

ENGINE

ON-VEHICLE INSPECTION

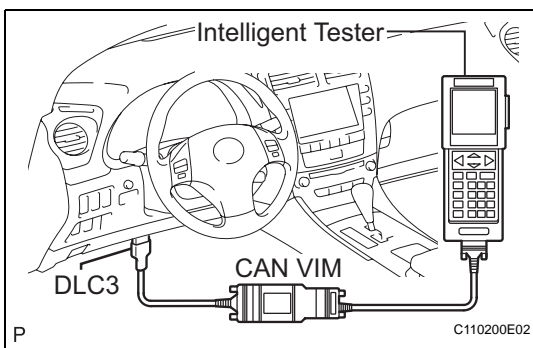
1. **INSPECT ENGINE COOLANT**
 - (a) Inspect the engine coolant (See page [CO-1](#)).
2. **INSPECT ENGINE OIL**
 - (a) Inspect the engine oil (See page [LU-1](#)).
3. **INSPECT BATTERY**
 - (a) Inspect the battery (See page [CH-4](#)).
4. **INSPECT SPARK PLUGS**
 - (a) Inspect the spark plugs (See page [IG-5](#)).
5. **INSPECT AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY**
 - (a) Remove the air cleaner filter element sub-assembly.
 - (b) Visually check that there is no dirt, blockage, and/or damage to the air cleaner filter element.

HINT:

 - If there is any dirt or a blockage in the air cleaner filter element, clean it with compressed air.
 - If any dirt or a blockage remains even after cleaning the air cleaner filter element with compressed air, replace it.
6. **INSPECT VALVE LASH ADJUSTER NOISE**
 - (a) Rev up the engine several times. Check that the engine does not emit unusual noises. If unusual noises occur, warm up the engine and idle it for over 30 minutes. Then repeat this procedure.

HINT:

If any defects or problems are found during the inspection above, perform lash adjuster inspection (See page [EM-87](#)).



7. INSPECT IGNITION TIMING

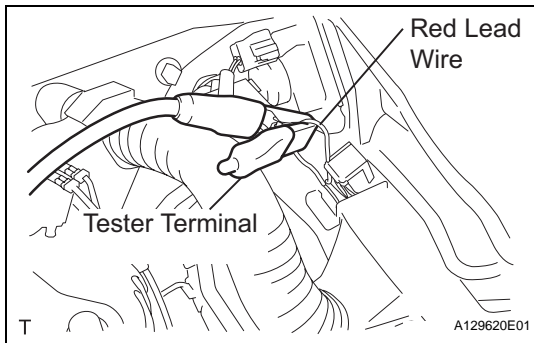
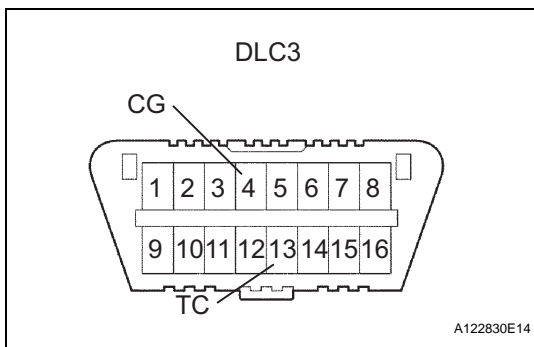
- (a) Warm up the engine.
- (b) When using the intelligent tester:
 - Check the ignition timing.
 - (1) Connect the intelligent tester to the DLC3.
 - (2) Enter DATA LIST mode with the intelligent tester.

Ignition timing:

8 to 12° BTDC at idle

HINT:

Refer to the intelligent tester operator's manual for help when selecting the DATA LIST.



(c) When not using the intelligent tester:

Check the ignition timing.

- (1) Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.

SST 09843-18040

NOTICE:

- Confirm the terminal numbers before connecting them. Connection with a wrong terminal can damage the engine.
- Turn off all electrical systems before connecting the terminals.
- Perform this inspection after the cooling fan motor is turned off.

- (2) Remove the V-bank cover.

- (3) Pull out the red lead wire harness.

- (4) Connect the tester terminal of the timing light to the red lead wire as shown in the illustration.

NOTICE:

Use a timing light which can detect the first signal.

- (5) Check the ignition timing at idle.

Ignition timing:

8 to 12° BTDC at idle

NOTICE:

When checking the ignition timing, the transmission should be in neutral.

HINT:

Run the engine at 1,000 to 1,300 rpm for 5 seconds, and then check that the engine rpm returns to idle speed.

- (6) Disconnect terminals 13 (TC) and 4 (CG) of the DLC3.

- (7) Check the ignition timing at idle.

Ignition timing:

12 to 22° BTDC at idle

- (8) Confirm that the ignition timing moves to the advanced angle side when the engine rpm is increased.

- (9) Remove the timing light.

8. INSPECT ENGINE IDLE SPEED

- (a) Warm up the engine.

(b) When using the intelligent tester:

Check the idle speed.

- (1) Connect the intelligent tester to the DLC3.

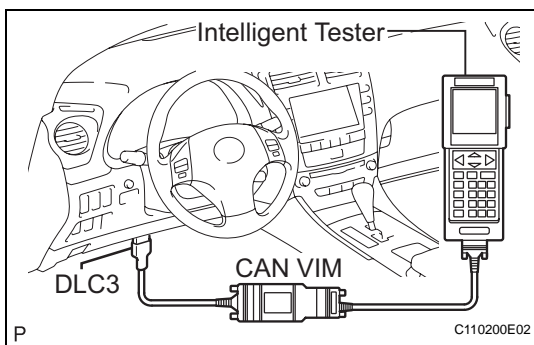
- (2) Enter DATA LIST mode with the intelligent tester.

Idle speed:

600 to 700 rpm

NOTICE:

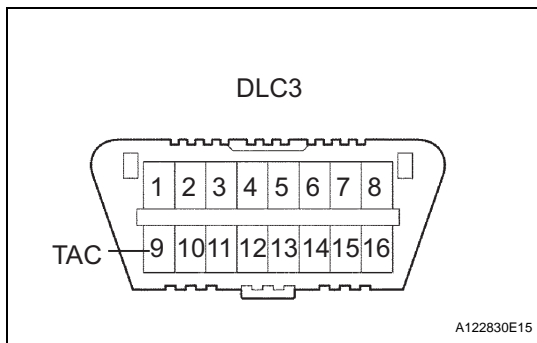
- When checking the idle speed, the transmission should be in neutral.
- Check the idle speed with the cooling fan off.



- **Switch off all accessories and air conditioning before connecting the intelligent tester.**

HINT:

Refer to the intelligent tester operator's manual for further details.



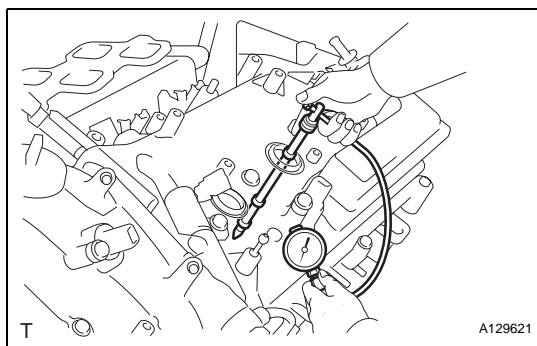
- (c) When not using the intelligent tester:
Check the idle speed.
- (1) Using SST, connect the tachometer test probe to terminal 9 (TAC) of the DLC3.
SST 09843-18030
 - (2) Check the idle speed.
Idle speed:
600 to 700 rpm

9. INSPECT COMPRESSION

- (a) Warm up and stop the engine.
- (b) Disconnect the injector connectors.
- (c) Remove the intake air surge tank (See page [FU-13](#)).
- (d) Remove the 6 ignition coils.
- (e) Remove the 6 spark plugs.
- (f) Check the cylinder compression pressure.
 - (1) Insert a compression gauge into the spark plug hole.
 - (2) While cranking the engine, measure the compression pressure.
Compression pressure:
1.4 MPa (14 kgf/cm², 199 psi)
Minimum pressure:
0.98 MPa (10 kgf/cm², 142 psi)
Difference between each cylinder:
0.1 MPa (1.0 kgf/cm², 15 psi)

NOTICE:

 - **Always use a fully charged battery to obtain an engine speed of 250 rpm or more.**
 - **Check the other cylinders' compression pressure in the same way.**
 - **This measurement must be done as quickly as possible.**
 - (3) If the cylinder compression is low, pour a small amount of engine oil into the cylinder through the spark plug hole and inspect again.
HINT:
 - If adding oil increases the compression, the piston rings and/or cylinder bore may be worn or damaged.
 - If pressure stays low, a valve may be stuck or seated improperly, or there may be leakage in the gasket.
- (g) Install the 6 spark plugs.
Torque: 18 N*m (184 kgf*cm, 13 ft.*lbf)



- (h) Install the 6 ignition coils.
Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)
 (i) Install the intake air surge tank. (See page [FU-17](#)).

10. INSPECT CO/HC

- (a) Start the engine.
 (b) Run the engine at 2,500 rpm for approximately 180 seconds.
 (c) Insert the CO/HC meter testing probe at least 40 cm (1.3 ft) into the tailpipe during idling.
 (d) Check CO/HC concentration at idle and/or 2,500 rpm.

HINT:

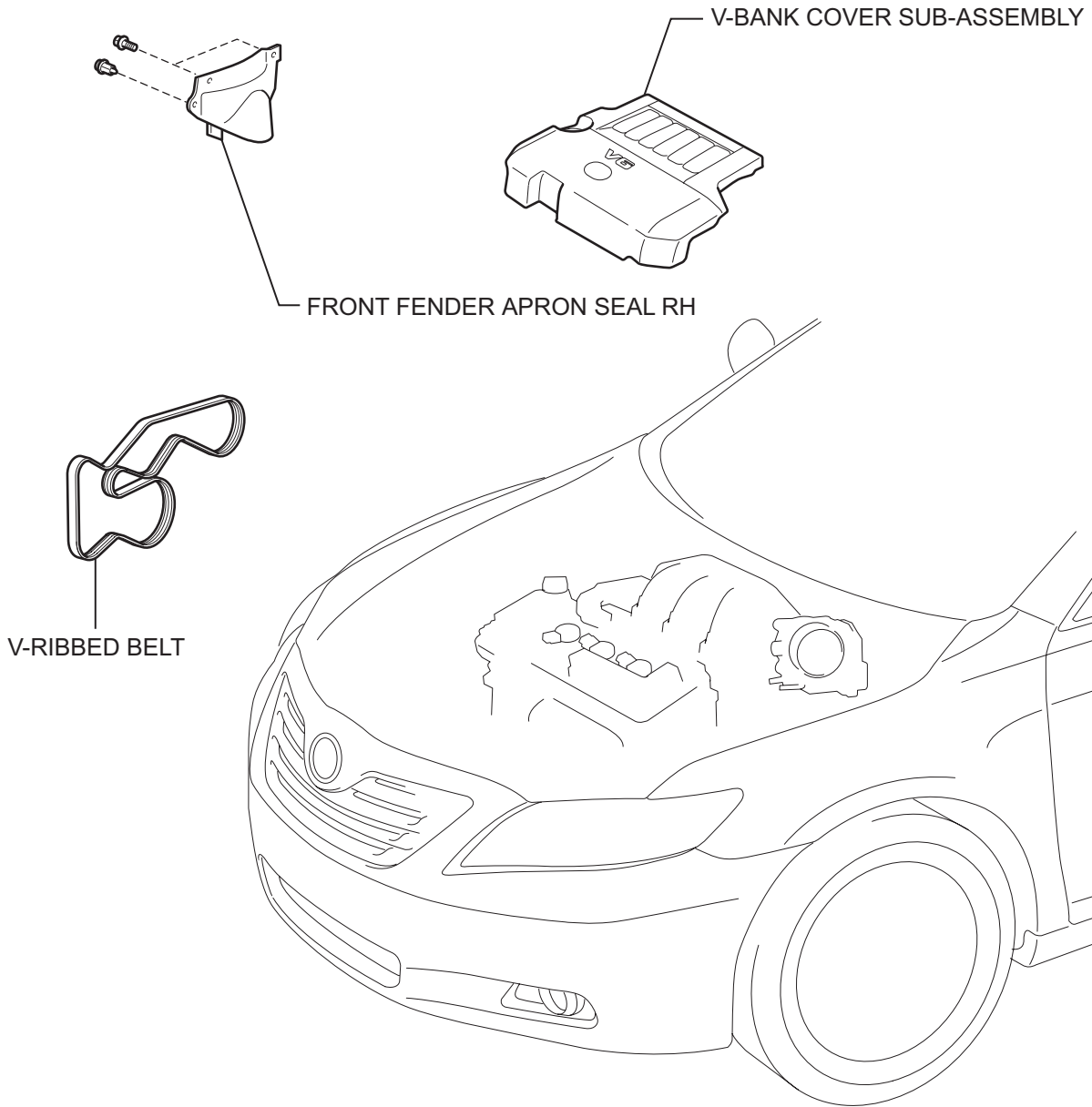
Check regulations and restrictions in your area when performing 2 mode CO/HC concentration testing (engine check at both idle speed and at 2,500 rpm).

If the CO/HC concentration does not comply with regulations, perform troubleshooting in the order given below.

- (1) Check A/F sensor and heated oxygen sensor operation.
- (2) See the table below for possible causes, and then inspect and repair.

CO	HC	Problems	Causes
Normal	High	Rough idle	<ol style="list-style-type: none"> 1. Faulty ignitions: <ul style="list-style-type: none"> – Incorrect timing – Fouled, shorted or improperly gapped plugs 2. Incorrect valve clearance 3. Leaks in intake and exhaust valves 4. Leaks in cylinders
Low	High	Rough idle (fluctuating HC reading)	<ol style="list-style-type: none"> 1. Vacuum leaks: <ul style="list-style-type: none"> – PCV hoses – Intake manifold – Throttle body – Brake booster line 2. Lean mixture causing misfire
High	High	Rough idle (black smoke from exhaust)	<ol style="list-style-type: none"> 1. Restricted air filter 2. Plugged PCV valve 3. Faulty SFI system: <ul style="list-style-type: none"> – Faulty fuel pressure regulator – Defective ECT sensor – Defective MAF meter – Faulty ECM – Faulty injectors – Faulty throttle position sensor

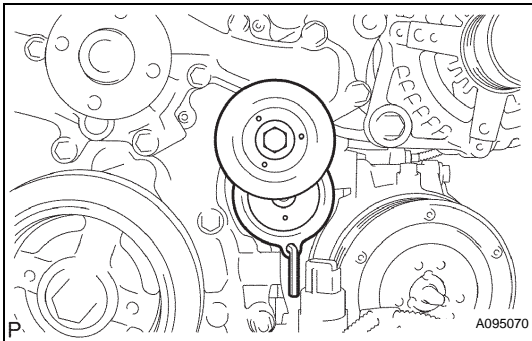
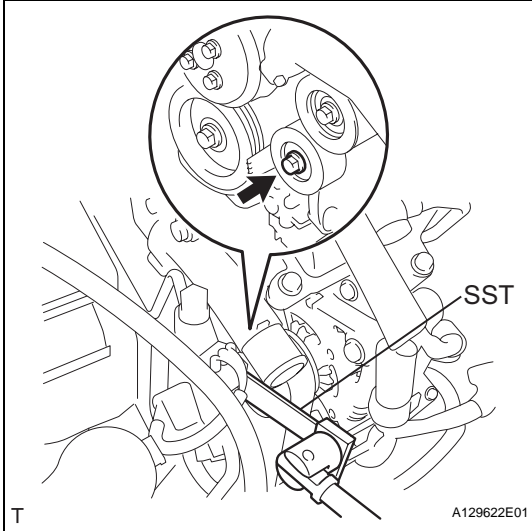
DRIVE BELT COMPONENTS



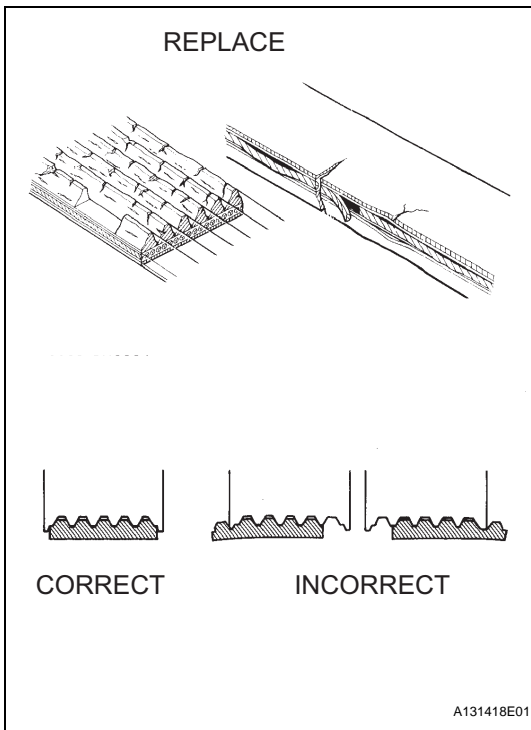
EM

REMOVAL

1. REMOVE FRONT WHEEL RH
2. REMOVE FRONT FENDER APRON SEAL RH
3. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-23](#))
4. REMOVE V-RIBBED BELT
 - (a) Using SST, release the belt tension by turning the belt tensioner counterclockwise, and remove the V-ribbed belt from the belt tensioner.
SST 09249-63010



- (b) While turning the belt tensioner counterclockwise, align with its holes, and then insert the 5 mm bi-hexagon wrench into the holes to fix the V-ribbed belt tensioner.



INSPECTION

1. INSPECT V-RIBBED BELT

- (a) Visually check the V-ribbed belt for excessive wear, frayed cords, etc.

If any defect has been found, replace the V-ribbed belt.

HINT:

Cracks on the rib side of a V-ribbed belt are considered acceptable.

If the drive belt has chunks missing from its ribs, it should be replaced.

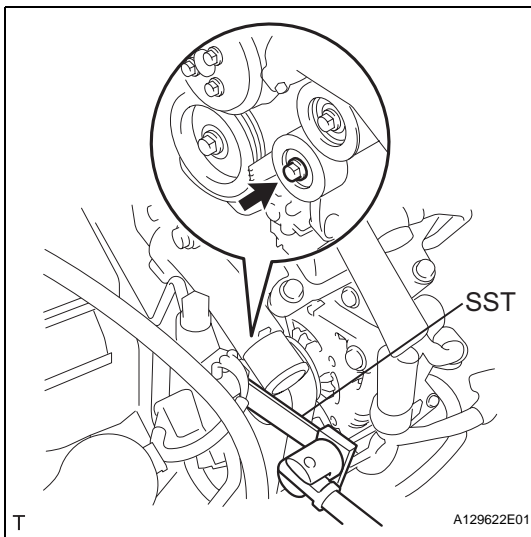
HINT:

- A "new belt" is a belt which has been used for less than 5 minutes with the engine running.
- A "used belt" is a belt which has been used for 5 minutes or more with the engine running.

2. INSPECT V-RIBBED BELT TENSIONER ASSEMBLY

- (a) Check that nothing gets caught in the tensioner by turning it clockwise and counterclockwise.

If a malfunction exists, replace the tensioner.

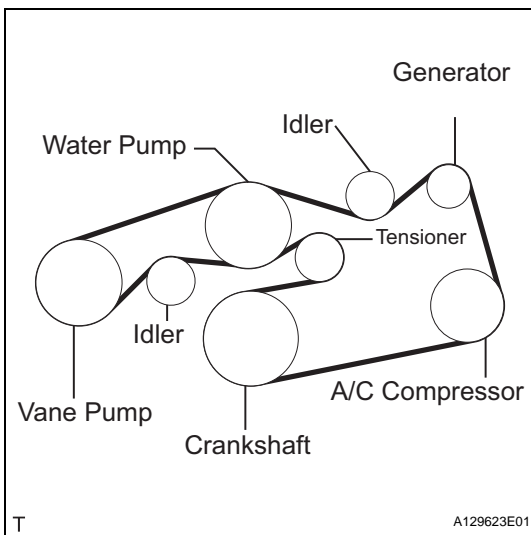


INSTALLATION

1. INSTALL V-RIBBED BELT

- (a) Install the V-ribbed belt.
- (b) Using SST, turn the belt tensioner counterclockwise and remove the bar.

SST 09249-63010



- (c) If it is difficult to install the V-ribbed belt, perform the following procedure:

- (1) Put the V-ribbed belt on every pulley except the tensioner pulley as shown in the illustration.
- (2) While releasing the belt tension by turning the belt tensioner counterclockwise, put the V-ribbed belt on the tensioner pulley.

NOTICE:

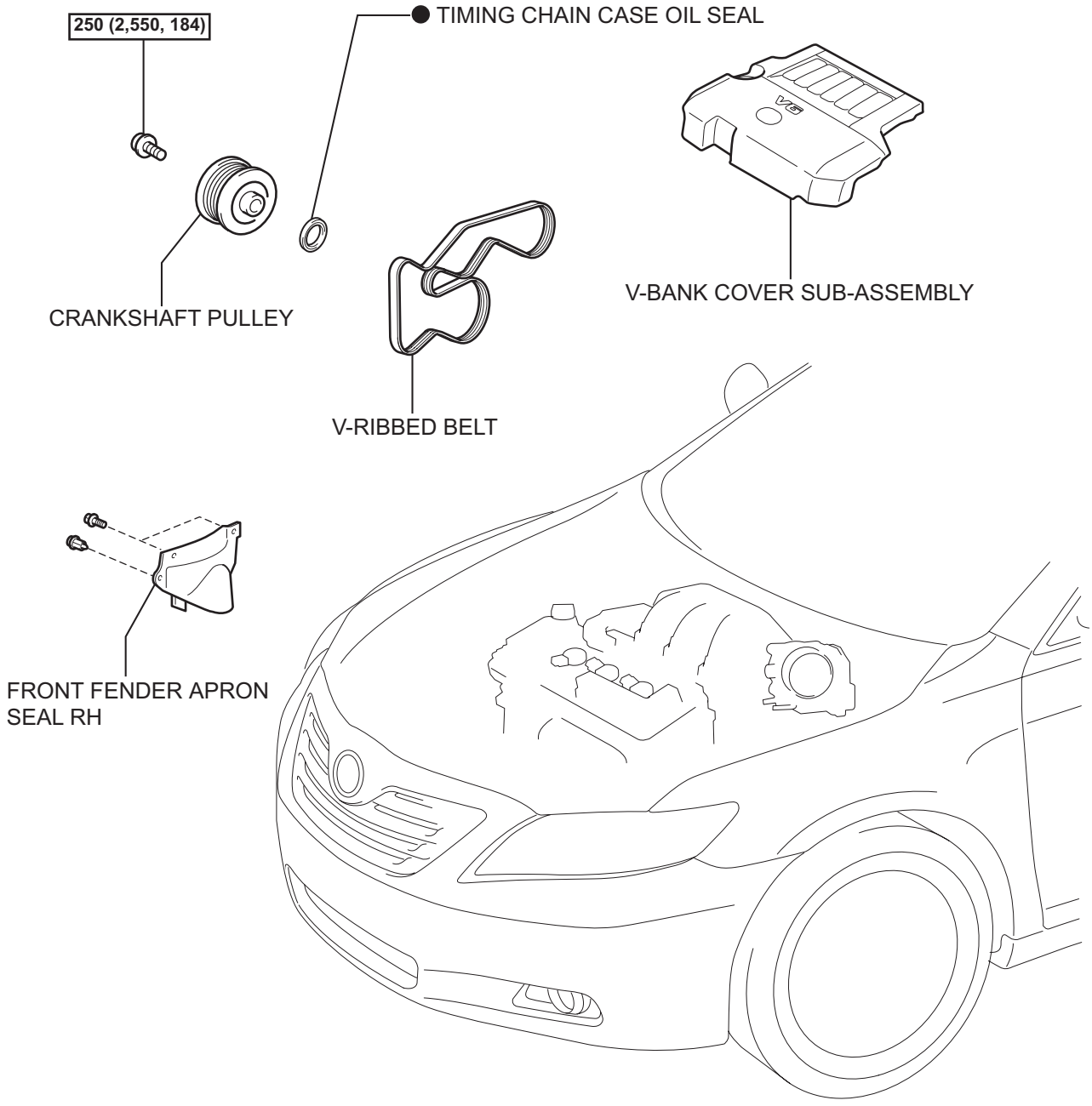
- **Put the backside of the V-ribbed belt on the tensioner pulley and idler pulley.**
 - **Check that the V-ribbed belt is properly set to each pulley.**
- (3) After installing the V-ribbed belt, check that it fits properly in the ribbed grooves. Confirm that the belt has not slipped out of the grooves on the bottom of the crank pulley by hand.

2. **INSTALL V-BANK COVER SUB-ASSEMBLY (See page [EM-52](#))**
3. **INSTALL FRONT FENDER APRON SEAL RH**
4. **INSTALL FRONT WHEEL RH**
Torque: 103 N*m (1,050 kgf*cm, 76 ft.*lbf)

ENGINE FRONT OIL SEAL

COMPONENTS

EM



250 (2,550, 184)

CRANKSHAFT PULLEY

● TIMING CHAIN CASE OIL SEAL

V-BANK COVER SUB-ASSEMBLY

V-RIBBED BELT

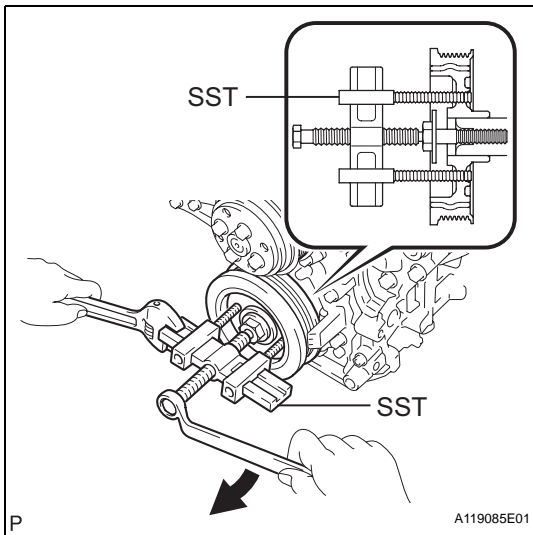
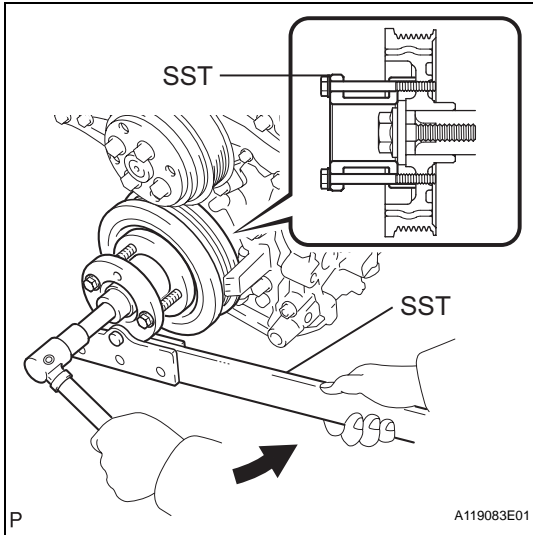
FRONT FENDER APRON SEAL RH

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

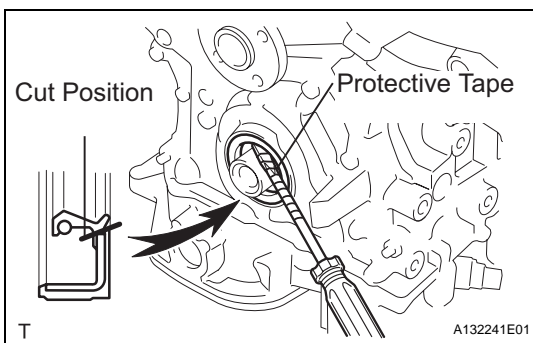
● Non-reusable part

REMOVAL

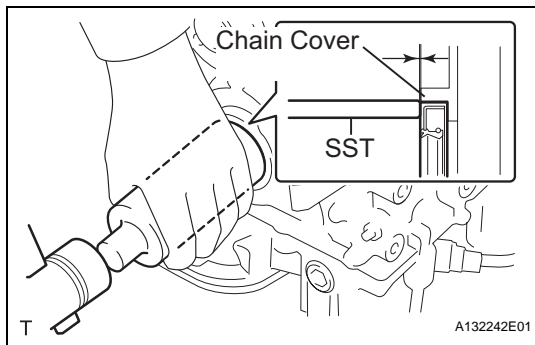
1. REMOVE FRONT WHEEL RH
2. REMOVE FRONT FENDER APRON SEAL RH
3. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-23](#))
4. REMOVE V-RIBBED BELT (See page [EM-6](#))
5. REMOVE CRANKSHAFT PULLEY
 - (a) Using SST, loosen the crankshaft pulley bolt.
SST 09213-70011 (09213-70020), 09330-00021



- (b) Using SST, remove the crankshaft pulley bolt and crankshaft pulley.
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)



6. REMOVE TIMING CHAIN CASE OIL SEAL
 - (a) Using a screwdriver, pry out the oil seal.
HINT:
Tape the screwdriver tip before use.
NOTICE:
After the removal, check the crankshaft for damage. If it is damaged, smooth the surface with 400-grit sandpaper.



INSTALLATION

1. INSTALL TIMING CHAIN CASE OIL SEAL

- (a) Apply MP grease to a new oil seal lip.
- (b) Using SST and a hammer, tap in the oil seal until its surface is flush with the timing chain cover edge.

SST 09316-60011 (09316-00011)

NOTICE:

- Keep the lip free of foreign matter.
- Do not tap the oil seal at an angle.

2. INSTALL CRANKSHAFT PULLEY

- (a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.

- (b) Using SST, install the pulley bolt.

SST 09213-70011 (09213-70020), 09330-00021

Torque: 250 N*m (2,550 kgf*cm, 184 ft.*lbf)

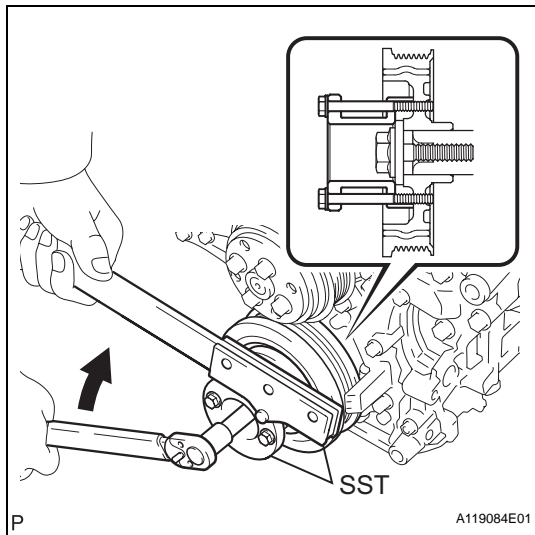
3. INSTALL V-RIBBED BELT (See page [EM-7](#))

4. INSTALL V-BANK COVER SUB-ASSEMBLY (See page [EM-52](#))

5. INSTALL FRONT FENDER APRON SEAL RH

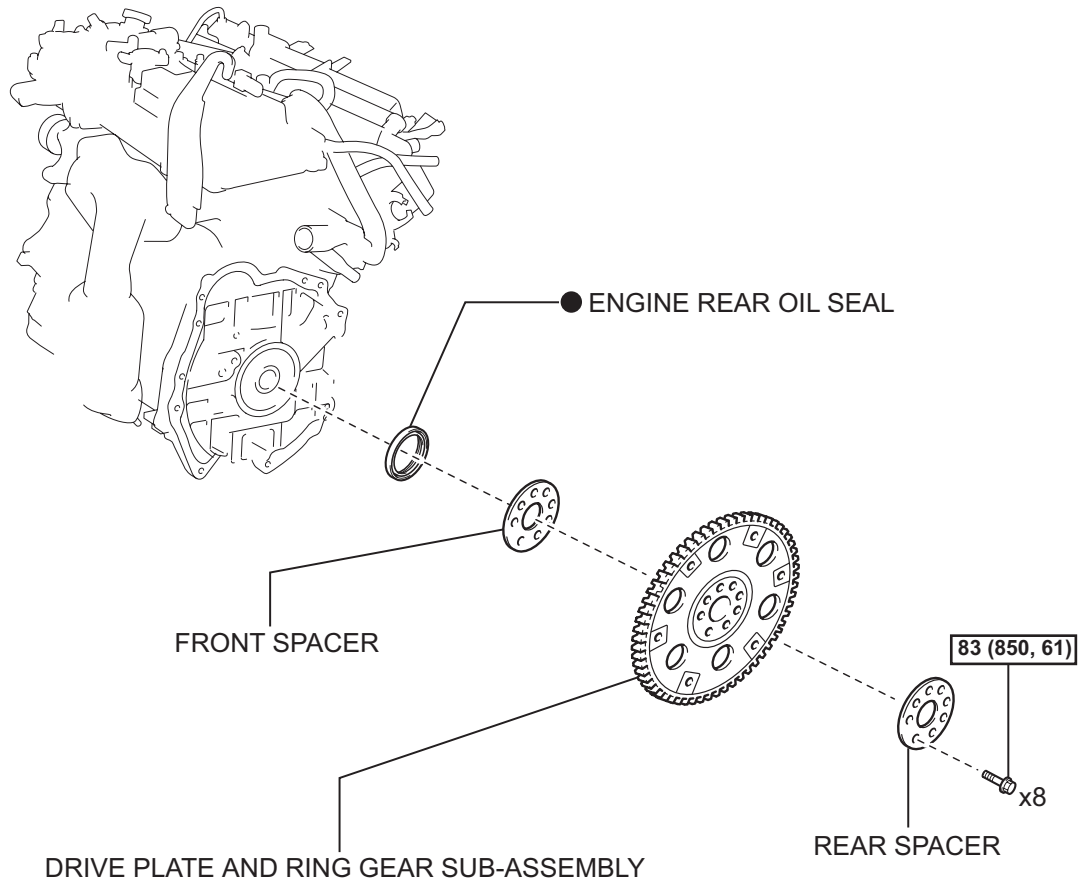
6. INSTALL FRONT WHEEL RH

Torque: 103 N*m (1,050 kgf*cm, 76 ft.*lbf)



ENGINE REAR OIL SEAL

COMPONENTS



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

● Non-reusable part

REMOVAL

1. REMOVE AUTOMATIC TRANSAXLE ASSEMBLY

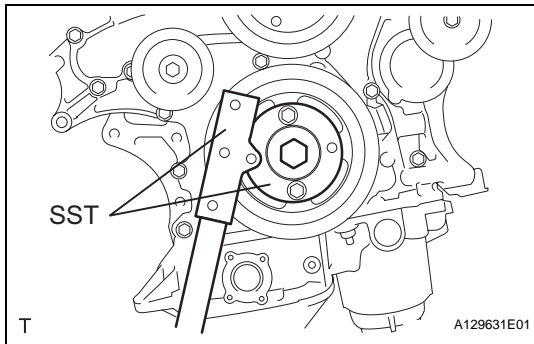
HINT:

See page [AX-207](#).

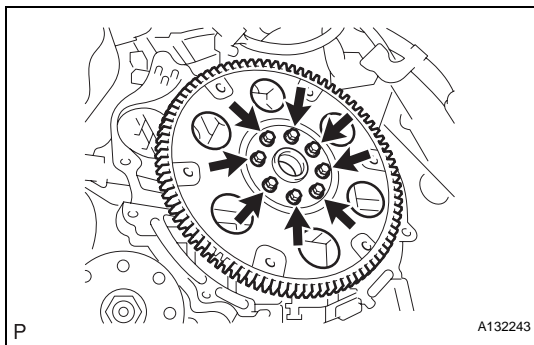
2. REMOVE DRIVE PLATE AND RING GEAR SUB-ASSEMBLY

(a) Using SST, hold the crankshaft.

SST 09213-70011 (09213-70020), 09330-00021



(b) Remove the 8 bolts, front spacer, drive plate and rear spacer.



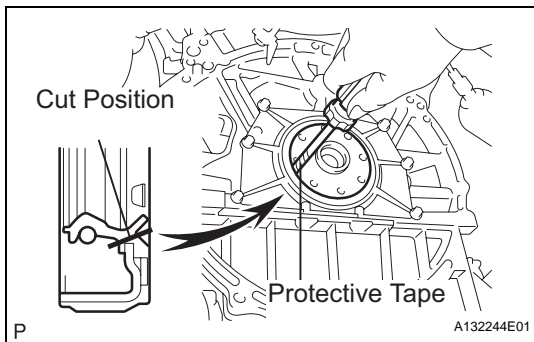
3. REMOVE ENGINE REAR OIL SEAL

(a) Using a knife, cut off the oil seal lip.

(b) Using a screwdriver, pry out the oil seal.

NOTICE:

Be careful not to damage the crankshaft. Tape the screwdriver tip before use.



INSTALLATION

1. INSTALL ENGINE REAR OIL SEAL

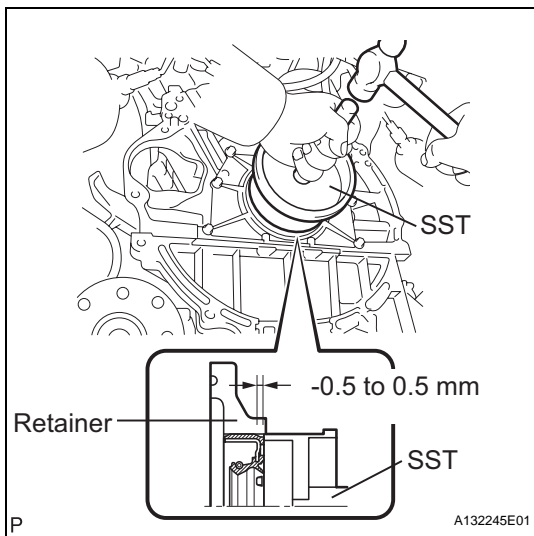
(a) Apply MP grease to a new oil seal lip.

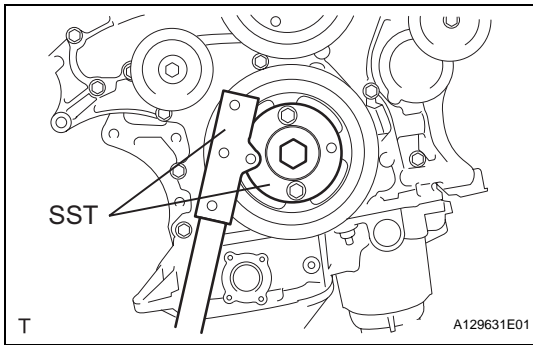
(b) Using SST and a hammer, tap in the oil seal.

SST 09223-15030, 09950-70010 (09951-07150)

Oil seal tap in depth:

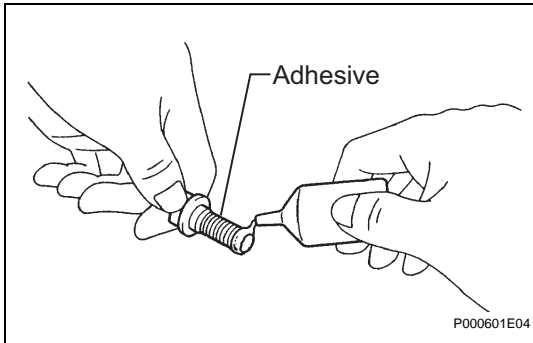
-0.5 to 0.5 mm (-0.020 to 0.020 in.)





2. INSTALL DRIVE PLATE AND RING GEAR SUB-ASSEMBLY

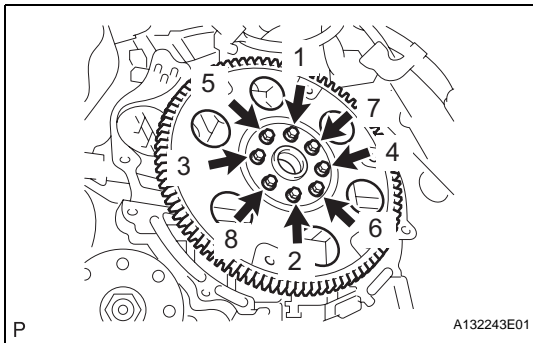
- (a) Using SST, hold the crankshaft.
SST 09213-70011 (09213-70020), 09330-00021



- (b) Apply adhesive to 2 or 3 threads of the mounting bolt end.

Adhesive:

Part No. 08833-00070, THREE BOND 1324 or equivalent



- (1) Install the front spacer, drive plate and rear spacer on the crankshaft.
- (2) Install and tighten the 8 mounting bolts uniformly in several steps.

Torque: 83 N*m (850 kgf*cm, 61 ft.*lbf)

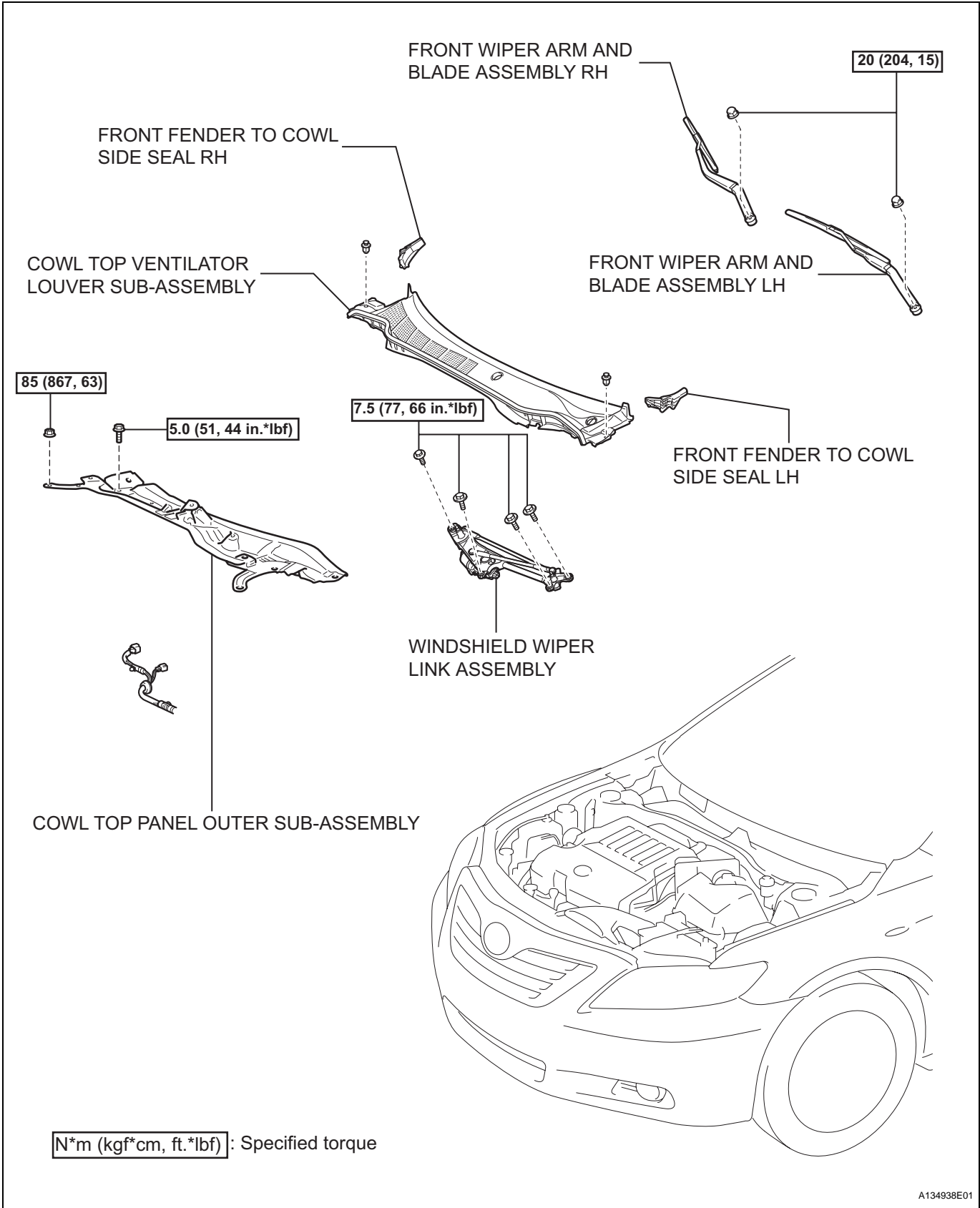
3. INSTALL AUTOMATIC TRANSAXLE ASSEMBLY

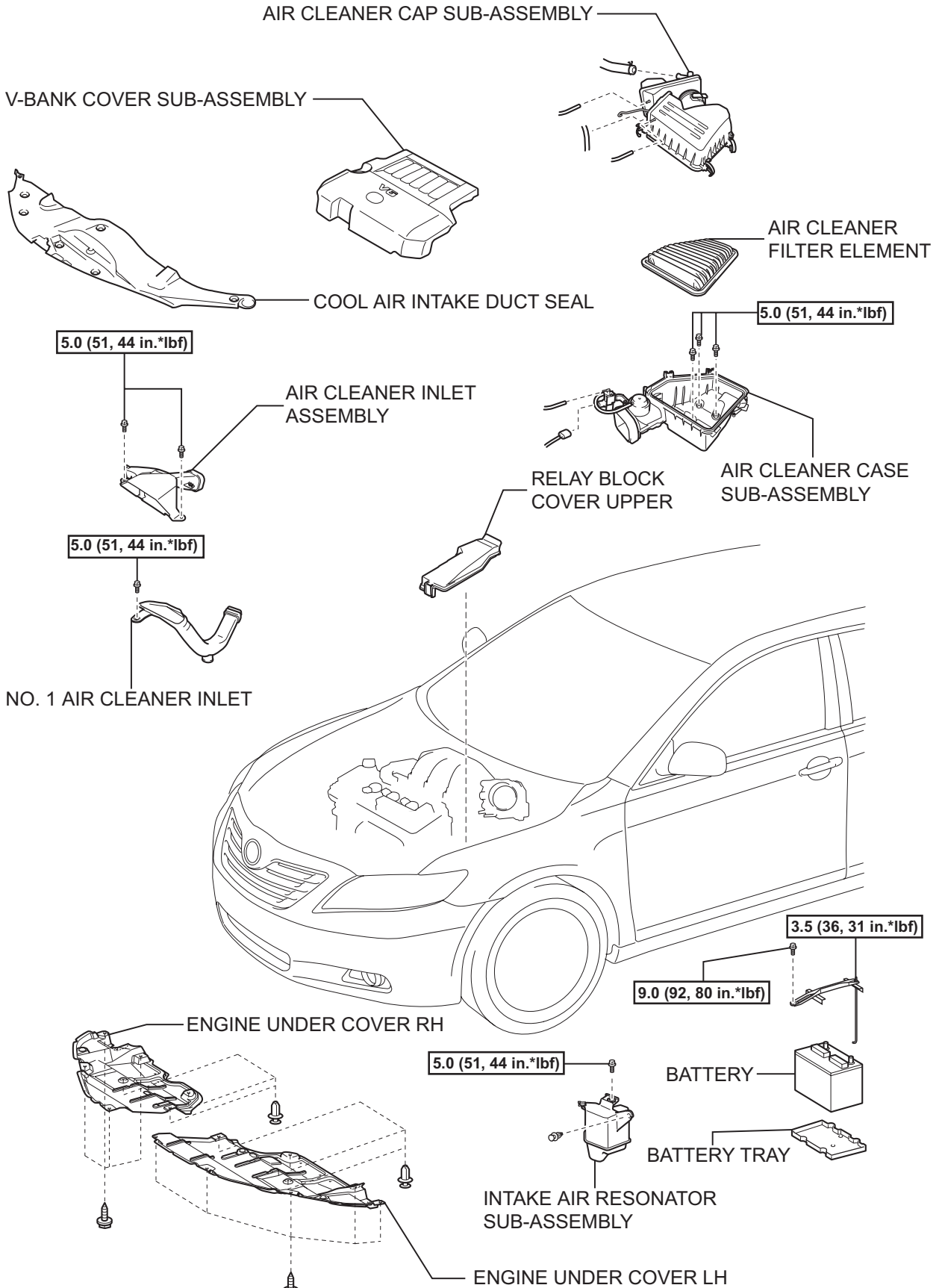
HINT:

See page [AX-214](#).

ENGINE ASSEMBLY

COMPONENTS

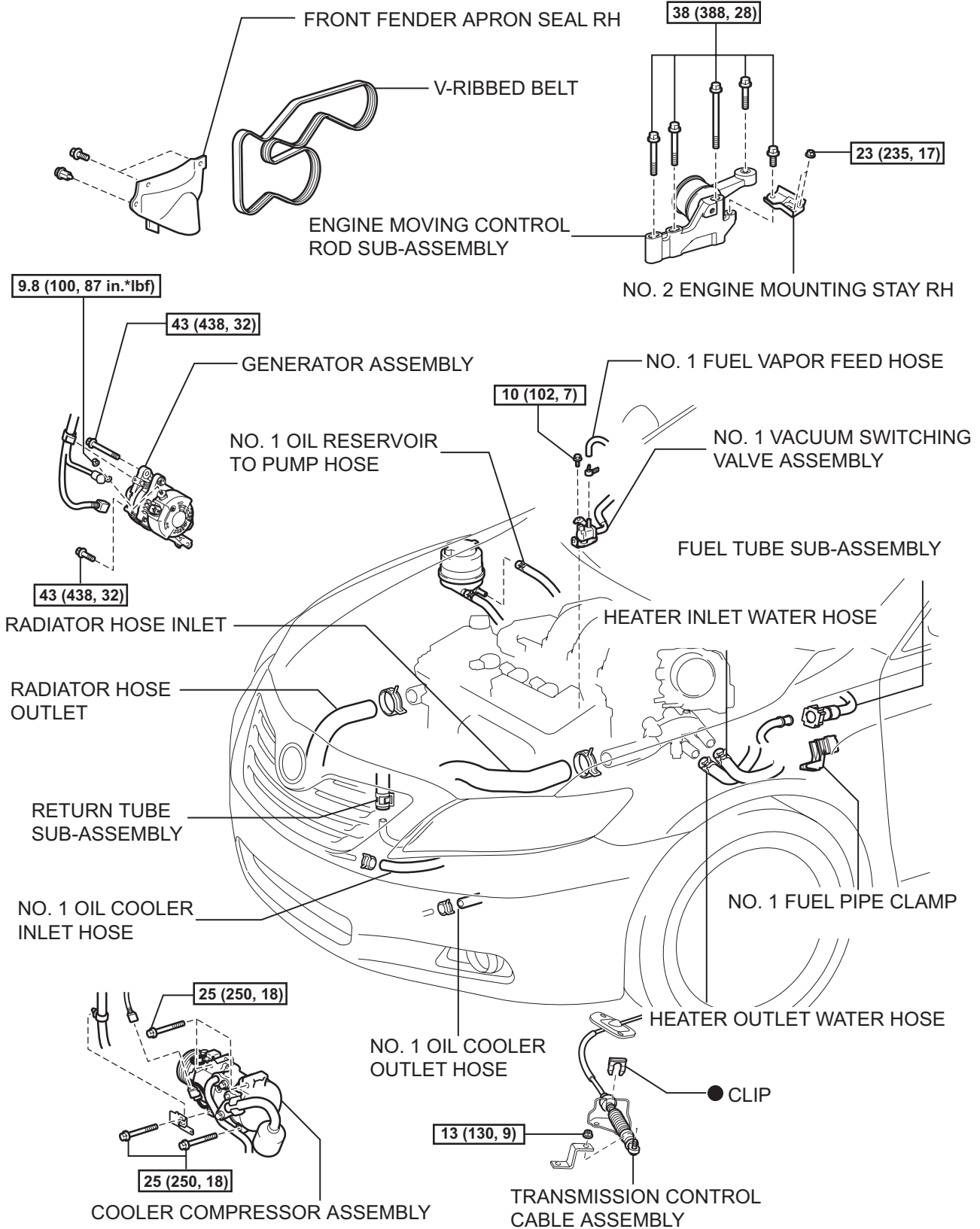




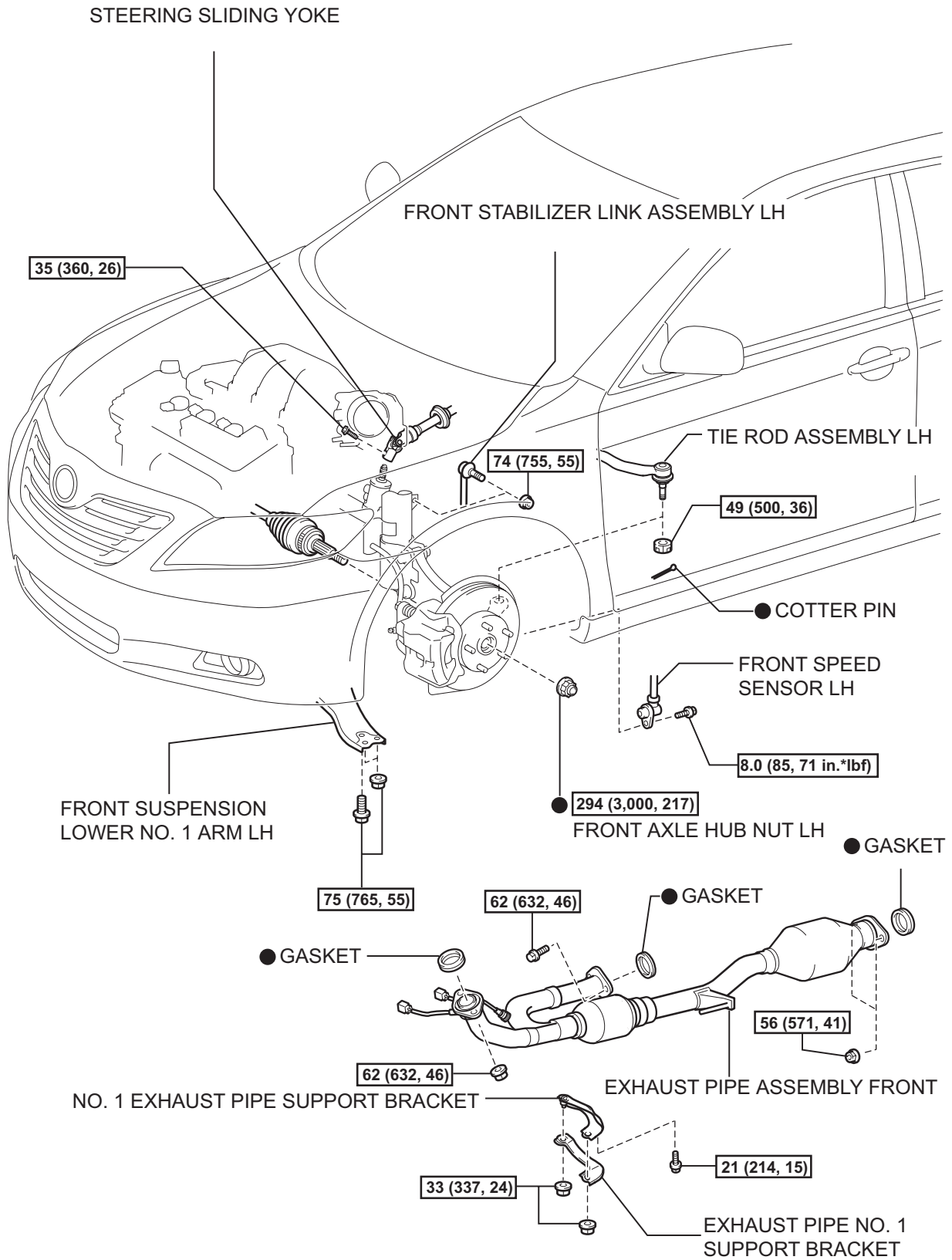
EM

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

EM



N*m (kgf*cm, ft.*lbf) : Specified torque ● Non-reusable part

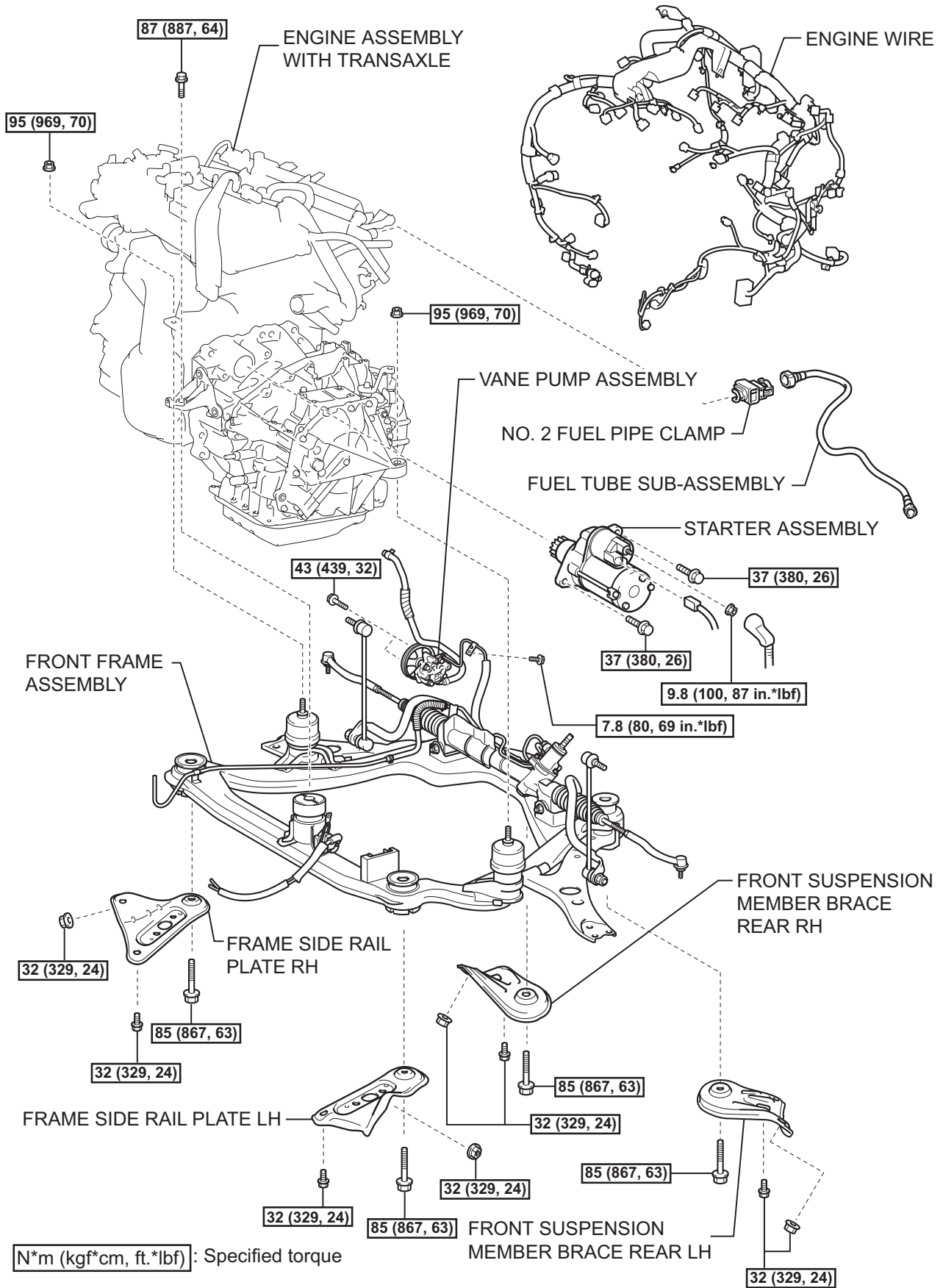


EM

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

● Non-reusable part

EM



EM

