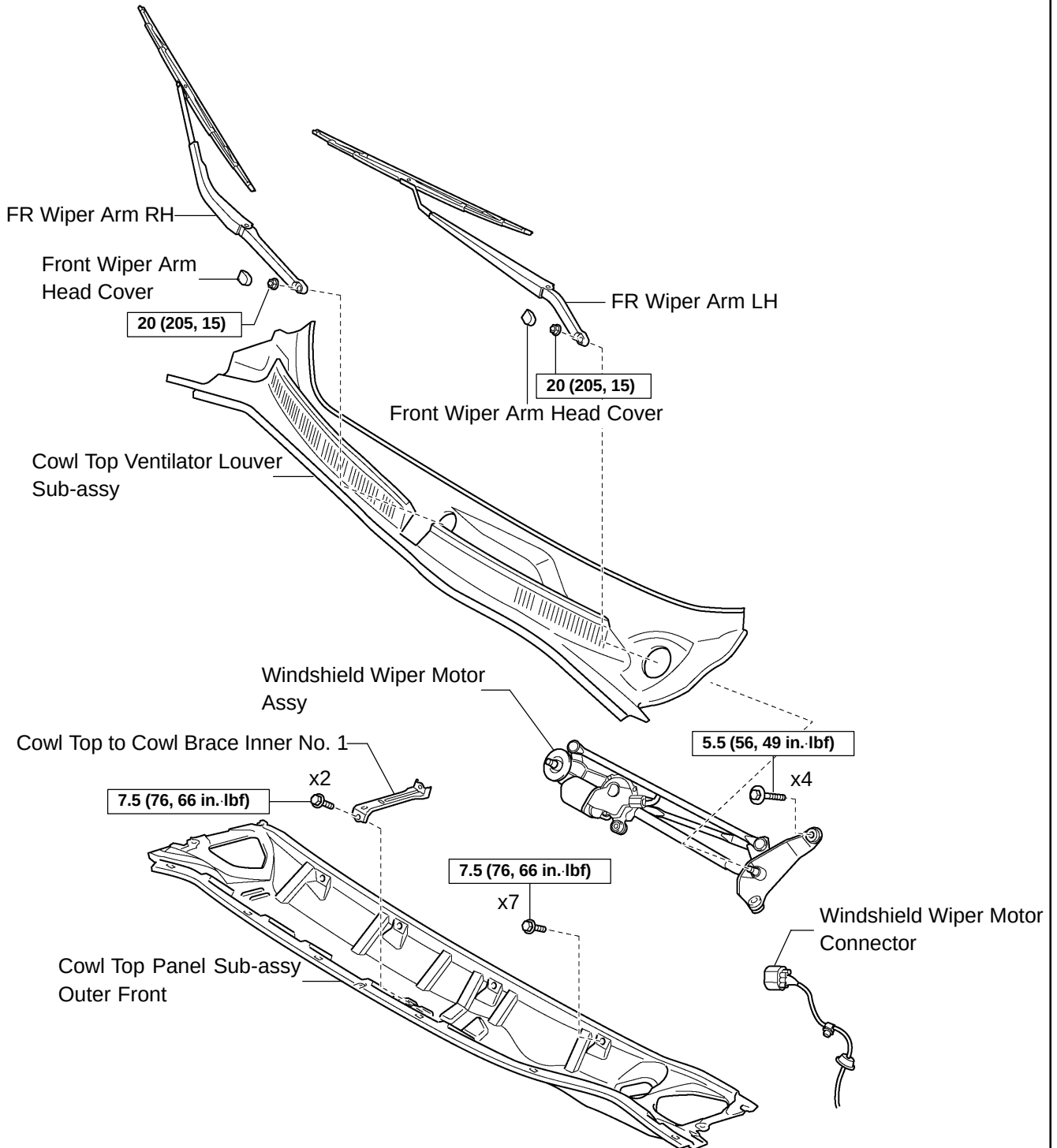


OIL PUMP ASSY COMPONENTS

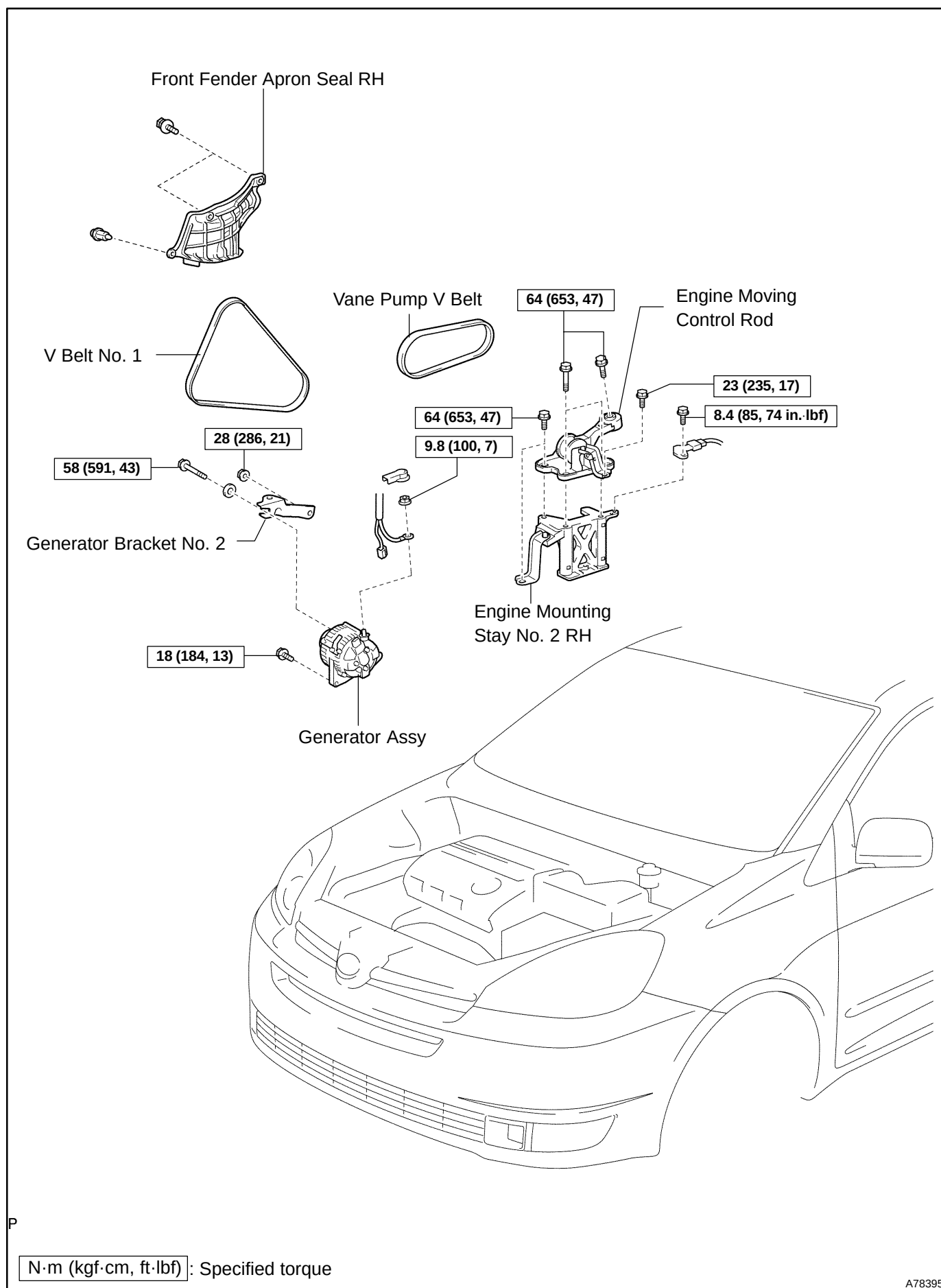
170FG-01

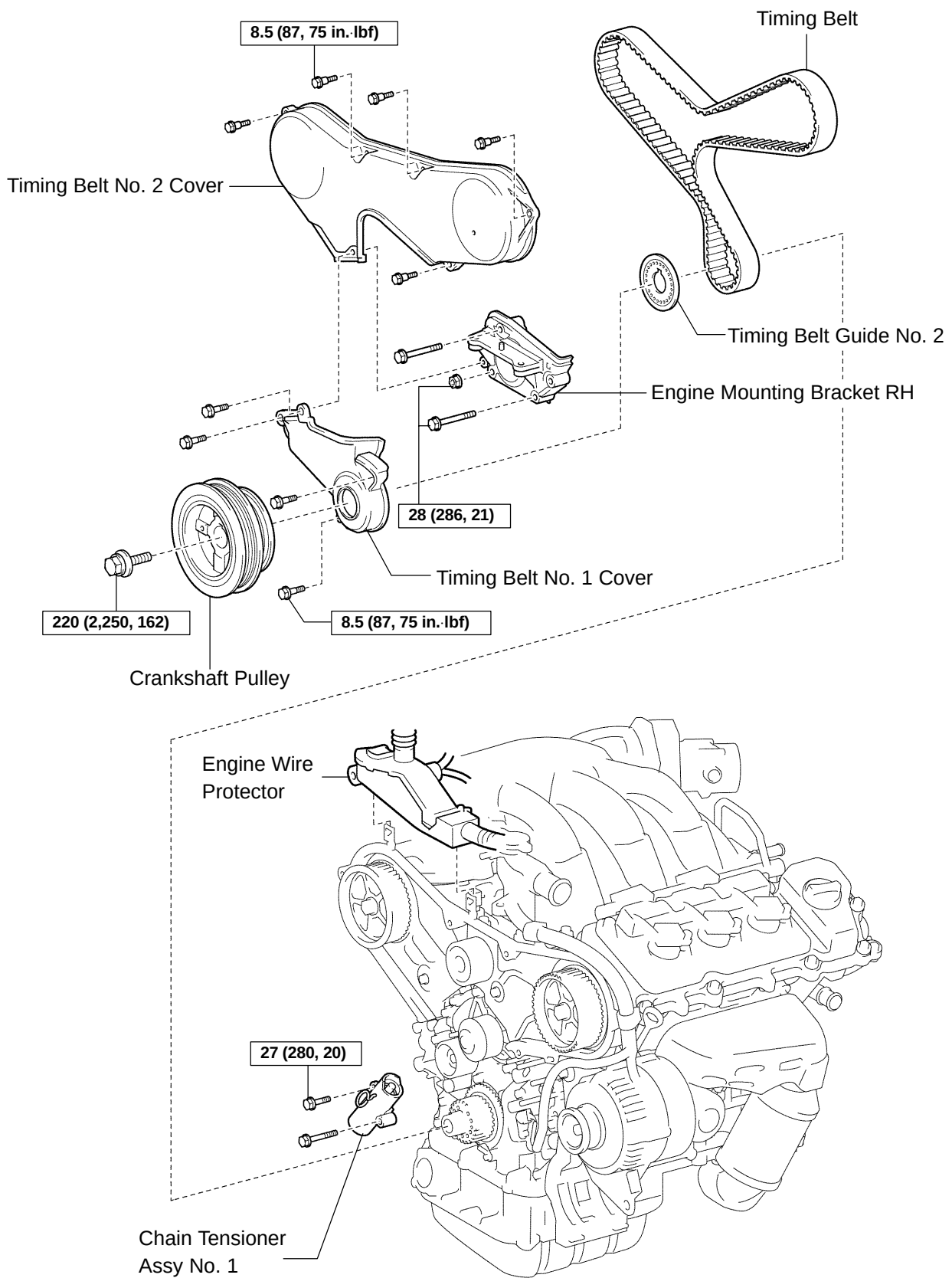


N·m (kgf·cm, ft·lbf) : Specified torque

Y

A79467

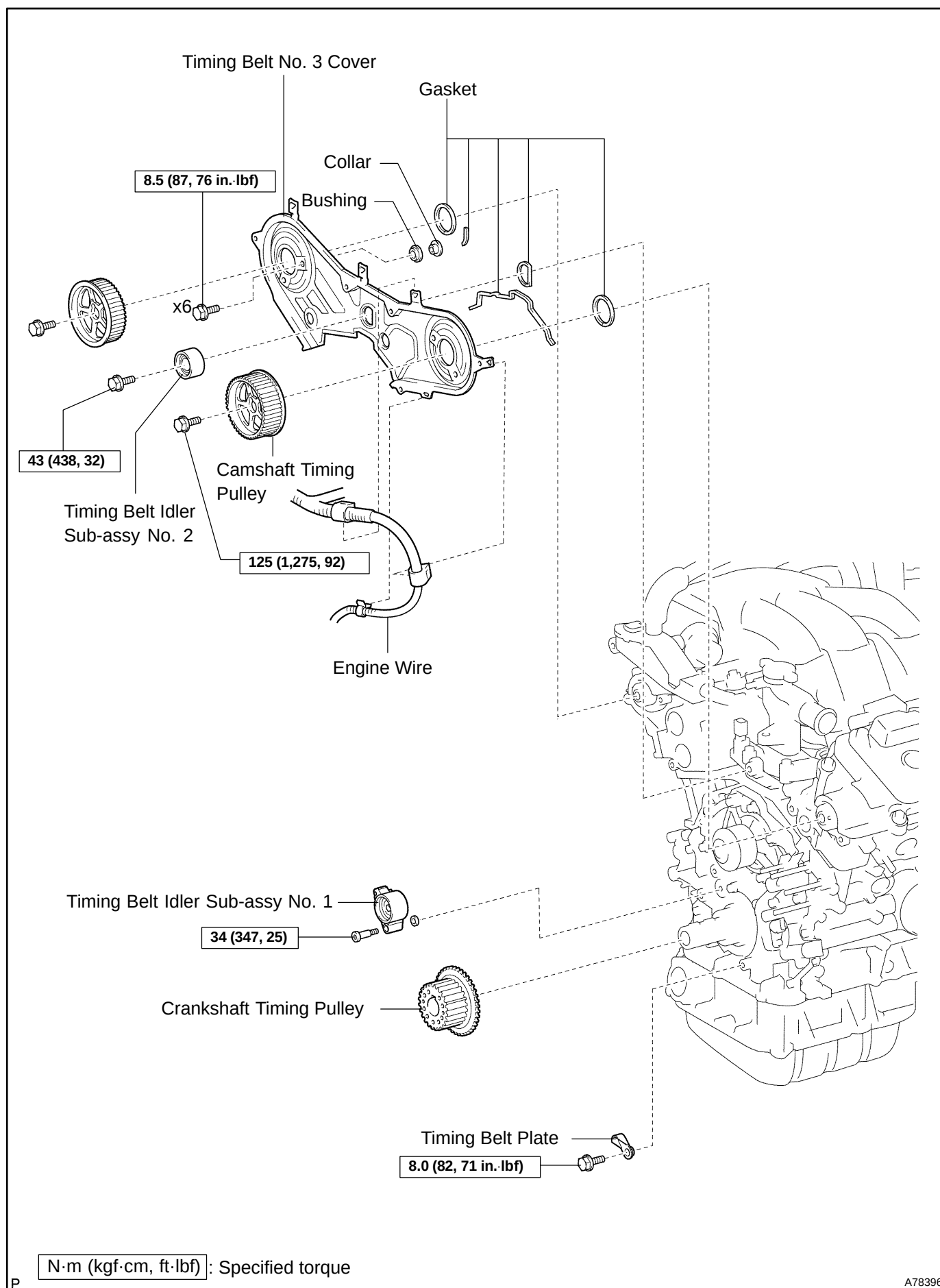




N·m (kgf·cm, ft·lbf) : Specified torque

P

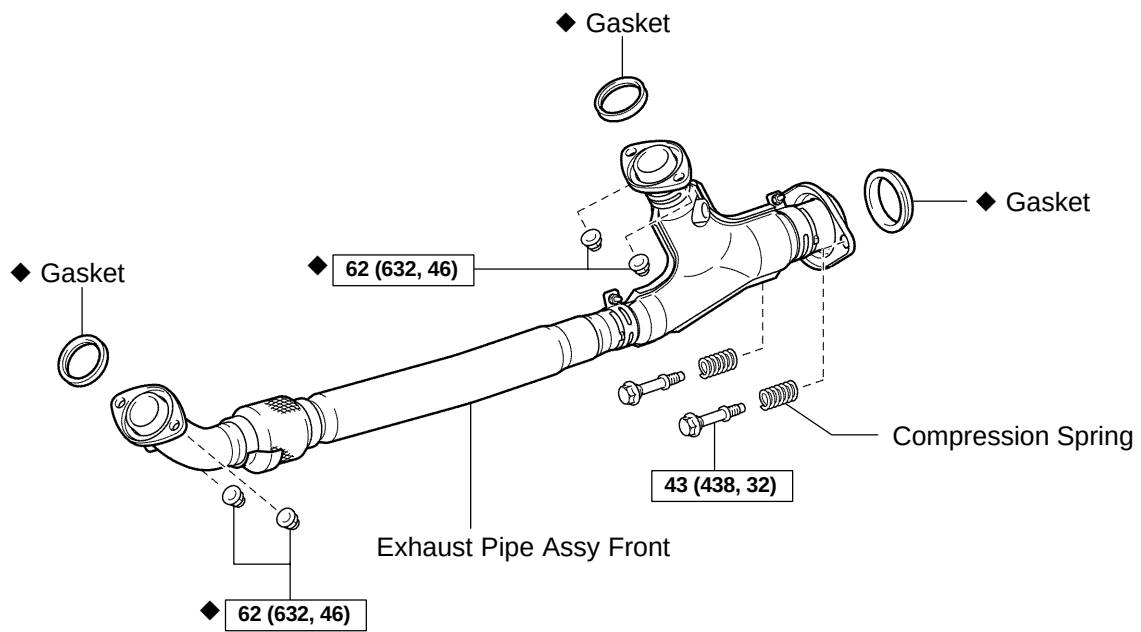
A78353



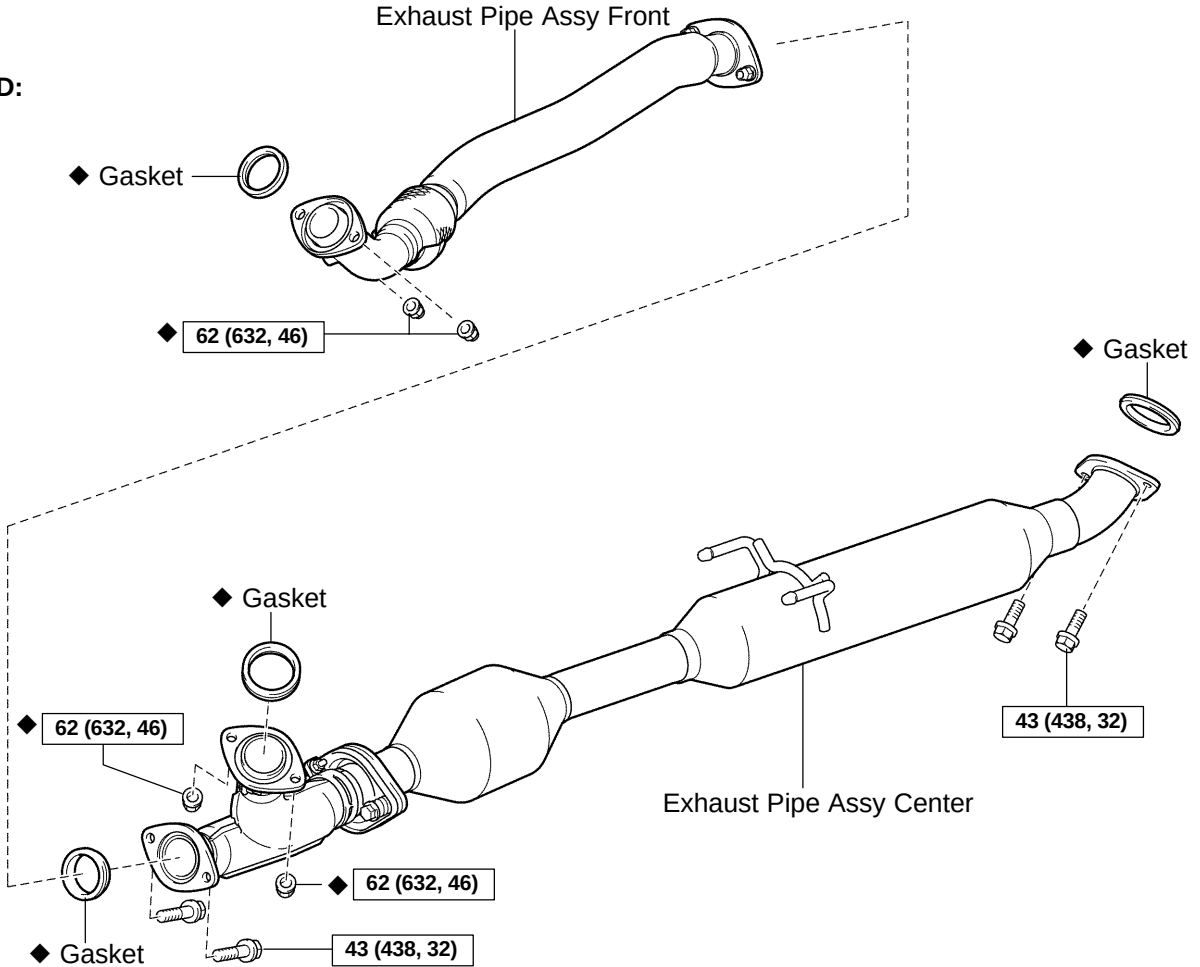
P

A78396

FF:



4WD:

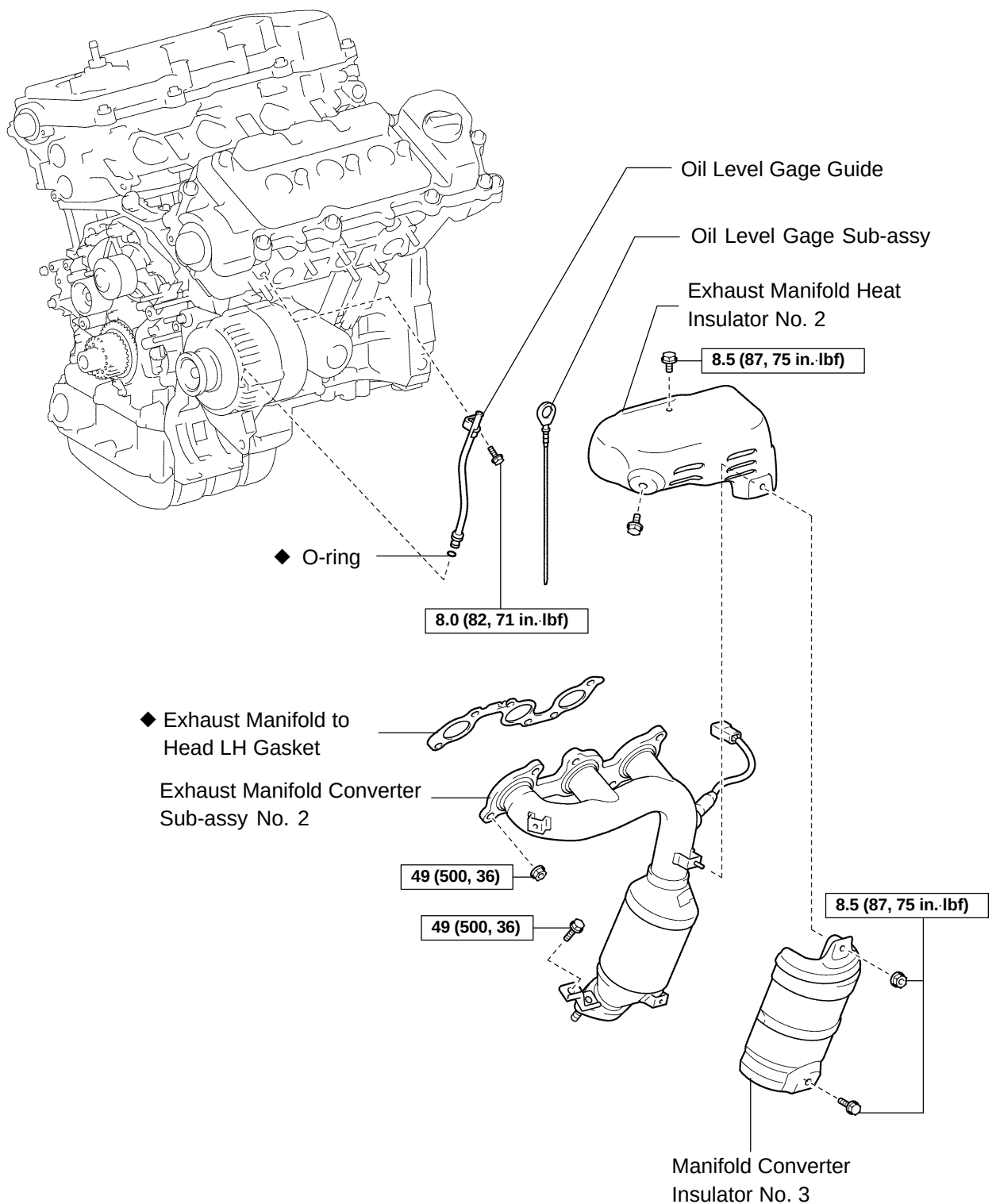


N·m (kgf·cm, ft·lbf) : Specified torque ◆ Non-reusable part

P

A78333

A78392

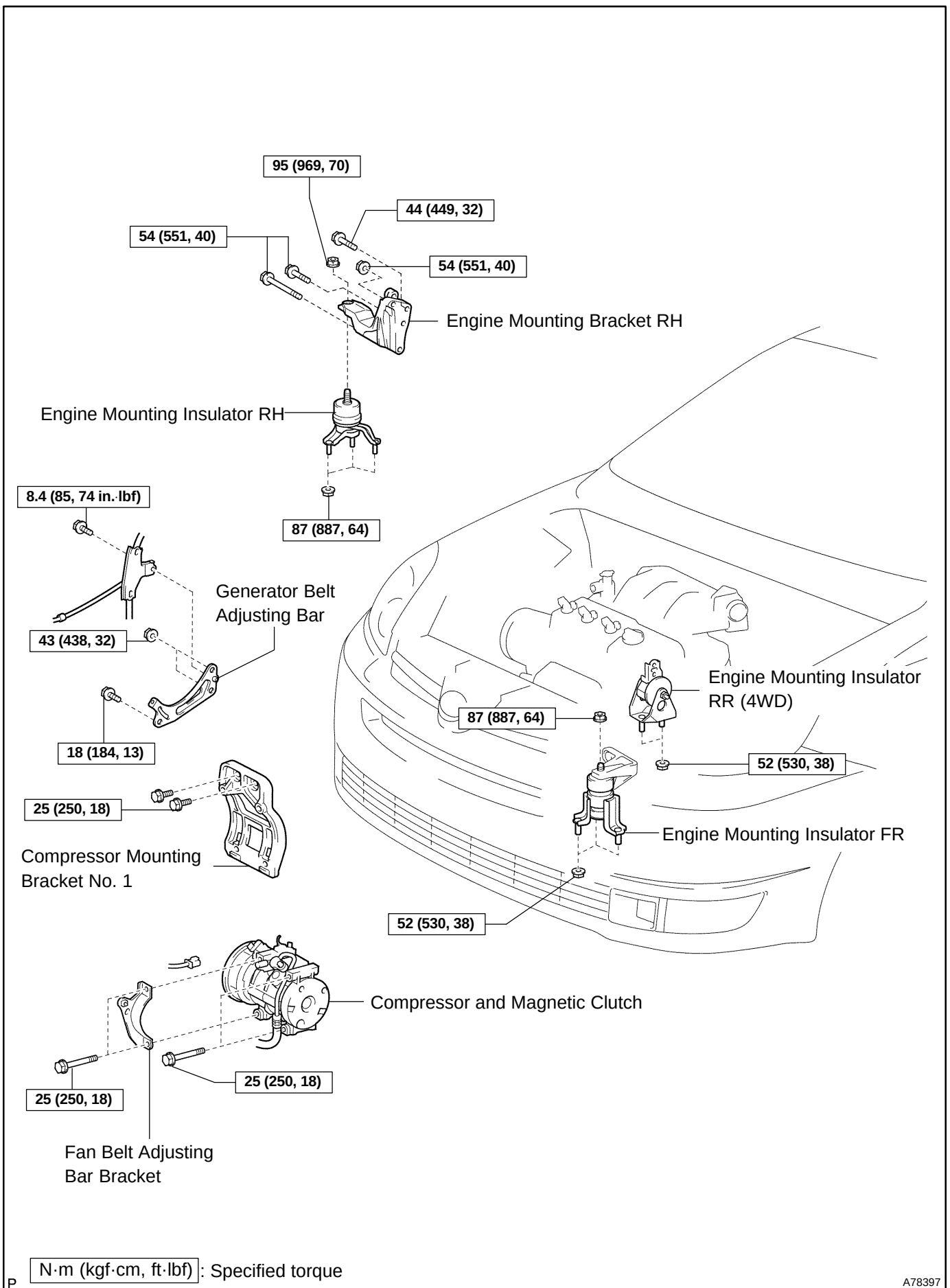


N·m (kgf·cm, ft·lbf) : Specified torque

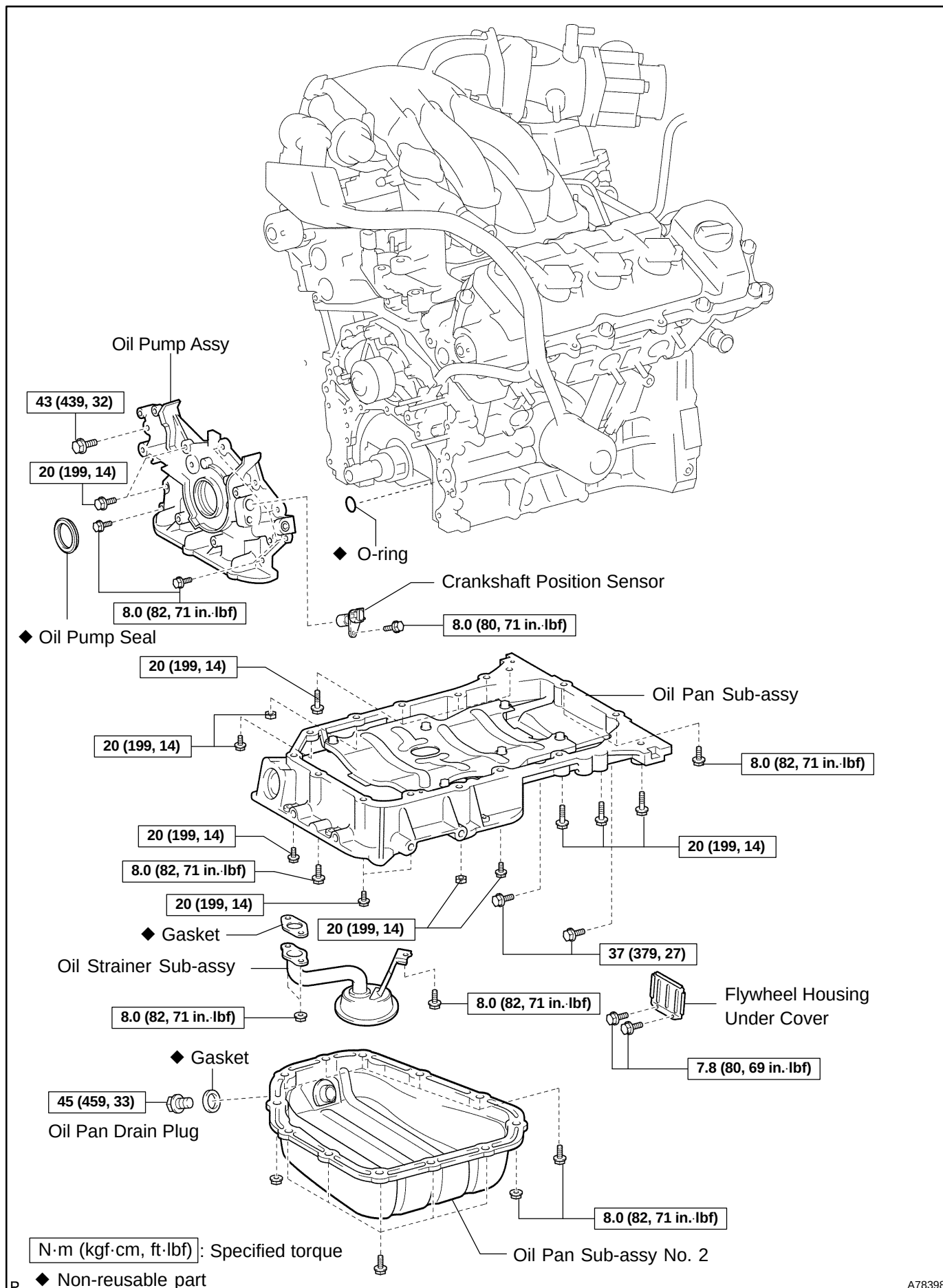
◆ Non-reusable part

P

A78375



A78397



A78398

LUBRICATION SYSTEM

ON-VEHICLE INSPECTION

17020-08

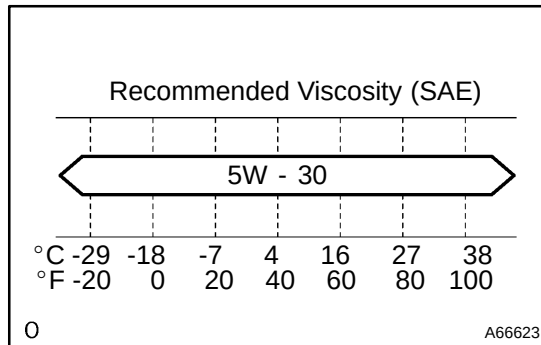
1. CHECK ENGINE OIL LEVEL

- (a) After warm up the engine and then 5 minutes after the engine stop, oil level should be between the low level and full level marks of the dipstick.

If low, check for leakage and add oil up to the full level mark.

NOTICE:

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



2. CHECK ENGINE OIL QUALITY

- (a) Check the oil for deterioration, entry of water, discoloring or thinning.

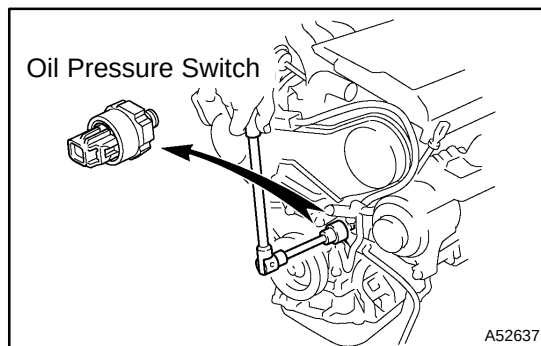
If the quality is visibly poor, replace the oil.

Oil grade:

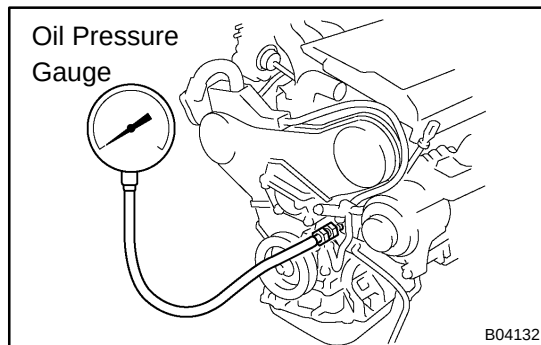
API grade "SL" Energy-Conserving or ILSAC multi-grade engine oil. Recommended viscosity is as shown in the illustration.

3. REMOVE OIL PRESSURE SWITCH ASSY

- (a) Disconnect the oil pressure switch connector.



- (b) Using a deep socket wrench 27mm, remove the oil pressure switch.



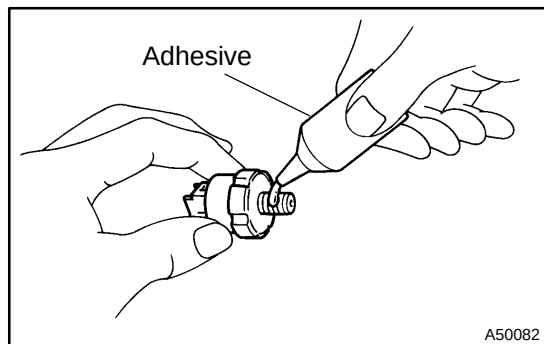
4. INSTALL OIL PRESSURE GAUGE

- (a) Install the oil pressure gauge.

5. WARM UP ENGINE

6. CHECK OIL PRESSURE**Oil pressure:**

At idle	29 kPa (0.3 kgf/cm ² , 4.3 psi) or more
At 3,000 rpm	294 to 539 kPa (3.0 to 5.5 kgf/cm ² , 43 to 78 psi)

7. REMOVE OIL PRESSURE GAUGE**8. INSTALL OIL PRESSURE SWITCH ASSY**

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

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

- (b) Using a deep socket wrench 27mm, install the oil pressure switch.

Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)**NOTICE:****Do not start the engine within 1 hour after the installation.**

- (c) Connect the oil pressure switch connector.

9. START ENGINE AND CHECK FOR LEAKS

OVERHAUL

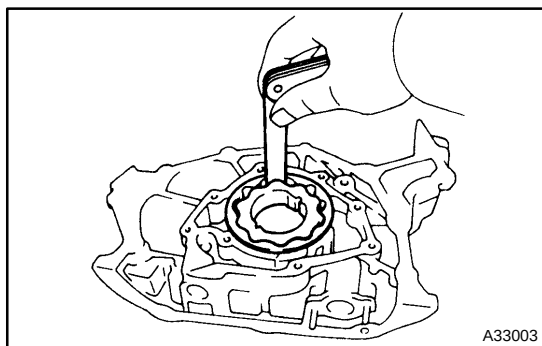
1. INSPECT OIL PUMP ASSY

- (a) Remove the oil pump cover.
 - (1) Remove the 10 screws and the oil pump cover.
- (b) Remove oil pump rotor set.

NOTICE:

Do not change the combination and install direction of the two rotors.

- (c) Inspect oil pump rotor set.
 - (1) Apply a light coat of engine oil to the oil pump rotor set and place them into the oil pump body. Check that the rotors revolve smoothly.

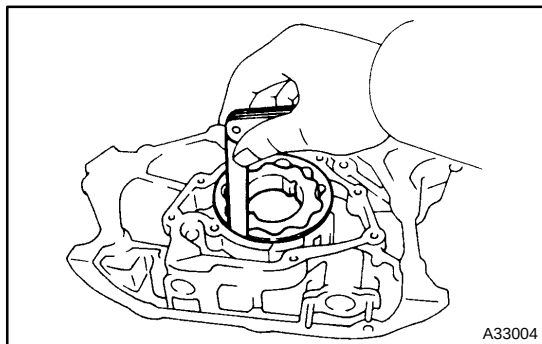


- (d) Inspect rotor tip clearance.
 - (1) Using a feeler gauge, measure the clearance between the drive and the driven rotor tips.

Standard tip clearance:

0.11 to 0.24 mm (0.0043 to 0.0094 in.)

Maximum tip clearance: 0.35 mm (0.0138 in.)

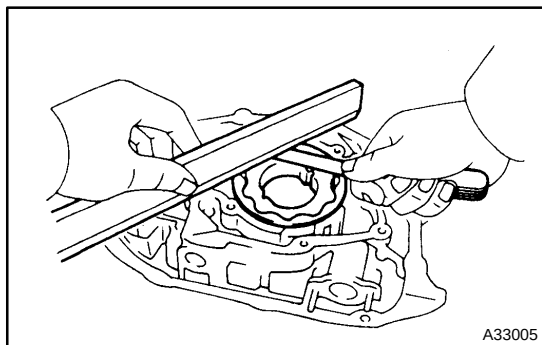


- (e) Inspect rotor body clearance.
 - (1) Using a feeler gauge, measure the clearance between the driven rotor and body.

Standard body clearance:

0.125 to 0.162 mm (0.0050 to 0.0064 in.)

Maximum body clearance: 0.30 mm (0.0118 in.)

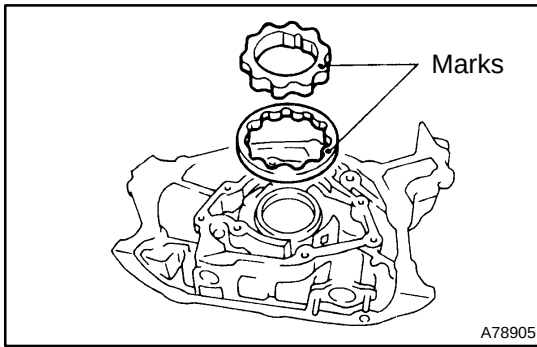


- (f) Inspect rotor side clearance.
 - (1) Using a feeler gauge and precision straight edge, measure the clearance between the rotors and precision straight edge.

Standard side clearance:

0.03 to 0.09 mm (0.0012 to 0.0035 in.)

Maximum side clearance: 0.15 mm (0.0059 in.)



- (g) Install oil pump rotor set.
 - (1) Apply a light coat of engine oil to the oil pump gear set and place it into pump body with the marks facing the pump body cover side.
 - (h) Install oil pump cover.
 - (1) Install the 10 screws and the oil pump cover.
- Torque: 10 N·m (105 kgf·cm, 8 ft·lbf)**

OIL FILTER SUB-ASSY REPLACEMENT

1701H-11

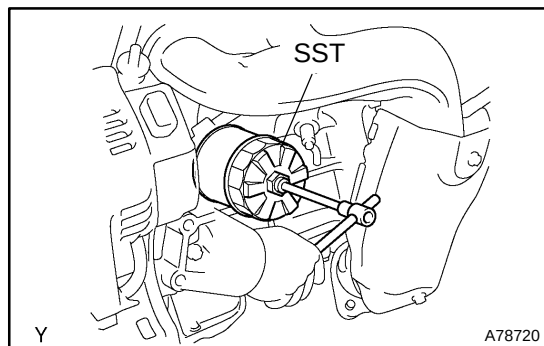
CAUTION:

- Prolonged and repeated contact with engine oil will result in the removal of natural oil 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 water-less hand cleaner to remove any used engine oil. Do not use gasoline, thinners, or solvents.
- In order to preserve the environment, used oil and used oil filter must be disposed of at designated disposal sites.

1. DRAIN ENGINE OIL

- Remove the oil filler cap.
- Remove the oil drain plug, and drain the oil into a container.
- Clean and install the oil drain plug with a new gasket.

Torque: 45 N·m (459 kgf·cm, 33 ft·lbf)

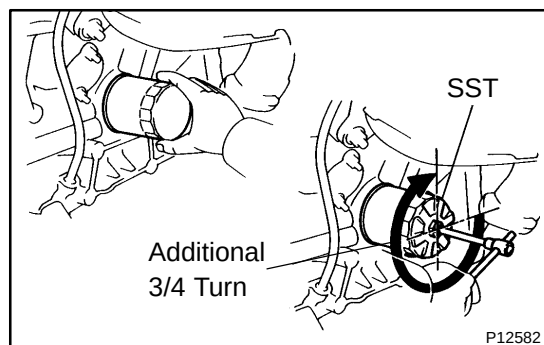


2. REMOVE OIL FILTER SUB-ASSY

- Using SST, remove the oil filter.
SST 09228-07501

3. INSTALL OIL FILTER SUB-ASSY

- Check and clean the oil filter installation surface.
- Apply clean engine oil to the gasket of a new oil filter.
- Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.



- Using SST, tighten it an additional 3/4 turn.
SST 09228-07501

4. ADD ENGINE OIL

- Fill with fresh engine oil.

Capacity:

Drain and refill w/ Oil filter change 4.7 liters (5.0 US qts, 4.1 Imp. qts)

Drain and refill w/o Oil filter change 4.5 liters (4.8 US qts, 4.0 Imp. qts)

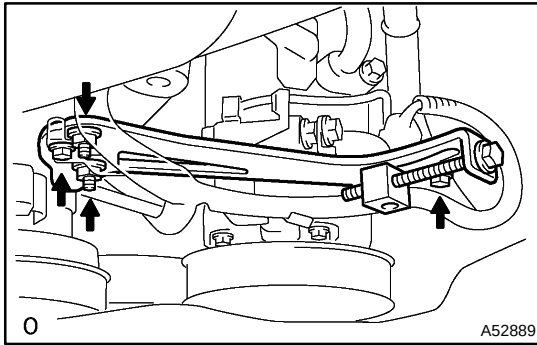
Dry fill 5.5 liters (5.8 US qts, 4.8 Imp. qts)

- Install the oil filler cap.

5. CHECK FOR ENGINE OIL LEAKS

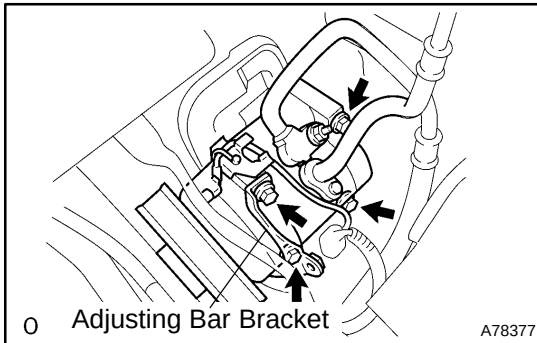
REPLACEMENT

1. DRAIN ENGINE OIL (See page [17-23](#))
2. REMOVE FRONT WHEEL RH
3. REMOVE FRONT WIPER ARM HEAD CAP
4. REMOVE FR WIPER ARM RH (See page [66-8](#))
5. REMOVE FR WIPER ARM LH (See page [66-8](#))
6. REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSY (See page [66-8](#))
7. REMOVE WIPER LINK ASSY (See page [66-8](#))
8. REMOVE COWL TOP TO COWL BRACE INNER NO.1 (See page [11-13](#))
9. REMOVE COWL TOP PANEL SUB-ASSY OUTER FRONT (See page [11-13](#))
10. REMOVE FRONT FENDER APRON SEAL RH
11. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See page [14-5](#))
12. REMOVE GENERATOR ASSY (See page [19-19](#))
13. REMOVE VANE PUMP V BELT (See page [14-5](#))
14. REMOVE ENGINE MOVING CONTROL ROD (See page [14-84](#))
15. REMOVE ENGINE MOUNTING STAY NO.2 RH (See page [14-84](#))
16. REMOVE GENERATOR BRACKET NO.2 (See page [14-84](#))
17. REMOVE CRANKSHAFT PULLEY (See page [14-84](#))
SST 09213-54015 (91651-60855), 09330-00021, 09950-50013 (09951-05010, 09952-05010,
09953-05020, 09954-05031)
18. REMOVE TIMING BELT NO.1 COVER
19. REMOVE TIMING BELT NO.2 COVER (See page [14-84](#))
20. REMOVE ENGINE MOUNTING BRACKET RH (See page [14-84](#))
21. REMOVE TIMING BELT GUIDE NO.2
22. REMOVE TIMING BELT (See page [14-84](#))
23. REMOVE TIMING BELT IDLER SUB-ASSY NO.2
24. REMOVE CAMSHAFT TIMING PULLEY (See page [14-99](#))
SST 09960-10010 (09962-01000, 09963-01000), 09249-63010
25. REMOVE TIMING BELT NO.3 COVER (See page [14-99](#))
26. REMOVE TIMING BELT IDLER SUB-ASSY NO.1 (See page [16-13](#))
27. REMOVE CRANKSHAFT TIMING PULLEY (See page [14-152](#))
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05011)
28. REMOVE EXHAUST PIPE ASSY CENTER (4WD DRIVE TYPE) (See page [15-6](#))
29. REMOVE EXHAUST PIPE ASSY FRONT (2WD DRIVE TYPE) (See page [15-2](#))
30. REMOVE EXHAUST PIPE ASSY FRONT (4WD DRIVE TYPE) (See page [15-6](#))
31. REMOVE MANIFOLD CONVERTER INSULATOR NO.3 (See page [14-146](#))
32. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.2 (See page [14-146](#))
33. REMOVE EXHAUST MANIFOLD CONVERTER SUB-ASSY NO.2 (See page [14-146](#))
34. REMOVE OIL LEVEL GAGE GUIDE (See page [14-146](#))



35. REMOVE GENERATOR BELT ADJUSTING BAR

- (a) Remove the 2 bolts, the 2 nuts and the adjusting bar.

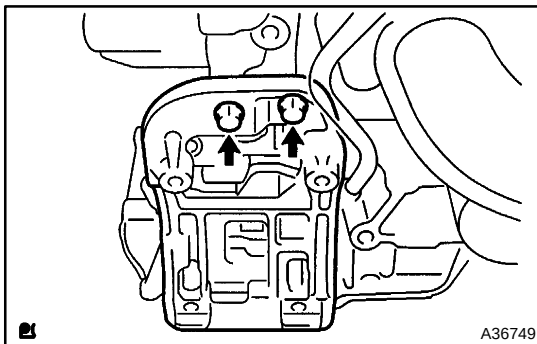


36. SEPARATE COMPRESSOR AND MAGNETIC CLUTCH

- (a) Disconnect the compressor connector.
 (b) Remove the 4 bolts, the adjusting bar bracket and the compressor.

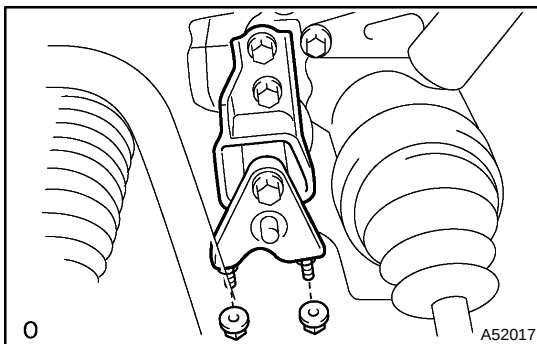
HINT:

The hoses are off to the side instead of detaching.



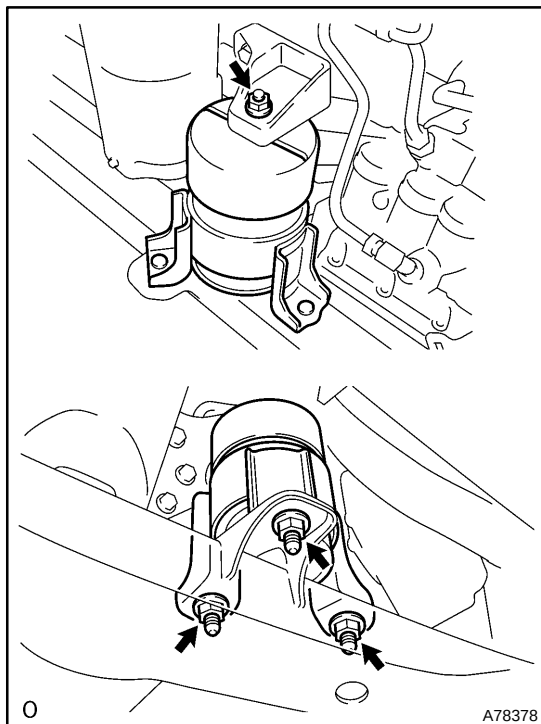
37. REMOVE COMPRESSOR MOUNTING BRACKET NO.1

- (a) Remove the 2 bolts and the compressor mounting bracket No. 1.



38. SEPARATE ENGINE MOUNTING INSULATOR RR (4WD DRIVE TYPE)

- (a) Remove the 2 nuts and disconnect the engine mounting insulator RR.

**39. SEPARATE ENGINE MOUNTING INSULATOR FR**

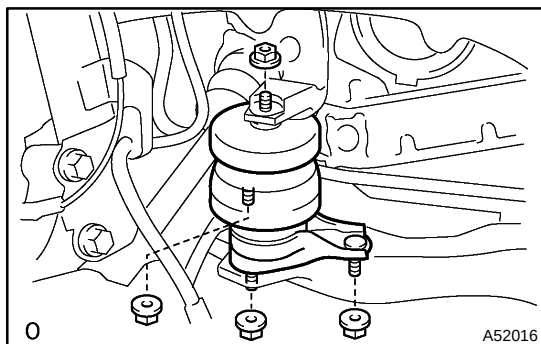
- (a) Remove the 4 nuts and separate the engine mounting insulator FR.

NOTICE:

Do not remove the engine mounting insulator FR.

40. REMOVE ENGINE MOUNTING INSULATOR RH

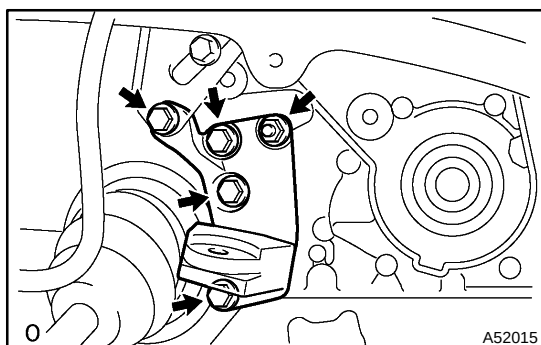
- (a) Remove the bolt and disconnect the power steering return hose clamp from the frame.



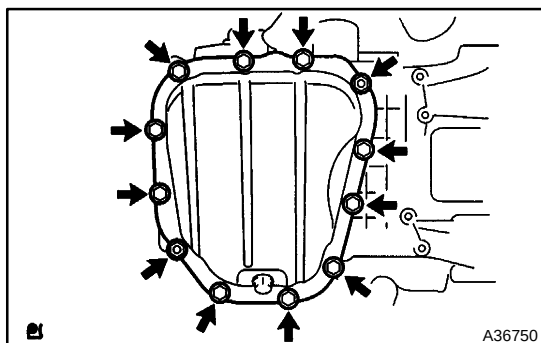
- (b) Remove the 4 nuts.
 (c) Place a wooden block on a jack underneath the engine.
 (d) Jack-up the engine and remove the engine mounting insulator RH.

NOTICE:

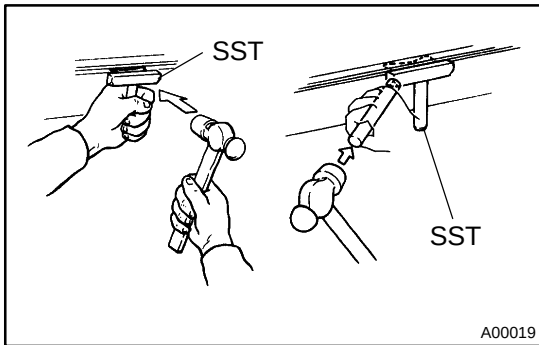
Be careful not to damage the oil pan.

**41. REMOVE ENGINE MOUNTING BRACKET RH**

- (a) Remove the 4 bolts, the nut and the bracket.

**42. REMOVE OIL PAN SUB-ASSY NO.2**

- (a) Remove the 10 bolts and the 2 nuts.



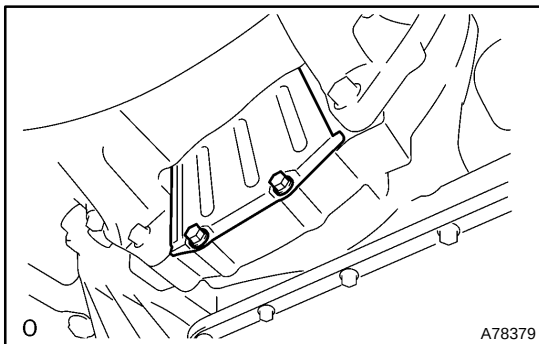
- (b) Insert the blade of SST between oil pan No.1 and oil pan No.2, cut off the sealer and remove the oil pan No.2.
SST 09032-00100

NOTICE:

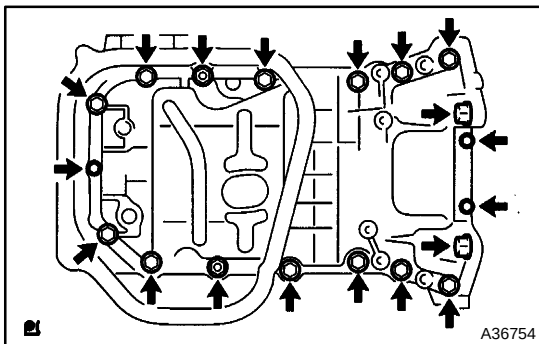
- Be careful not to damage the contact surface of oil pan No. 1 where oil pan No. 2 is mounting.
- Do not damage flange portion of oil pan No. 2 when removing.

43. REMOVE OIL STRAINER SUB-ASSY

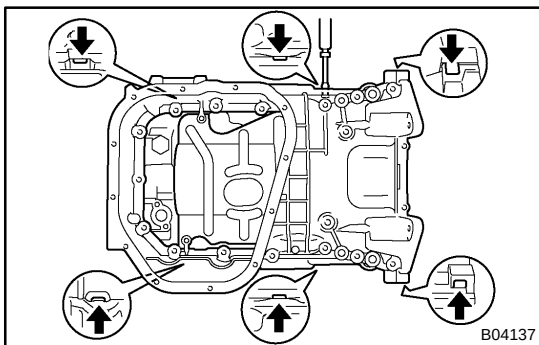
- (a) Remove the bolt, the 2 nuts, the oil strainer and the gasket.

**44. REMOVE OIL PAN SUB-ASSY**

- (a) Remove the 2 bolts and the flywheel housing under cover.



- (b) Loosen and remove the 17 bolts and the 2 nuts uniformly.



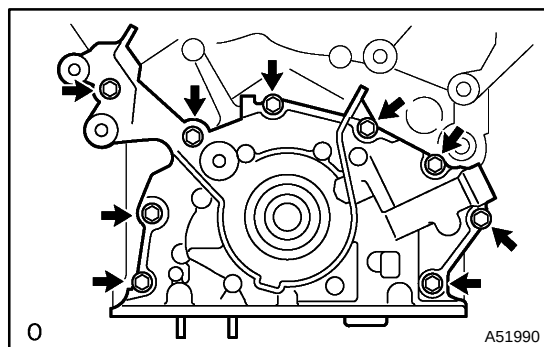
- (c) Using a screwdriver, remove the oil pan by prying between the cylinder block and the oil pan.

NOTICE:

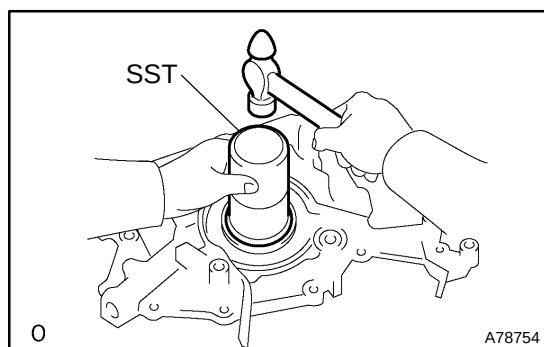
Be careful not to damage the contact surfaces of the oil pan and cylinder block.

45. REMOVE CRANKSHAFT POSITION SENSOR

- (a) Disconnect the crankshaft position sensor connector.
(b) Remove the bolt and the crankshaft position sensor.

**46. REMOVE OIL PUMP ASSY**

- (a) Remove the 9 bolts.
- (b) Using a screwdriver, remove the oil pump by prying between the oil pump and the main bearing cap.
- (c) Remove the O-ring.

**47. INSTALL OIL PUMP SEAL**

- (a) Using SST and a hammer, tap in a new oil seal until its surface is flush with the oil pump body edge.

SST 09223-00010

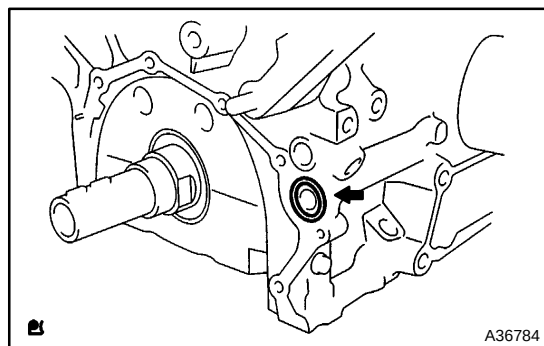
NOTICE:

- **Be careful not to tap the oil seal at an angle.**
- **Keep the lip free of foreign objects.**

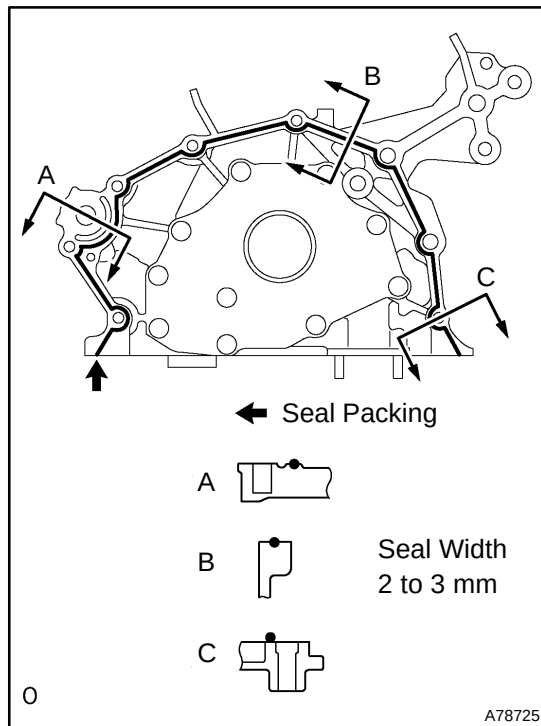
- (b) Apply MP grease to the oil seal lip.

48. INSTALL OIL PUMP ASSY

- (a) Remove any old seal packing material from the contact surface.



- (b) Apply a light coat of engine oil to a new O-ring and place it on the cylinder block.

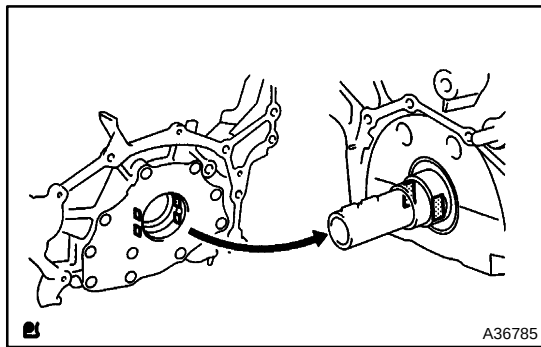


- (c) Apply a continuous bead of seal packing (Diameter 2 to 3 mm (0.08 to 0.12 in.)) as shown in the illustration.

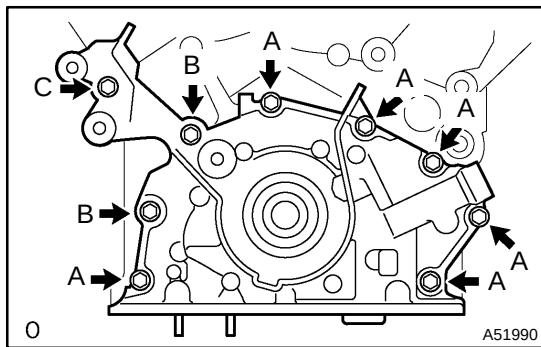
Seal packing: Part No. 08826-00080 or equivalent

NOTICE:

- Remove any oil from contact surface.
- Apply seal packing to the inner side of the bolt holes.
- Install the oil pump within 3 minutes after applying seal packing.
- Do not expose the seal to engine oil within 2 hours after installing.



- (d) Align the key of the oil pump drive gear with the keyway located on the crankshaft, and slide the oil pump into place.



- (e) Install the oil pump with the 9 bolts. Tighten the bolts uniformly in several steps.

Torque:

Bolt A 8.0 N·m (82 kgf·cm, 71 in·lbf)

Bolt B 20 N·m (199 kgf·cm, 14 ft·lbf)

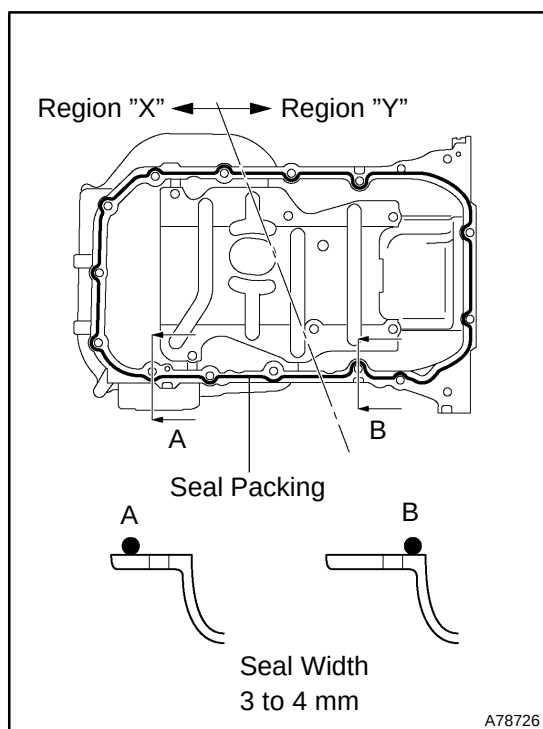
Bolt C 43 N·m (439 kgf·cm, 32 ft·lbf)

49. INSTALL CRANKSHAFT POSITION SENSOR

Torque: 8.0 N·m (80 kgf·cm, 71 in·lbf)

50. INSTALL OIL PAN SUB-ASSY

- (a) Remove any old seal packing from the contact surface.



- (b) Apply a continuous bead of seal packing (Diameter 3 to 4 mm (0.12 to 0.16 in.)) as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

NOTICE:

- Remove any oil from the contact surface.
 - Apply seal packing to the outer side of the bolt holes in the region "X".
 - Apply seal packing to the inner side of the bolt holes in the region "Y".
 - Install the oil pan within 3 minutes after applying seal packing.
 - Do not expose the seal to engine oil within 2 hours after installing.
- (c) Install the oil pan No.1 with the 17 bolts and the 2 nuts. Tighten the bolts uniformly in several steps.
- Torque:**
 10 mm head 8.0 N·m (82 kgf·cm, 71 in·lbf)
 12 mm head 20 N·m (199 kgf·cm, 14 ft·lbf)
 14 mm head 37 N·m (379 kgf·cm, 27 ft·lbf)
- (d) Install the flywheel housing under cover with the 2 bolts.
- Torque: 7.8 N·m (80 kgf·cm, 69 in·lbf)**

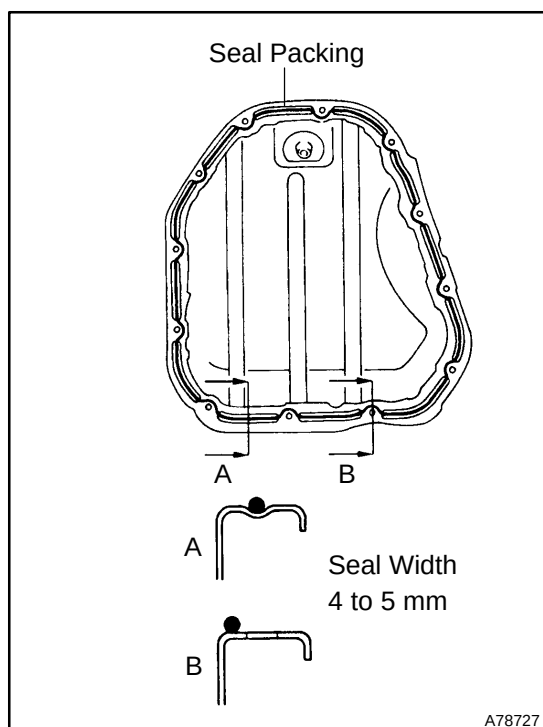
51. INSTALL OIL STRAINER SUB-ASSY

- (a) Install a new gasket and the oil strainer with the bolt and the 2 nuts.

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

52. INSTALL OIL PAN SUB-ASSY NO.2

- (a) Remove any old seal packing from the contact surface.

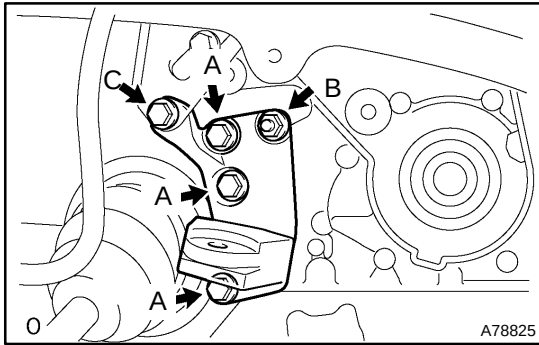
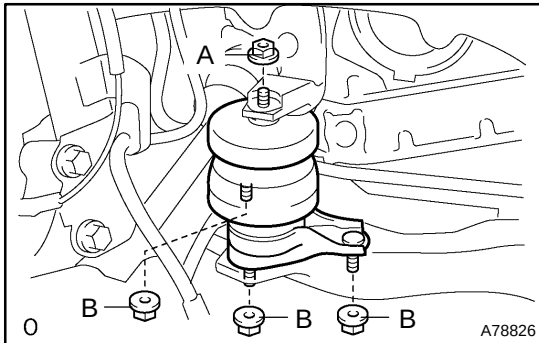
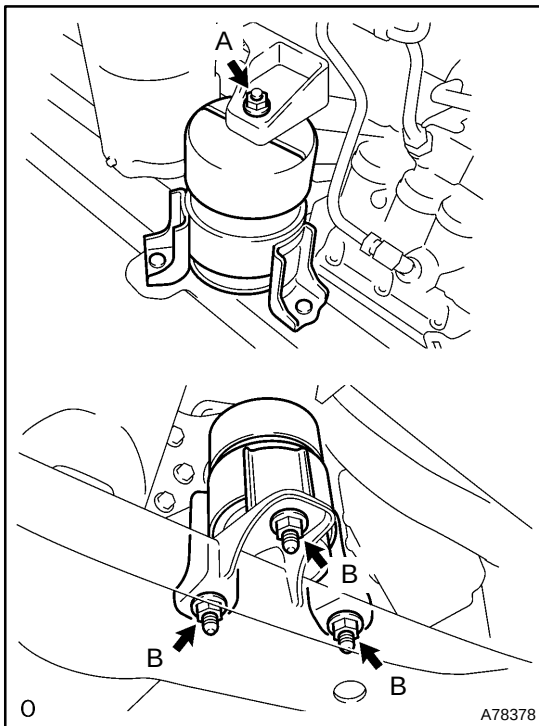
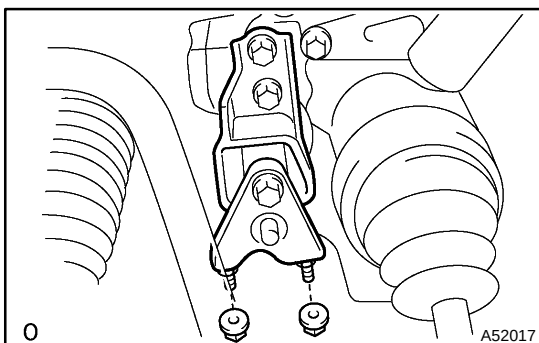


- (b) Apply a continuous bead of seal packing (Diameter 4 to 5 mm (0.16 to 0.20 in.)) as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

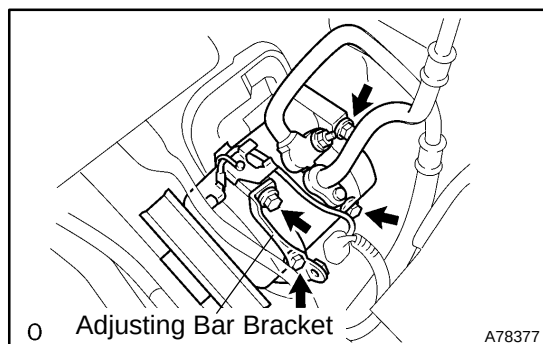
NOTICE:

- Remove any oil from the contact surface.
 - Apply seal packing to the inner side of the bolt holes.
 - Install the oil pan within 3 minutes after applying seal packing.
 - Do not expose the seal to engine oil within 2 hours after installing.
- (c) Install the oil pan No. 2 with the 10 bolts and the 2 nuts.
- Torque: 8.0 N·m (82 kgf·cm, 71 in·lbf)**

**53. INSTALL ENGINE MOUNTING BRACKET RH****Torque:****Bolt A 54 N·m (551 kgf·cm, 40 ft·lbf)****Nut B 54 N·m (551 kgf·cm, 40 ft·lbf)****Bolt C 44 N·m (449 kgf·cm, 32 ft·lbf)****54. INSTALL ENGINE MOUNTING INSULATOR RH****Torque:****Nut A 95 N·m (969 kgf·cm, 70 ft·lbf)****Nut B 87 N·m (887 kgf·cm, 64 ft·lbf)****55. INSTALL ENGINE MOUNTING INSULATOR FR****Torque:****Nut A 87 N·m (887 kgf·cm, 64 ft·lbf)****Nut B 52 N·m (530 kgf·cm, 38 ft·lbf)****56. INSTALL ENGINE MOUNTING INSULATOR RR (4WD DRIVE TYPE)****Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)**

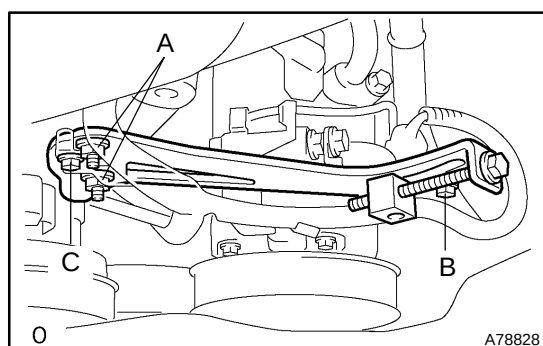
57. INSTALL COMPRESSOR MOUNTING BRACKET NO.1

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

**58. INSTALL COMPRESSOR AND MAGNETIC CLUTCH**

- (a) Install the compressor and the adjusting bar bracket with the 4 bolts.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

**59. INSTALL GENERATOR BELT ADJUSTING BAR**

- (a) Install the adjusting bar with the 2 bolts and the 2 nuts.

Torque:

Nut A 43 N·m (438 kgf·cm, 32 ft·lbf)

Bolt B 18 N·m (184 kgf·cm, 13 ft·lbf)

Bolt C 8.4 N·m (85 kgf·cm, 74 in·lbf)

- 60. INSTALL OIL LEVEL GAGE GUIDE (See page [14-146](#))
- 61. INSTALL EXHAUST MANIFOLD CONVERTER SUB-ASSY NO.2 (See page [14-146](#))
- 62. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.2 (See page [14-146](#))
- 63. INSTALL MANIFOLD CONVERTER INSULATOR NO.3 (See page [14-146](#))
- 64. INSTALL EXHAUST PIPE ASSY FRONT (2WD DRIVE TYPE) (See page [15-2](#))
- 65. INSTALL EXHAUST PIPE ASSY FRONT (4WD DRIVE TYPE) (See page [15-6](#))
- 66. INSTALL EXHAUST PIPE ASSY CENTER (4WD DRIVE TYPE) (See page [15-6](#))
- 67. INSTALL CRANKSHAFT TIMING PULLEY (See page [14-152](#))
- 68. INSTALL TIMING BELT IDLER SUB-ASSY NO.1 (See page [16-13](#))
- 69. INSTALL TIMING BELT NO.3 COVER (See page [14-99](#))
- 70. INSTALL CAMSHAFT TIMING PULLEY (See page [14-99](#))
SST 09960-10010 (09962-01000, 09963-01000), 09249-63010
- 71. INSTALL TIMING BELT IDLER SUB-ASSY NO.2 (See page [14-99](#))
- 72. INSPECT TIMING BELT (See page [14-84](#))
- 73. INSTALL TIMING BELT (See page [14-84](#))
SST 09960-10010 (09962-01000, 09963-01000)
- 74. INSTALL CHAIN TENSIONER ASSY NO.1 (See page [14-84](#))
- 75. INSTALL TIMING BELT GUIDE NO.2 (See page [14-84](#))
- 76. INSTALL ENGINE MOUNTING BRACKET RH (See page [14-84](#))
- 77. INSTALL TIMING BELT NO.2 COVER (See page [14-84](#))
- 78. INSTALL TIMING BELT NO.1 COVER (See page [14-84](#))
- 79. INSTALL CRANKSHAFT PULLEY (See page [14-84](#))
SST 09213-54015 (91651-60855), 09330-00021
- 80. INSTALL GENERATOR BRACKET NO.2 (See page [14-84](#))
- 81. INSTALL ENGINE MOUNTING STAY NO.2 RH (See page [14-84](#))

82. INSTALL ENGINE MOVING CONTROL ROD (See page [14-84](#))
83. INSTALL VANE PUMP V BELT (See page [14-5](#))
84. INSTALL GENERATOR ASSY (See page [19-19](#))
85. INSTALL V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See page [14-5](#))
86. INSPECT DRIVE BELT DEFLECTION AND TENSION (REFERENCE) (See page [14-1](#))
87. INSTALL COWL TOP PANEL SUB-ASSY OUTER FRONT (See page [11-13](#))
88. INSTALL COWL TOP TO COWL BRACE INNER NO.1 (See page [11-13](#))
89. INSTALL WIPER LINK ASSY (See page [66-8](#))
90. INSTALL FR WIPER ARM LH (See page [66-8](#))
91. INSTALL FR WIPER ARM RH (See page [66-8](#))
92. INSTALL FRONT WHEEL RH (See page [14-5](#))
93. ADD ENGINE OIL (See page [17-23](#))
94. CHECK FOR ENGINE OIL LEAKS
95. CHECK FOR EXHAUST GAS LEAKS