

INSTALLATION

1. INSTALL ACCELERATOR PEDAL

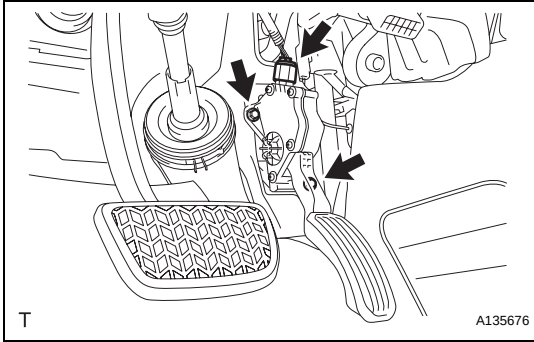
NOTICE:

- Avoid physical shock to the accelerator pedal assembly.
- Do not disassemble the accelerator pedal assembly.

- (a) Install the accelerator pedal assembly with the 2 bolts.

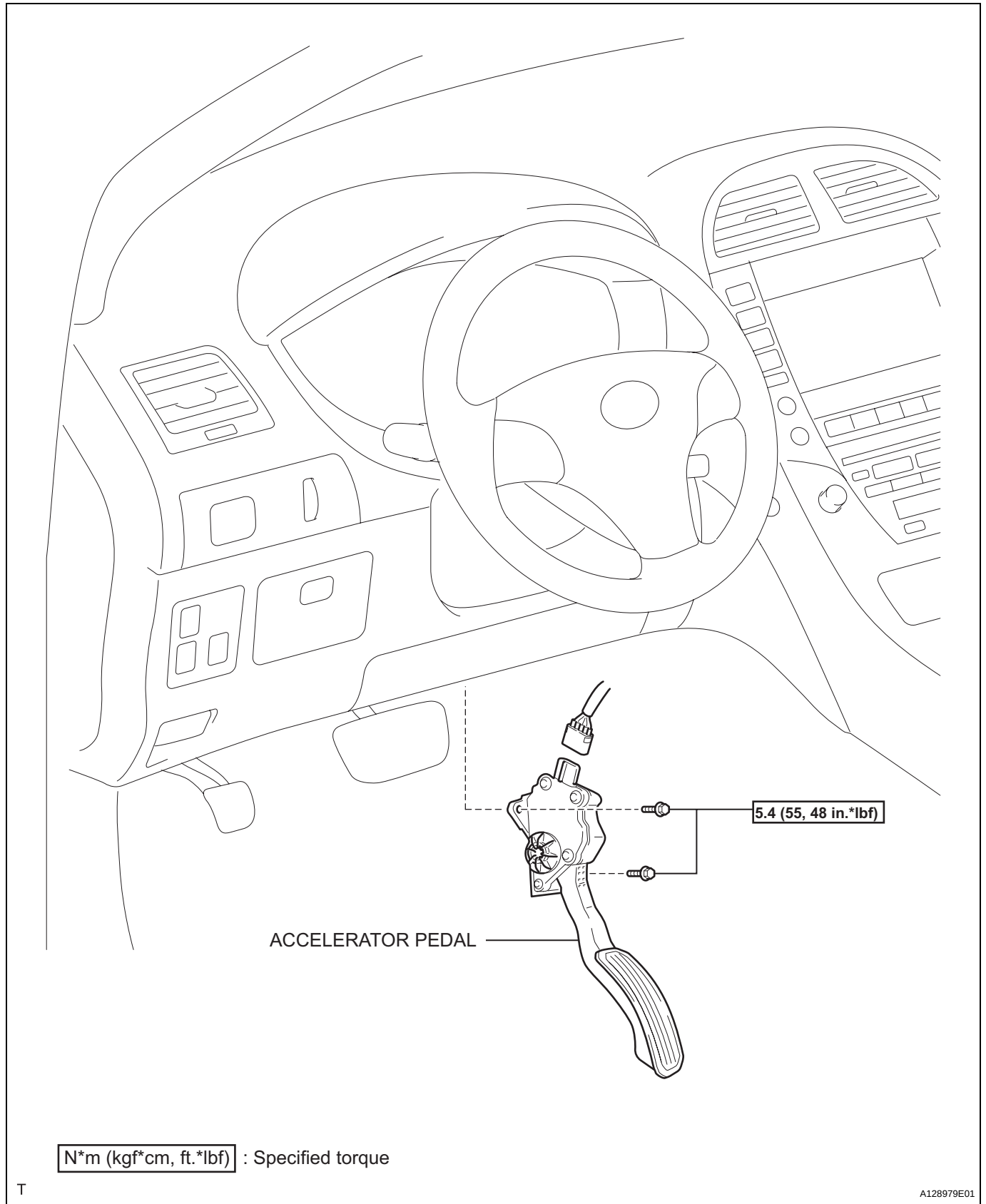
Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

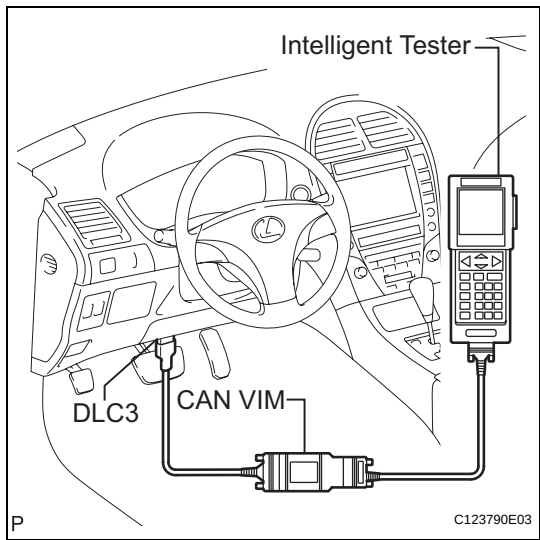
- (b) Connect the accelerator pedal connector.



ACCELERATOR PEDAL

COMPONENTS





ON-VEHICLE INSPECTION

1. CHECK ACCELERATOR PEDAL ROD

- (a) Measure the voltage.
 - (1) Connect the intelligent tester to the DLC3.
 - (2) Turn the engine switch on (IG).
 - (3) Turn the intelligent tester on.
 - (4) Select the menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / ALL / ACCEL POS #1, ACCEL POS #2.
 - (5) Operate the accelerator pedal, and then check that the ACCEL POS #1 and ACCEL POS #2 values are within the specifications.

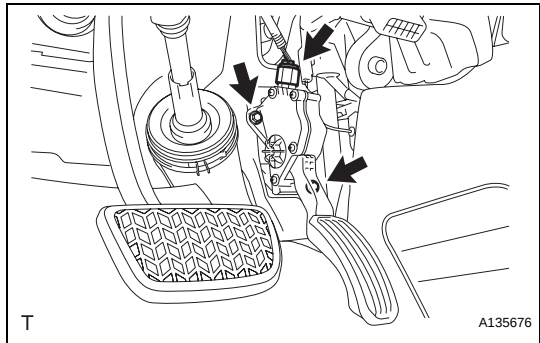
Standard voltage (ACCEL POS #1)

Accelerator Pedal Condition	Specified Condition
Released	0.5 to 1.1 V
Depressed	2.5 to 4.5 V

Standard voltage (ACCEL POS #2)

Accelerator Pedal Condition	Specified Condition
Released	1.2 to 2.0 V
Depressed	3.4 to 5.0 V

If the result is not as specified, check the accelerator pedal rod, wire harness or ECM.



REMOVAL

1. REMOVE ACCELERATOR PEDAL

- (a) Disconnect the accelerator pedal connector.
- (b) Remove the 2 bolts and the accelerator pedal assembly.

INSTALLATION

1. INSTALL ECM

- (a) Install the ECM bracket with the 4 screws.

Torque: 3.0 N*m (31 kgf*cm, 27 in.*lbf)

- (b) Connect the 2 ECM connectors.

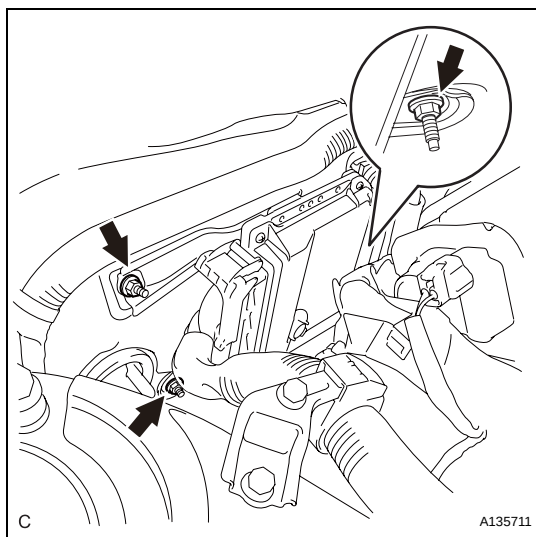
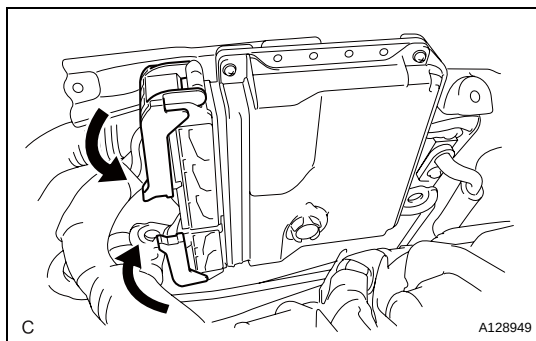
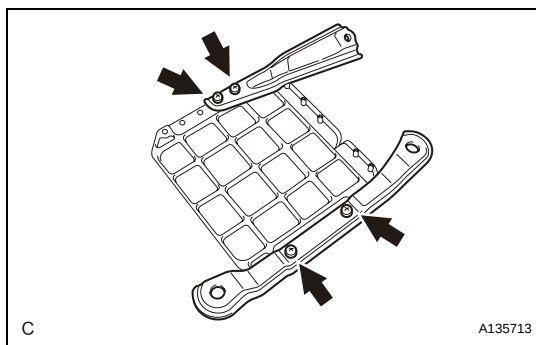
NOTICE:

When connecting the connector, make sure that dirt, water and other foreign matter do not become stuck between the connector and other parts.

- (1) Connect the 2 ECM connectors and lower the 2 levers.

NOTICE:

Make sure that the 2 levers are securely lowered.



- (c) Install the ECM with the 3 nuts.

Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)

2. INSTALL FRONT SUSPENSION UPPER CENTER BRACE (See page [BR-25](#))

3. INSTALL ENGINE ROOM SIDE COVER LH (See page [EM-50](#))

4. INSTALL ENGINE ROOM SIDE COVER RH (See page [EM-50](#))

5. INSTALL COOL AIR INTAKE DUCT SEAL (See page [EM-50](#))

6. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

7. PERFORM INITIALIZATION

- (a) Perform initialization procedure (See page [IN-33](#)).

NOTICE:

Some vehicle systems require initialization after reconnecting the cable to the negative battery terminal.

ECM

COMPONENTS

ES

FRONT SUSPENSION UPPER CENTER BRACE

85 (867, 63)

85 (867, 63)

ENGINE ROOM SIDE COVER RH

ENGINE ROOM SIDE COVER LH

COOL AIR INTAKE DUCT SEAL

8.0 (82, 71 in.*lbf)

3.0 (31, 27 in.*lbf)

3.0 (31, 27 in.*lbf)

ECM

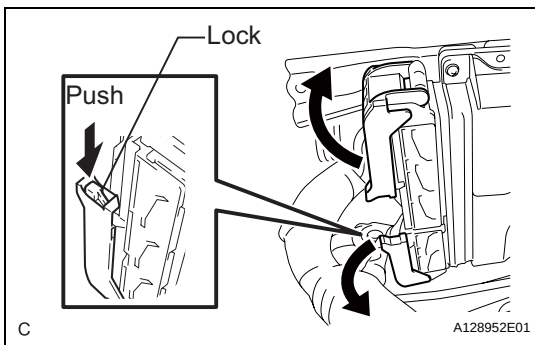
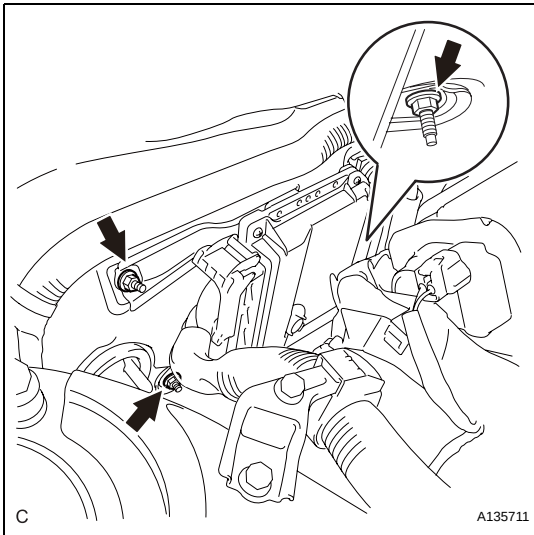
8.0 (82, 71 in.*lbf)

N*m (kgf*cm, ft.*lbf) : Specified torque

REMOVAL

1. DISCONNECT CABLE TO NEGATIVE BATTERY TERMINAL
2. REMOVE COOL AIR INTAKE DUCT SEAL (See page [EM-22](#))
3. REMOVE ENGINE ROOM SIDE COVER LH (See page [EM-22](#))
4. REMOVE ENGINE ROOM SIDE COVER RH (See page [EM-22](#))
5. REMOVE FRONT SUSPENSION UPPER CENTER BRACE (See page [BR-22](#))
6. REMOVE ECM
 - (a) Remove the 3 nuts.

ES



- (b) Disconnect the 2 ECM connectors and remove the ECM.

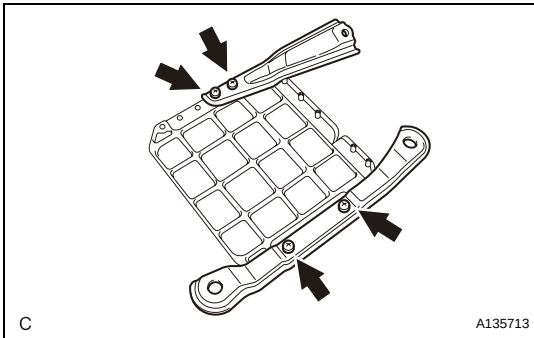
- (1) Raise the 2 levers while pushing the locks on the 2 levers, and disconnect the 2 ECM connectors.

NOTICE:

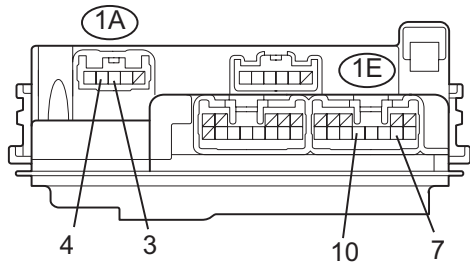
After disconnecting the connector, make sure that dirt, water and other foreign matter do not contact the connecting part of the connector.

- (2) Remove the ECM.

- (c) Remove the 4 screws and 2 ECM brackets.



Engine Room R/B Unit D:



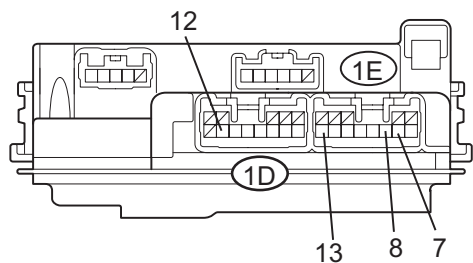
AIR FUEL RATIO SENSOR RELAY

INSPECTION

1. INSPECT AIR FUEL RATIO SENSOR RELAY
- (a) Using an ohmmeter, measure the resistance according to the value(s) in the table below.
- Standard resistance**

Tester connection	Specified Condition
1A-3 - 1A-4	10 kΩ or higher
1A-3 - 1A-4	Below 1 Ω (Battery voltage applied between terminals 1E-7 and 1E-10)

Engine Room R/B Unit D:



A137364E04

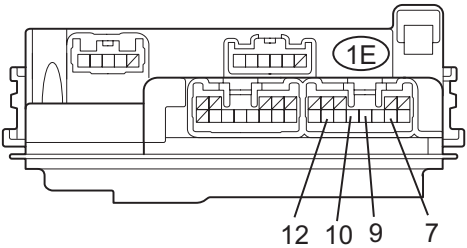
CIRCUIT OPENING RELAY

INSPECTION

1. **INSPECT CIRCUIT OPENING RELAY**
- (a) Using an ohmmeter, measure the resistance according to the value(s) in the table below.
- Standard resistance**

Tester connection	Specified Condition
1E-7 - 1E-13	10 kΩ or higher
1E-7 - 1E-13	Below 1 Ω (Battery voltage applied between terminals 1E-8 and 1D-12)

Engine Room R/B Unit D:



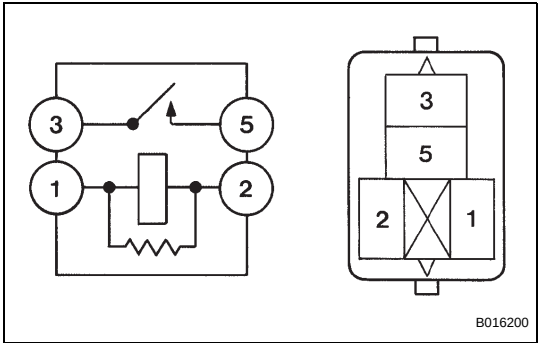
A137364E01

EFI RELAY

INSPECTION

1. **INSPECT EFI RELAY**
- (a) Using an ohmmeter, measure the resistance according to the value(s) in the table below.
- Standard resistance**

Tester connection	Specified Condition
1E-7 - 1E-12	10 kΩ or higher
1E-7 - 1E-12	Below 1 Ω (Battery voltage applied between terminals 1E-9 and 1E-10)



IG2 RELAY

INSPECTION

- 1. INSPECT IG2 RELAY**
- (a) Using an ohmmeter, measure the resistance according to the value(s) in the table below.
- Standard resistance**

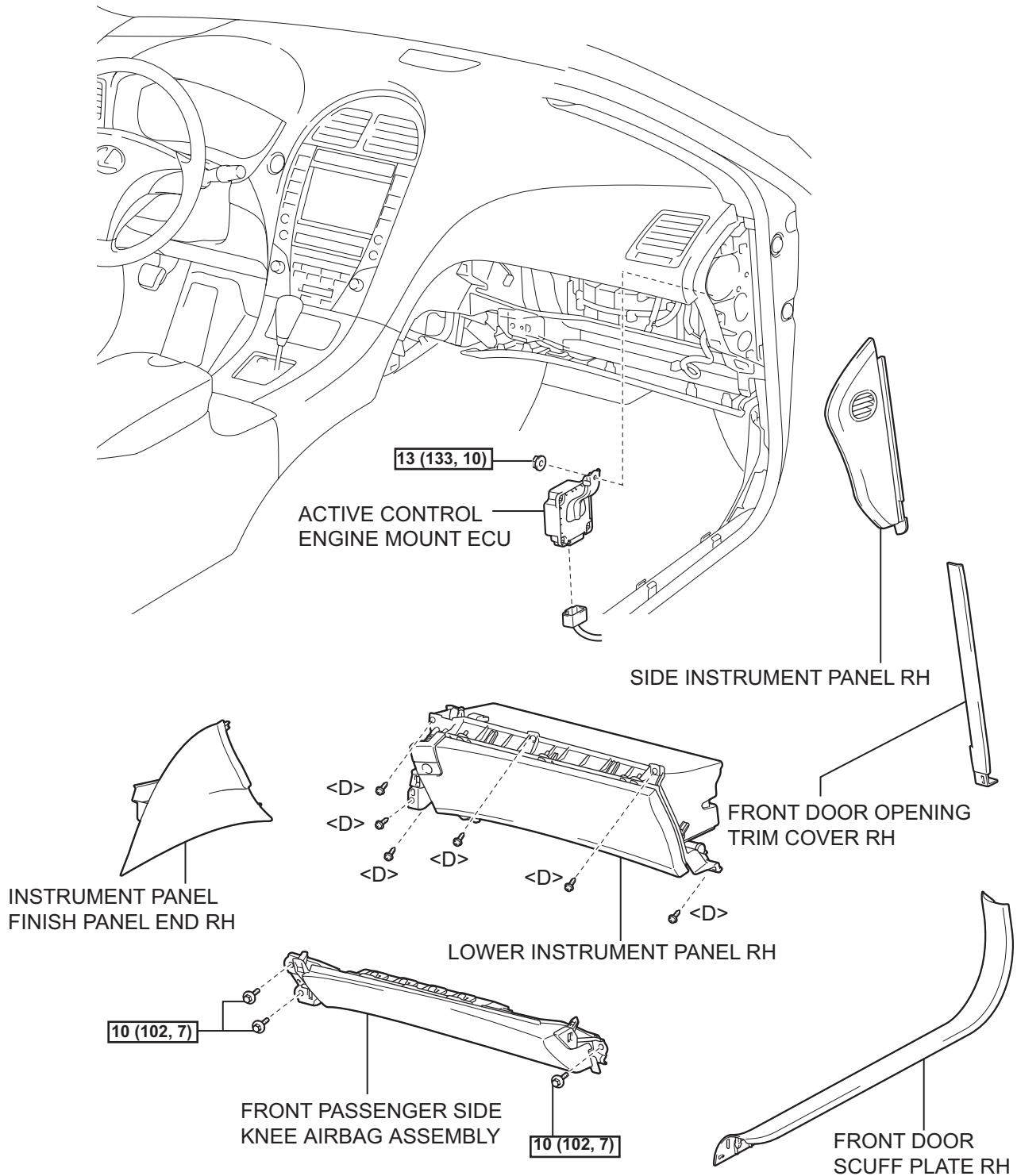
Tester Connection	Specified Condition
3 - 5	10 kΩ or higher
3 - 5	Below 1 Ω (Battery voltage applied between terminals 1 and 2)

If the result is not as specified, replace the relay.

ACTIVE CONTROL ENGINE MOUNT ECU

COMPONENTS

ES



[N*m (kgf*cm, ft.*lbf)]: Specified torque

REMOVAL

1. PRECAUTION

CAUTION:

Be sure to read "PRECAUTION" thoroughly before servicing (See page [IP-1](#)).

2. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait for 90 seconds after disconnecting the cable to prevent airbag deployment (See page [RS-1](#)).

3. REMOVE SIDE INSTRUMENT PANEL RH (See page [IP-15](#))

4. REMOVE INSTRUMENT PANEL FINISH PANEL END RH (See page [IP-15](#))

5. REMOVE FRONT DOOR SCUFF PLATE RH (See page [IR-42](#))

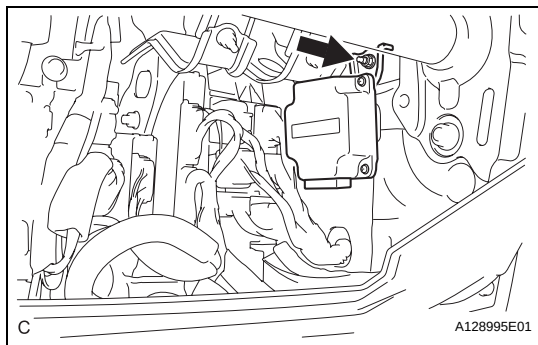
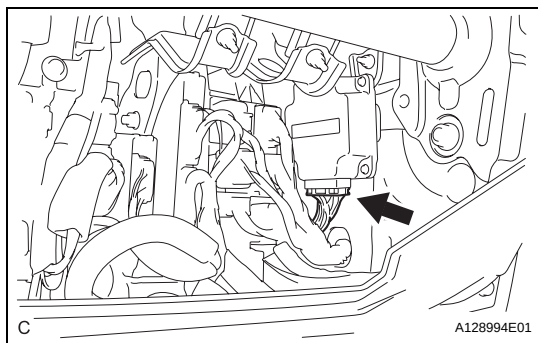
6. REMOVE FRONT DOOR OPENING TRIM COVER RH (See page [IR-42](#))

7. REMOVE FRONT PASSENGER SIDE KNEE AIRBAG ASSEMBLY (See page [RS-396](#))

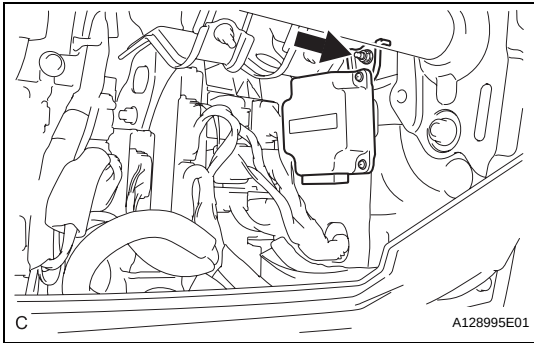
8. REMOVE LOWER INSTRUMENT PANEL RH (See page [IP-16](#))

9. REMOVE ACTIVE CONTROL ENGINE MOUNT ECU

(a) Disconnect the connector.

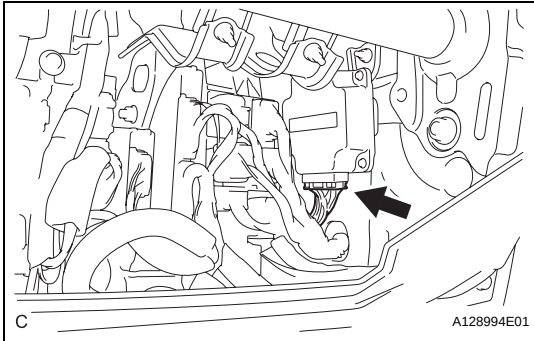


(b) Remove the nut and active control engine mount ECU.



INSTALLATION

1. **INSTALL ACTIVE CONTROL ENGINE MOUNT ECU**
 - (a) Install the active control engine mount ECU with the nut.
Torque: 13 N*m (133 kgf*cm, 10 ft.*lbf)

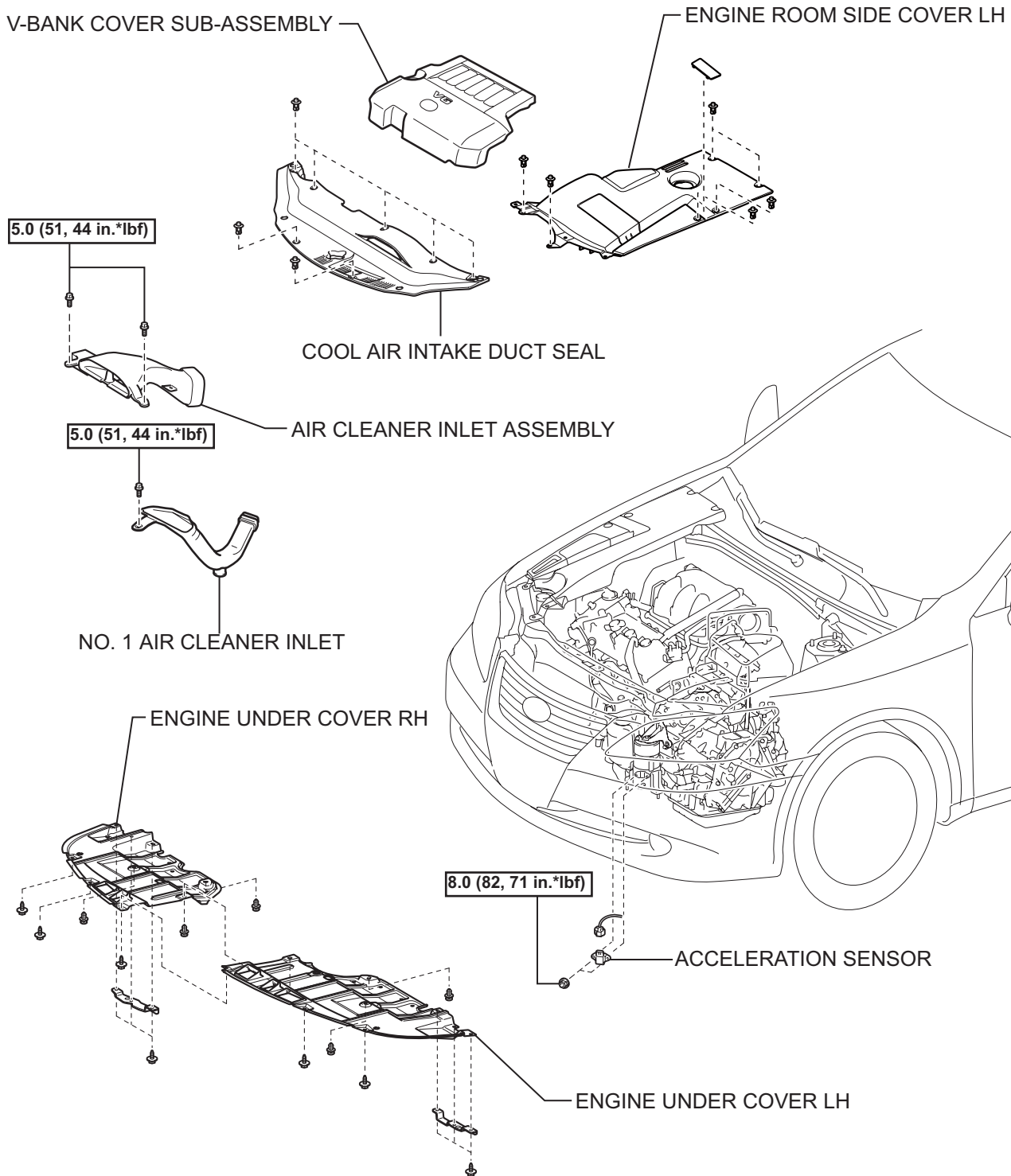


- (b) Connect the connector.
2. **INSTALL LOWER INSTRUMENT PANEL RH** (See page [IP-42](#))
3. **INSTALL FRONT PASSENGER SIDE KNEE AIRBAG ASSEMBLY** (See page [RS-395](#))
4. **INSTALL FRONT DOOR OPENING TRIM COVER RH** (See page [IR-64](#))
5. **INSTALL FRONT DOOR SCUFF PLATE RH** (See page [IR-65](#))
6. **INSTALL INSTRUMENT PANEL FINISH PANEL END RH** (See page [IP-46](#))
7. **INSTALL SIDE INSTRUMENT PANEL RH** (See page [IP-47](#))
8. **CONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
9. **INSPECT FRONT PASSENGER SIDE KNEE AIRBAG ASSEMBLY** (See page [RS-395](#))
10. **INSPECT SRS WARNING LIGHT** (See page [RS-395](#))
11. **PERFORM INITIALIZATION**
 - (a) Perform initialization procedure (See page [IN-33](#)).
NOTICE:
Some vehicle systems require initialization after reconnecting the cable to the negative battery terminal.

ACCELERATION SENSOR

COMPONENTS

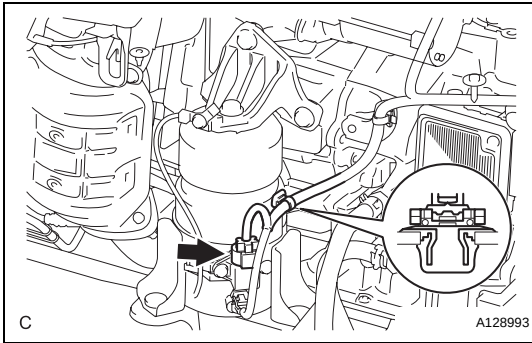
ES



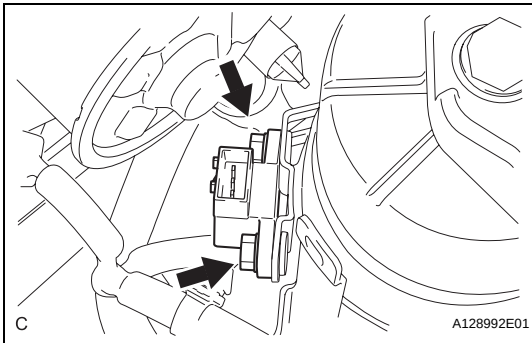
N*m (kgf*cm, ft.*lbf): Specified torque

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL
2. REMOVE ENGINE UNDER COVER LH
3. REMOVE ENGINE UNDER COVER RH
4. REMOVE COOL AIR INTAKE DUCT SEAL (See page [EM-22](#))
5. REMOVE ENGINE ROOM SIDE COVER LH (See page [EM-22](#))
6. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-23](#))
7. REMOVE AIR CLEANER INLET ASSEMBLY (See page [EM-23](#))
8. REMOVE NO. 1 AIR CLEANER INLET (See page [EM-23](#))
9. REMOVE ACCELERATION SENSOR
 - (a) Disconnect the acceleration sensor connector and clamp.

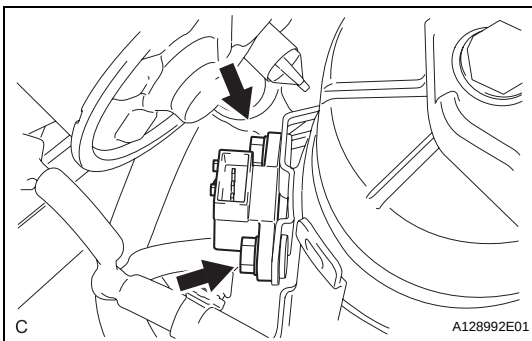
ES

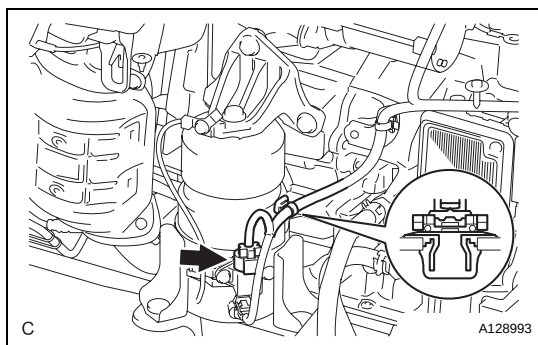
- (b) Remove the 2 nuts and acceleration sensor.



INSTALLATION

1. INSTALL ACCELERATION SENSOR
 - (a) Install the acceleration sensor with the 2 nuts.
Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)





(b) Connect the acceleration sensor connector and clamp.

2. **INSTALL NO. 1 AIR CLEANER INLET** (See page [EM-48](#))
3. **INSTALL AIR CLEANER INLET ASSEMBLY** (See page [EM-48](#))
4. **INSTALL V-BANK COVER SUB-ASSEMBLY** (See page [EM-49](#))
5. **INSTALL ENGINE ROOM SIDE COVER LH** (See page [EM-49](#))
6. **INSTALL COOL AIR INTAKE DUCT SEAL** (See page [EM-50](#))
7. **INSTALL ENGINE UNDER COVER RH**
8. **INSTALL ENGINE UNDER COVER LH**
9. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
10. **PERFORM INITIALIZATION**
 - (a) Perform initialization procedure (See page [IN-33](#)).

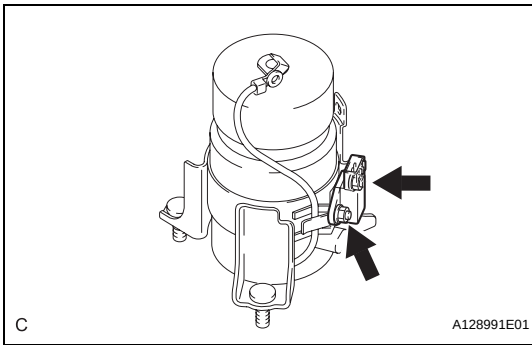
NOTICE:

Some vehicle systems require initialization after reconnecting the cable to the negative battery terminal.

INSTALLATION

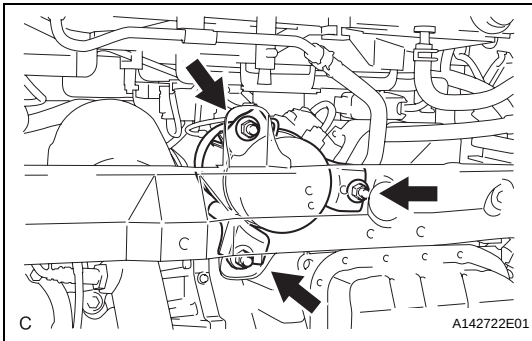
1. INSTALL ACTIVE CONTROL ENGINE MOUNT

- (a) Install the acceleration sensor with the 2 nuts.
Torque: 8.0 N*m (81 kgf*cm, 71 in.*lbf)



- (b) Install the active control engine mount with the 3 nuts.

Torque: 52 N*m (530 kgf*cm, 38 ft.*lbf)



2. INSTALL ENGINE MOUNTING BRACKET FR

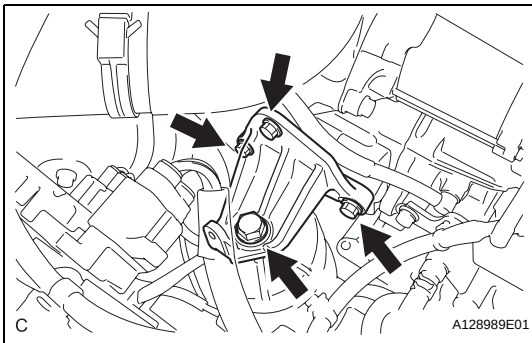
- (a) Install the engine mounting bracket FR with the 4 bolts.

Torque: Automatic Transaxle Side

64 N*m (653 kgf*cm, 47 ft.*lbf)

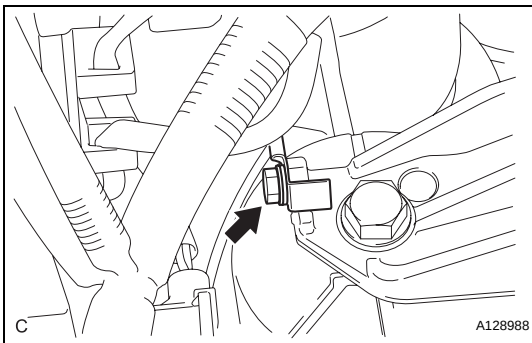
Active Engine Mounting Side

87 N*m (887 kgf*cm, 64 ft.*lbf)



- (b) Connect the earth cable with the bolt.

Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)



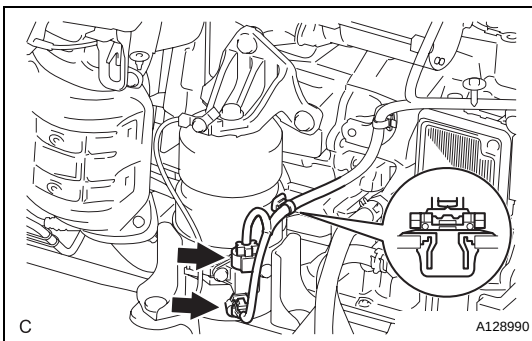
- (c) Connect the 2 connectors and clamp.

3. INSTALL NO. 1 AIR CLEANER INLET (See page [EM-48](#))

4. INSTALL AIR CLEANER INLET ASSEMBLY (See page [EM-48](#))

5. INSTALL V-BANK COVER SUB-ASSEMBLY (See page [EM-49](#))

6. INSTALL ENGINE ROOM SIDE COVER LH (See page [EM-50](#))



7. INSTALL COOL AIR INTAKE DUCT SEAL (See page [EM-50](#))
8. INSTALL ENGINE UNDER COVER RH
9. INSTALL ENGINE UNDER COVER LH
10. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL
11. PERFORM INITIALIZATION
 - (a) Perform initialization procedure (See page [IN-33](#)).
NOTICE:
Some vehicle systems require initialization after reconnecting the cable to the negative battery terminal.

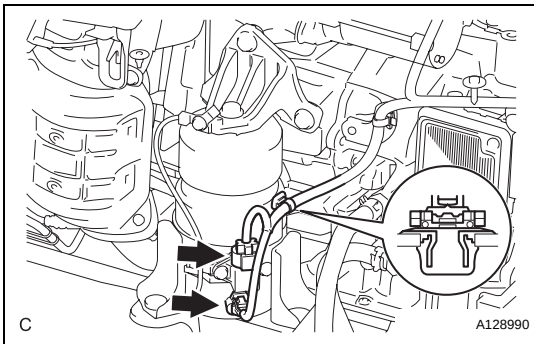
REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL
2. REMOVE ENGINE UNDER COVER LH
3. REMOVE ENGINE UNDER COVER RH
4. REMOVE COOL AIR INTAKE DUCT SEAL (See page [EM-22](#))
5. REMOVE ENGINE ROOM SIDE COVER LH (See page [EM-22](#))
6. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-23](#))
7. REMOVE AIR CLEANER INLET ASSEMBLY (See page [EM-23](#))
8. REMOVE NO. 1 AIR CLEANER INLET (See page [EM-23](#))
9. REMOVE ENGINE MOUNTING BRACKET FR

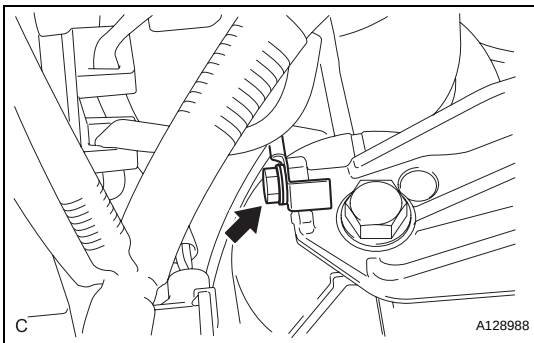
HINT:

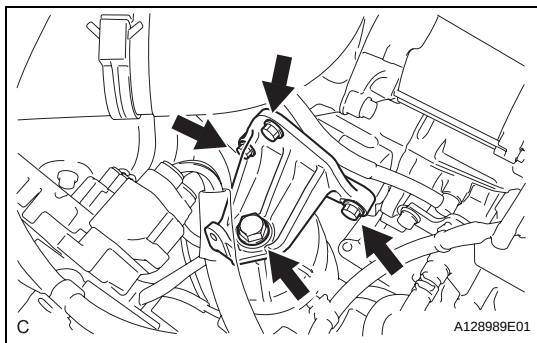
Securely support the automatic transaxle using a jack.

- (a) Disconnect the 2 connectors and clamp.



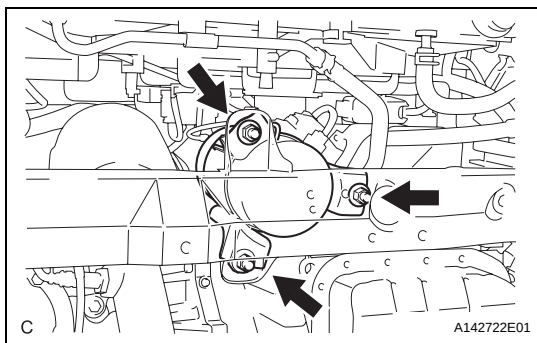
- (b) Remove the bolt and disconnect the earth cable.





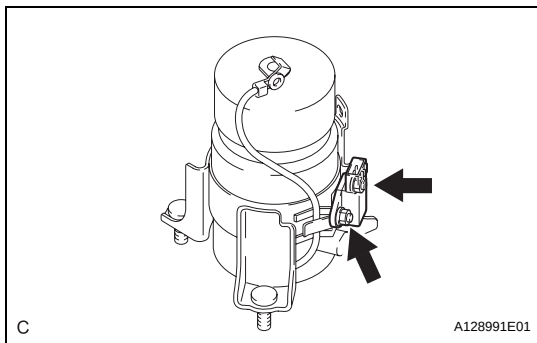
- (c) Remove the 4 bolts and engine mounting bracket FR.

ES

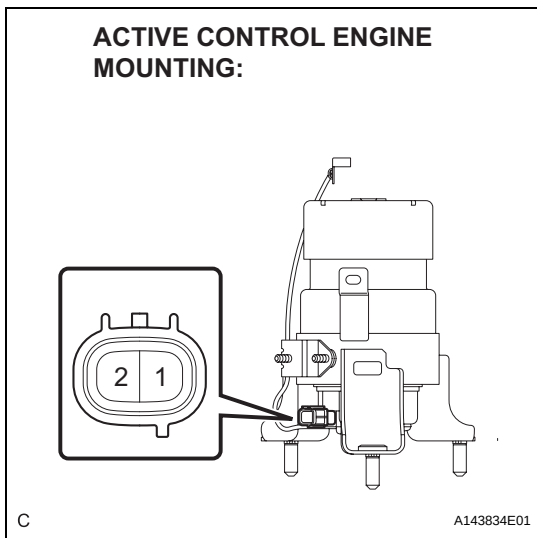


10. REMOVE ACTIVE CONTROL ENGINE MOUNT

- (a) Remove the 3 nuts and active control engine mount.



- (b) Remove the 2 nuts and acceleration sensor.



INSPECTION

1. INSPECT ACTIVE CONTROL ENGINE MOUNTING

- (a) Using an ohmmeter, measure the resistance between the terminals.

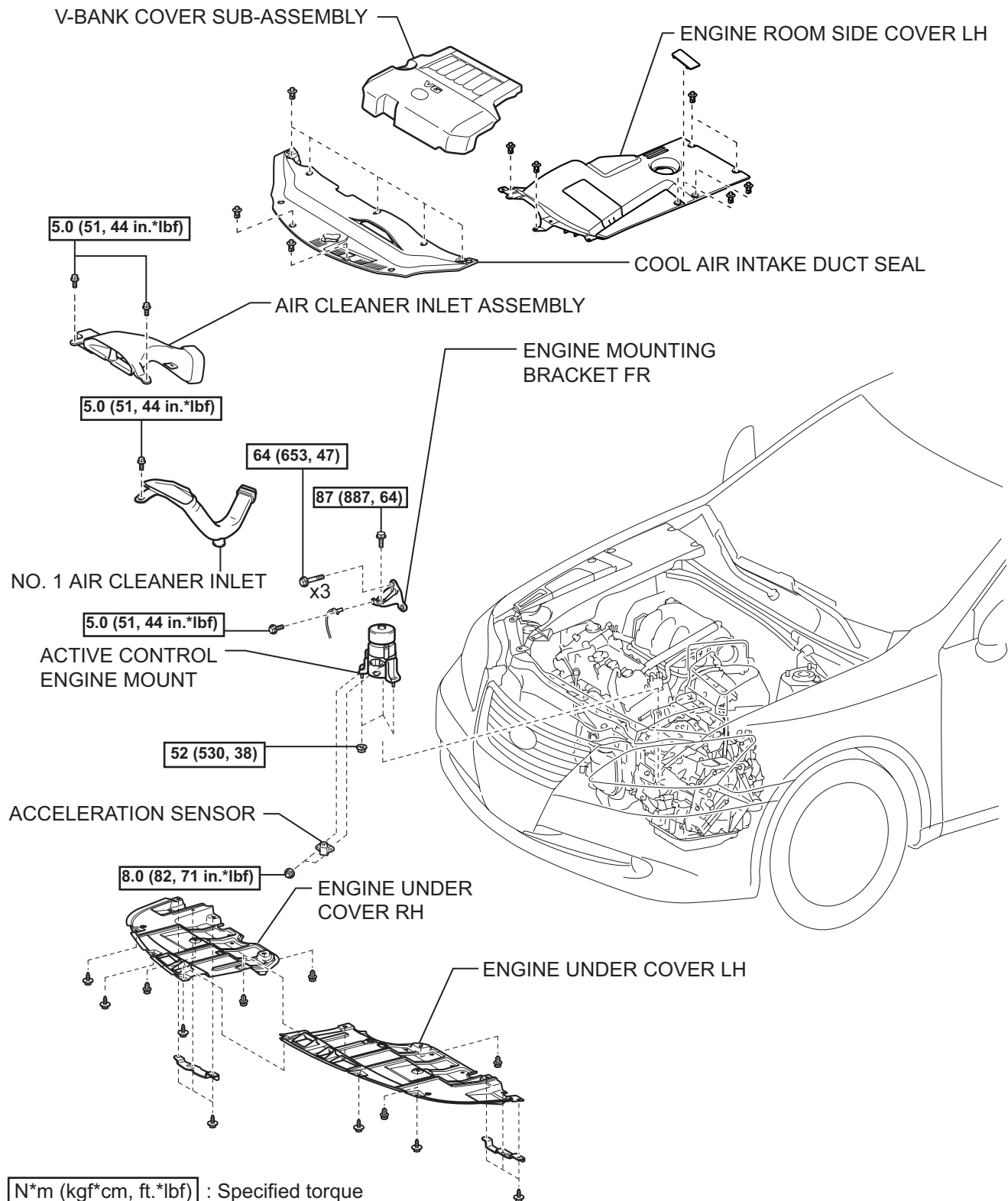
Standard resistance:

0.55 to 0.95Ω

If the resistance is not as specified, replace the active control engine mounting.

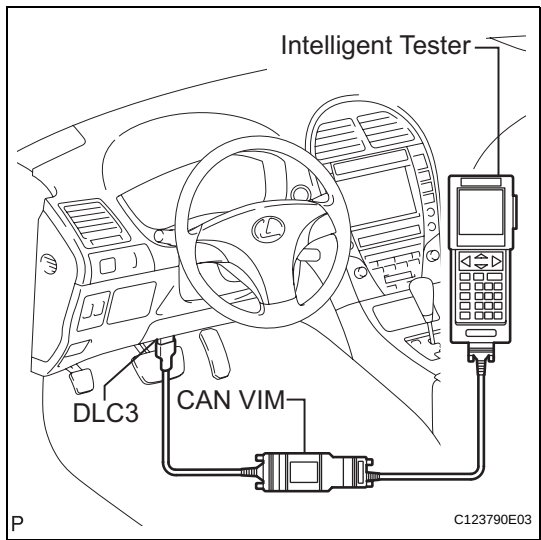
ACTIVE CONTROL ENGINE MOUNT

COMPONENTS



ES

ES



ON-VEHICLE INSPECTION

- 1. INSPECT ACTIVE ENGINE MOUNTING
 - (a) Inspect the active engine mounting.
 - (1) Connect the intelligent tester to DLC3.
 - (2) Start the engine and turn the intelligent tester on.
 - (3) Enter the following menus: DIAGNOSIS / OBD/ MOBD / E-ACM / ACTIVE TEST.

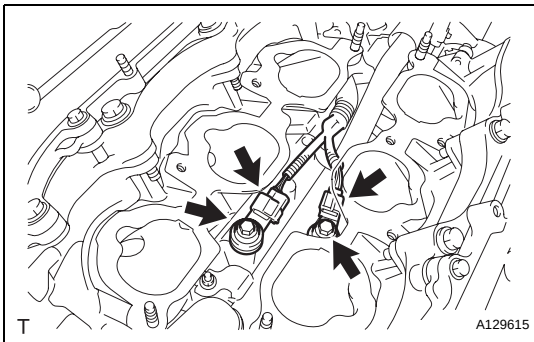
Item	Test Details	Diagnostic Note
CHECK THE E-ACM	[Tester Details] Operate the E-ACM actuator [Vehicle Condition] Engine running	-

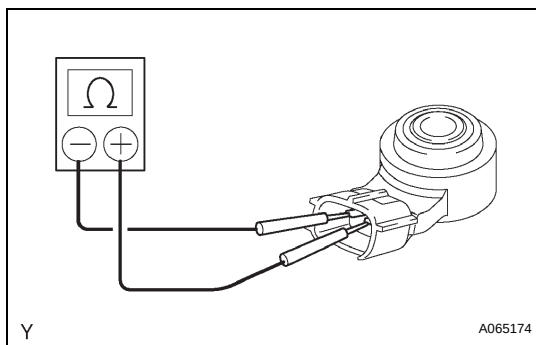
- (4) Check if the active mount control operates.

Standard:
The active mount control operates normally.

REMOVAL

1. DISCHARGE FUEL SYSTEM PRESSURE (See page [FU-35](#))
2. REMOVE ENGINE UNDER COVER LH
3. REMOVE ENGINE UNDER COVER RH
4. DRAIN ENGINE COOLANT (See page [CO-5](#))
5. REMOVE COOL AIR INTAKE DUCT SEAL (See page [EM-22](#))
6. REMOVE ENGINE ROOM SIDE COVER LH (See page [EM-22](#))
7. REMOVE ENGINE ROOM SIDE COVER RH (See page [EM-22](#))
8. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-23](#))
9. REMOVE FRONT SUSPENSION UPPER CENTER BRACE (See page [BR-22](#))
10. REMOVE AIR CLEANER INLET ASSEMBLY (See page [EM-23](#))
11. REMOVE AIR CLEANER CAP SUB-ASSEMBLY (See page [ES-519](#))
12. REMOVE AIR CLEANER CASE SUB-ASSEMBLY (See page [EM-23](#))
13. REMOVE NO. 1 AIR CLEANER INLET (See page [EM-23](#))
14. REMOVE INTAKE AIR SURGE TANK (See page [FU-12](#))
15. SEPARATE FUEL TUBE SUB-ASSEMBLY (See page [FU-13](#))
16. REMOVE INTAKE MANIFOLD (See page [EM-31](#))
17. REMOVE KNOCK CONTROL SENSOR
 - (a) Disconnect the 2 knock control sensor connectors.
 - (b) Remove the 2 bolts and 2 knock control sensors.

ES



INSPECTION

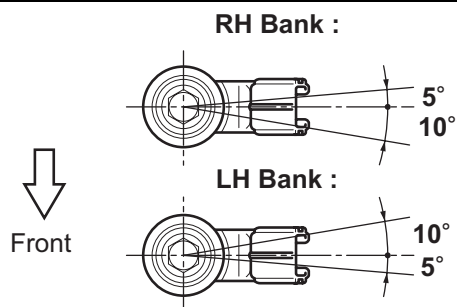
1. INSPECT KNOCK CONTROL SENSOR

- (a) Using an ohmmeter, measure the resistance between the terminals.

Standard resistance:

120 to 280 k Ω at 20°C (68°F)

If the result is not as specified, replace the sensor.



INSTALLATION

1. INSTALL KNOCK CONTROL SENSOR

- (a) Install the 2 knock control sensors with the 2 bolts as shown in the illustration.

Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf)

- (b) Connect the 2 knock control sensor connectors.

2. INSTALL INTAKE MANIFOLD (See page [EM-40](#))

3. CONNECT FUEL TUBE SUB-ASSEMBLY (See page [FU-17](#))

4. INSTALL INTAKE AIR SURGE TANK (See page [FU-17](#))

5. INSTALL NO. 1 AIR CLEANER INLET (See page [EM-48](#))

6. INSTALL AIR CLEANER CASE SUB-ASSEMBLY (See page [EM-48](#))

7. INSTALL AIR CLEANER CAP SUB-ASSEMBLY (See page [ES-522](#))

8. INSTALL AIR CLEANER INLET ASSEMBLY (See page [EM-48](#))

9. ADD ENGINE COOLANT (See page [CO-6](#))

10. CHECK FOR ENGINE COOLANT LEAKS (See page [CO-1](#))

11. CHECK FOR FUEL LEAKS (See page [FU-7](#))

12. INSTALL FRONT SUSPENSION UPPER CENTER BRACE (See page [BR-25](#))

13. INSTALL V-BANK COVER SUB-ASSEMBLY (See page [EM-49](#))

14. INSTALL ENGINE ROOM SIDE COVER LH (See page [EM-50](#))

15. INSTALL ENGINE ROOM SIDE COVER RH (See page [EM-50](#))

16. INSTALL COOL AIR INTAKE DUCT SEAL (See page [EM-50](#))

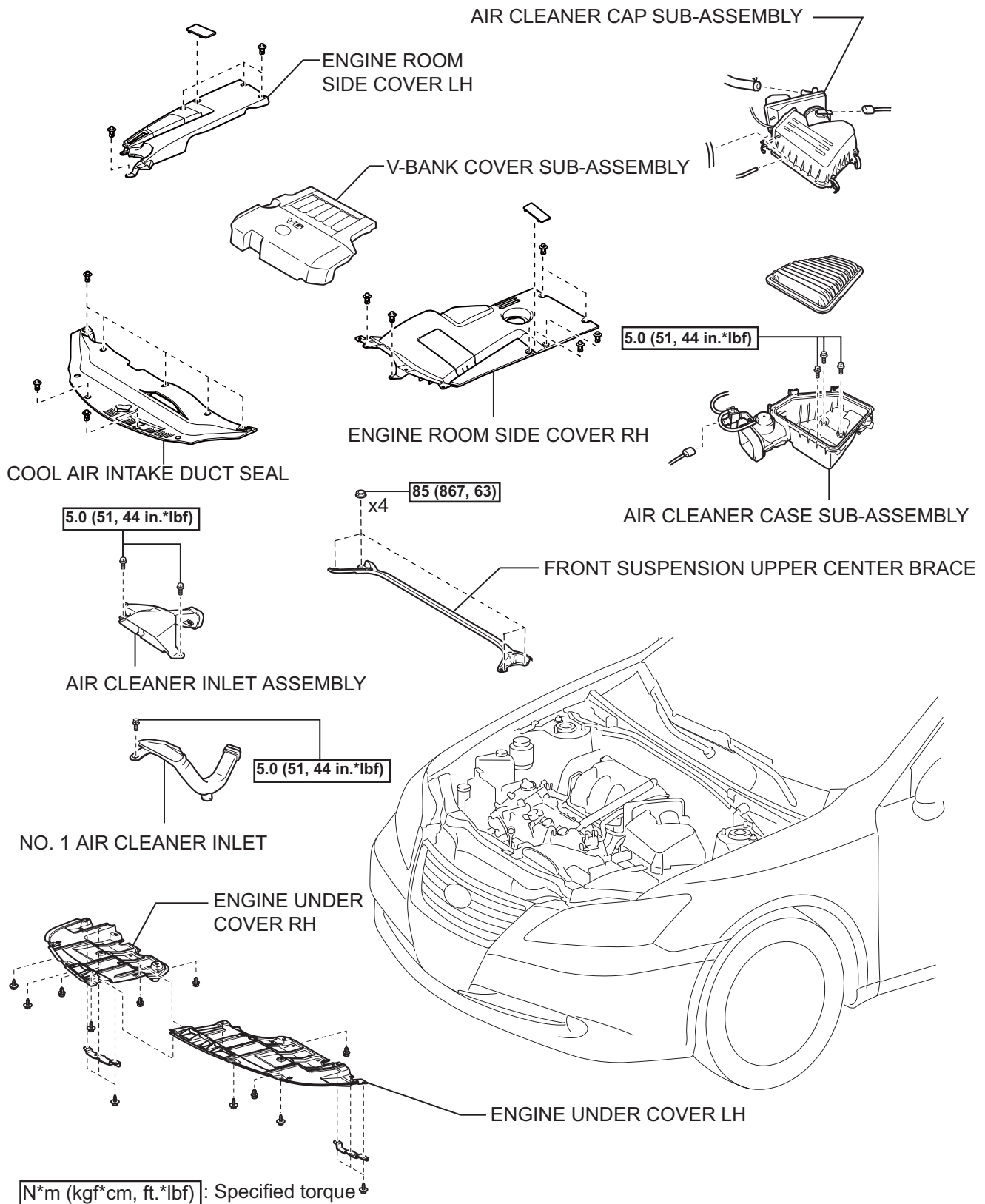
17. INSTALL ENGINE UNDER COVER RH

18. INSTALL ENGINE UNDER COVER LH

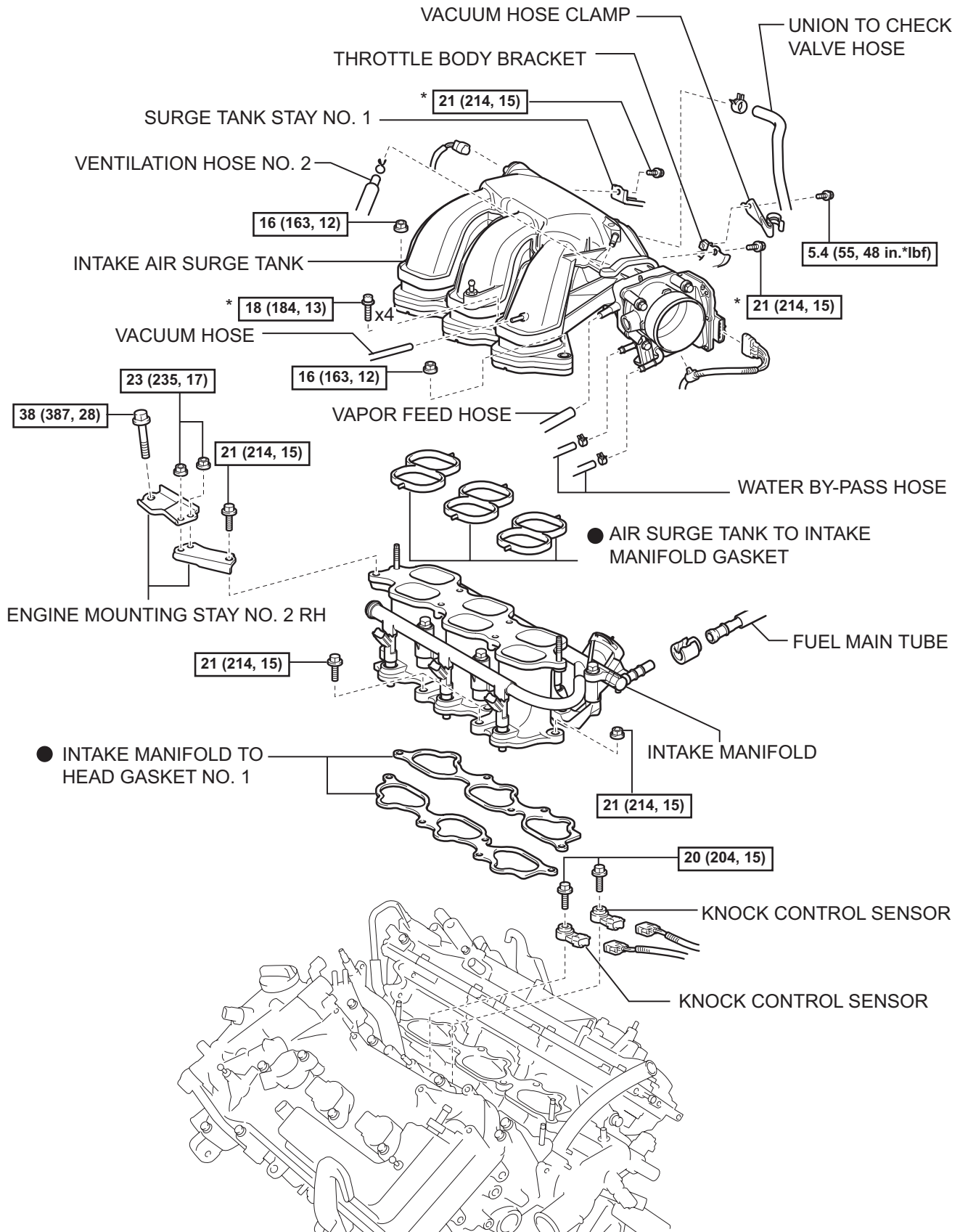
KNOCK SENSOR

COMPONENTS

ES



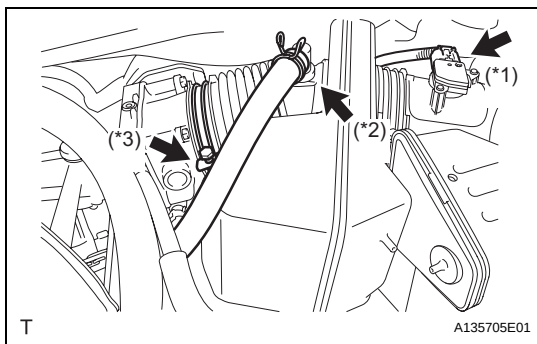
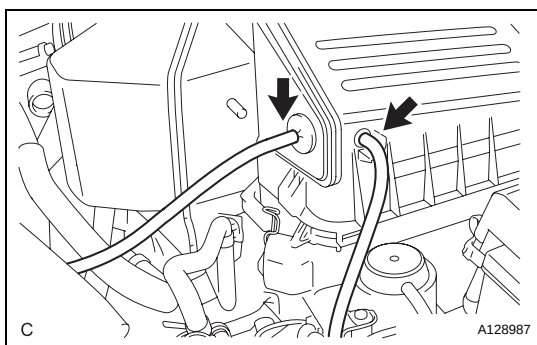
ES



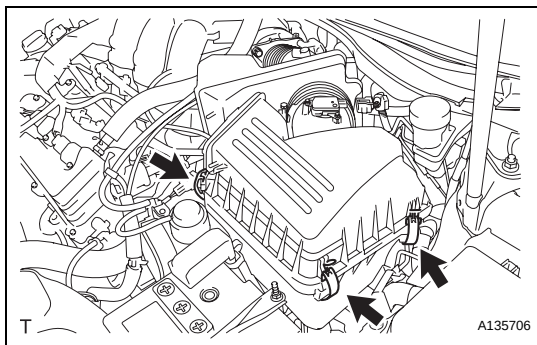
N*m (kgf*cm, ft.*lbf) : Specified torque ● Non-reusable part * DO NOT apply oil

REMOVAL

1. REMOVE ENGINE UNDER COVER LH
2. REMOVE ENGINE UNDER COVER RH
3. DRAIN ENGINE COOLANT (See page [CO-5](#))
4. REMOVE COOL AIR INTAKE DUCT SEAL (See page [EM-22](#))
5. REMOVE ENGINE ROOM SIDE COVER LH (See page [EM-22](#))
6. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-23](#))
7. REMOVE AIR CLEANER INLET ASSEMBLY (See page [EM-23](#))
8. REMOVE AIR CLEANER CAP SUB-ASSEMBLY
 - (a) Disconnect the 2 vacuum hoses.

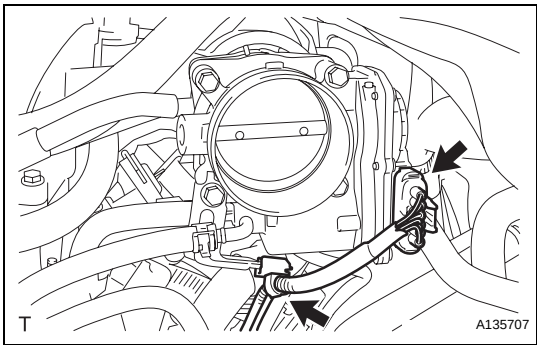


- (b) Disconnect the mass air flow meter connector (*1).
- (c) Disconnect the No. 2 ventilation hose (*2).
- (d) Disconnect the hose band (*3).



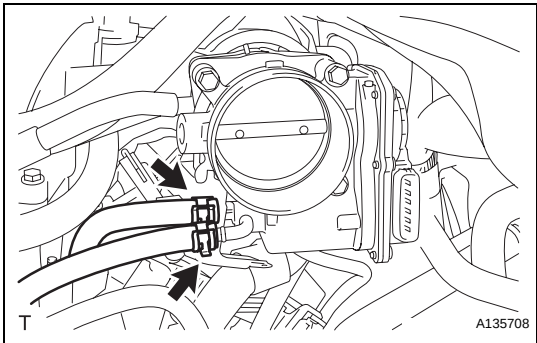
- (e) Disconnect the 3 bands, and remove the air cleaner cap sub-assembly.

9. REMOVE AIR CLEANER CASE SUB-ASSEMBLY (See page [EM-23](#))
10. REMOVE NO. 1 AIR CLEANER INLET (See page [EM-23](#))

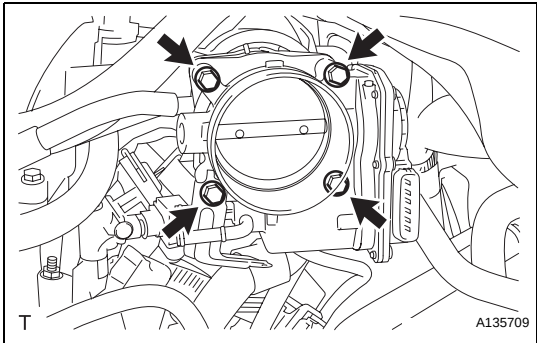


11. REMOVE THROTTLE BODY

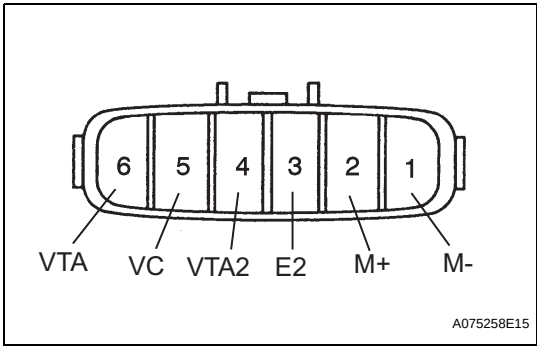
- (a) Disconnect the throttle body connector and clamp.



- (b) Disconnect the 2 water by-pass hoses from the throttle body.



- (c) Remove the 4 bolts and throttle body.
(d) Remove the throttle body gasket from the intake air surge tank.



INSPECTION

1. INSPECT THROTTLE BODY

- (a) Measure the resistance between the terminals.

Standard resistance

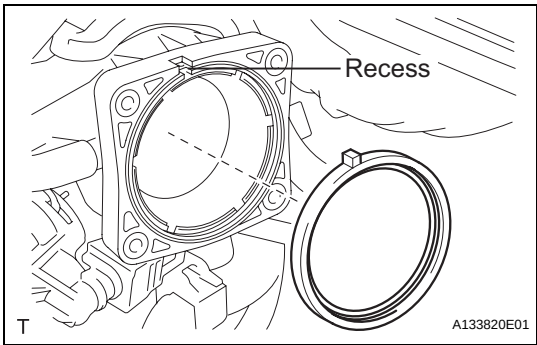
Tester Connection	Condition	Specified Condition
2 (M+) - 1 (M-)	20°C (68°F)	0.3 to 100 Ω
5 (VC) - 3 (E2)	20°C (68°F)	1.2 to 3.2 kΩ

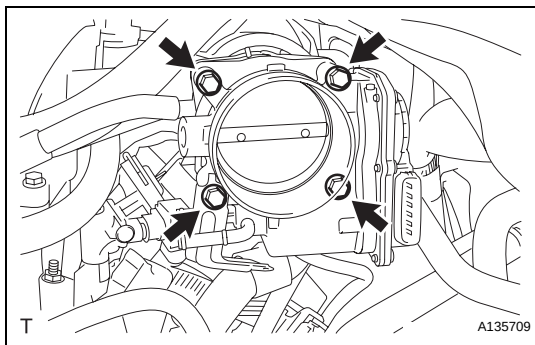
If the result is not as specified, replace the throttle body assembly.

INSTALLATION

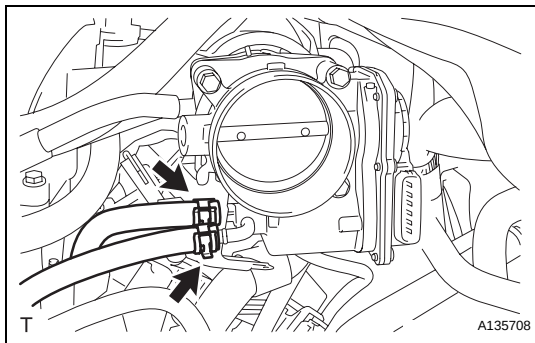
1. INSTALL THROTTLE BODY

- (a) Install a new throttle body gasket to the intake air surge tank.

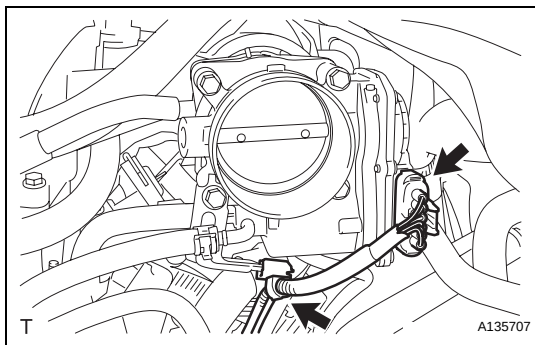




- (b) Install the throttle body with the 4 bolts.
Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)

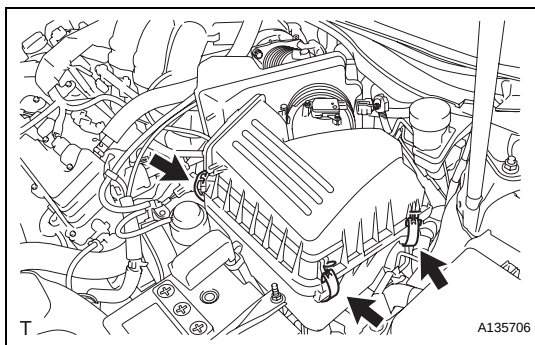


- (c) Connect the 2 water by-pass hoses.

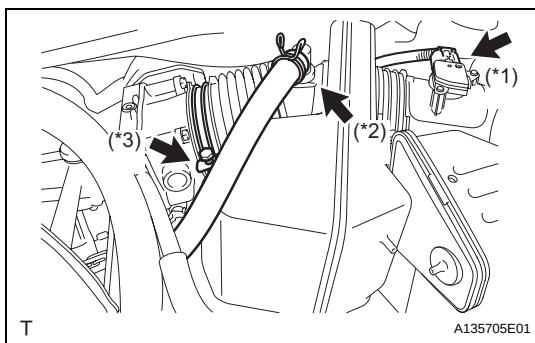


- (d) Connect the throttle body connector and clamp.

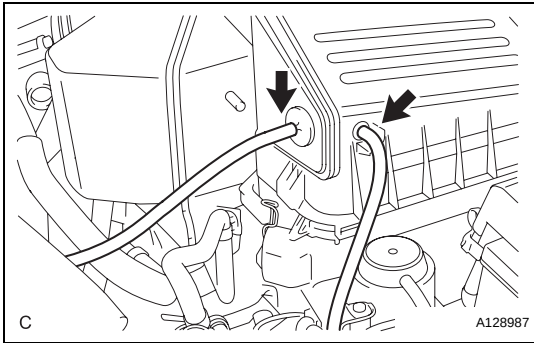
2. **INSTALL NO. 1 AIR CLEANER INLET** (See page [EM-48](#))
3. **INSTALL AIR CLEANER CASE SUB-ASSEMBLY** (See page [EM-48](#))



4. **INSTALL AIR CLEANER CAP SUB-ASSEMBLY**
 - (a) Install the air cleaner cap sub-assembly, and connect the 3 bands.



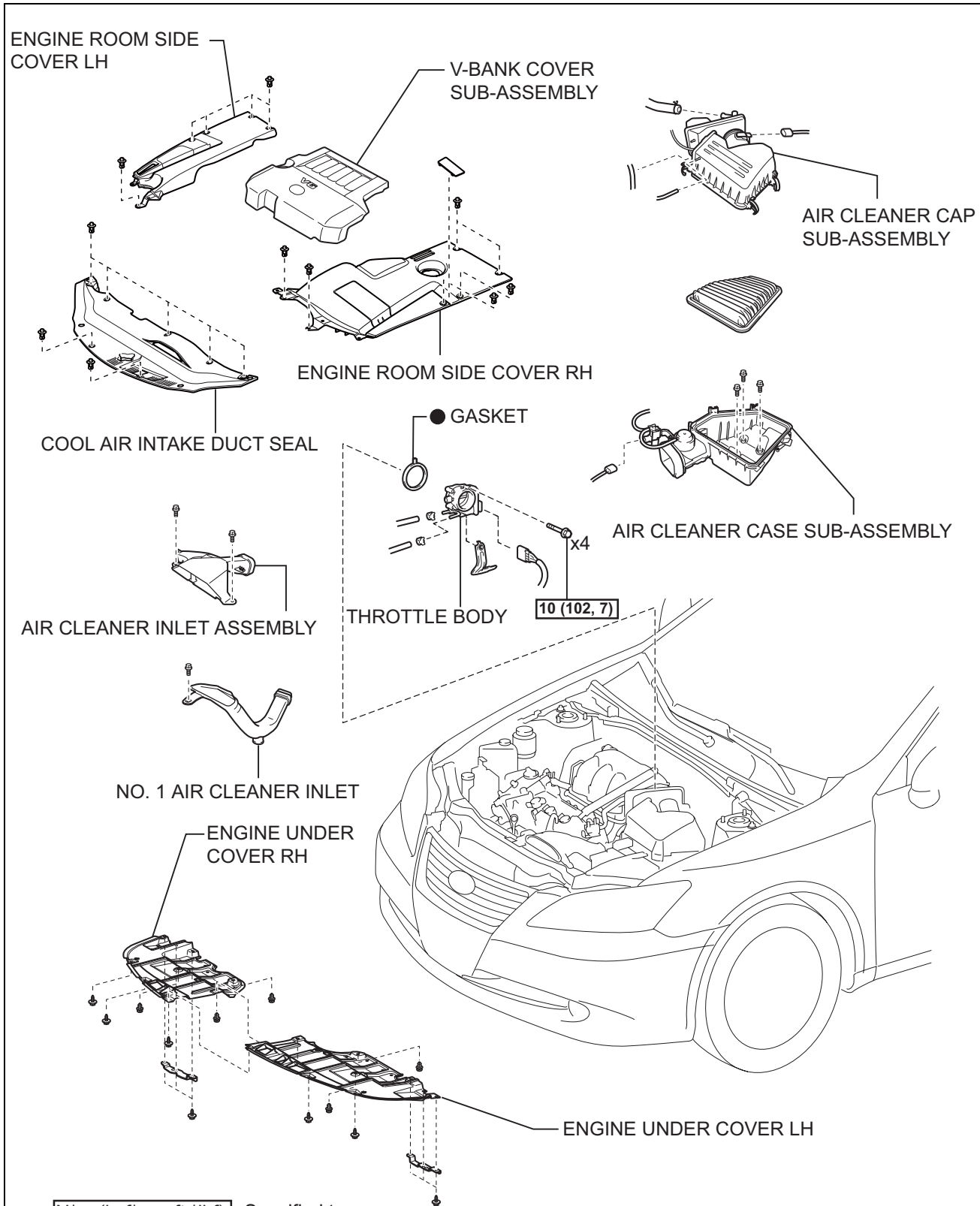
- (b) Connect the mass air flow meter connector (*1).
- (c) Connect the No. 2 ventilation hose (*2).
- (d) Connect the hose band (*3).



- (e) Connect the 2 vacuum hoses.
5. **INSTALL AIR CLEANER INLET ASSEMBLY** (See page [EM-48](#))
 6. **ADD ENGINE COOLANT** (See page [CO-6](#))
 7. **CHECK FOR ENGINE COOLANT LEAKS** (See page [CO-1](#))
 8. **CHECK FUNCTION OF THROTTLE BODY** (See page [ES-519](#))
 9. **INSTALL ENGINE ROOM SIDE COVER LH** (See page [EM-50](#))
 10. **INSTALL COOL AIR INTAKE DUCT SEAL** (See page [EM-50](#))
 11. **INSTALL V-BANK COVER SUB-ASSEMBLY** (See page [EM-49](#))

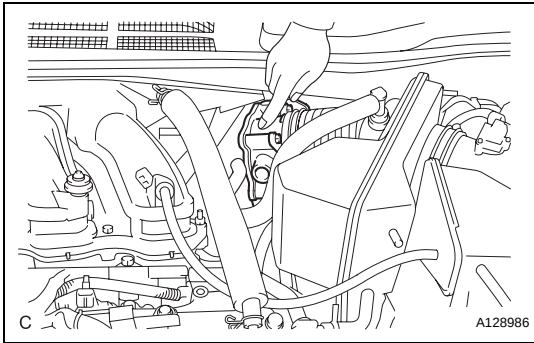
THROTTLE BODY

COMPONENTS



N*m (kgf*cm, ft.*lbf) : Specified torque

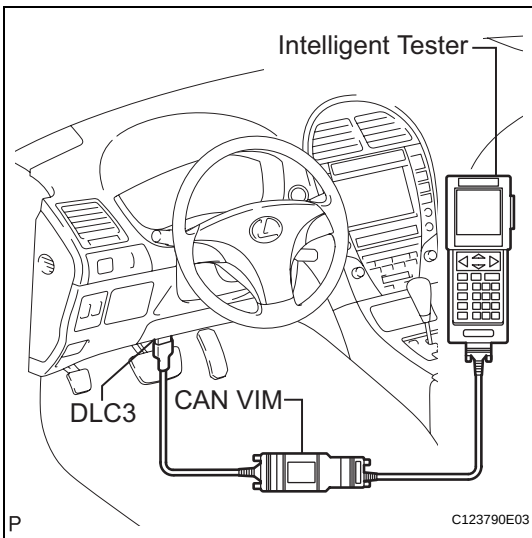
● Non-reusable part



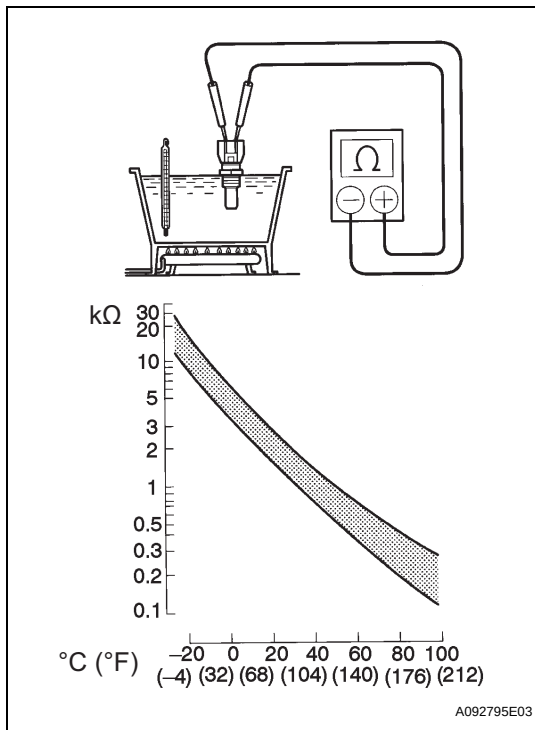
ON-VEHICLE INSPECTION

1. INSPECTION THROTTLE BODY

- (a) Inspect the throttle control motor for operating sounds.
- (1) Turn the engine switch on (IG).
 - (2) When turning the accelerator pedal position sensor lever, check for running sounds of the motor. The motor should be running smoothly without friction sounds.
- If operation is not as specified, check the throttle control motor, wiring and ECM (See page [ES-521](#)).



- (b) Inspect the throttle position sensor.
- (1) Connect the intelligent tester (with CAN VIM) to the DLC3.
 - (2) Turn the engine switch on (IG).
 - (3) Check that the MIL is off.
 - (4) Check that, under the CURRENT DATA, THROTTLE POS (throttle valve opening percentage) is within the standard range below.
- Standard throttle valve opening percentage:**
60 % or more
- If operation is not as specified, check the throttle position sensor, wiring and ECM (See page [ES-521](#)).



INSPECTION

1. INSPECT ENGINE COOLANT TEMPERATURE SENSOR

- (a) Measure the resistance between the terminals.

Standard resistance

Condition	Specified Condition
Approx. 20°C (68°F)	2.32 to 2.59 kΩ
Approx. 80°C (176°F)	0.31 to 0.326 kΩ

If the result is not as specified, replace the sensor.

NOTICE:

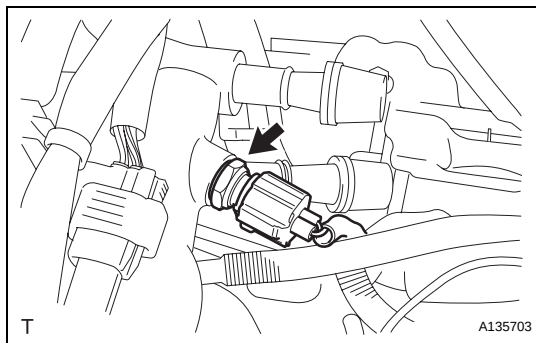
If checking the ECT sensor in the water, keep the terminals dry. After checking, dry the sensor.

ES

INSTALLATION

1. INSTALL ENGINE COOLANT TEMPERATURE SENSOR

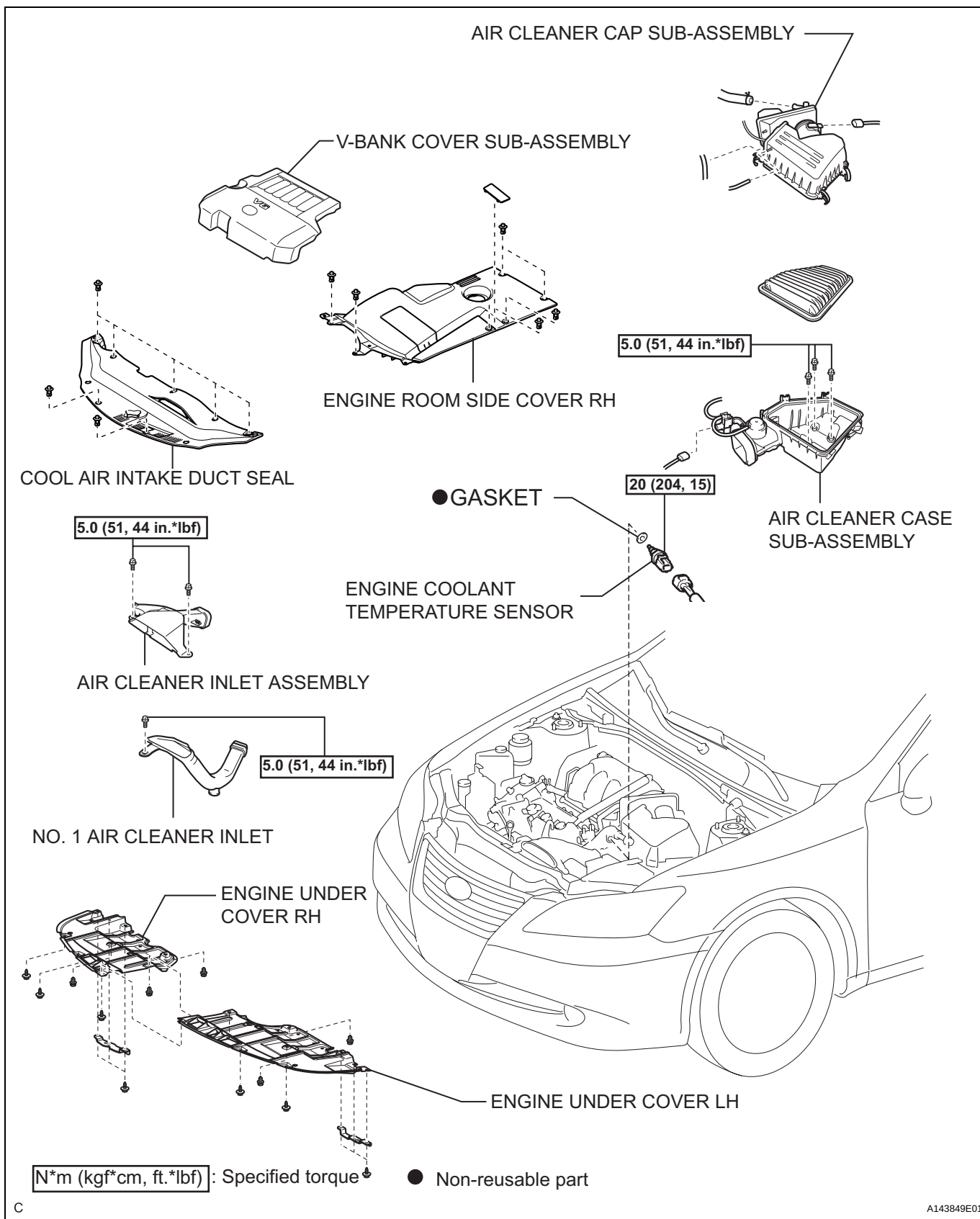
- (a) Install a new gasket to the engine coolant temperature sensor.
- (b) Install the engine coolant temperature sensor.
Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf)
- (c) Connect the engine coolant temperature sensor connector.



2. INSTALL NO. 1 AIR CLEANER INLET (See page [EM-48](#))
3. INSTALL AIR CLEANER CASE SUB-ASSEMBLY (See page [EM-48](#))
4. INSTALL AIR CLEANER CAP SUB-ASSEMBLY (See page [ES-522](#))
5. INSTALL AIR CLEANER INLET ASSEMBLY (See page [EM-48](#))
6. ADD ENGINE COOLANT (See page [CO-6](#))
7. CHECK FOR ENGINE COOLANT LEAKS (See page [CO-1](#))
8. INSTALL ENGINE ROOM SIDE COVER LH (See page [EM-50](#))
9. INSTALL COOL AIR INTAKE DUCT SEAL (See page [EM-50](#))
10. INSTALL V-BANK COVER SUB-ASSEMBLY (See page [EM-49](#))
11. INSTALL ENGINE UNDER COVER RH
12. INSTALL ENGINE UNDER COVER LH

ENGINE COOLANT TEMPERATURE SENSOR

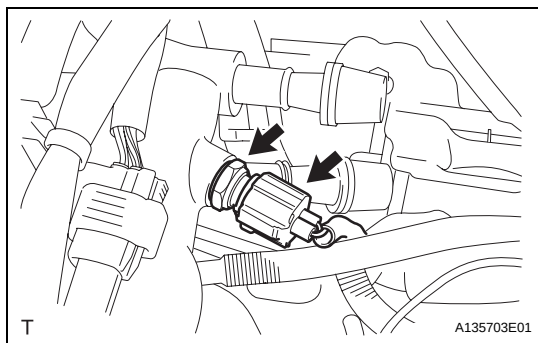
COMPONENTS



ES

REMOVAL

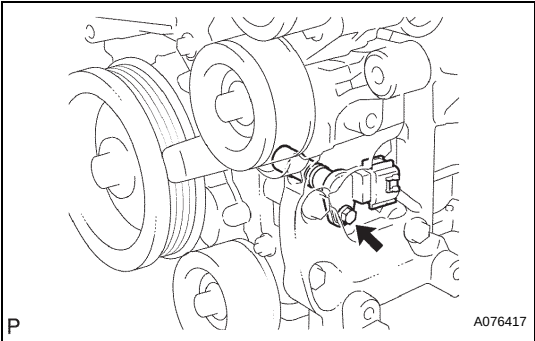
1. REMOVE ENGINE UNDER COVER LH
2. REMOVE ENGINE UNDER COVER RH
3. DRAIN ENGINE COOLANT (See page [CO-5](#))
4. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-23](#))
5. REMOVE COOL AIR INTAKE DUCT SEAL (See page [EM-22](#))
6. REMOVE ENGINE ROOM SIDE COVER LH (See page [EM-22](#))
7. REMOVE AIR CLEANER INLET ASSEMBLY (See page [EM-23](#))
8. REMOVE AIR CLEANER CAP SUB-ASSEMBLY (See page [ES-519](#))
9. REMOVE AIR CLEANER CASE SUB-ASSEMBLY (See page [EM-23](#))
10. REMOVE NO. 1 AIR CLEANER INLET (See page [EM-23](#))
11. REMOVE ENGINE COOLANT TEMPERATURE SENSOR
 - (a) Remove the engine coolant temperature sensor connector.
 - (b) Remove the engine coolant temperature sensor.
 - (c) Remove the gasket from the engine coolant temperature sensor.



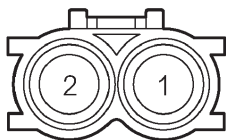
ES

REMOVAL

- 1. REMOVE GENERATOR ASSEMBLY
HINT:
(See page CH-13)
- 2. DISCONNECT COOLER COMPRESSOR ASSEMBLY
HINT:
(See page AC-195)
- 3. REMOVE CRANKSHAFT POSITION SENSOR
 - (a) Disconnect the crankshaft position sensor connector.
 - (b) Remove the bolt and crankshaft position sensor.



Crankshaft Position Sensor:



INSPECTION

- 1. INSPECT CRANKSHAFT POSITION SENSOR
 - (a) Using an ohmmeter, measure the resistance between the terminals.
- Standard resistance**

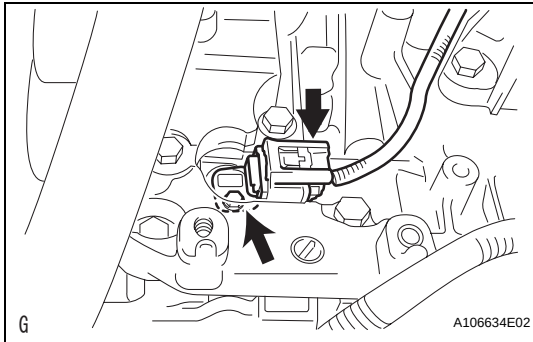
Condition	Specified Condition
Cold	1,630 to 2,740 Ω
Hot	2,065 to 3,225 Ω

NOTICE:
The terms "cold" and "hot" refer to the temperature of the coils. "Cold" means approximately -10 to 50°C (14 to 122°F). "Hot" means approximately 50 to 100°C (122 to 212°F). If the resistance is not as specified, replace the sensor.

INSTALLATION

1. INSTALL CRANKSHAFT POSITION SENSOR

- (a) Apply a light coat of engine oil to the O-ring of the crankshaft position sensor.
- (b) Install the crankshaft position sensor with the bolt.
Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)
- (c) Connect the crankshaft position sensor connector.



2. INSTALL COOLER COMPRESSOR ASSEMBLY

HINT:

(See page [AC-201](#))

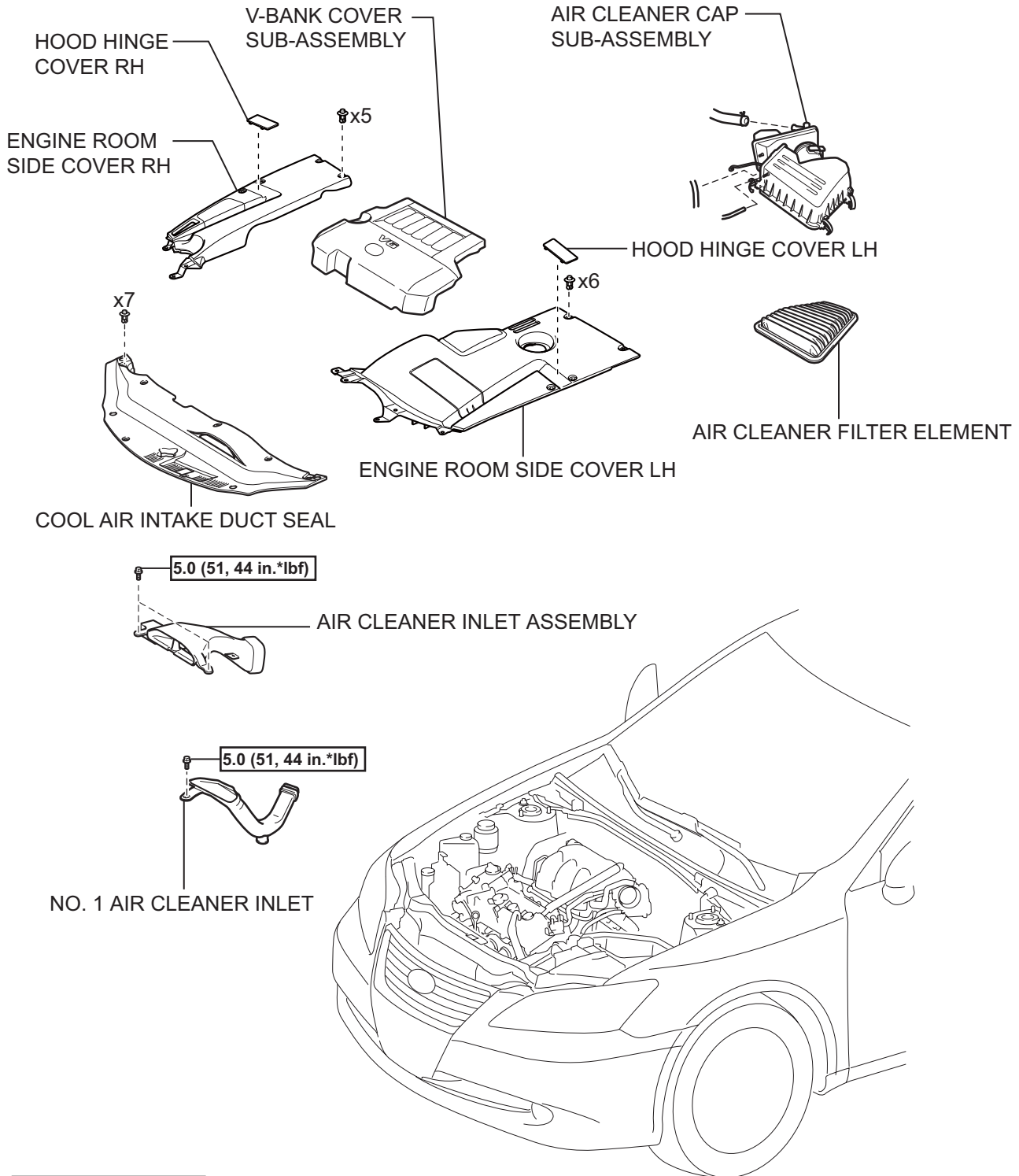
3. INSTALL GENERATOR ASSEMBLY

HINT:

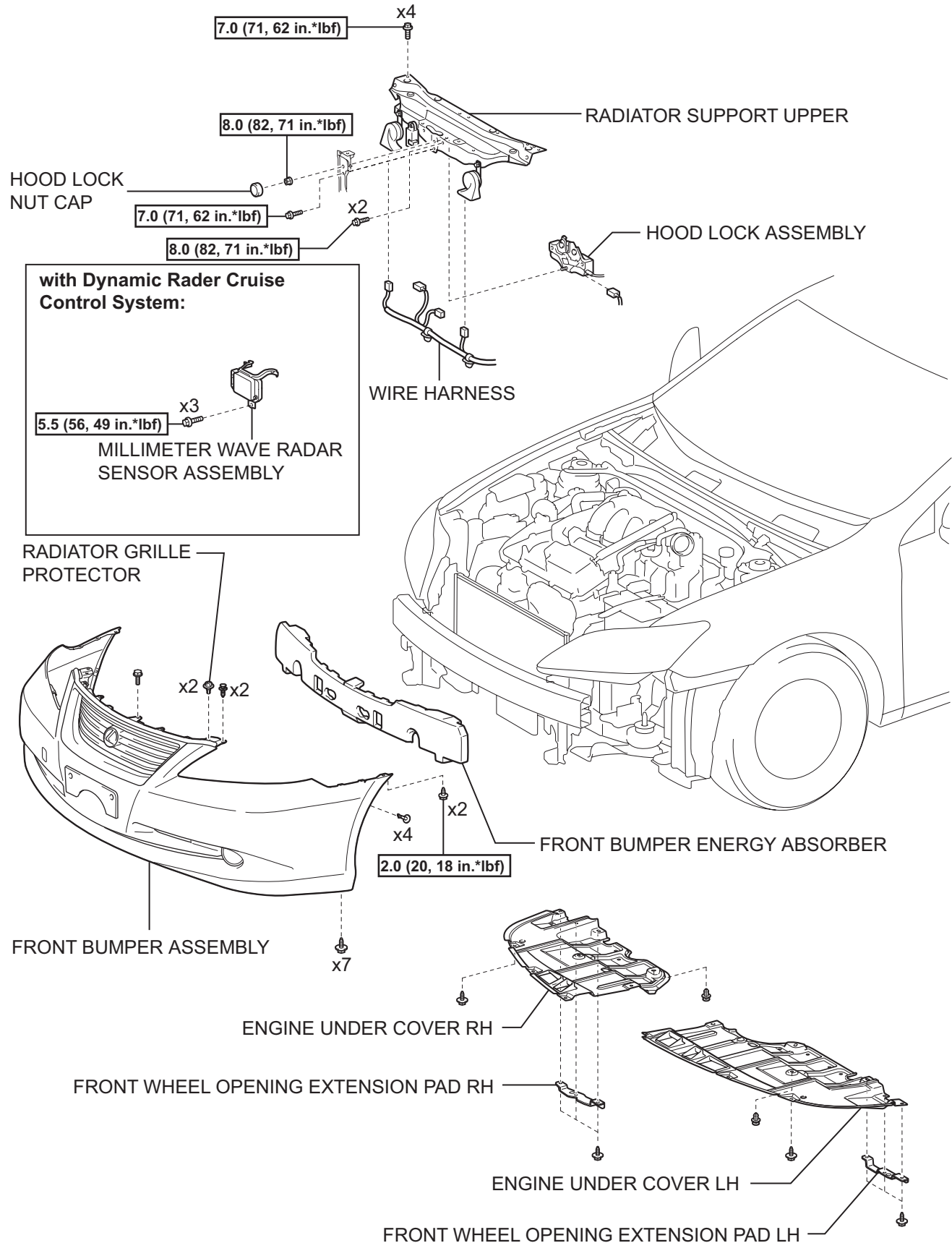
(See page [CH-22](#))

CRANKSHAFT POSITION SENSOR

COMPONENTS

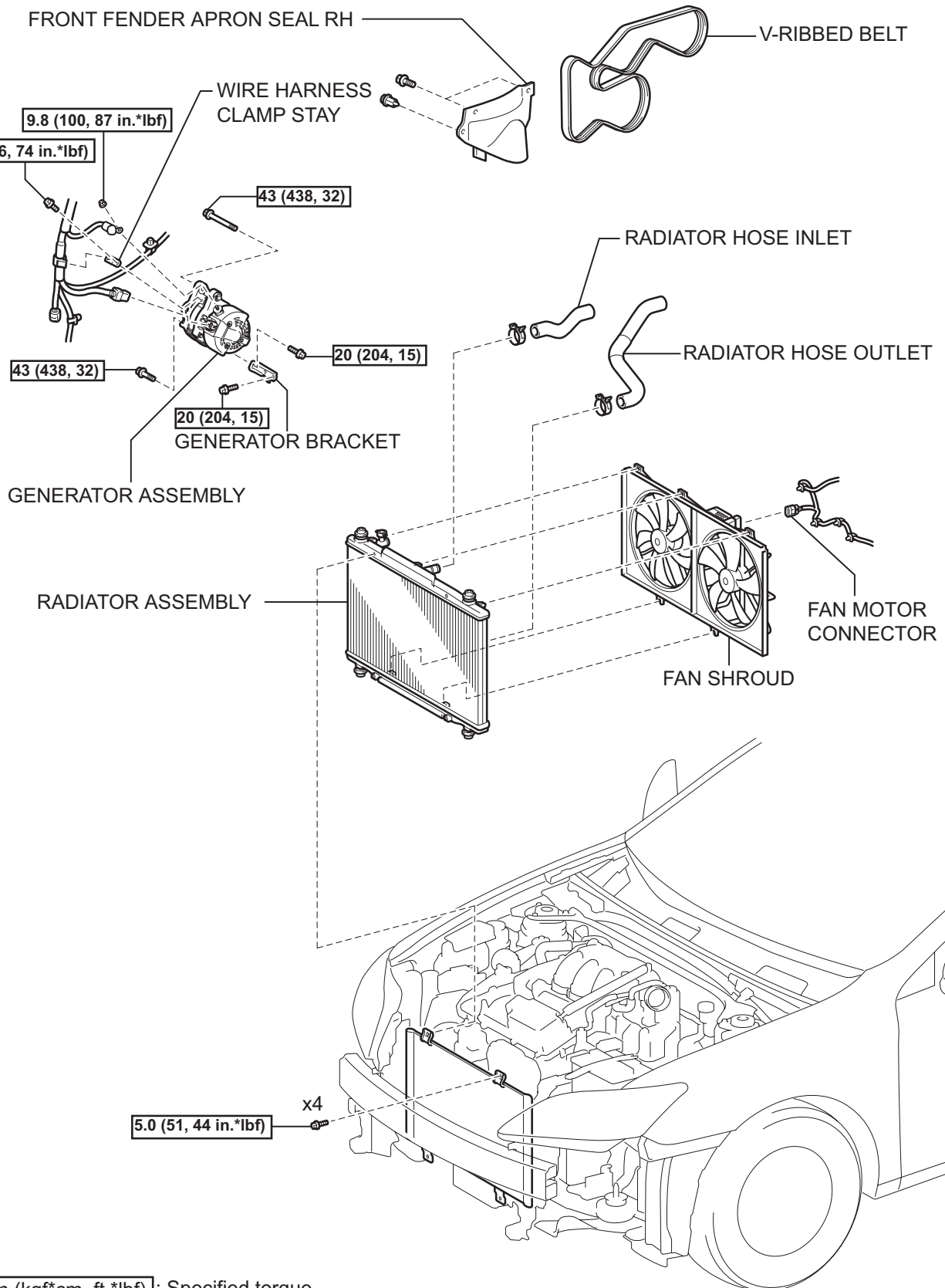


N*m (kgf*cm, ft.*lbf): Specified torque

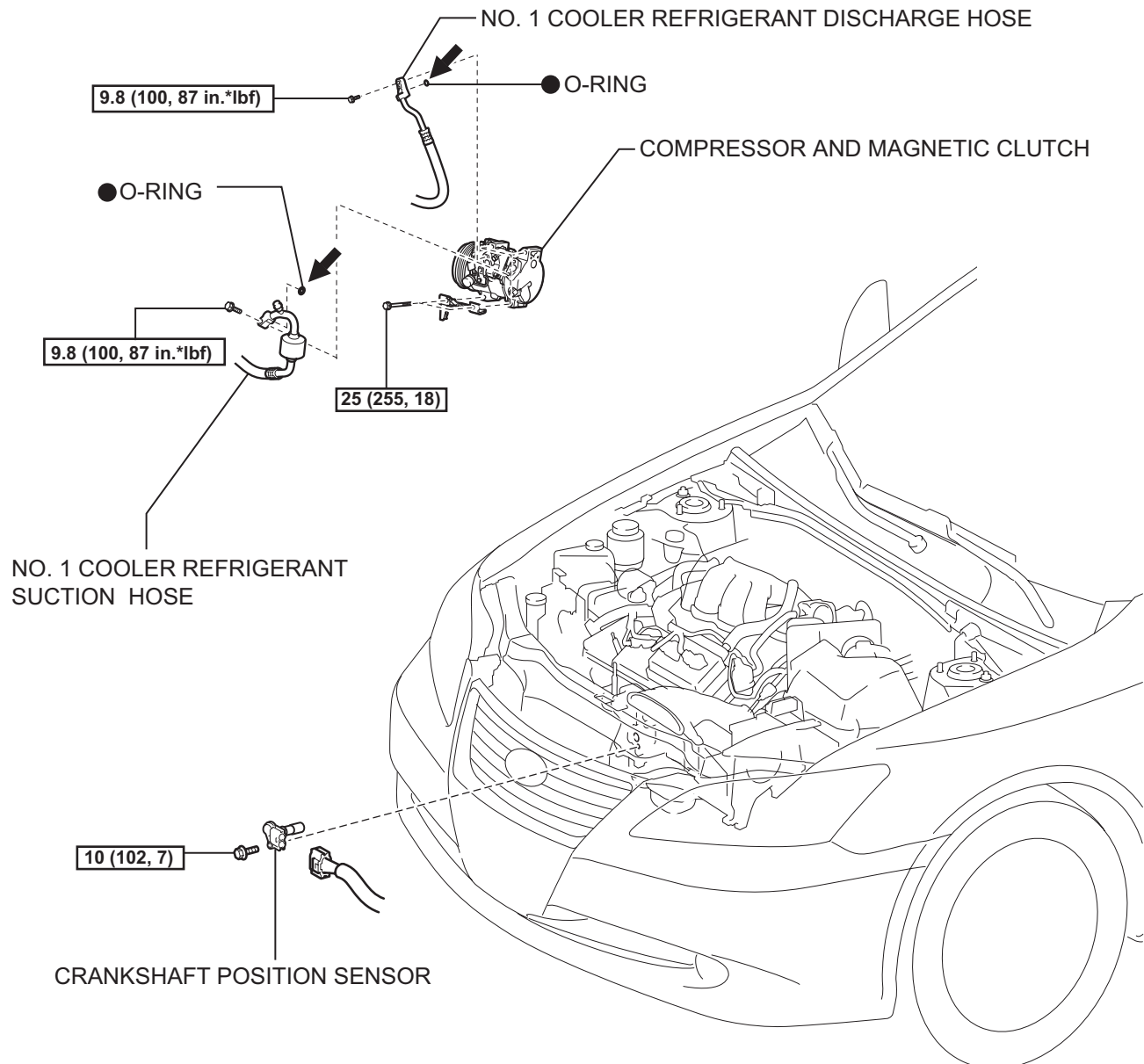


N*m (kgf*cm, ft.*lbf): Specified torque

ES



N*m (kgf*cm, ft.*lbf) : Specified torque

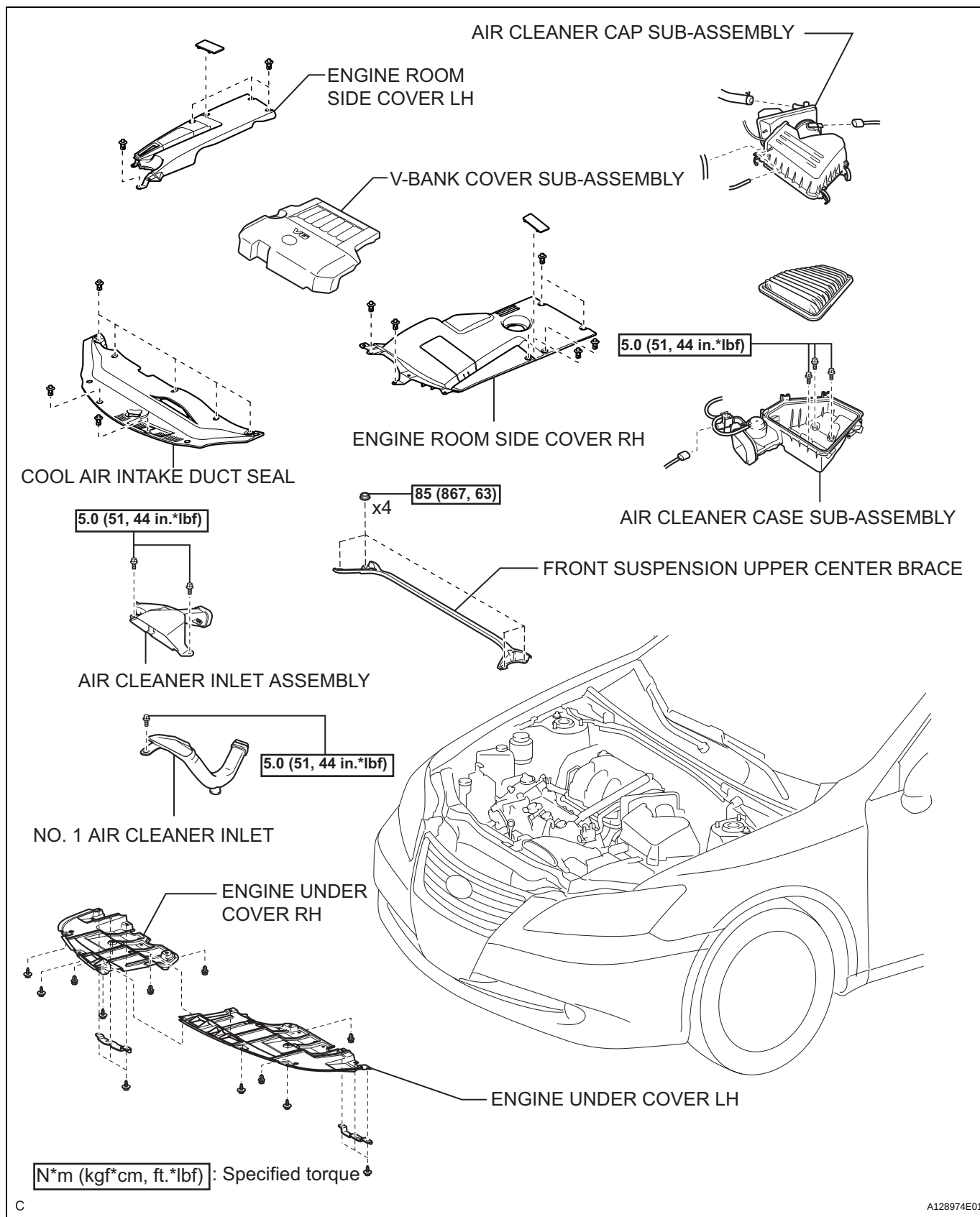


N*m (kgf*cm, ft.*lbf) : Specified torque ← Compressor oil ND-OIL 8 or equivalent ● Non-reusable part

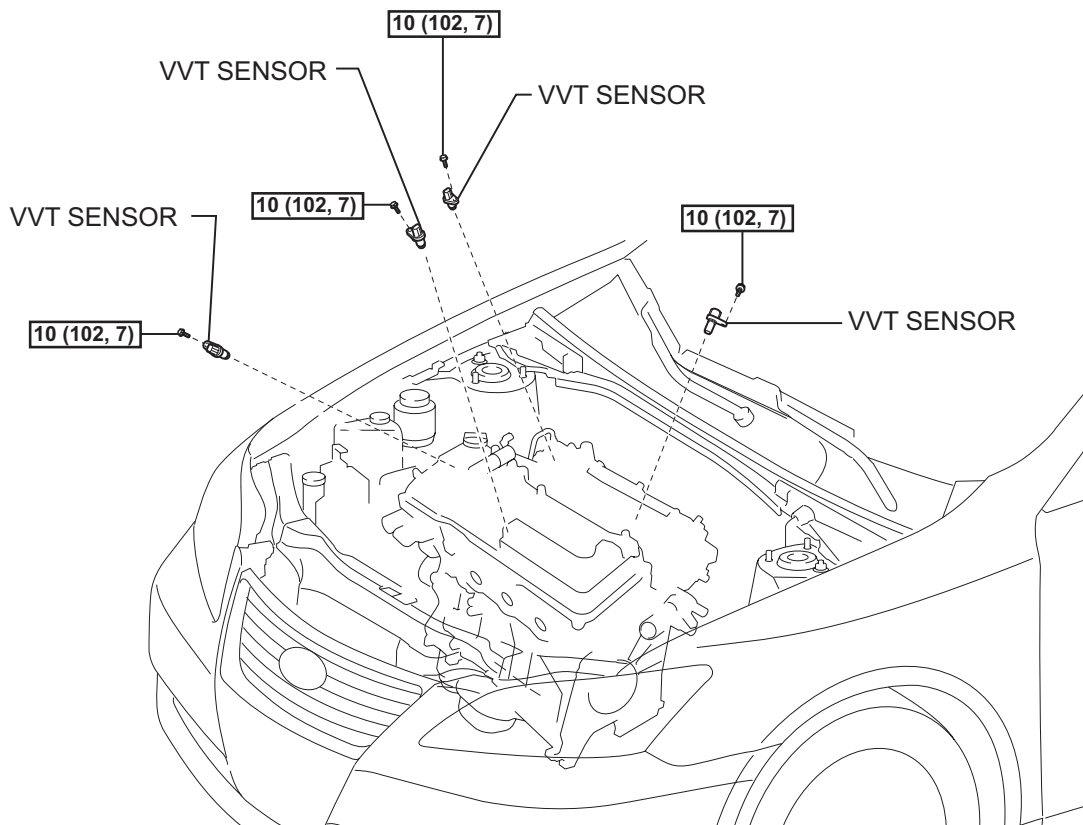
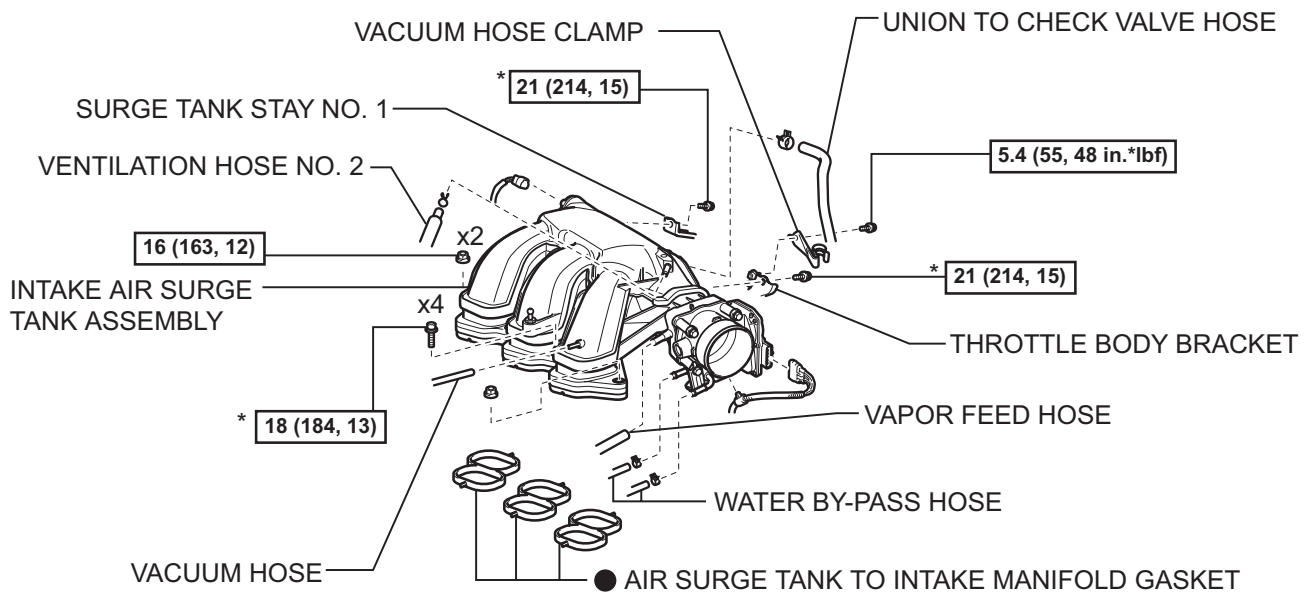
ES

VVT SENSOR

COMPONENTS



ES



N*m (kgf*cm, ft.*lbf) : Specified torque ● Non-reusable part * DO NOT apply oil

INSPECTION

1. INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY

(a) Resistance inspection.

- (1) Using an ohmmeter, measure the resistance between the terminals.

Standard resistance:

6.9 to 7.9 Ω at 20°C (68°F)

If necessary, replace the camshaft timing oil control valve assembly.

(b) Movement inspection.

- (1) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, and check the movement of the valve.

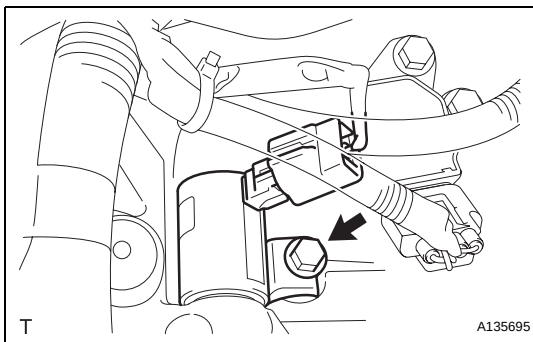
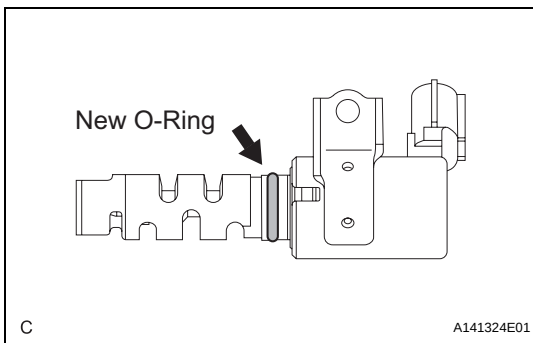
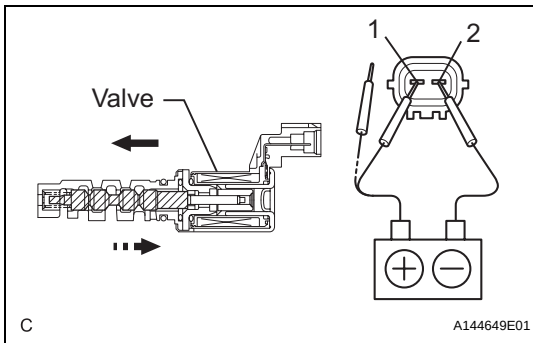
NOTICE:

Confirm that the valve moves freely and does not stick in any position.

If necessary, replace the camshaft timing oil control valve assembly.

HINT:

Accumulation of foreign objects causes subtle pressure leaks. The subtle pressure leaks will cause the camshaft to advance, and this will cause a DTC to be set.

ES

INSTALLATION

1. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE (for Bank 2 Exhaust Side)

- (a) Apply a light coat of engine oil to a new O-ring and install it to the camshaft timing oil control valve.

- (b) Install the camshaft timing oil control valve with the bolt.

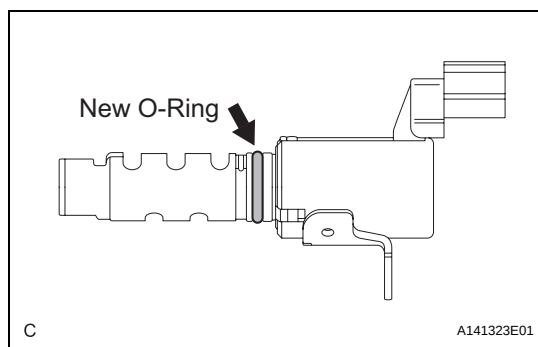
Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)

NOTICE:

Make sure that the O-ring is not cracked or jammed when installing the oil control valve.

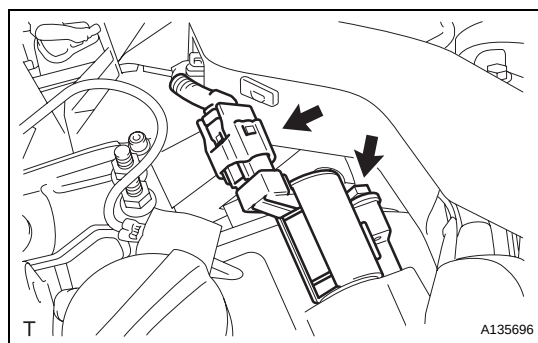
- (c) Connect the camshaft timing oil control valve connector.

ES



2. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE (for Bank 2 Intake Side)

- (a) Apply a light coat of engine oil to a new O-ring and install it to the camshaft timing oil control valve.



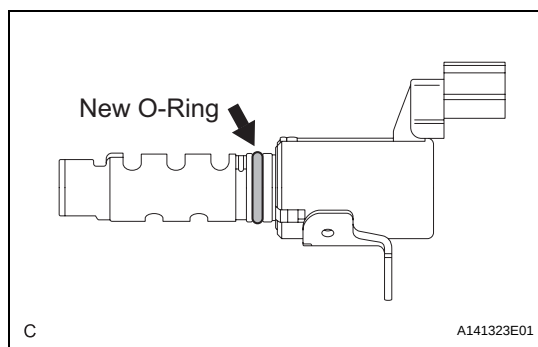
- (b) Install the camshaft timing oil control valve with the bolt.

Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)

NOTICE:

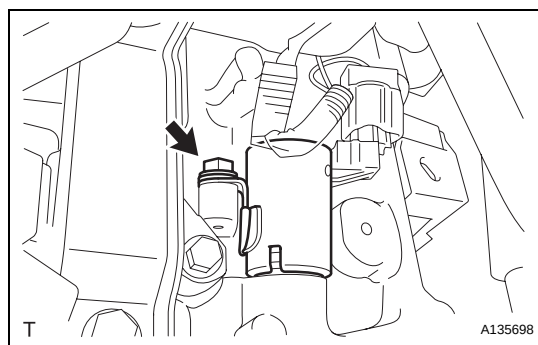
Make sure that the O-ring is not cracked or jammed when installing the oil control valve.

- (c) Connect the camshaft timing oil control valve connector.



3. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE (for Bank 1 Exhaust Side)

- (a) Apply a light coat of engine oil to a new O-ring and install it to the camshaft timing oil control valve.



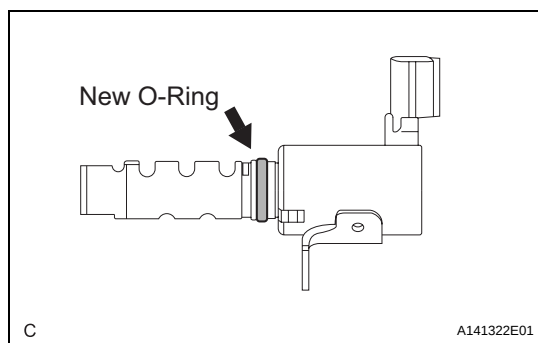
- (b) Install the camshaft timing oil control valve with the bolt.

Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)

NOTICE:

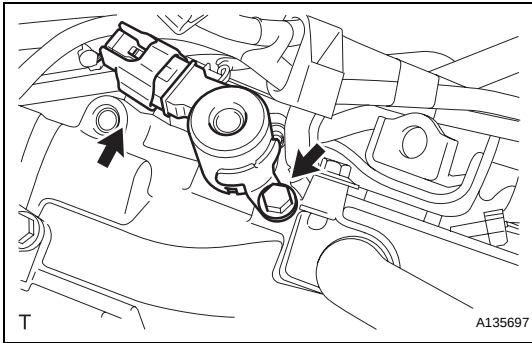
Make sure that the O-ring is not cracked or jammed when installing the oil control valve.

- (c) Connect the camshaft timing oil control valve connector.



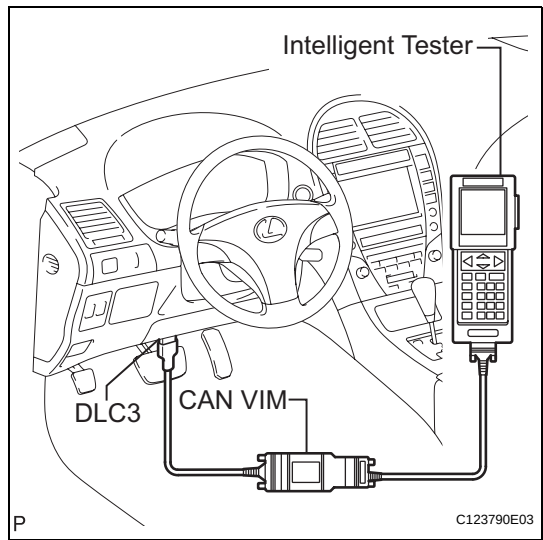
4. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE (for Bank 1 Intake Side)

- (a) Apply a light coat of engine oil to a new O-ring and install it to the camshaft timing oil control valve.



- (b) Install the camshaft timing oil control valve with the bolt.
Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)
NOTICE:
Make sure that the O-ring is not cracked or jammed when installing the oil control valve.
- (c) Connect the camshaft timing oil control valve connector.

5. INSTALL INTAKE AIR SURGE TANK (See page [FU-17](#))
6. INSTALL NO. 1 AIR CLEANER INLET (See page [EM-48](#))
7. INSTALL AIR CLEANER CASE SUB-ASSEMBLY (See page [EM-48](#))
8. INSTALL AIR CLEANER CAP SUB-ASSEMBLY (See page [ES-522](#))
9. INSTALL AIR CLEANER INLET ASSEMBLY (See page [EM-48](#))
10. INSTALL FRONT SUSPENSION UPPER CENTER BRACE (See page [BR-25](#))
11. ADD ENGINE COOLANT (See page [CO-6](#))
12. CHECK FOR ENGINE COOLANT LEAKS (See page [CO-1](#))
13. INSTALL V-BANK COVER SUB-ASSEMBLY (See page [EM-49](#))
14. INSTALL ENGINE ROOM SIDE COVER LH (See page [EM-50](#))
15. INSTALL ENGINE ROOM SIDE COVER RH (See page [EM-50](#))
16. INSTALL COOL AIR INTAKE DUCT SEAL (See page [EM-50](#))
17. INSTALL ENGINE UNDER COVER RH
18. INSTALL ENGINE UNDER COVER LH



ON-VEHICLE INSPECTION

1. INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY

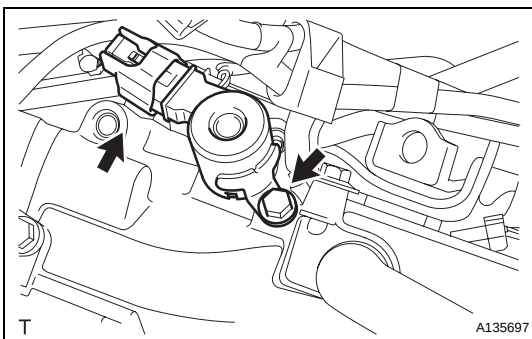
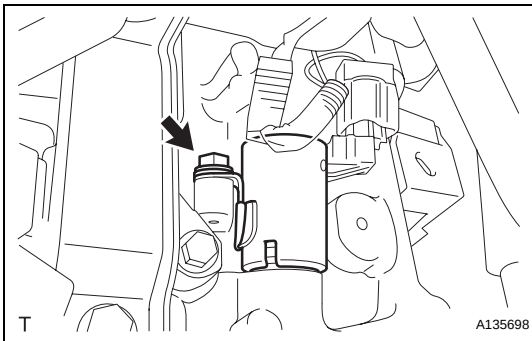
- (a) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (b) Turn the engine switch on (IG).
- (c) Start and warm up the engine.
- (d) Connect the intelligent tester and select VVT from the ACTIVE TEST menu.
- (e) Check the engine speed when the OCV is operated with the intelligent tester.

OK

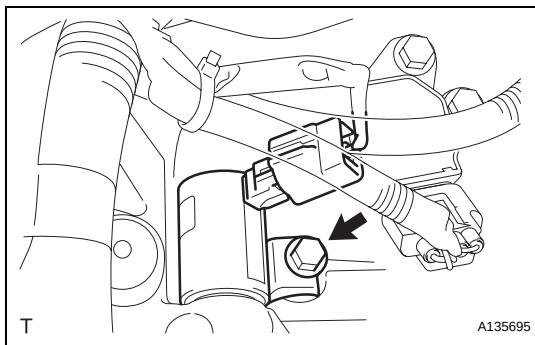
Condition	Specified Condition
VVT system is OFF (OCV is OFF)	Normal engine speed
VVT system is ON (OCV is ON)	Rough idle or engine stalled

REMOVAL

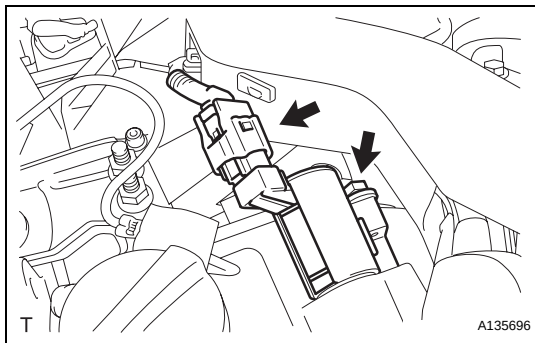
1. REMOVE ENGINE UNDER COVER LH
2. REMOVE ENGINE UNDER COVER RH
3. REMOVE COOL AIR INTAKE DUCT SEAL (See page [EM-22](#))
4. REMOVE ENGINE ROOM SIDE COVER LH (See page [EM-22](#))
5. REMOVE ENGINE ROOM SIDE COVER RH (See page [EM-22](#))
6. DRAIN ENGINE COOLANT (See page [CO-5](#))
7. REMOVE FRONT SUSPENSION UPPER CENTER BRACE (See page [BR-22](#))
8. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-23](#))
9. REMOVE AIR CLEANER INLET ASSEMBLY (See page [EM-23](#))
10. REMOVE AIR CLEANER CAP SUB-ASSEMBLY (See page [ES-519](#))
11. REMOVE AIR CLEANER CASE SUB-ASSEMBLY (See page [EM-23](#))
12. REMOVE NO. 1 AIR CLEANER INLET (See page [EM-23](#))
13. REMOVE INTAKE AIR SURGE TANK (See page [FU-12](#))
14. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (for Bank 1 Exhaust Side)
 - (a) Disconnect the camshaft timing oil control valve connector.
 - (b) Remove the bolt and camshaft timing oil control valve.
 - (c) Remove the O-ring from the camshaft timing oil control valve.



15. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (for Bank 1 Intake Side)
 - (a) Disconnect the camshaft timing oil control valve connector.
 - (b) Remove the bolt and camshaft timing oil control valve.
 - (c) Remove the O-ring from the camshaft timing oil control valve.

**16. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE
(for Bank 2 Exhaust Side)**

- Disconnect the camshaft timing oil control valve connector.
- Remove the bolt and camshaft timing oil control valve.
- Remove the O-ring from the camshaft timing oil control valve.

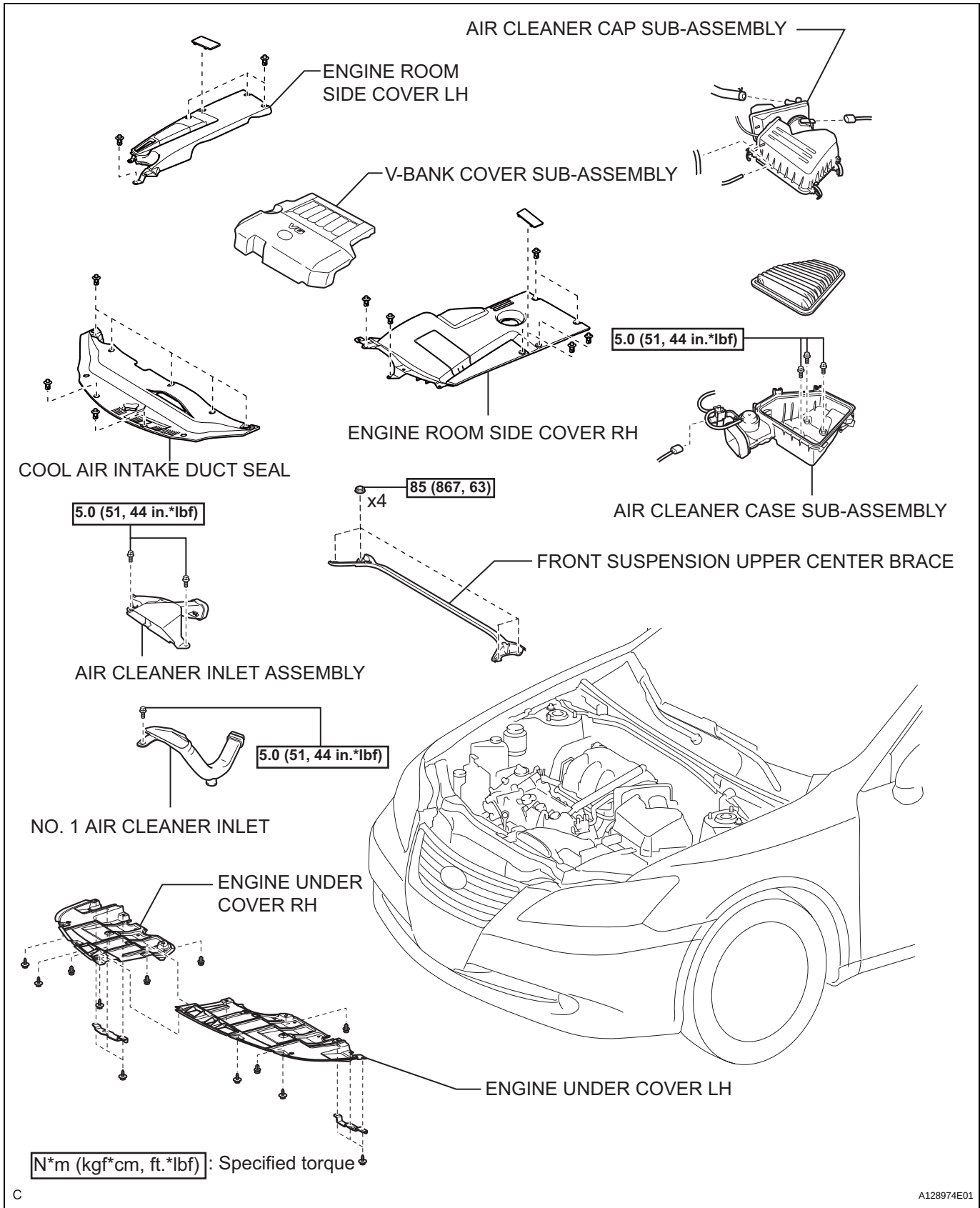
**17. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE
(for Bank 2 Intake Side)**

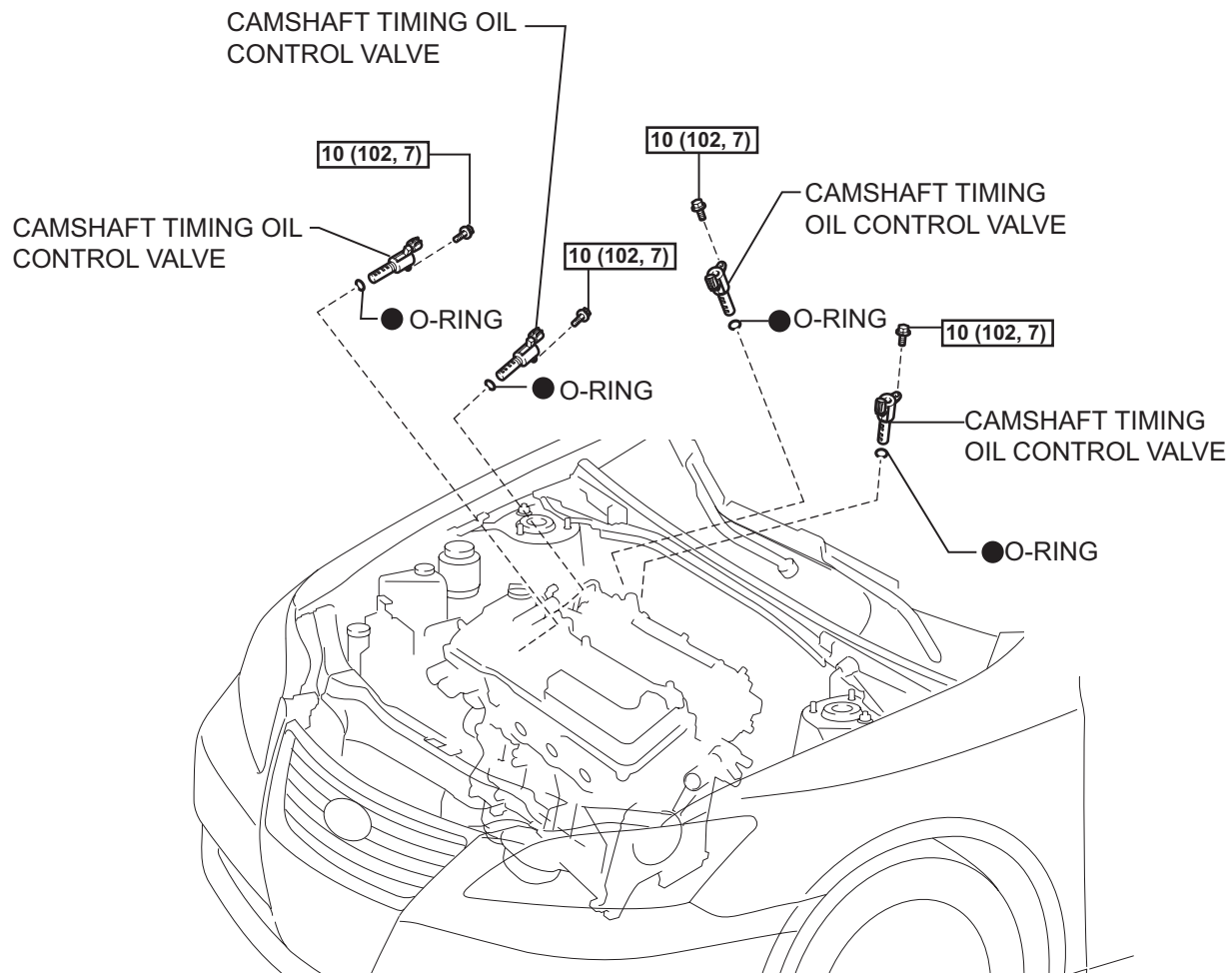
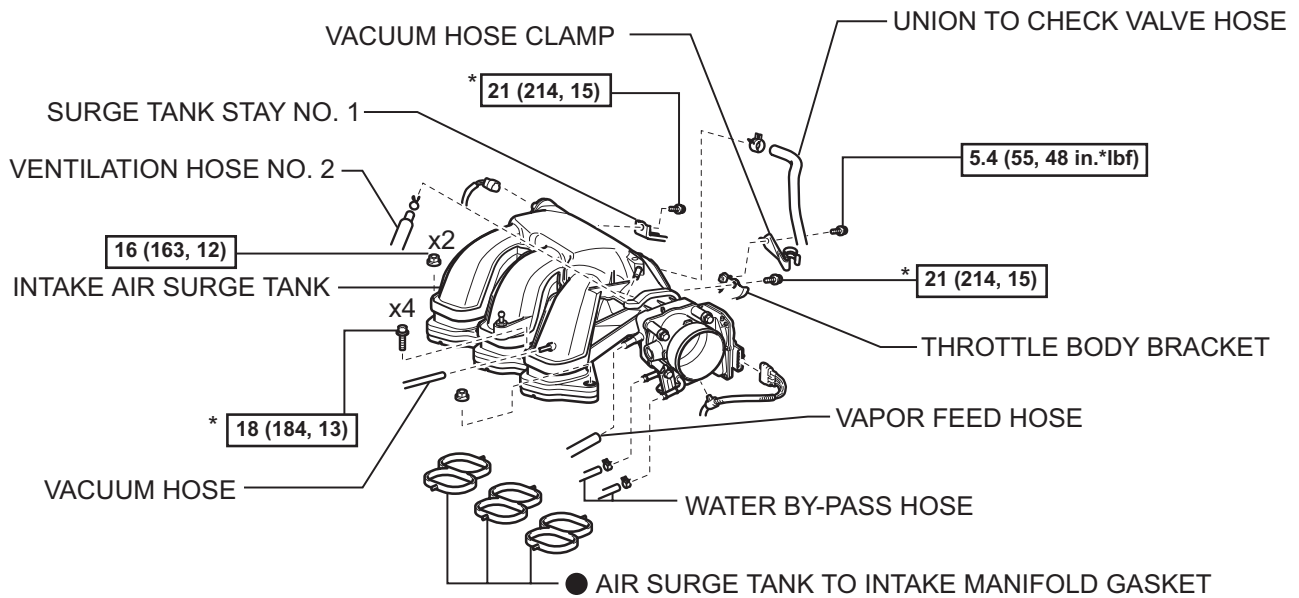
- Disconnect the camshaft timing oil control valve connector.
- Remove the bolt and camshaft timing oil control valve.
- Remove the O-ring from the camshaft timing oil control valve.

CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY

COMPONENTS

ES

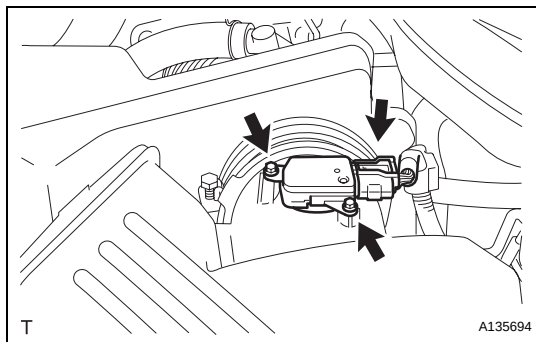




$\text{N*m (kgf*cm, ft.*lbf)}$: Specified torque ● Non-reusable part * DO NOT apply oil

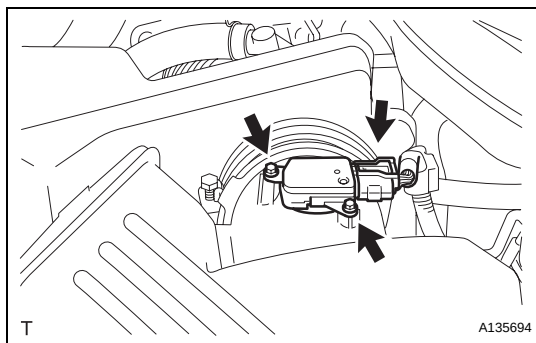
REMOVAL

1. REMOVE COOL AIR INTAKE DUCT SEAL (See page [EM-22](#))
2. REMOVE ENGINE ROOM SIDE COVER LH (See page [EM-22](#))
3. REMOVE MASS AIR FLOW METER
 - (a) Disconnect the mass air flow meter connector.
 - (b) Remove the 2 screws and mass air flow meter.



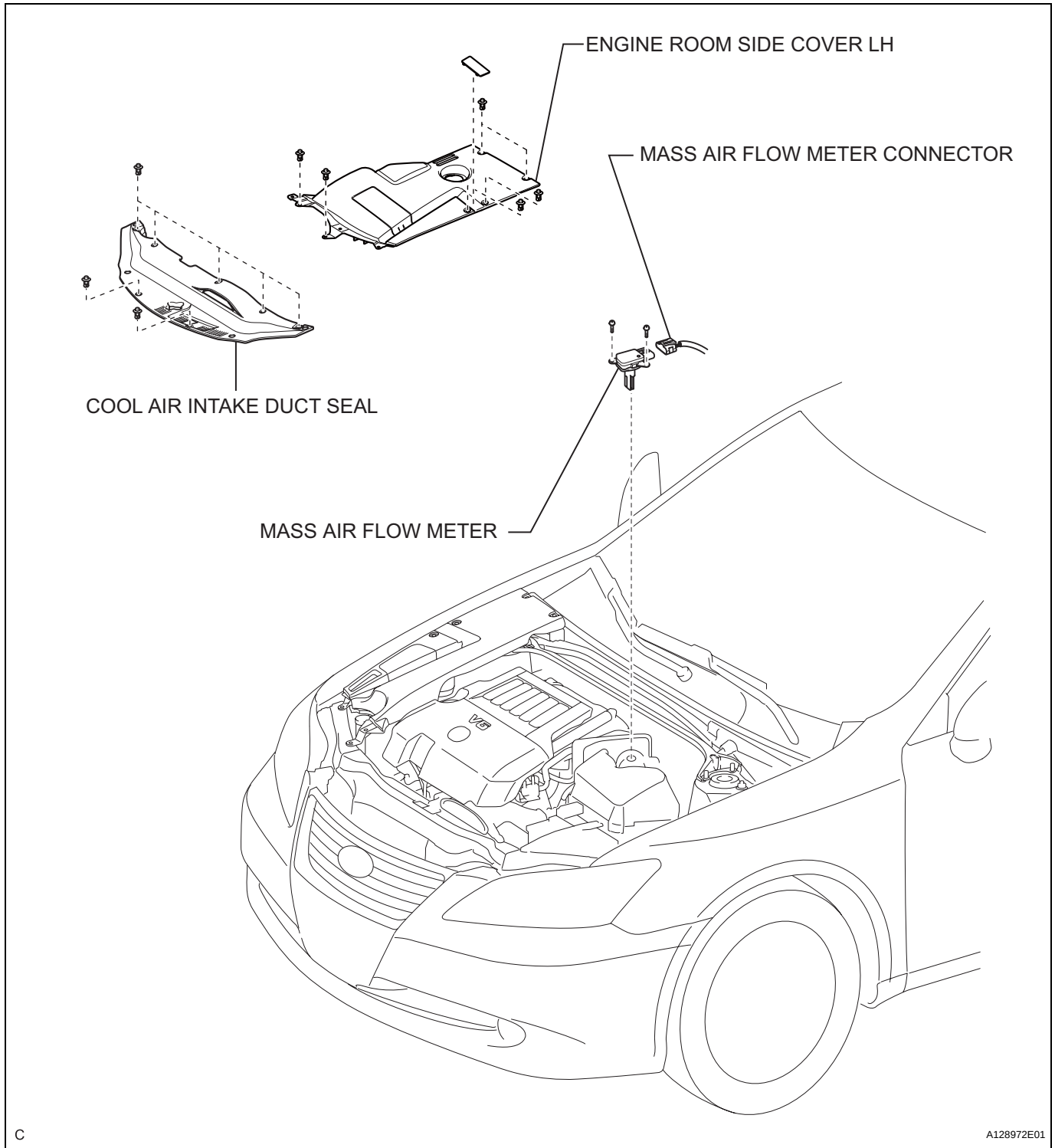
INSTALLATION

1. INSTALL MASS AIR FLOW METER
 - (a) Install the mass air flow meter with the 2 screws.
 - (b) Connect the mass air flow meter connector.
2. INSTALL ENGINE ROOM SIDE COVER LH (See page [EM-50](#))
3. INSTALL COOL AIR INTAKE DUCT SEAL (See page [EM-50](#))



MASS AIR FLOW METER

COMPONENTS



ON-VEHICLE INSPECTION

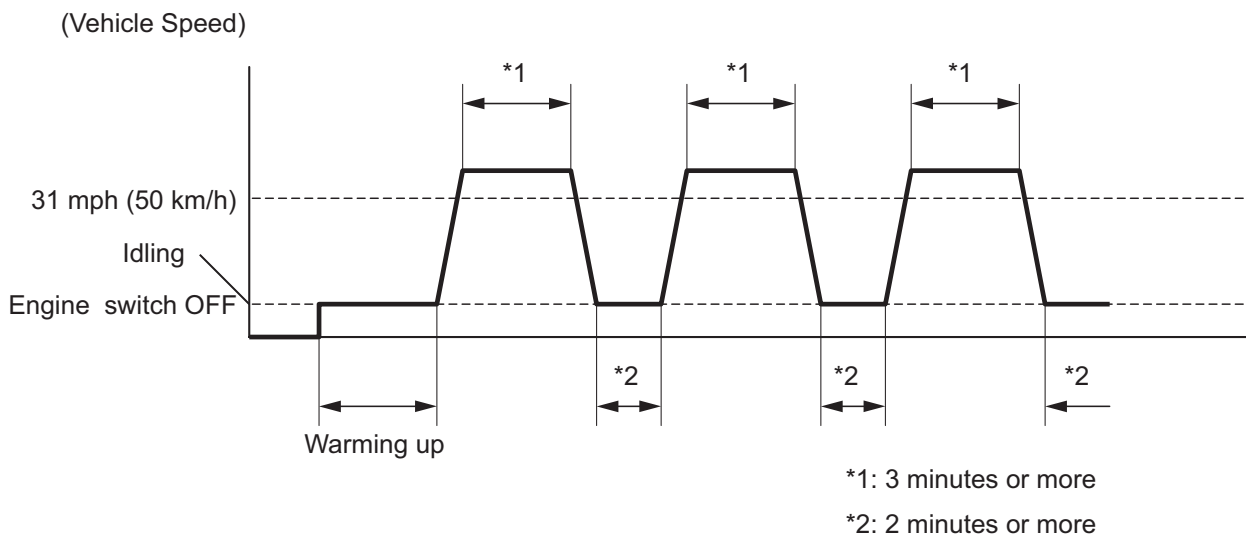
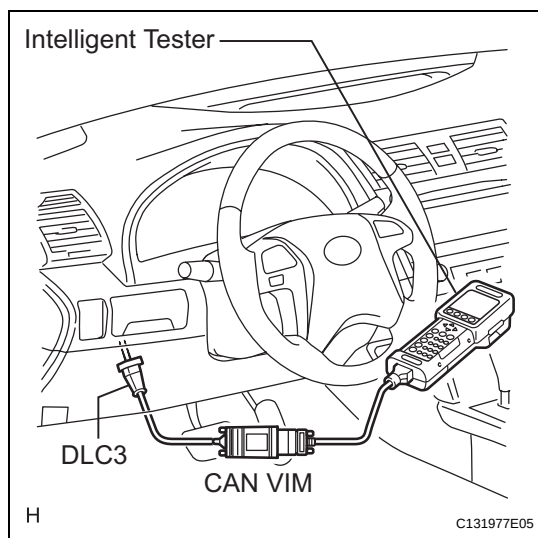
1. CHECK MASS AIR FLOW METER

NOTICE:

- Perform the MAF meter inspection by following the procedures below.
- Only replace the MAF meter when both the LONG FT#1 value and MAF value in the DATA LIST (with the engine stopped) are not within the normal operating range.

(a) Perform confirmation driving pattern.

- (1) Connect the intelligent tester to the DLC3.
- (2) Turn the engine switch on (IG).
- (3) Turn the tester on.
- (4) Clear the DTCs (See page [ES-41](#)).
- (5) Start the engine and warm it up with all accessory switches off (until the engine coolant temperature is 75°C (167°F) or more).
- (6) Drive the vehicle at 31 mph (50 km/h) or more for 3 minutes or more (*1).
- (7) Allow the engine to idle (accelerator pedal fully released) for 2 minutes or more (*2).
- (8) Perform steps (*1) and (*2) at least 3 times or more.



(b) Read values using the intelligent tester (LONG FT#1).

- (1) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / LONG FT#1.

- (2) Read the values displayed on the tester.

Standard value:

Within -15 to +15 %

If the result is not within the specified range, perform the inspection below.

- (c) Read values using the intelligent tester (MAF).

NOTICE:

- Turn off the engine.
- Perform the inspection with the vehicle indoors and on a level surface.
- Perform the inspection of the MAF meter while it is installed to the air cleaner case (installed to the vehicle).
- During the test, do not use the exhaust air duct to perform suction on the exhaust pipe.

- (1) Turn off the engine (do not run the engine).
- (2) Turn the engine switch on (IG).
- (3) Turn the tester on.
- (4) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / MAF.
- (5) Wait 30 seconds, and read the values on the intelligent tester.

Standard condition:

Less than 0.56 g/sec

- If the result is not as specified, replace the MAF meter.
- If the result is within the specified range, inspect the cause of the extremely rich or lean air fuel ratio.