ENGINE (2AZ–FSE)

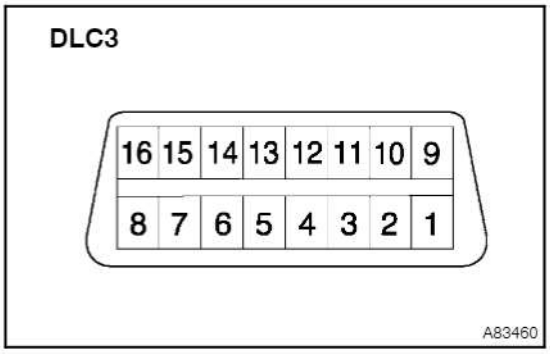
141N2–01

INSPECTION

1. **INSPECT COOLANT (See page 16–7)**
2. **INSPECT ENGINE OIL (See page 17–1)**
3. **INSPECT BATTERY (See page 19–6)**
4. **INSPECT AIR CLEANER FILTER ELEMENT SUB–ASSY**
5. **INSPECT SPARK PLUG (See page 18–3)**
6. **INSPECT V–RIBBED BELT**
7. **INSPECT IGNITION TIMING**

(a) Warm up the engine.

(b) Remove the DLC3 cover from the DLC3 connector.



(c) When using the hand–held tester.

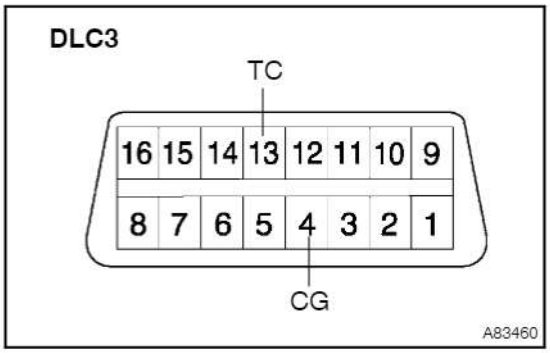
(1) Connect the hand–held tester to the DLC3.

(2) Enter DATA LIST MODE on the hand–held tester.

Ignition timing: 8 to 12° BTDC

HINT:

Please refer to the hand–held tester operator's manual if you need help to select DATA LIST.



(d) When not using the hand–held tester.

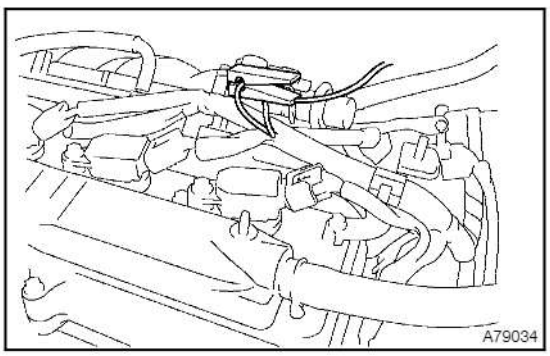
(1) Using SST, connect terminals 13 (TC) and 4 (CG) of DLC3.

SST 09843–18040

NOTICE:

- **Be careful to connect correctly. It causes breakage of the engine.**
- **Turn all electrical systems OFF before connecting the terminals.**
- **Operate the inspection after the cooling fan motor is turned OFF**

(2) Remove the cylinder head cover No.2 (see page 14–45).



(3) Pull out the wire harness as shown in the illustration. Connect the clip of the timing light to the engine.

NOTICE:

- **Use a timing light which detects the first signal.**
- **After checking, be sure to wrap the wire harness with tape.**

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(4) Inspect the ignition timing at idle.

Ignition timing: 8 to 12° BTDC

NOTICE:

When checking the ignition timing, shift the transmission to the neutral position.

HINT:

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

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

(6) Inspect the ignition timing at idle.

Ignition timing: 5 to 23° BTDC

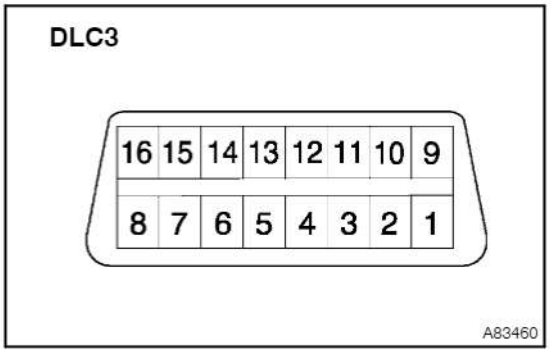
(7) Confirm that ignition timing moves to advanced angle when the engine speed is increased.

(8) Remove the timing light.

8. INSPECT ENGINE IDLE SPEED

(a) Warm up the engine.

(b) Remove the DLC3 cover from the DLC3 connector.



(c) When using the hand–held tester:

(1) Connect the hand–held tester to the DLC3.

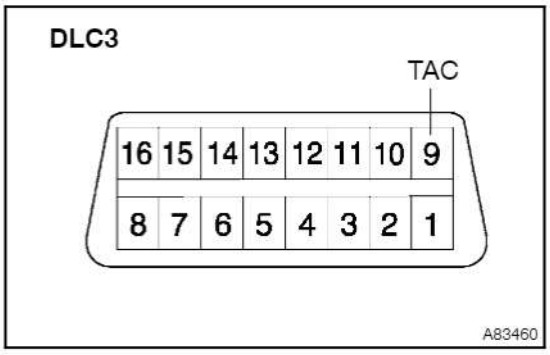
Idle speed: 625 to 725 rpm

NOTICE:

- **Check idle speed with the cooling fan OFF.**
- **Switch off all accessories and air conditioning.**

HINT:

Please refer to the hand–held tester operator's manual if you need help to select DATA LIST.



(d) When not using hand–held tester:

(1) Using SST, connect the tachometer test prove to terminal 9 (TAC) of DLC3.

SST 09843–18030

(2) Check the idle speed.

Idle speed: 625 to 725 rpm

NOTICE:

- **Check the idle speed with the cooling fan OFF.**
- **Switch OFF all accessories and air conditioning.**

9. INSPECT COMPRESSION

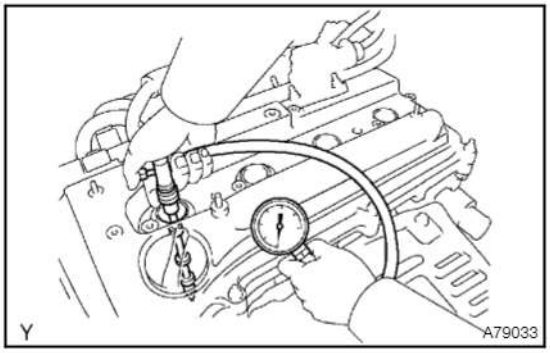
(a) Stop a warm engine.

(b) Disconnect the injector connectors.

(c) Remove all ignition coils.

(d) Remove all spark plugs.

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(e) Inspect the cylinder compression pressure.
SST 09992–00500
(1) Insert a compression gauge into the spark plug hole.
(2) Fully open the throttle with hand.
(3) While cranking the engine, measure the compression pressure.

Compression pressure:
1.3 MPa (13.3 kgf/cm^2, 189 psi)
Minimum pressure:
1.0 MPa (10.2 kgf/cm^2, 145 psi)
Difference between each cylinder:
0.1 MPa (1.0 kgf/cm^2, 14 psi)

NOTICE:
- **Always use a fully–charged battery to obtain engine speed of 250 rpm or more.**
- **Check the other cylinder's compression pressure in the same way.**
- **This measurement must be done quickly as possible.**

(4) 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, it is likely that the piston rings and/or cylinder bore may be worn or damaged.
- If pressure stays low, the valve may be sticking or seating improperly, or there may be leakage past the gasket.

10. INSPECT CO/HC

(a) Start the engine.
(b) Race 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 the CO/HC concentration at idle and/or 2,500 rpm.

HINT:
When performing the 2 modes test (2,500 rpm and idle), follow the measurement order prescribed by the applicable local regulations.
If the CO/HC concentration does not comply with regulations, troubleshoot in the order given below.
(1) Check the A/F sensor and heated oxygen sensor operation.
(2) See the table below for possible causes, then inspect and repair the applicable causes if necessary.

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CO	HC	Problems	Causes
Normal	High	Rough idle	1. Faulty ignitions: • Incorrect timing • Fouled, shorted or improperly gapped plugs 2. Incorrect valve clearance 3. Leaky in intake and exhaust valves 4. Leaky in cylinders
Low	High	Rough idle (Fluctuating HC reading)	1. Vacuum leaks: • PCV hoses • Intake manifold • Throttle body • Brake booster line 2. Lean mixture causing misfire
High	High	Rough idle (Black smoke from exhaust)	1. Restricted air filter 2. Plugged PCV valve 3. Faulty SFI systems: • Faulty pressure regulator • Defective water temperature sensor • Faulty ECM • Faulty injectors • Faulty throttle position sensor • Faulty MAF sensor

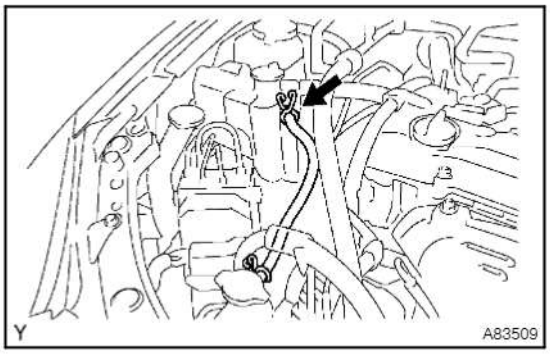
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FAN AND GENERATOR V BELT (2AZ–FSE)

141N3–01

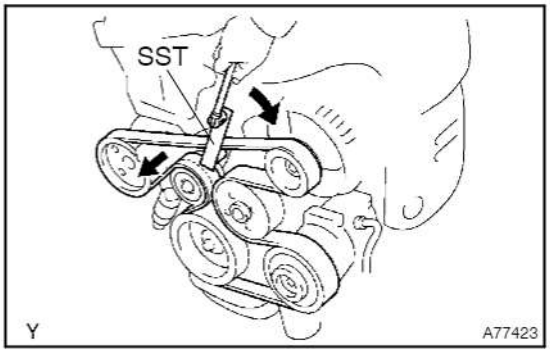
REPLACEMENT

1. REMOVE RADIATOR SUPPORT OPENING COVER (See page 14–23)
2. REMOVE ENGINE ROOM COVER SIDE (See page 14–23)
3. REMOVE ENGINE UNDER COVER LH (See page 14–23)
4. REMOVE ENGINE UNDER COVER NO.4 RH (See page 14–23)
5. REMOVE ENGINE UNDER COVER RH (See page 14–23)



6. REMOVE FAN AND GENERATOR V BELT

(a) Disconnect the radiator reserve tank hose as shown in the illustration.



(b) Using SST, loosen the V belt tensioner arm clockwise, then remove the fan and generator V belt.
SST 09249–63010

7. INSTALL FAN AND GENERATOR V BELT

(a) Using SST, loosen the V belt tensioner arm clockwise, then install the fan and generator V belt.
SST 09249–63010

8. INSTALL ENGINE UNDER COVER RH
9. INSTALL ENGINE UNDER COVER NO.4 RH
10. INSTALL ENGINE UNDER COVER LH
11. INSTALL ENGINE ROOM COVER SIDE
12. INSTALL RADIATOR SUPPORT OPENING COVER

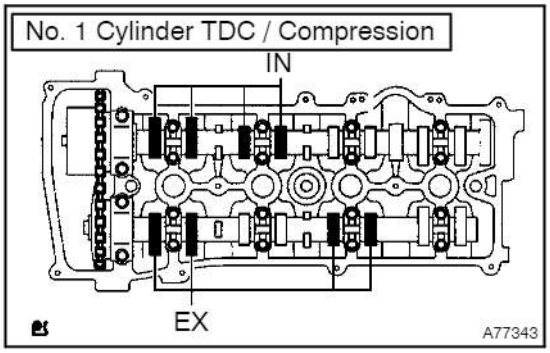
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VALVE CLEARANCE (2AZ–FSE)

141N4–01

ADJUSTMENT

1. DISCHARGE FUEL SYSTEM PRESSURE (See page 11–4)
2. REMOVE RADIATOR SUPPORT OPENING COVER (See page 14–23)
3. REMOVE ENGINE ROOM COVER SIDE (See page 14–23)
4. REMOVE ENGINE UNDER COVER LH (See page 14–23)
5. REMOVE ENGINE UNDER COVER NO.4 RH (See page 14–23)
6. REMOVE ENGINE UNDER COVER RH (See page 14–23)
7. REMOVE ENGINE COVER SUB–ASSY NO.1 (See page 14–45)
8. REMOVE FUEL PRESSURE PULSATION DAMPER ASSY
9. REMOVE FUEL TUBE SUB–ASSY (See page 11–4)
10. REMOVE FUEL PIPE SUB–ASSY NO.1 (See page 11–24)
    SST 09023–12900
11. REMOVE IGNITION COIL ASSY (See page 14–45)
12. REMOVE CYLINDER HEAD COVER SUB–ASSY (See page 14–45)
13. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14–45)



14. INSPECT VALVE CLEARANCE

HINT:

Inspect and adjust the valve clearance when the engine is cold.

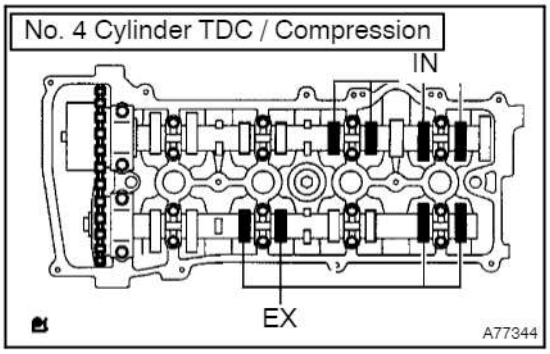
(a) Check the valves indicated in the illustration.

(1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

Valve clearance (Cold):
Intake 0.19 to 0.29 mm (0.0075 to 0.0114 in.)
Exhaust 0.30 to 0.40 mm (0.0118 to 0.0157 in.)

(2) Record the out–of specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

(b) Turn the crankshaft clockwise 1 revolution (360°), then set No. 4 cylinder to TDC/compression.



(c) Check the valves indicated in the illustration.

(1) Using a feeler gauge, measure the clearance between the valve lifter and the camshaft.

Valve clearance (Cold):
Intake 0.19 to 0.29 mm (0.0075 to 0.0114 in.)
Exhaust 0.30 to 0.40 mm (0.0118 to 0.0157 in.)

(2) Record the out–of specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

15. ADJUST VALVE CLEARANCE

NOTICE:

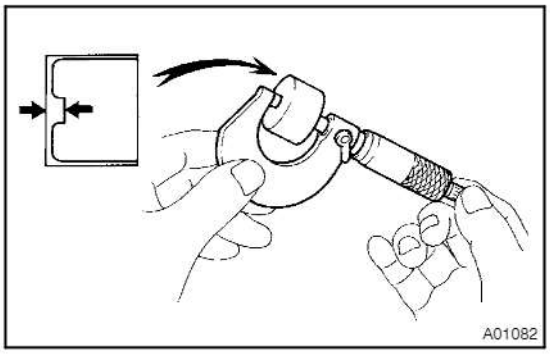
Be sure not to turn the crankshaft without the chain tensioner.

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(a) Set the No. 1 cylinder to TDC/compression (see page 14–45).
(b) Remove the chain tensioner (see page 14–45).

NOTICE:
Be careful not to drop anything inside the timing chain cover.

(c) Remove the camshafts (see page 14–64).
(d) Tie the timing chain with a string.
(e) Remove the valve lifters.


A01082

(f) Determine the replacement valve lifter size according to these Formula or Charts:
(1) Using a micrometer, measure the thickness of the removed lifter.
(2) Calculate the thickness of a new lifter so that the valve clearance comes within the specified valve.

A	Thickness of new lifter
B	Thickness of used lifter
C	Measured valve clearance

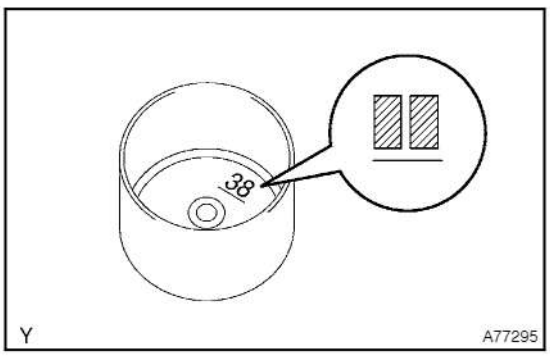
Valve clearance:
Intake: A = B + (C – 0.24 mm (0.0094 in.))
Exhaust: A = B + (C – 0.35 mm (0.0138 in.))

EXAMPLE: (Intake)
Measure valve clearance = 0.44 mm (0.0173 in.)
0.44 mm (0.0173 in.) – 0.24 mm (0.0094 in.) = 0.20 mm (0.0079 in.)
(Measured – Specification = Excess clearance)
Used shim measurement = 5.30 mm (0.2087 in.)
0.20 mm (0.0079 in.) + 5.30 mm (0.2087 in.) = 5.50 mm (0.2165 in.)
(Excess clearance + Used shim = Ideal new shim)
Closest new shim = 5.50 mm (0.2165 in.) = Shim No. "50"

(3) Select a new lifter with a thickness which is as close to the calculated valves as possible.

HINT:

- The lifter are available in 35 sizes in increments of 0.020 mm (0.0008 in.), from 5.060 mm (0.1992 in.) to 5.740 mm (0.2260 in.).



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- Identification number inside the valve lifter shows the value of the 2 decimal places. (The illustration shows 5.380 mm (0.2118 in.))
- Refer to the New Lifter Thickness Table on the next 2 pages.

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Valve Lifter Selection Chart (Intake)

Measured Clearance mm (in.) \ Installed Lifter Thickness mm (in.)	5.060 (0.1992)	5.080 (0.2000)	5.100 (0.2008)	5.120 (0.2016)	5.140 (0.2024)	5.160 (0.2031)	5.180 (0.2039)	5.200 (0.2047)	5.210 (0.2051)	5.220 (0.2055)	5.230 (0.2059)	5.240 (0.2063)	5.250 (0.2067)	5.260 (0.2071)	5.270 (0.2075)	5.280 (0.2079)	5.290 (0.2083)	5.300 (0.2087)	5.310 (0.2091)	5.320 (0.2094)	5.330 (0.2098)	5.340 (0.2102)	5.350 (0.2106)	5.360 (0.2110)	5.370 (0.2114)	5.380 (0.2118)	5.390 (0.2122)	5.400 (0.2126)	5.410 (0.2130)	5.420 (0.2134)	5.430 (0.2138)	5.440 (0.2142)	5.450 (0.2146)	5.460 (0.2150)	5.470 (0.2154)	5.480 (0.2157)	5.490 (0.2161)	5.500 (0.2165)	5.510 (0.2169)	5.520 (0.2173)	5.530 (0.2177)	5.540 (0.2181)	5.550 (0.2185)	5.560 (0.2189)	5.570 (0.2193)	5.580 (0.2197)	5.590 (0.2201)	5.600 (0.2205)	5.620 (0.2213)	5.640 (0.2220)	5.660 (0.2228)	5.680 (0.2236)	5.700 (0.2244)	5.720 (0.2252)	5.740 (0.2260)
0.000 – 0.030 (0.0000 – 0.0012)																																																							
0.031 – 0.050 (0.0012 – 0.0020)																																																							
0.051 – 0.070 (0.0020 – 0.0028)									06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54
0.071 – 0.090 (0.0028 – 0.0035)							06	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56
0.091 – 0.110 (0.0036 – 0.0043)						06	08	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56
0.111 – 0.130 (0.0044 – 0.0051)					06	08	10	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58
0.131 – 0.150 (0.0052 – 0.0059)				06	08	10	12	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58
0.151 – 0.170 (0.0059 – 0.0067)			06	08	10	12	14	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60
0.171 – 0.189 (0.0067 – 0.0074)		06	08	10	12	14	16	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62
0.190 – 0.290 (0.0075 – 0.0114)																																																								
0.291 – 0.310 (0.0115 – 0.0122)	12	14	16	18	20	22	24	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74
0.311 – 0.330 (0.0122 – 0.0130)	14	16	18	20	22	24	26	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	
0.331 – 0.350 (0.0130 – 0.0138)	16	18	20	22	24	26	28	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74			
0.351 – 0.370 (0.0138 – 0.0146)	18	20	22	24	26	28	30	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74					
0.371 – 0.390 (0.0146 – 0.0154)	20	22	24	26	28	30	32	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74							
0.391 – 0.410 (0.0154 – 0.0161)	22	24	26	28	30	32	34	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74									
0.411 – 0.430 (0.0162 – 0.0169)	24	26	28	30	32	34	36	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74											
0.431 – 0.450 (0.0170 – 0.0177)	26	28	30	32	34	36	38	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74													
0.451 – 0.470 (0.0178 – 0.0185)	28	30	32	34	36	38	40	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74															
0.471 – 0.490 (0.0185 – 0.0193)	30	32	34	36	38	40	42	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74																	
0.491 – 0.510 (0.0193 – 0.0201)	32	34	36	38	40	42	44	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74																			
0.511 – 0.530 (0.0201 – 0.0209)	34	36	38	40	42	44	46	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74																					
0.531 – 0.550 (0.0209 – 0.0217)	36	38	40	42	44	46	48	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74																							
0.551 – 0.570 (0.0217 – 0.0224)	38	40	42	44	46	48	50	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74																									
0.571 – 0.590 (0.0225 – 0.0232)	40	42	44	46	48	50	52	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74																											
0.591 – 0.610 (0.0233 – 0.0240)	42	44	46	48	50	52	54	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74																											
0.611 – 0.630 (0.0241 – 0.0248)	44	46	48	50	52	54	56	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74																											
0.631 – 0.650 (0.0248 – 0.0256)	46	48	50	52	54	56	58	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74																											
0.651 – 0.670 (0.0256 – 0.0264)	48	50	52	54	56	58	60	62	64	64	66	66	68	68	70	70	72	72	74	74																											
0.671 – 0.690 (0.0264 – 0.0272)	50	52	54	56	58	60	62	64	66	66	68	68	70	70	72	72	74	74																											
0.691 – 0.710 (0.0272 – 0.0280)	52	54	56	58	60	62	64	66	68	68	70	70	72	72	74	74																											
0.711 – 0.730 (0.0280 – 0.0287)	54	56	58	60	62	64	66	68	70	70	72	72	74	74																											
0.731 – 0.750 (0.0288 – 0.0295)	56	58	60	62	64	66	68	70	72	72	74	74																													
0.751 – 0.770 (0.0296 – 0.0303)	58	60	62	64	66	68	70	72	74	74																													
0.771 – 0.790 (0.0304 – 0.0311)	60	62	64	66	68	70	72	74																															
0.791 – 0.810 (0.0311 – 0.0319)	62	64	66	68	70	72	74																																
0.811 – 0.830 (0.0319 – 0.0327)	64	66	68	70	72	74																																	
0.831 – 0.850 (0.0327 – 0.0335)	66	68	70	72	74																																		
0.851 – 0.870 (0.0335 – 0.0343)	68	70	72	74																																			
0.871 – 0.890 (0.0343 – 0.0350)	70	72	74																																				
0.891 – 0.910 (0.0351 – 0.0358)	72	74																																					
0.911 – 0.930 (0.0359 – 0.0366)	74																																						

New Lifter Thickness mm (in.)

Lifter No.	Thickness	Lifter No.	Thickness	Lifter No.	Thickness
06	5.060 (0.1992)	30	5.300 (0.2087)	54	5.540 (0.2181)
08	5.080 (0.2000)	32	5.320 (0.2094)	56	5.560 (0.2189)
10	5.100 (0.2008)	34	5.340 (0.2102)	58	5.580 (0.2197)
12	5.120 (0.2016)	36	5.360 (0.2110)	60	5.600 (0.2205)
14	5.140 (0.2024)	38	5.380 (0.2118)	62	5.620 (0.2213)
16	5.160 (0.2031)	40	5.400 (0.2126)	64	5.640 (0.2220)
18	5.180 (0.2039)	42	5.420 (0.2134)	66	5.660 (0.2228)
20	5.200 (0.2047)	44	5.440 (0.2142)	68	5.680 (0.2236)
22	5.220 (0.2055)	46	5.460 (0.2150)	70	5.700 (0.2244)
24	5.240 (0.2063)	48	5.480 (0.2157)	72	5.720 (0.2252)
26	5.260 (0.2071)	50	5.500 (0.2165)	74	5.740 (0.2260)
28	5.280 (0.2079)	52	5.520 (0.2173)		

Intake valve clearance (Cold):
0.19 to 0.29 mm (0.008 to 0.011 in.)

EXAMPLE:

The 5.250 mm (0.2067 in.) lifter is installed, and the measured clearance is 0.400 mm (0.0157 in.).

Replace the 5.250 mm (0.2067 in.) lifter with a new No. 42 lifter.

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Valve Lifter Selection Chart (Exhaust)

Measured Clearance mm (in.) / Installed Lifter Thickness mm (in.)	5.060 (0.1992)	5.080 (0.2000)	5.100 (0.2008)	5.120 (0.2016)	5.140 (0.2024)	5.160 (0.2031)	5.180 (0.2039)	5.200 (0.2047)	5.210 (0.2051)	5.220 (0.2055)	5.230 (0.2059)	5.240 (0.2063)	5.250 (0.2067)	5.260 (0.2071)	5.270 (0.2075)	5.280 (0.2079)	5.290 (0.2083)	5.300 (0.2087)	5.310 (0.2091)	5.320 (0.2094)	5.330 (0.2098)	5.340 (0.2102)	5.350 (0.2106)	5.360 (0.2110)	5.370 (0.2114)	5.380 (0.2118)	5.390 (0.2122)	5.400 (0.2126)	5.410 (0.2130)	5.420 (0.2134)	5.430 (0.2138)	5.440 (0.2142)	5.450 (0.2146)	5.460 (0.2150)	5.470 (0.2154)	5.480 (0.2157)	5.490 (0.2161)	5.500 (0.2165)	5.510 (0.2169)	5.520 (0.2173)	5.530 (0.2177)	5.540 (0.2181)	5.550 (0.2185)	5.560 (0.2189)	5.570 (0.2193)	5.580 (0.2197)	5.590 (0.2201)	5.600 (0.2205)	5.620 (0.2213)	5.640 (0.2220)	5.660 (0.2228)	5.680 (0.2236)	5.700 (0.2244)	5.720 (0.2252)	5.740 (0.2260)
0.000-0.030 (0.0000-0.0012)																							06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	34	36	38	40	42	44
0.031-0.050 (0.0012-0.0020)																						06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	36	38	40	42	44	46
0.051-0.070 (0.0020-0.0028)																				06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	38	40	42	44	46	48
0.071-0.090 (0.0028-0.0035)																		06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	40	42	44	46	48	50
0.091-0.110 (0.0036-0.0043)																06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	42	44	46	48	50	52
0.111-0.130 (0.0044-0.0051)														06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	44	46	48	50	52	54
0.131-0.150 (0.0052-0.0059)												06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	46	48	50	52	54	56
0.151-0.170 (0.0059-0.0067)									06	06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	48	50	52	54	56	58
0.171-0.190 (0.0067-0.0075)								06	08	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	50	52	54	56	58	60
0.191-0.210 (0.0075-0.0083)							06	08	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	52	54	56	58	60	62
0.211-0.230 (0.0083-0.0091)						06	08	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	54	56	58	60	62	64
0.231-0.250 (0.0091-0.0098)					06	08	10	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	56	58	60	62	64	66
0.251-0.270 (0.0099-0.0106)				06	08	10	12	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	58	60	62	64	66	68
0.271-0.290 (0.0107-0.0114)			06	08	10	12	14	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	60	62	64	66	68	70
0.291-0.299 (0.0115-0.0118)		06	08	10	12	14	16	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	62	64	66	68	70	72
0.300-0.400 (0.0118-0.0157)																																																							
0.401-0.420 (0.0158-0.0165)	12	14	16	18	20	22	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	68	70	72	74	74	74	
0.421-0.440 (0.0166-0.0173)	14	16	18	20	22	24	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	70	72	74	74	74		
0.441-0.460 (0.0174-0.0181)	16	18	20	22	24	26	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	72	74	74	74			
0.461-0.480 (0.0181-0.0189)	16	20	22	24	26	28	30	32	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	74	74	74				
0.481-0.500 (0.0189-0.0197)	20	22	24	26	28	30	32	34	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74					
0.501-0.520 (0.0197-0.0205)	22	24	26	28	30	32	34	36	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74						
0.521-0.540 (0.0205-0.0213)	24	26	28	30	32	34	36	38	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	76	76	74							
0.541-0.560 (0.0213-0.0220)	26	28	30	32	34	36	38	40	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74								
0.561-0.580 (0.0221-0.0228)	28	30	32	34	36	38	40	42	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74										
0.581-0.600 (0.0229-0.0236)	30	32	34	36	38	40	42	44	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74												
0.601-0.620 (0.0237-0.0244)	32	34	36	38	40	42	44	46	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74														
0.621-0.640 (0.0244-0.0252)	34	36	38	40	42	44	46	48	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																
0.641-0.660 (0.0252-0.0260)	36	38	40	42	44	46	48	50	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																		
0.661-0.680 (0.0260-0.0268)	38	40	42	44	46	48	50	52	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																				
0.681-0.700 (0.0268-0.0276)	40	42	44	46	48	50	52	54	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																						
0.701-0.720 (0.0276-0.0283)	42	44	46	48	50	52	54	56	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																								
0.721-0.740 (0.0284-0.0291)	44	46	48	50	52	54	56	58	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																										
0.741-0.760 (0.0292-0.0299)	46	48	50	52	54	56	58	60	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																												
0.761-0.780 (0.0300-0.0307)	48	50	52	54	56	58	60	62	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																														
0.781-0.800 (0.0307-0.0315)	50	52	54	56	58	60	62	64	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																																
0.801-0.820 (0.0315-0.0323)	52	54	56	58	60	62	64	66	66	68	68	70	70	72	72	74	74	74	74	74	74																																		
0.821-0.840 (0.0323-0.0331)	54	56	58	60	62	64	66	68	68	70	70	72	72	74	74	74	74	74	74																																				
0.841-0.860 (0.0331-0.0339)	56	58	60	62	64	66	68	70	70	72	72	74	74	74	74	74	74																																						
0.861-0.880 (0.0339-0.0346)	58	60	62	64	66	68	70	72	72	74	74	74	74	74	74																																								
0.881-0.900 (0.0347-0.0354)	60	62	64	66	68	70	72	74	74	74	74	74	74																																										
0.901-0.920 (0.0355-0.0362)	62	64	66	68	70	72	74	74	74	74	74																																												
0.921-0.940 (0.0363-0.0370)	64	66	68	70	72	74	74	74	74																																														
0.941-0.960 (0.0370-0.0378)	66	68	70	72	74	74	74																																																
0.961-0.980 (0.0378-0.0386)	68	70	72	74	74	74																																																	
0.981-1.000 (0.0386-0.0394)	70	72	74	74	74																																																		
1.001-1.020 (0.0394-0.0402)	72	74	74	74																																																			
1.021-1.040 (0.0402-0.0409)	74	74	74																																																				
1.041-1.060 (0.0410-0.0417)	74	74																																																					
1.061-1.080 (0.0418-0.0425)	74																																																						

New lifter thickness mm (in.)

Lifter No.	Thickness	Lifter No.	Thickness	Lifter No.	Thickness
06	5.060 (0.1992)	30	5.300 (0.2087)	54	5.540 (0.2181)
08	5.080 (0.2000)	32	5.320 (0.2094)	56	5.560 (0.2189)
10	5.100 (0.2008)	34	5.340 (0.2102)	58	5.580 (0.2197)
12	5.120 (0.2016)	36	5.360 (0.2110)	60	5.600 (0.2205)
14	5.140 (0.2024)	38	5.380 (0.2118)	62	5.620 (0.2213)
16	5.160 (0.2031)	40	5.400 (0.2126)	64	5.640 (0.2220)
18	5.180 (0.2039)	42	5.420 (0.2134)	66	5.660 (0.2228)
20	5.200 (0.2047)	44	5.440 (0.2142)	68	5.680 (0.2236)
22	5.220 (0.2055)	46	5.460 (0.2150)	70	5.700 (0.2244)
24	5.240 (0.2063)	48	5.480 (0.2157)	72	5.720 (0.2252)
26	5.260 (0.2071)	50	5.500 (0.2165)	74	5.740 (0.2260)
28	5.280 (0.2079)	52	5.520 (0.2173)		

Exhaust valve clearance (Cold):
0.30 to 0.40 mm (0.0118 to 0.0157 in.)

EXAMPLE:

The 5.340 mm (0.2102 in.) lifter is installed, and the measured clearance is 0.440 mm (0.0173 in.).

Replace the 5.340 mm (0.2102 in.) lifter with a new No. 44 lifter.

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(g) Install the camshafts (see page 14–64).
(h) Install the chain tensioner (see page 14–45).

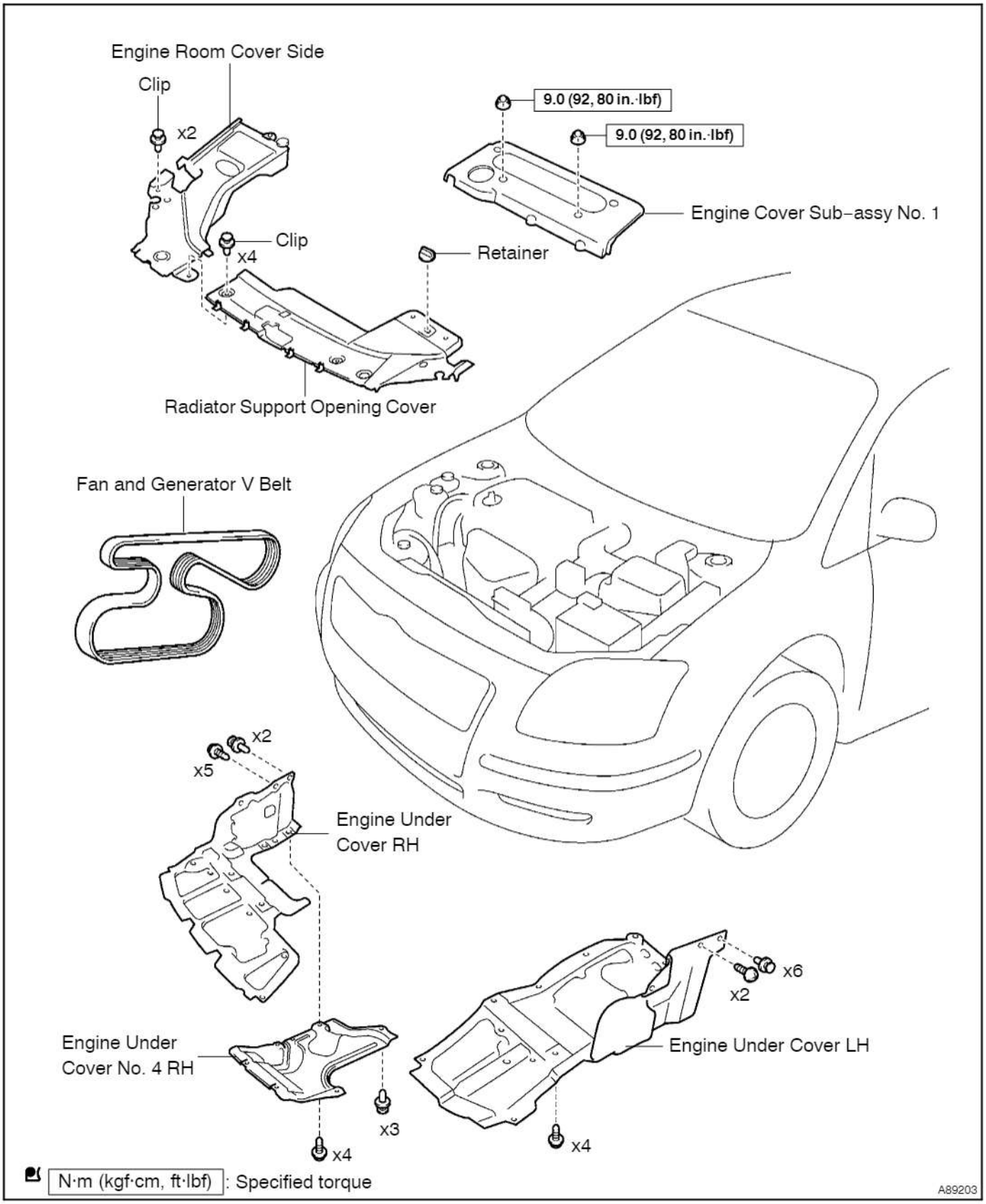
16. **INSTALL CYLINDER HEAD COVER SUB–ASSY (See page 14–45)**
17. **INSTALL IGNITION COIL ASSY**
    Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
18. **INSTALL FUEL PIPE SUB–ASSY NO.1 (See page 11–24)**
    SST 09023–12900
19. **INSTALL FUEL TUBE SUB–ASSY (See page 11–4)**
20. **INSTALL FUEL PRESSURE PULSATION DAMPER ASSY (See page 11–24)**
21. **CHECK FOR ENGINE OIL LEAKS**
22. **CHECK FOR FUEL LEAKS (See page 11–4)**
23. **INSTALL ENGINE COVER SUB–ASSY NO.1**
    Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

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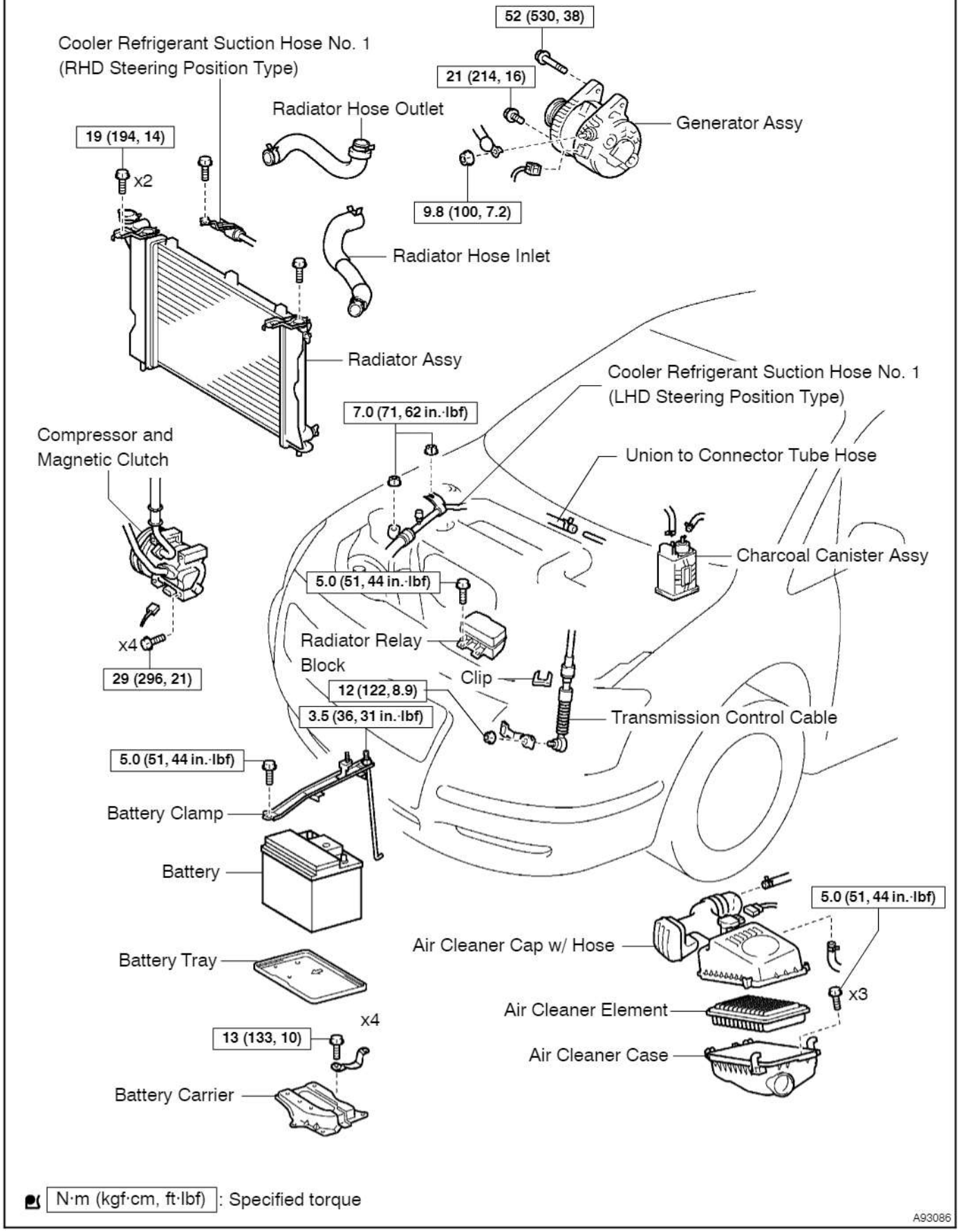
PARTIAL ENGINE ASSY (2AZ–FSE)

COMPONENTS

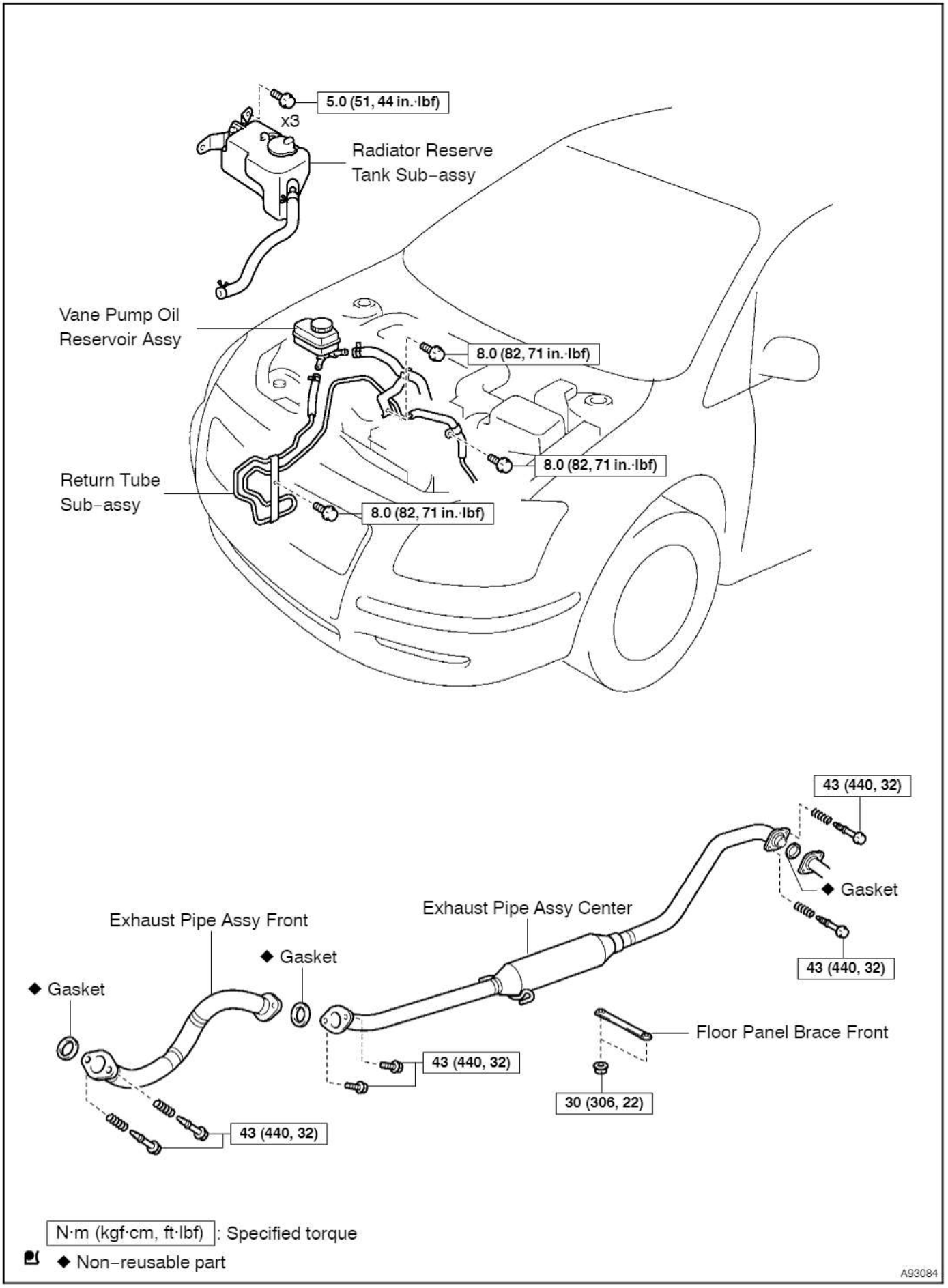
141BE–02



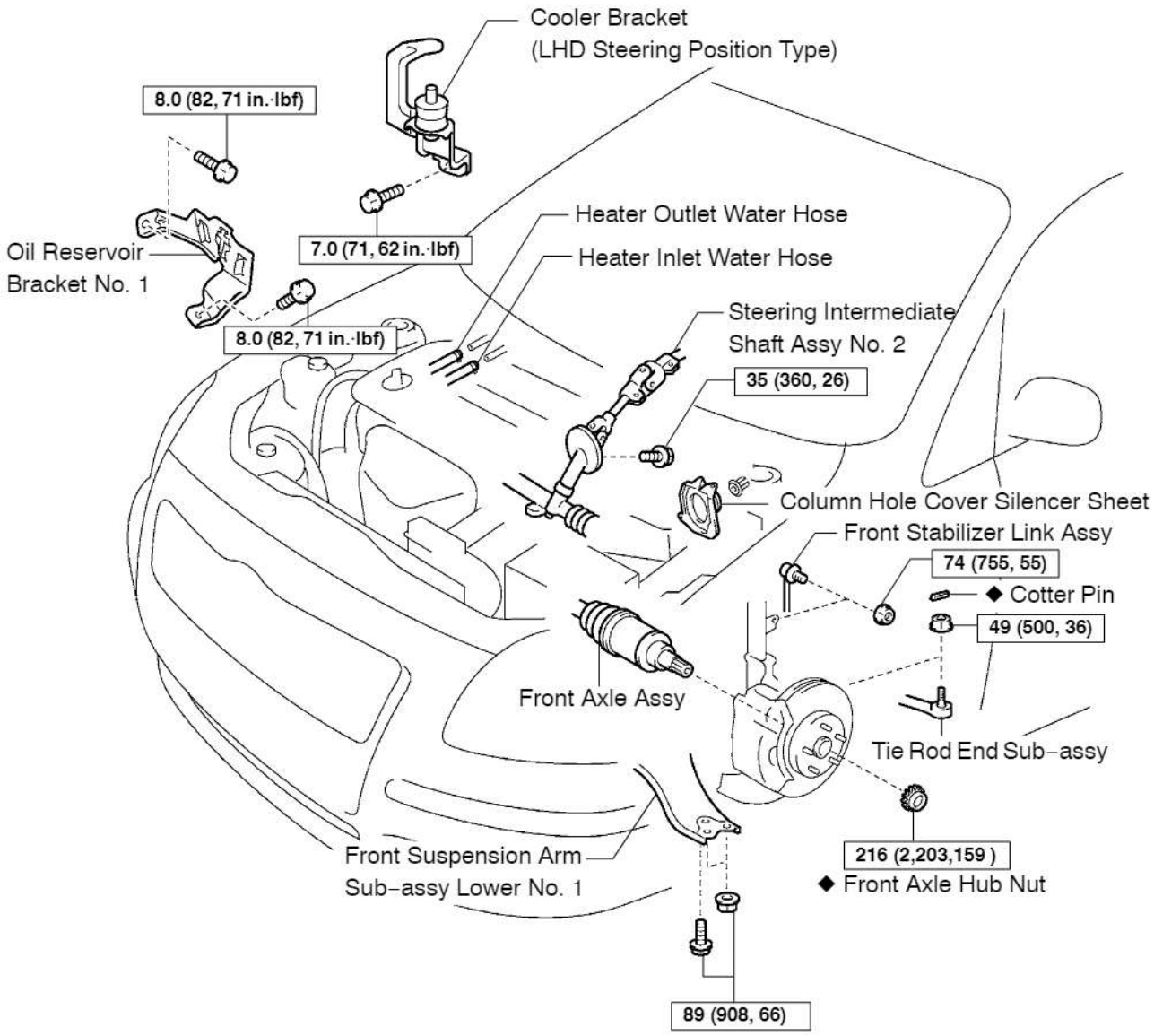
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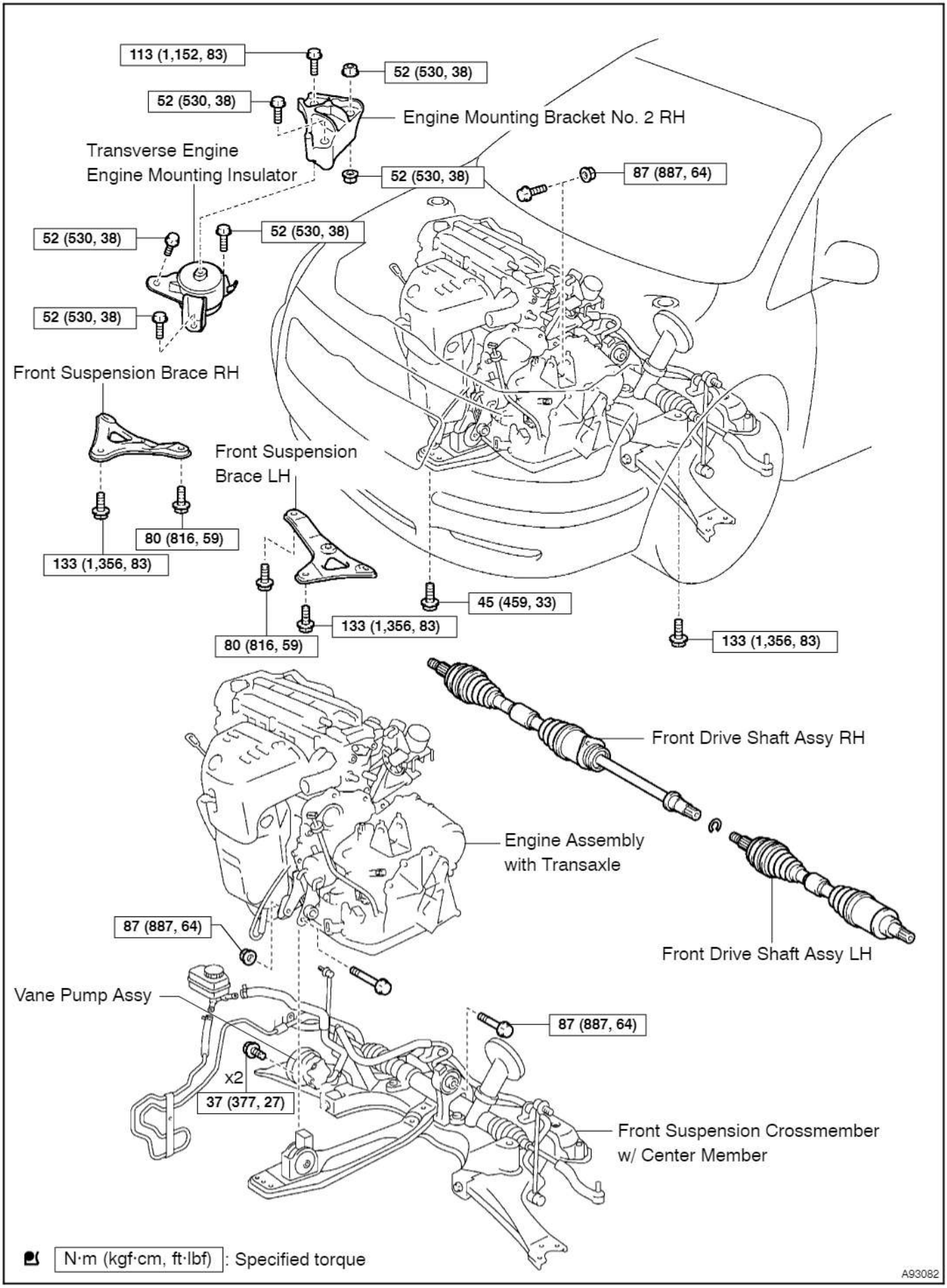


N·m (kgf·cm, ft·lbf) : Specified torque

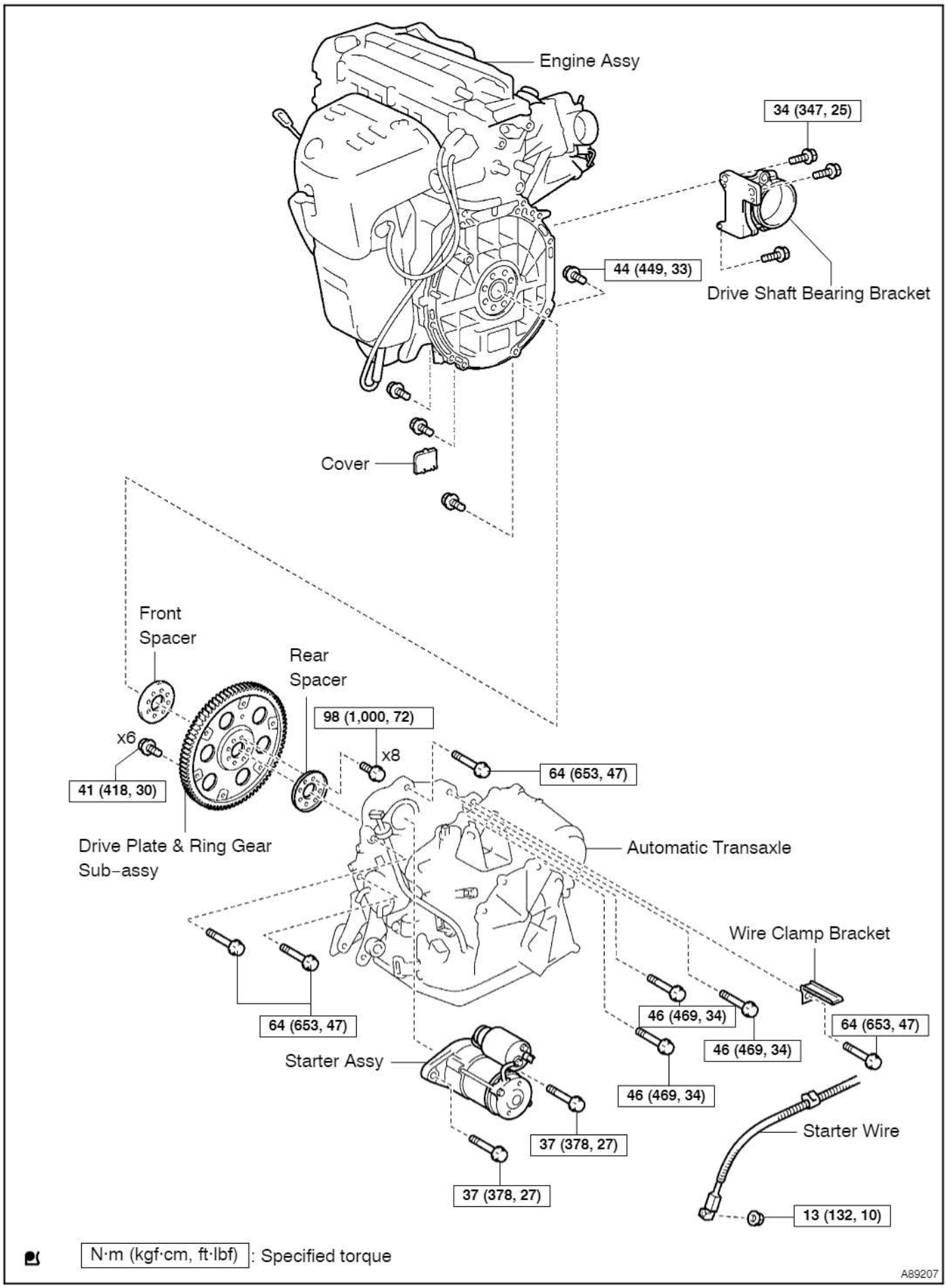
◆ Non–reusable part

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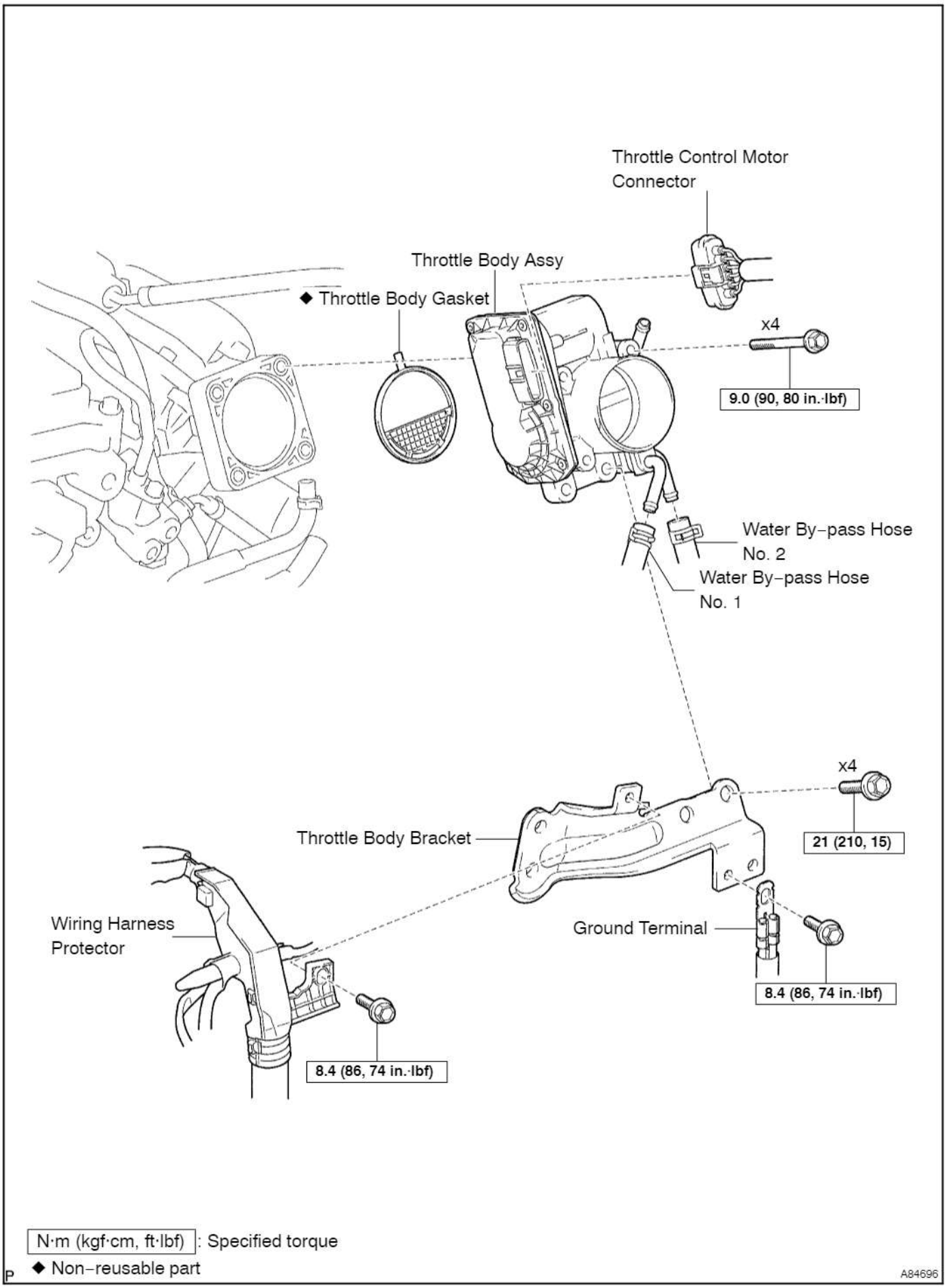
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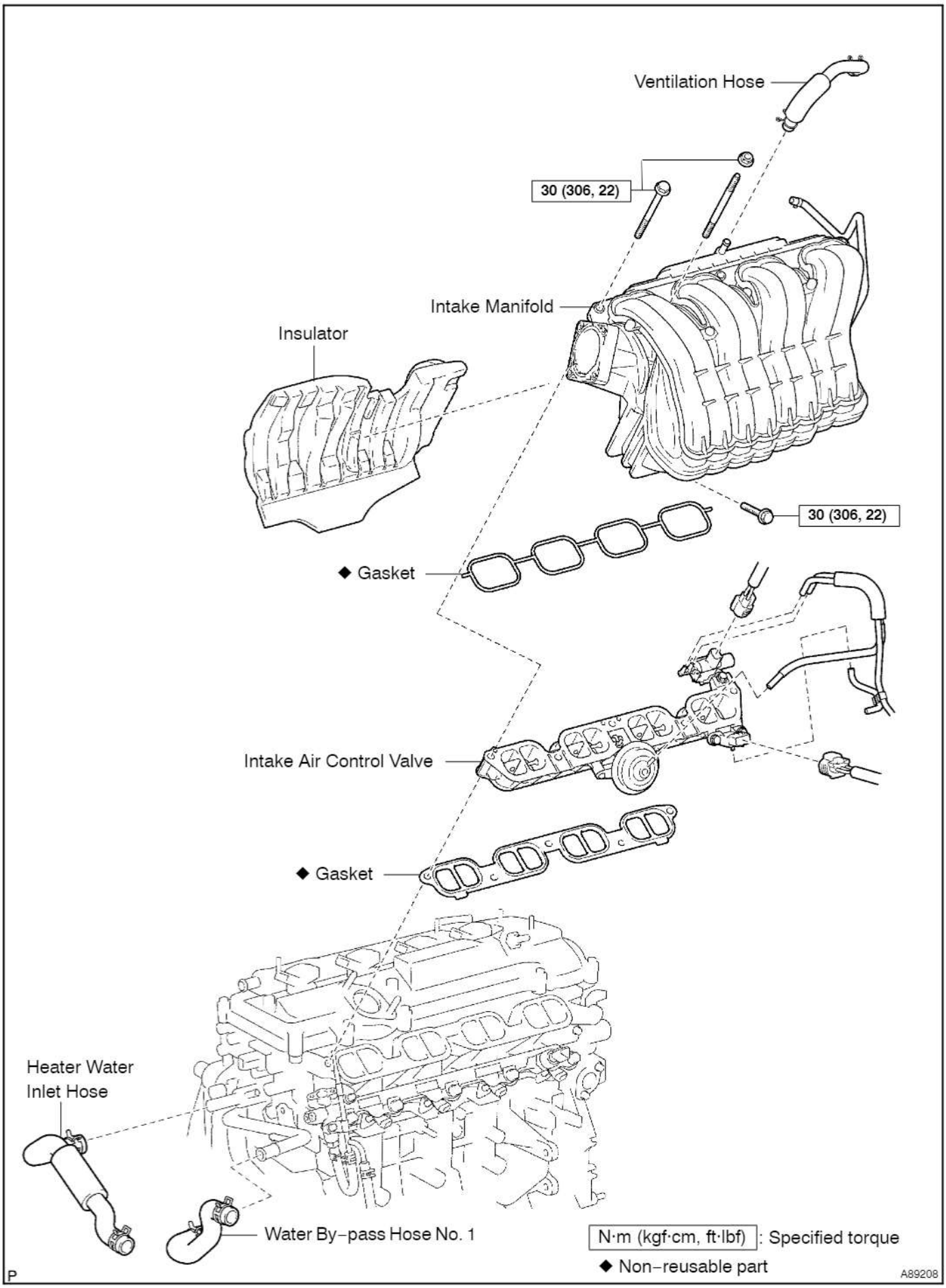
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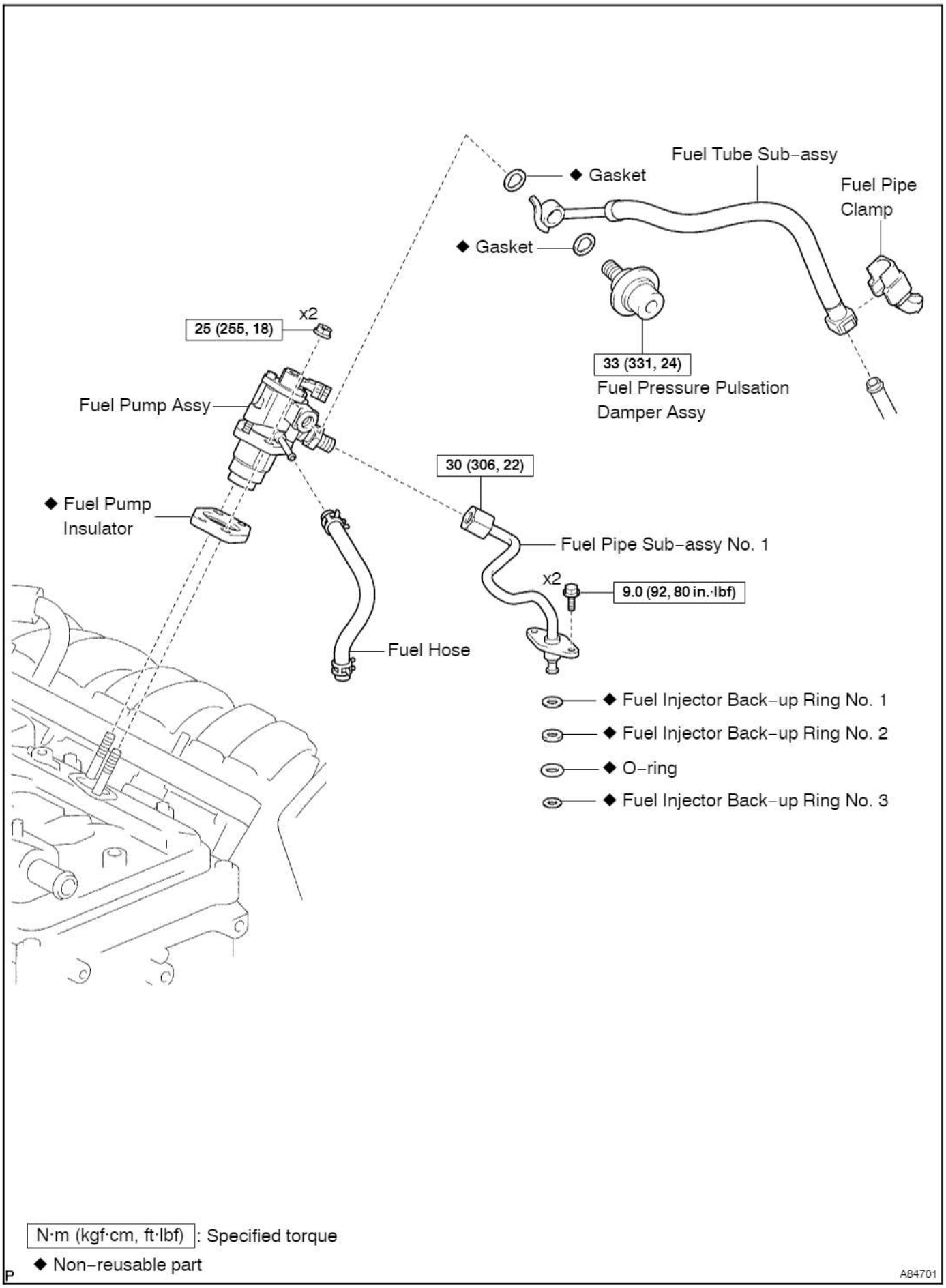
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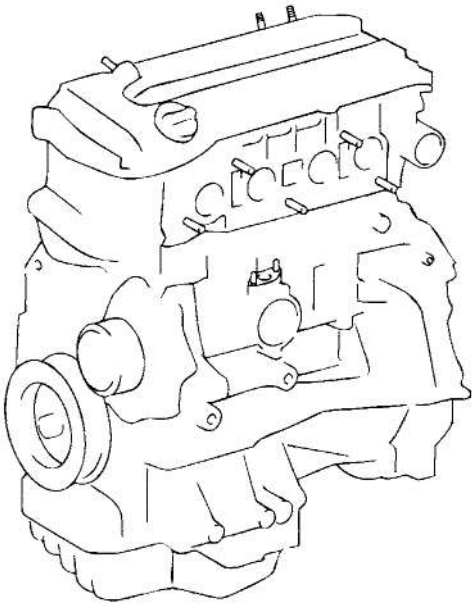


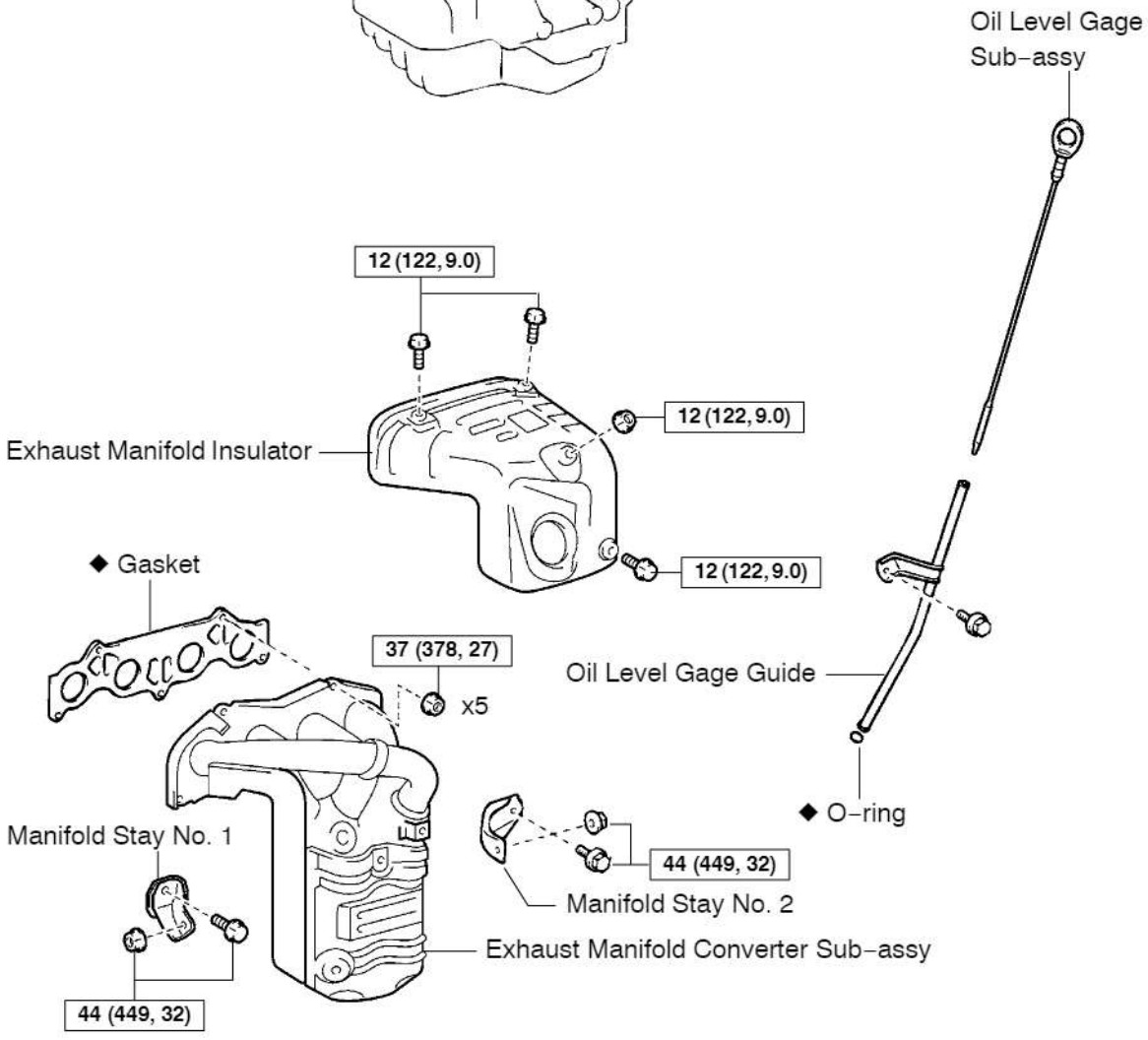
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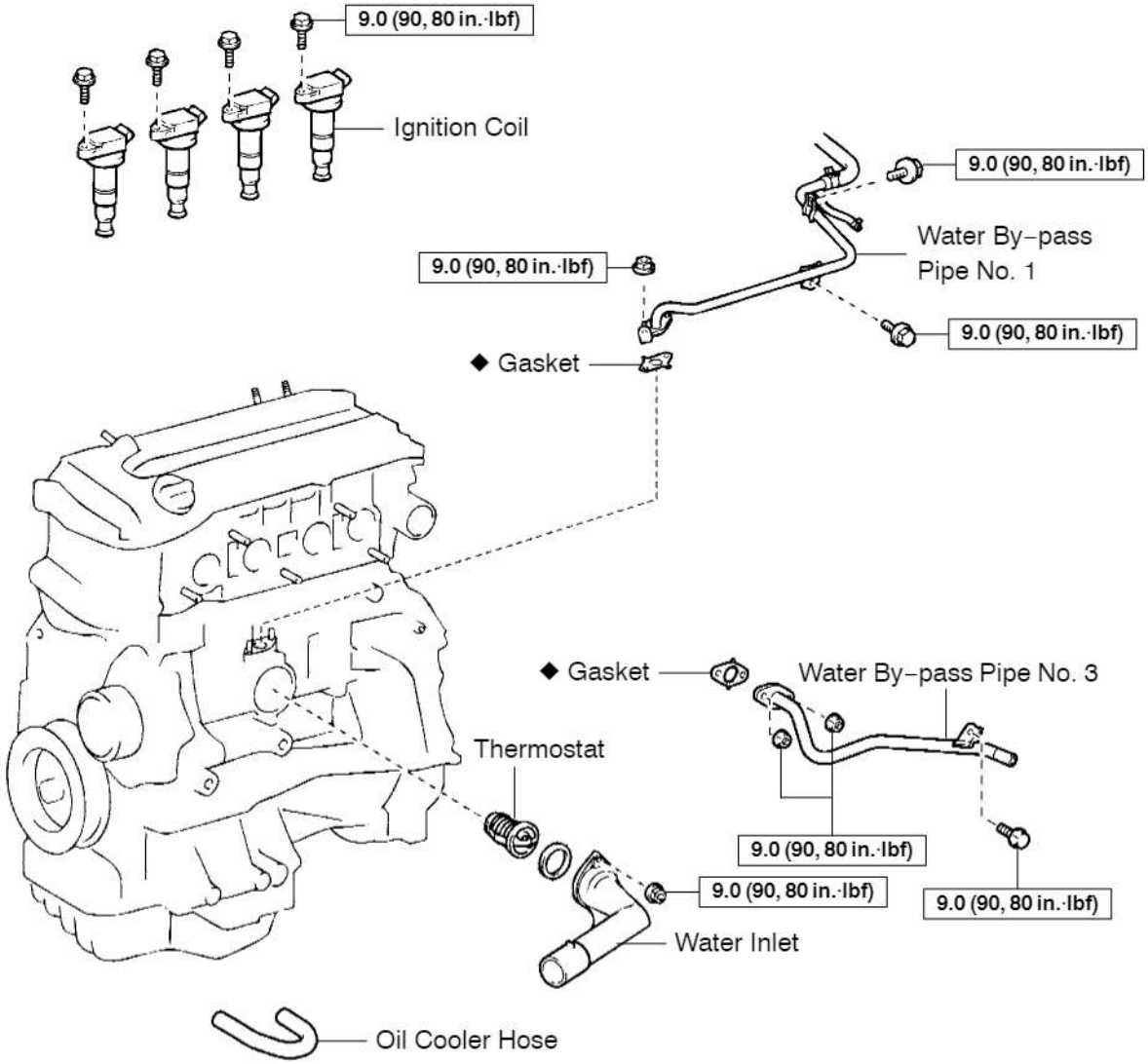


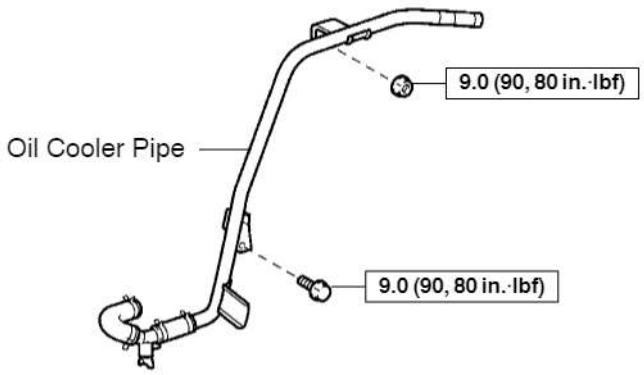
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

A93080

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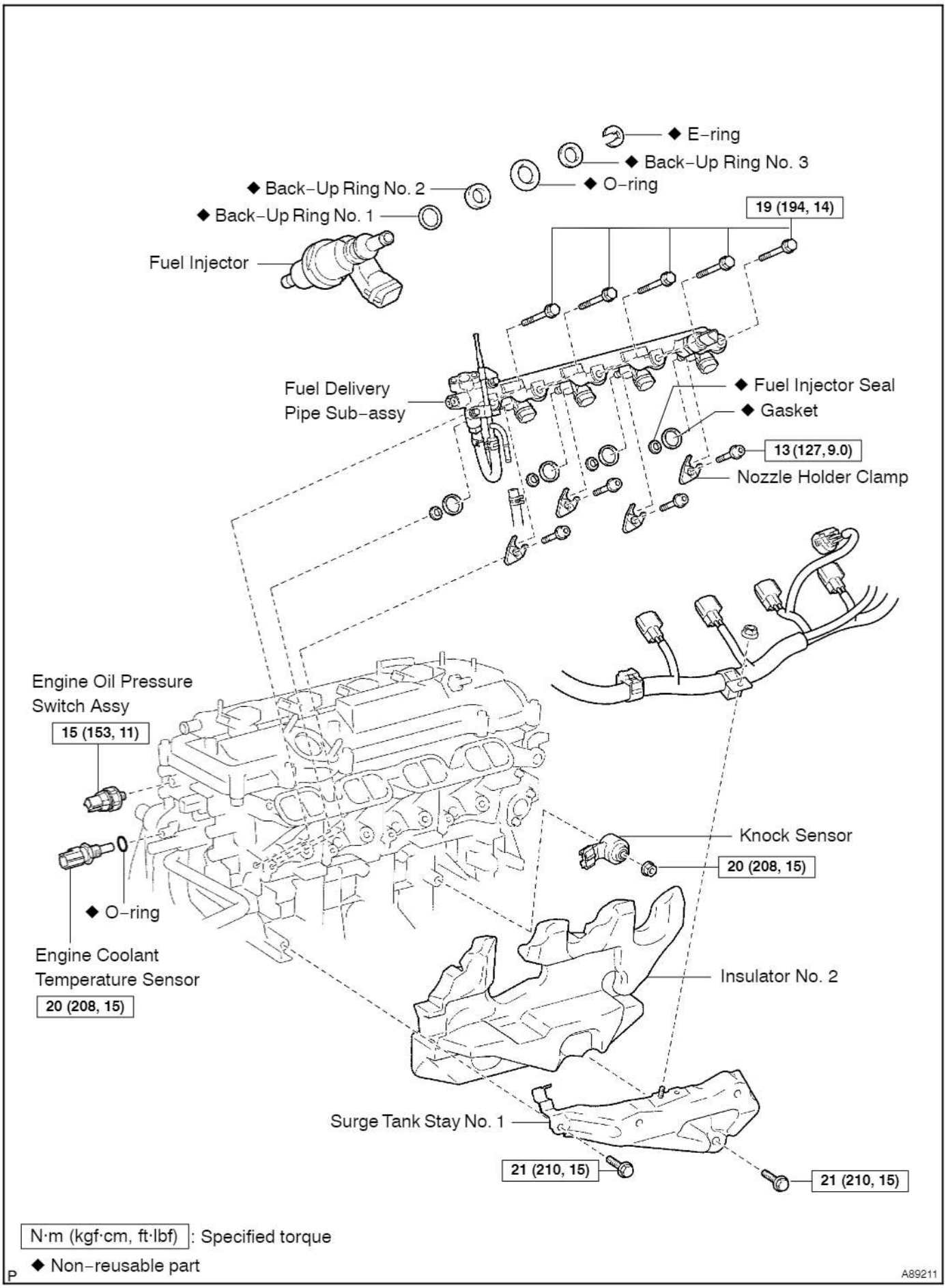


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

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

◆ Non–reusable part

P

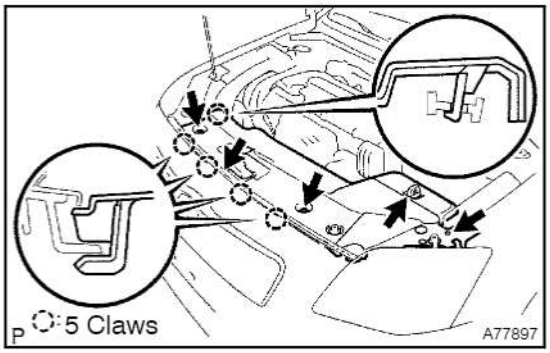
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141N5–01

REPLACEMENT

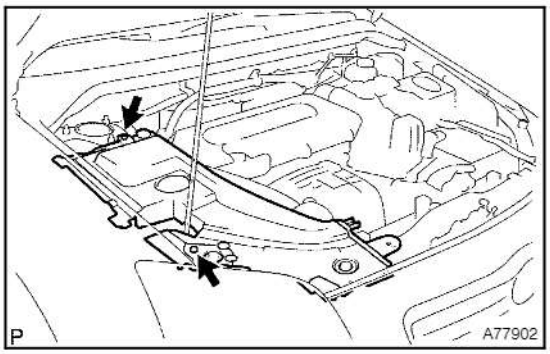
1. DISCHARGE FUEL SYSTEM PRESSURE (See page 11–4)
2. REMOVE FRONT WHEELS



3. REMOVE RADIATOR SUPPORT OPENING COVER

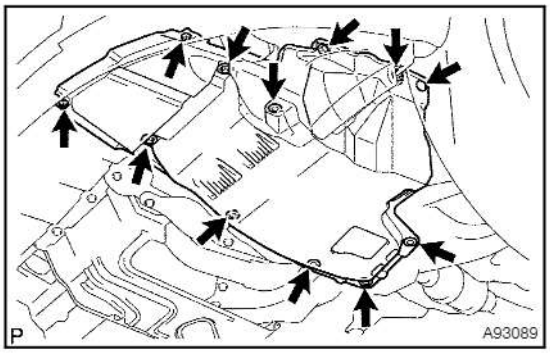
(a) Remove the retainer and 4 clips.

(b) Unfasten the 5 claws, then remove the radiator support opening cover.



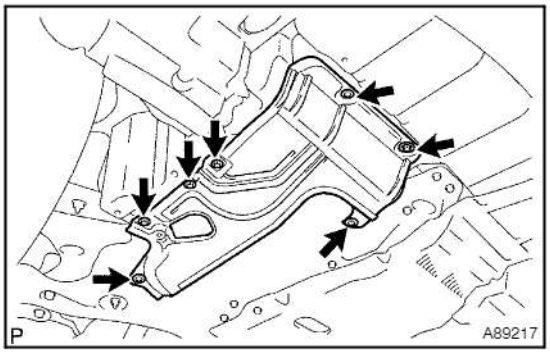
4. REMOVE ENGINE ROOM COVER SIDE

(a) Remove the 2 clips, then remove the engine room cover side.



5. REMOVE ENGINE UNDER COVER LH

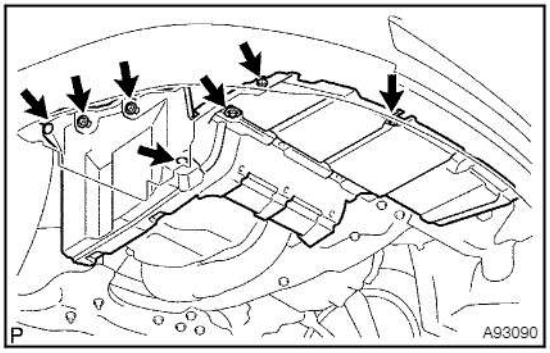
(a) Remove the 6 screws and 6 clips, and then remove the engine under cover LH.



6. REMOVE ENGINE UNDER COVER NO.4 RH

(a) Remove the 4 screws and 3 clips, then remove the engine under cover No. 4 RH.

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7. REMOVE ENGINE UNDER COVER RH

(a) Remove the 5 screws and 2 clips, then remove the engine under cover RH.

8. DRAIN COOLANT (See page 16–7)

9. DRAIN ENGINE OIL (See page 17–6)

10. DRAIN AUTOMATIC TRANSAXLE FLUID (See Pub. No. RM1018E on page 40–2)

11. REMOVE ENGINE COVER SUB–ASSY NO.1 (See page 14–45)

12. DISCONNECT RADIATOR HOSE INLET (See page 16–9)

13. DISCONNECT RADIATOR HOSE OUTLET (See page 16–9)

14. SEPARATE RADIATOR RELAY BLOCK (See page 16–9)

15. SEPARATE COOLER REFRIGERANT SUCTION HOSE NO.1 (RHD STEERING POSITION TYPE) (See page 55–1)

16. REMOVE RADIATOR ASSY (See page 16–9)

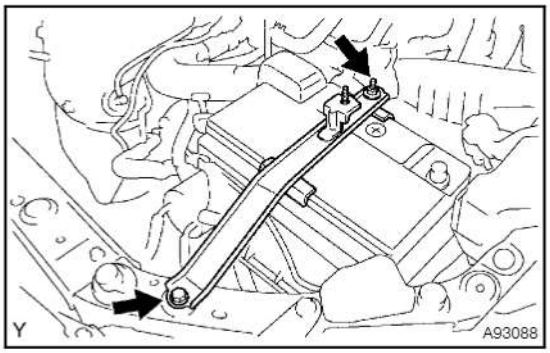
17. REMOVE FAN AND GENERATOR V BELT (See page 14–5)

18. REMOVE GENERATOR ASSY (See page 19–8)

19. REMOVE W/PULLEY COMPRESSOR ASSY (See page 55–4)

HINT:

Secure the hoses off to the side instead of detaching.



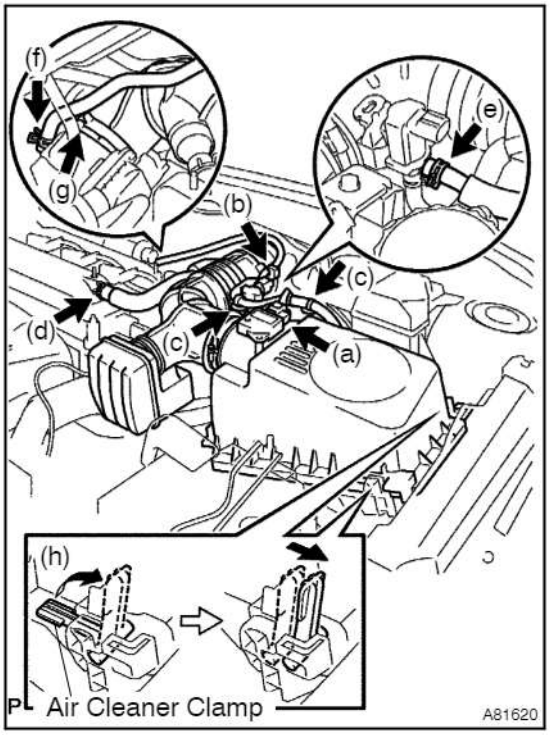
20. REMOVE BATTERY

(a) Disconnect the battery positive terminal.

(b) Remove the bolt and a nut, then remove the battery clamp.

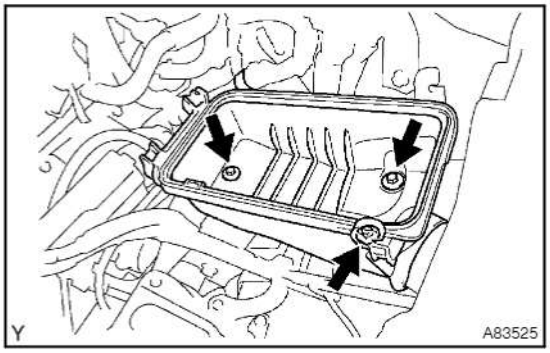
(c) Remove the battery from the vehicle.

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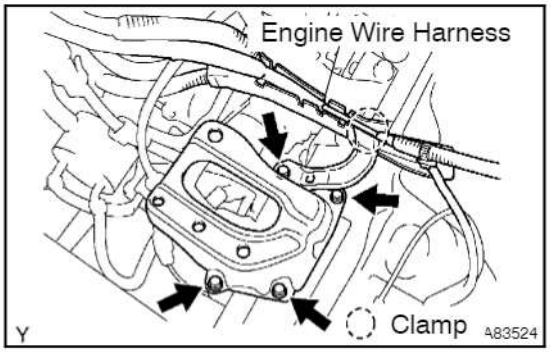


21. REMOVE AIR CLEANER ASSEMBLY WITH HOSE

(a) Disconnect the mass air flow meter connector.
(b) Disconnect the VSV connector.
(c) Remove the 2 wire harness clamps.
(d) Disconnect the ventilation hose.
(e) Disconnect the fuel vapor feed hose No. 1.
(f) Disconnect the fuel vapor feed hose No. 2.
(g) Loosen the hose clamp bolt.
(h) Raise the air cleaner clamp up, then slide it to the air cleaner cap.
(i) Remove the air cleaner cap together with the air cleaner hose.



(j) Remove the 3 bolts and air cleaner case.



22. REMOVE BATTERY CARRIER

(a) Separate the engine wire harness from the clamp.
(b) Remove the 4 bolts and the battery carrier.

23. REMOVE RADIATOR RESERVE TANK ASSY

(a) Remove the 3 bolts, then remove the radiator reserve tank together with bracket.

24. SEPARATE RETURN TUBE SUB–ASSY (See page 14–45)

25. REMOVE VANE PUMP OIL RESERVOIR ASSY (See page 14–45)

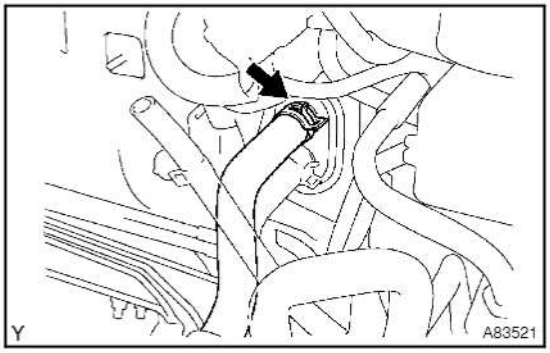
26. REMOVE OIL RESERVOIR BRACKET NO.1 (See page 14–45)

27. SEPARATE COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD STEERING POSITION TYPE) (See page 14–45)

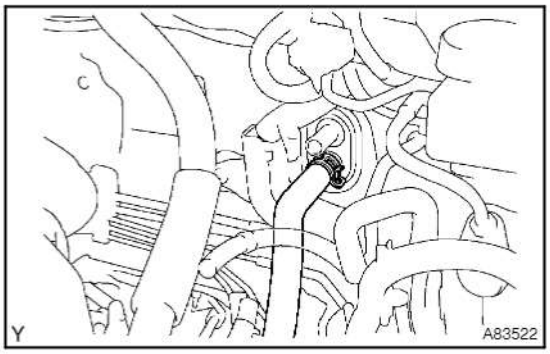
28. REMOVE COOLER BRACKET (LHD STEERING POSITION TYPE) (See page 14–45)

29. REMOVE ENGINE SERVICE COVER BRACKET RH (RHD STEERING POSITION TYPE) (See page 14–45)

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30. DISCONNECT HEATER INLET WATER HOSE



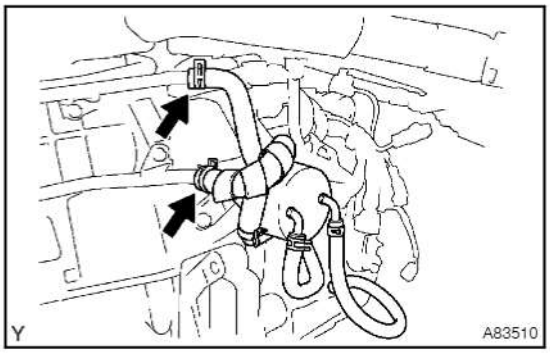
31. DISCONNECT HEATER OUTLET WATER HOSE

32. REMOVE CHARCOAL CANISTER ASSY

33. DISCONNECT FUEL TUBE SUB–ASSY (See page 11–4)

34. DISCONNECT UNION TO CONNECTOR TUBE HOSE

(a) Disconnect the union to connector tube hose from the brake booster.



35. DISCONNECT TRANSMISSION OIL COOLER

(a) Disconnect the transmission oil cooler.

36. REMOVE FLOOR PANEL BRACE FRONT (See page 15–2)

37. REMOVE EXHAUST PIPE ASSY CENTER (See page 15–2)

38. REMOVE EXHAUST PIPE ASSY FRONT (See page 15–2)

39. REMOVE FRONT AXLE HUB LH NUT (See page 30–4)

SST 09330–00030

40. REMOVE FRONT AXLE HUB RH NUT

SST 09330–00030

HINT:

Perform the same procedure as above on the opposite side.

41. SEPARATE TIE ROD END SUB–ASSY LH (See page 30–4)

42. SEPARATE TIE ROD END SUB–ASSY RH

HINT:

Perform the same procedure as above on the opposite side.

43. SEPARATE FRONT STABILIZER LINK ASSY LH (See page 30–4)

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44. SEPARATE FRONT STABILIZER LINK ASSY RH

HINT:

Perform the same procedure as above on the opposite side.

45. SEPARATE FRONT SUSPENSION ARM SUB–ASSY LOWER NO.1 LH
(See Pub. No. RM1018E on page 26–16)

46. SEPARATE FRONT SUSPENSION ARM SUB–ASSY LOWER NO.1 RH

HINT:

Perform the same procedure as above on the opposite side.

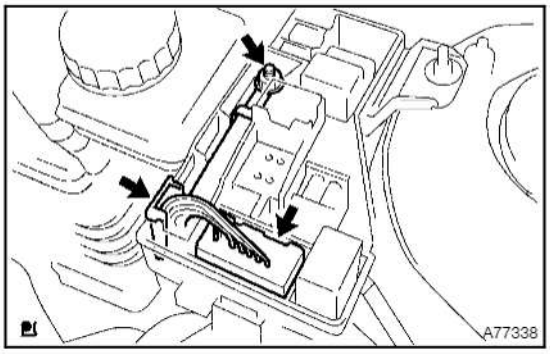
47. SEPARATE FRONT AXLE ASSY LH (See page 30–4)

48. SEPARATE FRONT AXLE ASSY RH

HINT:

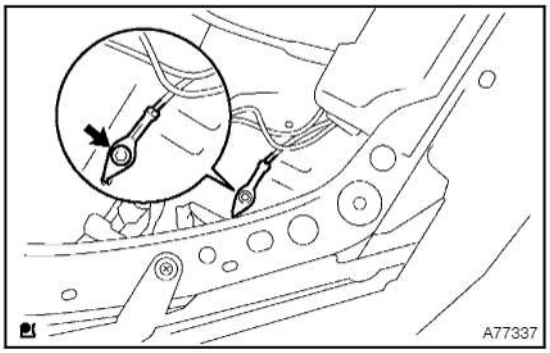
Perform the same procedure as above on the opposite side.

49. SEPARATE TRANSMISSION CONTROL CABLE ASSY (See page 40–3)



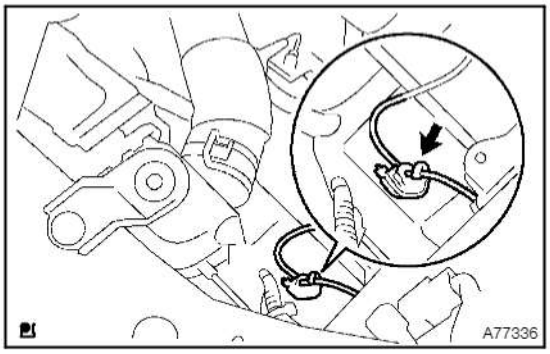
50. SEPARATE ENGINE ROOM RELAY BLOCK NO.2

(a) Remove the nut, then disconnect the connector shown in the illustration.



51. SEPARATE ENGINE WIRE

(a) Remove the bolt, then separate the grand terminal.



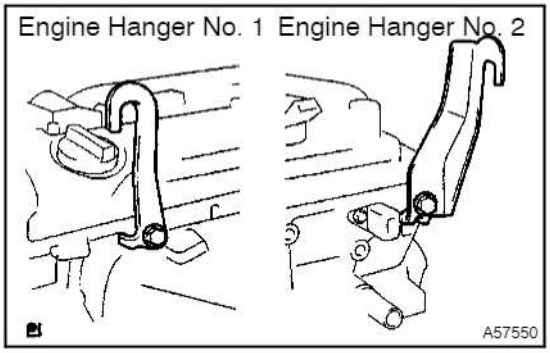
(b) Separate the ground terminal connector.

(c) Remove the glove compartment door panel (see Pub. No. RM1018E on page 71–11).

(d) Separate the engine wire.

52. SEPARATE STEERING INTERMEDIATE SHAFT ASSY NO.2
(See Pub. No. RM1018E on page 51–36)

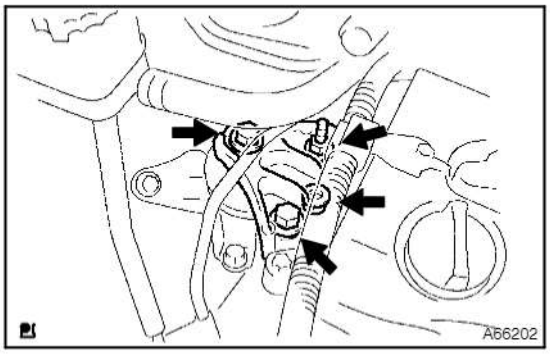
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53. INSTALL ENGINE HANGERS

(a) Install the engine hanger No. 1 (12281–28010, 28020, 28030) with the bolt (91512–61020).
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)

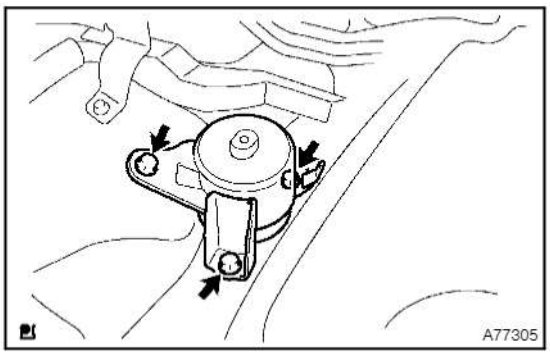
(b) Install the engine hanger No. 2 (12282–28010, 28020, 28030) with the bolt (91512–61020).
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)



54. REMOVE ENGINE MOUNTING BRACKET NO.2 RH

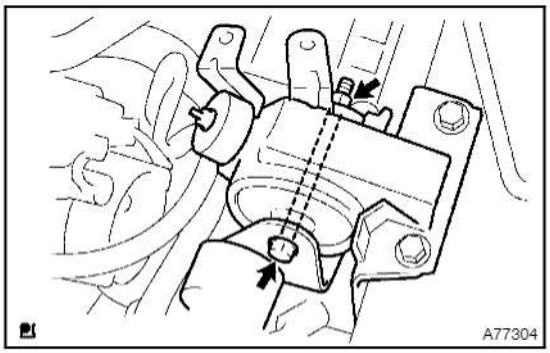
(a) Set the engine lifter.

(b) Remove the 2 bolts and 2 nuts, then detach the mounting bracket No. 2.



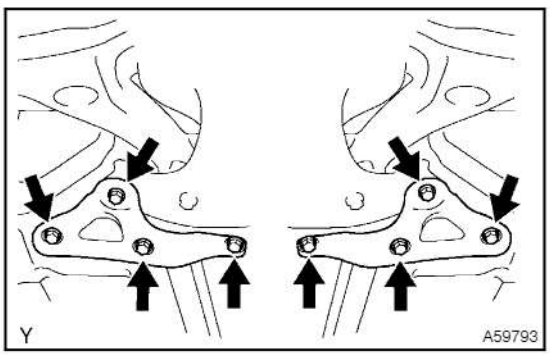
55. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Remove the 3 bolts and engine mounting insulator.



56. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

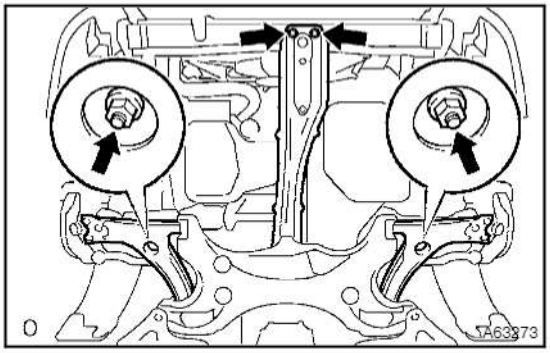
(a) Remove the through bolt and nut, then detach the engine mounting insulator.



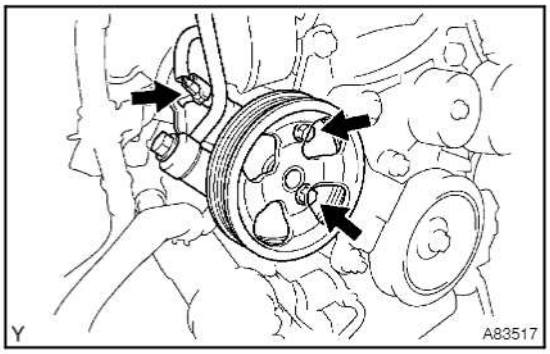
57. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE

(a) Remove the 8 bolts and front suspension member braces.

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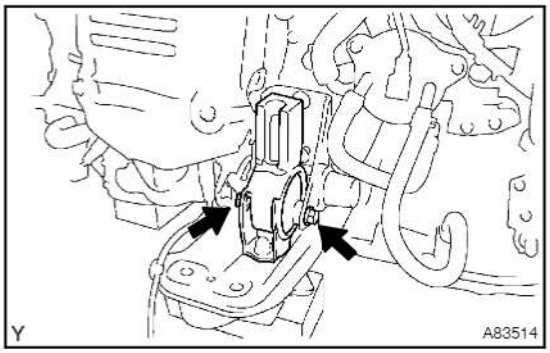
(b) Remove the 2 bolts and 2 nuts shown in the illustration.
(c) Carefully remove the engine assembly with transaxle from the vehicle.



58. SEPARATE VANE PUMP ASSY

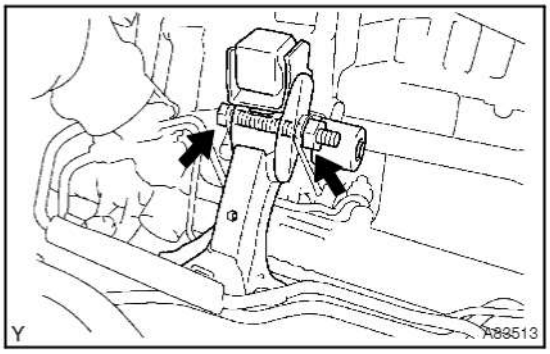
(a) Disconnect the PS oil pressure switch connector.
(b) Remove the 2 bolts, then separate the vane pump from the engine.

59. REMOVE STARTER ASSY (See page 19–3)



60. REMOVE FRONT SUSPENSION CROSSMEMBER W/CENTER MEMBER

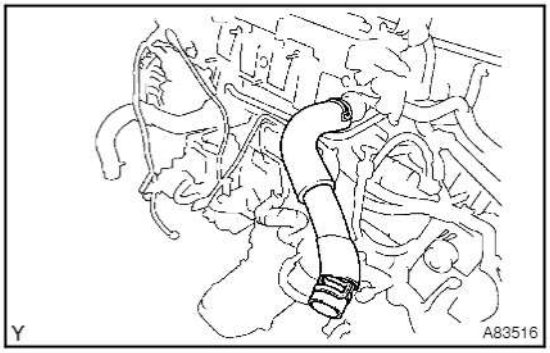
(a) Remove the through bolt and a nut from the engine mounting insulator FR.



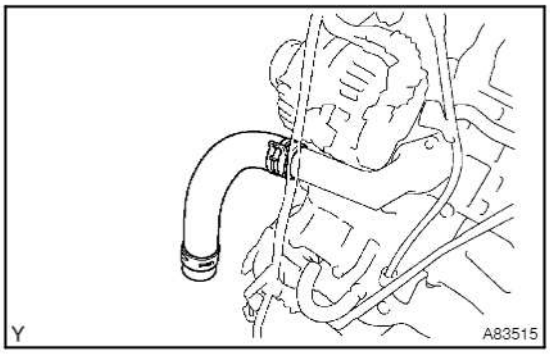
(b) Remove the through bolt and a nut from the engine mounting insulator RR.

61. REMOVE FRONT DRIVE SHAFT ASSY LH (See page 30–4)
62. REMOVE FRONT DRIVE SHAFT ASSY RH (See page 30–4)

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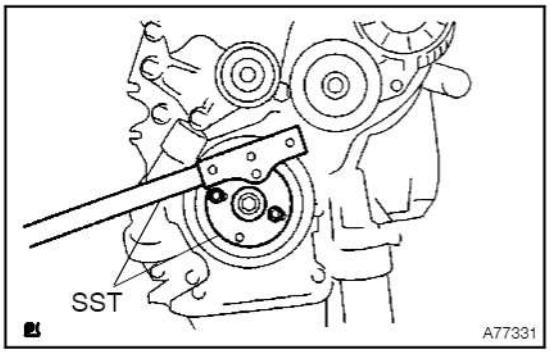


63. REMOVE RADIATOR HOSE INLET



64. REMOVE RADIATOR HOSE OUTLET

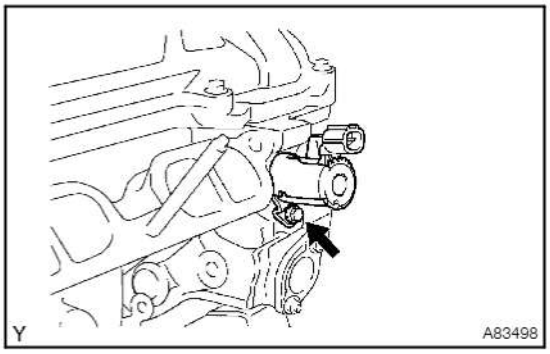
65. REMOVE AUTOMATIC TRANSAXLE ASSY (See page 40–3)



66. REMOVE DRIVE PLATE & RING GEAR SUB–ASSY

(a) Using SST, hold the crankshaft pulley.
SST 09213–54015 (91651–60855), 09330–00021

(b) Remove the 8 bolts and drive plate and ring gear.



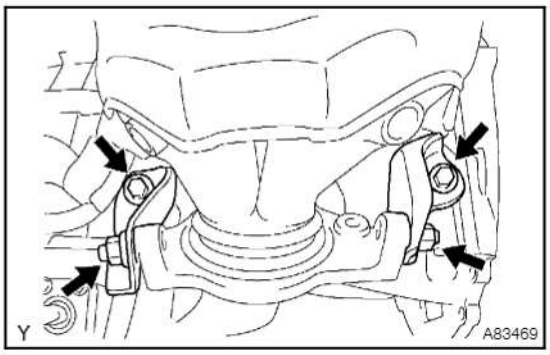
67. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE ASSY

(a) Remove the bolt, O–ring and the camshaft timing oil control valve.

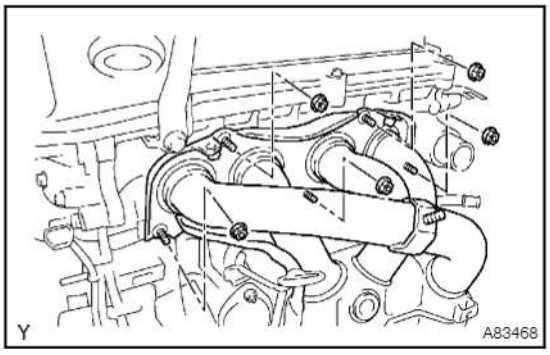
68. REMOVE THROTTLE BODY BRACKET (See page 10–8)
69. REMOVE THROTTLE BODY ASSY (See page 10–8)
70. REMOVE FUEL PRESSURE PULSATION DAMPER ASSY
71. DISCONNECT FUEL TUBE SUB–ASSY (See page 11–1)
72. REMOVE FUEL PIPE SUB–ASSY NO.1 (See page 11–24)

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73. REMOVE FUEL PUMP ASSY (See page 11–24)
74. REMOVE INTAKE MANIFOLD (See page 11–13)
75. REMOVE SURGE TANK STAY NO.1 (See page 11–13)
76. REMOVE INTAKE MANIFOLD INSULATOR NO.2 (See page 11–13)
77. REMOVE NOZZLE HOLDER CLAMP (See page 11–13)
78. REMOVE FUEL DELIVERY PIPE SUB–ASSY (See page 11–13)
79. REMOVE FUEL INJECTOR ASSY (See page 11–13)
80. REMOVE V–RIBBED BELT TENSIONER ASSY (See page 14–45)
81. REMOVE IGNITION COIL ASSY (See page 14–45)
82. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.1
(a) Remove the 3 bolts and nut, then remove the exhaust manifold heat insulator.

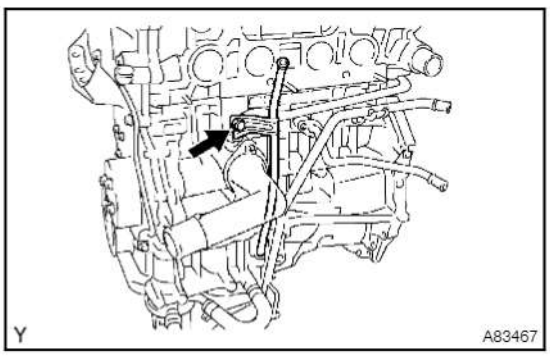


83. REMOVE EXHAUST MANIFOLD CONVERTER SUB–ASSY
(a) Remove the 2 bolts and 2 nuts, then detach the No. 1 and No. 2 exhaust manifold stay.



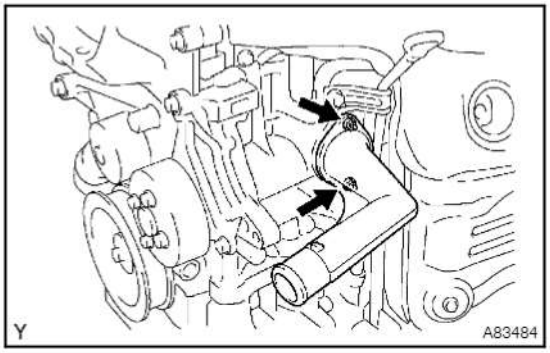
(b) Remove the 5 nuts, the exhaust manifold converter and gasket.

84. REMOVE OIL LEVEL GAGE SUB–ASSY



85. REMOVE OIL LEVEL GAGE GUIDE
(a) Remove the bolt, then detach the oil level gage guide.

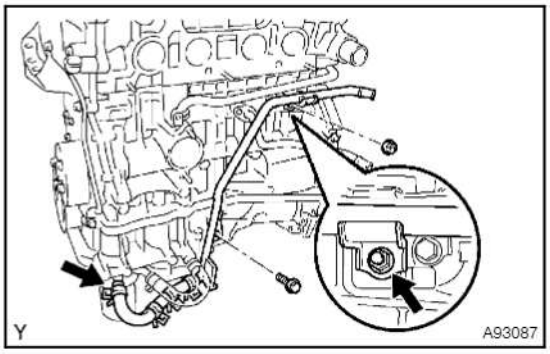
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86. REMOVE WATER INLET

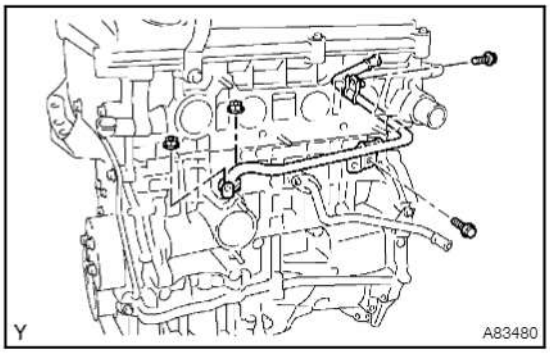
(a) Remove the 2 nuts and the water inlet.

87. REMOVE THERMOSTAT



88. REMOVE OIL COOLER PIPE

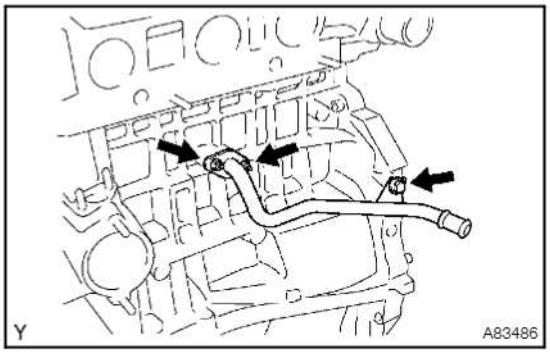
(a) Remove the bolt and nut shown in the illustration, then disconnect the oil cooler pipe from the cylinder block.



89. REMOVE WATER BY–PASS PIPE NO.1

(a) Remove the 2 bolts and 2 nuts.

(b) Remove the water by–pass pipe No. 1 and a gasket.

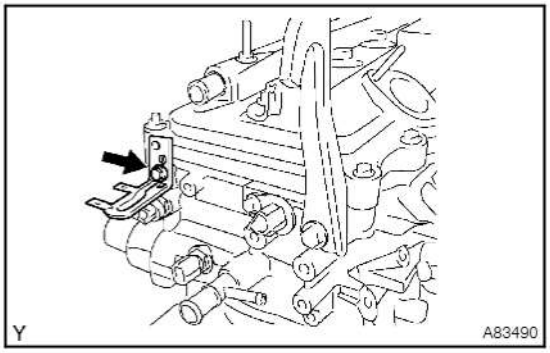


90. REMOVE WATER BY–PASS PIPE NO.3

(a) Remove the bolt and 2 nuts.

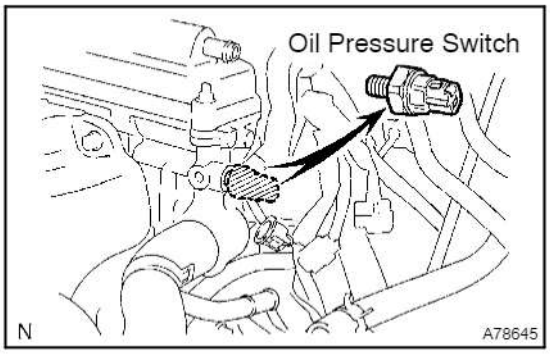
(b) Remove the water by–pass pipe No.3 and gasket.

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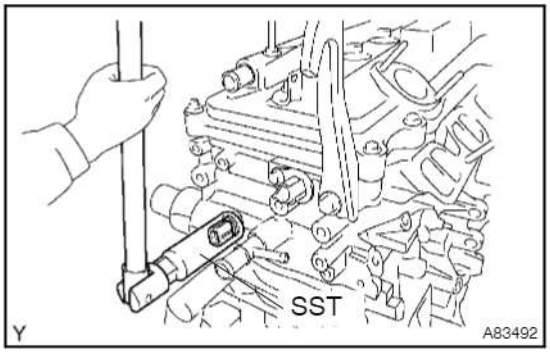


91. REMOVE ENGINE OIL PRESSURE SWITCH ASSY

(a) Remove the bolt and oxygen sensor bracket.



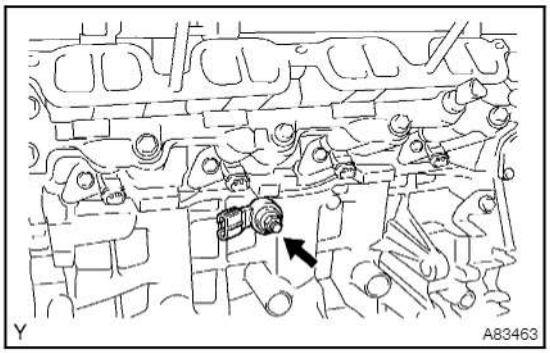
(b) Using SST, remove the engine oil pressure switch.
SST 09268–46021



92. REMOVE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

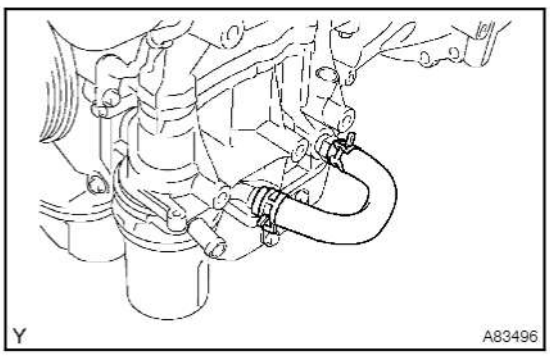
(a) Using SST, remove the coolant temperature sensor
SST 09817–33190

(b) Remove the gasket.



93. REMOVE KNOCK SENSOR

(a) Remove the nut and knock sensor.



94. REMOVE OIL COOLER HOSE

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95. REPLACE PARTIAL ENGINE ASSY

96. INSTALL KNOCK SENSOR

Torque: 20 N·m (208 kgf·cm, 15 ft·lbf)

97. INSTALL E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

(a) Install a new gasket to the engine coolant temperature sensor.

(b) Using SST, install the engine coolant temperature sensor.

SST 09817–33190

Torque: 20 N·m (208 kgf·cm, 15 ft·lbf)

98. INSTALL ENGINE OIL PRESSURE SWITCH ASSY

(a) Clean the threads of the oil pressure switch, apply adhesive there.

Adhesive: Part No. 08833 – 00080 THREE BOND 1344 or equivalent.

(b) Install the oil pressure switch.

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

SST 09268–46021

99. INSTALL WATER BY–PASS PIPE NO.3

(a) Install the water by–pass No.2 in the cylinder block with a new gasket.

(b) Fasten the water by–pass pipe No.3 with the bolt and 2 nuts.

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

100. INSTALL WATER BY–PASS PIPE NO.1

(a) Install the water by–pass pipe No. 1 and a new gasket.

(b) Install the 2 bolts and 2 nuts.

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

101. INSTALL OIL COOLER PIPE

(a) Install the oil cooler pipe with the 2 bolts.

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

102. INSTALL THERMOSTAT (See page 16–14)

103. INSTALL WATER INLET

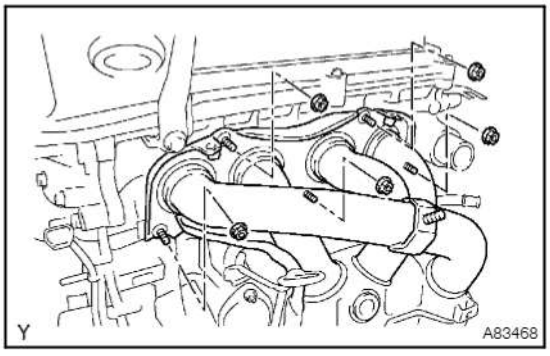
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

104. INSTALL OIL LEVEL GAGE GUIDE

(a) Apply a light coat of engine oil to the O–ring, then install it to the oil level gage guide.

(b) Install the oil level gage and guide with the bolt.

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

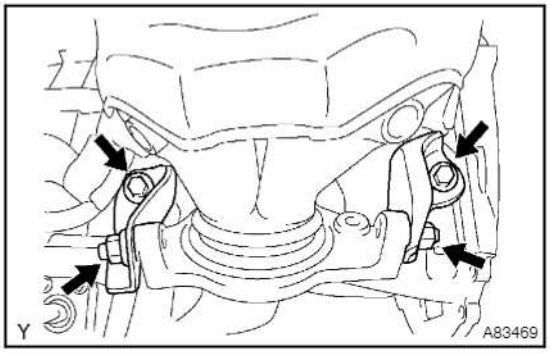


105. INSTALL EXHAUST MANIFOLD CONVERTER SUB–ASSY

(a) Install a new gasket and the exhaust manifold converter with the 5 nuts.

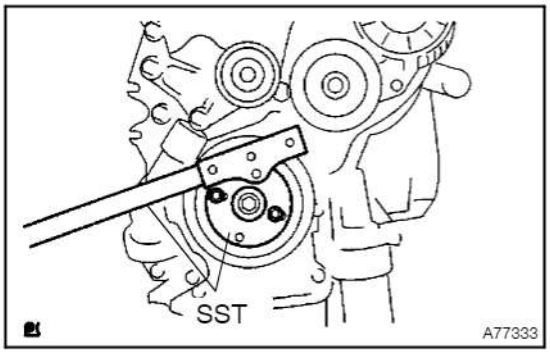
Torque: 37 N·m (378 kgf·cm, 27 ft·lbf)

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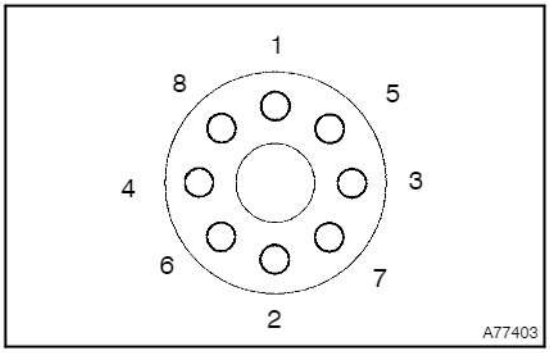
(b) Install the No. 1 and No. 2 exhaust manifold stays with the 2 bolts and 2 nuts.
Torque: 44 N·m (449 kgf·cm, 32 ft·lbf)

106. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.1
Torque: 12 N·m (122 kgf·cm, 9.0 ft·lbf)
107. INSTALL V–RIBBED BELT TENSIONER ASSY
Torque: 60 N·m (607 kgf·cm, 44 ft·lbf)
108. INSTALL IGNITION COIL ASSY
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
109. INSTALL FUEL INJECTOR ASSY (See page 11–13)
110. INSTALL FUEL DELIVERY PIPE SUB–ASSY (See page 11–13)
111. INSTALL NOZZLE HOLDER CLAMP (See page 11–13)
112. INSTALL SURGE TANK STAY NO.1 (See page 11–13)
113. INSTALL INTAKE MANIFOLD (See page 11–13)
114. INSTALL FUEL PUMP ASSY (See page 11–24)
115. INSTALL FUEL PIPE SUB–ASSY NO.1 (See page 11–24)
SST 09023–12900
116. INSTALL FUEL PRESSURE PULSATION DAMPER ASSY (See page 11–24)
117. INSTALL THROTTLE BODY ASSY (See page 10–8)
118. INSTALL THROTTLE BODY BRACKET (See page 10–8)
119. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE ASSY
(a) Apply a light coat of engine oil to the new O–ring, then install it to the camshaft timing oil control valve.
(b) Install the camshaft oil control valve with the bolt.
Torque: 9.0 N·m (92 kgf·cm, 79 in.·lbf)



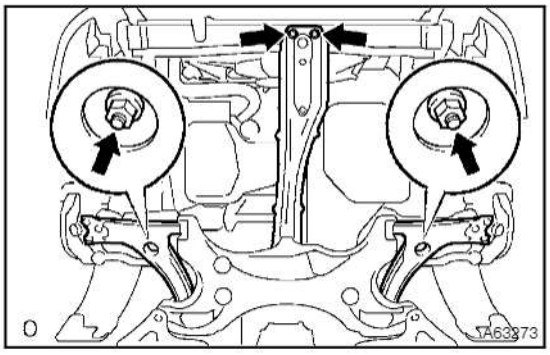
120. INSTALL DRIVE PLATE & RING GEAR SUB–ASSY
(a) Hold the crankshaft with SST.
SST 09213–54015 (91651–60855), 09330–00021
Adhesive:
Part No. 08833–00070, THREE BOND or equivalent

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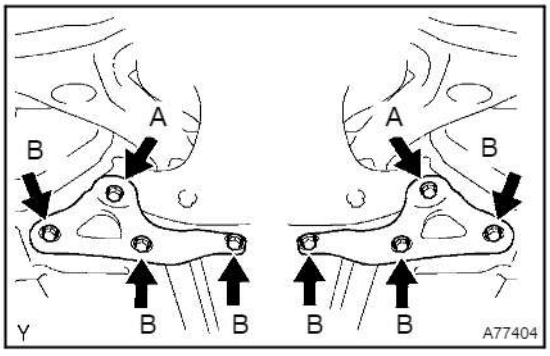


(b) Install the drive plate.
(1) Clean the bolt and bolt hole.
(2) Apply adhesive to the bolts.
(3) Using several steps, install and tighten the 8 bolts uniformly in the sequence shown in the illustration.
Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

121. INSTALL AUTOMATIC TRANSAXLE ASSY (See page 40–3)
122. INSTALL FRONT DRIVE SHAFT ASSY LH (See page 30–4)
123. INSTALL FRONT DRIVE SHAFT ASSY RH (See page 30–4)
124. INSTALL FRONT SUSPENSION CROSSMEMBER W/CENTER MEMBER
(a) Install the engine mounting insulator FR with the through bolt and nut.
Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)
(b) Install the engine mounting insulator RR with the through bolt and nut.
Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)
125. INSTALL STARTER ASSY (See page 19–3)
126. INSTALL VANE PUMP ASSY
Torque: 37 N·m (370 kgf·cm, 27 ft·lbf)

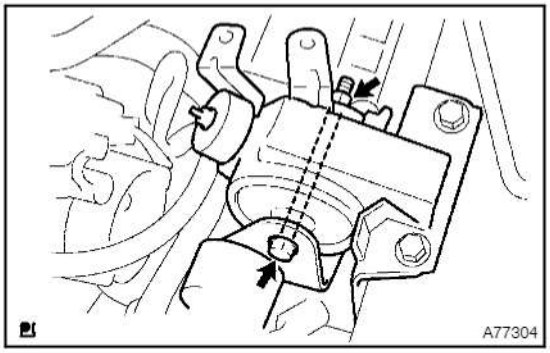


127. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE
(a) Install the 2 bolts and 2 nuts as shown in the illustration.
Torque:
45 N·m (459 kgf·cm, 33 ft·lbf) for Bolt
133 N·m (1,356 kgf·cm, 98 ft·lbf) for Nut



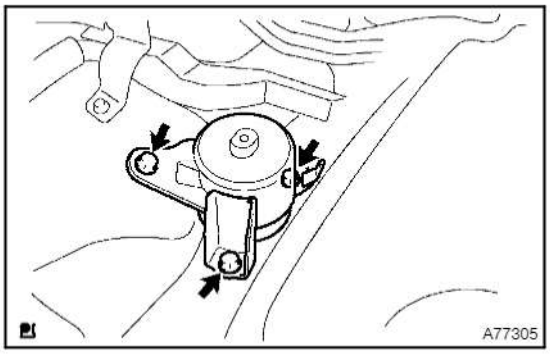
(b) Install the front suspension member braces with the 8 bolts.
Torque:
133 N·m (1,356 kgf·cm, 98 ft·lbf) for Bolt A
80 N·m (816 kgf·cm, 59 ft·lbf) for Bolt B

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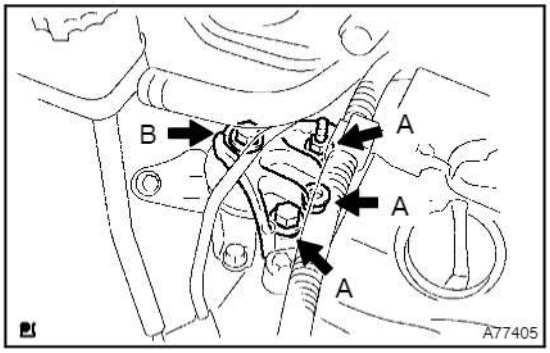
128. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install the bolt, nut and transverse engine engine mounting insulator.
Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)



129. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Install the 3 bolts and transverse engine engine mounting insulator.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



130. INSTALL ENGINE MOUNTING BRACKET NO.2 RH

(a) Install the 2 bolts, 2 nuts and engine mounting bracket No. 2 RH.
Torque:
52 N·m (530 kgf·cm, 38 ft·lbf) for A
113 N·m (1,152 kgf·cm, 83 ft·lbf) for B

131. REMOVE ENGINE HANGERS

132. INSTALL STEERING INTERMEDIATE SHAFT ASSY NO.2 (See Pub. No. RM1018E on page 51–36)

133. INSTALL TRANSMISSION CONTROL CABLE ASSY (See page 40–3)

134. INSTALL FRONT AXLE ASSY LH (See page 30–4)

135. INSTALL FRONT AXLE ASSY RH

HINT:
Perform the same procedure as above on the opposite side.

136. INSTALL FRONT SUSPENSION ARM SUB–ASSY LOWER NO.1 LH
(See Pub. No. RM1018E on page 26–16)

137. INSTALL FRONT SUSPENSION ARM SUB–ASSY LOWER NO.1 RH

HINT:
Perform the same procedure as above on the opposite side.

138. INSTALL FRONT STABILIZER LINK ASSY LH
Torque: 74 N·m (755 kgf·cm, 55 ft·lbf)

139. INSTALL FRONT STABILIZER LINK ASSY RH
Torque: 74 N·m (755 kgf·cm, 55 ft·lbf)

140. INSTALL TIE ROD END SUB–ASSY LH (See page 30–4)

141. INSTALL TIE ROD END SUB–ASSY RH

HINT:
Perform the same procedure as above on the opposite side.

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142. INSTALL FRONT AXLE HUB LH NUT (See page 30–4)
143. INSTALL FRONT AXLE HUB RH NUT

HINT:

Perform the same procedure as above on the opposite side.

144. INSTALL EXHAUST PIPE ASSY FRONT (See page 15–2)
145. INSTALL EXHAUST PIPE ASSY CENTER (See page 15–2)
146. INSTALL FLOOR PANEL BRACE FRONT
Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)
147. CONNECT FUEL TUBE SUB–ASSY (See page 11–1)
148. INSTALL COOLER BRACKET (LHD STEERING POSITION TYPE)
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
149. INSTALL ENGINE SERVICE COVER BRACKET RH (RHD STEERING POSITION TYPE)
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
150. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD STEERING POSITION TYPE)
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
151. INSTALL OIL RESERVOIR BRACKET NO.1
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
152. INSTALL RETURN TUBE SUB–ASSY
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
153. INSTALL VANE PUMP OIL RESERVOIR ASSY
154. INSTALL RADIATOR RESERVE TANK ASSY
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
155. INSTALL BATTERY CARRIER
Torque: 13 N·m (131 kgf·cm, 9.5 ft·lbf)
156. INSTALL AIR CLEANER ASSEMBLY WITH HOSE
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
157. INSTALL BATTERY
Torque:
5.0 N·m (51 kgf·cm, 44 in.·lbf) for Bolt
3.5 N·m (36 kgf·cm, 31 in.·lbf) for Nut
158. INSTALL W/PULLEY COMPRESSOR ASSY(See page 55–4)
159. INSTALL GENERATOR ASSY (See page 19–8)
160. INSTALL FAN AND GENERATOR V BELT (See page 14–5)
161. INSTALL RADIATOR ASSY (See page 16–9)
162. CONNECT COOLER REFRIGERANT SUCTION HOSE NO.1 (RHD STEERING POSITION TYPE) (See page 55–1)
163. INSTALL RADIATOR RELAY BLOCK
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)
164. INSTALL ENGINE COVER SUB–ASSY NO.1
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
165. ADD AUTOMATIC TRANSAXLE FLUID (See Pub. No. RM1018E on page 40–2)
166. ADD ENGINE OIL (See page 17–6)
167. ADD COOLANT (See page 16–7)
168. ADD POWER STEERING FLUID (See Pub. No. RM1018E on page 51–4)
169. BLEED POWER STEERING FLUID (See Pub. No. RM1018E on page 51–4)
170. CHECK FOR ENGINE OIL LEAKS
171. CHECK FOR ENGINE COOLANT LEAKS (See page 16–1)
172. CHECK FOR FUEL LEAKS (See page 11–4)
173. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

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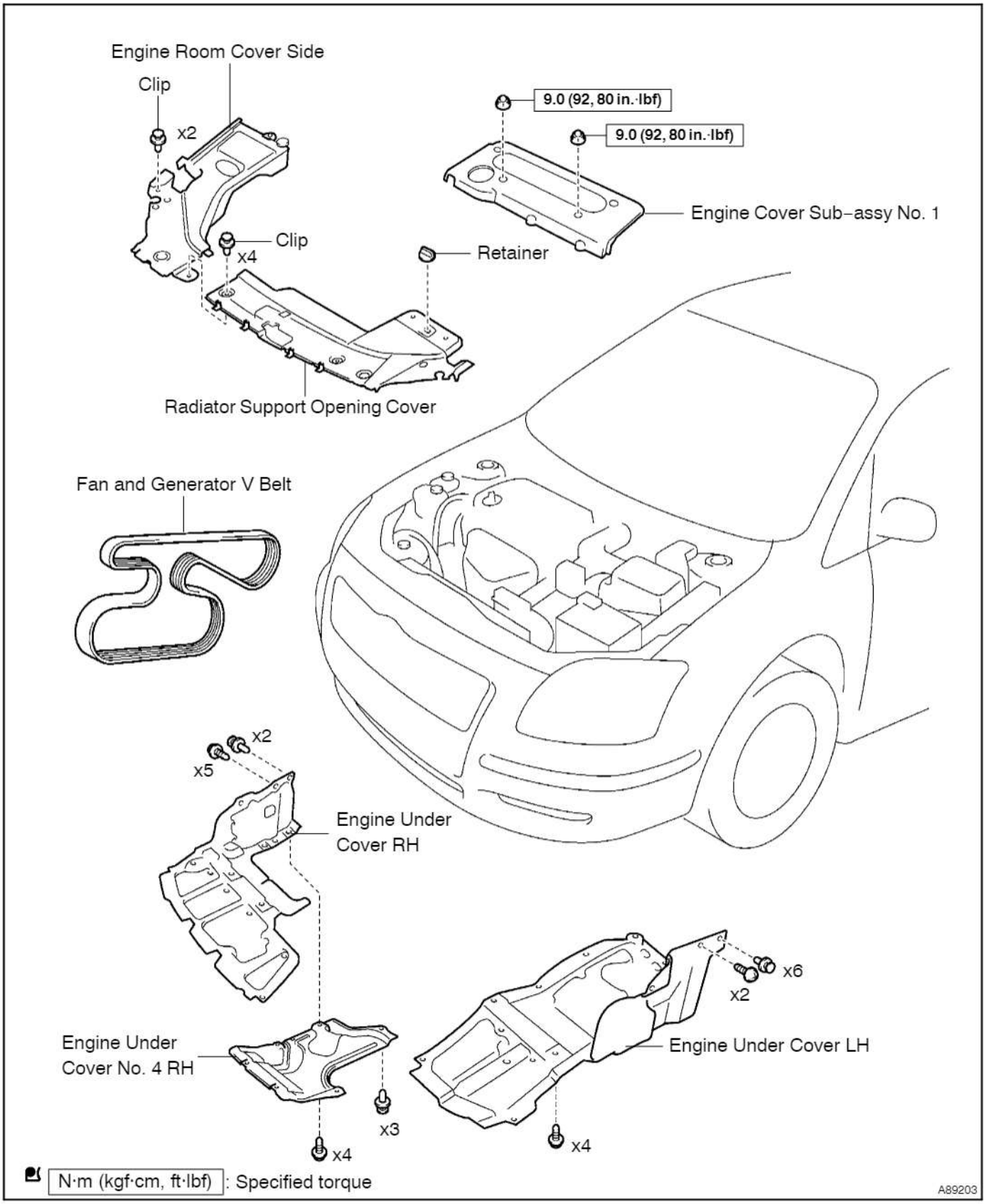
174. CHECK POWER STEERING FULUID LEVEL IN RESERVOIR
(See Pub. No. RM1018E on page 51–4)
175. ADJUST FRONT WHEEL ALIGNMENT (See Pub. No. RM1018E on page 26–6)
176. INSPECT CHECK IDLE SPEED AND IGNITION TIMING (See page 14–1)
177. INSPECT CO/HC (See page 14–1)
178. CHECK ABS SPEED SENSOR SIGNAL

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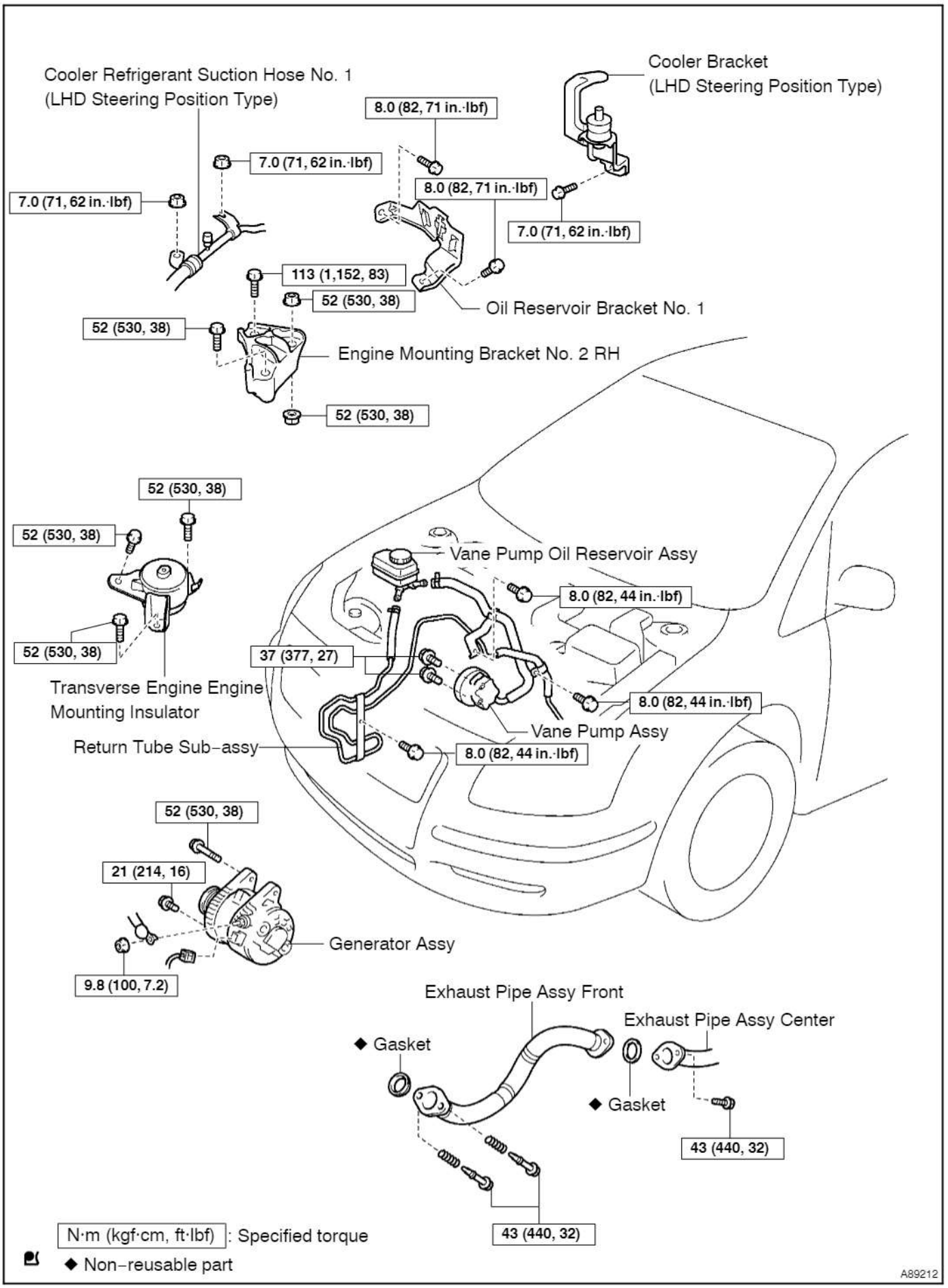
CHAIN SUB–ASSY (2AZ–FSE)

COMPONENTS

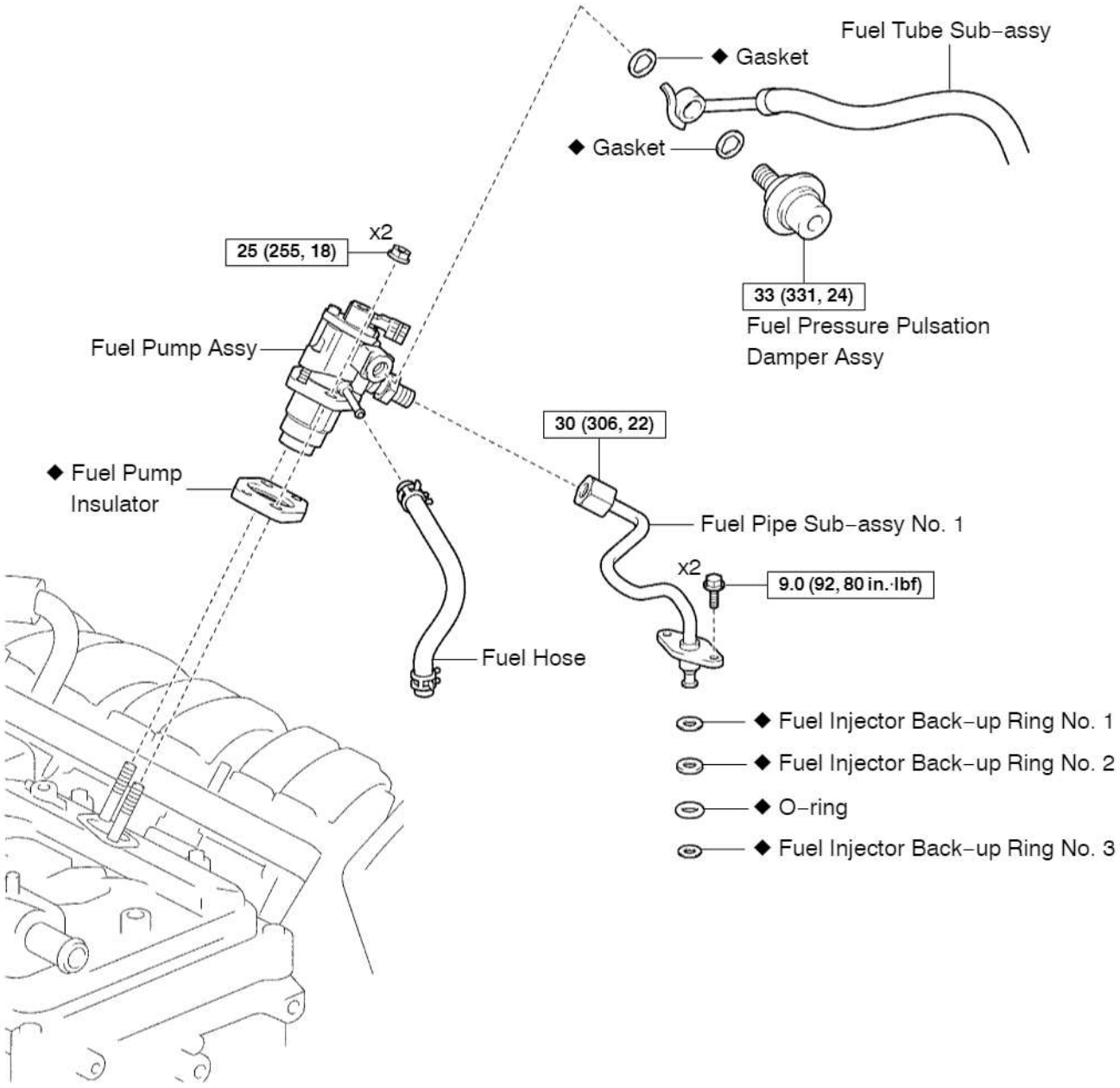
141N8–01



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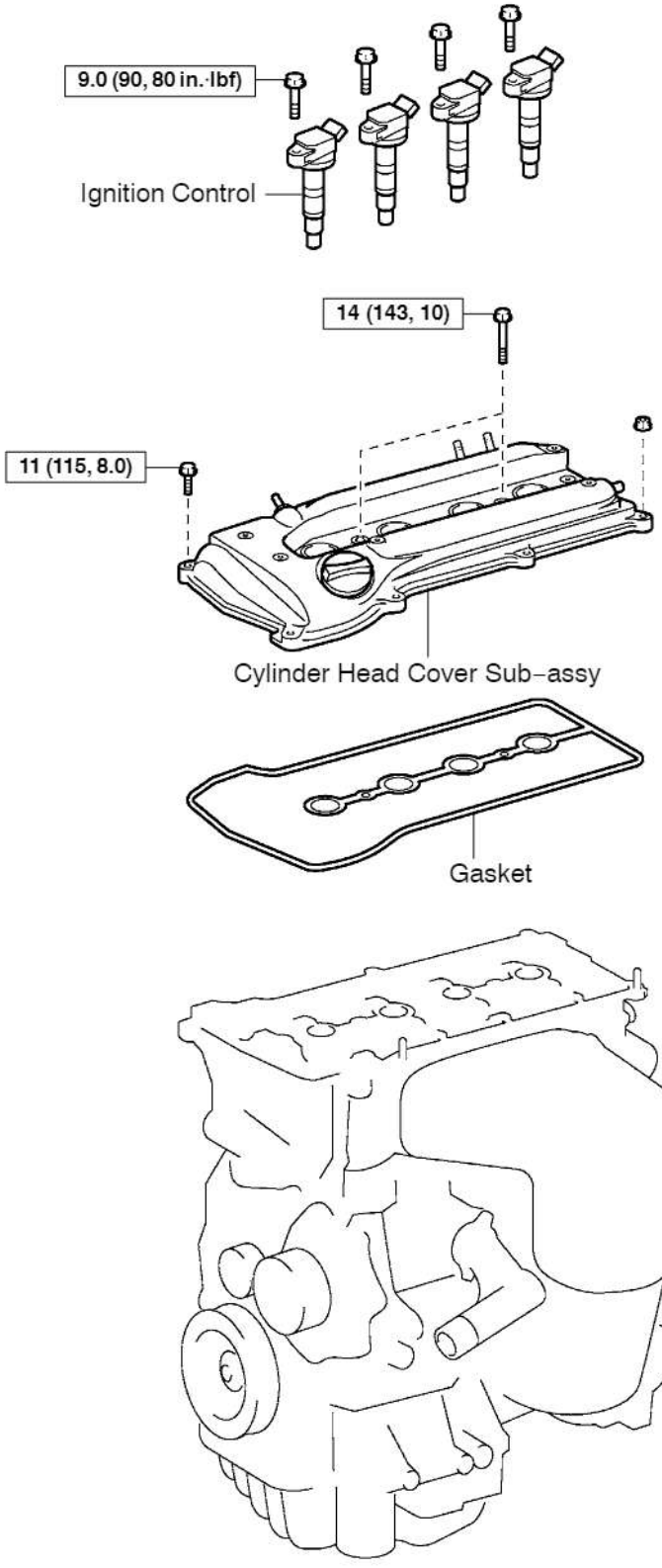
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

P

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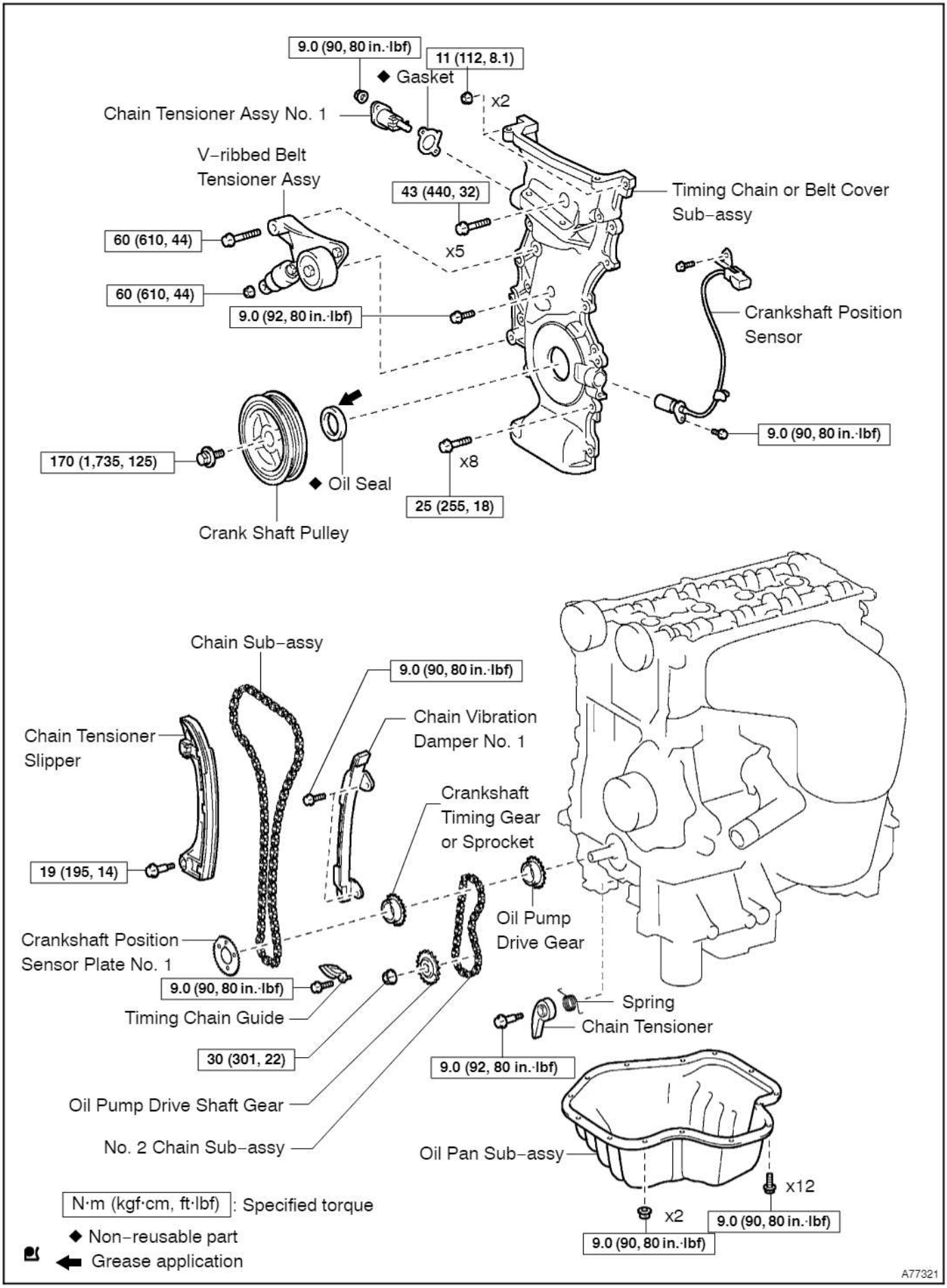
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N·m (kgf·cm, ft·lbf) : Specified torque

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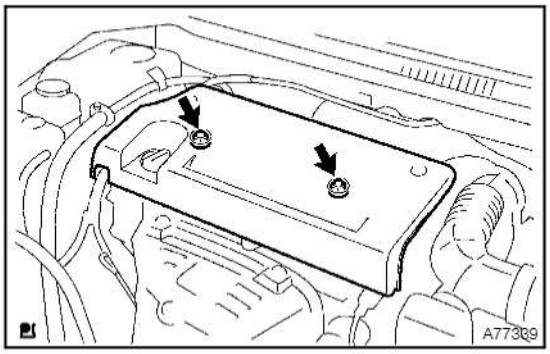


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REPLACEMENT

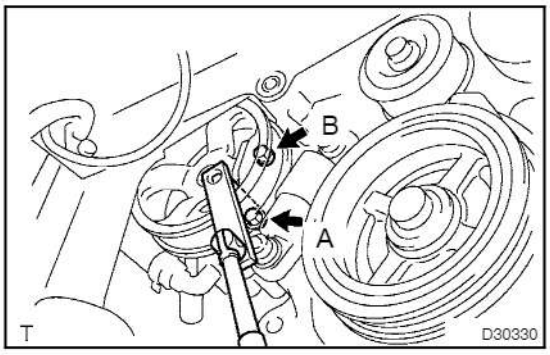
1. DISCHARGE FUEL SYSTEM PRESSURE (See page 11–4)
2. REMOVE FRONT WHEEL RH
3. REMOVE RADIATOR SUPPORT OPENING COVER (See page 14–23)
4. REMOVE ENGINE ROOM COVER SIDE (See page 14–23)
5. REMOVE ENGINE UNDER COVER LH (See page 14–23)
6. REMOVE ENGINE UNDER COVER NO.4 RH (See page 14–23)
7. REMOVE ENGINE UNDER COVER RH (See page 14–23)
8. DRAIN ENGINE OIL (See page 17–6)



9. REMOVE ENGINE COVER SUB–ASSY NO.1

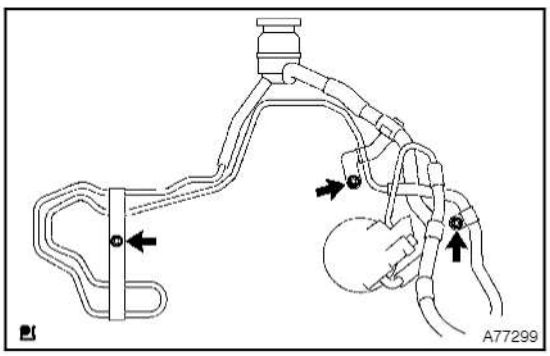
(a) Remove the 2 nuts and engine cover No. 1.

10. REMOVE FUEL PRESSURE PULSATION DAMPER ASSY
11. DISCONNECT FUEL TUBE SUB–ASSY (See page 11–4)
12. SEPARATE FUEL PIPE SUB–ASSY NO.1 (See page 11–24)
    SST 09023–12900
13. REMOVE FUEL PUMP ASSY (See page 11–24)
14. REMOVE FAN AND GENERATOR V BELT (See page 14–5)
    SST 09249–63010
15. REMOVE GENERATOR ASSY (See page 19–8)
16. REMOVE EXHAUST PIPE ASSY FRONT (See page 15–2)



17. SEPARATE VANE PUMP ASSY

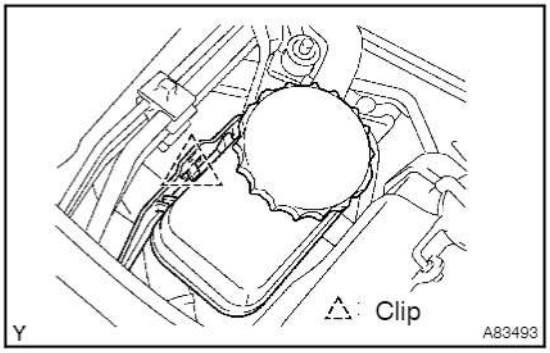
(a) Disconnect the connector from oil pressure switch.
(b) Using SST and a deep socket (14mm), loosen the bolt A.
    SST 09249–63010
(c) Remove the bolt B, then detach the vane pump assembly.



18. SEPARATE RETURN TUBE SUB–ASSY

(a) Remove the 3 bolts, then separate the return tube as shown in the illustration.

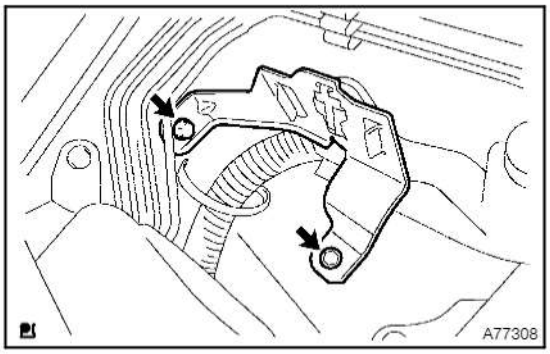
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19. REMOVE VANE PUMP OIL RESERVOIR ASSY

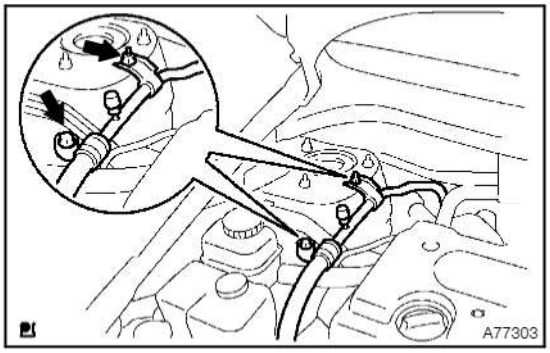
(a) Disconnect the 2 hoses.

(b) Remove the clip fitting shown in the illustration, then remove the vane pump oil reservoir assembly.



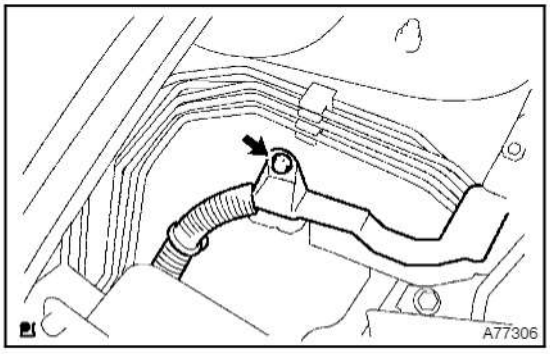
20. REMOVE OIL RESERVOIR BRACKET NO.1

(a) Remove the 2 bolts, then the oil pump reservoir bracket No. 1.



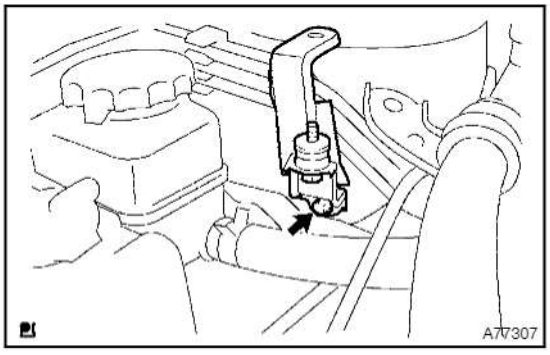
21. SEPARATE COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD STEERING POSITION TYPE)

(a) Remove the 2 nuts, then separate the Cooler refrigerant Suction hose No. 1.



22. SEPARATE ENGINE WIRE

(a) Remove the bolt, then separate the clamp and engine wire.



23. REMOVE COOLER BRACKET (LHD STEERING POSITION TYPE)

(a) Remove the bolt and cooler bracket.

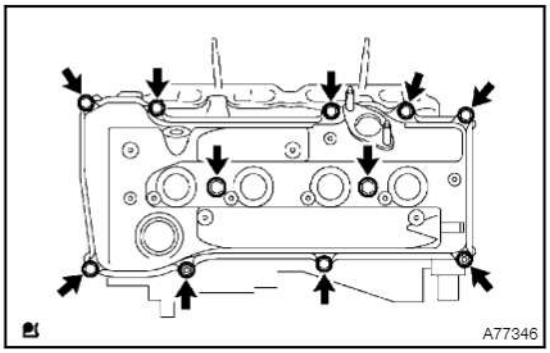
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24. REMOVE ENGINE SERVICE COVER BRACKET RH (RHD STEERING POSITION TYPE)

(a) Remove the bolt and the engine service cover bracket RH.

25. REMOVE IGNITION COIL ASSY

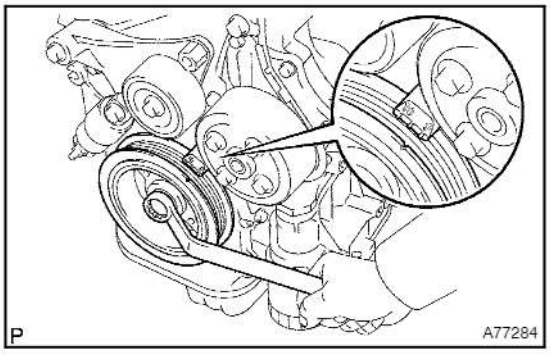
(a) Remove the 4 bolts and 4 ignition coils.



26. REMOVE CYLINDER HEAD COVER SUB–ASSY

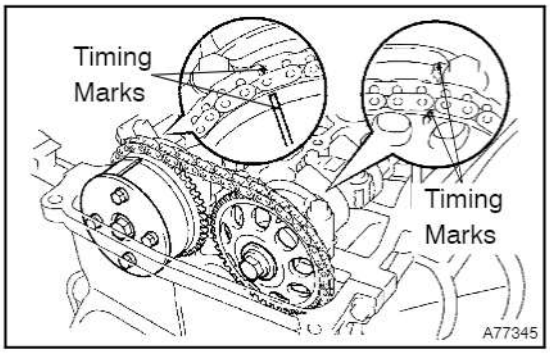
(a) Disconnect the 2 PCV hoses from the cylinder head cover.

(b) Remove the 9 bolts and 2 nuts, then remove the cylinder head cover and gasket.



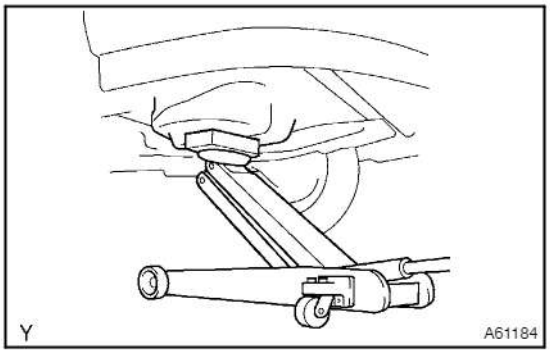
27. SET NO. 1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley, then align its groove with timing mark 0 of the timing chain cover.



(b) Check that each timing mark of the camshaft timing gears is aligned with the timing marks of the No. 1 and No. 2 bearing caps as shown in the illustration.

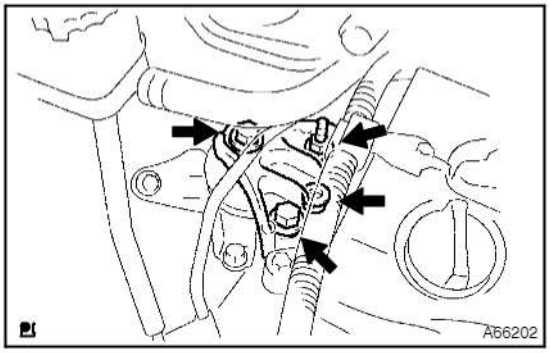
If not, turn the crankshaft 1 revolution (360°), then align the marks as above.



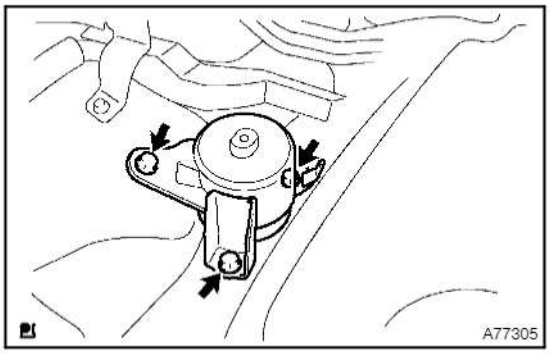
28. REMOVE ENGINE MOUNTING BRACKET NO.2 RH

(a) Set the jack underneath the engine, then place a wooden block on the jack.

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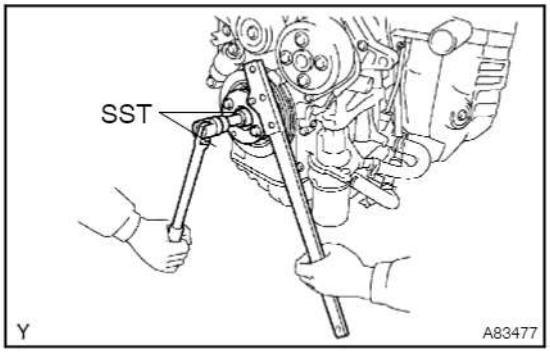


(b) Remove the 2 bolts and 2 nuts, then detach the mounting bracket No. 2 RH.



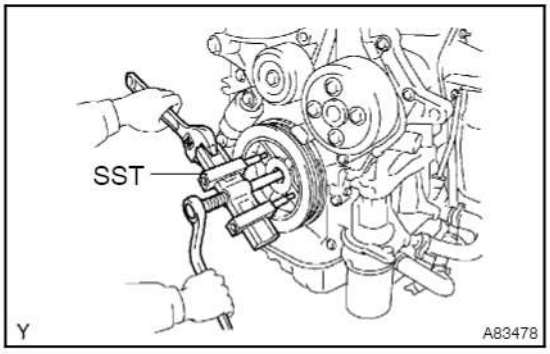
29. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Remove the 3 bolts and the engine mounting insulator.

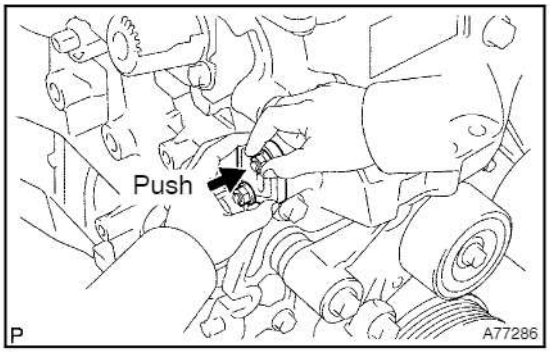


30. REMOVE CRANKSHAFT PULLEY

(a) Using SST, hold the crankshaft pulley, then loosen a crankshaft pulley bolt.
SST 09213–54015 (91651–60855), 09330–00021



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



31. REMOVE CHAIN TENSIONER ASSY NO.1

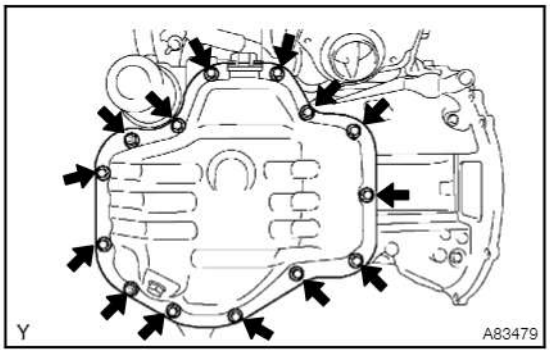
(a) Remove the 2 nuts, the chain tensioner No. 1 and gasket.

NOTICE:

Do not turn the crankshaft.

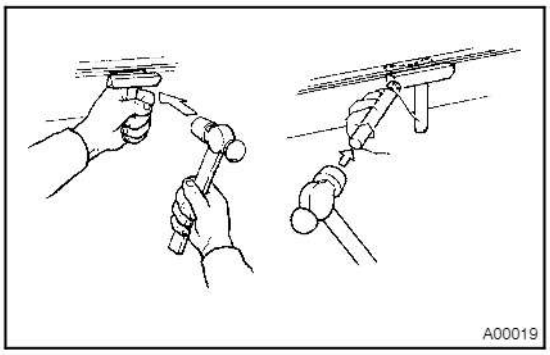
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32. REMOVE CRANKSHAFT POSITION SENSOR (See page 18–6)



33. REMOVE OIL PAN SUB–ASSY

(a) Remove the 12 bolts and 2 nuts.

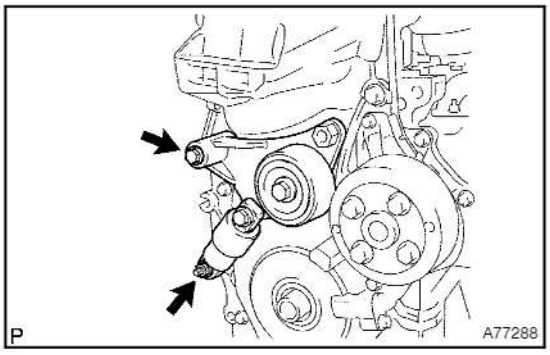


(b) Insert the blade of SST among the crank case, timing chain cover and oil pan, then cut off applied sealer and remove the oil pan.

SST 09032–00100

NOTICE:

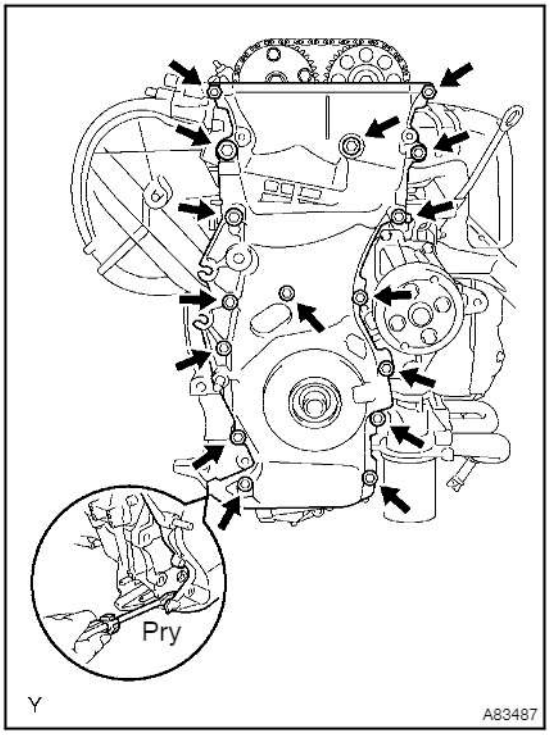
Be careful not to damage the contact surface of the timing chain cover, crank case and oil pan.



34. REMOVE V–RIBBED BELT TENSIONER ASSY

(a) Remove the bolt and nut, then remove the V–ribbed belt tensioner.

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35. REMOVE TIMING CHAIN OR BELT COVER SUB–ASSY

(a) Remove the 14 bolts and 2 nuts.

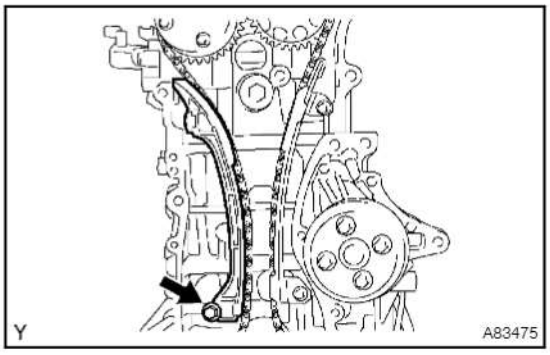
(b) Using a screwdriver, pry between the timing chain cover and cylinder head or cylinder block.

(c) Remove the timing chain cover.

NOTICE:

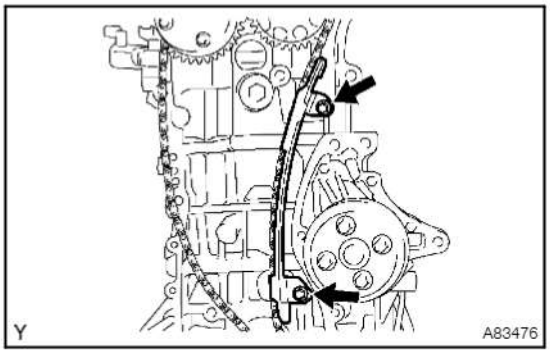
Be careful not to damage the contact surface of the timing chain cover, cylinder head and cylinder block.

36. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1



37. REMOVE CHAIN VIBRATION DAMPER NO.1

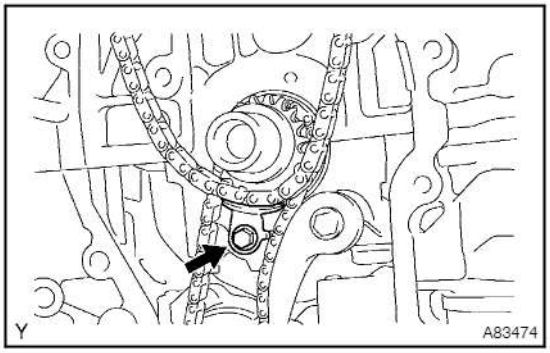
(a) Remove the bolt and chain vibration damper No. 1



38. REMOVE CHAIN TENSIONER SLIPPER

(a) Remove the 2 bolts and chain tensioner slipper.

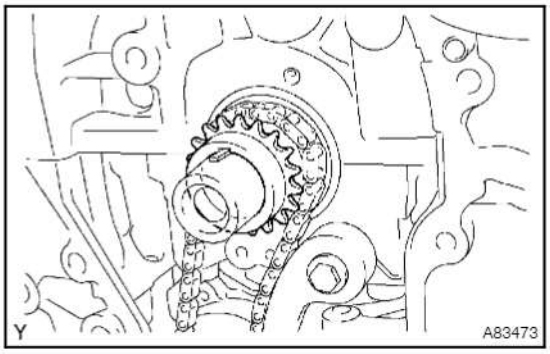
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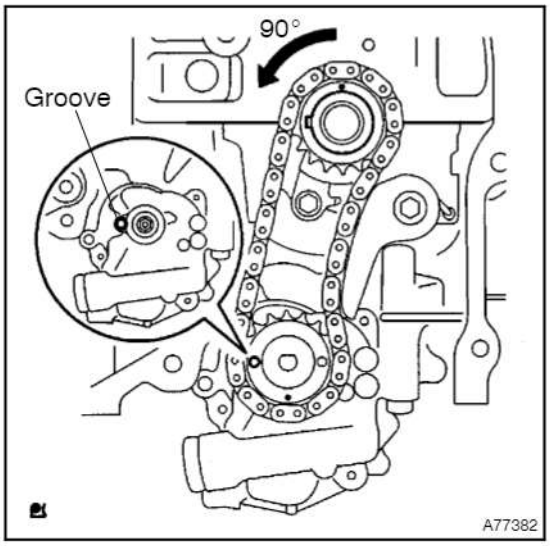
39. REMOVE TIMING CHAIN GUIDE

(a) Remove the bolt and timing chain guide.

40. REMOVE CHAIN SUB–ASSY

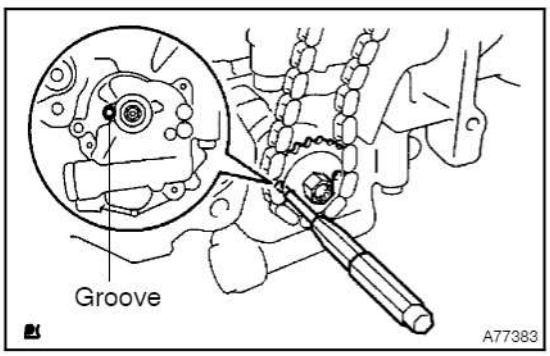


41. REMOVE CRANKSHAFT TIMING GEAR OR SPROCKET



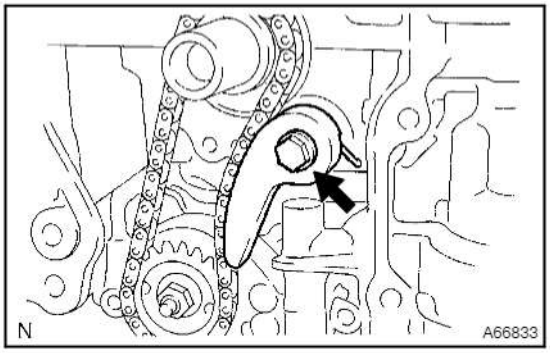
42. REMOVE NO.2 CHAIN SUB–ASSY

(a) Turn the crankshaft counterclockwise 90°, then align an adjusting hole of the oil pump drive shaft gear with the groove of the oil pump.

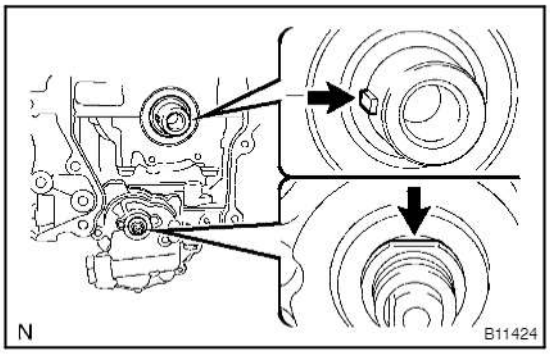


(b) Put a 4 mm diameter bar in the adjusting hole of the oil pump drive shaft gear to lock in position, then remove the nut.

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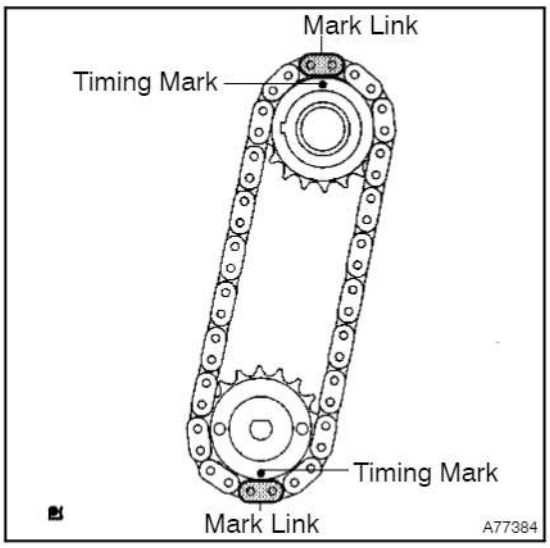


(c) Remove the bolt, then remove the chain tensioner and spring.
(d) Remove the oil pump drive shaft gear and chain No. 2.

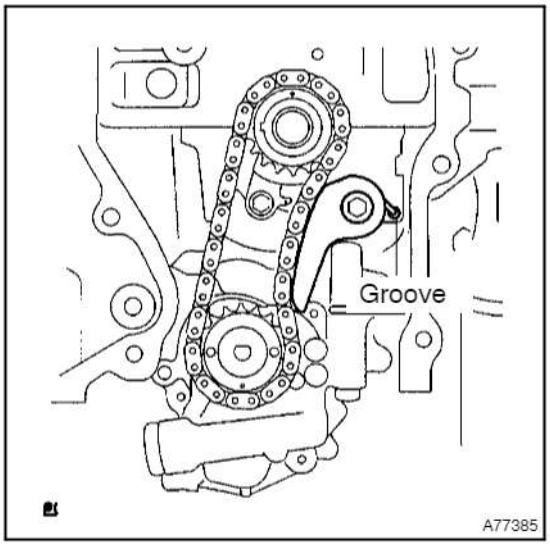


43. INSTALL NO.2 CHAIN SUB–ASSY

(a) Set the crankshaft key to the left side position.
(b) Position the flat portion of the drive shaft upward.

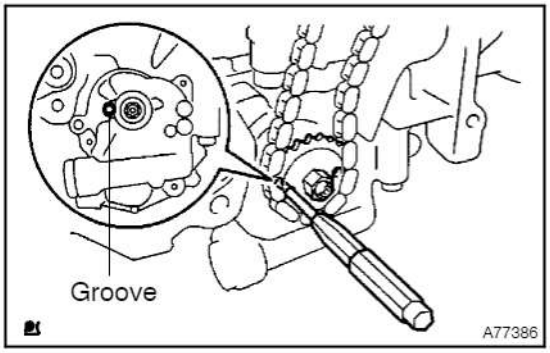


(c) Align the mark links (yellow colored links) with the timing marks of each gear as shown in the illustration.
(d) Install the gears to the crankshaft and oil pump shaft wrapped with the chain.
(e) Temporarily tighten the oil pump drive shaft gear with the nut.



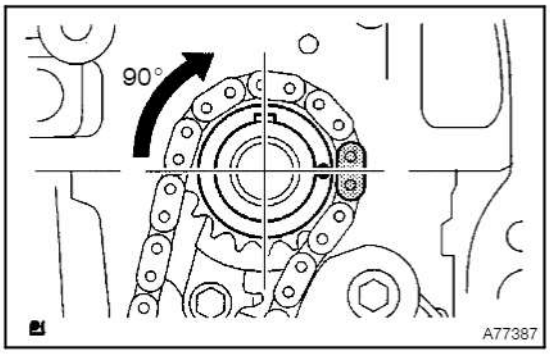
(f) Insert the damper spring into the adjusting hole, then install the chain tensioner plate with the bolt.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

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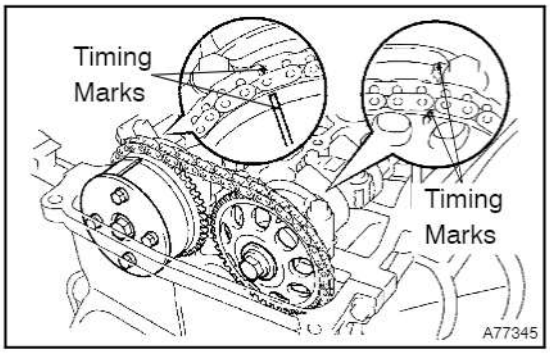
(g) Align an adjusting hole of the sprocket with the groove of the oil pump.

(h) Insert a 4 mm diameter bar into the adjusting hole of the sprocket to lock in position, then tighten the nut.
Torque: 30 N·m (301 kgf·cm, 22 ft·lbf)



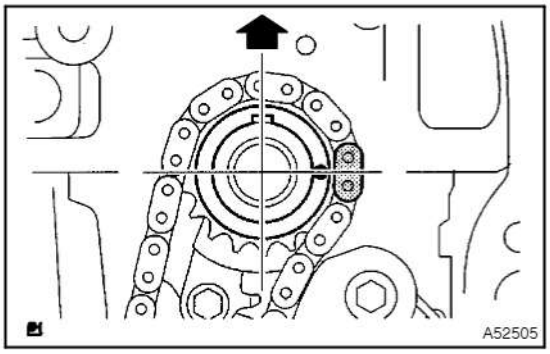
(i) Rotate the crankshaft clockwise 90°, then position the crankshaft key upward.

44. INSTALL CRANKSHAFT TIMING GEAR OR SPROCKET



45. SET NO. 1 CYLINDER TO TDC/COMPRESSION

(a) Turn the camshafts with a wrench on the hexagonal lobe, then align the timing marks of the camshaft timing gear with each timing mark located on the No. 1 and No. 2 bearing caps as shown in the illustration.



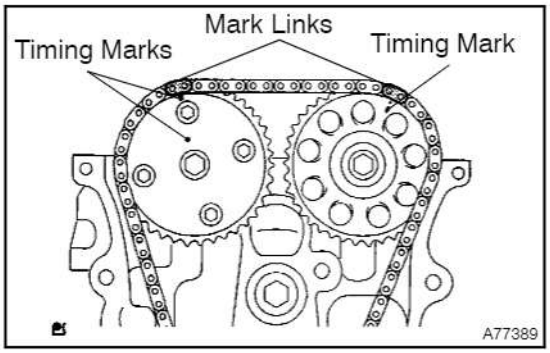
(b) Using the crankshaft pulley bolt, turn the crankshaft and position the key on the crankshaft upward.

46. INSTALL CHAIN VIBRATION DAMPER NO.1
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

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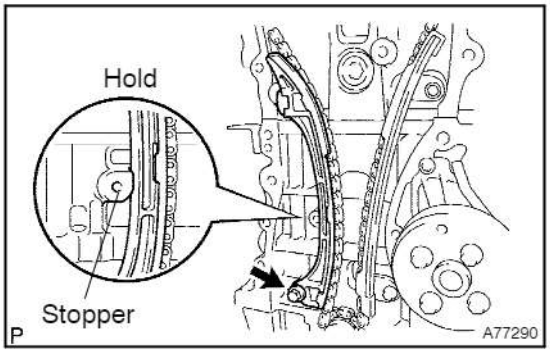
47. INSTALL CHAIN SUB–ASSY

(a) Install the chain to the crankshaft timing gear or sprocket.



(b) Align the mark links (gold or yellow colored links) with each timing mark located on the camshaft timing gears, then install the chain.

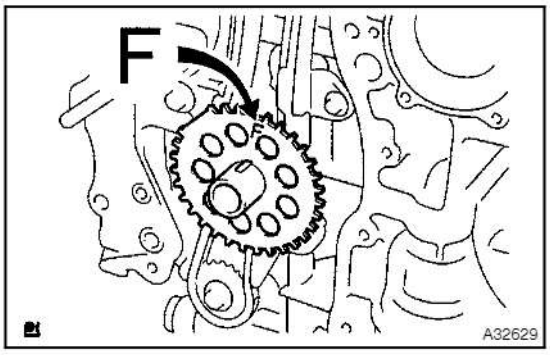
48. INSTALL TIMING CHAIN GUIDE
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)



49. INSTALL CHAIN TENSIONER SLIPPER

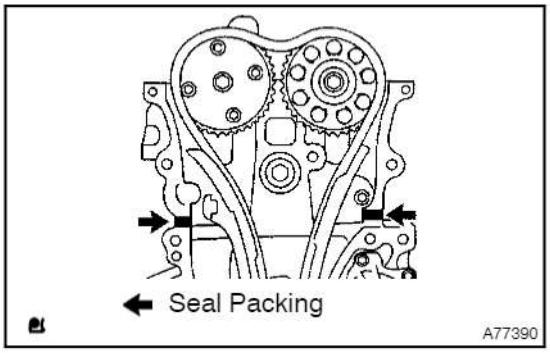
(a) Install the chain tensioner slipper with bolt.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

(b) Check that the chain tensioner slipper is held on the cylinder block stopper.



50. INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1

(a) Install the plate with the "F" mark facing forward.



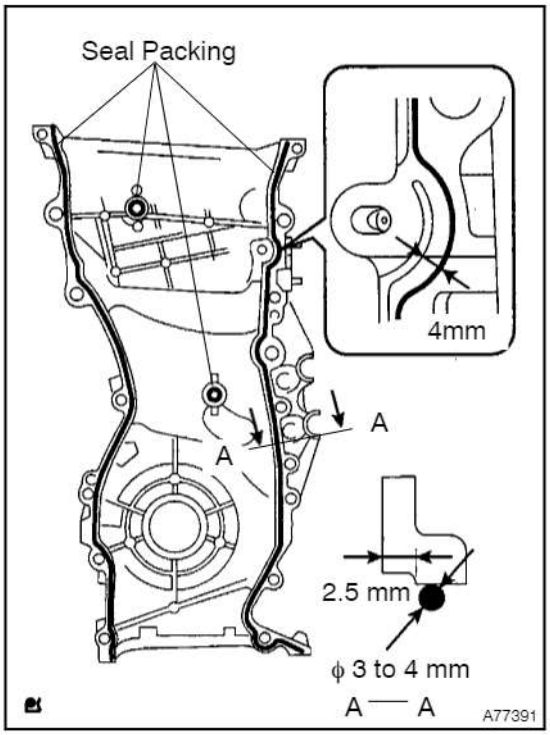
51. INSTALL TIMING CHAIN OR BELT COVER SUB–ASSY
NOTICE:

- **Remove any oil from the contact surface.**
- **Install the chain cover within 3 minutes after applying seal packing.**
- **Do not start the engine within 2 hours of installation.**

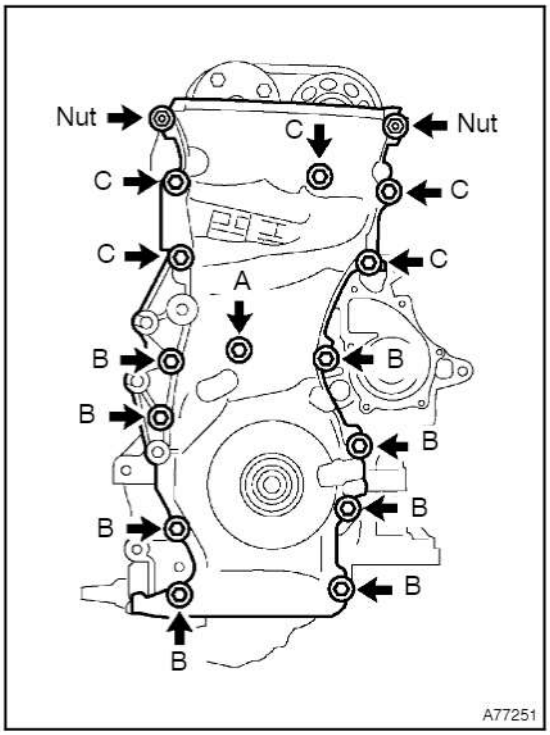
(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the timing chain cover.

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(b) Apply a continuous bead (Diameter 2 mm (0.09 in.)) of seal packing as shown in the illustration.
Seal packing: Part No. 08826 – 00080 or equivalent.

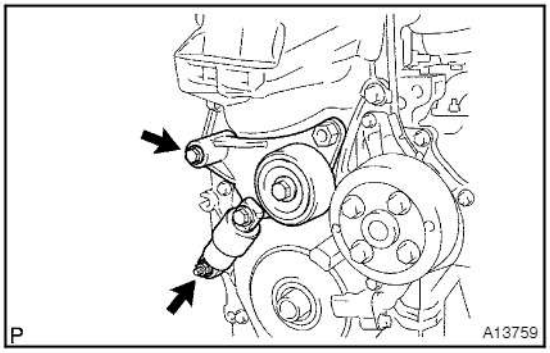


(c) Apply a continuous bead (Diameter 3 to 4 mm (0.118 to 0.157 in.)) of seal packing as shown in the illustration.
Seal packing: Part No. 08826 – 00080 or equivalent



(d) Install the timing chain cover with the 14 bolts and 2 nuts.
Torque:
9.0 N·m (92 kgf·cm, 80 in.·lbf) for Bolt A
25 N·m (255 kgf·cm, 18 ft·lbf) for Bolt B
43 N·m (438 kgf·cm, 32 ft·lbf) for Bolt C
11 N·m (112 kgf·cm, 8.1 ft·lbf) for Nut

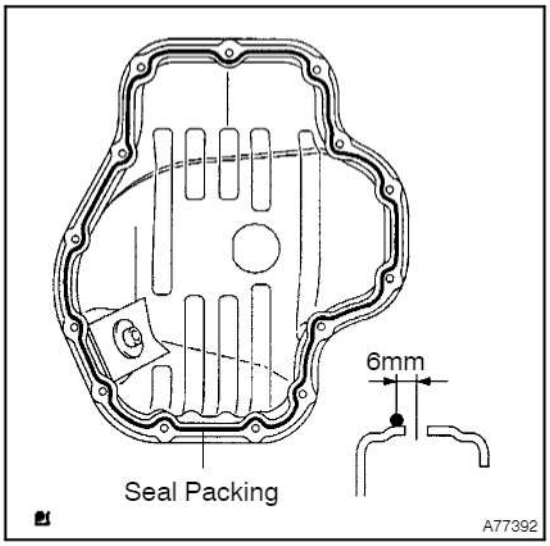
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52. INSTALL V–RIBBED BELT TENSIONER ASSY

(a) Install the V–ribbed belt tensioner with the bolt and nut.
Torque: 60 N·m (610 kgf·cm, 44 ft·lbf)

NOTICE:
The drive tensioner should be fastened together with the timing chain cover, so be sure install it within 15 minutes after the timing chain cover is installed.

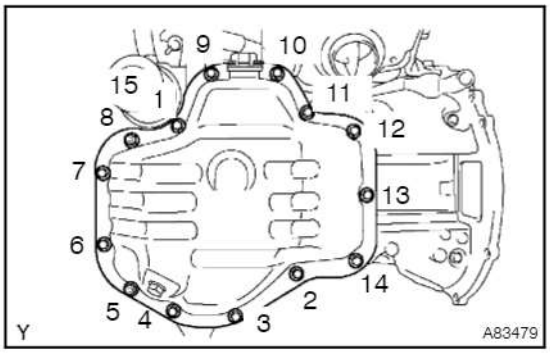


53. INSTALL OIL PAN SUB–ASSY

NOTICE:
- **Remove any oil from the contact surface.**
- **Install the oil pan within 3 minutes after applying seal packing.**
- **Do not start the engine within 2 hours of installation.**

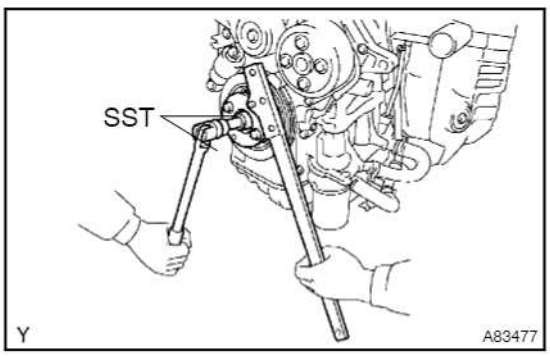
(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surface of the cylinder block and oil pan.

(b) Apply a continuous bead (Diameter 3 to 4 mm (0.118 to 0.157 in.)) of seal packing as shown in the illustration, then install the oil pan.
Seal packing: part No. 08826 – 00080 or equivalent



(c) Install the oil pan with the 12 bolts and 2 nuts sequence shown in the illustration.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

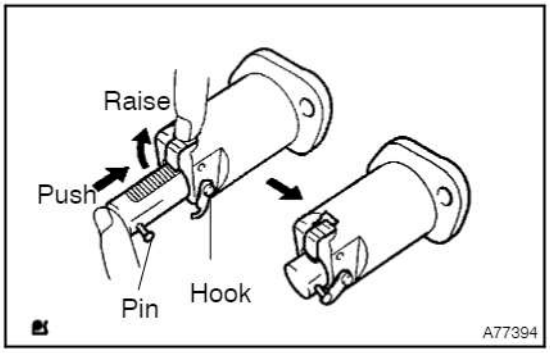
54. INSTALL CRANKSHAFT POSITION SENSOR (See page 18–6)



55. INSTALL CRANKSHAFT PULLEY

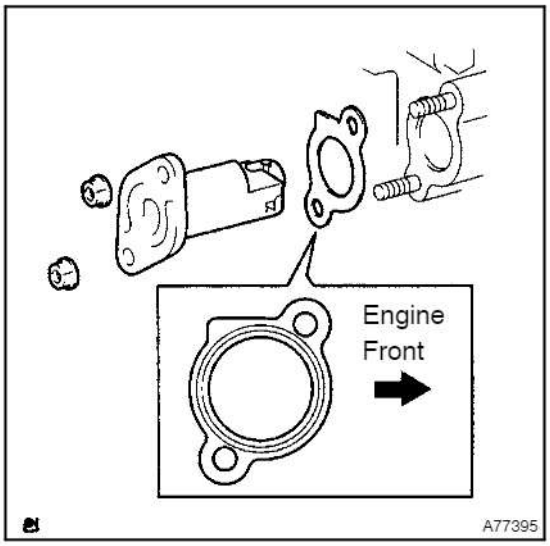
(a) Using SST, tighten the set bolt.
SST 09213–54015 (91651–60855), 09330–00021
Torque: 170 N·m (1,733 kgf·cm, 125 ft·lbf)

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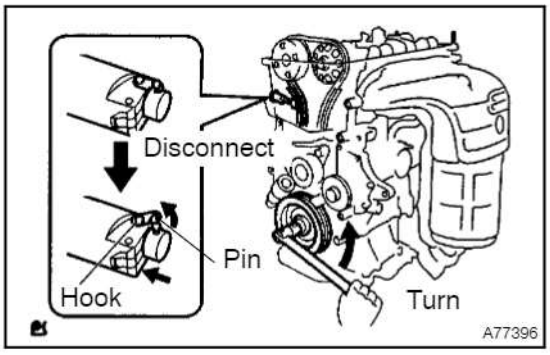
56. INSTALL CHAIN TENSIONER ASSY NO.1

(a) Release the ratchet pawl, fully push in the plunger and apply the hook to the pin so that the plunger is located in position.

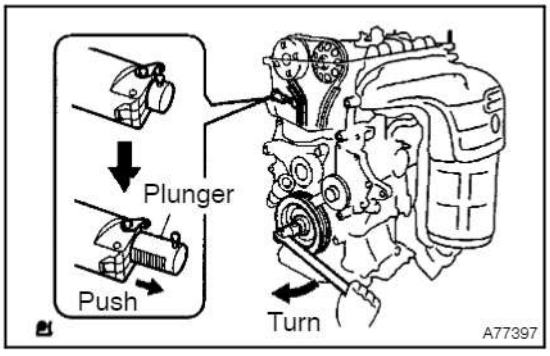


(b) Install a new gasket chain tensioner with the 2 nuts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

NOTICE:
If the hook is released while inserting, apply the hook again and insert the chain tensioner.



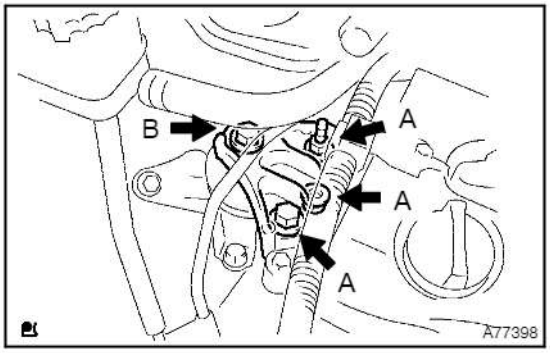
(c) Turn the crankshaft counterclockwise, then check that the hook is disengaged from the plunger knock pin.



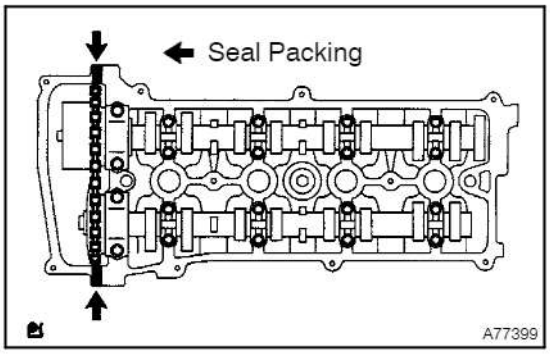
(d) Turn the crankshaft clockwise, then check that the plunger is extended.

57. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

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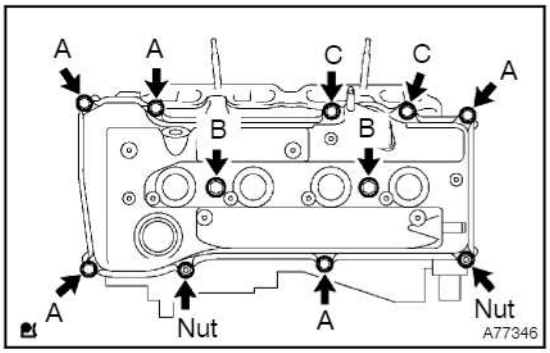


58. INSTALL ENGINE MOUNTING BRACKET NO.2 RH
Torque:
52 N·m (530 kgf·cm, 38 ft·lbf) for A
113 N·m (1,152 kgf·cm, 83 ft·lbf) for B



59. INSTALL CYLINDER HEAD COVER SUB–ASSY
(a) Remove any old seal packing (FIPG) material.
(b) Apply seal packing to the 2 locations as shown in the illustration.
Seal Packing: Part No. 08826–00080 or equivalent

NOTICE:
- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 5 minutes after applying seal packing.**
- **Do not expose the seal to engine oil 2 hours after installing.**



(c) install the cylinder head cover with the 9 bolts and 2 nuts.
Torque:
11 N·m (112 kgf·cm, 8 ft·lbf) for Nnt
11 N·m (112 kgf·cm, 8 ft·lbf) for Bolt A
14 N·m (143 kgf·cm, 10 ft·lbf) for Bolt B
21 N·m (214 kgf·cm, 16 ft·lbf) for Bolt C

60. INSTALL COOLER BRACKET (LHD STEERING POSITION TYPE)
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
61. INSTALL ENGINE SERVICE COVER BRACKET RH (RHD STEERING POSITION TYPE)
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
62. INSTALL ENGINE WIRE
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)
63. INSTALL OIL RESERVOIR BRACKET NO.1
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
64. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD STEERING POSITION TYPE)
65. INSTALL RETURN TUBE SUB–ASSY
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
66. INSTALL IGNITION COIL ASSY
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

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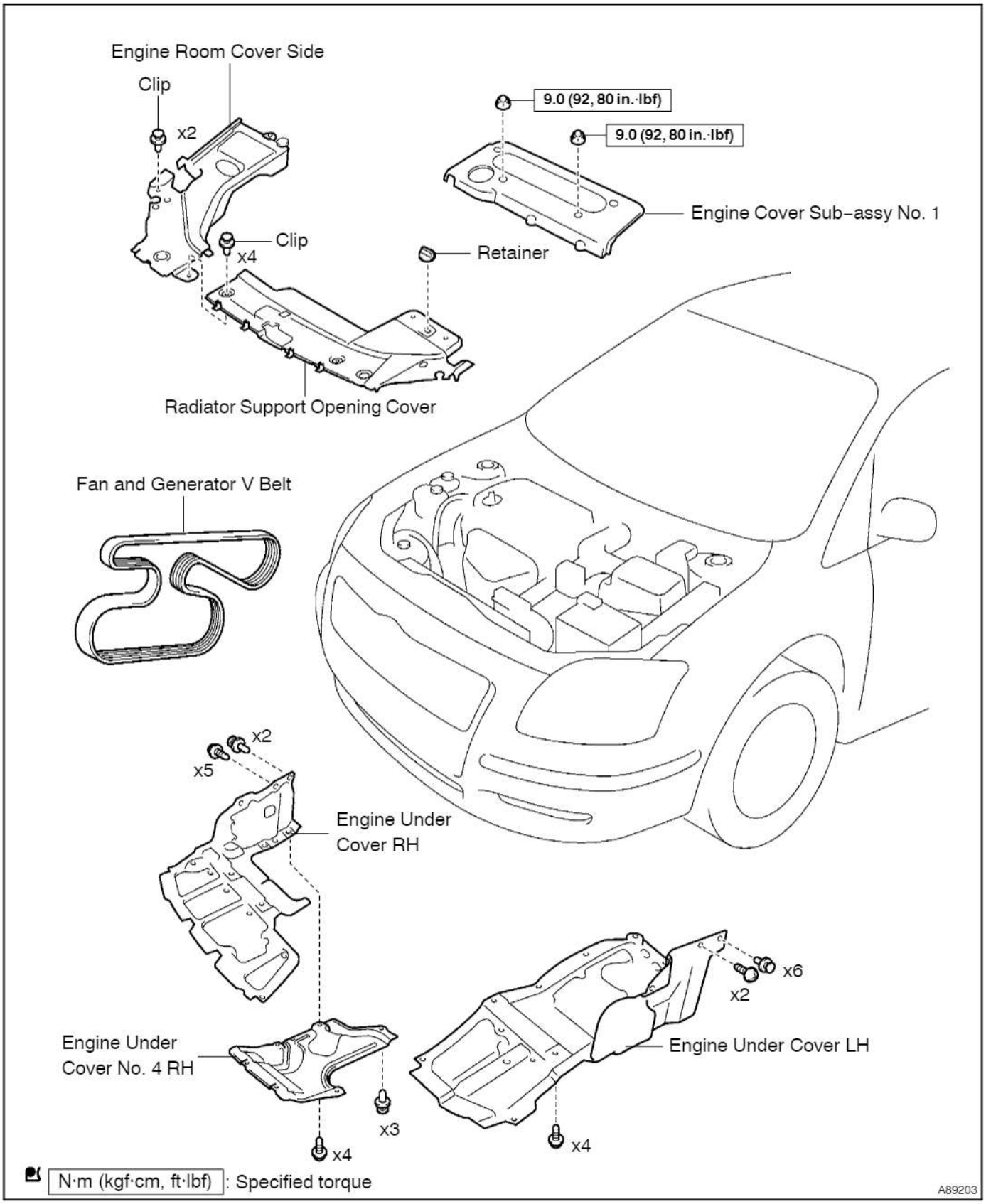
67. **INSTALL VANE PUMP ASSY**
    Torque: 37 N·m (377 kgf·cm, 27 ft·lbf)
    SST 09249–63010
68. **INSTALL EXHAUST PIPE ASSY FRONT (See page 15–2)**
69. **INSTALL GENERATOR ASSY (See page 19–8)**
70. **INSTALL FAN AND GENERATOR V BELT (See page 14–5)**
    SST 09249–63010
71. **INSTALL FUEL PUMP ASSY (See page 11–24)**
72. **INSTALL FUEL PIPE SUB–ASSY NO.1 (See page 11–24)**
    SST 09023–12900
73. **INSTALL FUEL TUBE SUB–ASSY (See page 11–4)**
74. **INSTALL FUEL PRESSURE PULSATION DAMPER ASSY (See page 11–24)**
75. **ADD ENGINE OIL (See page 17–6)**
76. **CHECK FOR ENGINE OIL LEAKS**
77. **CHECK FOR FUEL LEAKS**
78. **INSTALL ENGINE COVER SUB–ASSY NO.1**
    Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
79. **INSTALL FRONT WHEEL RH**
    Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
80. **ADD POWER STEERING FLUID (See Pub. No. RM1018E on page 51–4)**
81. **BLEED POWER STEERING FLUID (See Pub. No. RM1018E on page 51–4)**
82. **CHECK POWER STEERING FULUID LEVEL IN RESERVER**
    (See Pub. No. RM1018E on page 51–4)

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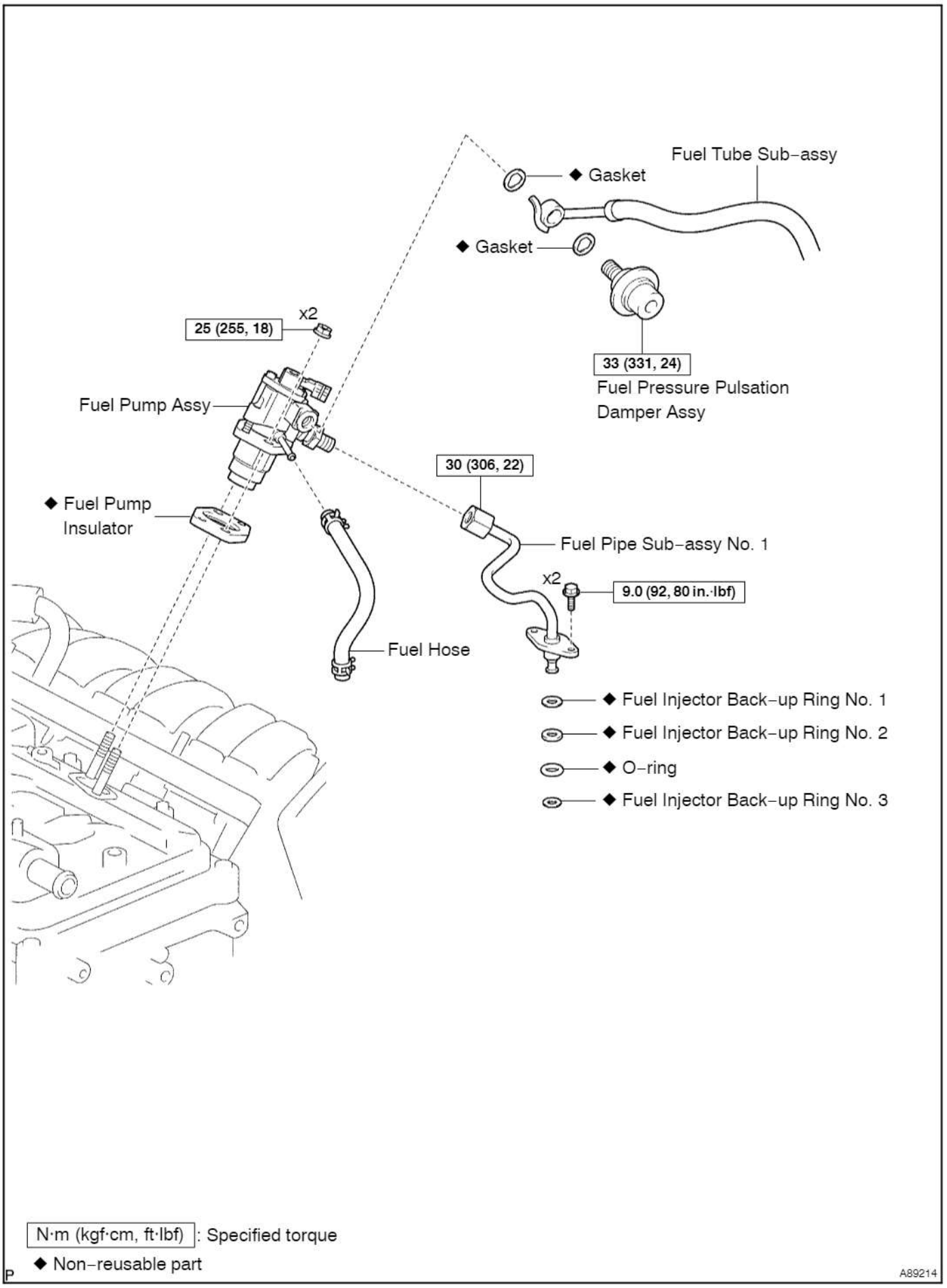
CAMSHAFT (2AZ–FSE)

COMPONENTS

141N8–01



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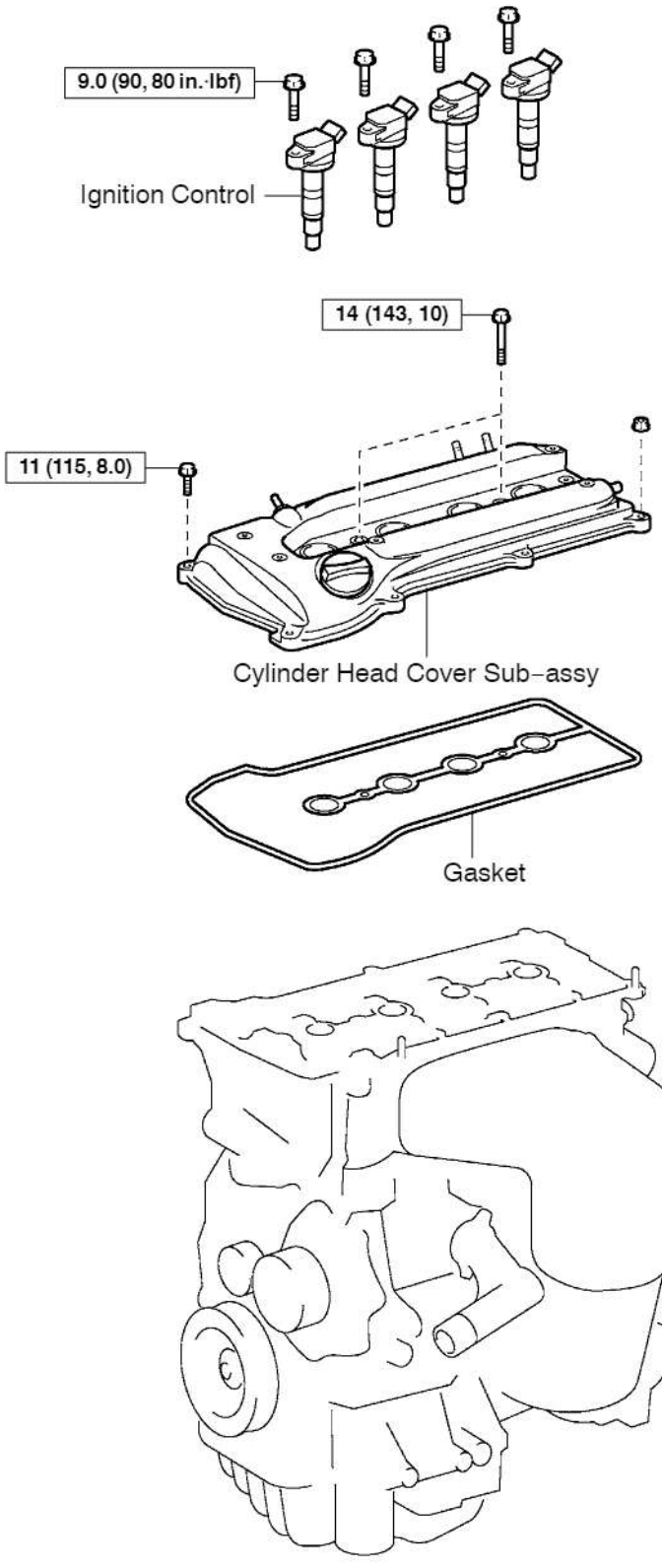
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

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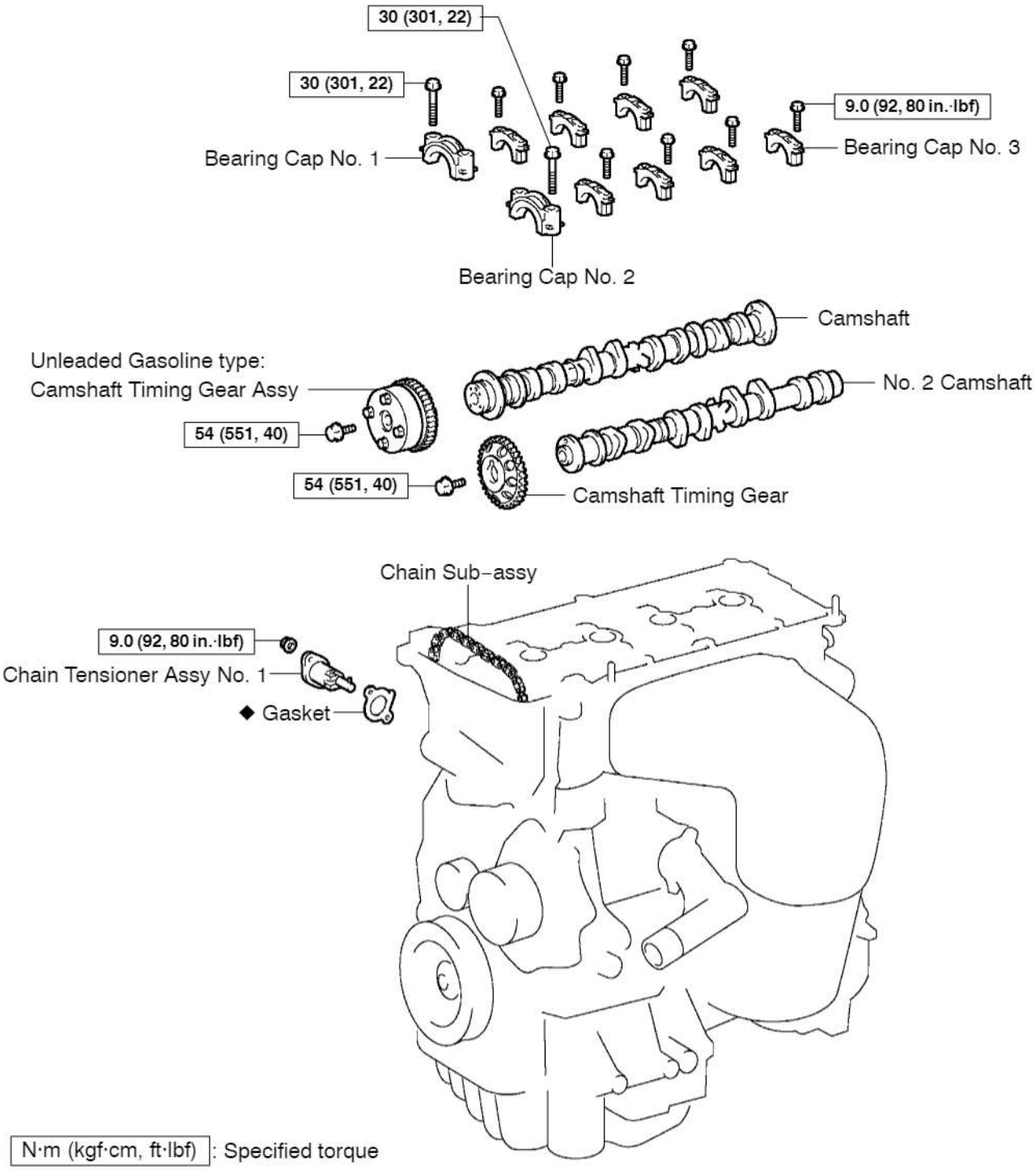
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N·m (kgf·cm, ft·lbf) : Specified torque

A89213

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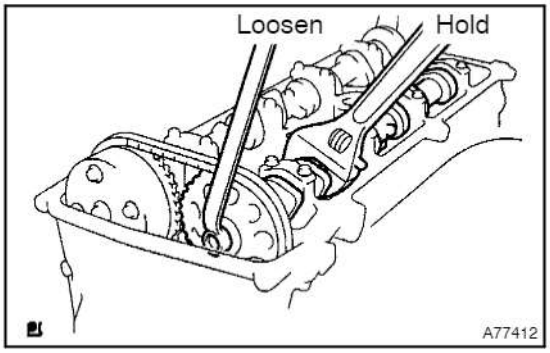


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141N9–01

REPLACEMENT

1. DISCHARGE FUEL SYSTEM PRESSURE (See page 11–4)
2. REMOVE RADIATOR SUPPORT OPENING COVER (See page 14–23)
3. REMOVE ENGINE ROOM COVER SIDE (See page 14–23)
4. REMOVE ENGINE UNDER COVER LH (See page 14–23)
5. REMOVE COVER, ENGINE UNDER, NO.4 RH (See page 14–23)
6. REMOVE ENGINE UNDER COVER RH (See page 14–23)
7. REMOVE ENGINE COVER SUB–ASSY NO.1 (See page 14–45)
8. REMOVE IGNITION COIL ASSY (See page 14–45)
9. REMOVE FUEL PRESSURE PULSATION DAMPER ASSY
10. REMOVE FUEL TUBE SUB–ASSY (See page 11–4)
11. REMOVE FUEL PIPE SUB–ASSY NO.1 (See page 11–4)
    SST 09023–12900
12. REMOVE FUEL PUMP ASSY (See page 11–24)
13. REMOVE CYLINDER HEAD COVER SUB–ASSY (See page 14–45)
14. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14–45)
15. REMOVE CHAIN TENSIONER ASSY NO.1 (See page 14–45)

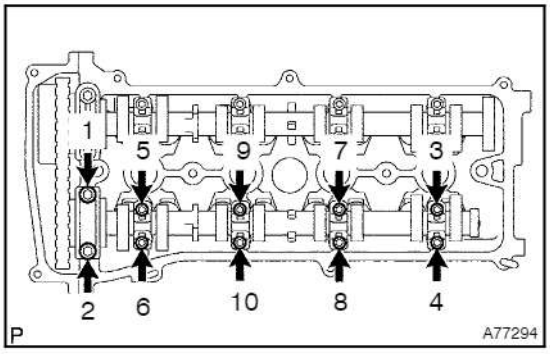


16. REMOVE NO.2 CAMSHAFT

(a) Hold the No. 2 camshaft with a wrench on the hexagonal lobe, then loosen the camshaft timing gear set bolt.

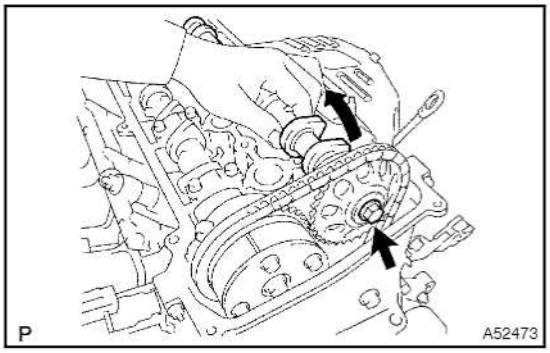
NOTICE:

Be careful not to damage the cylinder head and valve lifter with the wrench.



(b) Using several steps, loosen and remove the 10 camshaft bearing cap bolts uniformly in the sequence shown in the illustration.

(c) Remove the 5 camshaft bearing caps.

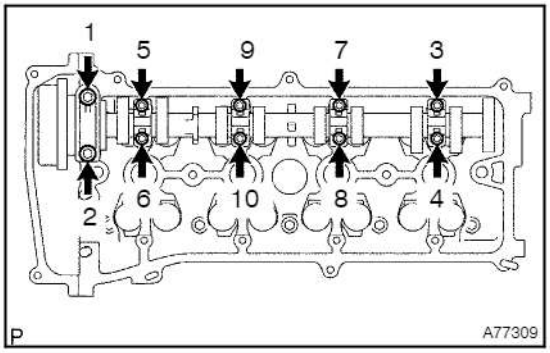


(d) Raising the No. 2 camshaft, remove the set bolt.

(e) Remove the camshaft timing gear from the No. 2 camshaft with with the timing chain wrapped.

(f) Remove the camshaft timing gear from the timing chain.

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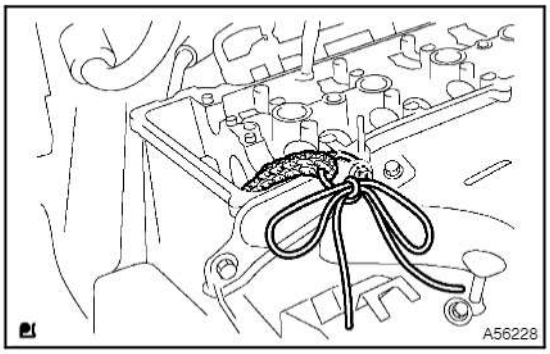


17. REMOVE CAMSHAFT

(a) Using several steps, loosen and remove the 10 camshaft bearing cap bolts uniformly in the sequence shown in the illustration.

(b) Remove 5 camshaft bearings.

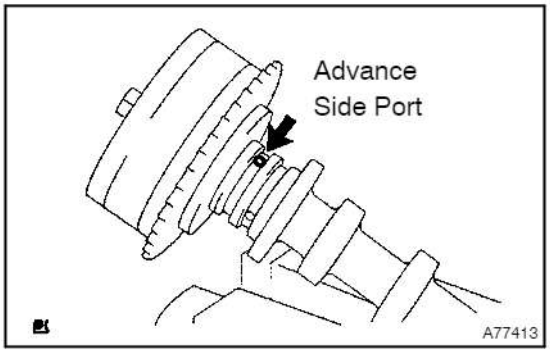
(c) Remove the camshaft.



(d) Tie the timing chain as shown in the illustration.

NOTICE:

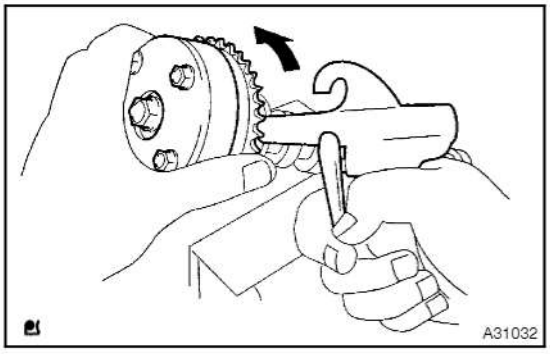
- **Be careful not to drop anything inside the timing chain cover.**
- **Do not expose the chain to water and dust.**



18. REMOVE CAMSHAFT TIMING GEAR ASSY

(a) Clamp the camshaft in a vise, then make sure the camshaft timing gear does not rotate.

(b) Cover all the oil ports with vinyl tape except an advance side port shown in the illustration.



(c) Put air pressure into the oil port with 150 kpa (1.5 kgf/cm^2 21 psi), then turn the camshaft timing gear to the advance direction (counterclockwise) with hand.

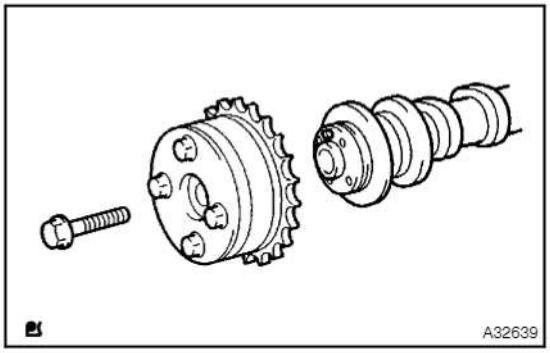
CAUTION:

Cover the ports with shop rag to avoid oil splashing.

HINT:

Depending on the air pressure, the camshaft timing gear will turn to the advance angle side without applying force with hand. Also, under the condition that the pressure can be hardly applied because of the air leakage from the port, there may be the case that the lock pin could be hardly released.

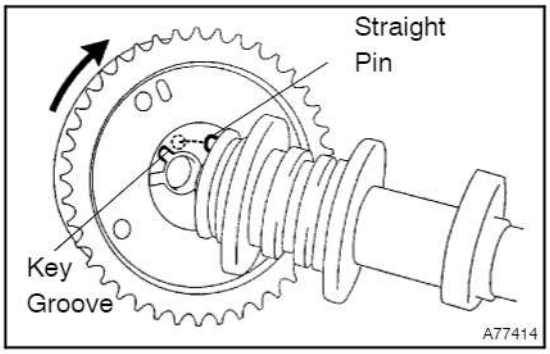
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(d) Remove a fringe bolt of camshaft timing gear.

NOTICE:

- **Be sure not to remove the other 4 bolts.**
- **When reusing the camshaft timing gear, release the straight pin lock first, and then install the gear.**



19. INSTALL CAMSHAFT TIMING GEAR ASSY

(a) Put the camshaft timing gear and the camshaft together with the straight pin off the key groove.

(b) Turn the camshaft timing gear assembly to the left direction (as shown in the illustration) while lightly pushing it toward the camshaft. Push further at the position where the pin gets into the groove.

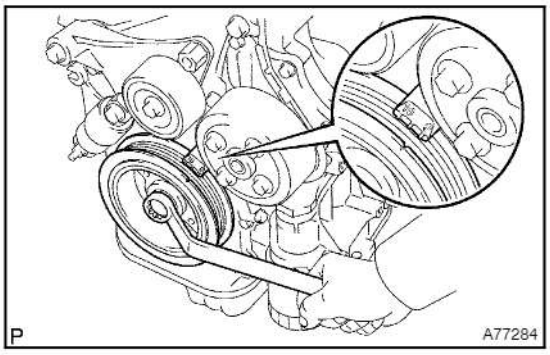
NOTICE:

Be sure not to turn the camshaft timing gear to the retard angle side (to the right direction).

(c) Check that there is no clearance between the gear's fringe and the camshaft.

(d) Tighten the fringe bolt with the camshaft timing gear fixed.
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)

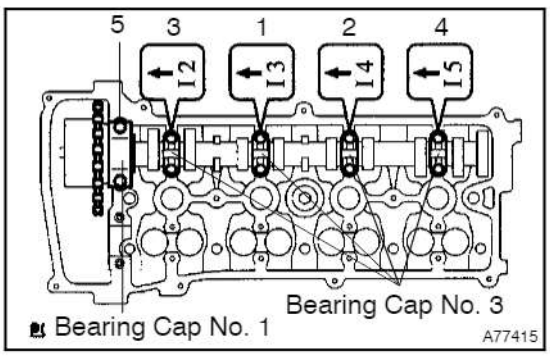
(e) Check that the camshaft timing gear can move to the retard angle side (to the right direction) and is locked at the most retarded position.



20. INSTALL CAMSHAFT

(a) Turn the crankshaft pulley, then align its groove with the timing mark 0 of the timing chain cover.

(b) Install the timing chain on the camshaft timing gear, with the painted links aligned with the timing marks on the camshaft timing gear.

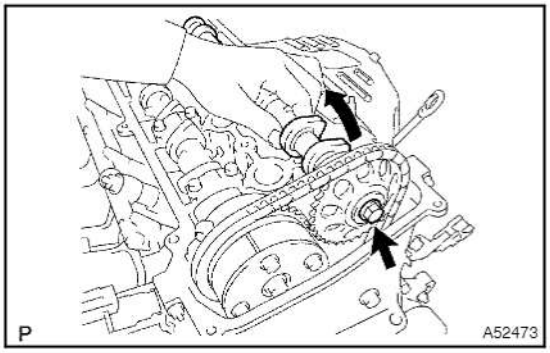


(c) Examine the front marks and numbers, then tighten the bolts in the sequence shown in the illustration.
Torque:
30 N·m (301 kgf·cm, 22 ft·lbf) for Bearing cap No. 1
9.0 N·m (92 kgf·cm, 80 in.·lbf) for Bearing cap No. 3

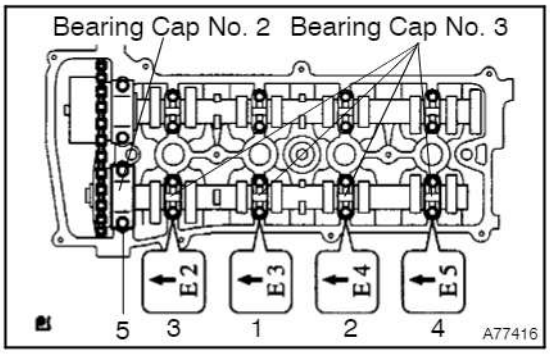
21. INSTALL NO.2 CAMSHAFT

(a) Put the No. 2 camshaft on the cylinder head with the painted links of chain aligned with the timing mark on the camshaft timing gear.

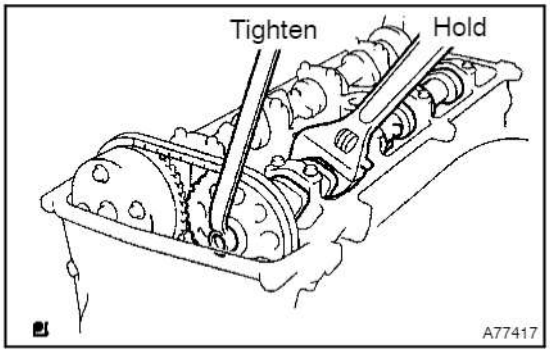
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(b) Raising the No. 2 camshaft, tighten the set bolt temporarily.

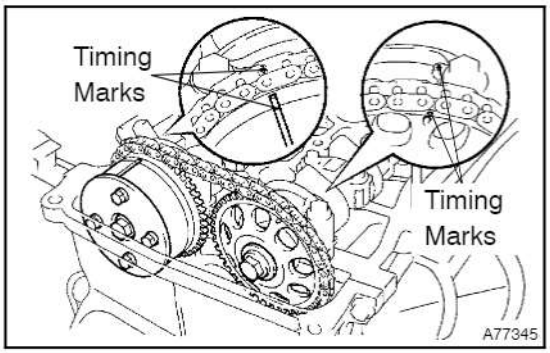


(c) Examine the from marks and numbers, then tighten the bolts in the sequence shown in the illustration.
Torque:
30 N·m (301 kgf·cm, 22 ft·lbf) for Bearing cap No. 2
9.0 N·m (92 kgf·cm, 80 in.·lbf) for Bearing cap No. 3



(d) Hold the camshaft with a wrench on the hexagonal lobe, then tighten the camshaft timing gear set bolt.
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)

NOTICE:
Be careful not to damage the cylinder head and valve lifter.



(e) Check that the match marks on the timing chain and camshaft timing gears are positioned as shown in the illustration

22. **INSTALL CHAIN TENSIONER ASSY NO.1 (See page 14–45)**
23. **INSTALL CYLINDER HEAD COVER SUB–ASSY (See page 14–45)**
24. **INSTALL FUEL PUMP ASSY (See page 11–24)**
25. **INSTALL FUEL PIPE SUB–ASSY NO.1 (See page 11–24)**
    SST 09023–12900
26. **INSTALL FUEL TUBE SUB–ASSY (See page 11–4)**
27. **INSTALL FUEL PRESSURE PULSATION DAMPER ASSY (See page 11–24)**
28. **INSTALL IGNITION COIL ASSY**
    Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

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29. CHECK FOR ENGINE OIL LEAKS

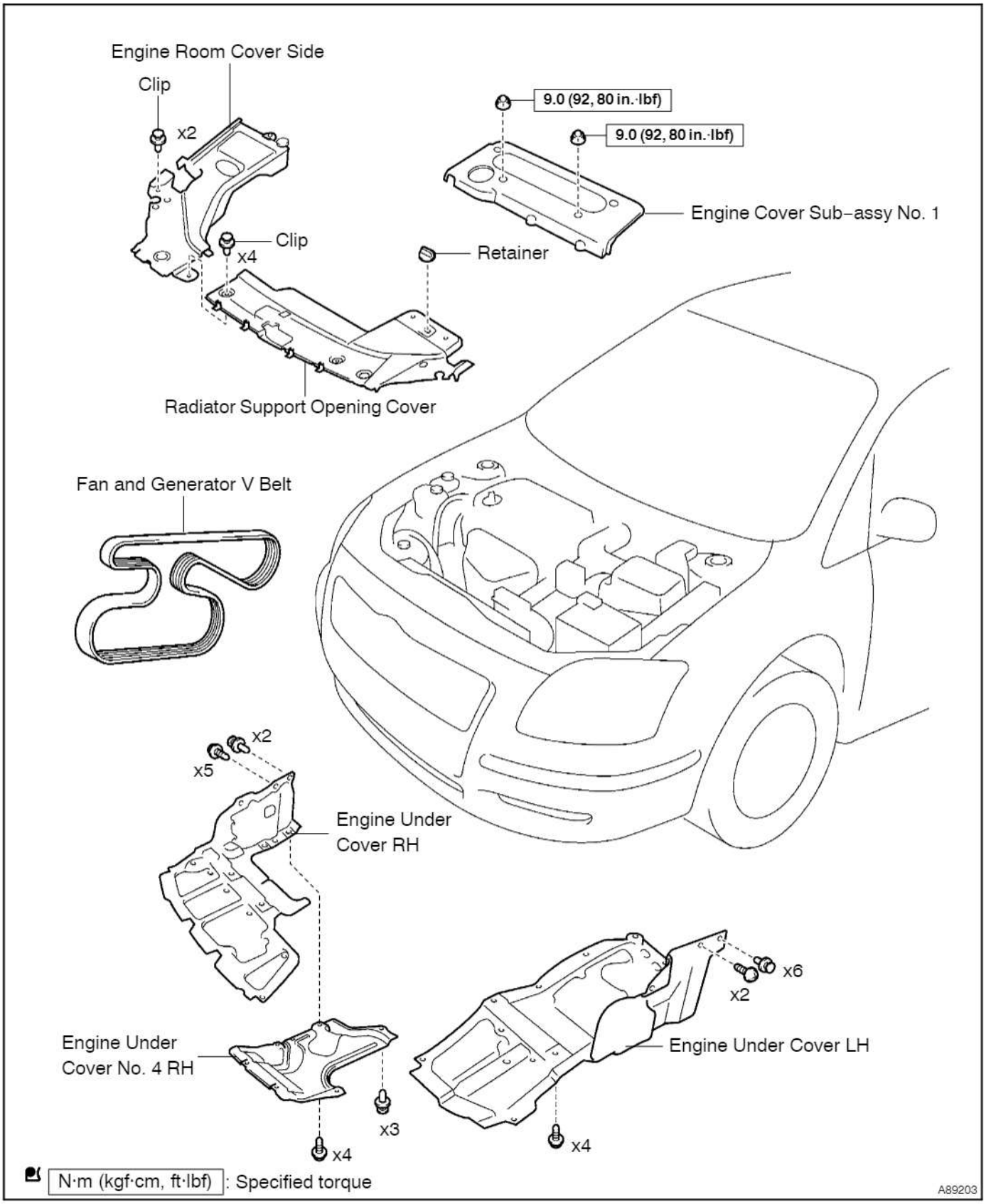
30. INSTALL ENGINE COVER SUB–ASSY NO.1
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

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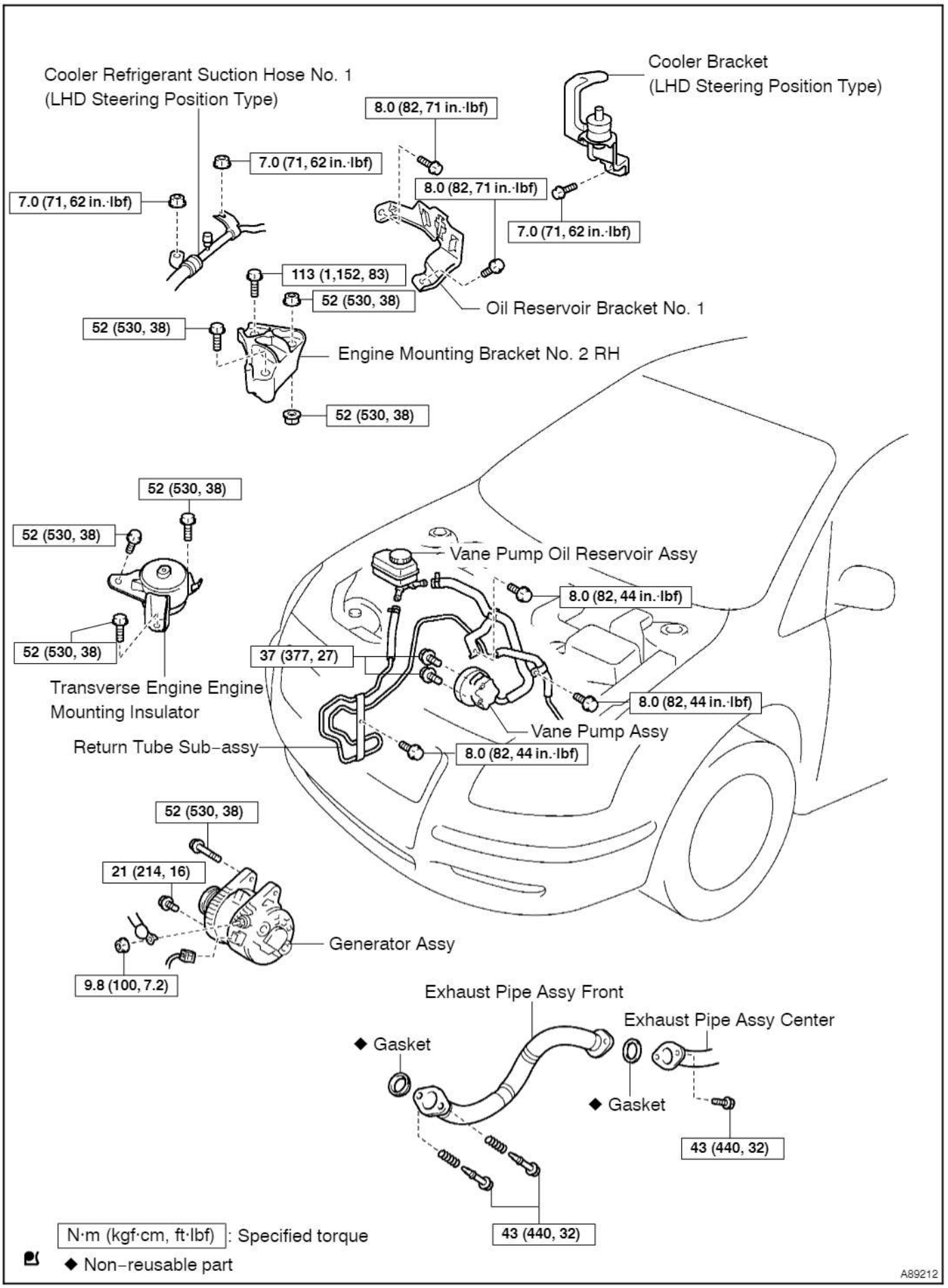
CYLINDER HEAD GASKET (2AZ–FSE)

COMPONENTS

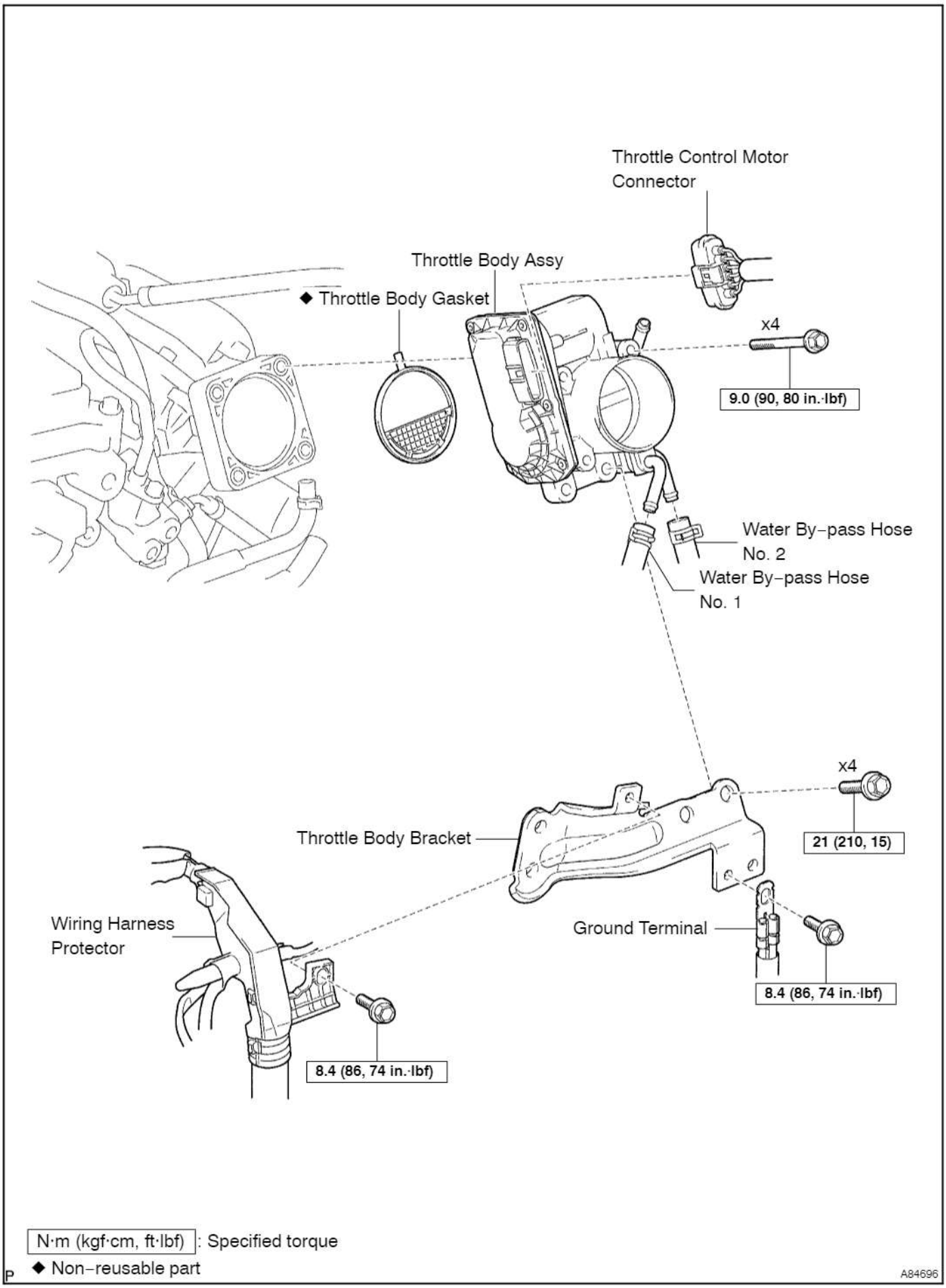
141NA–01



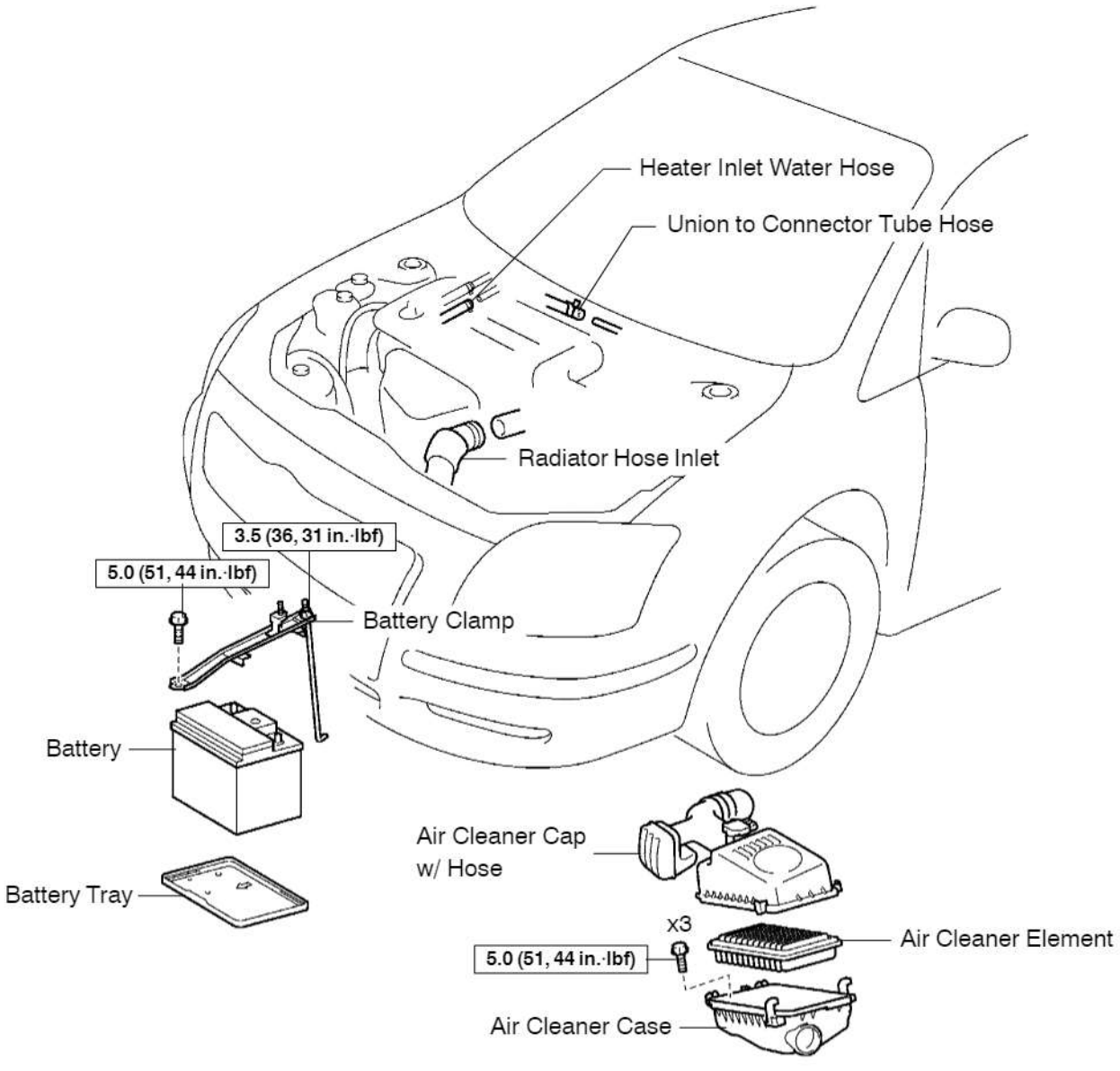
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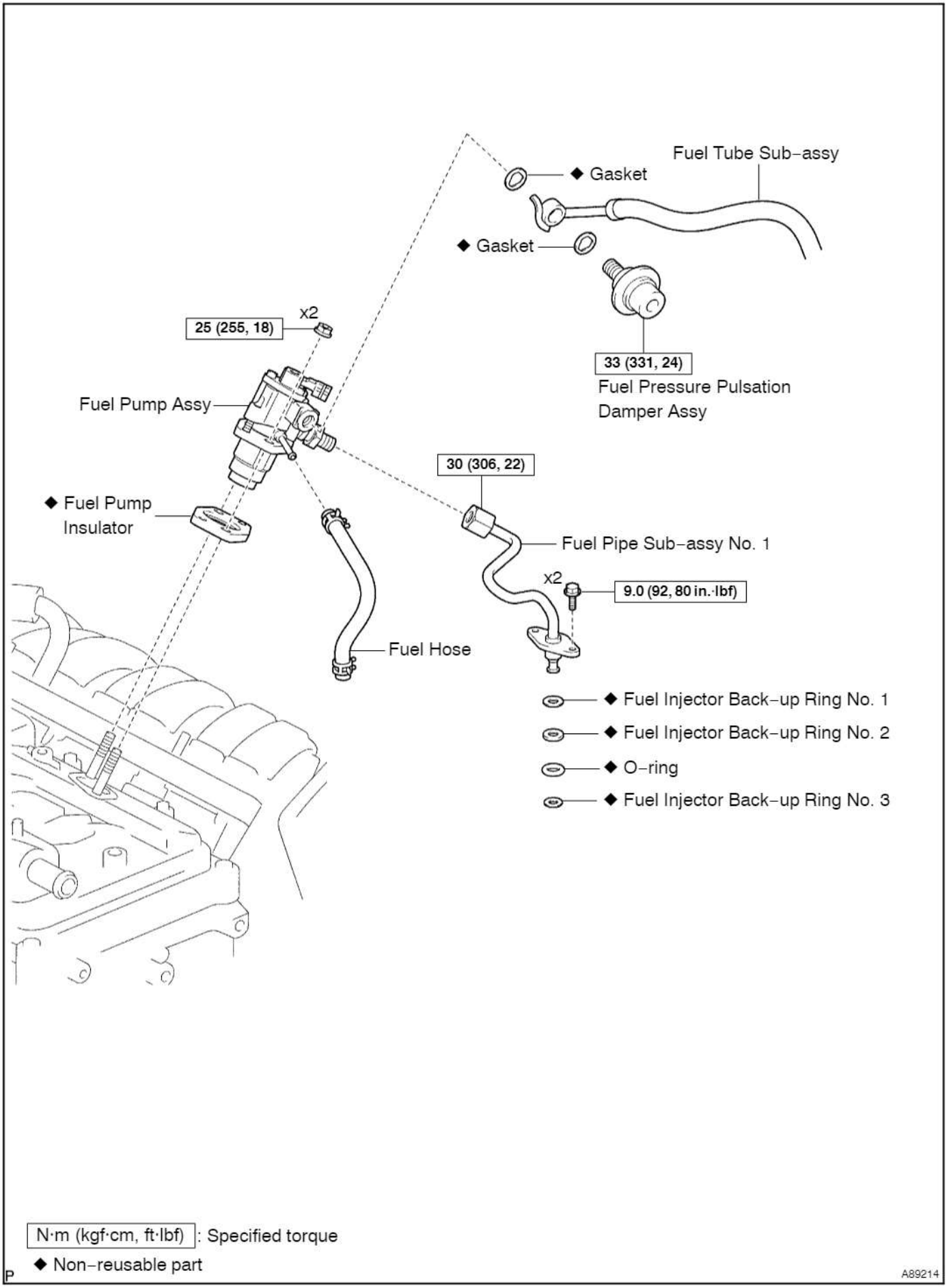
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N·m (kgf·cm, ft·lbf) : Specified torque

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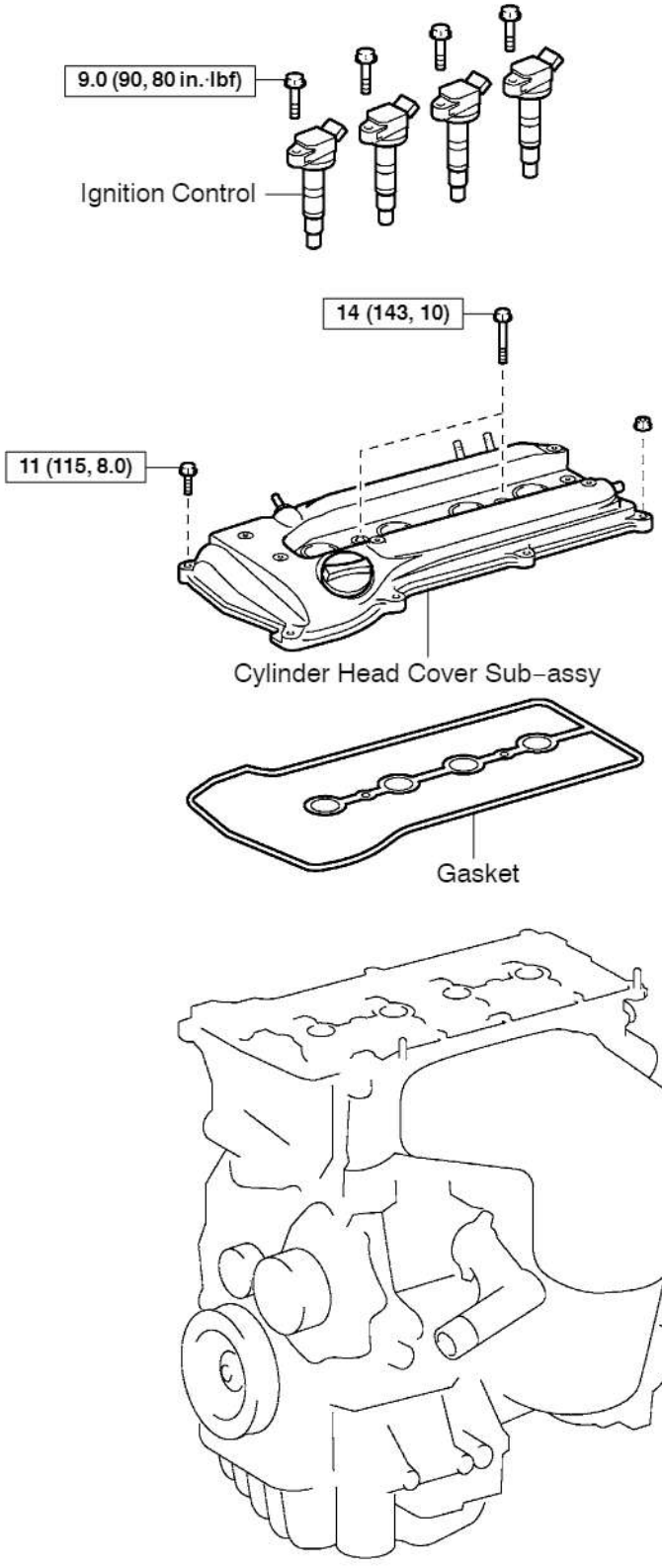
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

P

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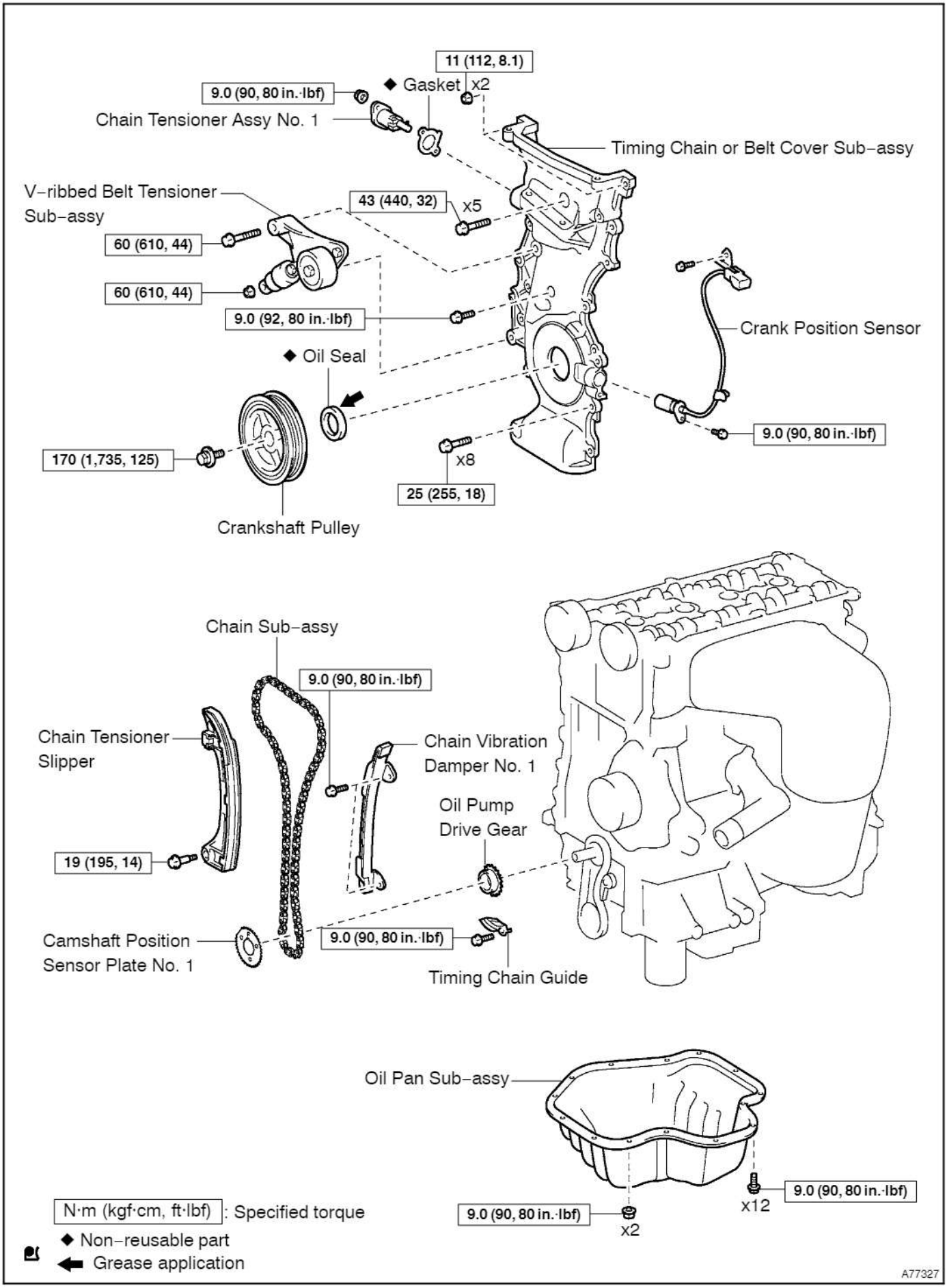
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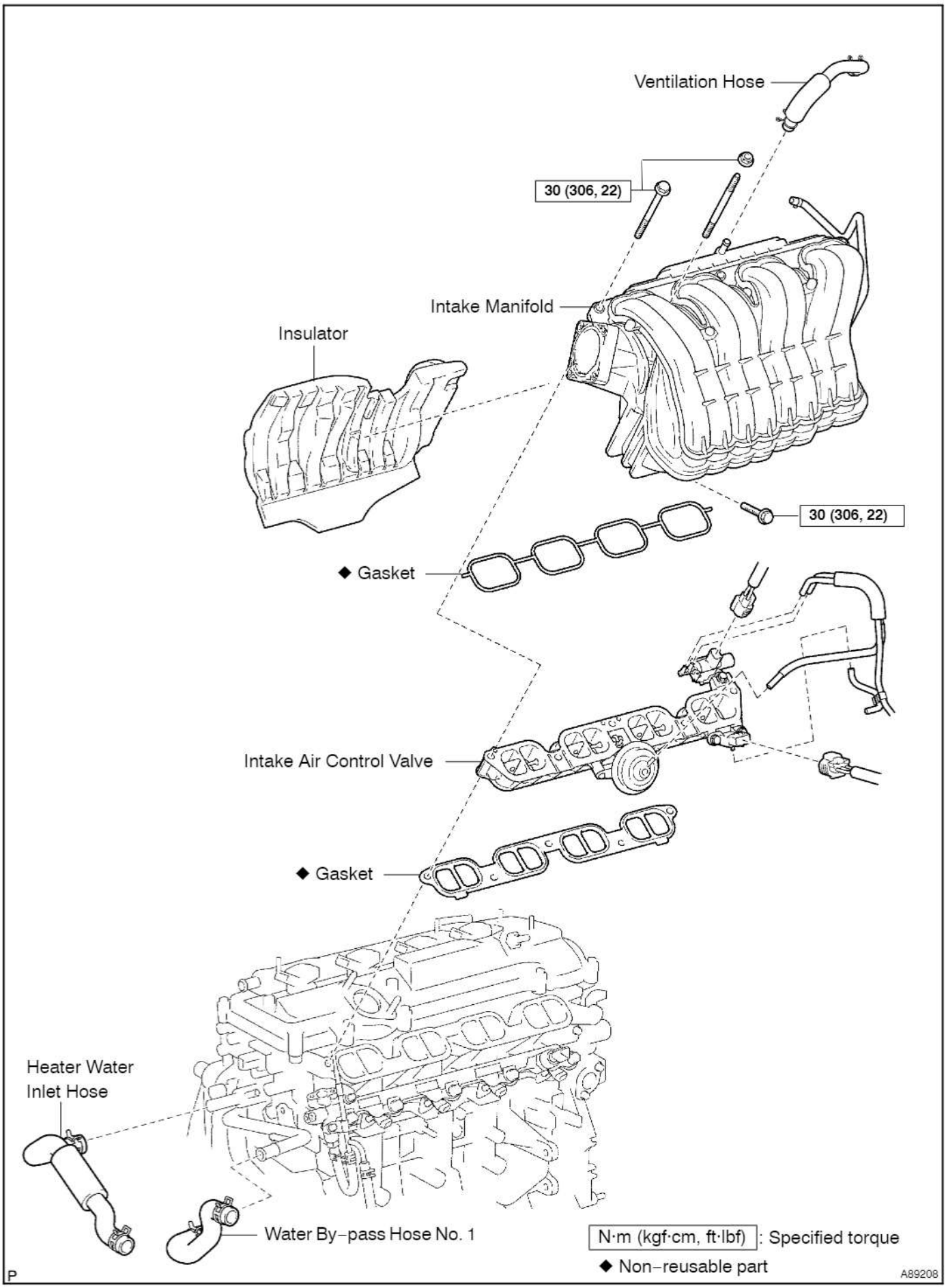
N·m (kgf·cm, ft·lbf) : Specified torque

A89213

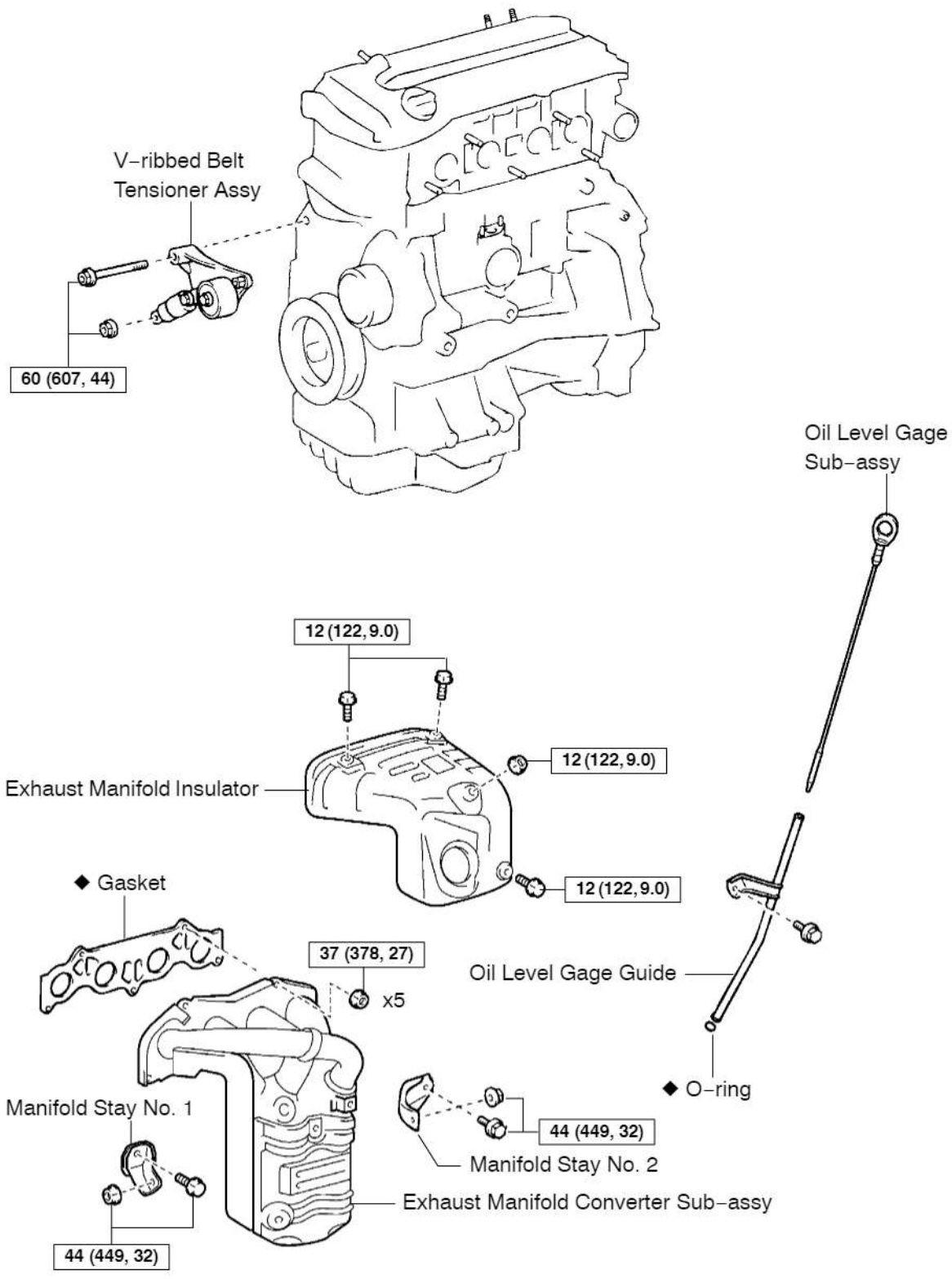
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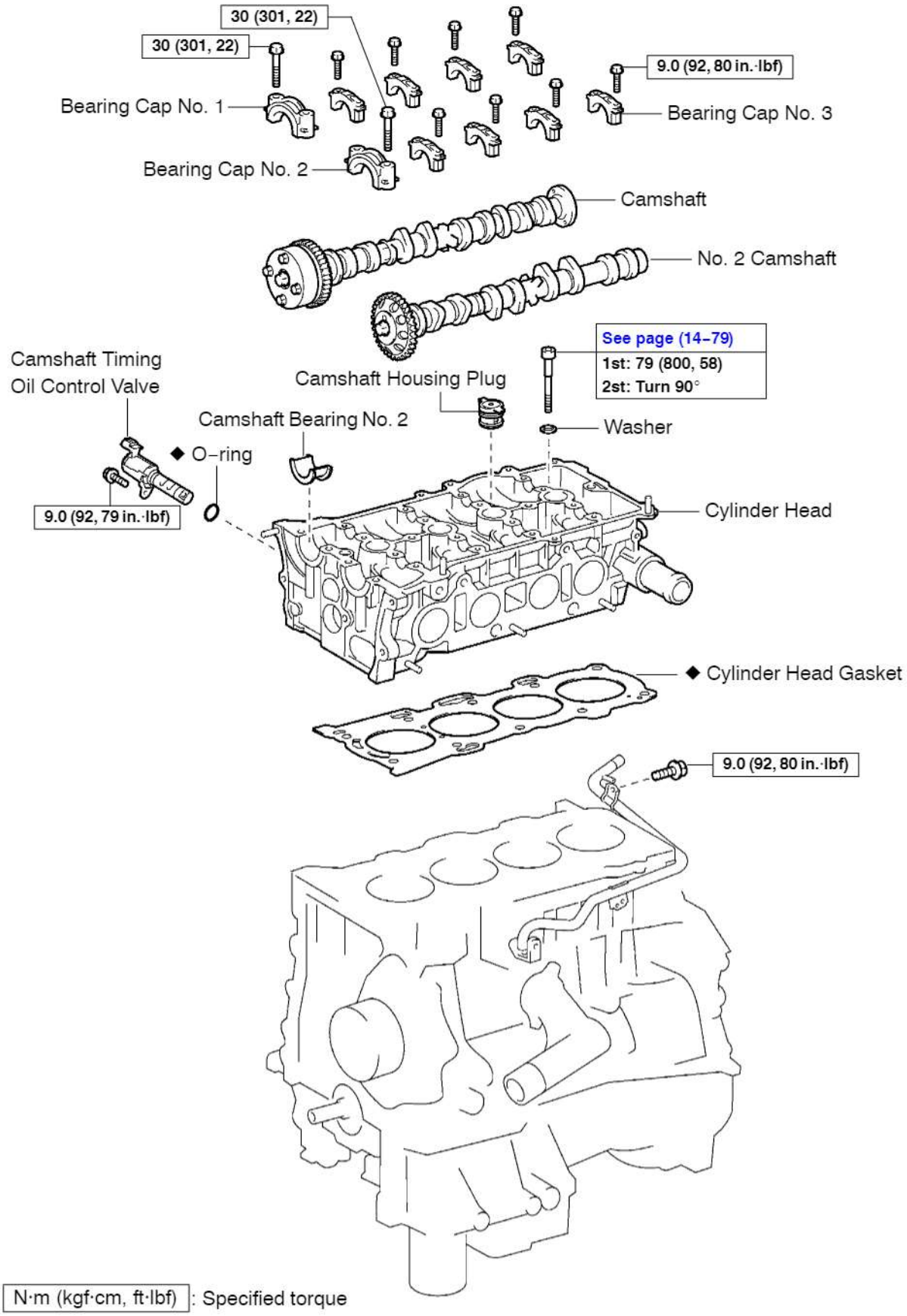


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

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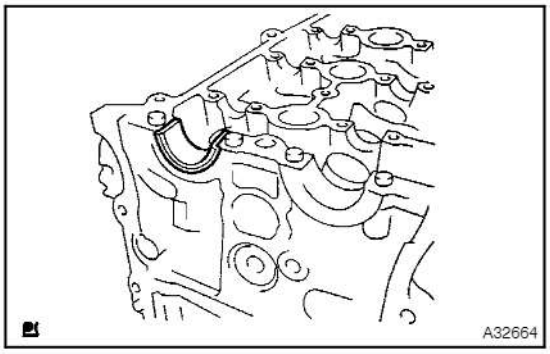
141NB–01

REPLACEMENT

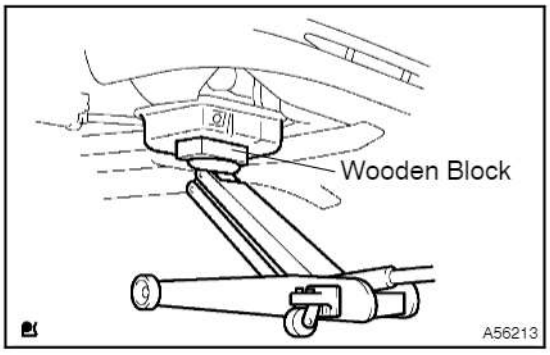
1. DISCHARGE FUEL SYSTEM PRESSURE (See page 11–4)
2. REMOVE FRONT WHEEL RH
3. REMOVE RADIATOR SUPPORT OPENING COVER (See page 14–23)
4. REMOVE ENGINE ROOM COVER SIDE (See page 14–23)
5. REMOVE ENGINE UNDER COVER LH (See page 14–23)
6. REMOVE ENGINE UNDER COVER NO.4 RH (See page 14–23)
7. REMOVE ENGINE UNDER COVER RH (See page 14–23)
8. DRAIN COOLANT (See page 16–7)
9. DRAIN ENGINE OIL (See page 17–6)
10. REMOVE ENGINE COVER SUB–ASSY NO.1 (See page 14–45)
11. REMOVE FUEL PRESSURE PULSATION DAMPER ASSY
12. SEPARATE FUEL TUBE SUB–ASSY (See page 11–4)
13. REMOVE FUEL PIPE SUB–ASSY NO.1 (See page 11–24)
    SST 09023–12900
14. REMOVE FUEL PUMP ASSY (See page 11–24)
15. REMOVE FAN AND GENERATOR V BELT (See page 14–5)
    SST 09249–63010
16. REMOVE GENERATOR ASSY (See page 19–8)
17. REMOVE EXHAUST PIPE ASSY FRONT (See page 15–2)
18. SEPARATE VANE PUMP ASSY (See page 14–45)
19. REMOVE IGNITION COIL ASSY (See page 14–45)
20. SEPARATE RETURN TUBE SUB–ASSY (See page 14–45)
21. SEPARATE COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD STEERING POSITION TYPE) (See page 14–45)
22. REMOVE VANE PUMP OIL RESERVOIR ASSY (See page 14–45)
23. REMOVE OIL RESERVOIR BRACKET NO.1 (See page 14–45)
24. SEPARATE ENGINE WIRE (See page 14–23)
25. REMOVE COOLER BRACKET (LHD STEERING POSITION TYPE) (See page 14–45)
26. REMOVE ENGINE SERVICE COVER BRACKET RH (RHD STEERING POSITION TYPE) (See page 14–45)
27. REMOVE CYLINDER HEAD COVER SUB–ASSY (See page 14–45)
28. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14–45)
29. REMOVE ENGINE MOUNTING BRACKET NO.2 RH (See page 14–45)
30. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR (See page 14–45)
31. REMOVE CRANKSHAFT PULLEY (See page 14–45)
    SST 09213–54015 (91651–60855), 09330–00021, 09950–50013 (09951–05010, 09952–05010, 09953–05020, 09954–05021)
32. REMOVE CHAIN TENSIONER ASSY NO.1 (See page 14–45)
33. REMOVE CRANKSHAFT POSITION SENSOR (See page 14–45)
34. REMOVE OIL PAN SUB–ASSY (See page 14–45)
    SST 09032–00100
35. REMOVE V–RIBBED BELT TENSIONER ASSY (See page 14–45)
36. REMOVE TIMING CHAIN OR BELT COVER SUB–ASSY (See page 14–45)
37. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1 (See page 14–45)
38. REMOVE CHAIN TENSIONER SLIPPER (See page 14–45)
39. REMOVE CHAIN VIBRATION DAMPER NO.1 (See page 14–45)
40. REMOVE TIMING CHAIN GUIDE (See page 14–45)
41. REMOVE CHAIN SUB–ASSY (See page 14–45)

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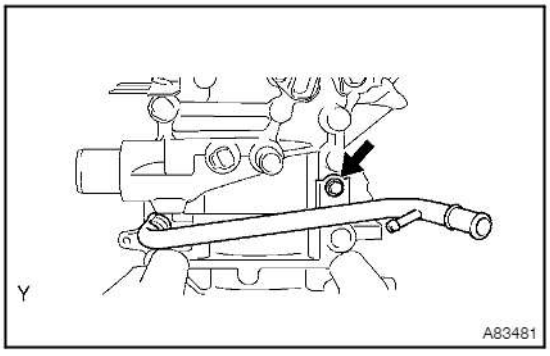
42. REMOVE BATTERY (See page 14–45)
43. REMOVE AIR CLEANER ASSEMBLY WITH HOSE (See page 14–23)
44. DISCONNECT RADIATOR HOSE INLET (See page 14–23)
45. DISCONNECT UNION TO CONNECTOR TUBE HOSE (See page 14–23)
46. DISCONNECT HEATER INLET WATER HOSE (See page 14–23)
47. SEPARATE FUEL TUBE SUB–ASSY (See page 11–1)
48. SEPARATE ENGINE WIRE
49. REMOVE THROTTLE BODY ASSY (See page 10–8)
50. REMOVE CHARCOAL CANISTER ASSY
51. REMOVE INTAKE MANIFOLD (See page 11–13)
52. REMOVE MANIFOLD CONVERTER INSULATOR NO.1 (See page 14–23)
53. REMOVE EXHAUST MANIFOLD CONVERTER SUB–ASSY (See page 14–23)
54. REMOVE NO.2 CAMSHAFT (See page 14–64)
55. REMOVE CAMSHAFT (See page 14–64)
56. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE ASSY (See page 14–23)



57. REMOVE CAMSHAFT BEARING NO.2

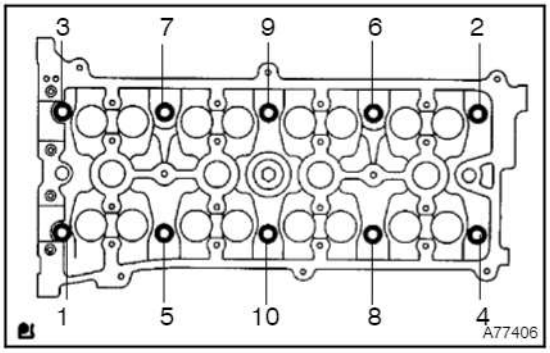


58. SUPPORT ENGINE ASSEMBLY WITH TRANSAXLE
(a) Install the oil pan sub–assy.
(b) Set the jack under the engine assembly with transaxle, then place a wooden block on the jack.
(c) Remove the chain block and sling devise.



59. REMOVE CYLINDER HEAD SUB–ASSY
(a) Remove the bolt, then separate the water by–pass pipe.
(b) Remove the camshaft housing plug.

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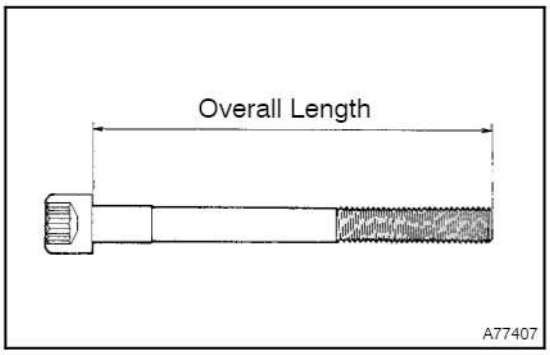
(c) Using several steps, loosen the 10 cylinder head bolts with 10 mm bi–hexagon wrench uniformly in the sequence shown in the illustration.

(d) Remove the 10 cylinder head bolts and plate washers.

NOTICE:

- **Be careful not to drop washers into the cylinder head.**
- **Head warpage or cranking could result from removing bolts and installing incorrect order.**

60. REMOVE CYLINDER HEAD GASKET

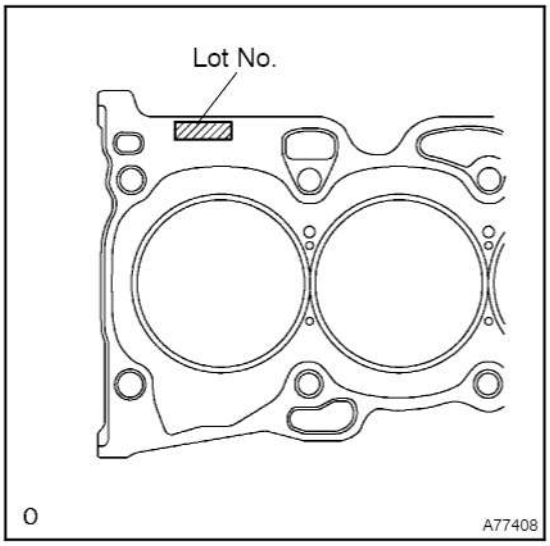


61. INSPECT CYLINDER HEAD SET BOLT

(a) Using a vernier calipers, measure the length of the cylinder head set bolts from the seat to the end.

Standard bolt length:
161.3 to 162.3 mm (6.350 to 6.390 in.)
Maximum bolt length: 164.2 mm (6.465 in.)

If the length is greater than maximum, replace the cylinder head set bolts.



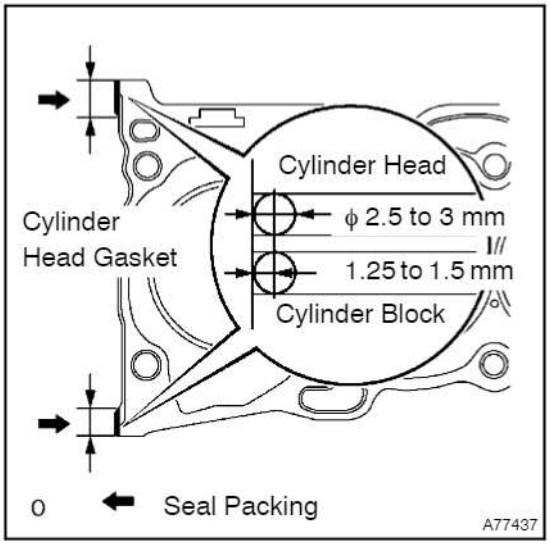
62. INSTALL CYLINDER HEAD GASKET

(a) Place a new cylinder head gasket on the cylinder block surface with the Lot No. stamp upward.

NOTICE:

- **Remove any oil from contact surface.**
- **Be careful of the installation direction.**
- **Place the cylinder head gently in order not to damage the gasket with the bottom part of the head.**

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63. INSTALL CYLINDER HEAD SUB–ASSY

HINT:

The cylinder head set bolts are tightened in the 2 successive steps.

(a) Apply a continuous bead (Diameter 2.5 to 3 mm (0.098 to 0.118 in.)) of seal packing as shown in the illustration.

Seal packing: Part No. 08826–00080 or equivalent

NOTICE:

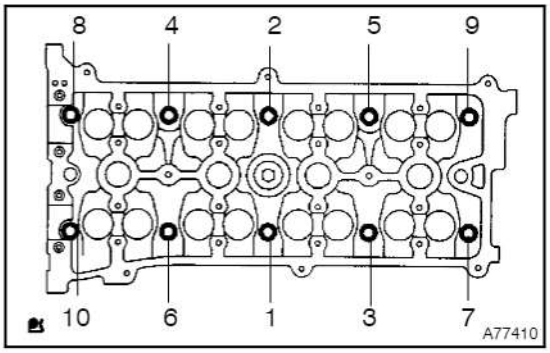
- **Remove any oil from contact surface.**
- **Install the cylinder head within 3 minutes after applying seal packing.**
- **After installing the cylinder head, cylinder head bolts must be tightened within 15 minutes.**
- **Do not start the engine within 2 hours of installation.**

(b) Apply a light coat of engine oil on the threads of the cylinder head bolts.

(c) Install bolts and plate washers to the cylinder head.

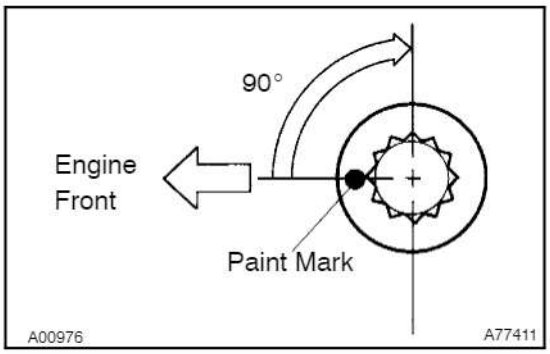
NOTICE:

Do not drop the washers into the cylinder head.



(d) Using several steps, install and tighten the 10 cylinder head bolts and plate washers with a 10 mm bi–hexagon wrench uniformly in the sequence shown in the illustration.

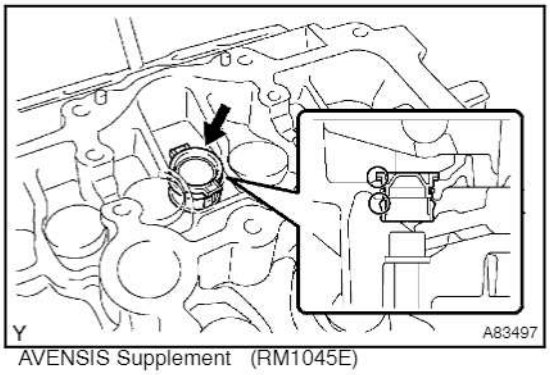
Torque: 79 N·m (806 kgf·cm, 58 ft·lbf)



(e) Mark the front side of the cylinder head set bolts with paint.

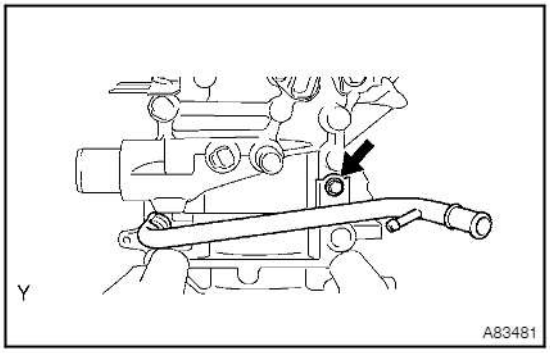
(f) Retighten the cylinder head set bolts by 90° in the same sequence as a step (d).

(g) Check that each paint mark is now at a 90° angle to the front.



(h) Install the camshaft housing plug as shown in the illustration.

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(i) Install the water by–pass pipe with a bolt.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

64. **INSTALL CAMSHAFT TIMING OIL CONTROL VALVE ASSY**
65. **INSTALL CAMSHAFT (See page 14–64)**
66. **INSTALL NO.2 CAMSHAFT (See page 14–64)**
67. **INSTALL EXHAUST MANIFOLD CONVERTER SUB–ASSY (See page 14–23)**
68. **INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.1 (See page 14–23)**
69. **INSTALL INTAKE MANIFOLD (See page 11–13)**
70. **INSTALL THROTTLE BODY ASSY (See page 10–8)**
71. **INSTALL AIR CLEANER ASSEMBLY WITH HOSE (See page 14–23)**
72. **INSTALL BATTERY**
    Torque:
    5.0 N·m (51 kgf·cm, 44 in.·lbf) for Bolt
    3.5 N·m (36 kgf·cm, 31 in.·lbf) for Nut
73. **INSTALL CHAIN VIBRATION DAMPER NO.1 (See page 14–45)**
74. **INSTALL CHAIN SUB–ASSY (See page 14–45)**
75. **INSTALL TIMING CHAIN GUIDE (See page 14–45)**
76. **INSTALL CHAIN TENSIONER SLIPPER (See page 14–45)**
77. **INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1 (See page 14–45)**
78. **INSTALL TIMING CHAIN OR BELT COVER SUB–ASSY (See page 14–45)**
79. **INSTALL V–RIBBED BELT TENSIONER ASSY (See page 14–45)**
80. **INSTALL OIL PAN SUB–ASSY (See page 14–45)**
81. **INSTALL CRANKSHAFT POSITION SENSOR (See page 14–45)**
82. **INSTALL CRANKSHAFT PULLEY (See page 14–45)**
    SST 09213–54015 (91651–60855), 09330–00021
83. **INSTALL CHAIN TENSIONER ASSY NO.1 (See page 14–45)**
84. **INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR**
    Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)
85. **INSTALL ENGINE MOUNTING BRACKET NO.2 RH (See page 14–45)**
86. **INSTALL CYLINDER HEAD COVER SUB–ASSY (See page 14–45)**
87. **INSTALL COOLER BRACKET (LHD STEERING POSITION TYPE)**
    Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
88. **INSTALL ENGINE SERVICE COVER BRACKET RH (RHD STEERING POSITION TYPE)**
    Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
89. **INSTALL OIL RESERVOIR BRACKET NO.1**
    Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
90. **INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD STEERING POSITION TYPE)**
91. **INSTALL RETURN TUBE SUB–ASSY**
    Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
92. **INSTALL IGNITION COIL ASSY**
    Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
93. **INSTALL FUEL PUMP ASSY (See page 11–24)**

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94. **INSTALL FUEL PIPE SUB–ASSY NO.1 (See page 11–24)**
    SST 09023–12900
95. **INSTALL FUEL TUBE SUB–ASSY (See page 11–24)**
96. **INSTALL FUEL PRESSURE PULSATION DAMPER ASSY (See page 11–24)**
97. **INSTALL ENGINE COVER SUB–ASSY NO.1**
    Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)
98. **INSTALL VANE PUMP ASSY**
    Torque: 37 N·m (377 kgf·cm, 27 ft·lbf)
99. **INSTALL EXHAUST PIPE ASSY FRONT (See page 15–2)**
100. **INSTALL GENERATOR ASSY (See page 19–8)**
101. **INSTALL FAN AND GENERATOR V BELT (See page 14–5)**
    SST 09249–63010
102. **ADD COOLANT (See page 16–7)**
103. **ADD ENGINE OIL (See page 17–6)**
104. **CHECK FOR ENGINE COOLANT LEAKS (See page 16–1)**
105. **CHECK FOR ENGINE OIL LEAKS**
106. **CHECK FOR FUEL LEAKS (See page 11–4)**
107. **INSTALL FRONT WHEEL RH**
    Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
108. **ADD POWER STEERING FLUID (See Pub. No. RM1018E on page 51–4)**
109. **BLEED POWER STEERING FLUID (See Pub. No. RM1018E on page 51–4)**
110. **CHECK POWER STEERING FULUID LEVEL IN RESERVOIR**
    (See Pub. No. RM1018E on page 51–4)
111. **CHECK FUNCTION OF THROTTLE BODY**

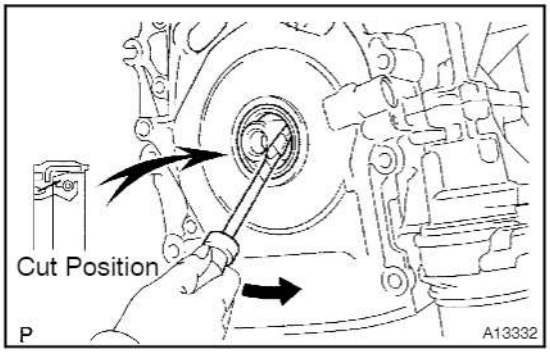
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TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL (2AZ–FSE)

141NC–01

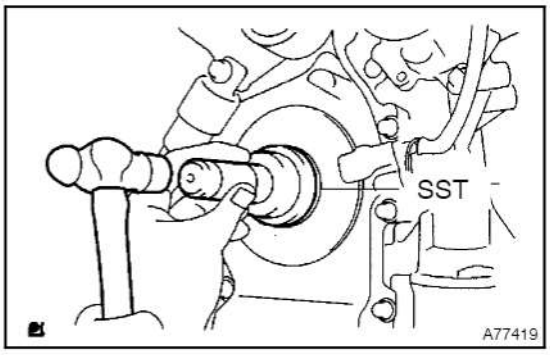
REPLACEMENT

1. **REMOVE FRONT WHEEL RH**
2. **REMOVE RADIATOR SUPPORT OPENING COVER (See page 14–23)**
3. **REMOVE ENGINE ROOM COVER SIDE (See page 14–23)**
4. **REMOVE ENGINE UNDER COVER LH (See page 14–23)**
5. **REMOVE ENGINE UNDER COVER NO.4 RH (See page 14–23)**
6. **REMOVE ENGINE UNDER COVER RH (See page 14–23)**
7. **REMOVE ENGINE COVER SUB–ASSY NO.1 (See page 14–45)**
8. **REMOVE FAN AND GENERATOR V BELT (See page 14–5)**
   SST 09249–63010
9. **REMOVE CRANKSHAFT PULLEY (See page 14–45)**
   SST 09213–54015 (91651–60855), 09330–00021, 09950–50013 (09951–05010, 09952–05010, 09953–05020, 09954–05021)



10. **REMOVE TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL**
    (a) Using a screwdriver with tip wrapped in the tape, pry out the oil seal.

HINT:
After removal, check that the crankshaft is not damaged.
If damaged, smooth the surface with 400–grit sandpaper.



11. **INSTALL TIMING GEAR CASE OR TIMING CHAIN CASE OIL SEAL**
    (a) Apply MP grease to a new oil seal lip.

NOTICE:
Keep the lip off foreign materials.

    (b) Using SST and a hammer, tap in the oil seal until its surface is flush with the rear oil seal retainer edge.
    SST 09223–22010

NOTICE:
Wipe off extra grease on the crankshaft.

12. **INSTALL CRANKSHAFT PULLEY (See page 14–45)**
    SST 09213–54015 (91651–60855), 09330–00021
13. **INSTALL FAN AND GENERATOR V BELT (See page 14–5)**
    SST 09249–63010
14. **INSTALL ENGINE COVER SUB–ASSY NO.1**
    Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)
15. **INSTALL FRONT WHEEL RH**
    Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
16. **CHECK FOR ENGINE OIL LEAKS**

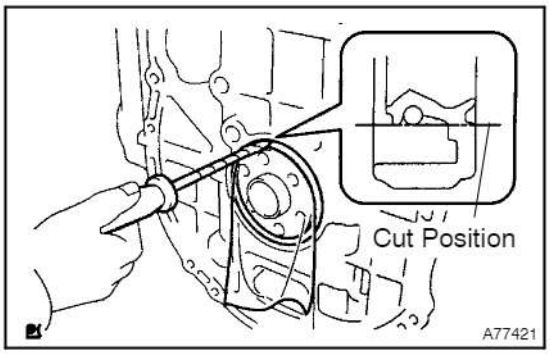
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ENGINE REAR OIL SEAL (2AZ–FSE)

141BS–02

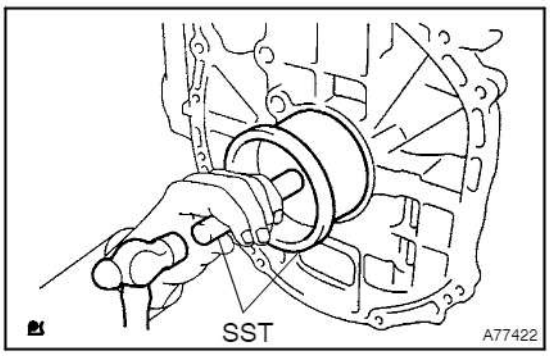
REPLACEMENT

1. **REMOVE AUTOMATIC TRANSAXLE ASSY (See page 40–3)**
2. **REMOVE DRIVE PLATE & RING GEAR SUB–ASSY (See page 14–23)**
   SST 09213–54015 (91651–60855), 09330–00021



3. **REMOVE ENGINE REAR OIL SEAL**
   (a) Using a knife, cut off the engine rear oil seal lip.
   (b) Using a screwdriver with the tip wrapped in tape, pry out the engine rear oil seal.

HINT:
After the removal, check that the crankshaft is not damaged. If damaged, smooth the surface with 400–grit sandpaper.



4. **INSTALL ENGINE REAR OIL SEAL**
   (a) Apply MP grease to a new engine rear oil seal lip.

NOTICE:
Keep the lip off foreign materials.

   (b) Using SST and a hammer, tap in the engine rear oil seal until its surface is flush with the engine rear oil seal retainer edge.
   SST 09223–15030, 09950–70010 (09951–07100)

NOTICE:
Wipe off extra grease on the crankshaft.

5. **INSTALL DRIVE PLATE & RING GEAR SUB–ASSY (See page 14–23)**
   SST 09213–54015 (91651–60855), 09330–00021
6. **INSTALL AUTOMATIC TRANSAXLE ASSY (See page 40–3)**

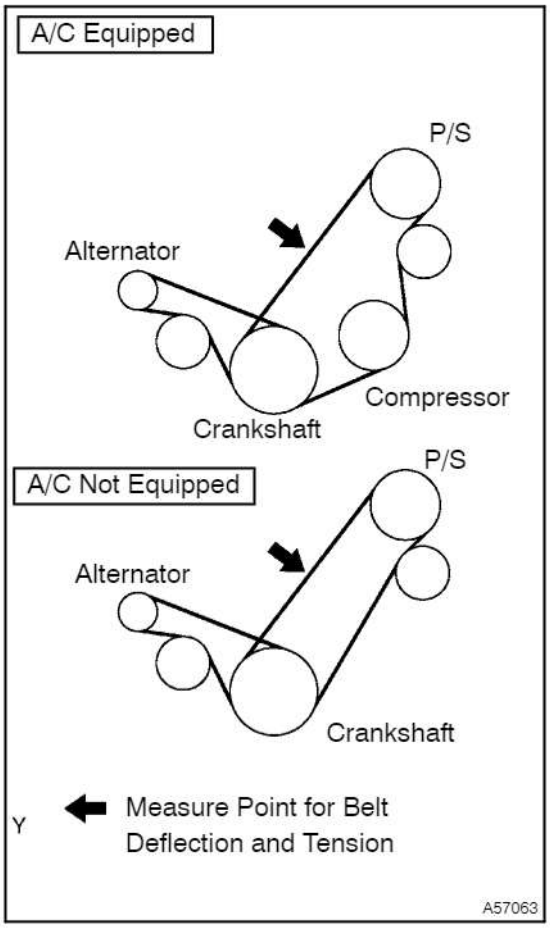
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ENGINE (1CD–FTV)(From September, 2003)

141ND–01

INSPECTION

1. INSPECT ENGINE COOLANT (See page 16–15)
2. INSPECT ENGINE OIL (See page 17–9)
3. INSPECT BATTERY (See Pub. No. RM1018E on page 19–26)
4. INSPECT AIR CLEANER FILTER ELEMENT SUB–ASSY



5. INSPECT DRIVE BELT

(a) Inspect the vane pump V–ribbed belt.

(1) Measure the belt deflection.

Pressing force: 98 N (10 kgf, 22 lbf)

	New Belt mm (in.)	Used Belt mm (in.)
A/C Equipped	8.0 to 10.5 (0.31 to 0.41)	10.5 to 12.5 (0.41 to 0.49)
A/C Not Equipped	10 to 12 (0.39 to 0.47)	14 to 17 (0.55 to 0.67)

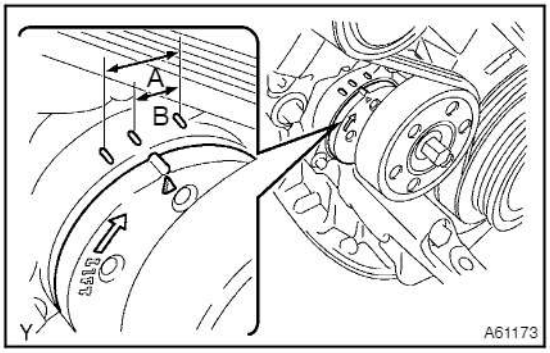
(2) Measure the belt tension.

	New Belt N (kgf, lbf)	Used Belt N (kgf, lbf)
A/C Equipped	647 to 843 (66 to 86, 145 to 189)	441 to 637 (45 to 65, 99 to 143)
A/C Not Equipped	686 to 784 (70 to 80, 154 to 176)	294 to 441 (30 to 45, 66 to 99)

NOTICE:

- **Check the drive belt deflection at the specified point.**
- **When installing a new belt, set its tension value as specified.**
- **When inspecting the belt which has been used for over 5 minutes, apply the specifications of "Used Belt."**
- **When reinstalling the belt which has been used for over 5 minutes, adjust its deflection and tension to the intermediate value of each specification of "Used Belt."**
- **The V–ribbed belt tension and deflection should be checked after 2 revolutions of engine cranking.**
- **When using a belt tension gauge, confirm the accuracy by using a master gauge first.**

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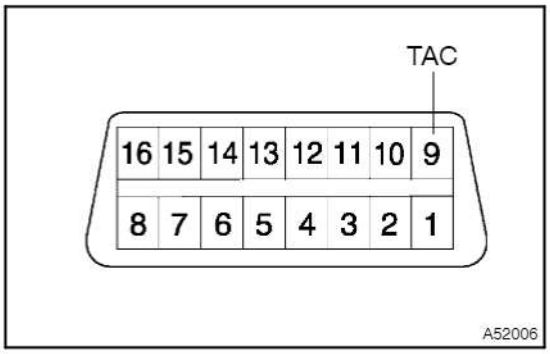


(b) Inspect the generator V–ribbed belt.
(1) Check that the tension indicator is within range A on the auto tensioner scale.

If the tension indicator is not within range A, replace the belt with a new one.

HINT:

When replacing the drive belt with a new one, the tension indicator should be within range B.



6. INSPECT ENGINE IDLE SPEED

(a) Using SST, connect a tachometer test probe to terminal 9 (TAC) of the DLC3.
SST 09843–18040

(b) Check the idle speed.
Idle speed: 750 to 850 rpm

NOTICE:

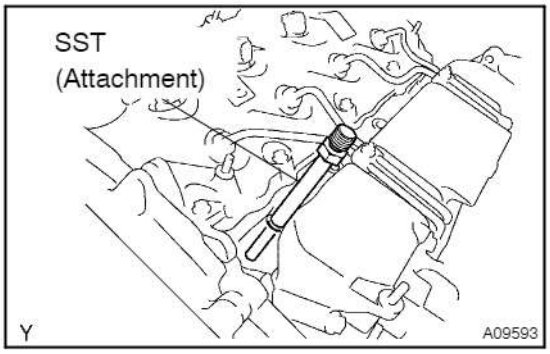
- **Check the idle speed with the cooling fan OFF.**
- **Switch OFF all accessories and air conditioning before connecting the test probe to the terminal.**

7. INSPECT MAXIMUM SPEED

(a) Start the engine.
(b) Fully depress the accelerator pedal.
(c) Check the maximum speed.
Maximum speed: 5,100 to 5,250 rpm

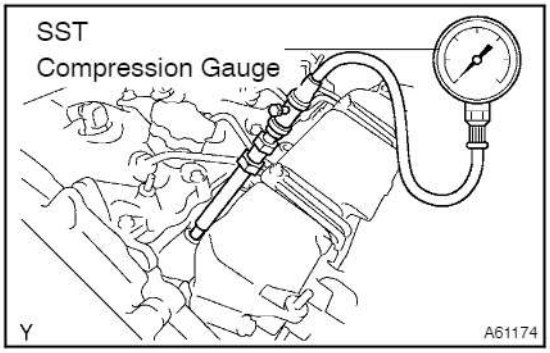
8. INSPECT COMPRESSION

(a) Warm up the engine to the normal operating temperature, then stop the engine.
(b) Remove the 4 glow plugs
(see Pub. No. RM1018E on page 19–33).
(c) Disconnect the 4 injector connectors.



(d) Inspect the cylinder compression pressure.
(1) Install SST (an attachment) to the glow plug hole.
SST 09992–00025 (09992–00121, 09992–00211)
Torque: 12 N·m (125 kgf·cm, 95 ft·lbf)

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(2) Connect SST (a compression gauge) to SST (the attachment).

SST 09992–00025 (09992–00121, 09992–00211)

(3) Fully open the throttle valve, then start the engine.

(4) While cranking the engine, measure the compression pressure.

NOTICE:

- **Always use a fully–charged battery to obtain engine speed of 250 rpm or more.**
- **Check the other cylinder compression pressure in the same way.**
- **This measurement must be done as quickly as possible.**

Compression pressure:
2,628 kPa (26.8 kgf/cm^2, 381 psi) or more
Minimum pressure:
2,157 kPa (22.0 kgf/cm^2, 312 psi) or more
Difference between each cylinder:
490 kPa (5.0 kgf/cm^2, 71 psi) or less

(5) If the cylinder compression is low, pour a small amount of engine oil into the cylinder through the glow plug hole, then measure the compression pressure again.

HINT:

- If adding oil raises the compression pressure, the piston rings and/or cylinder bore may be worn or damaged.
- If the compression pressure stays low, the valve may be sticking or seating improperly, or there may be leakage past the gasket.

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VALVE CLEARANCE (1CD–FTV)(From September, 2003)

141NE–01

ADJUSTMENT

NOTICE:

- **Before removing the injection pipes, clean them up with a soft brush and compressed air.**
- **After removing the injection pipes, cover the supply pump, common rail and injector mounting area of the cylinder head cover with vinyl tape to prevent dust from being introduced.**
- **After removing the cylinder head cover, protect the injector inlet with a vinyl or plastic bag to prevent foreign objects from being introduced.**

HINT:

Inspect and adjust the valve clearance after the engine becomes cold.

1. REMOVE RADIATOR SUPPORT OPENING COVER

2. REMOVE FRONT WHEEL RH

3. REMOVE ENGINE UNDER COVER LH

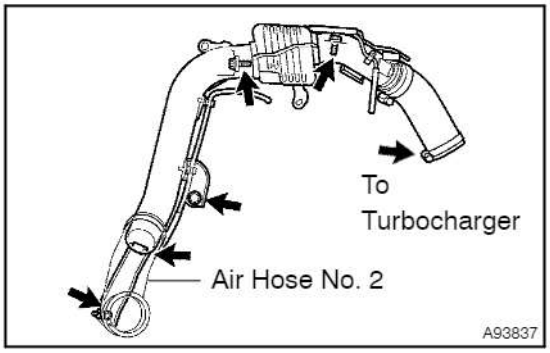
4. REMOVE ENGINE UNDER COVER SUB–ASSY NO.1

5. REMOVE ENGINE UNDER COVER RH

6. REMOVE ENGINE COVER SUB–ASSY NO.1

(a) Remove the 5 nuts, then remove the engine cover.

7. REMOVE BATTERY



8. REMOVE AIR TUBE NO.1

(a) Disconnect the vacuum hoses and connectors.

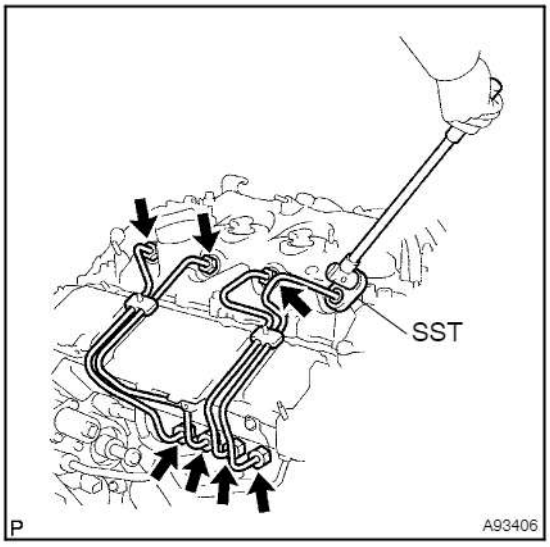
(b) Loosen the 2 hose clamps.

(c) Remove the 3 bolts and nut, then detach the air tube No. 1.

9. REMOVE TIMING BELT NO.2 COVER (See page 14–138)

10. REMOVE FUEL PIPE NO.3 (See page 14–108)

SST 09023–12700



11. REMOVE INJECTION PIPE SUB–ASSY NO.1

(a) Remove the 2 upper injection pipe clamps from the intake manifold.

(b) Using SST, remove the injection pipe from the common rail side.

SST 09023–12700

(c) Using SST, remove the injection pipe from the injector side.

SST 09023–12700

(d) After removing the fuel pipe, in order to prevent dust or foreign objects from being introduced, cover the common rail with vinyl tape and protect the injector inlet with a vinyl or plastic bag.

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12. REMOVE INJECTION PIPE SUB–ASSY NO.2

SST 09023–12700

HINT:

Perform the same procedures as the injection pipe No. 1.

13. REMOVE INJECTION PIPE SUB–ASSY NO.3

SST 09023–12700

HINT:

Perform the same procedures as the injection pipe No. 1.

14. REMOVE INJECTION PIPE SUB–ASSY NO.4

SST 09023–12700

HINT:

Perform the same procedures as the injection pipe No. 1.

15. REMOVE NOZZLE LEAKAGE PIPE NO.2 (See page 14–108)

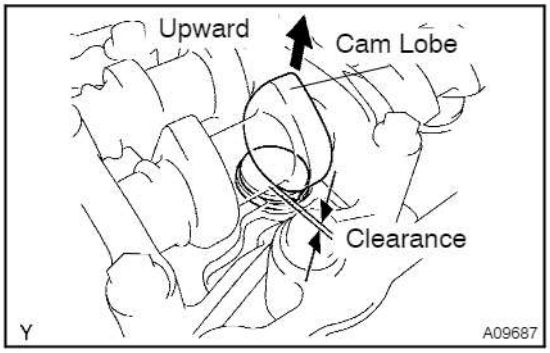
16. REMOVE CYLINDER HEAD COVER SUB–ASSY (See page 14–151)

17. REMOVE NOZZLE LEAKAGE PIPE ASSY (See page 11–46)

18. REMOVE INJECTOR ASSY (See page 11–46)

HINT:

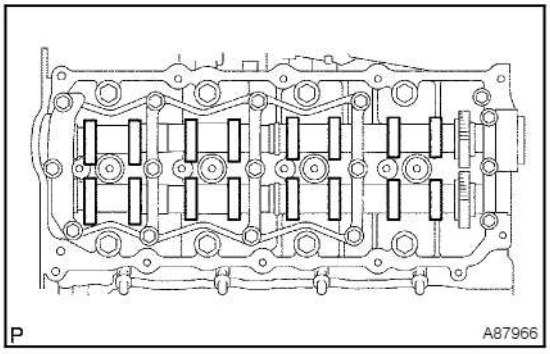
Since each injector assembly has characteristic fuel injecting behavior, keep them in the correct order so that they can be returned to the original locations when reassembling.



19. INSPECT VALVE CLEARANCE

(a) Turn the crankshaft so that the cam lobe located over the inspecting valve faces upward.

(b) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

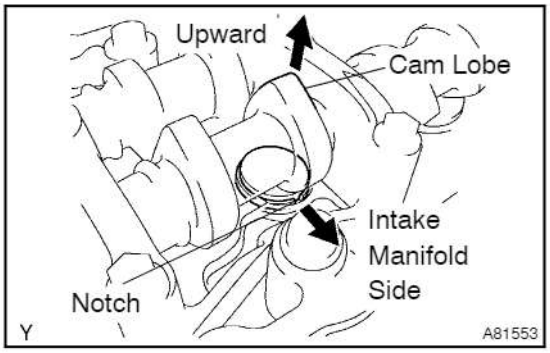


(c) Measure the clearance at 16 places.

(d) Record the out–of–specification valve clearance measurements. They will be used later to select an adjusting shim to replace.

Valve clearance (Cold):

Intake	0.20 to 0.30 mm (0.008 to 0.012 in.)
Exhaust	0.35 to 0.45 mm (0.014 to 0.018 in.)



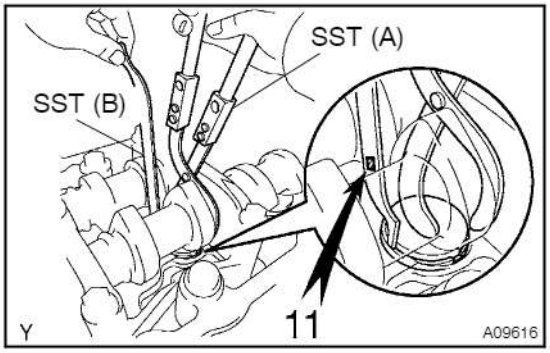
20. ADJUST VALVE CLEARANCE

(a) Remove the adjusting shim.

(1) Turn the crankshaft so that the cam lobe located over the adjusting valve faces upward.

(2) Position the notch of the valve lifter toward the intake manifold side.

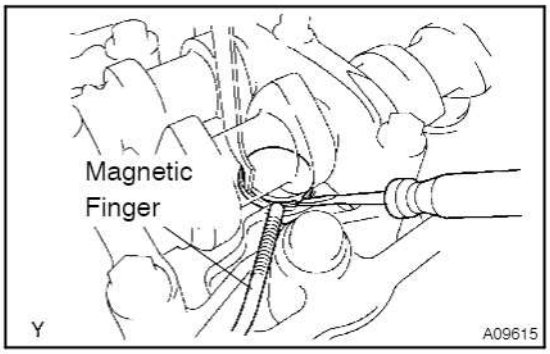
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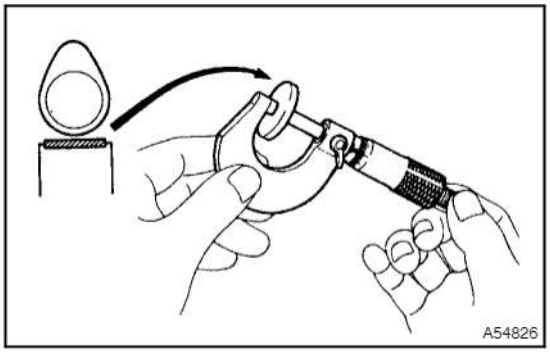
(3) Using SST (A), press down the valve lifter, then place SST (B) between the camshaft and valve lifter. Remove SST (A).

SST 09248–55050 (09248–05510, 09248–05520)

HINT:
Use SST (B) marked with "11".



(4) Remove the adjusting shim using a small screwdriver and magnetic finger.



(b) Select the size of an adjusting shim to replace by following the formula or the charts attached to the end of this section.

(1) Using a micrometer, measure the thickness of the removed shim.

(2) Calculate the thickness of a new shim so that the valve clearance comes within the specified value.

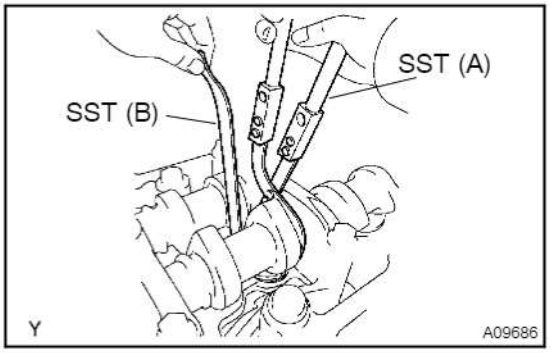
HINT:
T ..... Thickness of the removed adjusting shim
A ..... Measured valve clearance
N ..... Thickness of a new adjusting shim
Intake: N = T + (A – 0.25 mm (0.010 in.))
Exhaust: N = T + (A – 0.40 mm (0.016 in.))

(3) Select a new shim with a thickness which is as close to the calculated value as possible.

EXAMPLE (Intake):
Measured valve clearance = 0.45 mm (0.0177 in.)
0.45 mm (0.0177 in.) – 0.25 mm (0.0098 in.) = 0.20 mm (0.0078 in.)
(Measured – Specification = Excess clearance)
Used shim measurement = 2.80 mm (0.1102 in.)
0.20 mm (0.0078 in.) + 2.80 mm (0.1102 in.) = 3.00 mm (0.1181 in.)
(Excess clearance + Used shim = Ideal new shim)
Closest new shim = 3.00 mm (0.1181 in.)
Select No. 21 shim

HINT:
The shims are available in 17 sizes in increments of 0.05 mm (0.0020 in.), from 2.50 mm (0.0984 in.) to 3.30 mm (0.1299 in.).

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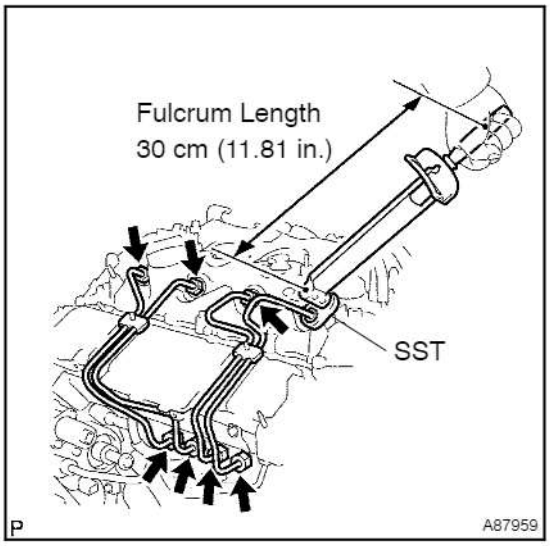
(c) Install the new adjusting shim.
(1) Place the new adjusting shim on the valve lifter.
(2) Using SST (A), press down the valve lifter, then remove SST (B).
SST 09248–55050 (09248–05510, 09248–05520)
(d) Recheck the valve clearance.

21. INSTALL INJECTOR ASSY (See page 11–46)
22. INSTALL NOZZLE LEAKAGE PIPE ASSY (See page 11–46)
SST 09992–00242
23. INSTALL CYLINDER HEAD COVER SUB–ASSY (See page 14–151)
24. INSTALL NOZZLE LEAKAGE PIPE NO.2 (See page 14–108)

25. INSTALL INJECTION PIPE SUB–ASSY NO.1

NOTICE:
When assembling the pipes, perform the operation with the engine cold at room temperature.

(a) Remove the vinyl or plastic bag from the injector and the vinyl tape from the common rail.
(b) Temporarily install the injection pipe.



(c) Using SST, tighten the nut of the injection pipe on the common rail side.
SST 09023–12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the injection pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

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(d) Using SST, tighten the nut of the injection pipe on the injector side.
SST 09023–12700
Torque:
For used pipe:
36 N·m (372 kgf·cm, 27 ft·lbf) with SST
40 N·m (408 kgf·cm, 30 ft·lbf) without SST
For new pipe:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the injection pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

(e) Install the 2 upper injection pipe clamps.

26. INSTALL INJECTION PIPE SUB–ASSY NO.2
SST 09023–12700
HINT:
Perform the same procedures as the injection pipe No. 1.

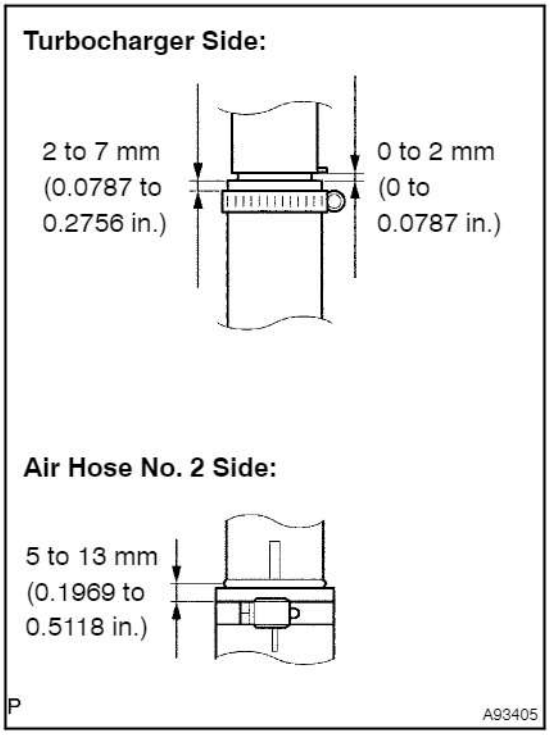
27. INSTALL INJECTION PIPE SUB–ASSY NO.3
SST 09023–12700
HINT:
Perform the same procedures as the injection pipe No. 1.

28. INSTALL INJECTION PIPE SUB–ASSY NO.4
SST 09023–12700
HINT:
Perform the same procedures as the injection pipe No. 1.

29. INSTALL FUEL PIPE NO.3 (See page 14–108)

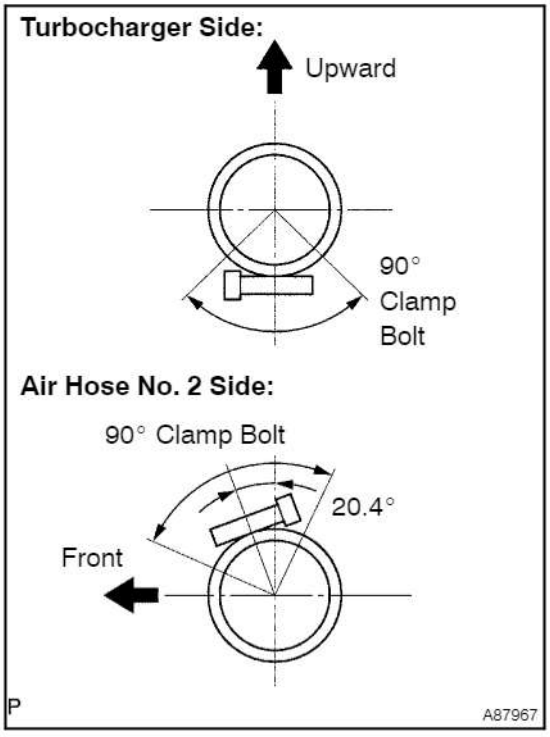
30. INSTALL TIMING BELT NO.2 COVER (See page 14–138)

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31. INSTALL AIR TUBE NO.1

(a) Install a new air hose No. 2 and new 2 hose clamps as shown in the illustration.



(b) Tighten the 2 hose clamps as shown in the illustration.
Torque: 6.0 N·m (61 kgf·cm, 53 in.·lbf)

(c) Install the air tube No. 1 with the 3 bolts and nut.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

32. INSTALL BATTERY (See page 14–108)

33. INSTALL ENGINE COVER SUB–ASSY NO.1
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

34. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

35. CHECK FOR FUEL LEAKS (See page 11–46)

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Adjusting Shim Selection Chart (Intake)

	2.500 (0.0984)	2.525 (0.0994)	2.550 (0.1004)	2.575 (0.1014)	2.600 (0.1024)	2.625 (0.1033)	2.650 (0.1043)	2.675 (0.1053)	2.700 (0.1063)	2.725 (0.1073)	2.750 (0.1083)	2.775 (0.1093)	2.800 (0.1102)	2.825 (0.1112)	2.850 (0.1122)	2.875 (0.1132)	2.900 (0.1142)	2.925 (0.1152)	2.950 (0.1161)	2.975 (0.1171)	3.000 (0.1181)	3.025 (0.1191)	3.050 (0.1201)	3.075 (0.1211)	3.100 (0.1220)	3.125 (0.1230)	3.150 (0.1240)	3.175 (0.1250)	3.200 (0.1260)	3.225 (0.1270)	3.250 (0.1280)	3.275 (0.1289)	3.300 (0.1299)
0.000 ~ 0.020 (0.0000 ~ 0.0008)									01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23
0.021 ~ 0.040 (0.0008 ~ 0.0016)									01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25
0.041 ~ 0.060 (0.0016 ~ 0.0024)								01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25
0.061 ~ 0.080 (0.0024 ~ 0.0031)							01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25
0.081 ~ 0.100 (0.0032 ~ 0.0039)						01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27
0.101 ~ 0.120 (0.0040 ~ 0.0047)					01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27
0.121 ~ 0.140 (0.0048 ~ 0.0055)					01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29
0.141 ~ 0.160 (0.0056 ~ 0.0063)				01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29
0.161 ~ 0.180 (0.0063 ~ 0.0071)			01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29
0.181 ~ 0.199 (0.0071 ~ 0.0078)		01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31
0.200 ~ 0.300 (0.0079 ~ 0.0118)																																	
0.301 ~ 0.320 (0.0119 ~ 0.0126)	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33	
0.321 ~ 0.340 (0.0126 ~ 0.0134)	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33		
0.341 ~ 0.360 (0.0134 ~ 0.0142)	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33			
0.361 ~ 0.380 (0.0142 ~ 0.0150)	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33				
0.381 ~ 0.400 (0.0150 ~ 0.0157)	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33				
0.401 ~ 0.420 (0.0158 ~ 0.0165)	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33					
0.421 ~ 0.440 (0.0166 ~ 0.0173)	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33						
0.441 ~ 0.460 (0.0174 ~ 0.0181)	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33							
0.461 ~ 0.480 (0.0181 ~ 0.0189)	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33								
0.481 ~ 0.500 (0.0189 ~ 0.0197)	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33								
0.501 ~ 0.520 (0.0197 ~ 0.0205)	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33									
0.521 ~ 0.540 (0.0205 ~ 0.0213)	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33										
0.541 ~ 0.560 (0.0213 ~ 0.0220)	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33											
0.561 ~ 0.580 (0.0221 ~ 0.0228)	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33												
0.581 ~ 0.600 (0.0229 ~ 0.0236)	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33												
0.601 ~ 0.620 (0.0237 ~ 0.0244)	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33													
0.621 ~ 0.640 (0.0244 ~ 0.0252)	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33														
0.641 ~ 0.660 (0.0252 ~ 0.0260)	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33															
0.661 ~ 0.680 (0.0260 ~ 0.0268)	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33																
0.681 ~ 0.700 (0.0268 ~ 0.0276)	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																
0.701 ~ 0.720 (0.0276 ~ 0.0283)	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																	
0.721 ~ 0.740 (0.0284 ~ 0.0291)	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																		
0.741 ~ 0.760 (0.0292 ~ 0.0299)	21	23	23	25	25	27	27	29	29	31	31	33	33	33																			
0.761 ~ 0.780 (0.0300 ~ 0.0307)	21	23	23	25	25	27	27	29	29	31	31	33	33																				
0.781 ~ 0.800 (0.0307 ~ 0.0315)	23	23	25	25	27	27	29	29	31	31	33	33	33																				
0.801 ~ 0.820 (0.0315 ~ 0.0323)	23	25	25	27	27	29	29	31	31	33	33	33																					
0.821 ~ 0.840 (0.0323 ~ 0.0331)	25	25	27	27	29	29	31	31	33	33	33																						
0.841 ~ 0.860 (0.0331 ~ 0.0339)	25	27	27	29	29	31	31	33	33	33																							
0.861 ~ 0.880 (0.0339 ~ 0.0346)	25	27	27	29	29	31	31	33	33																								
0.881 ~ 0.900 (0.0347 ~ 0.0354)	27	27	29	29	31	31	33	33	33																								
0.901 ~ 0.920 (0.0355 ~ 0.0362)	27	29	29	31	31	33	33	33																									
0.921 ~ 0.940 (0.0363 ~ 0.0370)	29	29	31	31	33	33	33																										
0.941 ~ 0.960 (0.0370 ~ 0.0378)	29	31	31	33	33	33																											
0.961 ~ 0.980 (0.0378 ~ 0.0386)	29	31	31	33	33																												
0.981 ~ 1.000 (0.0386 ~ 0.0394)	31	31	33	33	33																												
1.001 ~ 1.020 (0.0394 ~ 0.0402)	31	33	33	33																													
1.121 ~ 1.040 (0.0402 ~ 0.0409)	33	33	33																														
1.041 ~ 1.060 (0.0410 ~ 0.0417)	33	33																															
1.161 ~ 1.080 (0.0418 ~ 0.0425)	33																																
1.081 ~ 1.100 (0.0426 ~ 0.0433)	33																																

New Shim Thickness mm (in.)

Shim No.	Thickness	Shim No.	Thickness
01	2.500 (0.0984)	19	2.950 (0.1161)
03	2.550 (0.1004)	21	3.000 (0.1181)
05	2.600 (0.1024)	23	3.050 (0.1201)
07	2.650 (0.1043)	25	3.100 (0.1220)
09	2.700 (0.1063)	27	3.150 (0.1240)
11	2.750 (0.1083)	29	3.200 (0.1260)
13	2.800 (0.1102)	31	3.250 (0.1280)
15	2.850 (0.1122)	33	3.300 (0.1299)
17	2.900 (0.1142)		

Intake valve clearance (Cold):
0.20 to 0.30 mm (0.008 to 0.012 in.)

EXAMPLE: The 2.800 mm (0.1102 in.) shim is installed, and the measured clearance is 0.450 mm (0.0177 in.). Replace the 2.800 mm (0.1102 in.) shim with a new No. 21 shim.

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Adjusting Shim Selection Chart (Exhaust)

	2.500 (0.0984)	2.525 (0.0994)	2.550 (0.1004)	2.575 (0.1014)	2.600 (0.1024)	2.625 (0.1033)	2.650 (0.1043)	2.675 (0.1053)	2.700 (0.1063)	2.725 (0.1073)	2.750 (0.1073)	2.775 (0.1083)	2.800 (0.1102)	2.825 (0.1112)	2.850 (0.1122)	2.875 (0.1132)	2.900 (0.1142)	2.925 (0.1152)	2.950 (0.1161)	2.975 (0.1171)	3.000 (0.1181)	3.025 (0.1191)	3.050 (0.1201)	3.075 (0.1211)	3.100 (0.1220)	3.125 (0.1230)	3.150 (0.1240)	3.175 (0.1250)	3.200 (0.1260)	3.225 (0.1270)	3.250 (0.1280)	3.275 (0.1289)	3.300 (0.1299)
0.000 ~ 0.020 (0.0000 ~ 0.0008)															01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17
0.021 ~ 0.040 (0.0008 ~ 0.0016)															01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	
0.041 ~ 0.060 (0.0016 ~ 0.0024)														01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	
0.061 ~ 0.080 (0.0024 ~ 0.0031)													01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	
0.081 ~ 0.100 (0.0032 ~ 0.0039)												01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	
0.101 ~ 0.120 (0.0040 ~ 0.0047)											01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	
0.121 ~ 0.140 (0.0048 ~ 0.0055)											01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	
0.141 ~ 0.160 (0.0056 ~ 0.0063)										01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	
0.161 ~ 0.180 (0.0063 ~ 0.0071)									01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	
0.181 ~ 0.200 (0.0071 ~ 0.0079)								01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	
0.201 ~ 0.220 (0.0079 ~ 0.0087)							01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	
0.221 ~ 0.240 (0.0087 ~ 0.0094)							01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	
0.241 ~ 0.260 (0.0095 ~ 0.0102)						01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	
0.261 ~ 0.280 (0.0103 ~ 0.0110)					01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	
0.281 ~ 0.300 (0.0111 ~ 0.0118)				01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	
0.301 ~ 0.320 (0.0119 ~ 0.0126)			01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	
0.321 ~ 0.340 (0.0126 ~ 0.0134)			01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	
0.341 ~ 0.349 (0.0134 ~ 0.0137)		01	01	01	03	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	
0.350 ~ 0.450 (0.0138 ~ 0.0177)																																		
0.451 ~ 0.460 (0.0178 ~ 0.0181)	03	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33		
0.461 ~ 0.480 (0.0181 ~ 0.0189)	05	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33			
0.481 ~ 0.500 (0.0189 ~ 0.0197)	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33				
0.501 ~ 0.520 (0.0197 ~ 0.0205)	05	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33				
0.521 ~ 0.540 (0.0205 ~ 0.0213)	07	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33					
0.541 ~ 0.560 (0.0213 ~ 0.0220)	07	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33						
0.561 ~ 0.580 (0.0221 ~ 0.0228)	09	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33							
0.581 ~ 0.600 (0.0229 ~ 0.0236)	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33	33							
0.601 ~ 0.620 (0.0237 ~ 0.0244)	09	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33								
0.621 ~ 0.640 (0.0244 ~ 0.0252)	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33									
0.641 ~ 0.660 (0.0252 ~ 0.0260)	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33										
0.661 ~ 0.680 (0.0260 ~ 0.0268)	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33											
0.681 ~ 0.700 (0.0268 ~ 0.0276)	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33	33											
0.701 ~ 0.720 (0.0276 ~ 0.0283)	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33												
0.721 ~ 0.740 (0.0284 ~ 0.0291)	15	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33													
0.741 ~ 0.760 (0.0292 ~ 0.0299)	15	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33														
0.761 ~ 0.780 (0.0300 ~ 0.0307)	17	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33															
0.781 ~ 0.800 (0.0307 ~ 0.0315)	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33	33															
0.801 ~ 0.820 (0.0315 ~ 0.0323)	17	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																
0.821 ~ 0.840 (0.0323 ~ 0.0331)	19	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																	
0.841 ~ 0.860 (0.0331 ~ 0.0339)	19	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																		
0.861 ~ 0.880 (0.0339 ~ 0.0346)	21	21	23	23	25	25	27	27	29	29	31	31	33	33	33																			
0.881 ~ 0.900 (0.0347 ~ 0.0354)	21	23	23	25	25	27	27	29	29	31	31	33	33	33	33																			
0.901 ~ 0.920 (0.0355 ~ 0.0362)	21	23	23	25	25	27	27	29	29	31	31	33	33	33																				
0.921 ~ 0.940 (0.0363 ~ 0.0370)	23	23	25	25	27	27	29	29	31	31	33	33	33																					
0.941 ~ 0.960 (0.0370 ~ 0.0378)	23	25	25	27	27	29	29	31	31	33	33	33																						
0.961 ~ 0.980 (0.0378 ~ 0.0386)	25	25	27	27	29	29	31	31	33	33	33																							
0.981 ~ 1.000 (0.0386 ~ 0.0394)	25	27	27	29	29	31	31	33	33	33	33																							
1.001 ~ 1.020 (0.0394 ~ 0.0402)	25	27	27	29	29	31	31	33	33	33																								
1.021 ~ 1.040 (0.0402 ~ 0.0409)	27	27	29	29	31	31	33	33	33																									
1.041 ~ 1.060 (0.0410 ~ 0.0417)	27	29	29	31	31	33	33	33																										
1.061 ~ 1.080 (0.0418 ~ 0.0425)	29	29	31	31	33	33	33																											
1.081 ~ 1.100 (0.0426 ~ 0.0433)	29	31	31	33	33	33	33																											
1.101 ~ 1.120 (0.0433 ~ 0.0441)	29	31	31	33	33	33																												
1.121 ~ 1.140 (0.0441 ~ 0.0449)	31	31	33	33	33																													
1.141 ~ 1.160 (0.0449 ~ 0.0457)	31	33	33	33																														
1.161 ~ 1.180 (0.0457 ~ 0.0465)	33	33	33																															
1.181 ~ 1.200 (0.0465 ~ 0.0472)	33	33	33																															
1.201 ~ 1.220 (0.0473 ~ 0.0480)	33	33																																
1.221 ~ 1.240 (0.0481 ~ 0.0488)	33																																	

New Shim Thickness mm (in.)

Shim No.	Thickness	Shim No.	Thickness
01	2.500 (0.0984)	19	2.950 (0.1161)
03	2.550 (0.1004)	21	3.000 (0.1181)
05	2.600 (0.1024)	23	3.050 (0.1201)
07	2.650 (0.1043)	25	3.100 (0.1220)
09	2.700 (0.1063)	27	3.150 (0.1240)
11	2.750 (0.1083)	29	3.200 (0.1260)
13	2.800 (0.1102)	31	3.250 (0.1280)
15	2.850 (0.1122)	33	3.300 (0.1299)
17	2.900 (0.1142)		

Exhaust valve clearance (Cold):
0.35 to 0.45 mm (0.014 to 0.018 in.)

EXAMPLE: The 2.800 mm (0.1102 in.) shim is installed, and the measured clearance is 0.590 mm (0.0232 in.). Replace the 2.800 mm (0.1102 in.) shim with a new No. 21 shim.

Y

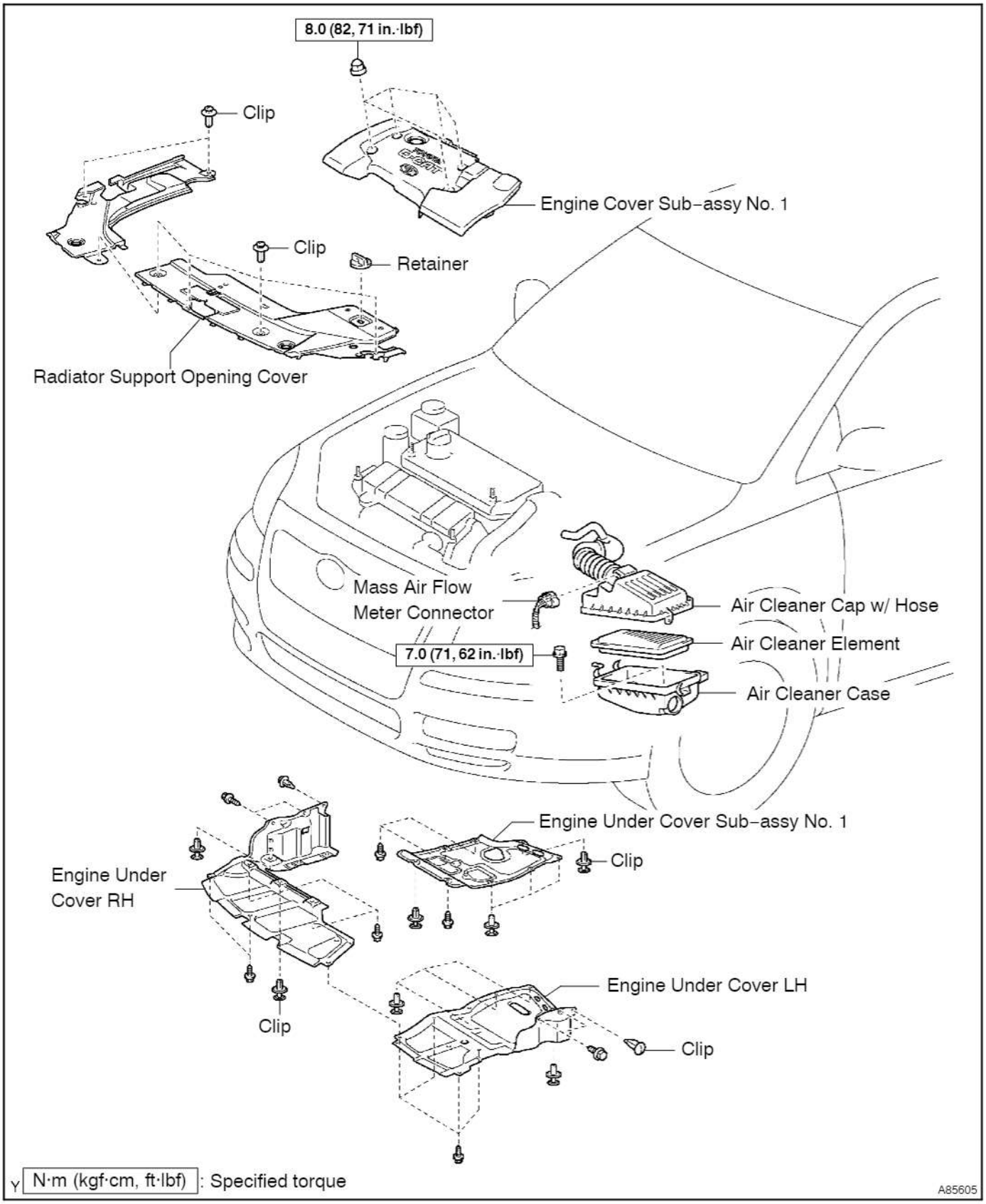
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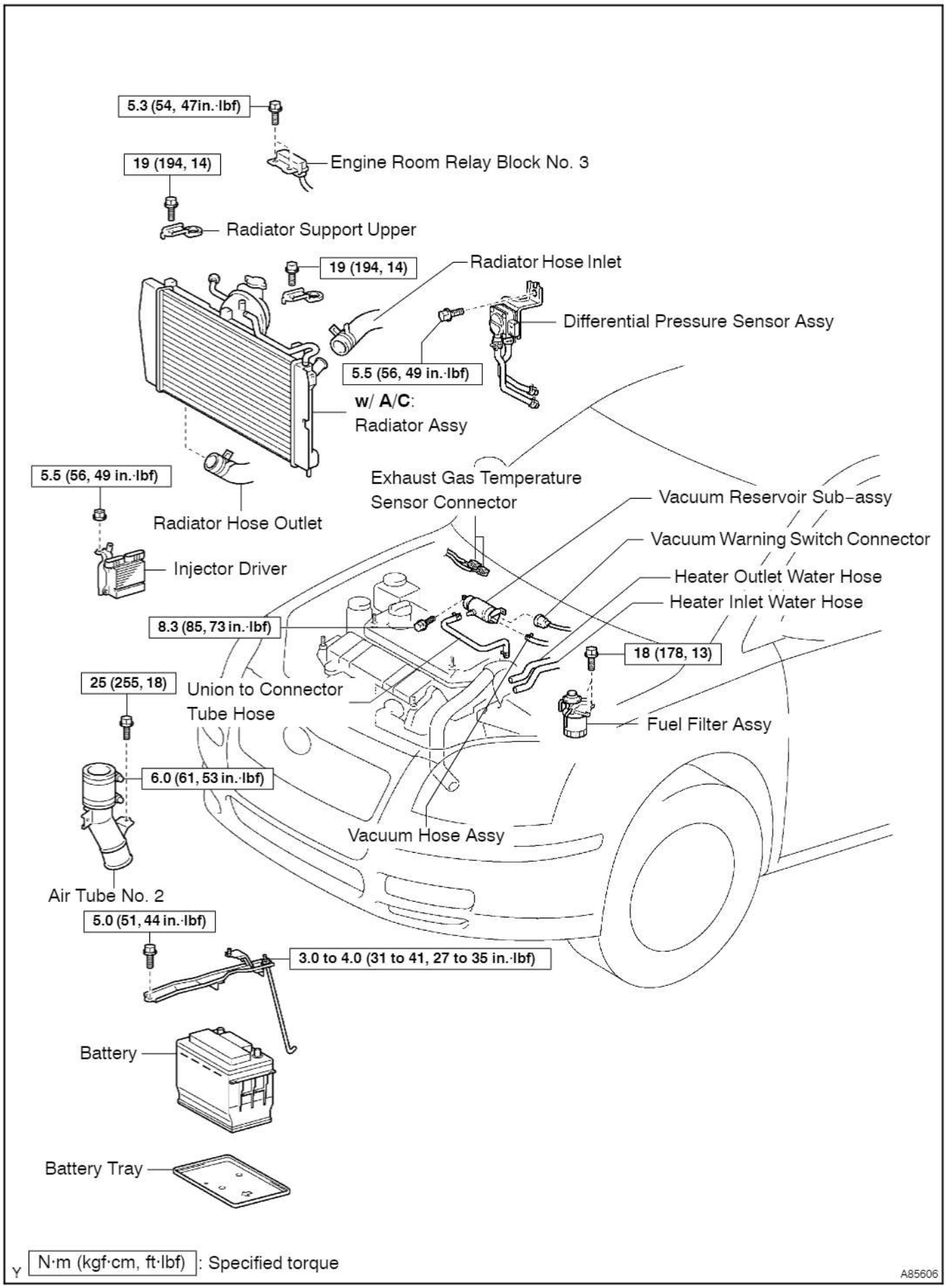
PARTIAL ENGINE ASSY (1CD–FTV)(From September, 2003)

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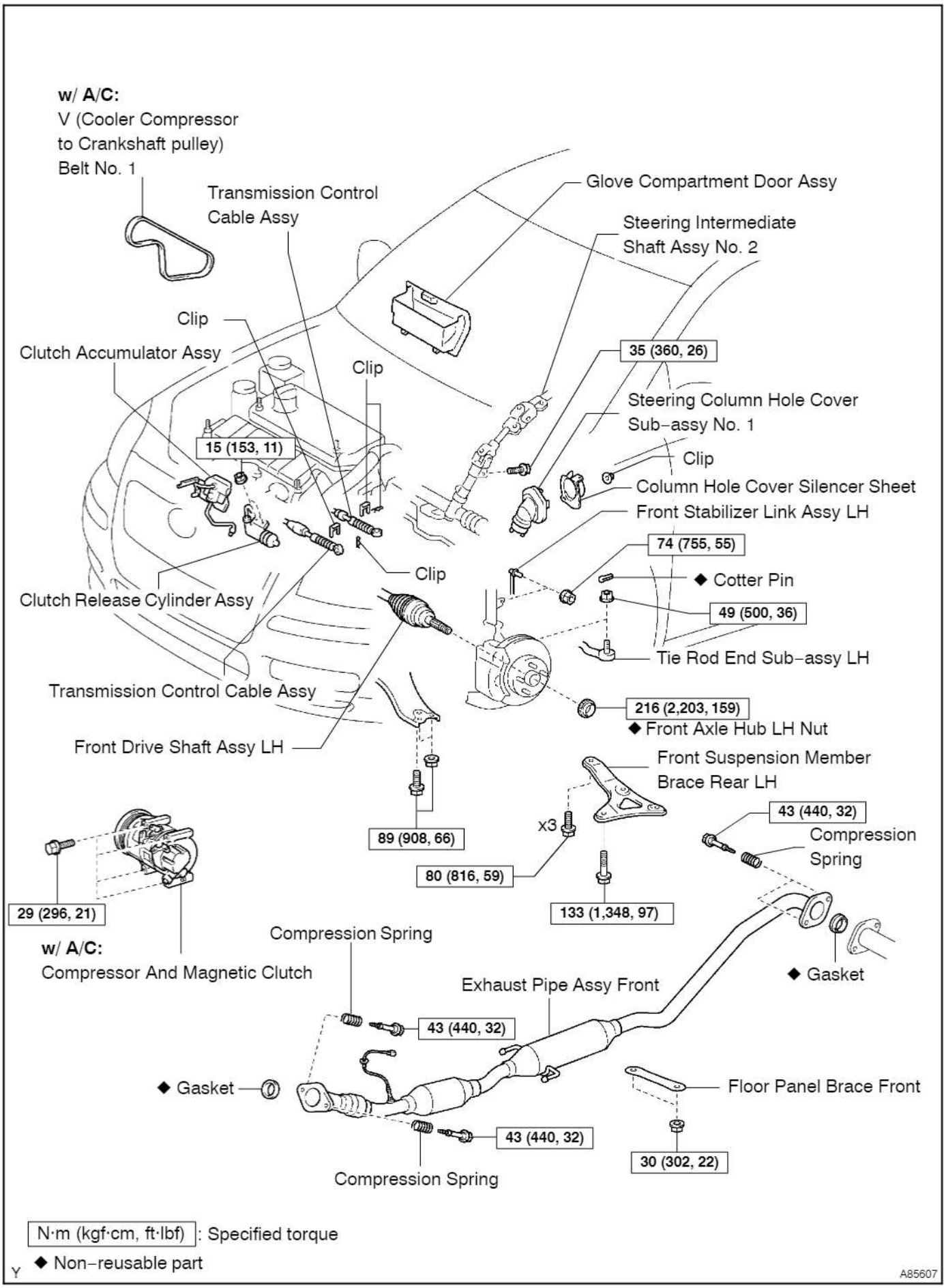
COMPONENTS



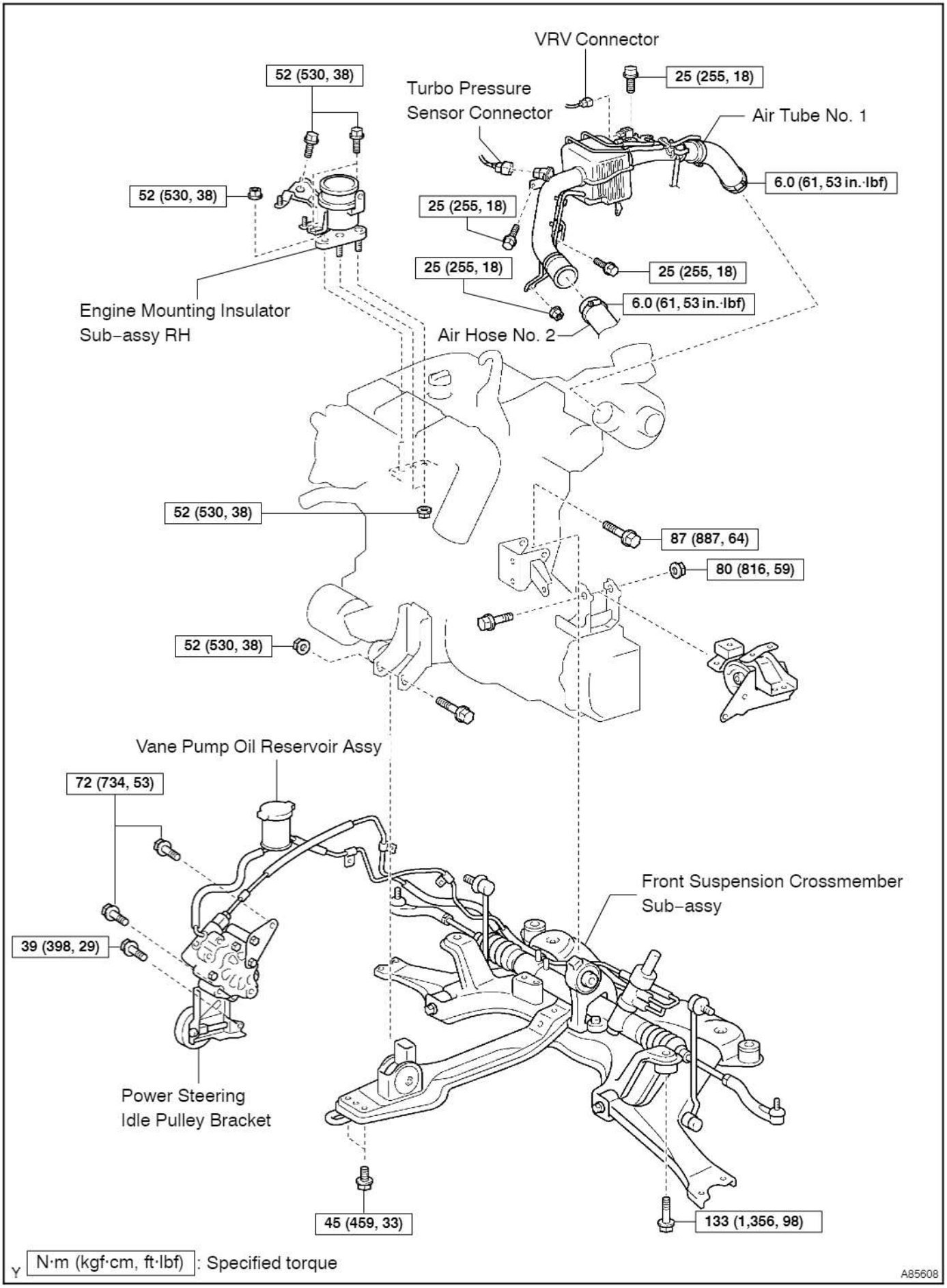
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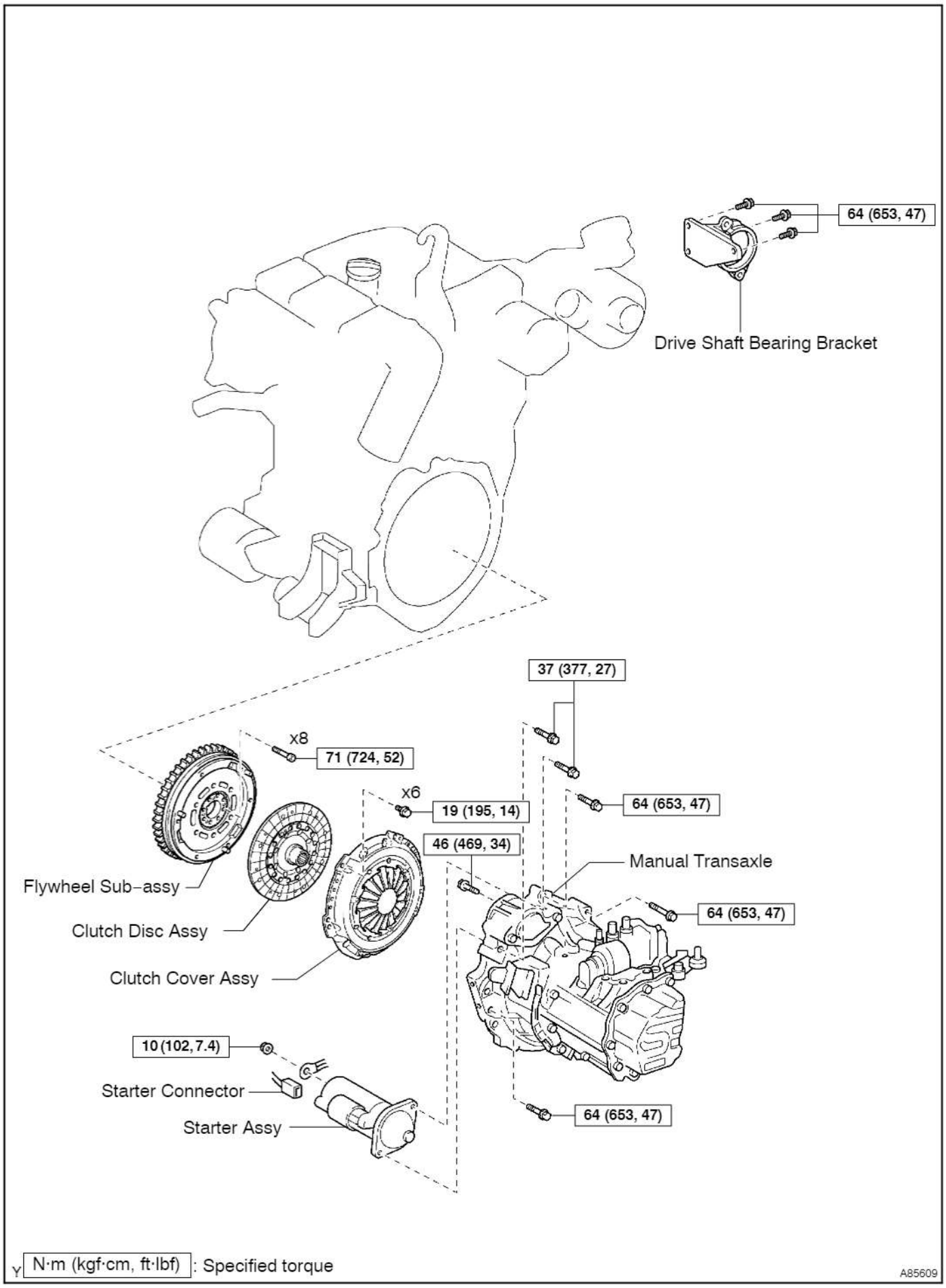
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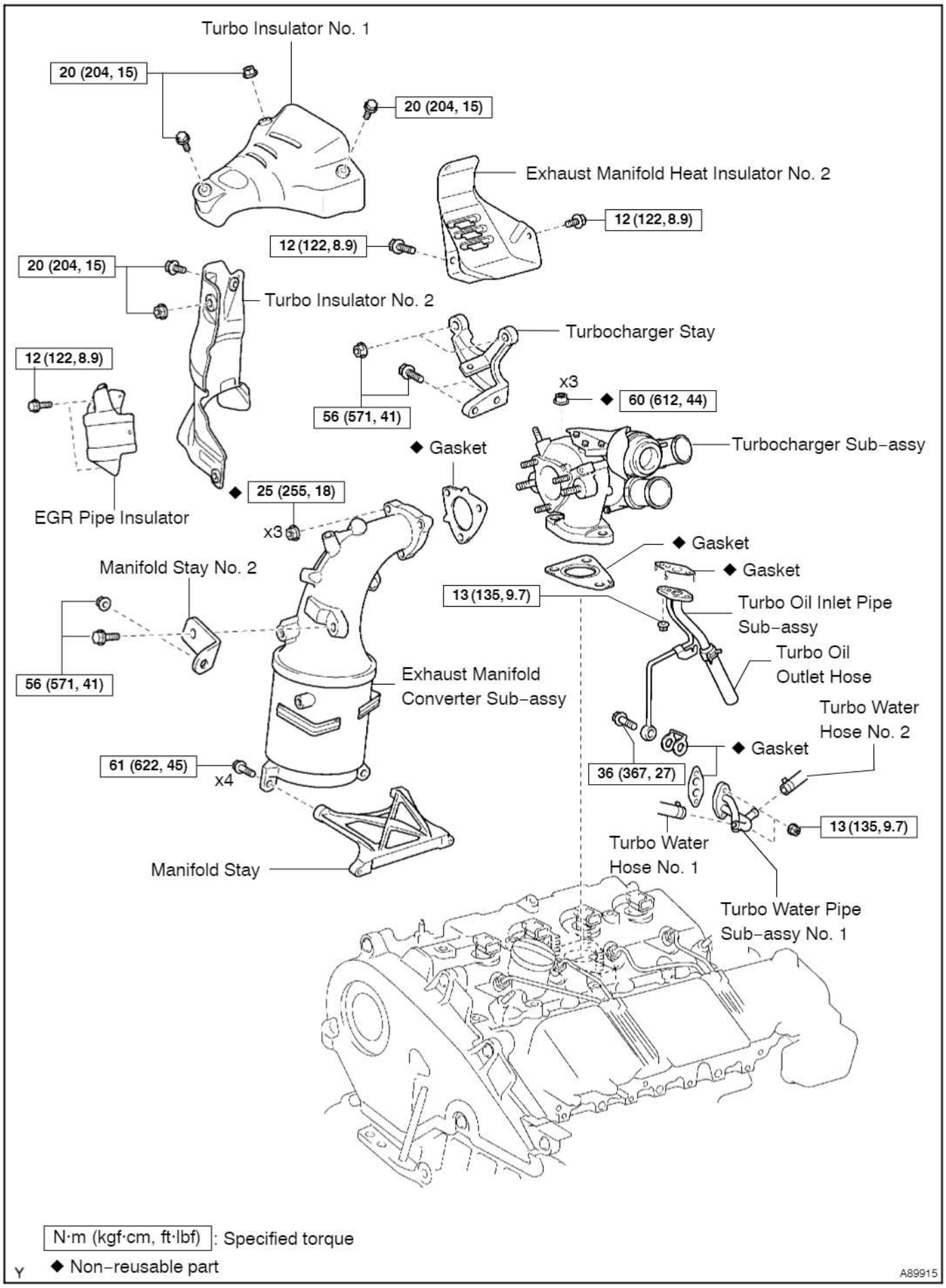
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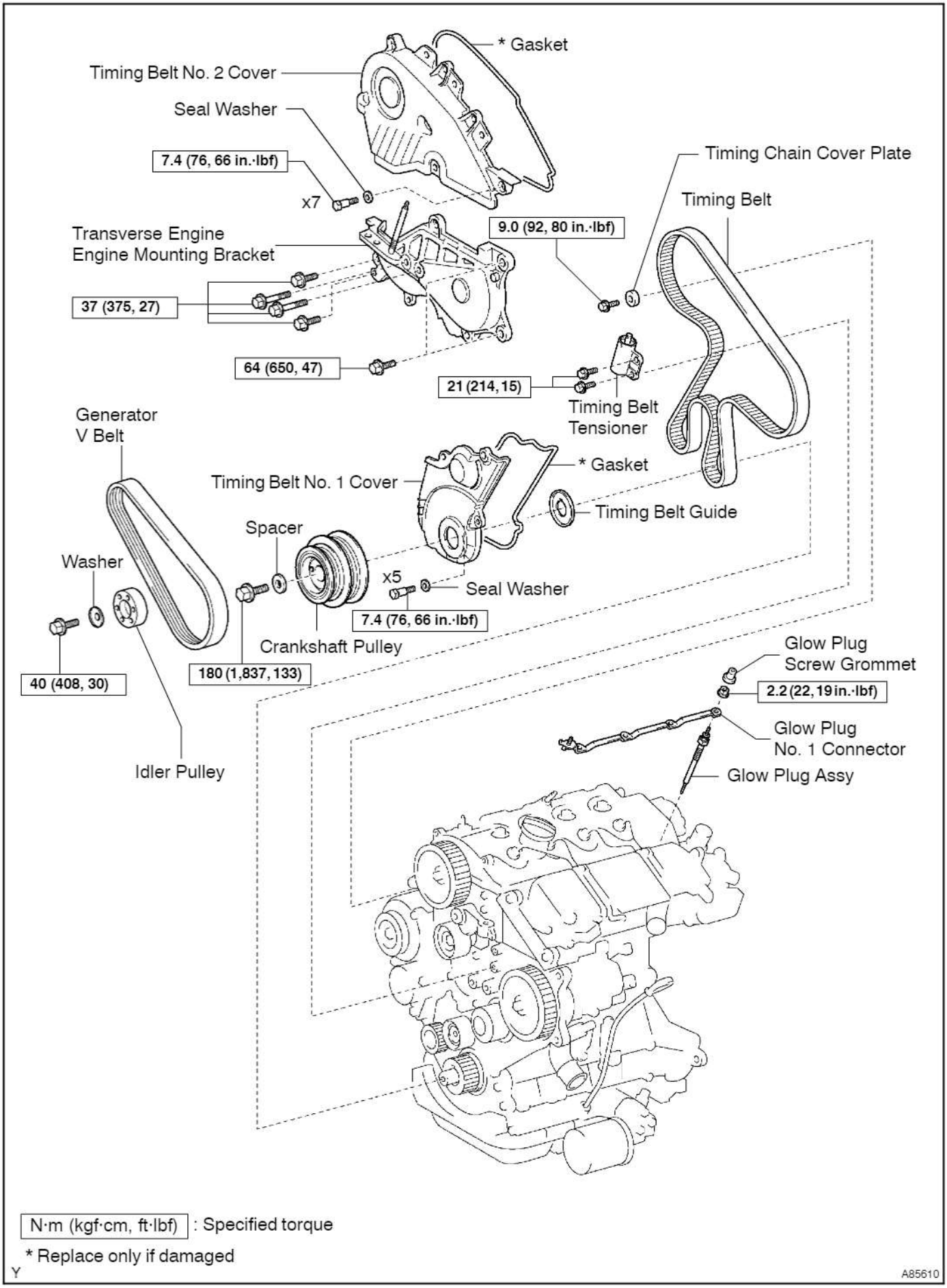
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

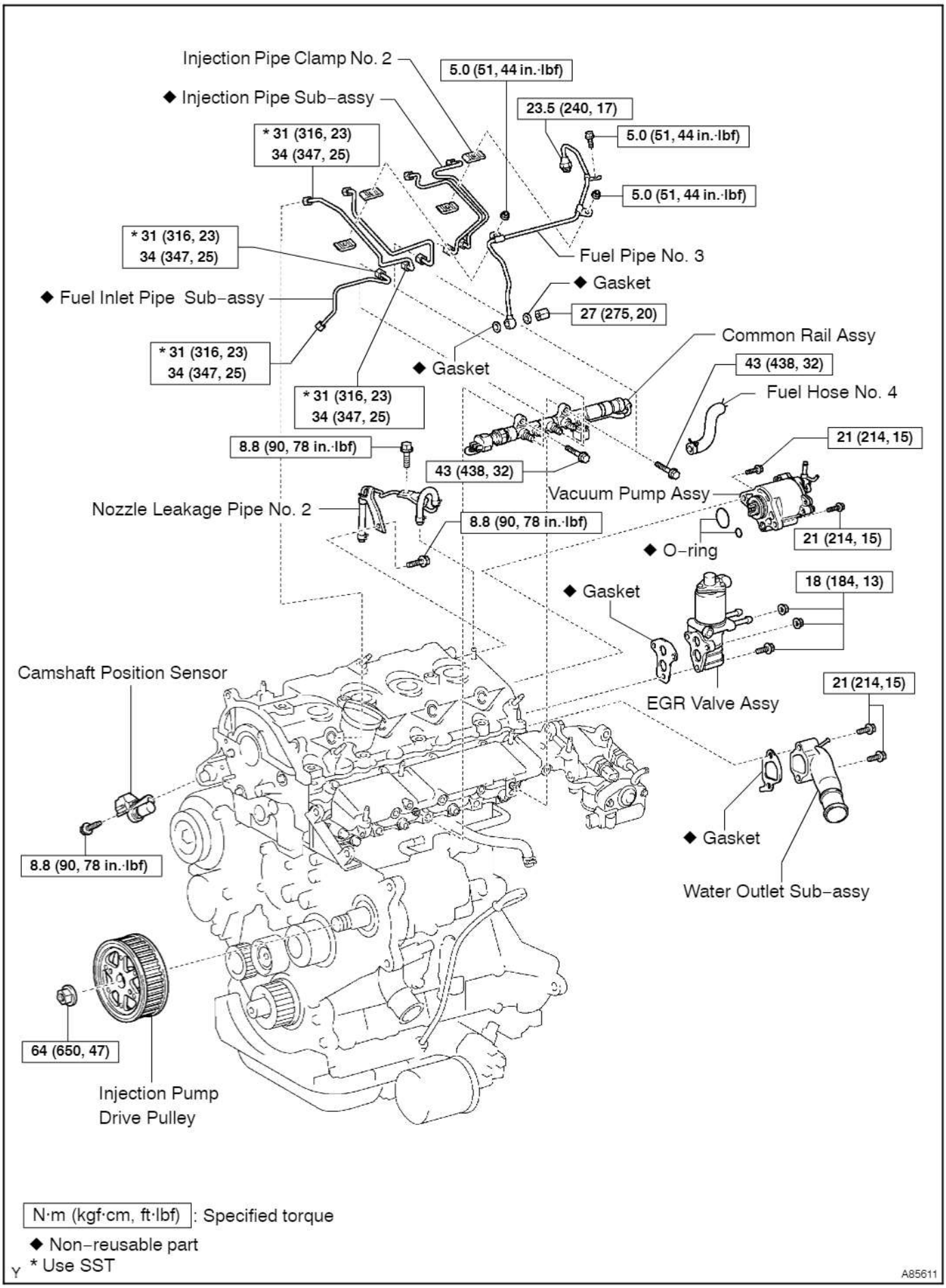
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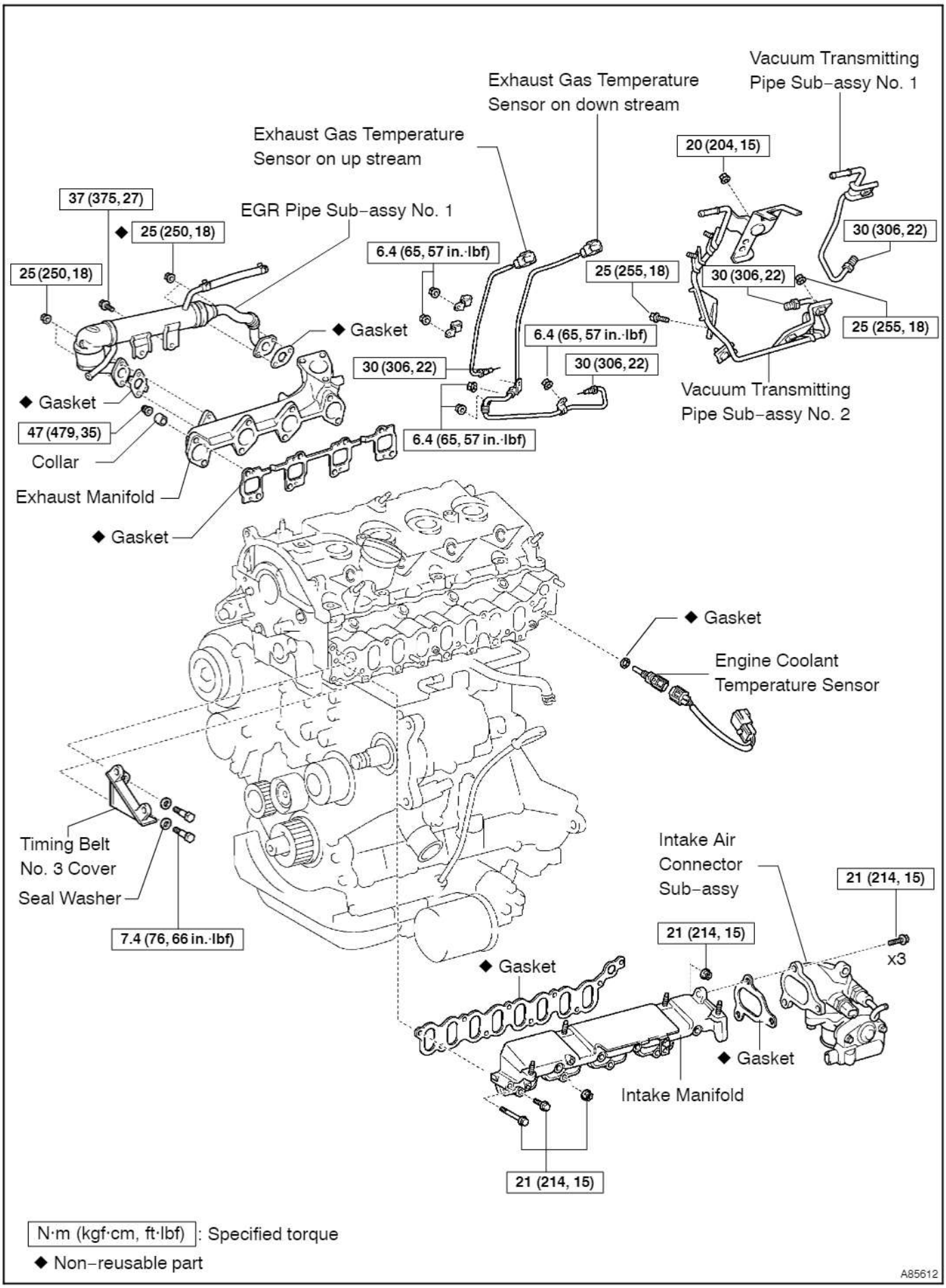
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

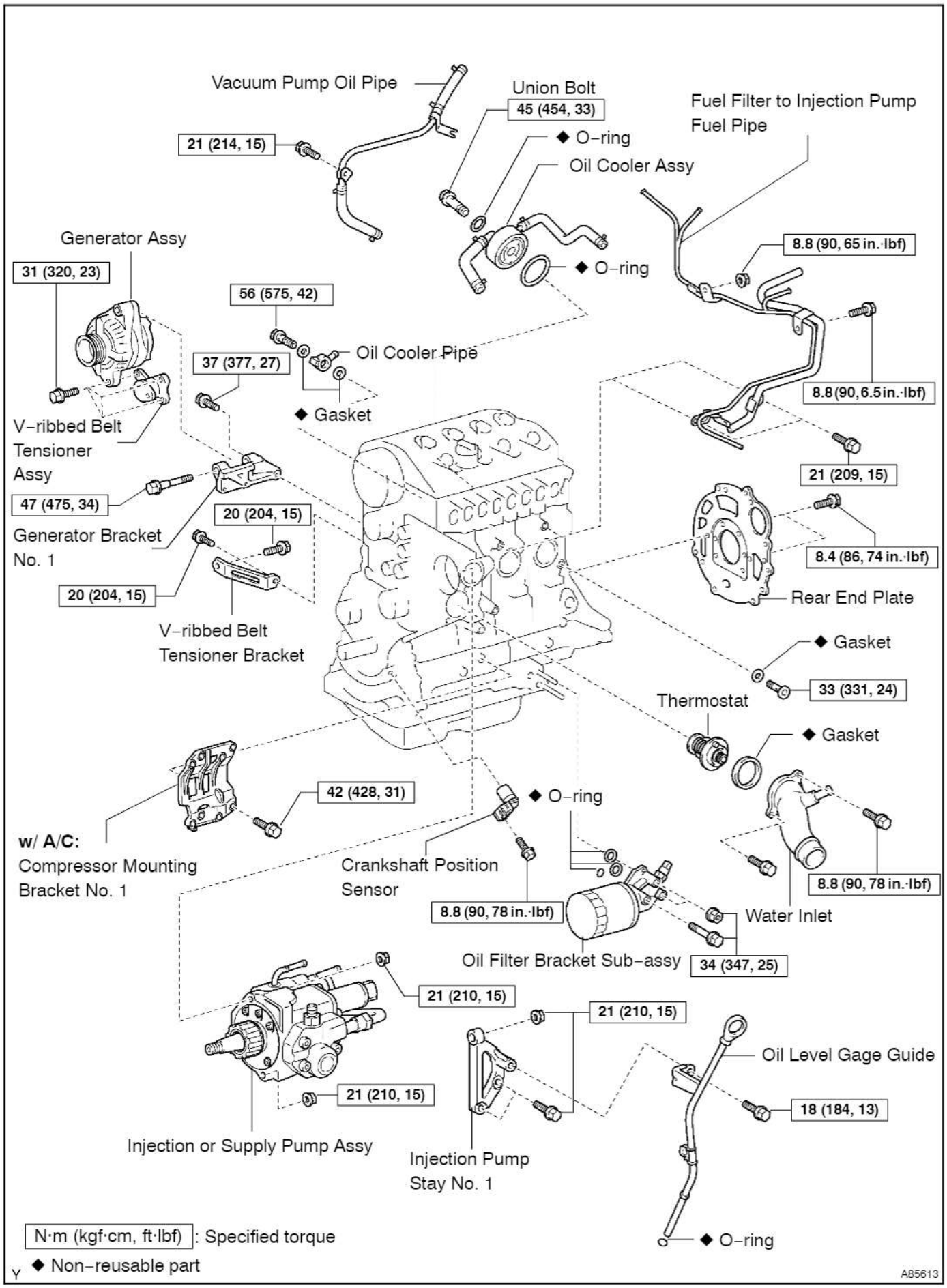
Y * Use SST

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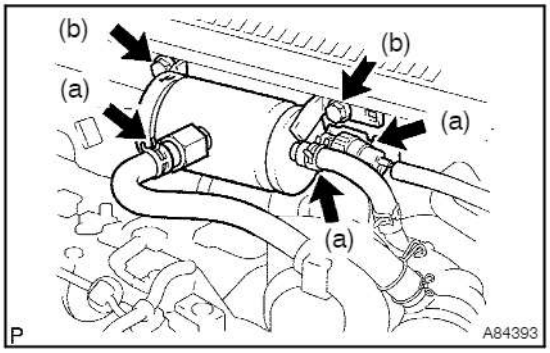
REPLACEMENT

1. **REMOVE FRONT WHEELS**
2. **REMOVE ENGINE UNDER COVER LH**
3. **REMOVE ENGINE UNDER COVER SUB–ASSY NO.1**
4. **REMOVE ENGINE UNDER COVER RH**
5. **REMOVE RADIATOR SUPPORT OPENING COVER**
6. **REMOVE ENGINE ROOM COVER SIDE**
7. **DRAIN ENGINE COOLANT (See page 16–19)**
8. **DRAIN ENGINE OIL (See Pub No. RM1018E on page 17–30)**
9. **DRAIN MANUAL TRANSAXLE OIL**
   Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
10. **REMOVE ENGINE COVER SUB–ASSY NO.1**

(a) Remove the 5 nuts, then remove the engine cover.

11. **REMOVE BATTERY**
12. **REMOVE AIR CLEANER ASSY**

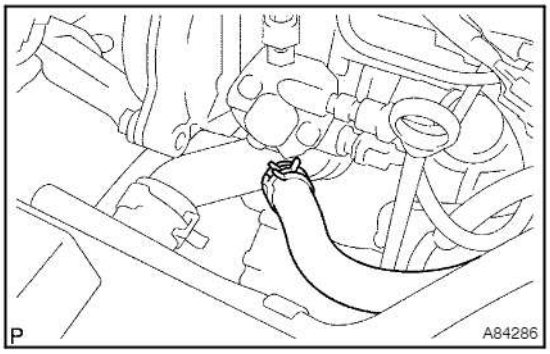
(a) Disconnect the mass air flow meter connector.
(b) Remove the air cleaner cap together with the air cleaner hose.
(c) Remove the air cleaner filter element.
(d) Remove the 3 bolts and air cleaner case.



13. **REMOVE VACUUM RESERVOIR SUB–ASSY**

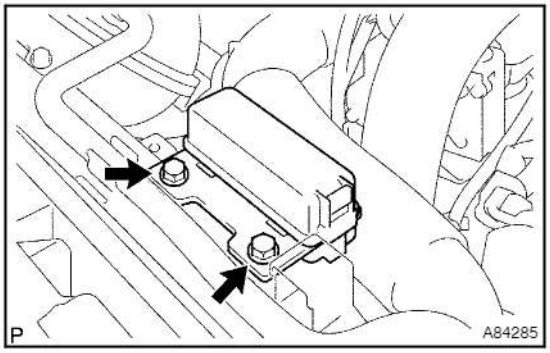
(a) Disconnect the 2 vacuum hoses and connector.
(b) Remove the 2 bolts and vacuum reservoir.

14. **REMOVE FUEL FILTER ASSY (See Pub. No. RM1018E on page 11–82)**
15. **REMOVE RADIATOR HOSE INLET**
16. **REMOVE RADIATOR HOSE OUTLET**



17. **DISCONNECT WATER BY–PASS HOSE NO.2**

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18. REMOVE ENGINE ROOM RELAY BLOCK NO.3

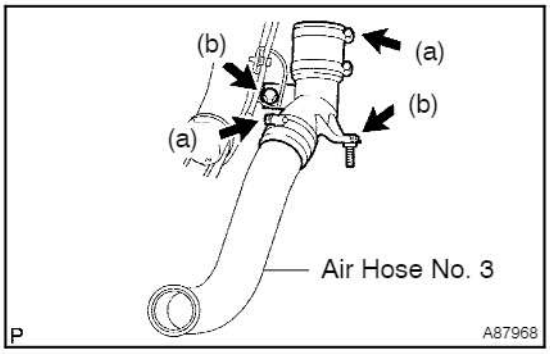
(a) Remove the 2 bolts, then remove the engine room relay block.

19. REMOVE RADIATOR ASSY (W/ AIR CONDITIONING)
(See Pub. No. RM1018E on page 16–51)

20. DISCONNECT HEATER INLET WATER HOSE

21. DISCONNECT HEATER OUTLET WATER HOSE

22. DISCONNECT FUEL HOSE NO.2



23. REMOVE AIR TUBE NO.2

(a) Loosen the 2 hose clamps, then disconnect the air hose No. 3.

(b) Remove the 2 bolts and air tube No. 2.

24. SEPARATE TRANSMISSION CONTROL CABLE ASSY

(a) Remove the 2 clips, then separate the control cable assembly.

25. REMOVE INJECTOR DRIVER

(a) Remove the 2 nuts which secure the injector driver.

(b) Disconnect the injector driver connector and harness clamp.

(c) Remove the injector driver.

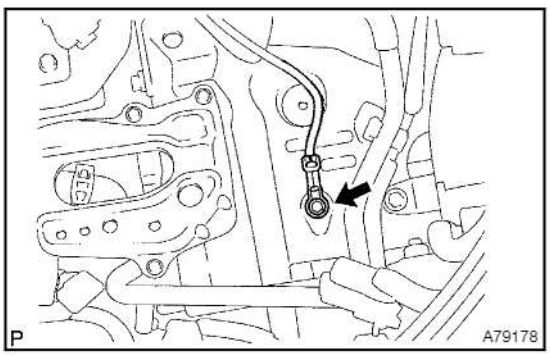
26. DISCONNECT ENGINE WIRE

(a) Remove the glove compartment door.

(b) Disconnect the engine wire from the ECM and junction block.

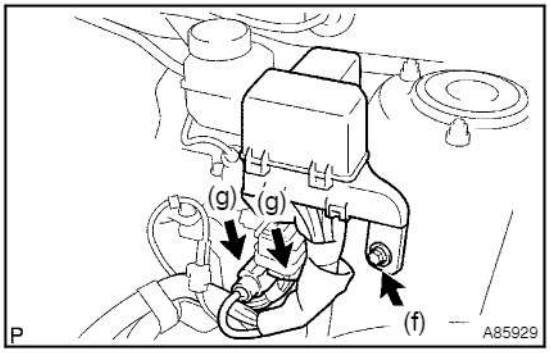
(c) Pull out the engine wire.

(d) Disconnect the engine wire from the engine room junction block.

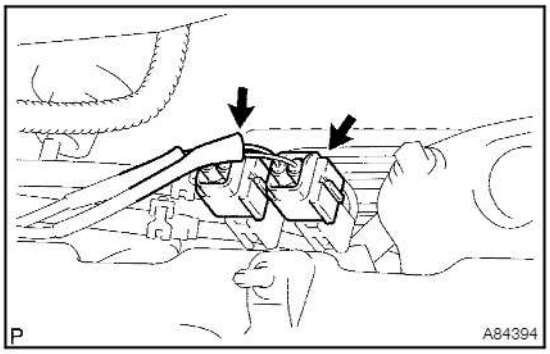


(e) Remove the bolt, then disconnect the wire harness from the body.

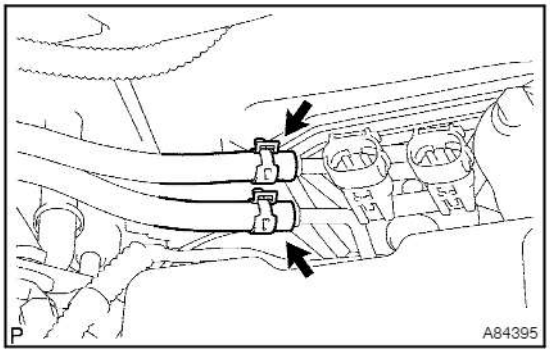
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(f) Remove the bolt and engine room relay block No. 3.
(g) Disconnect the 2 connectors.
(h) Disconnect the wire harness from the fuel filter support.

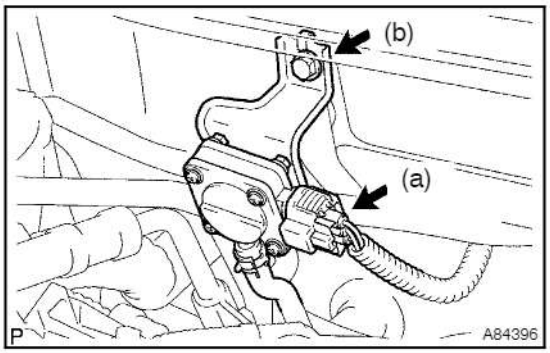


(i) Disconnect the 2 exhaust gas temperature sensor connectors.



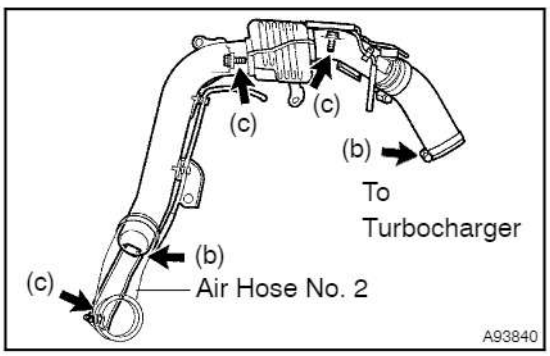
27. DISCONNECT VACUUM HOSE

(a) Disconnect the 2 vacuum hoses.



28. REMOVE DIFFERENTIAL PRESSURE SENSOR ASSY

(a) Disconnect the connector.
(b) Remove the bolt and differential pressure sensor.



29. REMOVE AIR TUBE NO.1

(a) Disconnect the vacuum hoses and connectors.
(b) Loosen the 2 hose clamps.
(c) Remove the 2 bolts and nut, then detach the air tube No. 1.

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30. REMOVE CLUTCH ACCUMULATOR ASSY (See Pub. No. RM1018E on page 42–22)
SST 09023–00100

31. REMOVE CLUTCH RELEASE CYLINDER ASSY (See Pub. No. RM1018E on page 42–17)

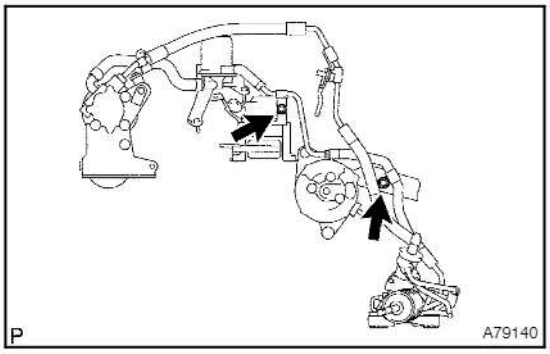
32. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See Pub. No. RM1018E on page 14–269)

33. SEPARATE COMPRESSOR AND MAGNETIC CLUTCH (W/ AIR CONDITIONING) (See Pub. No. RM1018E on page 55–86)

HINT:
Secure the hoses off to the side instead of detaching.

34. REMOVE FLOOR PANEL BRACE FRONT (See page 15–6)

35. REMOVE EXHAUST PIPE ASSY FRONT (See page 15–6)



36. SEPARATE RETURN TUBE SUB–ASSY
(a) Remove the 2 clamp bolts, then separate the return tube sub–assembly.

37. SEPARATE VANE PUMP OIL RESERVOIR ASSY

38. REMOVE FRONT AXLE HUB LH NUT (See Pub. No. RM1018E on page 30–6)
SST 09930–00010

HINT:
Perform the same procedure as above on the opposite side.

39. SEPARATE TIE ROD END SUB–ASSY LH (See Pub. No. RM1018E on page 30–6)
SST 09628–62011

HINT:
Perform the same procedure as above on the opposite side.

40. SEPARATE FRONT STABILIZER LINK ASSY LH (See Pub. No. RM1018E on page 30–6)

HINT:
Perform the same procedure as above on the opposite side.

41. REMOVE COLUMN HOLE COVER SILENCER SHEET
(a) Remove the 2 clips and column hole cover silencer sheet.

42. REMOVE STEERING COLUMN HOLE COVER SUB–ASSY NO.1

43. REMOVE STEERING INTERMEDIATE SHAFT ASSY NO.2 (See Pub. No. RM1018E on page 51–36)

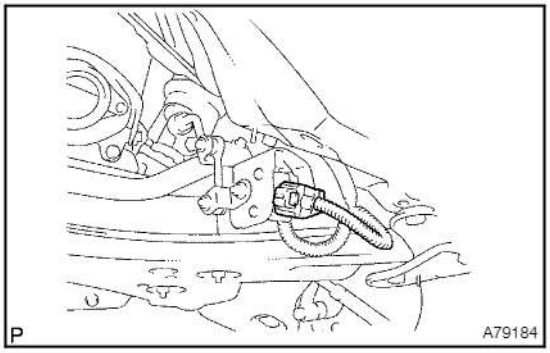
44. SEPARATE FRONT SUSPENSION ARM SUB–ASSY LOWER NO.1 LH (See Pub. No. RM1018E on page 30–6)

HINT:
Perform the same procedure as above on the opposite side.

45. SEPARATE FRONT AXLE ASSY LH (See Pub. No. RM1018E on page 30–6)

HINT:
Perform the same procedure as above on the opposite side.

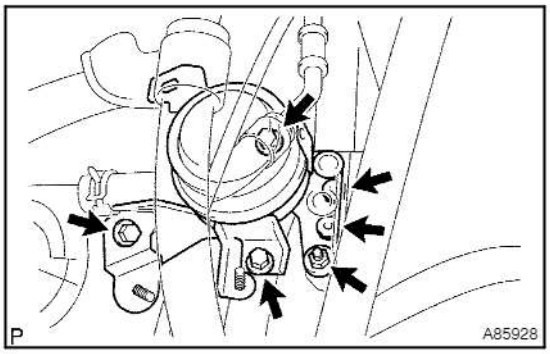
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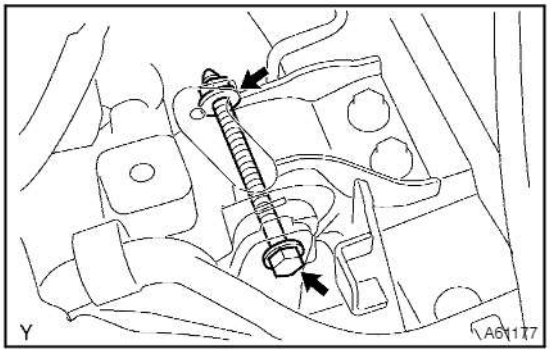
46. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE

(a) Disconnect the height control sensor connector (with discharge head lamp).

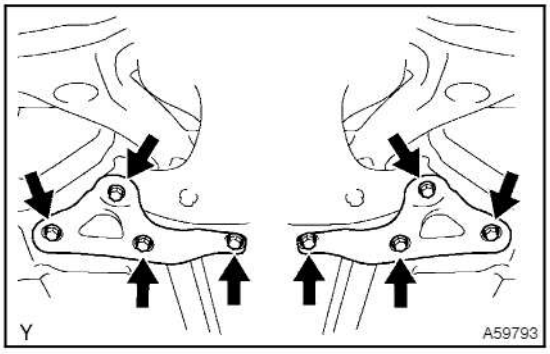
(b) Set the engine lifter.



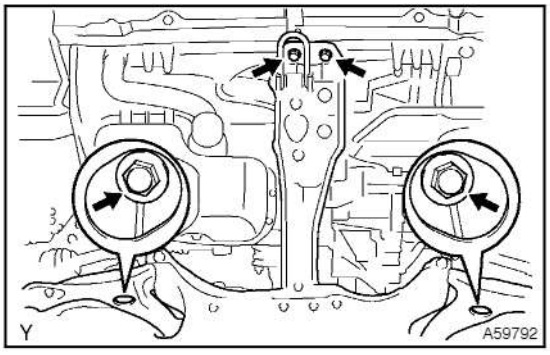
(c) Remove the 3 bolts, 3 nuts and engine mounting insulator sub–assembly RH.



(d) Remove the through bolt and nut, then detach the engine mounting insulator LH from the vehicle.



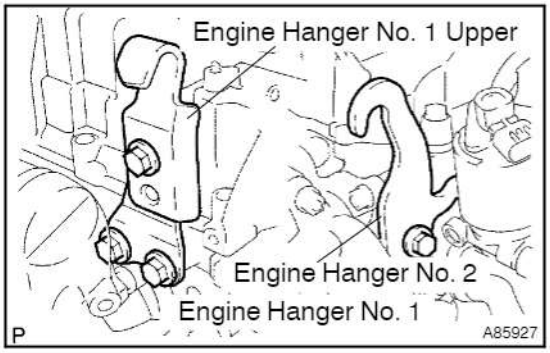
(e) Remove the 8 bolts and front suspension member brace rear RH and LH.



(f) Remove the 2 bolts and 2 nuts.

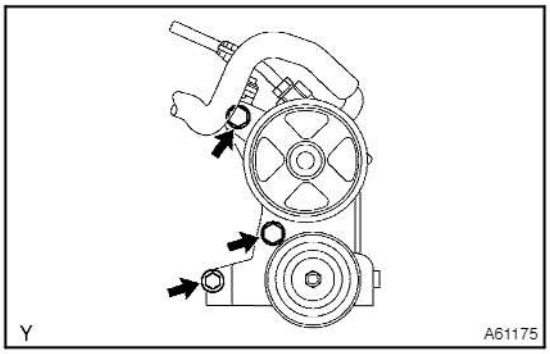
(g) Carefully remove the engine together with the transaxle from the vehicle.

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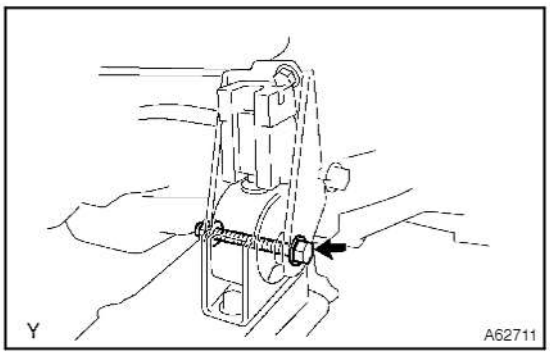
(h) Install the 2 engine hangers with the 2 bolts.
Part No.:
No. 1 engine hanger upper (yellow) 12284–27020
No. 1 engine hanger upper (black) 12284–27030
No. 1 engine hanger 12281–27050
No. 2 engine hanger 12282–27060
Bolt 91642–81025
Torque: 37 N·m (377 kgf·cm, 27 ft·lbf)

(i) Attach the engine sling, then hang the engine with the chain block.



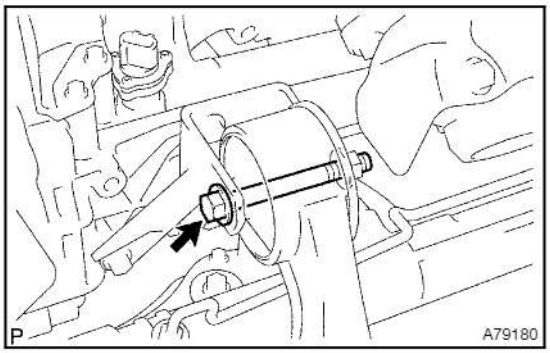
47. REMOVE POWER STEERING IDLE PULLEY BRACKET

(a) Remove the 3 bolts and power steering idle pulley bracket.



48. REMOVE FRONT SUSPENSION CROSSMEMBER SUB–ASSY

(a) Remove the through bolt and nut, then detach the engine mounting insulator front from the engine mounting bracket.

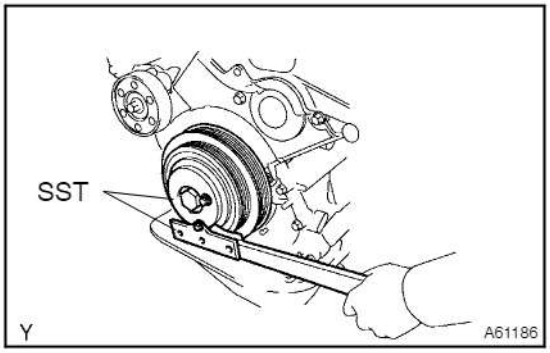


(b) Remove the through bolt, then detach the engine mounting insulator rear from the suspension crossmember.

(c) Separate the engine together with the transaxle from the suspension crossmember and engine mounting member.

49. REMOVE STARTER ASSY (See Pub. No. RM1018E on page 19–24)
50. REMOVE MANUAL TRANSAXLE (See Pub. No. RM1018E on page 41–33)
51. REMOVE CLUTCH COVER ASSY (See Pub. No. RM1018E on page 42–26)
52. REMOVE CLUTCH DISC ASSY (See Pub. No. RM1018E on page 42–26)

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53. REMOVE FLYWHEEL SUB–ASSY

(a) Hold the crankshaft with SST.
SST 09213–54015 (09213–70020), 09330–00021

(b) Using a Torx socket wrench (T55), remove the 8 Torx screws and flywheel.

54. REMOVE REAR END PLATE

(a) Remove the 2 bolts and rear end plate.

55. REMOVE DRIVE SHAFT BEARING BRACKET

56. REMOVE ENGINE MOUNTING BRACKET FR

57. REMOVE ENGINE MOUNTING BRACKET RR

58. REMOVE GLOW PLUG ASSY (See Pub. No. RM1018E on page 19–33)

59. REMOVE GENERATOR V BELT (See Pub. No. RM1018E on page 14–269)

60. REMOVE CRANKSHAFT PULLEY (See page 14–138)
SST 09213–54015 (09213–70020), 09330–00021, 09950–50013 (09951–05010, 09952–05010, 09953–05020, 09954–05031)

61. REMOVE IDLER PULLEY SUB–ASSY (See page 14–138)

62. REMOVE TIMING BELT NO.2 COVER (See page 14–138)

63. REMOVE TIMING BELT NO.1 COVER (See page 14–138)

64. REMOVE TIMING BELT GUIDE

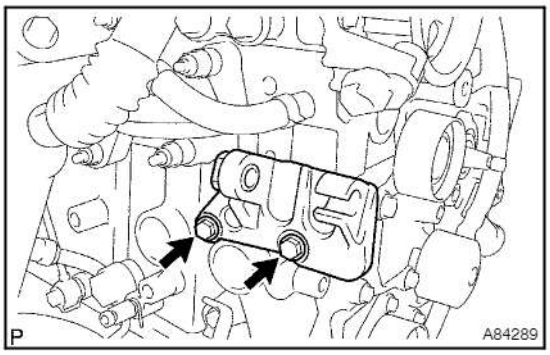
65. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET (See page 14–138)

66. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14–138)

67. REMOVE TIMING BELT (See page 14–138)

HINT:
If reusing the timing belt, draw an arrow on the belt which indicates the engine revolution direction and put match marks on the pulleys and belt before removing. This operation will be very helpful when reinstalling the timing belt.

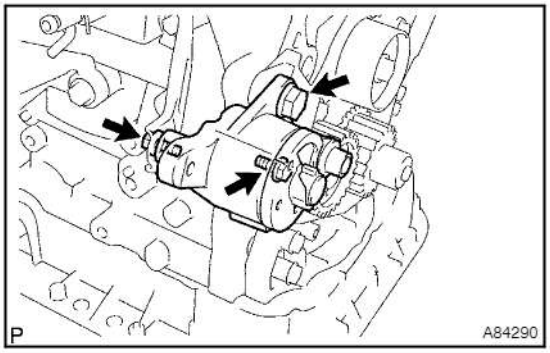
68. REMOVE GENERATOR ASSY (See Pub. No. RM1018E on page 19–29)



69. REMOVE GENERATOR BRACKET NO.1

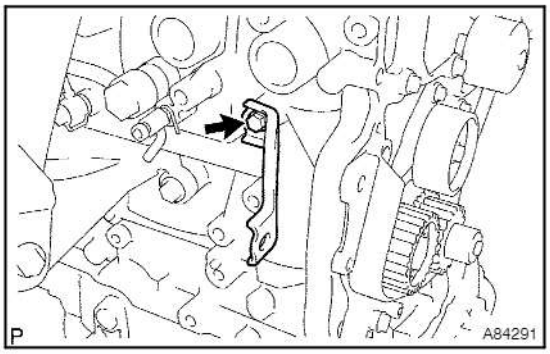
(a) Remove the 2 bolts and generator bracket.

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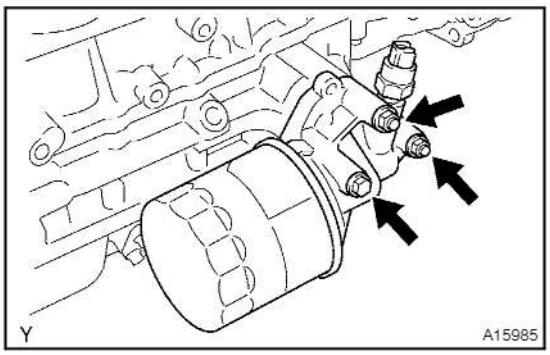
70. REMOVE V–RIBBED BELT TENSIONER ASSY

(a) Remove the 3 bolts and V–ribbed belt tensioner.



71. REMOVE V–RIBBED BELT TENSIONER BRACKET

(a) Remove the bolt and V–ribbed belt tensioner bracket.



72. REMOVE OIL FILTER BRACKET SUB–ASSY

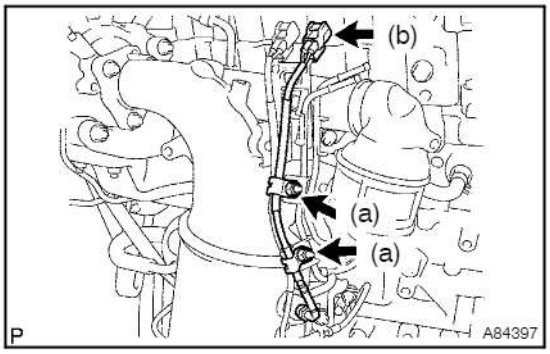
(a) Remove the bolt and 2 nuts, then remove the oil filter bracket and gasket.

73. REMOVE TURBO INSULATOR NO.2 (See page 13–12)

74. REMOVE TURBO INSULATOR NO.1 (See page 13–12)

75. REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.2 (See page 13–12)

76. REMOVE EGR PIPE INSULATOR (See page 13–12)

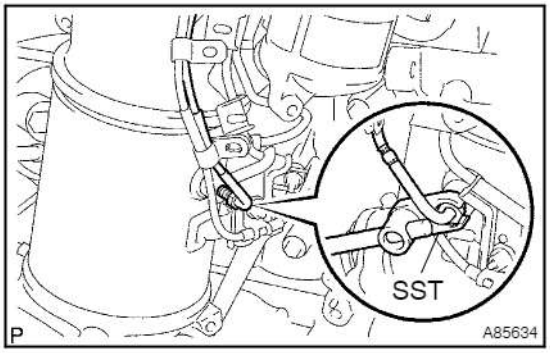


77. REMOVE EXHAUST GAS TEMPERATURE SENSOR

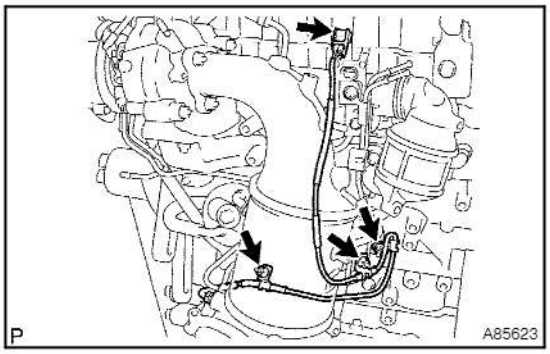
(a) Remove the 2 nuts, then detach the wire harness from the clamp.

(b) Disconnect the connector.

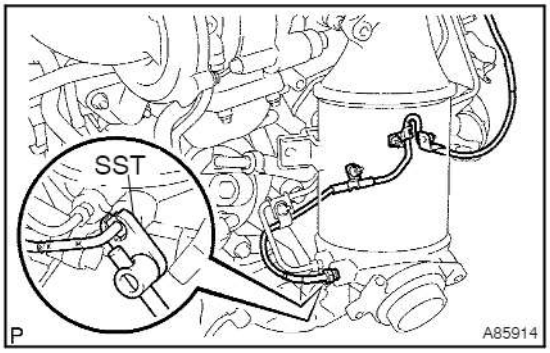
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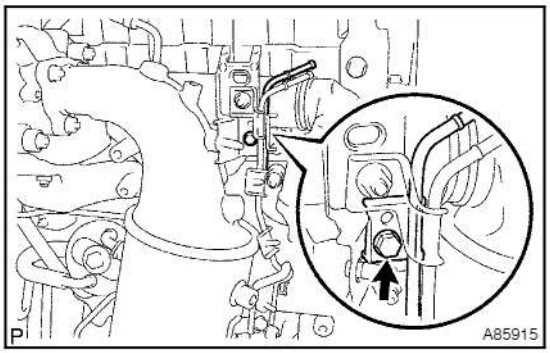
(c) Using SST, remove the exhaust gas temperature sensor on up stream.
SST 09023–38400



(d) Remove the 3 nuts, then detach the wire harness from the clamp.
(e) Disconnect the connector.

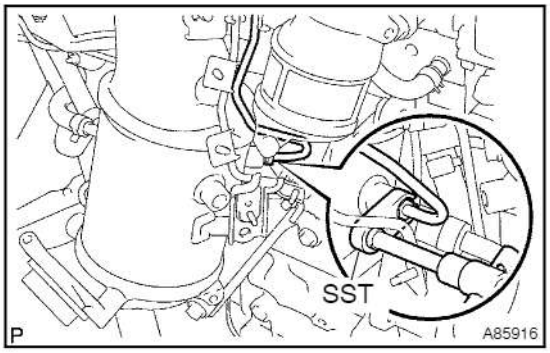


(f) Using SST, remove the exhaust gas temperature sensor on down stream.
SST 09023–38400



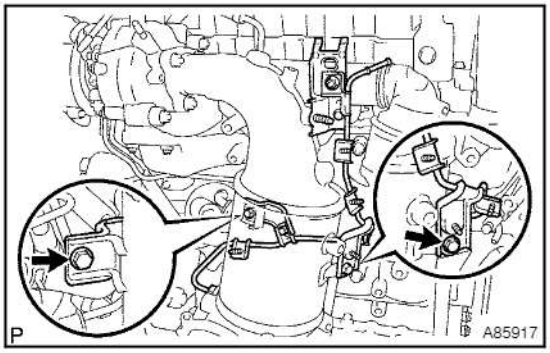
78. REMOVE VACUUM TRANSMITTING PIPE SUB–ASSY NO.1

(a) Remove the bolt.



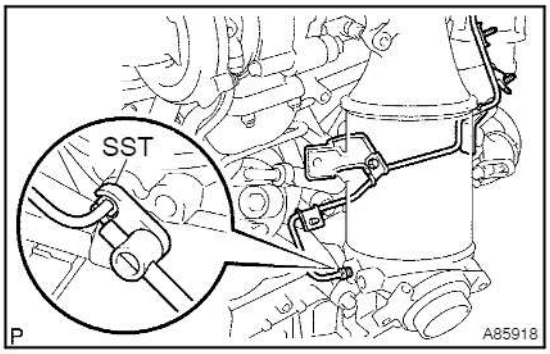
(b) Using SST, remove the vacuum pipe.
SST 09023–38200

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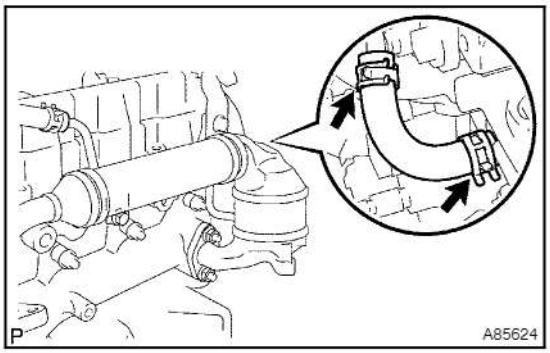
79. REMOVE VACUUM TRANSMITTING PIPE SUB–ASSY NO.2

(a) Remove the 2 bolts.

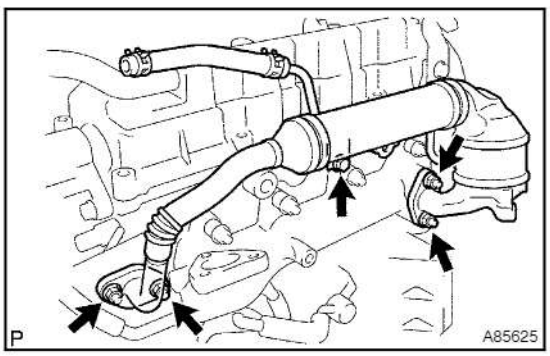


(b) Using SST, remove the vacuum pipe.
SST 09023–38200

80. REMOVE MANIFOLD STAY NO.2 (See page 13–12)
81. REMOVE MANIFOLD STAY (See page 13–12)
82. REMOVE MANIFOLD CONVERTER SUB–ASSY (See page 13–12)
83. REMOVE TURBOCHARGER STAY (See page 13–12)
84. DISCONNECT TURBO WATER HOSE NO.1 (See page 13–12)
85. DISCONNECT TURBO WATER HOSE NO.2 (See page 13–12)
86. REMOVE TURBO OIL INLET PIPE SUB–ASSY (See page 13–12)
87. REMOVE TURBOCHARGER SUB–ASSY (See page 13–12)



88. DISCONNECT WATER BY–PASS HOSE NO.3

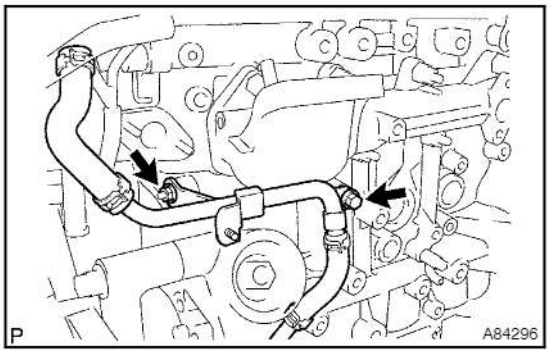


89. REMOVE EGR PIPE SUB–ASSY NO.1

(a) Remove the bolt and 4 nut, then detach the EGR pipe and 2 gaskets.

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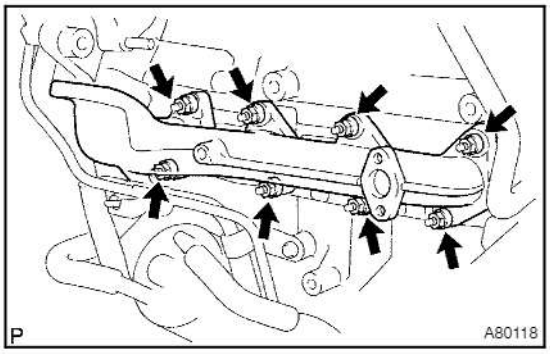
90. REMOVE OIL COOLER ASSY (See Pub. No. RM1018E on page 17–32)



91. REMOVE VACUUM PUMP OIL PIPE

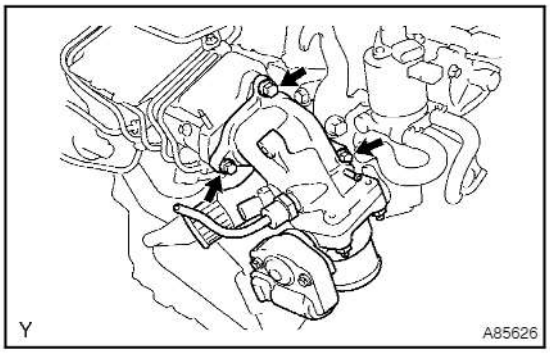
(a) Disconnect the 2 hoses.

(b) Remove the bolt and nut, then remove the vacuum pump oil pipe.



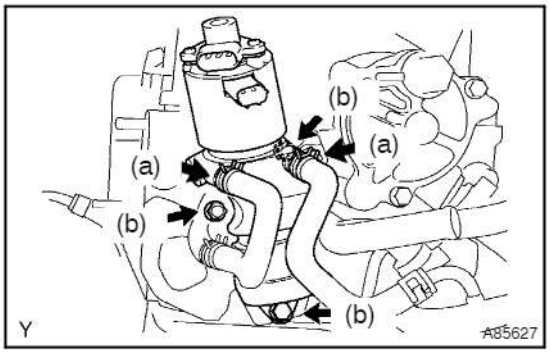
92. REMOVE EXHAUST MANIFOLD

(a) Remove the 8 nuts, exhaust manifold and gasket.



93. REMOVE INTAKE AIR CONNECTOR

(a) Remove the 3 bolts, intake air connector together with the diesel throttle body and gasket.

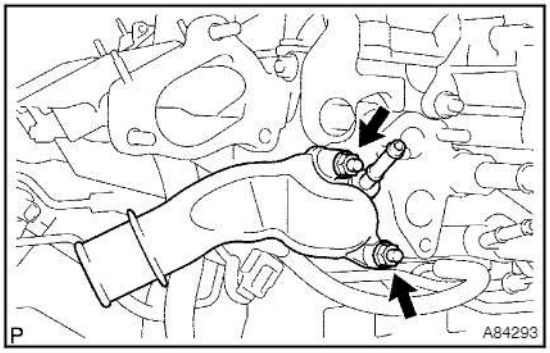


94. REMOVE EGR VALVE ASSY

(a) Disconnect the 2 hoses.

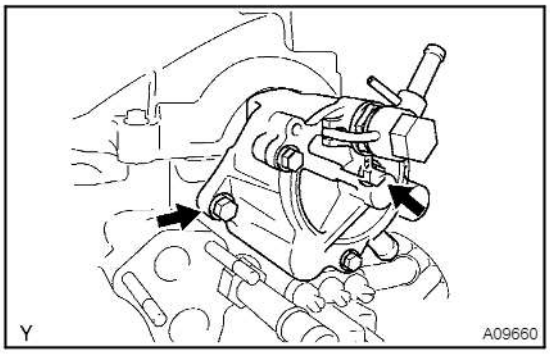
(b) Remove the bolt and 2 nuts, then remove the EGR valve and gasket.

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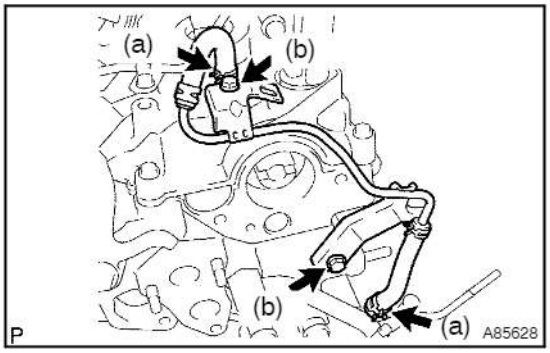
95. REMOVE WATER OUTLET SUB–ASSY

(a) Remove the 2 bolts, water outlet and gasket.



96. REMOVE VACUUM PUMP ASSY

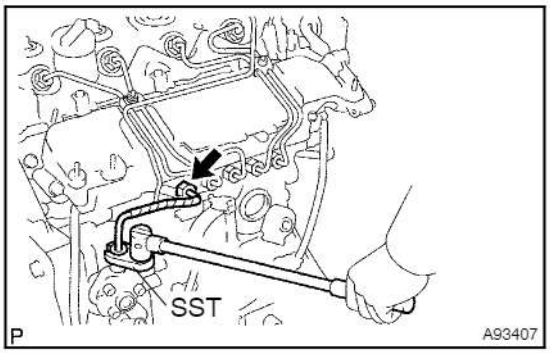
(a) Remove the 2 bolts, vacuum pump and 2 O–rings.



97. REMOVE NOZZLE LEAKAGE PIPE NO.2

(a) Disconnect the 2 hoses.

(b) Remove the 2 bolts, nozzle leakage pipe No. 2.



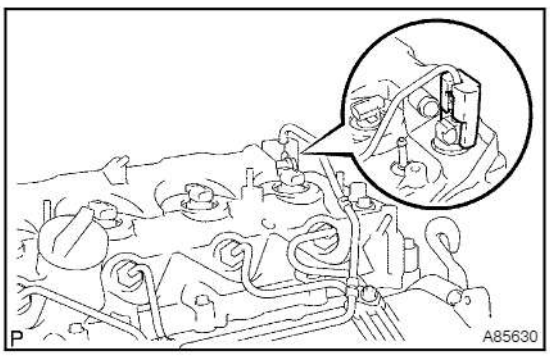
98. REMOVE FUEL INLET PIPE SUB–ASSY

(a) Using SST, remove the fuel inlet pipe from the common rail side.

SST 09023–12700

(b) Using SST, remove the fuel inlet pipe from the pump side.

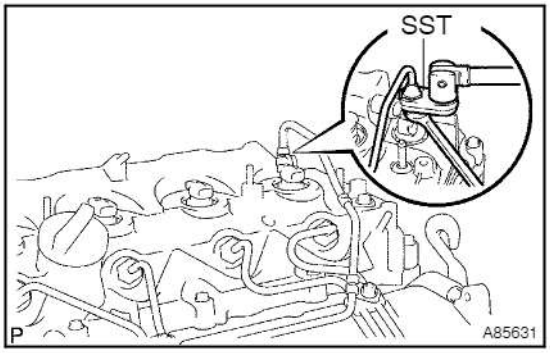
SST 09023–12700



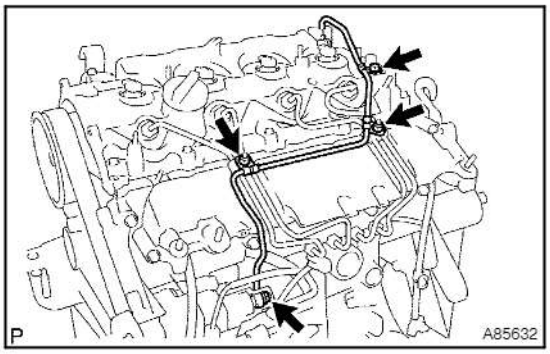
99. REMOVE FUEL PIPE NO.3

(a) Remove the fuel pipe insulator.

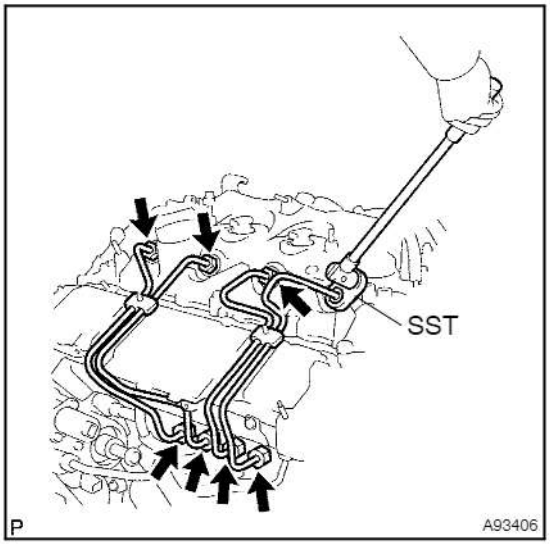
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(b) Hold the hexagonal lobe of the exhaust fuel addition injector assembly first. Using SST, remove the fuel pipe No. 3 from the injector side.
SST 09023–12700



(c) Remove the bolt and 3 nuts, then remove the fuel pipe No. 3 and 2 gaskets.



100. REMOVE INJECTION PIPE SUB–ASSY NO.1

(a) Remove the 2 upper injection pipe clamps from the intake manifold.

(b) Using SST, remove the injection pipe from the common rail side.
SST 09023–12700

(c) Using SST, remove the injection pipe from the injector side.
SST 09023–12700

(d) After removing the fuel pipe, in order to prevent dust or foreign objects from being introduced, cover the common rail with vinyl tape and protect the injector inlet with a vinyl or plastic bag.

(e) Remove the 2 lower injection pipe clamps from the intake manifold.

101. REMOVE INJECTION PIPE SUB–ASSY NO.2

SST 09023–12700

HINT:

Perform the same procedures as the injection pipe No. 1.

102. REMOVE INJECTION PIPE SUB–ASSY NO.3

SST 09023–12700

HINT:

Perform the same procedures as the injection pipe No. 1.

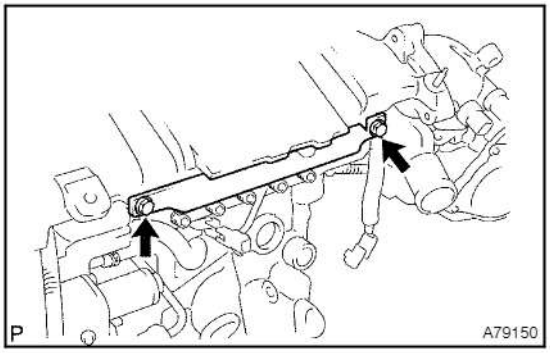
103. REMOVE INJECTION PIPE SUB–ASSY NO.4

SST 09023–12700

HINT:

Perform the same procedures as the injection pipe No. 1.

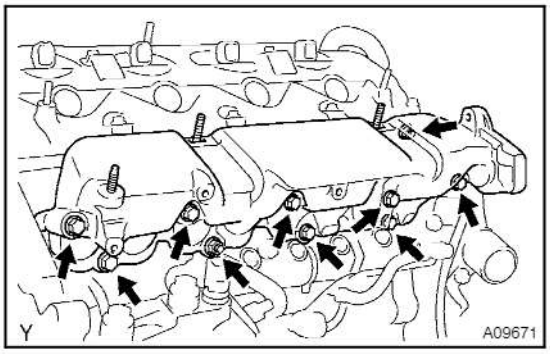
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104. REMOVE INTAKE MANIFOLD INSULATOR NO.1

(a) Remove the 2 bolts and intake manifold insulator.

105. REMOVE COMMON RAIL ASSY (See page 11–67)



106. REMOVE INTAKE MANIFOLD

(a) Remove the 8 bolts and 2 nuts, then remove the intake manifold and gasket.

107. REMOVE INJECTION PUMP DRIVE PULLEY (See page 11–58)

SST 09960–10010 (09962–01000, 09963–01000)

108. REMOVE TIMING BELT NO.3 COVER

(a) Remove the 2 bolts and 2 seal washers, then remove the timing belt cover.

109. REMOVE OIL LEVEL GAGE GUIDE (See page 17–11)

110. REMOVE INJECTION PUMP STAY NO.1 (See page 11–58)

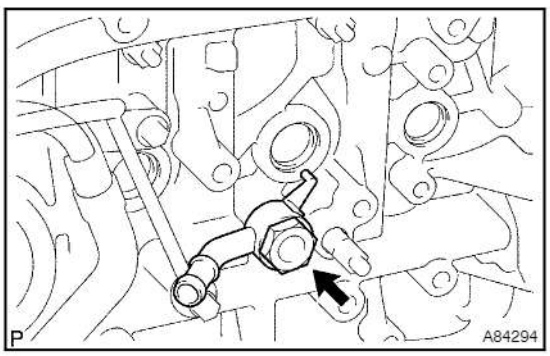
111. REMOVE INJECTION OR SUPPLY PUMP ASSY (See page 11–58)

112. REMOVE COMPRESSOR MOUNTING BRACKET NO.1 (W/ AIR CONDITIONING)

(a) Remove the 4 bolts and compressor mounting bracket.

113. REMOVE WATER INLET (See Pub. No. RM1018E on page 16–50)

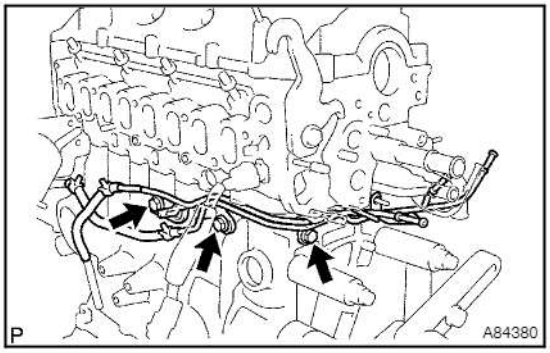
114. REMOVE THERMOSTAT



115. REMOVE OIL COOLER PIPE

(a) Using a socket wrench for 27 mm, remove the union bolt, oil cooler pipe and gasket.

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116. REMOVE FUEL FILTER TO INJECTION PUMP FUEL PIPE

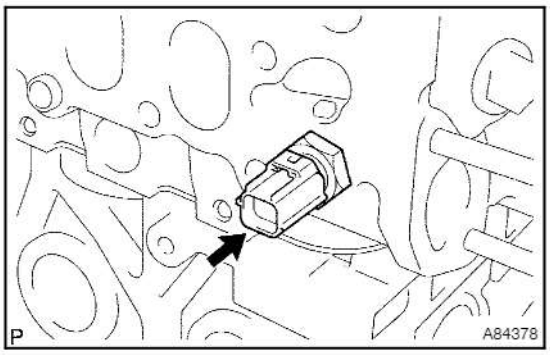
(a) Remove the 3 bolts and fuel pipe.

117. REMOVE CRANKSHAFT POSITION SENSOR

(a) Remove the bolt and crankshaft position sensor.

118. REMOVE CAMSHAFT POSITION SENSOR

(a) Remove the bolt and camshaft position sensor.



119. REMOVE ENGINE COOLANT TEMPERATURE SENSOR

120. REPLACE PARTIAL ENGINE ASSY

121. INSTALL ENGINE COOLANT TEMPERATURE SENSOR
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

122. INSTALL CAMSHAFT POSITION SENSOR
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

123. INSTALL CRANKSHAFT POSITION SENSOR
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

124. INSTALL FUEL FILTER TO INJECTION PUMP FUEL PIPE
Torque:
8.8 N·m (90 kgf·cm, 78 in.·lbf) for M6
21 N·m (209 kgf·cm, 15 ft·lbf) for M8

125. INSTALL OIL COOLER PIPE

(a) Using a socket wrench for 27 mm, install 2 new gaskets and the oil cooler pipe with the union bolt.
Torque: 56 N·m (575 kgf·cm, 42 ft·lbf)

126. INSTALL THERMOSTAT (See Pub. No. RM1018E on page 16–50)

127. INSTALL WATER INLET (See Pub. No. RM1018E on page 16–50)

128. INSTALL COMPRESSOR MOUNTING BRACKET NO.1 (W/ AIR CONDITIONING)
Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

129. INSTALL INJECTION OR SUPPLY PUMP ASSY (See page 11–58)

130. INSTALL INJECTION PUMP STAY NO.1 (See page 11–58)

131. INSTALL OIL LEVEL GAGE GUIDE (See page 17–11)

132. INSTALL TIMING BELT NO.3 COVER
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

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133. INSTALL INJECTION PUMP DRIVE PULLEY (See page 11–58)

SST 09960–10010 (09962–01000, 09963–01000)

134. INSTALL INTAKE MANIFOLD

(a) Install a new gasket and the intake manifold with the 8 bolts and 2 nuts.

Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)

135. INSTALL COMMON RAIL ASSY (See page 11–67)

136. INSTALL INTAKE MANIFOLD INSULATOR NO.1

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

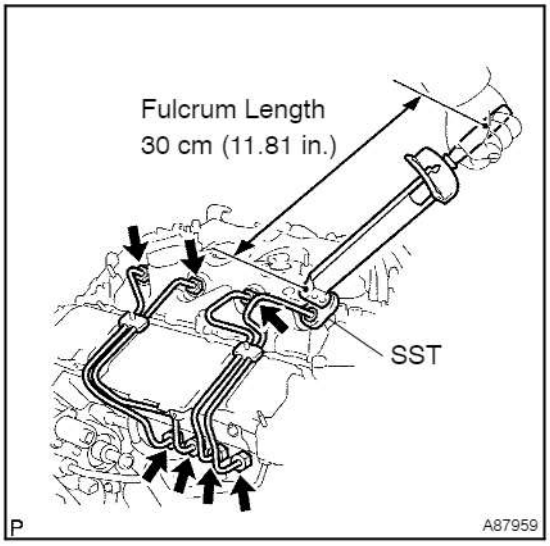
137. INSTALL INJECTION PIPE SUB–ASSY NO.1

NOTICE:

- **In case of replacing the injectors, the injection pipes must be replaced, too.**
- **When assembling the pipes, perform the operation with the engine cold at room temperature.**

(a) Install the 2 lower injection pipe clamps to the intake manifold.

(b) Temporarily install a new injection pipe.



(c) Using SST, tighten the nut of the injection pipe on the common rail side.

SST 09023–12700

Torque:

31 N·m (316 kgf·cm, 23 ft·lbf) with SST

34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:

- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the injection pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

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(d) Using SST, tighten the nut of the injection pipe on the injector side.
SST 09023–12700
Torque:
For used pipe:
36 N·m (372 kgf·cm, 27 ft·lbf) with SST
40 N·m (408 kgf·cm, 30 ft·lbf) without SST
For new pipe:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

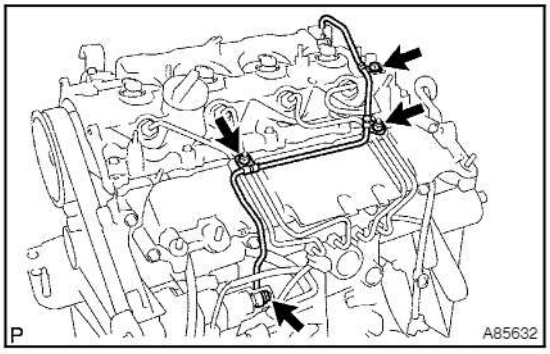
HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the injection pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

(e) Install the 2 upper injection pipe clamps.

138. INSTALL INJECTION PIPE SUB–ASSY NO.2
SST 09023–12700
HINT:
Perform the same procedures as the injection pipe No. 1.

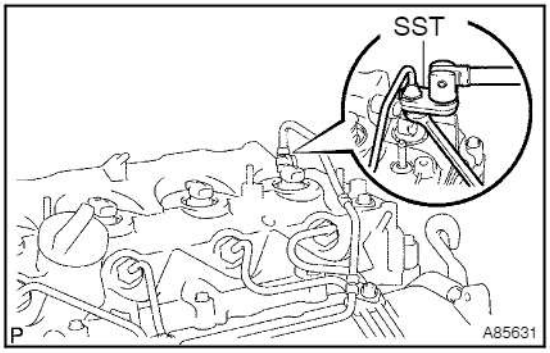
139. INSTALL INJECTION PIPE SUB–ASSY NO.3
SST 09023–12700
HINT:
Perform the same procedures as the injection pipe No. 1.

140. INSTALL INJECTION PIPE SUB–ASSY NO.4
SST 09023–12700
HINT:
Perform the same procedures as the injection pipe No. 1.



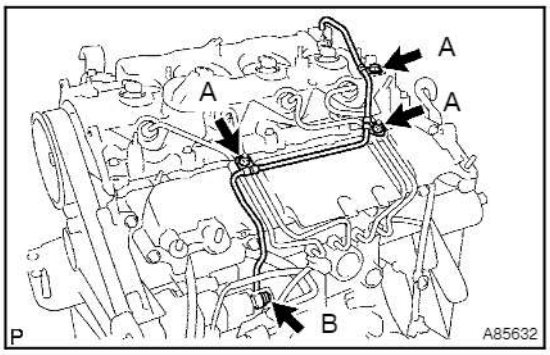
141. INSTALL FUEL PIPE NO.3
(a) Install 2 new gaskets, then temporarily install the bolt, 3 nuts and fuel pipe No. 3.

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(b) Hold the hexagonal lobe of the exhaust fuel addition injector assembly first. Using SST, tighten the nut of the fuel pipe No. 3 on the injector side.
SST 09023–12700
Torque:
22 N·m (223 kgf·cm, 16 ft·lbf) with SST
23.5 N·m (240 kgf·cm, 17 ft·lbf) without SST

HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the injection pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.



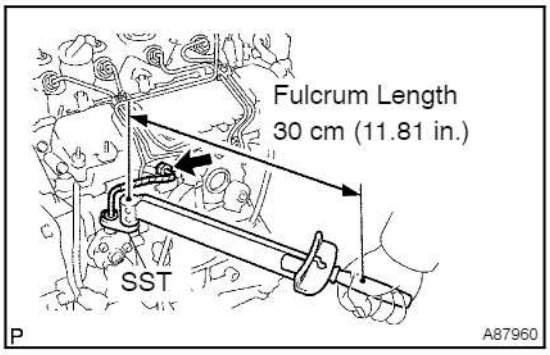
(c) Tighten the bolt and 3 nuts.
Torque:
5.0 N·m (51 kgf·cm, 44 in.·lbf) for bolt and nut A
27 N·m (275 kgf·cm, 20 ft·lbf) for nut B

(d) Install the fuel pipe insulator.

142. INSTALL FUEL INLET PIPE SUB–ASSY

NOTICE:
- **In case of replacing the cylinder head, the fuel inlet pipe must be replaced, too.**
- **When assembling the pipe, perform the operation with the engine cold at room temperature.**

(a) Temporarily install a new fuel inlet pipe.



(b) Using SST, tighten the nut of the fuel inlet pipe on the common rail side.
SST 09023–12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the inlet pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

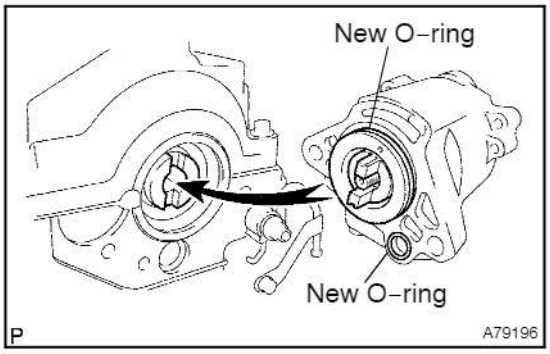
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(c) Using SST, tighten the nut of the fuel inlet pipe on the pump side.
SST 09023–12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:

- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the inlet pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

143. INSTALL NOZZLE LEAKAGE PIPE NO.2
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)



144. INSTALL VACUUM PUMP ASSY

(a) Install 2 new O–rings to the vacuum pump.

(b) Align the key of the vacuum pump with the keyway of the exhaust camshaft, then insert the vacuum pump into place. Secure the pump with the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

145. INSTALL WATER OUTLET SUB–ASSY

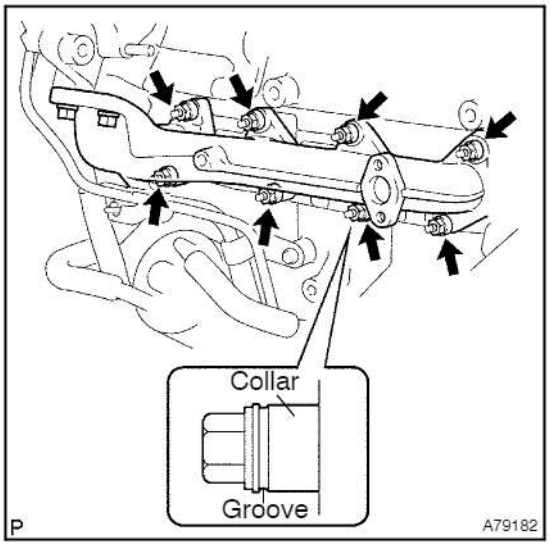
(a) Install a new gasket and the water outlet with the 2 bolts.
Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)

146. INSTALL EGR VALVE ASSY

(a) Install a new gasket and the EGR valve with the bolt and 2 nuts.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

147. INSTALL INTAKE AIR CONNECTOR

(a) Install a new gasket and the intake air connector together with the diesel throttle body with the 3 bolts.
Torque: 21 N·m (209 kgf·cm, 15 ft·lbf)



148. INSTALL EXHAUST MANIFOLD

(a) Install a new gasket, the exhaust manifold and 8 collars with new 8 nuts.
Torque: 47 N·m (474 kgf·cm, 34 ft·lbf)

HINT:

When installing the collars, pay attention to the mounting orientation. The ring groove of the collar should be outward. Refer to the illustration on the left.

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149. INSTALL VACUUM PUMP OIL PIPE

Torque:
21 N·m (214 kgf·cm, 15 ft·lbf) for bolt
8.8 N·m (90 kgf·cm, 78 in.·lbf) for nut

150. INSTALL OIL COOLER ASSY (See Pub. No. RM1018E on page 17–32)

151. INSTALL EGR PIPE SUB–ASSY NO.1

(a) Install 2 new gaskets and the EGR pipe with the bolt and 4 new nuts.

Torque:
37 N·m (375 kgf·cm, 27 ft·lbf) for bolt
25 N·m (250 kgf·cm, 18 ft·lbf) for nut

152. INSTALL TURBOCHARGER SUB–ASSY (See page 13–12)

153. INSTALL TURBO OIL INLET PIPE SUB–ASSY (See page 13–12)

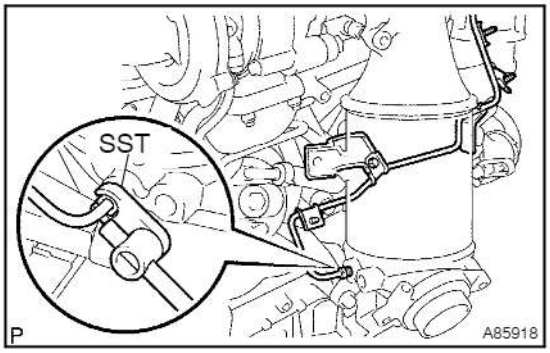
154. INSTALL TURBOCHARGER STAY (See page 13–12)

155. INSTALL MANIFOLD CONVERTER SUB–ASSY (See page 13–12)

156. INSTALL MANIFOLD STAY NO.2 (See page 13–12)

157. INSTALL VACUUM TRANSMITTING PIPE SUB–ASSY NO.2

(a) Temporarily install the vacuum pipe.



(b) Using SST, tighten the nut of the vacuum pipe on the manifold converter side.

SST 09023–38200

Torque:
27 N·m (275 kgf·cm, 20 ft·lbf) with SST
30 N·m (306 kgf·cm, 22 ft·lbf) without SST

HINT:

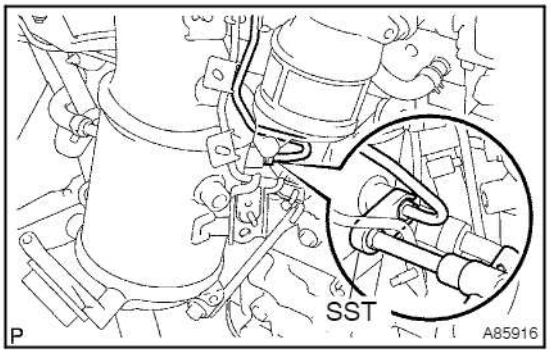
Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).

(c) Install the 2 bolts.

Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

158. INSTALL VACUUM TRANSMITTING PIPE SUB–ASSY NO.1

(a) Temporarily install the vacuum pipe.



(b) Using SST, tighten the nut of the vacuum pipe on the manifold converter side.

SST 09023–38200

Torque:
27 N·m (275 kgf·cm, 20 ft·lbf) with SST
30 N·m (306 kgf·cm, 22 ft·lbf) without SST

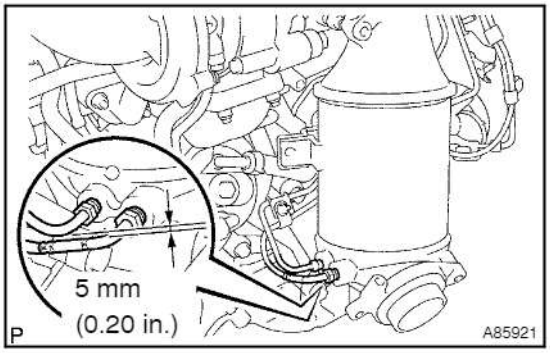
HINT:

Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).

(c) Install the bolt.

Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

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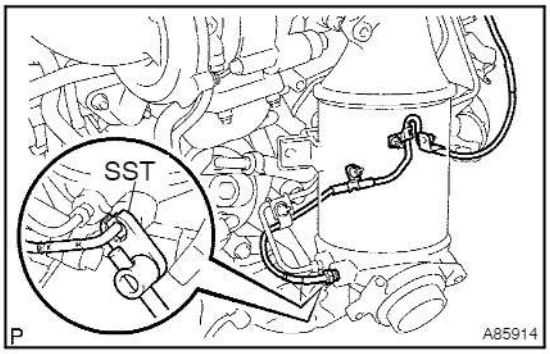


159. INSTALL EXHAUST GAS TEMPERATURE SENSOR

(a) Temporarily install the 3 nuts and exhaust gas temperature sensor on down stream as shown in the illustration.

NOTICE:

Keep 5 mm (0.20 in.) of the clearance between the exhaust gas temperature sensor and vacuum transmitting pipe.



(b) Using SST, tighten the sensor on the manifold converter side.

SST 09023–38400

Torque:

27 N·m (275 kgf·cm, 20 ft·lbf) with SST

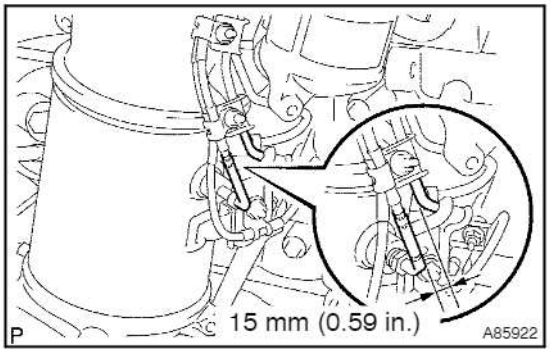
30 N·m (306 kgf·cm, 22 ft·lbf) without SST

HINT:

Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).

(c) Tighten the 3 nuts.

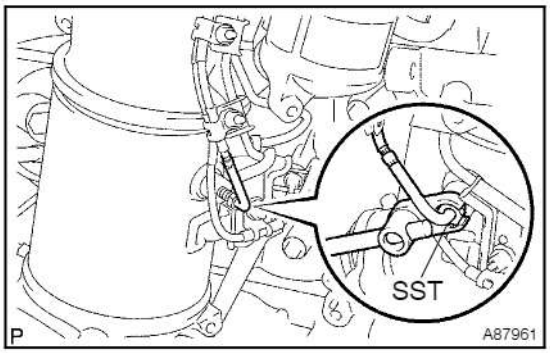
Torque: 6.4 N·m (65 kgf·cm, 57 in.·lbf)



(d) Temporarily install the 2 nuts and exhaust gas temperature sensor on up stream as shown in the illustration.

NOTICE:

Keep 15 mm (0.59 in.) of the clearance between the exhaust gas temperature sensor and vacuum transmitting pipe.



(e) Using SST, tighten the sensor on the manifold converter side.

SST 09023–38400

Torque:

27 N·m (275 kgf·cm, 20 ft·lbf) with SST

30 N·m (306 kgf·cm, 22 ft·lbf) without SST

HINT:

Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).

(f) Tighten the 2 nuts.

Torque: 6.4 N·m (65 kgf·cm, 57 in.·lbf)

160. INSTALL EGR PIPE INSULATOR (See page 13–12)

161. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.2 (See page 13–12)

162. INSTALL TURBO INSULATOR NO.1 (See page 13–12)

163. INSTALL TURBO INSULATOR NO.2 (See page 13–12)

164. INSTALL OIL FILTER BRACKET SUB–ASSY

(a) Install a new gasket and the oil filter bracket with the bolt and 2 nuts.

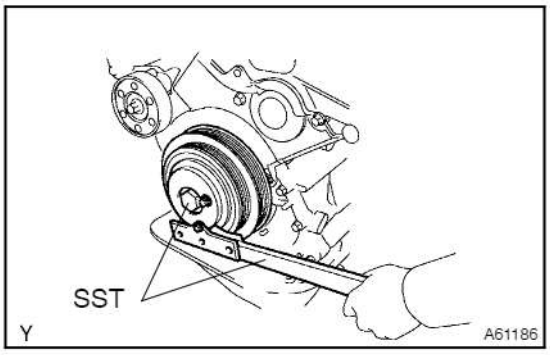
Torque: 34 N·m (347 kgf·cm, 25 ft·lbf)

165. INSTALL V–RIBBED BELT TENSIONER BRACKET

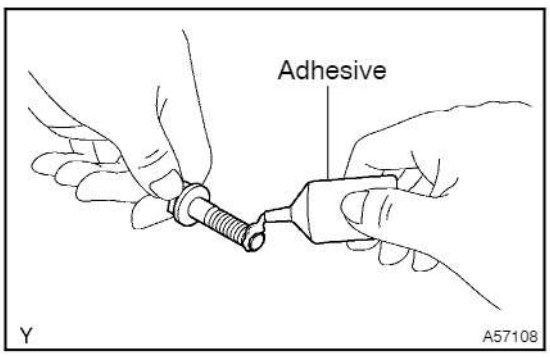
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

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166. INSTALL V–RIBBED BELT TENSIONER ASSY
Torque: 31 N·m (316 kgf·cm, 23 ft·lbf)
167. INSTALL GENERATOR BRACKET NO.1
Torque: 37 N·m (377 kgf·cm, 27 ft·lbf)
168. INSTALL GENERATOR ASSY (See Pub. No. RM1018E on page 19–29)
169. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14–138)
SST 09960–10010 (09962–01000, 09963–01000)
170. INSTALL TIMING BELT (See page 14–138)
171. CHECK VALVE TIMING (See page 14–138)
172. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET (See page 14–138)
173. INSTALL TIMING BELT GUIDE (See page 14–138)
174. INSTALL TIMING BELT NO.1 COVER (See page 14–138)
175. INSTALL TIMING BELT NO.2 COVER (See page 14–138)
176. INSTALL IDLER PULLEY SUB–ASSY
Torque: 40 N·m (408 kgf·cm, 30 ft·lbf)
177. INSTALL CRANKSHAFT PULLEY (See page 14–138)
SST 09213–54015 (09213–70020), 09330–00021
178. INSTALL GLOW PLUG ASSY (See Pub. No. RM1018E on page 19–33)
179. INSTALL ENGINE MOUNTING BRACKET RR
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)
180. INSTALL ENGINE MOUNTING BRACKET FR
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)
181. INSTALL DRIVE SHAFT BEARING BRACKET
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)
182. INSTALL REAR END PLATE
Torque: 8.4 N·m (86 kgf·cm, 74 in.·lbf)

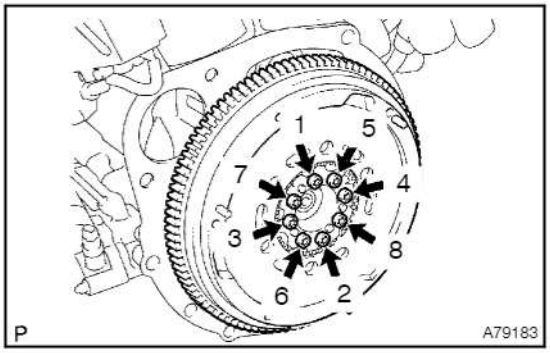


183. INSTALL FLYWHEEL SUB–ASSY
(a) Using SST, hold the crankshaft.
SST 09213–54015 (09213–70020), 09330–00021
(b) Clean the bolts and their bolt holes.



(c) Apply adhesive to the 2 or 3 threads of the bolt end.
Adhesive: Part No. 08833–00070, THREE BOND 1324 or equivalent

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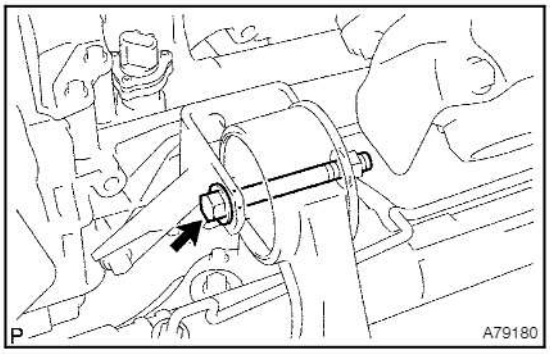
(d) Using a Torx socket wrench (T55), uniformly install and tighten the 8 Torx screws in several steps in the sequence shown in the illustration.
Torque: 71 N·m (720 kgf·cm, 52 ft·lbf)

184. INSTALL CLUTCH DISC ASSY (See Pub. No. RM1018E on page 42–26)
SST 09301–00210

185. INSTALL CLUTCH COVER ASSY (See Pub. No. RM1018E on page 42–26)

186. INSTALL MANUAL TRANSAXLE (See Pub. No. RM1018E on page 41–33)

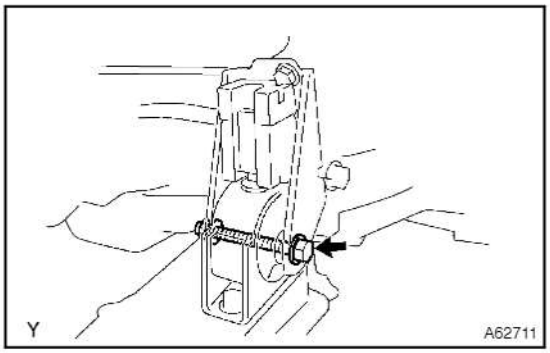
187. INSTALL STARTER ASSY (See Pub. No. RM1018E on page 19–24)



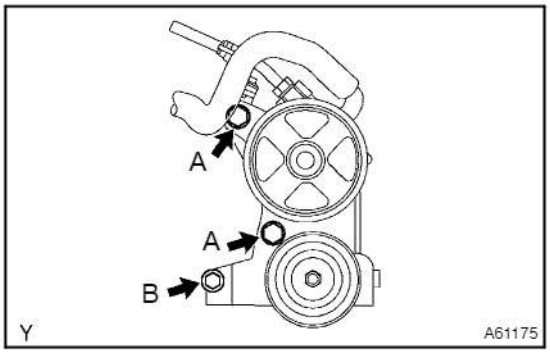
188. INSTALL FRONT SUSPENSION CROSSMEMBER SUB–ASSY

(a) Attach the engine together with the transaxle to the suspension crossmember and engine mounting member.

(b) Install the bolt which secures the rear engine mounting bracket to the mounting insulator.
Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)



(c) Install the bolt which secures the front engine mounting bracket to the mounting insulator.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



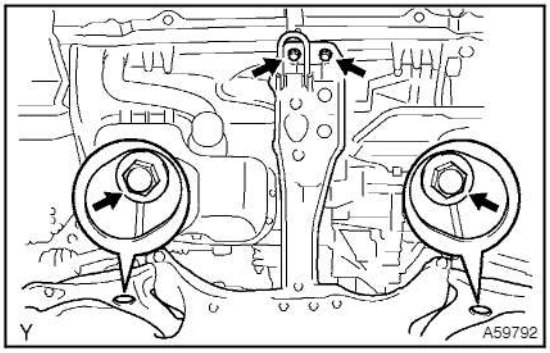
189. INSTALL POWER STEERING IDLE PULLEY BRACKET

(a) Install the power steering idle pulley bracket with the 3 bolts.
Torque:
72 N·m (734 kgf·cm, 53 ft·lbf) for bolt A
39 N·m (398 kgf·cm, 29 ft·lbf) for bolt B

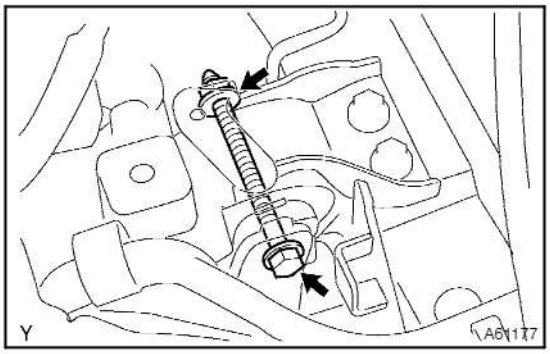
190. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE

(a) Set the engine together with the transaxle on the engine lifter.

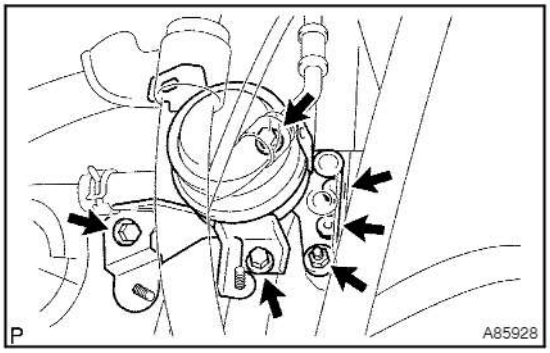
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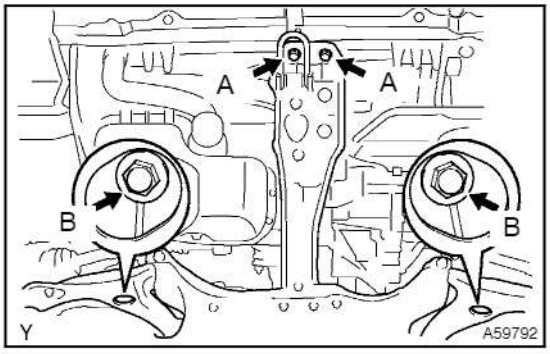
(b) Temporarily install the suspension crossmember with the 2 bolts and 2 nuts.



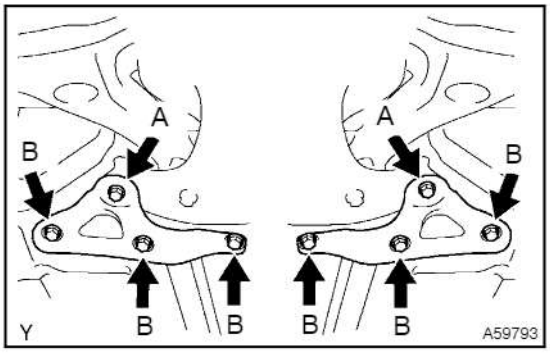
(c) Install the engine mounting insulator LH.
Torque: 80 N·m (816 kgf·cm, 59 ft·lbf)



(d) Install the engine mounting insulator RH.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)



(e) Install the front suspension crossmember with the 2 bolts and 2 nuts.
Torque:
45 N·m (459 kgf·cm, 33 ft·lbf) for bolt A
133 N·m (1,356 kgf·cm, 98 ft·lbf) for nut B



(f) Install the front suspension member brace LH and RH with the 8 bolts.
Torque:
133 N·m (1,356 kgf·cm, 98 ft·lbf) for bolt A
80 N·m (816 kgf·cm, 59 ft·lbf) for bolt B

NOTICE:
After installing the crossmember, check that the positioning holes on the crossmember and vehicle are aligned.

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191. INSTALL FRONT AXLE ASSY LH (See Pub. No. RM1018E on page 30–6)

HINT:

Perform the same procedure as above on the opposite side.

192. INSTALL FRONT SUSPENSION ARM SUB–ASSY LOWER NO.1 LH (See Pub. No. RM1018E on page 30–6)

HINT:

Perform the same procedure as above on the opposite side.

193. INSTALL STEERING INTERMEDIATE SHAFT ASSY NO.2 (See Pub. No. RM1018E on page 51–36)

194. INSTALL FRONT STABILIZER LINK ASSY LH (See Pub. No. RM1018E on page 30–6)

HINT:

Perform the same procedure as above on the opposite side.

195. INSTALL TIE ROD END SUB–ASSY LH (See Pub. No. RM1018E on page 30–6)

HINT:

Perform the same procedure as above on the opposite side.

196. INSTALL FRONT AXLE HUB LH NUT (See Pub. No. RM1018E on page 30–6)

HINT:

Perform the same procedure as above on the opposite side.

197. INSTALL RETURN TUBE SUB–ASSY

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

198. INSTALL EXHAUST PIPE ASSY FRONT (See page 15–6)

199. INSTALL FLOOR PANEL BRACE FRONT (See page 15–6)

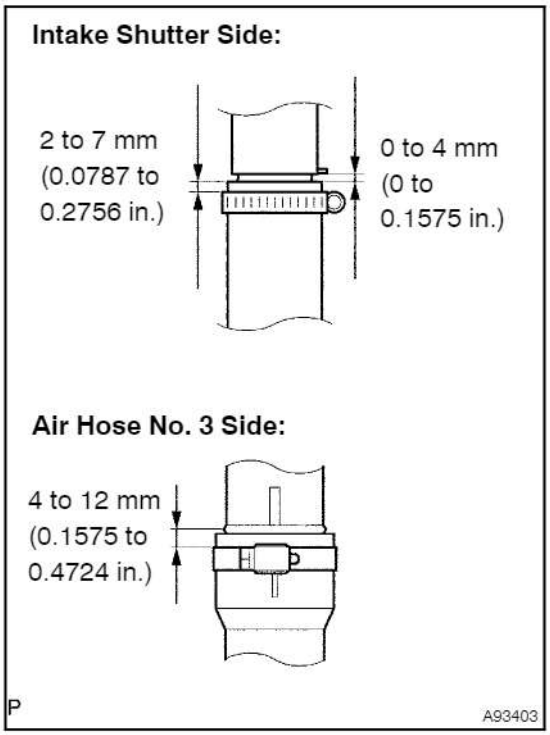
200. INSTALL COMPRESSOR AND MAGNETIC CLUTCH (W/ AIR CONDITIONING) (See Pub. No. RM1018E on page 55–86)

201. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See Pub. No. RM1018E on page 14–269)

202. INSTALL CLUTCH RELEASE CYLINDER ASSY (See Pub. No. RM1018E on page 42–17)

203. INSTALL CLUTCH ACCUMULATOR ASSY (See Pub. No. RM1018E on page 42–22)

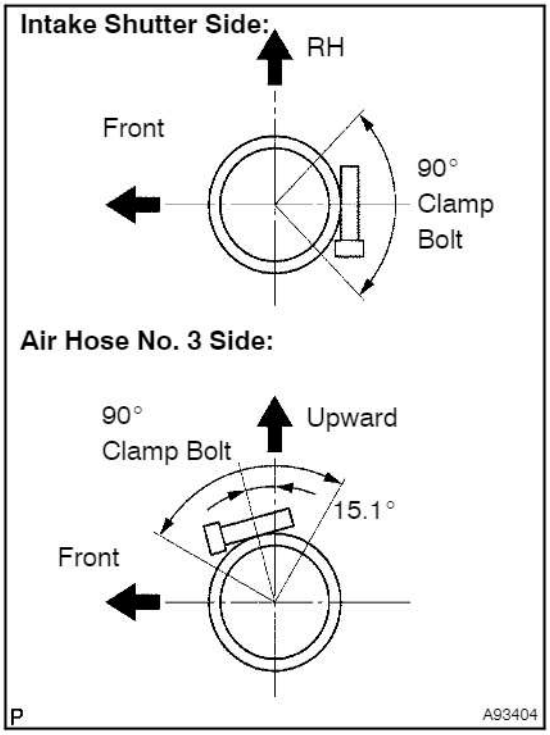
SST 09023–00100



204. INSTALL AIR TUBE NO.2

(a) Install the air hose and 2 hose clamps as shown in the illustration.

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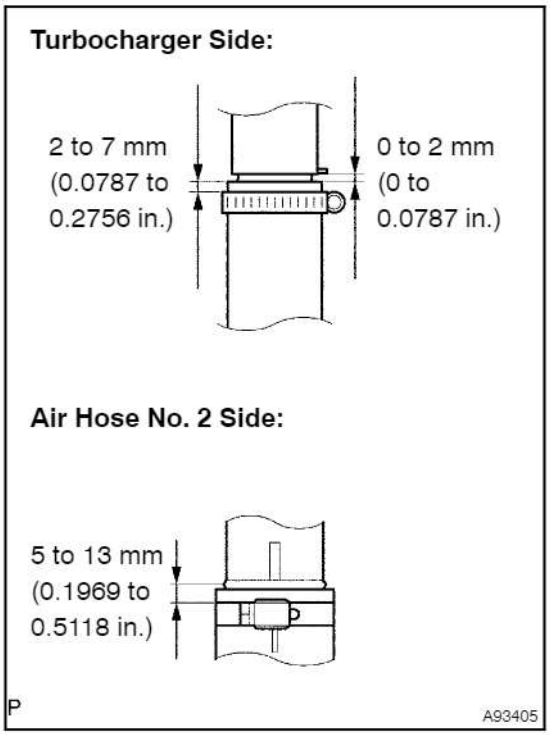


(b) Tighten the 2 hose clamps as shown in the illustration.
Torque:
6.0 N·m (61 kgf·cm, 53 in.·lbf) for intake shutter side
5.3 N·m (54 kgf·cm, 47 in.·lbf) for air hose No. 3 side

(c) Install the bolt and air tube No. 2 assembly to the transaxle.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

205. CONNECT ENGINE WIRE
Torque:
8.4 N·m (85 kgf·cm, 74 in.·lbf) for wire harness
5.3 N·m (54 kgf·cm, 47 in.·lbf) for engine room relay block No. 2

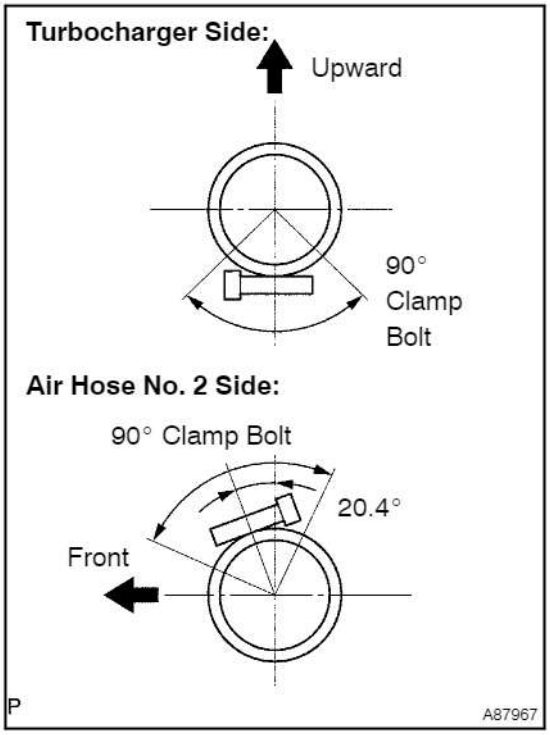
206. INSTALL INJECTOR DRIVER
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



207. INSTALL AIR TUBE NO.1

(a) Install a new air hose No. 2 and new 2 hose clamps as shown in the illustration.

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(b) Tighten the 2 hose clamps as shown in the illustration.
Torque: 6.0 N·m (61 kgf·cm, 53 in.·lbf)

(c) Install the air tube No. 1 with the 3 bolts and nut.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

208. INSTALL DIFFERENTIAL PRESSURE SENSOR ASSY
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
209. INSTALL RADIATOR ASSY (W/ AIR CONDITIONING) (See Pub. No. RM1018E on page 16–51)
210. INSTALL ENGINE ROOM RELAY BLOCK NO.3
Torque: 5.3 N·m (54 kgf·cm, 47 in.·lbf)
211. INSTALL FUEL FILTER ASSY (See Pub. No. RM1018E on page 11–82)
212. INSTALL AIR CLEANER ASSY
Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)
213. INSTALL BATTERY
Torque:
5.0 N·m (51 kgf·cm, 44 in.·lbf) for bolt
3.0 to 4.0 N·m (31 to 41 kgf·cm, 27 to 35 in.·lbf) for nut
5.4 N·m (55 kgf·cm, 48 in.·lbf) for terminal
214. INSTALL ENGINE COVER SUB–ASSY NO.1
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
215. BLEED CLUTCH PIPE LINE (See Pub. No. RM1018E on page 42–12)
216. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
217. ADD MANUAL TRANSAXLE OIL (See Pub. No. RM1018E on page 41–5)
218. ADD ENGINE OIL (See Pub. No. RM1018E on page 17–30)
219. ADD ENGINE COOLANT (See page 16–19)
220. CHECK CLUTCH FLUID LEAKAGE
221. CHECK FLUID LEVEL IN RESERVOIR
222. CHECK BRAKE FLUID LEAKAGE
223. CHECK FOR ENGINE OIL LEAKS
224. CHECK FOR FUEL LEAKS (See page 11–46)
225. CHECK FOR ENGINE COOLANT LEAKS (See page 16–15)
226. CHECK FOR EXHAUST GAS LEAKS
227. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT (See Pub. No. RM1018E on page 26–6)

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228. INSPECT ENGINE IDLE SPEED (See page 14–87)

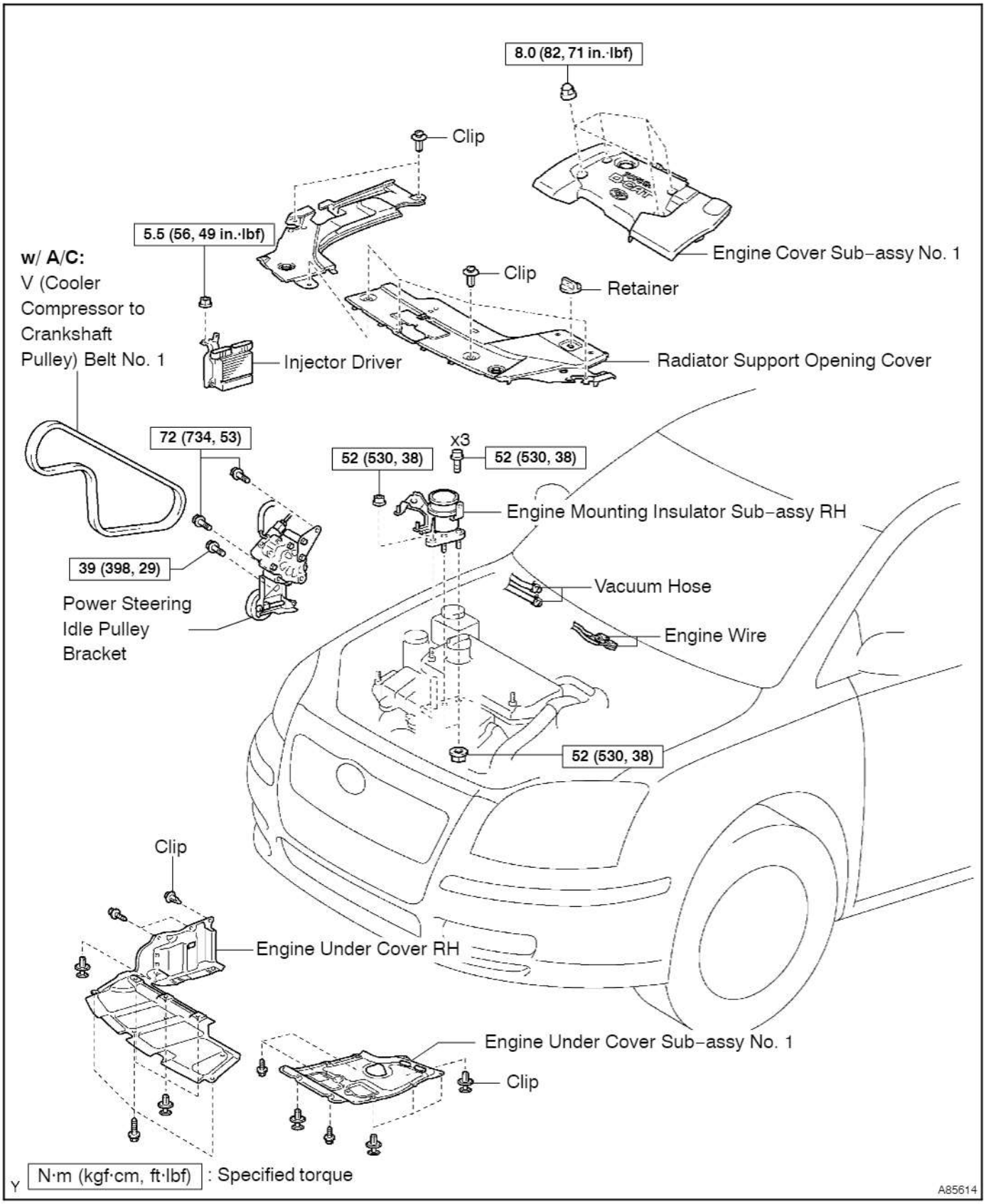
229. CHECK ABS SPEED SENSOR SIGNAL (See Pub. No. RM1018E on page 05–756)

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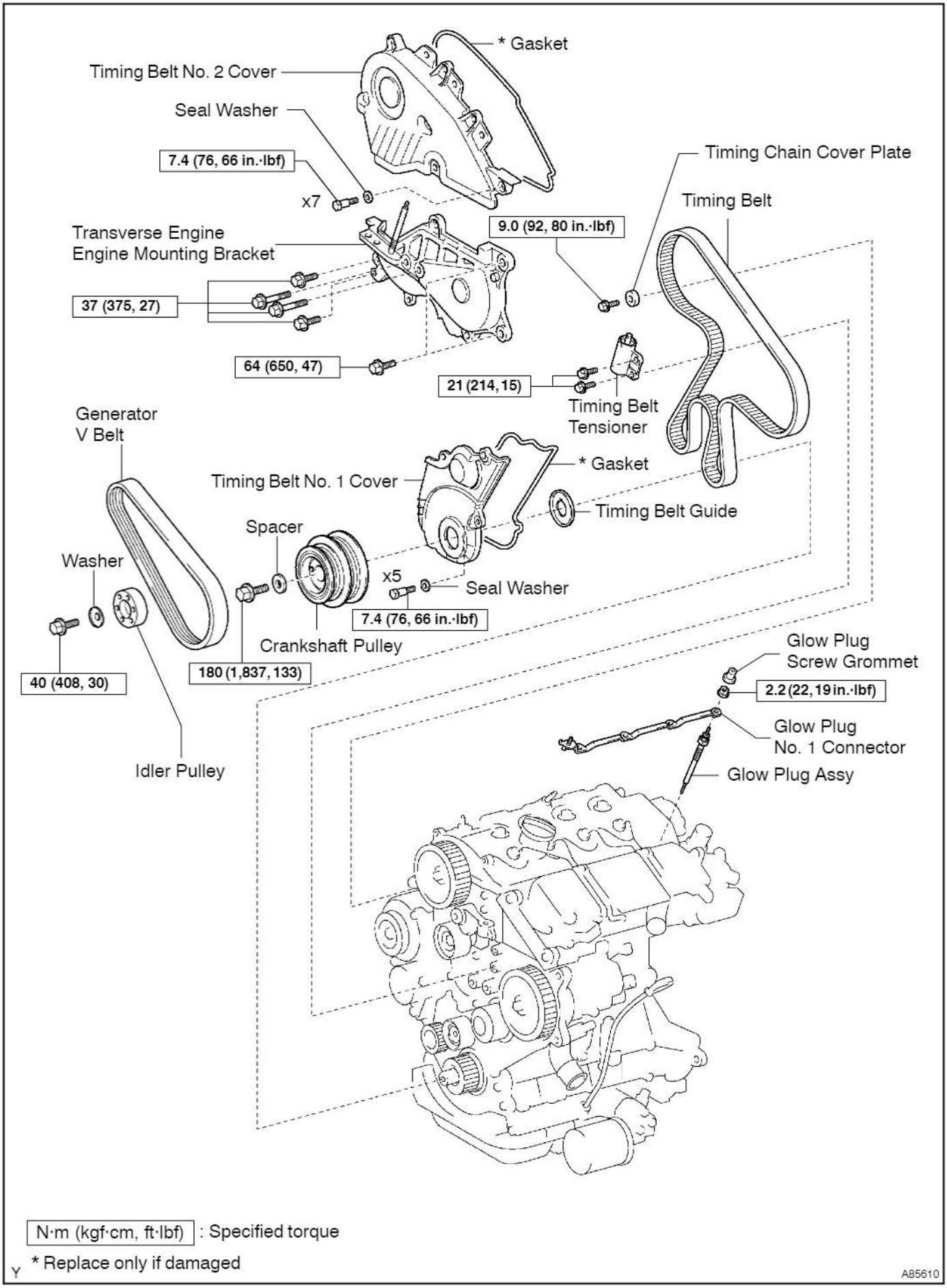
TIMING BELT (1CD–FTV)(From September, 2003)

COMPONENTS

141NH–01



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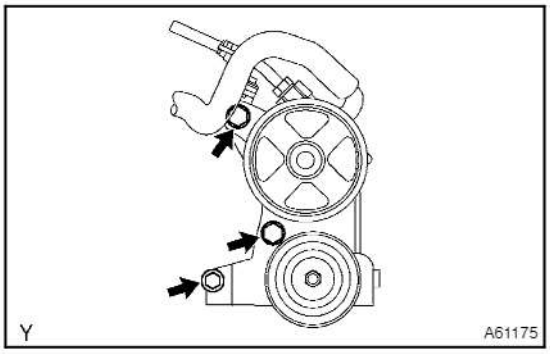


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141NI–01

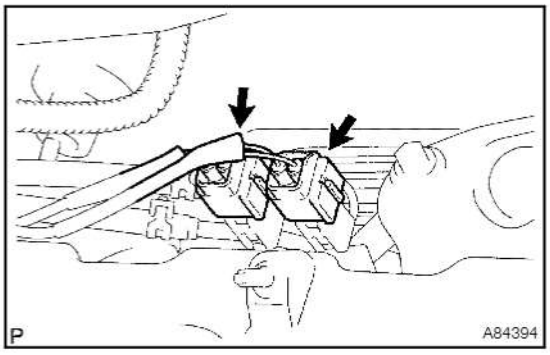
REPLACEMENT

1. REMOVE FRONT WHEEL RH
2. REMOVE ENGINE UNDER COVER SUB–ASSY NO.1
3. REMOVE ENGINE UNDER COVER RH
4. REMOVE RADIATOR SUPPORT OPENING COVER
5. REMOVE ENGINE ROOM COVER SIDE
6. REMOVE ENGINE COVER SUB–ASSY NO.1 (See page 14–90)
7. REMOVE INJECTOR DRIVER (See page 14–108)
8. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See Pub. No. RM1018E on page 14–269)
9. REMOVE GENERATOR V BELT (See Pub. No. RM1018E on page 14–269)



10. SEPARATE POWER STEERING IDLE PULLEY BRACKET

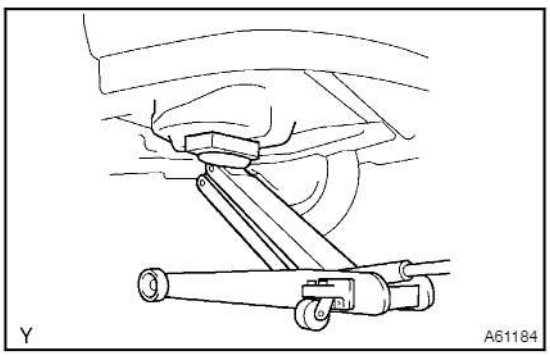
(a) Remove the 3 bolts and power steering idle pulley bracket.



11. DISCONNECT ENGINE WIRE

(a) Disconnect the 2 exhaust gas temperature sensor connectors.

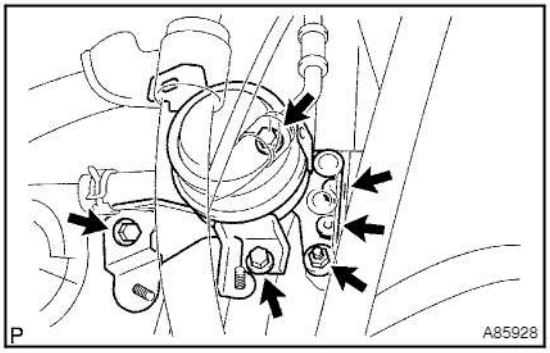
12. DISCONNECT VACUUM HOSE (See page 14–108)



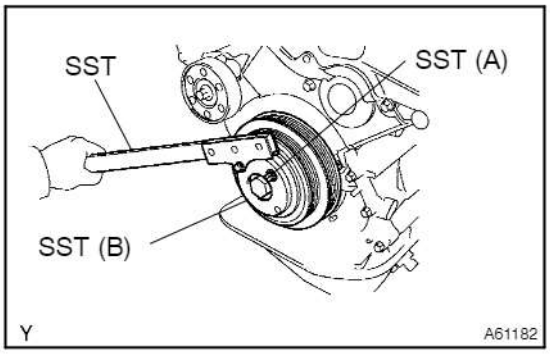
13. REMOVE ENGINE MOUNTING INSULATOR SUB–ASSY RH

(a) Place a wooden block on a jack underneath the engine.

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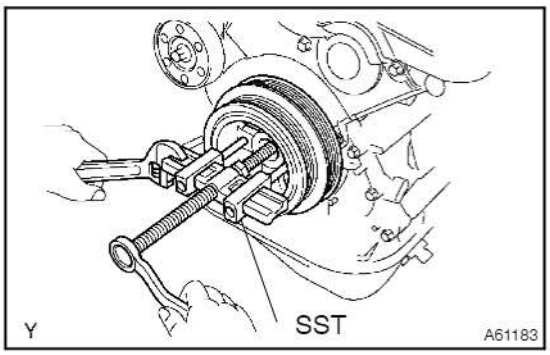
(b) Remove the 3 bolts and 3 nuts, then detach the engine mounting insulator sub–assembly RH.



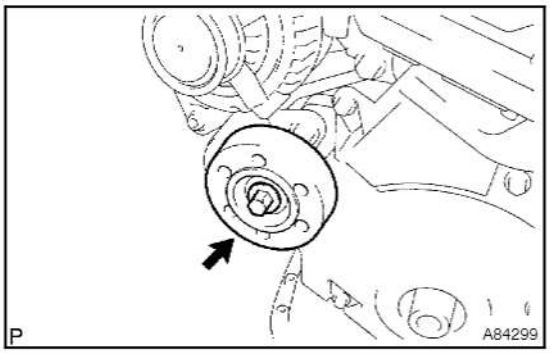
14. REMOVE CRANKSHAFT PULLEY

(a) Using SST, remove the pulley bolt.
SST 09213–54015 (09213–70020), 09330–00021

HINT:
When using SST (A) (09213–70020), a plate washer (5 mm (0.20 in.)) must be inserted between SST (A) and SST (B).

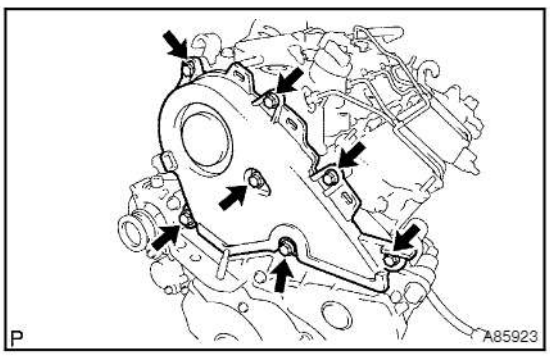


(b) Using SST, remove the pulley.
SST 09950–50013 (09951–05010, 09952–05010, 09953–05020, 09954–05031)



15. REMOVE IDLER PULLEY SUB–ASSY

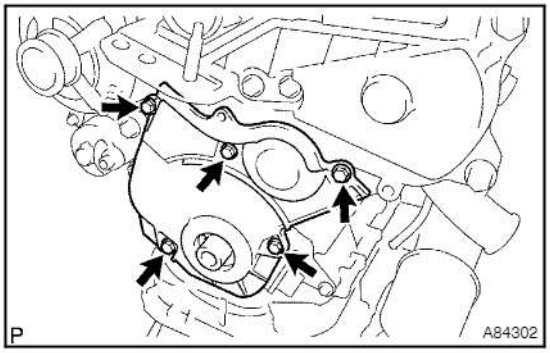
(a) Remove the bolt and washer, then remove the pulley.



16. REMOVE TIMING BELT NO.2 COVER

(a) Remove the 7 bolts and 7 seal washers, then remove the timing belt cover.

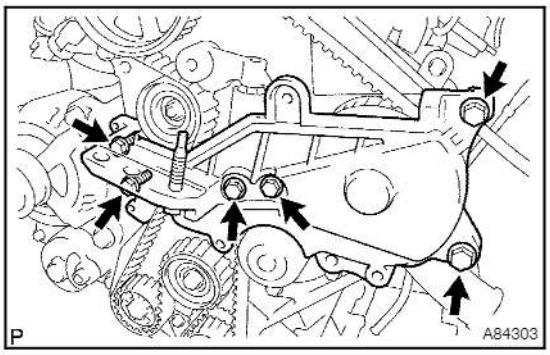
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17. REMOVE TIMING BELT NO.1 COVER

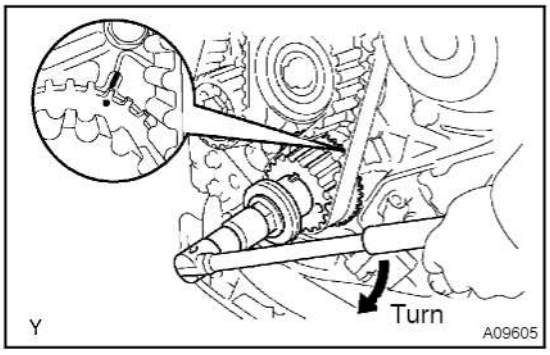
(a) Remove the 5 bolts and 5 seal washers, then remove the timing belt cover.

18. REMOVE TIMING BELT GUIDE



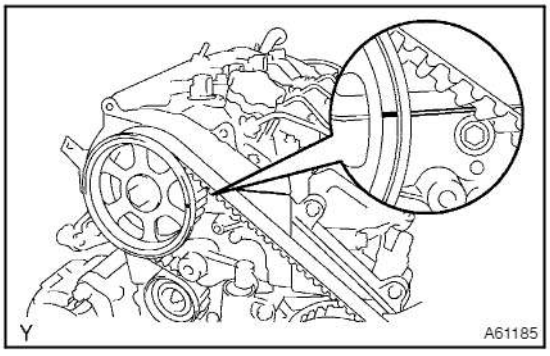
19. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

(a) Remove the 6 bolts and engine mounting bracket.



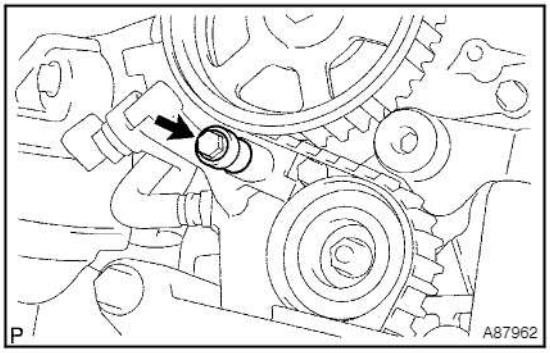
20. SET NO. 1 CYLINDER TO TDC/COMPRESSION

(a) Using the crankshaft pulley bolt, align the dot mark of the crankshaft timing gear with the TDC mark of the oil pump by turning the crankshaft.



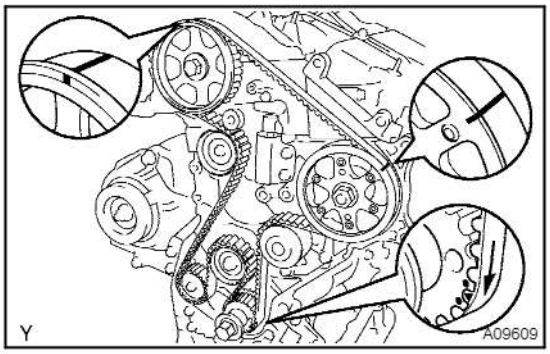
(b) Check that the timing mark of the camshaft timing pulley is aligned with the joint of the cylinder head and cylinder head cover.

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21. REMOVE TIMING CHAIN COVER PLATE

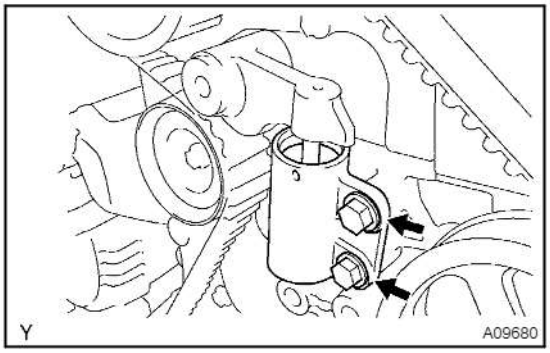
(a) Remove the bolt and timing chain cover plate.



22. REMOVE TIMING BELT

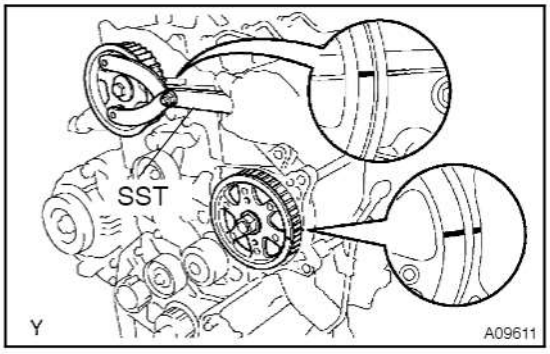
HINT:

If reusing the timing belt, draw an arrow on the belt which indicates the engine revolution direction and put match marks on the pulleys and belt before removing. This operation will be very helpful when reinstalling the timing belt.



(a) Alternately loosen the 2 bolts to remove the timing belt tensioner.

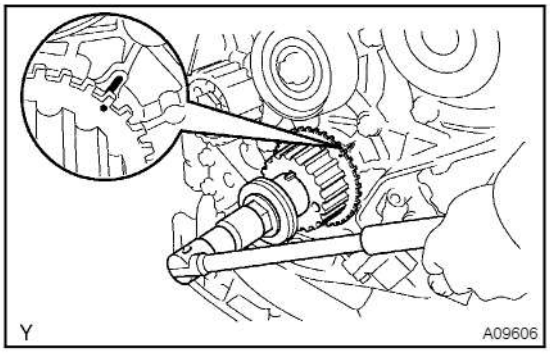
(b) Remove the timing belt.



23. SET NO. 1 CYLINDER TO TDC/COMPRESSION

(a) Using SST, set the pulleys of the camshaft and injection pump so that each timing mark of the pulleys is aligned with its timing mark on the cylinder head assembly and water pump assembly.

SST 09960–10010 (09962–01000, 09963–01000)



(b) Using the crankshaft pulley bolt, align the dot mark of the crankshaft timing gear with the TDC mark of the oil pump by turning the crankshaft.

NOTICE:

Be very careful in turning the camshaft and crankshaft. Since the valve head and piston head are sensitive, contact of the piston head with the valve heads may damage them.

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24. INSTALL TIMING BELT

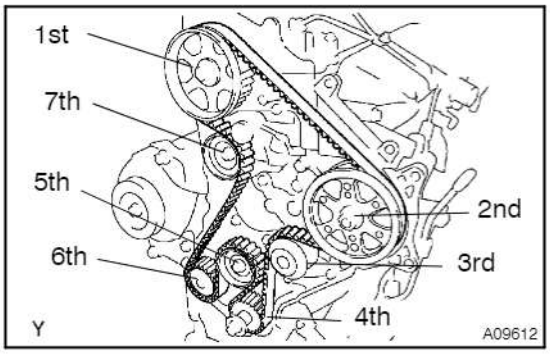
NOTICE:

The engine should be cold.

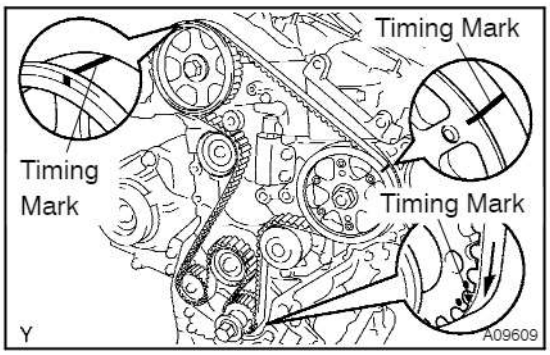
(a) Remove any oil or water on each pulley, then keep them clean.

NOTICE:

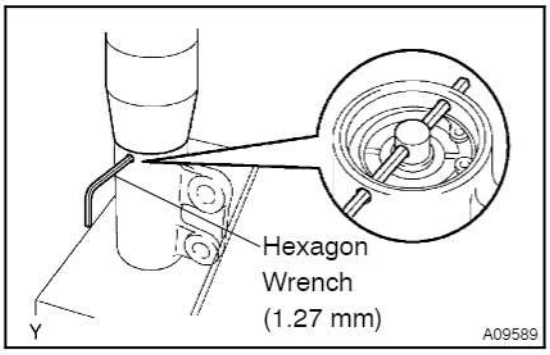
Do not use any cleaning agent.



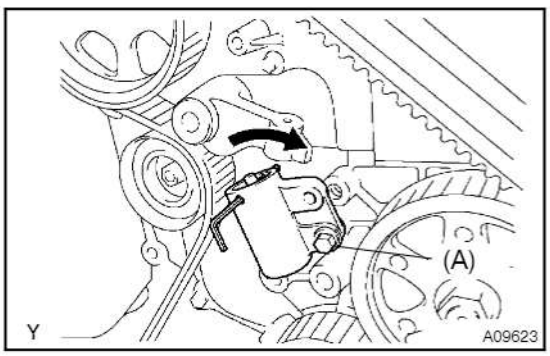
(b) Install the timing belt in the following order:
1. Camshaft timing pulley
2. Supply pump drive pulley
3. Water pump pulley
4. Crankshaft timing pulley
5. No. 2 idler pulley
6. Oil pump pulley
7. No. 1 idler pulley



(c) Check that the timing marks are aligned as shown in the illustration.

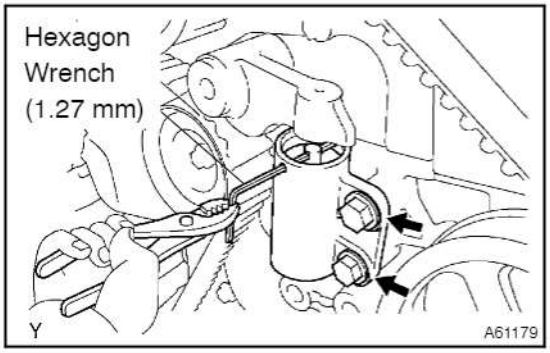


(d) Install the timing belt tensioner.
(1) Using a press, slowly press in the push rod with pressure of 981 to 9,807 N (100 to 1,000 kgf, 200 to 2,205 lbf).
(2) Align the holes of the push rod and housing, then insert hexagon wrench (1.27 mm) through the holes to keep the setting position of the push rod.
(3) Release the press.

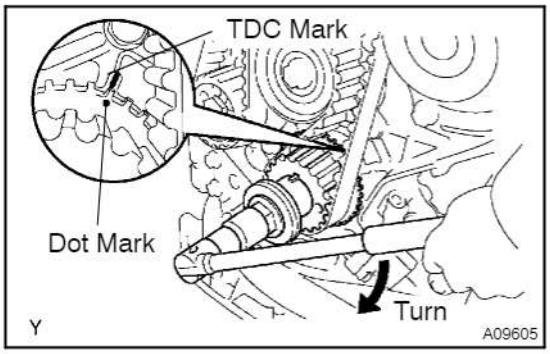


(4) Temporarily install the tensioner with bolt (A).
(5) Turn the tensioner clockwise, then temporarily install the other bolt.

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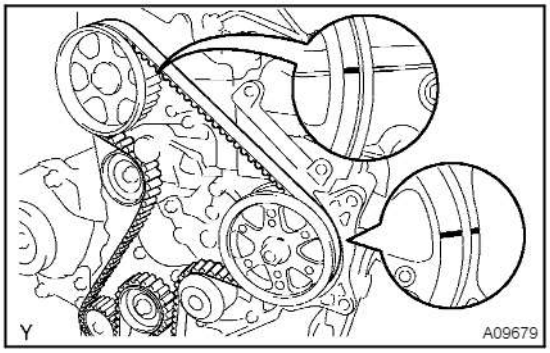


(6) Alternately tighten the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)
(7) Remove the hexagon wrench from the tensioner.



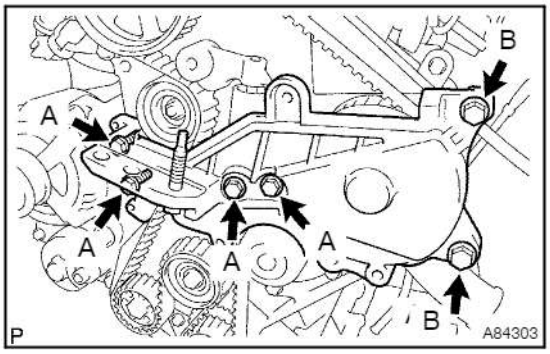
25. CHECK VALVE TIMING
(a) Slowly turn the crankshaft by 2 complete revolutions (720°) from the TDC to TDC.

NOTICE:
Always turn the crankshaft clockwise.
HINT:
Align the TDC mark with the dot mark.



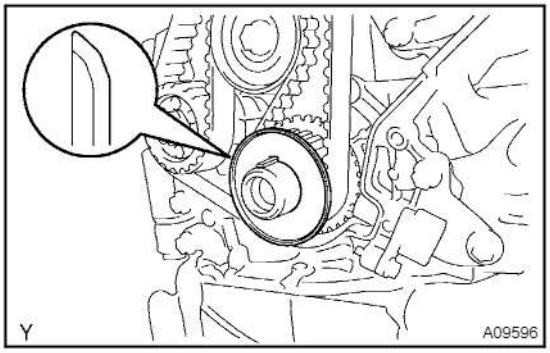
(b) Check that each timing mark of the pulleys is aligned with the timing marks of the engine assembly as shown in the illustration.
If the timing marks are not aligned, remove the timing belt, then reinstall it.
(c) Remove the crankshaft pulley bolt.

26. INSTALL TIMING CHAIN COVER PLATE
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)



27. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET
Torque:
37 N·m (375 kgf·cm, 27 ft·lbf) for bolt A
64 N·m (650 kgf·cm, 47 ft·lbf) for bolt B

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28. INSTALL TIMING BELT GUIDE

(a) Install the belt guide with the cap side facing outward.

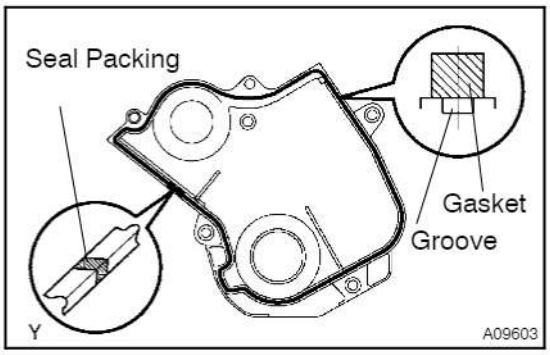
29. INSTALL TIMING BELT NO.1 COVER

(a) Check the timing belt cover gasket for cracks or deteriorations, etc.

If the gasket has cracked or deteriorated, replace it by the following steps:

(1) Using a screwdriver and gasket scraper, remove all the old gaskets.

(2) Thoroughly clean all components to remove all the loose material.



(3) Remove the backing paper from a new gasket, then affix the gasket to the timing belt cover as shown in the illustration.

NOTICE:

- **Affix the gasket at the center of the groove.**
- **At the corners, try to keep the gasket thickness uniform.**

(4) After installing the gasket, press it down so that the adhesive firmly sticks to the timing belt cover.

(5) If there is a gap between the ends of the gasket, use seal packing to close the gap.

Seal packing: Part No. 08826–00080 or equivalent

(b) Install the No. 1 timing belt cover and gasket with the 5 bolts and 5 seal washers.

Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

(c) After installing the belt cover, check that there is no peelings of the gasket.

30. INSTALL TIMING BELT NO.2 COVER

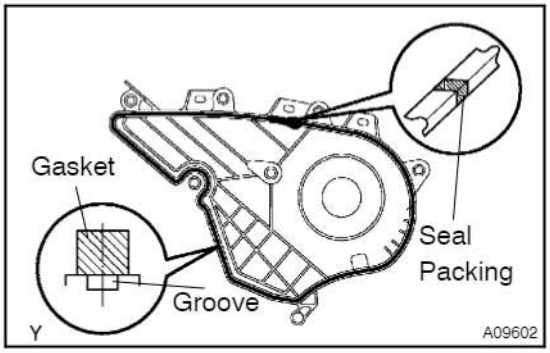
(a) Check the timing belt cover gasket for cracks or deteriorations, etc.

If the gasket has cracked or deteriorated, replace it by the following steps:

(1) Using a screwdriver and gasket scraper, remove all the old gasket.

(2) Thoroughly clean all components to remove all the loose material.

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(3) Remove the backing paper from a new gasket, then affix the gasket to the timing belt cover as shown in the illustration.

NOTICE:

- **Affix the gasket at the center of the groove.**
- **At the corners, try to keep the gasket thickness uniform.**

(4) After installing the gasket, press it down so that the adhesive firmly sticks to the timing belt cover.

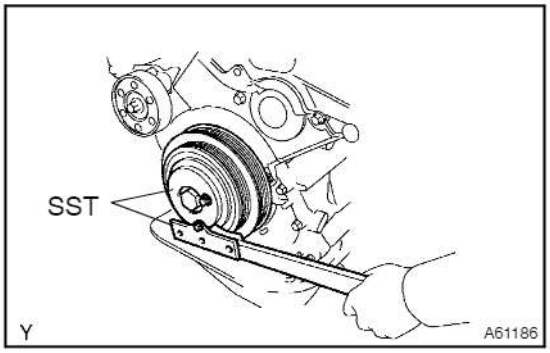
(5) If there is a gap between the ends of the gasket, use seal packing to close the gap.

Seal packing: Part No. 08826–00080 or equivalent

(b) Install the No. 2 timing belt cover and gasket with the 7 bolts and 7 seal washers.

Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

31. INSTALL IDLER PULLEY SUB–ASSY
Torque: 40 N·m (408 kgf·cm, 30 ft·lbf)



32. INSTALL CRANKSHAFT PULLEY

(a) Align the keyway of the pulley with the key located on the crankshaft, then slide the pulley into place.

(b) Using SST, install the pulley bolt.
SST 09213–54015 (09213–70020), 09330–00021
Torque: 180 N·m (1,835 kgf·cm, 133 ft·lbf)

HINT:
When using the bolt (91651–60855), a plate washer (5 mm (0.20 in.)) must be inserted between the pulley bolt and SST.

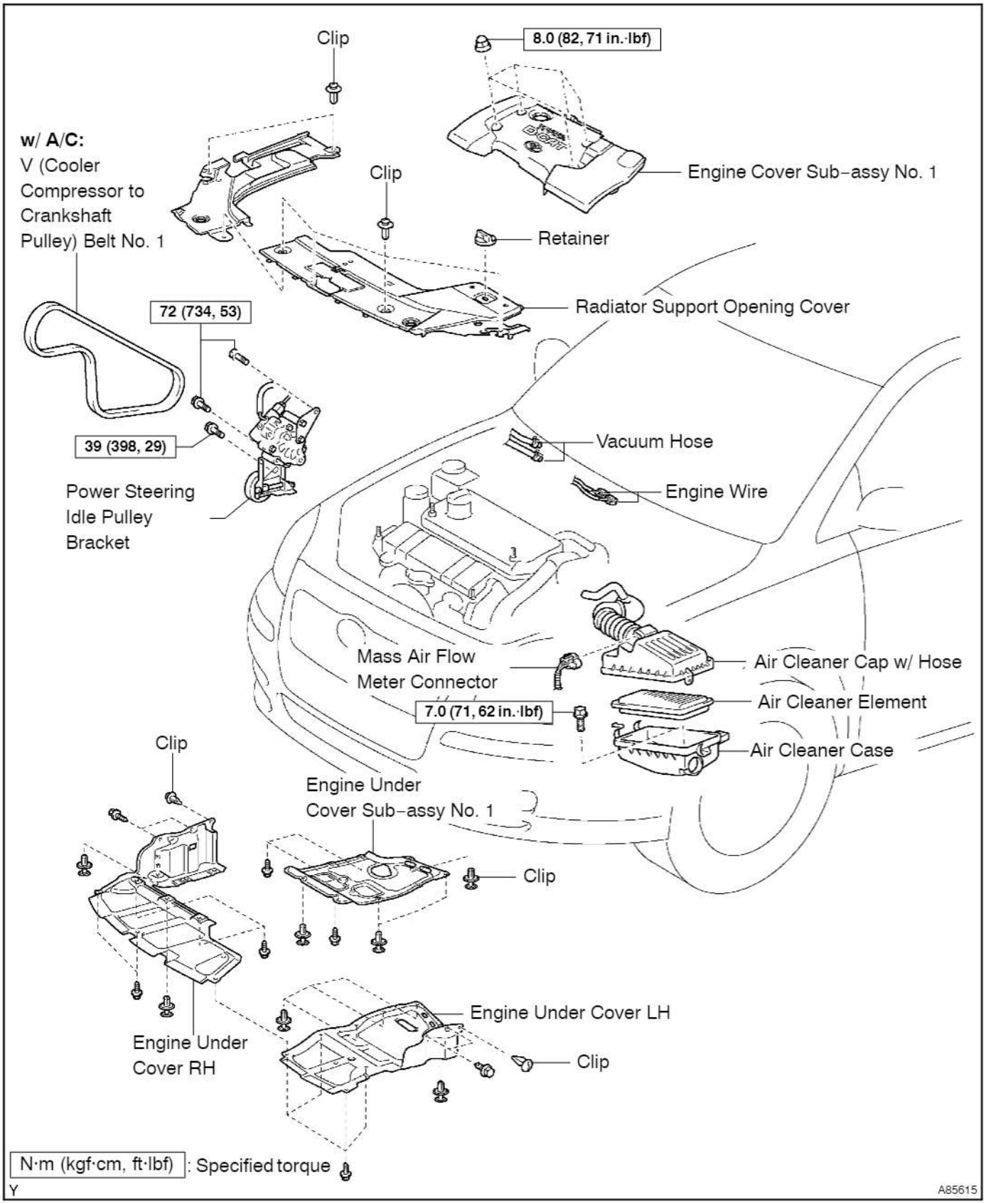
33. INSTALL ENGINE MOUNTING INSULATOR SUB–ASSY RH
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)
34. INSTALL POWER STEERING IDLE PULLEY BRACKET (See page 14–108)
35. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See Pub. No. RM1018E on page 14–269)
36. INSTALL INJECTOR DRIVER (See page 14–108)
37. INSTALL ENGINE COVER SUB–ASSY NO.1 (See page 14–90)
38. INSTALL FRONT WHEELS
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

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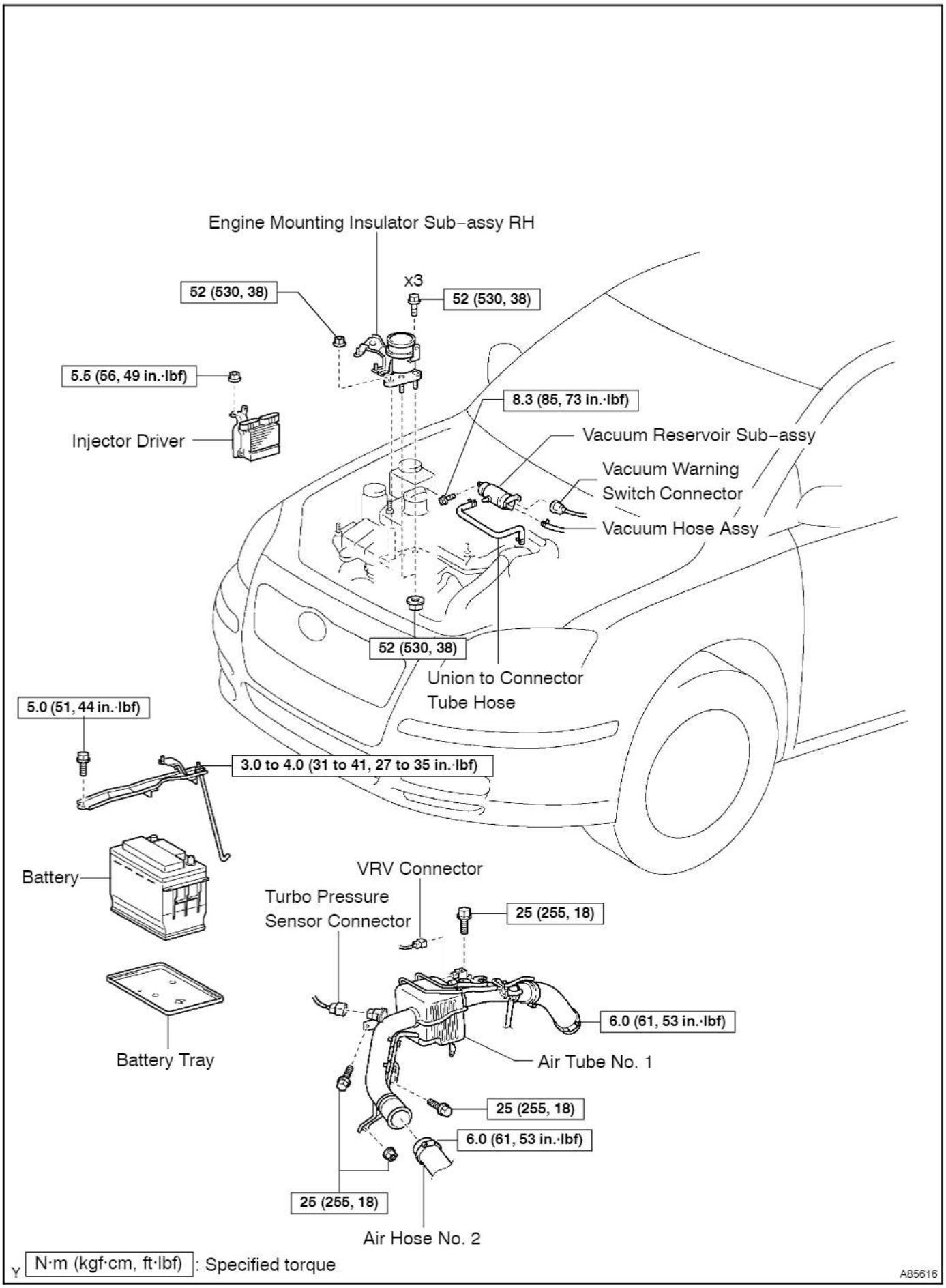
CAMSHAFT (1CD–FTV)(From September, 2003)

COMPONENTS

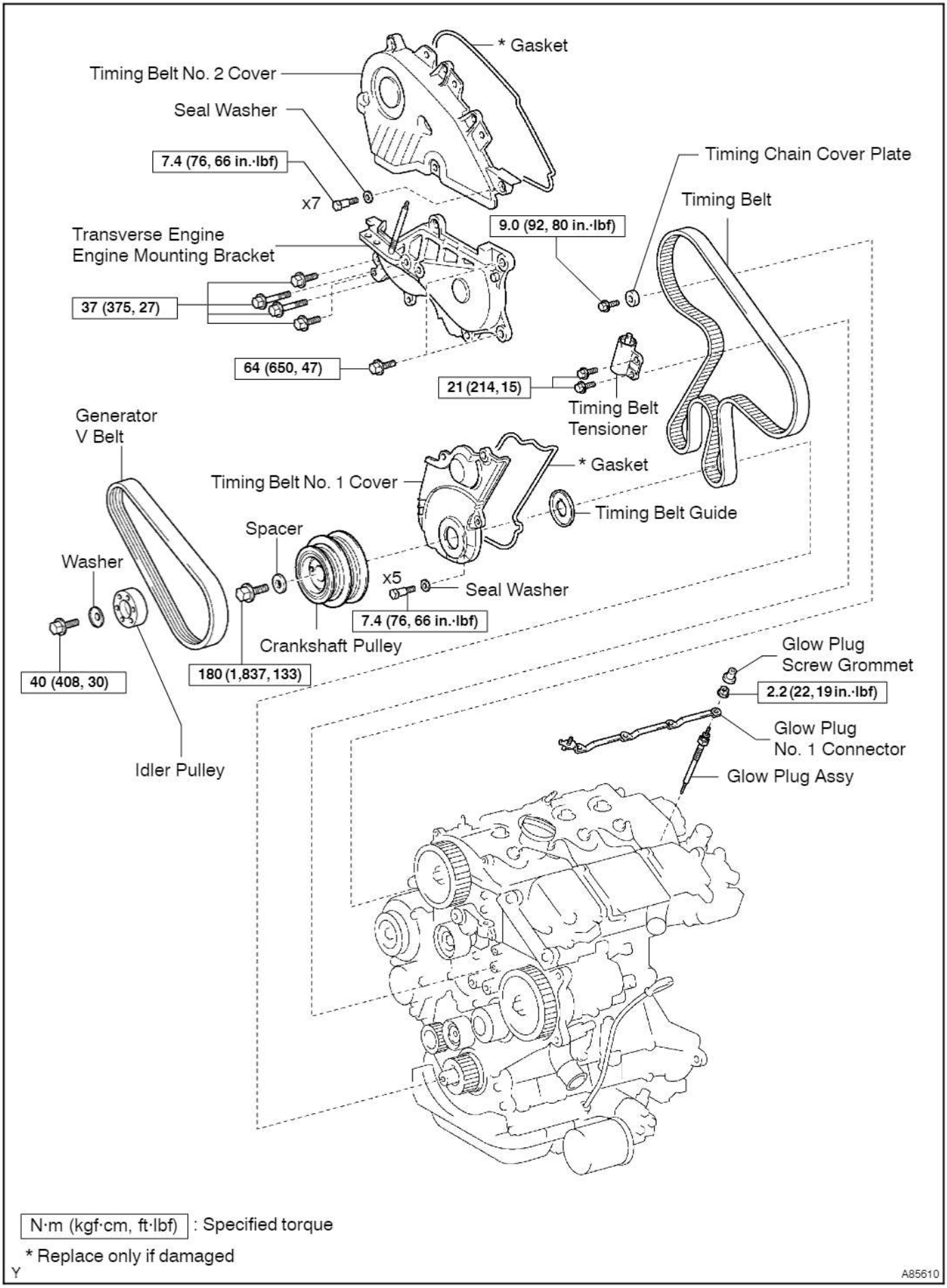
141NJ–01



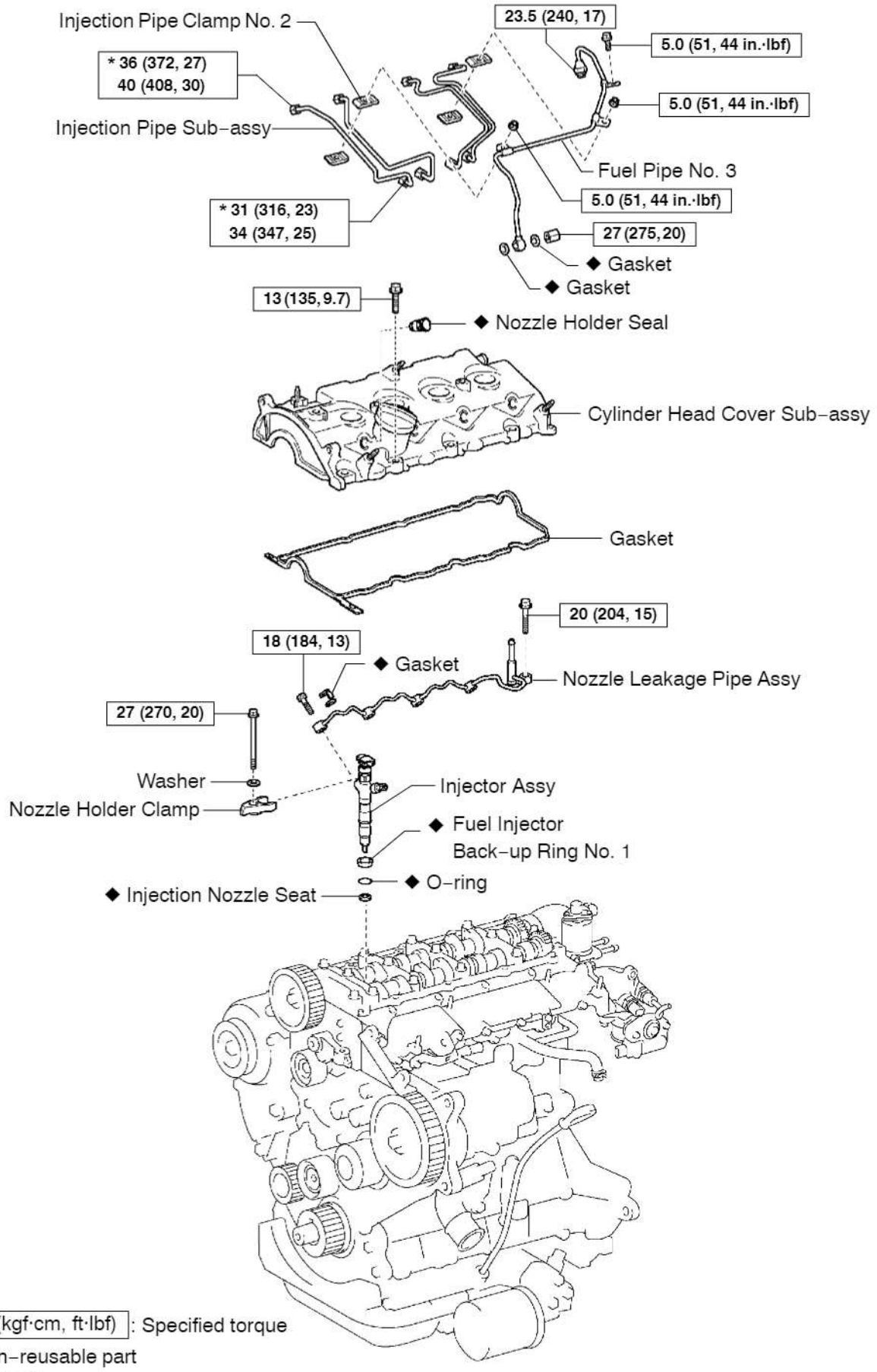
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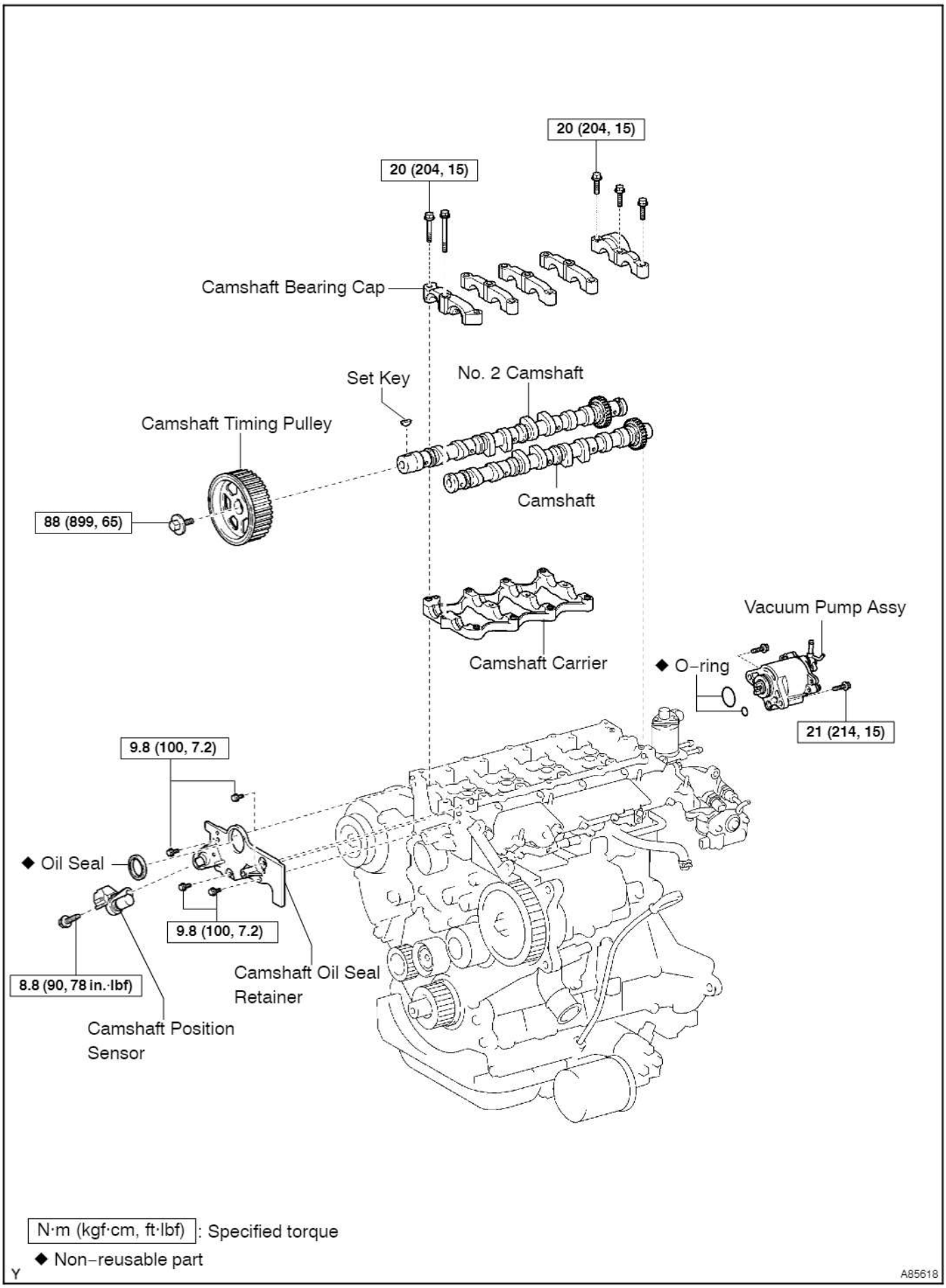
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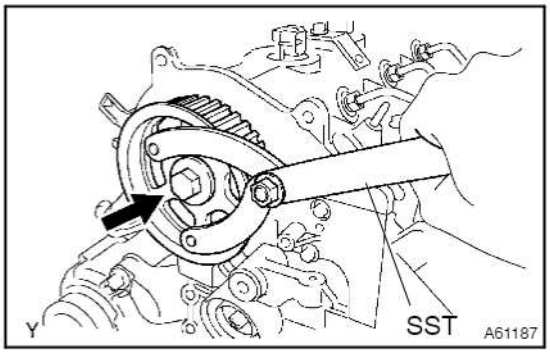


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141NK–01

REPLACEMENT

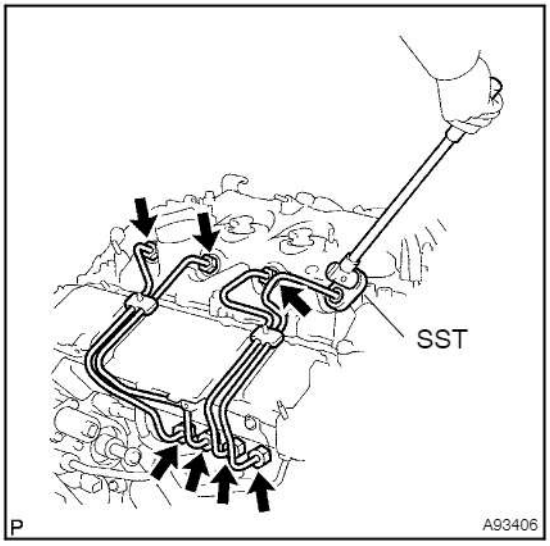
1. REMOVE FRONT WHEEL RH
2. REMOVE ENGINE UNDER COVER LH
3. REMOVE ENGINE UNDER COVER SUB–ASSY NO.1
4. REMOVE ENGINE UNDER COVER RH
5. REMOVE RADIATOR SUPPORT OPENING COVER
6. REMOVE ENGINE ROOM COVER SIDE
7. REMOVE ENGINE COVER SUB–ASSY NO.1 (See page 14–90)
8. REMOVE AIR CLEANER ASSY (See page 14–108)
9. REMOVE BATTERY
10. REMOVE VACUUM RESERVOIR SUB–ASSY (See page 14–108)
11. REMOVE AIR TUBE NO.1 (See page 14–108)
12. REMOVE INJECTOR DRIVER (See page 14–108)
13. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See Pub. No. RM1018E on page 14–269)
14. REMOVE GENERATOR V BELT (See Pub. No. RM1018E on page 14–269)
15. SEPARATE POWER STEERING IDLE PULLEY BRACKET (See page 14–138)
16. DISCONNECT ENGINE WIRE (See page 14–138)
17. DISCONNECT VACUUM HOSE (See page 14–108)
18. REMOVE ENGINE MOUNTING INSULATOR SUB–ASSY RH (See page 14–138)
19. REMOVE CRANKSHAFT PULLEY (See page 14–138)
    SST 09213–54015 (09213–70020), 09330–00021, 09950–50013 (09951–05010, 09952–05010, 09953–05020, 09954–05031)
20. REMOVE IDLER PULLEY SUB–ASSY (See page 14–138)
21. REMOVE TIMING BELT NO.2 COVER (See page 14–138)
22. REMOVE TIMING BELT NO.1 COVER (See page 14–138)
23. REMOVE TIMING BELT GUIDE
24. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET (See page 14–138)
25. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14–138)
26. REMOVE TIMING CHAIN COVER PLATE (See page 14–138)
27. REMOVE TIMING BELT (See page 14–138)
28. REMOVE CAMSHAFT POSITION SENSOR (See page 14–108)



29. REMOVE CAMSHAFT TIMING PULLEY
(a) Using SST, remove the pulley bolt.
SST 09960–10010 (09962–01000, 09963–01000)
(b) Remove the timing pulley.
HINT:
Using a plastic–faced hammer, tap out the pulley.
(c) Remove the set key.

30. REMOVE FUEL PIPE NO.3 (See page 14–108)
SST 09023–12700

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31. REMOVE INJECTION PIPE SUB–ASSY NO.1

(a) Remove the 2 upper injection pipe clamps from the intake manifold.

(b) Using SST, remove the injection pipe from the common rail side.
SST 09023–12700

(c) Using SST, remove the injection pipe from the injector side.
SST 09023–12700

(d) After removing the fuel pipe, in order to prevent dust or foreign objects from being introduced, cover the common rail with vinyl tape and protect the injector inlet with a vinyl or plastic bag.

32. REMOVE INJECTION PIPE SUB–ASSY NO.2
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

33. REMOVE INJECTION PIPE SUB–ASSY NO.3
SST 09023–12700

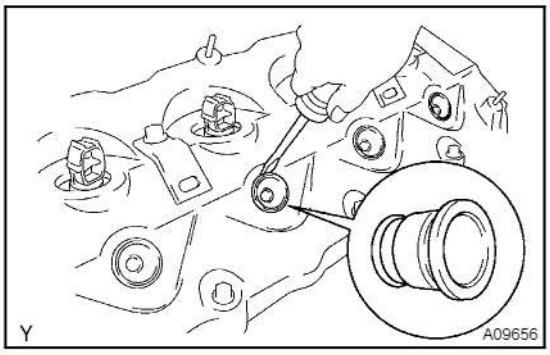
HINT:
Perform the same procedures as the injection pipe No. 1.

34. REMOVE INJECTION PIPE SUB–ASSY NO.4
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

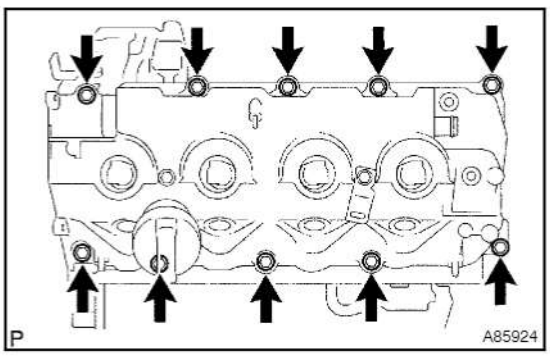
35. REMOVE VACUUM PUMP ASSY (See page 14–108)

36. REMOVE NOZZLE LEAKAGE PIPE NO.2 (See page 14–108)



37. REMOVE NOZZLE HOLDER SEAL

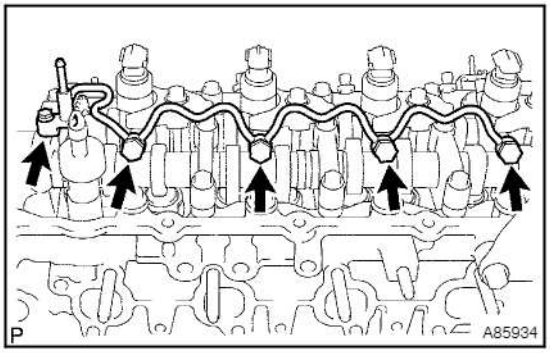
(a) Using a screwdriver, pry out the 4 nozzle holder seals.



38. REMOVE CYLINDER HEAD COVER SUB–ASSY

(a) Remove the 10 bolts, cylinder head cover and gasket.

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39. REMOVE NOZZLE LEAKAGE PIPE ASSY

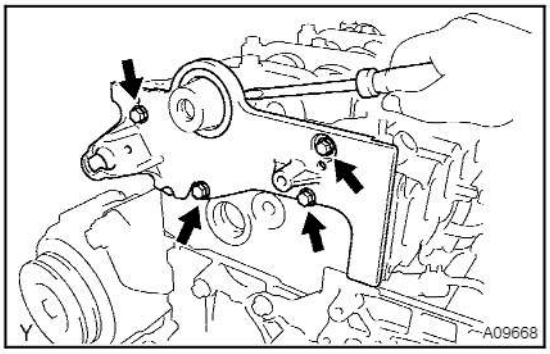
(a) Remove the 4 hollow screws and bolt.

(b) Remove the nozzle leakage pipe and 4 gaskets from the cylinder head and injector.

40. REMOVE INJECTOR ASSY (See page 11–46)

HINT:

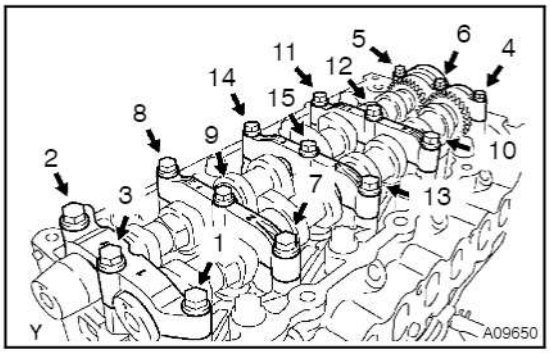
Since each injector assembly has characteristic fuel injecting behavior, keep them in the correct order so that they can be returned to the original locations when reassembling.



41. REMOVE CAMSHAFT OIL SEAL RETAINER

(a) Remove the 4 bolts.

(b) Using a screwdriver, remove the oil seal retainer by prying between the oil seal retainer and camshaft bearing cap.



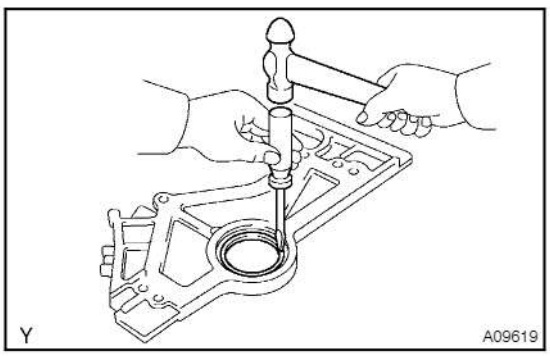
42. REMOVE CAMSHAFT

(a) Using several steps, loosen and remove the 14 bearing cap bolts uniformly in the sequence shown in the illustration.

(b) Remove the 5 bearing caps and camshaft sub–assembly.

43. REMOVE NO.2 CAMSHAFT

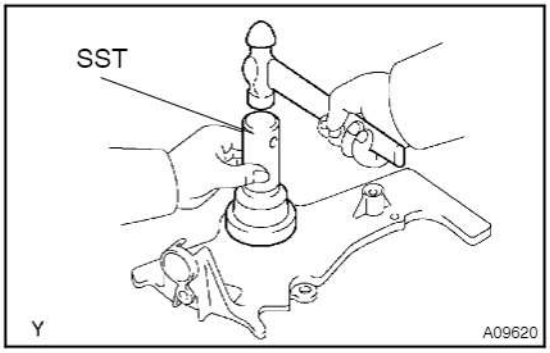
(a) Remove the camshaft sub–assembly and camshaft carrier.



44. REMOVE CAMSHAFT OIL SEAL

(a) Using a screwdriver and hammer, tap out the oil seal.

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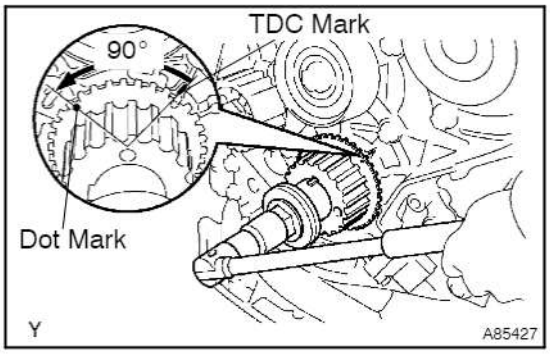
45. INSTALL CAMSHAFT OIL SEAL

(a) Using SST and a hammer, tap in a new oil seal until its surface is flush with the camshaft oil seal retainer edge.
SST 09223–46011

(b) Apply multipurpose grease to a new oil seal lip.

NOTICE:

Keep the lip free of foreign object.



46. SET NO. 1 CYLINDER TO TDC/COMPRESSION

(a) Using the crankshaft pulley bolt, turn the crankshaft to set the dot mark of the crankshaft timing gear at the position of 90° BTDC.

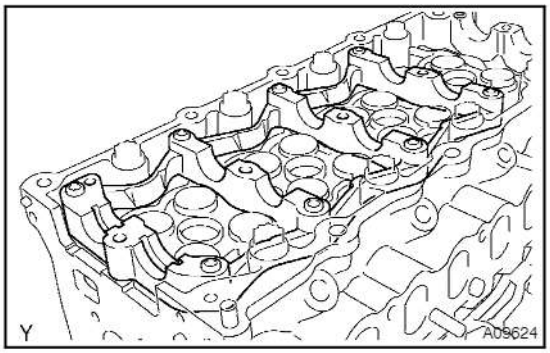
NOTICE:

If the timing belt is disengaged, the crankshaft timing gear placed at wrong angle can cause contact of the piston head with the valve head.

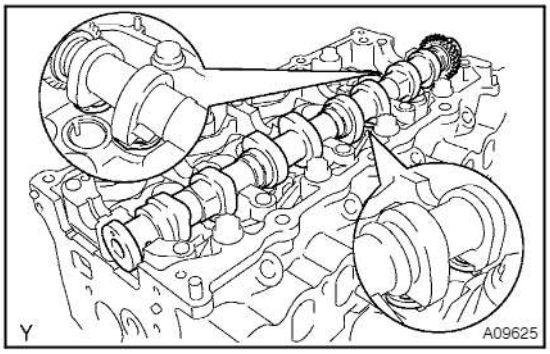
47. INSTALL CAMSHAFT

NOTICE:

Since the thrust clearance of the camshaft is small, the camshaft must be kept level while being installed. If the camshaft is not kept level, the cylinder head or camshaft may be damaged. To avoid this, the following procedures should be carried out.



(a) Place the camshaft carrier on the cylinder head.

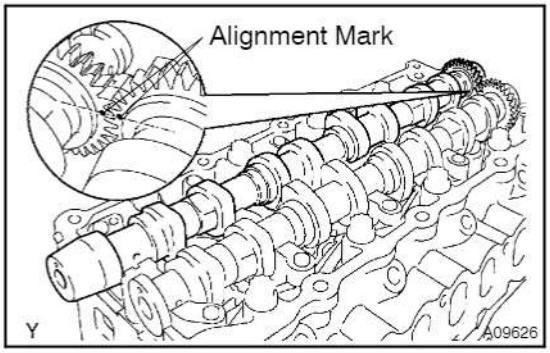


(b) Install the camshaft.

(c) Apply engine oil to the cam and gear of the camshaft, and the journal of the camshaft carrier.

(d) Place the intake camshaft on the camshaft carrier so that the No. 3 and No. 4 of the cylinder cam lobes face downward as shown in the illustration.

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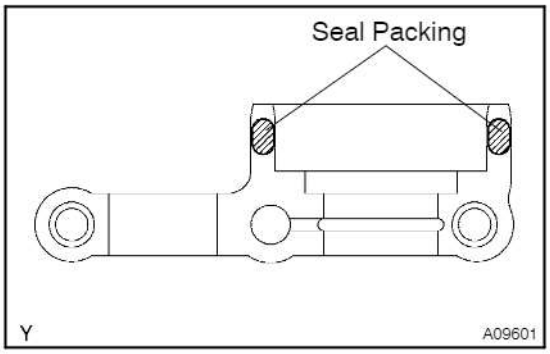
48. INSTALL NO.2 CAMSHAFT

(a) Install the No. 2 camshaft.

(b) Apply engine oil to the cam and gear of the camshaft, and the journal of the camshaft carrier.

(c) Engage the exhaust camshaft gear and intake camshaft gear by aligning the alignment marks on each gear.

(d) Roll down the exhaust camshaft onto the bearing journals while engaging the gears with each other.

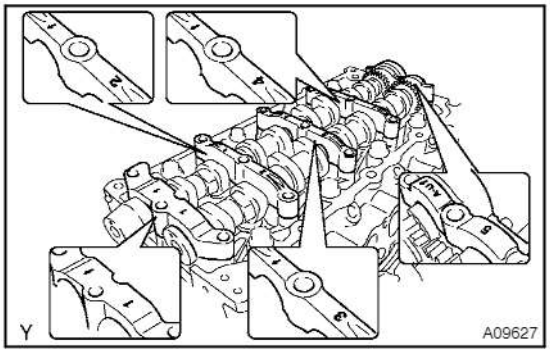


(e) Install the camshaft bearing caps.

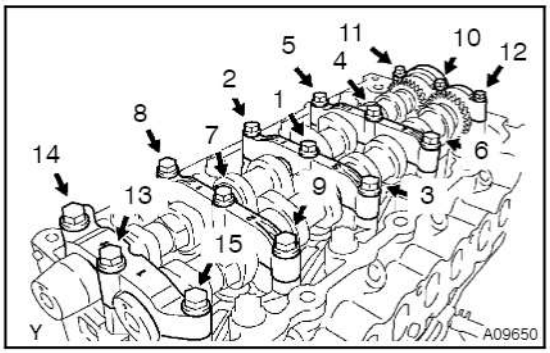
(1) Remove any old packing (FIPG) material from the No. 5 camshaft bearing cap.

(2) Apply seal packing to the No. 5 camshaft bearing cap as shown in the illustration.

Seal packing: Part No. 08826–00080 or equivalent



(3) Place the 5 bearing caps in their proper locations.



(4) Using several steps, install and tighten the 15 bearing cap bolts uniformly in the sequence shown in the illustration.

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

49. INSPECT VALVE CLEARANCE (See page 14–90)

50. ADJUST VALVE CLEARANCE (See page 14–90)

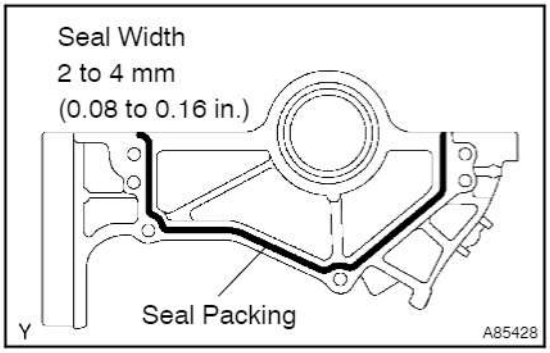
51. INSTALL CAMSHAFT OIL SEAL RETAINER

(a) Remove any old packing (FIPG) material. Be careful not to drop any oil on the contact surfaces of the oil seal retainer and cylinder block.

(1) Thoroughly clean all components to remove all the loose material.

(2) Using non–residue solvent, clean both the sealing surfaces.

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(b) Apply seal packing to the oil seal retainer as shown in the illustration.

Seal packing: Part No. 08826–00080 or equivalent

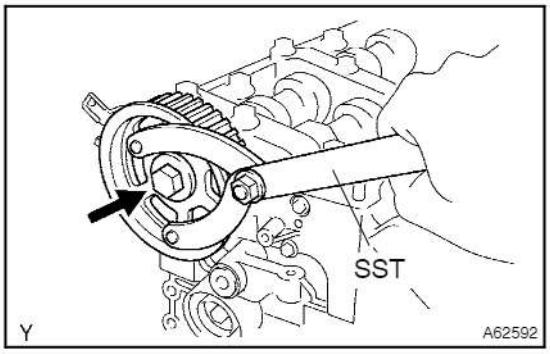
(1) Install a nozzle of which opening is cut to 2 to 4 mm (0.08 to 0.16 in.).

(2) The parts must be set within 3 minutes and must be assembled within 15 minutes after applying seal packing.

(3) Immediately remove the nozzle from the tube, then reinstall the cap.

(c) Install the oil seal retainer with the 4 bolts. Tighten the 4 bolts uniformly in several steps.

Torque: 9.8 N·m (100 kgf·cm, 7.2 ft·lbf)



52. INSTALL CAMSHAFT TIMING PULLEY

(a) Install the pulley set key to the groove of the camshaft.

(b) Align the keyway of the timing pulley with the key located on the camshaft, then slide the pulley into place.

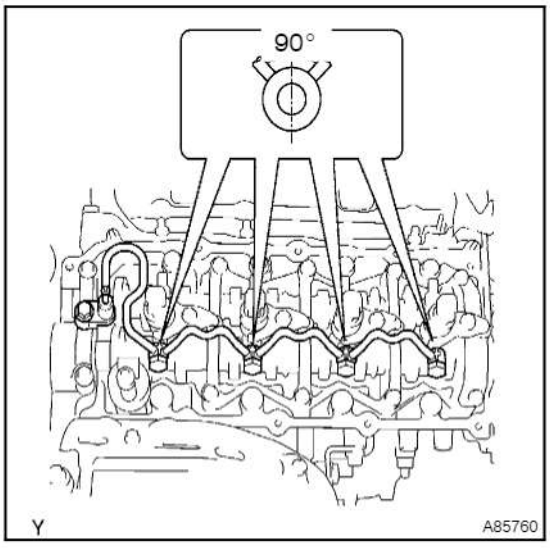
(c) Using SST, install the pulley bolt.

SST 09960–10010 (09962–01000, 09963–01000)

Torque: 88 N·m (899 kgf·cm, 65 ft·lbf)

53. INSTALL CAMSHAFT POSITION SENSOR (See page 14–108)

54. INSTALL INJECTOR ASSY



55. INSTALL NOZZLE LEAKAGE PIPE ASSY

(a) Remove the bolt which is tightened at the center of the camshaft bearing cap No. 4.

(b) Install the nozzle leakage pipe and 4 new gaskets.

NOTICE:

When installing the gaskets, pay attention to the mounting orientation. Install the gasket so that the joint of the gasket comes within the ranges shown in the illustration.

(c) Apply a light coat of engine oil to the 4 hollow screws and bolt.

(d) Tighten the 4 hollow screws and bolt by hand.

(e) Tighten the 4 hollow screws and bolt.

Torque:

16 N·m (163 kgf·cm, 12 ft·lbf) for hollow screw

20 N·m (204 kgf·cm, 15 ft·lbf) for flange bolt

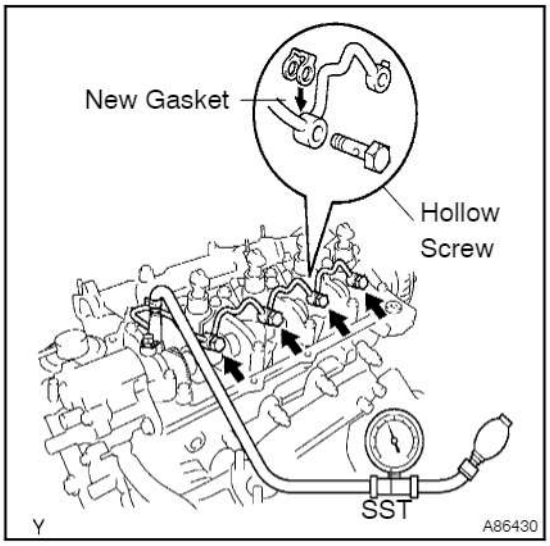
NOTICE:

In any case, when the torque exceeds the upper limit, replace the leakage pipe hollow screw and gaskets with new ones.

(f) Check that there are no leaks from the nozzle leakage pipe connection.

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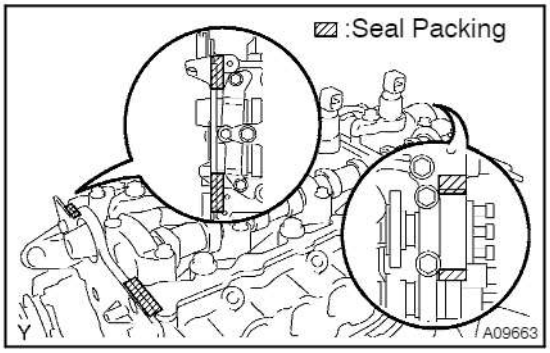
(1) Apply a light coat of soapy water (any fluid to detect fuel leakage) to the nozzle leakage pipe connection.



(2) Using SST (a turbocharger pressure gauge), attach SST to the fuel return side of the nozzle leakage pipe, then maintain 100 kPa (1.0 kgf/cm^2, 14.5 psi) of pressure for 60 seconds to check that there are no bubbles from the pipe connection.

SST 09992–00242

(3) After checking fuel leaks, wipe off soapy water from the pipe connection.



56. INSTALL CYLINDER HEAD COVER SUB–ASSY

(a) Remove any old packing (FIPG) material.

(b) Apply seal packing to the cylinder head as illustrated.
Seal packing: Part No. 08826–00080 or equivalent

(c) Install the gasket to the cylinder head cover.

(d) Install the cylinder head cover with the 10 bolts.
Torque: 13 N·m (135 kgf·cm, 9.7 ft·lbf)

57. INSTALL NOZZLE HOLDER SEAL

(a) Install 4 new nozzle holder seals.

58. INSTALL NOZZLE LEAKAGE PIPE NO.2 (See page 14–108)

59. INSTALL VACUUM PUMP ASSY (See page 14–108)

60. INSTALL INJECTION PIPE SUB–ASSY NO.1

NOTICE:

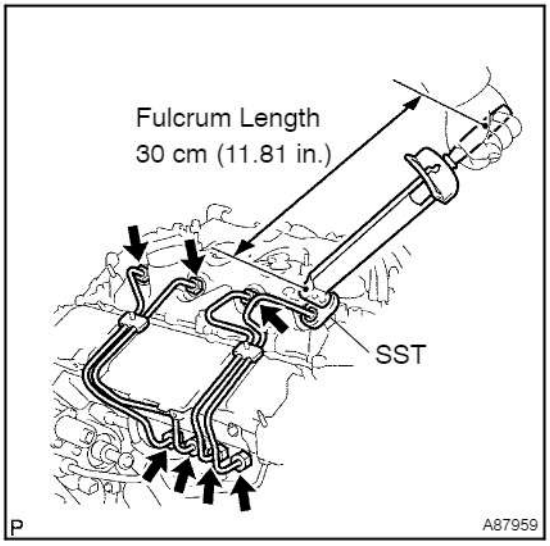
When assembling the pipes, perform the operation with the engine cold at room temperature.

(a) Install the 2 lower injection pipe clamps to the intake manifold.

(b) Remove the vinyl or plastic bag from the injector and the vinyl tape from the common rail.

(c) Temporarily install the injection pipe.

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(d) Using SST, tighten the nut of the injection pipe on the common rail side.
SST 09023–12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the injection pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

(e) Using SST, tighten the nut of the injection pipe on the injector side.
SST 09023–12700
Torque:
For used pipe:
36 N·m (372 kgf·cm, 27 ft·lbf) with SST
40 N·m (408 kgf·cm, 30 ft·lbf) without SST
For new pipe:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the injection pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

(f) Install the 2 upper injection pipe clamps.

61. INSTALL INJECTION PIPE SUB–ASSY NO.2
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

62. INSTALL INJECTION PIPE SUB–ASSY NO.3
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

63. INSTALL INJECTION PIPE SUB–ASSY NO.4
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

64. INSTALL FUEL PIPE NO.3 **(See page 14–108)**
SST 09023–12700

65. INSTALL TIMING BELT **(See page 14–138)**

66. CHECK VALVE TIMING **(See page 14–138)**

67. INSTALL TIMING CHAIN COVER PLATE **(See page 14–138)**

68. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET **(See page 14–138)**

69. INSTALL TIMING BELT GUIDE **(See page 14–138)**

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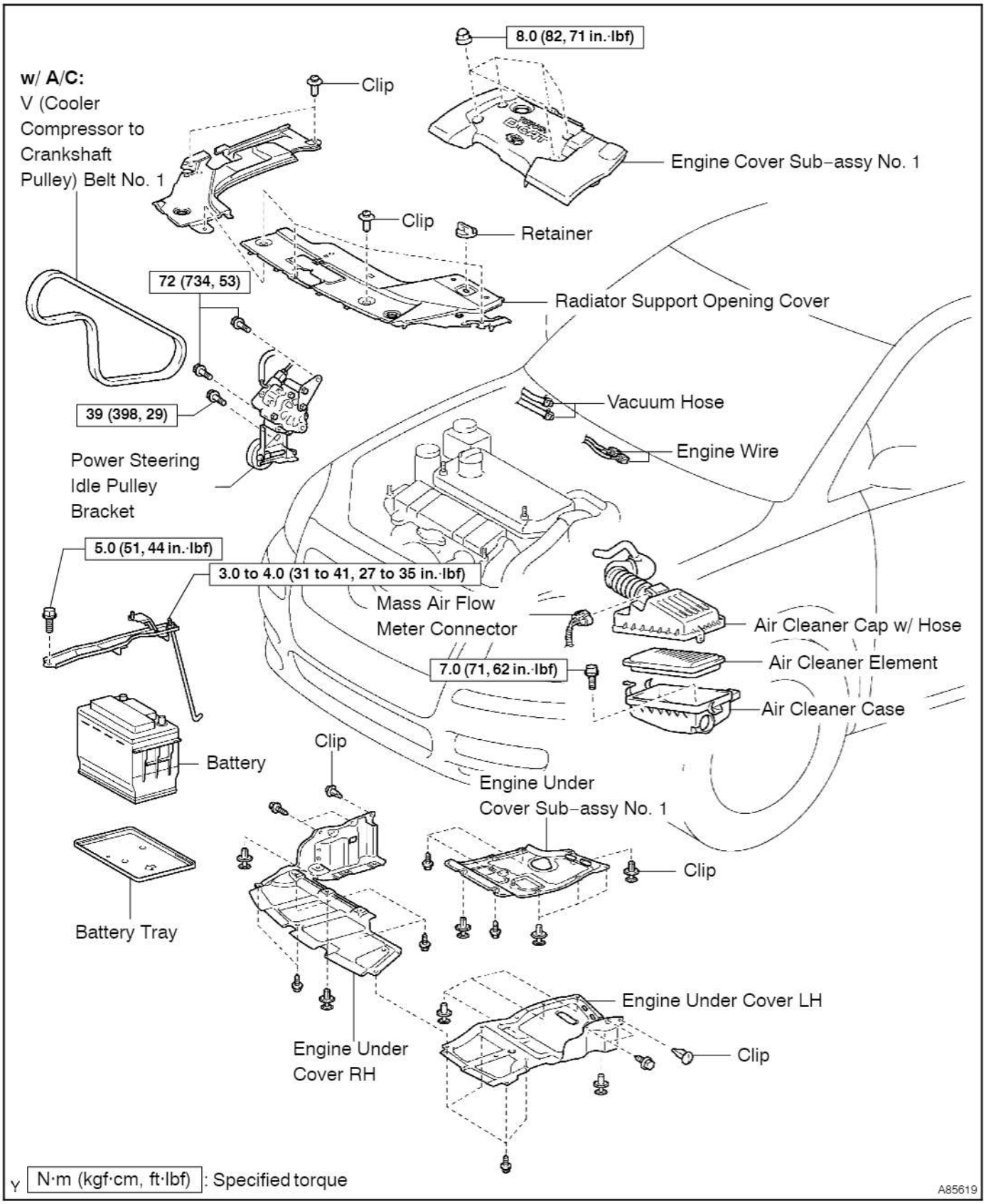
70. **INSTALL TIMING BELT NO.1 COVER (See page 14–138)**
71. **INSTALL TIMING BELT NO.2 COVER (See page 14–138)**
72. **INSTALL IDLER PULLEY SUB–ASSY (See page 14–138)**
73. **INSTALL CRANKSHAFT PULLEY (See page 14–138)**
    SST 09213–54015 (09213–70020), 09330–00021
74. **INSTALL ENGINE MOUNTING INSULATOR SUB–ASSY RH (See page 14–138)**
75. **INSTALL POWER STEERING IDLE PULLEY BRACKET (See page 14–108)**
76. **ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See Pub. No. RM1018E on page 14–269)**
77. **INSTALL INJECTOR DRIVER (See page 14–108)**
78. **INSTALL AIR TUBE NO.1 (See page 14–108)**
79. **INSTALL VACUUM RESERVOIR SUB–ASSY (See page 14–108)**
80. **INSTALL BATTERY (See page 14–108)**
81. **INSTALL AIR CLEANER ASSY (See page 14–108)**
82. **INSTALL ENGINE COVER SUB–ASSY NO.1 (See page 14–90)**
83. **INSTALL FRONT WHEEL RH**
    Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
84. **CHECK FOR FUEL LEAKS (See page 11–46)**

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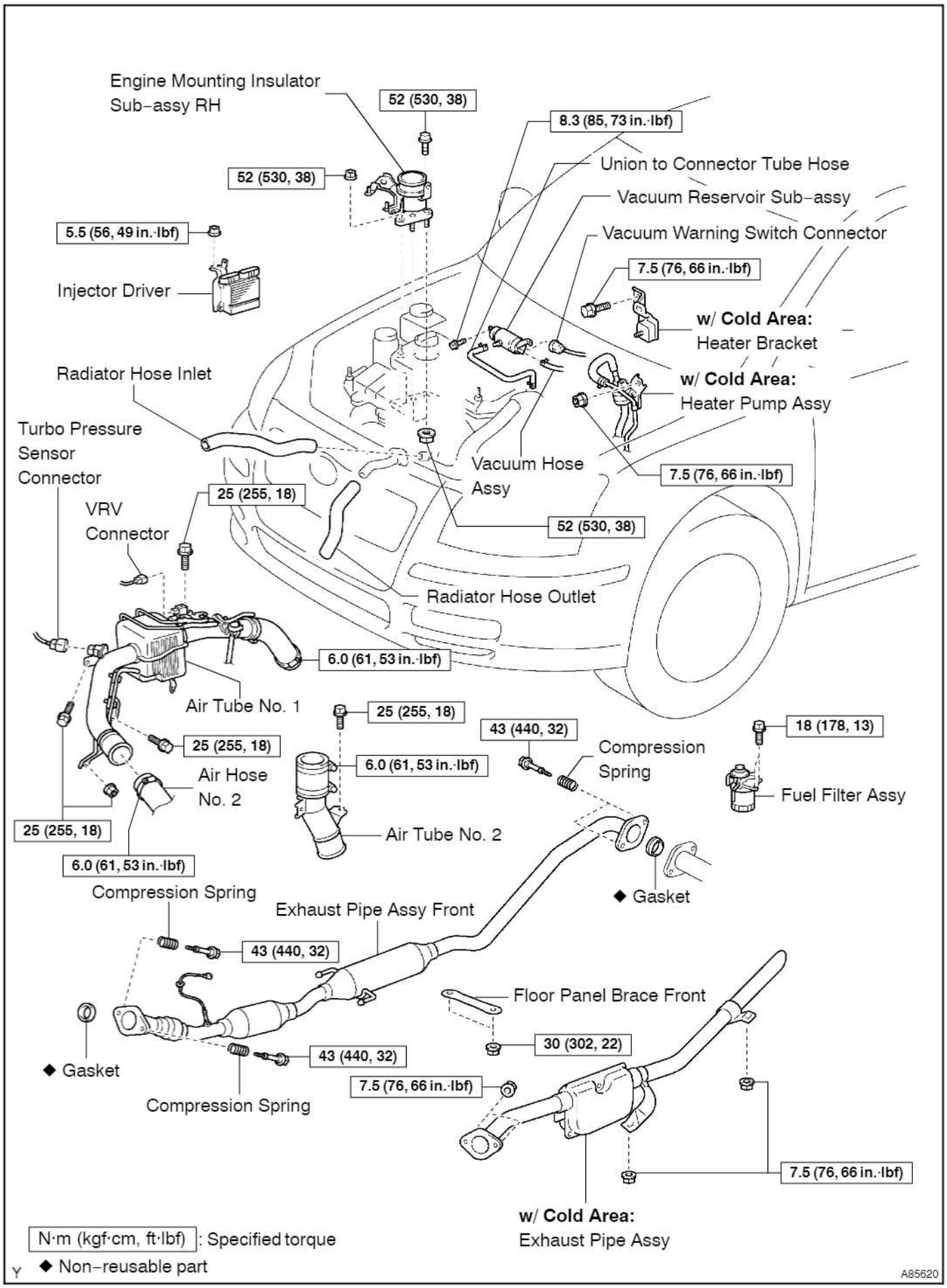
CYLINDER HEAD GASKET (1CD–FTV)(From September, 2003)

COMPONENTS

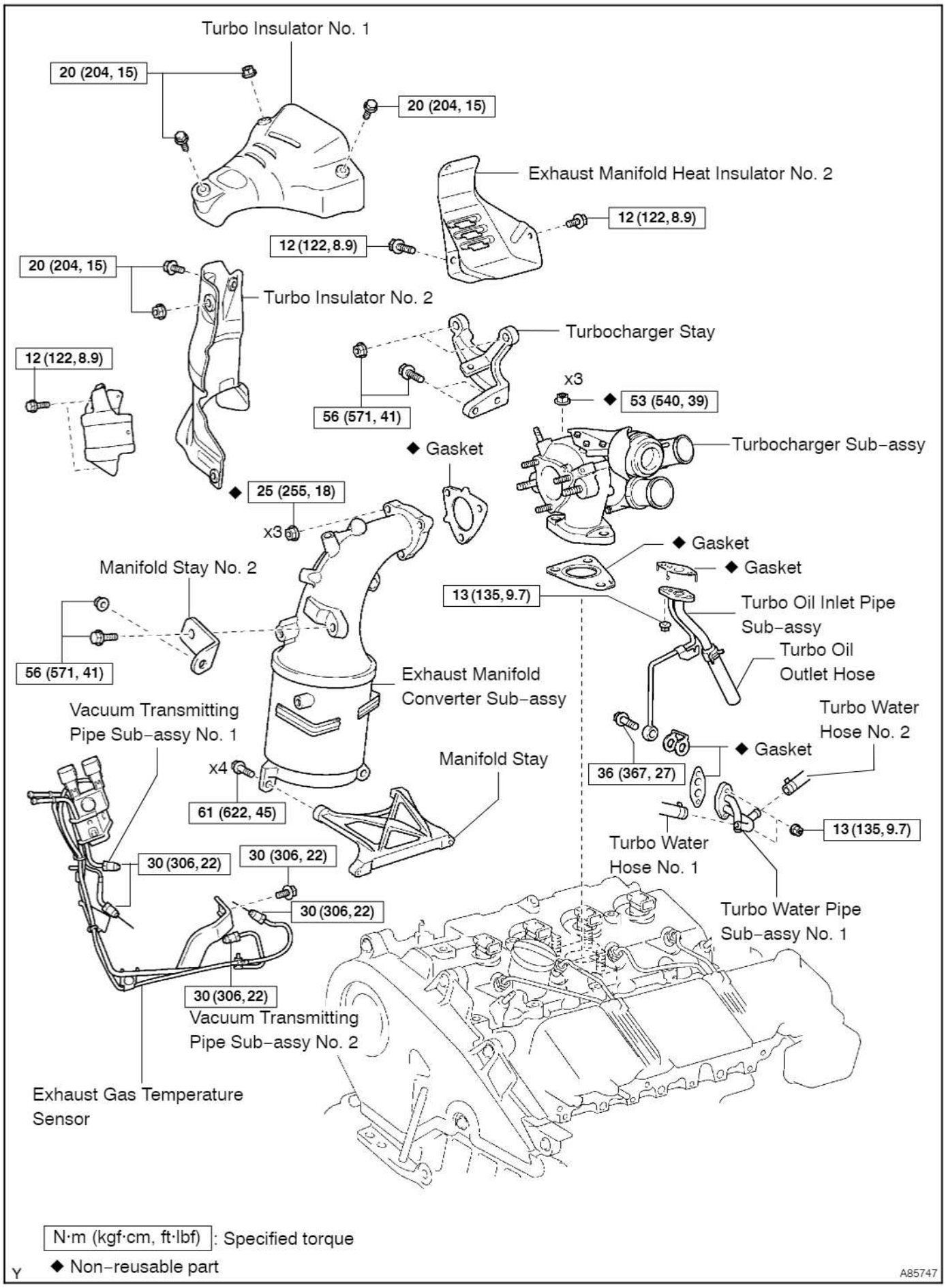
141NL–01



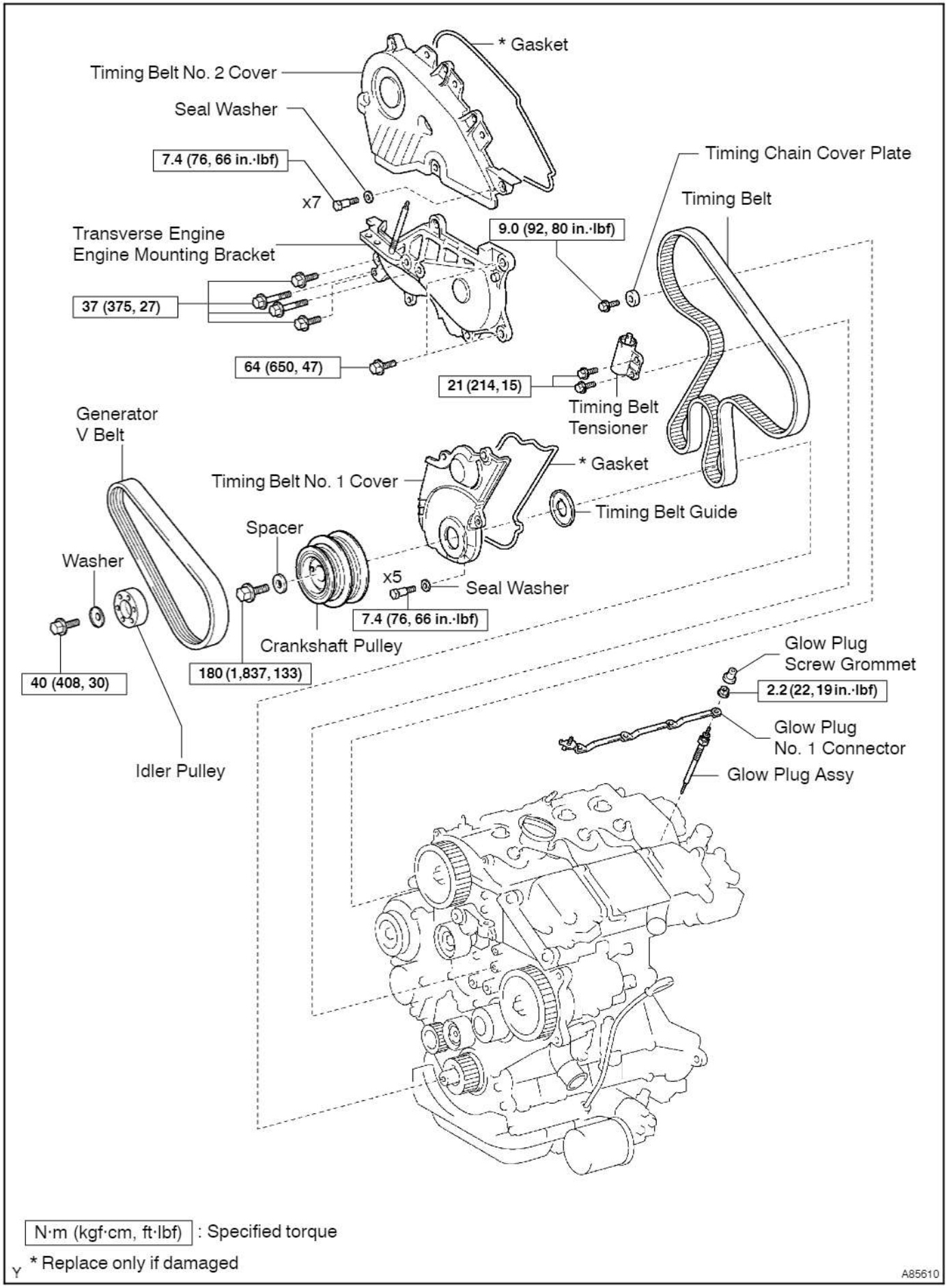
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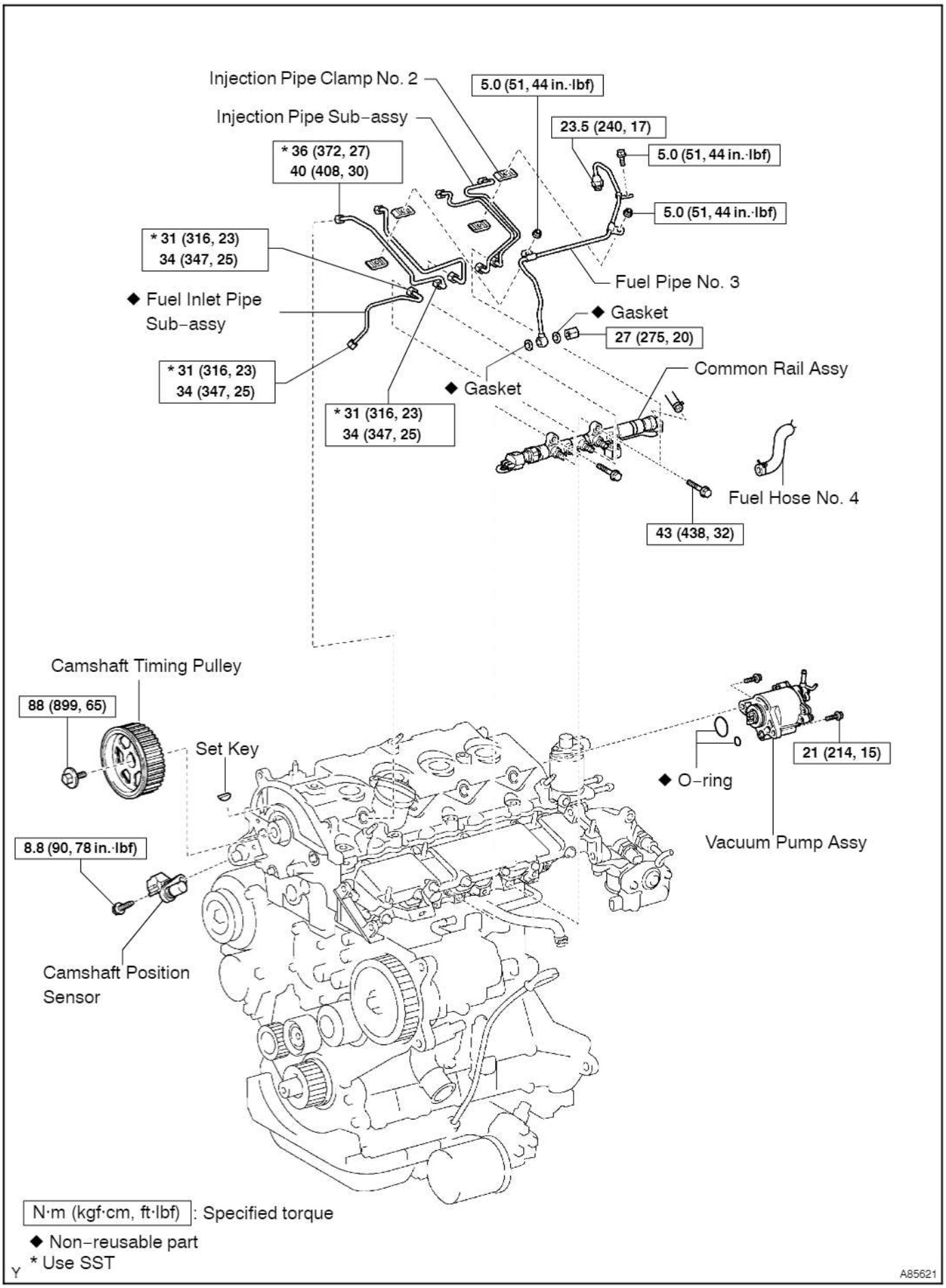
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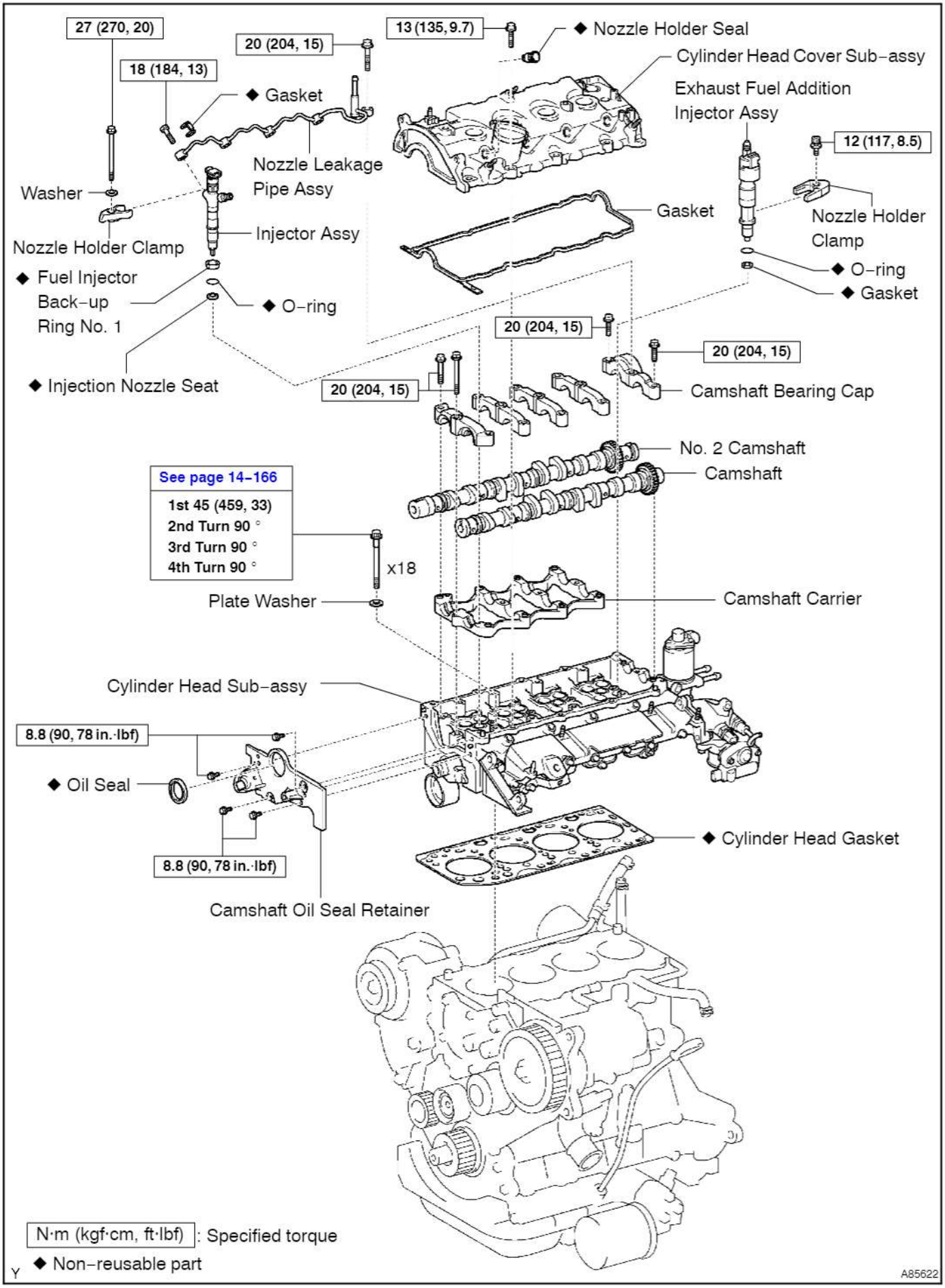
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141NM–01

REPLACEMENT

1. REMOVE FRONT WHEEL RH
2. REMOVE ENGINE UNDER COVER LH
3. REMOVE ENGINE UNDER COVER SUB–ASSY NO.1
4. REMOVE ENGINE UNDER COVER RH
5. REMOVE RADIATOR SUPPORT OPENING COVER
6. REMOVE ENGINE ROOM COVER SIDE
7. DRAIN ENGINE COOLANT (See page 16–19)
8. DRAIN ENGINE OIL (See Pub. No. RM1018E on page 17–30)
9. REMOVE ENGINE COVER SUB–ASSY NO.1 (See page 14–90)
10. REMOVE VACUUM RESERVOIR SUB–ASSY (See page 14–108)
11. REMOVE AIR CLEANER ASSY (See page 14–108)
12. REMOVE BATTERY
13. REMOVE AIR TUBE NO.2 (See page 14–108)
14. REMOVE AIR TUBE NO.1 (See page 14–108)
15. REMOVE INJECTOR DRIVER (See page 14–108)
16. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See Pub. No. RM1018E on page 14–269)
17. REMOVE GENERATOR V BELT (See Pub. No. RM1018E on page 14–269)
18. SEPARATE POWER STEERING IDLE PULLEY BRACKET (See page 14–138)
19. DISCONNECT ENGINE WIRE (See page 14–138)
20. DISCONNECT VACUUM HOSE (See page 14–108)
21. REMOVE DIFFERENTIAL PRESSURE SENSOR ASSY(See page 14–108)
22. REMOVE ENGINE MOUNTING INSULATOR SUB–ASSY RH (See page 14–138)
23. REMOVE CRANKSHAFT PULLEY (See page 14–138)
    SST 09213–54015 (09213–70020), 09330–00021, 09950–50013 (09951–05010, 09952–05010, 09953–05020, 09954–05031)
24. REMOVE IDLER PULLEY SUB–ASSY (See page 14–138)
25. REMOVE TIMING BELT NO.2 COVER (See page 14–138)
26. REMOVE TIMING BELT NO.1 COVER (See page 14–138)
27. REMOVE TIMING BELT GUIDE
28. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET (See page 14–138)
29. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14–138)
30. REMOVE TIMING CHAIN COVER PLATE (See page 14–138)
31. REMOVE TIMING BELT (See page 14–138)

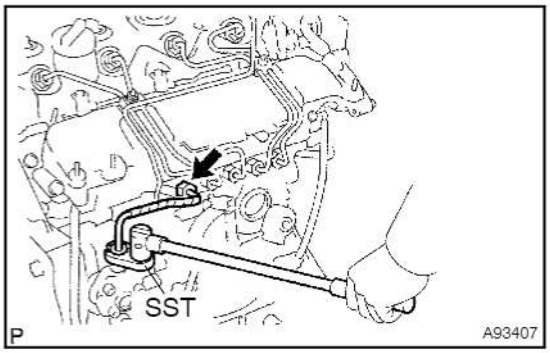
HINT:

If reusing the timing belt, draw an arrow on the timing belt which indicates the engine revolution direction and put match marks on the pulleys and timing belt.

32. REMOVE FUEL FILTER ASSY (See Pub. No. RM1018E on page 11–82)
33. REMOVE HEATER PUMP ASSY (W/ COLD AREA) (See page 13–12)
34. REMOVE HEATER BRACKET (W/ COLD AREA) (See page 13–12)
35. REMOVE FLOOR PANEL BRACE FRONT (See page 15–6)
36. REMOVE EXHAUST PIPE ASSY FRONT (See page 15–6)
37. REMOVE EXHAUST PIPE ASSY (W/ COLD AREA) (See page 13–12)
38. DISCONNECT RADIATOR HOSE INLET
39. DISCONNECT HEATER INLET WATER HOSE
40. DISCONNECT HEATER OUTLET WATER HOSE
41. DISCONNECT FUEL PIPE TO FUEL TUBE FUEL HOSE
42. DISCONNECT OIL COOLER HOSE

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43. **REMOVE TURBO INSULATOR NO.2 (See page 13–12)**
44. **REMOVE TURBO INSULATOR NO.1 (See page 13–12)**
45. **REMOVE EXHAUST MANIFOLD HEAT INSULATOR NO.2 (See page 13–12)**
46. **REMOVE EGR PIPE INSULATOR (See page 13–12)**
47. **REMOVE GENERATOR ASSY (See Pub. No. RM1018E on page 19–29)**
48. **REMOVE EXHAUST GAS TEMPERATURE SENSOR (See page 14–108)**
    SST 09023–38400
49. **REMOVE VACUUM TRANSMITTING PIPE SUB–ASSY NO.1 (See page 14–108)**
    SST 09023–38200
50. **REMOVE VACUUM TRANSMITTING PIPE SUB–ASSY NO.2 (See page 14–108)**
    SST 09023–38200
51. **REMOVE MANIFOLD STAY NO.2 (See page 13–12)**
52. **REMOVE MANIFOLD STAY (See page 13–12)**
53. **REMOVE MANIFOLD CONVERTER SUB–ASSY (See page 13–12)**
54. **REMOVE TURBOCHARGER STAY (See page 13–12)**
55. **REMOVE TURBO WATER HOSE NO.1 (See page 13–12)**
56. **REMOVE TURBO WATER HOSE NO.2 (See page 13–12)**
57. **SEPARATE TURBO OIL INLET PIPE SUB–ASSY (See page 13–12)**
58. **REMOVE TURBOCHARGER SUB–ASSY (See page 13–12)**
59. **REMOVE CAMSHAFT POSITION SENSOR (See page 14–108)**
60. **REMOVE CAMSHAFT TIMING PULLEY (See page 14–151)**
    SST 09960–10010 (09962–01000, 09963–01000)

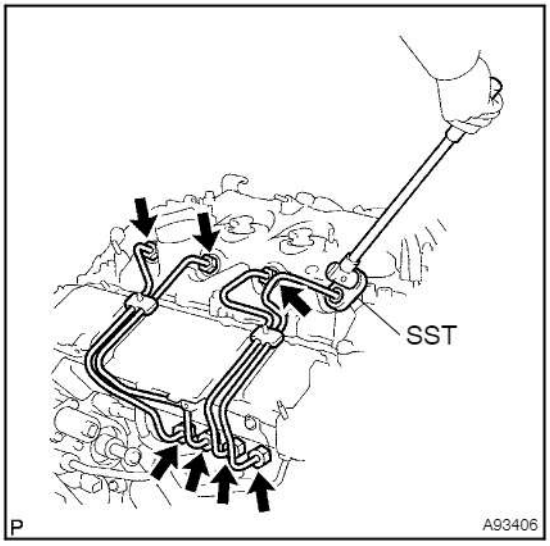


61. **REMOVE FUEL INLET PIPE SUB–ASSY**
    (a) Using SST, remove the fuel inlet pipe from the common rail side.
    SST 09023–12700
    (b) Using SST, remove the fuel inlet pipe from the pump side.
    SST 09023–12700

NOTICE:
After removing the fuel pipe, cover the common rail and injector mounting holes with vinyl tape to prevent dust from being introduced.

62. **REMOVE FUEL PIPE NO.3 (See page 14–108)**
    SST 09023–12700

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63. REMOVE INJECTION PIPE SUB–ASSY NO.1

(a) Remove the 2 upper injection pipe clamps from the intake manifold.

(b) Using SST, remove the injection pipe from the common rail side.
SST 09023–12700

(c) Using SST, remove the injection pipe from the injector side.
SST 09023–12700

(d) After removing the fuel pipe, in order to prevent dust or foreign objects from being introduced, cover the common rail with vinyl tape and protect the injector inlet with a vinyl or plastic bag.

(e) Remove the 2 lower injection pipe clamps from the intake manifold.

64. REMOVE INJECTION PIPE SUB–ASSY NO.2
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

65. REMOVE INJECTION PIPE SUB–ASSY NO.3
SST 09023–12700

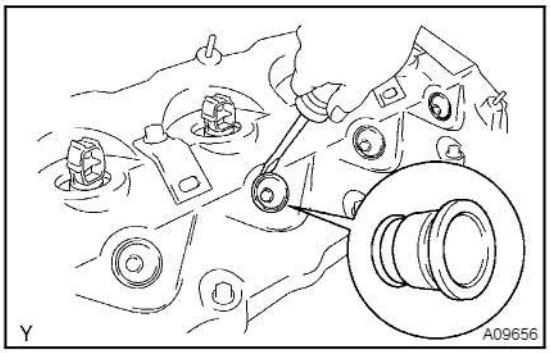
HINT:
Perform the same procedures as the injection pipe No. 1.

66. REMOVE INJECTION PIPE SUB–ASSY NO.4
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

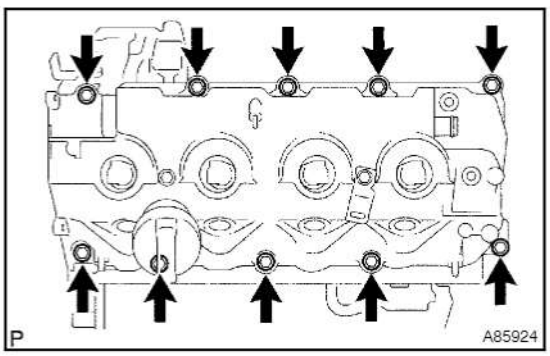
67. REMOVE VACUUM PUMP ASSY (See page 14–108)

68. REMOVE NOZZLE LEAKAGE PIPE NO.2 (See page 14–108)



69. REMOVE NOZZLE HOLDER SEAL

(a) Using a screwdriver, pry out the 4 nozzle holder seals.



70. REMOVE CYLINDER HEAD COVER SUB–ASSY

(a) Remove the 10 bolts, cylinder head cover and gasket.

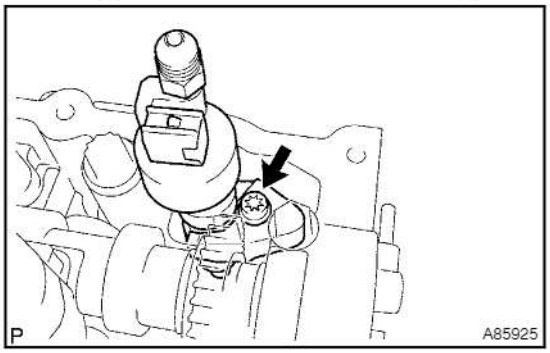
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71. REMOVE NOZZLE LEAKAGE PIPE ASSY (See page 14–151)

72. REMOVE INJECTOR ASSY (See page 11–46)

HINT:

Since each injector assembly has characteristic fuel injecting behavior, keep them in the correct order so that they can be returned to the original locations when reassembling.



73. REMOVE EXHAUST FUEL ADDITION INJECTOR ASSY

(a) Using a Torx socket wrench (T40), remove the Torx screw.

NOTICE:

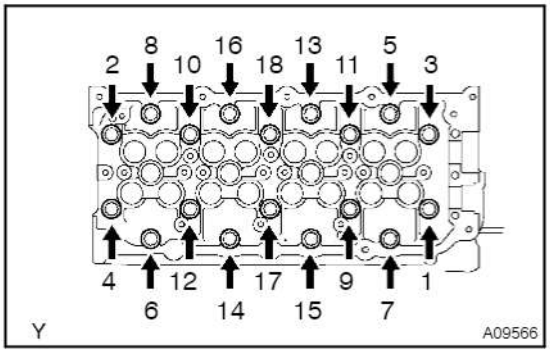
Be careful that the tools do not interfere with the resin part when removing.

(b) Remove the nozzle holder clamp, addition injector and gasket.

74. REMOVE CAMSHAFT OIL SEAL RETAINER (See page 14–151)

75. REMOVE CAMSHAFT (See page 14–151)

76. REMOVE NO.2 CAMSHAFT (See page 14–151)

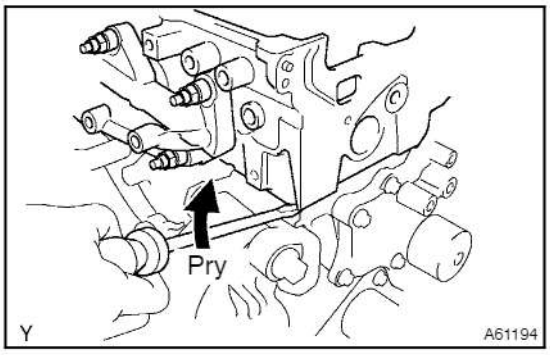


77. REMOVE CYLINDER HEAD SUB–ASSY

(a) Using several steps, loosen the 18 cylinder head bolts uniformly in the sequence shown in the illustration. Remove the 18 cylinder head bolts and plate washers.

NOTICE:

Removing the bolts in a wrong order could cause warpage or cracks of the cylinder head.



(b) Lift the cylinder head from the dowels on the cylinder block, then place the cylinder head on wooden blocks on a work bench.

NOTICE:

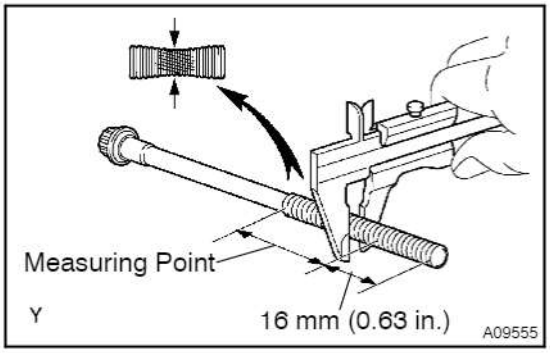
Be careful not to damage the contact surfaces of the cylinder head and cylinder block.

HINT:

To lift the cylinder head, pry between the cylinder head and cylinder block using a screwdriver.

78. REMOVE CYLINDER HEAD GASKET

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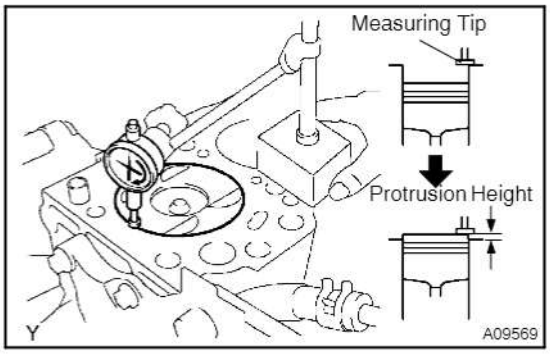
79. INSPECT CYLINDER HEAD SET BOLT

(a) Using vernier calipers, measure the tension portion diameter of the bolts.

Standard outside diameter:

10.40 to 11.00 mm (0.4094 to 0.4331 in.)

If the diameter is less than minimum, replace the bolt.



80. INSTALL CYLINDER HEAD GASKET

(a) Measure the protrusion height of the piston heads.

(1) Clean the cylinder block with solvent.

(2) Set the piston to measure to slightly before the TDC.

(3) Place a dial indicator on the cylinder block, then calibrate the dial indicator at 0 mm (0 in.).

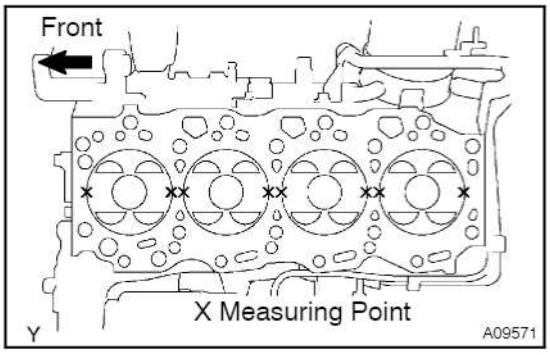
HINT:

- Place the measuring tip of the dial indicator as shown in the illustration.
- Make sure that the measuring tip is square to the cylinder block gasket and piston head when measuring.

(4) Find the most overhung position of the piston head by slowly turning the crankshaft clockwise and counterclockwise.

(5) Measure the protrusion height of the piston head for each cylinder at 2 places as shown in the illustration. (Total of 8 measurements.)

(6) Record the higher protrusion height of the 2 measurements at each cylinder.



(b) Select a new cylinder head gasket.

HINT:

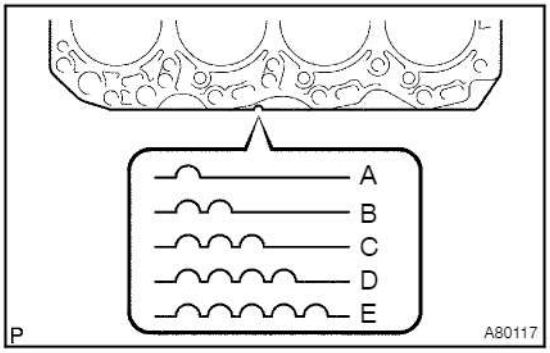
There are 5 sizes of new cylinder head gaskets, marked "A", "B", "C", "D", and "E".

New cylinder head gasket thickness:

A	0.85 to 0.95 mm (0.0335 to 0.0374 in.)
B	0.90 to 1.00 mm (0.0354 to 0.0394 in.)
C	0.95 to 1.05 mm (0.0374 to 0.0413 in.)
D	1.00 to 1.10 mm (0.0394 to 0.0433 in.)
E	1.05 to 1.15 mm (0.0413 to 0.0453 in.)

(1) Find the highest protrusion height among the 4 measurement records. It is used to select a new cylinder head gasket.

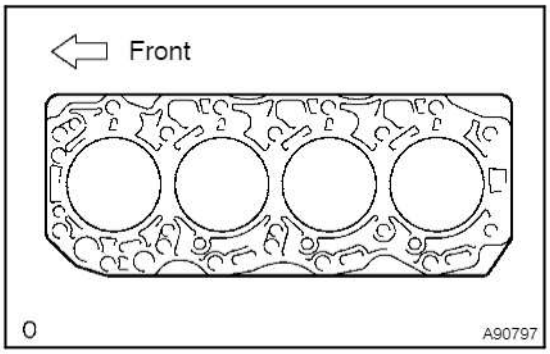
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(2) Select a new gasket among A to E using the matrix below.

New gasket matrix:

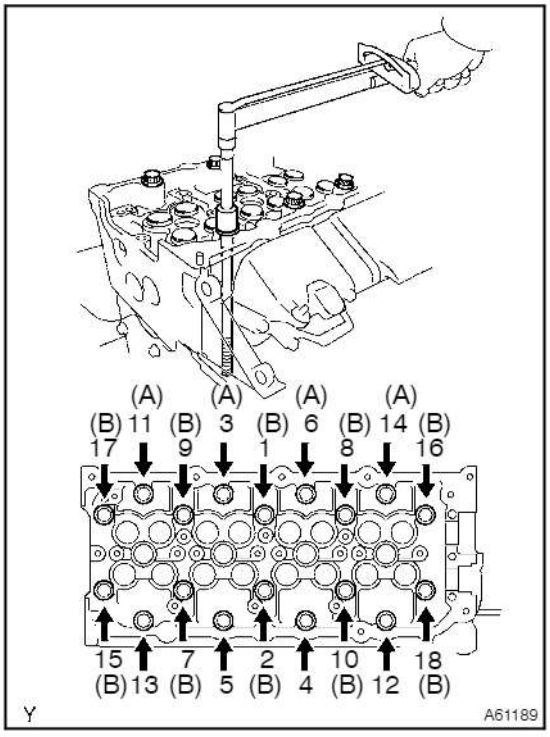
Piston Protrusion mm (in.)	Gasket Size
0.165 to 0.220 (0.0065 to 0.0087)	A
0.220 to 0.270 (0.0087 to 0.0106)	B
0.270 to 0.320 (0.0106 to 0.0126)	C
0.320 to 0.370 (0.0126 to 0.0146)	D
0.370 to 0.425 (0.0146 to 0.0167)	E



(c) Place the selected new cylinder head gasket on the cylinder block.

NOTICE:

Pay attention to the mounting orientation.



81. INSTALL CYLINDER HEAD SUB–ASSY

HINT:

- The cylinder head bolts are tightened in 4 successive steps (steps (c), (e), (f) and (g)).
- If the cylinder head bolt is broken or deformed, replace it with a new bolt.

(a) Apply a light coat of engine oil to the threads of the cylinder head bolts and plate washers.

(b) Install the plate washer to the cylinder head bolt.

(c) Using several steps, install and tighten the 18 cylinder head bolts uniformly in the sequence shown in the illustration.

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

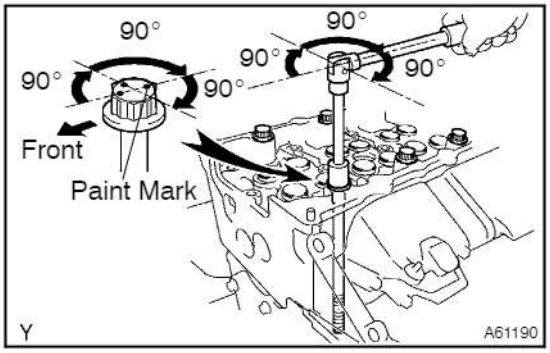
HINT:

See the table below for the bolt length.

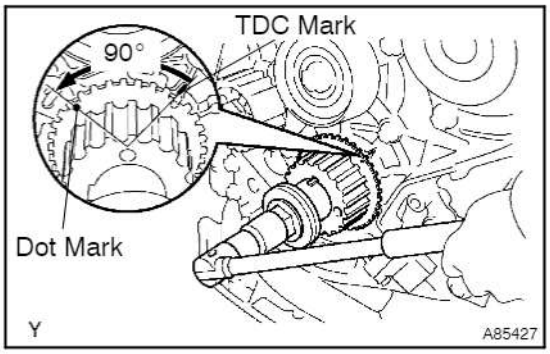
Bolt Type	Bolt Length
(A)	160mm (6.30 in.)
(B)	104mm (4.09 in.)

If the cylinder head bolt does not meet the specified torque, replace the cylinder head bolt with a new bolt.

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(d) Mark the front of the cylinder head bolt with paint.
(e) Retighten the cylinder head bolts by 90° in the same sequence as step (c).
(f) Retighten the cylinder head bolts by an additional 90° in the same sequence as step (c).
(g) Retighten the cylinder head bolts by one more additional 90° in the same sequence as step (c).
(h) Check that each painted mark is now at the intake manifold side.



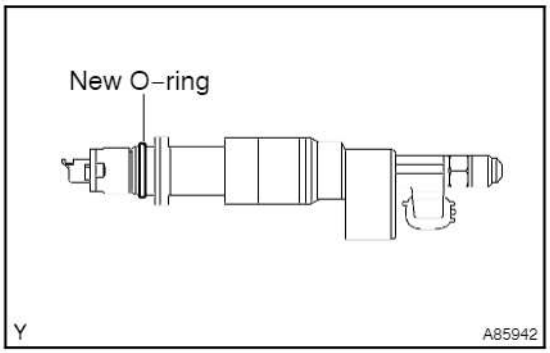
82. SET NO. 1 CYLINDER TO TDC/COMPRESSION

(a) Using the crankshaft pulley bolt, turn the crankshaft to set the dot mark of the crankshaft timing gear at the position of 90° BTDC.

NOTICE:

If the timing belt is disengaged, the crankshaft timing gear placed at wrong angle can cause contact of the piston head with the valve head.

83. INSTALL CAMSHAFT (See page 14–151)
84. INSTALL NO.2 CAMSHAFT (See page 14–151)
85. REMOVE CAMSHAFT OIL SEAL (See page 14–151)
86. INSTALL CAMSHAFT OIL SEAL (See page 14–151)
SST 09223–46011
87. INSTALL CAMSHAFT OIL SEAL RETAINER (See page 14–151)



88. INSTALL EXHAUST FUEL ADDITION INJECTOR ASSY

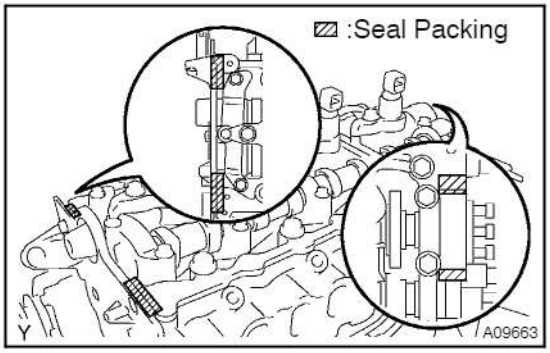
(a) Install a new gasket to the cylinder head.
(b) Install a new O–ring to the injector.
(c) Apply a light coat of engine oil to the O–ring on the injector.
(d) Install the addition injector and nozzle holder clamp.
(e) Using a Torx socket wrench (T40), install the Torx screw.
Torque: 12 N·m (117 kgf·cm, 8.5 ft·lbf)

NOTICE:

Be careful that the tools do not interfere with the resin part when installing.

89. INSTALL CAMSHAFT TIMING PULLEY (See page 14–151)
SST 09960–10010 (09962–01000, 09963–01000)
90. INSTALL CAMSHAFT POSITION SENSOR (See page 14–108)
91. INSTALL INJECTOR ASSY (See page 11–46)
92. INSTALL NOZZLE LEAKAGE PIPE ASSY (See page 14–151)
SST 09992–00242

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93. INSTALL CYLINDER HEAD COVER SUB–ASSY

(a) Remove any old packing (FIPG) material.

(b) Apply seal packing to the cylinder head as illustrated.
Seal packing: Part No. 08826–00080 or equivalent

(c) Install the gasket to the head cover.

(d) Install the cylinder head cover with the 10 bolts.
Torque: 13 N·m (135 kgf·cm, 9.7 ft·lbf)

94. INSTALL NOZZLE HOLDER SEAL

(a) Install 4 new nozzle holder seals.

95. INSTALL NOZZLE LEAKAGE PIPE NO.2 (See page 14–108)

96. INSTALL VACUUM PUMP ASSY (See page 14–108)

97. INSTALL INJECTION PIPE SUB–ASSY NO.1

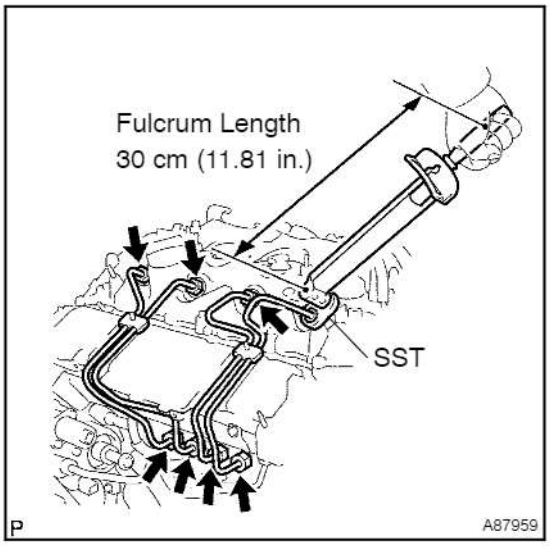
NOTICE:

When assembling the pipes, perform the operation with the engine cold at room temperature.

(a) Remove the vinyl or plastic bag from the injector and the vinyl tape from the common rail.

(b) Install the 2 lower injection pipe clamps to the intake manifold.

(c) Temporarily install the injection pipe.



(d) Using SST, tighten the nut of the injection pipe on the common rail side.
SST 09023–12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:

- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the injection pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

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(e) Using SST, tighten the nut of the injection pipe on the injector side.
SST 09023–12700
Torque:
For used pipe:
36 N·m (372 kgf·cm, 27 ft·lbf) with SST
40 N·m (408 kgf·cm, 30 ft·lbf) without SST
For new pipe:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the injection pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

(f) Install the 2 upper injection pipe clamps.

98. INSTALL INJECTION PIPE SUB–ASSY NO.2
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

99. INSTALL INJECTION PIPE SUB–ASSY NO.3
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

100. INSTALL INJECTION PIPE SUB–ASSY NO.4
SST 09023–12700

HINT:
Perform the same procedures as the injection pipe No. 1.

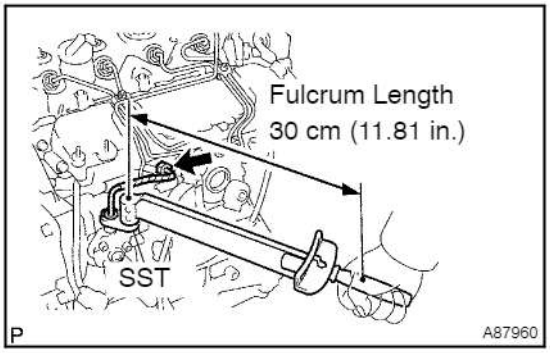
101. INSTALL FUEL PIPE NO.3 **(See page 14–108)**
SST 09023–12700

102. INSTALL FUEL INLET PIPE SUB–ASSY

NOTICE:
- **In case of replacing the cylinder head gasket, the fuel inlet pipe must be replaced, too.**
- **When assembling the pipe, perform the operation with the engine cold at room temperature.**

(a) Temporarily install a new fuel inlet pipe.

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(b) Using SST, tighten the nut of the fuel inlet pipe on the common rail side.
SST 09023–12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the inlet pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

(c) Using SST, tighten the nut of the fuel inlet pipe on the pump side.
SST 09023–12700
Torque:
31 N·m (316 kgf·cm, 23 ft·lbf) with SST
34 N·m (347 kgf·cm, 25 ft·lbf) without SST

HINT:
- Use a torque wrench with the fulcrum length of 30 cm (11.81 in.).
- After the inlet pipe is reassembled, check that the used pipe has no deflection and is installed properly. If it has deflection or could not be installed properly, replace the used pipe with a new pipe.

103. INSTALL TURBOCHARGER SUB–ASSY (See page 13–12)
104. INSTALL TURBO OIL INLET PIPE SUB–ASSY (See page 13–12)
105. INSTALL TURBOCHARGER STAY (See page 13–12)
106. INSTALL MANIFOLD CONVERTER SUB–ASSY (See page 13–12)
107. INSTALL MANIFOLD STAY NO.2 (See page 13–12)
108. INSTALL VACUUM TRANSMITTING PIPE SUB–ASSY NO.2 (See page 14–108)
SST 09023–38200
109. INSTALL VACUUM TRANSMITTING PIPE SUB–ASSY NO.1 (See page 14–108)
SST 09023–38200
110. INSTALL EXHAUST GAS TEMPERATURE SENSOR (See page 14–108)
SST 09023–38400
111. INSTALL GENERATOR ASSY (See Pub. No. RM1018E on page 19–29)
112. INSTALL EGR PIPE INSULATOR (See page 13–12)
113. INSTALL EXHAUST MANIFOLD HEAT INSULATOR NO.2 (See page 13–12)
114. INSTALL TURBO INSULATOR NO.1 (See page 13–12)
115. INSTALL TURBO INSULATOR NO.2 (See page 13–12)
116. INSTALL EXHAUST PIPE ASSY (W/ COLD AREA) (See page 13–12)
117. INSTALL EXHAUST PIPE ASSY FRONT (See page 15–6)
118. INSTALL FLOOR PANEL BRACE FRONT (See page 15–6)
119. INSTALL HEATER BRACKET (W/ COLD AREA) (See page 13–12)
120. INSTALL HEATER PUMP ASSY (W/ COLD AREA) (See page 13–12)
121. INSTALL FUEL FILTER ASSY (See Pub. No. RM1018E on page 11–82)

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122. **SET NO. 1 CYLINDER TO TDC/COMPRESSION** (See page 14–138)
SST 09960–10010 (09962–01000, 09963–01000)
123. **INSTALL TIMING BELT** (See page 14–138)
124. **CHECK VALVE TIMING** (See page 14–138)
125. **INSTALL TIMING CHAIN COVER PLATE** (See page 14–138)
126. **INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET** (See page 14–138)
127. **INSTALL TIMING BELT GUIDE** (See page 14–138)
128. **INSTALL TIMING BELT NO.1 COVER** (See page 14–138)
129. **INSTALL TIMING BELT NO.2 COVER** (See page 14–138)
130. **INSTALL IDLER PULLEY SUB–ASSY** (See page 14–138)
131. **INSTALL CRANKSHAFT PULLEY** (See page 14–138)
SST 09213–54015 (09213–70020), 09330–00021
132. **INSTALL ENGINE MOUNTING INSULATOR SUB–ASSY RH** (See page 14–138)
133. **INSTALL POWER STEERING IDLE PULLEY BRACKET** (See page 14–108)
134. **ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1**
(See Pub. No. RM1018E on page 14–269)
135. **INSTALL INJECTOR DRIVER** (See page 14–108)
136. **INSTALL AIR TUBE NO.1** (See page 14–108)
137. **INSTALL AIR TUBE NO.2** (See page 14–108)
138. **INSTALL DIFFERENTIAL PRESSURE SENSOR ASSY** (See page 14–108)
139. **INSTALL BATTERY** (See page 14–108)
140. **INSTALL AIR CLEANER ASSY** (See page 14–108)
141. **INSTALL VACUUM RESERVOIR SUB–ASSY** (See page 14–108)
142. **INSTALL ENGINE COVER SUB–ASSY NO.1** (See page 14–90)
143. **INSTALL FRONT WHEEL RH**
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
144. **ADD ENGINE OIL (See Pub. No. RM1018E on page 17–30)**
145. **ADD ENGINE COOLANT** (See page 16–19)
146. **CHECK FOR FUEL LEAKS** (See page 11–46)
147. **CHECK FOR ENGINE OIL LEAKS**
148. **CHECK FOR ENGINE COOLANT LEAKS** (See page 16–15)
149. **CHECK FOR EXHAUST GAS LEAKS**

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CRANKSHAFT SEAL (1CD–FTV)(From September, 2003)

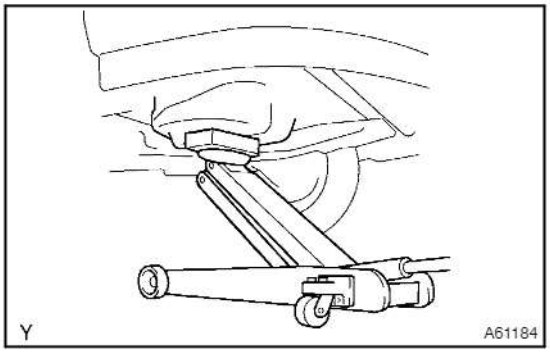
141NN–01

REPLACEMENT

1. **DRAIN ENGINE OIL**

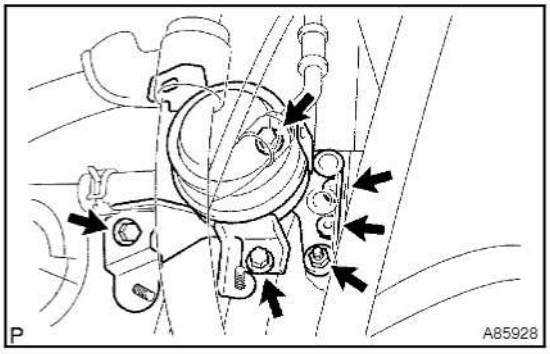
(a) Install a new gasket and the drain plug after draining engine oil.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

2. **REMOVE FRONT WHEEL RH**
3. **REMOVE ENGINE UNDER COVER SUB–ASSY NO.1**
4. **REMOVE ENGINE UNDER COVER RH**
5. **REMOVE RADIATOR SUPPORT OPENING COVER**
6. **REMOVE ENGINE ROOM COVER SIDE**
7. **REMOVE ENGINE COVER NO.1 (See page 14–90)**
8. **REMOVE INJECTOR DRIVER (See page 14–108)**
9. **REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See Pub. No. RM1018E on page 14–269)**
10. **REMOVE GENERATOR V BELT (See Pub. No. RM1018E on page 14–269)**
11. **SEPARATE POWER STEERING IDLE PULLEY BRACKET (See page 14–138)**
12. **DISCONNECT ENGINE WIRE (See page 14–138)**
13. **DISCONNECT VACUUM HOSE (See page 14–108)**



14. **REMOVE ENGINE MOUNTING INSULATOR SUB–ASSY RH**

(a) Place a wooden block on a jack underneath the engine.

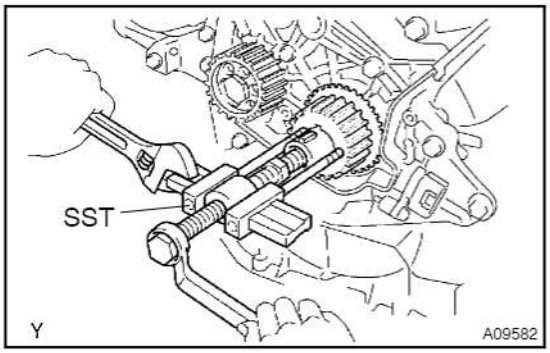


(b) Remove the 3 bolts and 3 nuts, then detach the engine mounting insulator sub–assembly.

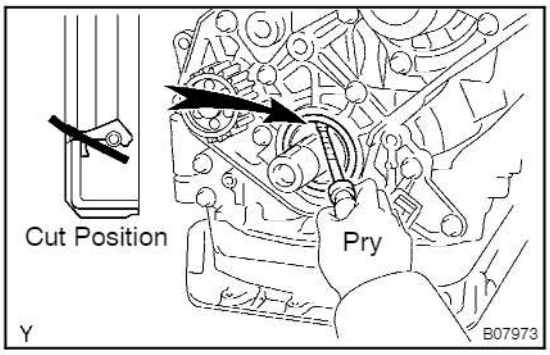
15. **REMOVE CRANKSHAFT PULLEY (See page 14–138)**
SST 09213–54015 (09213–70020), 09330–00021, 09950–50013 (09951–05010, 09952–05010, 09953–05020, 09954–05031)
16. **REMOVE IDLER PULLEY SUB–ASSY (See page 14–138)**
17. **REMOVE TIMING BELT NO.2 COVER (See page 14–138)**
18. **REMOVE TIMING BELT NO.1 COVER (See page 14–138)**
19. **REMOVE TIMING BELT GUIDE**
20. **REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET (See page 14–138)**

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21. **SET NO. 1 CYLINDER TO TDC/COMPRESSION** (See page 14–138)
22. **REMOVE TIMING CHAIN COVER PLATE** (See page 14–138)
23. **REMOVE TIMING BELT** (See page 14–138)



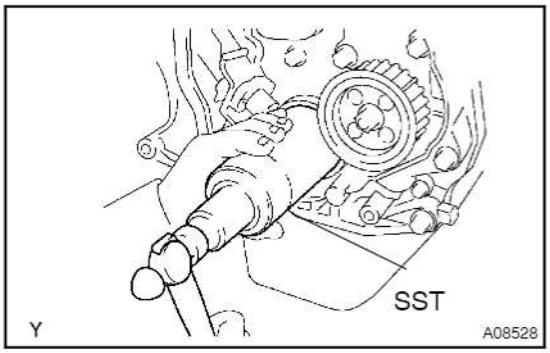
24. **REMOVE CRANKSHAFT TIMING PULLEY**
(a) If the timing pulley cannot be removed by hand, use SST to remove the pulley.
SST 09950–50013 (09951–05010, 09952–05010, 09953–05010, 09953–05020, 09954–05021)



25. **REMOVE CRANKSHAFT 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. Wrap the tip of the screwdriver with tape.

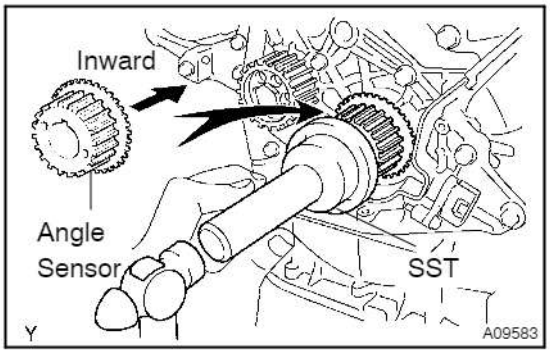


26. **INSTALL CRANKSHAFT SEAL**
(a) Apply multipurpose grease to a new oil seal lip.

NOTICE:

Keep the lip free of foreign objects.

(b) Using SST and a hammer, tap in the oil seal until its surface is flush with the oil pump edge.
SST 09316–60011 (09316–00011)



27. **INSTALL CRANKSHAFT TIMING PULLEY**
(a) Align the keyway of the timing pulley with the key located on the crankshaft, then slide the pulley into place.
(b) Using SST and a hammer, tap in the timing pulley with the angle sensor facing inward.
SST 09223–46011

28. **SET NO. 1 CYLINDER TO TDC/COMPRESSION** (See page 14–138)
SST 09960–10010 (09962–01000, 09963–01000)
29. **INSTALL TIMING BELT** (See page 14–138)
30. **CHECK VALVE TIMING** (See page 14–138)

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31. **INSTALL TIMING CHAIN COVER PLATE (See page 14–138)**
32. **INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET (See page 14–138)**
33. **INSTALL TIMING BELT GUIDE (See page 14–138)**
34. **INSTALL TIMING BELT NO.1 COVER (See page 14–138)**
35. **INSTALL TIMING BELT NO.2 COVER (See page 14–138)**
36. **INSTALL IDLER PULLEY SUB–ASSY (See page 14–138)**
37. **INSTALL CRANKSHAFT PULLEY (See page 14–138)**
    SST 09213–54015 (09213–70020), 09330–00021
38. **INSTALL ENGINE MOUNTING INSULATOR SUB–ASSY RH (See page 14–138)**
39. **INSTALL POWER STEERING IDLE PULLEY BRACKET (See page 14–108)**
40. **ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See Pub. No. RM1018E on page 14–269)**
41. **INSTALL INJECTOR DRIVER (See page 14–108)**
42. **INSTALL ENGINE COVER NO.1 (See page 14–90)**
43. **INSTALL FRONT WHEEL RH**
    Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
44. **ADD ENGINE OIL**
45. **CHECK FOR ENGINE OIL LEAKS**

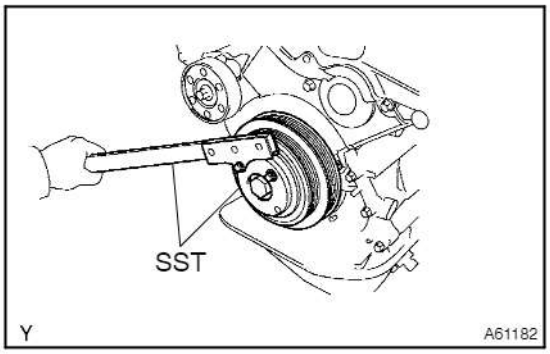
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ENGINE REAR OIL SEAL (1CD–FTV)(From September, 2003)

141NO–01

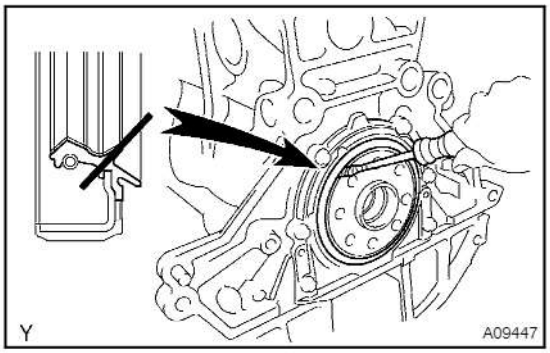
REPLACEMENT

1. **REMOVE MANUAL TRANSAXLE ASSY (See Pub. No. RM1018E on page 41–33)**
   SST 09930–00010, 09628–62011, 09520–01010, 09520–24010 (09520–32040)
2. **REMOVE CLUTCH COVER ASSY (See Pub. No. RM1018E on page 42–26)**
3. **REMOVE CLUTCH DISC ASSY (See Pub. No. RM1018E on page 42–26)**



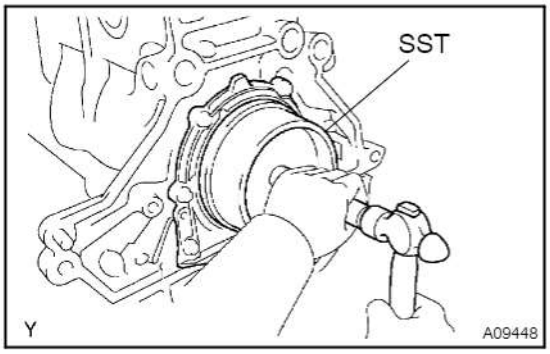
4. **REMOVE FLYWHEEL SUB–ASSY**
(a) Hold the crankshaft with SST.
SST 09213–54015 (09213–70020), 09330–00021
(b) Using a Torx socket wrench (T55), remove the 8 Torx screws and flywheel.

5. **REMOVE REAR END PLATE**
(a) Remove the 2 bolts and rear end plate.



6. **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:
After removing, check that the crankshaft is not damaged. If damaged, smooth the surface with 400–grit sandpaper.



7. **INSTALL ENGINE REAR OIL SEAL**
(a) Apply multipurpose grease to a new oil seal lip.

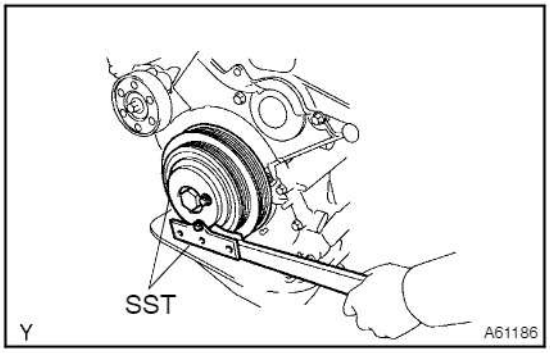
NOTICE:
Keep the lip free of foreign objects.

(b) Using SST and a hammer, tap in the oil seal until its surface is flush with the rear oil seal retainer edge.
SST 09223–15030, 09950–70010 (09951–07100)

NOTICE:
Wipe off extra grease on the crankshaft.

8. **INSTALL REAR END PLATE**
Torque: 8.4 N·m (86 kgf·cm, 74 in.·lbf)

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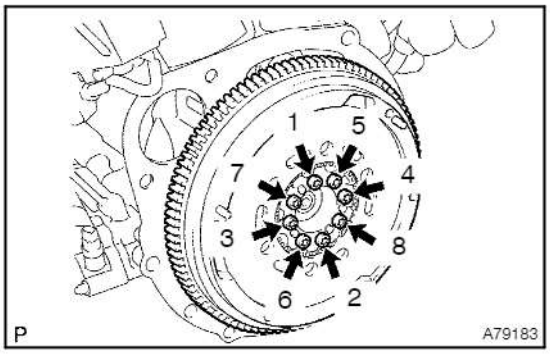


9. INSTALL FLYWHEEL SUB–ASSY

(a) Hold the crankshaft with SST.
SST 09213–54015 (09213–70020), 09330–00021

(b) Clean the bolts and bolt holes.

(c) Apply adhesive to the 2 or 3 threads of the bolt end.
Adhesive: Part No. 08833–00070, THREE BOND 1324 or equivalent



(d) Using a Torx socket wrench (T55), uniformly install and tighten the 8 Torx screws in several steps in the sequence shown in the illustration.
Torque: 71 N·m (720 kgf·cm, 52 ft·lbf)

10. INSTALL CLUTCH DISC ASSY (See Pub. No. RM1018E on page 42–26)
SST 09301–00220

11. INSTALL CLUTCH COVER ASSY (See Pub. No. RM1018E on page 42–26)

12. INSTALL MANUAL TRANSAXLE ASSY (See Pub. No. RM1018E on page 41–33)
SST 09670–00010

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