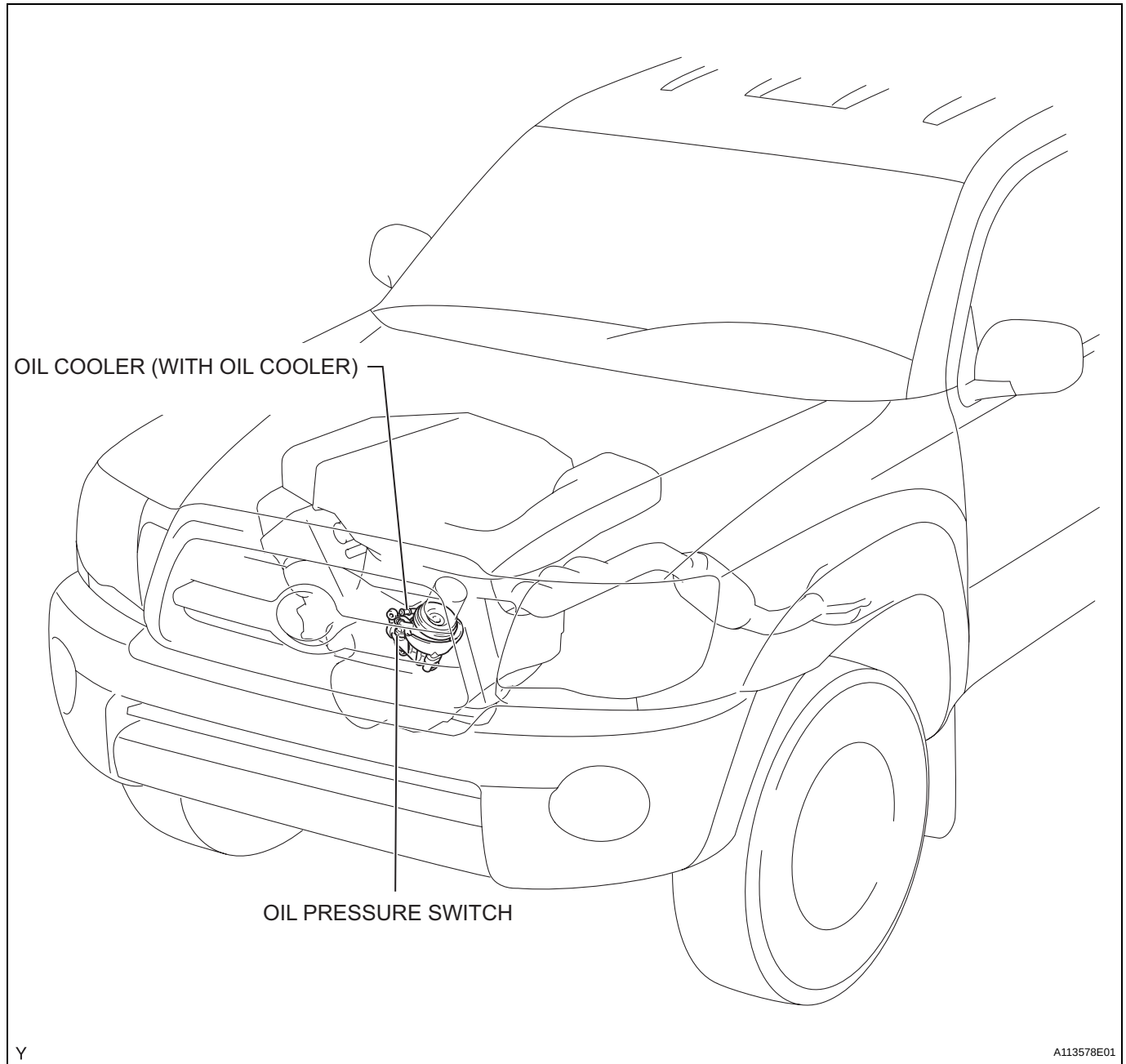
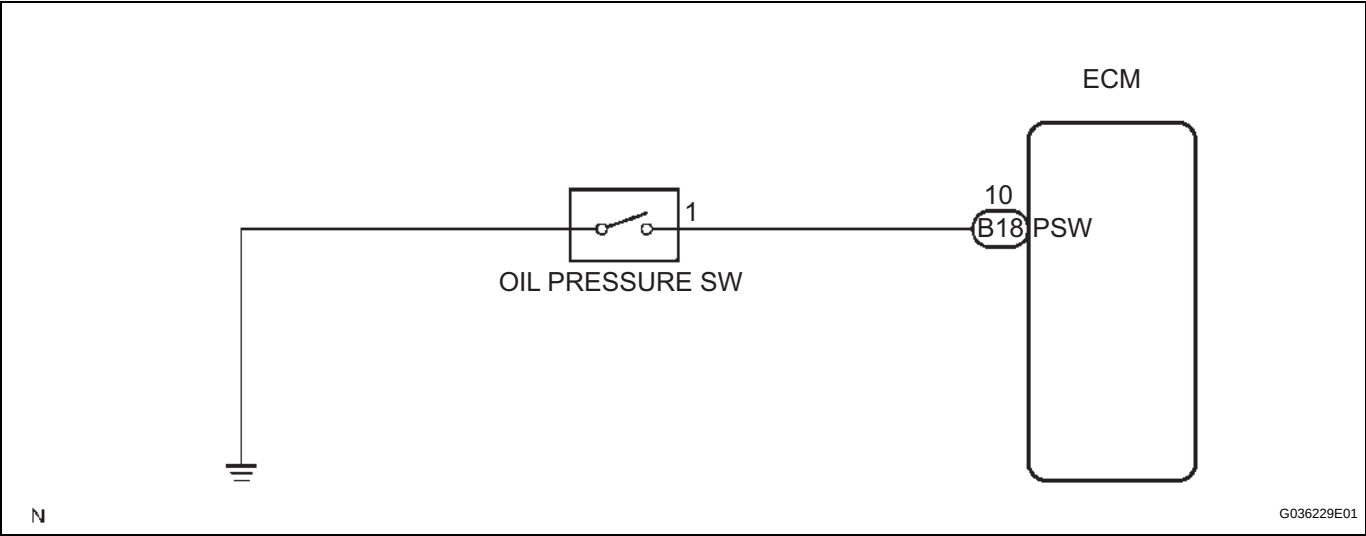


LUBRICATION SYSTEM

PARTS LOCATION



SYSTEM DIAGRAM



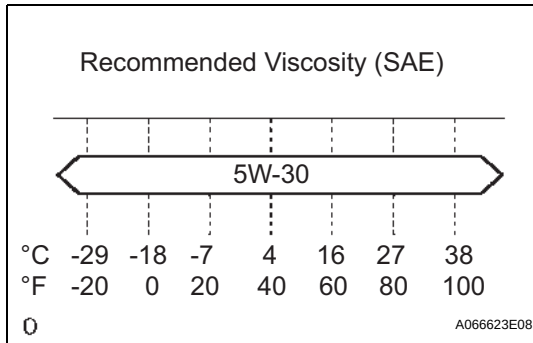
ON-VEHICLE INSPECTION

1. CHECK ENGINE OIL LEVEL

- Warm up the engine, then stop the engine and wait for 5 minutes.
- Check that the engine oil level is between the low level and full level marks on the level gauge. If low, check for leakage and top oil up to the full level mark.

NOTICE:

Do not fill with engine oil to above the full level mark.



2. CHECK ENGINE OIL QUALITY

- Check the oil for deterioration, water intrusion, discoloration or thinning. If the quality is visibly poor, replace the oil.

Oil grade:

Use API grade SM "Energy-Conserving" or ILSAC multigrade engine oil.

SAE 5W-30 is the best choice for good fuel economy and good starting in cold weather.

If SAE 5W-30 is not available, use SAE 10W-30.

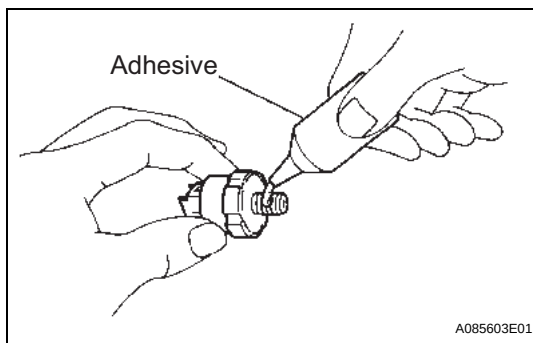
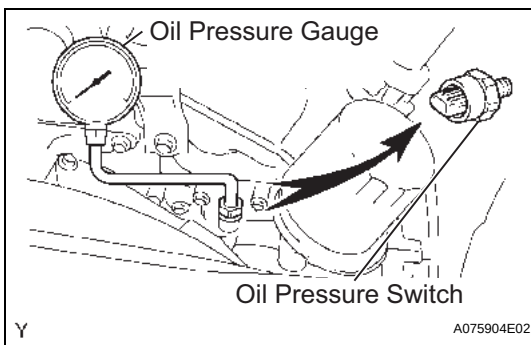
However, it should be replaced with SAE 5W-30 at the next oil replacement.

3. INSPECT OIL PRESSURE

- Disconnect the oil pressure switch connector.
- Using a 24 mm deep socket wrench, remove the oil pressure switch.
- Install the oil pressure gauge.
- Warm up the engine.
- Inspect the oil pressure.

Oil pressure

When Idling	29 kPa (0.3 kgf*cm ² , 4.3 psi) or more
At 3,000 rpm	294 to 588 kPa (3.0 to 6.0 kgf*cm ² , 43 to 85 psi)



- Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

- Using a 24 mm deep socket wrench, install the oil pressure switch.

Torque: 15 N*m (153 kgf*cm, 11 ft.*lbf)

NOTICE:

Do not start the engine within 1 hour of installation.

- Connect the oil pressure switch connector.
- Check for engine oil leakage.

OIL FILTER

REMOVAL

CAUTION:

- Prolonged and repeated contact with engine oil will cause the removal of natural oils from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.
- Precautions should be taken when replacing engine oil to minimize the risk of your skin making contact with used engine oil.
- Wash your skin thoroughly with soap and water, or use waterless hand cleaner to remove any used engine oil. Do not use gasoline, thinners, or solvents.
- For environmental protection, used oil and used oil filters must be disposed of only at designated disposal sites.

1. DRAIN ENGINE OIL

- (a) Remove the engine under cover seal No. 3.
- (b) Remove the oil pan drain plug and drain the engine oil.
- (c) Clean the oil pan drain plug and install it with a new gasket.

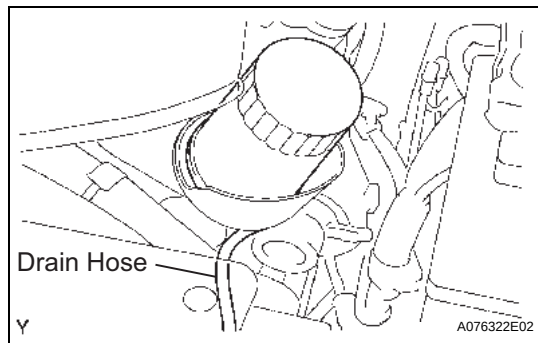
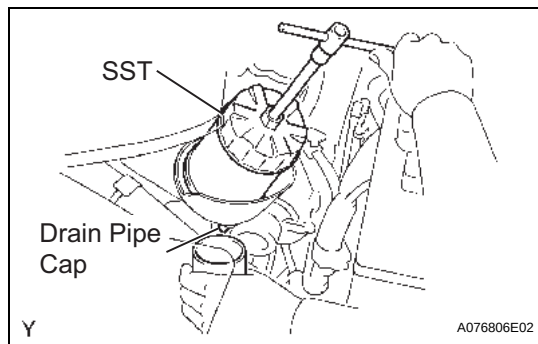
Torque: 40 N*m (408 kgf*cm, 30 ft.*lbf)

2. REMOVE OIL FILTER SUB-ASSEMBLY

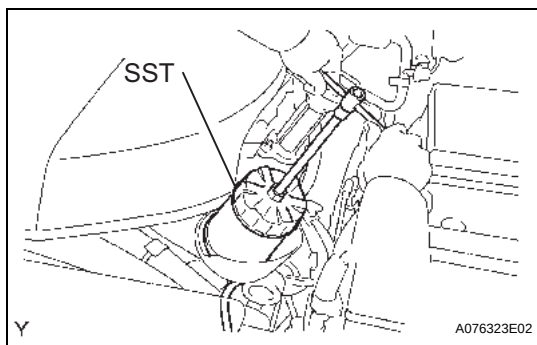
- (a) Remove the drain pipe cap.
- (b) While removing the oil filter with SST, catch the oil from the oil filter with a container.

SST 09228-07501

- (c) Install the drain pipe cap.



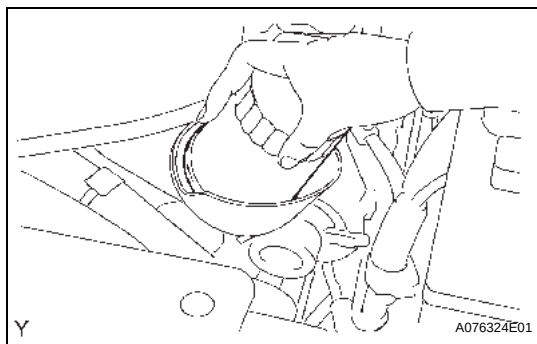
- (d) Clean the oil catch plate.
HINT:
When using a drain hose, perform the following procedures.
- (e) Remove the drain pipe cap.
- (f) Connect a drain hose to the oil filter bracket.
HINT:
 - Drain hose inside diameter: 8 mm (0.31 in.)
 - Drain hose length: 900 mm (35.43 in.)
- (g) Feed the drain hose down through the engine under cover, and put the drain oil container beneath the drain hose to catch the oil from the oil filter.



- (h) Using SST, remove the oil filter.

SST 09228-07501

- (i) Remove the drain hose and install the drain pipe cap.
(j) Clean the oil catch plate.



INSTALLATION

1. INSTALL OIL FILTER SUB-ASSEMBLY

- (a) Clean the oil filter contact surface on the oil filter bracket.
(b) Apply clean engine oil to the rubber gasket of a new oil filter.
(c) Tighten the oil filter by hand until the rubber gasket comes into contact with the seat of the filter bracket.

- (d) Using SST, tighten it an additional 3/4 turn to set the filter.

SST 09228-07501

Torque: 18 N*m (184 kgf*cm, 13 ft.*lbf)

2. ADD ENGINE OIL

- (a) Fill with fresh engine oil.

Capacity:

2WD

Drain and refill with oil filter change	4.5 liters (4.8 US qts, 4.0 Imp. qts)
Drain and refill without oil filter change	4.2 liters (4.4 US qts, 3.7 Imp. qts)
Dry fill	5.6 liters (5.9 US qts, 4.9 Imp. qts)

PRE RUNNER and 4WD

Drain and refill with oil filter change	5.2 liters (5.5 US qts, 4.6 Imp. qts)
Drain and refill without oil filter change	4.9 liters (5.2 US qts, 4.3 Imp. qts)
Dry fill	6.0 liters (6.3 US qts, 5.3 Imp. qts)

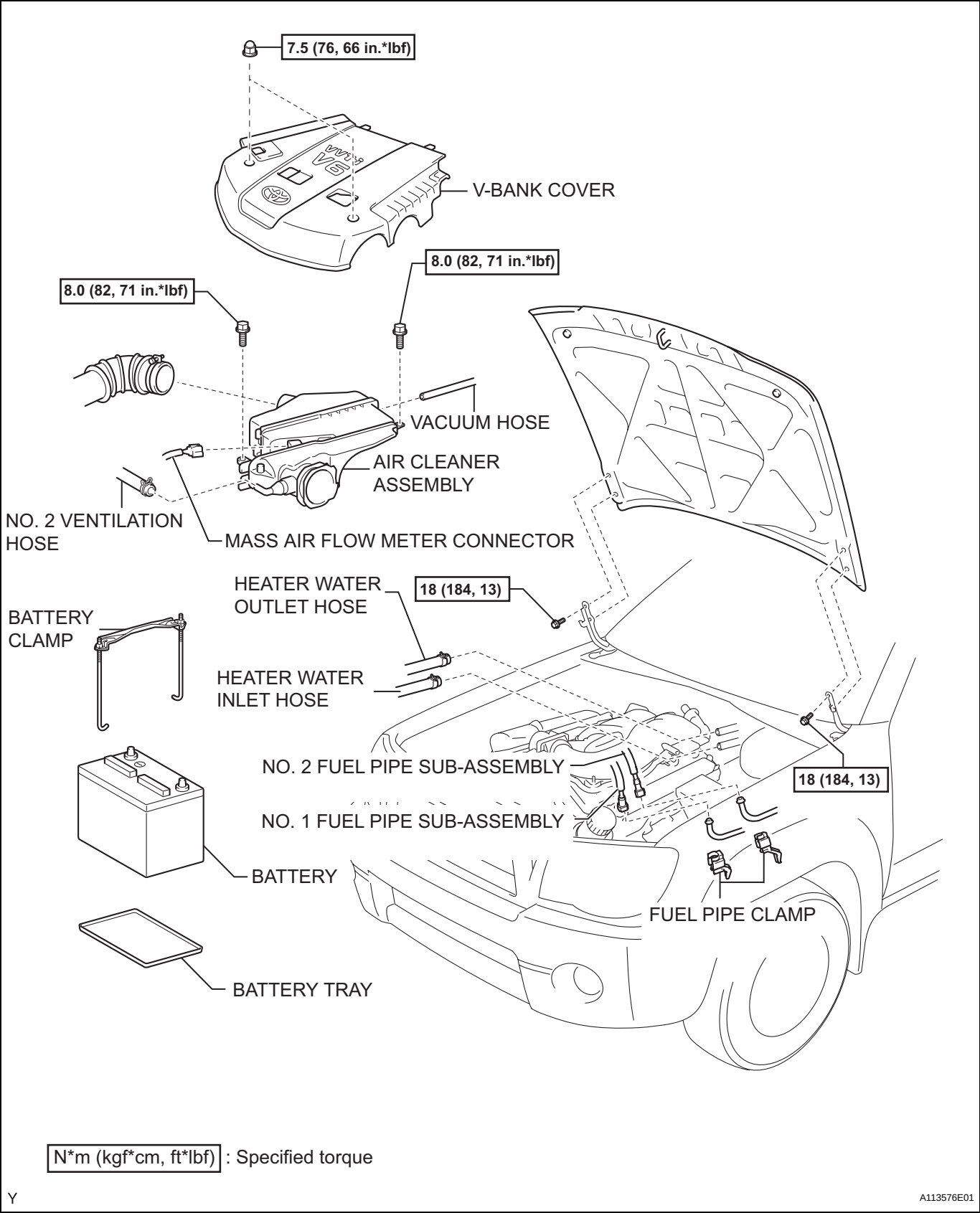
- (b) Reinstall the oil filler cap.

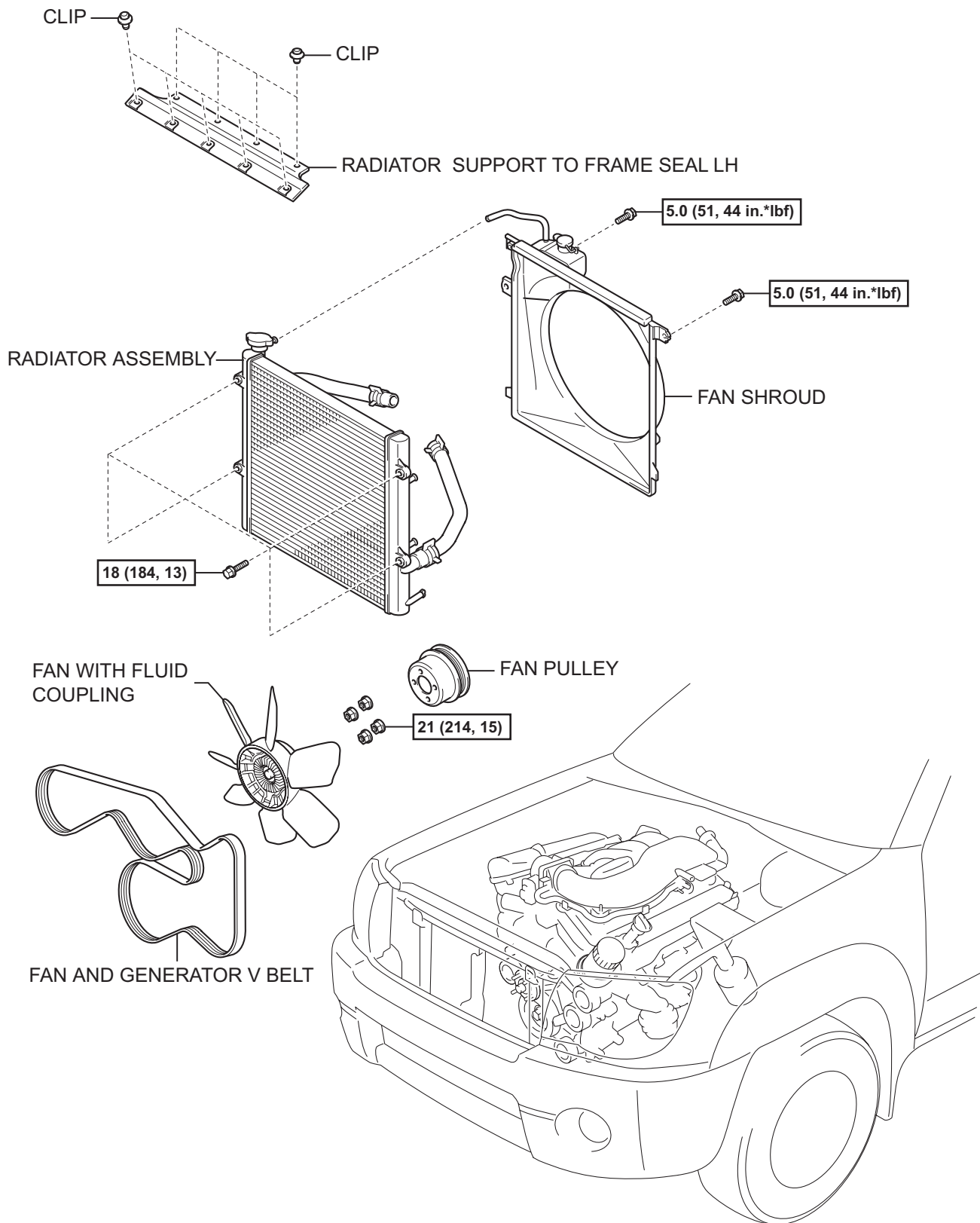
3. CHECK FOR ENGINE OIL LEAKAGE

4. CHECK ENGINE OIL LEVEL

OIL PUMP (for 2WD)

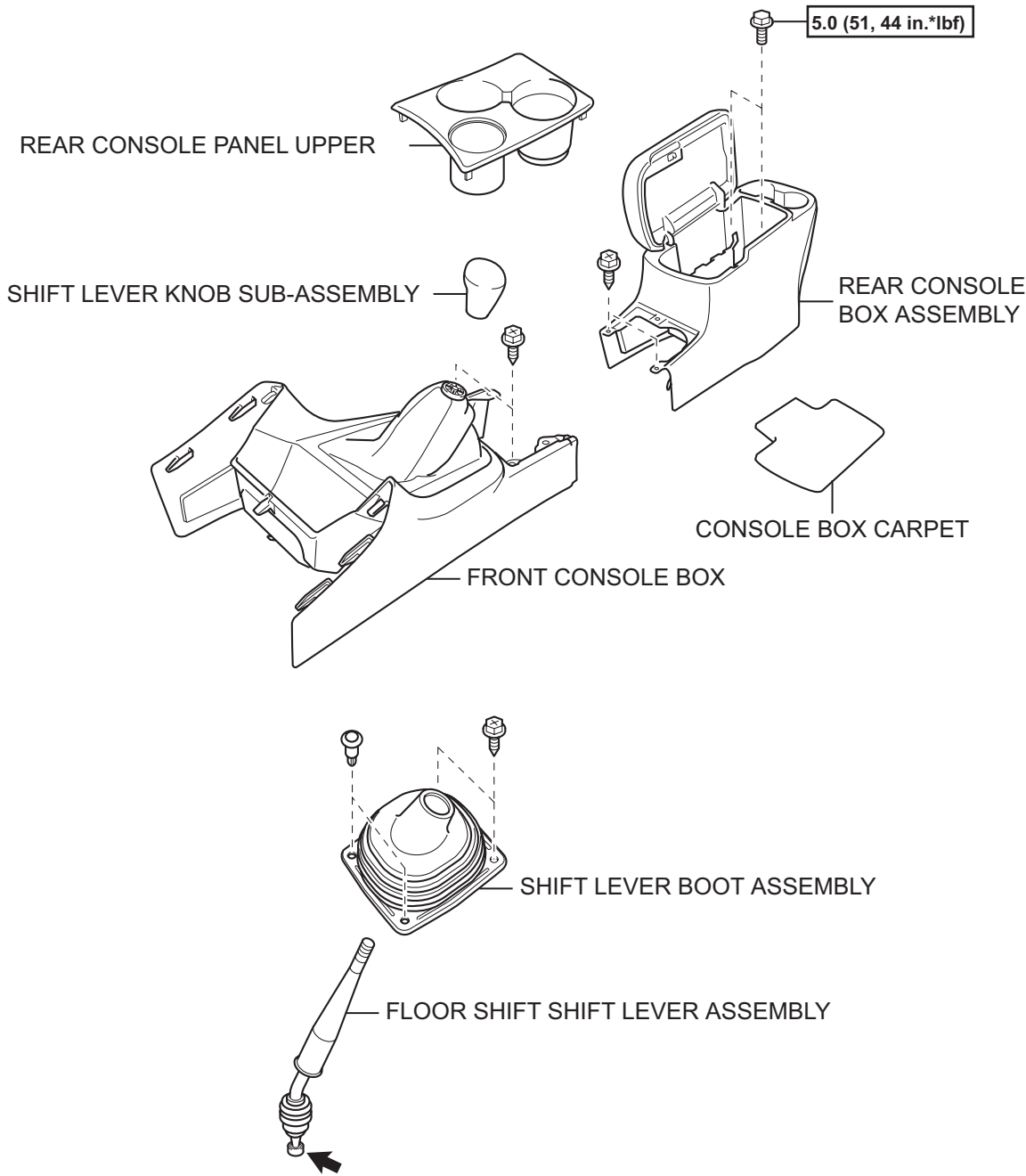
COMPONENTS





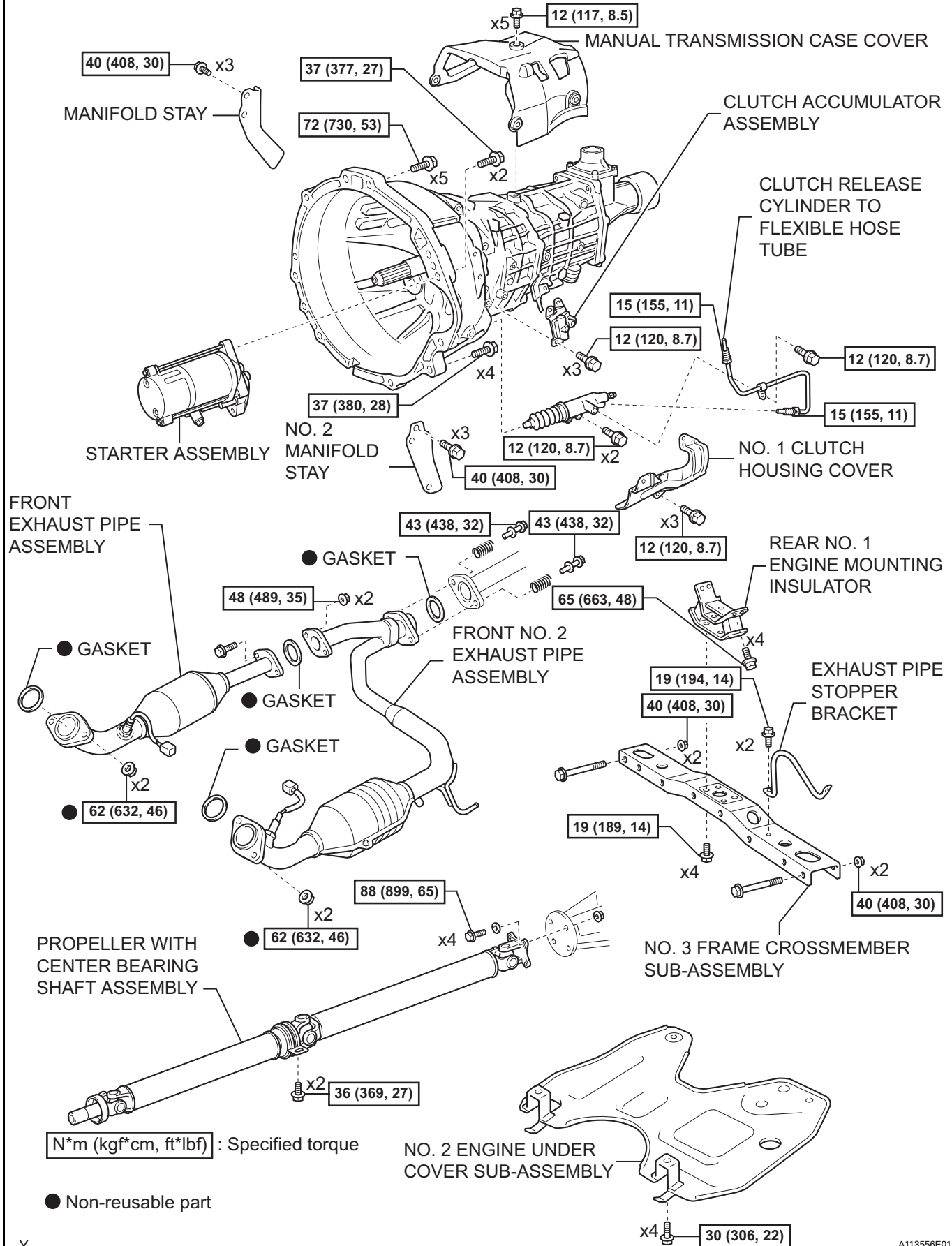
N*m (kgf*cm, ft*lbf) : Specified torque

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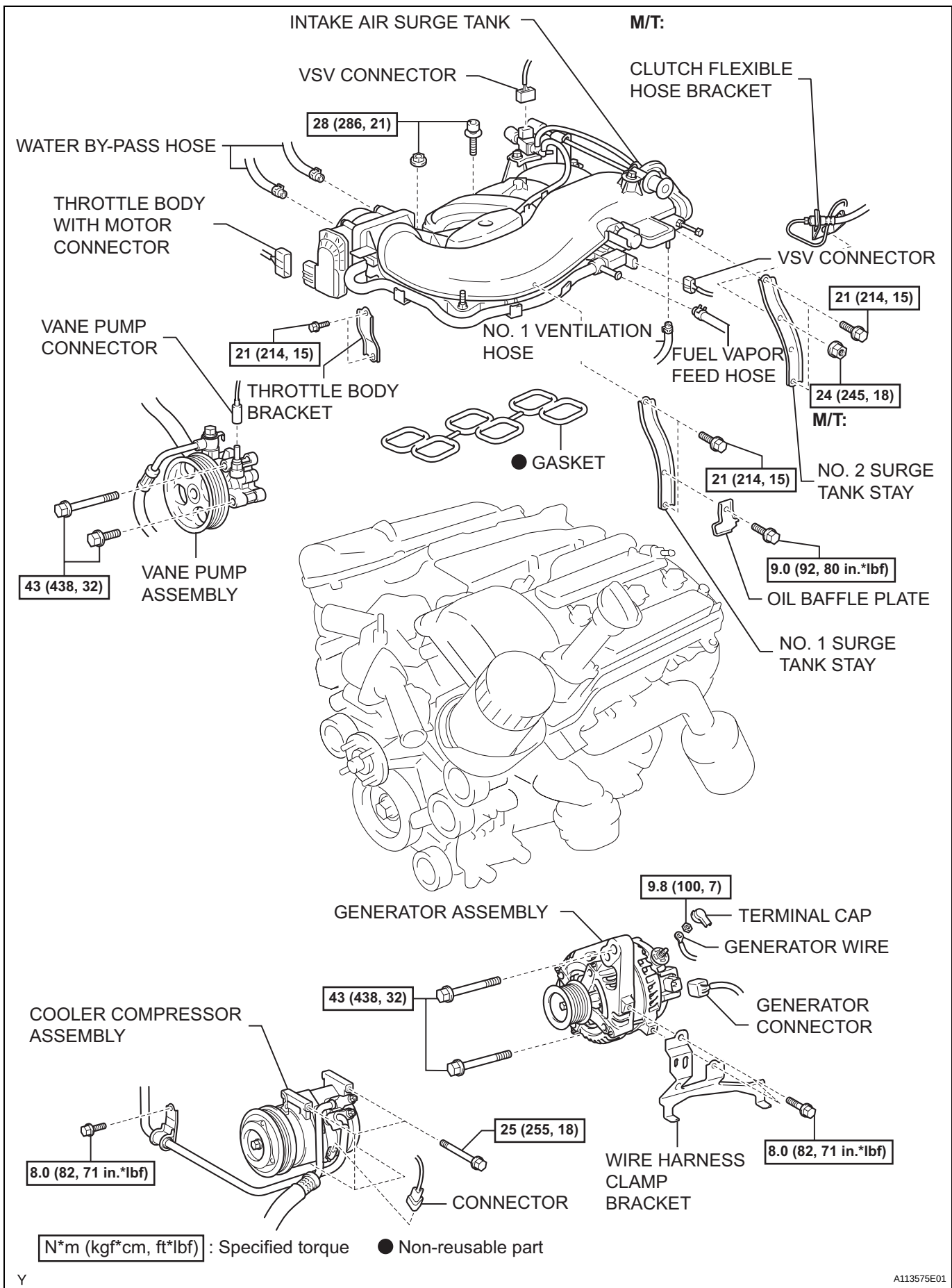


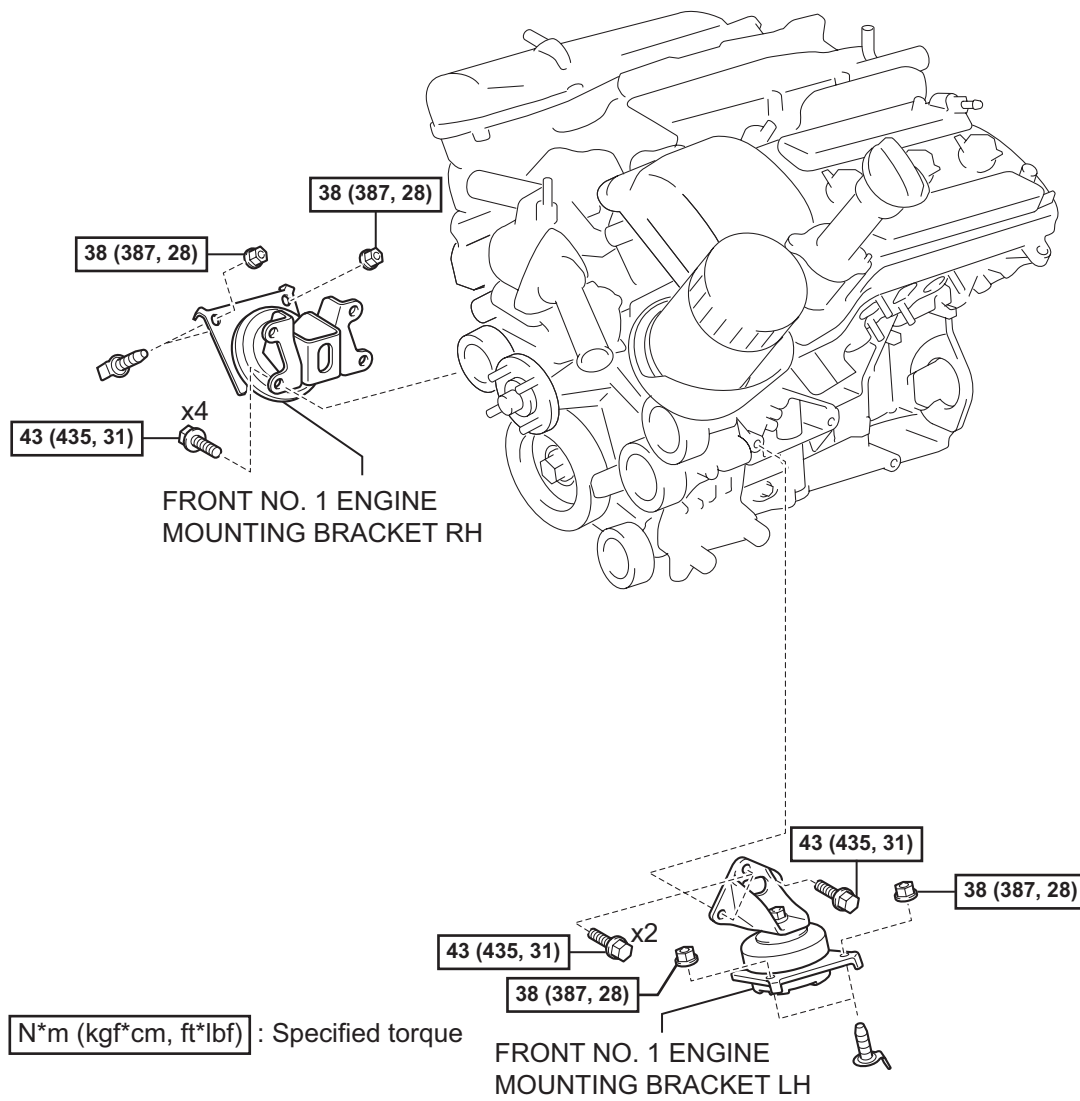
LU

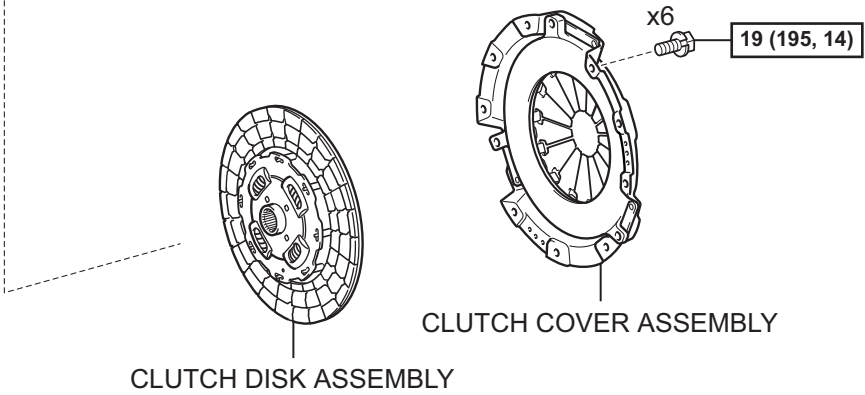
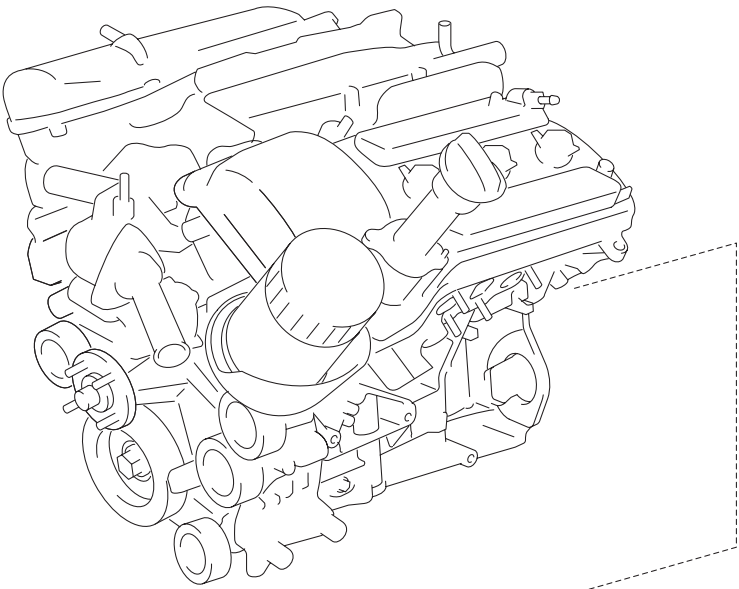
2WD AND PRE RUNNER, MANUAL TRANSMISSION:



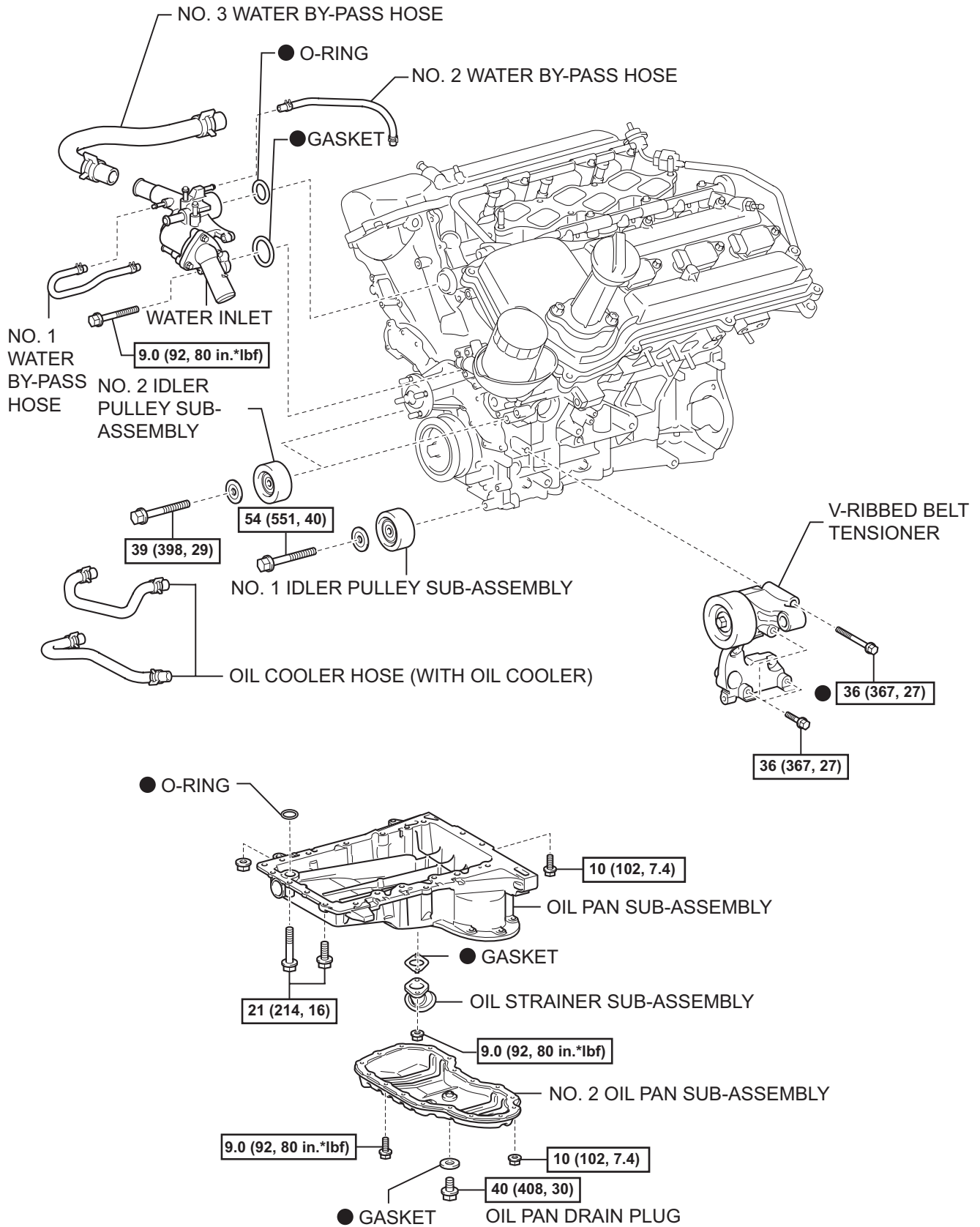
LU





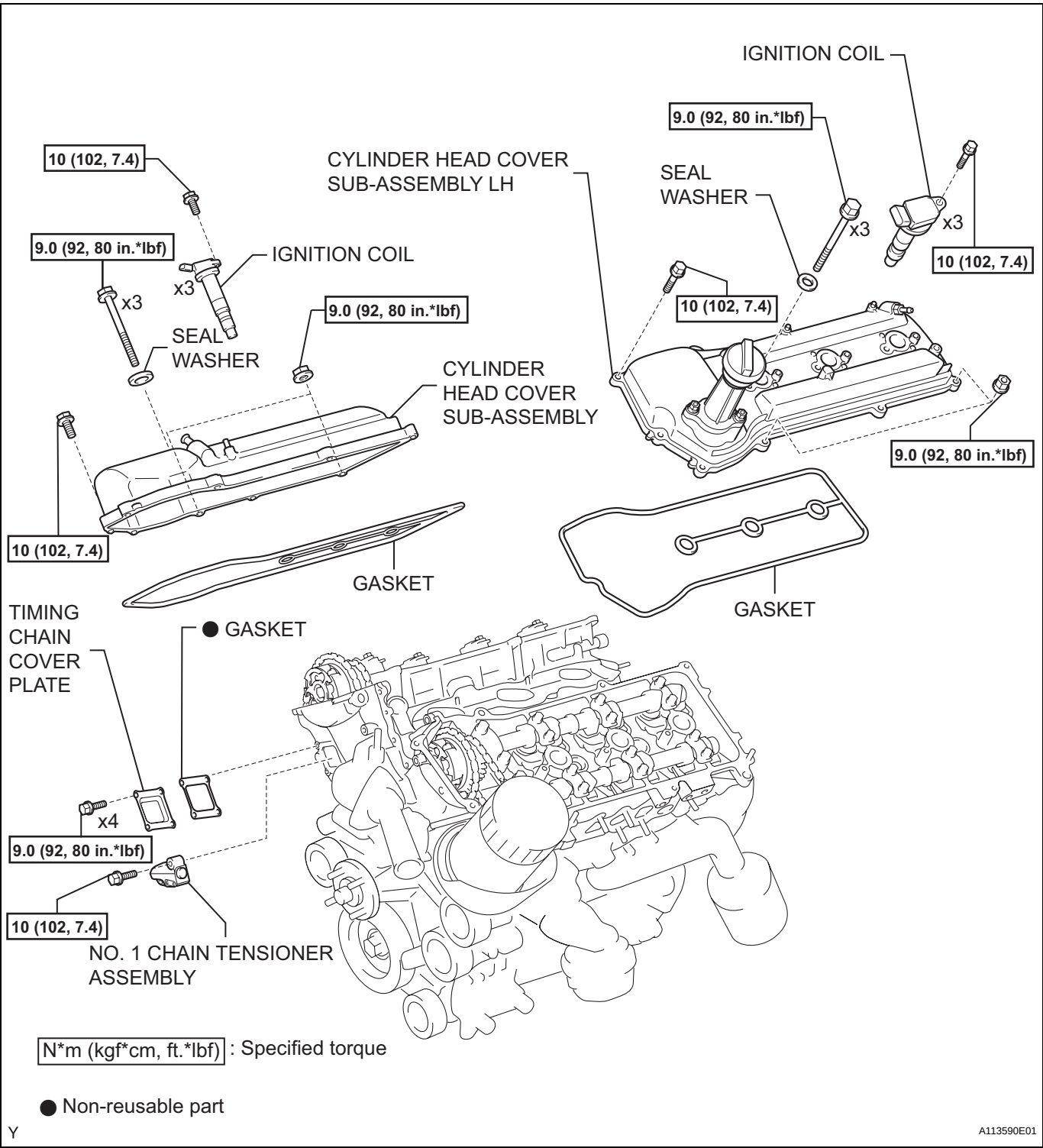


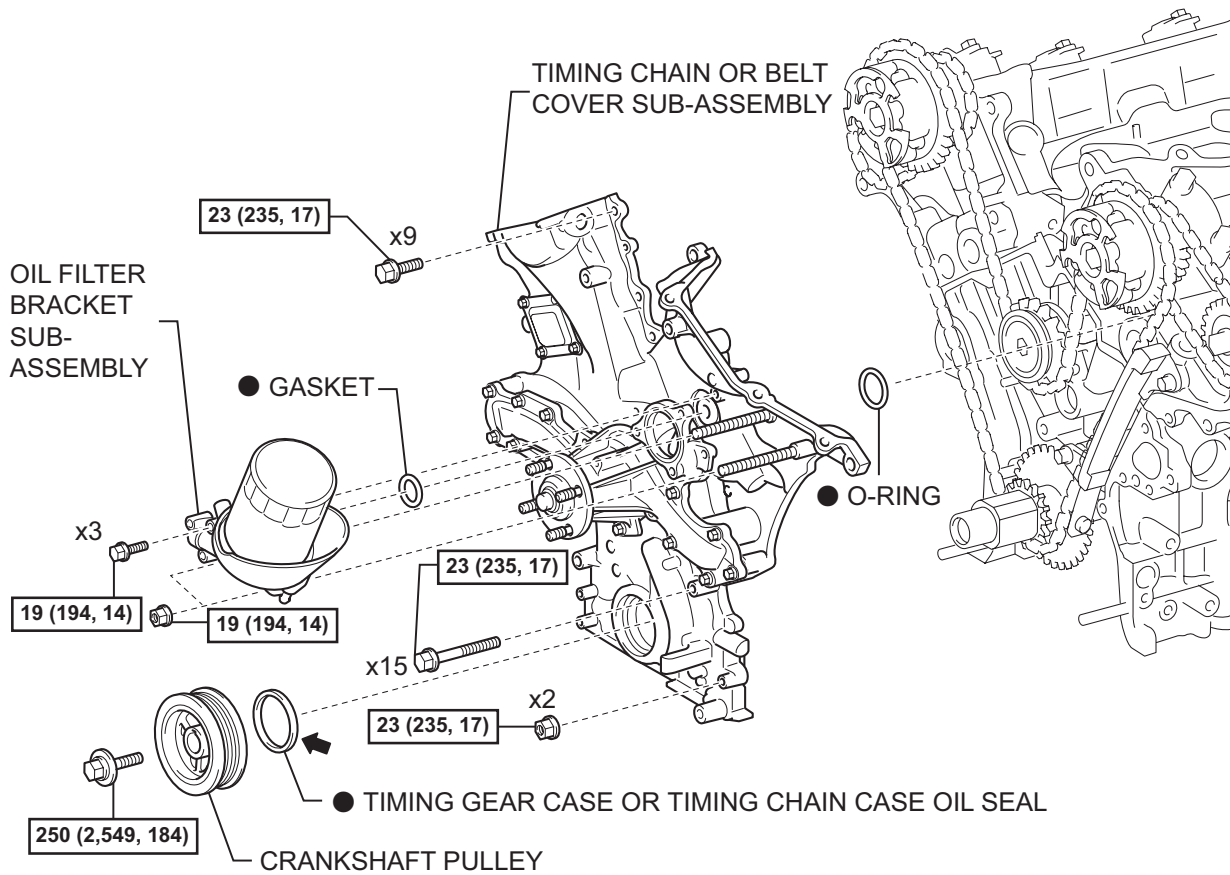
N*m (kgf*cm, ft*lbf) : Specified torque



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

● Non-reusable part



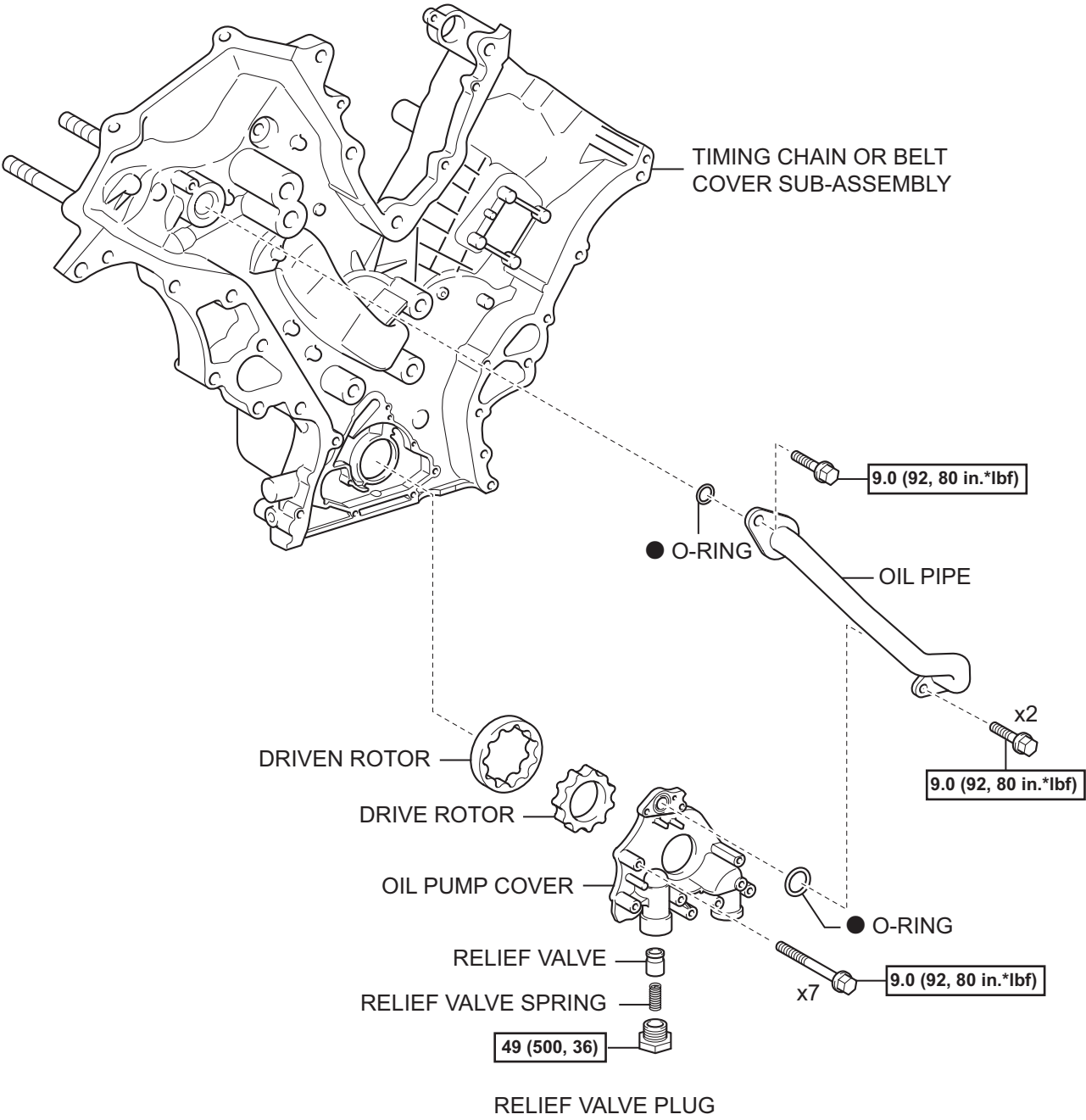


N*m (kgf*cm, ft.*lbf) : Specified torque

● Non-reusable part

➡ Apply MP grease

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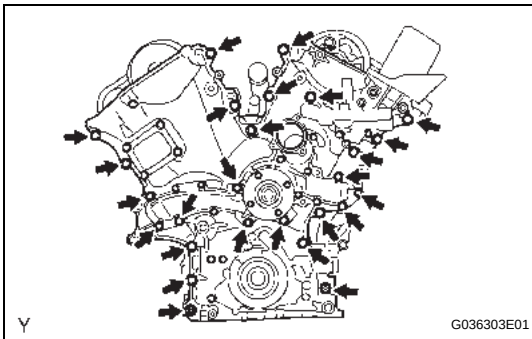
N*m (kgf*cm, ft.*lbf) : Specified torque

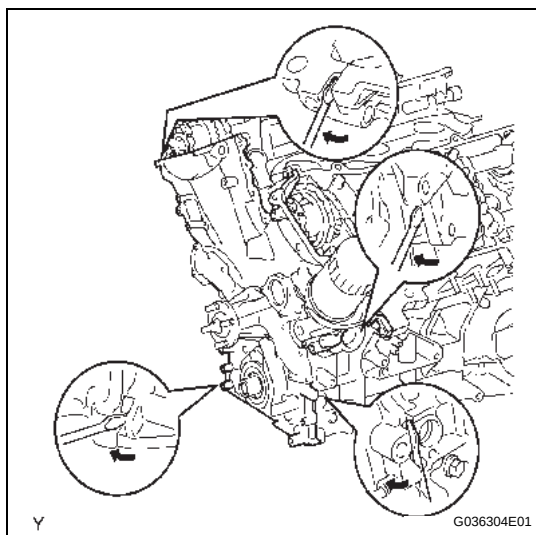
● Non-reusable part

Y

REMOVAL

1. **DISCHARGE FUEL SYSTEM PRESSURE**
(See page [FU-1](#))
2. **REMOVE BATTERY**
3. **DRAIN ENGINE COOLANT** (See page [CO-3](#))
4. **DRAIN ENGINE OIL** (See page [LU-4](#))
5. **REMOVE ENGINE ASSEMBLY**
(See page [EM-186](#))
6. **REMOVE OIL LEVEL GAUGE GUIDE**
7. **REMOVE WATER INLET** (See page [CO-9](#))
8. **REMOVE V-RIBBED BELT TENSIONER ASSEMBLY**
(See page [EM-44](#))
9. **REMOVE NO.2 IDLER PULLEY SUB-ASSEMBLY** (See page [EM-24](#))
10. **REMOVE NO.1 IDLER PULLEY SUB-ASSEMBLY** (See page [EM-24](#))
11. **REMOVE CRANKSHAFT PULLEY** (See page [EM-45](#))
12. **REMOVE NO.2 OIL PAN SUB-ASSEMBLY** (See page [EM-24](#))
13. **REMOVE OIL STRAINER SUB-ASSEMBLY** (See page [EM-24](#))
14. **REMOVE OIL PAN SUB-ASSEMBLY** (See page [EM-25](#))
15. **REMOVE IGNITION COIL ASSEMBLY** (See page [IG-7](#))
16. **REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY**
(See page [EM-59](#))
17. **REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY LH** (See page [EM-59](#))
18. **REMOVE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY** (See page [ES-407](#))
19. **REMOVE VVT SENSOR** (See page [IG-8](#))
20. **REMOVE OIL FILTER BRACKET SUB-ASSEMBLY**
(a) Remove the 3 bolts, 2 nuts, oil filter bracket and gasket.
21. **REMOVE TIMING CHAIN OR BELT COVER SUB-ASSEMBLY**
(a) Remove the 24 bolts and 2 nuts.





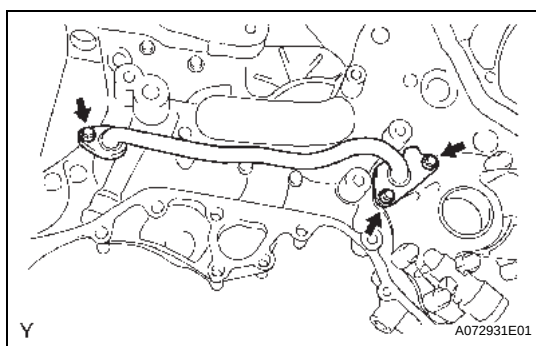
- (b) Remove the timing chain cover by prying between the timing chain cover and cylinder head or cylinder block with a screwdriver.

NOTICE:

Be careful not to damage the contact surfaces of the timing chain cover, cylinder block and cylinder head.

- (c) Remove the O-ring from the LH cylinder head.

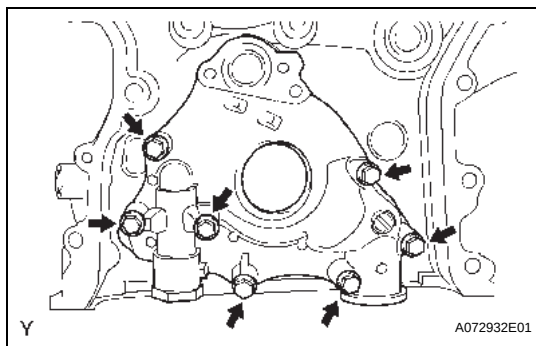
22. REMOVE TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL (See page [EM-236](#))



DISASSEMBLY

1. REMOVE OIL PUMP COVER

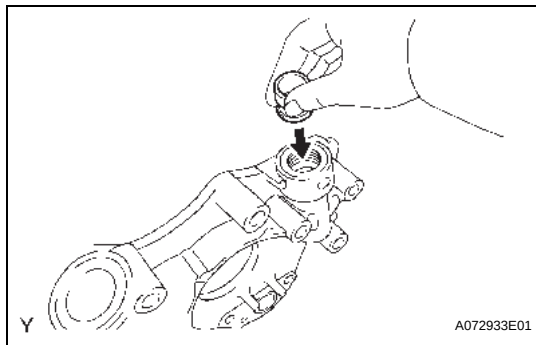
- (a) Remove the 3 bolts, then remove the oil pipe.
(b) Remove the 2 O-rings.



- (c) Remove the 7 bolts, then remove the oil pump cover, drive rotor and driven rotor.

2. REMOVE OIL PUMP RELIEF VALVE

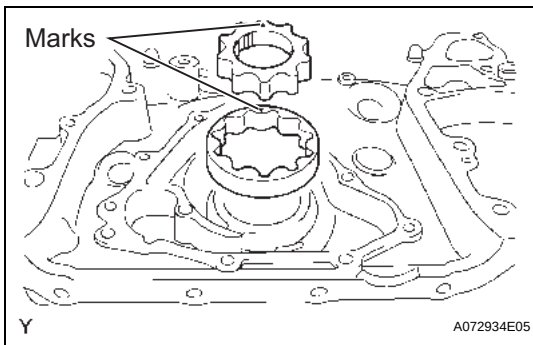
- (a) Remove the relief valve plug.
(b) Remove the relief valve spring and relief valve.



INSPECTION

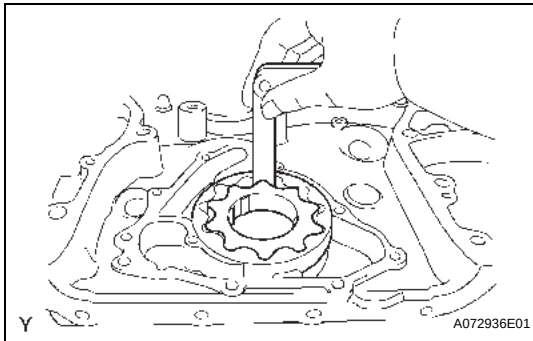
1. INSPECT OIL PUMP RELIEF VALVE

- (a) Coat the valve with engine oil, then check that it falls smoothly into the valve hole by its own weight. If not, replace the relief valve. If necessary, replace the oil pump assembly.



2. INSPECT OIL PUMP ROTOR SET

- (a) Place the drive and driven rotors into the timing chain cover with the marks facing upward.



- (b) Check the rotor tip clearance.

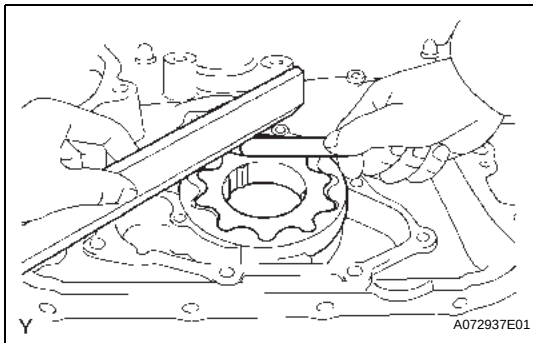
- (1) Using a feeler gauge, measure the clearance between the drive and driven rotor tips.

Standard clearance:

0.06 to 0.16 mm (0.0024 to 0.0063 in.)

Maximum tip clearance: 0.16 mm (0.0063 in.)

If the clearance is greater than the maximum, replace the drive and driven rotors together.



- (c) Check the rotor side clearance.

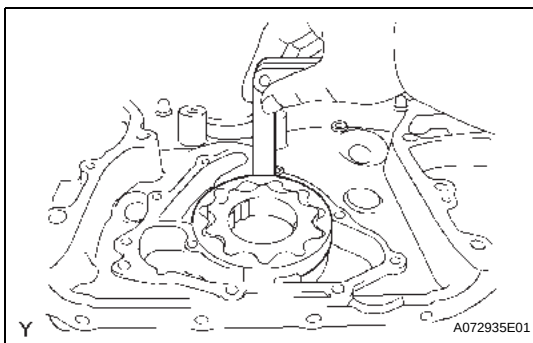
- (1) Using a feeler gauge and precision straight edge, measure the clearance between the rotors and precision straight edge.

Standard clearance:

0.03 to 0.09 mm (0.0012 to 0.0035 in.)

Maximum side clearance: 0.09 mm (0.0035 in.)

If the clearance is greater than the maximum, replace the drive and driven rotors. If necessary, replace the timing chain cover assembly.



- (d) Check the rotor body clearance.

- (1) Using a feeler gauge, measure the clearance between the driven rotor and body.

Standard clearance:

0.250 to 0.325 mm (0.0098 to 0.0128 in.)

Maximum body clearance: 0.325 mm (0.0128 in.)

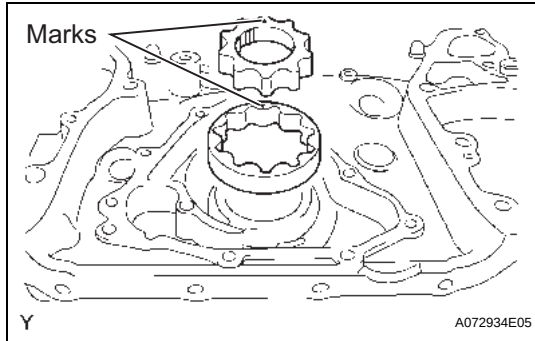
If the clearance is greater than the maximum, replace the drive and driven rotors. If necessary, replace the timing chain cover assembly.

REASSEMBLY

1. INSTALL OIL PUMP RELIEF VALVE

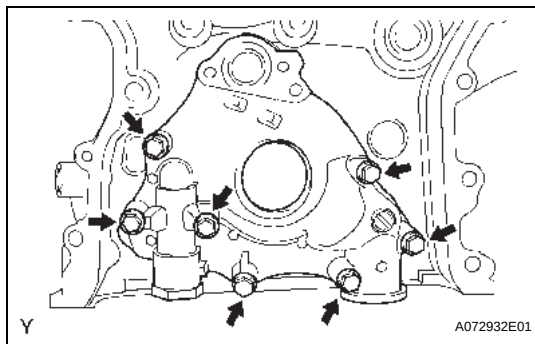
- Coat the relief valve with engine oil and insert the relief valve and spring into the valve hole.
- Install the relief valve plug.

Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)



2. INSTALL OIL PUMP COVER

- Apply fresh engine oil to the drive and driven rotors.
- Place the drive and driven rotors into the timing chain cover with the marks facing the oil pump cover side.

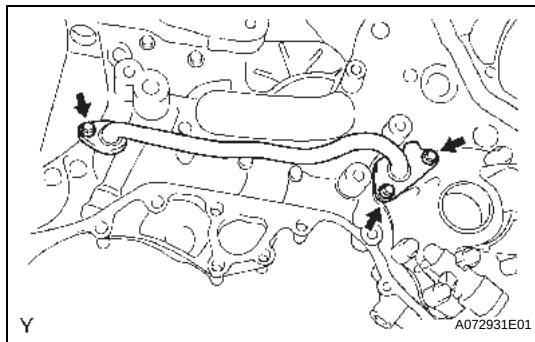


- Install the oil pump cover with the 7 bolts.

Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)

- Install a new O-ring onto the oil pump cover.

- Install a new O-ring onto the oil pipe.



- Install the oil pipe with the 3 bolts.

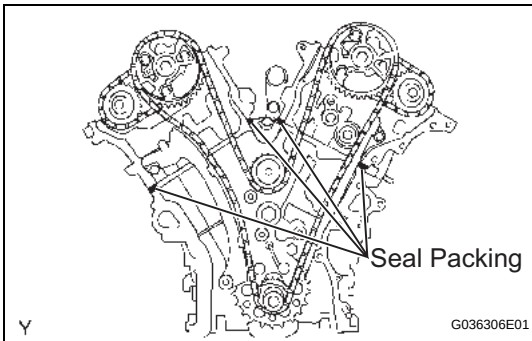
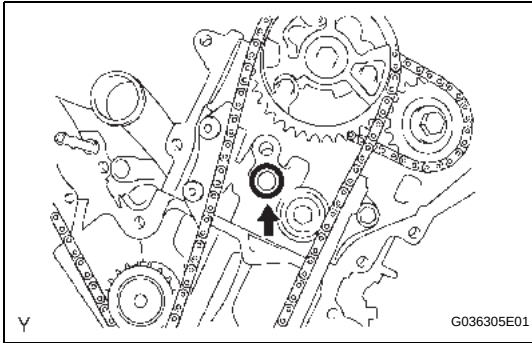
Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)

INSTALLATION

1. INSTALL TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL (See page EM-236)

2. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSEMBLY

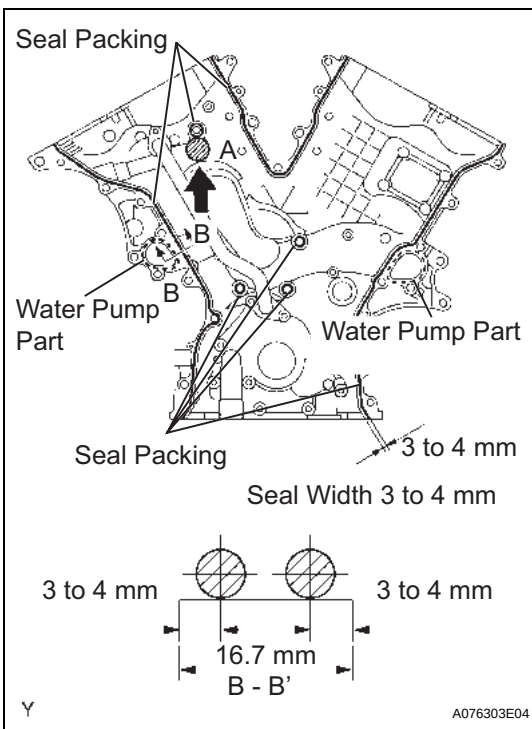
- Remove any old packing (FIPG) material. Be careful not to drop any oil on the contact surfaces of the timing chain cover, cylinder head and cylinder block.
- Install a new O-ring onto the LH cylinder head as shown in the illustration.



- Apply continuous beads of seal packing (diameter 3 to 4 mm (0.12 to 0.16 in.)) to the 4 locations shown in the illustration.

Seal packing:

Part No. 08826-00080 or equivalent



- Apply continuous beads of seal packing (diameter 3 to 4 mm (0.12 to 0.16 in.)) to the timing chain cover as shown in the illustration.

Seal packing:

Water pump part:

Part No. 08826-00100 or equivalent

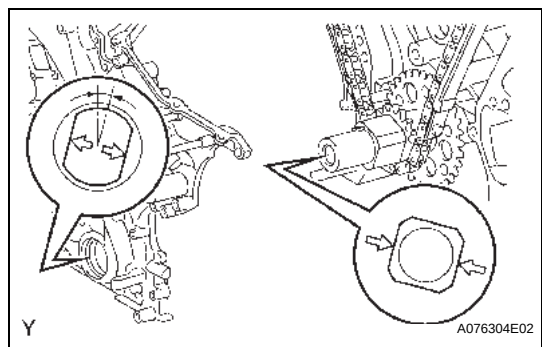
Other parts:

Part No. 08826-00080 or equivalent

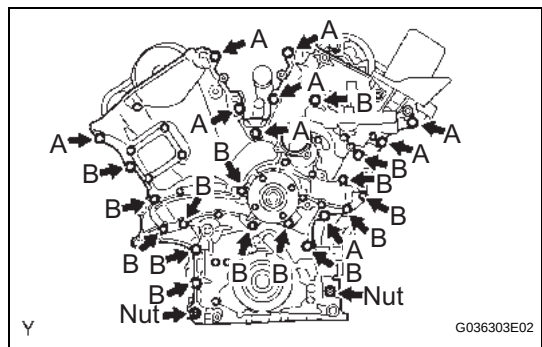
NOTICE:

- Install the timing chain cover within 3 minutes of applying the seal packing. Timing chain cover bolts and nuts must be tightened within 15 minutes of installation. Otherwise, the seal packing must be removed and reapplied.
- Do not apply seal packing to portion A shown in the illustration.

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- (e) Align the key way of the oil pump drive rotor with the rectangular portion of the crankshaft timing gear, and slide the timing chain cover into place.



- (f) Install the timing chain cover with the 24 bolts and 2 nuts. Tighten the bolts and nuts uniformly in several steps.

Torque: 23 N*m (235 kgf*cm, 17 ft.*lbf)

NOTICE:

Pay attention not to wrap the chain and slipper over the timing chain cover seal line.

Each bolt length is as follows

Bolt	Length
A	25 mm (0.98 in.)
B	55 mm (2.17 in.)

3. INSTALL OIL FILTER BRACKET SUB-ASSEMBLY

- (a) Install a new gasket and the oil filter bracket with the 3 bolts and 2 nuts.

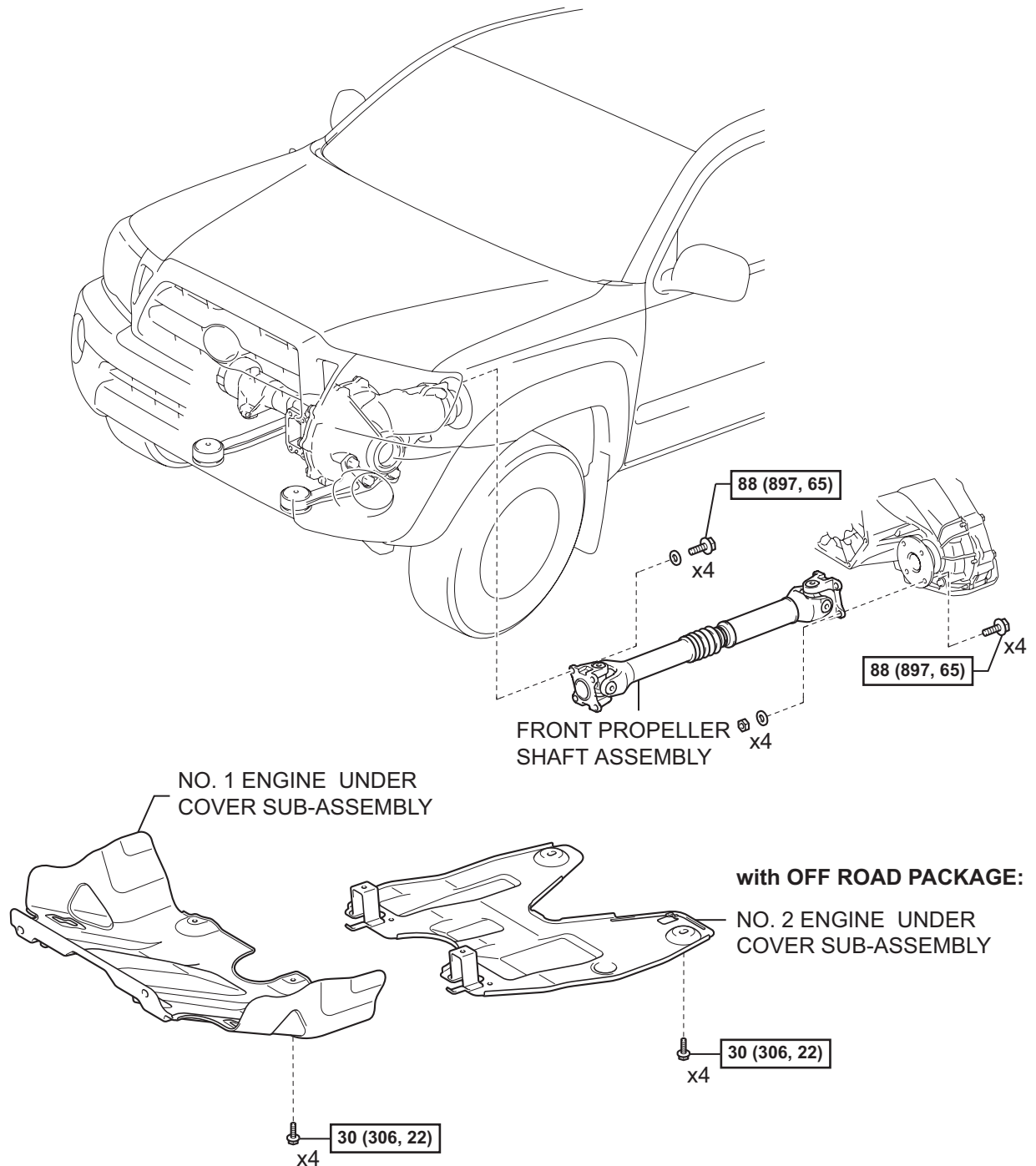
Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf)

- 4. INSTALL VVT SENSOR (See page [IG-8](#))**
- 5. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (See page [ES-408](#))**
- 6. INSTALL CYLINDER HEAD COVER SUB-ASSEMBLY LH (See page [EM-68](#))**
- 7. INSTALL CYLINDER HEAD COVER SUB-ASSEMBLY (See page [EM-68](#))**
- 8. INSTALL IGNITION COIL ASSEMBLY (See page [IG-8](#))**
- 9. INSTALL OIL PAN SUB-ASSEMBLY (See page [EM-31](#))**
- 10. INSTALL OIL STRAINER SUB-ASSEMBLY (See page [EM-29](#))**
- 11. INSTALL NO.2 OIL PAN SUB-ASSEMBLY (See page [EM-29](#))**
- 12. INSTALL CRANKSHAFT PULLEY (See page [EM-30](#))**
- 13. INSTALL NO.1 IDLER PULLEY SUB-ASSEMBLY (See page [EM-30](#))**
- 14. INSTALL NO.2 IDLER PULLEY SUB-ASSEMBLY (See page [EM-30](#))**
- 15. INSTALL V-RIBBED BELT TENSIONER ASSEMBLY (See page [EM-30](#))**
- 16. INSTALL WATER INLET (See page [CO-10](#))**

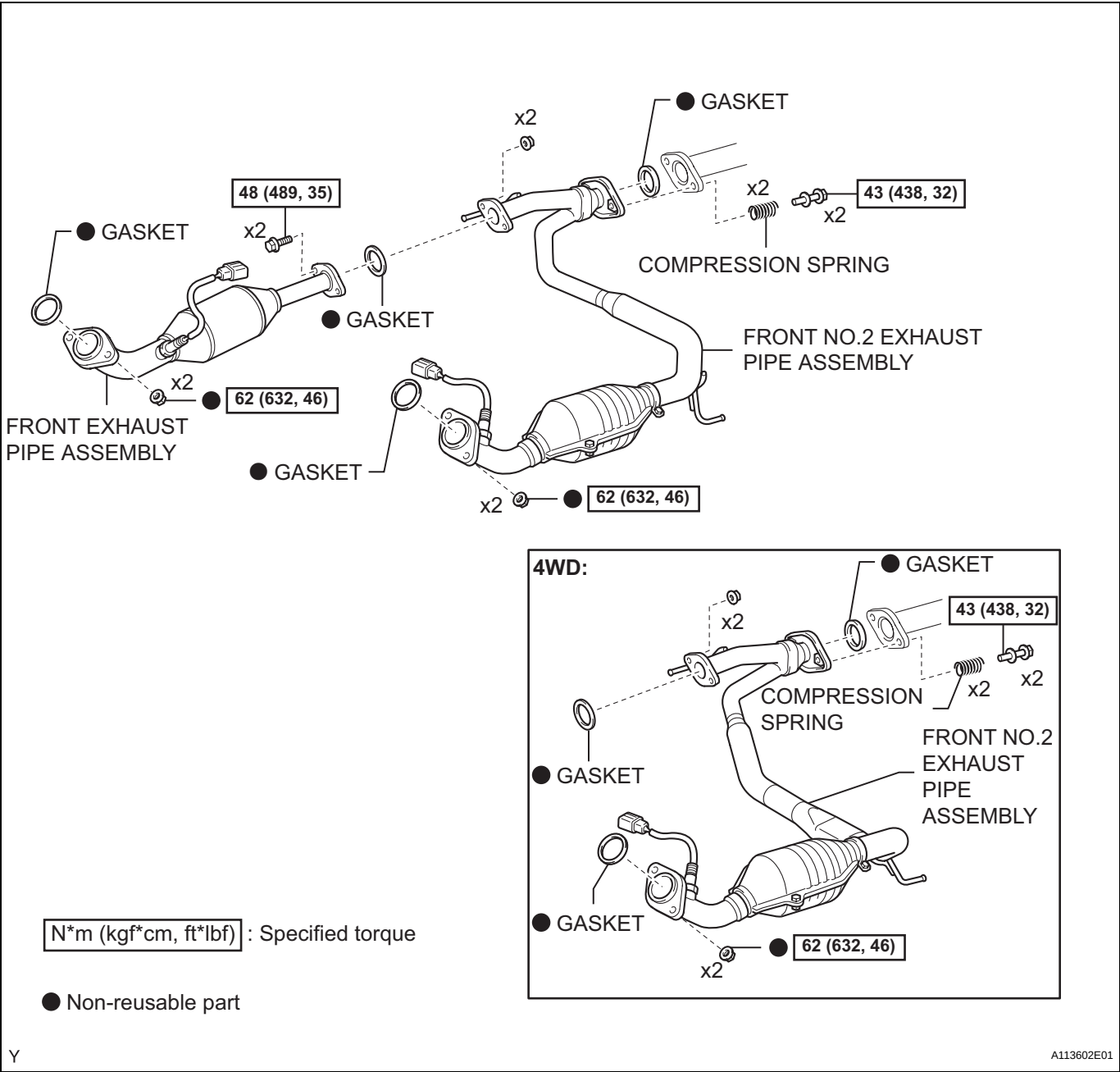
17. INSTALL OIL LEVEL GAUGE GUIDE
18. INSTALL ENGINE ASSEMBLY
(See page [EM-190](#))
19. INSTALL BATTERY
20. ADD ENGINE COOLANT (See page [CO-3](#))
21. ADD ENGINE OIL (See page [LU-5](#))
22. CHECK FOR ENGINE COOLANT LEAKAGE (See
page [CO-4](#))
23. CHECK FOR ENGINE OIL LEAKAGE
24. CHECK FOR FUEL LEAKAGE
25. CHECK FOR EXHAUST GAS LEAKAGE
26. INSPECT IGNITION TIMING (See page [EM-1](#))
27. INSPECT ENGINE IDLING SPEED (See page [EM-2](#))
28. INSPECT CO/HC (See page [EM-3](#))

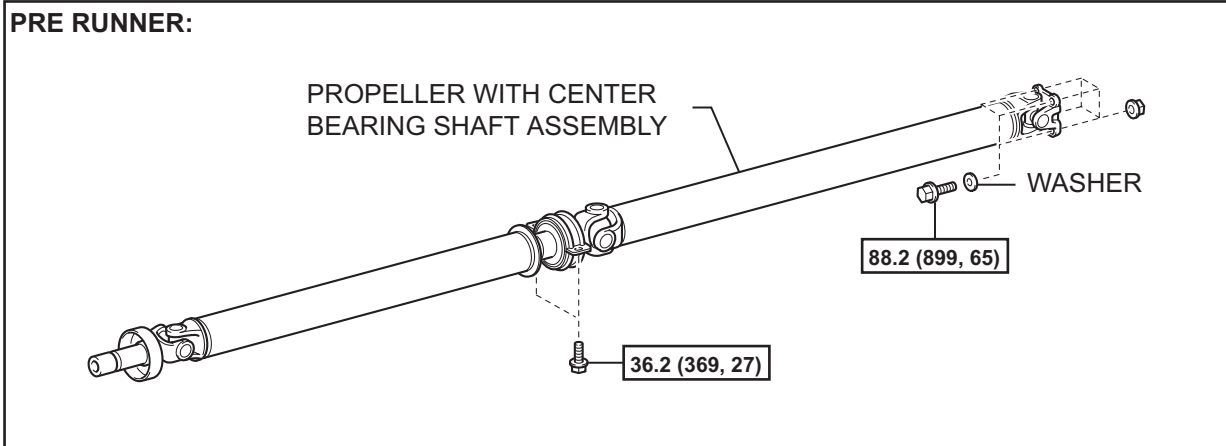
OIL PUMP (for 4WD and Pre-Runner)

COMPONENTS

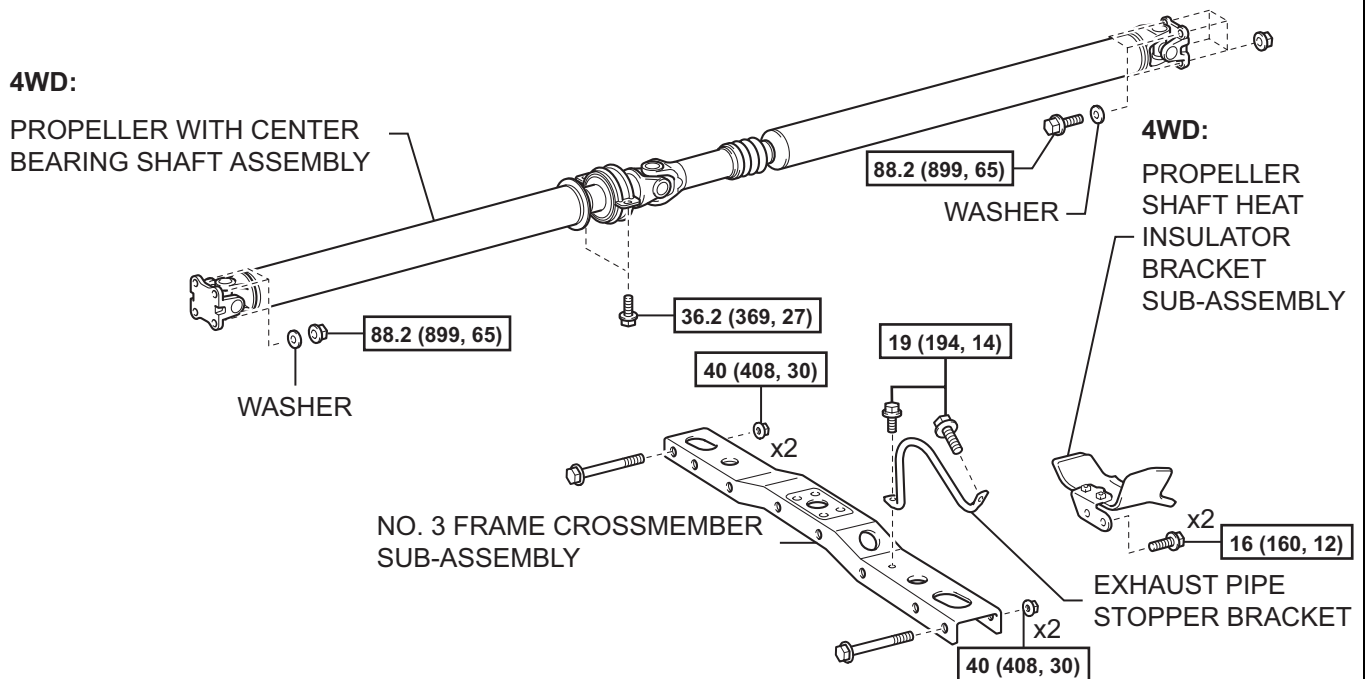


N*m (kgf*cm, ft*lbf) : Specified torque

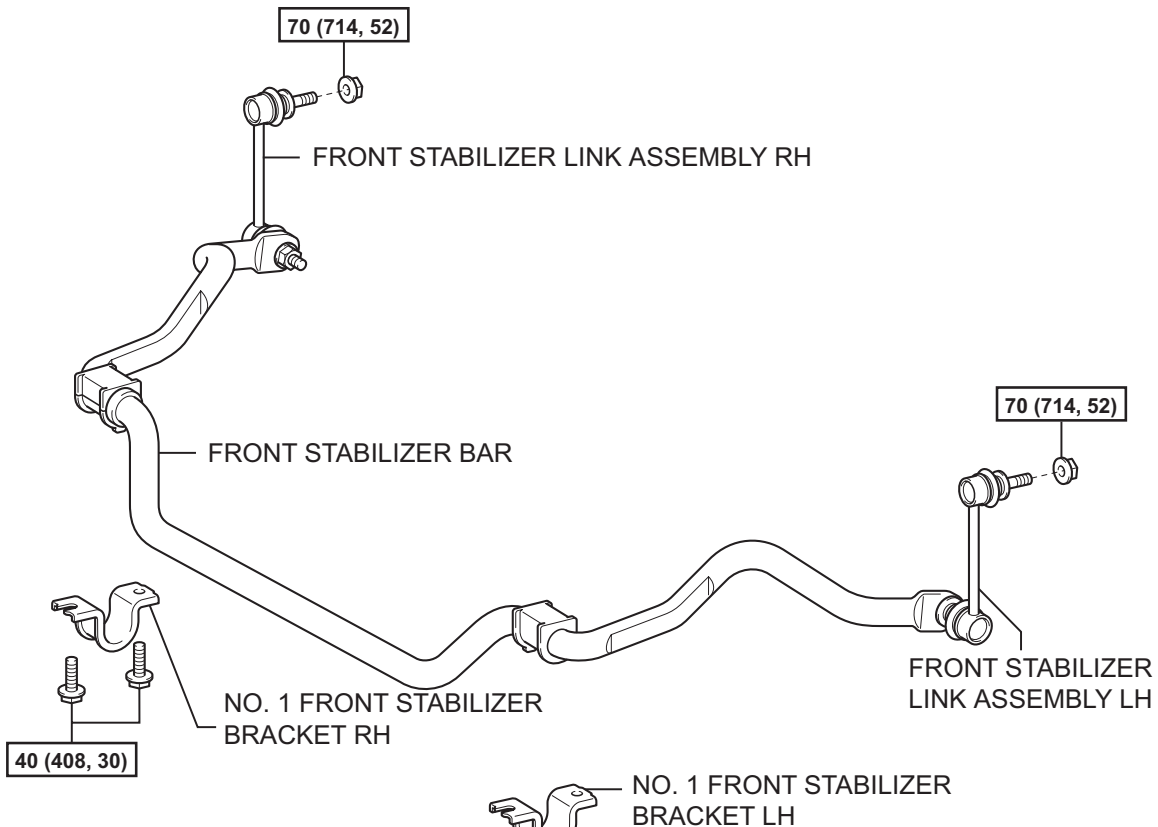
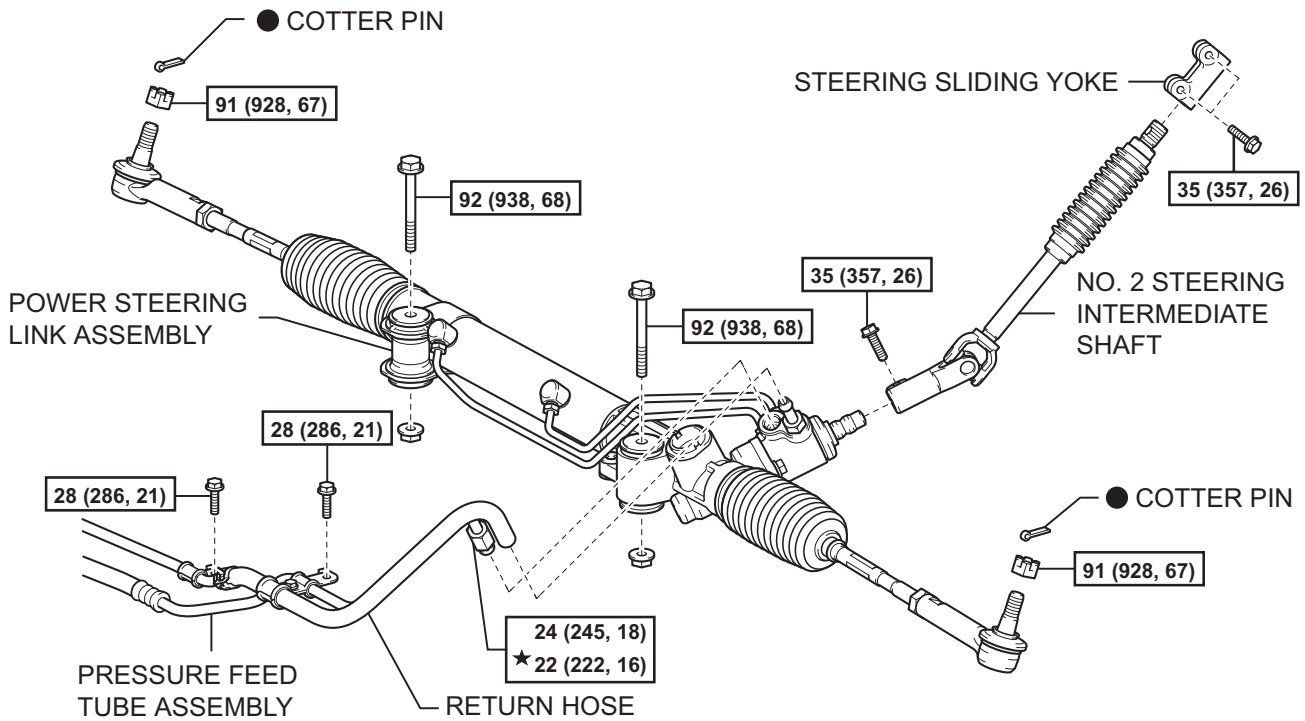


PRE RUNNER:**4WD:**

PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY

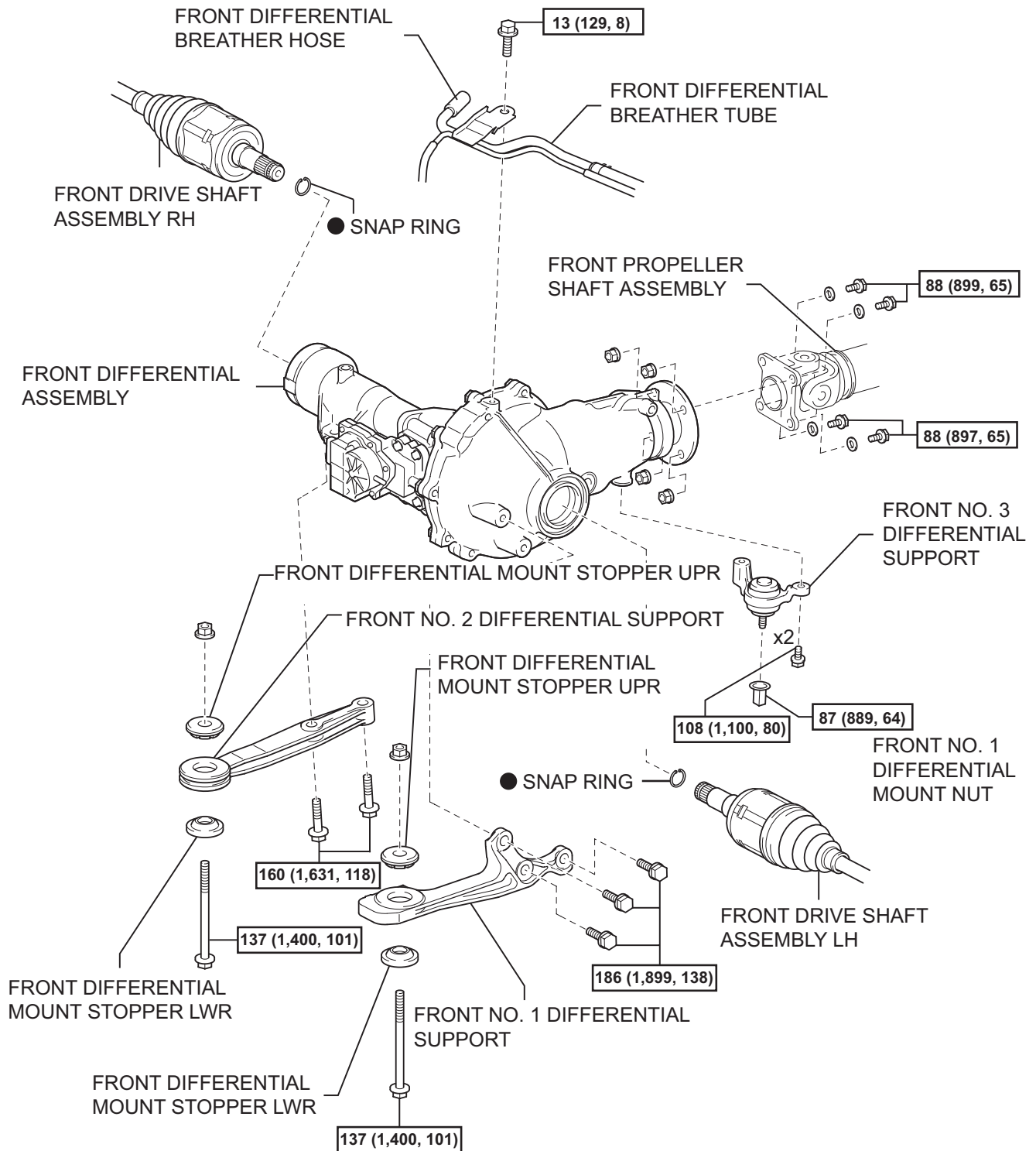


N*m (kgf*cm, ft*lb) : Specified torque



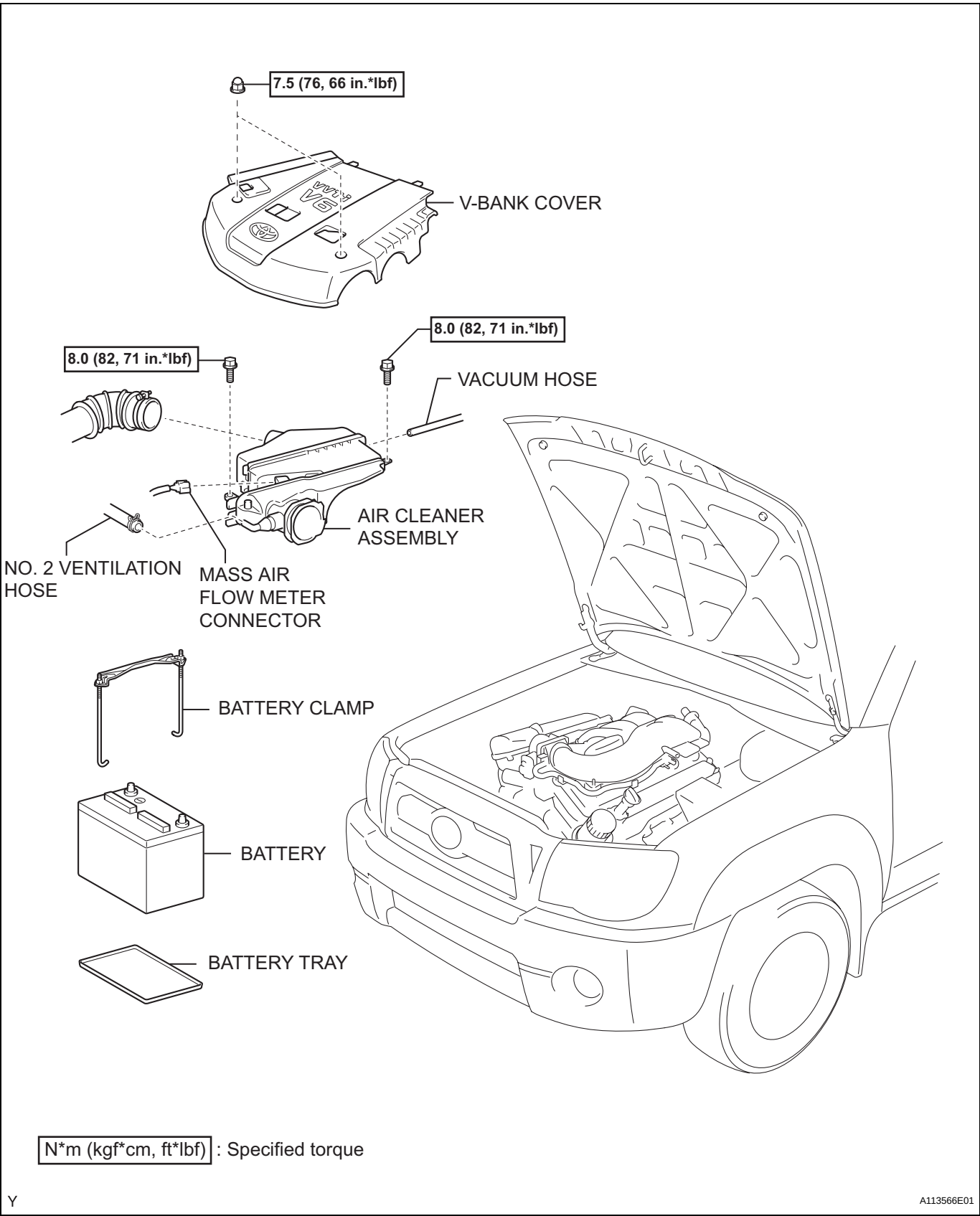
N*m (kgf*cm, ft*lb) : Specified torque

● Non-reusable part ★ For use with SST

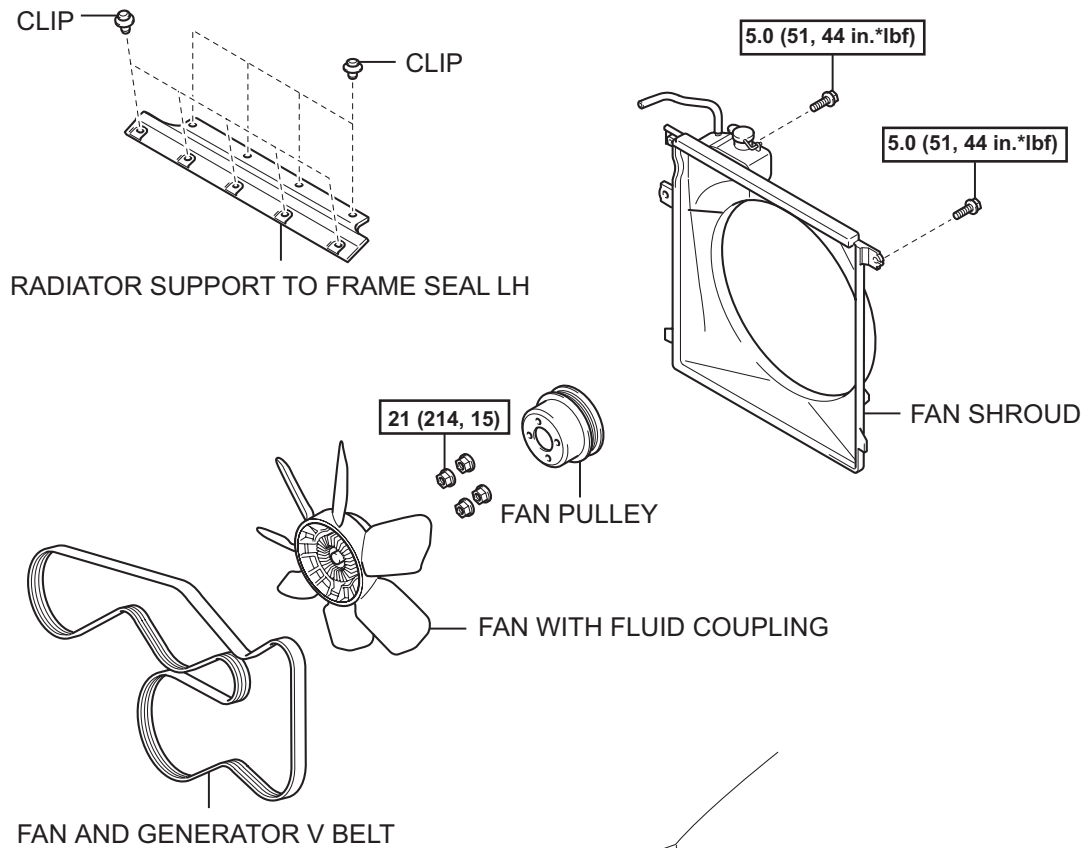


N*m (kgf*cm, ft*lb) : Specified torque

● Non-reusable part

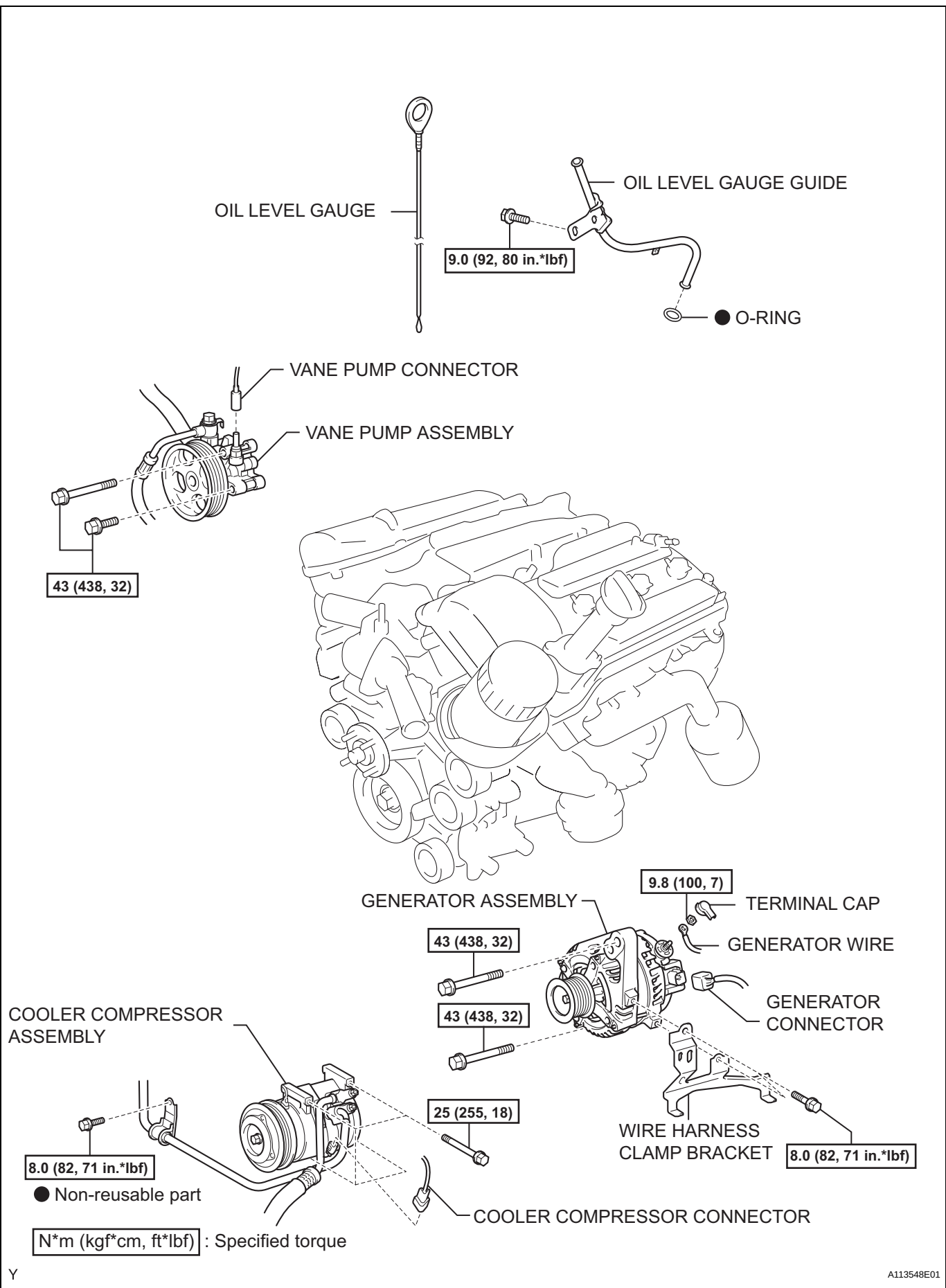


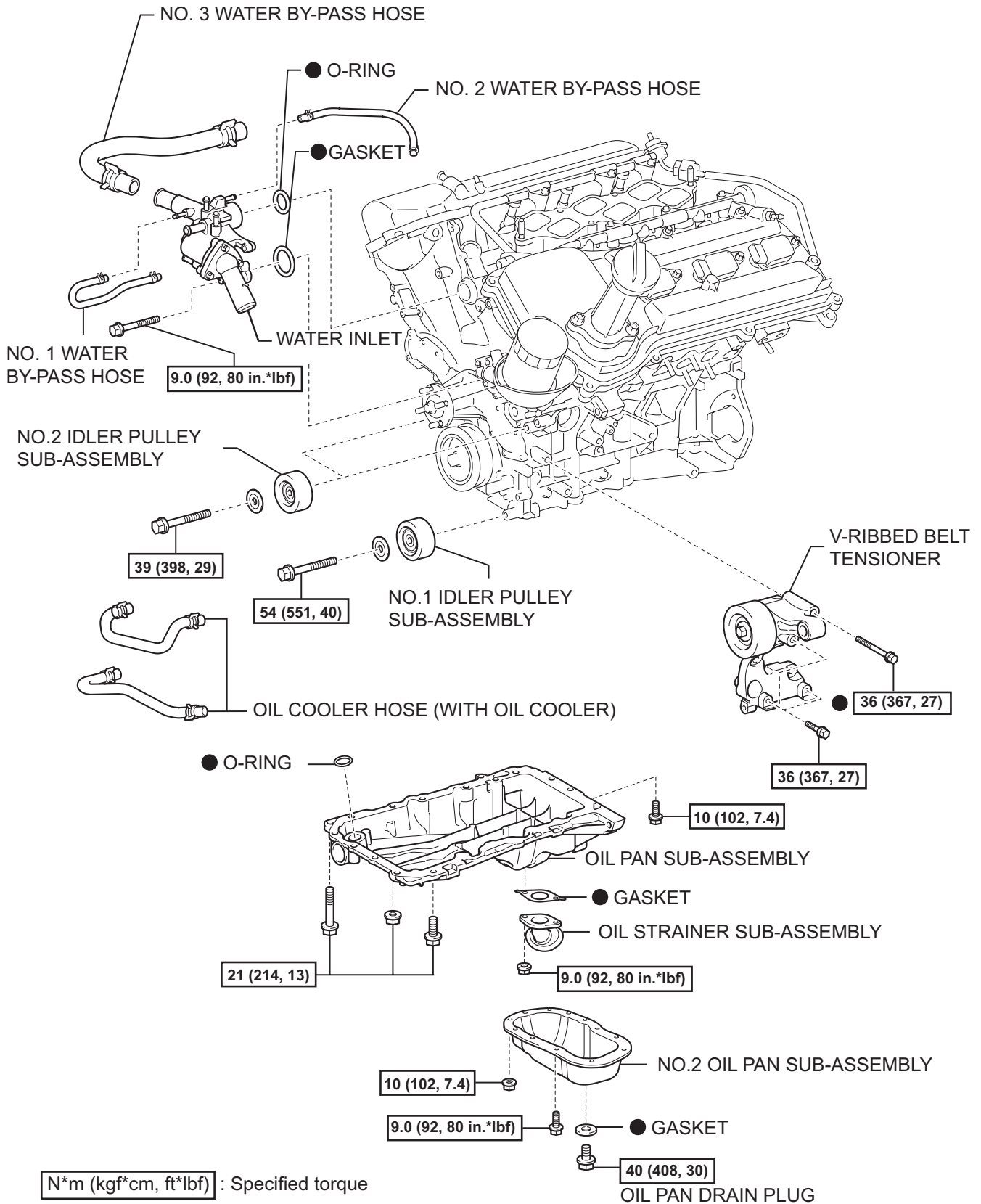
LU



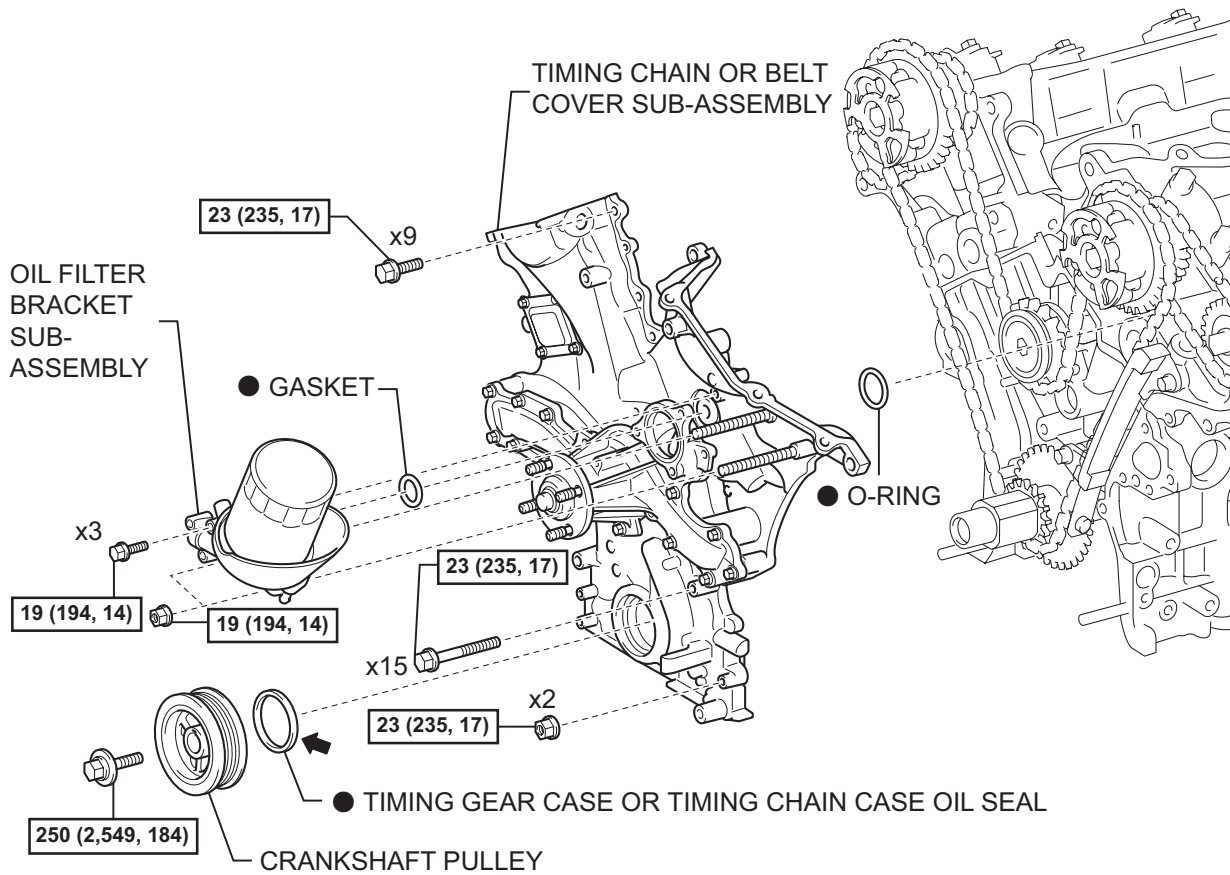
N*m (kgf*cm, ft*lbf) : Specified torque

LU







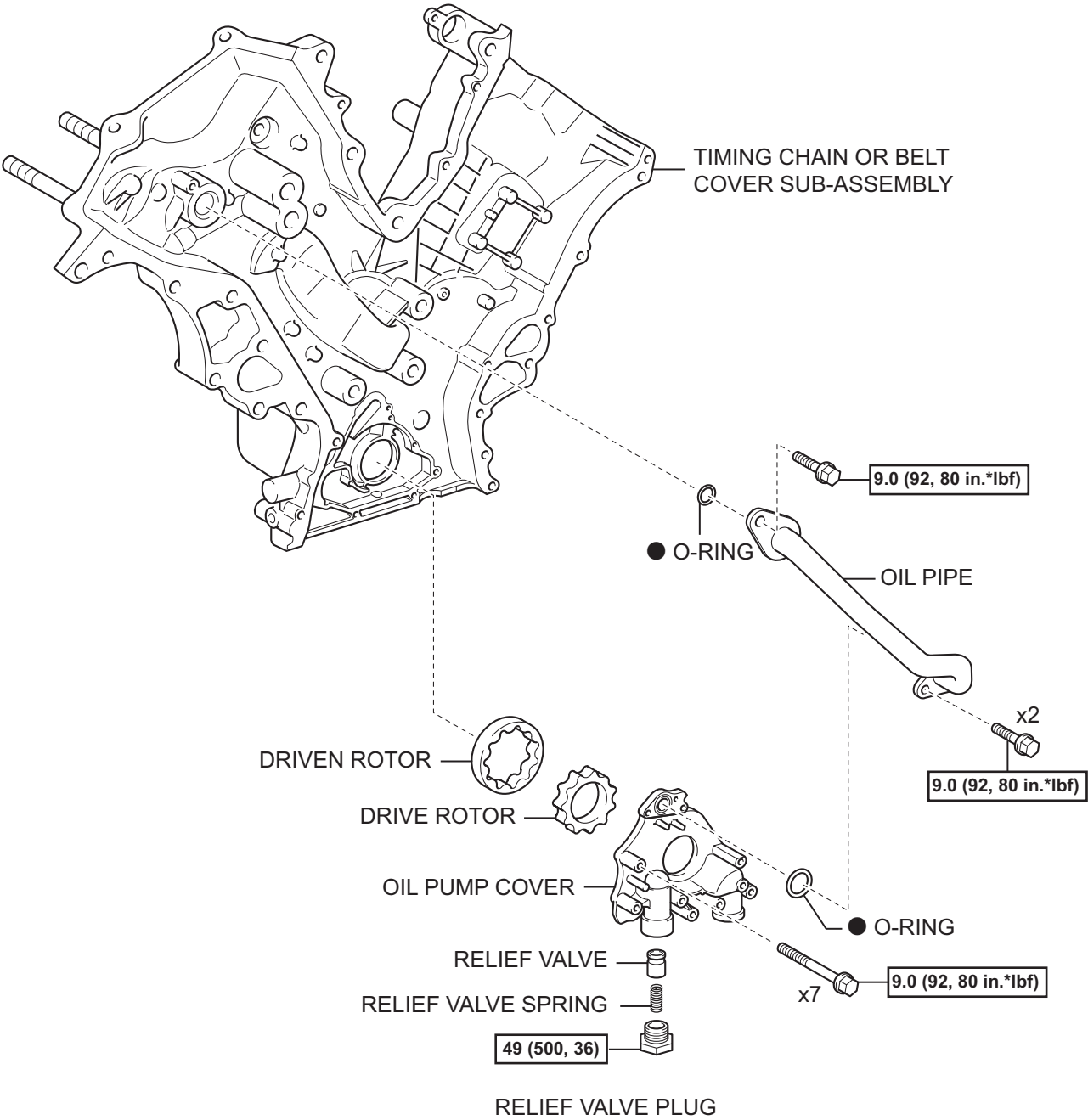


[N*m (kgf*cm, ft.*lbf)] : Specified torque

● Non-reusable part

← Apply MP grease

LU



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

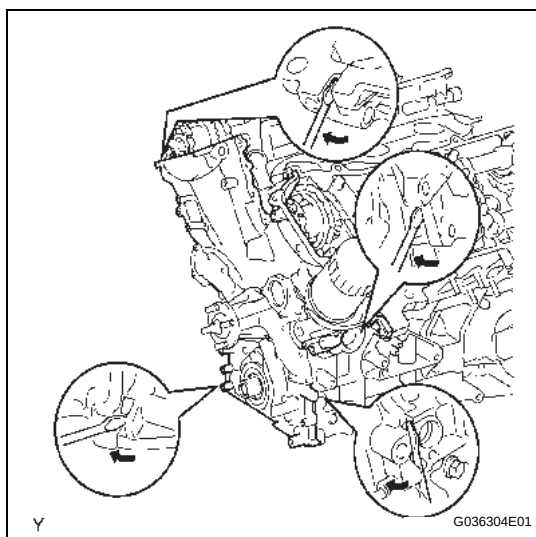
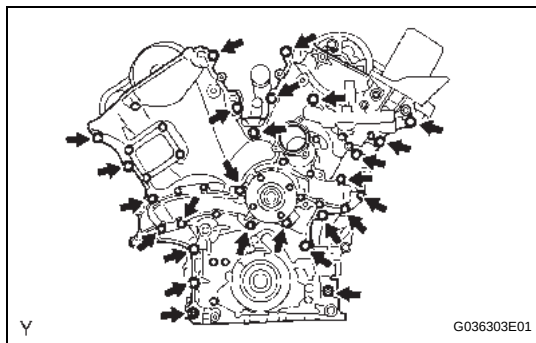
● Non-reusable part

Y

REMOVAL

1. DISCHARGE FUEL SYSTEM PRESSURE
(See page [FU-1](#))
2. REMOVE BATTERY
3. DRAIN ENGINE COOLANT (See page [CO-3](#))
4. DRAIN ENGINE OIL (See page [LU-4](#))
5. REMOVE POWER STEERING LINK ASSEMBLY
(See page [PS-53](#))
6. REMOVE FRONT DIFFERENTIAL CARRIER ASSEMBLY (for 4WD)
(See page [DF-19](#))
7. REMOVE V-BANK COVER (See page [ES-414](#))
8. REMOVE RADIATOR SUPPORT TO FRAME SEAL LH
(See page [CO-15](#))
9. REMOVE FAN SHROUD (See page [CO-15](#))
10. REMOVE AIR CLEANER ASSEMBLY (See page [ES-415](#))
11. REMOVE OIL LEVEL GAUGE GUIDE
12. REMOVE WATER INLET (See page [CO-9](#))
13. SEPARATE PUMP ASSEMBLY, VANE (See page [EM-44](#))
14. REMOVE GENERATOR ASSEMBLY (See page [CH-7](#))
15. SEPARATE COOLER COMPRESSOR ASSEMBLY
(See page [ES-409](#))
16. REMOVE V-RIBBED BELT TENSIONER ASSEMBLY
(See page [EM-44](#))
17. REMOVE NO.2 IDLER PULLEY SUB-ASSEMBLY (See page [EM-44](#))
18. REMOVE NO.1 IDLER PULLEY SUB-ASSEMBLY (See page [EM-44](#))
19. REMOVE CRANKSHAFT PULLEY (See page [EM-45](#))
20. REMOVE NO.2 OIL PAN SUB-ASSEMBLY (See page [EM-45](#))
21. REMOVE OIL STRAINER SUB-ASSEMBLY (See page [EM-45](#))
22. REMOVE OIL PAN SUB-ASSEMBLY (See page [EM-46](#))
23. REMOVE INTAKE AIR SURGE TANK (See page [FU-11](#))
24. REMOVE IGNITION COIL ASSEMBLY (See page [IG-7](#))
25. REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY
(See page [EM-59](#))

26. REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY LH (See page [EM-59](#))
27. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (See page [ES-407](#))
28. REMOVE VVT SENSOR (See page [IG-8](#))
29. REMOVE OIL FILTER BRACKET SUB-ASSEMBLY
 - (a) Remove the 3 bolts, 2 nuts, oil filter bracket and gasket.
30. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSEMBLY
 - (a) Remove the 24 bolts and 2 nuts.



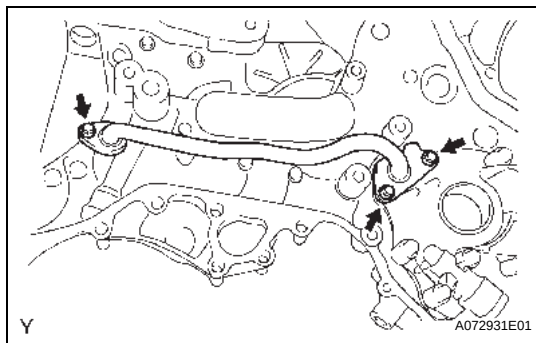
- (b) Remove the timing chain cover by prying between the timing chain cover and cylinder head or cylinder block with a screwdriver.

NOTICE:

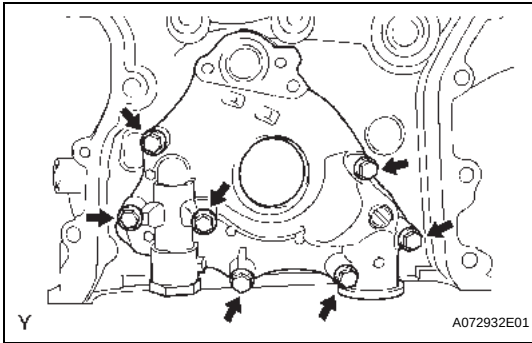
Be careful not to damage the contact surfaces of the timing chain cover, cylinder block and cylinder head.

- (c) Remove the O-ring from the LH cylinder head.

31. REMOVE TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL (See page [EM-236](#))

**DISASSEMBLY**

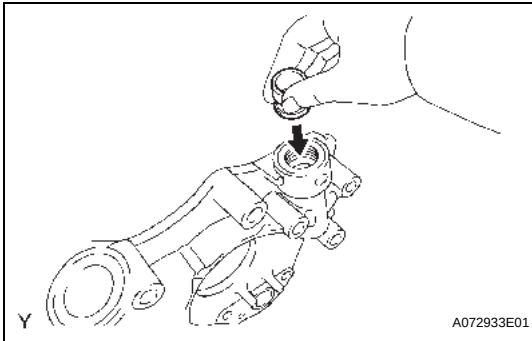
1. REMOVE OIL PUMP COVER
 - (a) Remove the 3 bolts, then remove the oil pipe.
 - (b) Remove the 2 O-rings.



- (c) Remove the 7 bolts, then remove the oil pump cover, drive rotor and driven rotor.

2. REMOVE OIL PUMP RELIEF VALVE

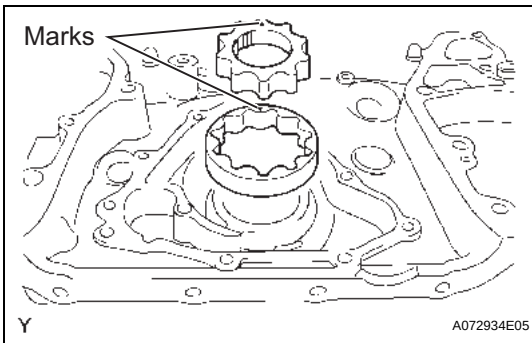
- (a) Remove the relief valve plug.
(b) Remove the relief valve spring and relief valve.



INSPECTION

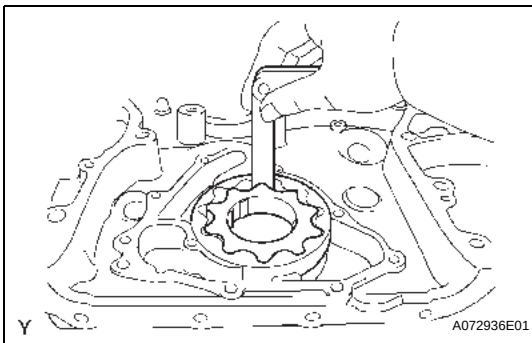
1. INSPECT OIL PUMP RELIEF VALVE

- (a) Coat the valve with engine oil, then check that it falls smoothly into the valve hole by its own weight. If not, replace the relief valve. If necessary, replace the oil pump assembly.



2. INSPECT OIL PUMP ROTOR SET

- (a) Place the drive and driven rotors into the timing chain cover with the marks facing upward.



- (b) Check the rotor tip clearance.
(1) Using a feeler gauge, measure the clearance between the drive and driven rotor tips.

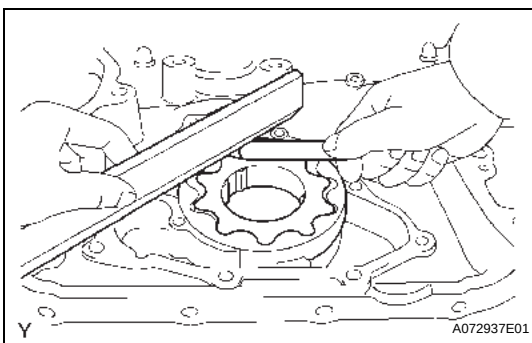
Standard clearance:

0.06 to 0.16 mm (0.0024 to 0.0063 in.)

Maximum tip clearance:

0.16 mm (0.0063 in.)

If the clearance is greater than the maximum, replace the drive and driven rotors together.



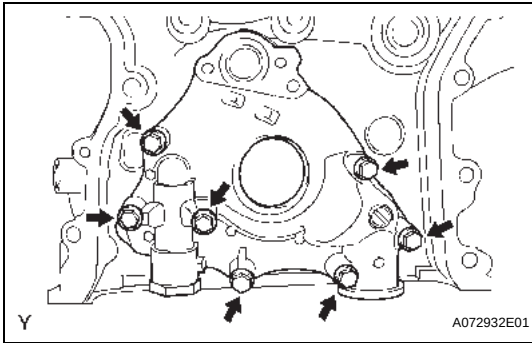
- (c) Check the rotor side clearance.
(1) Using a feeler gauge and precision straight edge, measure the clearance between the rotors and precision straight edge.

Standard clearance:

0.03 to 0.09 mm (0.0012 to 0.0035 in.)

Maximum side clearance:

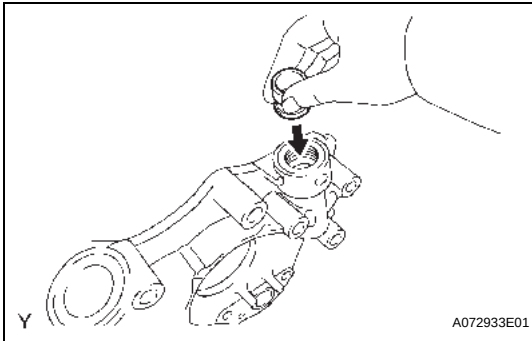
0.09 mm (0.0035 in.)



- (c) Remove the 7 bolts, then remove the oil pump cover, drive rotor and driven rotor.

2. REMOVE OIL PUMP RELIEF VALVE

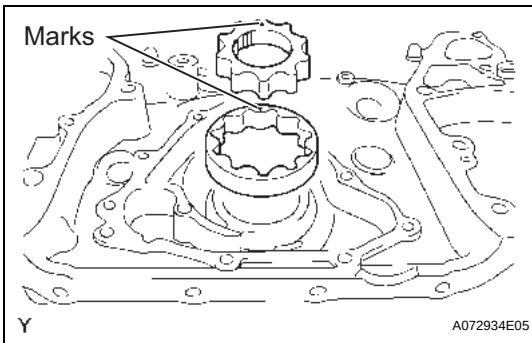
- (a) Remove the relief valve plug.
(b) Remove the relief valve spring and relief valve.



INSPECTION

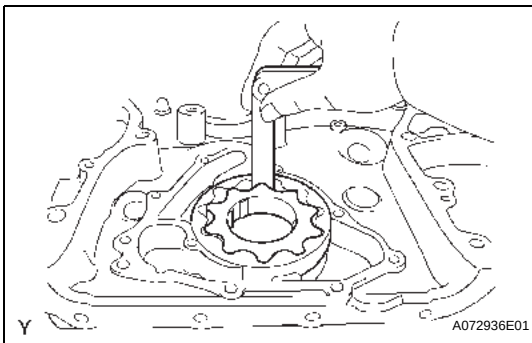
1. INSPECT OIL PUMP RELIEF VALVE

- (a) Coat the valve with engine oil, then check that it falls smoothly into the valve hole by its own weight. If not, replace the relief valve. If necessary, replace the oil pump assembly.



2. INSPECT OIL PUMP ROTOR SET

- (a) Place the drive and driven rotors into the timing chain cover with the marks facing upward.



- (b) Check the rotor tip clearance.
(1) Using a feeler gauge, measure the clearance between the drive and driven rotor tips.

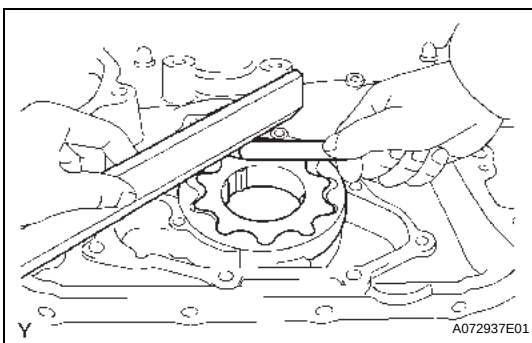
Standard clearance:

0.06 to 0.16 mm (0.0024 to 0.0063 in.)

Maximum tip clearance:

0.16 mm (0.0063 in.)

If the clearance is greater than the maximum, replace the drive and driven rotors together.



- (c) Check the rotor side clearance.
(1) Using a feeler gauge and precision straight edge, measure the clearance between the rotors and precision straight edge.

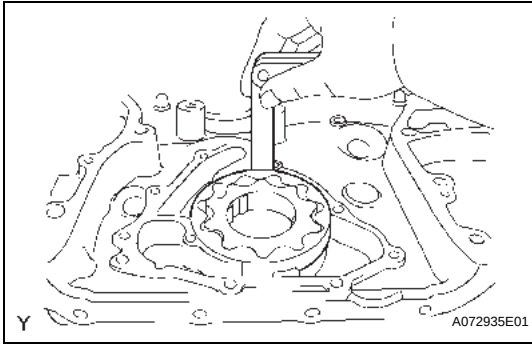
Standard clearance:

0.03 to 0.09 mm (0.0012 to 0.0035 in.)

Maximum side clearance:

0.09 mm (0.0035 in.)

If the clearance is greater than the maximum, replace the drive and driven rotors. If necessary, replace the timing chain cover assembly.



- (d) Check the rotor body clearance.
- (1) Using a feeler gauge, measure the clearance between the driven rotor and body.

Standard clearance:

0.250 to 0.325 mm (0.0098 to 0.0128 in.)

Maximum body clearance:

0.325 mm (0.0128 in.)

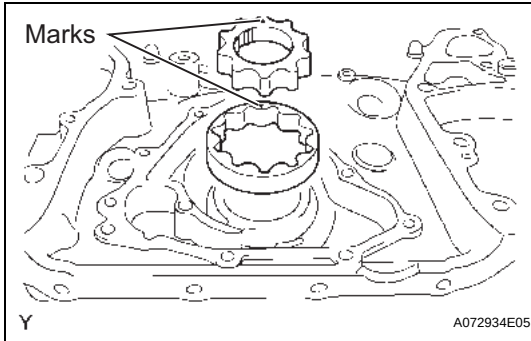
If the clearance is greater than the maximum, replace the drive and driven rotors. If necessary, replace the timing chain cover assembly.

REASSEMBLY

1. INSTALL OIL PUMP RELIEF VALVE

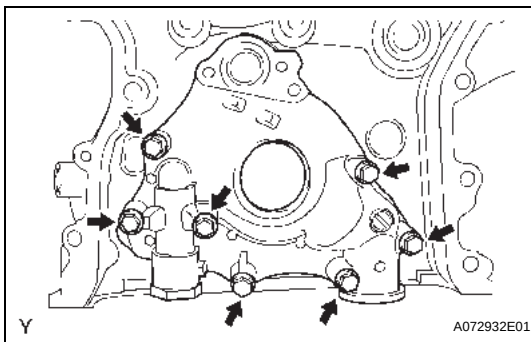
- Coat the relief valve with engine oil and insert the relief valve and spring into the valve hole.
- Install the relief valve plug.

Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)



2. INSTALL OIL PUMP COVER

- Apply fresh engine oil to the drive and driven rotors.
- Place the drive and driven rotors into the timing chain cover with the marks facing the oil pump cover side.

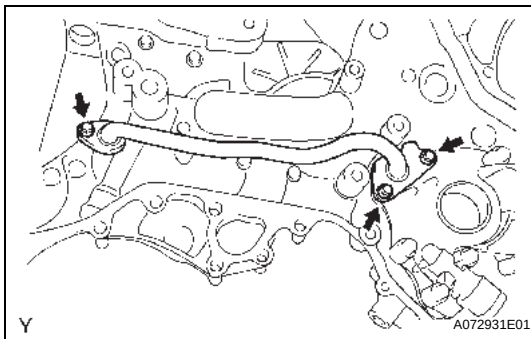


- Install the oil pump cover with the 7 bolts.

Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)

- Install a new O-ring onto the oil pump cover.

- Install a new O-ring onto the oil pipe.



- Install the oil pipe with the 3 bolts.

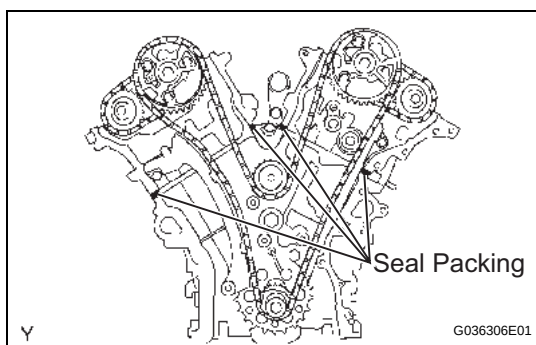
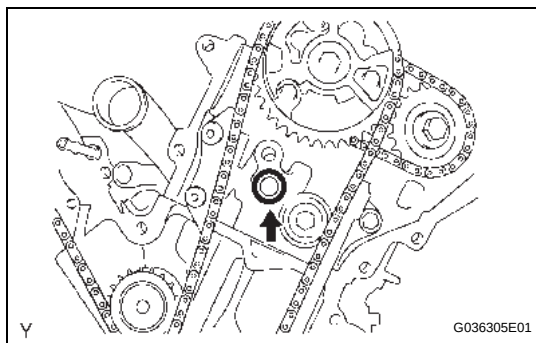
Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)

INSTALLATION

1. INSTALL TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL (See page EM-236)

2. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSEMBLY

- (a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the timing chain cover, cylinder head and cylinder block.
- (b) Install a new O-ring onto the LH cylinder head as shown in the illustration.



- (c) Apply continuous beads of seal packing (diameter 3 to 4 mm (0.12 to 0.16 in.)) to the 4 locations shown in the illustration.

Seal packing:

Part No. 08826-00080 or equivalent

- (d) Apply continuous beads of seal packing (diameter 3 to 4 mm (0.12 to 0.16 in.)) to the timing chain cover as shown in the illustration.

Seal packing:

Water pump part:

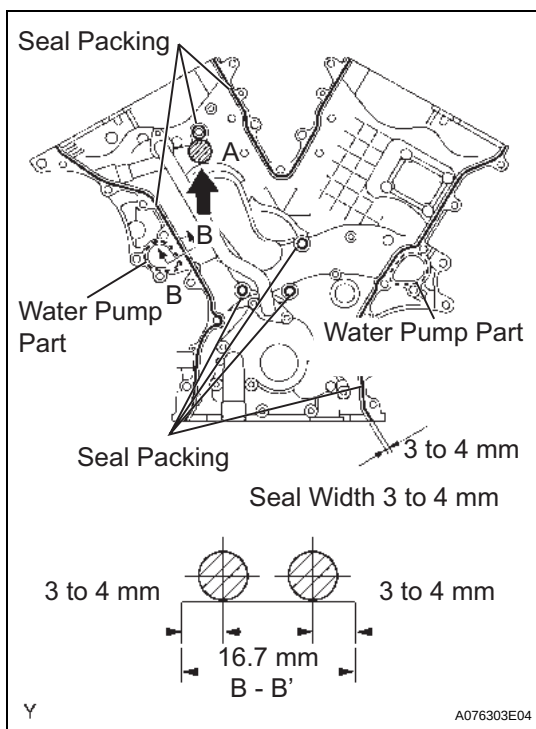
Part No. 08826-00100 or equivalent

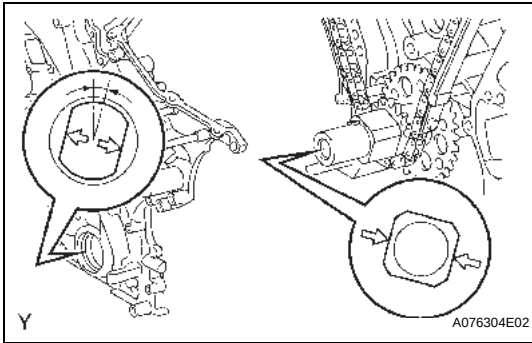
Other parts:

Part No. 08826-00080 or equivalent

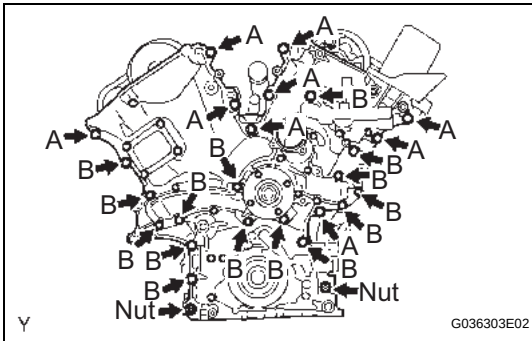
NOTICE:

- Install the timing chain cover within 3 minutes after applying seal packing. Timing chain cover bolts and nuts must be tightened within 15 minutes of installation. Otherwise the seal packing must be removed and reapplied.
- Do not apply seal packing to portion A shown in the illustration.





- (e) Align the key way of the oil pump drive rotor with the rectangular portion of the crankshaft timing gear, and slide the timing chain cover into place.



- (f) Install the timing chain cover with the 24 bolts and 2 nuts. Tighten the bolts and nuts uniformly in several steps.

Torque: 23 N*m (235 kgf*cm, 17 ft.*lbf)

NOTICE:

Pay attention not to wrap the chain and slipper over the timing chain cover seal line.

Each bolt length is as follows

Bolt	Length
A	25 mm (0.98 in.)
B	55 mm (2.17 in.)

3. INSTALL OIL FILTER BRACKET SUB-ASSEMBLY

- (a) Install a new gasket and oil filter bracket with the 3 bolts and 2 nuts.

Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf)

4. INSTALL VVT SENSOR (See page [IG-8](#))

5. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (See page [ES-408](#))

6. INSTALL CYLINDER HEAD COVER SUB-ASSEMBLY LH (See page [EM-68](#))

7. INSTALL CYLINDER HEAD COVER SUB-ASSEMBLY (See page [EM-68](#))

8. INSTALL IGNITION COIL ASSEMBLY (See page [IG-7](#))

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

10. INSTALL OIL PAN SUB-ASSEMBLY (See page [EM-49](#))

11. INSTALL OIL STRAINER SUB-ASSEMBLY (See page [EM-51](#))

12. INSTALL NO.2 OIL PAN SUB-ASSEMBLY (See page [EM-51](#))

13. INSTALL CRANKSHAFT PULLEY (See page [EM-51](#))

14. INSTALL NO.1 IDLER PULLEY SUB-ASSEMBLY (See page [EM-51](#))

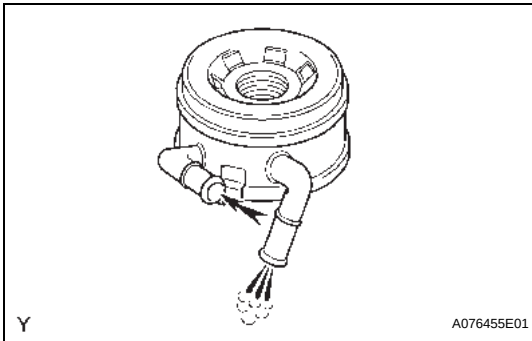
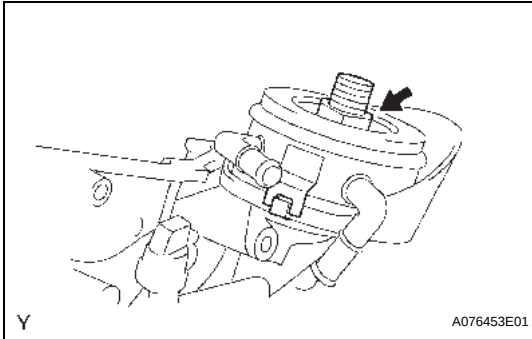
15. INSTALL NO.2 IDLER PULLEY SUB-ASSEMBLY (See page [EM-52](#))

16. INSTALL V-RIBBED BELT TENSIONER ASSEMBLY
(See page [EM-52](#))
17. INSTALL COOLER COMPRESSOR ASSEMBLY (See
page [ES-410](#))
18. INSTALL GENERATOR ASSEMBLY (See page [CH-13](#))
19. INSTALL VANE PUMP ASSEMBLY (See page [EM-52](#))
20. INSTALL WATER INLET (See page [CO-10](#))
21. INSTALL OIL LEVEL GAUGE GUIDE
22. INSTALL AIR CLEANER ASSEMBLY (See page [ES-416](#))
23. INSTALL FAN SHROUD (See page [CO-20](#))
24. INSTALL RADIATOR SUPPORT TO FRAME SEAL LH
25. INSTALL FRONT DIFFERENTIAL CARRIER
ASSEMBLY
(See page [DF-38](#))
26. INSTALL POWER STEERING LINK ASSEMBLY
(See page [PS-67](#))
27. INSTALL BATTERY
28. ADD ENGINE OIL (See page [LU-5](#))
29. ADD ENGINE COOLANT (See page [CO-3](#))
30. ADD DIFFERENTIAL OIL (for 4WD)
31. INSPECT DIFFERENTIAL OIL (for 4WD) (See page
[DF-8](#))
32. ADD POWER STEERING FLUID (See page [PS-3](#))
33. BLEED POWER STEERING FLUID (See page [PS-2](#))
34. CHECK FOR ENGINE OIL LEAKAGE
35. CHECK FOR ENGINE COOLANT LEAKAGE (See
page [CO-4](#))
36. CHECK FOR FUEL LEAKAGE
37. CHECK FOR EXHAUST GAS LEAKAGE
38. CHECK POWER STEERING FLUID LEAKAGE
39. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT
(See page [SP-7](#))
40. INSTALL V-BANK COVER (See page [ES-416](#))
41. INSPECT IGNITION TIMING (See page [EM-1](#))
42. INSPECT ENGINE IDLING SPEED (See page [EM-2](#))
43. INSPECT COMPRESSION (See page [EM-2](#))
44. INSPECT CO/HC (See page [EM-3](#))

ENGINE OIL COOLER

REMOVAL

1. DRAIN ENGINE COOLANT (See page [CO-3](#))
2. REMOVE OIL FILTER SUB-ASSEMBLY (See page [LU-4](#))
3. REMOVE V-BANK COVER (See page [ES-414](#))
4. REMOVE OIL COOLER ASSEMBLY
 - (a) Disconnect the 2 oil cooler hoses from the oil cooler.
 - (b) Remove the union bolt, then remove the plate washer and oil cooler.
 - (c) Remove the O-ring from the oil cooler.



INSPECTION

1. INSPECT OIL COOLER ASSEMBLY
 - (a) Check the oil cooler for damage and clogging. If necessary, replace the oil cooler.

INSTALLATION

1. INSTALL OIL COOLER ASSEMBLY

- (a) Clean the oil cooler contact surface on the cooler mounting.
- (b) Install a new O-ring onto the oil cooler.
- (c) Apply a light coat of engine oil to the threads of the union bolt.
- (d) Install the oil cooler and plate washer with the union bolt.

Torque: 68 N*m (693 kgf*cm, 50 ft.*lbf)

- (e) Connect the 2 oil cooler hoses to the oil cooler.

2. INSTALL OIL FILTER SUB-ASSEMBLY (See page [LU-5](#))

3. ADD ENGINE COOLANT (See page [CO-3](#))

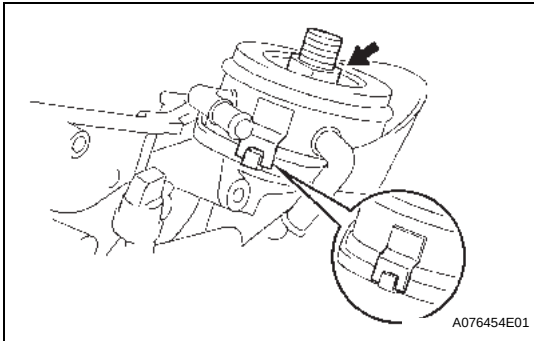
4. ADD ENGINE OIL (See page [LU-5](#))

5. CHECK ENGINE OIL LEVEL

6. CHECK FOR ENGINE OIL LEAKAGE

7. CHECK FOR ENGINE COOLANT LEAKAGE (See page [CO-4](#))

8. INSTALL V-BANK COVER (See page [ES-416](#))



LUBRICATION SYSTEM

ON-VEHICLE INSPECTION

1. CHECK ENGINE OIL LEVEL

- (a) Warm up the engine, then stop the engine and wait for 5 minutes. Check that the engine oil level is between low and full marks on the oil level gage. If the engine oil level is low, check for oil leakage and add engine oil up to the full level mark.

NOTICE:

Do not add engine oil to above the full level mark.

2. CHECK ENGINE OIL QUALITY

- (a) Check the oil for deterioration, water intrusion, discoloration or thinning. If the quality is visibly poor, replace the oil.

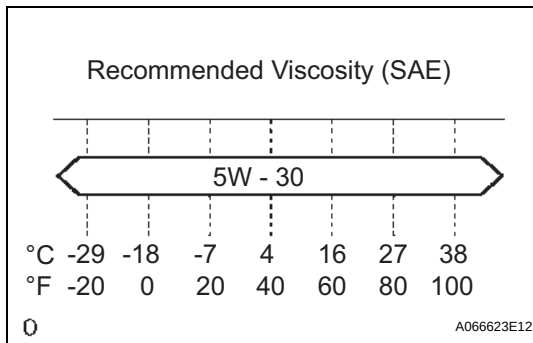
Oil grade:

Use API grade SM "Energy-Conserving", or ILSAC multigrade engine oil.

SAE 5W-30 is the best choice for good fuel economy and good starting in cold weather.

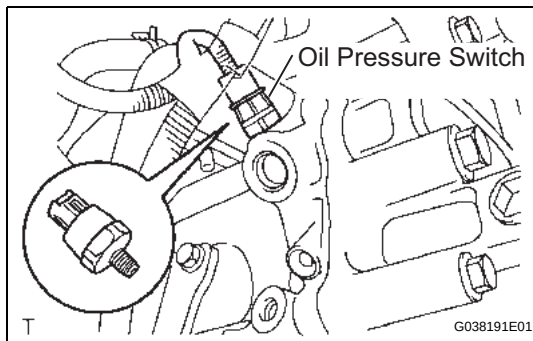
If SAE 5W-30 is not available, use SAE 10W-30.

However, it should be replaced with SAE 5W-30 at the next oil replacement.



3. INSPECT OIL PRESSURE

- (a) Remove the 4 bolts, then remove the No. 1 engine under cover. (PRE RUNNER AND 4WD TYPE)
 (b) Disconnect the oil pressure switch connector.
 (c) Using a 24 mm deep socket wrench, remove the oil pressure switch.

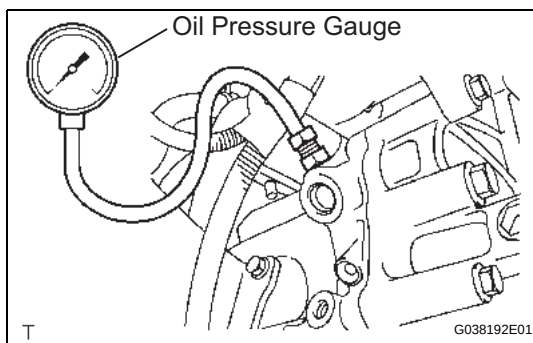


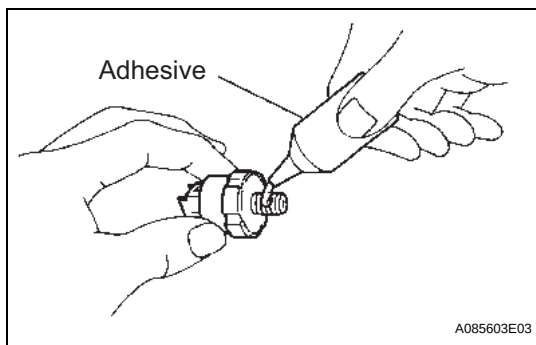
- (d) Install the oil pressure gauge.
 (e) Warm up the engine.
 (f) Inspect the oil pressure.

Oil pressure

When Idling	29 kPa (0.3 kgf*cm ² , 4.2 psi) or more
At 3,000 rpm	160 to 490 kPa (1.6 to 5.3 kgf*cm ² , 23 to 75 psi)

- (g) Remove the oil pressure gauge.





- (h) Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:

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

- (i) Using a 24 mm deep socket wrench, install the oil pressure switch.

Torque: 15 N*m (153 kgf*cm, 11 ft.*lbf)

NOTICE:

Do not start the engine for at least 1 hour after installation.

- (j) Connect the oil pressure switch connector.
(k) Check for engine oil leakage.
(l) Install the engine under cover No. 1 with the 4 bolts.
(PRE RUNNER AND 4WD TYPE)
Torque: 30 N*m (306 kgf*cm, 22 ft.*lbf)

OIL FILTER

REMOVAL

CAUTION:

- Prolonged and repeated contact with engine oil causes removal of natural oils from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.
- Precautions should be taken when replacing engine oil to minimize the risk of your skin making contact with used engine oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use a waterless hand cleaner to remove any used engine oil. Do not use gasoline, thinners or solvents.
- For environmental protection, used oil and used oil filters must be disposed of at designated disposal sites.

1. DRAIN ENGINE OIL

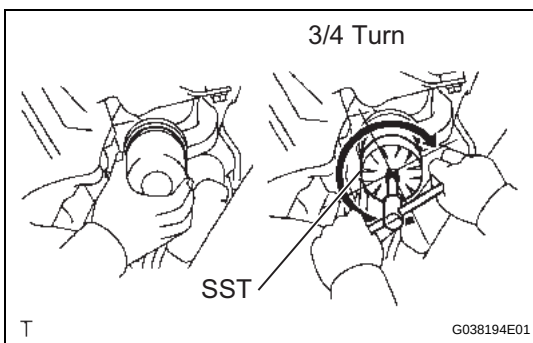
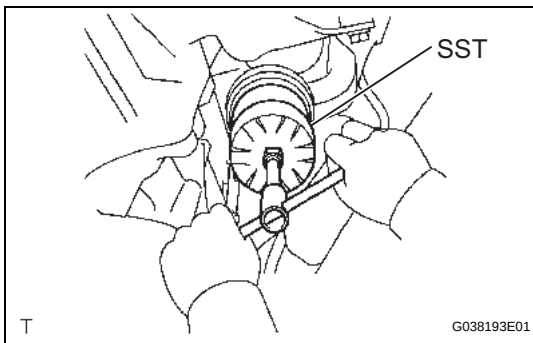
- Remove the oil filler cap.
- Remove the oil pan drain plug and drain the engine oil.
- Install a new gasket, then install the oil pan drain plug.

Torque: 38 N*m (382 kgf*cm, 28 ft.*lbf)

2. REMOVE OIL FILTER SUB-ASSEMBLY

- Using SST, remove the oil filter.

SST 09228-07501



INSTALLATION

1. INSTALL OIL FILTER SUB-ASSEMBLY

- Remove any dirt or foreign objects from the contact surface of the engine side.
- Apply a light coat of engine oil to the O-ring of a new oil filter.
- Install the oil filter by hand until the O-ring comes into contact with the seat.
- Using SST, retighten it by 3/4 turn.

SST 09228-07501

Reference torque:

13 N*m(133 kgf/cm, 10 ft.*lbf)

2. ADD ENGINE OIL
- (a) Fill with fresh engine oil.

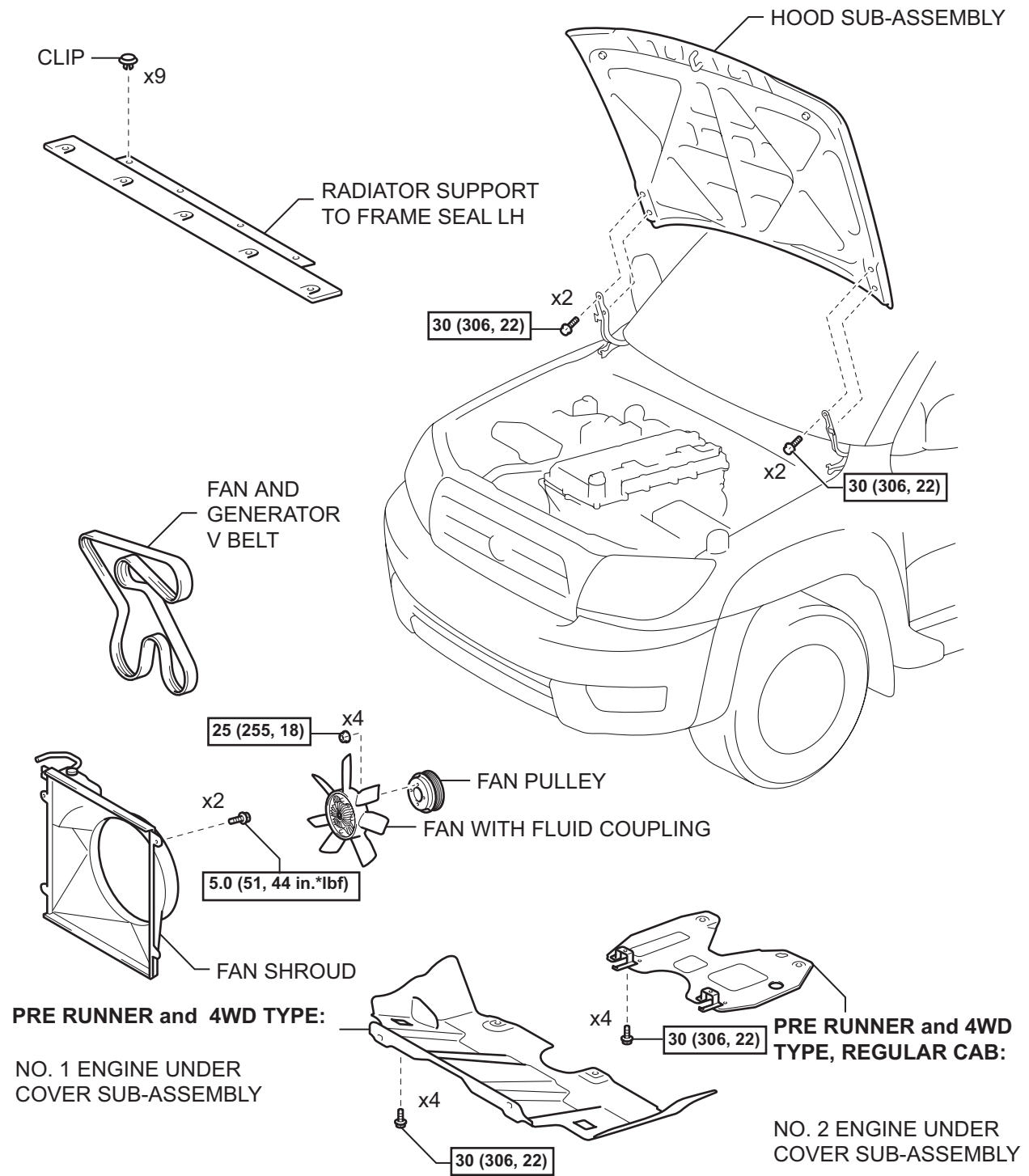
Capacity

Drain and refill with oil filter change	5.8 liters (6.1 US qts, 5.1 Imp. qts)
Drain and refill without oil filter change	5.1 liters (5.4 US qts, 4.5 Imp. qts)
Dry fill	6.1 liters (6.4 US qts, 5.4 Imp. qts)

3. CHECK FOR ENGINE OIL LEAKAGE

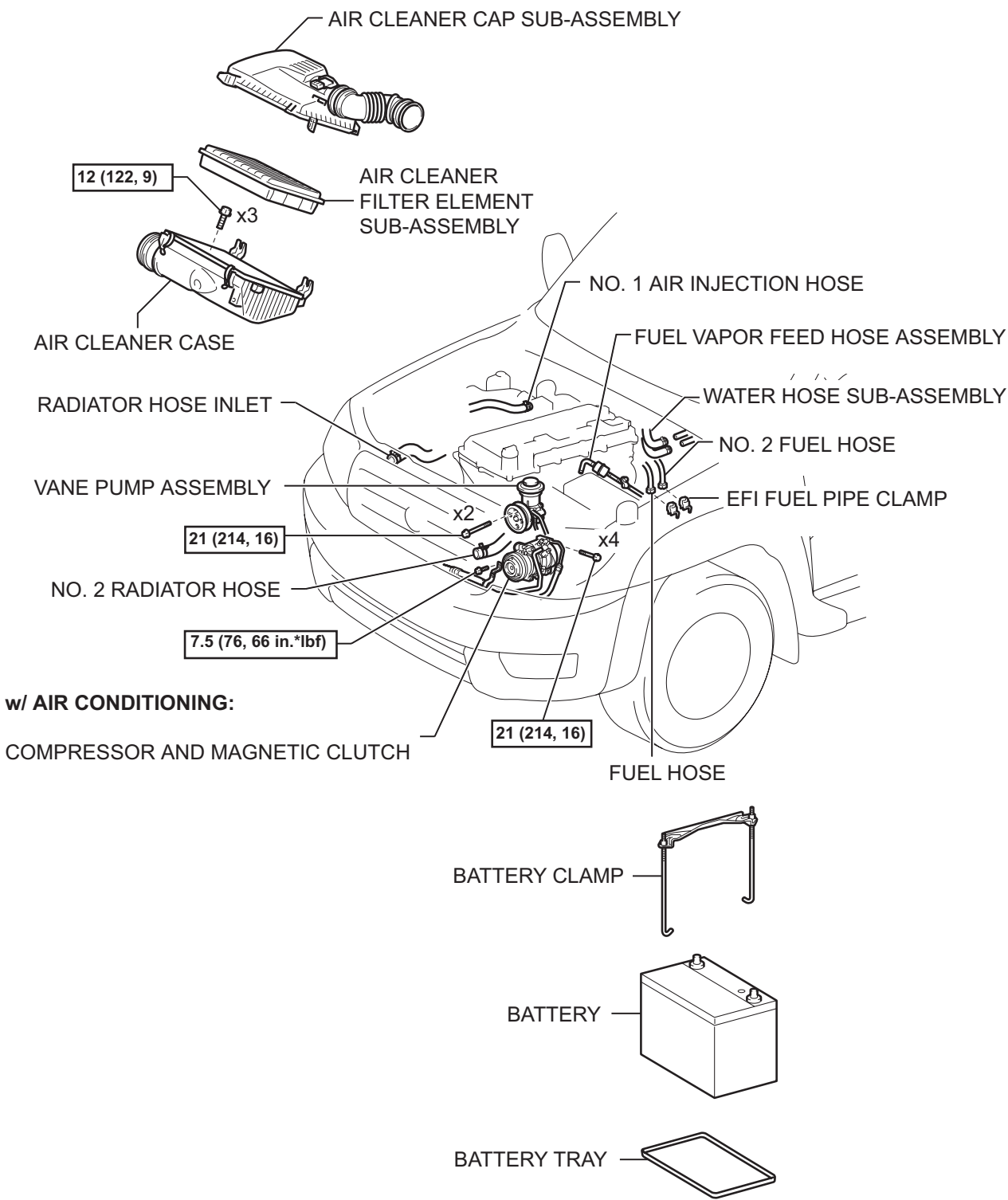
OIL PUMP

COMPONENTS



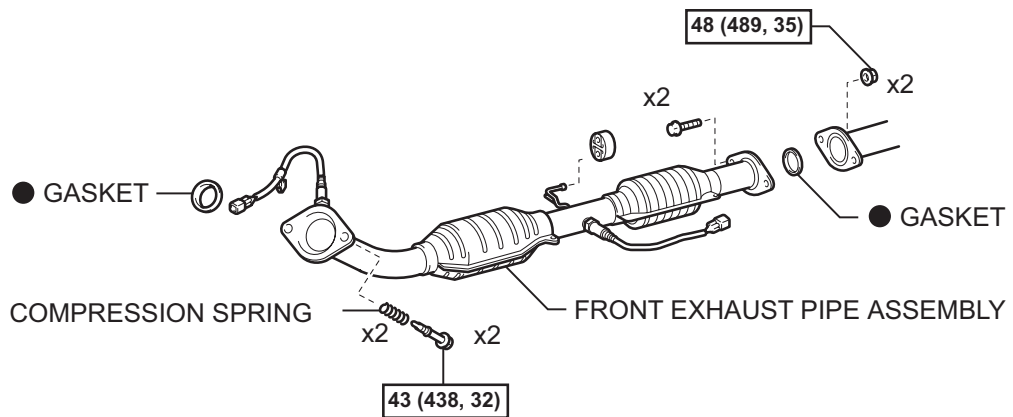
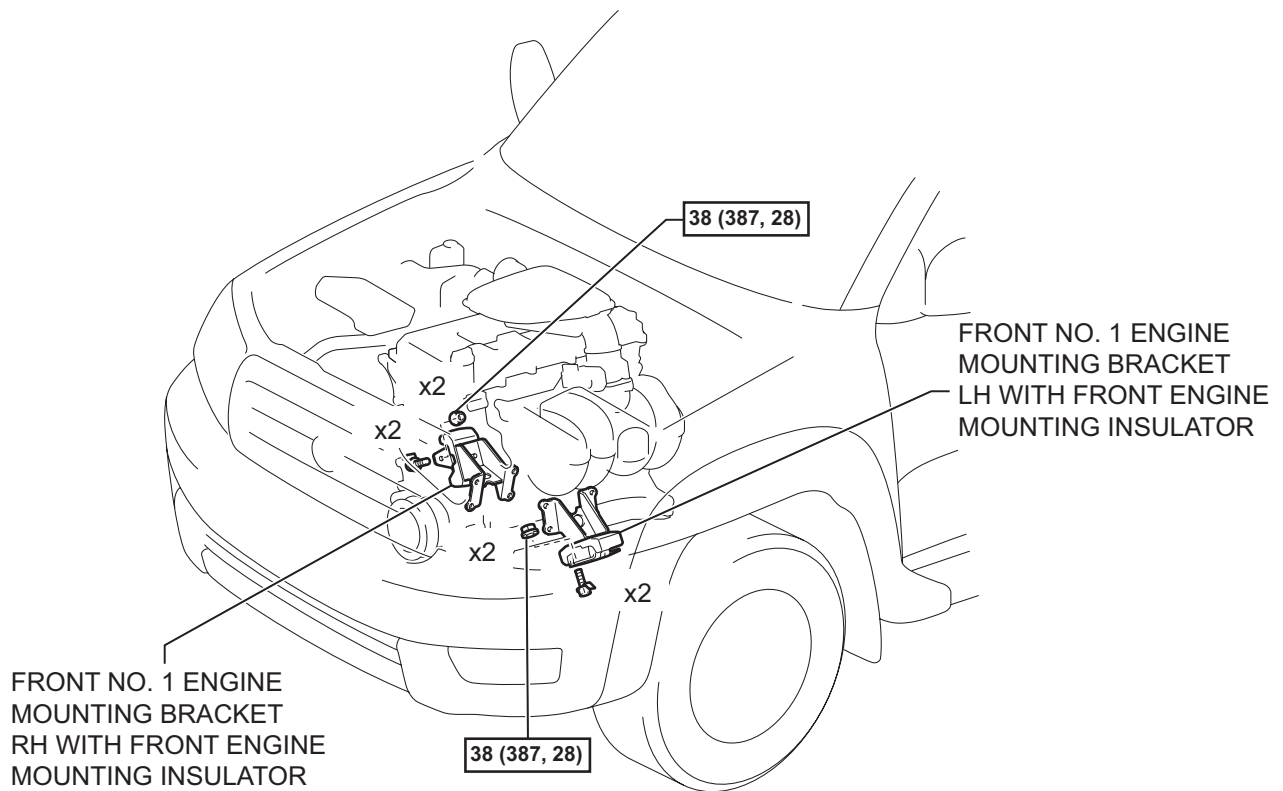
N*m (kgf*cm, ft*lbf) : Specified torque





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





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

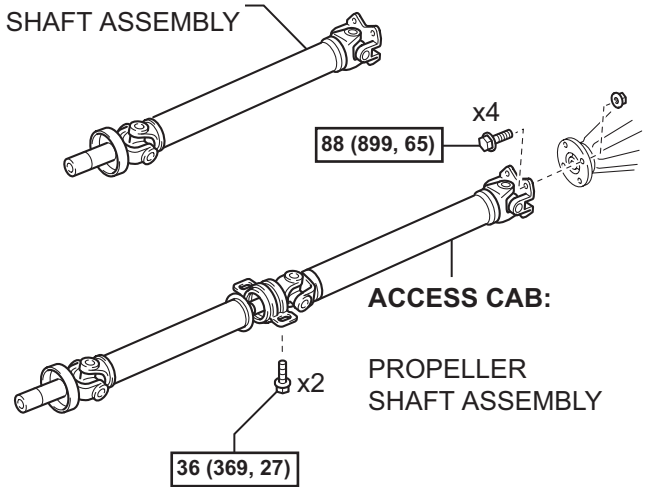
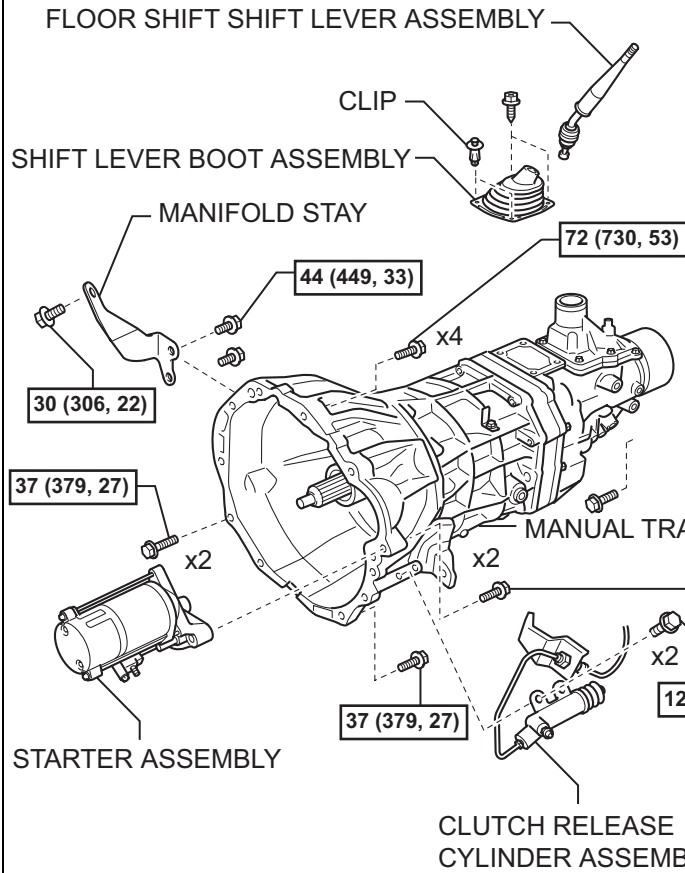
● Non-reusable part



MANUAL TRANSMISSION, 2WD:

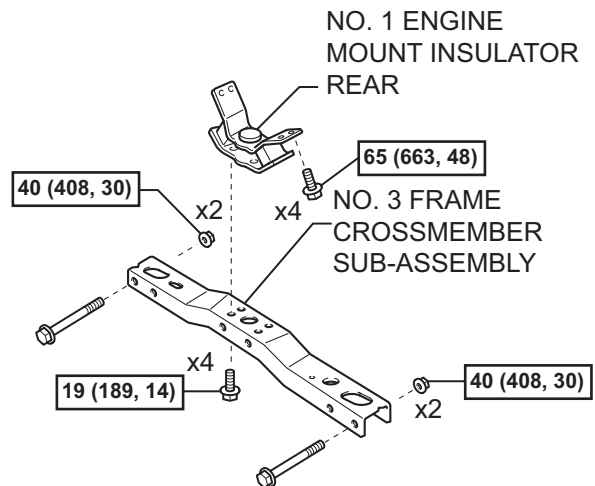
REGULAR CAB:

PROPELLER SHAFT ASSEMBLY



ACCESS CAB:

PROPELLER SHAFT ASSEMBLY



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

● Non-reusable part

MANUAL TRANSMISSION, 4WD:**REGULAR CAB:****PROPELLER SHAFT ASSEMBLY****FLOOR SHIFT SHIFT LEVER ASSEMBLY****CLIP****SHIFT LEVER BOOT ASSEMBLY****MANIFOLD STAY**

44 (449, 33)

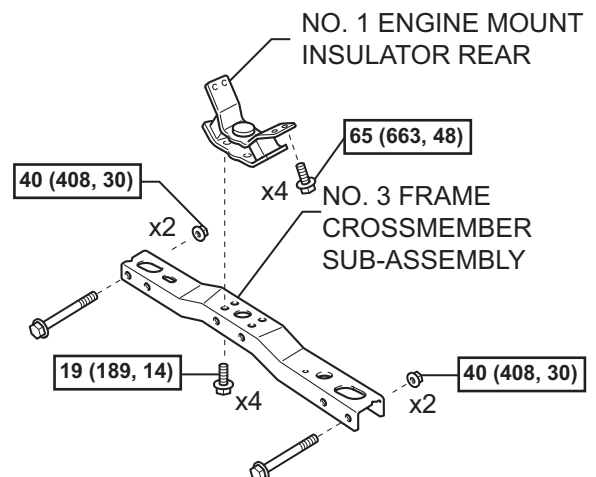
72 (730, 53)

30 (306, 22)

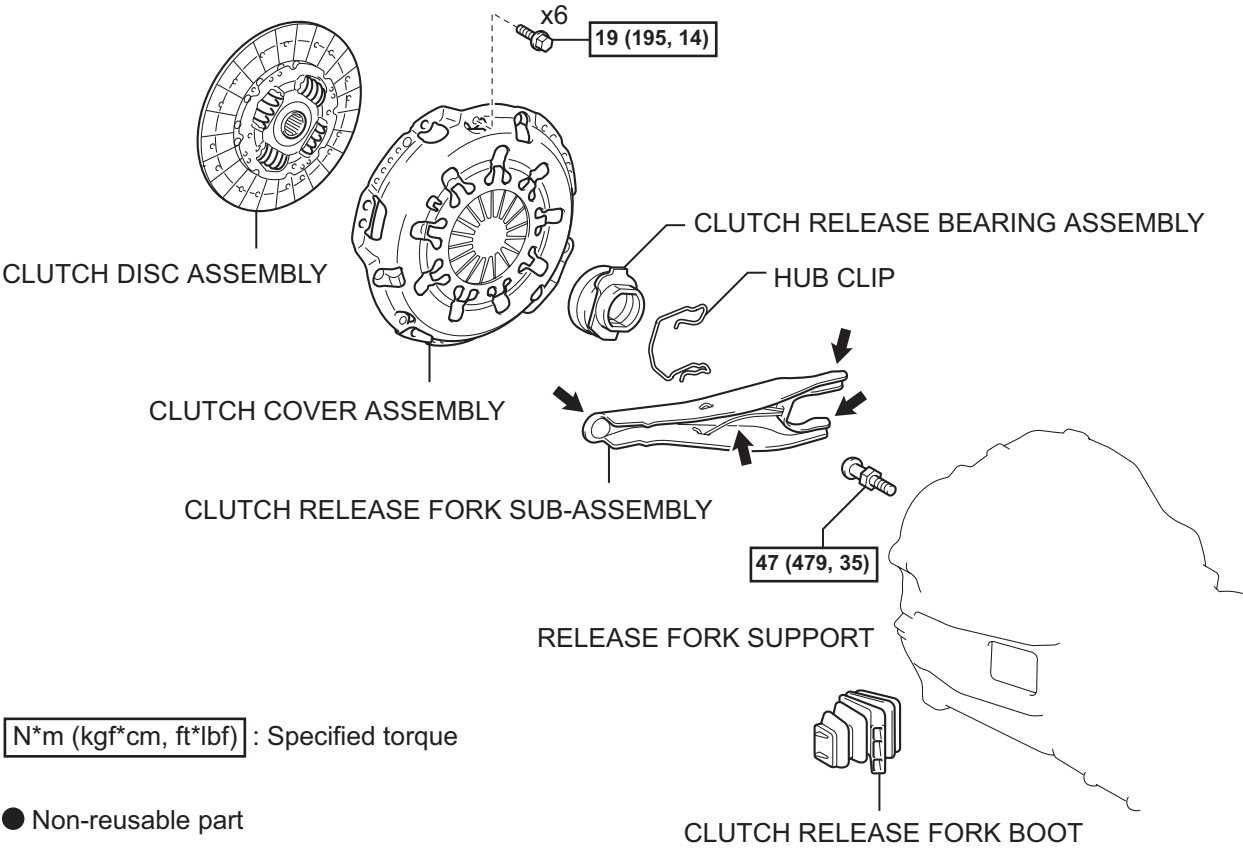
STARTER ASSEMBLY**MANUAL TRANSMISSION UNIT ASSEMBLY****CLUTCH RELEASE CYLINDER ASSEMBLY****TRANSFER ASSEMBLY****PROPELLER SHAFT ASSEMBLY FRONT****ACCESS CAB:****PROPELLER SHAFT ASSEMBLY**

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

● Non-reusable part



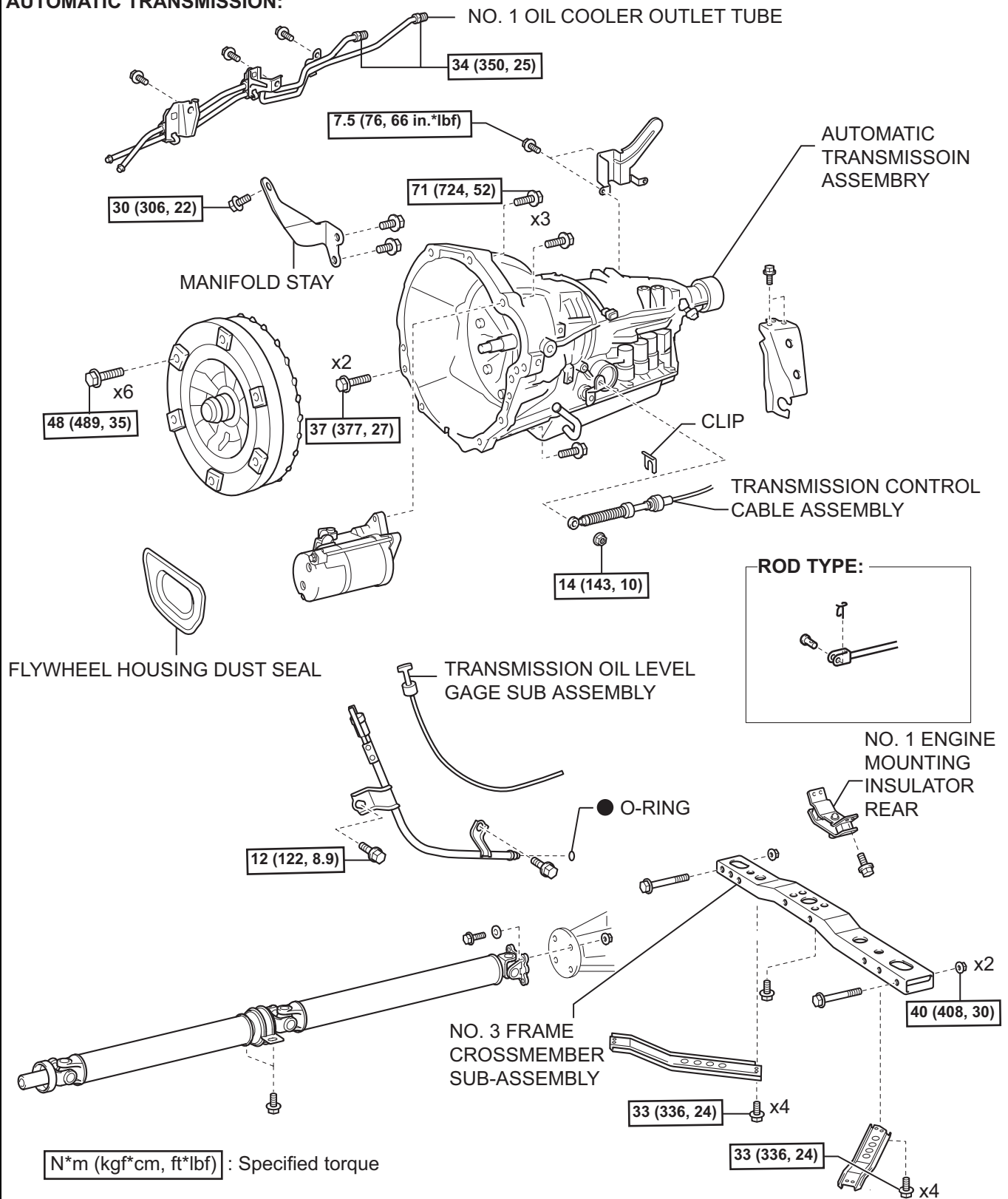
MANUAL TRANSMISSION:



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

● Non-reusable part

← Release hub grease

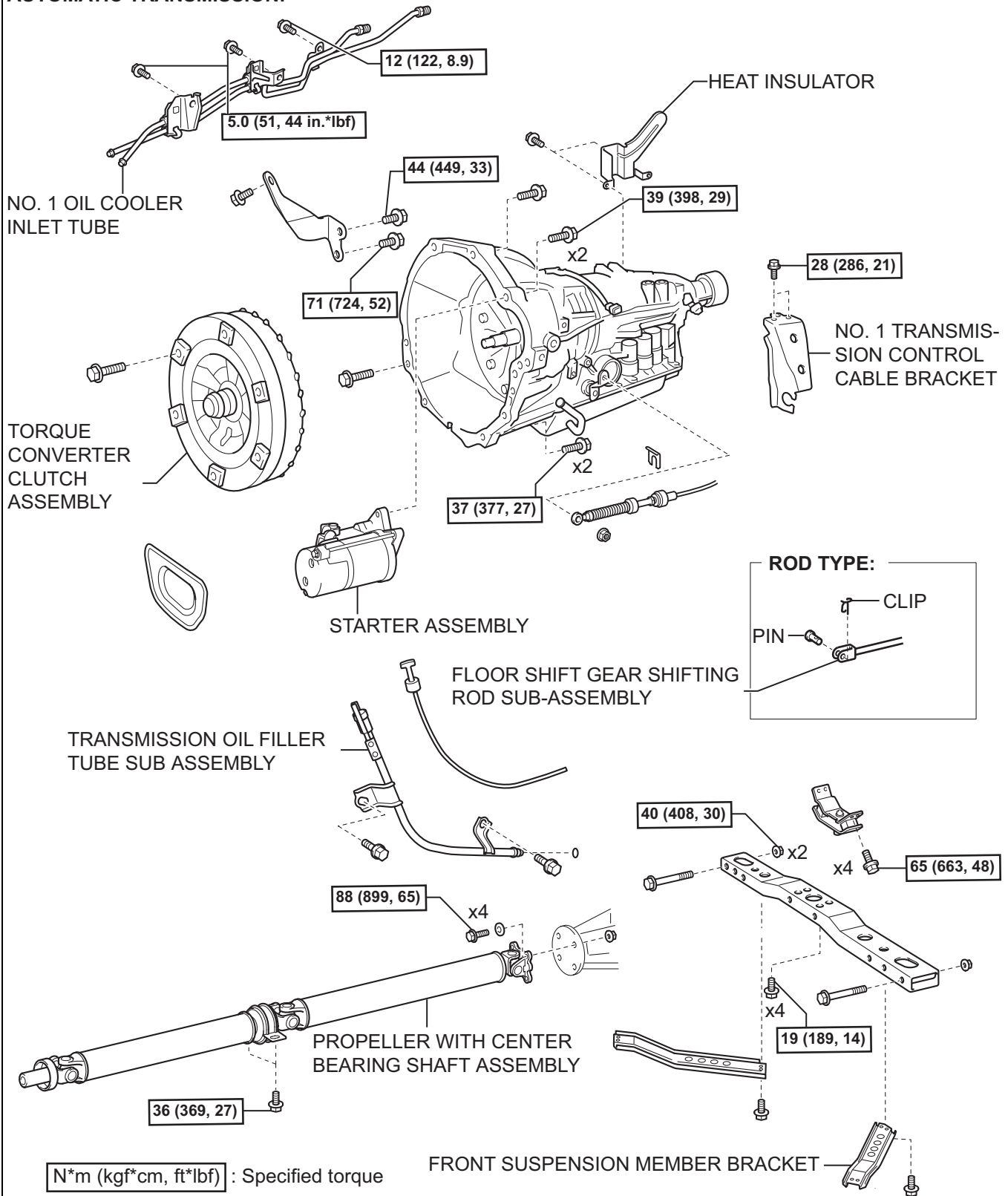
AUTOMATIC TRANSMISSION:

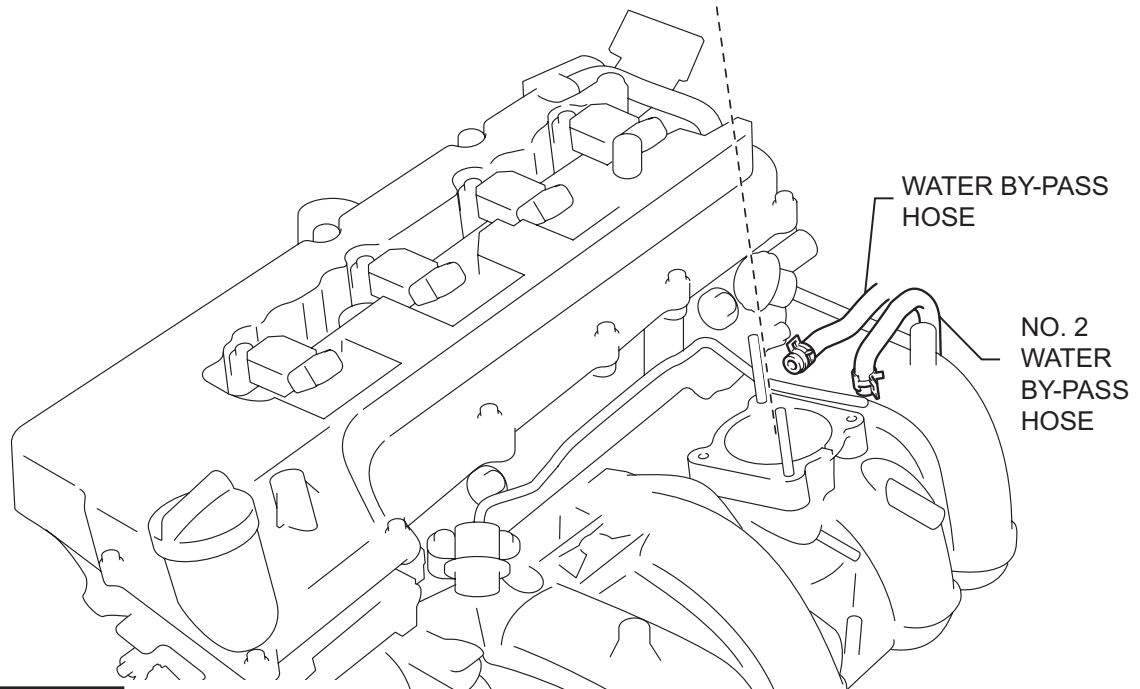
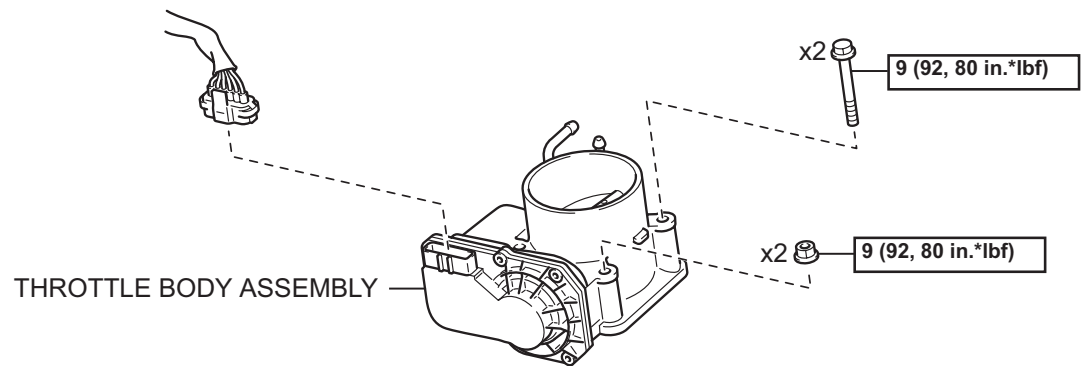
Y

A113552E01

LU

AUTOMATIC TRANSMISSION:

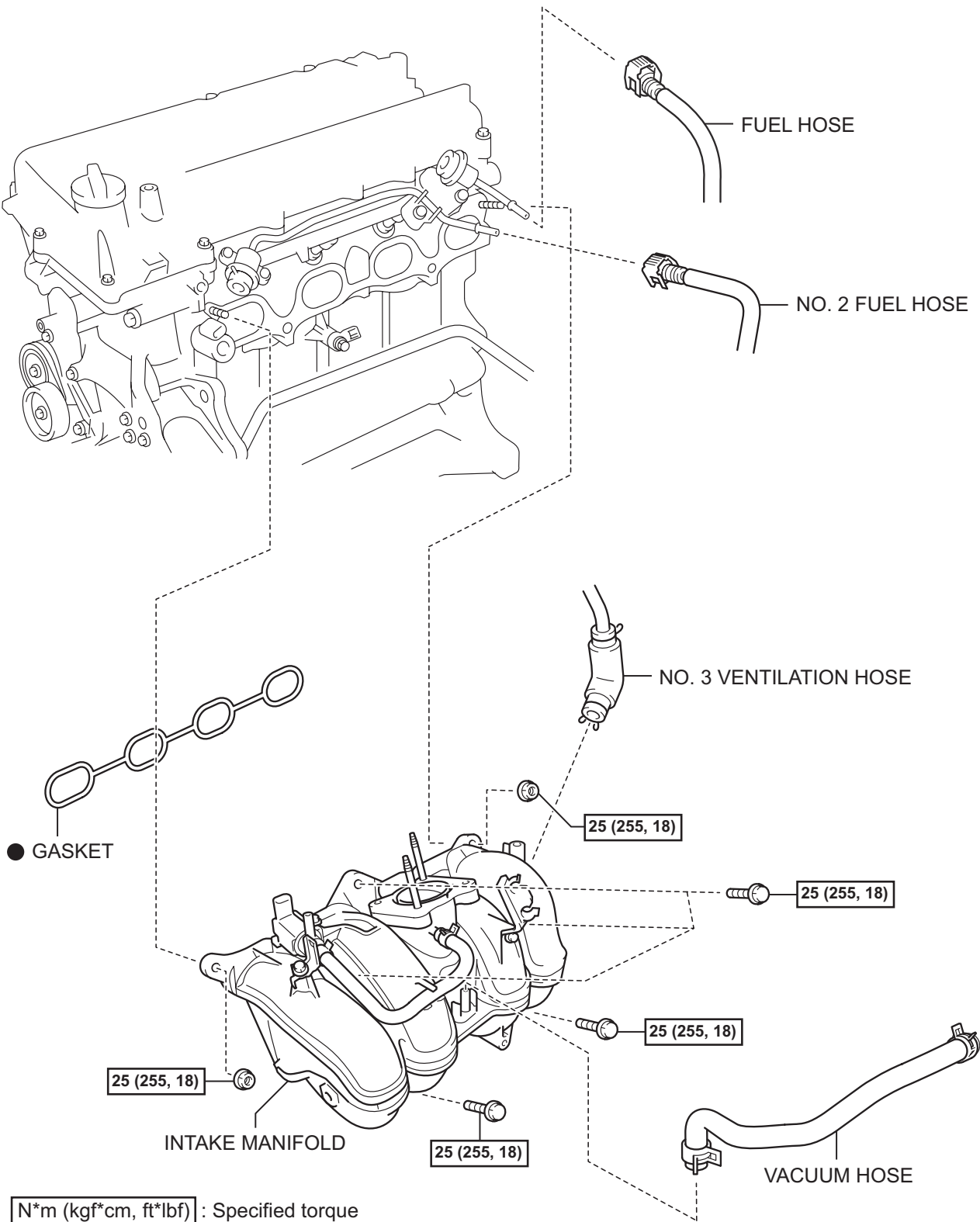




N*m (kgf*cm, ft*lbf) : Specified torque

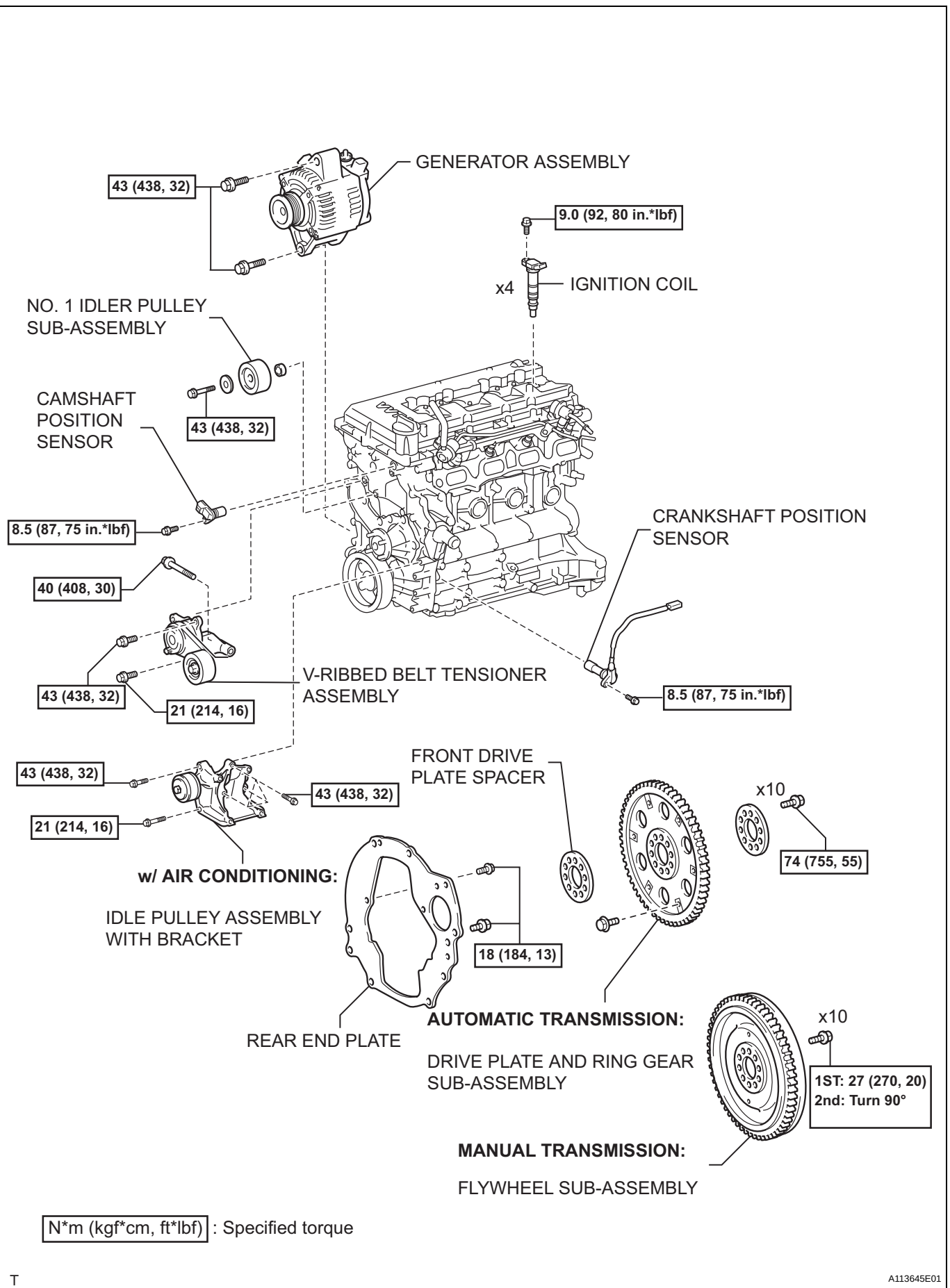
● Non-reusable part

LU

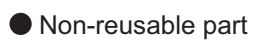


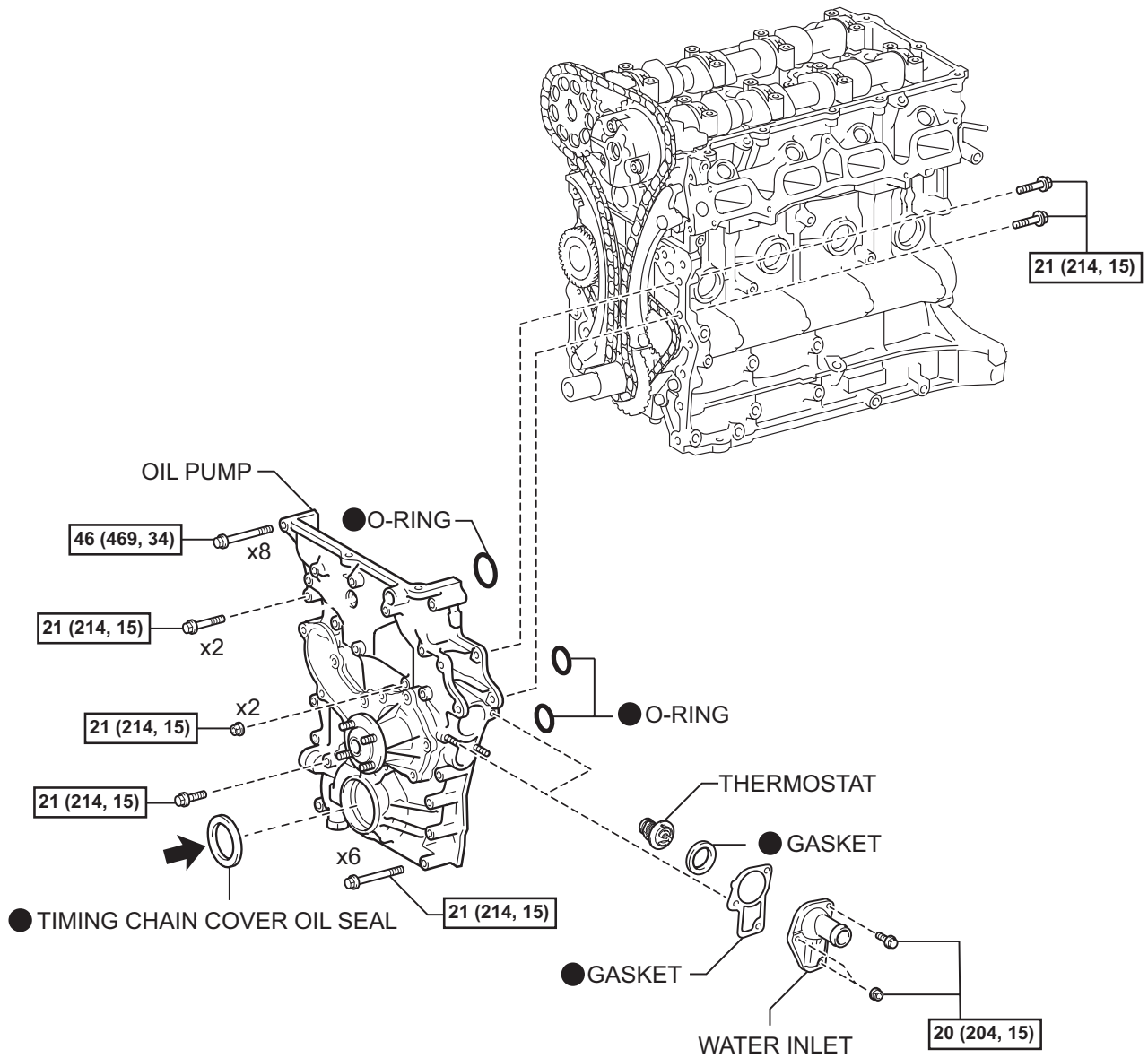
N*m (kgf*cm, ft*lb) : Specified torque

● Non-reusable part



LU



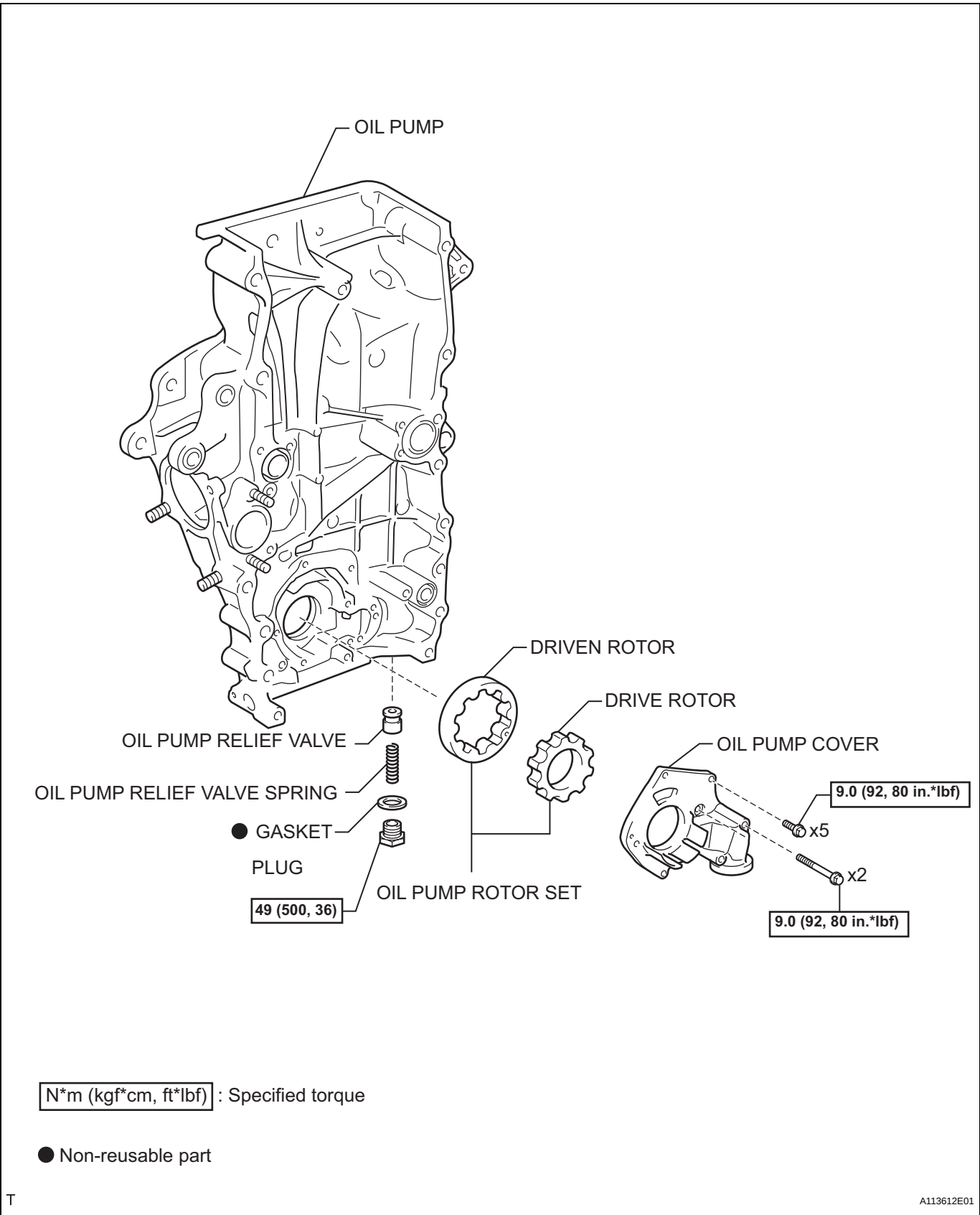


$\text{N}\cdot\text{m}$ (kgf $\cdot\text{cm}$, ft. $\cdot\text{lbf}$) : Specified torque

● Non-reusable part

➡ Apply MP grease

LU



REMOVAL

1. REMOVE HOOD SUB-ASSEMBLY
2. DISCHARGE FUEL SYSTEM PRESSURE
(See Page [FU-1](#))
3. REMOVE ENGINE UNDER COVER SUB-ASSEMBLY NO.1 (for Pre Runner and 4WD Type)
(a) Remove the 4 bolts, then remove the engine under cover No. 1.
4. REMOVE ENGINE UNDER COVER SUB-ASSEMBLY NO.2 (for Pre Runner and 4WD Type, Regular Cab)
(a) Remove the 4 bolts, then remove the engine under cover No. 2.
5. DRAIN ENGINE OIL (See page [LU-3](#))
6. DRAIN ENGINE COOLANT (See page [CO-3](#))
7. REMOVE BATTERY
8. REMOVE BATTERY TRAY
9. REMOVE RADIATOR SUPPORT TO FRAME SEAL LH
(See page [CO-12](#))
10. REMOVE FAN SHROUD (See page [CO-13](#))
11. REMOVE AIR CLEANER CAP SUB-ASSEMBLY (See page [EC-14](#))
12. REMOVE AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY
13. REMOVE AIR CLEANER CASE
(a) Remove the 3 bolts, then remove the air cleaner case.
14. SEPARATE VANE PUMP ASSEMBLY (See page [EM-21](#))
15. REMOVE RADIATOR HOSE NO.2
16. SEPARATE COMPRESSOR AND MAGNETIC CLUTCH (With Air Conditioning) (See page [EM-21](#))
17. REMOVE RADIATOR HOSE INLET
18. SEPARATE WATER HOSE SUB-ASSEMBLY (See page [EM-92](#))
19. DISCONNECT FUEL HOSE (See page [FU-11](#))
20. DISCONNECT FUEL HOSE NO.2 (See page [FU-11](#))
21. SEPARATE FUEL VAPOR FEED HOSE ASSEMBLY
(See page [EM-93](#))
22. DISCONNECT AIR INJECTION SYSTEM NO.1 HOSE
(See page [EM-93](#))
23. DISCONNECT ENGINE WIRE (See page [EM-93](#))
24. REMOVE EXHAUST PIPE ASSEMBLY TAIL (See page [EX-2](#))

25. REMOVE EXHAUST PIPE ASSEMBLY FRONT (See page [EX-2](#))

26. REMOVE MANUAL TRANSMISSION UNIT ASSEMBLY

Transmission	See page
R155	MT-6
R155F	MT-8

27. REMOVE AUTOMATIC TRANSMISSION ASSEMBLY (See Page [AT-109](#))

28. REMOVE ENGINE ASSEMBLY (See page [EM-93](#))

29. REMOVE CLUTCH COVER ASSEMBLY (for Manual Transmission)

Transmission	See page
R155	CL-30
R155F	CL-35

30. REMOVE CLUTCH DISC ASSEMBLY (for Manual Transmission)

Transmission	See page
R155	CL-30
R155F	CL-35

31. REMOVE FLYWHEEL SUB-ASSEMBLY (for Manual Transmission) (See page [EM-77](#))

32. REMOVE DRIVE PLATE & RING GEAR SUB-ASSEMBLY (for Automatic Transmission) (See page [EM-78](#))

33. REMOVE REAR END PLATE (See page [EM-66](#))

34. REMOVE INTAKE AIR CONNECTOR (See page [ES-452](#))

35. REMOVE GENERATOR ASSEMBLY (See page [CH-7](#))

36. REMOVE V-RIBBED BELT TENSIONER ASSEMBLY (See page [CO-5](#))

37. REMOVE IDLER PULLEY SUB-ASSEMBLY NO.1 (See page [EM-23](#))

38. REMOVE IDLE PULLEY ASSEMBLY W/BRACKET (With Air Conditioning) (See page [ES-446](#))

39. REMOVE CRANKSHAFT POSITION SENSOR (See page [ES-446](#))

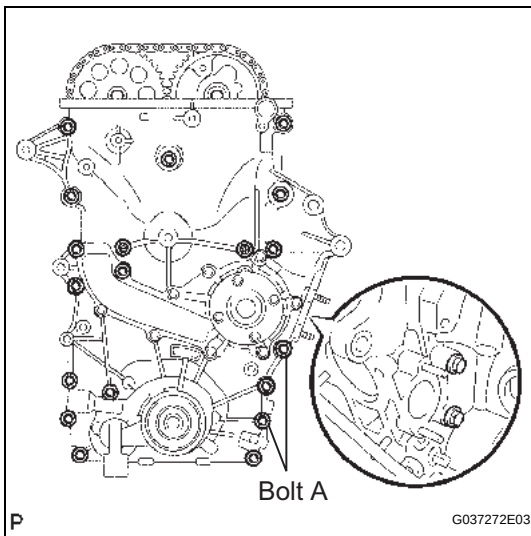
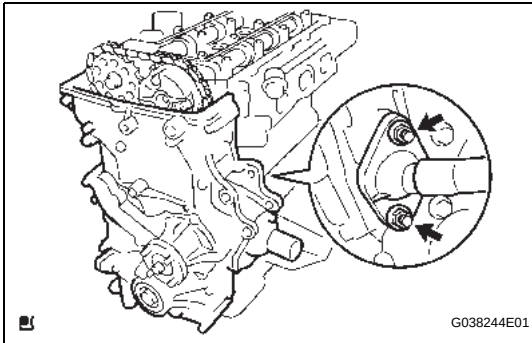
40. REMOVE CAMSHAFT POSITION SENSOR (See page [ES-444](#))

41. REMOVE INTAKE MANIFOLD TO HEAD GASKET NO. 1 (See page [ES-460](#))

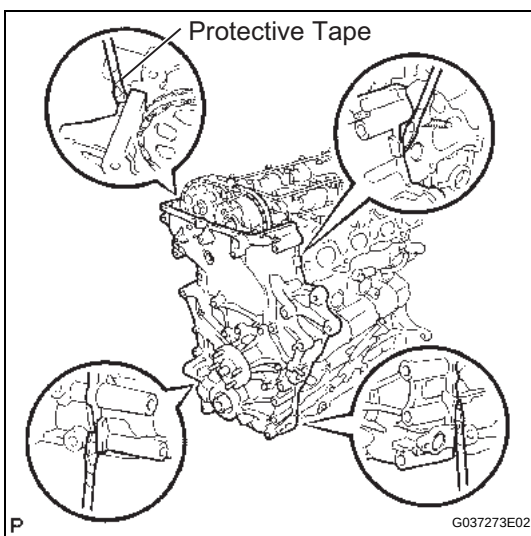
42. REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY (See page [EM-38](#))

43. REMOVE CRANKSHAFT PULLEY (See page [EM-74](#))

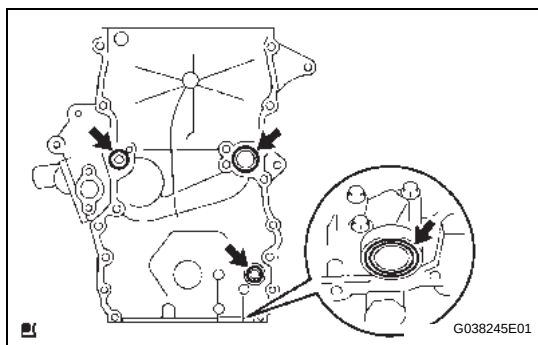
44. REMOVE OIL LEVEL GAGE SUB-ASSEMBLY
45. REMOVE OIL PAN SUB-ASSEMBLY NO.2 (See page [EM-24](#))
46. REMOVE OIL STRAINER SUB-ASSEMBLY (See page [EM-24](#))
47. REMOVE OIL PAN SUB-ASSEMBLY (See page [EM-25](#))
48. REMOVE OIL PUMP
 - (a) Remove the 2 nuts, then separate the water by-pass pipe No. 1.



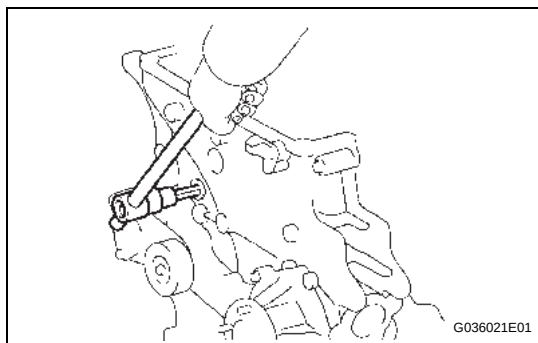
- (b) Remove the 19 bolts and 2 nuts shown in the illustration.
HINT:
If the vehicle is equipped with air conditioning, bolts A are already removed since they are for installing the idle pulley with bracket.



- (c) Remove the oil pump by prying between the oil pump and cylinder head or cylinder block with a screwdriver.
HINT:
Tape the screwdriver tip before use.
NOTICE:
Be careful not to damage the contact surfaces of the cylinder head, cylinder block and timing chain cover.



(d) Remove the 4 O-rings.

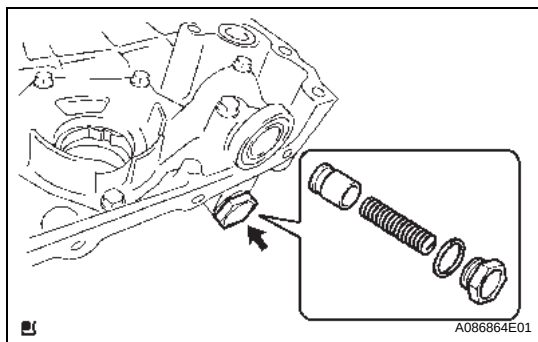


(e) Using a 10 mm socket hexagon wrench, remove the head straight screw plug.

49. REMOVE WATER INLET (See page [CO-7](#))

50. REMOVE THERMOSTAT (See page [CO-7](#))

51. REMOVE TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL (See page [EM-149](#))



DISASSEMBLY

1. REMOVE OIL PUMP RELIEF VALVE

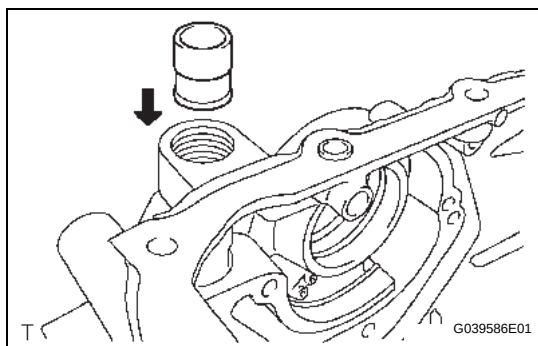
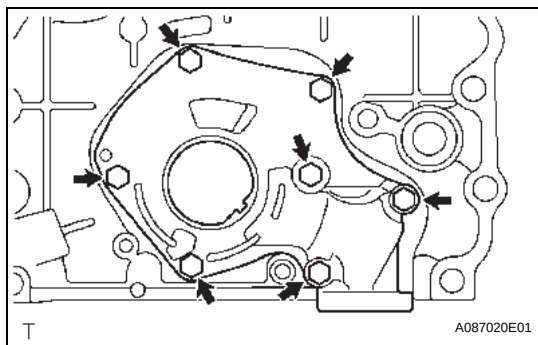
- Using a 27 mm socket wrench, remove the relief valve plug and gasket.
- Remove the valve spring and oil pump relief valve.

2. REMOVE OIL PUMP COVER

- Remove the 7 bolts and oil pump cover.

3. REMOVE OIL PUMP ROTOR SET

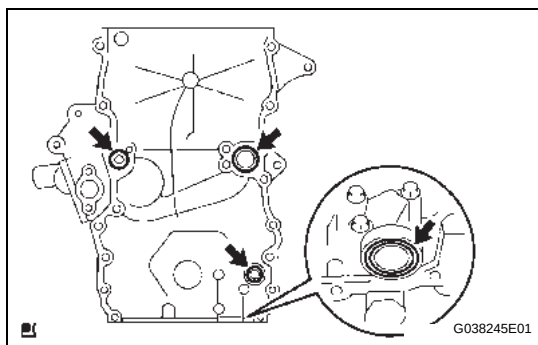
- Remove the oil pump rotor set from the timing chain cover.



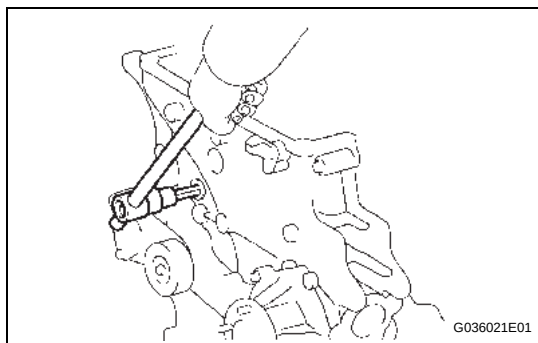
INSPECTION

1. REMOVE OIL PUMP RELIEF VALVE

- Coat the relief valve with engine oil and drop it into the relief valve hole.
- Check that the relief valve falls in smoothly by its own weight.
If it does not, replace the relief valve. If necessary, replace the timing chain cover.



(d) Remove the 4 O-rings.

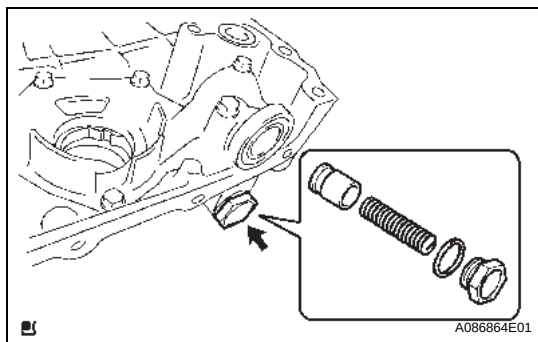


(e) Using a 10 mm socket hexagon wrench, remove the head straight screw plug.

49. REMOVE WATER INLET (See page [CO-7](#))

50. REMOVE THERMOSTAT (See page [CO-7](#))

51. REMOVE TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL (See page [EM-149](#))



DISASSEMBLY

1. REMOVE OIL PUMP RELIEF VALVE

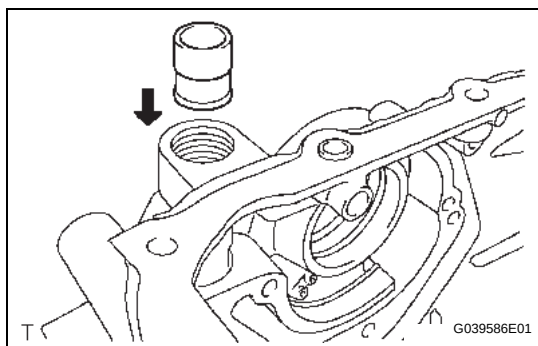
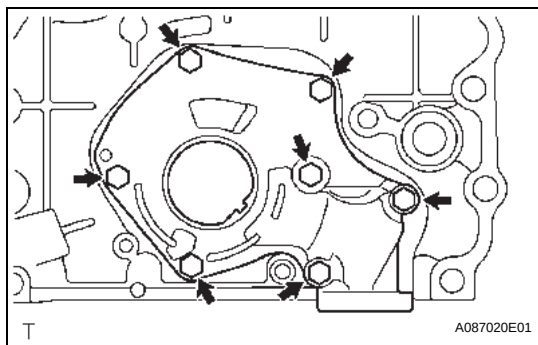
- Using a 27 mm socket wrench, remove the relief valve plug and gasket.
- Remove the valve spring and oil pump relief valve.

2. REMOVE OIL PUMP COVER

- Remove the 7 bolts and oil pump cover.

3. REMOVE OIL PUMP ROTOR SET

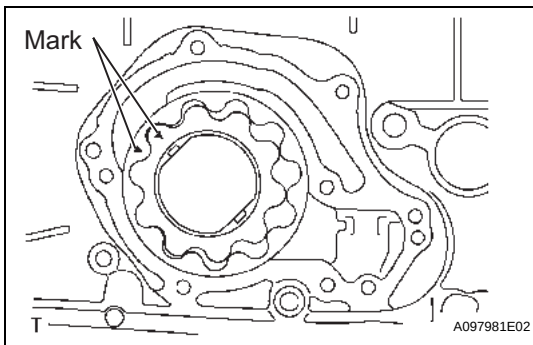
- Remove the oil pump rotor set from the timing chain cover.



INSPECTION

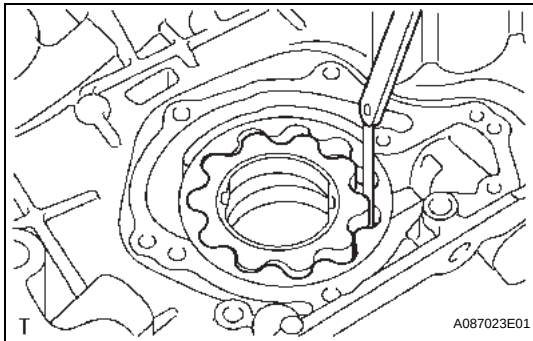
1. REMOVE OIL PUMP RELIEF VALVE

- Coat the relief valve with engine oil and drop it into the relief valve hole.
- Check that the relief valve falls in smoothly by its own weight.
If it does not, replace the relief valve. If necessary, replace the timing chain cover.



2. INSPECT OIL PUMP ROTOR SET

- (a) Install the rotors to the timing chain cover with the rotors' marks facing outward. Check that the rotors revolves smoothly.



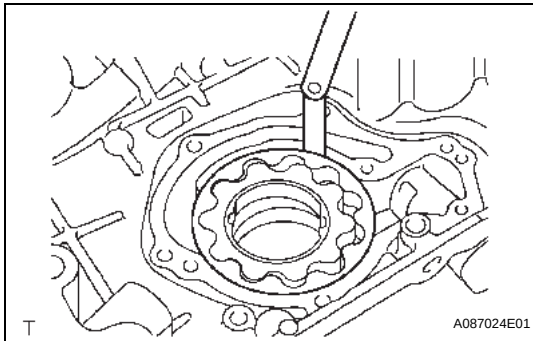
3. INSPECT ROTOR TIP CLEARANCE

- (a) Check the tip clearance.
 - (1) Using a feeler gauge, measure the clearance between the drive and driven rotor tips, as shown in the illustration.

Tip clearance

Standard	0.040 to 0.160 mm (0.0016 to 0.0063 in.)
Maximum	0.26 mm (0.0102 in.)

If the tip clearance is greater than the maximum, replace the timing chain cover.



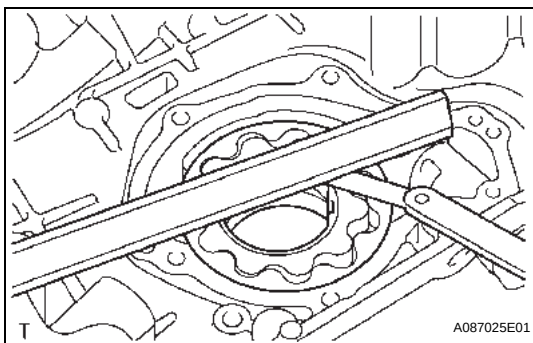
4. INSPECT ROTOR BODY CLEARANCE

- (a) Check the body clearance.
 - (1) Using a feeler gauge, measure the clearance between the timing chain cover and driven rotor, as shown in the illustration.

Body clearance

Standard	0.250 to 0.325 mm (0.0098 to 0.0128 in.)
Maximum	0.425 mm (0.0167 in.)

If the body clearance is greater than the maximum, replace the timing chain cover.



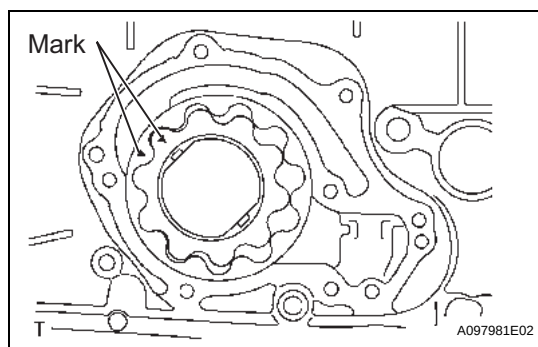
5. INSPECT ROTOR SIDE CLEARANCE

- (a) Check the side clearance.
 - (1) Using a feeler gauge and precision straight edge, measure the clearance between the rotors and precision straight edge, as shown in the illustration.

Side clearance

Standard	0.025 to 0.075 mm (0.0010 to 0.0030 in.)
Maximum	0.130 mm (0.0051 in.)

If the side clearance is greater than the maximum, replace the timing chain cover.



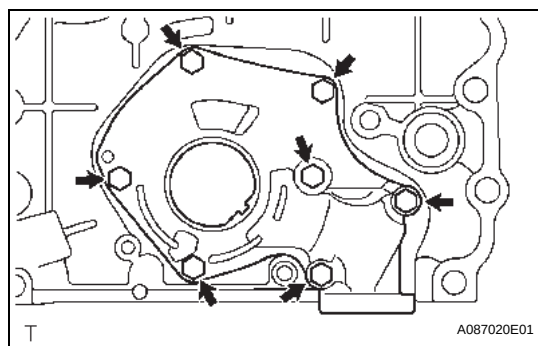
6. INSTALL OIL PUMP ROTOR SET

- (a) Coat the oil pump gear set with engine oil and place it into timing chain cover with the marks facing outward (oil pump cover side). Check that the rotors revolve smoothly.

REASSEMBLY

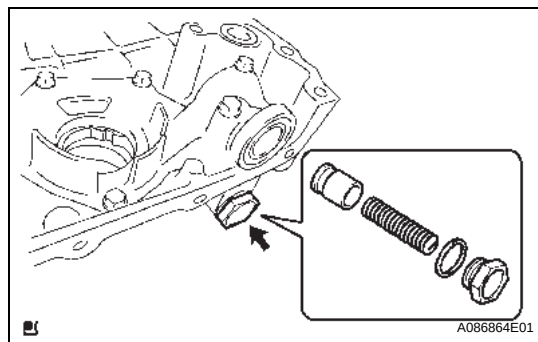
1. INSTALL OIL PUMP COVER

- (a) Install the oil pump cover with the 7 bolts.
Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)



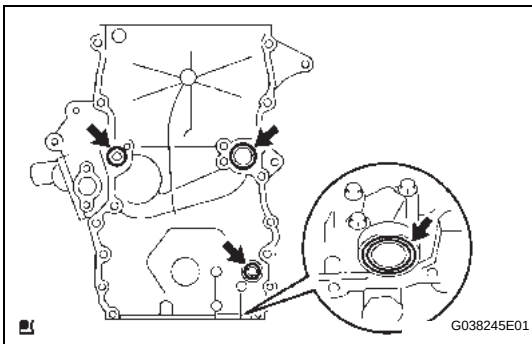
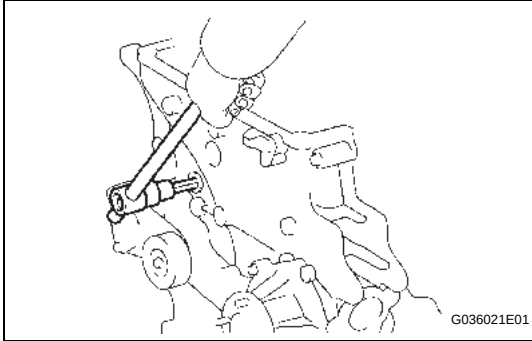
2. INSTALL OIL PUMP RELIEF VALVE

- (a) Coat the oil pump relief valve with engine oil.
- (b) Insert the relief valve and relief valve spring into the timing chain cover hole.
- (c) Install a new gasket to the relief valve plug.
- (d) Using a 27 mm socket wrench, install the plug.
Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)



INSTALLATION

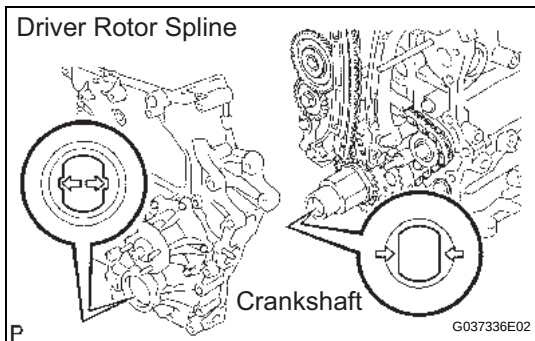
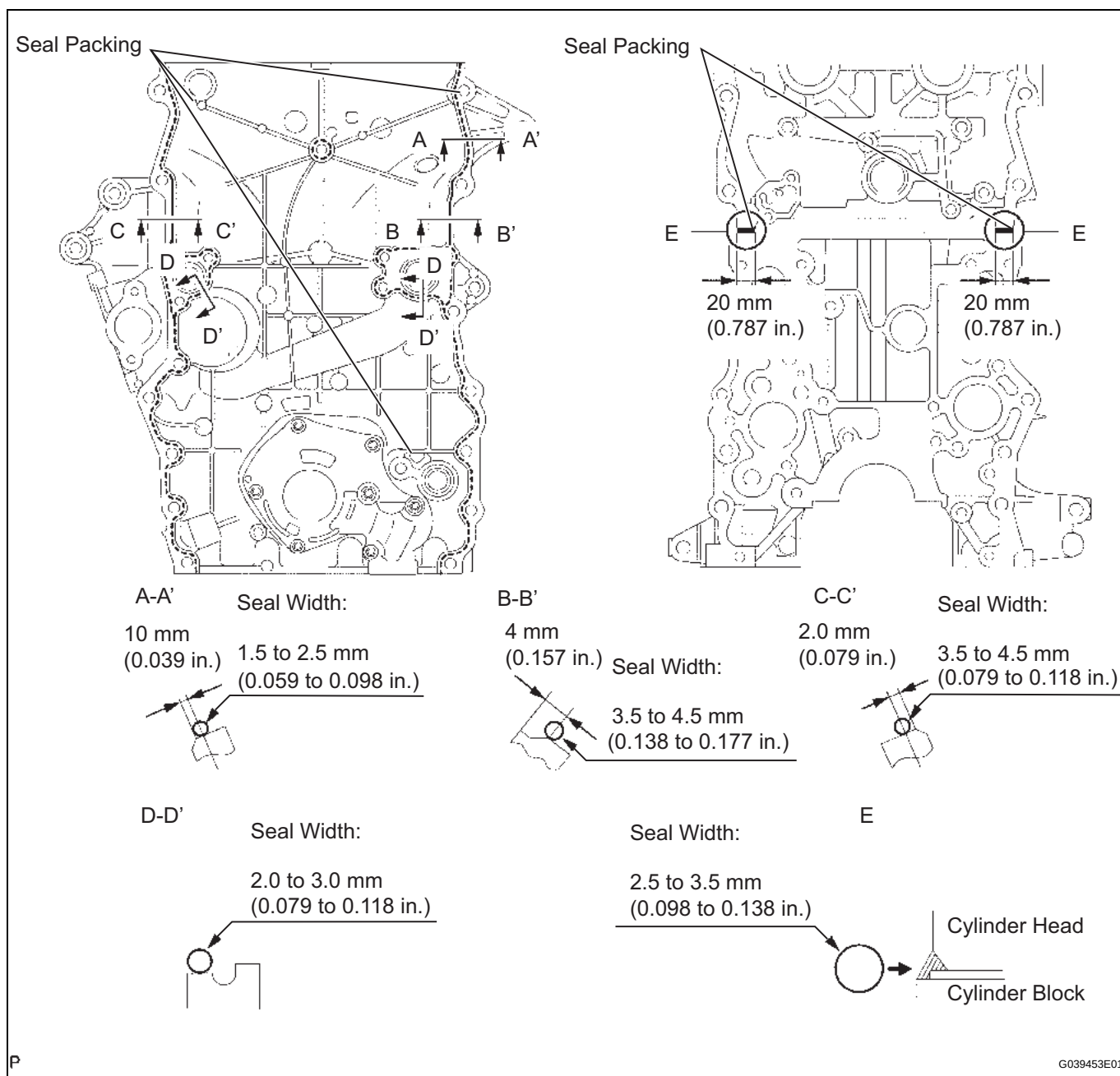
1. INSTALL TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL (See page [EM-149](#))
2. INSTALL THERMOSTAT (See page [CO-8](#))
3. INSTALL WATER INLET (See page [CO-8](#))
4. INSTALL OIL PUMP
 - (a) Apply adhesive to the head straight screw plug.
Adhesive:
Part No. 08833-00070, THREE BOND 1324 or equivalent
 - (b) Using a 10 mm socket hexagon wrench, install the head straight screw plug.
Torque: 17 N*m (170 kgf*cm, 12 ft.*lbf)
 - (c) Install 4 new O-rings onto the oil pump as shown in the illustration.
 - (d) Apply continuous beads of seal packing to the places shown in the illustration.
Seal packing:
Part No. 08826-00080 or equivalent
Seal width:



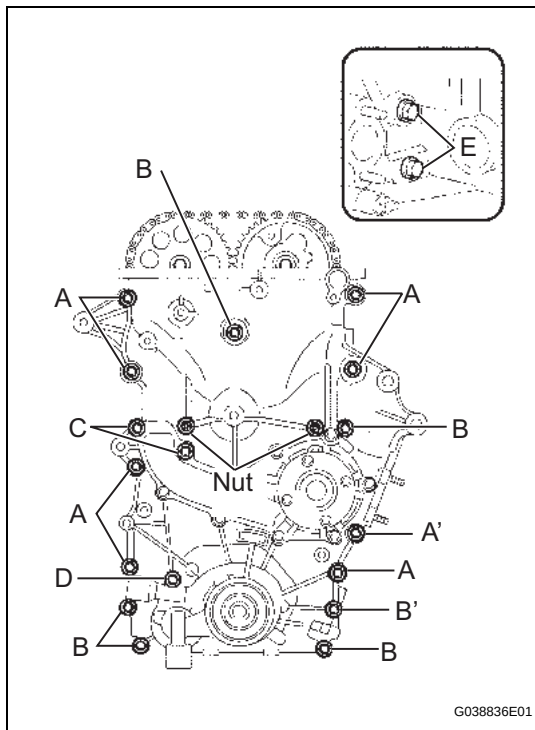
Position	Specified Condition
A - A'	2.5 to 3.0 mm (0.098 to 0.118 in.)
B - B', C - C'	4.0 to 4.5 mm (0.157 to 0.177 in.)
D - D'	2.5 to 3.0 mm (0.098 to 0.118 in.)
E	2.5 to 3.5 mm (0.098 to 0.138 in.)

NOTICE:

- Remove any oil from the contact surface.
- Install the chain cover within 3 minutes and tighten the bolts within 15 minutes of applying seal packing.
- Do not start the engine for at least 4 hours after installation.



- (e) Align the oil pump's drive rotor spline and the crankshaft as shown in the illustration. Install the spline and chain cover onto the crankshaft.
- (f) Loosely install the oil pump with the 19 bolts and 2 nuts, but do not tighten the bolts and nuts yet.



- (g) Provisionally install the oil pump with the 19 bolts and 2 nuts.

NOTICE:

If the vehicle is equipped with air conditioning, install bolts A' and B' when installing the idle pulley with bracket since they are for this purpose.

HINT:

Bolt length:

75 mm (2.95 in.) for bolt A, B

87 mm (3.43 in.) for bolt C

95 mm (3.74 in.) for bolt D

35 mm (1.37 in.) for bolt E

- (h) Fully tighten the bolts and nuts, except bolts A, in the following order: Area 1, Area 3 and then Area 2.

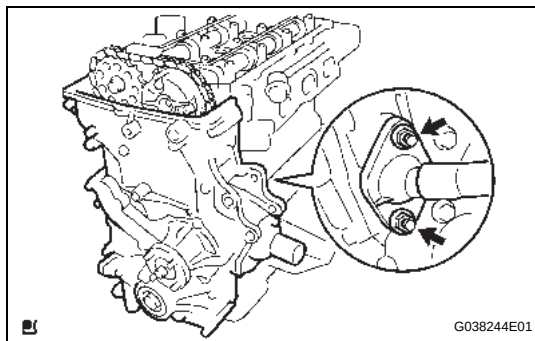
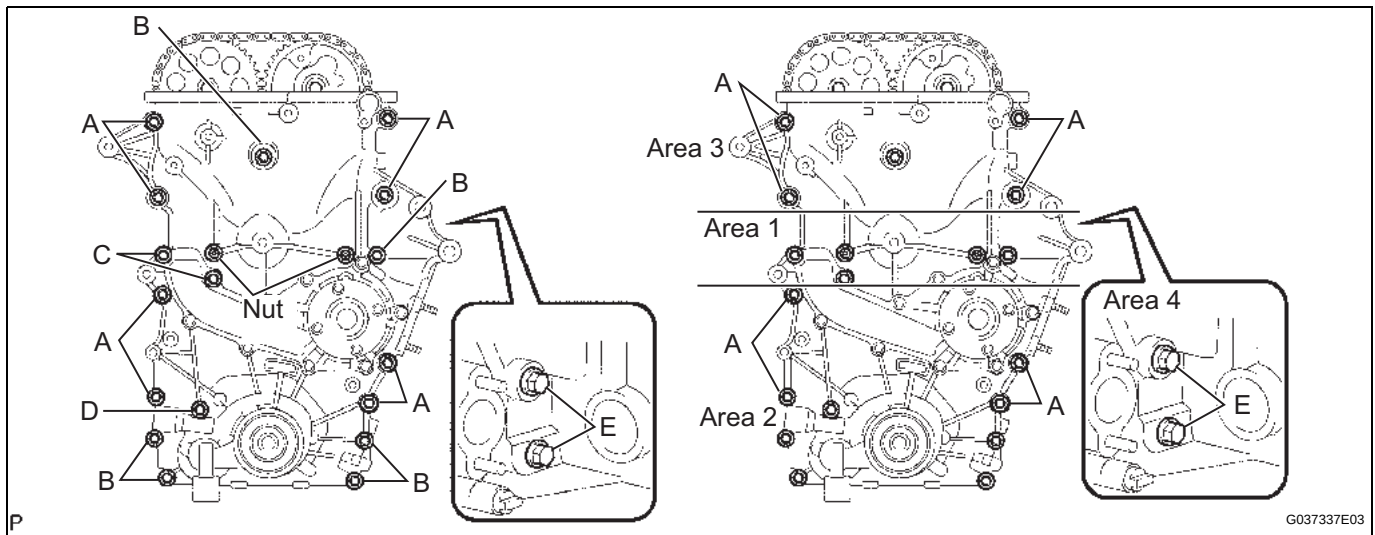
Torque: 21 N*m (214 kgf*cm, 15 ft.*lbf)

- (i) Fully tighten the bolts A in the following order: Area 2 and then Area 3.

Torque: 46 N*m (469 kgf*cm, 34 ft.*lbf)

- (j) Fully tighten the bolts E in Area 4.

Torque: 21 N*m (214 kgf*cm, 15 ft.*lbf)



- (k) Install a new gasket, then install the water by-pass pipe No. 1 with the 2 nuts.

Torque: 18 N*m (178 kgf*cm, 13 ft.*lbf)

5. INSTALL OIL PAN SUB-ASSEMBLY (See page [LU-24](#))
6. INSTALL OIL STRAINER SUB-ASSEMBLY (See page [EM-32](#))
7. INSTALL OIL PAN SUB-ASSEMBLY NO.2 (See page [EM-32](#))
8. INSTALL OIL LEVEL GAGE SUB-ASSEMBLY
9. INSTALL CRANKSHAFT PULLEY (See page [EM-75](#))
10. INSTALL CYLINDER HEAD COVER SUB-ASSEMBLY (See page [EM-48](#))

11. INSTALL INTAKE MANIFOLD TO HEAD GASKET NO. 1 (See page [ES-463](#))
12. INSTALL CAMSHAFT POSITION SENSOR (See page [ES-444](#))
13. INSTALL CRANKSHAFT POSITION SENSOR (See page [ES-447](#))
14. INSTALL IDLE PULLEY ASSEMBLY W/BRACKET (w/ Air Conditioning System) (See page [ES-448](#))
15. INSTALL IDLER PULLEY SUB-ASSEMBLY NO.1 (See page [EM-33](#))
16. INSTALL V-RIBBED BELT TENSIONER ASSEMBLY (See page [CO-6](#))
17. INSTALL GENERATOR ASSEMBLY (See page [CH-13](#))
18. INSTALL INTAKE AIR CONNECTOR (See page [ES-455](#))
19. INSTALL REAR END PLATE (See page [EM-72](#))
20. INSTALL DRIVE PLATE & RING GEAR SUB-ASSEMBLY (for Automatic Transmission) (See page [EM-79](#))
21. INSTALL FLYWHEEL SUB-ASSEMBLY (for Manual Transmission) (See page [EM-79](#))
22. INSTALL CLUTCH DISC ASSEMBLY (for Manual Transmission)

Transmission	See page
R155	CL-32
R155F	CL-37

23. INSTALL CLUTCH COVER ASSEMBLY (for Manual Transmission)

Transmission	See page
R155	CL-32
R155F	CL-37

24. INSTALL ENGINE ASSEMBLY (See page [EM-98](#))
25. INSTALL AUTOMATIC TRANSMISSION ASSEMBLY (See page [AT-113](#))
26. INSTALL MANUAL TRANSMISSION UNIT ASSEMBLY

Transmission	See page
R155	MT-9
R155F	MT-11

27. INSTALL EXHAUST PIPE ASSEMBLY FRONT (See page [EX-2](#))
28. INSTALL EXHAUST PIPE ASSEMBLY TAIL (See page [EX-2](#))
29. CONNECT ENGINE WIRE

30. CONNECT AIR INJECTION SYSTEM NO.1 HOSE (See page [EM-99](#))
31. CONNECT FUEL VAPOR FEED HOSE ASSEMBLY (See page [EM-99](#))
32. CONNECT FUEL HOSE NO.2 (See page [FU-17](#))
33. CONNECT FUEL HOSE (See page [FU-17](#))
34. INSTALL WATER HOSE SUB-ASSEMBLY (See page [EM-99](#))
35. INSTALL RADIATOR HOSE INLET
36. INSTALL COMPRESSOR AND MAGNETIC CLUTCH (w/ Air Conditioning System) (See page [EM-34](#))
37. INSTALL RADIATOR HOSE NO.2
38. INSTALL VANE PUMP ASSEMBLY (See page [EM-34](#))
39. INSTALL AIR CLEANER CASE
 - (a) Install the air cleaner case with the 3 bolts.
Torque: 12 N*m (122 kgf*cm, 9 ft.*lbf)
40. INSTALL AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY
41. INSTALL AIR CLEANER CAP SUB-ASSEMBLY (See page [EC-17](#))
42. INSTALL FAN SHROUD (See page [CO-18](#))
43. INSTALL RADIATOR SUPPORT TO FRAME SEAL LH (See page [CO-19](#))
44. INSTALL BATTERY TRAY
45. INSTALL BATTERY
46. ADD ENGINE OIL (See page [LU-4](#))
47. ADD ENGINE COOLANT (See page [CO-3](#))
48. CHECK ENGINE OIL LEVEL
49. CHECK FUEL LEAKAGE
50. CHECK ENGINE COOLANT LEAKAGE (See page [CO-2](#))
51. CHECK OIL LEAKAGE
52. CHECK EXHAUST GAS LEAKAGE
53. INSTALL ENGINE UNDER COVER SUB-ASSEMBLY NO.1 (for Pre Runner and 4WD Type)
 - (a) Install the engine under cover No. 1 with the 4 bolts.
Torque: 30 N*m (306 kgf*cm, 22 ft.*lbf)
54. INSTALL ENGINE UNDER COVER SUB-ASSEMBLY NO.2 (for Pre Runner and 4WD Type, Regular Cab)
 - (a) Install the engine under cover No. 2 with the 4 bolts.
Torque: 30 N*m (306 kgf*cm, 22 ft.*lbf)
55. INSTALL HOOD SUB-ASSEMBLY (See page [ED-7](#))