# ELECTRICAL SYSTEM
## SECTION EL

When you read wiring diagrams:
- Read GI section, "HOW TO READ WIRING DIAGRAMS".

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Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

The Supplemental Restraint System “Air Bag” and “Seat Belt Pre-tensioner”, used along with a seat belt, help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bag modules (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the RS section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses are covered with yellow insulation either just before the harness connectors or for the complete harness, for easy identification.
HARNESS CONNECTOR

Description

HARNESS CONNECTOR
• All harness connectors have been modified to prevent accidental loosing or disconnection.
• The connector can be disconnected by pushing or lifting the locking section.
CAUTION:
Do not pull the harness when disconnecting the connector.

[Example]
**Description**

**NORMAL OPEN, NORMAL CLOSED AND MIXED TYPE RELAYS**

Relays can mainly be divided into three types: normal open, normal closed and mixed type relays.

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<td><img src="image6" alt="Diagram" /></td>
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**TYPE OF STANDARDIZED RELAYS**

- 1M ... 1 Make
- 1T ... 1 Transfer
- 2M ... 2 Make
- 1M-1T ... 1 Make 1 Break

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<th>2M</th>
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POWER SUPPLY ROUTING

Wiring Diagram — POWER —

EL-POWER-01

FUSE AND FUSIBLE LINK BOX

E7

E65

B/R \ R/G \ W/R \ G \ G/W \ Y/B \ R/G \ GY/R

GY/R ➔ H/LAMP, DTRL, THEFT

R/G ➔ FPCM, F/PUMP, AIRREG

Y/B ➔ MAIN, MAFS, CMP5, IGN, SG

G/W ➔ DEF, H/M/R

G ➔ To EL-POWER-04

W/R ➔ To EL-POWER-03

R/G ➔ HORN, ASCD, THEFT

B/R ➔ CHARGE

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TEL479
POWER SUPPLY ROUTING

Wiring Diagram — POWER — (Cont’d)

EL-POWER-05

Refer to last page (Foldout page).

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POWER SUPPLY ROUTING

Fuse
- If fuse is blown, be sure to eliminate cause of problem before installing new fuse.
- Use fuse of specified rating. Never use fuse of more than specified rating.
- Do not install fuse in oblique direction; always insert it into fuse holder properly.
- Remove fuse for clock if vehicle is not used for a long period of time.

Fusible Link
A melted fusible link can be detected either by visual inspection or by feeling with finger tip. If its condition is questionable, use circuit tester or test lamp.

CAUTION:
- If fusible link should melt, it is possible that a critical circuit (power supply or large current carrying circuit) is shorted. In such a case, carefully check these circuits and eliminate cause of problem.
- Never wrap outside of fusible link with vinyl tape. Extreme care should be taken with this link to ensure that it does not come into contact with any other wiring harness, or vinyl or rubber parts.

Circuit Breaker
If the current in a circuit is 30A for example, the circuit is broken within 8 to 20 seconds.
Circuit breakers are used in the following systems:
- Power window
- Power door lock
- Electric sunroof
- Power seat
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CAUTION:
- If it becomes necessary to start the engine with a booster battery and jumper cables, use a 12-volt booster battery.
- After connecting battery cables, ensure that they are tightly clamped to battery terminals for good contact.
- Never add distilled water through the hole used to check specific gravity.

How to Handle Battery

METHODS OF PREVENTING OVER-DISCHARGE
The following precautions must be taken to prevent over-discharging a battery.
- The battery surface (particularly its top) should always be kept clean and dry.
- The terminal connections should be clean and tight.
- At every routine maintenance check, check the electrolyte level.

- When the vehicle is not going to be used over a long period of time, disconnect the negative battery terminal. (If the vehicle has an extended storage switch, turn it off.)

- Check the charge condition of the battery. Periodically check the specific gravity of the electrolyte. Keep a close check on charge condition to prevent over-discharge.
How to Handle Battery (Cont’d)

CHECKING ELECTROLYTE LEVEL

WARNING:
Do not allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, do not touch or rub your eyes until you have thoroughly washed your hands. If the acid contacts the eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention.

Normally the battery does not require additional water. However, when the battery is used under severe conditions, adding distilled water may be necessary during the battery life.

- Remove the cell plug using a suitable tool.
- Add distilled water up to the MAX level.

SULPHATION
When a battery has been left unattended for a long period of time and has a specific gravity of less than 1.100, it will be completely discharged, resulting in sulphation on the cell plates.

Compared with a battery discharged under normal conditions, the current flow in a “sulphated” battery is not as smooth although its voltage is high during the initial stage of charging, as shown in the figure at the left.

SPECIFIC GRAVITY CHECK
Read hydrometer and thermometer indications at eye level.

- When electrolyte level is too low, tilt battery case to raise it for easy measurement.
BATTERY

How to Handle Battery (Cont’d)

- Use the chart below to correct your hydrometer reading according to electrolyte temperature.

**Hydrometer temperature correction**

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<thead>
<tr>
<th>Battery electrolyte temperature °C (°F)</th>
<th>Add to specific gravity reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>71 (160)</td>
<td>0.032</td>
</tr>
<tr>
<td>66 (150)</td>
<td>0.028</td>
</tr>
<tr>
<td>60 (140)</td>
<td>0.024</td>
</tr>
<tr>
<td>54 (130)</td>
<td>0.020</td>
</tr>
<tr>
<td>49 (120)</td>
<td>0.016</td>
</tr>
<tr>
<td>43 (110)</td>
<td>0.012</td>
</tr>
<tr>
<td>38 (100)</td>
<td>0.008</td>
</tr>
<tr>
<td>32 (90)</td>
<td>0.004</td>
</tr>
<tr>
<td>27 (80)</td>
<td>0</td>
</tr>
<tr>
<td>21 (70)</td>
<td>-0.004</td>
</tr>
<tr>
<td>16 (60)</td>
<td>-0.008</td>
</tr>
<tr>
<td>10 (50)</td>
<td>-0.012</td>
</tr>
<tr>
<td>4 (40)</td>
<td>-0.016</td>
</tr>
<tr>
<td>-1 (30)</td>
<td>-0.020</td>
</tr>
<tr>
<td>-7 (20)</td>
<td>-0.024</td>
</tr>
<tr>
<td>-12 (10)</td>
<td>-0.028</td>
</tr>
<tr>
<td>-18 (0)</td>
<td>-0.032</td>
</tr>
</tbody>
</table>

**Corrected specific gravity**

<table>
<thead>
<tr>
<th>Corrected specific gravity</th>
<th>Approximate charge condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.260 - 1.280</td>
<td>Fully charged</td>
</tr>
<tr>
<td>1.230 - 1.250</td>
<td>3/4 charged</td>
</tr>
<tr>
<td>1.200 - 1.220</td>
<td>1/2 charged</td>
</tr>
<tr>
<td>1.170 - 1.190</td>
<td>1/4 charged</td>
</tr>
<tr>
<td>1.140 - 1.160</td>
<td>Almost discharged</td>
</tr>
<tr>
<td>1.110 - 1.130</td>
<td>Completely discharged</td>
</tr>
</tbody>
</table>
**BATTERY**

**How to Handle Battery (Cont’d)**

**CHARGING THE BATTERY**

**CAUTION:**

a. Do not “quick charge” a fully discharged battery.

b. Keep the battery away from open flame while it is being charged.

c. When connecting the charger, connect the leads first, then turn on the charger. Do not turn on the charger first, as this may cause a spark.

d. If battery electrolyte temperature rises above 60°C (140°F), stop charging. Always charge battery at a temperature below 60°C (140°F).

**Charging rates:**

<table>
<thead>
<tr>
<th>Amps</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1 hour</td>
</tr>
<tr>
<td>25</td>
<td>2 hours</td>
</tr>
<tr>
<td>10</td>
<td>5 hours</td>
</tr>
<tr>
<td>5</td>
<td>10 hours</td>
</tr>
</tbody>
</table>

Do not charge at more than 50 ampere rate.

**Note:** The ammeter reading on your battery charger will automatically decrease as the battery charges. This indicates that the voltage of the battery is increasing normally as the state of charge improves. The charging amps indicated above refer to initial charge rate.

- If, after charging, the specific gravity of any two cells varies more than .050, the battery should be replaced.

---

**Service Data and Specifications (SDS)**

<table>
<thead>
<tr>
<th>Applied area</th>
<th>USA</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
<td>Option</td>
</tr>
<tr>
<td>Type</td>
<td>65D26R</td>
<td>80D26R</td>
</tr>
<tr>
<td>Capacity</td>
<td>V-AH</td>
<td>12-65</td>
</tr>
</tbody>
</table>
System Description

Power is supplied at all times
• to ignition switch terminal (1)
• through 20A fuse (No. 51, located in the fuse and fusible link box).

Power is supplied at all times
• to starter relay terminal (3)
• through 30A fusible link (letter (4), located in the fuse and fusible link box).

With the ignition switch in the ON or START position, power is supplied
• through 7.5A fuse (No. 20, located in the fuse block [J/R])
• to theft warning starter relay terminal (1).

Also, with the ignition switch in the START position, power is supplied
• from ignition switch terminal (5)
• to starter relay terminal (2)
• through 7.5A fuse (No. 24, located in the fuse block [J/R]).

If the theft warning system is not triggered, ground is supplied
• to starter relay terminal (1)
• through theft warning starter relay terminal (4)
• to theft warning starter relay terminal (3)
• through body grounds (MTS and NBI).

The starter relay is energized and power is supplied
• from starter relay terminal (5)
• to starter hold relay terminal (6)
• through starter hold relay terminal (3)
• to starter relay terminal (2)
• through diode.

Power is also supplied
• from starter relay terminal (5)
• to inhibitor switch terminal (2)
• through inhibitor switch terminal (1), with the select lever in the P or N position
• to terminal (2) of the starter motor windings.

The starter motor plunger closes and provides a closed circuit between the battery and the starter motor. The starter motor is grounded to the cylinder block. With power and ground supplied, the starter motor operates.

If the theft warning system is triggered, terminal (2) of the theft warning starter relay is grounded and power to the inhibitor switch is interrupted.
STARTING SYSTEM

Construction

M2T25282

Service Data and Specifications (SDS)

STARTER

<table>
<thead>
<tr>
<th>Type</th>
<th>M2T25282</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction gear</td>
<td>12</td>
</tr>
</tbody>
</table>

| System voltage              | 11.0     |
| No-load                     |          |
| Terminal voltage            | V        |
| Current                     | A        |
| Revolution                  | rpm      |
| Minimum length of brush     | mm (in)  |
| Brush spring tension        | N (kg, lb)|
| (With new brush)            |          |
| Minimum diameter of commutator | mm (in) |
| Difference "C" in height of pinion assembly | mm (in) |

Unit: mm (in)
N\cdot m (kg\cdot m, in\cdot lb)

High-temperature grease point
System Description

The alternator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. AC voltage is converted into DC voltage by the diode assembly in the alternator. Power is supplied at all times to alternator terminal 4 through:

- 100A fusible link (letter A, located in the fuse and fusible link box), and
- 10A fuse (No. 62, located in the fuse and fusible link box).

Voltage output through alternator terminal 1, is controlled by the IC regulator at terminal 4. The charging circuit is protected by the 100A fusible link.

Terminal 2 of the alternator supplies ground through body ground 614. With the ignition switch in the ON or START position, power is supplied:

- through 7.5A fuse (No. 31, located in the fuse block J/B)
- to combination meter terminal 2 for the charge warning indicator.

Ground is supplied to terminal 2 of the combination meter through terminal 3 of the alternator. With power and ground supplied, the charge warning indicator will illuminate. When the alternator is providing sufficient voltage, the ground is opened and the charge warning indicator will go off.

If the charge warning indicator illuminates with the engine running, a malfunction is indicated. Refer to “Trouble-shooting” (EL-36).
Trouble-shooting

Before conducting an alternator test, make sure that the battery is fully charged. A 30-volt voltmeter and suitable test probes are necessary for the test. The alternator can be checked easily by referring to the Inspection Table.

Before starting trouble-shooting, inspect the fusible link.

WITH IC REGULATOR

1) Use fully charged battery.
2) Light : Charge warning light
   ACG : Alternator parts except IC regulator
   IC-RG : IC regulator
   OK : IC-alternator is in good condition.
3) When reaching "Damaged ACG", remove alternator from vehicle and disassembly, inspect and correct or replace faulty parts.
4) *Method of grounding F terminal (HITACHI make only)

Gasoline engine model
   Contact tip of wire with brush and attach wire to alternator body.

5) Terminals “S”, “L”, “B” and “E” are marked on rear cover of alternator.

SEL030Z

EL-36
Construction

LR190-717C

1 Rotor assembly
2 Ball bearing
3 Stator assembly
4 Rear cover assembly
5 Rear cover
6 Brush holder assembly
7 Brush set
8 Regulator assembly
9 Diode assembly
10 Condenser
11 Nut assembly
12 Front cover assembly
13 Ball bearing
14 Screw kit
15 Pulley
16 Through bolt
17 Pulley nut

MEL913DA

3.1 - 3.9
(0.32 - 0.40, 27.8 - 34.7)

39 - 59
(4.0 - 6.0, 29 - 43)

N·m (kg·m, in-lb)
N·m (kg·m, ft-lb)
*Rear bearing

**CAUTION:**
Rear cover may be hard to remove because a ring is used to lock outer race of rear bearing. Be careful not to lose this ring during removal.
## Service Data and Specifications (SDS)

### ALTERNATOR

<table>
<thead>
<tr>
<th>Type</th>
<th>LR190-717C HITACHI</th>
<th>A2T33593A MITSUBISHI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal rating V-A</td>
<td>12.60</td>
<td></td>
</tr>
<tr>
<td>Ground polarity</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Minimum revolution under no-load (When 13.5 volts is applied) rpm</td>
<td>Less than 1,000</td>
<td>Less than 1,300</td>
</tr>
<tr>
<td>Hot output current A/rpm</td>
<td>More than 23/1,300</td>
<td>More than 20/1,300</td>
</tr>
<tr>
<td></td>
<td>More than 63/2,500</td>
<td>More than 61/2,500</td>
</tr>
<tr>
<td>Regulated output voltage V</td>
<td>14.1 - 14.7</td>
<td></td>
</tr>
<tr>
<td>Minimum length of brush mm (in)</td>
<td>6.0 (0.236)</td>
<td>More than 5.0 (0.197)</td>
</tr>
<tr>
<td>Brush spring pressure N (g, oz)</td>
<td>1.000 - 3.432 (102 - 350, 3.60 - 12.34)</td>
<td>4.609 - 5.786 (470 - 590, 15.58 - 20.81)</td>
</tr>
<tr>
<td>Slip ring minimum diameter mm (in)</td>
<td>More than 26.0 (1.024)</td>
<td>More than 22.1 (0.870)</td>
</tr>
<tr>
<td>Rotor (Field coil) resistance Ω</td>
<td>3.4</td>
<td>—</td>
</tr>
</tbody>
</table>

---

EL-39
Combination Switch/Check

Lighting Switch

Front Wiper Switch

Intermittent Wiper Volume

Turn Signal Lamp Switch

CELO05

EL-40

1132
Combination Switch/Replacement

- Each switch can be replaced without removing combination switch base.

- To remove combination switch base, remove base attaching screw.
Power is supplied at all times
- through 15A fuse (No. 52, located in the fuse and fusible link box)
- to headlamp control unit terminal (8).

Power is also supplied at all times
- through 15A fuse (No. 51, located in the fuse and fusible link box)
- to headlamp control unit terminal (1).

Low beam operation
When the lighting switch is moved to the 2ND position and placed in LOW ("B") position, power is supplied
- from headlamp control unit terminal (6)
- to LH headlamp (low) terminal (1), and
- from headlamp control unit terminal (3)
- to RH headlamp (low) terminal (1).

Terminal (2) of each headlamp supplies ground through body grounds (E15) and (E6). With power and ground supplied, the low beam headlamps illuminate.

High beam operation
When the lighting switch is moved to the 2ND position and placed in HIGH ("A") or PASS ("C") position, power is supplied
- from headlamp control unit terminal (6)
- to LH headlamp (low) terminal (1), and
- from headlamp control unit terminal (3)
- to RH headlamp (low) terminal (1).

Terminal (2) of each headlamp supplies ground through body grounds (E15) and (E6). Also, when the lighting switch is moved to the 2ND position and placed in HIGH ("A") or PASS ("C") position, power is supplied
- from headlamp control unit terminal (6)
- to LH headlamp (high) terminal (1), and
- from headlamp control unit terminal (5)
- to RH headlamp (high) terminal (1), and
- to combination meter terminal (13) for the HIGH BEAM indicator.

Terminal (2) of each headlamp supplies ground through body grounds (E15) and (E6).

Ground is also supplied to terminal (12) of the combination meter through body grounds (MA) and (MB).

With power and ground supplied, all headlamps and the HIGH BEAM indicator illuminate.
## Trouble Diagnoses (For U.S.A.)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible cause</th>
<th>Repair order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. LH headlamp ground</td>
<td>2. Check LH headlamp ground. (Terminal ②)</td>
</tr>
<tr>
<td></td>
<td>3. 15A fuse</td>
<td>3. Check 15A fuse (No. ③, located in fusible link).</td>
</tr>
<tr>
<td></td>
<td>2. RH headlamp ground</td>
<td>2. Check RH headlamp ground. (Terminal ②)</td>
</tr>
<tr>
<td></td>
<td>3. 15A fuse</td>
<td>3. Check 15A fuse (No. ③, located in fusible link).</td>
</tr>
<tr>
<td>LH high beam does not operate, but LH low beam operates.</td>
<td>1. Bulb</td>
<td>1. Check bulb.</td>
</tr>
<tr>
<td></td>
<td>2. Open in LH high beam circuit</td>
<td>2. Check Y wire between control unit and LH headlamp for an open circuit.</td>
</tr>
<tr>
<td>LH low beam does not operate, but LH high beam operates.</td>
<td>1. Bulb</td>
<td>1. Check bulb.</td>
</tr>
<tr>
<td></td>
<td>2. Open in LH low beam circuit</td>
<td>2. Check G/Y wire between control unit and LH headlamp for an open circuit.</td>
</tr>
<tr>
<td>RH high beam does not operate, but RH low beam operates.</td>
<td>1. Bulb</td>
<td>1. Check bulb.</td>
</tr>
<tr>
<td></td>
<td>2. Open in RH high beam circuit</td>
<td>2. Check LG/B wire between control unit and RH headlamp for an open circuit.</td>
</tr>
<tr>
<td>RH low beam does not operate, but HH high beam operates.</td>
<td>1. Bulb</td>
<td>1. Check bulb.</td>
</tr>
<tr>
<td></td>
<td>2. Open in HH low beam circuit</td>
<td>2. Check L/B wire between control unit and HH headlamp for an open circuit.</td>
</tr>
<tr>
<td>High beam indicator does not work.</td>
<td>1. Bulb</td>
<td>1. Check bulb in combination meter.</td>
</tr>
<tr>
<td></td>
<td>2. High beam indicator ground</td>
<td>2. Check combination meter ground. (Terminal ③)</td>
</tr>
<tr>
<td></td>
<td>3. Open in high beam circuit</td>
<td>3. Check LG/B wire between control unit and combination meter for an open circuit.</td>
</tr>
</tbody>
</table>
System Description (For Canada)

The headlamp system for Canada vehicles contains a daytime light control unit. It activates the high beam headlamps at approximately half illumination whenever the engine is running. If the parking brake is applied before the engine is started, the daytime lights will not be illuminated. The daytime lights will illuminate once the parking brake is released. After that, the daytime lights will continue to operate even when the parking brake is applied.

Power is supplied at all times

- through 15A fuse (No. 22, located in the fuse and fusible link box)
- to daytime light control unit terminal 8 and
- to headlamp control unit terminal 8.

Power is also supplied at all times

- through 15A fuse (No. 51, located in the fuse and fusible link box)
- to daytime light control unit terminal 7, and
- to headlamp control unit terminal 1.

With the ignition switch in the ON or START position, power is supplied

- through 7.5A fuse (No. 30, located in the fuse block [J/B])
- to daytime light control unit terminal 14.

Ground is supplied to daytime light control unit terminal 6 through body grounds E15 and E37.

HEADLAMP OPERATION

Low beam operation

When the lighting switch is moved to the 2ND position and placed in LOW ("B") position, power is supplied

- from headlamp control unit terminal 6
- to LH headlamp (low) terminal 1.

Ground is supplied to LH headlamp (low) terminal 2 through body grounds E15 and E37.

Also, when the lighting switch is moved to the 2ND position and placed in LOW ("B") position, power is supplied

- from headlamp control unit terminal 3
- to RH headlamp (low) terminal 1.

Ground is supplied to RH headlamp (low) terminal 2 through body grounds E15 and E37 (through daytime light control unit).

With power and ground supplied, the low beam headlamps illuminate.

High beam operation

When the lighting switch is moved to the 2ND position and placed in HIGH ("A") or PASS ("C") position, power is supplied

- from headlamp control unit terminal 6
- to LH headlamp (low) terminal 1.

Ground is supplied to LH headlamp (low) terminal 2 through body grounds E15 and E37.

Also, when the lighting switch is moved to the 2ND position and placed in HIGH ("A") or PASS ("C") position, power is supplied

- from headlamp control unit terminal 3
- to RH headlamp (low) terminal 1.

Ground is supplied to RH headlamp (low) terminal 2 through body grounds E15 and E37 (through daytime light control unit).

Also, when the lighting switch is moved to the 2ND and HIGH ("A") or PASS ("C") position, power is supplied

- from headlamp control unit terminal 11
- to LH headlamp (high) terminal 1.

Ground is supplied to LH headlamp (high) terminal 2 through body grounds E15 and E37.

Also, when the lighting switch is moved to the 2ND and HIGH ("A") or PASS ("C") position, power is supplied

- from headlamp control unit terminal 9
- to RH headlamp (high) terminal 1.

Ground is supplied to RH headlamp (high) terminal 2 through body grounds E15 and E37 (through daytime light control unit).

With power and ground supplied, all headlamps illuminate.

DAYTIME LIGHT OPERATION

With the engine running and the lighting switch in the OFF or 1ST position, power is supplied

- to headlamp control unit terminal 3
- through headlamp control unit terminal 6
• to RH headlamp (high) terminal ①
• through RH headlamp (high) terminal ②
• to daytime light control unit terminal ③.

Also, with the engine running and the lighting switch in the OFF or 1ST position, power is supplied
• to headlamp control unit terminal ④
• through headlamp control unit terminal ⑤
• to RH headlamp (low) terminal ⑥
• through RH headlamp (low) terminal ⑦
• to daytime light control unit terminal ⑧

These powers are supplied
• through daytime light control unit terminal ⑨
• to LH headlamp (low) terminal ⑩, and
• through daytime light control unit terminal ⑪
• to LH headlamp (high) terminal ❼.

Ground is supplied to both headlamp terminals ② through body grounds ⑩ and ⑪.

Because RH and LH headlamps (low), and RH and LH headlamps (high) are now wired in series, they operate at half illumination.
# HEADLAMP

## Operation (Daytime light system for Canada)

After starting the engine with the lighting switch in the "OFF" position or "1ST" position, the headlamps automatically turn on. Lighting switch operations other than the above are the same as conventional light systems.

<table>
<thead>
<tr>
<th>Engine</th>
<th>With engine stopped</th>
<th>With engine running</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OFF</td>
<td>1ST</td>
</tr>
<tr>
<td>Lighting switch</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Headlamp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Low beam</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Clearance and tail lamp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>License and Instrument illumination lamp</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

O : Lamp "ON"
X : Lamp "OFF"
Δ : Lamp dims.

*: When starting the engine with the parking brake released, the daytime lamp will come ON.
When starting the engine with the parking brake applied, the daytime lamp won't come ON.
## Trouble Diagnoses (For Canada)

**DAYTIME LIGHT CONTROL UNIT INSPECTION TABLE**
(Data are reference values.)

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Item</th>
<th>Condition</th>
<th>Judgement standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Start/parking brake signal</td>
<td>When turning ignition switch to &quot;ST&quot;.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When turning ignition switch to &quot;ON&quot; from &quot;ST&quot; with parking brake set.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When releasing parking brake with engine running. CAUTION: Block wheels and ensure selector lever is in N or P position.</td>
<td>1V or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When turning ignition switch to &quot;OFF&quot;.</td>
<td>1V or less</td>
</tr>
<tr>
<td>5</td>
<td>Lighting switch (Lo beam)</td>
<td>When turning lighting switch to &quot;HEAD&quot; (2nd position).</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td>7</td>
<td>Power source</td>
<td>When turning ignition switch to &quot;ON&quot;.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When turning ignition switch to &quot;OFF&quot;.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td>8</td>
<td>Power source</td>
<td>When turning ignition switch to &quot;ON&quot;.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When turning ignition switch to &quot;OFF&quot;.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td>14</td>
<td>Power source</td>
<td>When turning ignition switch to &quot;ON&quot;.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When turning ignition switch to &quot;ST&quot;.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When turning ignition switch to &quot;OFF&quot;.</td>
<td>1V or less</td>
</tr>
<tr>
<td>3</td>
<td>Hi beam indicator (Combination meter)</td>
<td>When turning lighting switch to &quot;HI BEAM&quot;.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When turning lighting switch to &quot;FLASH TO PASS&quot;.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td>Terminal No.</td>
<td>Item</td>
<td>Condition</td>
<td>Judgement standard</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>9</td>
<td>LH hi beam</td>
<td>When turning lighting switch to “Hi BEAM”.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td>10</td>
<td>LH headlamp control (Power source)</td>
<td>When releasing parking brake with engine running and turning lighting switch to “OFF” or “1ST” (daytime light operation). CAUTION: Block wheels and ensure selector lever is in N or P position.</td>
<td>Approx. half battery voltage</td>
</tr>
<tr>
<td>11</td>
<td>RH headlamp control (ground)</td>
<td>When lighting switch is turned to “HEAD”.</td>
<td>1V or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When releasing parking brake with engine running and turning lighting switch to “OFF” or “1ST” position (daytime light operation). CAUTION: Block wheels and ensure selector lever is in N or P position.</td>
<td>Approx. half battery voltage</td>
</tr>
<tr>
<td>6</td>
<td>Ground</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Alternator</td>
<td>When turning ignition switch to “ON”.</td>
<td>1V or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When engine is running.</td>
<td>Battery positive voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When turning ignition switch to “OFF”.</td>
<td>1V or less</td>
</tr>
</tbody>
</table>
Bulb Replacement
The headlamp is a semi-sealed beam type which uses a replaceable halogen bulb. The bulb can be replaced from the engine compartment side without removing the headlamp body.

- Grasp only the plastic base when handling the bulb. Never touch the glass envelope.

1. Disconnect the battery cable.
2. Turn the bulb retaining ring counterclockwise until it is free from the headlamp reflector, and then remove it.
3. Disconnect the harness connector from the back side of the bulb.
4. Remove the headlamp bulb carefully. Do not shake or rotate the bulb when removing it.
5. Install in the reverse order of removal.

CAUTION:
- Do not leave the bulb out of the headlamp reflector for a long period of time as dust, moisture, smoke, etc. may enter the headlamp body and affect the performance of the headlamp. Thus, the headlamp bulb should not be removed from the headlamp reflector until just before a replacement bulb is to be installed.

Aiming Adjustment
Before performing aiming adjustment, make sure of the following.
- Keep all tires inflated to correct pressure.
- Place vehicle on level ground.
- See that vehicle is unloaded (except for full levels of coolant, engine oil and fuel, and spare tire, jack, and tools). Have the driver or equivalent weight placed in driver's seat.

LOW BEAM
1. Open the hood.
2. Adjust water level by turning the adjusting screw (vertical direction). The bubble should be centered in the gauge as shown in the illustration.

3. Adjust indicator by turning the adjusting screw with a Philips screwdriver. (horizontal direction) The inner red line should align with the indicator line. Never turn screw (A).
**HEADLAMP**

**Aiming Adjustment (Cont’d)**

**ADJUSTMENT AFTER HEADLAMP ASSEMBLY REPLACEMENT**

If the vehicle has had front body repair and the headlamp assembly has been replaced, the aiming should be checked using the aiming chart as shown in the illustration.

a. Adjust headlamps so that main axis of light is parallel to center line of body and is aligned with point P shown in the illustration.

b. Dotted lines in illustration show center of headlamp.

- **“H”**: Horizontal center line of headlamps
- **“WL”**: Distance between each headlamp center
- **“L”**: 7,620 mm (300.00 in)
- **“C”**: 75 mm (2.95 in)

Even if the horizontal indicator does not align with the indicator line after aiming by the chart, the following variations are acceptable.

**Unit: mm (in)**

**Indicator**

- ACCEPTABLE
- ACCEPTABLE
EXTerior Lamp

Turn Signal and Hazard Warning Lamps/
System Description

TURN SIGNAL OPERATION
With the hazard switch in the OFF position and the ignition switch in the ON or START position, power is supplied
- through 7.5A fuse (No. [21], located in the fuse block [J/B])
- to hazard switch terminal [2]
- through terminal [1] of the hazard switch
- to combination flasher unit terminal [1]
- through terminal [3] of the combination flasher unit
- to multi-remote control relay-2 terminal [4]
- to turn signal switch terminal [1].
Ground is supplied to combination flasher unit terminal [2] through body grounds [M13] and [M26].

LH turn
When the turn signal switch is moved to the LH position, power is supplied from turn signal switch terminal [3] to
- front turn signal lamp LH terminal [1]
- rear combination lamp LH terminal [2]
- combination meter terminal [10], and
Ground is supplied to the front turn signal lamp LH terminal [2] through body grounds [E15] and [E37].
Ground is supplied to the rear combination lamp LH terminal [1] through body grounds [T2] and [T6].
Ground is supplied to combination meter terminal [2] through body grounds [M13] and [M26].
With power and ground supplied, the flasher unit controls the flashing of the LH turn signal lamps.

RH turn
When the turn signal switch is moved to the RH position, power is supplied from turn signal switch terminal [2] to
- front turn signal lamp RH terminal [1]
- rear combination lamp RH terminal [2]
- combination meter terminal [10], and
Ground is supplied to the front turn signal lamp RH terminal [2] through body grounds [E15] and [E37].
Ground is supplied to the rear combination lamp RH terminal [1] through body ground [T2] and [T6].
Ground is supplied to combination meter terminal [2] through body grounds [M13] and [M26].
With power and ground supplied, the flasher unit controls the flashing of the RH turn signal lamps.

HAZARD LAMP OPERATION
Power is supplied at all times to hazard switch terminal [3] through:
- 10A fuse (No. [1], located in the fuse block [J/B]).
With the hazard switch in the ON position, power is supplied
- through terminal [1] of the hazard switch
- to combination flasher unit terminal [1]
- through terminal [3] of the combination flasher unit
- to hazard switch terminal [4].
Ground is supplied to combination flasher unit terminal [2] through body grounds [M13] and [M26].
Power is supplied through terminal [5] of the hazard switch to
- front turn signal lamp LH terminal [1]
- rear combination lamp LH terminal [2]
- combination meter terminal [10].
Power is supplied through terminal [6] of the hazard switch to
- front turn signal lamp RH terminal [1]
- rear combination lamp RH terminal [2]
- combination meter terminal [10], and
Ground is supplied to terminal [2] of the front turn signal lamps through body grounds [E15] and [E37].
Ground is supplied to terminal [1] of the rear combination lamps through body grounds [T2] and [T6].
Ground is supplied to combination meter terminal [2] through body grounds [M13] and [M26].
With power and ground supplied, the flasher unit controls the flashing of the hazard warning lamps.
WITH MULTI-REMOTE CONTROL SYSTEM

Power is supplied at all times
- through 10A fuse (No. 1, located in the fuse block [J/B])
- to multi-remote control relay-1 terminal ①, ⑥ and ⑧, and
- to multi-remote control relay-2 terminal ②.

Ground is supplied to multi-remote control relay-1 terminal ② and multi-remote control relay-2 terminal ①, when the multi-remote control system is triggered through the multi-remote control unit.

(Refer to "MULTI-REMOTE CONTROL SYSTEM").

The multi-remote control relay-1 and multi-remote control relay-2 are energized.

Power is supplied through terminal ⑤ of the multi-remote control relay-1
- to front turn signal lamp RH terminal ①,
- to rear combination lamp RH terminal ② and
- to combination meter terminal ③.

Power is supplied through terminal ⑦ of the multi-remote control relay-1
- to front turn signal lamp LH terminal ①,
- to rear combination lamp LH terminal ② and
- to combination meter terminal ④.

With power and ground supplied, the multi-remote control unit controls the flashing of the hazard warning lamps.
Turn Signal and Hazard Warning Lamps/Wiring Diagram — TURN —
EXTerior Lamp
Turn Signal and Hazard Warning Lamps/Wiring
Diagram — TURN — (Cont’d)

EL-TURN-02

Preceding page

A: SB
B: PU

Preceding page

C: B/Y
D: R/W

Rear Combination Lamp LH (Turn Signal)
T9

Refer to last page (Foldout page).

Refer to EL-POWER.

M1
E62
B2

EL-70
## Turn Signal and Hazard Warning Lamps/ Trouble Diagnoses

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible cause</th>
<th>Repair order</th>
</tr>
</thead>
</table>
| Turn signal and hazard warning lamps do not operate. | 1. Hazard switch  
2. Combination flasher unit  
2. Refer to combination flasher unit check.  
3. Check wiring to combination flasher unit for open circuit. |
| Turn signal lamps do not operate but hazard warning lamps operate. | 1. 7.5A fuse  
2. Hazard switch  
3. Turn signal switch  
4. Open in turn signal switch circuit | 1. Check 7.5A fuse (No. 21, located in fuse block). Turn ignition switch ON and verify battery positive voltage is present at terminal 2 of hazard switch.  
2. Check hazard switch.  
3. Check turn signal switch.  
4. Check harness between combination flasher unit terminal 3 and turn signal switch terminal 1 for open circuit. |
| Hazard warning lamps do not operate but turn signal lamps operate. | 1. 10A fuse  
2. Hazard switch  
3. Open in hazard switch circuit | 1. Check 10A fuse (No. 1, located in fuse block). Verify battery positive voltage is present at terminal 3 of hazard switch.  
2. Check hazard switch.  
3. Check harness between combination flasher unit terminal 3 and hazard switch terminal 4 for open circuit. |
| Individual turn signal lamp or turn indicators do not operate. | 1. Bulb  
2. Check ground circuit for the bulb. |
Combination Flasher Unit Check
- Before checking, ensure that bulbs meet specifications.
- Connect a battery and test lamp to the combination flasher unit, as shown. Combination flasher unit is properly functioning if it blinks when power is supplied to the circuit.

Bulb Specifications

<table>
<thead>
<tr>
<th></th>
<th>Wattage (12 volt)</th>
<th>Bulb No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headlamp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High beam (Inside)</td>
<td>65</td>
<td>9005</td>
</tr>
<tr>
<td>Low beam (Outside)</td>
<td>55</td>
<td>9006</td>
</tr>
<tr>
<td>Front turn signal</td>
<td>27</td>
<td>1157NA</td>
</tr>
<tr>
<td>Front clearance lamp</td>
<td>5</td>
<td>—</td>
</tr>
<tr>
<td>Front side marker lamp</td>
<td>3.8</td>
<td>194</td>
</tr>
<tr>
<td>Rear combination lamp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn signal</td>
<td>27</td>
<td>1156</td>
</tr>
<tr>
<td>Stop/Tail</td>
<td>27/8</td>
<td>1157</td>
</tr>
<tr>
<td>Back-up lamp</td>
<td>27</td>
<td>1156</td>
</tr>
<tr>
<td>Rear side marker lamp</td>
<td>3.8</td>
<td>194</td>
</tr>
<tr>
<td>License plate lamp</td>
<td>5</td>
<td>—</td>
</tr>
<tr>
<td>High-mounted stop lamp</td>
<td>18</td>
<td>921</td>
</tr>
</tbody>
</table>
**INTERIOR LAMP**

**Illumination/System Description**

Power is supplied at all times
- through 15A fuse (No. 50, located in the fuse and fusible link box)
- to tail lamp relay terminal 3 and 1.

Ground is supplied to tail lamp relay terminal 2, when the lighting switch is moved to the 1ST or 2ND position.

The tail lamp relay is energized.

The lighting switch must be in the 1ST or 2ND position for illumination.

The illumination control switch is a thumbwheel that controls the amount of current to the illumination system. As the amount of current increases, the illumination becomes brighter.

The glove box lamp, cigarette lighter, rear power window sub-switch LH, and rear power window sub-switch RH illumination is not controlled by the illumination control switch. The intensity of these lamps does not change.

The following chart shows the power and ground connector terminals for the components included in the illumination system.

<table>
<thead>
<tr>
<th>Component</th>
<th>Connector No.</th>
<th>Power terminal</th>
<th>Ground terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD player and radio</td>
<td>M52</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Push control unit</td>
<td>M52</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>A/T indicator</td>
<td>M39</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Hazard switch</td>
<td>M52</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Power window main switch</td>
<td>D76</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Power window sub-switch (passenger side)</td>
<td>D23</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Rear power window sub-switch LH</td>
<td>D45</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Rear power window sub-switch RH</td>
<td>D55</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Cigarette lighter</td>
<td>M50</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Combination meter</td>
<td>M20, M20</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Clock</td>
<td>M51</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>ASCD main switch</td>
<td>M41</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Glove box lamp</td>
<td>M81</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Illumination control switch</td>
<td>M10</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Auto anti-dazzling inside mirror</td>
<td>R8</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

With the exception of the glove box lamp, cigarette lighter, rear power window sub-switch LH, and rear power window sub-switch RH illumination, the ground for all of the components are controlled through terminals 3, 4 and 5 of the illumination control switch and body grounds M10 and M50.

The glove box lamp terminal 3 and cigarette lighter illumination terminal 1 are grounded directly through body grounds M10 and M50.

The rear power window sub-switch LH terminal 3 is grounded directly through body grounds 88 and 83.

The rear power window sub-switch RH terminal 3 is grounded directly through body grounds 854 and 871.
INTERIOR LAMP
Illumination/Wiring Diagram — ILL — (Cont’d)

EL-ILL-02

EL-76
INTERIOR LAMP

Interior, Spot and Trunk Room Lamps/System Description

Power is supplied at all times
- through 7.5A fuse (No. 23, located in the fuse block [J/B])
- to footwell lamp (driver side) terminal 2,
- to footwell lamp (passenger side) terminal 2,
- to step lamp (driver side) terminal 1,
- to step lamp (passenger side) terminal 1,
- to trunk room lamp terminal 1,
- to rear step lamp LH terminal 1,
- to rear step lamp RH terminal 1,
- to interior lamp terminal 1,
- to spot lamp terminal 1,
- to vanity mirror illumination (driver side) terminal 1,
- to vanity mirror illumination (passenger side) terminal 1, and
- to rear door switch relay terminal 2.

INTERIOR LAMP

Switch operation
With interior lamp switch is ON, ground is supplied to turn interior lamp on. When a door switch is set to OPEN with interior lamp switch in DOOR, ground is supplied
- to interior lamp terminal 2
- through diode terminal 1
- to diode terminal 2
- through front door switch (driver side) terminal 1
- through front door switch (passenger side) terminal 1
- through rear door switch relay terminal 3 (when rear door switch relay is energized by rear door switch LH or rear door switch RH).

Interior lamp timer operation by time control system
With interior lamp switch in DOOR and front door switch (driver side) set to CLOSED, time control unit receives position signals. Ground is then supplied
- to interior lamp terminal 2
- through time control unit (located in the fuse block [J/B]) terminal 1A.
Time control unit is grounded at terminal 1A to control interior lamp operation.

Interior lamp control by multi-remote control system
Multi-remote control system receives a signal to turn interior lamp on with interior lamp switch set to DOOR. Ground is then supplied
- to interior lamp terminal 2
- through multi-remote control unit terminal 17.
Multi-remote control unit is grounded at terminal 17 to turn interior lamp on.

SPOT LAMP AND VANITY MIRROR LAMP

With a switch ON, power is supplied
- to spot lamp,
- to vanity mirror lamp (driver side) and
- to vanity mirror lamp (passenger side).
Ground is supplied
- to spot lamp terminal 2,
- to vanity mirror illumination (driver side) terminal 2 and
- to vanity mirror lamp (passenger side) terminal 2
- through body grounds (M4 and M6).
Also, when lighting switch is moved to 1ST or 2ND position, ground is supplied
- to spot lamp terminal 3
- through lighting switch terminal 5
- to lighting switch terminal 6
- through body grounds (E10) and (E17).
With power and ground supplied, the lamp turns on.

**TRUNK ROOM LAMP**

When trunk room lamp switch is in OPEN position, ground is supplied
- to trunk room lamp terminal ②
- through trunk room lamp switch terminal ①
- to trunk room lamp switch terminal ②
- through body grounds ⑬ and ⑭.

With power and ground supplied, trunk room lamp turns on.

**FOOTWELL AND STEP LAMPS**

When front door switch (driver side) or front door switch (passenger side) is set to OPEN, ground is supplied
- to footwell lamp (driver side) terminal ①,
- to footwell lamp (passenger side) terminal ①,
- to step lamp (driver side) terminal ②,
- to step lamp (passenger side) terminal ②,
- to rear step lamp LH terminal ②, and
- to rear step lamp RH terminal ②
- through front door switch (driver side) terminal ① or
- through front door switch (passenger side) terminal ①.

Also, when rear door switch relay is energized by rear door switch LH or rear door switch RH, ground is supplied to the above terminals through rear door switch relay terminal ③.
## Bulb Specifications

<table>
<thead>
<tr>
<th>Lamp Type</th>
<th>Wattage (12 volt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior lamp</td>
<td>10</td>
</tr>
<tr>
<td>Spot lamp (Type A)</td>
<td>10</td>
</tr>
<tr>
<td>Spot lamp (Type B)</td>
<td>8</td>
</tr>
<tr>
<td>Step lamp</td>
<td>3.4</td>
</tr>
<tr>
<td>Trunk room lamp</td>
<td>3.4</td>
</tr>
</tbody>
</table>
System Description

With the ignition switch in the ON or START position, power is supplied
- through 7.5A fuse (No. 11, located in the fuse block [J/B])
- to combination meter terminal 2
- for the tachometer,
- for the speedometer, fuel gauge and water temperature gauge.

Ground is supplied
- to combination meter terminals 7 and 11
- through body grounds M2 and M12.

The reading on the water temperature gauge is based on the resistance change of the thermal transmitter.

A variable ground is supplied to terminal 5 of the combination meter for the water temperature gauge.

The tachometer is regulated by a signal
- from terminal 5 of the ECM (ECCS control module)
- to combination meter terminal 2 for the tachometer.

The fuel gauge is regulated by a variable ground signal supplied
- to combination meter terminal 10 for the fuel gauge
- from terminal 5 of the fuel tank gauge unit
- through terminal 4 of the fuel tank gauge unit and
- through body grounds M13 and M11.

The vehicle speed sensor provides a voltage signal to the combination meter for the speedometer and the voltage is converted into the vehicle speed.

The voltage is supplied
- to combination meter terminals 6 and 17 for the speedometer
- from terminals 2 and 1 of the vehicle speed sensor.
METER AND GAUGES

Speedometer, Tachometer, Temp. and Fuel Gauges/Wiring Diagram — METER —

EL-METER-01

Refer to EL-POWER.

Next page

Refer to last page (Foldout page).

Refer to EL-POWER.
METER AND GAUGES

Inspection/Fuel Gauge and Water Temperature Gauge

INSPECTION START

CHECK POWER SOURCE.
1) Turn ignition switch "ON".
2) Check voltage between terminal ③ and ground.
   Battery voltage should exist.
   OK
   NG
   Check the following items.
   1) Harness continuity between battery terminal and combination meter
   2) Ignition relay
   3) Fusible link and fuse
   4) Ignition switch

CHECK GAUGE OPERATION.
1) Turn ignition switch "ON".
2) Connect terminals ⑥ (Fuel), ⑦ (Temp.) and ground with wire for less than 10 seconds.
3) Check operation of gauge.
   Gauge should move smoothly to full scale.
   OK
   NG
   Repair or replace gauge.

Check harness continuity between component and combination meter ⑥.
   OK
   NG
   Repair or replace.

CHECK COMPONENT.
Check gauge units and harness.
Refer to "Fuel Tank Gauge Unit Check" (EL-93), "Thermal Transmitter Check" (EL-93).
   OK
   NG
   Repair or replace.
   Refer to FE section. (Fuel tank gauge unit)

Reinstall any part removed.

INSPECTION END

EL-92

1184
Fuel Tank Gauge Unit Check
- For removal, refer to FE section.
  Check the resistance between terminals (6) and (5).

<table>
<thead>
<tr>
<th>Ohmmeter</th>
<th>Float position</th>
<th>Resistance value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+)</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>*3 Full</td>
<td>48 (1.89)</td>
</tr>
<tr>
<td>G</td>
<td>*2 1/2</td>
<td>112 (4.41)</td>
</tr>
<tr>
<td>G</td>
<td>*1 Empty</td>
<td>172 (6.77)</td>
</tr>
</tbody>
</table>

*1 and *3: When float rod is in contact with stopper.

Fuel Warning Lamp Sensor Check
- It will take a short time for the bulb to light.

Thermal Transmitter Check
Check the resistance between the terminals of thermal transmitter and body ground.

| Water temperature | Resistance  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>60°C (140°F)</td>
<td>Approx. 70 - 90Ω</td>
</tr>
<tr>
<td>100°C (212°F)</td>
<td>Approx. 21 - 24Ω</td>
</tr>
</tbody>
</table>

Oil Pressure Switch Check

<table>
<thead>
<tr>
<th>Oil pressure kPa (kg/cm², psi)</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 10 - 20 (0.1 - 0.2, 1.4 - 2.8)</td>
<td>NO</td>
</tr>
<tr>
<td>Less than 10 - 20 (0.1 - 0.2, 1.4 - 2.8)</td>
<td>YES</td>
</tr>
</tbody>
</table>

Check the continuity between the terminals of oil pressure switch and body ground.
Vehicle Speed Sensor Signal Check

1. Remove vehicle speed sensor from transmission.
2. Turn vehicle speed sensor pinion quickly and measure voltage across ③ and ⑤.

Vehicle speed sensor

Voltmeter

Approx. 0.5V
[Alternating current (AC)]
WARNING LAMPS

Wiring Diagram — WARN — (Cont’d)

EL-WARN-04

To EL-METER SB

Refer to last page (Foldout page).

EL-99
**Diode Check**

- Check continuity using an ohmmeter.
- Diode is functioning properly if test results are as shown in the figure at left.

**NOTE:** Specifications may vary depending on the type of tester. Before performing this inspection, be sure to refer to the instruction manual of your tester.

- Diodes for warning lamps are built into the combination meter printed circuit.

Refer to "Combination Meter" (EL-88).
Front Wiper and Washer/System Description

WIPER OPERATION

The wiper switch is controlled by a lever built into the combination switch. There are three wiper switch positions:
- LO speed
- HI speed
- INT (Intermittent)

With the ignition switch in the ACC or ON position, power is supplied:
- through 20A fuse (No. 5, located in the fuse block [J/B])
- to wiper motor terminal (2) and
- to wiper relay terminal (1).

Low and high speed wiper operation

Ground is supplied to wiper switch terminal (7) through body grounds (115 and 127).

When the wiper switch is placed in the LO position, ground is supplied:
- through terminal (4) of the wiper switch
- to wiper motor terminal (6).

With power and ground supplied, the wiper motor operates at low speed.

When the wiper switch is placed in the HI position, ground is supplied:
- through terminal (8) of the wiper switch
- to wiper motor terminal (5).

With power and ground supplied, the wiper motor operates at high speed.

Auto stop operation

When the wiper switch is placed in the OFF position, the wiper motor will continue to operate until the wiper arms reach the base of the windshield.

When wiper arms are not located at base of windshield with wiper switch OFF, ground is supplied:
- from terminal (1) of the wiper switch
- to wiper motor terminal (6), in order to continue wiper motor operation at low speed.

Ground is also supplied:
- through terminal (3) of the wiper switch
- to wiper relay terminal (3)
- through terminal (4) of the wiper motor, and
- through body grounds (115 and 127).

When wiper arms reach base of windshield, wiper motor terminals 3 and 2 are connected instead of terminals 3 and 4. Wiper motor will then stop wiper arms at the PARK position.

Intermittent operation

The wiper motor operates the wiper arms one time at low speed at a set interval of approximately 2 to 21 seconds. This feature is controlled by the time control unit (located in the fuse block [J/B]).

When the wiper switch is placed in the INT position, ground is supplied:
- to time control unit (located in the fuse block [J/B]) terminal (8A)
- from wiper switch terminal (5)
- through body grounds (115 and 127).

The desired interval time is input:
- to time control unit (located in the fuse block [J/B]) terminal (8A)
- from wiper switch terminal (5).

Based on these two inputs, an intermittent ground is supplied:
- to wiper relay terminal (2)
- from time control unit (located in the fuse block [J/B]) terminal (14E).

With power and ground supplied, the wiper relay is activated.

When activated, an intermittent ground is supplied:
- to wiper motor terminal (6)
- through the wiper switch terminal (4)
- to wiper switch terminal (3)
- through wiper relay terminal (3)
- to wiper relay terminal (5).
WIPER AND WASHER

Front Wiper and Washer/System Description (Cont’d)

- through body grounds 22E and 23F.

Wiper motor operates at desired low speeds with time control unit (located in the fuse block [J/B]) terminal 14E grounded.

WASHER OPERATION

With the ignition switch in the ACC or ON position, power is supplied
- through 20A fuse (No. 5, located in the fuse block [J/B])
- to washer motor terminal 2.

When the lever is pulled to the WASH position, ground is supplied
- to washer motor terminal 1, and
- to time control unit (located in the fuse block [J/B]) terminal 25A
- from terminal 1B of the wiper switch
- through terminal 1D of the wiper switch, and
- through body grounds 1E and 2F.

With power and ground supplied, the washer motor operates.
Wiper motor will then operate at low speed for approximately 3 seconds to clean windshield. This feature is controlled by the time control unit in the same manner as the intermittent operation.
**Installation**

1. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it “OFF” (Auto Stop).
2. Lift the blade up and then set it down onto glass surface to set the blade center to clearance “L1” or “L2” immediately before tightening nut.
3. Eject washer fluid. Turn on wiper switch to operate wiper motor and then turn it “OFF”.
4. Ensure that wiper blades stop within clearance “L1” & “L2”.
   - Clearance “L1” : 29 - 44 mm (1.14 - 1.73 in)
   - Clearance “L2” : 22 - 37 mm (0.87 - 1.46 in)
- Tighten windshield wiper arm nuts to specified torque.

**Windshield wiper:**

17 - 23 N·m (1.7 - 2.3 kg-m, 12 - 17 ft-lb)

- Before reinstalling wiper arm, clean up the pivot area as illustrated. This will reduce possibility of wiper arm looseness.
Washer Nozzle Adjustment

- Using Tool J36126, adjust windshield washer nozzle to correct its spray pattern.

Before attempting to turn the nozzle, gently tap the end of the tool to free the nozzle. This will prevent "rounding out" the small female square in the center of the nozzle.
HORN, CIGARETTE LIGHTER, CLOCK
Wiring Diagram — HORN — (Cont’d)

EL-HORN-02

1201

* : This connector is not shown in "HARNESS LAYOUT" EL section.

Refer to last page (Foldout page)
EL67, M10

EL-109
REAR WINDOW DEFOGGER

System Description

The rear window defogger system is controlled by the time control unit. The rear window defogger operates only for approximately 15 minutes.

Power is supplied at all times

- to rear window defogger relay terminal (3)
- through 20A fuse (No. 35), located in the fuse block [J/B] and
- to rear window defogger relay terminal (6)
- through 20A fuse (No. 34), located in the fuse block [J/B].

With the ignition switch in the ON or START position, power is supplied

- to the rear window defogger relay terminal (1).

When the rear window defogger switch in the AUTO A/C is activated, ground is supplied

- through terminal (2) of the A/C auto amplifier
- to the time control unit (located in the fuse block [J/B]) terminal (2A).

The time control unit (located in the fuse block [J/B]) terminal (2A) then supplies ground to the rear window defogger relay terminal (2).

With power and ground supplied, the rear window defogger relay is energized.

Power is supplied

- through terminals (5) and (7) of the rear window defogger relay
- to condenser terminal (1)
- through terminal (2) of the condenser
- to the rear window defogger terminal (3).

The rear window defogger has an independent ground.

With power and ground supplied, the rear window defogger filaments heat and defog the rear window.

When the system is activated, the rear window defogger ON signal is sent.

- to terminal (2) of the A/C auto amplifier
- from terminal (2) of the rear window defogger relay.

The rear window defogger indicator in the AUTO A/C illuminates.

Door mirror defogger

Door mirror defogger is connected parallel to rear window defogger. For wiring diagram of door mirror defogger, refer to "POWER DOOR MIRROR WITH HEATED MIRROR" (EL-137).

With rear window defogger switch ON, time control unit activates rear window defogger relay. Power is supplied

- to door mirror defogger relay terminal (1)
- through terminals (5) and (7) of the rear window defogger relay.

Then door mirror defogger relay is energized power is supplied to door mirror defogger.
**Filament Check**

1. Attach probe circuit tester (in volt range) to middle portion of each filament.

- When measuring voltage, wind a piece of tin foil around the top of the negative probe and press the foil against the wire with your finger as shown.

2. If a filament is burned out, circuit tester registers 0 or 12 volts.

3. To locate burned out point, move probe to left and right along filament to determine point where tester needle swings abruptly.
Filament Repair

REPAIR EQUIPMENT
1. Conductive silver composition (Dupont No. 4817 or equivalent)
2. Ruler 30 cm (11.8 in) long
3. Drawing pen
4. Heat gun
5. Alcohol
6. Cloth

REPAIRING PROCEDURE
1. Wipe broken heat wire and its surrounding area clean with a cloth dampened in alcohol.
2. Apply a small amount of conductive silver composition to tip of drawing pen.
Shake silver composition container before use.
3. Place ruler on glass along broken line. Deposit conductive silver composition on break with drawing pen. Slightly overlap existing heat wire on both sides [preferably 5 mm (0.20 in)] of the break.
4. After repair has been completed, check repaired wire for continuity. This check should be conducted 10 minutes after silver composition is deposited.
Do not touch repaired area while test is being conducted.

5. Apply a constant stream of hot air directly to the repaired area for approximately 20 minutes with a heat gun. A minimum distance of 3 cm (1.2 in) should be kept between repaired area and hot air outlet. If a heat gun is not available, let the repaired area dry for 24 hours.
Audio/System Description

Refer to Owner's Manual for audio system operating instructions.

WITH BOSE SYSTEM

Power is supplied at all times
- through 7.5A fuse (No. 13, located in the fuse block [J/B])
- to radio and CD player terminal 6.

With the ignition switch in the ACC or ON position, power is supplied
- through 10A fuse (No. 9, located in the fuse block [J/B])
- to radio and CD player terminal 16.

Ground is supplied through the case of the radio.
Also, radio and CD player terminal 2 is grounded to body grounds 911 and 988 through audio amp. relay terminals 1 and 2.

Power is supplied at all times
- through 15A fuse (No. 2, located in the fuse block [J/B])
- to front door speaker (driver side) terminal 4
- to front door speaker (passenger side) terminal 1.

Power is also supplied at all times
- through 15A fuse (No. 14, located in the fuse block [J/B])
- to rear speaker LH terminal 18 and
- to rear speaker RH terminal 17.

When the radio POWER button is pressed, audio signals are supplied
- through radio and CD player terminals 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15.
- to terminals 5 and 6 of the front door speaker (driver side)
- to terminals 3 and 2 of the front door speaker (passenger side)
- to terminals 11 and 12 of the rear speaker LH
- to terminals 9 and 8 of the rear speaker RH
- to LH and RH tweeters through terminals 7, 8, 9, and 10 of the front door speakers.

Power Antenna/System Description

Power is supplied at all times
- through 7.5A fuse (No. 13, located in the fuse block [J/B])
- to power antenna timer and motor terminal 6.

With the ignition switch in the ACC or ON position, power is supplied
- through 10A fuse (No. 9, located in the fuse block [J/B])
- to radio and CD player terminal 16.

Ground is supplied to the power antenna timer and motor through body grounds 911 and 988.

When the radio is turned to the ON position, battery voltage is supplied
- through radio and CD player terminal 5
- to power antenna timer and motor terminal 4.

When battery voltage is supplied to the power antenna timer and motor terminal 4, power supplied to the power antenna timer and motor terminal 6 drives the motor.
The antenna rises and is held in the extended position.

When the radio is turned to the OFF position, battery voltage is interrupted
- from radio and CD player terminal 5
- to power antenna terminal 4.
The antenna retracts.
### AUDIO AND POWER ANTENNA

#### Trouble Diagnoses

**RADIO**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible causes</th>
<th>Repair order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio is inoperative (no digital display and no sound from speakers).</td>
<td>1. 10A fuse 2. Poor radio case ground 3. Radio</td>
<td>1. Check 10A fuse (No. 9, located in fuse block). Turn ignition switch ON and verify battery positive voltage is present at terminal 9 of radio. 2. Check radio case ground. 3. Remove radio for repair.</td>
</tr>
<tr>
<td>Radio presets are lost when ignition switch is turned OFF.</td>
<td>1. 7.5A fuse 2. Radio</td>
<td>1. Check 7.5A fuse (No. 13, located in fuse block). Verify battery positive voltage is present at terminal 13 of radio. 2. Remove radio for repair.</td>
</tr>
</tbody>
</table>

**BOSE SYSTEM**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible causes</th>
<th>Repair order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio controls are operational, but no sound is heard from any speaker.</td>
<td>1. 15A fuse 2. Audio amp. relay 3. Audio amp. relay ground 4. Amp. ON signal 5. Radio output 6. Radio</td>
<td>1. Check 15A fuse (No. 2, located in fuse block). Verify battery positive voltage is present at terminal 2 of audio amp. relay. 2. Check audio amp. relay. 3. Check audio amp. relay ground (Terminal 2). 4. Turn ignition switch ACC and radio ON. Verify battery positive voltage is present at terminal 2 of audio amp. relay. 5. Check radio output voltage. 6. Remove radio for repair.</td>
</tr>
</tbody>
</table>
# AUDIO AND POWER ANTENNA

## Trouble Diagnoses (Cont’d)

### POWER ANTENNA

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible causes</th>
<th>Repair order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power antenna does not operate.</td>
<td>1. 7.5A fuse</td>
<td>1. Check 7.5A fuse (No. 2, located in fuse block). Verify that battery positive voltage is present at terminal 8 of power antenna timer and motor.</td>
</tr>
<tr>
<td></td>
<td>2. 10A fuse</td>
<td>2. Check 10A fuse (No. 9, located in fuse block). Turn ignition switch ON and verify that battery positive voltage is present at terminal 7 of radio.</td>
</tr>
<tr>
<td></td>
<td>3. Radio signal</td>
<td>3. Turn ignition switch and radio ON. Verify that battery positive voltage is present at terminal 4 of power antenna timer and motor.</td>
</tr>
<tr>
<td></td>
<td>4. Power antenna timer ground</td>
<td>4. Check power antenna timer ground (Terminal 2).</td>
</tr>
<tr>
<td></td>
<td>5. Power antenna timer and motor</td>
<td>5. Check power antenna timer and motor.</td>
</tr>
</tbody>
</table>

### Location of Antenna

[Diagram showing the location of the antenna and feeder cable near the car.]
Antenna Rod Replacement

REMOVAL
1. Remove antenna nut and antenna base.

2. Withdraw antenna rod while raising it by operating antenna motor.

INSTALLATION
1. Lower antenna rod by operating antenna motor.
2. Insert gear section of antenna rope into place with it facing toward antenna motor.
3. As soon as antenna rope is wound on antenna motor, stop antenna motor. Insert antenna rod lower end into antenna motor pipe.
4. Retract antenna rod completely by operating antenna motor.
5. Install antenna nut and base.
Window Antenna Repair

ELEMENT CHECK
1. Attach probe circuit tester (in ohm range) to antenna terminal on each side.

2. If an element is broken, no continuity will exist.

3. To locate broken point, move probe to left and right along element to determine point where tester needle swings abruptly.

ELEMENT REPAIR
Refer to REAR WINDOW DEFOGGER "Filament Repair" (EL-113).
Wiring Diagram — PHONE —

Refer to EL-POWER.

TRANSCIVER UNIT

STRG SW B

TEL

MIC-

MIC+

BR

BR/W

BR

BR/W

TELEPHONE MICROPHONE

RECEIVER CONTROL UNIT

Refer to last page (Foldout page).

M1

M42

M45

W

W

W

W

W

1217
ELECTRIC SUNROOF

Wiring Diagram — SROOF —

EL-SROOF-01

Refer to EL-POWER.

Refer to last page (Foldout page).
* This connector is not shown in "HARNESS LAYOUT" EL section.
POWER SEAT

Wiring Diagram — SEAT —

EL-SEAT-01

Refer to EL-POWER.

POWER SEAT (DRIVER'S SIDE) B17

CONTROL UNIT (EL1, EL2)

SLIDE

POWER SEAT SWITCH (EL3)

LIMIT SWITCH

SLIDING DEVICE (EL4, EL5)

Next page

Refer to last page (Foldout page).

1 2 3 B17 W

21 22 23 24 EL3 B

25 26 27 28 29 30 31 32 33 34 EL2 W

35 36 37 38 39 40 41 42 43 44 EL3* W

14 15 16 EL4 W

17 18 19 20 EL5 W

*: This connector is not shown in “HARNESS LAYOUT” EL section.

EL-131

1223
POWER SEAT
Wiring Diagram — SEAT — (Cont’d)

EL-SEAT-02

POWER SEAT (DRIVER’S SIDE)

CONTROL UNIT
EL1, EL2

RECLINING
N
F
R

FRONT LIFTER
U
N
D

REAR LIFTER
U
N
D

RECLINING DEVICE
EL5
FRONT
REAR
M
FULLY FRONT
FULLY REAR

LIMIT SWITCH
OTHER
OTHER

LIFTING DEVICE
EL7
FRONT LIFTER
UP
FULLY UP
FULLY DOWN
DOWN

REAR LIFTER
UP
FULLY UP
FULLY DOWN

* : This connector is not shown in "HARNESS LAYOUT" EL section.
This connector is not shown in "HARNESS LAYOUT" EL section.
DOOR MIRROR WITH HEATED MIRROR

Wiring Diagram — H/MIRR —

EL-H/MIRR-01

Refer to EL-POWER.

Next page

Refer to last page (Foldout page): M1

EL-137
Component Parts and Harness Connector Location

A ASCD hold relay
   Park/Neutral position relay
   Horn relay

B ASCD actuator
   ASCD pump

C ASCD cancel switch
   Stop lamp switch

D Data link connector for CONSULT

E ASCD main switch
   ASCD steering switch
   Indicator lamp

D ASCD control unit
System Description

Refer to Owner's Manual for ASCD operating instructions. When the ignition switch is in the ON or START position, power is supplied
- through 7.5A fuse (No. 30, located in the fuse block [J/B])
- to ASCD main switch terminal 1 and
- to ASCD hold relay terminal 5.

When ASCD main switch is in the ON position, power is supplied
- from terminal 2 of the ASCD main switch
- to ASCD control unit terminal 4 and
- from terminal 3 of the ASCD main switch
- to ASCD hold relay terminal 2.

Ground is supplied
- to ASCD hold relay terminal 1
- through body grounds EL3 and EL4.

With power and ground supplied, the ASCD hold relay is activated, and power is supplied
- from terminal 3 of the ASCD hold relay
- to park/neutral position relay terminal 4.

Power remains supplied also to ASCD control unit terminal 4 when the ASCD main switch is released to the N (neutral) position.

Ground is supplied
- to ASCD control unit terminal 3
- through body grounds MT4 and MS3.

Inputs

At this point, the system is ready to activate or deactivate, based on inputs from the following:
- speedometer in the combination meter
- stop lamp switch
- ASCD steering switch
- park/neutral position relay
- ASCD cancel switch.

A vehicle speed input is supplied
- from terminal 5 of the combination meter
- to ASCD control unit terminal 7.

Power is supplied at all times
- to stop lamp switch terminal 1
- through 15A fuse (No. 4, located in the fuse block [J/B]).

When the brake pedal is depressed, power is supplied
- from terminal 2 of the stop lamp switch
- to ASCD control unit terminal 10.

Power is supplied at all times
- through 15A fuse (No. 55, located in the fuse and fusible link box)
- to horn relay terminal 1
- through terminal 2 of the horn relay
- to ASCD steering switch terminal 1.

When the SET/COAST switch is depressed, power is supplied
- from terminal 2 of the ASCD steering switch
- to ASCD control unit terminal 2.

When the RESUME/ACCEL switch is depressed, power is supplied
- from terminal 3 of the ASCD steering switch
- to ASCD control unit terminal 1.

When the ASCD CANCEL switch is depressed, power is supplied
- to ASCD control unit terminals 1 and 2.

When the system is activated, power is supplied
- to ASCD control unit terminal 5.

Power is interrupted when
- the shift lever is placed in P or N or
- the brake pedal is depressed.
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

System Description (Cont’d)

Outputs
The ASCD actuator controls the throttle drum via the ASCD wire based on inputs from the ASCD control unit. The ASCD actuator consists of a vacuum motor, an air valve, and a release valve.

Power is supplied
- from terminal ⑧ of the ASCD control unit
- to ASCD pump terminal ①.

Ground is supplied to the vacuum motor
- from terminal ⑨ of the ASCD control unit
- to ASCD pump terminal ④.

Ground is supplied to the air valve
- from terminal ⑩ of the ASCD control unit
- to ASCD pump terminal ②.

Ground is supplied to the release valve
- from terminal ⑪ of the ASCD control unit
- to ASCD pump terminal ③.

When the system is activated, power is supplied
- from terminal ⑫ of the ASCD control unit
- to combination meter terminal ⑭ and
- to A/T control unit terminal ⑮.

Ground is supplied
- to combination meter terminal ⑭
- through body grounds ⑯ and ⑰.

With power and ground supplied, the CRUISE indicator illuminates.

When the RESUME/ACCEL button is depressed, a signal is sent
- from terminal ⑬ of the ASCD control unit
- to A/T control unit terminal ⑳.

When this occurs, the A/T control unit cancels overdrive.
Trouble Diagnoses

CONSULT
1. Turn off ignition switch.
2. Connect "CONSULT" to data link connector.

3. Turn on ignition switch.
4. Turn on ASCD main switch.
5. Touch START (on CONSULT display).
6. Touch ASCD.
7. Touch SELF-DIAG RESULTS.

- Self-diagnostic results are shown on display.
  Refer to table on page EL-155.

8. Touch DATA MONITOR.

- Touch START.
- Data monitor results are shown on display.
  Refer to table on page EL-155.

For further information, read the CONSULT Operation Manual.
## AUTOMATIC SPEED CONTROL DEVICE (ASCD)

### Trouble Diagnoses (Cont’d)

#### Self-diagnostic results

<table>
<thead>
<tr>
<th>Diagnostic Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* NO SELF DIAGNOSTIC FAILURE INDICATED. FURTHER TESTING MAY BE REQUIRED.**</td>
<td>• Even if no self-diagnostic failure is indicated, further testing may be required as far as the customer complains.</td>
</tr>
<tr>
<td>POWER SUPPLY-VALVE</td>
<td>• The power supply circuit for the valves is open. (An abnormally high voltage is entered.)</td>
</tr>
<tr>
<td>VACUUM PUMP</td>
<td>• The vacuum pump circuit is open or shorted. (An abnormally high or low voltage is entered.)</td>
</tr>
<tr>
<td>AIR VALVE</td>
<td>• The air valve circuit is open or shorted. (An abnormally high or low voltage is entered.)</td>
</tr>
<tr>
<td>VHCL SP-S/FAILSAFE</td>
<td>• The vehicle speed sensor or the fail-safe circuit is malfunctioning.</td>
</tr>
<tr>
<td>CONTROL UNIT</td>
<td>• The ASCD control unit is malfunctioning.</td>
</tr>
<tr>
<td>RELEASE VALVE</td>
<td>• The release valve circuit is open or shorted. (An abnormally high or low voltage is entered.)</td>
</tr>
<tr>
<td>BRAKE SW/STOP/L SW</td>
<td>• The brake (cancel) switch or stop lamp switch is malfunctioning.</td>
</tr>
</tbody>
</table>

#### Data monitor

<table>
<thead>
<tr>
<th>Monitored item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRAKE SW</td>
<td>• Indicates [ON/OFF] condition of the brake (cancel) switch circuit.</td>
</tr>
<tr>
<td>STOP LAMP SW</td>
<td>• Indicates [ON/OFF] condition of the stop lamp switch circuit.</td>
</tr>
<tr>
<td>SET SW</td>
<td>• Indicates [ON/OFF] condition of the set switch circuit.</td>
</tr>
<tr>
<td>RESUME/ACC SW</td>
<td>• Indicates [ON/OFF] condition of the resume/accelerate switch circuit.</td>
</tr>
<tr>
<td>CANCEL SW</td>
<td>• Indicates [ON/OFF] condition of the cancel circuit.</td>
</tr>
<tr>
<td>VHCL SPEED SE</td>
<td>• The present vehicle speed computed from the vehicle speed sensor signal is displayed.</td>
</tr>
<tr>
<td>SET VHCL SPD</td>
<td>• The preset vehicle speed is displayed.</td>
</tr>
<tr>
<td>VACUUM PUMP</td>
<td>• The operation time of the vacuum pump is displayed.</td>
</tr>
<tr>
<td>AIR VALVE</td>
<td>• The operation time of the air valve is displayed.</td>
</tr>
<tr>
<td>PW SUP-VALVE</td>
<td>• Indicates [ON/OFF] condition of the circuit for the air valve and the release valve.</td>
</tr>
<tr>
<td>CRUISE LAMP</td>
<td>• Indicates [ON/OFF] condition of the cruise lamp circuit.</td>
</tr>
<tr>
<td>A/T OD CANCEL</td>
<td>• Indicates [ON/OFF] condition of the OD cancel circuit.</td>
</tr>
<tr>
<td>FAIL SAFE-LOW</td>
<td>• The fail-safe (LOW) circuit function is displayed.</td>
</tr>
<tr>
<td>FAIL SAFE-SPD</td>
<td>• The fail-safe (SPEED) circuit function is displayed.</td>
</tr>
</tbody>
</table>
## AUTOMATIC SPEED CONTROL DEVICE (ASCD)
### Trouble Diagnoses (Cont’d)

## SYMPTOM CHART

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROCEDURE</th>
<th>Diagnostic Procedure</th>
<th>Electrical Components Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASAP control unit cannot be set properly.</td>
<td>EL-157</td>
<td>EL-160</td>
<td>EL-161</td>
</tr>
<tr>
<td>Engine hunts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large difference between set speed and actual vehicle speed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deceleration is greatest immediately after ASCD has been set.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEL switch will not operate.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESUME switch will not operate.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set speed cannot be canceled.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“CRUISE” indicator lamp blinks.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 1

SYMPTOM: ASCD control cannot be set.

Turn ASCD main switch "OFF" and "ON" to make sure indicator illuminates.

A. CHECK POWER SUPPLY FOR ASCD MAIN SWITCH.
   1. Disconnect main switch harness connector.
   2. Do approx. 12 volts exist between main switch harness terminal ① and body ground?

   No

   CHECK fuse and harness.

   Yes

   CHECK ASCD MAIN SWITCH.
   Refer to "Electrical Components Inspection" (EL-169).
   CHECK ASCD HOLD RELAY.

B. CHECK POWER SUPPLY CIRCUIT FOR ASCD CONTROL UNIT.
   1. Turn ASCD main switch "ON".
   2. Check voltage between control unit harness terminal ④ and ③.
   Battery voltage should exist.

   OK

   NG

   Check continuity between control unit harness terminal ④ and ASCD hold relay.

C. CHECK CUTOFF CIRCUIT FOR ASCD CONTROL UNIT.
   See "BRAKE SW" in "Data monitor" mode.

   BRAKE SWITCH
   When switch is depressed: OFF
   When switch is released: ON
   OR

   Check voltage between control unit harness terminals ⑤ and ③.
   Battery voltage should exist.

   OK

   (Next page)
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont’d)

D

CHECK SET/COAST SWITCH CIRCUIT
FOR ASCD CONTROL UNIT.

See "SET SW" in "Data monitor" mode.

SET SW
When switch is pressed: ON
When switch is released: OFF

OR

1. Push and hold SET/COAST button on ASCD steering switch.
2. Check voltage between control unit harness terminals ② and ③.

Battery voltage should exist.

NG

Does horn work?

No

Check fuse and horn relay.

Yes

CHECK ASCD STEERING SWITCH.
Refer to "Electrical Components Inspection" (EL-169).

OK

E

CHECK VEHICLE SPEED SENSOR CIRCUIT.

See "VHCL SPEED SE” in "Data monitor" mode while driving.

OR

1. Apply wheel chocks and jack up rear of vehicle.
2. Connect voltmeter between control unit harness terminals ⑦ and ⑨.
3. Slowly turn front wheel.
4. Check deflection of voltmeter pointer.

NG

CHECK VEHICLE SPEED SENSOR.
Refer to "Electrical Components Inspection” (EL-169).

OK

CHECK ASCD ACTUATOR/ASCD PUMP.
Refer to "Electrical Components Inspection” (EL-168).

NG

Replace ASCD actuator/ASCD pump.

OK

(Next page)
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont'd)

F

CHECK OUTPUT FOR ASCD ACTUATOR/ASCD PUMP.

1. Read out “PW SUP-VALVE” in “Data monitor” mode while driving.

PW SUP-VALVE:
ON (When ASCD is operating.)
OFF (When ASCD is not operating.)

OR

1. Check voltage between control unit harness terminals ⑥ and ③.
Voltage is 0V

G

CHECK ASCD ACTUATOR/ASCD PUMP CIRCUIT.

1. Disconnect ASCD control unit connector.
2. Measure resistance between control unit harness terminals ⑥ and ④, ⑥, ⑥.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Resistance [Ω]</th>
</tr>
</thead>
<tbody>
<tr>
<td>⑩</td>
<td>Approx. 8 - 45</td>
</tr>
<tr>
<td>⑤</td>
<td>Approx. 65</td>
</tr>
<tr>
<td>④</td>
<td>Approx. 65</td>
</tr>
</tbody>
</table>

NG

Repair short or open circuit in ASCD actuator/ASCD pump harness.

Check the ASCD control unit harness.
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont'd)
DIAGNOSTIC PROCEDURE 2

SYMPTOM: Engine hunts.

1. Check vacuum hose for breakage, cracks or fracture.
   - OK
   - NG: Repair or replace hose.

2. Does ASCD wire move smoothly?
   - OK
   - NG: Repair or replace wire.

3. CHECK ASCD ACTUATOR/ASCD PUMP. Refer to “Electrical Components Inspection” (EL-168).
   - OK
   - NG: Replace ASCD actuator/ASCD pump.

Replace ASCD control unit.

DIAGNOSTIC PROCEDURE 3

SYMPTOM: Large difference between set vehicle speed and actual speed.

1. Check ASCD wire and ASCD actuator move smoothly.
   - OK
   - NG: Replace wire or ASCD actuator.

2. Check vacuum hose for breakage, cracks or fracture.
   - OK
   - NG: Repair or replace hose.

3. CHECK ASCD ACTUATOR/ASCD PUMP. Refer to “Electrical Components Inspection” (EL-168).
   - OK
   - NG: Replace ASCD actuator/ASCD pump.

Replace ASCD control unit.
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 4

SYMPTOM: Deceleration is greatest immediately after ASCD has been set.

1. Check tension of ASCD wire and that ASCD wire move smoothly.
   - NG: ADJUST OR REPLACE ASCD WIRE. Refer to “ASCD Wire Adjustment” (EL-170).
   - OK:

2. Check vacuum hose for breakage, cracks or fracture.
   - NG: Repair or replace hose.
   - OK:

3. CHECK ASCD ACTUATOR/ASCD PUMP. Refer to “Electrical Components Inspection” (EL-168).
   - NG: Replace ASCD actuator/ASCD pump.
   - OK:

4. Replace ASCD control unit.
Trouble Diagnoses (Cont’d)
DIAGNOSTIC PROCEDURE 5
SYMPTOM: ACCEL switch will not operate.

A

Check constant-speed function for operating using SET/COAST switch.  

OK

NG

Go to “DIAGNOSTIC PROCEDURE 1” (EL-157).

A

CHECK RESUME/ACCEL SWITCH CIRCUIT.

See “RESUME/ACC SW” in “Data monitor” mode.

RESUME/ACC SW
When switch is pressed: ON
When switch is released: OFF

OR

Check voltage between control unit harness terminals (1) and (3).

• After pressing and holding RESUME/ACC switch.
  Battery voltage should exist.
• After releasing RESUME/ACC switch.
  Voltage is 0V.

A

ASCD control unit connector

(1)

G/W

(2)

V

(3)

(4)

CONNECT

SEL254RA

B

Does vehicle accelerate when RESUME/ACCEL switch is pressed?

No

 Replace control unit.

Yes

B

Does vehicle maintain the new (faster) speed when RESUME/ACCEL switch is released?

No

 Replace control unit.

Yes

System is OK.
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 6

SYMPTOM: RESUME switch will not operate.

A

Check constant-speed function for operation using SET/COAST switch.

OK

NG

Go to “DIAGNOSTIC PROCEDURE 1” (EL-157).

B

CHECK RESUME/ACCEL SWITCH CIRCUIT.

NG

CHECK ASCD STEERING SWITCH.

Refer to “Electrical Components Inspection” (EL-169).

See “RESUME/ACC SW” in “Data monitor” mode.

RESUME/ACC SW

When switch is pressed: ON

When switch is released: OFF

OR

Check voltage between control unit harness terminals ① and ③.

- After pressing and holding RESUME/ACC switch.
  Battery voltage should exist.

- After releasing RESUME/ACC switch.
  Voltage is 0V.

C

Set vehicle speed at 80 km/h (50 MPH) by pressing SET/COAST switch.

OK

While cruising at set speed, depress and release brake pedal.

OK

Does speed control disengage and “CRUISE” lamp turn off?

No

CHECK ASCD CANCEL SWITCH AND STOP LAMP SWITCH.

Refer to “Electrical Components Inspection” (EL-169).

Yes

(Next page)
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont’d)

D

Above 48 km/h (30 MPH), press and release "RESUME/ACCEL switch.

OK

Does vehicle return to previously set speed [80 km/h (50 MPH)]?

No

Replace control unit.

Yes

System is OK.
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 7

SYMPTOM: Set speed cannot be cancelled.

A

CHECK ASCD CANCEL AND INHIBITOR SWITCH CIRCUIT.
1. Turn ASCD main switch “ON”.
2. See “BRAKE SW” in “Data monitor” mode.

BRAKE SW
When brake pedal is released: ON
When brake pedal is depressed: OFF

OR

2. Check voltage between control unit harness terminals 5 and 3.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Voltage [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCD CAN-CEL switch Depressed</td>
<td>0</td>
</tr>
<tr>
<td>ASCD CAN-CEL switch Released</td>
<td>Approx. 12</td>
</tr>
<tr>
<td>A/T shift lever position is at any position except N or P.</td>
<td>Approx. 12</td>
</tr>
<tr>
<td>A/T shift lever position is at N or P.</td>
<td>0</td>
</tr>
</tbody>
</table>

B

CHECK STOP LAMP SWITCH CIRCUIT.
See “STOP LAMP SW” in “Data monitor” mode.

STOP LAMP SW
When brake pedal is released: OFF
When brake pedal is depressed: ON

OR

Check voltage between control unit harness terminals 10 and 8.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Voltage [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop lamp switch Depressed</td>
<td>Approx. 12</td>
</tr>
<tr>
<td>Stop lamp switch Released</td>
<td>0</td>
</tr>
</tbody>
</table>

OK (Next page)
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont’d)

Check ASCD wire moves smoothly. OK
NG Replace ASCD wire.

CHECK ASCD ACTUATOR/ASCD PUMP. Refer to "Electrical Components Inspection" (EL-168).
OK
NG Replace ASCD actuator/ASCD pump.

Replace ASCD control unit.
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 8

SYMPTOM: “CRUISE” indicator lamp blinks.

---

Does indicator lamp blink when ASCD main switch is turned to “ON” again?

No

Does indicator lamp blink when brake pedal is depressed slowly?

No

Adjust installation of stop lamp switch and ASCD brake switch. Refer to BR section.

Yes

CHECK ASCD STEERING SWITCH.
Refer to “Electrical Components Inspection” (EL-169).

NG

Replace ASCD steering switch.

OK

Replace control unit.

---

CHECK ASCD ACTUATOR/ASCD PUMP.
Refer to “Electrical Components Inspection” (EL-166).

NG

Replace ASCD actuator/ASCD pump.

OK

---

CHECK ASCD ACTUATOR/ASCD PUMP CIRCUIT.
1. Check voltage between control unit harness terminals ⑧ and ⑨.
   **Voltage is 0V.**
2. Disconnect ASCD control unit connector.
3. Measure resistance between control unit harness terminals ⑧, ⑨, ⑩, ⑪.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Resistance [Ω]</th>
</tr>
</thead>
<tbody>
<tr>
<td>⑧</td>
<td>Approx. 2 - 45</td>
</tr>
<tr>
<td>⑨</td>
<td>Approx. 65</td>
</tr>
<tr>
<td>⑩</td>
<td>Approx. 65</td>
</tr>
</tbody>
</table>

NG

Replace short or open circuit in ASCD actuator/ASCD pump harness.

OK

Replace ASCD control unit.
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont’d)

ELECTRICAL COMPONENTS INSPECTION

ASCD actuator/ASCD pump

1. Disconnect ASCD actuator/ASCD pump connector.
2. Check ASCD actuator/ASCD pump operations as shown.

A

Check to see if motor starts when 12V DC is applied across 1 and 4.

OK

NG

Replace ASCD pump.

B

Check to see if ASCD wire is pulled when 12V DC is applied across 1, 2, 3 and 4.

OK (wire is pulled.)

NG

Disconnect vacuum hose from ASCD actuator and check for presence of vacuum pressure at ASCD pump.

NG

OK

Replace ASCD actuator.

C

Check to see if ASCD wire returns to original position 50 to 60 seconds after disconnecting lead from 4.

OK (Wire does not return.)

NG

Replace ASCD pump.

D

Disconnect lead from 1 to see if ASCD wire returns immediately.

OK (Wire returns.)

NG

Replace ASCD pump.

ASCD actuator/ASCD pump are OK.
AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont’d)

ASCD main switch
Check continuity between terminals by pushing switch to each position.

<table>
<thead>
<tr>
<th>Switch position</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>○○○○○</td>
</tr>
<tr>
<td>N</td>
<td>○○○○</td>
</tr>
<tr>
<td>OFF</td>
<td>○○○○</td>
</tr>
</tbody>
</table>

ASCD steering switch
Check continuity between terminals by pushing each button.

<table>
<thead>
<tr>
<th>Button</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET/COAST</td>
<td>○○○○○</td>
</tr>
<tr>
<td>RESUME/ACCEL</td>
<td>○○○○○</td>
</tr>
<tr>
<td>CANCEL</td>
<td>○○○○○</td>
</tr>
</tbody>
</table>

ASCD cancel switch and stop lamp switch

<table>
<thead>
<tr>
<th>Condition</th>
<th>Continuity</th>
<th>ASCD cancel switch</th>
<th>Stop lamp switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>When brake pedal is depressed</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>When brake pedal is released</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Check each switch after adjusting brake pedal — refer to BR section.

Inhibitor switch

<table>
<thead>
<tr>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>When shift lever position is “N” or “P”</td>
<td>Yes</td>
</tr>
<tr>
<td>When shift lever position is any position except “N” or “P”</td>
<td>No</td>
</tr>
</tbody>
</table>

Vehicle speed sensor

1. Remove vehicle speed sensor from transaxle.
2. Turn vehicle speed sensor pinion quickly and measure voltage across ② and ①.
CAUTION:
- Be careful not to twist ASCD wire when removing it.
- Do not tense ASCD wire excessively during adjustment.

After confirming that accelerator wire is properly adjusted, adjust the tension of ASCD wire in the following manner.

1. After adjusting the length of the accelerator wire, turn a securing nut by 1/2 to 1 turn from throttle open starting position to the wire loosening direction to fix. (Must be securing carried out to prevent response delay of operation of the ASCD)
2. Securely tighten lock nut to hold adjusting nut in place.
- For ASCD cancel switch and clutch switch adjustment, refer to BR and CL sections.
POWER WINDOW

System Description

Power is supplied at all times
- through circuit breaker (located in the fuse block [J/B])
- to power window main switch terminal ④.

With ignition switch in ON or START position, power is supplied
- through 7.5A fuse (No.①0), located in the fuse block [J/B])
- to power window main switch terminal ⑤.

Power is supplied at all times
- through 20A fuse (No.①5), located in the fuse block [J/B])
- to power window amplifier (passenger side) terminal ⑦.

Power is supplied at all times
- through 20A fuse (No.⑦), located in the fuse block [J/B])
- to rear power window amplifier LH terminal ⑧.

Power is supplied at all times
- through 20A fuse (No.⑧), located in the fuse block [J/B])
- to rear power window amplifier RH terminal ⑨.

MANUAL OPERATION

Driver’s door

Ground is supplied
- to power window main switch terminal ③
- through body grounds MTA and MBE.

WINDOW UP

When a driver side switch in the power window main switch is pressed in the up position, power is supplied
- to power window regulator (driver side) terminal ①
- through power window main switch terminal ⑥.

Ground is supplied
- to power window regulator (driver side) terminal ②
- through power window main switch terminal ③.

Then, the motor raises the window until the switch is released.

WINDOW DOWN

When a driver side switch in the power window main switch is pressed in the down position, power is supplied
- to power window regulator (driver side) terminal ②
- through power window main switch terminal ①.

Ground is supplied
- to power window regulator (driver side) terminal ①
- through power window main switch terminal ⑥.

Then, the motor lowers the window until the switch is released.

Except driver’s door

Ground is supplied
- to power window main switch terminal ③
- through body grounds MTA and MBE.

PASSENGER’S DOOR

Ground is supplied
- to power window amplifier (passenger side) terminal ⑦
- through body grounds MTA and MBE.

NOTE:

Figures in brackets [ ] refer to terminal Nos. arranged in order when the UP or DOWN section of power window switch is pressed.

Operation by main switch

Power window main switch signal is sent
- through power window main switch terminal ⑥
- to power window amplifier (passenger side) terminal ⑦.
POWER WINDOW

System Description (Cont'd)

The subsequent operations are the same as those outlined under “Operation by sub-switches”.

Operation by sub-switches

Power window sub-switch (passenger side) signal is sent
- from power window sub-switch (passenger side) terminals [2], [3] and [4]
- to power window amplifier (passenger side) terminals [2], [7] and [4].

Power is supplied
- through power window amplifier (passenger side) [2], [3]
- to power window regulator (passenger side) [1], [2].

Ground is supplied
- to power window regulator (passenger side) [2], [1]
- through power window sub-switch (passenger side) [2], [3].

Then, the motor raises or lowers the window until the switch is released.

REAR DOOR LH

Ground is supplied
- to rear power window amplifier LH terminal [2]
- through body grounds [59] and [61].

NOTE:

Figures in brackets [ ] refer to terminal Nos. arranged in order when the UP or DOWN section of power window switch is pressed.

Operation by main switch

Power window main switch signal is sent
- through power window main switch terminal [11]
- to rear power window amplifier LH terminal [2].

The subsequent operations are the same as those outlined under “Operation by sub-switches”.

Operation by sub-switches

Rear power window sub-switch LH signal is sent
- from rear power window sub-switch LH terminals [2], [3] and [4]
- to rear power window amplifier LH terminals [2], [7] and [4].

Power is supplied
- through rear power window sub-switch LH [2], [3]
- to rear power window regulator LH [1], [2].

Ground is supplied
- to rear power window regulator LH [2], [1]
- through rear power window sub-switch LH [2], [3].

Then, the motor raises or lowers the window until the switch is released.

REAR DOOR RH

Ground is supplied
- to rear power window amplifier RH terminal [2]
- through body grounds [59] and [61].

NOTE:

Figures in brackets [ ] refer to terminal Nos. arranged in order when the UP or DOWN section of power window switch is pressed.

Operation by main switch

Power window main switch signal is sent
- through power window main switch terminal [1]
- to rear power window amplifier RH terminal [2].

The subsequent operations are the same as those outlined under “Operation by sub-switches”.

Operation by sub-switches

Rear power window sub-switch RH signal is sent
- from rear power window sub-switch RH terminals [2], [3] and [4]
- to rear power window amplifier RH terminals [2], [7] and [4].

Power is supplied
- through rear power window sub-switch RH [2], [3]
- to rear power window regulator RH [1], [2].

Ground is supplied
- to rear power window regulator RH [2], [1]
- through rear power window sub-switch RH [2], [3].

Then, the motor raises or lowers the window until the switch is released.
AUTOMATIC OPERATION
The power window AUTO feature enables the driver to open the driver’s window without holding the window switch in the down position.
The AUTO feature only operates on the driver's window downward movement.
When the AUTO switch in the power window main switch is pressed and released, the driver’s window will travel to the fully open position.

POWER WINDOW LOCK
The power window lock is designed to lock-out window operation to all windows except the driver’s door window.
When the lock switch in power window main switch is pressed to LOCK position, power window lock signal is sent
- through power window main switch terminal ②,
- to power window amplifier (passenger side) terminal ③,
- to rear power window amplifier LH terminal ④, and
- to rear power window amplifier RH terminal ⑤.
This prevents all power window motors except driver side from operating.
POWER WINDOW

Wiring Diagram — WINDOW — (Cont’d)

EL-WINDOW-02

1268
# Trouble Diagnoses
## SYMPTOM CHART

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Main Power Supply and Ground Circuit Check</th>
<th>Diagnostic Procedure</th>
<th>Electrical Components Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Page</td>
<td>EL-180</td>
<td>EL-180</td>
<td>EL-180</td>
</tr>
<tr>
<td><strong>SYMPTOM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All power windows cannot be operated.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Passenger power windows cannot be operated.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver's power window cannot be operated but other windows can be operated.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger power windows cannot be operated by main switch but can be operated by passenger's switches.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
POWER WINDOW

Trouble Diagnoses (Cont’d)
MAIN POWER SUPPLY AND GROUND CIRCUIT CHECK

Procedure 1
Main power supply

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Battery voltage existence</th>
</tr>
</thead>
<tbody>
<tr>
<td>④ - Ground</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Ground circuit

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>③ - Ground</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Procedure 2
Power supply for power window amp. (front and rear passengers)

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Battery voltage existence</th>
</tr>
</thead>
<tbody>
<tr>
<td>⑦ - Ground</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Ground circuit for power window amp. (front and rear passengers)

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>⑦ - Ground</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Procedure 3
Power supply for ignition signal

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Ignition switch</th>
<th>Battery voltage existence</th>
</tr>
</thead>
<tbody>
<tr>
<td>⑥ - Ground</td>
<td>ON</td>
<td>Yes</td>
</tr>
</tbody>
</table>
POWER WINDOW

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 1

SYMPTOM:
Driver’s power window cannot be operated but other power windows can be operated.

A

START

CHECK DRIVER’S WINDOW MOTOR CIRCUIT.
1) Disconnect 6-pin connector from main switch.
2) Check power window operation.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Window</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 6</td>
<td>Up</td>
</tr>
<tr>
<td>1 - 6</td>
<td>Down</td>
</tr>
</tbody>
</table>

OK → Replace main switch.

NG

B

1) Disconnect connector from driver’s power window motor.
2) Check continuity.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Continuity should exist.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td></td>
</tr>
<tr>
<td>6 - 1</td>
<td></td>
</tr>
</tbody>
</table>

NG → Repair harness.

OK

C

Does continuity exist?

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Ground</td>
<td>Repair harness. There will be incorrect grounding.</td>
<td></td>
</tr>
<tr>
<td>6 - Ground</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NG → Go to POWER WINDOW MOTOR in Electrical Components Inspection.
(See page EL-185.)

NG → Check system again.

OK → Replace power window motor.

NG → Repair harness.
POWER WINDOW

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 2

SYMPTOM:
Passenger power windows cannot be operated.

START

A

CHECK PASSENGER POWER WINDOW CIRCUIT.
1) Disconnect connector from power window amp.
2) Check power window.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Window operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Up</td>
</tr>
<tr>
<td>②</td>
<td>Down</td>
</tr>
</tbody>
</table>

OK

Go to Diagnostic Procedure 3.
(See page EL-183.)

NG

Repair harness.

B

1) Disconnect connector from power window motor.
2) Check continuity.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Continuity should exist.</th>
</tr>
</thead>
<tbody>
<tr>
<td>① - ①</td>
<td></td>
</tr>
<tr>
<td>② - ②</td>
<td></td>
</tr>
</tbody>
</table>

NG

Repair harness.

C

Does continuity exist?

Yes

Repair harness. There will be incorrect grounding.

No

Go to POWER WINDOW MOTOR in Electrical Components Inspection.
(See page EL-185.)

OK

Check system again.

NG

Repair harness.

Does continuity exist?

Yes

Repair harness. There will be incorrect grounding.

No

Go to POWER WINDOW MOTOR in Electrical Components Inspection.
(See page EL-185.)

OK

Check system again.

NG

Repair harness.

NG

Repair harness.

Replace power window motor.
POWER WINDOW

Trouble Diagnoses (Cont’d)
DIAGNOSTIC PROCEDURE 3

SYMPTOM:
Passenger power windows cannot be operated but driver’s power window can be operated.

START

A

CHECK POWER WINDOW LOCK SIGNAL CIRCUIT.
1) Disconnect connector from power window amp.
2) Check battery voltage between terminal  for each connector and ground while ignition switch is “ON”.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Power window lock switch</th>
<th>Battery voltage exists</th>
</tr>
</thead>
<tbody>
<tr>
<td>@ - @</td>
<td>ON</td>
<td>No</td>
</tr>
<tr>
<td>@ - Ground</td>
<td>OFF</td>
<td>Yes</td>
</tr>
</tbody>
</table>

OK

B

NG

D

Check continuity.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Passenger switches</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>@ - @</td>
<td>Up</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Down</td>
<td>No</td>
</tr>
<tr>
<td>@ - @</td>
<td>Up</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Down</td>
<td>Yes</td>
</tr>
</tbody>
</table>

OK

Replace power window amp.

NG

Go to POWER WINDOW SUB-SWITCH in Electrical Components Inspection. (See page EL-185.)

OK

Replace power window switch.

NG

Repair harness between power window amp. and power window switch.

NG

Repair harness.

Yes

Repair harness. There will be incorrect grounding.

No

Replace main switch.
POWER WINDOW

Trouble Diagnoses (Cont’d)
DIAGNOSTIC PROCEDURE 4

SYMPTOM:
Passenger power windows cannot be operated by main switch but can be operated by passenger’s switches.

A

CHECK DATA LINE SIGNAL CIRCUIT.
1) Disconnect connectors from power window amp.
2) Check voltage while power window lock switch is "OFF".

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Main switch operation</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>@ - Ground</td>
<td>Up</td>
<td>Above 12V</td>
</tr>
<tr>
<td></td>
<td>Down</td>
<td>Approx. 4V</td>
</tr>
<tr>
<td></td>
<td>No operation</td>
<td>Approx. 0V</td>
</tr>
</tbody>
</table>

E

1) Disconnect 12-pin connector from main switch.
2) Check continuity.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Continuity should exist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger</td>
<td>@ - @</td>
</tr>
<tr>
<td>Rear left</td>
<td>@ - @</td>
</tr>
<tr>
<td>Rear right</td>
<td>@ - @</td>
</tr>
</tbody>
</table>

C

Does continuity exist?

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger</td>
<td>Repair harness. There will be incorrect grounding.</td>
</tr>
<tr>
<td>Rear left</td>
<td>Repair harness.</td>
</tr>
<tr>
<td>Rear right</td>
<td>Repair harness.</td>
</tr>
</tbody>
</table>

No

Replace main switch.
POWER WINDOW

Trouble Diagnoses (Cont'd)

ELECTRICAL COMPONENTS INSPECTION

Power window motor

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>①</td>
<td>②</td>
</tr>
<tr>
<td>①</td>
<td>②</td>
</tr>
</tbody>
</table>

Power window sub-switch

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>① - ②</td>
<td>UP</td>
<td>Yes</td>
</tr>
<tr>
<td>① - ②</td>
<td>Down</td>
<td>No</td>
</tr>
<tr>
<td>① - ②</td>
<td>UP</td>
<td>No</td>
</tr>
<tr>
<td>① - ②</td>
<td>Down</td>
<td>Yes</td>
</tr>
</tbody>
</table>
POWER DOOR LOCK

System Description

Power is supplied at all times
• through circuit breaker (located in the fuse block [J/B])
• to door lock timer terminal [1]

Power is also supplied
• through 10A fuse (No. 12, located in the fuse block)
• to key switch terminal [1]

INPUT

When the key switch is in ON position (ignition key is inserted in the key cylinder), power is supplied
• through key switch terminal [2]
• to door lock timer terminal [7]

When the driver door is open, ground signal is supplied
• to door lock timer terminal [4]
• through front door switch (driver side) terminal [2]
• to front door switch (driver side) terminal [3]
• through body grounds [86] and [87]

When the passenger door is open, ground signal is supplied
• to door lock timer terminal [12]
• through front door switch (passenger side) terminal [2]
• to front door switch (passenger side) terminal [3]
• through body grounds [86] and [87]

When the door lock & unlock switch in the power window main switch is in LOCK position, ground signal is supplied
• to door lock timer terminal [16]
• through power window main switch terminal [7]
• to power window main switch terminal [3]
• through body grounds [94] and [85]

When the door lock & unlock switch in the power window main switch is in UNLOCK position, ground signal is supplied
• to door lock timer terminal [15]
• through power window main switch terminal [8]
• to power window main switch terminal [3]
• through body grounds [114] and [115]

When the door lock knob or door key is turned to UNLOCK position, then door lock actuator (door unlock sensor) is in UNLOCK position.

Ground signal is supplied
• to door lock timer terminal [16]
• through front door lock actuator (driver side) (door unlock sensor) terminal [4]
• to front door lock actuator (driver side) (door unlock sensor) terminal [3]
• through body grounds [114] and [115], and
• to door lock timer terminal [9]
• through front door lock actuator (passenger side) (door unlock sensor) terminal [4]
• to front door lock actuator (passenger side) (door unlock sensor) terminal [3]
• through body grounds [114] and [115].

With door key turned to UNLOCK position, continuity exists between Full Stroke and Neutral of the front door key cylinder switch (unlock switch).

Ground signal is then sent
• to door lock timer terminal [14]
• through front door key cylinder switches (driver side) and (passenger side) (unlock switch) terminal [2]
• to front door key cylinder switches (driver side) and (passenger side) (unlock switch) terminal [4]
• through body grounds [113] and [115].
POWER DOOR LOCK
System Description (Cont’d)

OUTPUT

Unlock
Ground is supplied
- to front door lock actuator (driver side) terminal ②,
- to front door lock actuator (passenger side) terminal ②,
- to rear door lock actuator LH terminal ② and
- to rear door lock actuator RH terminal ②
- through door lock timer terminal ③.

DRIVER’S DOOR
Power is supplied to front door lock actuator (driver side) terminal ①
- through door lock timer terminal ⑥.

OTHER DOORS
Power is supplied
- to front door lock actuator (passenger side) terminal ①,
- to rear door lock actuator LH terminal ① and
- to rear door lock actuator RH terminal ①
- through door lock timer terminal ③.

Then, the door is unlocked.

Lock
Ground is supplied
- to front door lock actuator (driver side) terminal ①
- through door lock timer terminal ⑥, and
- to front door lock actuator (passenger side) terminal ①,
- to rear door lock actuator LH terminal ① and
- to rear door lock actuator RH terminal ①
- through door lock timer terminal ③.

Power is supplied
- to front door lock actuator (driver side) terminal ②,
- to front door lock actuator (passenger side) terminal ②,
- to rear door lock actuator LH terminal ② and
- to rear door lock actuator RH terminal ②
- through door lock timer terminal ②.

Then, the door is locked.

For details concerning input and output conditions, refer to "DOOR LOCK TIMER INSPECTION".

OPERATION BY MULTI-REMOTE CONTROL SYSTEM
Multi-remote control unit sends a signal to terminal ⑥ (Unlock signal) or terminal ⑩ (Lock signal) of door lock timer. Door lock timer will operate the same when it receives a lock or unlock signal from other switches.
POWER DOOR LOCK

Wiring Diagram — D/LOCK —

Refer to EL-POWER.

Refer to last page (Foldout page).

EL-D/LOCK-01

EL-189
# POWER DOOR LOCK

## Trouble Diagnoses

**DOOR LOCK TIMER INSPECTION**
- Carry out the following inspections:
  1. Check power source and ground.
  2. Check input signals.
     - If the input signal is NG, go to ELECTRICAL COMPONENTS INSPECTION.
  3. Check output signals.
     - If the input signal is OK, and the output signal is NG, replace the door lock timer.
     - If the input signal and output signal are OK, check door lock actuator in ELECTRICAL COMPONENTS INSPECTION.

### Lock & unlock operation by lock knob or main switch

(The voltages are approximate values.)

<table>
<thead>
<tr>
<th>Operations</th>
<th>Lock knob switch</th>
<th>Lock knob switch</th>
<th>Main switch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LH</td>
<td>RH</td>
<td></td>
</tr>
<tr>
<td>Unlock → Lock</td>
<td>Unlock → Lock</td>
<td>N → Unlock</td>
<td>N → Lock</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connections</th>
<th>Operations</th>
<th>Key switch</th>
<th>Door switch LH</th>
<th>Door switch RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power source</td>
<td>12V</td>
<td>12V</td>
<td>12V</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
<td>Ground</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>Input signals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Lock knob switch LH</td>
<td>ON (Ground) → OFF (Open)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Lock knob switch RH</td>
<td>ON (Ground) → OFF (Open)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Door lock key switch (Lock)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Door lock key switch (Unlock)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Lock &amp; unlock switch (lock)</td>
<td></td>
<td>OFF (Open) → ON (Ground)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Lock &amp; unlock switch (unlock)</td>
<td></td>
<td>OFF (Open) → ON (Ground)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output signals</th>
<th>Operations</th>
<th>Door lock actuator (Lock power source)</th>
<th>Door lock actuator (Unlock power source)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>0V (Approx. 1.0 sec.)</td>
<td>0V</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>0V</td>
<td>*0V → 12V → 0V (Approx. 1.0 sec.)</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>0V</td>
<td>0V (Approx. 1.0 sec.)</td>
</tr>
</tbody>
</table>

*: When conducting the active test on the driver and passenger sides, door lock motors switch between the “LOCK”, “UNLOCK” and “STOP” positions at intervals of more than two seconds.
### POWER DOOR LOCK

**Trouble Diagnoses (Cont’d)**

**Unlock operation by door lock key switch**

(The voltages are approximate values.)

<table>
<thead>
<tr>
<th>Connections</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Door lock key switch LH</td>
</tr>
<tr>
<td></td>
<td>N → Unlock → N → Unlock</td>
</tr>
<tr>
<td></td>
<td>Unlock → Lock</td>
</tr>
<tr>
<td>1</td>
<td>Lock source</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>Key switch</td>
</tr>
<tr>
<td>4</td>
<td>Door switch LH</td>
</tr>
<tr>
<td>12</td>
<td>Door switch RH</td>
</tr>
<tr>
<td>10</td>
<td>Lock knob switch LH</td>
</tr>
<tr>
<td>9</td>
<td>Lock knob switch RH</td>
</tr>
<tr>
<td>11</td>
<td>Door lock key switch (Lock)</td>
</tr>
<tr>
<td>14</td>
<td>Door lock key switch (Unlock)</td>
</tr>
<tr>
<td>16</td>
<td>Lock &amp; unlock switch (Lock)</td>
</tr>
<tr>
<td>15</td>
<td>Lock &amp; unlock switch (Unlock)</td>
</tr>
<tr>
<td>2</td>
<td>Door lock actuator (Lock power source)</td>
</tr>
<tr>
<td>3</td>
<td>Door lock actuator (Unlock power source)</td>
</tr>
<tr>
<td>6</td>
<td>Driver’s door lock actuator (Unlock power source)</td>
</tr>
</tbody>
</table>

- The second unlock signal of door lock key switch is counted when it is within approximately 4 seconds of the first signal.
- Lock operation by key is mechanically transmitted to the lock knob switch.
- Operation of door lock key switch RH is the same as LH.
- When conducting the active test on the driver and passenger sides, door lock motors switch between the “LOCK”, "UNLOCK" and "STOP" positions at intervals of more than two seconds.
# POWER DOOR LOCK

## Trouble Diagnoses (Cont’d)

### Key reminder operation

(The voltages are approximate values.)

<table>
<thead>
<tr>
<th>Connections</th>
<th>Operations</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lock knob switch LH</td>
<td>Main switch</td>
</tr>
<tr>
<td></td>
<td>Unlock → Lock → Automatically unlocked</td>
<td>N → Lock → Automatically unlocked</td>
</tr>
<tr>
<td>1 Power source</td>
<td>12V</td>
<td>12V</td>
</tr>
<tr>
<td>5 Ground</td>
<td>0V</td>
<td>0V</td>
</tr>
<tr>
<td>7 Key switch</td>
<td>ON (12V) — Key is in the ignition.</td>
<td></td>
</tr>
<tr>
<td>4 Door switch LH</td>
<td>ON (Ground) — Either door is open.</td>
<td></td>
</tr>
<tr>
<td>12 Door switch RH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Lock knob switch LH</td>
<td><strong>Input</strong> signal <strong>signal</strong></td>
<td><strong>Input</strong> signal <strong>signal</strong></td>
</tr>
<tr>
<td></td>
<td>LOCK knob switch LH</td>
<td>LOCK knob switch RH</td>
</tr>
<tr>
<td></td>
<td>ON (Ground) → OFF (Open) → ON (Ground)</td>
<td></td>
</tr>
<tr>
<td>9 Lock knob switch RH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Door lock key switch (Lock)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Door lock key switch (Unlock)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 Lock &amp; unlock switch lock</td>
<td></td>
<td>OFF (Open) → ON (Ground) → OFF (Open)</td>
</tr>
<tr>
<td>15 Lock &amp; unlock switch unlock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Door lock actuator (Lock power source)</td>
<td>0V → 12V → 0V (Approx. 0.3 sec.)</td>
<td>0V → 12V → 0V (Approx. 0.3 sec.)</td>
</tr>
<tr>
<td>3 Door lock actuator (Unlock power source)</td>
<td>0V → 12V → 0V (Approx. 1.4 sec.)</td>
<td>0V → 12V → 0V (Approx. 1.4 sec.)</td>
</tr>
<tr>
<td>6 Driver’s door lock actuator (Unlock power source)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Operation of lock knob switch RH is the same as LH.
- When conducting the active test on the driver and passenger sides, door lock motors switch between the "LOCK", "UNLOCK" and "STOP" positions at intervals of more than two seconds.

---

## ELECTRICAL COMPONENTS INSPECTION

### Key switch

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>② - ①</td>
<td>Key is in the ignition.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Key is not in the ignition.</td>
<td>No</td>
</tr>
</tbody>
</table>

---

EL-196
# POWER DOOR LOCK

## Trouble Diagnoses (Cont’d)

### Door switch

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 2</td>
<td>Door is closed.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Door is open.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Lock knob switch

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 4</td>
<td>Lock</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Unlock</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Door unlock key switch

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Operation</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 3</td>
<td>Key is turned toward unlock</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Except above</td>
<td>No</td>
</tr>
</tbody>
</table>

### Lock and unlock switch

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Operation</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 7</td>
<td>Lock</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Neutral and unlock</td>
<td>No</td>
</tr>
<tr>
<td>3 - 8</td>
<td>Unlock</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Neutral and unlock</td>
<td>No</td>
</tr>
</tbody>
</table>

### Door lock actuator

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Lock</td>
</tr>
<tr>
<td>3</td>
<td>Unlock</td>
</tr>
<tr>
<td>2</td>
<td>Lock</td>
</tr>
<tr>
<td>1</td>
<td>Unlock</td>
</tr>
</tbody>
</table>
System Description

Power is supplied at all times
- through 7.5A fuse (No. 10, located in the fuse block [J/B])
- to multi-remote control unit terminal ①.

Power is supplied at all times
- through 10A fuse (No. 12, located in the fuse block [J/B])
- to key switch terminal ①.

Power is supplied at all times
- through 15A fuse (No. 34, located in the fuse block [J/B])
- to trunk lid opener actuator terminal ①.

Terminals ⑧ and ⑨ of the multi-remote control unit are grounded through body grounds ⑥0 and ⑥1.

INPUTS

When the key switch is ON (ignition key is inserted in key cylinder), power is supplied
- through key switch terminal ②
- to multi-remote control unit terminal ④.

When any of the four door switches are set to OPEN position, ground is provided
- to multi-remote control unit terminal ④
- through front door switch body grounds, and/or
- through rear door switch relay terminal ⑤
- to rear door switch relay terminal ⑤
- through body grounds ⑯4 and ⑯5.

(Rear door switch relay becomes energized by rear door switches.)

When the trunk room lamp switch is in OPEN position (trunk lid is open), ground is supplied
- to multi-remote control unit terminal ④
- through body grounds ⑯2 and ⑯3.

When the front door lock actuator (driver side) (door unlock sensor) is in UNLOCK position, ground is supplied
- to multi-remote control unit terminal ④
- through front door lock actuator (driver side) (door unlock sensor) terminal ③
- to front door lock actuator (driver side) (door unlock sensor) terminal ③
- through body grounds ⑯3 and ⑯6.

When the front door lock actuator (passenger side) (door unlock sensor) is in UNLOCK position, ground is supplied
- to multi-remote control unit terminal ④
- through front door lock actuator (passenger side) (door unlock sensor) terminal ③
- to front door lock actuator (passenger side) (door unlock sensor) terminal ③
- through body grounds ⑯3 and ⑯6.

When the rear door lock actuator LH and/or RH (door unlock sensor) is in UNLOCK position, ground is supplied
- to multi-remote control unit terminal ④
- through rear door lock actuator LH (door unlock sensor) terminal ③
- to rear door lock actuator LH (door unlock sensor) terminal ③
- through body grounds ⑯1 and ⑯3, and/or
- through rear door lock actuator RH (door unlock sensor) terminal ④
- to rear door lock actuator RH (door unlock sensor) terminal ④
- through body grounds ⑯4 and ⑯7.

Remote controller signal input
- through window antenna
- to multi-remote control unit terminal ④.

The multi-remote control system controls operation of the
- power door lock
- trunk lid opener
- interior lamp
- panic alarm
- hazard lamp
- ID code entry
OPERATED PROCEDURE

Power door lock operation

- Key switch OFF signal (key not in cylinder)
- Door switch CLOSE signal (all doors closed)

The two above signals are already input into multi-remote control unit. At this point, multi-remote control receives a LOCK signal from remote controller. Multi-remote control unit will then send a signal
  - from its terminal (§)
  - to door lock timer terminal (¶)

Door lock timer now locks all doors.

With key switch in OFF position (key not in cylinder), multi-remote control unit receives an UNLOCK signal from remote controller. Multi-remote control unit will then send a signal
  - from its terminal (§)
  - to door lock timer terminal (¶)
  - from multi-remote control unit terminal (©)
  - to theft warning control unit terminal (¶)

Door lock timer now unlocks all doors and deactivates theft warning system.

Refer to “Power Door Lock” and “THEFT WARNING SYSTEM”.

Trunk lid opener operation

With key switch in OFF position (key not in cylinder), multi-remote control unit receives an OPEN signal from remote controller. Ground is then supplied
  - to trunk lid opener actuator terminal (©)
  - from trunk lid opener cancel switch terminal (©)

With trunk lid opener cancel switch in ON position, a signal is sent
  - to trunk lid opener cancel switch terminal (©)
  - from multi-remote control unit terminal (©)
  - to multi-remote control unit terminal (©)
  - through body grounds (©) and (©)

When power and ground are provided, trunk lid opener actuator activates to open trunk lid. At this point, with signals door switch CLOSE (all doors closed) and door lock actuator (door unlock sensor) LOCK (all doors locked) inputted, an OPEN signal and a signal are sent
  - from multi-remote control unit terminal (©)
  - to theft warning control unit terminal (©)
  - from multi-remote control unit terminal (©)
  - to door lock timer terminal (¶)

Theft warning system now deactivates.

Refer to “THEFT WARNING SYSTEM”.

Interior lamp operation

Multi-remote control system turns interior lamp ON or OFF according to various inputs received.

Operating conditions
  - Key switch in OFF position (key not in cylinder)
  - Door switch in CLOSE position (all doors closed)

With interior lamp OFF under the above conditions, an ON signal is sent from remote controller.
  - Interior lamp then comes on for 30 seconds.

An ON or LOCK signal is sent from remote controller with interior lamp on.
  - Interior lamp will turn off.

An UNLOCK signal is sent from remote controller with interior lamp ON or OFF.
  - Interior lamp will turn on for 30 seconds.

For detailed description, refer to “Interior, Spot and Trunk Room Lamps”.

Panic alarm operation

Multi-remote control system activates horn and headlamps intermittently under the following conditions:
  - Key switch OFF (key not in cylinder)
  - An alarm signal is sent from remote controller to multi-remote control system.

Ground is supplied intermittently
  - to horn relay terminal (©) and theft warning relay terminal (©)
  - through multi-remote control unit terminal (©)

Through this, horn and headlamps operate intermittently.
MULTI-REMOTE CONTROL SYSTEM

System Description (Cont’d)

- Panic alarm operates for 30 seconds.
- When multi-remote control system receives any signal from remote controller during panic alarm operation, the alarm stops. However, the function indicated on remote controller will not be activated.

Hazard lamp operation

Multi-remote control system receives a LOCK signal from remote controller with the following signals already entered:
- Key switch OFF signal (key not in cylinder)
- Door switch CLOSE signal (all doors closed)
- Door lock actuator (door unlock sensor) LOCK (all doors locked)

Multi-remote control system will then send a ground signal
- to terminal ② of the multi-remote control relay-1 and
- to terminal ① of the multi-remote control relay-2
- through multi-remote control unit terminal ③.

Multi-remote control relay is now energized and hazard warning lamps flash.
Trouble Diagnoses Preliminary Inspection

PRELIMINARY INSPECTION PROCEDURE 1
All functions of remote control system function.

- Check remote controller battery. Refer to DIAGNOSTIC PROCEDURE 1.
  - NG: Replace battery.
  - OK: Enter the identity (ID) code of new remote controller. Then re-check operation to see if the trouble is indicated.
  - NG: Go to DIAGNOSTIC PROCEDURE 2.
  - OK: Replace controller.

PRELIMINARY INSPECTION PROCEDURE 2
Door lock and unlock does not function.

- Check if power door lock system functions with main switch or door lock knob switch.
  - NG: Check power door lock system including door lock timer inspection.
  - OK: Go to DIAGNOSTIC PROCEDURE 3.

PRELIMINARY INSPECTION PROCEDURE 3
Trunk open function does not function.

- Check if trunk opener switch functions.
  - NG: Check trunk opener switch circuit.
  - OK: Go to DIAGNOSTIC PROCEDURE 4.

PRELIMINARY INSPECTION PROCEDURE 4
Interior light does not function.

- Check if interior light comes on when door is opened.
  - NG: Check interior light circuit.
  - OK: Go to DIAGNOSTIC PROCEDURE 5.

PRELIMINARY INSPECTION PROCEDURE 5
Panic alarm does not function.

- Make sure horn and headlamps come on when theft warning system is actuated.
  - NG: Check theft warning system.
  - OK: Go to DIAGNOSTIC PROCEDURE 6.
Trouble Diagnoses

DIAGNOSTIC PROCEDURE 1
Remote controller buzzer does not sound when the button is pressed.

CHECK REMOTE CONTROLLER BATTERY.
Remove battery and measure voltage across battery positive and negative terminals ⊕ and ⊖.

<table>
<thead>
<tr>
<th>Measuring terminal</th>
<th>Standard value</th>
</tr>
</thead>
<tbody>
<tr>
<td>⊕</td>
<td></td>
</tr>
<tr>
<td>⊖</td>
<td></td>
</tr>
<tr>
<td>Battery positive terminal ⊕</td>
<td>Battery negative terminal ⊖</td>
</tr>
</tbody>
</table>

Note:
Remote controller does not function if battery is not set correctly.
**Trouble Diagnoses (Cont’d)**

**DIAGNOSTIC PROCEDURE 2**

All remote controls do not function even if remote controller buzzer does sound.

**A**

**CHECK MAIN POWER SUPPLY AND GROUND CIRCUIT.**
1) Remove key from ignition.
2) Disconnect 6-pin connector from multi-remote control unit. Check voltage across multi-remote control unit terminal (1) and GND.
   - Battery voltage should exist.

- NG: Check power supply harness.
- OK: Check GND harness.

**B**

Check continuity between terminal (8) and GND.
- Continuity should exist.

- NG: Check GND harness.
- OK: Check antenna circuit. (Refer to REAR WINDOW DEFOGGER “Filament Repair”.)

**C**

**CHECK ANTENNA CIRCUIT.**
Disconnect 1-pin connector from multi-remote control unit.
Check continuity between a terminal and filament on the rear window.
- Continuity should exist.

**D**

**CHECK IGNITION KEY SWITCH CIRCUIT.**
Disconnect 12-pin connector from multi-remote control unit.
Check voltage across multi-remote control unit terminal (8) and GND.
- Does battery voltage exist?

- No: Replace multi-remote control unit.
- Yes: Check door switch circuit.

**E**

**CHECK DOOR SWITCH CIRCUIT.**
Close all doors and push trunk switch.
Check continuity between terminals (4) and GND, (8) and GND.
- Does continuity exist?

- No: Replace multi-remote control unit.
- Yes: Check door switch circuit.
MULTI-REMOTE CONTROL SYSTEM

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 3

Door lock and unlock remote control do not function. Everything else does not function.

A

CHECK DOOR LOCK AND UNLOCK SIGNAL FOR DOOR LOCK TIMER.
1) Remove key from ignition.
2) Close all doors and trunk.
3) Remove door lock timer 12-pin connector.
   Push remote controller buttons and check continuity between terminals ③ and GND, ⑥ and GND.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Operation</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>③ - GND</td>
<td>Lock</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Unlock</td>
<td>No</td>
</tr>
<tr>
<td>⑥ - GND</td>
<td>Unlock</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Lock</td>
<td>No</td>
</tr>
</tbody>
</table>

NG

Does continuity exist continually?
Yes

Repair harness.
(There might be incorrect grounding.)

No

B

Remove multi-remote control unit 12-pin connector.
Check continuity between multi-remote control unit terminals and door lock timer.

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Remote control</th>
<th>Door lock timer</th>
</tr>
</thead>
<tbody>
<tr>
<td>③</td>
<td></td>
<td>③</td>
</tr>
<tr>
<td>⑥</td>
<td></td>
<td>⑥</td>
</tr>
</tbody>
</table>

Continuity should exist.

OK

Replace multi-remote control unit.
**Trouble Diagnoses (Cont’d)**

### DIAGNOSTIC PROCEDURE 4

**Trunk open remote control does not function. Everything else does function.**

**A**

**CHECK GROUND CIRCUIT FOR TRUNK OPEN FUNCTION.**
Disconnect 8-pin connector from multi-remote control unit.
Check continuity between terminal $\Theta$ and ground.
Continuity should exist.

**B**

**OK**

Ground multi-remote control unit connector terminal $\Theta$.
Does trunk lid opener function?

- **Yes**
  - Replace multi-remote control unit.

- **No**
  - Check trunk lid opener circuit.

**NG**

Repair harness.

---

### DIAGNOSTIC PROCEDURE 5

**Interior light does not function. Everything else does function.**

**A**

**CHECK INTERIOR LIGHT CIRCUIT.**
Disconnect multi-remote control unit 12-pin connector.
Ground multi-remote control unit connector terminal $\Omega$.
Does interior light function?

- **Yes**
  - Replace multi-remote control unit.

- **No**
  - Check interior light circuit.
## MULTI-REMOTE CONTROL SYSTEM

### Trouble Diagnoses (Cont’d)

#### DIAGNOSTIC PROCEDURE 6

Panic alarm function does not function. Everything else does function.

**A**

**CHECK PANIC ALARM CIRCUIT.**
- Disconnect 12-pin connector from multi-remote control unit.
- Ground multi-remote control unit connector terminal (A).
- Does panic alarm function function?

<table>
<thead>
<tr>
<th>Yes</th>
<th>Replace multi-remote control unit.</th>
</tr>
</thead>
</table>

**B**

- Disconnect 16-pin connector from theft warning control unit.
- Check continuity between terminals (A) of multi-remote control unit connector and (C) of theft warning control unit.
- Does continuity exist?

<table>
<thead>
<tr>
<th>No</th>
<th>Repair harness.</th>
</tr>
</thead>
</table>

#### DIAGNOSTIC PROCEDURE 7

Hazard indicator flashing does not function. Everything else does function.

**A**

**CHECK HAZARD INDICATOR FLASHING CIRCUIT.**
- Disconnect 12-pin connector from multi-remote control unit.
- Ground multi-remote control unit connector terminal (A).
- Does hazard indicator flashing function function?

<table>
<thead>
<tr>
<th>Yes</th>
<th>Replace multi-remote control unit.</th>
</tr>
</thead>
</table>

**B**

- Disconnect multi-remote control relay-1 connector.
- Check continuity between terminal (A) of multi-remote control unit connector and terminal (C) of multi-remote control relay-1.
- Does continuity exist?

<table>
<thead>
<tr>
<th>No</th>
<th>Repair harness.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Yes</th>
<th>Check multi-remote control relay-1 and harness.</th>
</tr>
</thead>
</table>
MULTI-REMOTE CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 8

Theft warning is actuated when door is unlocked or trunk lid is opened with remote control.

A

CHECK THEFT WARNING CANCEL SIGNAL CIRCUIT.
1) Disconnect theft warning control unit 16-pin connector.
2) Remove key from ignition.
3) Close all doors and trunk lid.
Check voltage between terminal (③) and GND when door unlock remote control function is operated.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Operation</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>⑥ - GND</td>
<td>Door is unlocked</td>
<td>12V → 0V → 12V</td>
</tr>
</tbody>
</table>

Does voltmeter gauge move when door is unlocked?

B

Yes  Replace multi-remote control unit.

No  Repair harness.

C

Disconnect 12-pin connector from multi-remote control unit.
Check continuity between terminals ⑥ of multi-remote control unit and ⑨ of theft warning control unit.

Does continuity exist?

D

Yes  Replace multi-remote control unit.

No  Repair harness.
MULTI-REMOTE CONTROL SYSTEM

Replacing Remote Controller or Control Unit

If the remote controller or the control unit needs to be replaced or if an additional remote controller needs to be set, enter the Identity (ID) code manually.

ID Code Entry Procedure
To enter the ID code, follow this procedure.

“Setting mode”.
Three steps must be followed to establish the “setting mode”.
(1) Open the trunk.
(2) Close and lock all doors.
(3) Insert and remove the key from the ignition more than six times within 10 seconds.
- At this time, the original ID codes are eliminated.

ID code entry:
(4) Unlock and lock the driver’s door inside lock lever once.
(5) Push lock button on the new remote controller once (for example, if door is locked using the remote controller during this ID code entry enable state, a new ID code can be entered).
- At this time, the new ID code is entered.
(6) If you need to enter additional remote controllers (including the original) repeat the step (4) and (5) for each additional controller.
(7) This ID code entry enable state and setting mode remain until any one of the doors is opened.

Note
- If the same ID code that existing in the memory is input, the entry is canceled, and no ID code will be entered.
- Entry of maximum four ID codes is allowed and any attempt to enter more will be ignored.
- Any ID codes entered after termination of the “setting” mode will not be accepted. Additionally remote control signals will be inhibited when an ID code has not been entered during the “setting” mode.
System Description

FUNCTION

- Time control unit has the following functions.

<table>
<thead>
<tr>
<th>Item</th>
<th>Details of control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermittent wiper control</td>
<td>Regulates intermittent time from approximately 2 to 21 seconds depending on the intermittent wiper volume setting.</td>
</tr>
<tr>
<td>Washer and wiper combination control</td>
<td>Wiper is operated in conjunction with washer switch.</td>
</tr>
<tr>
<td>Light warning chime timer</td>
<td>When driver's door is opened with light switch ON and ignition switch OFF, warning chime sounds.</td>
</tr>
<tr>
<td>Ignition key warning chime timer</td>
<td>When driver's door is opened with ignition switch OFF, warning chime sounds.</td>
</tr>
<tr>
<td>Rear defogger timer</td>
<td>Rear defogger operates for about 15 minutes when defogger switch is ON.</td>
</tr>
<tr>
<td>Interior lamp timer</td>
<td>Fades out interior lamp when driver's side door is opened and closed.</td>
</tr>
</tbody>
</table>

Power is supplied at all times

- to time control unit terminal 9 (located in the fuse block [J/B])
- through 7.5A fuse (No. 23, located in the fuse block [J/B]).

With the ignition switch in the ACC or ON position, power is supplied

- to time control unit terminal 2 (located in the fuse block [J/B])
- through 7.5A fuse (No. 7, located in the fuse block [J/B]).

With the ignition switch in the ON or START position, power is supplied

- to time control unit terminal 5 (located in the fuse block [J/B])
- through 7.5A fuse (No. 82, located in the fuse block [J/B]).

Time control unit (located in the fuse block [J/B]) terminal 24A is grounded through body grounds 111 and 166.

REAR WINDOW AND DOOR MIRROR DEFOGGER

The time control unit will operate the rear window and door mirror defogger for 15 minutes as long as the rear window defogger switch is in the ON position. For detailed description, refer to “REAR WINDOW DEFOGGER” (EL-110).

WARNING CHIME

Power is supplied at all times

- through 10A fuse (No. 12, located in the fuse block [J/B])
- to key switch terminal 1.

Power is supplied at all times

- through 7.5A fuse (No. 13, located in the fuse block [J/B])
- to warning chime terminal 1.

Power is supplied at all times

- through 15A fuse (No. 58, located in the fuse block and fusible link box)
- to tail lamp relay terminals 1 and 3.

Ground is supplied

- to warning chime terminal 3
- through body grounds 111 and 166.

When a signal, or combination of signals, is received by the time control unit, chime signal is supplied

- through time control unit (located in the fuse block [J/B]) terminal 24A.
- to warning chime terminal 2.

With power, ground and chime signal supplied, the warning chime will sound.

Ignition key warning chime

With the key in the ignition switch in the OFF position, and the driver’s door open, the warning chime will sound.

A battery positive voltage is supplied

- from key switch terminal 2
- to time control unit (located in the fuse block [J/B]) terminal 24A.
TIME CONTROL SYSTEM

System Description (Cont’d)

Ground is supplied
• from front door switch (driver side) terminal ②
• to time control unit (located in the fuse block [J/B]) terminal ③A.
Front door switch (driver side) terminal ③ is grounded through body grounds ③G and ③H.

Light warning chime
With the ignition switch in the OFF position, the driver’s door open, and the lighting switch in the 1ST or 2ND position, the warning chime will sound.
Tail lamp relay is energized.
A battery positive voltage is supplied
• through 7.5A fuse (No. ③G, located in the fuse block [J/B])
• to time control unit terminal ⑤ (located in the fuse block [J/B]) and
• from key switch terminal ②A
• to time control unit (located in the fuse block [J/B]) terminal ⑤A.
Ground is supplied
• from front door switch (driver side) terminal ②A
• to time control unit (located in the fuse block [J/B]) terminal ⑤A.

Seat belt warning chime
This warning chime sounds for approximately 6 seconds
• when ignition switch is turned from OFF to ON and seat belt is unfastened (seat belt switch ON).
The warning chime sounds until seat belt buckle switch is turned OFF (seat belt tongue is inserted into buckle).
Ground is supplied to time control unit (located in the fuse block [J/B]) terminal ⑤A when the seat belt is unfastened through the seat belt buckle switch and body grounds ③G and ③H.

FRONT WIPER AND WASHER
The time control system controls operation of the intermittent feature for the front wiper. It also controls wiper motor for the washer operation.
For detailed description, refer to “FRONT WIPER AND WASHER” (EL-102).

Interior lamp
Time control unit starts to dim interior lamp and ignition key hole illumination and turns them off within approximately 10 seconds when
• interior lamp switch is set to DOOR and front door switch (driver side) to CLOSED or
• interior lamp switch is set to DOOR and front door switch (driver side) is CLOSED and front door handle switches are moved from PULL to RELEASED.
Wiring Diagram — TIME —

IGNITION SWITCH
ACC or ON

TIME CONTROL UNIT
2 ACC
WIPER OUT
1 VR
14 WASH
13 INT
12

FUSE BLOCK
L/J8
MI, E85, E85

Refer to EL-POWER.

EL-TIME-01

Next page

Refer to last page (Foldout page).

EL-220

1312
TIME CONTROL SYSTEM

Trouble Diagnoses
PRELIMINARY CHECK

Procedure 1
- Light warning chime does not activate.

Does ignition key warning chime activate? Yes → Go to "DIAGNOSTIC PROCEDURE-4 — Step 1" (EL-233).

Does interior lamp fade out? Yes → Go to "DIAGNOSTIC PROCEDURE-4 — Step 2" (EL-233).

Go to "DIAGNOSTIC PROCEDURE-4 — Step 3" (EL-233).

Procedure 2
- Ignition key warning chime does not activate.

Does light warning chime activate? Yes → Go to "DIAGNOSTIC PROCEDURE-5 — Step 1" (EL-234).

Does interior lamp fade out? Yes → Go to "DIAGNOSTIC PROCEDURE-5 — Step 2" (EL-234).

Go to "DIAGNOSTIC PROCEDURE-5 — Step 3" (EL-234).

Procedure 3
- Seat belt warning chime does not activate.

Does seat belt warning lamp go off or come on? Yes → Go to "DIAGNOSTIC PROCEDURE-6 — Step 1" (EL-235).

Go to "DIAGNOSTIC PROCEDURE-6 — Step 2" (EL-235).
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont’d)

PREPARATIONS FOR TROUBLE DIAGNOSES

- Check for blown fuses. If necessary, repair or replace harness or related part.
- Check J/B internal circuit (continuity check) before diagnosing. This is because the time control unit is directly connected to the J/B which functions as an intermediate joint for input and output.
- Check the power supply and ground circuits of time control unit. Repair or replace harness if necessary.

**FUSE CHECK**

Power fuse check in J/B

<table>
<thead>
<tr>
<th>Fuse</th>
<th>Amperage</th>
<th>Power supply system</th>
<th>Main part generating loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>#5</td>
<td>20A</td>
<td>ACC</td>
<td>Wiper motor</td>
</tr>
<tr>
<td>#7</td>
<td>7.5A</td>
<td>ACC</td>
<td>Power antenna, Audio</td>
</tr>
<tr>
<td>#12</td>
<td>10A</td>
<td>BAT</td>
<td>Key switch, Air bag, Theft warning system</td>
</tr>
<tr>
<td>#13</td>
<td>7.5A</td>
<td>BAT</td>
<td>Clock, A/T control, Remote control door</td>
</tr>
<tr>
<td>#23</td>
<td>7.5A</td>
<td>BAT</td>
<td>Interior lamp, Footwell lamp</td>
</tr>
<tr>
<td>#25</td>
<td>7.5A</td>
<td>BAT</td>
<td>Tail lamp, Clearance lamp</td>
</tr>
<tr>
<td>#31</td>
<td>7.5A</td>
<td>IGN</td>
<td>Charge, A/T, ABS</td>
</tr>
<tr>
<td>#32</td>
<td>7.5A</td>
<td>IGN</td>
<td>HICAS, Power steering</td>
</tr>
<tr>
<td>#36</td>
<td>20A</td>
<td>IGN</td>
<td>Mirror, LD/SIG, DEF</td>
</tr>
</tbody>
</table>

**INTERNAL CIRCUIT CHECK IN J/B (Continuity check)**

- Remove J/B from vehicle.
- Remove TCU from J/B.
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont’d)

- Check for continuity between TCU connector and connector for the TCU output and input listed below:

<table>
<thead>
<tr>
<th>TCU connector</th>
<th>Connector for TCU output and input</th>
<th>TCU connector</th>
<th>Connector for TCU output and input</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14E(RED)</td>
<td>12</td>
<td>83A(M1)</td>
</tr>
<tr>
<td>2</td>
<td>5B(GREY)</td>
<td>13</td>
<td>82A(M1)</td>
</tr>
<tr>
<td>3</td>
<td>12A(M1)</td>
<td>14</td>
<td>84A(M1)</td>
</tr>
<tr>
<td>4</td>
<td>10A(M1)</td>
<td>15</td>
<td>24A(M1)</td>
</tr>
<tr>
<td>5</td>
<td>38A(M1)</td>
<td>16</td>
<td>2A(M1)</td>
</tr>
<tr>
<td>6</td>
<td>1E(GREY)</td>
<td>17</td>
<td>81A(M1)</td>
</tr>
<tr>
<td>9</td>
<td>3E(GREY)</td>
<td>18</td>
<td>4A(M1)</td>
</tr>
<tr>
<td>9</td>
<td>58A(M1)</td>
<td>19</td>
<td>3A(M1)</td>
</tr>
<tr>
<td>9</td>
<td>60A(M1)</td>
<td>20</td>
<td>11A(M1)</td>
</tr>
<tr>
<td>10</td>
<td>28A(M1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MAIN POWER SUPPLY AND GROUND CIRCUIT CHECK

Main power supply

Check the voltage at the back side of each fuse.

<table>
<thead>
<tr>
<th>Fuse</th>
<th>Battery voltage existence condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ignition switch position</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>#23</td>
<td>Yes</td>
</tr>
<tr>
<td>#32</td>
<td>No</td>
</tr>
<tr>
<td>#7</td>
<td>No</td>
</tr>
</tbody>
</table>

Ground circuit

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>24A - Ground</td>
<td>Yes</td>
</tr>
</tbody>
</table>
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 1

SYMPTOM: Intermittent wiper does not operate.

**A**

**WIPER RELAY OUTPUT SIGNAL CHECK**
1) Turn ignition switch to "ACC".
2) Turn wiper switch to "INT" or "OFF".
3) Measure voltage between FG connector terminal B6 and ground.

<table>
<thead>
<tr>
<th>Condition of wiper switch</th>
<th>Voltage [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Approx. 12</td>
</tr>
<tr>
<td>INT</td>
<td>Pointer swings from 0 to 12 every 3 to 23 seconds</td>
</tr>
</tbody>
</table>

**OK**
- Check wiper relay.

**NG**
- Replace wiper relay.
- Check wiper relay circuit.

**B**

**INTERMITTENT SWITCH INPUT SIGNAL CHECK**
Measure resistance between SMJ connector (11) terminal (55A) and ground. Turn wiper switch to "INT" or "OFF".

<table>
<thead>
<tr>
<th>Condition of wiper switch</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>No</td>
</tr>
<tr>
<td>INT</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**OK**
- Replace control unit.

**NG**
- Check wiper switch.
- Check harness continuity between TCU and wiper switch.
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 2

SYMPTOM: Intermittent time of wiper cannot be adjusted.

A

INTERMITTENT WIPER VOLUME INPUT SIGNAL CHECK

Measure resistance between SMJ connector terminal (B1) and ground while turning intermittent wiper volume.

<table>
<thead>
<tr>
<th>Position of wiper knob</th>
<th>Resistance [Ω]</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>0</td>
</tr>
<tr>
<td>L</td>
<td>Approx. 1 k</td>
</tr>
</tbody>
</table>

NG

Check intermittent wiper volume. Check harness continuity between TCU and wiper switch.

DIAGNOSTIC PROCEDURE 3

SYMPTOM: Wiper and washer activate individually but not in combination.

A

WASHER SWITCH INPUT SIGNAL CHECK

1) Turn ignition switch to “ACC”.
2) Measure voltage between SMJ connector terminal (B3A) and ground.

<table>
<thead>
<tr>
<th>Condition of washer switch</th>
<th>Voltage [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Approx. 12</td>
</tr>
<tr>
<td>ON</td>
<td>0</td>
</tr>
</tbody>
</table>

NG

Check harness continuity between TCU and washer switch.

B

WIPER RELAY OUTPUT SIGNAL CHECK

Connect SMJ connector. Measure voltage between engine room harness connector terminal (14E) and ground after operating washer switch. 0V for approx. 3 seconds after washer has operated.

OK

Replace wiper relay.

NG

Replace control unit.
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 4

SYMPTOM: Light warning chime does not activate.
- Perform “PRELIMINARY CHECK — Procedure 1” before referring to the following flow chart.

A

DOOR SWITCH FUNCTION CHECK
Measure resistance between SMJ connector (MT) terminal 6A and ground.

<table>
<thead>
<tr>
<th>Condition of driver’s door</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door is closed</td>
<td>No</td>
</tr>
<tr>
<td>Door is open</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Step 3

NG

Check door switch.
Check harness continuity between TCU and door switch.

E

CHIME CONTINUITY CHECK
Measure resistance between SMJ connector (MT) terminals 3A and 60A.
Continuity should exist.

Step 2

NG

Check chime.
Check harness continuity between TCU and chime.

C

LIGHT SWITCH INPUT SIGNAL CHECK
Connect SMJ connector (MT).
Measure voltage between engine room harness connector (ES) terminal 1B and ground.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Voltage [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light switch is ON</td>
<td>Approx. 12</td>
</tr>
<tr>
<td>Light switch is OFF</td>
<td>0</td>
</tr>
</tbody>
</table>

Step 1

NG

Check light switch and tail lamp relay.
Check harness continuity between TCU and light switch.

OK

Replace control unit.

EL-233
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 5

SYMPTOM: Ignition key warning chime does not activate.
- Perform “PRELIMINARY CHECK — Procedure 2” before referring to the following flow chart.

A. DOOR SWITCH FUNCTION CHECK
Measure resistance between SMJ connector (M1) terminal 4A and ground.

<table>
<thead>
<tr>
<th>Condition of driver's door</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door is closed</td>
<td>No</td>
</tr>
<tr>
<td>Door is open</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Step 3
Check door switch.
Check harness continuity between TCU and door switch.

B. CHIME CONTINUITY CHECK
Measure resistance between SMJ connector (M1) terminals 3A and 56A.
Continuity should exist.

Step 2
Check chime.
Check harness continuity between TCU and chime.

C. IGNITION KEY SWITCH INPUT SIGNAL CHECK
Measure voltage between SMJ connector (M1) terminal 28A and ground.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Voltage [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key is inserted</td>
<td>Approx. 12</td>
</tr>
<tr>
<td>Key is pulled</td>
<td>0</td>
</tr>
</tbody>
</table>

Step 1
Check ignition key switch.
Check harness continuity between TCU and ignition key switch.

OK

Replace control unit.
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 6

SYMPTOM: Seat belt warning chime does not activate.
- Perform "PRELIMINARY CHECK — Procedure 3" before referring to the following flow chart.

**A**

Step 2

**SEAT BELT SWITCH FUNCTION CHECK**
Check continuity between SMJ connector terminals 3A and 2A.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unfastened</td>
<td>Yes</td>
</tr>
<tr>
<td>Fastened</td>
<td>No</td>
</tr>
</tbody>
</table>

Check seat belt switch. Check harness continuity between TCU and seat belt switch.

**B**

Step 1

**CHIME CONTINUITY CHECK**
Measure resistance between SMJ connector terminal 5A and 6A. Continuity should exist.

OK

Check chime. Check harness continuity between TCU and chime.

Replace control unit.
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 7

SYMPTOM: Seat belt warning lamp does not come on, or does not go off after coming on.

A

<table>
<thead>
<tr>
<th>WARNING LAMP OUTPUT SIGNAL CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Connect all HEC connectors.</td>
</tr>
<tr>
<td>2) Turn ignition switch “ON”.</td>
</tr>
<tr>
<td>Measure voltage between terminal and ground as shown.</td>
</tr>
<tr>
<td>3) Does voltmeter needle keep swinging for about 7 seconds after ignition switch has been turned on?</td>
</tr>
</tbody>
</table>

Yes
- Check warning lamp.
- Check harness continuity between TCU and warning lamp.

No
- Replace control unit.

DIAGNOSTIC PROCEDURE 8

SYMPTOM: Rear defogger does not activate, or does not go off after activating.

A

<table>
<thead>
<tr>
<th>REAR WINDOW DEFOGGER OUTPUT SIGNAL CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure voltage between rear window defogger relay connector terminal and ground.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition of ignition switch</th>
<th>Voltage [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignition switch is “OFF”</td>
<td>Approx. 12</td>
</tr>
<tr>
<td>Ignition switch is “ON”</td>
<td>0</td>
</tr>
</tbody>
</table>

OK
- Check rear window defogger relay.
- Check circuit between rear window defogger relay and SMJ connector terminal (10A)
- Check rear window defogger circuit.

NG
- Check power supply.

B

<table>
<thead>
<tr>
<th>REAR WINDOW DEFOGGER SWITCH FUNCTION CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Disconnect SMJ connector (21)</td>
</tr>
<tr>
<td>2) Check continuity between SMJ connector terminal (10A) and ground.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition of defogger switch</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defogger switch is “OFF”</td>
<td>No</td>
</tr>
<tr>
<td>Defogger switch is “ON”</td>
<td>Yes</td>
</tr>
</tbody>
</table>

OK
- Replace control unit.

NG
- Check rear window defogger switch.
- Check harness continuity between TCU and rear window defogger switch.

Remedy.
TIME CONTROL SYSTEM

Trouble Diagnoses (Cont'd)
DIAGNOSTIC PROCEDURE 9

SYMPTOM: Interior lamp does not fade out after driver's door is closed.

A

DOOR SWITCH FUNCTION CHECK
Measure resistance between SMJ connector (MT) terminal (4A) and ground.

<table>
<thead>
<tr>
<th>Condition of driver's door</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door is closed</td>
<td>No</td>
</tr>
<tr>
<td>Door is open</td>
<td>Yes</td>
</tr>
</tbody>
</table>

NG
Check door switch.
Check harness continuity between TCU and door switch.

B

INTERIOR LAMP SIGNAL CHECK
Measure resistance between SMJ connector (MT) terminal (11A) and (58A).

<table>
<thead>
<tr>
<th>Interior lamp switch position</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior lamp: Door</td>
<td>Yes</td>
</tr>
<tr>
<td>Interior lamp: OFF</td>
<td>No</td>
</tr>
</tbody>
</table>

OK
Check interior lamp and harness between TCU and interior lamp.

NG
Replace TCU.
FUNCTION
- Time control unit has the following functions.

<table>
<thead>
<tr>
<th>Item</th>
<th>Details of control</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2</td>
<td>Intermittent wiper control Regulates intermittent time from approximately 3 to 23 seconds depending on the intermittent wiper volume setting.</td>
</tr>
<tr>
<td>3</td>
<td>Washer and wiper combination control Wiper is operated in conjunction with washer switch.</td>
</tr>
<tr>
<td>4</td>
<td>Light warning chime timer When driver's door is opened with light switch ON and ignition switch OFF, warning chime sounds.</td>
</tr>
<tr>
<td>5</td>
<td>Ignition key warning chime timer When driver's door is opened with ignition switch OFF, warning chime sounds.</td>
</tr>
<tr>
<td>6</td>
<td>Seat belt warning chime timer Sounds warning chime for about 7 seconds if ignition switch is turned &quot;ON&quot; when seat belt switch is &quot;ON&quot; (seat belt is unfastened).</td>
</tr>
<tr>
<td>7</td>
<td>Seat belt warning lamp timer Seat belt warning lamp blinks for about 7 seconds when ignition switch is turned to &quot;ON&quot;.</td>
</tr>
<tr>
<td>8</td>
<td>Rear defogger timer Rear defogger operates for about 15 minutes when defogger switch is ON.</td>
</tr>
<tr>
<td>9</td>
<td>Interior lamp timer Fades out interior lamp when driver's side door is opened and closed.</td>
</tr>
<tr>
<td>10</td>
<td>Door key hole illumination Illuminates for about 7 seconds when door outside handle is pulled.</td>
</tr>
</tbody>
</table>

UNIT LOCATION
- Time control unit locates behind fuse block (J/B).
THEFT WARNING SYSTEM

Description

1. OPERATION FLOW

2. SETTING THE THEFT WARNING SYSTEM

Initial condition
(1) Close all doors.
(2) Close hood and trunk lid.
(3) Pull key out of ignition.

Disarmed phase
When any door(s), hood or trunk lid is opened, the theft warning system turns into the "disarmed" phase. (The security indicator lamp blinks every second.)

Pre-armed phase and armed phase
The theft warning system turns into the "pre-armed" phase when hood, trunk lid and all doors are closed and locked. (The security indicator lamp illuminates.)

After about 30 seconds, the system automatically shifts into the "armed" phase (the system is set). (The security indicator lamp blinks every 2.4 seconds.)

3. CANCELING THE SET THEFT WARNING SYSTEM

When any of the following operations (a), (b) and (c) is performed, the armed phase is canceled.
(a) Unlock at least one door using either the key or the multi remote controller.
(b) Unlock the trunk lid with the key or the multi remote controller.
(c) Insert the key in ignition and turn ignition to "ACC" or "ON".

4. ACTIVATING THE ALARM OPERATION OF THE THEFT WARNING SYSTEM

Make sure the system is in the armed phase. (The security indicator lamp blinks every 2.4 seconds.)

When any of the following operations (a), (b) and (c) is performed, the system sounds the horns and flashes the headlamps for about 2.5 minutes. At the same time, the system disconnects the starting system circuit.
The starting system is kept dead even after the alarm turns off.
(a) Open the engine hood or trunk lid using the hood or trunk lid opener.
(b) Unlock any door without key or multi remote controller.
(c) Pull out the key cylinder from either front door or the trunk lid.

5. CANCELING THE ALARM OPERATION OF THE THEFT WARNING SYSTEM

The alarm operation can be canceled when the trunk lid or either front door is unlocked with key or multi remote controller.
THEFT WARNING SYSTEM
Wiring Diagram — THEFT — (Cont’d)

BATTERY

30A

FUSE BLOCK
(JR8)

E62
M1

STARTER RELAY

ED7

L/R
B/R

STARTER MOTOR

INHIBITOR SWITCH

E112

INTERUPT RELAY

THEFT WARNING CONTROL UNIT

M47

THEFT WARNING
STARTER RELAY

M17

IGNITION SWITCH
ON or START

7.5A
L/R

WHITE

7.5A

G1

MA
EM
LG
EC
FE
AT
PD
FA
RA
BR
ST
RS
BT

HA

IDX

EL-249

TEL532
Trouble Diagnoses

SYSTEM OPERATION CHECK
The system operation is canceled by turning ignition switch to "ACC" at any step in the following:
- A step between START and ARMED, or
- In the ARMED phase
in the following flow chart.

INDICATOR LAMP CIRCUIT CHECK
Go to Diagnostic Procedure 2 (EL-258).

"ON"

Does "SECURITY" indicator lamp remain "ON" or blinking?

Blinking

- DOOR SWITCH INPUT SIGNAL CHECK
  Go to Diagnostic Procedure 1-(1) (EL-254).
- HOOD SWITCH INPUT SIGNAL CHECK
  Go to Diagnostic Procedure 1-(2) (EL-255).
- TRUNK ROOM LAMP SWITCH INPUT SIGNAL CHECK
  Go to Diagnostic Procedure 1-(3) (EL-256).
- KEY CYLINDER TAMPER SWITCH INPUT SIGNAL CHECK
  Go to Diagnostic Procedure 1-(4) (EL-257).

Does "SECURITY" indicator lamp blink every second when
- each door is opened?
- hood is opened?
- trunk lid is opened?
- each key cylinder is withdrawn?
- all doors, hood and trunk lid are opened, and key cylinder is withdrawn?

No

DOOR SWITCH INPUT SIGNAL CHECK
Go to Diagnostic Procedure 1-(1) (EL-254).

HOOD SWITCH INPUT SIGNAL CHECK
Go to Diagnostic Procedure 1-(2) (EL-255).

TRUNK ROOM LAMP SWITCH INPUT SIGNAL CHECK
Go to Diagnostic Procedure 1-(3) (EL-256).

KEY CYLINDER TAMPER SWITCH INPUT SIGNAL CHECK
Go to Diagnostic Procedure 1-(4) (EL-257).

No

POWER SUPPLY AND GROUND CIRCUIT CHECK
(EL-253)

INDICATOR LAMP CIRCUIT CHECK
Go to Diagnostic Procedure 2 (EL-258).

Yes

(1) Go to next page.)
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)

1. Lock doors without key or multi-remote controller.

   2. Close all doors, hood and trunk lid. Install key cylinders properly.

   3. Does “SECURITY” indicator lamp turn on?

      a. Yes
      b. No

       3a. DOOR UNLOCK SENSOR INPUT SIGNAL CHECK
           Go to Diagnostic Procedure 3 (EL-259).

       3b. Unlock and open a door within 30 seconds while indicator lamp is on.

       4. Close all doors and lock using key or multi-remote controller.

       5. Does indicator lamp turn on?

          a. Yes
          b. No

           5a. DOOR LOCK SWITCH INPUT SIGNAL CHECK
               Go to Diagnostic Procedure 4 (EL-260).

           5b. After about 30 seconds, does indicator lamp turn off?

               a. Yes
               b. No

                5b1. Replace control unit.

                5b2. ARMED phase

               6. Unlock any door without key or multi-remote controller.

               7. Does alarm (horn and headlamps) operate?

                  a. Yes
                  b. No

                   7a. ALARM OUTPUT SIGNAL CHECK
                       Go to Diagnostic Procedure 5 (EL-261).

                   7b. Turn ignition switch to “START” with key. Does the engine start?

                       a. Yes
                       b. No

                        7b1. STARTER OUTPUT SIGNAL CHECK
                            Go to Diagnostic Procedure 6 (EL-262).

                        7b2. (Go to next page.)
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)

1. Lock and unlock door(s) and/or trunk lid using key or multi-remote controller.

2. Does alarm stop?
   - Yes
   - No → DOOR/TRUNK LID UNLOCK SWITCH INPUT SIGNAL CHECK
     Go to Diagnostic Procedure 7 (EL-263) and 8 (EL-264).

3. Turn ignition switch to “START”. Does the engine start?
   - Yes
   - No → STARTER OUTPUT SIGNAL CHECK
     Go to Diagnostic Procedure 6 (EL-262).

4. Close all doors, hood and trunk lid. Lock doors with key or multi-remote controller.

5. After indicator lamp starts to blink every 2.4 seconds, unlock a door without key or multi-remote controller.

6. Does alarm stop automatically after approx. 2.5 minutes?
   - Yes
   - No → Replace control unit.

7. Turn ignition switch to “START”. Does the engine start?
   - Yes
   - No → STARTER OUTPUT SIGNAL CHECK
     Go to Diagnostic Procedure 6 (EL-262).

8. Lock and unlock door(s) and/or trunk lid using key or multi-remote controller.

9. Turn ignition switch to “START”. Does the engine start?
   - Yes
   - No → STARTER OUTPUT SIGNAL CHECK
     Go to Diagnostic Procedure 6 (EL-262).

System is OK.
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)

POWER SUPPLY AND GROUND CIRCUIT CHECK

Main power supply circuit check

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Ignition switch position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>① - ⑤</td>
<td>Battery voltage</td>
</tr>
</tbody>
</table>

Power supply circuit check for system cancel

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Ignition switch position</th>
</tr>
</thead>
<tbody>
<tr>
<td>③ - ⑥</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>0V</td>
</tr>
</tbody>
</table>

Ground circuit check

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>⑦ - Ground</td>
<td>Yes</td>
</tr>
</tbody>
</table>
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 1

SYMPTOM: • Indicator lamp does not blink.
• Indicator lamp remains blinking.

Diagnostic procedure 1-(1)

A

DOOR SWITCH INPUT SIGNAL CHECK
Check continuity between control unit harness terminals ⑥ and ⑧.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>All doors are closed</td>
<td>No</td>
</tr>
<tr>
<td>At least one door is open</td>
<td>Yes</td>
</tr>
</tbody>
</table>

NG

DOOR SWITCH CHECK
Refer to “Electrical Components Inspection” (EL-265).

NG

Replace door switch.

OK

DOOR SWITCH CIRCUIT CHECK
Check harness continuity between control unit harness terminal ⑥ or ⑧ and door switch harness terminal.
Continuity should exist.

NG

Repair harness or connectors.

OK

CHECK THE CONNECTIONS AT EACH CONNECTOR.

CEL308

SEL655PE
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)

Diagnostic procedure 1-(2)

A

HOOD SWITCH INPUT SIGNAL CHECK
Check continuity between control unit harness terminals 4 and 5.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hood is open</td>
<td>Yes</td>
</tr>
<tr>
<td>Hood is closed</td>
<td>No</td>
</tr>
</tbody>
</table>

OK  →  Go to Diagnostic Procedure 2 (EL-258).

NG  →  Check hood switch and hood fitting condition.

NG  →  Adjust installation of hood switch or hood.

OK  →  HOOD SWITCH CHECK
Refer to "Electrical Components Inspection" (EL-265).

NG  →  Replace hood switch.

OK  →  HOOD SWITCH CIRCUIT CHECK
- Check harness continuity between control unit harness terminal 4 and hood switch harness terminal 2.
- Check harness continuity between hood switch terminal 1 and body ground.

NG  →  Repair harness or connectors.

OK  →  CHECK THE CONNECTIONS AT EACH CONNECTOR.
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)
Diagnostic procedure 1-(3)

A

TRUNK ROOM LAMP SWITCH INPUT SIGNAL CHECK
Check voltage between control unit harness terminals ☞ and ☜.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trunk lid is open</td>
<td>Approx. 0V</td>
</tr>
<tr>
<td>Trunk lid is closed</td>
<td>Approx. 12V</td>
</tr>
</tbody>
</table>

B

Does trunk room lamp come on?

Yes

TRUNK ROOM LAMP SWITCH CIRCUIT CHECK
Check harness continuity between control unit harness terminal ☞ and trunk room lamp harness terminal ☜.

NG

Replace trunk room lamp switch.

No

TRUNK ROOM LAMP SWITCH CHECK
Refer to “Electrical Components Inspection” (EL-265).

OK

E

CHECK THF CONNECTIONS AT EACH CONNECTOR.
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)
Diagnostic procedure 1-(4)

A

KEY CYLINDER TAMPER SWITCH INPUT SIGNAL CHECK
Check continuity between control unit harness terminals 6 and 9.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>No</td>
</tr>
<tr>
<td>Removed</td>
<td>Yes</td>
</tr>
</tbody>
</table>

NG

KEY CYLINDER TAMPER SWITCH CHECK
Refer to “Electrical Components Inspection” (EL-268).

OK

NG

Replace key cylinder tamper switch.

OK

KEY CYLINDER TAMPER SWITCH CIRCUIT CHECK
- Check harness continuity between control unit harness terminal 6 and tamper switch harness terminal 3.
- Check harness continuity between tamper switch terminal 4 and body ground.

Continuity should exist.

OK

CHECK THE CONNECTIONS AT EACH CONNECTOR.

B

MEL115F

EL-257
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)
DIAGNOSTIC PROCEDURE 2
SYMPTOM: Indicator lamp does not blink.

A

INDICATOR LAMP OUTPUT SIGNAL CHECK
Check voltage between control unit harness terminals ② and ⑧.
Pointer of voltmeter should deflect intermittently.

OK

CHECK INDICATOR LAMP.

NG
Replace control unit.

B

INDICATOR LAMP CIRCUIT CHECK
Check harness continuity between control unit harness terminal ② and indicator lamp harness terminal ⑧.
Continuity should exist.

OK

CHECK THE CONNECTIONS AT EACH CONNECTOR.

NG
Replace indicator lamp.

NG
Repair harness or connectors.
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)
DIAGNOSTIC PROCEDURE 3
SYMPTOM: Indicator lamp does not come on.

A
DOOR UNLOCK SENSOR INPUT SIGNAL CHECK
Check continuity between control unit harness terminals ⑧ and ⑨.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>All doors are locked.</td>
<td>No</td>
</tr>
<tr>
<td>At least one is unlocked.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

OK  Go to Diagnostic Procedure 4 (EL-260).

NG  Replace control unit.

B
DOOR UNLOCK SENSOR CHECK
Refer to "Electrical Components Inspection" (EL-266).

NG  Replace door lock actuator.

OK  Repair harness or connectors.

NG  Repair harness or connectors.

CHECK THE CONNECTIONS AT EACH CONNECTOR.
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)
DIAGNOSTIC PROCEDURE 4
SYMPTOM: Indicator lamp does not come on.

A

DOOR LOCK SWITCH INPUT SIGNAL CHECK (LOCK SIGNAL)
Check continuity between control unit harness terminals 7 and 8.

<table>
<thead>
<tr>
<th>Key position</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral/Lock</td>
<td>No</td>
</tr>
<tr>
<td>Between neutral and lock</td>
<td>Yes</td>
</tr>
</tbody>
</table>

OK

Go to Diagnostic Procedure 3 (EL-259).

NG

Replace control unit.

B

DOOR LOCK SWITCH CHECK
Refer to “Electrical Components Inspection” (EL-266).

NG

Replace key cylinder switch.

OK

DOOR LOCK SWITCH CIRCUIT CHECK
- Check harness continuity between control unit harness terminal 7 and door lock switch terminal 1.
- Check harness continuity between door lock switch terminal 3 and body ground.

Continuity should exist.

NG

Repair harness or connectors.

OK

CHECK THE CONNECTIONS AT EACH CONNECTOR.
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 5

SYMPTOM: Alarm does not operate.

A

ALARM SIGNAL OUTPUT CHECK
Check voltage between control unit harness terminals ⑧ and ⑨.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Voltmeter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Except alarm phase</td>
<td>12V</td>
</tr>
<tr>
<td>Alarm phase</td>
<td>Pointer deflects intermittently</td>
</tr>
</tbody>
</table>

NG → Replace control unit.

B

Check horn relay.

OK

NG → Replace relay.

C

HORN CIRCUIT CHECK
Check if voltage across horn relay harness terminal ① and body is 12V.
Check continuity between horn relay terminal ② and control unit harness terminal ⑨.

Continuity should exist.

NG → Repair harness and connectors.

OK

Check theft warning relay-1.

OK

NG → Replace theft warning relay-1.

C

THEFT WARNING HEADLAMP CIRCUIT CHECK
Check if voltage across theft warning relay harness terminal ② and body is 12V.
Check continuity between theft warning relay terminal ① and control unit harness terminals ⑨.

OK

Does headlamp come on when turning lighting switch “ON”?

No → Check headlamp system. Refer to “HEADLAMP?” (EL-43).

Yes

Repair harness and connectors between lamp relay and headlamp.
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)
DIAGNOSTIC PROCEDURE 6
SYMPTOM: STARTER MOTOR can be operated. (Starter killed phase)

STARTER MOTOR KILL OUTPUT SIGNAL CHECK.
Check voltage between control unit harness terminals ④ and ⑧ when ignition switch is turned to ON or "START".

Check theft warning starter relay.

Replace control unit.

Replace theft warning starter relay.

Repair harness between control unit and theft warning starter relay.

Approx. 12V

Approx. 0V

OK

NG

SEL673PC
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)

DIAGNOSTIC PROCEDURE 7

SYMPTOM: Alarm does not stop even if stop signal is given.

A

DOOR UNLOCK SWITCH INPUT SIGNAL CHECK (UNLOCK SIGNAL)
Check continuity between control unit harness terminals @ and @.

<table>
<thead>
<tr>
<th>Key position</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral/Unlock</td>
<td>No</td>
</tr>
<tr>
<td>Between neutral and unlock</td>
<td>Yes</td>
</tr>
</tbody>
</table>

OK

Replace control unit.

NG

Replace key cylinder switch.

B

DOOR UNLOCK SWITCH CIRCUIT CHECK
- Check harness continuity between control unit harness terminal @ and door unlock switch terminal @.
- Check harness continuity between door unlock switch terminal @ and body ground.

Continuity should exist.

OK

Repair harness or connectors.

NG

CHECK THE CONNECTIONS AT EACH CONNECTOR.
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)

Diagnostic Procedure 8

Symptom: Alarm does not stop even if stop signal is given.

A

Trunk Lid Unlock Switch Input Signal Check (Unlock Signal)
Check continuity between control unit harness terminals @ and ③.

<table>
<thead>
<tr>
<th>Key Position</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral/Unlock</td>
<td>No</td>
</tr>
<tr>
<td>Between neutral and unlock</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Replace control unit.

B

Trunk Lid Unlock Switch Check
Refer to "Electrical Components Inspection" (EL-266).

NG
Replace key cylinder switch.

OK

Trunk Lid Unlock Switch Circuit Check
- Check harness continuity between control unit harness terminal @ and trunk lid unlock switch terminal ①.
- Check harness continuity between trunk lid unlock switch terminal ② and body ground.

NG
Repair harness or connectors.

OK

Check the connections at each connector.
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)

ELECTRICAL COMPONENTS INSPECTION

Door switches
Check continuity between terminals when door switch is pushed and released.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Pushed</th>
<th>Released</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (switch body)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hood switch
Check continuity between terminals when hood switch is pushed and released.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Pushed</th>
<th>Released</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Trunk room lamp switch

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Trunk lid</th>
<th>Closed</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
THEFT WARNING SYSTEM

Trouble Diagnoses (Cont’d)
Key cylinder tamper switch, door lock switch and door unlock switch

- Door

<table>
<thead>
<tr>
<th>TAMPER SWITCH</th>
<th>DOOR LOCK SWITCH</th>
<th>DOOR UNLOCK SWITCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key cylinder</td>
<td>Key cylinder</td>
<td>Between</td>
</tr>
<tr>
<td>is installed</td>
<td>is removed</td>
<td>full stroke</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and neutral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Full stroke</td>
</tr>
</tbody>
</table>

- Trunk lid

<table>
<thead>
<tr>
<th>TAMPER SWITCH</th>
<th>TRUNK LID UNLOCK SWITCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key cylinder</td>
<td>Key cylinder</td>
</tr>
<tr>
<td>is installed</td>
<td>is removed</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Door unlock sensor

<table>
<thead>
<tr>
<th>LOCK</th>
<th>UNLOCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
Engine Compartment

- Front wiper motor
- Hood switch
- Theft warning horn
- ABS actuator (For anti-lock brake system)
- Daytime light control unit (For Canada)
- Fusible link, fuse and relay box
- Starter hold relay
- Starter relay
- Door mirror defogger relay
- Horn relay
- Rear window defogger relay
- ASCD hold relay
- Cooling fan relay
- Daytime light relay (For Canada)
- Wiper relay
- Park/Neutral position relay
- Fusible link
Luggage Compartment

- Anti-lock brake system control unit
- Stop and tail lamp sensor
- Multi-remote control unit
W2 : Diode
E81 : Diode
E82 : Fuse block (J/B)
E83 : Fuse block (J/B)
E84 : Fuse block (J/B)
E85 : Fuse block (J/B)
W1 : Not used
SMJ : To (MT9)
W6 : Ignition switch
W2 : Ignition key hole illumination
B2 : Key switch
B/16 : Lighting switch
L/8 : Front wiper switch

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Diode E80

Fuse block (J/B) — [Daytime light control unit]
Daytime light relay

Diode E84

Fuse block (J/B) — [Daytime light relay]

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* Be sure to connect and lock the connectors securely after repair work.
Failure to do so may cause the ECM to have diagnostic trouble codes.
Do not disconnect these connectors except in the case of working
according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.
1365

**Engine Room Harness (Cont’d)**

- **GY/6**: Daytime light control unit (For Canada)
- **GY/6**: Headlamp control relay unit
- **L/4**: Air conditioner relay
- **-**: Fuse and fusible link box
- **BR/6**: Rear window defogger relay
- **L/4**: Starter relay
- **GY/6**: Park/Neutral position relay
- **B/5**: Wiper relay
- **B/5**: Starter hold relay
- **L/4**: Door mirror defogger relay
- **W/3**: Horn relay
- **BR/6**: Daytime light relay (For Canada)
- **L/4**: ASCD hold relay
- **L/4**: Cooling fan relay
- **OR/20**: Joint connector-3
- **W/2**: Diode
- **B/1**: Battery
- **-**: Fuse, fusible link and relay box

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**Resistor E11**

- **AT control unit**: Line pressure solenoid valve
- **A/T control unit**: A/T control unit

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**Fuse, fusible link and relay box E09**

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- ***: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.
* Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes.
Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.
### Engine Control Harness

<table>
<thead>
<tr>
<th>Engine Control Sub-Harness-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F00</strong> B/2 : Injector No. 1</td>
</tr>
<tr>
<td><strong>F01</strong> GY/3 : Ignition coil No. 1</td>
</tr>
<tr>
<td><strong>F02</strong> B/2 : Injector No. 2</td>
</tr>
<tr>
<td><strong>F03</strong> GY/3 : Ignition coil No. 2</td>
</tr>
<tr>
<td><strong>F05</strong> B/2 : Injector No. 3</td>
</tr>
<tr>
<td><strong>F06</strong> GY/3 : Ignition coil No. 3</td>
</tr>
<tr>
<td><strong>F07</strong> — : Engine ground</td>
</tr>
<tr>
<td><strong>F08</strong> B/2 : Injector No. 4</td>
</tr>
<tr>
<td><strong>F09</strong> GY/3 : Ignition coil No. 4</td>
</tr>
<tr>
<td><strong>F10</strong> BR/8 : To <strong>F7</strong></td>
</tr>
<tr>
<td><strong>F11</strong> GY/8 : To <strong>F8</strong></td>
</tr>
<tr>
<td><strong>F12</strong> B/2 : Injector No. 5</td>
</tr>
<tr>
<td><strong>F13</strong> GY/3 : Ignition coil No. 5</td>
</tr>
<tr>
<td><strong>F14</strong> B/2 : Injector No. 6</td>
</tr>
<tr>
<td><strong>F15</strong> GY/3 : Ignition coil No. 6</td>
</tr>
<tr>
<td><strong>F16</strong> SB/2 : IACV-air regulator</td>
</tr>
<tr>
<td><strong>F17</strong> GY/6 : Power transistor unit</td>
</tr>
<tr>
<td><strong>F18</strong> GY/7 : Power transistor unit</td>
</tr>
<tr>
<td><strong>F19</strong> GY/6 : To <strong>F12</strong></td>
</tr>
<tr>
<td><strong>F20</strong> Y2 : IACV-AAC valve</td>
</tr>
<tr>
<td><strong>F21</strong> SB/2 : IACV-FICD solenoid valve</td>
</tr>
</tbody>
</table>

### Engine Control Sub-Harness-2

<table>
<thead>
<tr>
<th>Engine Control Sub-Harness-2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F00</strong> BR/4 : To <strong>F18</strong></td>
</tr>
<tr>
<td><strong>F01</strong> GY/1 : Compressor</td>
</tr>
<tr>
<td><strong>F02</strong> B/1 : Thermal transmitter</td>
</tr>
<tr>
<td><strong>F03</strong> GY/2 : Engine coolant temperature sensor</td>
</tr>
</tbody>
</table>

### Engine Control Sub-Harness-3

<table>
<thead>
<tr>
<th>Engine Control Sub-Harness-3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F70</strong> GY/3 : To <strong>F50</strong></td>
</tr>
<tr>
<td><strong>F71</strong> GY/2 : Crankshaft position sensor (OBD)</td>
</tr>
</tbody>
</table>

### Engine Control Sub-Harness-4

<table>
<thead>
<tr>
<th>Engine Control Sub-Harness-4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F70</strong> GY/2 : To <strong>F11</strong></td>
</tr>
<tr>
<td><strong>F71</strong> B/2 : Knock sensor</td>
</tr>
</tbody>
</table>

---

*: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes.

Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.
Z1 : ASCD steering switch, horn switch and air bag module (Driver's side)
Y/16 : To (M45)
W/2 : To (B10)
Y/24 : Air bag diagnosis sensor unit
GY/2 : To (B25)
Z6 : Air bag module (Passenger side-1)
Z8 : Air bag module (Passenger side-2)