1410P–01

REPLACEMENT

1. DISCONNECT BATTERY NEGATIVE TERMINAL

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

(a) Remove the 4 bolts and under cover.

3. REMOVE ENGINE UNDER COVER ASSY REAR

(a) Remove the 4 bolts and under cover.

4. DRAIN ENGINE COOLANT (See page 16–34)

5. REMOVE HOOD SUB–ASSY

(a) Remove the 4 bolts and hood sub–assy.

6. REMOVE AIR CLEANER ASSY

7. REMOVE INTERCOOLER ASSY (See page 13–11)

8. REMOVE RADIATOR ASSY (See page 13–8)

9. REMOVE FAN SHROUD

10. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (W/ AIR CONDITIONING) (See page 14–128)

11. REMOVE FAN AND GENERATOR V BELT (See page 14–128)

12. REMOVE FLUID COUPLING ASSY

(a) Remove the 4 pulley nuts, the fan, fluid coupling and fan pulley.

13. REMOVE FAN PULLEY

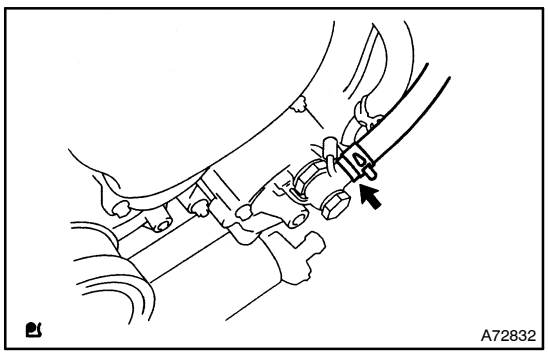
14. SEPARATE COMPRESSOR AND MAGNETIC CLUTCH (W/ AIR CONDITIONING)

(a) Disconnect the connector.

(b) Remove the 4 bolts and compressor and magnetic clutch.

HINT:

Disconnect the compressor and magnetic clutch with the high and low pressure hoses connected, and it should be hung with rope.



15. DISCONNECT VACUUM HOSE

(a) Disconnect the vacuum hose as shown in the illustration.

16. SEPARATE VANE PUMP OIL RESERVOIR ASSY

(a) Remove the 3 bolts and vane pump oil reservoir assy.

HINT:

Disconnect the vane pump oil reservoir assy with the hose connected, and then it should be hung with rope.

17. REMOVE VANE PUMP ASSY

(a) Remove the 2 nuts and vane pump assy.

HINT:

Disconnect the vane pump assy with the hose connected, and then it should be hung with rope.

18. DISCONNECT HEATER WATER INLET HOSE A

19. DISCONNECT HEATER WATER OUTLET HOSE A(FROM HEATER UNIT)

20. DISCONNECT INJECTION PUMP TO FUEL FILTER FUEL HOSE OR PIPE

21. DISCONNECT INJECTION PUMP TO FUEL PIPE FUEL HOSE

22. DISCONNECT ENGINE WIRE

23. REMOVE MANUAL TRANSMISSION UNIT ASSY (M/T TRANSMISSION) (See page 41–13)

24. REMOVE CLUTCH COVER ASSY (M/T TRANSMISSION) (See page 42–15)

25. REMOVE CLUTCH DISC ASSY (M/T TRANSMISSION) (See page 42–15)

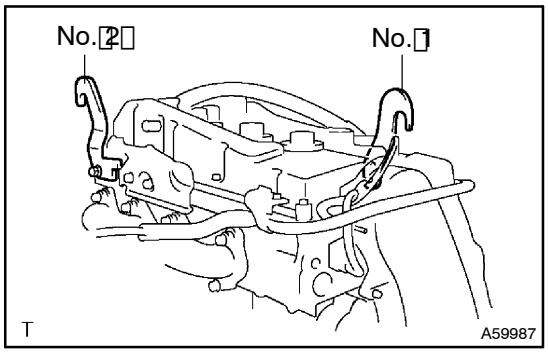
26. REMOVE FLYWHEEL SUB–ASSY (M/T TRANSMISSION) (See page 14–183)

27. REMOVE AUTOMATIC TRANSMISSION ASSY (A/T TRANSMISSION) (See page 40–20)

28. REMOVE DRIVE PLATE & RING GEAR SUB–ASSY (A/T TRANSMISSION) (See page 14–183)

29. REMOVE OIL PAN INSULATOR

(a) Remove the 2 bolts and oil pan insulator.



30. REMOVE ENGINE ASSEMBLY

(a) Install the 2 engine hangers in the correct direction.

Part No.

Parts name	Parts No.
Engine hanger No.1	12281–67080
Bolt	91512–81025
Engine hanger No.2	12282–67030
Bolt	91642–81030

Torque:
41 N·m (420 kgf·cm, 30 ft·lbf) No.1 engine hanger
20 N·m (200 kgf·cm, 14 ft·lbf) No.2 engine hanger

(b) Attach the chain block and engine sliding device to the engine hangers.

(c) Remove the 4 bolts and 4 nuts holding the engine mounting insulator FR to the frame brackets.

(d) Lift the engine out of the vehicle slowly and carefully.

HINT:
Make sure the engine is clear of all wiring, hoses and cables.

31. REMOVE ENGINE WIRE

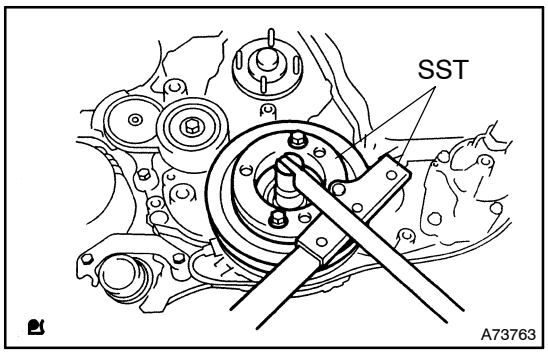
32. REMOVE TIMING BELT (See page 14–152)

33. REMOVE CAMSHAFT DRIVE GEAR

(a) Remove the 4 bolts, camshaft drive gear flange and camshaft drive gear pulley.

34. REMOVE VACUUM PUMP ASSY

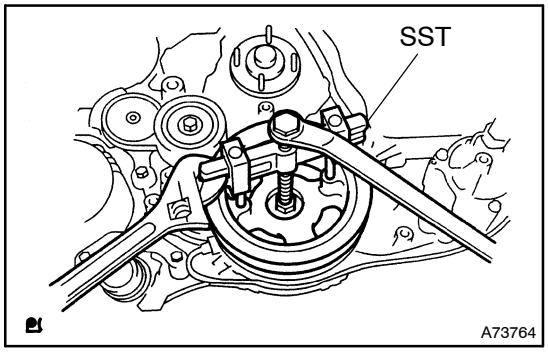
(a) Remove the 2 nuts, 2 O–rings and vacuum pump.



35. REMOVE CRANKSHAFT PULLEY

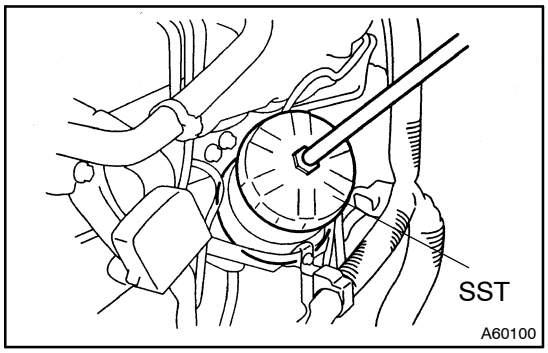
(a) Using SST, loosen the pulley bolt.

SST 09213–58013, 09330–00021



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

36. REMOVE INJECTION PIPE SET (See page 11–77)
37. REMOVE NOZZLE LEAKAGE PIPE ASSY (See page 11–77)
38. REMOVE NOZZLE HOLDER AND NOZZLE SET (See page 11–77)
39. REMOVE INJECTION OR SUPRY PUMP ASSY (See page 11–81)



40. REMOVE OIL FILTER SUB–ASSY
(a) Using SST, remove the oil filter.
SST 09228–10002

41. REMOVE OIL COOLER COVER SUB–ASSY (See page 17–54)
42. REMOVE EGR PIPE SUB–ASSY NO.1 (W/ EGR) (See page 12–22)
43. REMOVE INTAKE MANIFOLD
(a) Remove the 8 nuts, 4 gasket and intake manifold.
44. REMOVE WATER OUTLET
(a) Remove the 2 nuts, gasket and water outlet.
45. REMOVE DIESEL ENGINE ENGINE COOLANT TEMPERATURE SENSOR
46. REMOVE WATER TEMPERATURE SENDER GAGE ASSY
47. REMOVE CRANKSHAFT POSITION SENSOR
48. REMOVE GLOW PLUG ASSY (See page 19–32)
49. REMOVE WATER BY–PASS PIPE SUB–ASSY NO.2
(a) Remove the 2 nuts, gasket and heater water inlet pipe.
50. REMOVE VENTILATION PIPE
51. REMOVE EXHAUST MANIFOLD ASSY W/ TURBOCHARGER ASSY (See page 13–8)
52. REMOVE WATER BY–PASS PIPE SUB–ASSY
53. REMOVE OIL LEVEL GAGE GUIDE
54. REMOVE WATER INLET (See page 16–35)
55. REMOVE GENERATOR ASSY (See page 19–29)
56. REMOVE FAN BELT ADJUSTING BAR
(a) Remove the bolt and adjusting bar.
57. REMOVE GENERATOR BRACKET NO.1
(a) Remove the 4 bolts and generator bracket.
58. REMOVE INTERCOOLER SUPPORT BRACKET
(a) Remove the 2 bolts and support bracket.

59. REMOVE INTERCOOLER SUPPORT BRACKET NO.2

(a) Remove the 2 bolts and support bracket No. 2.

60. REMOVE ENGINE MOUNTING BRACKET FRONT NO.1 RH

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

61. REMOVE ENGINE MOUNTING BRACKET FRONT NO.1 LH

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

62. REMOVE OIL PAN COVER SUB–ASSY NO.1

(a) Remove the 4 bolts and oil pan cover sub–assy.

63. REMOVE ENGINE OIL LEVEL SENSOR

(a) Disconnect the connector.

(b) Remove the 4 bolts and engine oil level sensor.

64. REMOVE REAR END PLATE

(a) Remove the bolt and rear end plate.

65. REPLACE PARTIAL ENGINE ASSY

66. INSTALL REAR END PLATE

(a) Install the rear end plate with the bolt.

Torque: 8 N·m (82 kgf·cm, 71 in.·lbf)

67. INSTALL ENGINE OIL LEVEL SENSOR

(a) Install a new gasket and engine oil level sensor with the 4 bolts.

Torque: 8 N·m (82 kgf·cm, 71 in.·lbf)

68. INSTALL OIL PAN COVER SUB–ASSY NO.1

(a) Install the oil pan cover sub–assy with the 4 bolts.

Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

69. INSTALL ENGINE MOUNTING BRACKET FRONT NO.1 LH

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

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

70. INSTALL ENGINE MOUNTING BRACKET FRONT NO.1 RH

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

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

71. INSTALL INTERCOOLER SUPPORT BRACKET NO.2

(a) Install the intercooler support bracket with 2 bolts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

72. INSTALL INTERCOOLER SUPPORT BRACKET

(a) Install the intercooler support bracket with 2 bolts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

73. INSTALL GENERATOR BRACKET NO.1

(a) Install the generator bracket with 4 bolts.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

74. INSTALL FAN BELT ADJUSTING BAR

(a) Install the adjusting bar with bolt.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

75. INSTALL GENERATOR ASSY (See page 19–29)

76. INSTALL WATER INLET (See page 16–35)

77. INSTALL OIL LEVEL GAGE GUIDE

(a) Install a new O–ring, oil level gage guide and oil level gage with bolt.

Torque: 8 N·m (82 kgf·cm, 71 in.·lbf)

78. INSTALL WATER BY–PASS PIPE SUB–ASSY

(a) Install a new gasket and water outlet pipe with 2 nuts and 2 bolts.

Torque: 8 N·m (82 kgf·cm, 71 in.·lbf)

79. INSTALL EXHAUST MANIFOLD ASSY W/ TURBOCHARGER ASSY (See page 13–8)

80. INSTALL VENTILATION PIPE

(a) Install a ventilation pipe with 2 bolts.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

81. INSTALL WATER BY–PASS PIPE SUB–ASSY NO.2

(a) Install a new gasket and water inlet pipe with 2 nuts.
Torque: 8 N·m (82 kgf·cm, 71 in.·lbf)

82. INSTALL GLOW PLUG ASSY (See page 19–32)

83. INSTALL CRANKSHAFT POSITION SENSOR

(a) Install crankshaft position sensor with bolt.
Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)

84. INSTALL WATER TEMPERATURE SENDER GAGE ASSY

(a) Using SST, install the water temperature sender gage assy.
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

85. INSTALL DIESEL ENGINE ENGINE COOLANT TEMPERATURE SENSOR
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

86. INSTALL WATER OUTLET

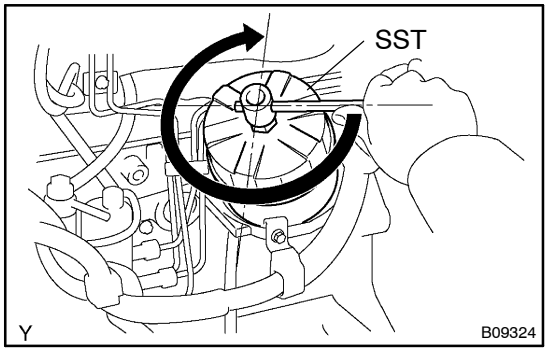
(a) Install a new gasket and water outlet with the 2 nuts.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

87. INSTALL INTAKE MANIFOLD

(a) Install a 4 new gaskets and intake manifold with 8 nuts.
Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)

88. INSTALL EGR PIPE SUB–ASSY NO.1 (W/ EGR) (See page 12–22)

89. INSTALL OIL COOLER COVER SUB–ASSY (See page 17–54)



90. INSTALL OIL FILTER SUB–ASSY

(a) Tighten the oil filter by hand until the rubber gasket contacts the seat of the filter mounting.

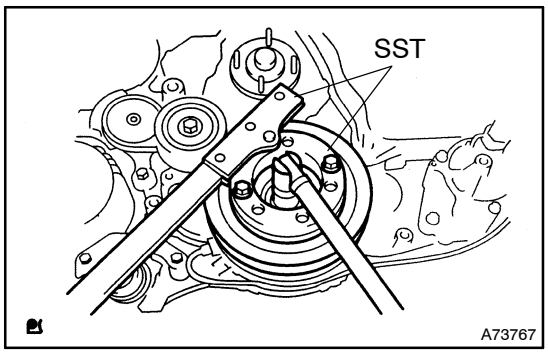
(b) Using SST, give it an additional 3/4 turn to seat the filter.
SST 09228–10002

91. INSTALL INJECTION PUMP SUPPLY PUMP ASSY (See page 11–81)

92. INSTALL NOZZLE HOLDER AND NOZZLE SET (See page 11–77)

93. INSTALL NOZZLE LEAKAGE PIPE ASSY (See page 11–77)

94. INSTALL INJECTION PIPE SET (See page 11–77)



95. INSTALL CRANKSHAFT PULLEY

(a) Align the pulley set key with the key groove of the pulley.

(b) Using SST, install the pulley bolt.
SST 09213–58013, 09330–00021
Torque: 365 N·m (3,725 kgf·cm, 125 ft·lbf)

96. INSTALL VACUUM PUMP ASSY

(a) Install a 2 new O–rings and vacuum pump with 2 nuts.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

97. INSTALL CAMSHAFT DRIVE GEAR

(a) Align the knock pin of the injection pump drive gear with the knock pin hole of the camshaft drive gear pulley, install the pulley and camshaft drive gear pulley flanges with the 4 bolts.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

98. INSTALL TIMING BELT (See page 14–152)

99. INSTALL ENGINE WIRE

100. INSTALL ENGINE ASSEMBLY

(a) Attach the chain block and engine sliding device to the engine hangers.

(b) Slowly lower the engine assembly into the engine compartment.

(c) Install the engine mounting bracket with 4 bolts and 4 nuts.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

(d) Remove the 2 engine hangers.

101. INSTALL OIL PAN INSULATOR

102. INSTALL DRIVE PLATE & RING GEAR SUB–ASSY (A/T TRANSMISSION) (See page 14–183)

103. INSTALL AUTOMATIC TRANSMISSION ASSY (A/T TRANSMISSION) (See page 40–20)

104. INSTALL FLYWHEEL SUB–ASSY (M/T TRANSMISSION) (See page 14–183)

105. INSTALL CLUTCH DISC ASSY (M/T TRANSMISSION) (See page 42–15)

106. INSTALL CLUTCH COVER ASSY (M/T TRANSMISSION) (See page 42–15)

107. INSTALL MANUAL TRANSMISSION UNIT ASSY (M/T TRANSMISSION) (See page 41–13)

108. CONNECT ENGINE WIRE

109. CONNECT INJECTION PUMP TO FUEL PIPE FUEL HOSE

110. CONNECT INJECTION PUMP TO FUEL FILTER FUEL HOSE OR PIPE

111. CONNECT HEATER WATER OUTLET HOSE A (FROM HEATER UNIT)

112. CONNECT HEATER WATER INLET HOSE A

113. INSTALL VANE PUMP ASSY

(a) Install the 2 new O–rings and vane pump assy with 2 nuts.
Torque: 39 N·m (398 kgf·cm, 29 ft·lbf)

114. INSTALL VANE PUMP OIL RESERVOIR ASSY

(a) Install the vane pump oil reservoir assy with 3 bolts.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

115. CONNECT VACUUM HOSE

116. INSTALL COMPRESSOR AND MAGNETIC CLUTCH (W/ AIR CONDITIONING)

(a) Install the compressor and magnetic clutch with the 4 bolts.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Connect the connector.

117. INSTALL FAN PULLEY

118. INSTALL FLUID COUPLING ASSY

(a) Install the fan pulley and fluid coupling with 4 bolts.
Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)

119. INSTALL FAN AND GENERATOR V BELT (See page 14–128)

120. INSTALL V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (W/ AIR CONDITIONING) (See page 14–128)

121. INSTALL FAN SHROUD

(a) Install the fan shroud with 3 bolts.
Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)

122. INSTALL RADIATOR ASSY (See page 16–36)

123. INSTALL INTERCOOLER ASSY (See page 13–11)

124. INSTALL AIR CLEANER ASSY

125. INSTALL HOOD SUB–ASSY

(a) Install the hood sub–assy with 4 bolts and 2 nuts.

Torque:
13 N·m (130 kgf·cm, 9 ft·lbf) for Bolt
18 N·m (180 kgf·cm, 13 ft·lbf) for Nut

126. ADJUST HOOD SUB–ASSY (See page 75–2)

127. INSTALL ENGINE UNDER COVER ASSY REAR

(a) Install the engine under cover with 4 bolts.

Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)

128. INSTALL ENGINE UNDER COVER SUB–ASSY NO.1

(a) Install the engine under cover with 4 bolts.

Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)

129. ADD ENGINE COOLANT (See page 16–34)

130. CHECK ENGINE OIL LEVEL (See page 17–27)

131. BLEED INJECTION PIPE (See page 11–77)

132. CHECK FOR ENGINE COOLANT LEAKS (See page 16–34)

133. CHECK FOR ENGINE OIL LEAKS

134. CHECK FOR FUEL LEAKS (See page 11–77)

135. CHECK FOR EXHAUST GAS LEAKS