

CYLINDER HEAD GASKET (HILUX/1KD-FTV, 2KD-FTV (TASA MADE FOR ARGENTINA))

141YN-06

REPLACEMENT

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag activation.

2. DRAIN ENGINE OIL

3. LOOSEN FUEL TANK CAP ASSY

4. REMOVE EXHAUST PIPE ASSY FRONT (See page 15-3)

5. REMOVE ENGINE COVER SUB-ASSY NO.1 (See page 14-24)

6. 1KD-TV:

REMOVE CHARGE AIR COOLER ASSY W/ INTAKE AIR CONNECTOR (See page 13-42)

7. REMOVE AIR CLEANER ASSY (See page 14-24)

8. 2KD-FTV:

REMOVE ENGINE COVER BRACKET (See page 14-24)

9. 2KD-FTV:

REMOVE AIR CLEANER PIPE SUB-ASSY NO.2 (See page 14-24)

10. REMOVE VENTILATION PIPE

11. REMOVE FAN SHROUD (See page 16-15)

12. REMOVE FAN PULLEY

13. DISCONNECT COOLER COMPRESSOR ASSY (See page 14-24)

14. REMOVE COMPRESSOR MOUNTING BRACKET NO.1 (See page 14-24)

15. REMOVE TURBOCHARGER SUB-ASSY (See page 13-29 or 13-37)

16. REMOVE MANIFOLD STAY (See page 14-24)

17. DISCONNECT WIRE HARNESS

18. REMOVE INJECTION PIPE (See page 11-14)

19. REMOVE NOZZLE LEAKAGE PIPE ASSY NO.2 (See page 11-14)

20. REMOVE EGR VALVE ASSY (See page 12-11)

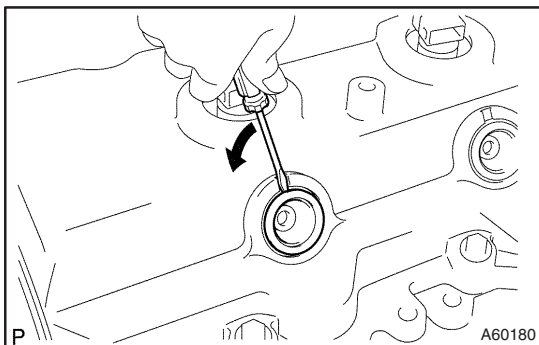
21. REMOVE TIMING BELT NO.1 COVER (See page 14-44)

22. REMOVE TIMING BELT (See page)

23. REMOVE CAMSHAFT TIMING PULLEY (See page 14-49)

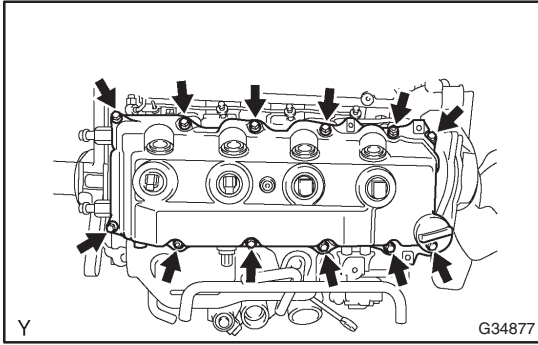
24. REMOVE TIMING BELT IDLER SUB-ASSY NO.1 (See page 14-44)

25. REMOVE TIMING BELT NO.2 COVER (See page 14-49)



26. REMOVE CYLINDER HEAD COVER SUB-ASSY

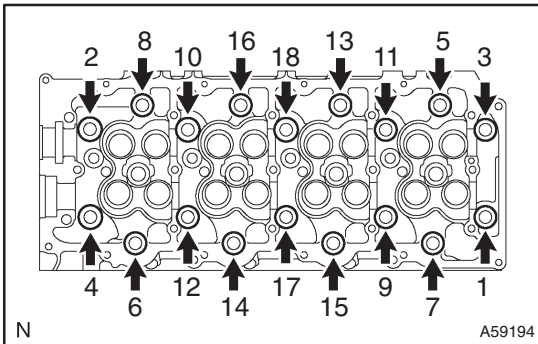
- (a) Using a small screwdriver, remove the holder seal by prying the portion between the holder seal and the cutout part of the cylinder head.



- (b) Remove the 10 bolts, 2 nuts, cylinder head cover and gasket.

27. REMOVE INJECTOR ASSY (See page 11-14)

28. REMOVE CAMSHAFT (See page 14-49)



29. REMOVE CYLINDER HEAD SUB-ASSY

- (a) Uniformly loosen and remove the 18 cylinder head bolts in several passes in the sequence shown in the illustration.

NOTICE:

Head warpage or cracking could result from removing bolts in the incorrect order.

- (b) Lift the cylinder head from the dowels on the cylinder block, and place the cylinder head on wooden blocks on a bench.

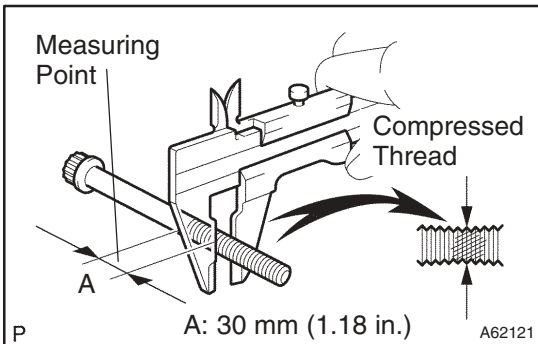
HINT:

If the cylinder head is difficult to lift, use a screwdriver to pry between the cylinder head and block.

NOTICE:

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

30. REMOVE CYLINDER HEAD GASKET



31. INSPECT CYLINDER HEAD SET BOLT

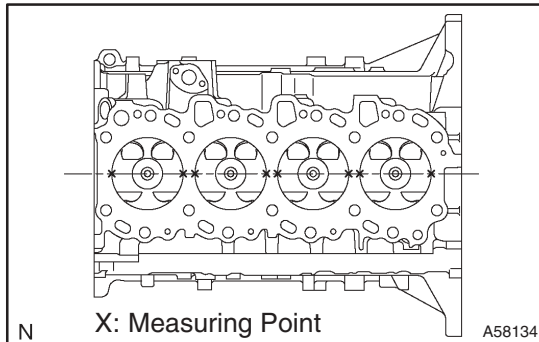
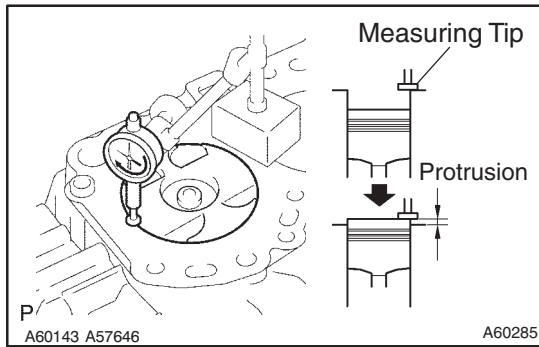
- (a) Using a vernier caliper, measure the minimum outside diameter of the compressed thread at the measuring point A.

Standard outside diameter:

11.8 to 12.0 mm (0.465 to 0.472 in.)

Minimum outside diameter: 11.6 mm (0.457 in.)

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



32. INSTALL CYLINDER HEAD GASKET

- (1) Find where the piston head protrudes most by slowly turning the crankshaft clockwise and counter-clockwise.

- (2) Measure the piston protrusion of each cylinder at 2 points as shown in the illustration.
- (3) For the piston protrusion value of each cylinder, use the average of the 2 measurements of each cylinder.

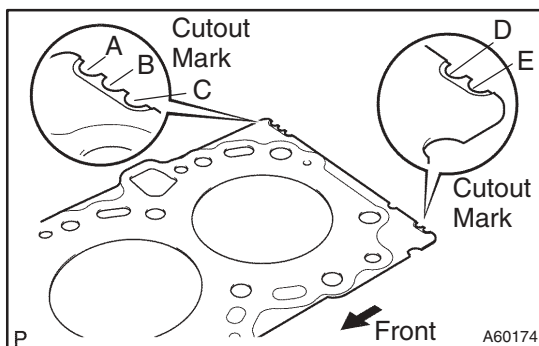
Piston protrusion:

0.005 to 0.254 mm (0.0002 to 0.0100 in.)

HINT:

When removing piston and connecting rod assembly:

If the protrusion is not as specified, remove the piston and connecting rod assembly and reinstall them.



- (a) Select a new cylinder head gasket.

HINT:

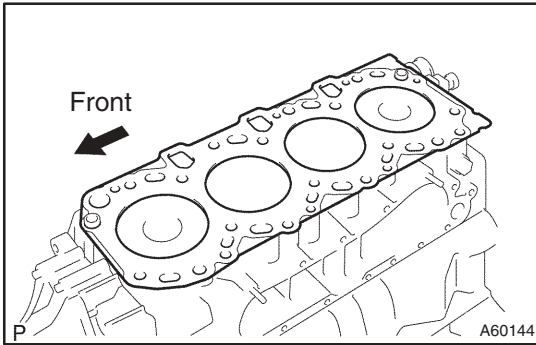
New cylinder head gaskets are available in 5 sizes, and are marked A, B, C, D or E.

New installed cylinder head gasket thickness:

A	0.80 to 0.90 mm (0.0315 to 0.0354 in.)
B	0.85 to 0.95 mm (0.0335 to 0.0374 in.)
C	0.90 to 1.00 mm (0.0354 to 0.0394 in.)
D	0.95 to 1.05 mm (0.0374 to 0.0413 in.)
E	1.00 to 1.10 mm (0.0394 to 0.0433 in.)

- (1) Select the largest piston protrusion value from the measurements made. Then select a new appropriate gasket according to the table below.

Piston Protrusion	Gasket Size
0.005 to 0.054 mm (0.0002 to 0.0021 in.)	Use A
0.055 to 0.104 mm (0.0022 to 0.0041 in.)	Use B
0.105 to 0.154 mm (0.0041 to 0.0061 in.)	Use C
0.155 to 0.204 mm (0.0061 to 0.0080 in.)	Use D
0.205 to 0.255 mm (0.0081 to 0.0100 in.)	Use E

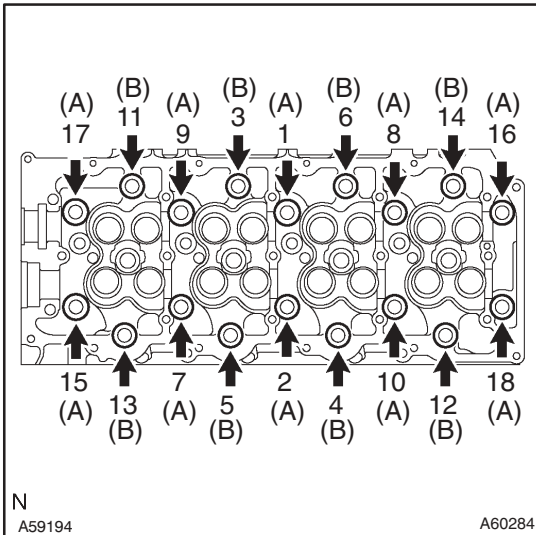


- (b) Place the cylinder head on the cylinder block.
 (1) Place the cylinder head gasket on the cylinder block.

NOTICE:

Be careful of the installation direction.

- (2) Place the cylinder head on the cylinder head gasket.



33. INSTALL CYLINDER HEAD SUB-ASSY

HINT:

- The cylinder head bolts are tightened in 3 progressive steps (steps (b), (d) and (f)).
- If any bolt is broken or deformed, replace it.

- (a) Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.
 (b) Install and uniformly tighten the 18 cylinder head bolts, in several passes in the sequence shown in the illustration.

Torque: 85 N·m (867 kgf·cm, 63 ft·lbf)

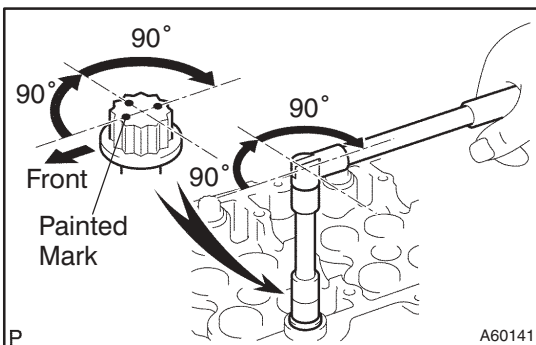
HINT:

Bolt length:

110 mm (4.33 in.) for A

167 mm (6.57 in.) for B

If any of the cylinder head bolts does not meet the torque specification, replace it.

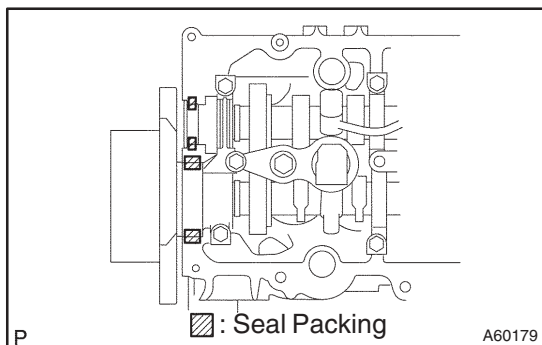


- (c) Mark the front of the cylinder head bolt with paint.
 (d) Further tighten the cylinder head bolts by 90° in the sequence shown in the illustration above.
 (e) Finally, tighten the cylinder head bolts by an additional 90°.
 (f) Check that the painted mark is now facing rearward.

34. INSTALL CAMSHAFT (See page 14–49)

35. INSTALL INJECTOR ASSY (See page 11–14)

36. CHECK FOR FUEL LEAKS (See page 11–14)

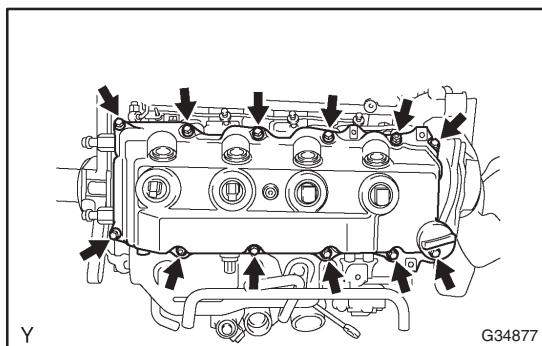
**37. INSTALL CYLINDER HEAD COVER SUB-ASSY**

- (a) Remove any old seal packing (FIPG) material from the cylinder head.
- (b) Apply seal packing to the specific areas shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

NOTICE:

- Remove any oil from the contact surface.
- Install the head cover within 3 minutes after applying seal packing.
- Do not start the engine for at least 2 hours after installing the seal packing.



- (c) Install the gasket and cylinder head cover with the 10 bolts and 2 nuts.

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

- (d) Install 4 new nozzle holder seals.

38. INSTALL TIMING BELT NO.2 COVER (See page 14-49)
39. INSTALL TIMING BELT IDLER SUB-ASSY NO.1 (See page 14-44)
40. INSTALL CAMSHAFT TIMING PULLEY (See page 14-49)
41. INSTALL TIMING BELT (See page 14-44)
42. INSTALL TIMING BELT NO.1 COVER (See page 14-44)
43. INSTALL EGR VALVE ASSY (See page 12-11)
44. INSTALL NOZZLE LEAKAGE PIPE ASSY NO.2 (See page 11-24)
45. INSTALL INJECTION PIPE (See page 11-24)
46. CONNECT WIRE HARNESS
47. INSTALL MANIFOLD STAY (See page 14-24)
48. INSTALL TURBOCHARGER SUB-ASSY (See page 13-29 or 13-37)
49. INSTALL COMPRESSOR MOUNTING BRACKET NO.1 (See page 14-24)
50. INSTALL COOLER COMPRESSOR ASSY (See page 14-24)
51. INSTALL FAN PULLEY
52. INSTALL FAN SHROUD (See page 16-15)
53. INSTALL VENTILATION PIPE
54. 2KD-FTV:
INSTALL AIR CLEANER PIPE SUB-ASSY NO.2 (See page 14-24)
55. 2KD-FTV:
INSTALL ENGINE COVER BRACKET (See page 14-24)
56. INSTALL AIR CLEANER ASSY (See page 14-24)
57. 1KD-FTV:
INSTALL CHARGE AIR COOLER ASSY W/ INTAKE AIR CONNECTOR (See page 13-42)
58. INSTALL ENGINE COVER SUB-ASSY NO.1 (See page 14-24)
59. INSTALL EXHAUST PIPE ASSY FRONT (See page 15-3)

60. TIGHTEN FUEL TANK CAP ASSY
61. ADD ENGINE OIL
62. BLEED AIR FROM FUEL SYSTEM ([See page 11-7](#))
63. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL
64. CHECK FOR ENGINE OIL LEAKS
65. CHECK FOR FUEL LEAKS
66. CHECK OIL LEVEL