COMBINATION METER

HOW TO PROCEED WITH TROUBLESHOOTING

057KA–02

1	Vehicle Brought to Workshop

2	Customer Problem Analysis (See page 05–639)

3	Problem Symptom Confirmation (See page 05–647)

4	Circuit Inspection (See page 05–648 – 05–668)

5	Repair or Replace

6	Confirmation Test

7	End

057KB–02

CUSTOMER PROBLEM ANALYSIS CHECK

COMBINATION METER Check Sheet

Inspector's name:

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date of Vehicle Brought in	⁄ ⁄	**Odometer Reading**	**Km Mile**

Date Problem First Occurred	⁄ ⁄
How Often Problem Occurs	☐Continuous ☐ Intermittent (Times a day)
Weather	☐ Fine ☐ Cloudy ☐ Snowy ☐ Other
Temperature	**Approx.**

Problem Symptom	**Gauge**	☐ Malfunction in speedometer ☐ Malfunction in tachometer ☐ Malfunction in fuel receiver gauge ☐ Malfunction in water temperature receiver gauge
	Buzzer	☐ Key unlock warning buzzer does not sound ☐ Light auto–turn off warning buzzer does not sound ☐ Malfunction in driver's seat belt warning buzzer ☐ All buzzers do not sound

H

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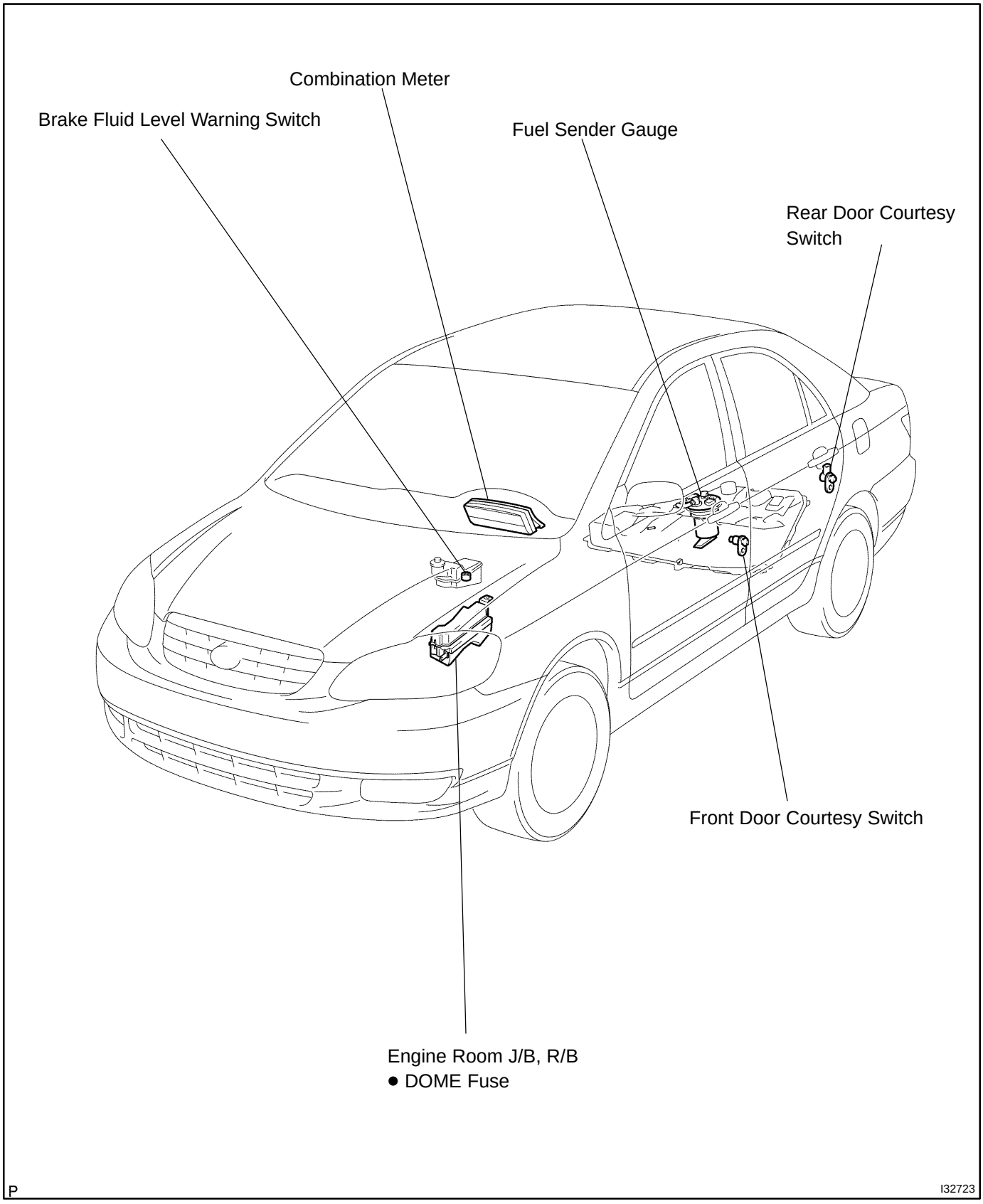
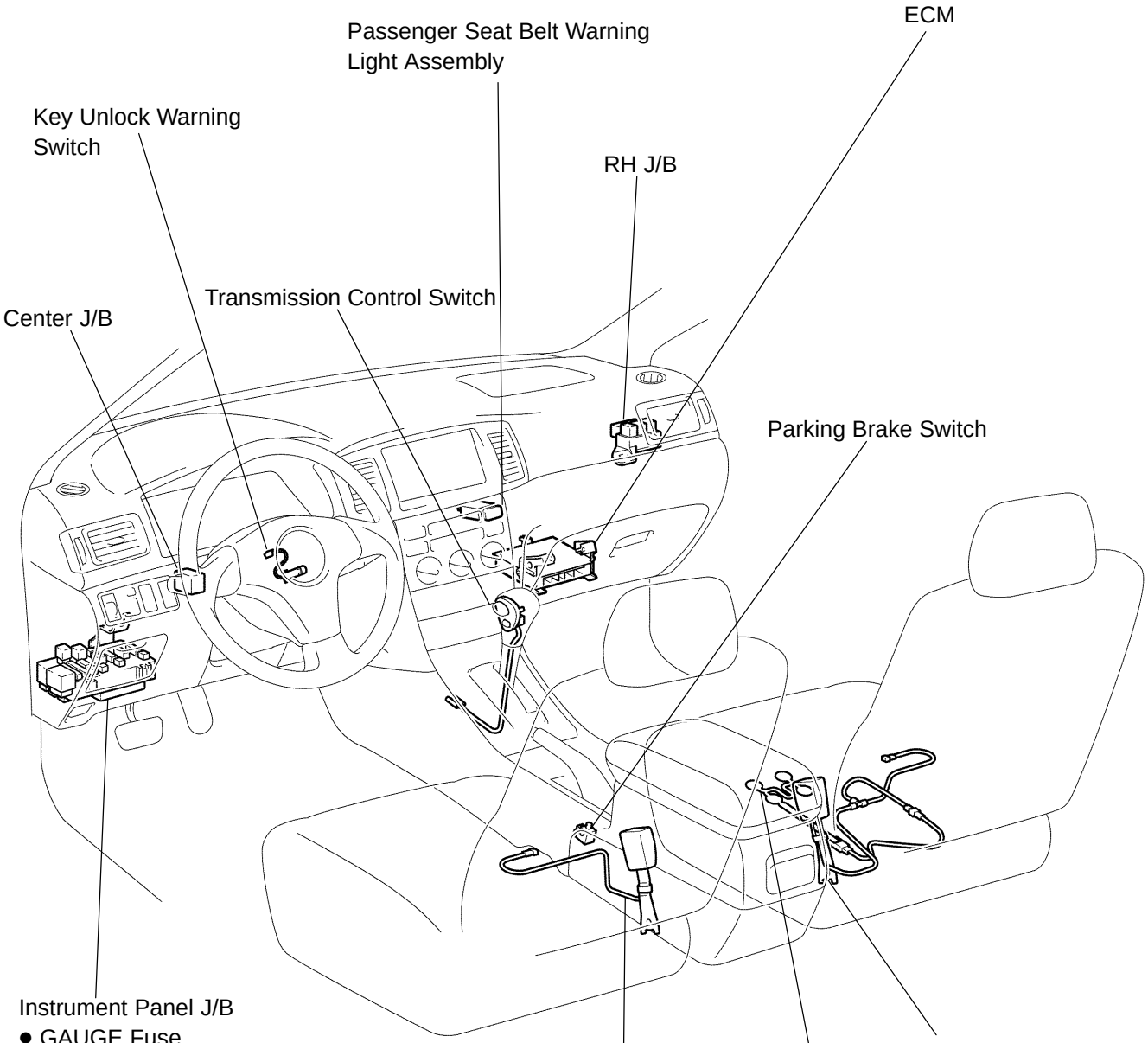
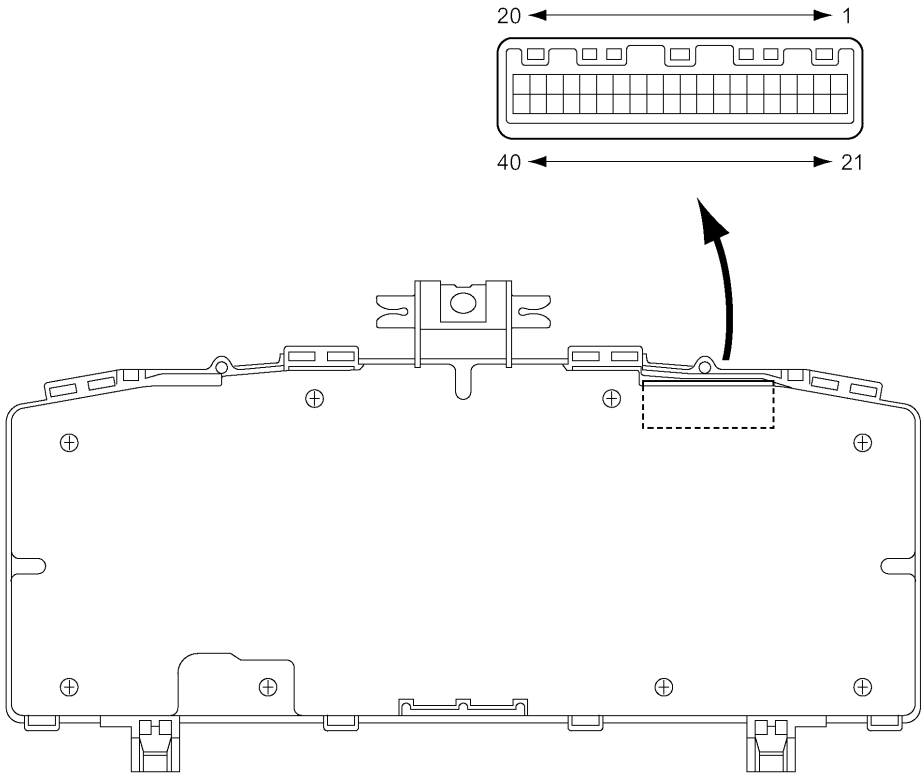
057KC–02

LOCATION




ECM
Passenger Seat Belt Warning Light Assembly
Key Unlock Warning Switch
RH J/B
Transmission Control Switch
Center J/B
Parking Brake Switch
Instrument Panel J/B
● GAUGE Fuse
● AM1 Fuse
Front Seat Belt Inner Belt (Passenger's)
Separate Type Front Seat Cushion Pad
Front Seat Belt Inner Belt (Driver's)

P I32724



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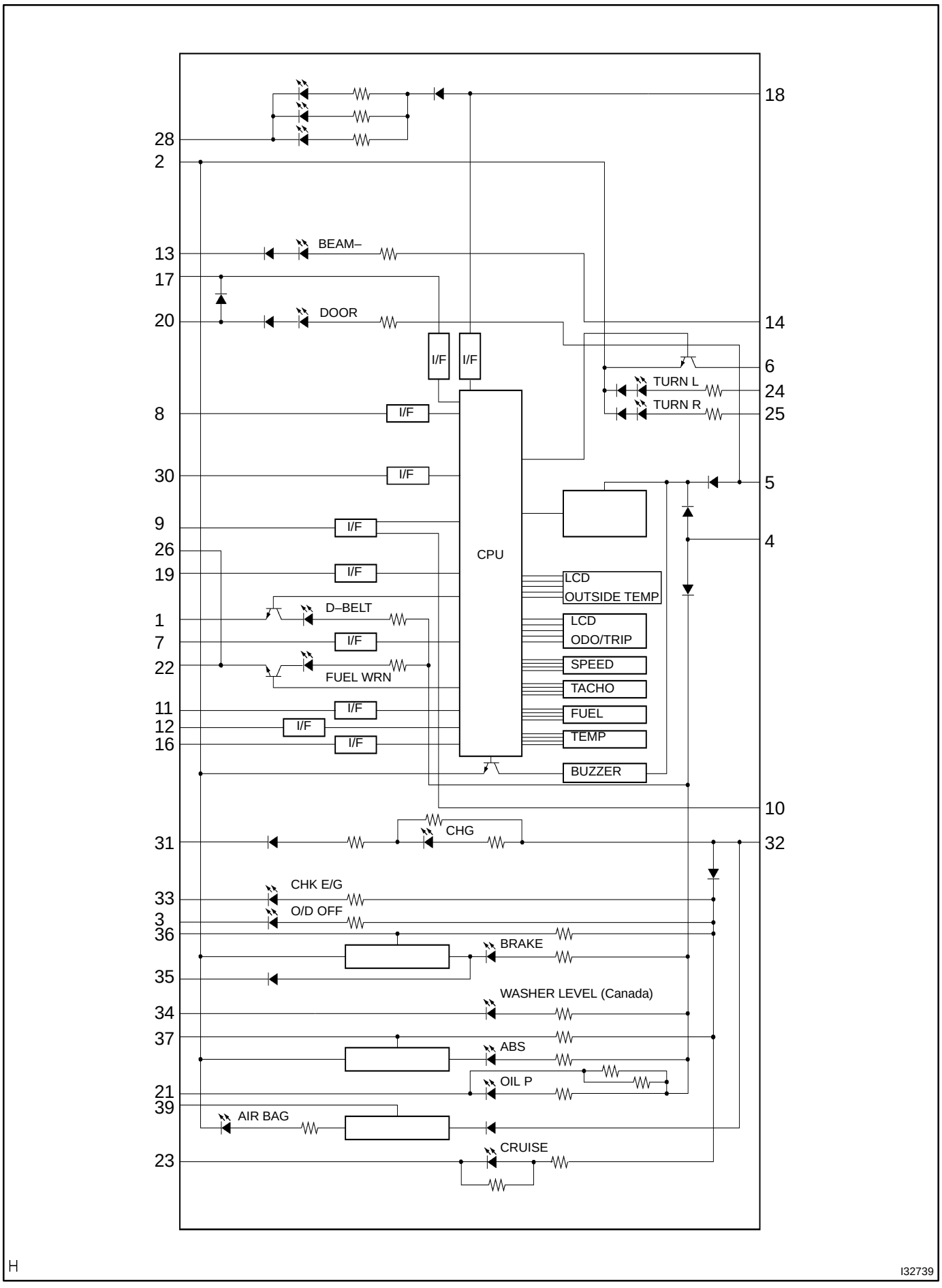
28
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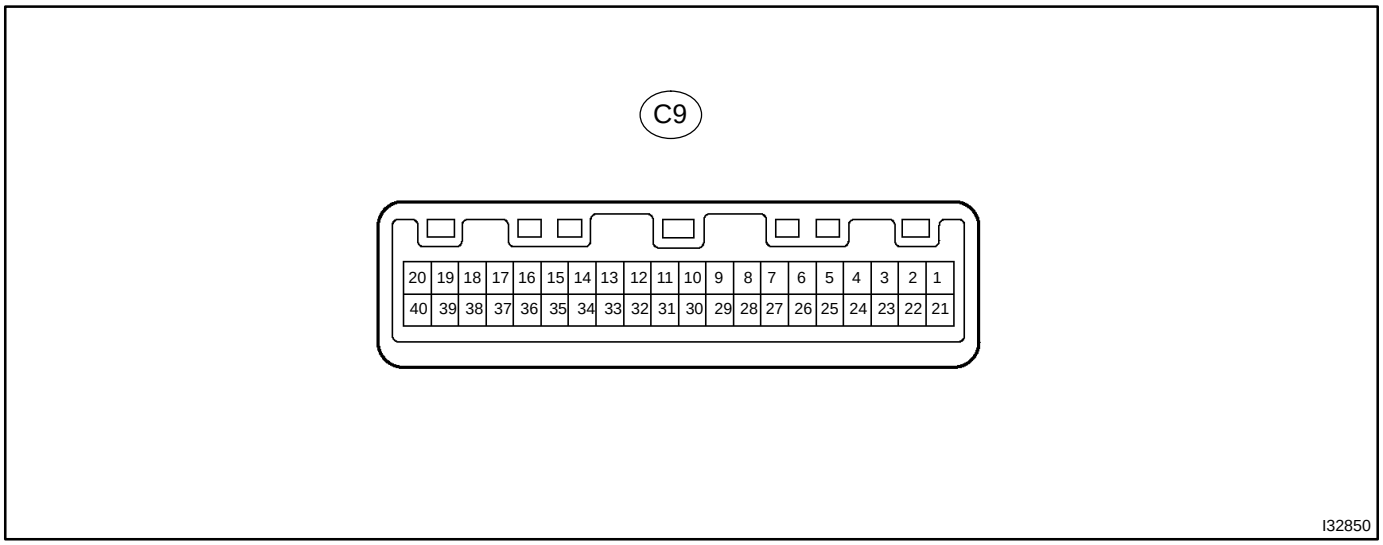
BEAM–
DOOR
I/F
I/F
I/F
I/F
I/F
I/F
I/F
I/F
I/F
I/F
D–BELT
FUEL WRN
CPU
TURN L
TURN R
LCD
OUTSIDE TEMP
LCD
ODO/TRIP
SPEED
TACHO
FUEL
TEMP
BUZZER
CHG
CHK E/G
O/D OFF
BRAKE
WASHER LEVEL (Canada)
ABS
OIL P
AIR BAG
CRUISE
H
I32739

Terminal No.		Wire harness side
C9	1	Ground (Signal Ground)
	2	Ground (Power Ground)
	3	ECM
	4	GAUGE Fuse
	5	DOME Fuse
	6	Front Passenger Seat Belt Warning Indicator
	7	Fuel sender gauge
	8	ECM
	9	Skid Control ECU (w/ ABS), Vehicle Speed Control Sensor (w/o ABS)
	10	Cruise Control ECU, ECM
	11	Buckle Switch RH
	12	Buckle Switch LH
	13	Ground
	14	HEAD RH UPR Fuse
	15	–
	16	Unlock Warning Switch
	17	Driver Side Courtesy Switch
	18	Tail Relay (USA), Combination Switch (Canada)
	19	ECM
	20	Except Driver Side Courtesy Switch
	21	Engine Oil Pressure Switch
	22	Fuel sender gauge
	23	Cruise Control ECU
	24	Turn Signal Flasher
	25	Turn Signal Flasher
	26	Ambient Temperature Sensor
	28	Rheostat
	30	Ambient Temperature Sensor
	31	Alternator
	32	GAUGE Fuse
	33	ECM
	34	Washer Level Sensor (Canada)
	35	Brake Fluid Level Warning Switch
	36	Skid Control ECU with Actuator (w/ ABS), Ground (w/o ABS)
	37	Skid Control ECU with Actuator (w/ ABS), Ground (w/o ABS)
	38	–
	39	Airbag Sensor Assembly
	40	–

057KD–04

TERMINALS OF ECU



Terminals No. (Symbols)	Wiring Color	Condition	STD Voltage (V)
1 ↔ Body ground (SIGNAL EARTH ↔ Body ground)	BR	Constant	Continuity
2 ↔ Body ground (POWER EARTH ↔ Body ground)	W–B	Constant	Continuity
3 ↔ Body ground (O/D ↔ Body ground)	LG	O/D off indicator light ON → OFF	Below 1V → 10 – 14 V
4 ↔ Body ground (IG1+ ↔ Body ground)	R–W	Ignition switch OFF or ACC → ON	Below 1V → 10 – 14 V
5 ↔ Body ground (+B ↔ Body ground)	L–W	Constant	10 – 14 V
6 ↔ Body ground (P–BELT OUT ↔ Body ground)	L	Passenger seat belt warning ON → OFF	Below 1V ↔ 10 – 14 V
7 ↔ Body ground (FUEL ↔ Body ground)	Y	Fuel level is full → empty	Below 1V → 4 – 7 V
8 ↔ Body ground (TEMP ↔ Body ground)	Y–R	Ignition switch ON	Pulse generation
9 ↔ Body ground (SP IN ↔ Body ground)	W–G	Ignition switch ON and slowly turn drive wheel	Below 1 V ↔ 10 – 14 V
10 ↔ Body ground (4P OUT ↔ Body ground)	V–W	Ignition switch ON and slowly turn drive wheel	Below 1 V ↔ 10 – 14 V
11 ↔ Body ground (P BELT SW ↔ Body ground)	L–W	Ignition switch ON and passenger seat belt buckle switch ON (Belt unfastened)	Below 1 V
		Ignition switch ON and passenger seat belt buckle switch OFF (Belt fastened)	10 – 14 V
12 ↔ Body ground (D BELT SW ↔ Body ground)	G–Y	Ignition switch ON and driver seat belt buckle switch ON (Belt unfastened)	Below 1 V
		Ignition switch ON and driver seat belt buckle switch OFF (Belt fastened)	10 – 14 V
13 ↔ Body ground (BEAM– ↔ Body ground)	W–B	Hi beam indicator light ON → OFF	Below 1V → 10 – 14 V
14 ↔ Body ground (BEAM+ ↔ Body ground)	R	Constant	10 – 14 V

16 ↔ Body ground (KEY SW ↔ Body ground)	L–B	Ignition key inserted	Below 1 V
		No ignition key inserted	10 – 14 V
17 ↔ Body ground (D DOOR ↔ Body ground)	R–W	Driver door opened → closed	Below 1V → 10 – 14 V
18 ↔ Body ground (ILL+ ↔ Body ground)	G	Tail light switch OFF → ON	Below 1V → 10 – 14 V
19 ↔ Body ground (TACHO ↔ Body ground)	B	Engine running	Pulse generation
20 ↔ Body ground (EXCEPT D DOOR ↔ Body ground)	R	Passenger door opened → closed	Below 1V → 10 – 14 V
21 ↔ Body ground (OIL P ↔ Body ground)	W	Oil pressure warning light ON → OFF	Below 1V → 10 – 14 V
22 ↔ Body ground (FUEL EARTH ↔ Body ground)	BR	Constant	Continuity
23 ↔ Body ground (CRUISE ↔ Body ground)	G–R	Ignition switch ON and cruise indicator light ON → OFF	Below 1V → 10 – 14 V
24 ↔ Body ground (TURN L ↔ Body ground)	G–B	Left turn indicator light OFF → ON	Below 1V → 10 – 14 V
25 ↔ Body ground (TURN R ↔ Body ground)	G–Y	Right turn indicator light OFF → ON	Below 1V → 10 – 14 V
26 ↔ 30 (OUT SIDE TEMP+ ↔ OUT SIDE TEMP–)	B – B–L	Outside temperature at +25°C (77°F)	1.6 – 1.8KΩ
28 ↔ Body ground (ILL– ↔ Body ground)	W–R	Ignition switch On and light control rheostat volume minimum	No voltage
31 ↔ Body ground (CHG– ↔ Body ground)	Y	Discharge indicator light OFF → ON	Below 1V → 10 – 14 V
32 ↔ Body ground (IG2 ↔ Body ground)	B–O	Ignition switch OFF → ON	Below 1V → 10 – 14 V
33 ↔ Body ground (CHK ENG ↔ Body ground)	R–Y	Malfunction indicator light ON → OFF	Below 1V → 10 – 14 V
34 ↔ Body ground (WASHER LEVEL ↔ Body ground)	* L–W	Washer level indicator light ON → OFF	Below 1V → 10 – 14 V
35 ↔ Body ground (BRAKE LEVEL SW ↔ Body ground)	R–W	Ignition switch ON and brake fluid level warning light ON → OFF	Below 1V → 10 – 14 V
36 ↔ Body ground (EBD ↔ Body ground)	R	Brake warning light ON → OFF	4 – 8 V → Below 1V
37 ↔ Body ground (ABS ↔ Body ground)	W–R	ABS warning light ON → OFF	4 – 8 V → Below 1V
39 ↔ Body ground (A/B ↔ Body ground)	B–Y	A/B warning light ON → OFF	Below 1V → 6 – 11 V

*: Canada

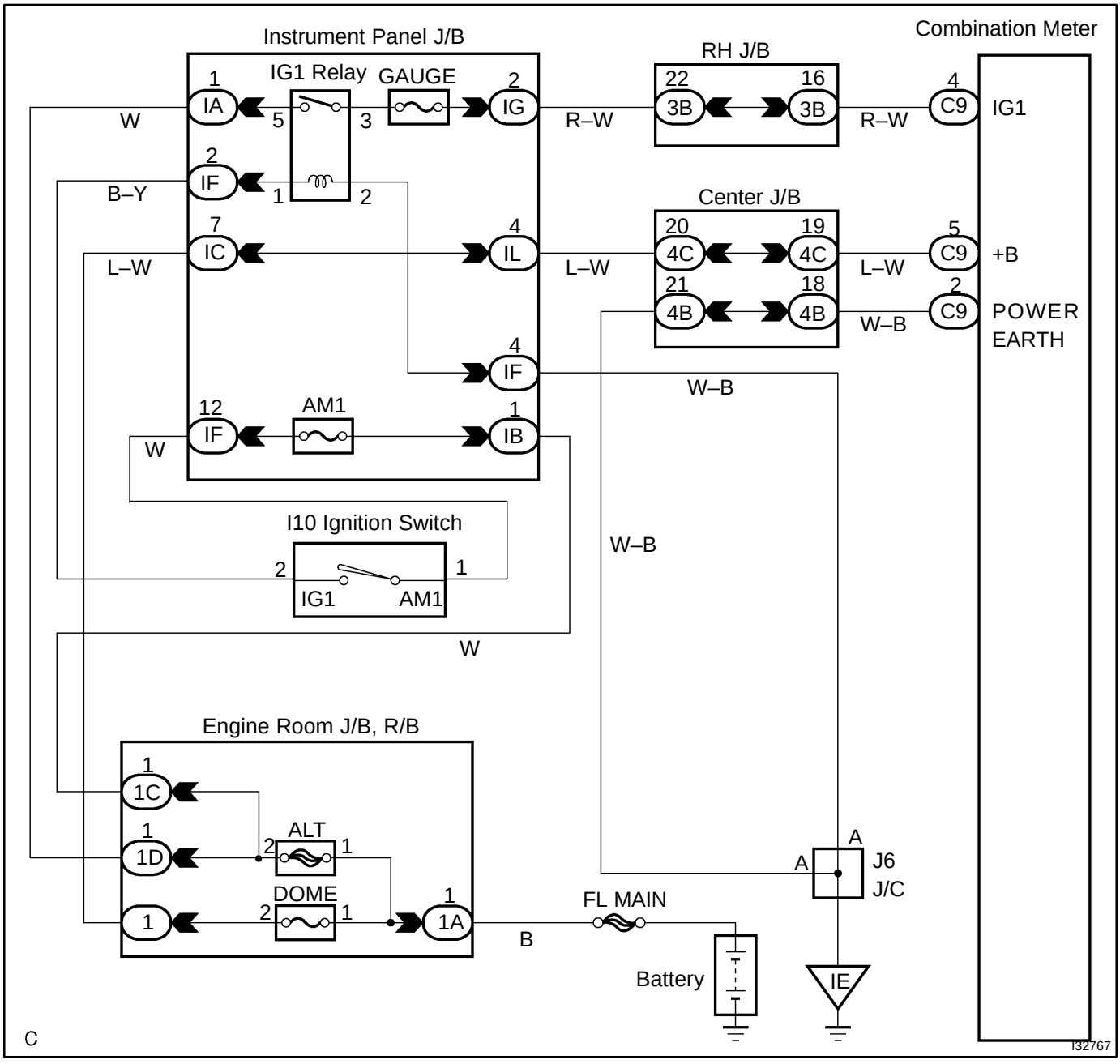
057KE–02

PROBLEM SYMPTOMS TABLE

Symptom	Suspect Area	See page
Entire combination meter does not operate.	3. Fuse 4. Wire–harness and connector 5. Combination meter assembly	05–648
Malfunction in speed meter.	1. Brake system 2. Wire–harness and connector 3. Combination meter assembly	05–650
Malfunction in tacho meter.	1. ECM 2. Wire–harness and connector 3. Combination meter assembly	05–653
Malfunction in fuel receiver gauge.	1. Fuel sender gauge 2. Wire–harness and connector 3. Combination meter assembly	05–655
Malfunction in water temperature gauge.	1. ECM 2. Wire–harness and connector 3. Combination meter assembly	05–657
”Key unlock warning bozzer” or ”Light auto turn off warning buzzer” does not operate.	1. Front door courtesy switch 2. Key unlock warning switch 3. Wire–harness and connector 4. Combination meter assembly	05–659
Driver seat belt warning buzzer does not sound.	1. Driver seat belt buckle switch 2. Wire–harness and connector 3. Combination meter assembly	05–663
Seat belt warning lamp for front passenger seat does not flash.	1. Front seat inner belt assembly 2. Separate type front seat cushion pad 3. Combination meter assembly 4. Passenger seat belt warning light assembly	05–663
Malfunction in clock.	1. Fuse 2. Wire–harness and connector 3. Clock assembly	05–666
The ambient temperature does not display.	1. Fuse 2. Wire–harness and connector 3. Ambient temperature sensor	05–668

ENTIRE COMBINATION METER DOES NOT OPERATE

WIRING DIAGRAM



INSPECTION PROCEDERE

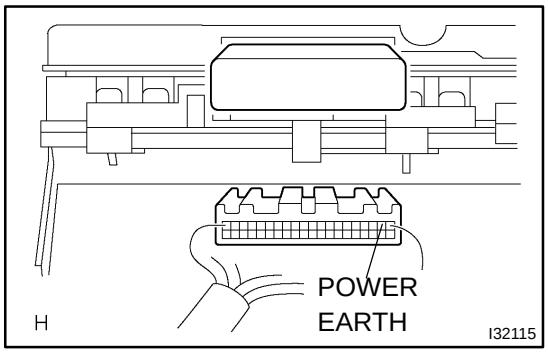
1	CHECK FUSE

(a) Check that continuity exists of DOME fuse.
(b) Check that continuity exists of GAUGE fuse.
(c) Check that continuity exists of AM1 fuse.

NG → REPLACE FUSE

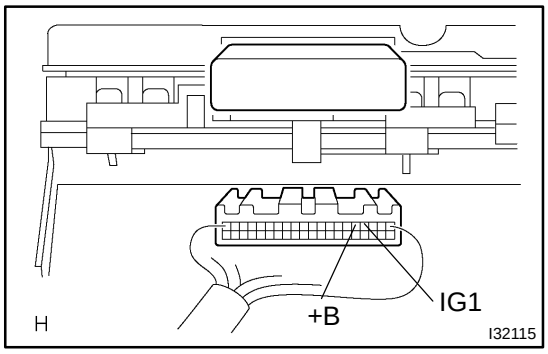
OK

2	INSPECT COMBINATION METER ASSY



(a) Check continuity.
(1) Disconnect the ”C9” connector from combination meter assy.
(2) Check continuity between terminal C9–2 of combination meter assy connector and body ground.

OK: Continuity exists



(b) Check voltage.
(1) Disconnect the ”C9” connector from combination meter assy.
(2) Measure voltage between terminal C9–5 of combination meter assy connector and body ground.

Voltage: 10 – 14 V

(3) Turn the ignition switch to ON.
(4) Measure voltage between terminal C9–4 of combination meter assy connector and body ground.

Voltage: 10 – 14 V

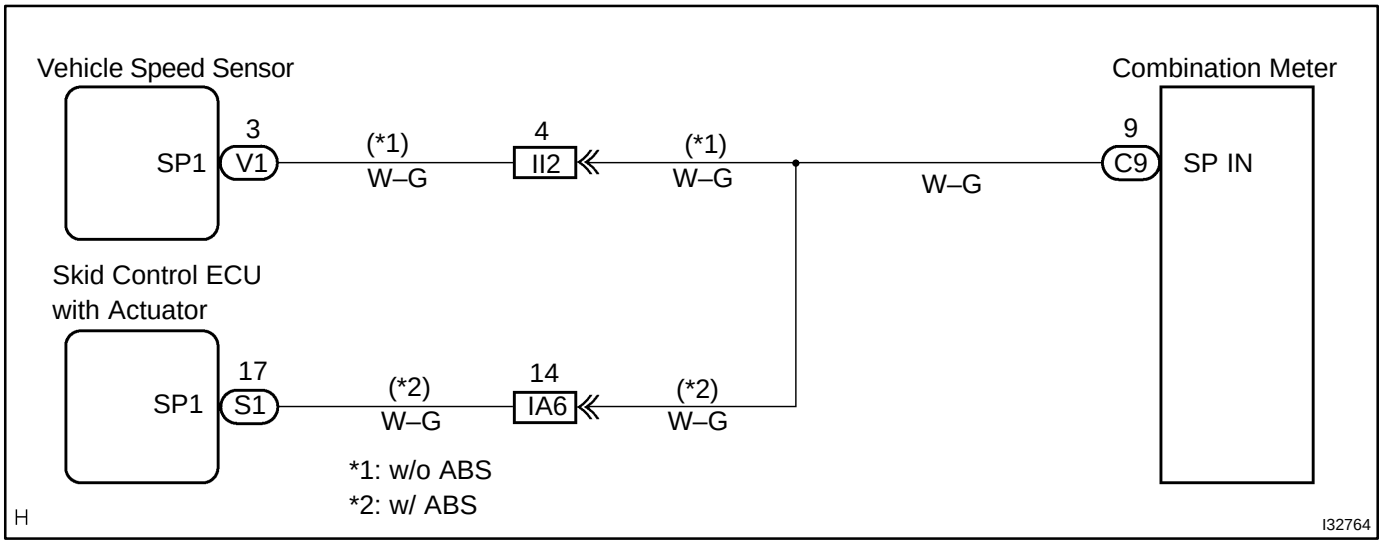
NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE COMBINATION METER ASSY

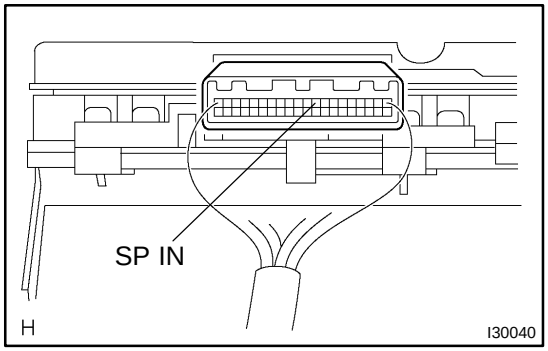
MALFUNCTION IN SPEEDOMETER

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK COMBINATION METER ASSY



(a) Remove the combination meter assy with connector still connected.

(b) Check voltage.

(1) Jack up either of the front wheels.

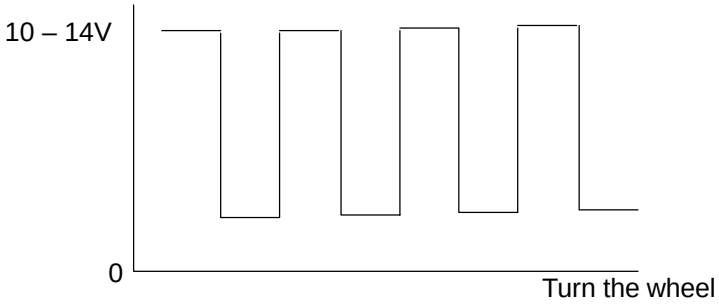
(2) Shift the shift lever to neutral.

(3) Turn the ignition switch to ON.

(4) Measure the voltage between terminals C9–9 of combination meter assy and body ground when front wheel is turning slowly.

Standard voltage:

Voltage is generated intermittently.



Result:

A	B	C
OK	NG (w/ ABS)	NG (w/o ABS)

B → **Go to step 2**

C → **Go to step 3**

A

CHECK AND REPLACE COMBINATION METER ASSY

2 CHECK OBD II SCAN TOOL OR HAND–HELD TESTER

(a) Check output value of skid control ECU.
   (1) Connect the hand–held tester to DLC3.
   (2) Turn the ignition switch to ON and push the hand–held tester main switch ON.
   (3) Select the DATA LIST mode on the hand–held tester.
   (4) Check that there is no difference between the speed value output from the speed sensor displayed by the hand–held tester and the speed value displayed by the speedometer when driving the vehicle.

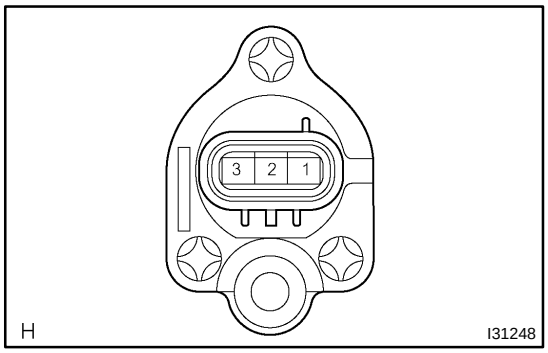
OK: There is almost no difference from the displayed speed value.

NG → **GO TO BRAKE SYSTEM**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

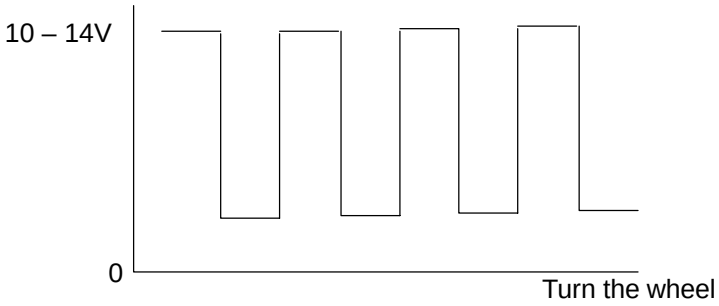
3	INSPECT SPEEDOMETER SENSOR



(a) Check voltage.
(1) Shift the shift lever to neutral.
(2) Jack up either of the front wheel.
(3) Turn the ignition switch to ON.
(4) Measure voltage between terminals 3 and 2 of speed sensor when the front wheel is turning slowly.

Standard voltage:

Voltage is generated intermittently.



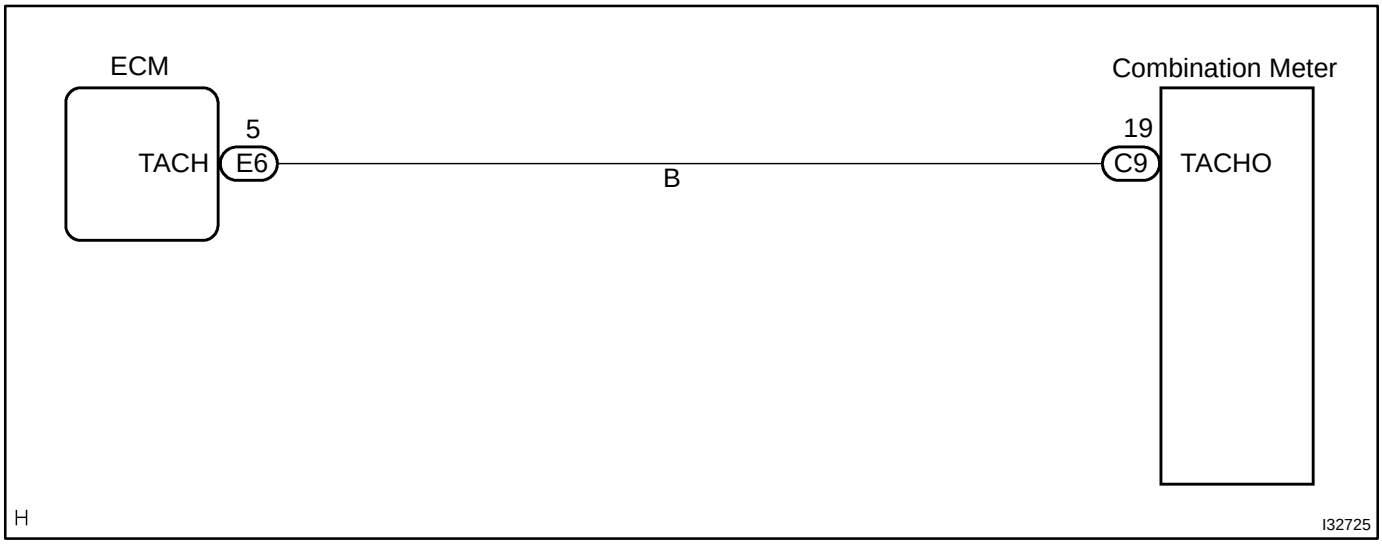
NG → **CHECK AND REPLACE SPEEDOMETER SENSOR**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

MALFUNCTION IN TACHOMETER

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE OF HAND–HELD TESTER

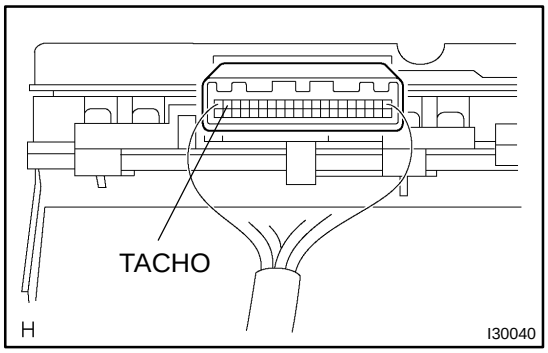
(a) Check output value of ECM.
  (1) Connect the hand–held tester to DLC3.
  (2) Turn the ignition switch to ON and push the hand–held tester main switch ON.
  (3) Select the DATA LIST mode on the hand–held tester.

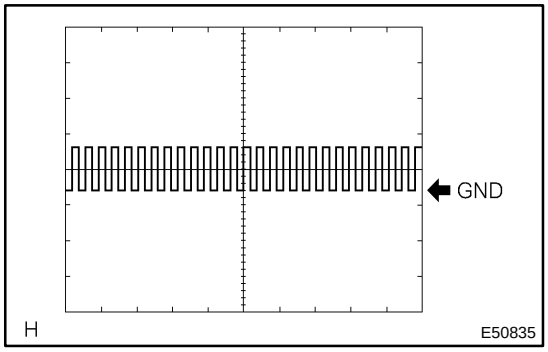
Item	Condition	Specified Condition	Mesurement Item / Range (Display)
ENGINE SPD	With Engine Idling	650 – 750rpm	Engine Speed / Min.: 0 rpm, Max.: 16,383rpm

NG → **GO TO ENGINE CONTROL SYSTEM**

OK

2	INSPECT COMBINATION METER ASSY





(REFERENCE) INSPECTION USING OSCILLOSCOPE

(a) Check the input signal waveform.
  (1) Remove the combination meter assy with connectors still connected.
  (2) Connect the oscilloscope to the terminals C9–19 of combination meter assy and body ground.
  (3) Start engine.
  (4) Check the signal waveform.

Item	Contents
Tool setting	10 V/ DIV, 20 ms/ DV
Vehicle condition	Engine idle speed

OK → **CHECK AND REPLACE COMBINATION METER ASSY**

NG

3	CHECK HARNESS AND CONNECTOR(BETWEEN ECM AND COMBINATION METER ASSY)

(a) Remove the combination meter.
(b) Check the continuity between terminals 5 (TACH) of ECM and C9–19 of combination meter connector.
Standard: There is continuity.

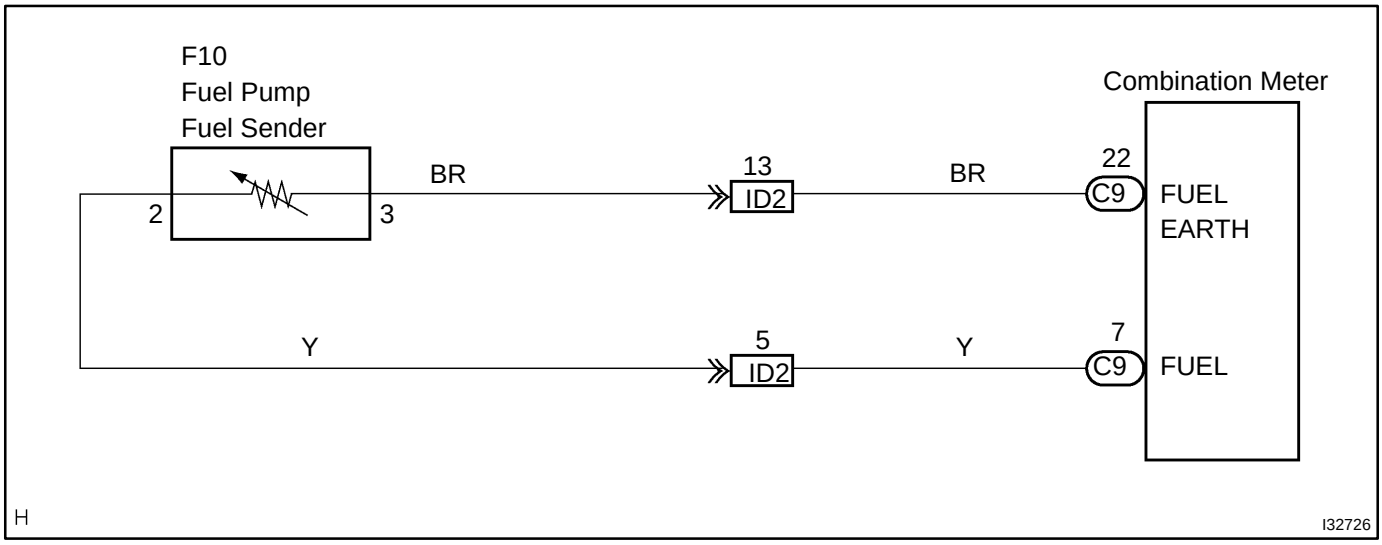
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

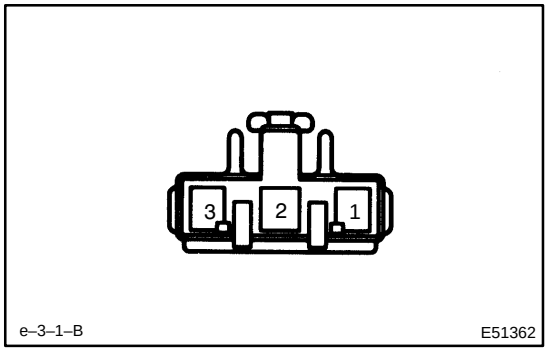
MALFUNCTION IN FUEL RECEIVER GAUGE

WIRING DIAGRAM



INSPECTION PROCEDERE

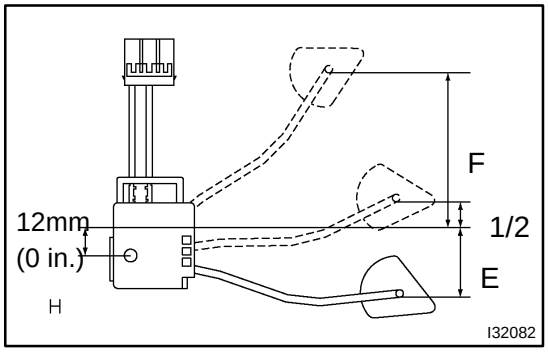
1	INSPECT FUEL SENDER GAGE ASSY



(a) Disconnect the connector fuel sender gauge.
(b) Check the float position between E and F and measure the resistance between terminals 2 and 3 of the connector. Check that the resistance value changes continuously.

Standard:

Float level	Float position mm (in.)	Resistance (Ω)
F	64.5 (2.53) ± 3 (0.12)	15.0 ± 1
1/2	11.6 (0.45) ± 3 (0.12)	54.7 ± 3
E	52.7 (2.07) ± 3 (0.12)	107.0 ± 1



NG → **REPLACE FUEL SENDER GAGE ASSY**

OK

2	CHECK HARNESS AND CONNECTOR(BETWEEN FUEL SENDER GAGE AND COMBINATION METER ASSY)

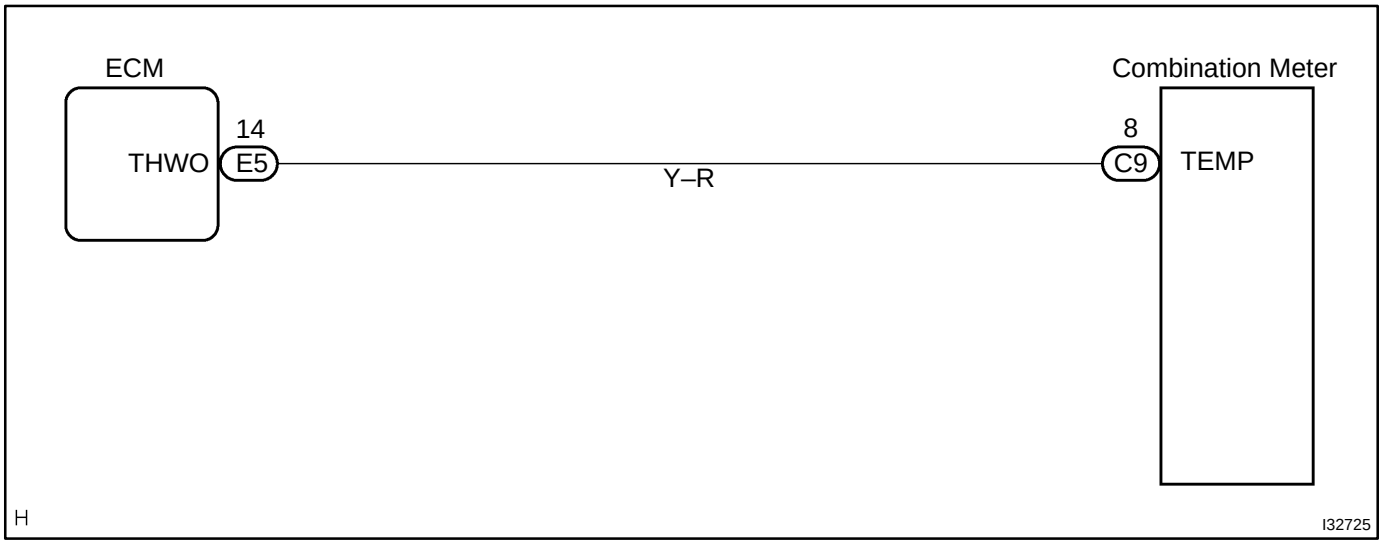
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE COMBINATION METER ASSY

MALFUNCTION IN WATER TEMPERATURE RECEIVER GAUGE

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE OF HAND–HELD TESTER

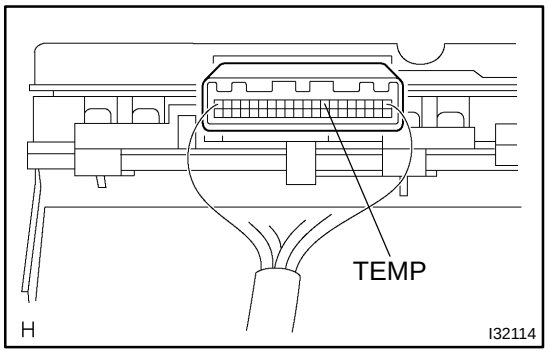
(a) Check output value of ECM.
  (1) Connect the hand–held tester to DLC3.
  (2) Turn the ignition switch to ON and push the hand–held tester main switch ON.
  (3) Select the DATA LIST mode on the hand–held tester.

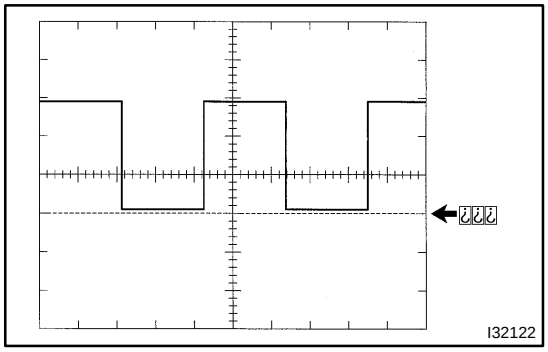
Item	Condition	Specified Condition	Mesurement Item /Range (Display)
COOLANT TEMP	After Warming Up	80 – 95°C (176 – 203°F)	Coolant Temperature / Min.: –40°C, Max.: 140°C

NG → GO TO ENGINE CONTROL SYSTEM

OK

2	INSPECT COMBINATION METER ASSY





(REFERENCE) INSPECTION USING OSCILLOSCOPE

(a) Check the input signal waveform.
  (1) Remove the combination meter with connectors still connected.
  (2) Connect the oscilloscope to the terminals C9–8 of combination meter assy and body ground.
  (3) Start engine.
  (4) Check the signal waveform.

Item	Contents
Tool setting	5 V/ DIV, 100 ms/ DV
Vehicle condition	Ignition switch ON

OK → **CHECK AND REPLACE COMBINATION METER ASSY**

NG

3	CHECK HARNESS AND CONNECTOR(BETWEEN ECM AND COMBINATION METER ASSY)

(a) Remove the combination meter.
(b) Check the continuity between terminals 14 (THWO) of ECM and C9–8 of combination meter connector.
Standard: There is continuity.

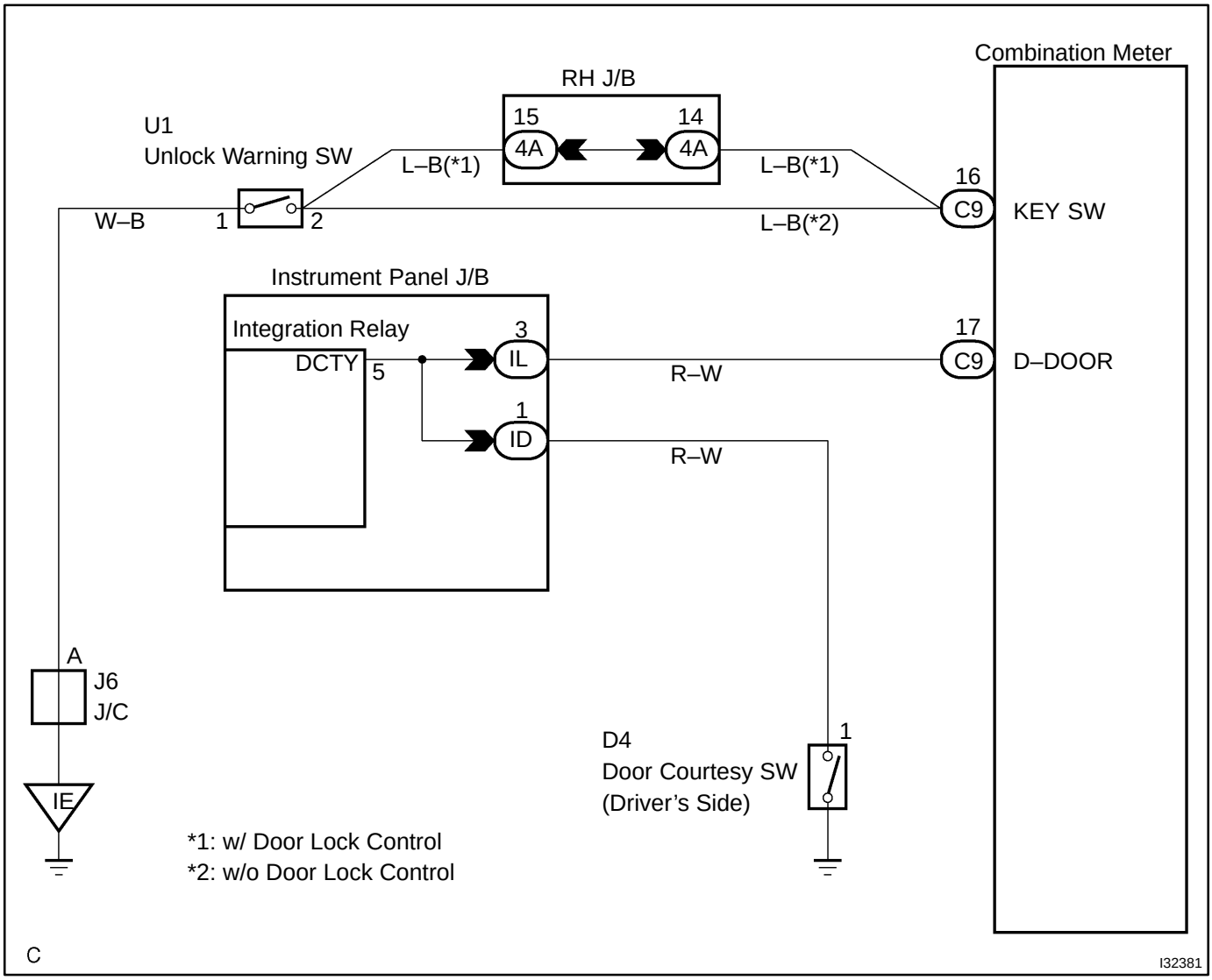
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

WARNING BUZZER DOES NOT SOUND (KEY REMINDER WARNING, LIGHT REMINDER WARNING)

WIRING DIAGRAM



INSPECTION PROCEDERE

1	CHECK BUZZER

(a) Check that all of the warning buzzers sound.

A	B
Some buzzers sound	No buzzer sounds

B → CHECK AND REPLACE COMBINATION METER ASSY

A

2	INSPECT FRONT DOOR COURTESY LAMP SWITCH ASSY(See Page 65–7)

NG → REPLACE FRONT DOOR COURTESY LAMP SWITCH ASSY

OK

3	INSPECT UN–LOCK WARNING SWITCH ASSY(See Page 05–682)

NG → REPLACE UN–LOCK WARNING SWITCH ASSY

OK

4	CHECK HARNESS AND CONNECTOR(BETWEEN UN–LOCK WARNING SWITCH AND COMBINATION METER ASSY)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5	CHECK HARNESS AND CONNECTOR(BETWEEN COURTESY LAMP SWITCH AND COMBINATION METER ASSY)

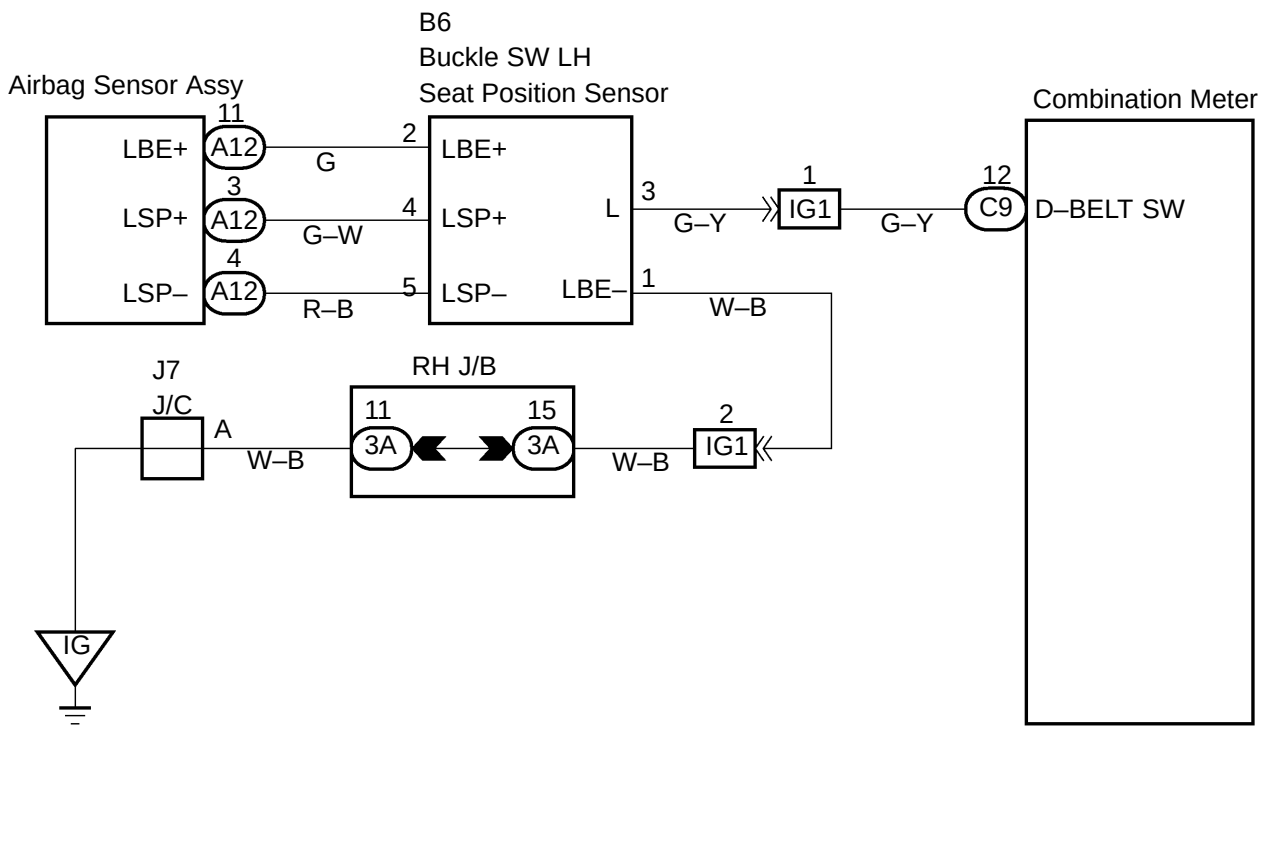
NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE COMBINATION METER ASSY

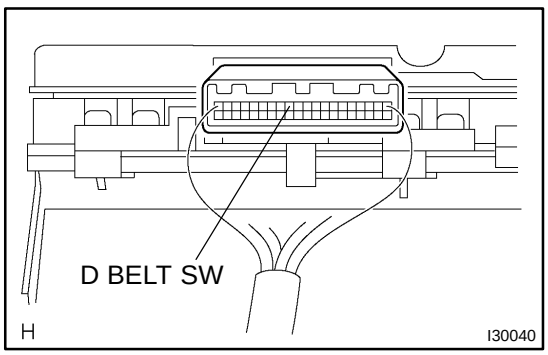
SEAT BELT WARNING LAMP FOR DRIVER'S SEAT DOES NOT OPERATE

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK COMBINATION METER ASSY

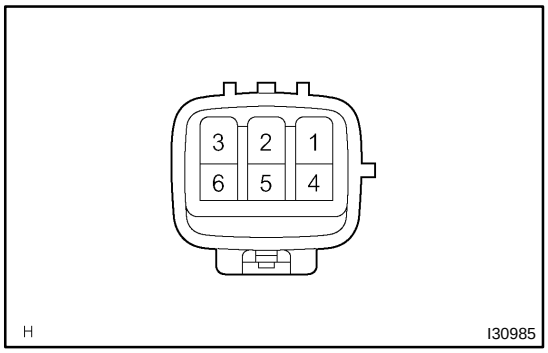


(a) Ground terminal C9–12 on the combination meter side.
(b) Check that the warning lightlights up.
OK: Warning light lights up.

NG → **CHECK AND REPLACE COMBINATION METER ASSY**

OK

2 INSPECT FRONT SEAT INNER BELT ASSY LH



(a) Disconnect the front seat inner belt assy.
(b) Check continuity front seat inner belt assy.

Belt condition	Terminal	Specified condition
Belt unfastend	1 – 2	Continuity
Belt fastend	1 – 2	No continuity

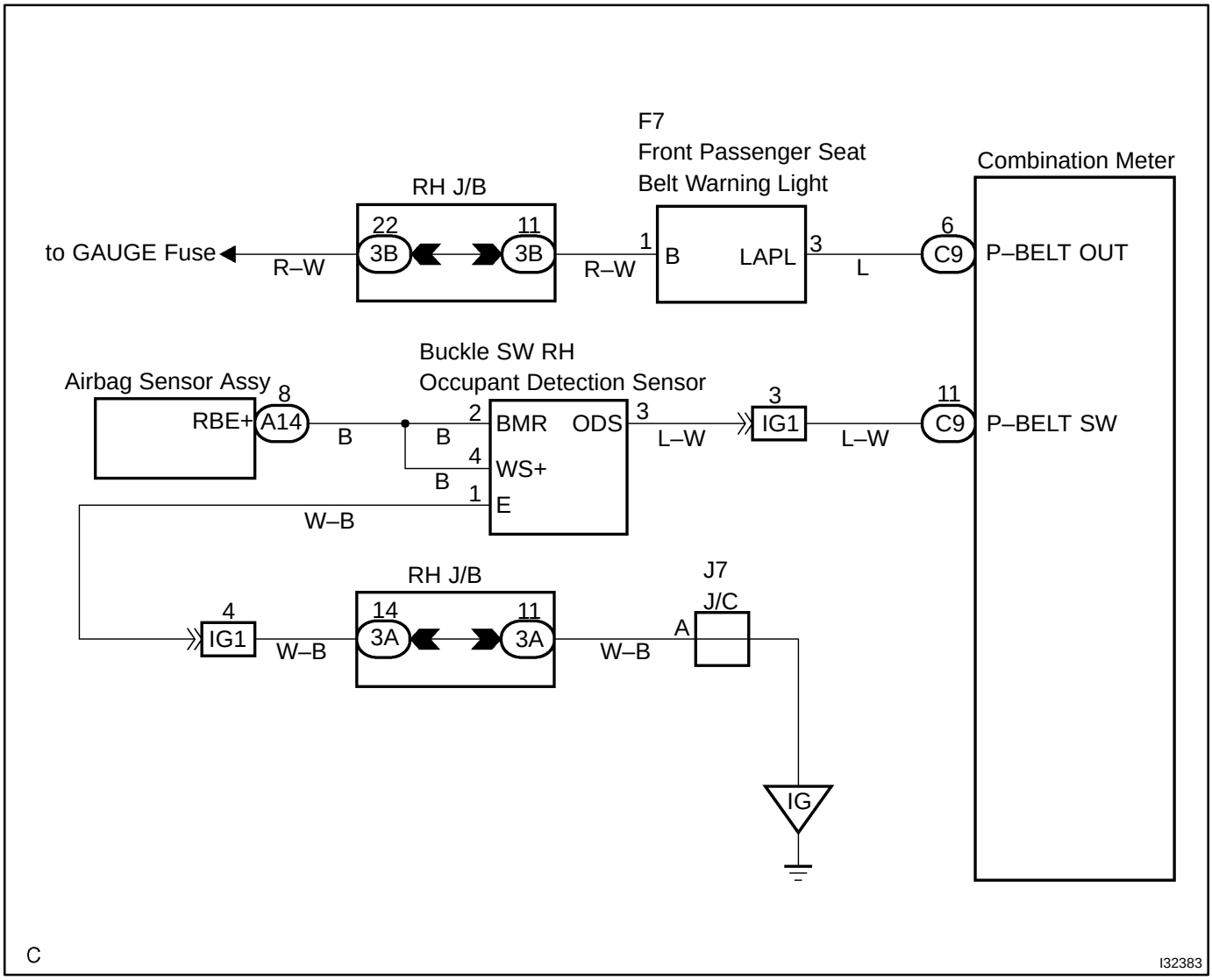
NG → **REPLACE FRONT SEAT INNER BELT ASSY LH**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

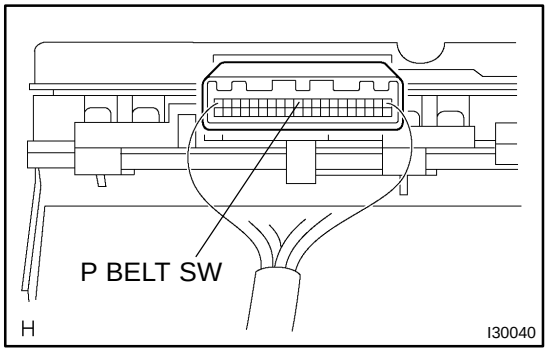
SEAT BELT WARNING LAMP FOR FRONT PASSENGER'S SEAT DOES NOT FLASH

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT COMBINATION METER ASSY

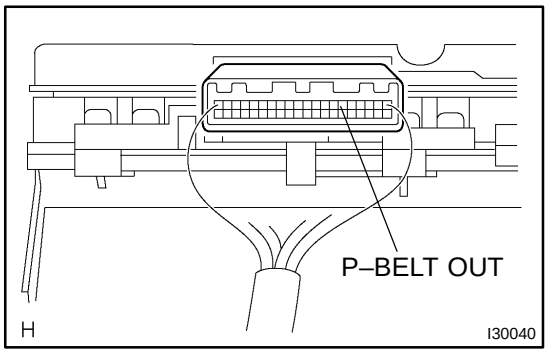


(a) Ground terminal C9–11 on the combination meter side.
(b) Check that the warning lightlights up.
OK: Warning light lights up.

OK	**Go to step 3**

NG

2 INSPECT PASSENGER SEAT BELT WARNING LAMP ASSY



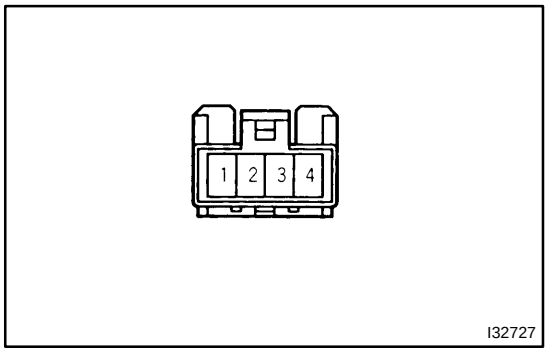
(a) Ground terminal C9–6 on the combination meter side.
(b) Check that the warning lightlights up.
OK: Warning light lights up.

NG	**CHECK AND REPLACE PASSENGER SEAT BELT WARNING LAMP ASSY**

OK

CHECK AND REPLACE COMBINATION METER ASSY

3 INSPECT FRONT SEAT INNER BELT ASSY RH



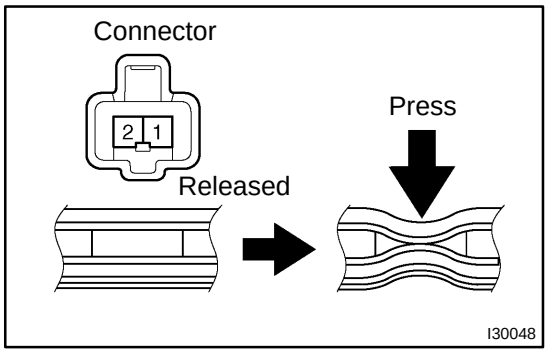
(a) Check continuity.
(1) Disconnect the front seat inner belt assy.
(2) Check the continuity in between terminals 1 and 2 of front seat inner belt assy RH.
OK:

Condition	Continuity
Seat belt is fastened	Continuity
Seat belt is unfastened	No continuity

NG	**CHECK AND REPLACE FRONT SEAT INNER BELT ASSY RH**

OK

4	INSPECT SEPARATE SEAT TYPE FRONT SEAT CUSHION PAD



(a) Disconnect the separate type front seat cushion pad.
(b) Check continuity separate type front seat cushion pad.

Sear condition	Terminal	Specified condition
Released	1 – 2	No continuity
Pressed	1 – 2	Continuity

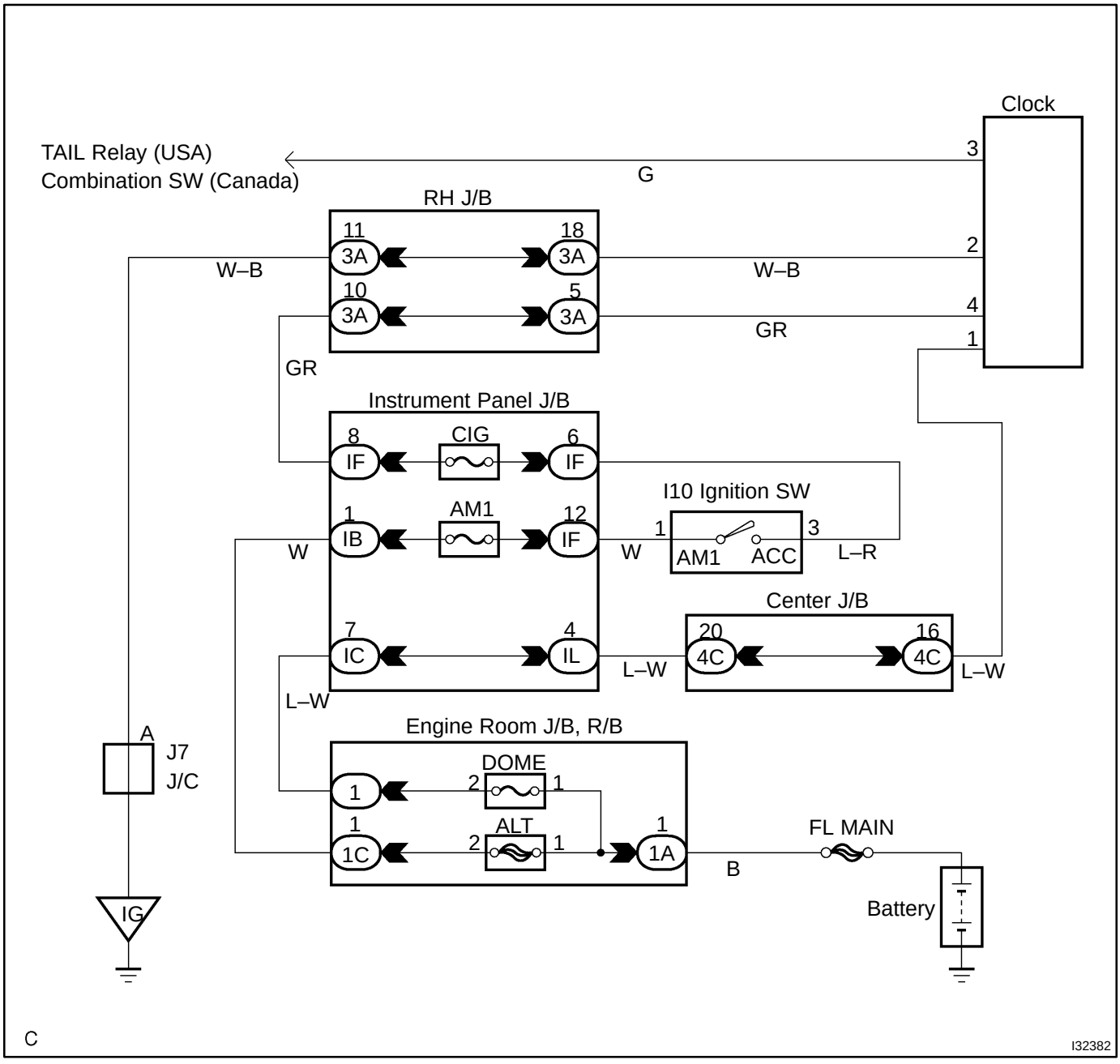
NG → **CHECK AND REPLACE SEPARATE SEAT TYPE FRONT SEAT CUSHION PAD**

OK

REPAIR OR REPLACE HARNESS AND CONNECTOR

MALFUNCTION IN CLOCK

WIRING DIAGRAM



INSPECTION PROCEDURE

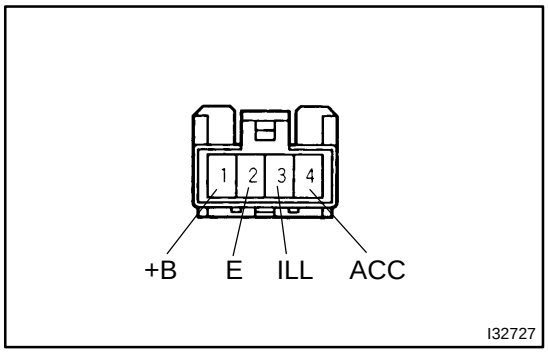
1	INSPECT FUSE

(a) Check the continuity in CIG fuse.
(b) Check the continuity in DOME fuse.

NG → REPLACE FUSE

OK

2	INSPECT HARNESS OR CONNECTOR



(a) Check voltage.
  (1) Remove the clock assy with connector still connected.
  (2) Measure voltage between terminal 1 (+B) of clock assy connector and body ground.
  Standard voltage: 10 – 14 V
  (3) Turn the ignition switch to ACC.
  (4) Measure voltage between terminal 4 (ACC) of clock assy connector and body ground.
  Standard voltage: 10 – 14 V

(b) Check continuity.
  (1) Check continuity Between terminal 2 (E) of clock assy connector and body ground.
  OK: Continuity exists

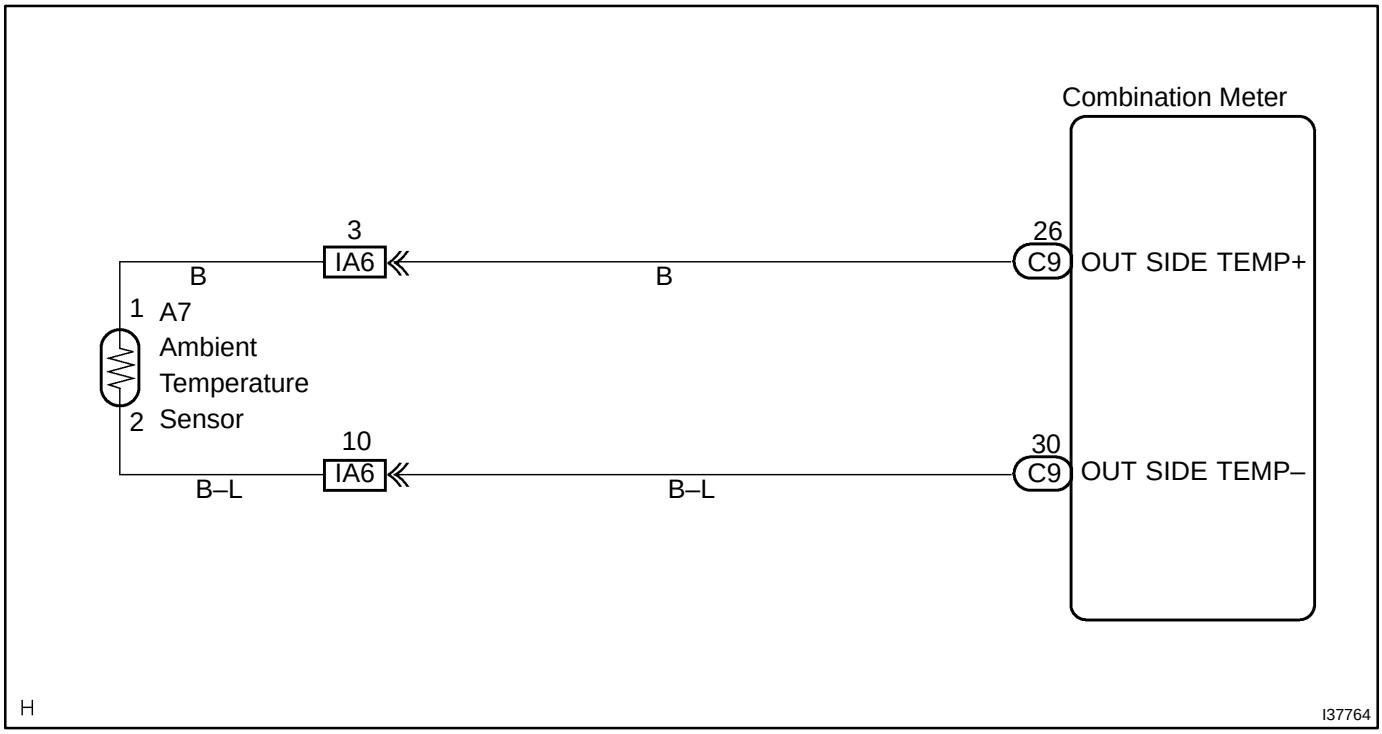
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE CLOCK ASSY

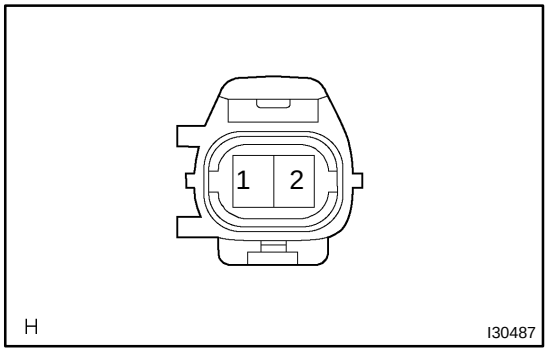
THE AMBIENT TEMPERATURE DOES NOT DISPLAY

WIRING DIAGRAM



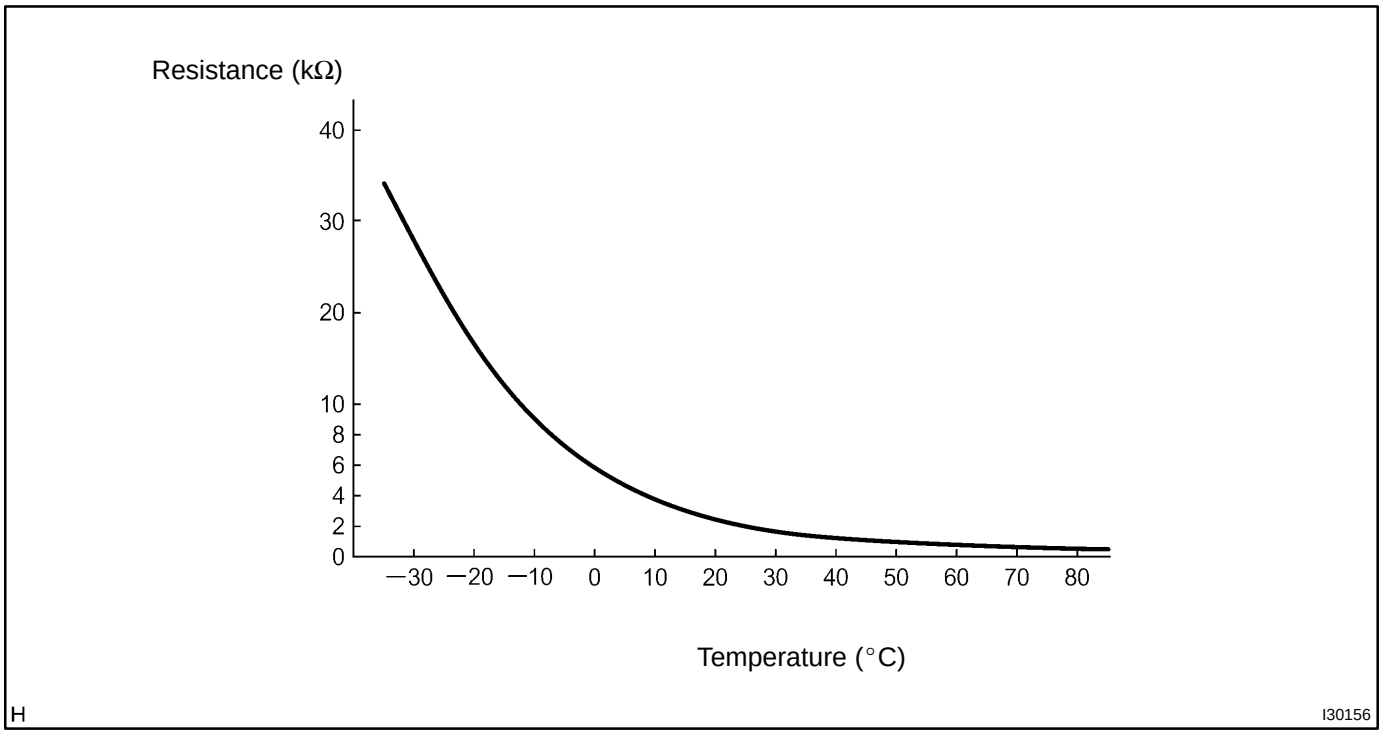
INSPECTION PROCEDURE

1	INSPECT OUTER AMBIENT TEMPERATURE SENSOR



(a) Remove cooler (ambient temp. sensor) thermistor.
(b) Measure resistance between terminals 1 and 2 of cooler (ambient temp. sensor) thermistor connector at each temperature.
Resistance:
at 0 °C (0 °F) : 9.097 – 9.701 kΩ
at 25 °C (77 °F) : 2.725 – 2.865 kΩ

HINT:
As the temperature increases, the resistance decreases.
Resistance:



NG → **REPLACE OUTER AMBIENT TEMPERATURE SENSOR**

OK

2	CHECK HARNESS AND CONNECTOR

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE COMBINATION METER ASSY