CYLINDER HEAD GASKET (1MZ–FE)

140I6–01

REPLACEMENT

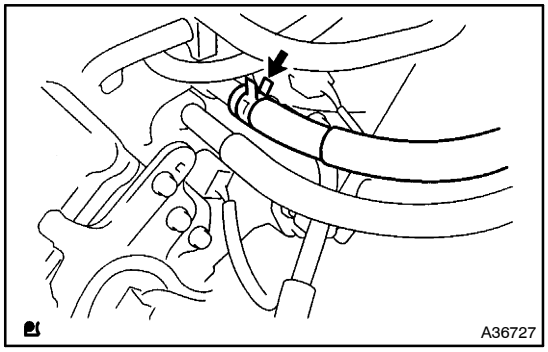
1. WORK FOR PREVENTING GASOLINE FROM SPILLING OUT (See page 11–49)
2. DRAIN COOLANT (See page 16–31)
3. DRAIN ENGINE OIL
4. REMOVE EXHAUST PIPE NO.1 SUPPORT BRACKET

5. REMOVE EXHAUST PIPE ASSY FRONT (See page 15–8)
6. REMOVE EGR PIPE SUB–ASSY NO.1

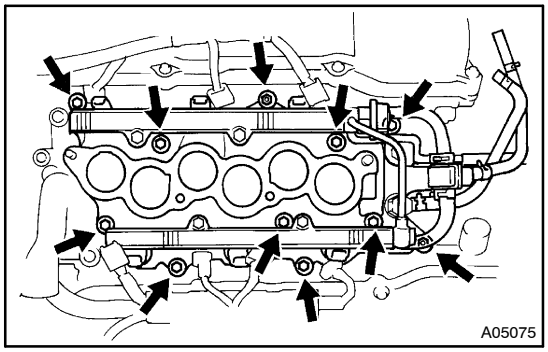
7. REMOVE EXHAUST MANIFOLD SUB–ASSY RH

8. REMOVE V–BANK COVER SUB–ASSY (See page 14–156)
9. REMOVE FRONT SUSPENSION UPPER BRACE CENTER (W/ FRONT SUSPENSION BRACE UPPER CENTER)

10. REMOVE AIR CLEANER ASSEMBLY WITH HOSE (See page 10–18)
11. REMOVE INTAKE AIR SURGE TANK (See page 14–143)
12. SEPARATE FUEL PIPE SUB–ASSY NO.1 (See page 14–87)



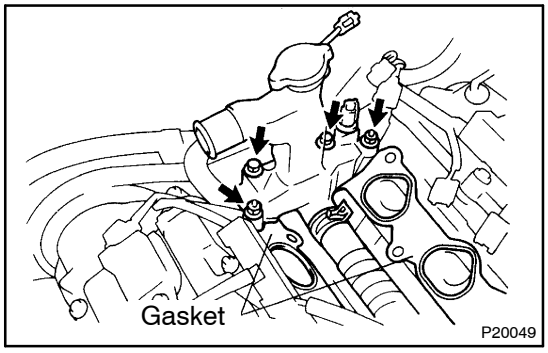
13. DISCONNECT HEATER INLET WATER HOSE



14. REMOVE INTAKE MANIFOLD

(a) Disconnect the injector connectors.
(b) Remove the 9 bolts, 2 nuts and intake manifold with delivery pipe.

15. DISCONNECT RADIATOR HOSE INLET



16. REMOVE WATER OUTLET

(a) Disconnect the water temperature sensor connector and grand cable.
(b) Remove the 2 bolts and 2 nuts.
(c) Disconnect the water bypass hose, and remove the water outlet.
(d) Remove the 2 gaskets.

17. REMOVE FRONT WHEEL RH
18. REMOVE FRONT FENDER APRON SEAL RH

19. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See page 14–141)
20. REMOVE VANE PUMP V BELT
(See page 14–141)
21. REMOVE ENGINE MOVING CONTROL ROD
(See page 14–156)
22. REMOVE ENGINE MOUNTING STAY NO.2 RH
(See page 14–156)
23. REMOVE GENERATOR BRACKET NO.2

24. REMOVE CRANKSHAFT PULLEY
(See page 14–174)
SST 09213–54015 (91651–60855), 09330–00021, 09950–50013 (09951–05010, 09952–05010, 09953–05010, 09954–05030)
25. REMOVE TIMING BELT NO.1 COVER

26. REMOVE TIMING BELT NO.2 COVER
(See page 14–174)
27. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

28. REMOVE TIMING BELT GUIDE NO.2

29. REMOVE TIMING BELT
(See page 14–211)
30. REMOVE TIMING BELT IDLER SUB–ASSY NO.2

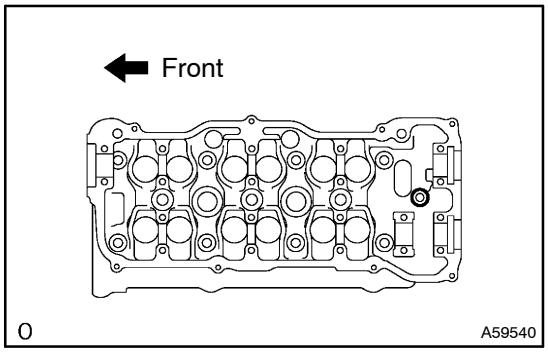
31. REMOVE CAMSHAFT TIMING PULLEY
(See page 14–180)
SST 09960–10010 (09962–01000, 09963–01000), 09249–63010
32. REMOVE TIMING BELT NO.3 COVER

33. REMOVE VANE PUMP ASSY
(See page 14–156)
34. REMOVE IGNITION COIL ASSY

35. REMOVE CYLINDER HEAD COVER SUB–ASSY

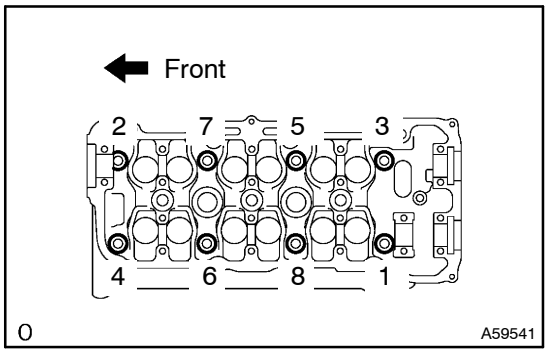
36. REMOVE CAMSHAFT
(See page 14–180)

37. REMOVE NO.2 CAMSHAFT
(See page 14–180)



38. REMOVE CYLINDER HEAD SUB–ASSY

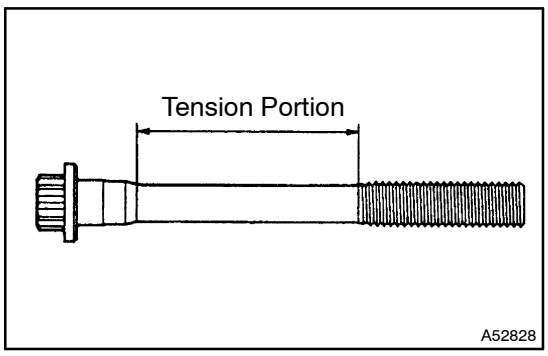
(a) Using an 8 mm hexagon wrench, remove the hexagon bolt.



(b) Uniformly loosen the 8 cylinder head bolts, in several passes, in the sequence shown. Remove the 8 cylinder head bolts and plate washers.

NOTICE:
- **Be careful no to drop washers into the cylinder head.**
- **Head warpage or cracking could result from removing bolts in an incorrect order.**

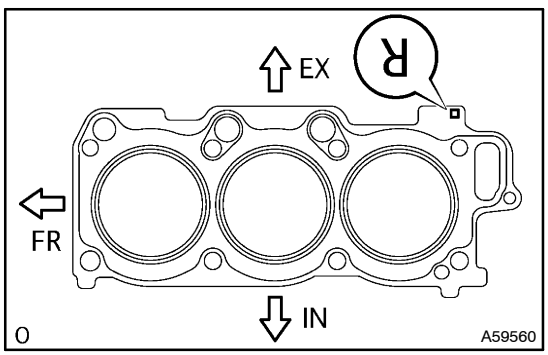
39. REMOVE CYLINDER HEAD GASKET



40. INSPECT CYLINDER HEAD SET BOLT

(a) Using vernier calipers, measure the tension portion diameter of the bolt.
Standard outside diameter:
8.95 – 9.05 mm (0.3524 – 0.3563 in.)
Minimum outside diameter: 8.75 mm (0.3775 in.)

If the diameter is less than minimum, replace the bolt.



41. INSTALL CYLINDER HEAD GASKET

(a) Place a new cylinder head gasket on the cylinder block surface with the R mark upward.

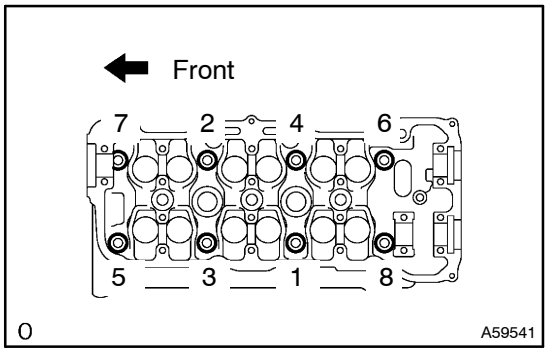
NOTICE:
- **Remove any oil from the contact surface.**
- **Be careful of the installation direction.**
- **Place the cylinder head quietly in order not to damage the gasket at the bottom part of the head.**

42. INSTALL CYLINDER HEAD SUB–ASSY

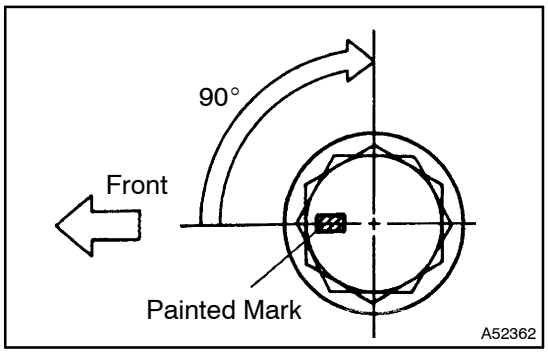
NOTICE:
The cylinder head bolts are tightened in 2 progressive steps.

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

(b) Install the plate washer to the cylinder head bolt.



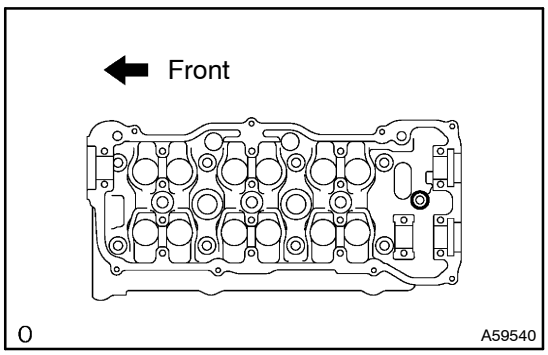
(c) Install and uniformly tighten the 8 cylinder head bolts, in several passes, in the sequence shown.
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)



(d) Mark the front side of each cylinder head bolt head with paint.

(e) Retighten the cylinder head bolts by 90° in the sequence shown.

(f) Check that the painted mark is now at a 90° angle to the front.



(g) Using an 8 mm socket hexagon wrench, install the hexagon bolt.
Torque: 19 N·m (189 kgf·cm, 14 ft·lbf)

43. INSTALL NO.2 CAMSHAFT
(See page 14–180)

44. INSTALL CAMSHAFT
(See page 14–180)

45. INSTALL CYLINDER HEAD COVER SUB–ASSY
(See page 14–143)

46. INSTALL IGNITION COIL ASSY

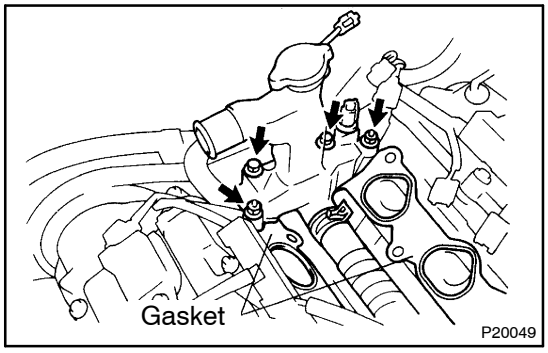
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

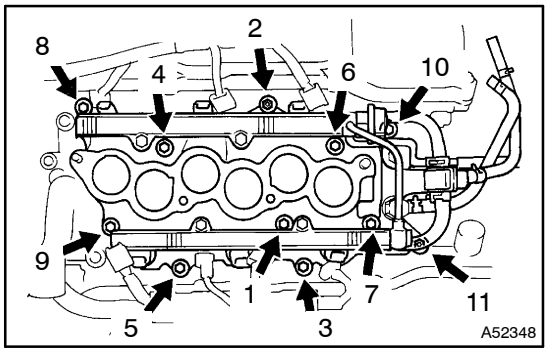
47. INSTALL VANE PUMP ASSY
(See page 14–156)
48. INSTALL TIMING BELT NO.3 COVER
(See page 14–180)
49. INSTALL CAMSHAFT TIMING PULLEY
(See page 14–180)
SST 09960–10010 (09962–01000, 09963–01000), 09249–63010
50. INSTALL TIMING BELT IDLER SUB–ASSY NO.2

Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)
51. INSPECT TIMING BELT
(See page 14–174)
52. INSTALL TIMING BELT
(See page 14–211)
SST 09960–10010 (09962–01000, 09963–01000)
53. INSTALL CHAIN TENSIONER ASSY NO.1
(See page 14–174)
54. INSTALL TIMING BELT GUIDE NO.2
(See page 14–174)
55. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

Torque: 28 N·m (286 kgf·cm, 21 ft·lbf)
56. INSTALL TIMING BELT NO.2 COVER
(See page 14–174)
57. INSTALL TIMING BELT NO.1 COVER
(See page 14–174)
58. INSTALL CRANKSHAFT PULLEY
(See page 14–174)
SST 09213–54015 (91651–60855), 09330–00021
59. INSTALL GENERATOR BRACKET NO.2

Torque: 28 N·m (286 kgf·cm, 21 ft·lbf)
60. INSTALL ENGINE MOUNTING STAY NO.2 RH
(See page 14–156)
61. INSTALL ENGINE MOVING CONTROL ROD
(See page 14–156)
62. INSTALL VANE PUMP V BELT
(See page 14–141)
63. INSTALL V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1
(See page 14–141)
64. INSPECT DRIVE BELT DEFLECTION AND TENSION(REFERENCE) (See page 14–137)





65. INSTALL WATER OUTLET

(a) Install 2 new gaskets to the cylinder head.
(b) Connect the water outlet to the bypass hose.
(c) Install the water outlet with the 2 bolts, 2 nuts and 2 plate washers, Alternately tighten the bolts and nuts.
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)

NOTICE:
Do not scratch the seal surface of the water outlet with the stud bolt.

66. INSTALL INTAKE MANIFOLD

(a) Install the intake manifold with the 9 bolts, 2 plate washers and 2 nuts. Uniformly tighten the bolts and nuts, in several passes, in the sequence shown.
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)
(b) Retighten the water outlet mounting bolts and nuts.
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)

67. CONNECT FUEL PIPE SUB–ASSY NO.1
(See page 14–156)
68. INSTALL INTAKE AIR SURGE TANK
(See page 14–143)
69. INSTALL AIR CLEANER ASSEMBLY WITH HOSE (See page 10–18)
70. CONNECT VACUUM HOSE (See page 14–156)
71. INSTALL FRONT SUSPENSION UPPER BRACE CENTER
(W/ FRONT SUSPENSION BRACE UPPER CENTER)

72. INSTALL V–BANK COVER SUB–ASSY
(See page 14–156)
73. INSTALL EXHAUST MANIFOLD SUB–ASSY RH
(See page 14–156)
74. INSTALL EGR PIPE SUB–ASSY NO.1
(See page 14–156)
75. INSTALL EXHAUST PIPE ASSY FRONT
(See page 15–8)
76. INSTALL EXHAUST PIPE NO.1 SUPPORT BRACKET
(See page 15–8)
77. INSTALL FRONT WHEEL RH
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
78. ADD ENGINE OIL
79. ADD COOLANT (See page 16–31)
80. INSPECT OIL LEAK
81. CHECK ENGINE COOLANT LEAK (See page 16–31)
82. INSPECT FUEL LEAK
83. CHECK EXHAUST GAS LEAK

84. INSPECT IGNITION TIMING (See page 14–137)
SST 09843–18040, 09843–18020

85. INSPECT ENGINE IDLE SPEED (See page 14–137)
SST 09843–18040

86. INSPECT COMPRESSION (See page 14–137)
SST 09992–00500

87. INSPECT CO/HC (See page 14–137)