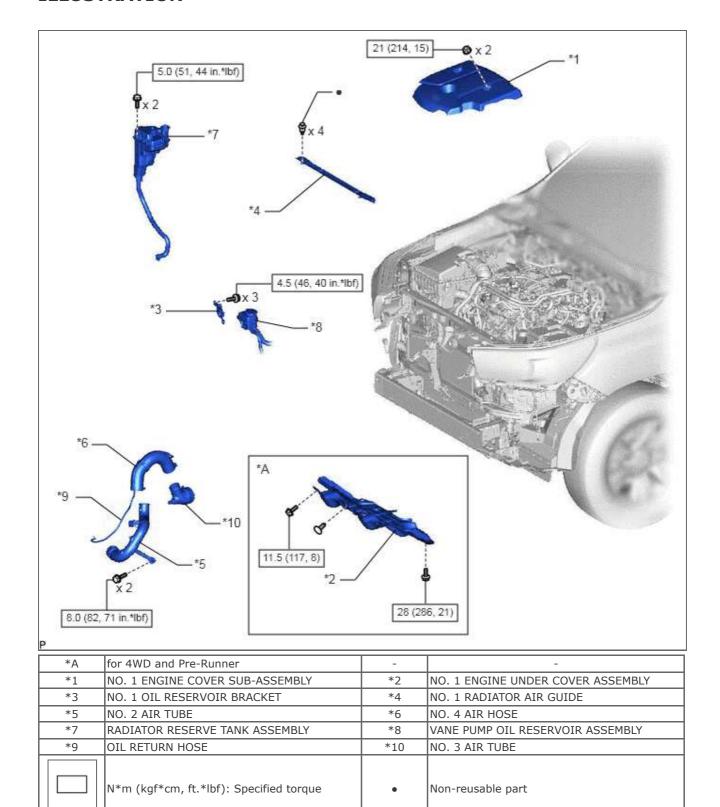
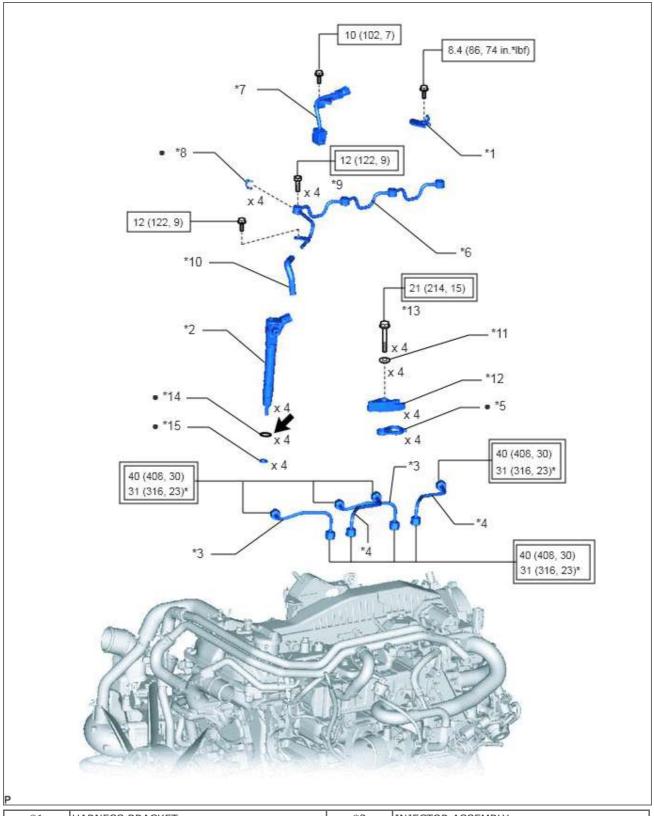
Exit

1GD-FTV ENGINE MECHANICAL CAMSHAFT COMPONENTS

ILLUSTRATION

Print





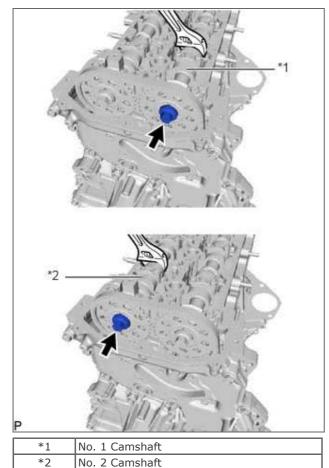
*1	HARNESS BRACKET	*2	INJECTOR ASSEMBLY
*3	NO. 1 INJECTION PIPE SUB-ASSEMBLY	*4	NO. 2 INJECTION PIPE SUB-ASSEMBLY
*5	NOZZLE HOLDER GASKET	*6	NOZZLE LEAKAGE PIPE ASSEMBLY
*7	WIRING HARNESS CLAMP BRACKET	*8	GASKET
*9	UNION BOLT	*10	NO. 5 FUEL HOSE
*11	WASHER	*12	NOZZLE HOLDER CLAMP
*13	NOZZLE HOLDER CLAMP BOLT	*14	O-RING

Uniformly tighten the 20 bolts in several steps in the order shown in the illustration.

Torque:

for bolt A: 10 N*m (102 kgf*cm, 7 ft.*lbf) for bolt B: 21 N*m (214 kgf*cm, 15 ft.*lbf)

k.



Hold the hexagonal portion of the No. 1 camshaft and No. 2 camshaft with a wrench, and tighten the 2 bolts.

Torque:

81 N*m (826 kgf*cm, 60 ft.*lbf)

NOTICE:

Be careful not to damage the cylinder head sub-assembly with the wrench.

- **I.** Remove the pin from the No. 2 chain tensioner assembly.
- m. Install a new gasket and the oil pump relief valve plug to the timing chain cover.

Torque:

46 N*m (469 kgf*cm, 34 ft.*lbf)

2.INSTALL TIMING CHAIN GUIDE

13566B

a. Install the timing chain guide to the cylinder head sub-assembly with the bolt.

Torque:

10 N*m (102 kgf*cm, 7 ft.*lbf)

■ 10.REMOVE NO. 1 RADIATOR HOSE	16571C
Click hereEngine / Hybrid System>1GD-FTV COOLING>RADIATOR>REMOVAL	
■ 11.DISCONNECT VANE PUMP OIL RESERVOIR ASSEMBLY	44360
Click hereEngine / Hybrid System>1GD-FTV COOLING>RADIATOR>REMOVAL	
■ 12.REMOVE NO. 1 OIL RESERVOIR BRACKET	44369A
Click hereEngine / Hybrid System>1GD-FTV COOLING>RADIATOR>REMOVAL	
■ 13.REMOVE RADIATOR RESERVE TANK ASSEMBLY	16470
Click hereEngine / Hybrid System>1GD-FTV COOLING>RADIATOR>REMOVAL	
14.DISCONNECT NO. 1 OIL COOLER OUTLET HOSE (for Automatic Transmission)	32942
Click hereEngine / Hybrid System>1GD-FTV COOLING>RADIATOR>REMOVAL	
15.DISCONNECT NO. 1 OIL COOLER INLET HOSE (for Automatic Transmission)	32941
Click hereEngine / Hybrid System>1GD-FTV COOLING>RADIATOR>REMOVAL	
16.REMOVE FAN SHROUD	16711
Click hereEngine / Hybrid System>1GD-FTV COOLING>RADIATOR>REMOVAL	
17.DISCONNECT NO. 2 RADIATOR HOSE	16572D
Click hereEngine / Hybrid System>1GD-FTV COOLING>RADIATOR>REMOVAL	
■ 18.REMOVE RADIATOR ASSEMBLY	16400
Click hereEngine / Hybrid System>1GD-FTV COOLING>RADIATOR>REMOVAL	
19.REMOVE NO. 4 AIR HOSE	17344E
Click hereEngine / Hybrid System>1GD-FTV ENGINE CONTROL>DIESEL THROTTLE BODY>REMOVA	AL
20.REMOVE INTERCOOLER AIR TUBE	17363K
Click hereEngine / Hybrid System>1GD-FTV ENGINE CONTROL>DIESEL THROTTLE BODY>REMOVA	AL
21.REMOVE DIESEL THROTTLE BODY ASSEMBLY	26100G
Click hereEngine / Hybrid System>1GD-FTV ENGINE CONTROL>DIESEL THROTTLE BODY>REMOVA	AL
22.REMOVE NO. 2 WATER BY-PASS PIPE	16278
Click hereEngine / Hybrid System>1GD-FTV EMISSION CONTROL>EGR VALVE>REMOVAL	
23.REMOVE NO. 1 FUEL PIPE (w/ DPF)	23811H
Click hereEngine / Hybrid System>1GD-FTV EMISSION CONTROL>EXHAUST FUEL ADDITION INJECTOR>REMOVAL	
24.REMOVE GAS FILTER	23265C

Click hereEngine / Hybrid System>1GD-FTV EMISSION CONTROL>EGR VALVE>REMOVAL

Click hereEngine / Hybrid System>1GD-FTV FUEL>FUEL INJECTOR>REMOVAL

40.REMOVE NO. 1 INJECTION PIPE SUB-ASSEMBLY AND NO. 2 INJECTION PIPE SUB-ASSEMBLY

Click hereEngine / Hybrid System>1GD-FTV FUEL>FUEL INJECTOR>REMOVAL

41.REMOVE INJECTOR ASSEMBLY

23670

Click hereEngine / Hybrid System>1GD-FTV FUEL>FUEL INJECTOR>REMOVAL

42.REMOVE NOZZLE HOLDER GASKET

23682

Click hereEngine / Hybrid System>1GD-FTV FUEL>FUEL INJECTOR>REMOVAL

43.REMOVE CAMSHAFT POSITION SENSOR

11301M

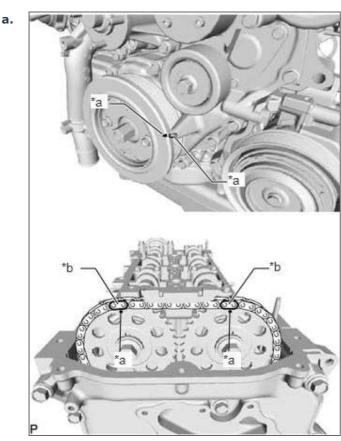
Click hereEngine / Hybrid System>1GD-FTV ENGINE CONTROL>CAMSHAFT POSITION SENSOR>REMOVAL

44.REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY

11201

Click hereEngine / Hybrid System>1GD-FTV LUBRICATION>OIL PUMP>REMOVAL

45.SET NO. 1 CYLINDER TO TDC/COMPRESSION



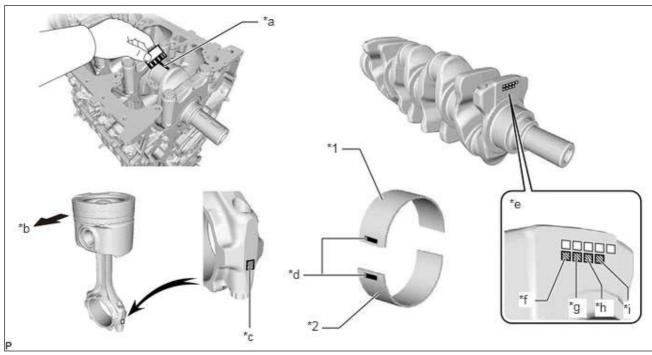
*a	Timing Mark
*b	Paint Mark

Align the timing mark of the crankshaft pulley and timing chain cover by rotating the crankshaft clockwise.

b. Make sure that the timing mark of the camshaft timing sprocket is at the top.

HINT:

If the timing mark is not at the top, turn the crankshaft pulley 1 revolution so that the timing mark is at the top (set the No. 1 piston to TDC/compression).

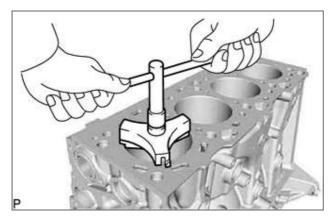


*1	No. 1 Connecting Rod Bearing	*2	No. 2 Connecting Rod Bearing
*a	Plastigage	*b	Front Side
*c	Connecting Rod Sub-assembly Big End Inside Diameter: Mark 1, 2 or 3	*d	Connecting Rod Bearing: Mark 2, 3, 4, 5 or 6
*e	Crank Pin Diameter: Mark 1, 2 or 3	*f	No. 1
*g	No. 2	*h	No. 3
*i	No. 4	-	-

i. Completely remove the Plastigage from the crank pin.

■ 3.REMOVE PISTON AND CONNECTING ROD SUB-ASSEMBLY

a.



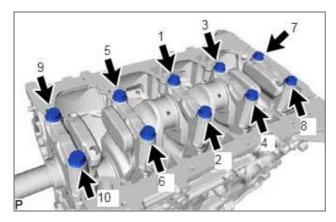
Using a ridge reamer, remove all the carbon from the top of the cylinder.

b. Push out the piston and connecting rod sub-assembly with connecting rod bearing through the top of the cylinder block sub-assembly to remove them.

HINT:

- \cdot $\;$ Keep the connecting rod sub-assembly and connecting rod cap together.
- · Arrange the piston and connecting rod sub-assemblies in the correct order.
- Be sure to arrange the removed piston and connecting rod sub-assemblies in such a way that they can be reinstalled exactly as before.

i.



Step 1:

Using several steps, install and uniformly tighten the 10 crankshaft bearing cap set bolts in the sequence shown in the illustration.

Torque:

95 N*m (969 kgf*cm, 70 ft.*lbf)

HINT

If any of the crankshaft bearing cap set bolts does not meet the torque specification, replace the crankshaft bearing cap set bolt.

- **j.** Step 2:
 - i. Mark the front of the crankshaft bearing cap set bolts with paint.
 - ii. Tighten the crankshaft bearing cap set bolts by 90°.
 - iii. Check that the painted marks are now at a 90° angle to the front.
- k. Check that the crankshaft turns smoothly.

8.INSPECT CRANKSHAFT THRUST CLEARANCE

Click hereEngine / Hybrid System>1GD-FTV ENGINE MECHANICAL>CYLINDER BLOCK>DISASSEMBLY

9.INSTALL CONNECTING ROD BEARING

13041

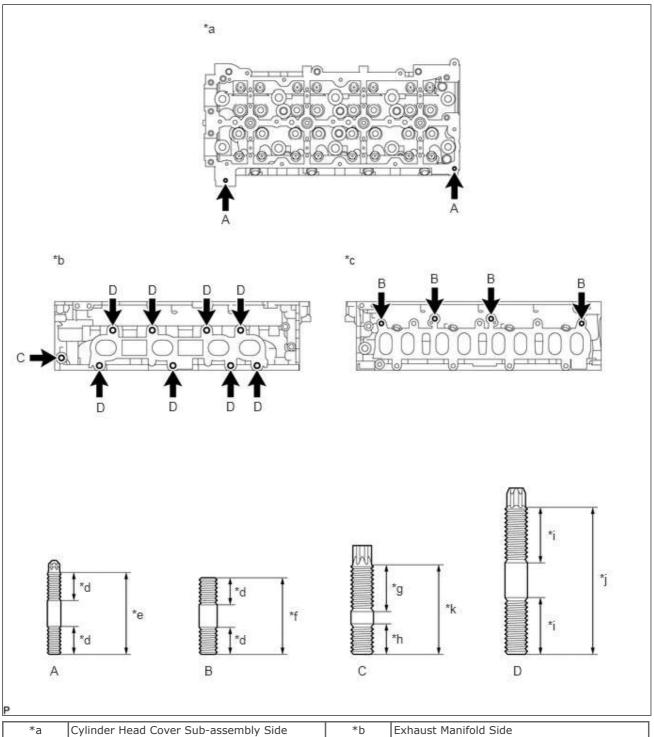
HINT:

Check that the No. 1 and No. 2 connecting rod bearing colors are correct, as the colors differ.

Bearing Color:

Item	Connecting Rod Bearing Color
No. 1 Connecting Rod Bearing	Brown
No. 2 Connecting Rod Bearing	Silver

a. Clean the backside of the connecting rod bearing and the connecting rod bearing surface of the connecting rod sub-assembly and connecting rod cap.



*a	Cylinder Head Cover Sub-assembly Side	*b	Exhaust Manifold Side
*c	Intake Manifold Side	*d	12 mm (0.472 in.)
*e	37 mm (1.46 in.)	*f	34 mm (1.34 in.)
*g	23 mm (0.906 in.)	*h	15 mm (0.591 in.)
*i	25 mm (0.984 in.)	*j	65 mm (2.56 in.)
*k	40 mm (1.57 in.)	-	-

2.INSTALL NO. 1 STRAIGHT SCREW PLUG WITH HEAD

11117E

a. Using a 6 mm hexagon wrench, install 4 new No. 1 straight screw plug with heads to the cylinder head subassembly.

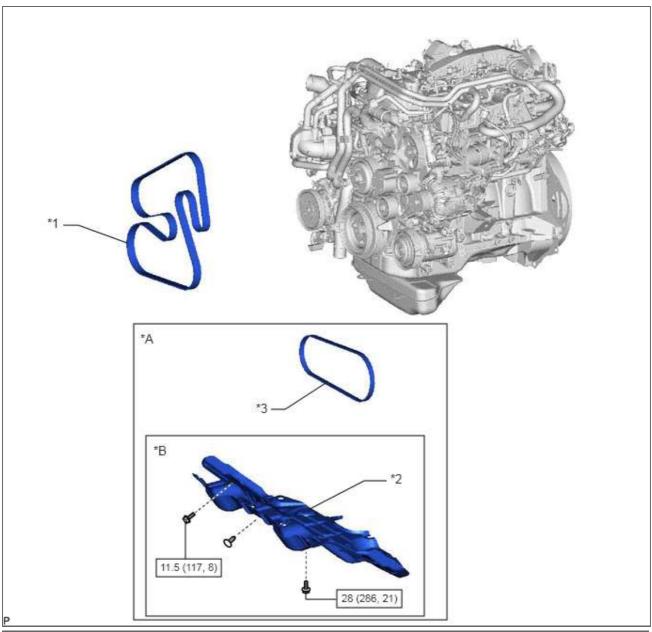
Torque: 25 N*m (255 kgf*cm, 18 ft.*lbf)

Exit

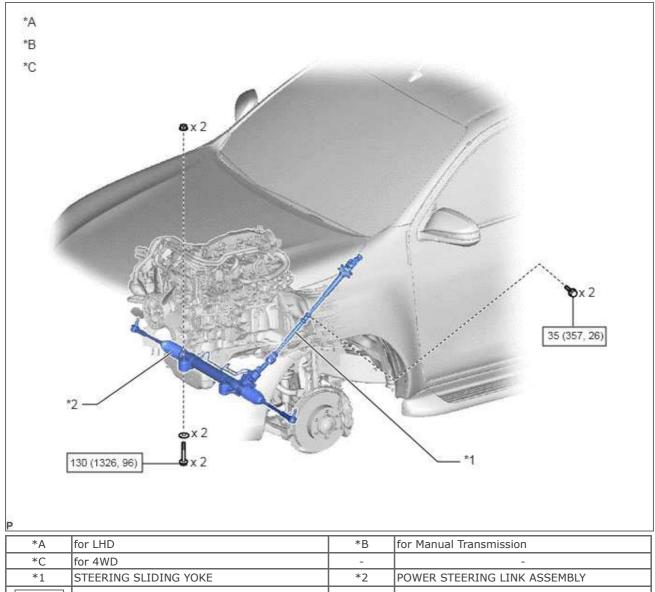
Print

Plint

1GD-FTV ENGINE MECHANICAL DRIVE BELT COMPONENTS

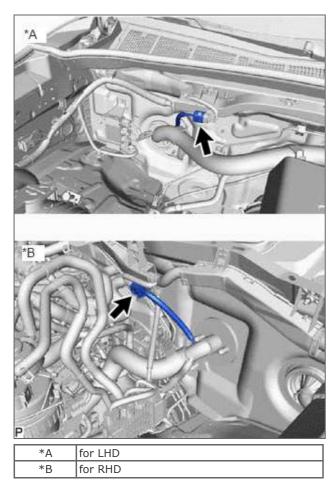


*A	w/ Viscous Heater	*B	for 4WD and Pre-Runner
*1	FAN AND GENERATOR V BELT	*2	NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY
*3	VISCOUS HEATER V BELT	-	-
	N*m (kgf*cm, ft.*lbf): Specified torque	-	-



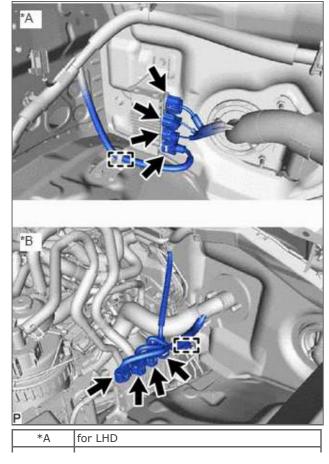
*A	for LHD	*B	for Manual Transmission
*C	for 4WD	-	-
*1	STEERING SLIDING YOKE	*2	POWER STEERING LINK ASSEMBLY
	N*m (kgf*cm, ft.*lbf) : Specified torque	-	-

c.

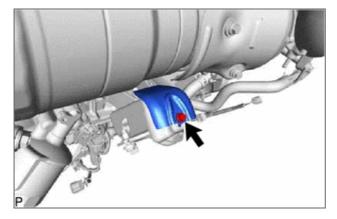


Disconnect the connector from the engine room main wire.

d.



a.

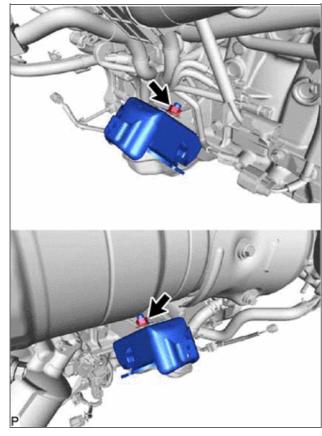


Remove the bolt and front engine mounting insulator RH from the front engine mounting insulator.

47.REMOVE FRONT ENGINE MOUNTING INSULATOR

12361





Remove the 2 nuts and 2 front engine mounting insulators from the 2 front engine mounting brackets.

14.REMOVE OIL FILLER CAP SUB-ASSEMBLY

12108

a. Remove the oil filler cap sub-assembly from the cylinder head cover sub-assembly.

■ 15.REMOVE OIL FILLER CAP GASKET

12108A

a. Remove the oil filler cap gasket from the oil filler cap sub-assembly.

16.REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY

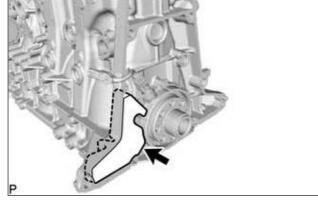
11201

Click hereEngine / Hybrid System>1GD-FTV LUBRICATION>OIL PUMP>REMOVAL

17.REMOVE NO. 5 CYLINDER BLOCK INSULATOR

12585

a.

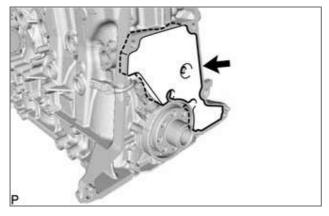


Remove the No. 5 cylinder block insulator from the cylinder block sub-assembly.

18.REMOVE NO. 1 CYLINDER BLOCK INSULATOR

12581A

a.



Remove the No. 1 cylinder block insulator from the cylinder block sub-assembly.

■ 19.REMOVE CRANKSHAFT POSITION SENSOR HARNESS BRACKET

13.INSTALL NO. 2 WATER BY-PASS PIPE SUB-ASSEMBLY

14.INSTALL ENGINE OIL PRESSURE SWITCH ASSEMBLY

16207

83530

17293

87101

a. Install the No. 2 water by-pass pipe sub-assembly with the 2 bolts to the engine water pump assembly and water inlet.

Torque:

TURBOCHARGER>INSTALLATION

TURBOCHARGER>INSTALLATION

Heater)

20.TIGHTEN TURBOCHARGER STAY

Click hereEngine / Hybrid System>1GD-FTV INTAKE / EXHAUST>EXHAUST MANIFOLD W/

21.INSTALL NO. 1 VISCOUS HEATER BRACKET SUB-ASSEMBLY (w/ Viscous

10 N*m (102 kgf*cm, 7 ft.*lbf)

b. Connect the No. 3 water by-pass hose to the water outlet sub-assembly, and slide the clamp to secure the hose.

Click hereEngine / Hybrid System>1GD-FTV LUBRICATION>OIL PRESSURE SWITCH>INSTALLATION 15407 15.TEMPORARILY INSTALL TURBO OIL INLET PIPE SUB-ASSEMBLY Click hereEngine / Hybrid System>1GD-FTV INTAKE / EXHAUST>EXHAUST MANIFOLD W/ TURBOCHARGER>INSTALLATION 16.TEMPORARILY INSTALL EXHAUST MANIFOLD WITH TURBOCHARGER SUB-17141 **ASSEMBLY** Click hereEngine / Hybrid System>1GD-FTV INTAKE / EXHAUST>EXHAUST MANIFOLD W/ TURBOCHARGER>INSTALLATION 17.INSTALL TURBO OIL OUTLET PIPE 15474 Click hereEngine / Hybrid System>1GD-FTV INTAKE / EXHAUST>EXHAUST MANIFOLD W/ TURBOCHARGER>INSTALLATION **18.TEMPORARILY INSTALL TURBOCHARGER STAY** 17293 Click hereEngine / Hybrid System>1GD-FTV INTAKE / EXHAUST>EXHAUST MANIFOLD W/ TURBOCHARGER>INSTALLATION 17141 ■ 19.TIGHTEN EXHAUST MANIFOLD WITH TURBOCHARGER SUB-ASSEMBLY Click hereEngine / Hybrid System>1GD-FTV INTAKE / EXHAUST>EXHAUST MANIFOLD W/



Using SST, hold the crankshaft pulley and install the supply pump shaft nut to the supply pump shaft.

09213-58014 (91551-80840) 09330-00021

Torque:

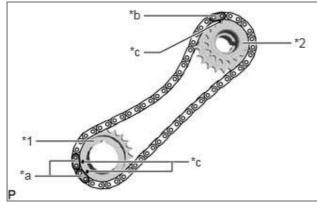
137 N*m (1397 kgf*cm, 101 ft.*lbf)

NOTICE:

If the supply pump shaft nut is tightened with torque higher than the specified torque, the No. 1 chain sub-assembly may break.

Remove the crankshaft pulley set bolt and crankshaft pulley from the crankshaft.





*1	Crankshaft Timing Sprocket
*2	Injection Pump Drive Gear
*a	Mark Plate (Pink)
*b	Mark Plate (Yellow)
*c	Timing Mark

Make sure that the timing marks of the crankshaft timing sprocket and injection pump drive gear are aligned with the mark plates of the No. 1 chain sub-assembly as shown in the illustration.

Remove the pin from the No. 1 chain tensioner assembly.



21.INSTALL CAMSHAFT TIMING SPROCKET

13523