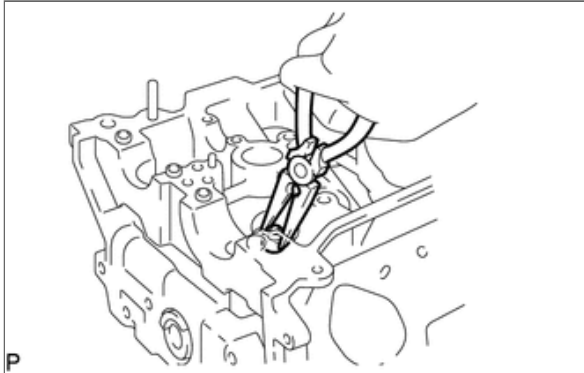
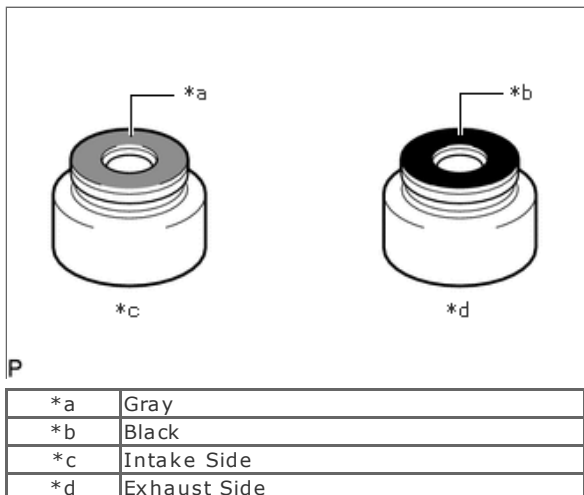


PROCEDURE**1.REPLACE VALVE STEM OIL SEAL****13711E****a.**

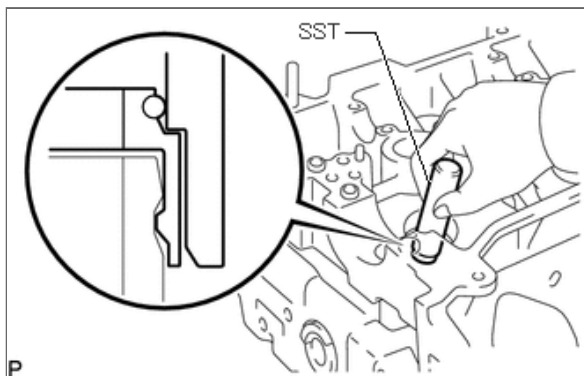
Using needle-nose pliers, remove the valve stem oil seal.

b.

Apply a light coat of engine oil to the valve stem oil seal.

NOTICE:

Make sure that the body identification colors of the valve stem oil seals are matching.

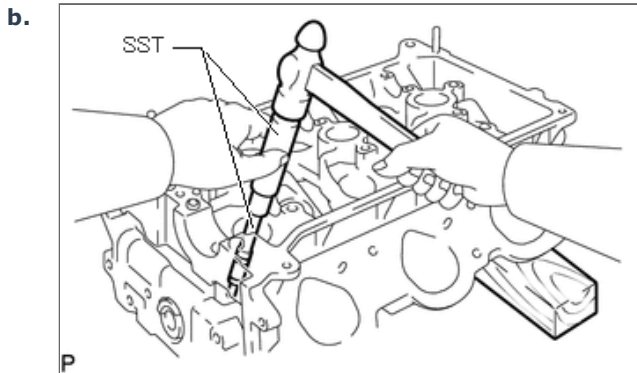
c.

Using SST and a hammer, push in a new valve stem oil seal.

SST**09201-41020**

2.REPLACE VALVE GUIDE BUSH

a. Gradually heat the cylinder head to 80 to 90°C (176 to 194°F).



Using SST and a hammer, tap out the valve guide bush.

SST

09201-10000
09201-01055
09950-70010 (09951-07100)

c. Using a caliper gauge, measure the bore diameter of the cylinder head.

Cylinder bush bore diameter:

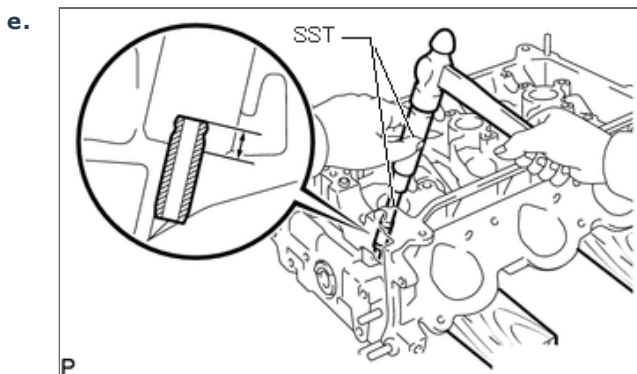
10.295 to 10.315 mm (0.405 to 0.406 in.)

Select a new valve guide bush (STD or O/S 0.05):

Item	Specified Condition
STD	10.333 to 10.344 mm (0.4068 to 0.4072 in.)
O/S 0.05	10.383 to 10.394 mm (0.4088 to 0.4092 in.)

- If the diameters are within the standard, install the STD bushes.
- If the bush bore diameter of the cylinder head is more than 10.315 mm (0.406 in.), machine the bush bore to a diameter of 10.345 to 10.365 mm (0.407 to 0.408 in.).
- If the bush bore diameter of the cylinder head is more than 10.365 mm (0.4081 in.), replace the cylinder head.

d. Gradually heat the cylinder head to 80 to 100°C (176 to 212°F).



Using SST, tap in a new valve guide bush to the standard protrusion height.

SST

09201-10000
09201-01055
09950-70010 (09951-07100)

Standard protrusion height:

9.1 to 9.5 mm (0.358 to 0.374 in.)

- f. Using a sharp 5.5 mm reamer, ream the valve guide bush to obtain the standard specified clearance between the valve guide bush and valve stem.

Standard Oil Clearance:

Item	Specified Condition
Intake side	0.025 to 0.060 mm (0.000984 to 0.00236 in.)
Exhaust side	0.030 to 0.065 mm (0.00118 to 0.00256 in.)

3.REPLACE UNION

HINT:

Perform this procedure only when replacement of the union is necessary.

- a. Remove the unions from the cylinder head sub-assembly (front side) and cylinder head LH (intake port side).
- b. Apply adhesive to 2 or 3 threads of the bolt ends of new unions.

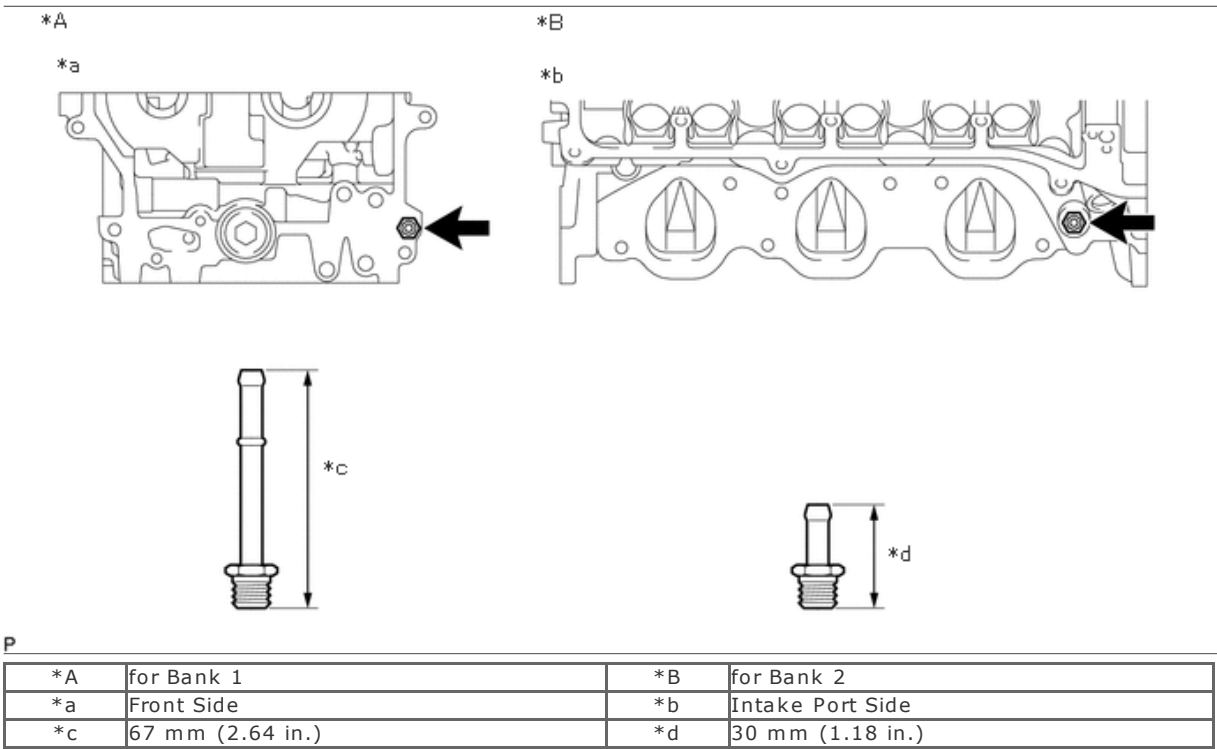
Adhesive:

Toyota Genuine Seal Adhesive 1324, Three Bond 1324 or equivalent

- c. Using a 12 mm deep socket wrench, install the 2 unions.

Torque:

15 N*m (153 kgf*cm, 11 ft.*lbf)

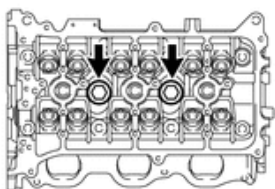


4.REPLACE NO. 1 STRAIGHT SCREW PLUG

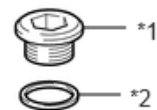
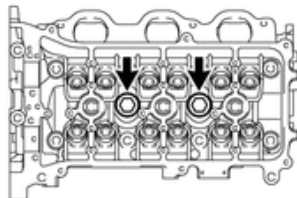
11117E

- a. Using a 14 mm hexagon wrench, remove the No. 1 straight screw plug and gasket.

*A



*B



P

*A	for Bank 1	*B	for Bank 2
*1	No. 1 Straight Screw Plug	*2	Gasket

- b. Using a 14 mm hexagon wrench, install a new gasket and No. 1 straight screw plug.

Torque:

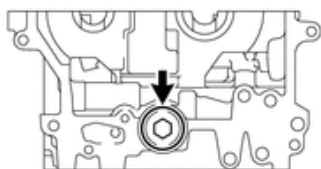
80 N*m (816 kgf*cm, 59 ft.*lbf)

5.REPLACE NO. 2 STRAIGHT SCREW PLUG

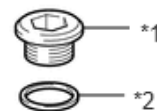
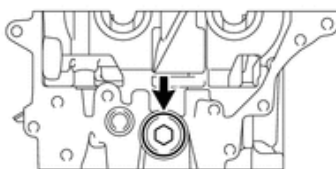
11117F

- a. Using a 14 mm hexagon wrench, remove the No. 2 straight screw plug and gasket.

*A



*B



P

*A	for Bank 1	*B	for Bank 2
*1	No. 2 Straight Screw Plug	*2	Gasket

- b. Using a 14 mm hexagon wrench, install a new gasket and No. 2 straight screw plug.

Torque:

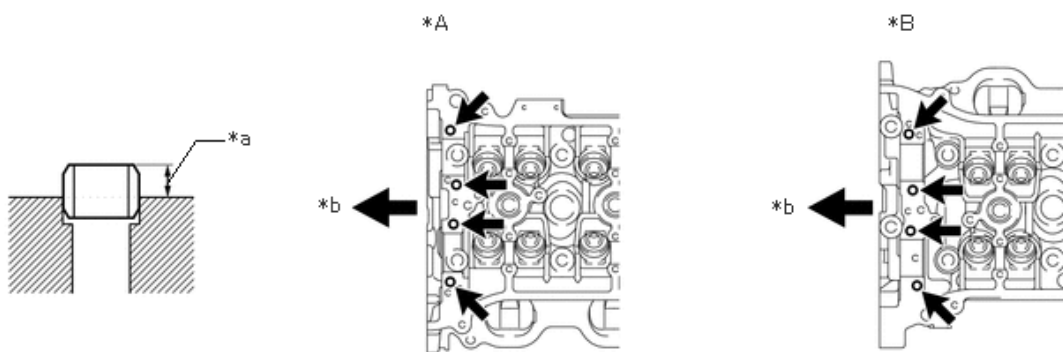
85 N*m (867 kgf*cm, 63 ft.*lbf)

6.REPLACE RING PIN

NOTICE:

It is not necessary to remove the ring pin unless it is being replaced.

- a. Remove the ring pins.
- b. Using a plastic-faced hammer, tap in new ring pins until they reach the standard protrusion height.
- Standard protrusion height:**
2.7 to 3.3 mm (0.106 to 0.130 in.)



P

*A	for Bank 1	*B	for Bank 2
*a	Protrusion Height	*b	Engine Front

7.REPLACE STRAIGHT PIN

NOTICE:

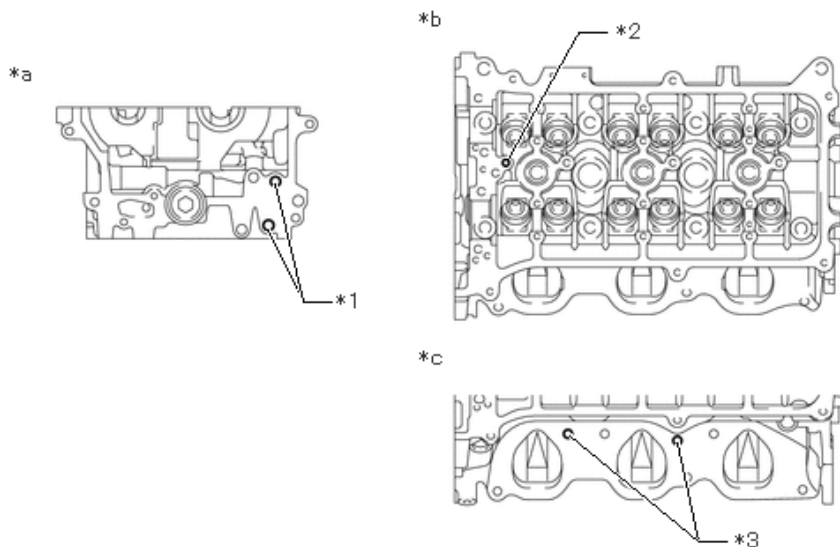
It is not necessary to remove the straight pin unless it is being replaced.

- Remove the straight pins.
- Using a plastic-faced hammer, tap in new straight pins until they reach the standard protrusion height.

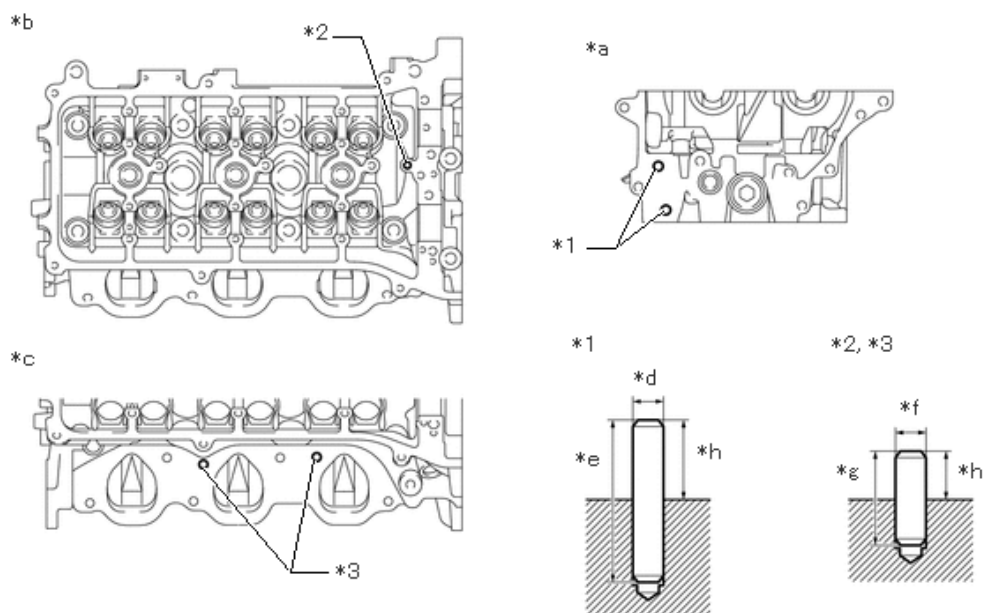
Standard Protrusion Height:

Item	Specified Condition
Straight pin A	17.5 to 19.5 mm (0.689 to 0.768 in.)
Straight pin B	7.5 to 8.5 mm (0.295 to 0.335 in.)
Straight pin C	7.0 to 9.0 mm (0.276 to 0.354 in.)

*A



*B



P

*A	for Bank 1	*B	for Bank 2
*1	Straight Pin A	*2	Straight Pin B
*3	Straight Pin C	-	-
*a	Front Side	*b	Upper Side
*c	Intake Manifold Side	*d	8.0 mm (0.315 in.)
*e	34.0 mm (1.34 in.)	*f	5.0 mm (0.197 in.)
*g	13.8 mm (0.543 in.)	*h	Protrusion Height

8.REPLACE STUD BOLT

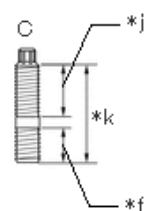
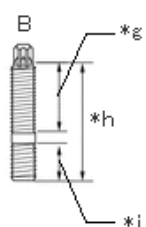
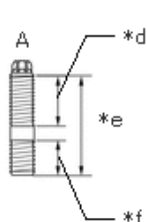
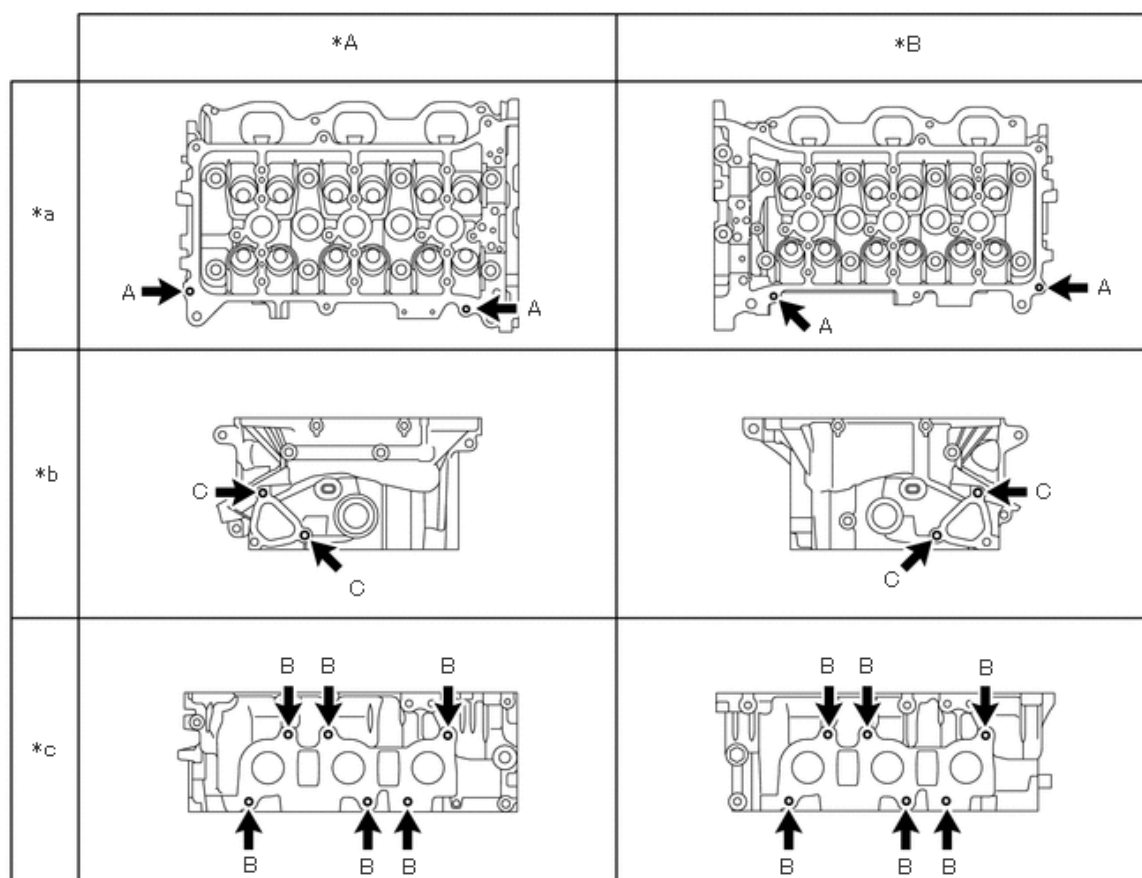
NOTICE:

If a stud bolt is deformed or its threads are damaged, replace it.

- Using an E6 and E7 "TORX" socket wrench, remove the stud bolts.
- Using an E6 and E7 "TORX" socket wrench, install new stud bolts.

Torque:

for stud bolt A : 4.0 N*m (41 kgf*cm, 35 in.*lbf)
 for stud bolt B : 9.5 N*m (97 kgf*cm, 84 in.*lbf)
 for stud bolt C : 4.0 N*m (41 kgf*cm, 35 in.*lbf)



*A	for Bank 1	*B	for Bank 2
*a	Upper Side	*b	Rear Side
*c	Exhaust Manifold Side	*d	21 mm (0.827 in.)
*e	34 mm (1.34 in.)	*f	9 mm (0.354 in.)
*g	20 mm (0.787 in.)	*h	35 mm (1.38 in.)
*i	13 mm (0.512 in.)	*j	16 mm (0.630 in.)
*k	27 mm (1.06 in.)	-	-