

HSA (HILL START AID)

SECTION 5A5

HSA (HILL START AID)

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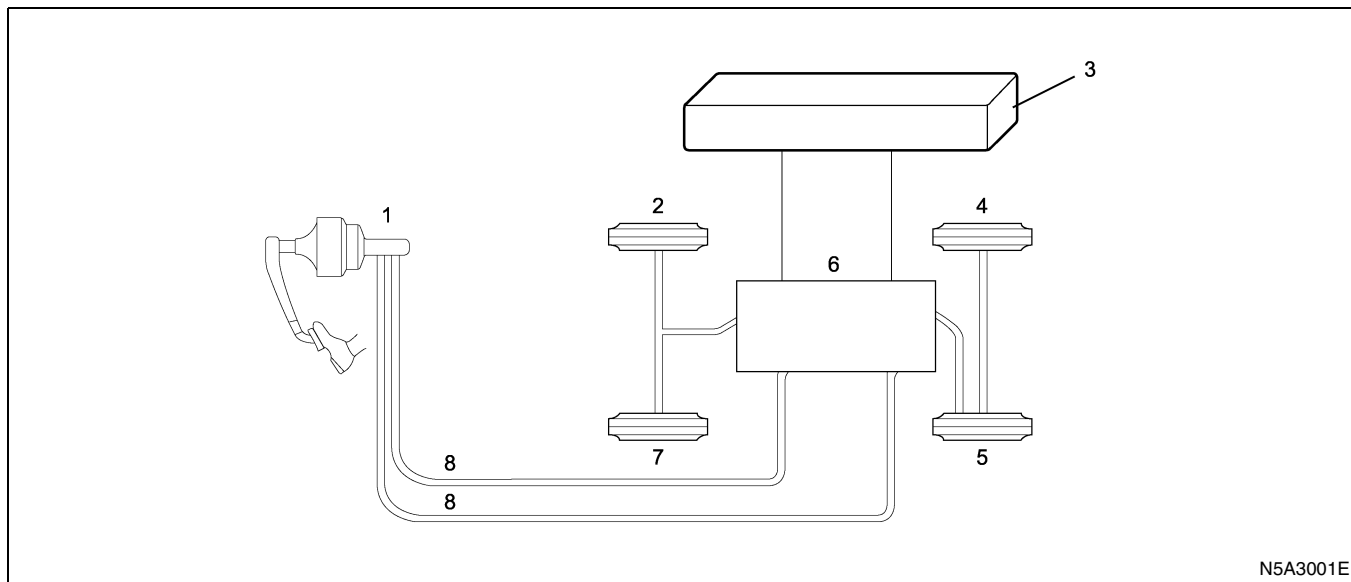
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HSA System

Description of Function and Operation

The HSA (hill start aid) is the system to retain the brake force with brake pedal not depressed when the vehicle is parked, and to automatically release the brake force when starting the vehicle.

The HSA control unit drives the HSA valve located in the pipe route between the master cylinder and the wheel cylinder, to hold/release the brake fluid pressure. Also, alarm function (activates when the door opened with HSA operating, when the HSA system has running long time, when the HSA pressure goes down) and self-diagnosis function are equipped with the HSA control unit.



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Legend

- | | |
|---------------------------|----------------------|
| 1. Servo unit master ring | 5. RL wheel cylinder |
| 2. FR wheel cylinder | 6. HSA valve |
| 3. HSA control unit | 7. FL wheel cylinder |
| 4. RR wheel cylinder | 8. Oil |

Contents of HSA Control

The HSA operates when all the following conditions are completed.

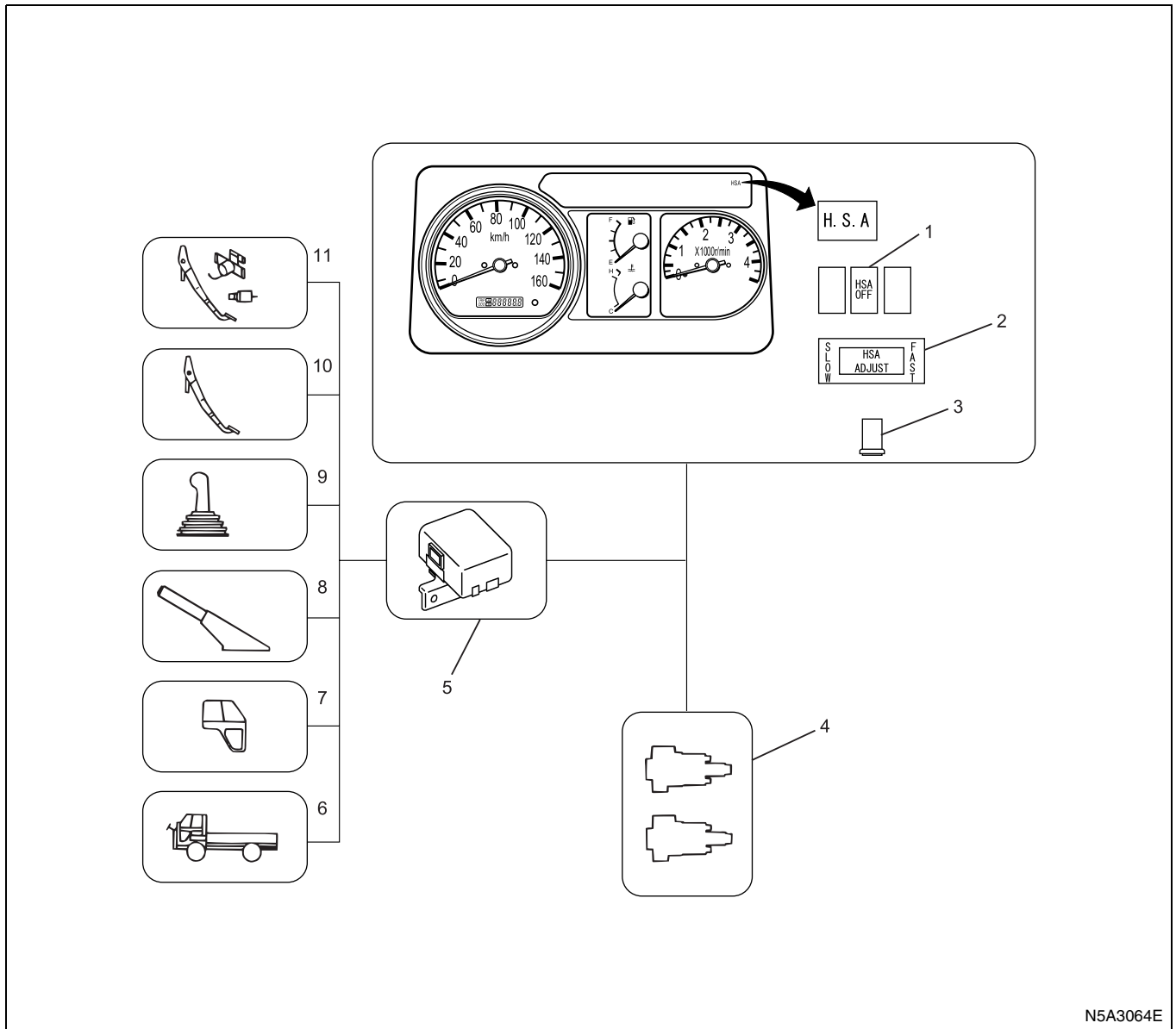
1. Brake pedal depressed
2. Parking brake released
3. Vehicle standstill

Notice:

The HSA can operate wherever the gearshift lever is set.

The HSA is released when any of the following is completed.

1. Gear except in neutral and clutch engaged more than half
2. Parking brake applied
3. HSA off switch depressed
4. Starter switch in ACC or OFF

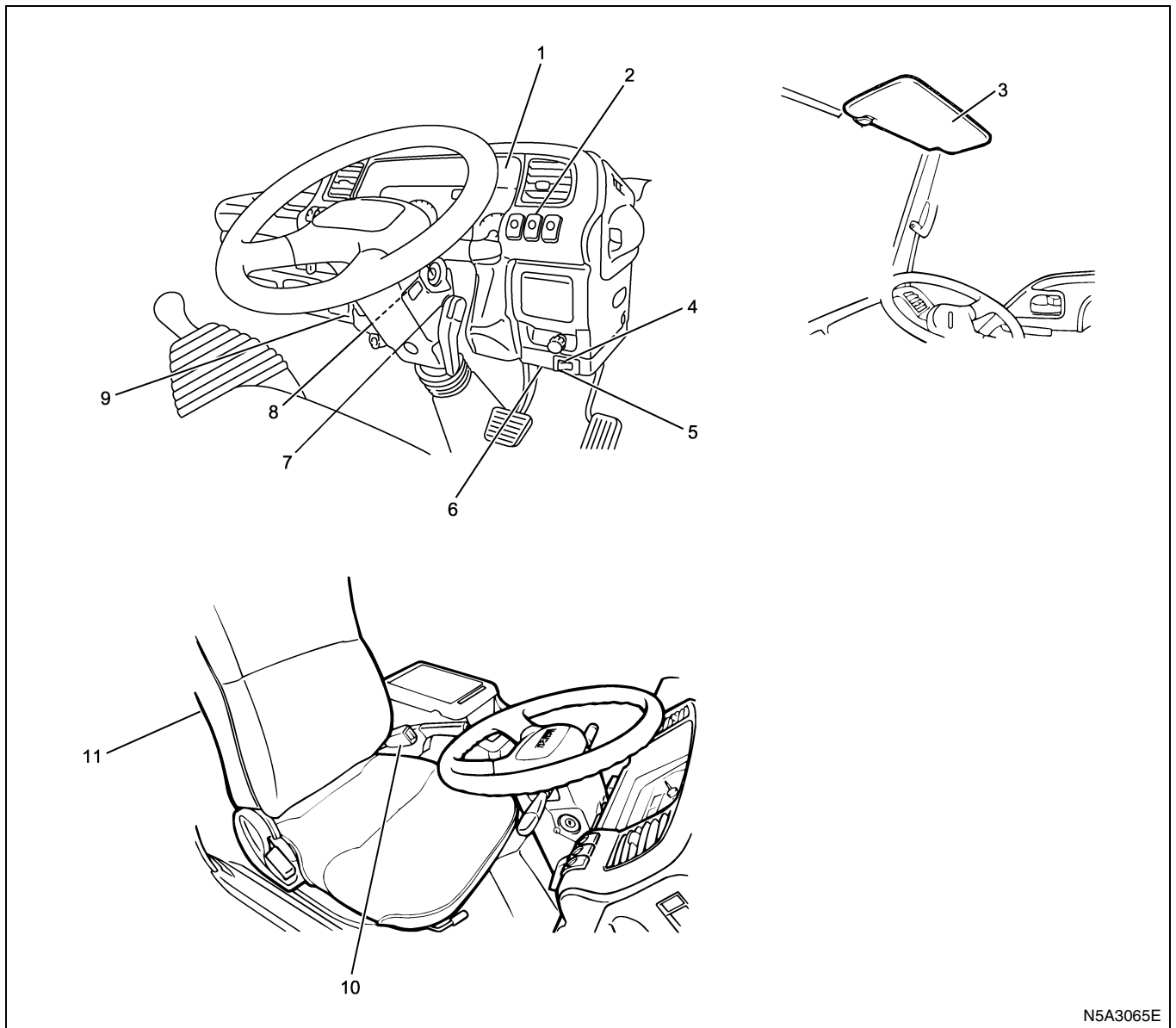


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Legend

- | | |
|---------------------------------|---|
| 1. HSA off switch | 7. Door switch |
| 2. HSA adjust switch | 8. Parking brake switch |
| 3. HSA reset switch | 9. Neutral switch |
| 4. HSA valve | 10. Stop lamp switch |
| 5. Control unit buzzer built-in | 11. Clutch stroke sensor/clutch fluid pressure sensor |
| 6. Speed sensor | |

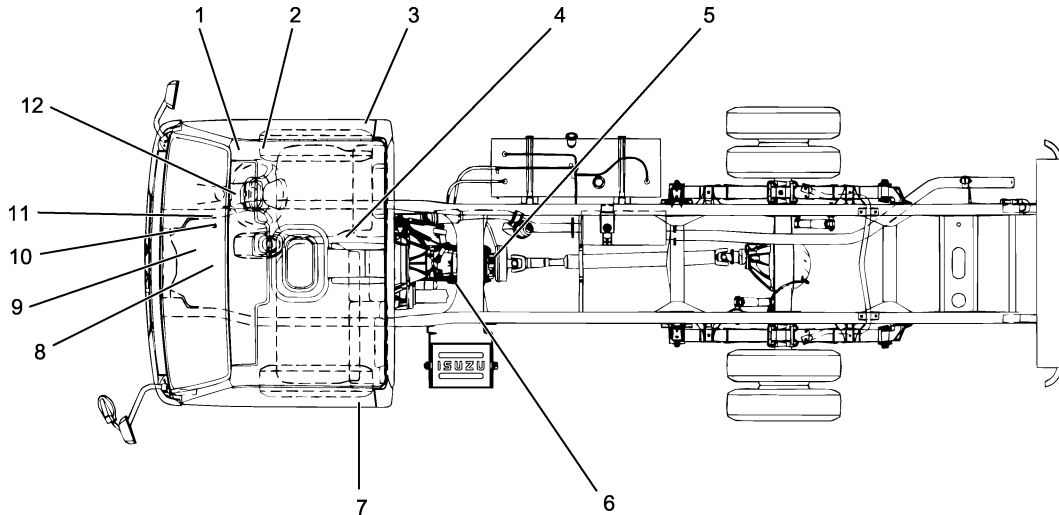
Part Location Diagram



N5A3065E

Legend

- | | |
|-----------------------|---------------------------------|
| 1. HSA indicator lamp | 7. Clutch stroke sensor |
| 2. HSA off switch | 8. Clutch fluid pressure switch |
| 3. HSA caution plate | 9. HSA control unit |
| 4. HSA adjust switch | 10. Parking switch |
| 5. HSA reset switch | 11. Door switch |
| 6. Stop lamp switch | |

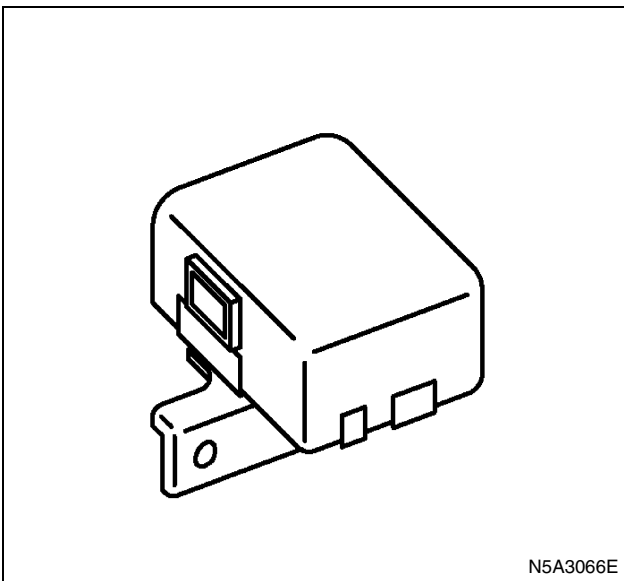


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Legend

- | | |
|--|--|
| 1. HSA off switch | 7. Door switch (LH) |
| 2. HSA reset switch, HSA adjust switch | 8. HSA control unit |
| 3. Door switch (RH) | 9. HSA valve |
| 4. Parking brake switch | 10. Clutch sensor/clutch fluid pressure switch |
| 5. Speed sensor | 11. HSA indicator lamp |
| 6. Neutral switch | 12. Stop lamp switch |

HSA Control Unit



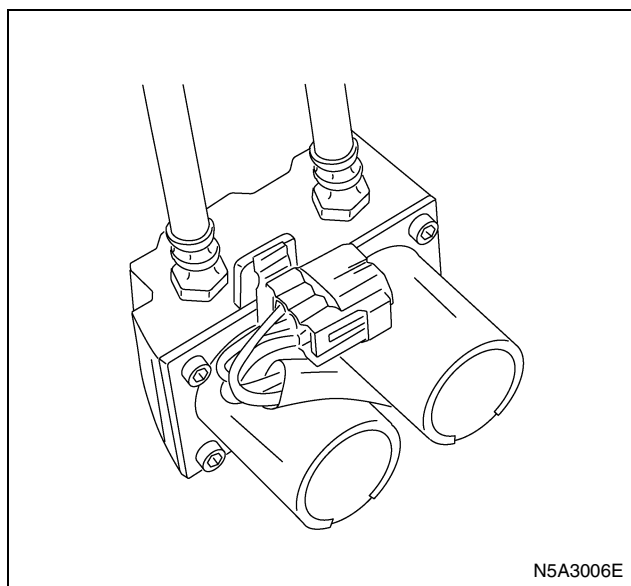
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The HSA control unit activates the HSA valve to hold/release the brake fluid pressure based on the input signal from each switch and sensor. When a malfunction occurs in the system, it activates the built-in buzzer and blinks the HSA indicator lamp to indicate the trouble code.

Also the system has the alarm functions as follows:

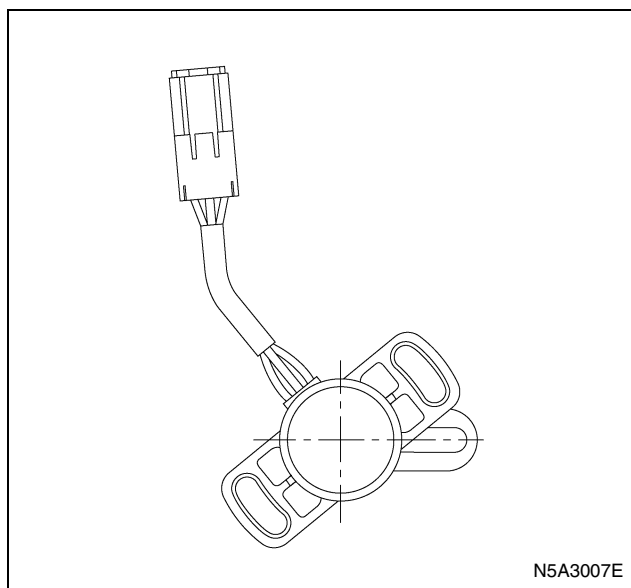
1. Door open alarm when HSA operating
When the door is opened while the HSA is operating; it triggers the built-in buzzer and blink the HSA indicator lamp.
2. HSA long-time operation alarm
When the HSA have operated for more than 8 minutes; it triggers the built-in buzzer and blink the HSA indicator lamp.
3. Vehicle motion alarm
When the vehicle speed reaches approx. 1.5km/h (1 mph) while HSA operating; it triggers the built-in buzzer and blink the HSA indicator lamp. (However, the HSA is released when the vehicle speed reaches 5km/h (3 mph).)

HSA Valve



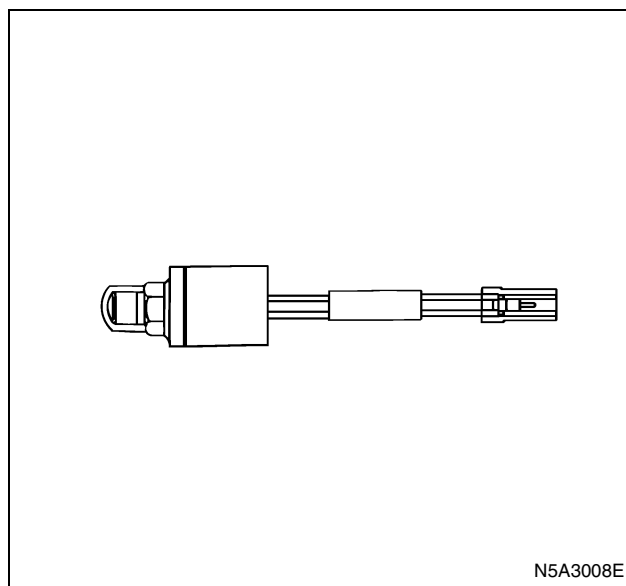
The HSA valve is located in the pipe route between the master cylinder and the wheel cylinder, and it is driven by the HSA control unit output (ON/OFF).

Clutch Sensor



The clutch sensor is installed to the clutch pedal bracket and changes the voltage being input to the HSA control unit by sensing the amount of clutch pedal depressed. This voltage is one of the signals to control the HSA operation/release.

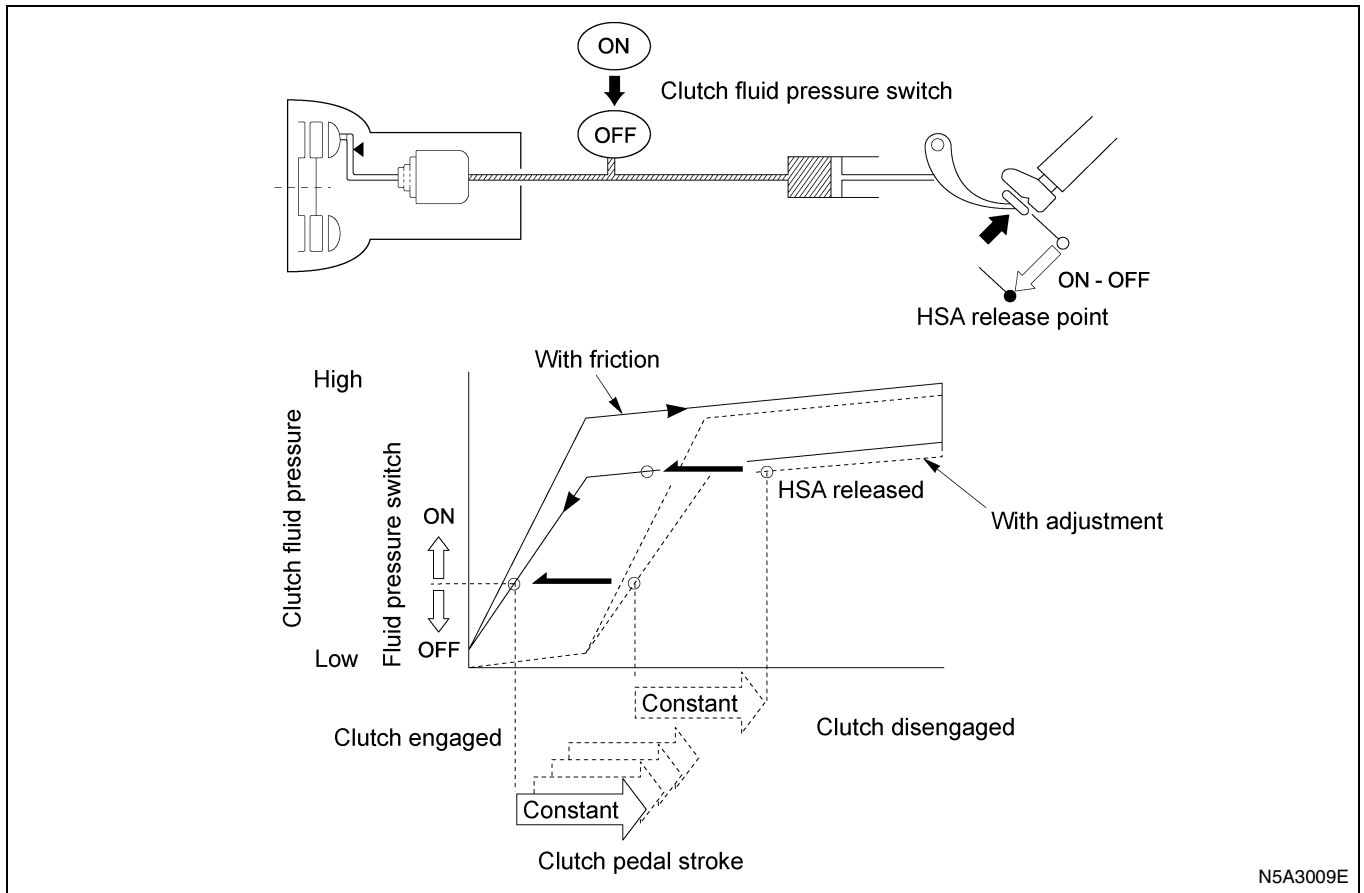
Clutch Fluid Pressure Switch



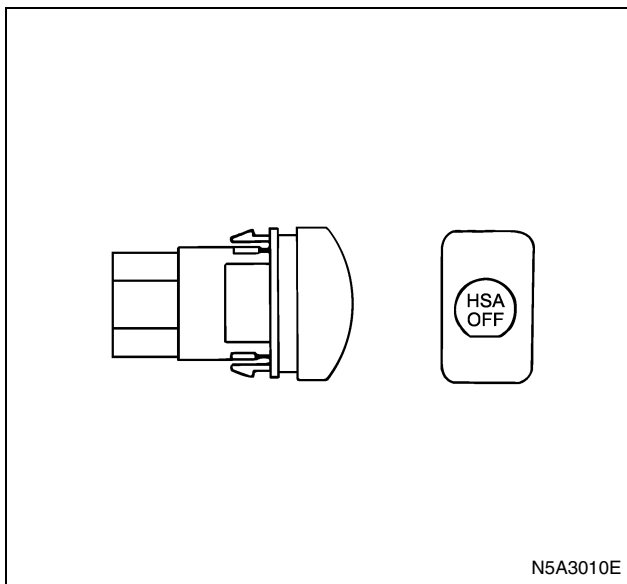
The clutch fluid pressure switch is off the contact with the clutch pedal fully engaged, and it contacts the point with the clutch pedal depressed (clutch disengaged). The HSA system memorizes the clutch meeting point (engaging point) to release the brake force at that point. However, the meeting point is gradually raised as the driven plate wears, resulting the brake force be released before the clutch engages. To prevent this, the HSA has a follow-up function automatically to co-op with the clutch wear.

Clutch-wear Automatic Follow-up Mechanism

The clutch fluid pressure switch is installed to the clutch master cylinder, and it turns ON with the clutch pedal depressed, and turns OFF with the clutch pedal released. Positional relationship between the stroke point where the HSA is released and this clutch fluid pressure switch OFF position is constant regardless the degree of clutch disc wear. Utilizing this characteristic, the HSA can follow-up the release point automatically even when the fluid pressure switch OFF point is shifted.

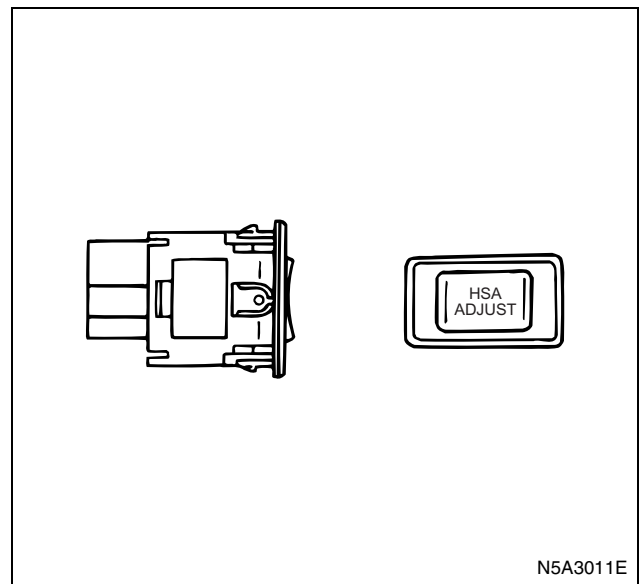


HSA Off Switch



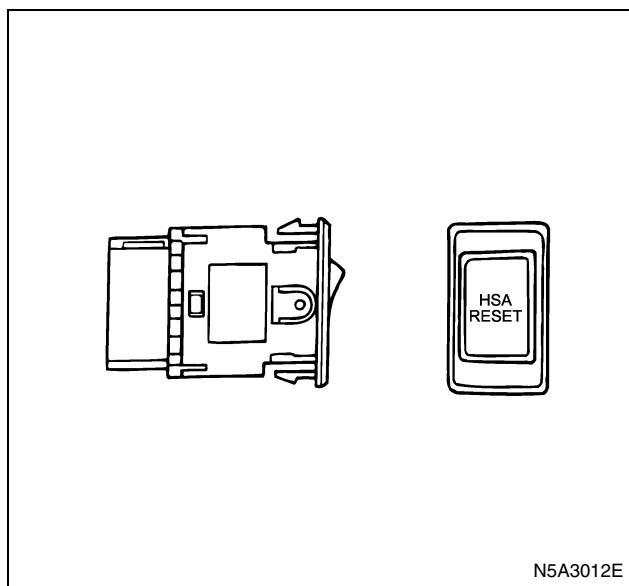
The HSA is released with this switch depressed.
(HSA off warning light comes on at this time.)

HSA Adjust Switch



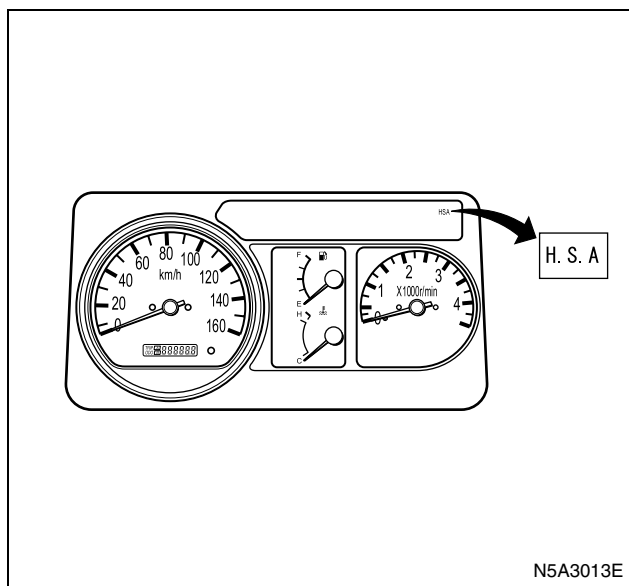
Used for fine adjustment of the clutch pedal position to release the HSA brake force when operating to start the vehicle. Also, used for initial adjustment.

HSA Reset Switch



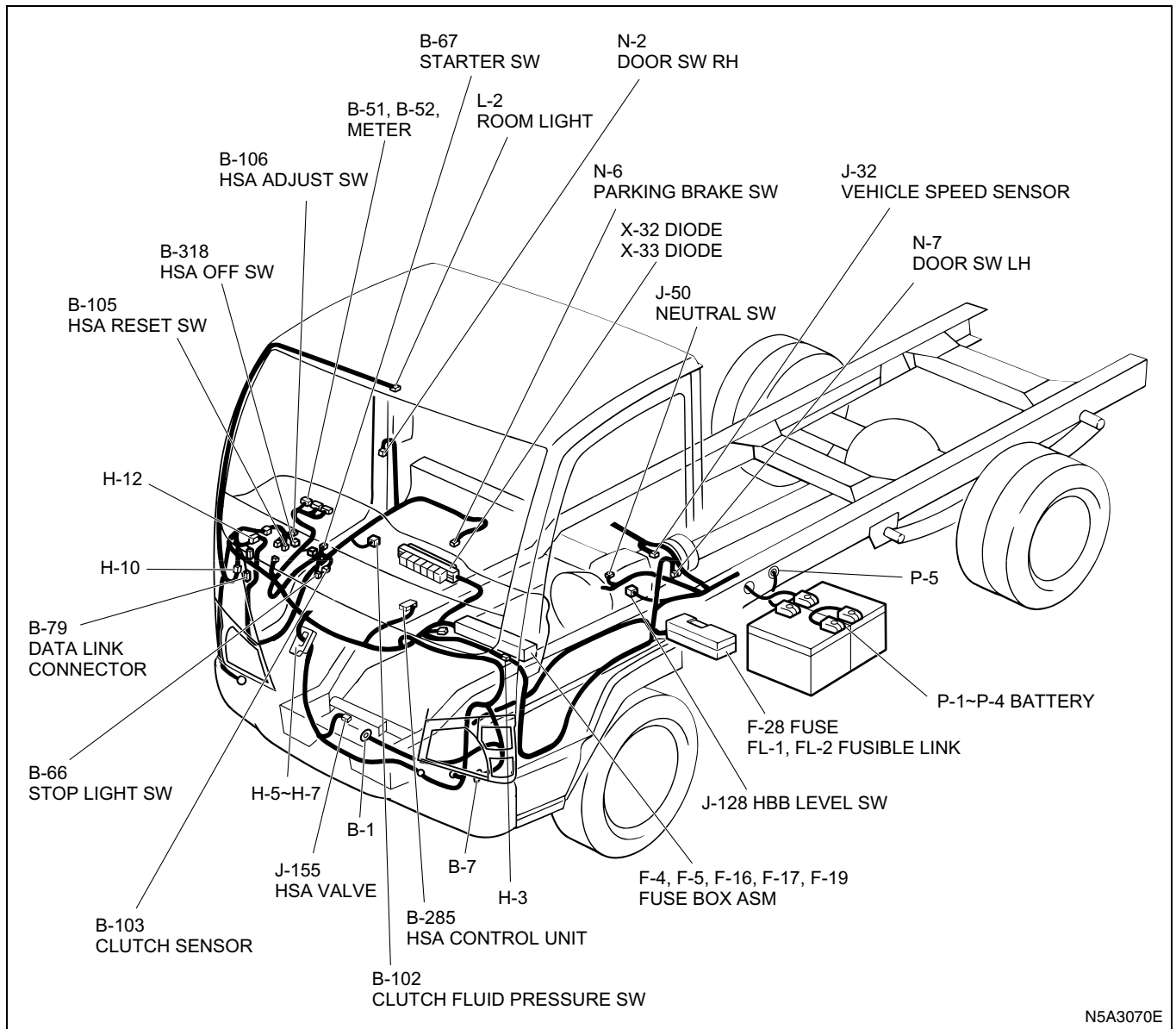
Used when the timing to release the HSA brake force is shifted considerably when operating to start the vehicle after clutch replacement or clutch play adjustment.

HSA Indicator Lamp

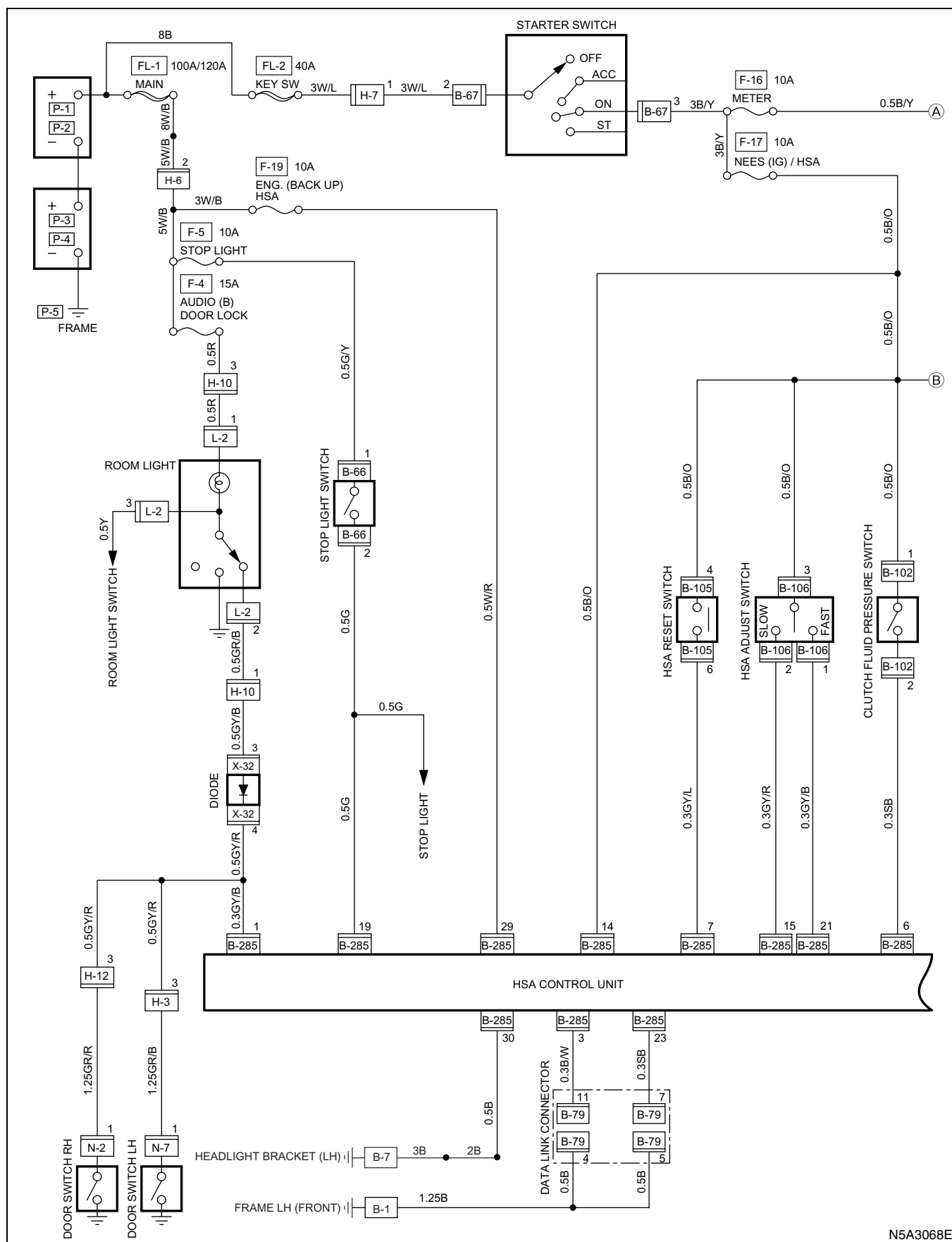


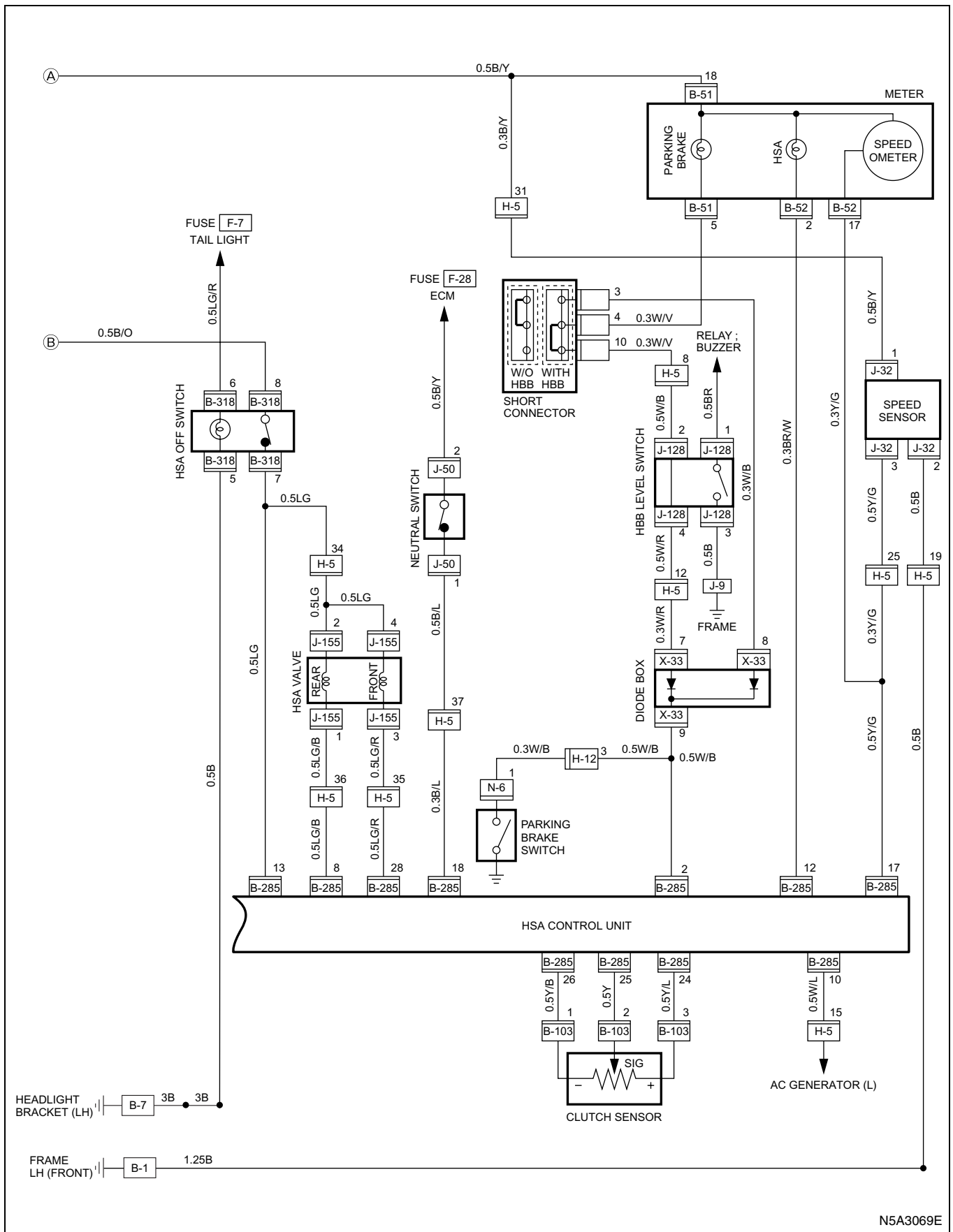
The HSA indicator lamp comes ON when HSA operating, and OFF when not operating. Also, it blinks synchronized with alarm. It blinks or illuminates when a malfunction occurs. Also used for while diagnosing.

Parts Location

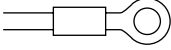
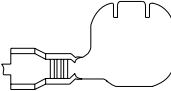
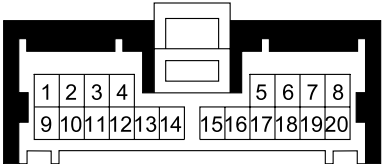
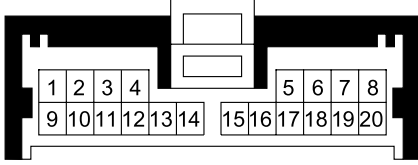
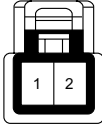
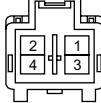
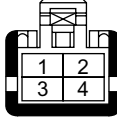
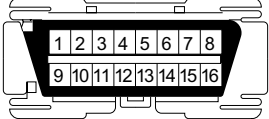


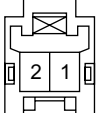
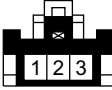
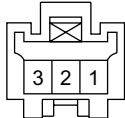
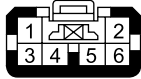
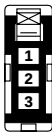
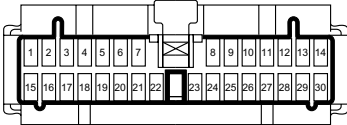
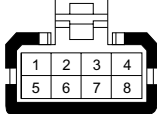
Circuit Diagram

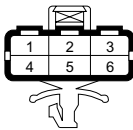
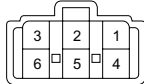
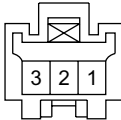
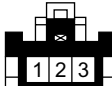
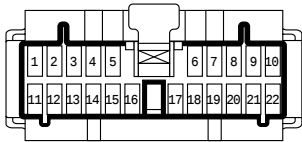
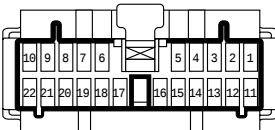
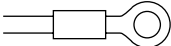


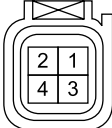
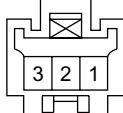
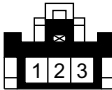
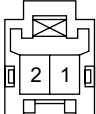


Connector List

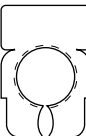
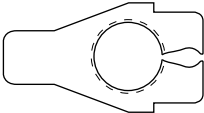
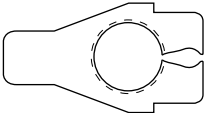
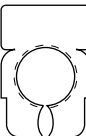
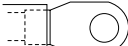
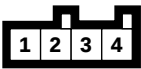
No.	Connector Face
B-1	 000-001
B-7	 000-012
B-51	 020-004
B-52	 020-005
B-66	 002-031
B-67	 004-002
B-67	 004-001
B-79	 016-005

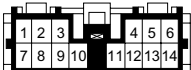
No.	Connector Face
B-102	 002-022
B-102	 002-023
B-103	 003-009
B-103	 003-010
B-105	 006-021
B-106	 003-014
B-285	 030-001
B-318	 008-005

No.	Connector Face
H-3	 006-014
H-3	 006-015
H-10	 003-010
H-10	 003-009
H-12	 022-001
H-12	 022-002
J-9	 000-001
J-32	 003-018

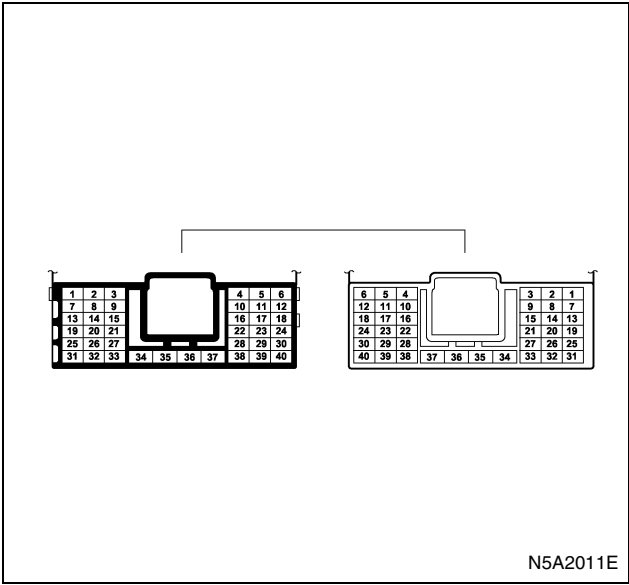
No.	Connector Face
J-50	 002-035
J-128	 004-018
J-155	 004-018
J-155	 004-011
L-2	 003-010
L-2	 003-009
N-2	 001-020
N-6	 002-023

5A5-14 HSA (HILL START AID)

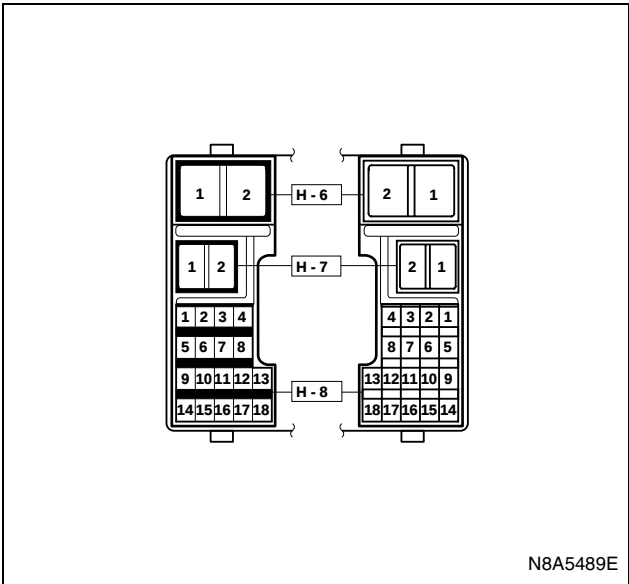
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N-7	 001-020
P-1	 000-004
P-2	 000-006
P-3	 000-006
P-4	 000-004
P-5	 000-002
X-32	 004-004

No.	Connector Face
X-33	 014-002

H-5



H-6, H-7



Procedure of Trouble Diagnosis

Description of Diagnosis

HSA diagnostic procedure is classified into two kinds; one is with diagnostic trouble codes indicated by blinking pattern of the HSA indicator lamp, and the other is from trouble symptoms. Refer to "Diagnostics with diagnostic trouble code" in the first case, and "Diagnostics with Phenomenon" in the latter case for diagnostic procedures.

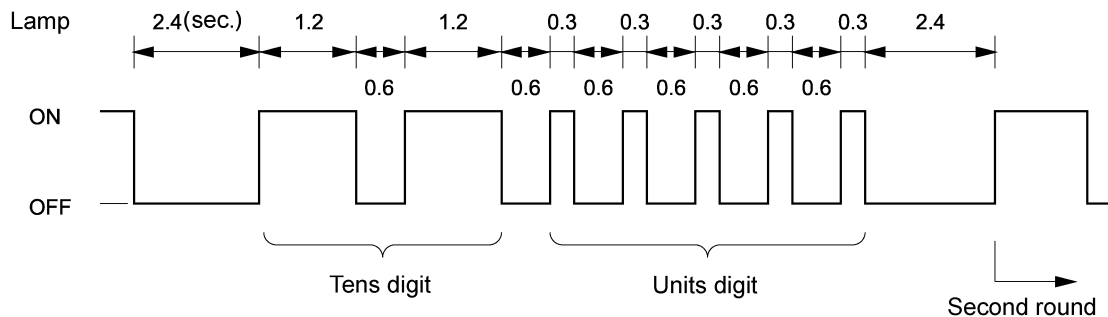
Self-diagnosis

The HSA can perform the self-diagnosis when a malfunction occurs in the system.

Perform the self-diagnosis in the following procedure. HSA indicates the result in the lamp blinking pattern and the buzzer.

1. Park the vehicle and apply the parking brake.
2. Press the adjust switch "FAST" or "SLOW" and hold it. Self-diagnosis display continues while the switch is pressed.
3. While pressing the switch, diagnostic trouble codes (DTC) are displayed with the HSA indicator lamp blinking pattern. Buzzer beeps in synchronization with lamp while displaying the trouble code.

Example of Code "25" indication

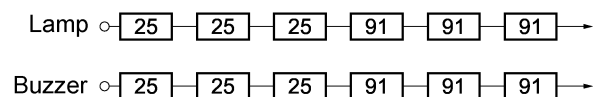


N5A3019E

Caution:

DTCs are displayed for three times each in turn. After taking a round, the DTCs are displayed in the same order repeatedly.

- When multiple number of trouble code stored; Code 25/Code 91



N5A3020E

Basic Diagnostic Procedure

Step	Action	Value	YES	NO
1	Turn the HSA off switch OFF. Does the HSA lamp blink?	—	Go to Step2	Go to Step3
2	Is there any trouble code?	—	Go to Step6, 7	Go to Step4, 5
3	Is the trouble reappeared?	—	Go to Step4, 5	Go to Step4, 5
4	What is the trouble symptom?	—	Go to Step5	Go to Step4
5	Has "Diagnostics with phenomenon" been performed?	—	Go to Step8	Go to Step5
6	Take notes all the trouble code appeared. What is the trouble code?	—	Go to Step7	Go to Step6
7	Has "Diagnostics with diagnostic trouble code" been performed?	—	Go to Step8	Go to Step7
8	Has the trouble part corrected?	—	End.	Go to Step8

Caution:

- Always perform the diagnosis in a predetermined sequence before performing the HSA system repair.
- After repair, make sure the HSA system operate/stop normally, and the trouble code does not appear again.
- Use the harness side (body side) connector to check for continuity (resistance) and voltage unless specified. Also, be especially careful not to damage the connector terminals with the tester etc.
- Check for continuity (resistance) with the starter switch OFF, and voltage with the starter switch ON.
- HSA control unit, HSA valve, clutch sensor, and speed sensor are non-disassembled parts; do not loosen the bolts and nuts.
- Do not directly apply external voltage to the HSA control unit, the clutch sensor, and the speed sensor. Use special care for electrostatic.

No.	Circuit to be checked	Power switch position	Tester scale/range	Terminal No.	Standard value	Remarks
1	Door switch circuit	—	DCV	1 (+) — 30 (—)	0 V	Door open *Note
		—	DCV	1 (+) — 30 (—)	Approx. 24 V	Door closed *Note
2	Stop lamp switch circuit	—	DCV	19 (+) — 30 (—)	0 V	Brake pedal depressed
		—	DCV	19 (+) — 30 (—)	Approx. 24 V	
3	Power supply circuit	—	DCV	29 (+) — 30 (—)	Approx. 24 V	
		OFF	DCV	14 (+) — 30 (—)	0 V	
		ON	DCV	14 (+) — 30 (—)	Approx. 24 V	
4	Clutch fluid pressure switch circuit	ON	DCV	6 (+) — 30 (—)	0 V	Clutch pedal depressed
		ON	DCV	6 (+) — 30 (—)	Approx. 24 V	
5	HSA reset switch circuit	ON	DCV	7 (+) — 30 (—)	0 V	Switch ON
		ON	DCV	7 (+) — 30 (—)	Approx. 24 V	
6	HSA adjust switch circuit	ON	DCV	15 (+) — 30 (—)	0 V	Switch "SLOW" side Switch "FAST" side
		ON	DCV	21 (+) — 30 (—)	0 V	
		ON	DCV	15 (+) — 30 (—)	Approx. 24 V	
		ON	DCV	21 (+) — 30 (—)	Approx. 24 V	
7	HSA off switch circuit	ON	DCV	13 (+) — 30 (—)	Approx. 24 V	Switch OFF
		ON	DCV	13 (+) — 30 (—)	0 V	Switch ON

No.	Circuit to be checked	Power switch position	Tester scale/range	Terminal No.	Standard value	Remarks
8	HSA valve circuit	OFF	Ω	8 — 28	111.6±10%	HSA off switch depressed, Control unit removed
9	Neutral switch circuit	ON	DCV	18 (+) — 30 (–)	0 V	Gear except in “Neutral”
		ON	DCV	18 (+) — 30 (–)	Approx. 24 V	Gear in “Neutral”
10	Parking brake switch circuit	ON	DCV	2 (+) — 30 (–)	Approx. 24 V	Parking brake released
		ON	DCV	2 (+) — 30 (–)	0 V	Parking brake applied
11	HSA indicator lamp circuit	ON	DCV	12 (+) — 30 (–)	Approx. 24 V	With indicator lamp OFF
		ON	DCV	12 (+) — 30 (–)	0 V	With indicator lamp ON
12	Clutch sensor circuit	OFF	Ω	24 — 26	2k Ω ±400 Ω	Clutch pedal operated
		OFF	Ω	25 — 26	400 Ω — 2.8k Ω	
		ON	DCV	24 (+) — 30 (–)	4.5 V or more	Clutch pedal released (clutch fully engaged)
		ON	DCV	25 (+) — 30 (–)	0.5V±0.2V	
13	Speed sensor circuit	ON	DCV	17 (+) — 30 (–)	2V or 14V	
14	Generator L terminal circuit	ON	DCV	10 (+) — 30 (–)	0 V	Engine stopping
		ON	DCV	10 (+) — 30 (–)	Approx. 24 V	Engine running

*Note: Position the room lamp switch at door interlock.

Function Check

HSA Adjustment

The HSA memorize the clutch meeting point to release the brake force. Therefore, releasing point must be adjusted after clutch replacement or clutch play adjustment.

Adjustment contains the “Initial adjustment” to memorize the clutch pedal position to release the HSA brake force, and the “Brake release adjustment” to fine adjustment of the clutch pedal position to release the brake for smooth starting of the vehicle.

Vehicle condition when adjustment is needed	Necessary adjustment
When the clutch-related parts are replaced, or clutch pedal play is adjusted. When the brake release timing is considerably fast/slow. When the brake drags at vehicle starting.	Initial adjustment
When the brake drags at vehicle starting. When the vehicle moves back at starting on a graded road. When the brake release timing does not match with the feeling.	Brake release adjustment (FAST) (SLOW) (FAST OR SLOW)

Initial Adjustment

1. Start the engine.
2. Make sure that the HSA off switch is not pressed (HSA in operation).
3. Apply the parking brake.
4. Disengage the clutch, move the gear position to 2nd, and press the HSA reset switch. (Buzzer (bleep*) continues at this time.)
5. Slowly release the clutch pedal, and press the “SLOW” or “FAST” of the HSA adjust switch when the engine speed goes down to 30 — 50 rpm lower than the idle speed. (Buzzer (bleep*) stops at this time.)

6. Move the gear back to neutral and slowly engage the clutch. In case when the buzzer goes off while in operation or when the HSA adjust switch is pressed by accident, retry the procedure from step 3.

Brake Release Adjustment

1. Start the engine.
2. Make sure that the HSA off switch is not pressed (HSA in operation).
3. Depress the brake, make sure the gear is in neutral, and release the parking brake lever.

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4. Check that the HSA indicator lamp is ON, disengage the clutch, and move the gear except in neutral position.
5. When the brake release is too slow that the brake drags at vehicle starting, press the "FAST" of the adjust switch.

When the brake release is too fast that the vehicle moves back at starting on a graded road, press the "SLOW" of the adjust switch.

Caution:

Each time pressing the switch, the buzzer bleeps. The number of times pressing the switch increase to the degree of change where to release the brake force at higher/lower clutch pedal position.

Number of times pressing the switch	
1 — 2 times	Fine adjustment "FAST" "SLOW"
2 — 3 times	When brake drags "FAST" When the vehicle on a graded road moves back. "SLOW"
3 — 5 times	When brake drags. "FAST" When the vehicle on a graded road moves back. "SLOW"

6. When the brake release timing does not match with the feeling, retry the procedure from step 3.
(Start over from the initial adjustment if messed up.)

List of Diagnostic Trouble Code

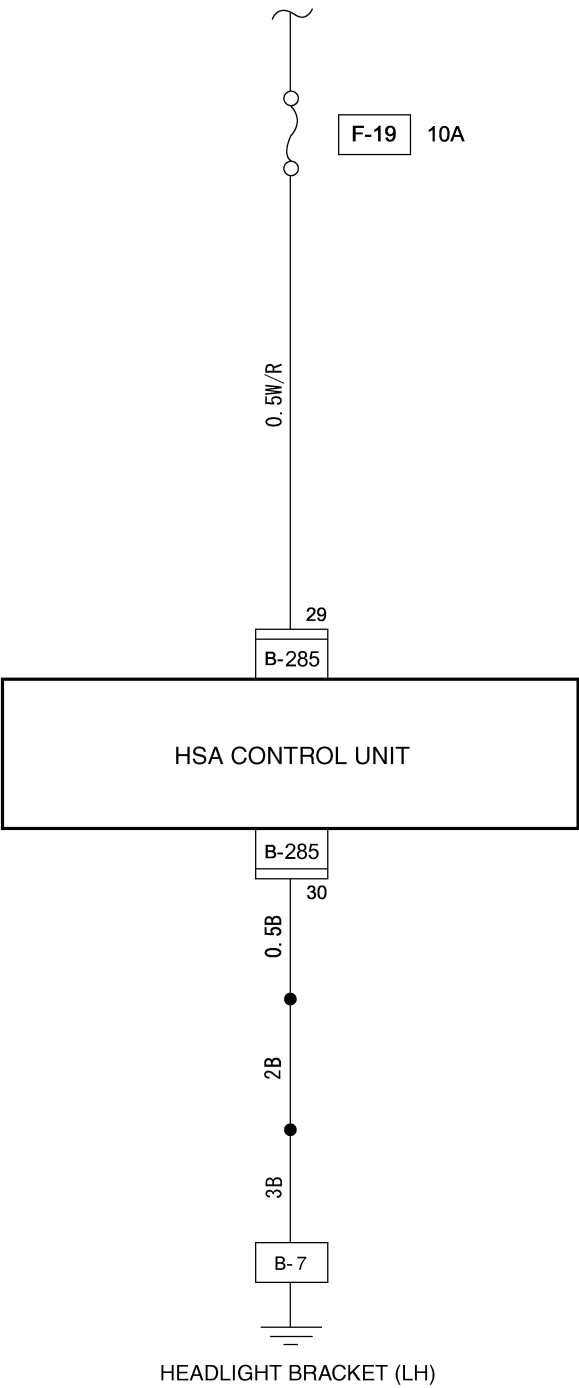
Code	Diagnosis item
01	Normal code
03	Back-up fuse open
08	Clutch sensor output voltage fault
19	Adjust switch "FAST" or "SLOW" is ON even when out of the adjustment limit, or adjust switch "FAST" or "SLOW" is ON when the vehicle speed 5 km/h (3 mph) or more.
25	Vehicle speed sensor output voltage fault
33	Control unit fault
36	Generator L terminal output does not exist even when the clutch is engaged and the gear is shifted with vehicle running.
86	Clutch fluid pressure switch does not turn ON with clutch pedal depressed, and it turns ON with the clutch engaged. (Clutch fluid pressure switch fault)
91	Solenoid valve drive signal and solenoid valve monitor conditions are erratic. (HSA valve fault)
Vehicle motion alarm	Detects vehicle speed 1.5km/h (1 mph) or more with solenoid valve operated and gear in neutral.
Longtime alarm	Solenoid valve has operated for more than 8 minutes continuously with brake not depressed.

About Diagnostic Trouble Code

The control unit clears the fault code when the fault part is judged to be normal.

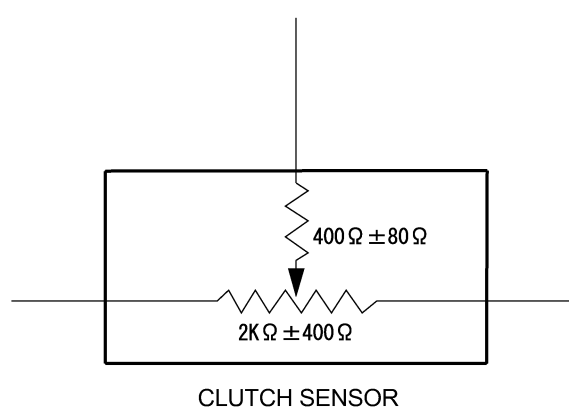
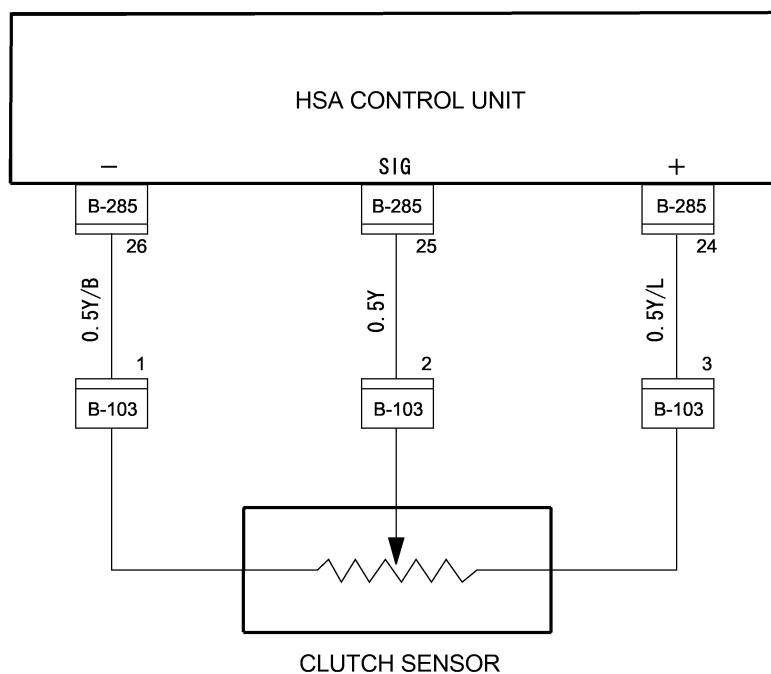
DTC 03 Back-up Fuse Open

Step	Action	Value	YES	NO
1	Check the fuse "F-19". Is the fuse "F-19" normal?	—	Go to Step2	Go to Step3
2	Check for battery voltage between the HSA control unit connector terminal 29 "B-285" and the body ground. Does it have the battery voltage?	20 V or more	Go to Step6	Go to Step7
3	Repair the short circuit in the circuit and the parts connected to the fuse "F-19". Is the repair completed?	—	Go to Step4	Go to Step3
4	Install a new fuse with the HSA control unit connector "B-285" disconnected. Is the fuse blown?	—	Go to Step2	Go to Step5
5	Connect the connector of the HSA control unit. Is the fuse blown?	—	Go to Step8	Go to Step10
6	Check the connector. Is the connector of the HSA control unit normal?	—	Go to Step8	Go to Step9
7	Repair the open circuit between the fuse "F-19" and 29 "B-285". Is the repair completed?	—	Go to Step10	Go to Step7
8	Replace the HSA control unit. Is the replacement completed?	—	Go to Step10	Go to Step8
9	Repair the connector. Is the repair completed?	—	Go to Step10	Go to Step9
10	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step10



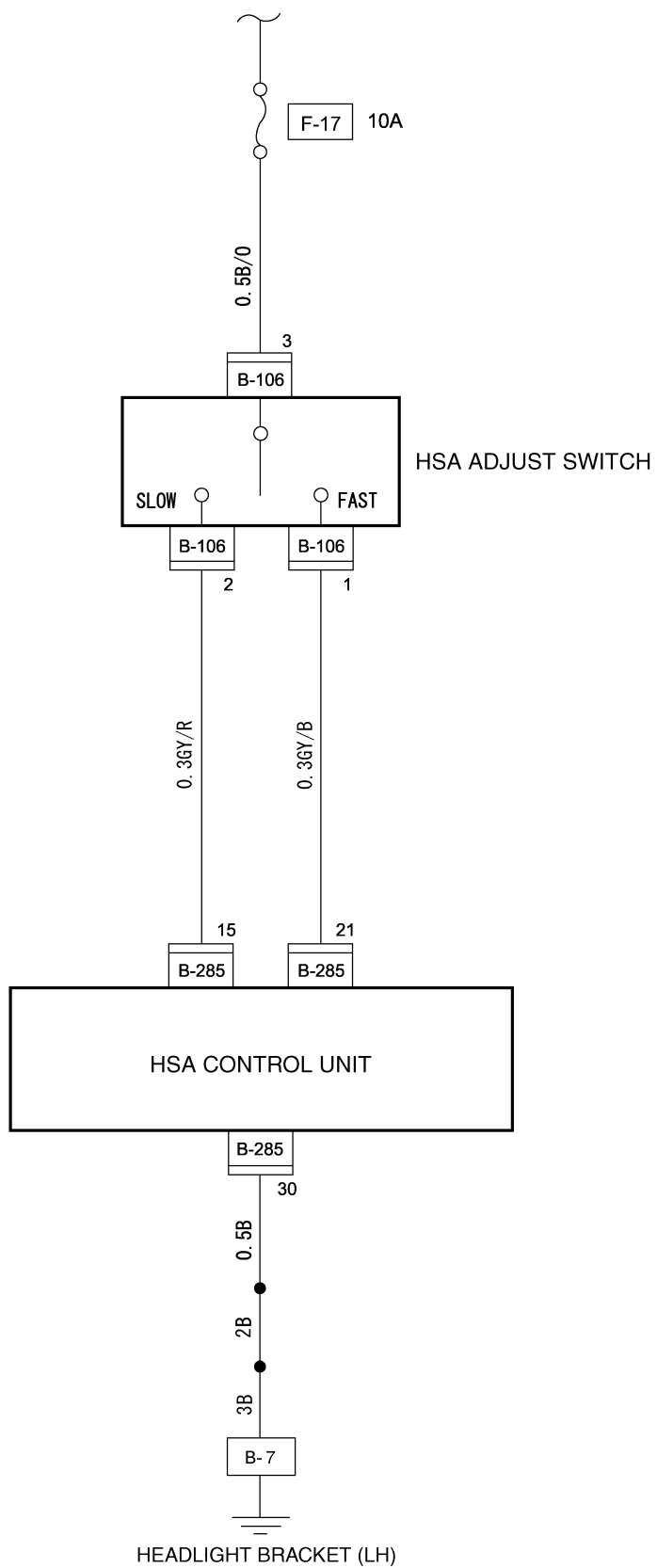
DTC 08 Clutch Sensor Output Voltage Fault

Step	Action	Value	YES	NO
1	Check the clutch sensor. Is the clutch sensor normal?	—	Go to Step2	Go to Step3
2	Measure the resistances between the HSA control unit and the clutch sensor connector terminals 24 “B-285” and 3 “B-103”, 25 “B-285” and 2 “B-103”, 26 “B-285” and 1 “B-103”. Are all the resistances less than 5Ω?	Less than 5Ω	Go to Step4	Go to Step5
3	Replace the clutch sensor. Is the replacement completed?	2kΩ±400	Go to Step4	Go to Step3
4	Replace the HSA control unit. Is the replacement completed?	—	Go to Step6	Go to Step4
5	Repair the open circuit of the circuit that has resistance of 5Ω or more. Is the repair completed?	—	Go to Step6	Go to Step5
6	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step6



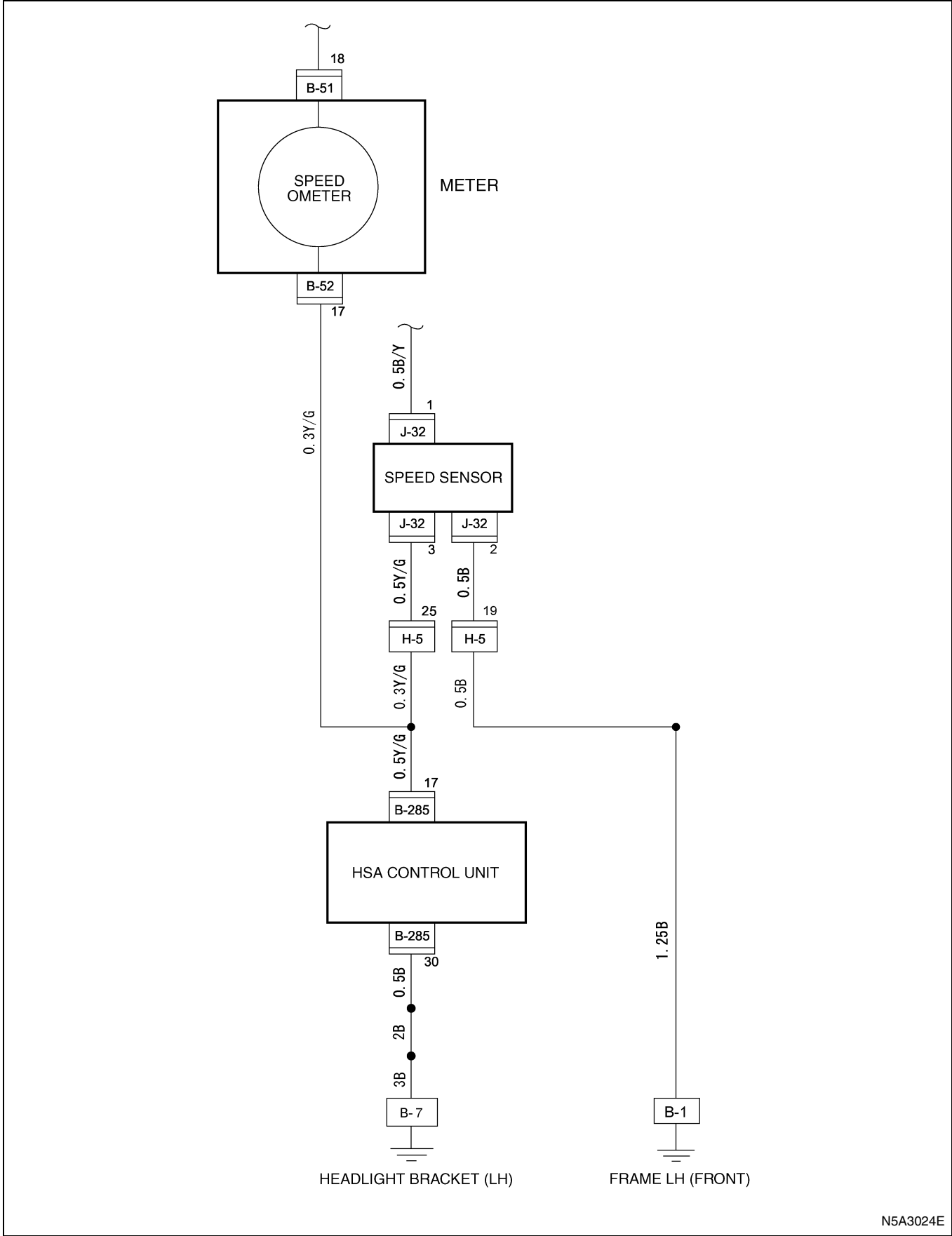
DTC 19 Adjust Switch “FAST” or “SLOW” Remain ON

Step	Action	Value	YES	NO
1	Is the battery voltage applied between the HSA adjust switch connector terminal 3 “B-106” and the body ground (connector disconnected)?	20 V or more	Go to Step2	Go to Step3
2	Is the continuity (resistance) of the HSA adjust switch normal?	—	Go to Step4	Go to Step5
3	Repair the open circuit between the fuse “F-17” and 3 “B-106”. Has the open circuit corrected?	—	Go to Step4	Go to Step3
4	Connect the connector of the HSA adjust switch. Measure the voltages between the HSA control unit connector terminals 15 “B-285”, 21 “B-285” and the body ground. Are the voltages 20V or more with adjust switch operating, and 0V not operating (with the HSA control unit connector disconnected)?	20V with switch operated 0V with not operated	Go to Step6	Go to Step7
5	Repair or replace the switch. Is the repair completed?	—	Go to Step6	Go to Step5
6	Replace the HSA control unit. Is the replacement completed?	—	Go to Step7	Go to Step6
7	Repair the open circuit between the HSA adjust switch connector terminals and the HSA control unit connector terminals 2 “B-106” — 15 “B-285”, 1 “B-106” — 21 “B-285”. Is the repair completed?	—	Go to Step8	Go to Step7
8	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step8



DTC 25 Vehicle Speed Sensor Output Voltage Fault

Step	Action	Value	YES	NO
1	Is there damage or improper connection in the HSA control unit and the speed sensor connector?	—	Go to Step2	Go to Step3
2	Measure the resistance between the speed sensor connector terminal 3 “J-32” and the control unit connector terminal 17 “B-285” (with the connector disconnected). Is the measurement completed?	Less than 5Ω	Go to Step4	Go to Step5
3	Repair the connector. Is the repair completed?	—	Go to Step4	Go to Step3
4	Measure the resistances between the speed sensor connector terminal 2 “J-32” and the body ground (with the connector disconnected). Is the measurement completed?	Less than 5Ω	Go to Step6	Go to Step7
5	Repair the open circuit, connector disconnection, etc. between 3 “J-32” and 17 “B-285” (with the connector disconnected). Is the repair completed?	—	Go to Step6	Go to Step5
6	Check for battery voltage between the speed sensor connector terminal 1 “J-32” and 2 “J-32” (with the connector disconnected). Is the measurement completed?	10V or more	Go to Step8	Go to Step9
7	Repair the open circuit, improper grounding, etc. between 2 “J-32” and “B-1” (with the connector disconnected). Is the repair completed?	—	Go to Step8	Go to Step7
8	Measure the sensor output voltage between the speed sensor connector terminal 3 “J-32” and 2 “J-32”. Is the measurement completed?	2V±1V — 14V+1V — 2V	Go to Step10	Go to Step11
9	Repair the open circuit, connector disconnection, etc. between 11 “B-53” (meter) and 1 “J-32” (with the connector disconnected). Is the repair completed?	—	Go to Step10	Go to Step9
10	Measure the resistance between the meter connector terminals 14 “B-52” and 11 “B-53”. Is the value 390 Ω± 5% (with the connector disconnected)?	390Ω±5%	Go to Step12	Go to Step13
11	Replace the speed sensor. Is the repair completed?	—	Go to Step14	Go to Step11
12	Replace the HSA control unit. Is the repair completed?	—	Go to Step14	Go to Step12
13	Replace the flexible substrate (printed circuit board) of the meter. Is the repair completed?	—	Go to Step14	Go to Step13
14	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step14

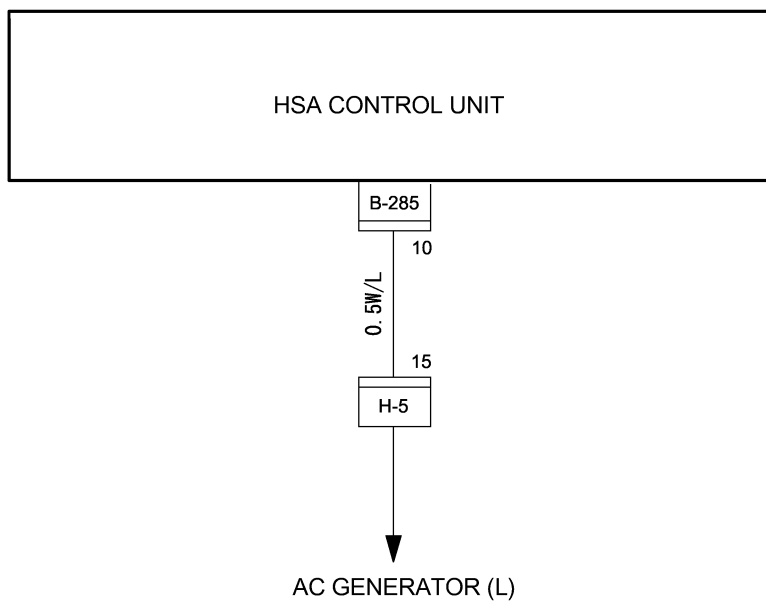


DTC 33 Control Unit Fault

Step	Action	Value	YES	NO
1	Disconnect the connector of the HSA control unit, and then reconnect it. When the trouble code "33" appears again, replace the HSA control unit. Is the repair completed?	—	Go to Step2	Go to Step1
2	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step2

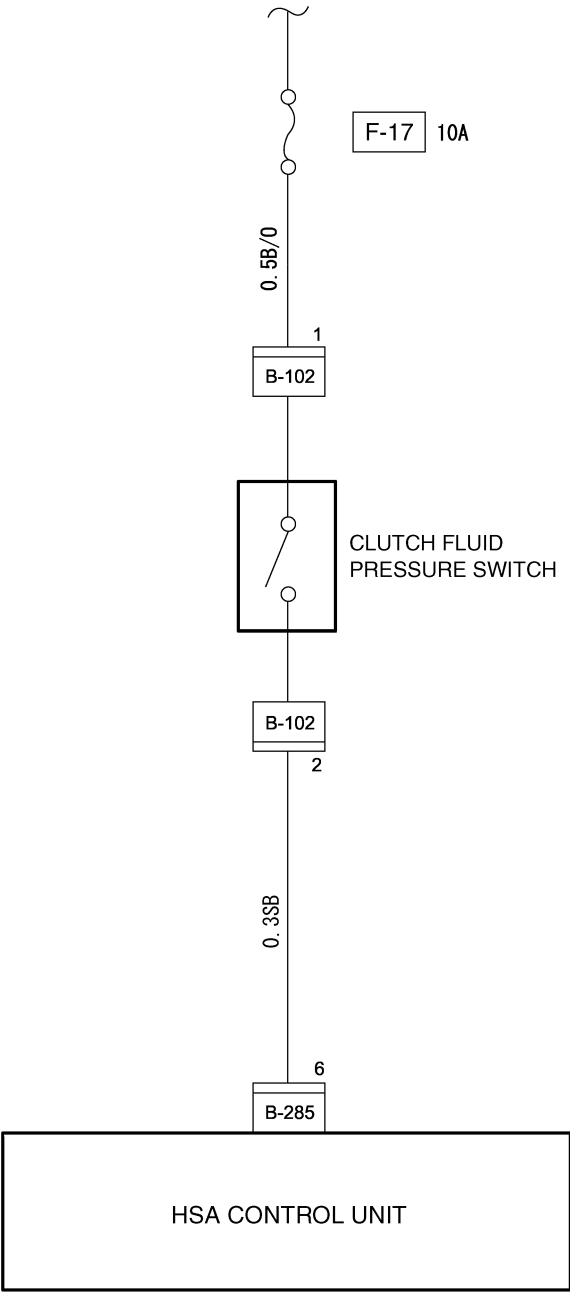
DTC 36 Generator Terminal Output Does not Exist With the Clutch Engaged and Vehicle Running

Step	Action	Value	YES	NO
1	Disconnect the HSA control unit connector "B-285", and start the engine. Is the voltage of approx. 24V applied between the connector terminal 10 "B-285" and the body ground?	Approx. 24V	Go to Step2	Go to Step3
2	Replace the HSA control unit. Is the repair completed?	—	Go to Step4	Go to Step2
3	Repair the open circuit between the AC generator "L" terminal and 10 "B-285". Is the repair completed?	—	Go to Step4	Go to Step3
4	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step4



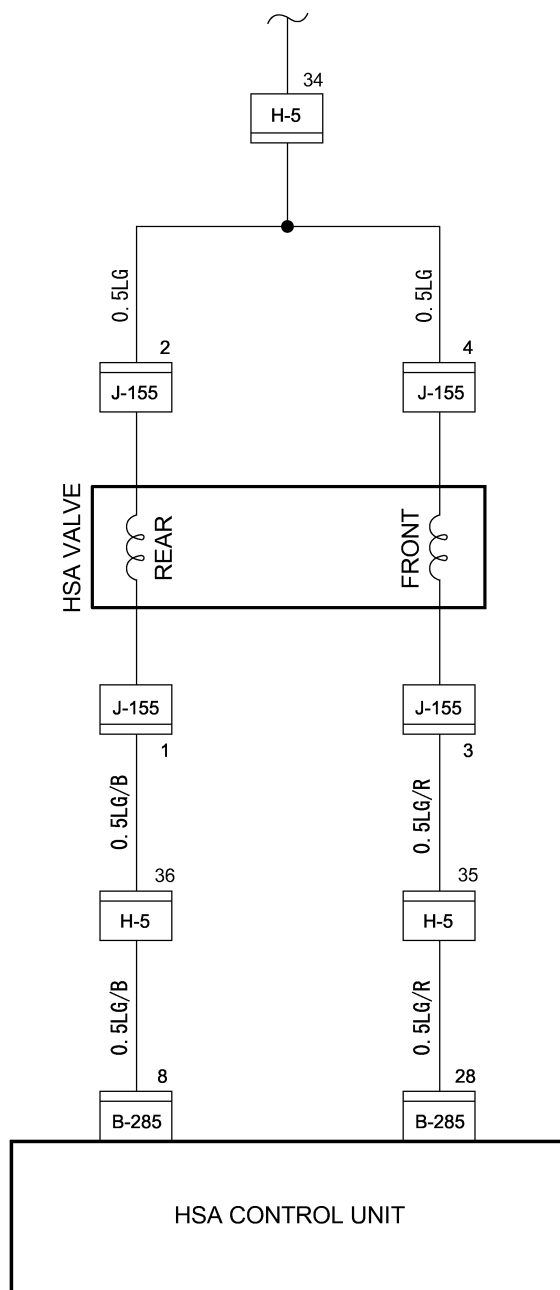
DTC 86 Clutch Switch Does not Turn ON With Clutch Pedal Depressed

Step	Action	Value	YES	NO
1	Is the clutch pedal play normal?	—	Go to Step2	Go to Step3
2	Is there improper connection or damage in the clutch fluid pressure switch connector?	—	Go to Step4	Go to Step5
3	Adjust the clutch play. Is the repair completed?	—	Go to Step4	Go to Step3
4	Measure the resistance of the clutch fluid pressure switch (at the switch side connector) (with the connector disconnected). Is the measurement completed?	5Ω or more with clutch pedal released, less than 5Ω with clutch pedal depressed	Go to Step6	Go to Step7
5	Repair the connector. Is the repair completed?	—	Go to Step6	Go to Step5
6	Measure the battery voltage between the clutch fluid pressure switch connector terminal 1 “B-102” and the body ground (with connector disconnected). Is the measurement completed?	20 V or more	Go to Step8	Go to Step9
7	Replace the clutch fluid pressure switch. Is the repair completed?	—	Go to Step8	Go to Step7
8	Measure the resistance between the clutch fluid pressure switch connector terminal 2 “B-102” and the HSA control unit connector terminal 6 “B-285” (with connector disconnected). Is the measurement completed?	Less than 5Ω	Go to Step10	Go to Step11
9	Repair the open circuit between the fuse “F-17” and 1 “B-102”. Is the repair completed?	—	Go to Step10	Go to Step9
10	Connect all the connectors, turn the starter switch to ON, engage the clutch then disengage the clutch for 5 seconds or more, and engage the clutch for 1 minute. Does the trouble code “86” appear again?	—	Go to Step12	Go to Step13
11	Repair the wire between 2 “B-102” and 6 “B-285”. Is the repair completed?	—	Go to Step13	Go to Step11
12	Replace the HSA control unit. Is the repair completed?	—	Go to Step13	Go to Step12
13	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step13



DTC 91 Solenoid Valve Drive Signal and Solenoid Valve Monitor Conditions Are Erratic

Step	Action	Value	YES	NO
1	Is the connector of the HSA valve normal?	—	Go to Step2	Go to Step3
2	Disconnect the connector of HSA valve. Measure the resistance in HSA valve. Is the measurement completed?	$55.8\Omega \pm 10\%$	Go to Step4	Go to Step5
3	Repair the connector. Is the repair completed?	—	Go to Step4	Go to Step3
4	Measure the resistances between the HSA valve connector terminals and the HSA control unit connector terminals 3 “J-155” and 28 “B-285” (front side), and 1 “J-155” and 8 “B-285” (rear side) (with the connector disconnected). Is the measurement completed?	Less than 5Ω	Go to Step6	Go to Step7
5	Replace the HSA valve. Is the repair completed?	—	Go to Step6	Go to Step5
6	Is the battery voltage applied between the HSA valve connector terminals 2 “J-155”, 4 “J-155” and the body ground (with connector disconnected)?	20 V or more	Go to Step8	Go to Step9
7	Repair the open circuit of the circuit that has resistance of 5Ω or more. Is the repair completed?	—	Go to Step8	Go to Step7
8	Replace the HSA control unit. Is the repair completed?	—	Go to Step10	Go to Step8
9	Repair the open circuit of the circuit that has resistance of less than 20V. Is the repair completed?	—	Go to Step10	Go to Step9
10	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step10



List of Trouble Phenomenon

For the troubles which are not appeared as trouble code, interview the customer and the test run the vehicle

to check for trouble symptom, and perform the diagnosis according the symptom.

Trouble symptom	Possible cause															Action to be taken
	Door switch	Parking brake switch	Clutch fluid pressure switch	HSA reset switch	HSA valve, pipe	ACG	HSA lamp (including meter)	HSA off switch	HSA adjust switch	Speed sensor	Neutral switch	Stop lamp switch	Clutch sensor	Back-up lamp switch	Diode box	
HSA does not operate.		○			○	○					○	○				Refer to the trouble symptom.
HSA does not release though the HSA off switch is depressed.					○			○								Refer to the trouble symptom.
HSA does not release though the vehicle is operated to start. (HSA indicator lamp remains ON.)											○		○			Refer to the trouble symptom.
HSA does not release though the parking brake is applied.		○														Refer to the trouble symptom.
HSA indicator lamp does not come on. (HSA does not operate.)		○			○	○					○	○				Refer to the trouble symptom.
HSA indicator lamp does not come on. (HSA does operate.)							○									Refer to the trouble symptom.
HSA indicator lamp does not go off. (HSA released.)							○									Refer to the trouble symptom.
Buzzer does not sound though the door is opened while HSA operating.	○														○	Refer to the trouble symptom.
HSA indicator lamp blinks abnormally and does not output the trouble code during self-diagnosis.		○					○									Refer to the trouble symptom.
Buzzer beeps continuously during self-diagnosis (trouble code output impossible)									○					○		Refer to the trouble symptom.

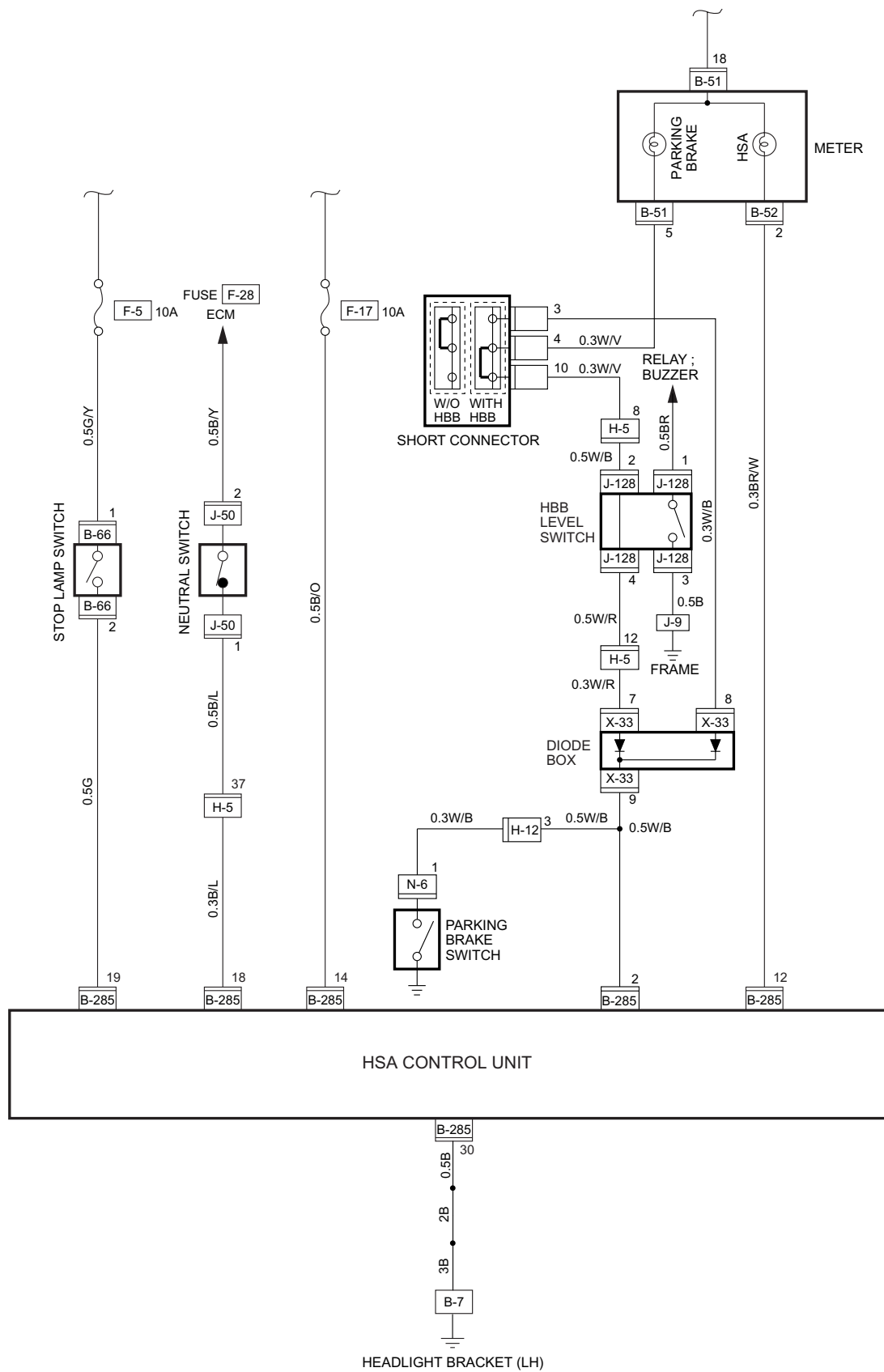
Symptom: HSA Does not Operate

Step	Action	Value	YES	NO
1	Does the HSA indicator lamp not illuminate?	—	Go to Step2	Go to Step3
2	Is the fuse “F-17” normal?	—	Go to Step4	Go to Step5
3	Check the HSA valve and the pipe, and repair or replace. Is the repair completed?	—	Go to Step5	Go to Step3
4	Measure the battery voltage between the HSA control unit connector terminal 14 “B-285” and the body ground (with connector disconnected). Is the measurement completed?	20 V or more	Go to Step6	Go to Step7
5	Repair the short circuit in the circuit and the parts (clutch fluid pressure switch, HSA valve, etc.) connected to the fuse “F-17”, and then replace the fuse. Is the repair completed?	—	Go to Step6	Go to Step5
6	Measure the resistance between the HSA control unit connector terminal 30 “B-285” and the body ground (with connector disconnected). Is the measurement completed?	Less than 5Ω	Go to Step8	Go to Step9
7	Repair the open circuit between the fuse “F-17” and 14 “B-285”. Is the repair completed?	—	Go to Step8	Go to Step7
8	Measure the battery voltage between the HSA control unit connector terminal 2 “B-285” and the body ground (with connector disconnected) with the parking brake not applied. Is the measurement completed?	20 V or more	Go to Step10	Go to Step11
9	Repair the open circuit or improper grounding between 30 “B-285” and the ground terminal “B-7” (in front of the frame LH) (with the connector disconnected). Is the repair completed?	—	Go to Step10	Go to Step9
10	Is the fuse “F-5” normal?	—	Go to Step12	Go to Step13
11	Is the continuity (resistance) of the parking brake switch normal?	—	Go to Step28	Go to Step29
12	Measure the continuity (resistance) in the switch side terminal of the stop lamp switch. Does the resistance exist when the brake pedal depressed, and no resistance when the brake pedal released (with the connector disconnected)?	—	Go to Step14	Go to Step15
13	Check and repair the short circuit in the stop lamp circuit, and then replace the fuse. Is the repair completed?	—	Go to Step14	Go to Step13
14	Measure the battery voltage between the stop lamp switch connector terminal 1 “B-66” and the body ground (with connector disconnected). Is the measurement completed?	20V or more	Go to Step16	Go to Step17

Step	Action	Value	YES	NO
15	Repair or replace the stop lamp switch. Is the repair completed?	—	Go to Step15	Go to Step15
16	Connect the connector of the stop lamp switch. Measure the battery voltage between the HSA control unit connector terminal 19 "B-285" and the body ground (with connector disconnected) with the brake pedal depressed. Is the measurement completed?	20V or more	Go to Step18	Go to Step19
17	Repair the open circuit between the fuse "F-5" and 1 "B-66" (stop lamp switch). Is the repair completed?	—	Go to Step18	Go to Step17
18	Is the continuity (resistance) of neutral switch normal?	—	Go to Step20	Go to Step21
19	Repair the open circuit between 2 "B-66" and 19 "B-285". Is the repair completed?	—	Go to Step20	Go to Step19
20	Measure the battery voltage between the neutral switch connector terminal 2 "J-50" and the body ground (with the connector disconnected). Is the measurement completed?	20V or more	Go to Step22	Go to Step23
21	Repair or replace the neutral switch. Is the repair completed?	—	Go to Step22	Go to Step21
22	Connect the connector "J-50" of the neutral switch. Measure the battery voltage between the HSA control unit connector terminal 18 "B-285" and the body ground (with connector disconnected) with the gear in neutral. Is the measurement completed?	20V or more with gear in neutral, 0V with gear except in neutral	Go to Step24	Go to Step25
23	Repair the open circuit between the fuse "F-28" and 2 "J-50". Is the repair completed?	—	Go to Step24	Go to Step23
24	Measure the voltage between the HSA control unit connector terminal 10 "B-285" and the body ground (connector disconnected) with engine running. Is the measurement completed?	Approx. 24 V	Go to Step26	Go to Step27
25	Repair the open circuit between 1 "J-50" and 18 "B-285". Is the repair completed?	—	Go to Step26	Go to Step25
26	Replace the HSA control unit. Is the repair completed?	—	Go to Step28	Go to Step29
27	Repair the open circuit between the AC generator "L" terminal and 10 "B-285". Is the repair completed?	—	Go to Step30	Go to Step27
28	Replace the HSA control unit. Is the repair completed?	—	Go to Step30	Go to Step28

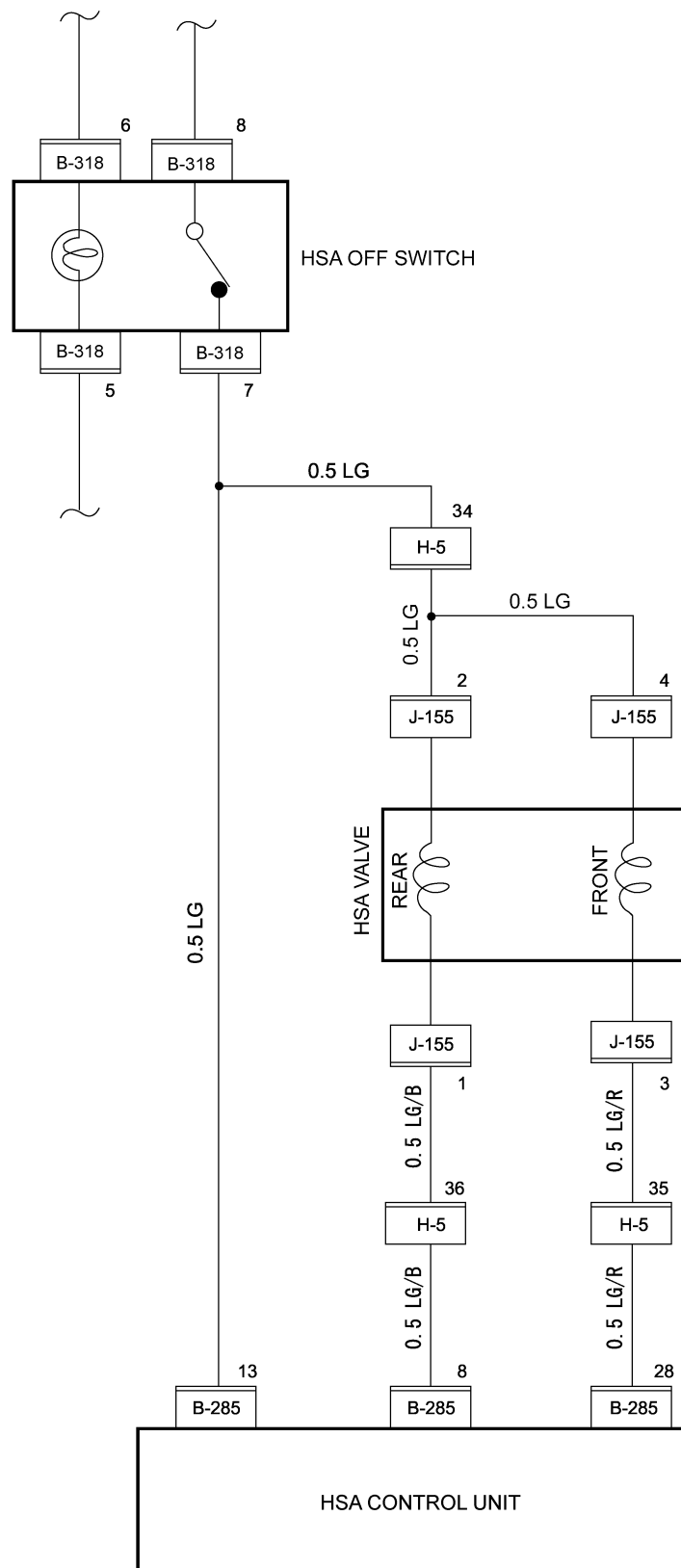
5A5-36 HSA (HILL START AID)

Step	Action	Value	YES	NO
29	Repair or replace the parking brake switch. Is the repair completed?	—	Go to Step30	Go to Step29
30	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step30



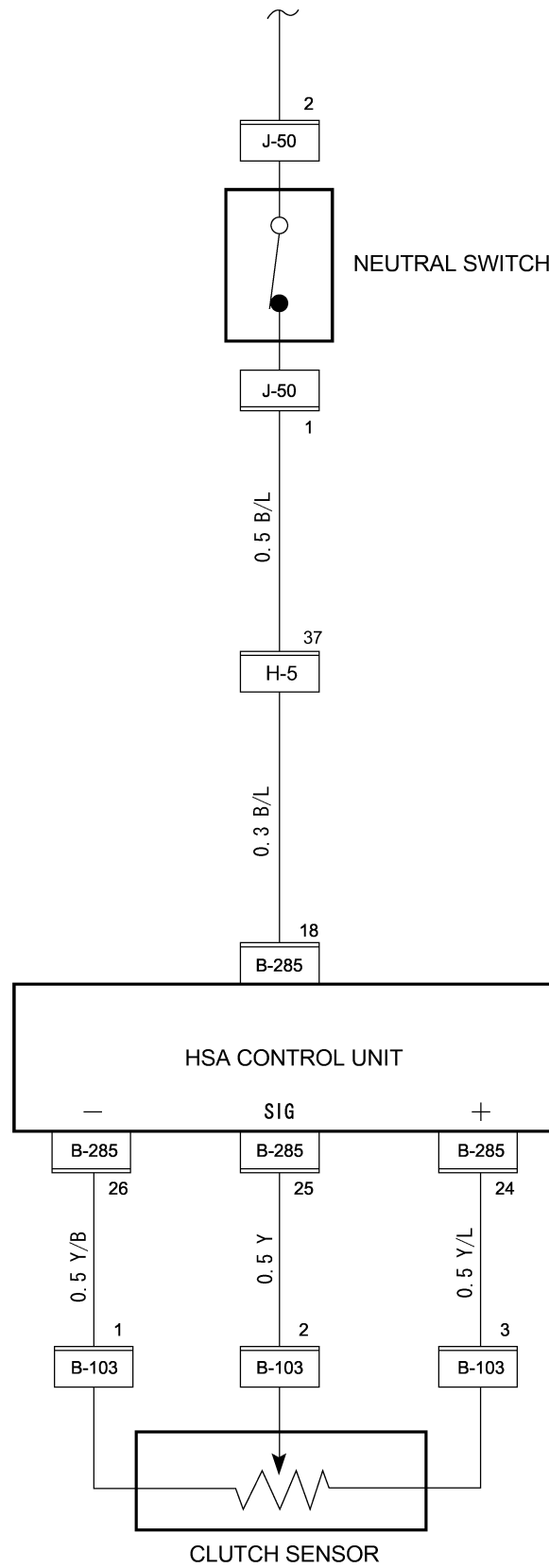
Symptom: HSA Does not Release Though the HSA Off Switch Is Depressed

Step	Action	Value	YES	NO
1	Is the continuity (resistance) of the HSA off switch normal?	—	Go to Step2	Go to Step3
2	Replace the HSA valve. Is the repair completed?	—	Go to Step4	Go to Step2
3	Replace the HSA off switch. Is the repair completed?	—	Go to Step4	Go to Step3
4	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step4



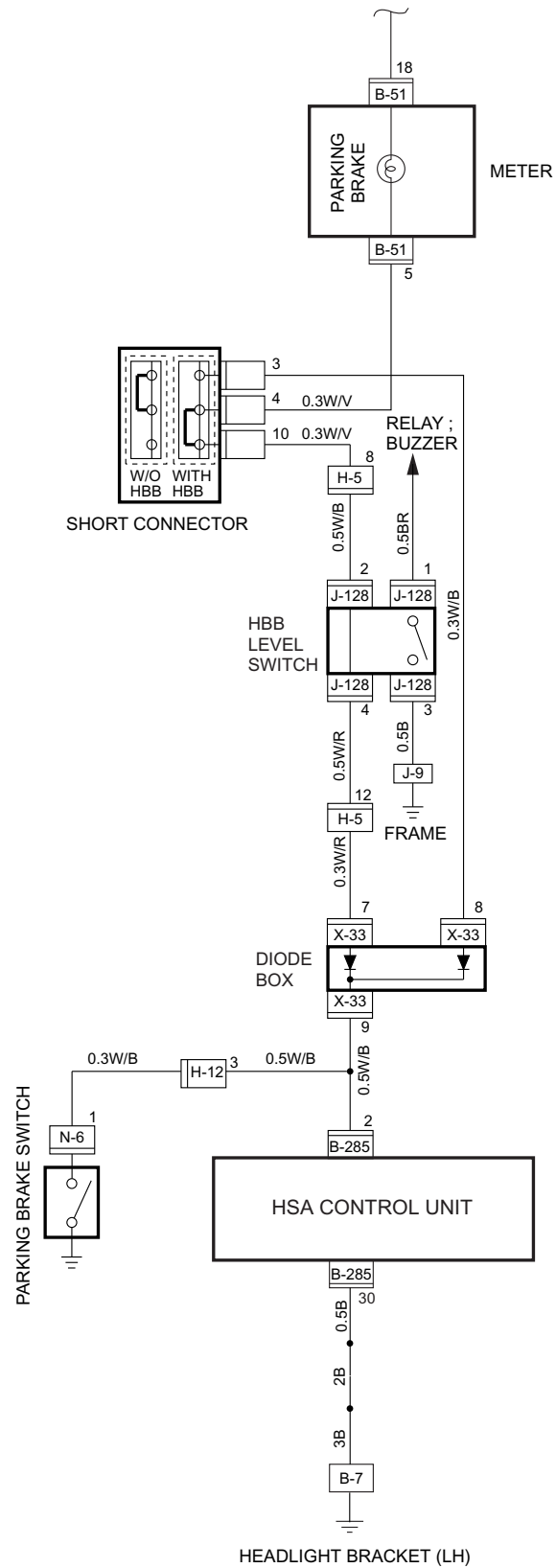
Symptom: HSA Does not Release Though the Vehicle Is Operated to Start (HSA Indicator Lamp Remains ON)

Step	Action	Value	YES	NO
1	Is the continuity (resistance) of neutral switch normal?	—	Go to Step2	Go to Step3
2	Is the clutch sensor properly installed (check the trouble code "08")?	—	Go to Step4	Go to Step5
3	Repair or replace the neutral switch. Is the repair completed?	—	Go to Step4	Go to Step3
4	Is the resistance between the clutch sensor terminals within the specified range?	—	Go to Step6	Go to Step7
5	After installation, perform the initial adjustment. Is the repair completed?	—	Go to Step8	Go to Step8
6	Replace the HSA control unit. Is the repair completed?	—	Go to Step8	Go to Step6
7	Replace the clutch sensor. Is the repair completed?	—	Go to Step8	Go to Step7
8	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step8



Symptom: HSA Does not Release Though the Parking Brake Is Applied

Step	Action	Value	YES	NO
1	Is the continuity (resistance) of the parking brake switch normal?	—	Go to Step2	Go to Step3
2	Measure the battery voltage between the parking brake switch connector terminal 1 “N-6” and the body ground (with the connector disconnected). Is the measurement completed?	20V or more	Go to Step4	Go to Step5
3	Repair or replace the parking brake switch. Is the repair completed?	—	Go to Step4	Go to Step3
4	Measure the battery voltage between the HSA control unit connector terminal 2 “B-285” and the body ground (with connector disconnected). Is the measurement completed?	20V or more	Go to Step6	Go to Step7
5	Repair the improper connection or open circuit between 5 “B-51” (meter) and 1 “N-6”. Is the repair completed?	—	Go to Step7	Go to Step5
6	Replace the HSA control unit. Is the repair completed?	—	Go to Step8	Go to Step6
7	Repair the open circuit between 5 “B-51” (meter) and 2 “B-285”. Is the repair completed?	—	Go to Step8	Go to Step7
8	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step8



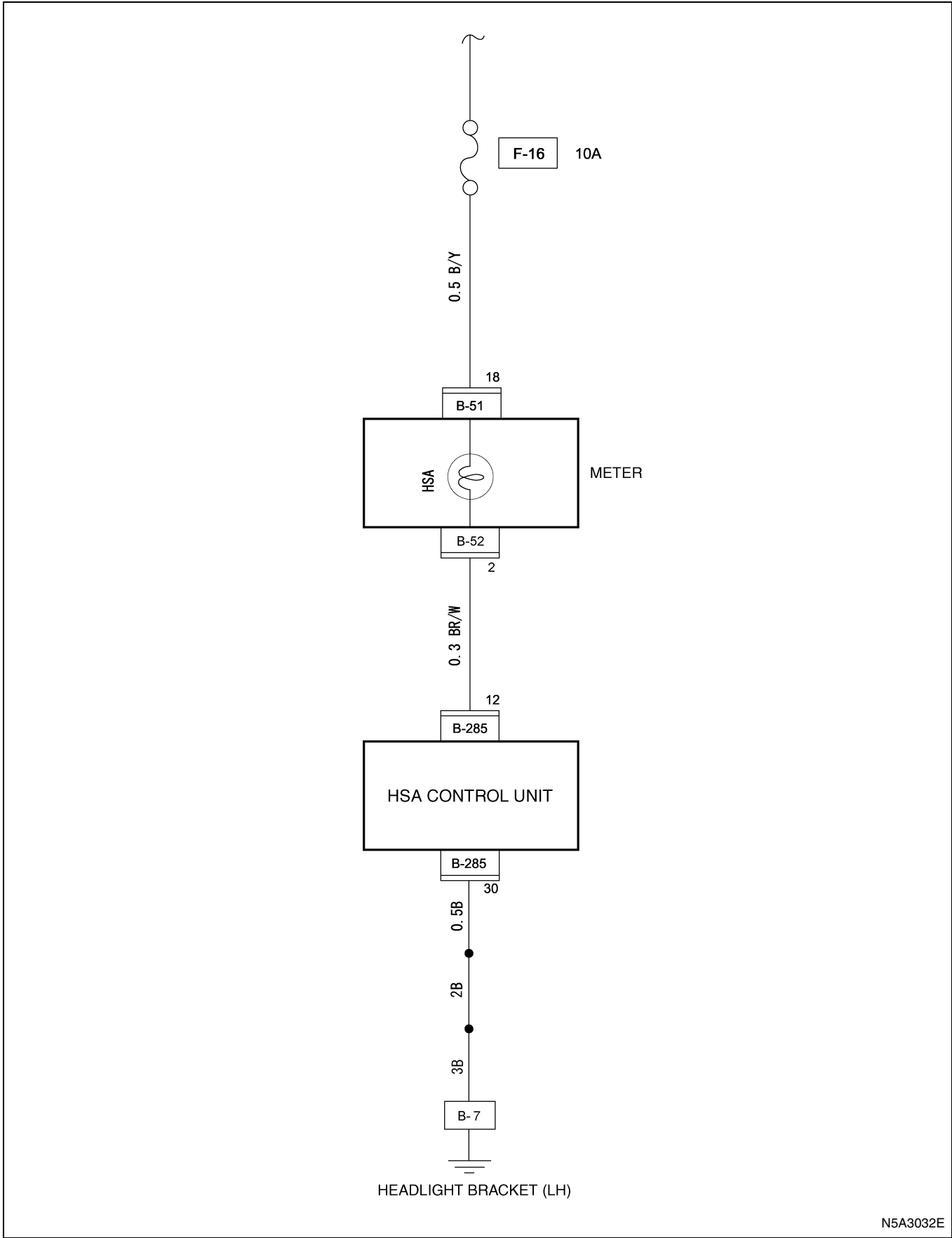
5A5-44 HSA (HILL START AID)

Symptom: HSA Indicator Lamp Does not Come On (HSA Does not Operate)

Step	Action	Value	YES	NO
1	Refer to "Symptom: HSA does not operate". Is this step completed?	—	—	Go to Step1

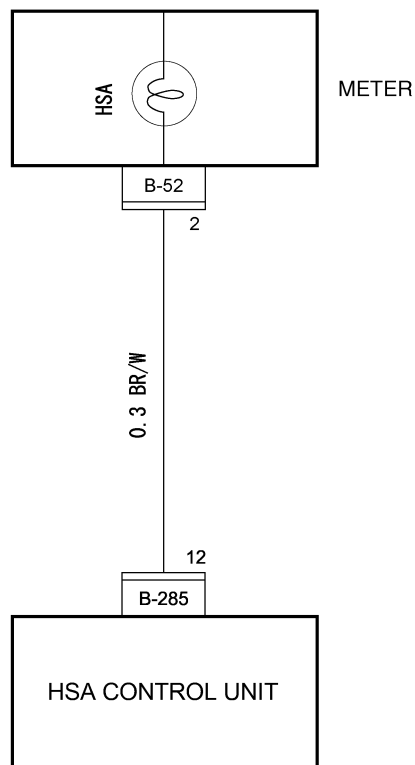
Symptom: HSA Indicator Lamp Does not Come On (HSA Does Operate)

Step	Action	Value	YES	NO
1	Does the meter operate normally?	—	Go to Step2	Go to Step3
2	Is the HSA indicator lamp normal?	—	Go to Step6	Go to Step7
3	Is the fuse “F-16” normal?	—	Go to Step4	Go to Step5
4	Repair the open circuit between the fuse “F-16” and 18 “B-51” (meter). Is the repair completed?	—	Go to Step5	Go to Step4
5	Replace the fuse. Is the repair completed?	—	Go to Step6	Go to Step5
6	Measure the battery voltage between the HSA control unit connector terminal 12 “B-285” and the body ground (with connector disconnected). Is the measurement completed?	20V or more	Go to Step8	Go to Step9
7	Replace the bulb. Is the repair completed?	—	Go to Step8	Go to Step7
8	Replace the HSA control unit. Is the repair completed?	—	Go to Step10	Go to Step8
9	Repair the open circuit between 2 “B-52” (meter) and 12 “B-285”. Is the repair completed?	—	Go to Step10	Go to Step9
10	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step10



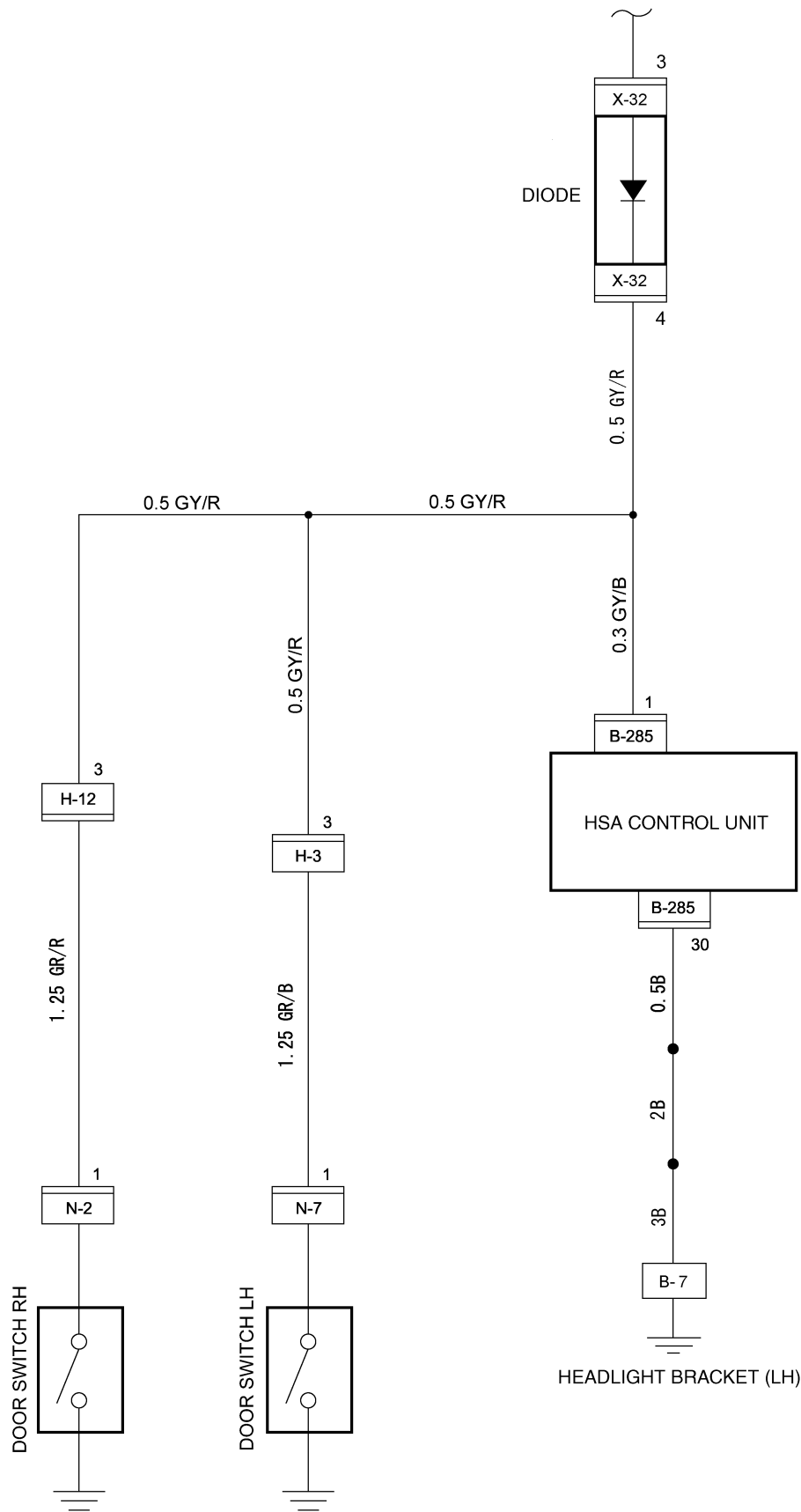
Symptom: HSA Indicator Lamp Does not Go Off (HSA Released)

Step	Action	Value	YES	NO
1	Does the HSA indicator lamp go off, when the connector of the HSA control unit is disconnected?	—	Go to Step2	Go to Step3
2	Replace the HSA control unit. Is the repair completed?	—	Go to Step4	Go to Step2
3	Repair the short circuit in the harness between 2 “B-52” (meter) and 12 “B-285” (control unit). Is the repair completed?	—	Go to Step4	Go to Step3
4	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	—



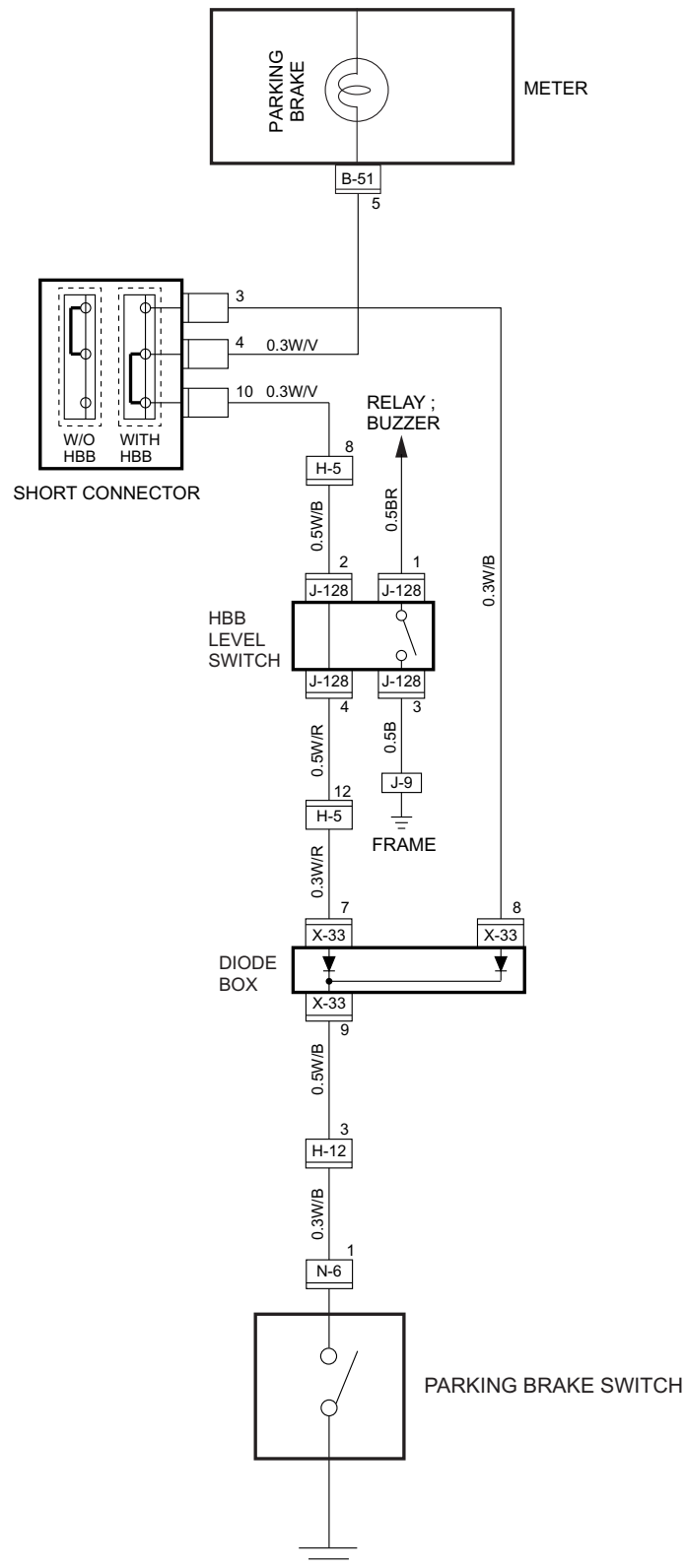
Symptom: Buzzer Does not Operate Though the Door Is Opened While HSA Operating

Step	Action	Value	YES	NO
1	Is the continuity (resistance) of the diode box normal?	—	Go to Step2	Go to Step3
2	Measure the voltage between the HSA control unit connector terminal 1 “B-285” and the body ground (connector disconnected) when the door opened. Also, measure the battery voltage when the door closed. Are the measurements completed?	Body ground voltage less than 3V Battery voltage 20 V or more	Go to Step4	Go to Step5
3	Replace the diode box. Is the repair completed?	—	Go to Step4	Go to Step3
4	Replace the HSA control unit. Is the repair completed?	—	Go to Step8	Go to Step4
5	Is the continuity (resistance) of the door switch normal?	—	Go to Step6	Go to Step6
6	Check the door switch circuit for open circuit, and the connector for improper connection. Is the repair completed?	—	Go to Step8	Go to Step6
7	Repair or replace the door switch. Is the repair completed?	—	Go to Step8	Go to Step6
8	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step8



Symptom: HSA Indicator Lamp Blinks Abnormally and Does not Output the Trouble Cord During Self-diagnosis

Step	Action	Value	YES	NO
1	Does the parking brake lamp (meter) come on when the parking brake is applied?	—	Go to Step2	Go to Step3
2	Replace the HSA control unit. Is the repair completed?	—	Go to Step6	Go to Step2
3	Is the continuity (resistance) of the parking brake switch normal?	—	Go to Step4	Go to Step5
4	Repair the improper connection or open circuit between 5 “B-51” (meter) and 1 “N-6”. Is the repair completed?	—	Go to Step6	Go to Step4
5	Repair or replace the parking brake switch. Is the repair completed?	—	Go to Step6	Go to Step5
6	After HSA repair, make sure no trouble is found during self-diagnosis. Is this step completed?	—	—	Go to Step6



Symptom: Buzzer Beeps Continuously During Self-diagnosis (Trouble Code Output Impossible)

Step	Action	Value	YES	NO
1	Refer to “Symptom: HSA indicator lamp blinks abnormally”. Is this step completed?	—	—	Go to Step1

Symptom: HSA Warning Lamp Had Blinked or Buzzer Had Beeped In the Past (Currently the System Is Normal)

Symptom	Possible cause	Action to be taken
HSA warning lamp had blinked in the past.	The warning lamp blinked when the back-up fuse "F-19" was disconnected.	The warning lamp blinked when the adjusted value was extremely off the point, or when the clutch play adjustment was not completed.
	This indicates no malfunction.	Properly adjust according to the adjustment procedure.
	The warning lamp blinked when the HSA had been operated for 7 — 8 minutes.	Longtime alarm. This indicates no malfunction.
	The warning lamp blinked when the vehicle had moved while the HSA operating. (The warning lamp blinked when the vehicle was started with brake dragged, or when the vehicle moved back because the brake pedal was depressed insufficiently.)	Vehicle motion alarm This indicates no malfunction.
	The warning lamp blinked when the adjust switch "FAST" or "SLOW" was depressed while the vehicle running.	Fault in adjust switch (code 19) was detected but not a malfunction. (When turning the adjust switch to OFF, the diagnosis stops and the lamp goes off.)
HSA warning buzzer had beeped in the past.	The warning buzzer beeped when the HSA had been operated for 7 — 8 minutes.	Longtime alarm. This indicates no malfunction.
	The warning buzzer beeped when the vehicle had moved while the HSA operating. (The warning lamp blinked when the vehicle was started with brake dragged, or when the vehicle moved back because the brake pedal was depressed insufficiently.)	Vehicle motion alarm. This indicates no malfunction.
	The warning buzzer beeped when the starter switch was turned ON with the back-up fuse "F-19" disconnected.	It was caused by the control unit being reset, and not a malfunction.

Caution:

The trouble code 03 is displayed when diagnosing with the fuse removed.

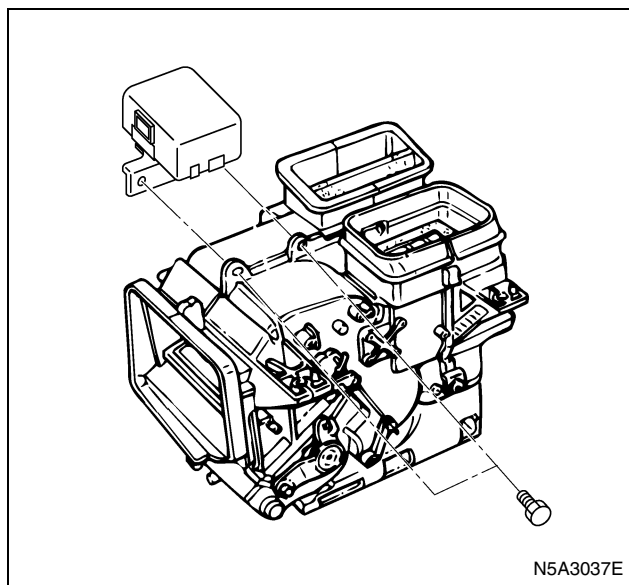
The warning lamp blinks when the HSA release adjustment is set-up fully to the FAST side or SLOW side with the HSA adjust switch depressed. With this condition, the vehicle will move back when starting or brake dragging. To prevent this, correctly adjust it.

Never operate the adjust switch while driving. Otherwise, it will lower the driver performance.

HSA Control Unit

Removal

1. Remove the instrument panel ASM.
 - Refer to the item regarding the instrument panel in the chapter 2 body section.
2. Remove the ventilation duct.
3. Remove the HSA control unit.
 - Remove the two installing bolts and nuts.Disconnect the two connectors.



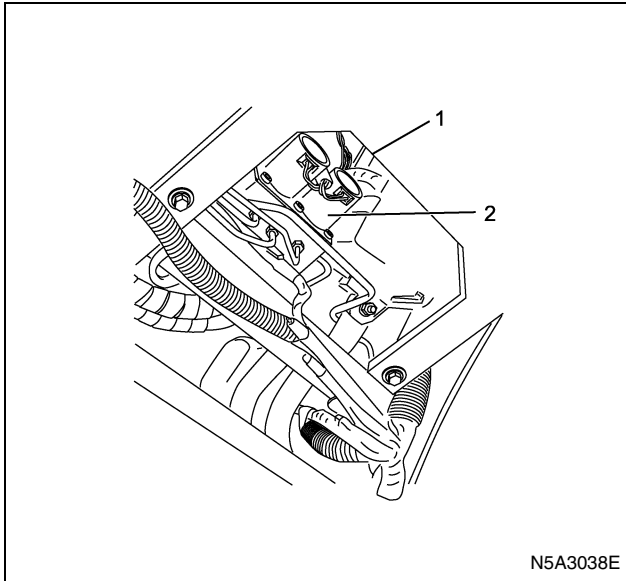
Installation

Install in the reverse order of removal.

HSA Valve

Removal

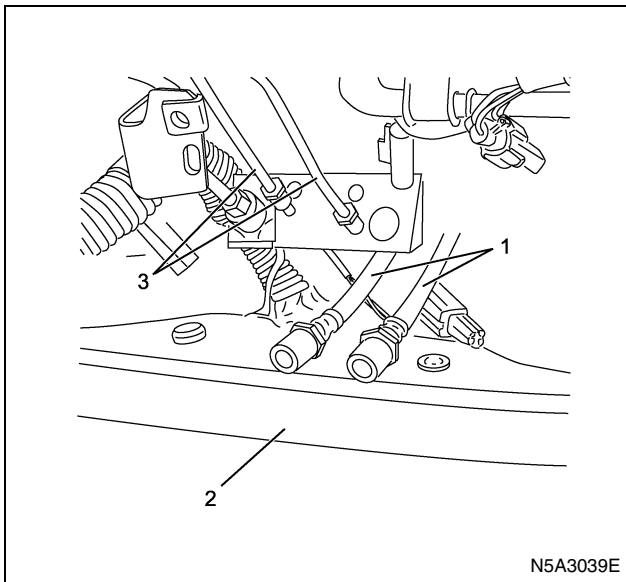
1. Remove the undercover.



Legend

1. Undercover
2. HSA valve

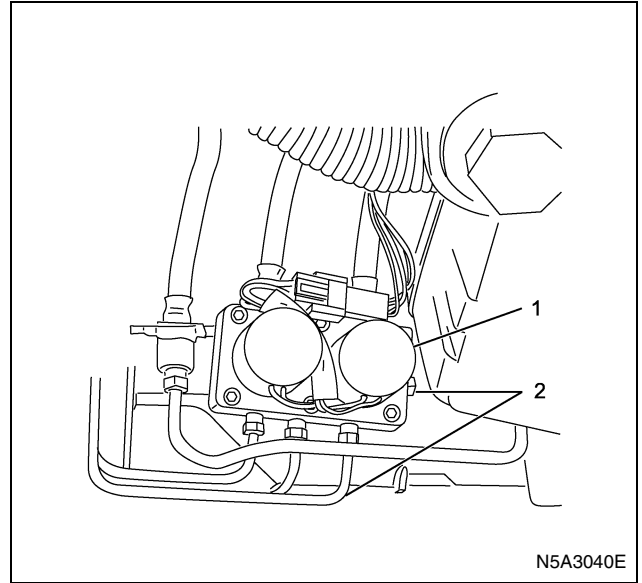
2. Disconnect the HSA valve connector.



Legend

1. Hose
2. Bumper
3. Brake pipe

3. Remove the radiator grille.
4. Disconnect the connection of the brake pipe and the hose.



Legend

1. HSA valve
2. Pipe

5. Disconnect the pipe.
6. Disconnect the HSA valve.

Installation

1. Install the two installing bolts of HSA valve.

Tighten:

Bolts to 21 N·m (2.1 kg·m/15.5 lb·ft)

2. Install the brake pipe.

Tighten:

Brake pipe to 16 N·m (1.6 kg·m/11.8 lb·ft)

3. Connect the connector.

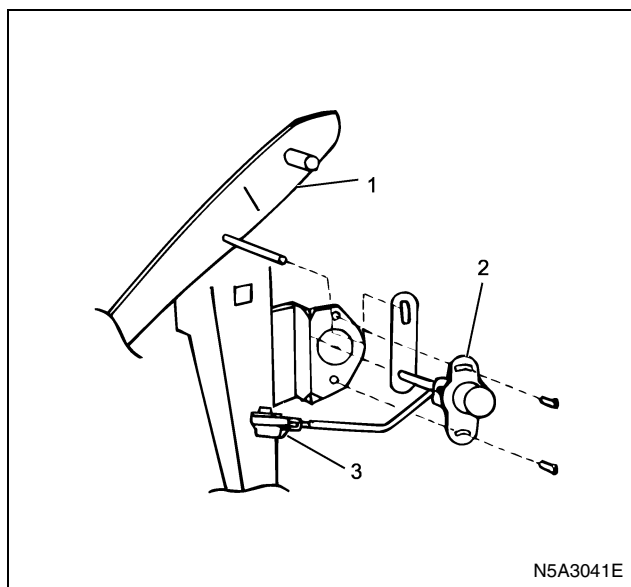
Caution:

- Make sure there is no dust or foreign materials in and around the pipe connection.
- Be careful to correctly connect the pipe.
- After installation, bleed air from the brake system completely.
- Be sure to use fresh specified brake fluid.

Clutch Sensor

Removal

1. Disconnect the connection of the connector.
2. Remove the two installing bolts of the clutch sensor.



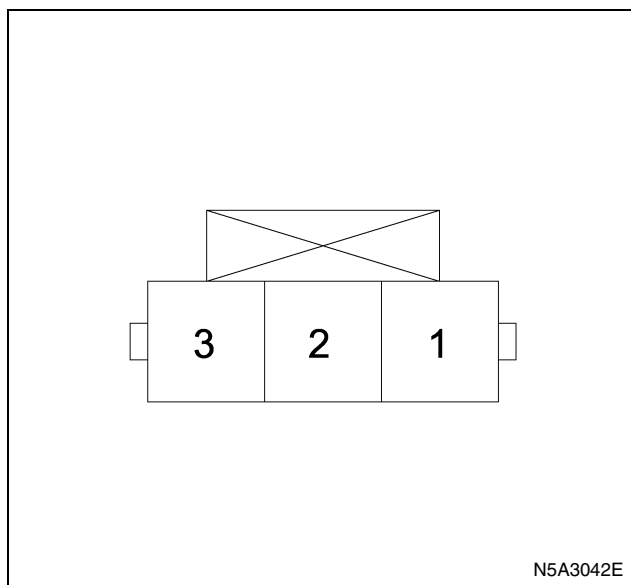
Legend

1. Clutch pedal
2. Clutch sensor
3. Connector

Inspection

Disconnect the connector of the clutch sensor, and measure the resistance between terminals.

1. Terminal 1 — Terminal 3 — $2k\Omega \pm 400\Omega$
2. Clutch pedal operated
 - Terminal 2 — Terminal 1 — Approx. 400Ω — $2.8k\Omega$

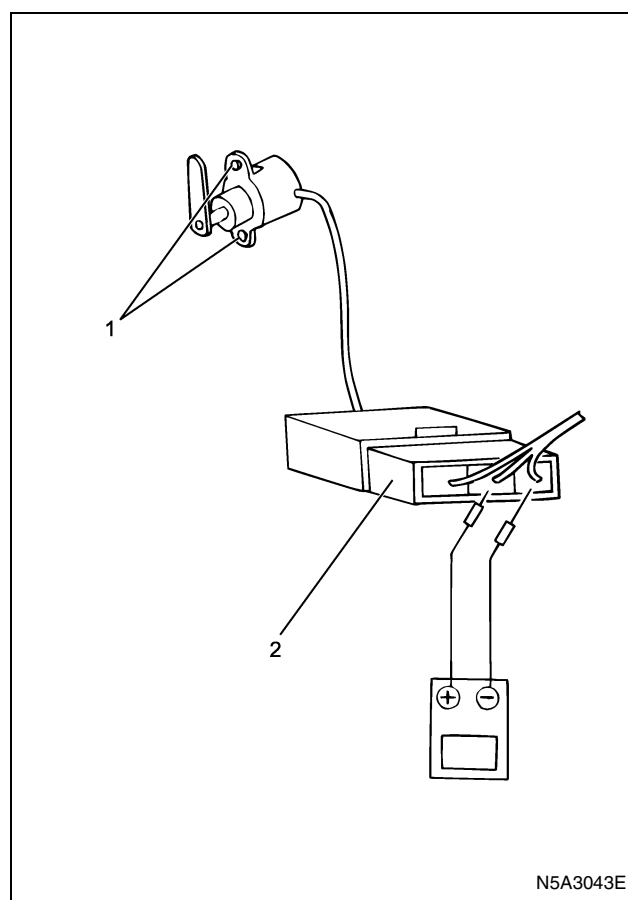


Adjustment

1. Loosen the installing bolts of the clutch sensor.
2. Turn the starter switch to "ON".
3. Adjust the sensor installing position so that the voltage between the clutch sensor connector terminals 2 (SIG) — terminal 1 (GND) is $0.5 \pm 0.2V$ when the clutch pedal is fully released (clutch fully engaged).

Caution:

- Adjust with the clutch sensor connector connected to the body side harness connector.
- For voltage check, connect the tester from the backside of the body side connector.



Legend

1. Clutch sensor installing nut
2. Body side connector

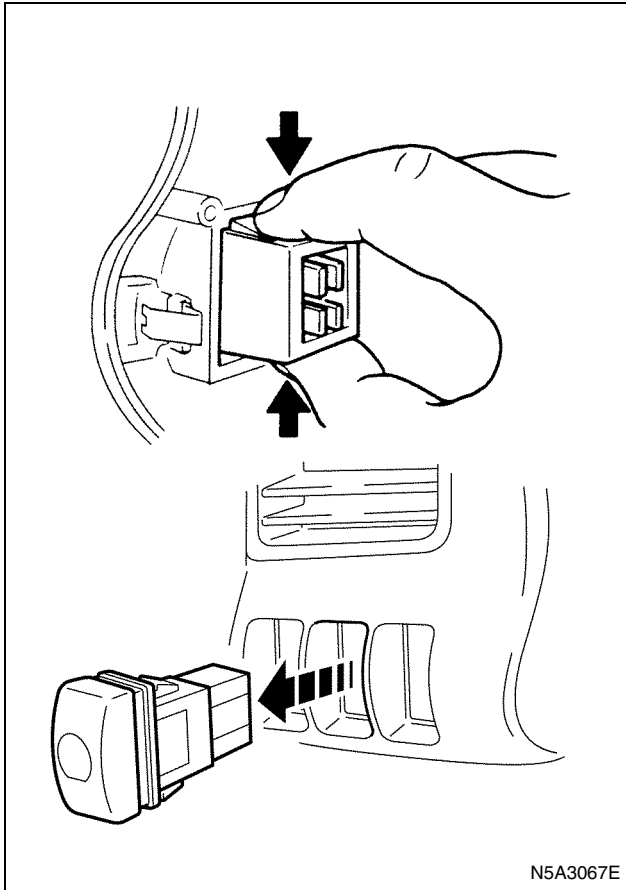
HSA Off Switch

Removal

1. Remove the meter cluster.
2. Disconnect the connector.
3. Remove the HSA off switch.
 - Remove it while pressing the switch claw from the backside of the instrument panel.

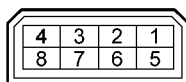
Installation

Install in the reverse order of removal.



Inspection

Check for continuity between the switch terminals.



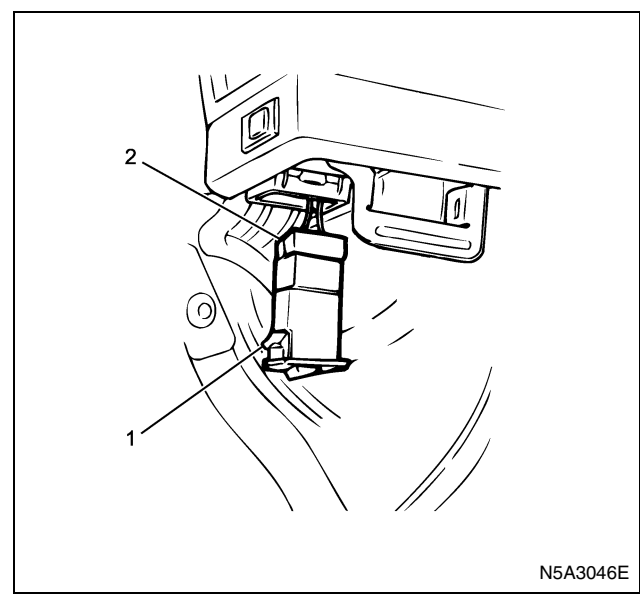
SW position	Terminal No.	7	8
O N			
OFF		○	○

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HSA Reset Switch

Removal

- 1. Remove the HSA reset switch.
- 2. Disconnect the connector.

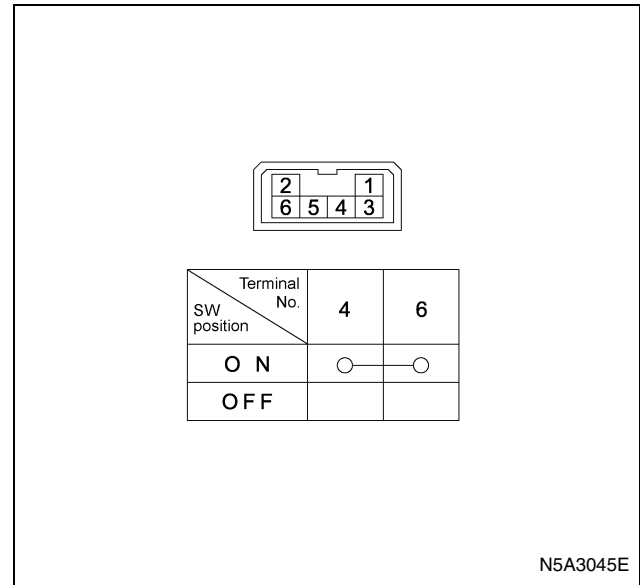


Legend

- 1. HSA reset switch
- 2. Connector

Inspection

Check for continuity between the switch terminals.



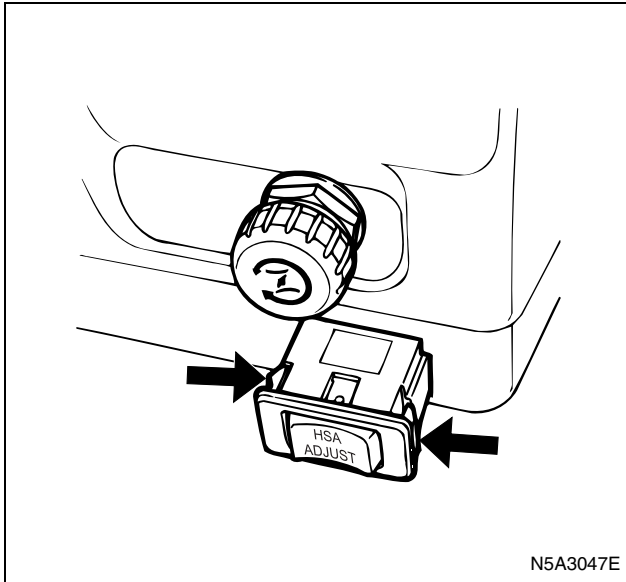
Installation

Install in the reverse order of removal.

HSA Adjust Switch

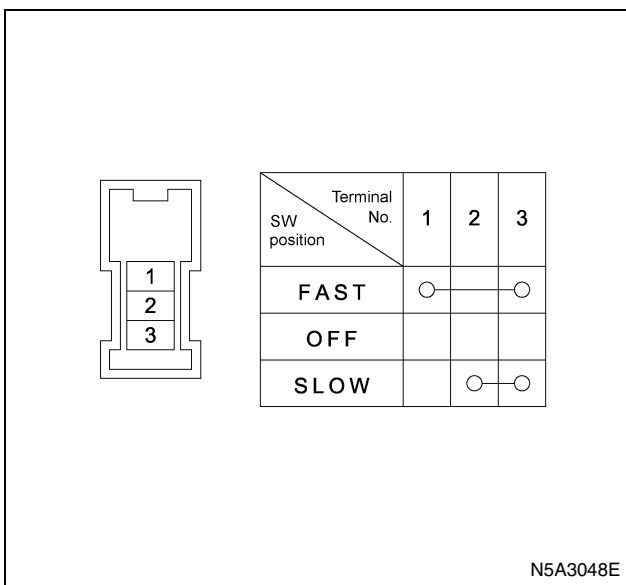
Removal

1. Disconnect the connector.
2. Remove the HSA adjust switch.
 - Remove it while pressing the switch claw from the backside of the instrument panel.



Inspection

Check for continuity between the switch terminals.



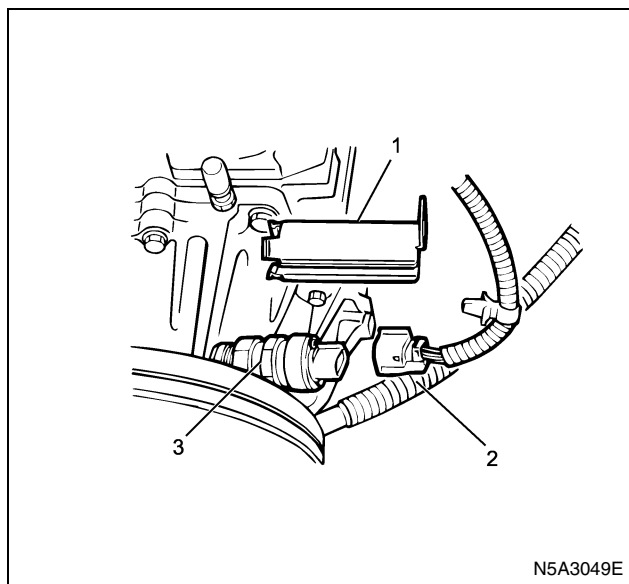
Installation

Install in the reverse order of removal.

Speed Sensor

Removal

1. Remove the protector.
2. Disconnect the connection of the connector.
3. Remove the speed sensor.



Legend

1. Protector
2. Connector
3. Speed sensor

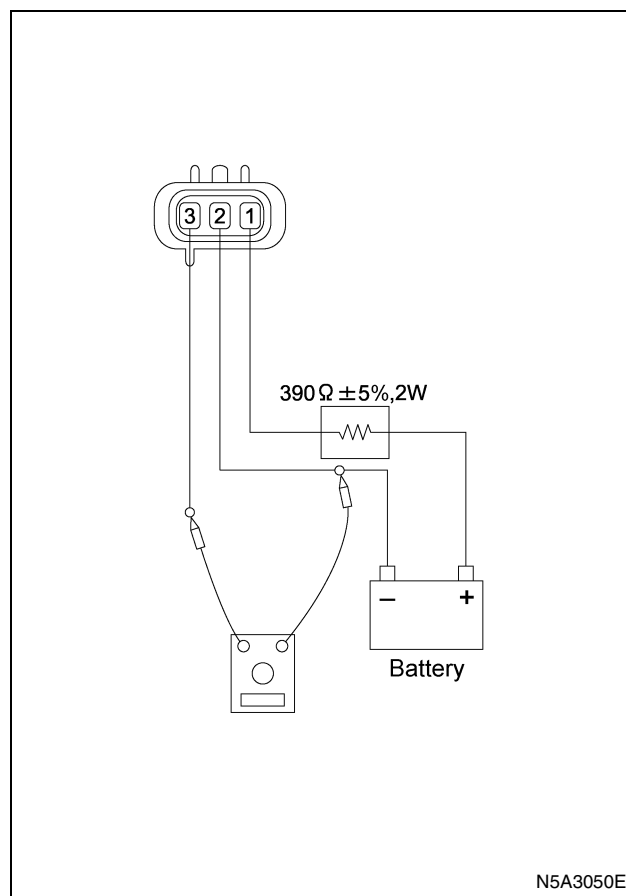
Inspection

1. Connect a resistance of $390\Omega \pm 5\%$, 2W between the speed sensor connector terminal 1 "J-32" and the battery (+) terminal, and connect 2 "J-32" to the battery (-) terminal.

Caution:

Never connect the battery (+) terminal to the connector 3 "J-32". It may cause the speed sensor failure.

2. Measure the voltage between 3 "J-32" and 2 "J-32" using a digital tester while slowly rotating the speed sensor shaft.
The voltage shows $2V \pm 1V$ and $14V (+1V, -2V)$ repeatedly for 8 times per one rotation of the shaft.
If the result of the inspection is unsatisfactory, replace with a new part.



Installation

1. Install the speed sensor.

Tighten:

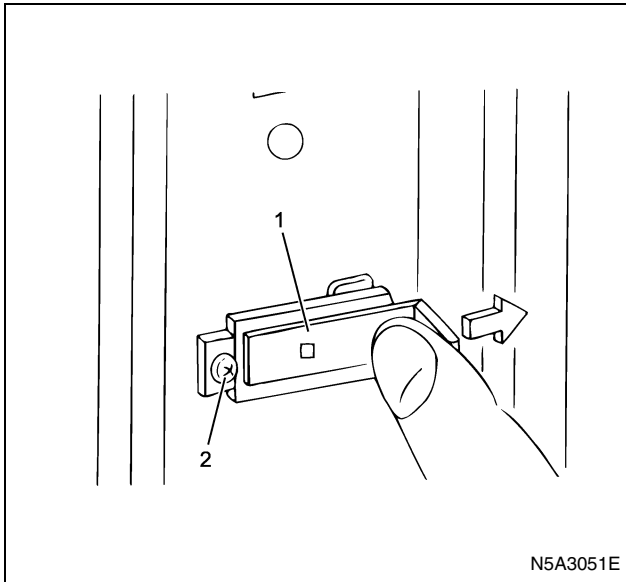
Speed sensor to 25 N·m (2.5 kg·m/18.4 lb·ft)

2. Install the protector.
3. Connect the connector.

Door Switch

Removal

1. Remove the installing screw while pressing the sliding part of the door switch.
 - Disconnect the connector.

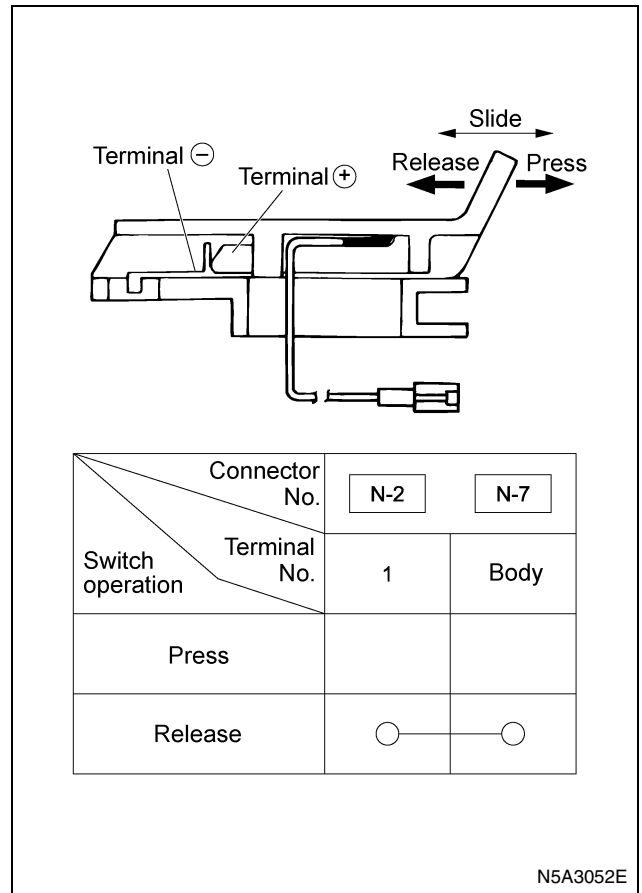


Legend

1. Sliding part
2. Screw

Inspection

Move the sliding part to check for continuity between the terminal and the body.



Installation

Install in the reverse order of removal.

Parking Brake Switch

Removal

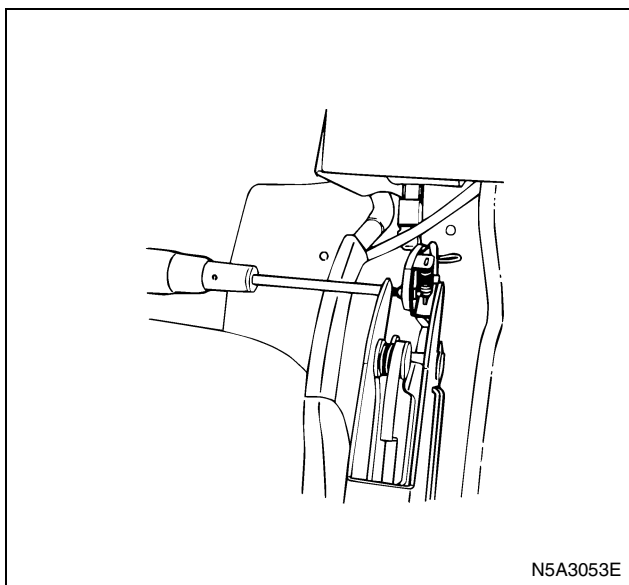
1. Remove the parking brake rear cover.
 - Disconnect the two clips.
2. Remove the parking brake switch.
 - Remove the one installing screw.
 - Disconnect the connector.

Legend

1. Parking brake lever
2. Parking brake switch

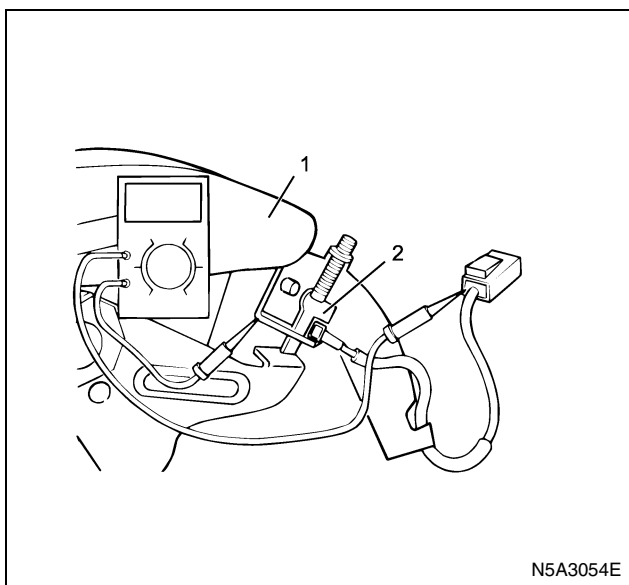
Installation

Install in the reverse order of removal.



Inspection

1. Disconnect the parking brake switch connector.
2. Connect the circuit between the switch terminal and the body to check for continuity.
 - With parking brake applied = Continuity exists
 - With parking brake released = No continuityIf the result of the inspection is unsatisfactory, repair or replace with a new part.



Neutral Switch

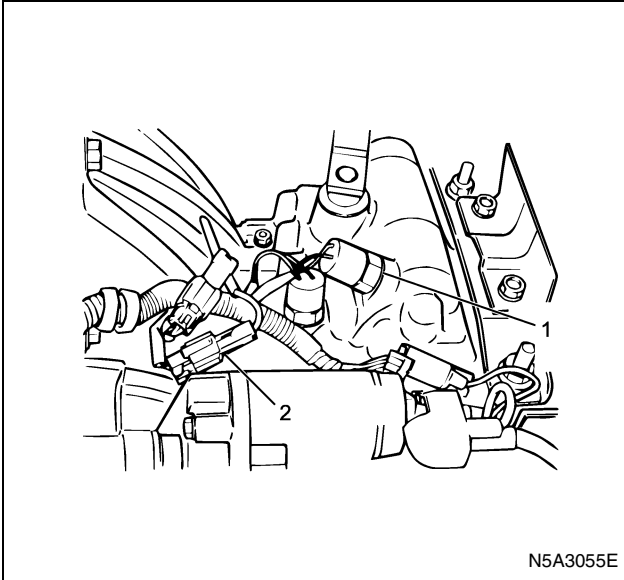
Removal

1. Remove the neutral switch.
 - Disconnect the connector.
 - Twist off the switch to remove.

Liquid gasket: THREE BOND 1141

Tighten:

Neutral switch to 34 N·m (3.5 kg·m/25.1 lb·ft)



Legend

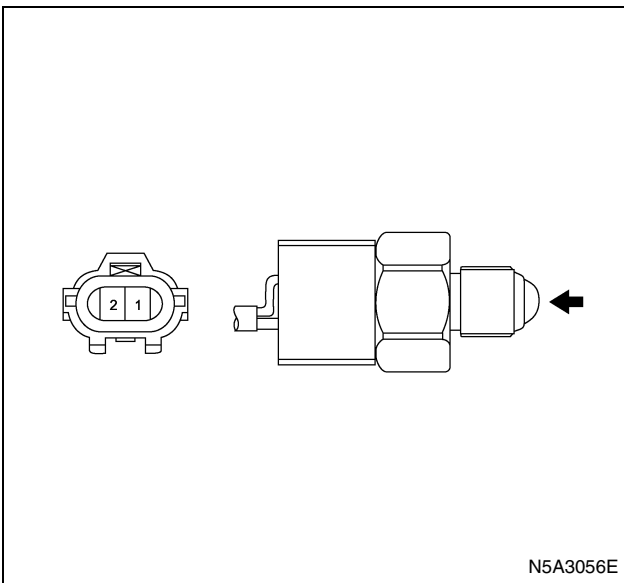
1. Neutral switch
2. Connector (gray)

Inspection

Press the switch to check the continuity between the connector terminals.

With switch released = Continuity exists

With switch pressed = No continuity



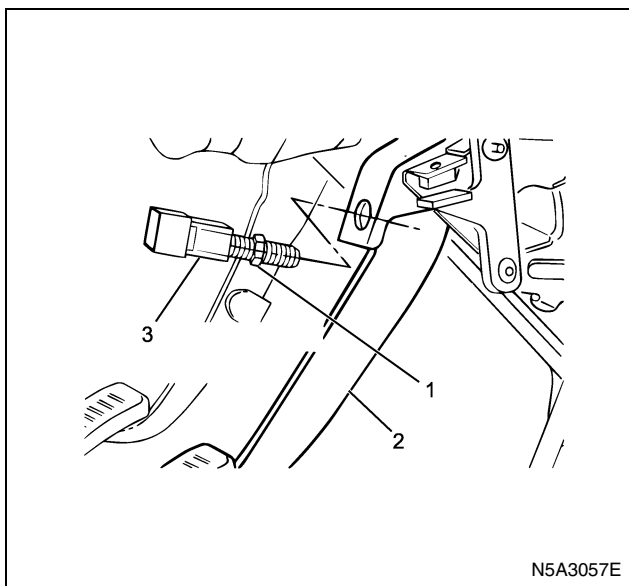
Installation

1. Apply liquid gasket to the threaded portion of the neutral switch to install.

Stop Lamp Switch

Removal

1. Remove the stop lamp switch.
 - Disconnect the connector of the stop lamp switch.
 - Loosen the lock nut.
 - Turn the switch body to remove from the bracket.



Legend

1. Brake pedal
2. Stop lamp switch
3. Lock nut

Caution:

Screw in until the thread end of the stop lamp switch contacts the brake pedal.

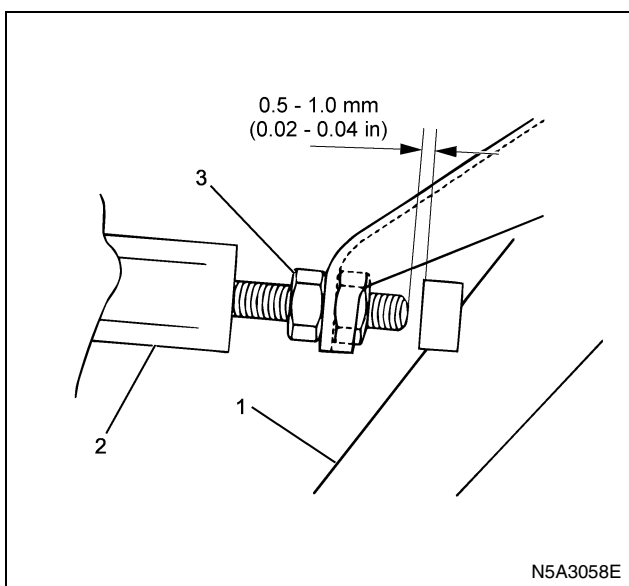
- After contacting with the pedal, back off the switch to make clearance between 0.5 — 1.0 mm (0.02 — 0.04 in), and then tighten the lock nut.

Legend

1. Lock nut
2. Brake pedal
3. Stop lamp switch

Installation

1. Install the stop lamp switch.
 - Screw in until the thread end of the stop lamp switch contacts the brake pedal.



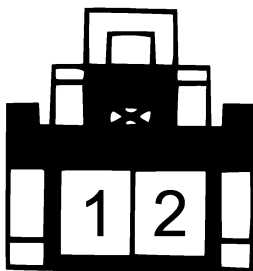
Clutch Fluid Pressure Switch

Removal

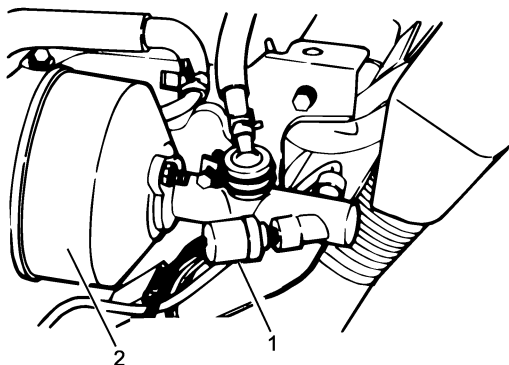
1. Check the clutch fluid pressure switch.
 - Disconnect the clutch fluid pressure switch connector, and check for continuity between the connector terminals with the clutch pedal fully depressed/released.
With clutch pedal depressed = Continuity exists
With clutch pedal released = No continuity

Tighten:

Clutch fluid pressure switch to 15 N·m (1.5 kg·m/11.1 lb·ft)



2. Remove the clutch fluid pressure switch.
 - Disconnect the connector, and twist off the hexagon nut portion of the switch.



Legend

1. Clutch fluid pressure switch
2. Clutch booster

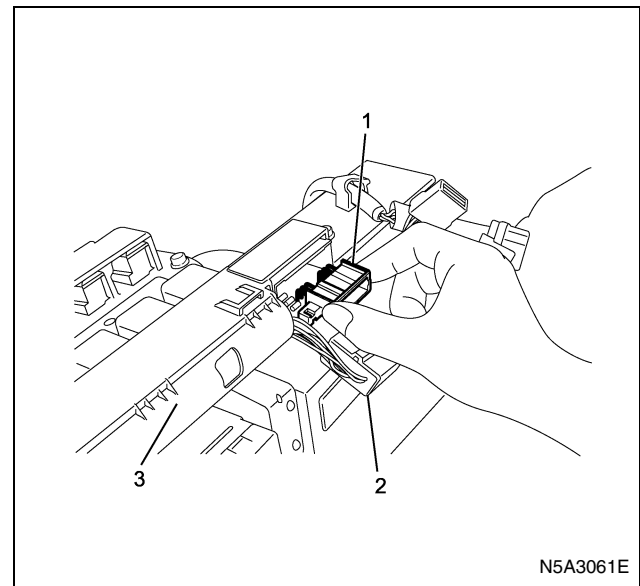
Installation

1. Install the clutch fluid pressure switch.

Diode Box

Removal

- 1. Remove the instrument panel.
- 2. Disconnect the connector.
- 3. Remove the diode box.



Legend

- 1. Diode box
- 2. Connector
- 3. Relay box

Inspection

Check for continuity between the unit terminals.

6	5	4			3	2	1
14	13	12	11	10	9	8	7

Terminal No.	3	4	8	9
Continuity				

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Installation

Install in the reverse order of removal.