position.