

Last Modified: 3-27-2012	6.4 G	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000T5102GX
Title: FA20 LUBRICATION: LUBRICATION SYSTEM: ON-VEHICLE INSPECTION (2013 FR-S)		

ON-VEHICLE INSPECTION

1. CHECK ENGINE OIL QUALITY

(a) Check the oil for deterioration, water contamination, discoloring or thinning.

If the quality is visibly poor, replace the oil and oil filter element.

2. CHECK ENGINE OIL LEVEL

(a) Warm up and stop the engine, and then wait for 5 minutes. The oil level should be between the dipstick's low level and full level marks.

If low, check for leakage and add oil up to the full level mark.

NOTICE:

Do not add engine oil above the full level mark.

HINT:

Engine oil is always being consumed when driving the vehicle.

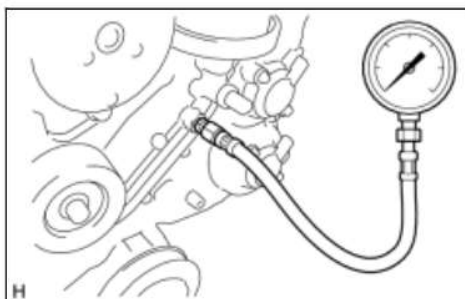
Generally, engine oil consumed at a rate of 1 liter every 3000 km, or 1 US qts. every 2000 miles.

In the following situations, oil consumption may increase and it may be necessary to add oil between maintenances.

- The engine is new.
- The oil quality is poor or the viscosity is inappropriate.
- The engine speed or load is high, the vehicle is towing something or the vehicle is being accelerated and decelerated frequently.
- The engine is idled for a very long time or the vehicle is frequently driven in traffic.

3. CHECK OIL PRESSURE

(a) Remove the oil pressure switch assembly **INFO** .



(b) Install the oil pressure gauge with adapter.

(c) Install the air cleaner assembly **INFO** .

(d) Warm up the engine.

(e) Check the oil pressure under the following conditions.

Specification Oil Pressure:

ITEM	ENGINE OIL TEMPERATURE	OIL PRESSURE
Idle	80°C (176°F)	50 kPa (0.5 kgf/cm ² , 7.3 psi) or more
6000 rpm		500 kPa (5.1 kgf/cm ² , 73 psi) or more

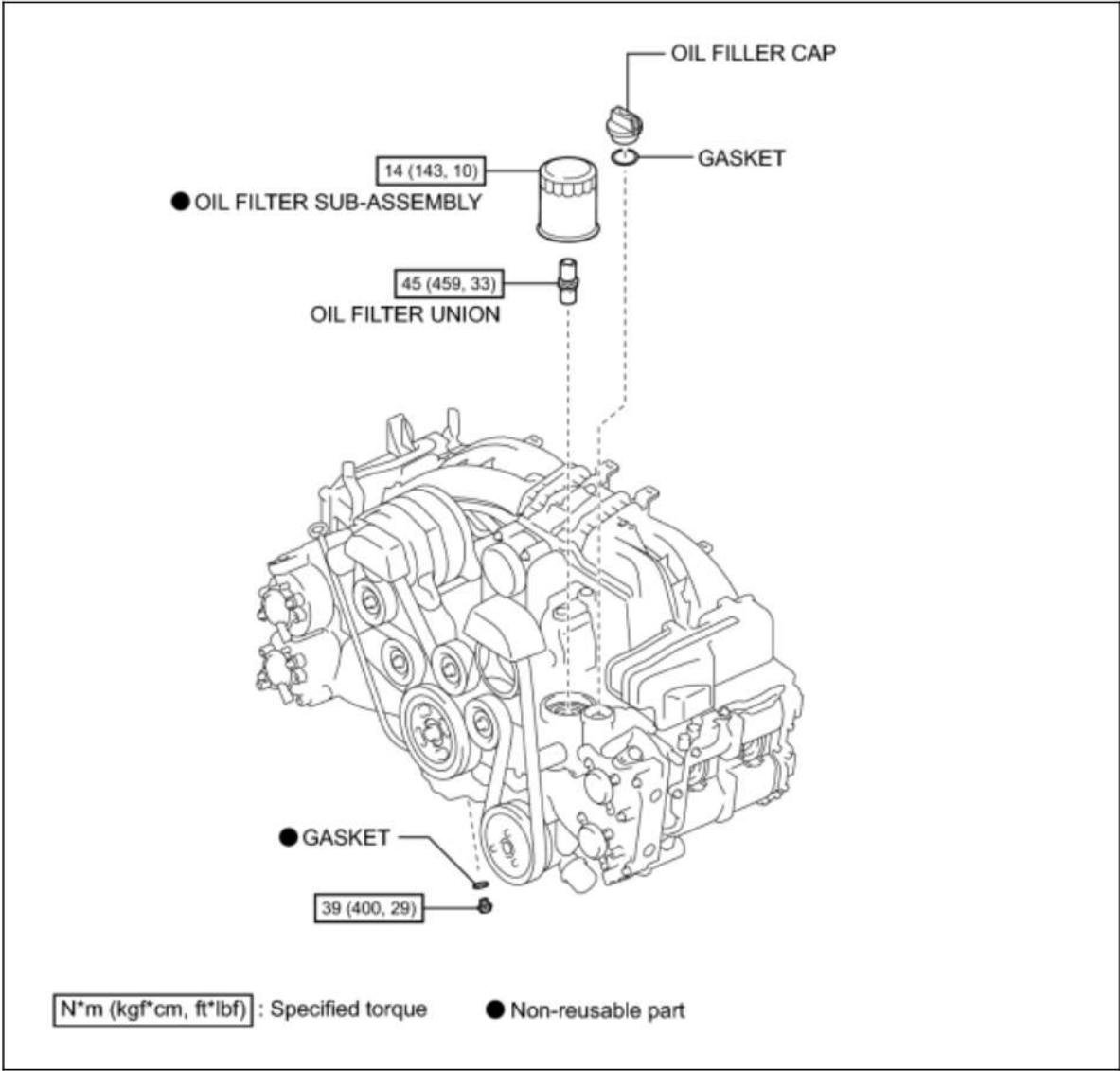
- (f) Remove the air cleaner assembly [INFO](#) .
- (g) Remove the oil pressure gauge with adapter.
- (h) Install the oil pressure switch assembly [INFO](#) .
- (i) Inspect for engine oil leaks.



Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000T50021X
Title: FA20 LUBRICATION: OIL AND OIL FILTER: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION



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Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000T4Z02CX
Title: FA20 LUBRICATION: OIL AND OIL FILTER: REPLACEMENT (2013 FR-S)		

REPLACEMENT

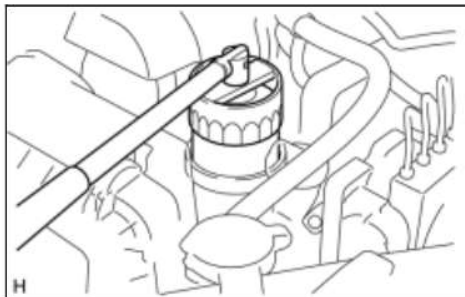
CAUTION:

- Prolonged and repeated contact with engine oil will result in removal of natural oils from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.
- Precautions should be taken when replacing engine oil to minimize the risk of your skin making contact with used engine oil. Protective clothing and gloves that cannot be penetrated by oil should be worn. The skin should be washed with soap and water, or use waterless hand cleaner, to remove any used engine oil thoroughly. Do not use gasoline, thinners, or solvents.
- In order to preserve the environment, used oil and used oil filters must be disposed of at designated disposal sites.

1. DRAIN ENGINE OIL

- Remove the oil filler cap.
- Remove the oil pan drain plug and drain the oil into a container.
- Clean and install the oil pan drain plug with a new oil pan drain plug gasket.

Torque: 39 N·m (400 kgf·cm, 29ft·lbf)

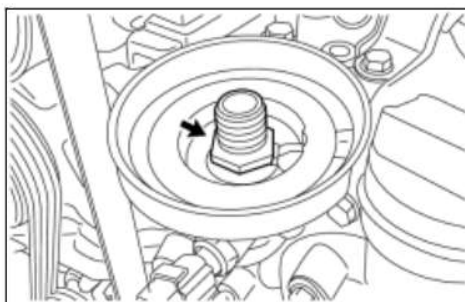


2. REMOVE OIL FILTER SUB-ASSEMBLY

- Remove any foreign matter and clean the installation surface of the engine.
- Using SST, remove the oil filter sub-assembly.

SST: 09228-22020

3. REMOVE OIL FILTER UNION



- Remove the oil filter union.

4. INSTALL OIL FILTER UNION

- (a) Install the oil filter union.

Torque: 45 N·m (459 kgf·cm, 33ft·lbf)

5. INSTALL OIL FILTER SUB-ASSEMBLY

- (a) Remove any foreign matter and clean the inside and installation surface of the engine.
 (b) Apply a light layer of engine oil to the seal rubber of a new oil filter sub-assembly.
 (c) Tighten the oil filter sub-assembly by hand.

NOTICE:

Do not damage the seal rubber of the oil filter sub-assembly.

- (d) Using SST, tighten the oil filter sub-assembly.

SST: 09228-22020

Torque: 14 N·m (143 kgf·cm, 10ft·lbf)

6. ADD ENGINE OIL

- (a) Add new engine oil and install the oil filler cap.

Standard Oil Grade:

OIL GRADE	OIL VISCOSITY (SAE)
API grade SL "energy-conserving", SM "energy-conserving", SN "resource-conserving" or ILSAC multigrade engine oil	• 0W-20 • 5W-30
API grade SL, SM or SN multigrade engine oil	• 5W-20

Standard Capacity:

ITEM	CAPACITY
Drain and refill with oil filter change	5.4 liters (5.7 US qts, 4.8 Imp. qts)
Drain and refill without oil filter change	5.2 liters (5.5 US qts, 4.6 Imp. qts)
Dry fill	6.3 liters (6.7 US qts, 5.5 Imp. qts)

7. INSPECT FOR ENGINE OIL LEAK

- (a) Start the engine. Make sure that there are no oil leaks from the connection point of the oil filter sub-assembly.

8. CHECK ENGINE OIL LEVEL INFO

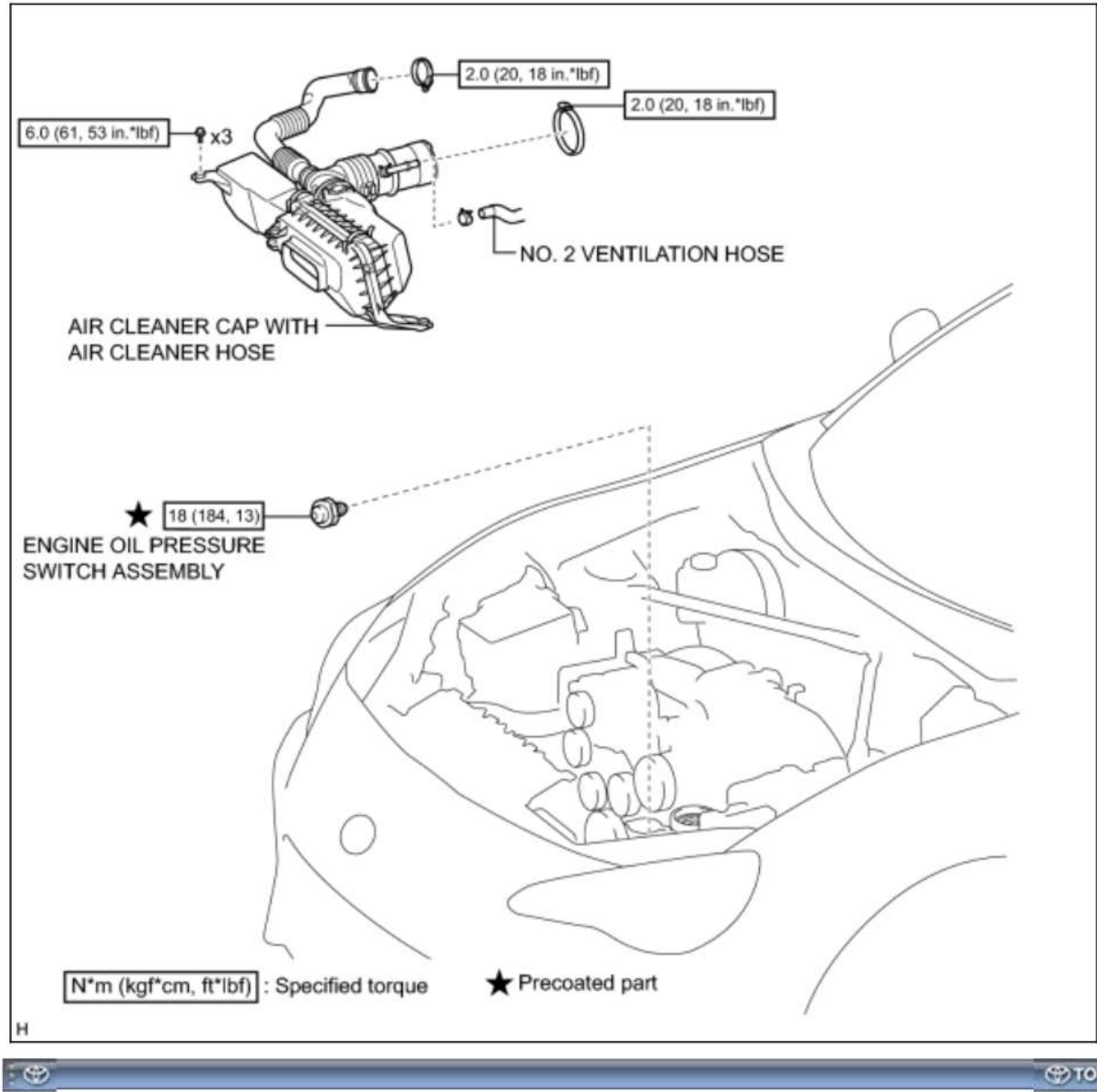


TOYOTA

Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM00000364101CX
Title: FA20 LUBRICATION: OIL PRESSURE SWITCH: COMPONENTS (2013 FR-S)		

COMPONENTS

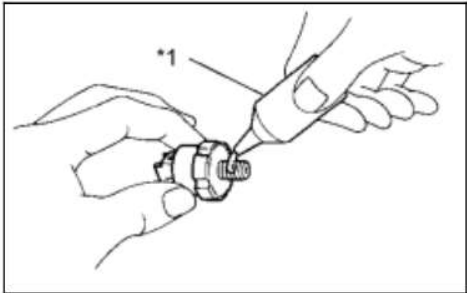
ILLUSTRATION



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000002ZA5074X
Title: FA20 LUBRICATION: OIL PRESSURE SWITCH: INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL ENGINE OIL PRESSURE SWITCH ASSEMBLY



(a) Apply adhesive to 2 or 3 threads of the engine oil pressure switch assembly.

Text in Illustration

*1	Adhesive
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Adhesive:
Toyota Genuine Adhesive 1324, Three Bond 1324 or equivalent

- (b) Using a 24 mm deep socket wrench, install the engine oil pressure switch assembly.
- Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

NOTICE:
Do not start the engine for at least 1 hour after installation.

- (c) Connect the engine oil pressure switch connector.

2. INSTALL AIR CLEANER CAP WITH AIR CLEANER HOSE INFO

3. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL INFO

4. INSPECT FOR OIL LEAK

- (a) Start the engine.
- (b) Check for engine oil leaks from the engine oil pressure switch assembly.

5. CHECK ENGINE OIL LEVEL INFO



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000002ZA8072X
Title: FA20 LUBRICATION: OIL PRESSURE SWITCH: REMOVAL (2013 FR-S)		

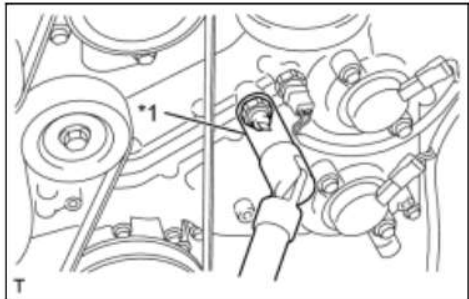
REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL INFO

2. REMOVE AIR CLEANER CAP WITH AIR CLEANER HOSE INFO

3. REMOVE ENGINE OIL PRESSURE SWITCH ASSEMBLY

(a) Disconnect the engine oil pressure switch connector.



(b) Using a 24 mm deep socket wrench, remove the engine oil pressure switch assembly.

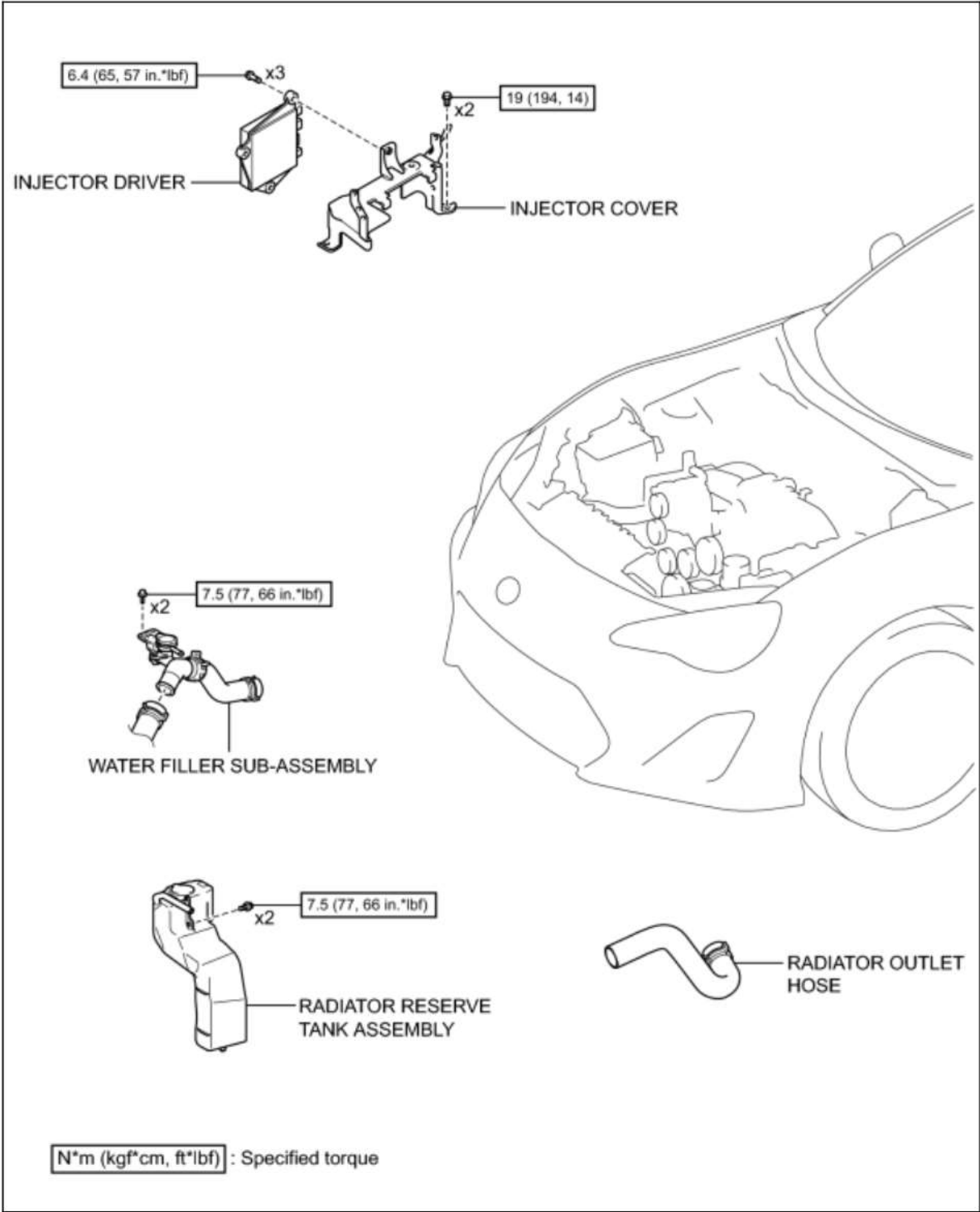
Text in Illustration

*1	24 mm Deep Socket Wrench
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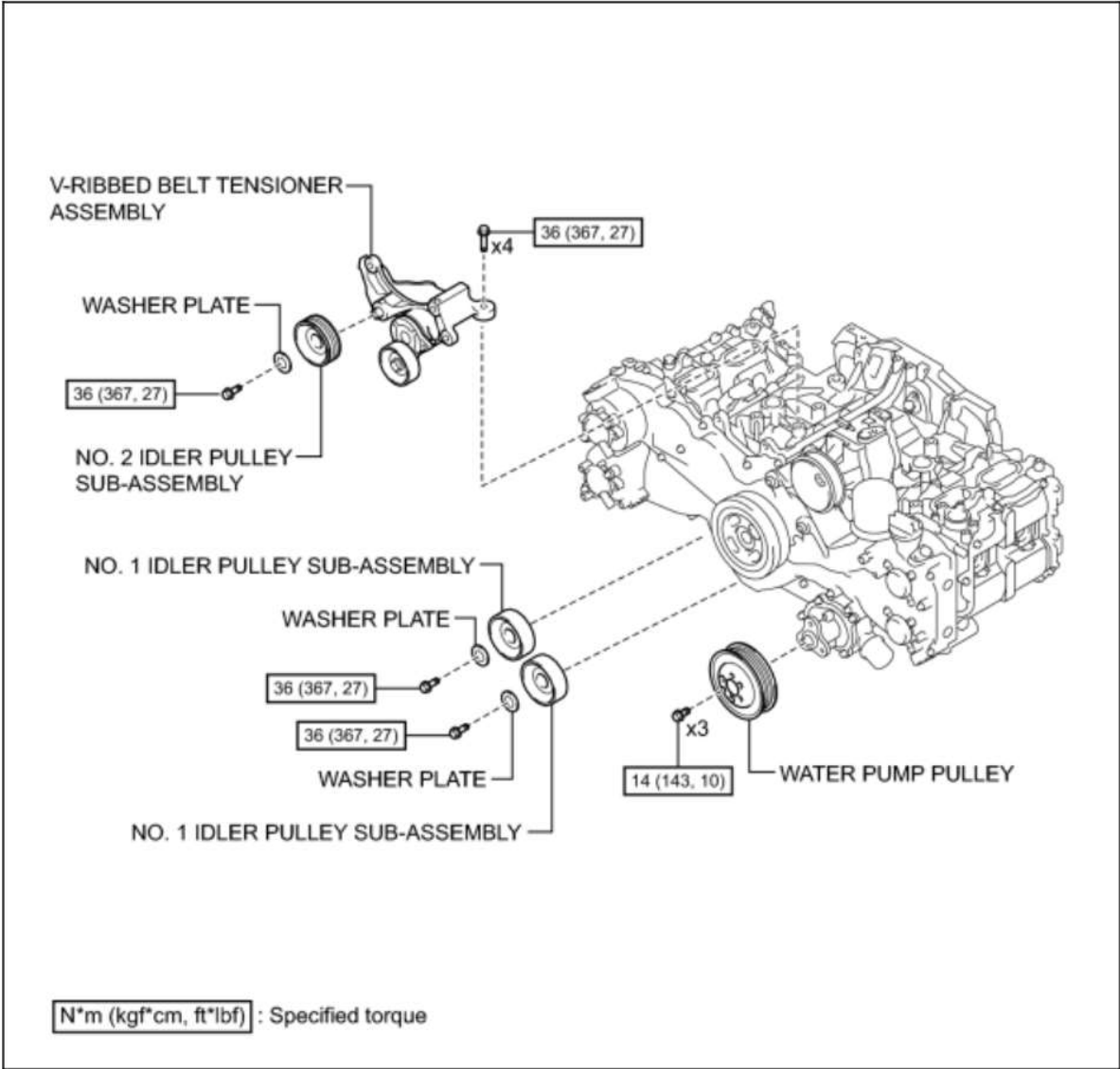
Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000T56024X
Title: FA20 LUBRICATION: OIL PUMP: COMPONENTS (2013 FR-S)		

COMPONENTS

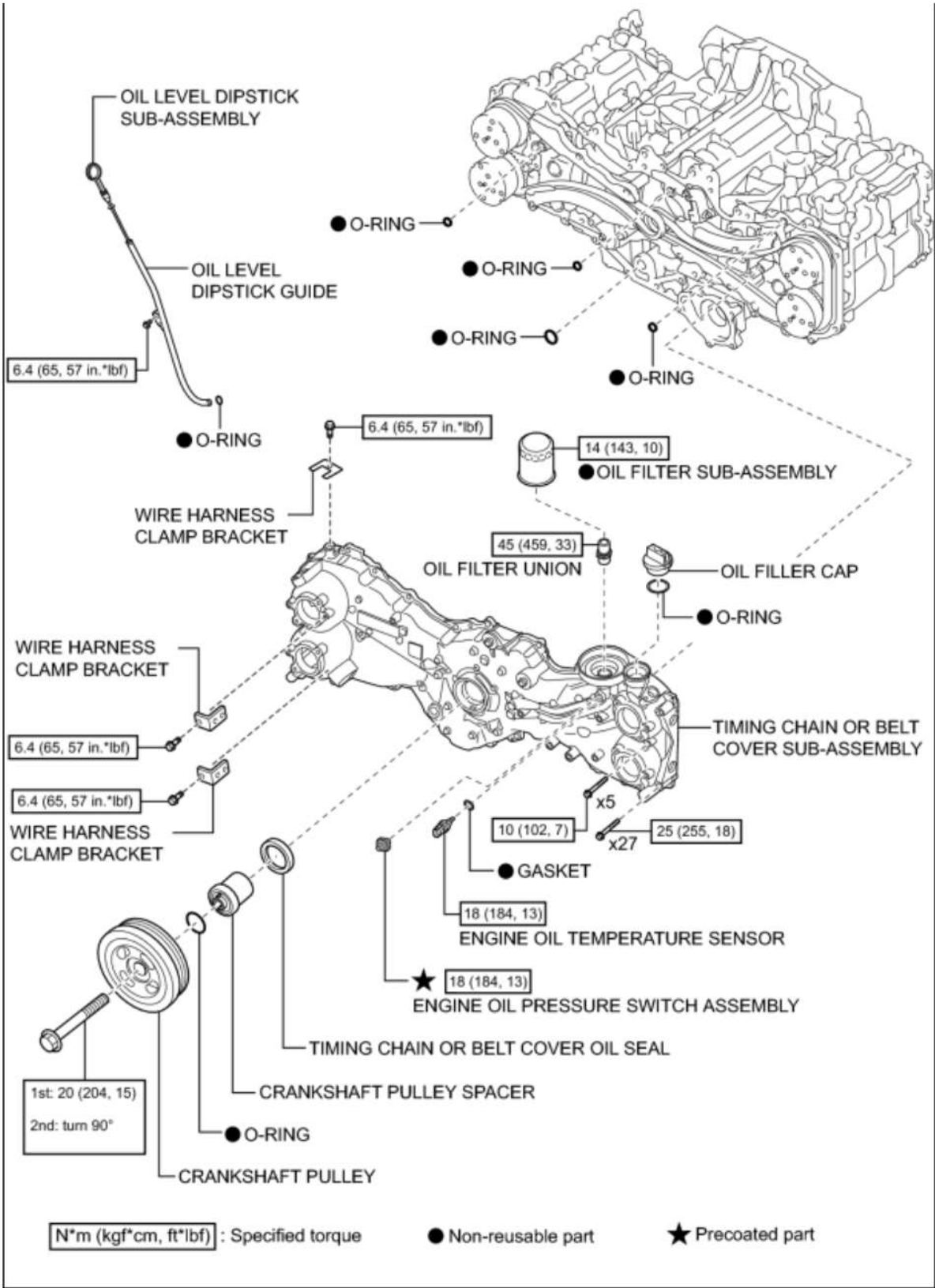
ILLUSTRATION



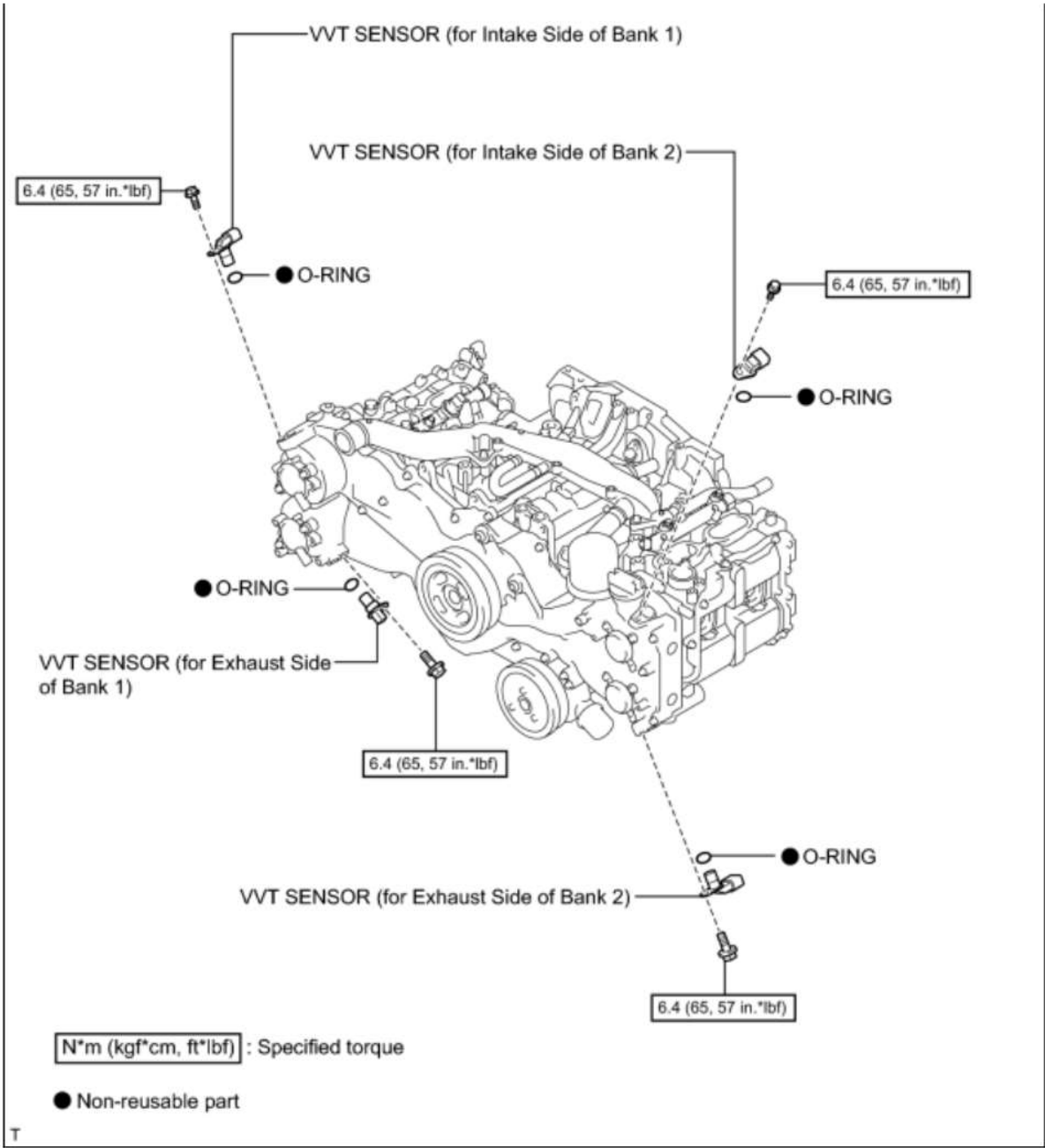
ILLUSTRATION



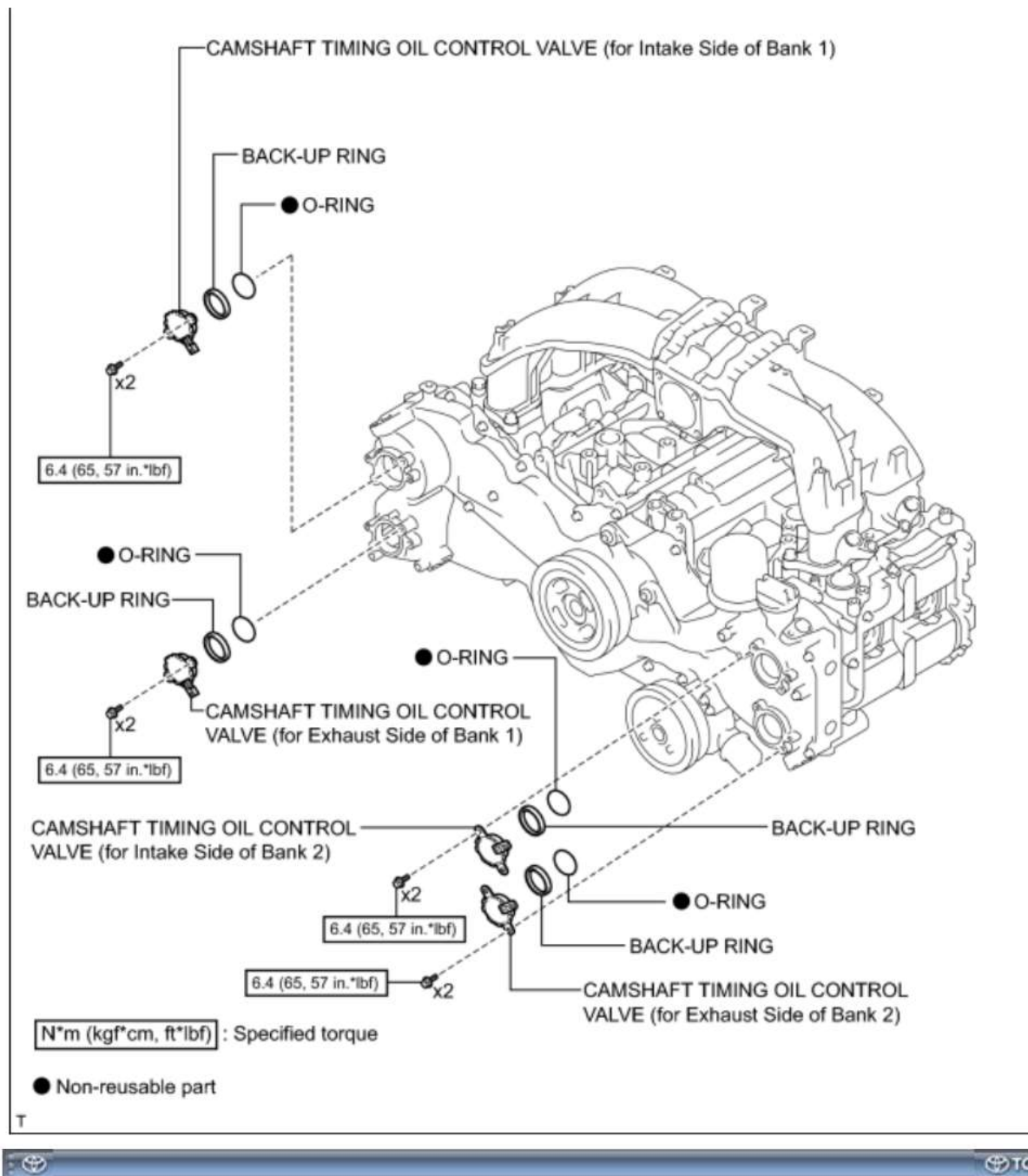
ILLUSTRATION



ILLUSTRATION



ILLUSTRATION



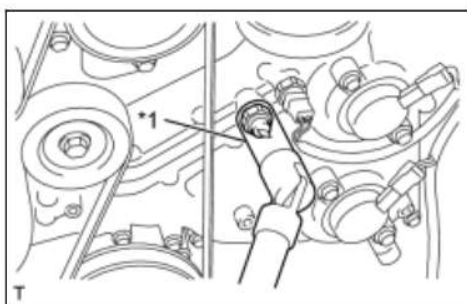
Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM00000591J000X
Title: FA20 LUBRICATION: OIL PUMP: DISASSEMBLY (2013 FR-S)		

DISASSEMBLY

1. REMOVE OIL FILTER SUB-ASSEMBLY INFO

2. REMOVE OIL FILTER UNION INFO

3. REMOVE ENGINE OIL PRESSURE SWITCH ASSEMBLY

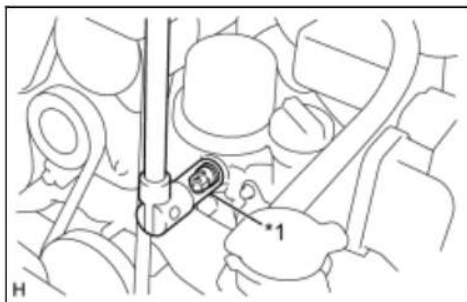


(a) Using a 24 mm deep socket wrench, remove the engine oil pressure switch assembly.

Text in Illustration

*1	24 mm Deep Socket Wrench
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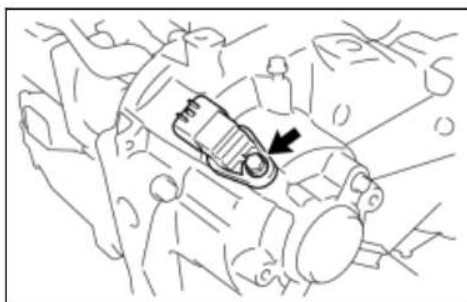
4. REMOVE ENGINE OIL TEMPERATURE SENSOR



(a) Using a 19 mm deep socket wrench, remove the engine oil temperature sensor.

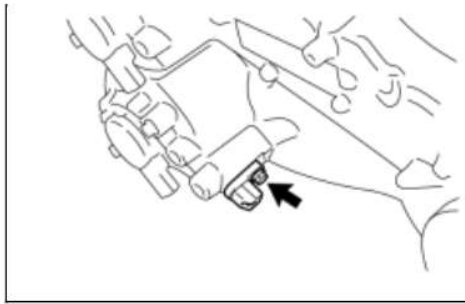
Text in Illustration

*1	19 mm Deep Socket Wrench
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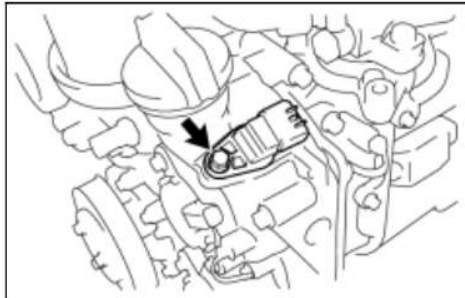
5. REMOVE VVT SENSOR (for Intake Side of Bank 1)

- (a) Remove the bolt and VVT sensor.
- (b) Remove the O-ring from the VVT sensor.



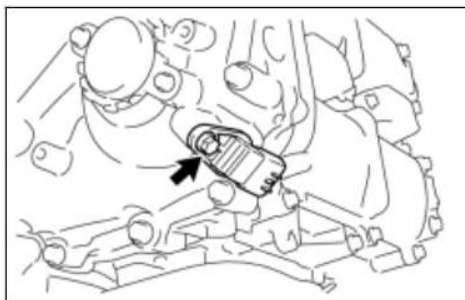
6. REMOVE VVT SENSOR (for Exhaust Side of Bank 1)

- (a) Remove the bolt and VVT sensor.
- (b) Remove the O-ring from the VVT sensor.



7. REMOVE VVT SENSOR (for Intake Side of Bank 2)

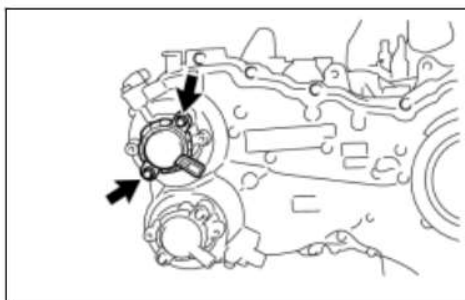
- (a) Remove the bolt and VVT sensor.
- (b) Remove the O-ring from the VVT sensor.



8. REMOVE VVT SENSOR (for Exhaust Side of Bank 2)

- (a) Remove the bolt and VVT sensor.
- (b) Remove the O-ring from the VVT sensor.

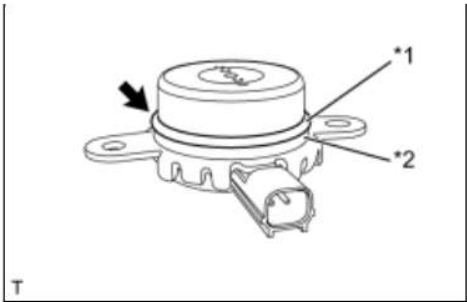
9. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (for Intake Side of Bank 1)



- (a) Remove the 2 bolts and camshaft timing oil control valve.

- (b) Remove the O-ring from the camshaft timing oil control valve.

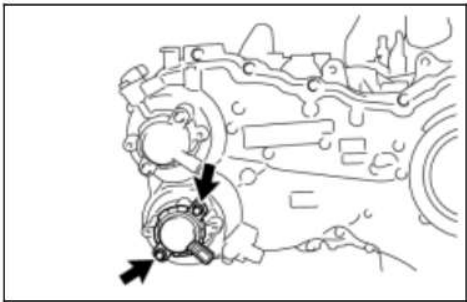
Text in Illustration



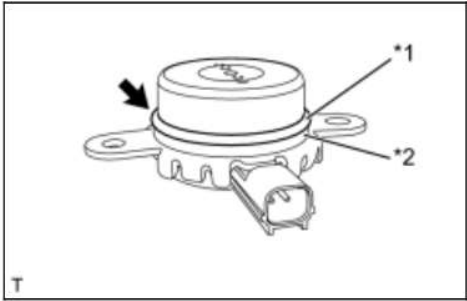
*1	O-ring
*2	Back-up Ring

(c) Remove the back-up ring from the camshaft timing oil control valve.

10. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (for Exhaust Side of Bank 1)



(a) Remove the 2 bolts and camshaft timing oil control valve.



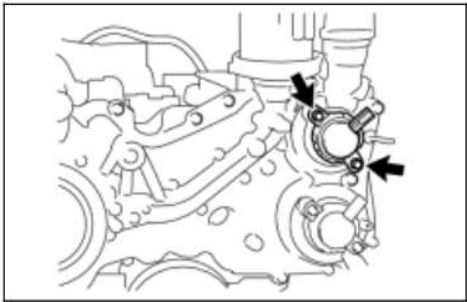
(b) Remove the O-ring from the camshaft timing oil control valve.

Text in Illustration

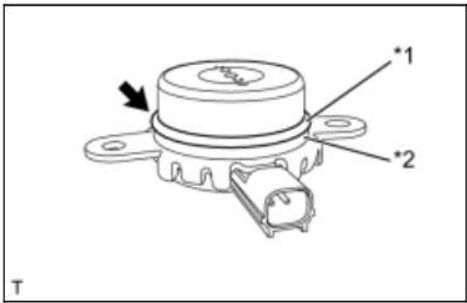
*1	O-ring
*2	Back-up Ring

(c) Remove the back-up ring from the camshaft timing oil control valve.

11. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (for Intake Side of Bank 2)



(a) Remove the 2 bolts and camshaft timing oil control valve.



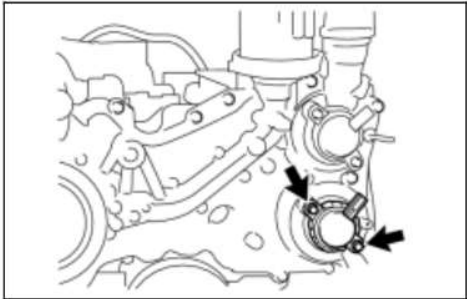
(b) Remove the O-ring from the camshaft timing oil control valve.

Text in Illustration

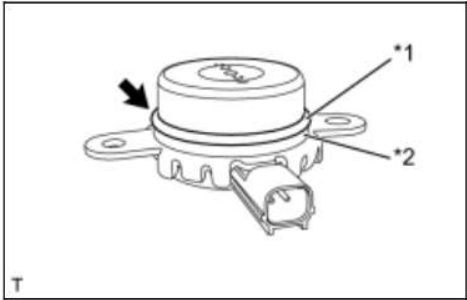
*1	O-ring
*2	Back-up Ring

(c) Remove the back-up ring from the camshaft timing oil control valve.

12. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (for Exhaust Side of Bank 2)



(a) Remove the 2 bolts and camshaft timing oil control valve.



(b) Remove the O-ring from the camshaft timing oil control valve.

Text in Illustration

*1	O-ring
*2	Back-up Ring

(c) Remove the back-up ring from the camshaft timing oil control valve.

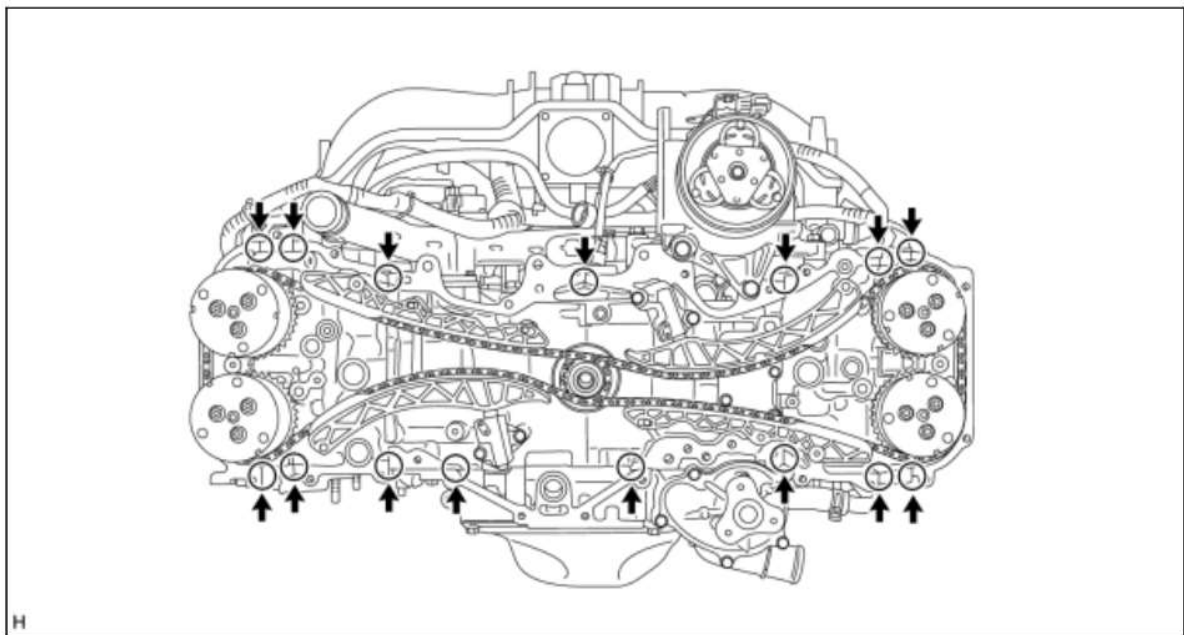


Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000T5302TX
Title: FA20 LUBRICATION: OIL PUMP: INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSEMBLY

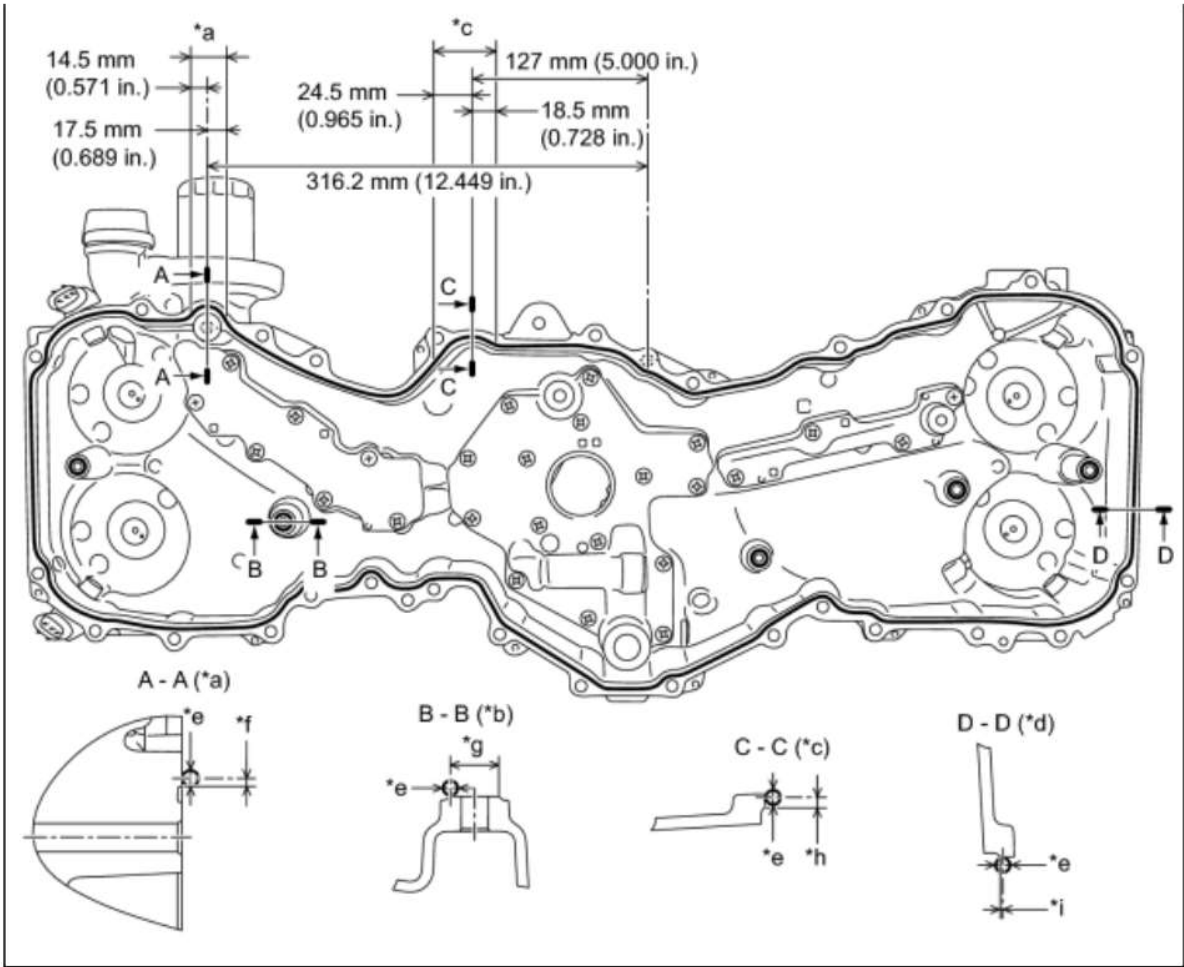
- (a) Apply a light coat of engine oil to the 4 O-rings.
- (b) Remove any old packing material remaining on the sealing surfaces before applying seal packing.
- (c) Apply seal packing in a continuous line to the engine unit as shown in the illustration.



Seal packing:

Toyota Genuine Seal Packing Black, Three Bond 1217G or equivalent

- (d) Apply seal packing in a line to the timing chain cover as shown in the following illustration.



Text in Illustration

*a	Range A	*b	Boss (5 locations)
*c	Range B	*d	Other than ranges A and B
*e	φ3.5 to 4.5 mm (0.138 to 0.177 in.)	*f	2 mm (0.079 in.)
*g	φ12 mm (0.472 in.)	*h	2.5 mm (0.098 in.)
*i	0.5 mm (0.020 in.)	-	-

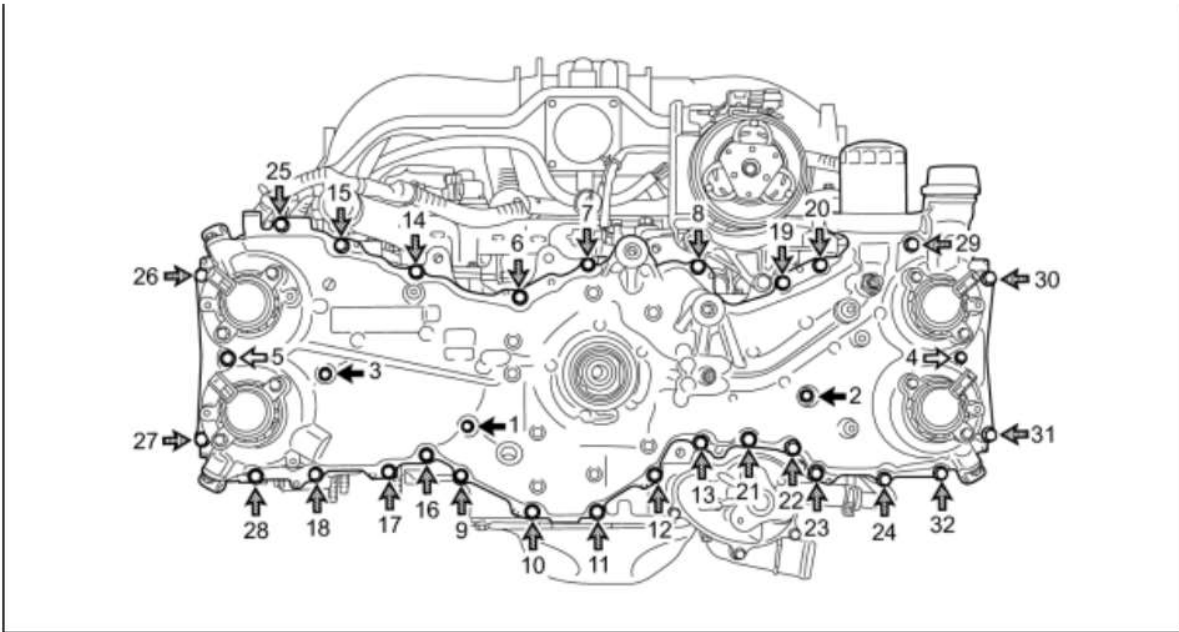
Seal packing:
Toyota Genuine Seal Packing 1217G or equivalent

NOTICE:

- If the contact surfaces are wet, wipe them with an oil-free cloth before applying seal packing.
- Install the chain cover within 3 minutes and tighten the bolts within 10 minutes after applying seal packing.
- Do not add engine oil for at least 2 hours after installing.
- Do not start the engine for at least 2 hours after installing.

(e) Temporarily tighten the timing chain cover with the 32 bolts.

(f) Fully tighten the 32 bolts shown in the illustration.



Text in Illustration

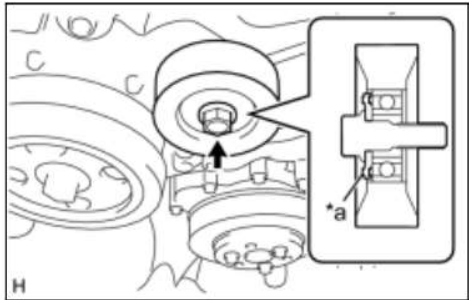
	Bolt A		Bolt B
	Bolt C		Bolt D

for bolt A and B - Torque: 10 N·m (102 kgf·cm, 7ft·lbf)
for bolt C and D - Torque: 25 N·m (255 kgf·cm, 18ft·lbf)
Bolt Length:

ITEM	LENGTH	ITEM	LENGTH
Bolt A	20 mm (0.787 in.)	Bolt B	25 mm (0.984 in.)
Bolt C	60 mm (2.362 in.)	Bolt D	50 mm (1.969 in.)

2. INSTALL TIMING CHAIN OR BELT COVER OIL SEAL INFO

3. INSTALL NO. 1 IDLER PULLEY SUB-ASSEMBLY



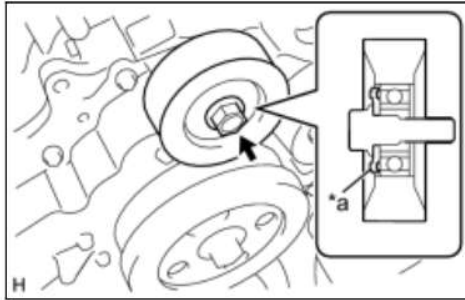
(a) Install the washer plate to the No. 1 idler pulley sub-assembly as shown in the illustration.

Text in Illustration

*a	Protrusion
----	------------

- (b) Install the washer plate and No. 1 idler pulley sub-assembly with the bolt.

Torque: 36 N·m (367 kgf·cm, 27ft·lbf)



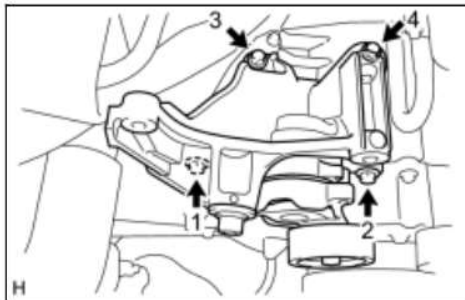
- (c) Install the washer plate to the No. 1 idler pulley sub-assembly as shown in the illustration.

Text in Illustration

*a	Protrusion
----	------------

- (d) Install the washer plate and No. 1 idler pulley sub-assembly with the bolt.

Torque: 36 N·m (367 kgf·cm, 27ft·lbf)

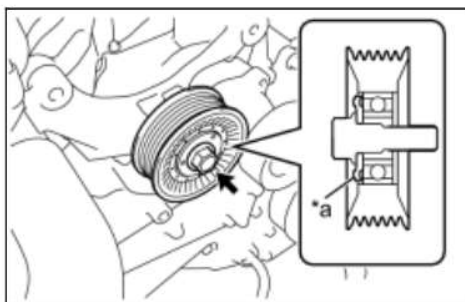


4. INSTALL V-RIBBED BELT TENSIONER ASSEMBLY

- (a) Temporarily install the V-ribbed belt tensioner with the 5 bolts.
(b) Tighten the 4 bolts in the order shown in the illustration.

Torque: 36 N·m (367 kgf·cm, 27ft·lbf)

5. INSTALL NO. 2 IDLER PULLEY SUB-ASSEMBLY



- (a) Install the washer plate to the No. 2 idler pulley sub-assembly as shown in the illustration.

Text in Illustration

*a	Protrusion
----	------------

- (b) Install the washer plate and No. 2 idler pulley sub-assembly with the bolt.

Torque: 36 N·m (367 kgf·cm, 27ft·lbf)

6. INSTALL OIL LEVEL DIPSTICK GUIDE

- (a) Install a new O-ring to the oil level dipstick guide.
(b) Apply a light coat of engine oil to the O-ring.
(c) Install the oil level dipstick guide with the bolt.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

(d) Install the oil level dipstick sub-assembly.

7. CONNECT ENGINE WIRE

- (a) Connect the camshaft position sensor connector and camshaft timing oil control valve connector.
- (b) Engage the wire harness clamp.
- (c) Connect the engine oil pressure switch connector and engine oil temperature sensor connector.
- (d) Connect the camshaft position sensor connector and camshaft timing oil control valve connector.
- (e) Connect the 2 camshaft position sensor connectors and camshaft timing oil control valve connector.
- (f) Connect the camshaft position sensor connector.
- (g) Install the wire harness bracket with the bolt.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

- (h) Engage the wire harness clamp.
- (i) Install the 2 wire harness brackets with the 2 bolts.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

8. INSTALL INJECTOR COVER (for Bank 1) INFO

9. INSTALL CRANKSHAFT PULLEY INFO

10. INSTALL WATER PUMP PULLEY INFO

11. CONNECT RADIATOR OUTLET HOSE INFO

12. INSTALL EXHAUST MANIFOLD

INFO

13. INSTALL WATER FILLER SUB-ASSEMBLY INFO

14. INSTALL RADIATOR RESERVE TANK ASSEMBLY INFO

15. INSTALL INJECTOR DRIVER INFO

16. INSTALL GENERATOR ASSEMBLY

INFO

17. ADD ENGINE COOLANT

18. ADD ENGINE OIL INFO

19. INSPECT FOR ENGINE OIL LEAK INFO

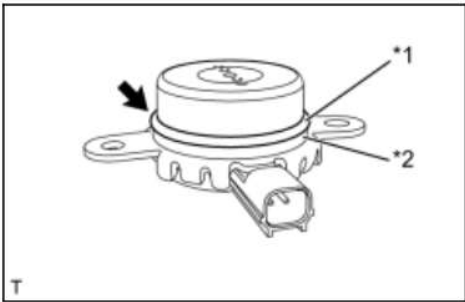
20. CHECK ENGINE OIL LEVEL INFO



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM00000591K000X
Title: FA20 LUBRICATION: OIL PUMP: REASSEMBLY (2013 FR-S)		

REASSEMBLY

1. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE (for Exhaust Side of Bank 2)

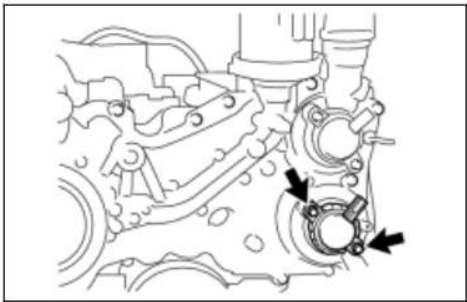


(a) Install the back-up ring to the camshaft timing oil control valve.

Text in Illustration

*1	O-ring
*2	Back-up Ring

(b) Apply a light coat of engine oil to a new O-ring and install it to the camshaft timing oil control valve.



(c) Install the camshaft timing oil control valve with the 2 bolts.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

NOTICE:

- If a component has been dropped or subjected to a strong impact, replace it.
- Make sure that the O-ring is not damaged or does not jump out of position during installation.

2. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE (for Intake Side of Bank 2)

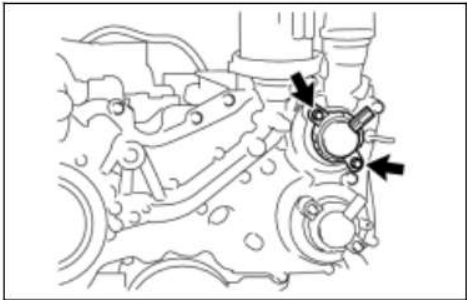


(a) Install the back-up ring to the camshaft timing oil control valve.

Text in Illustration

*1	O-ring
*2	Back-up Ring

(b) Apply a light coat of engine oil to a new O-ring and install it to the camshaft timing oil control valve.



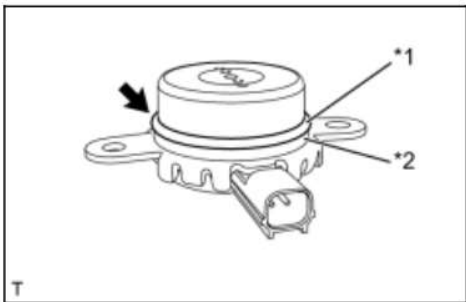
(c) Install the camshaft timing oil control valve with the 2 bolts.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

NOTICE:

- If a component has been dropped or subjected to a strong impact, replace it.
- Make sure that the O-ring is not damaged or does not jump out of position during installation.

3. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE (for Exhaust Side of Bank 1)

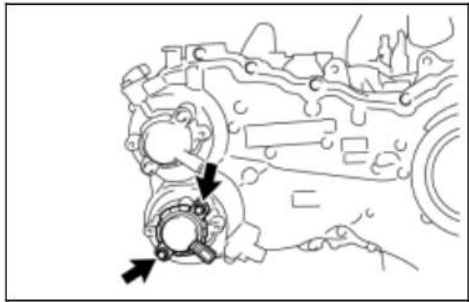


(a) Install the back-up ring to the camshaft timing oil control valve.

Text in Illustration

*1	O-ring
*2	Back-up Ring

(b) Apply a light coat of engine oil to a new O-ring and install it to the camshaft timing oil control valve.



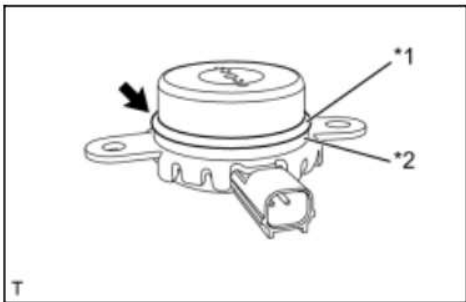
(c) Install the camshaft timing oil control valve with the 2 bolts.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

NOTICE:

- If a component has been dropped or subjected to a strong impact, replace it.
- Make sure that the O-ring is not damaged or does not jump out of position during installation.

4. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE (for Intake Side of Bank 1)

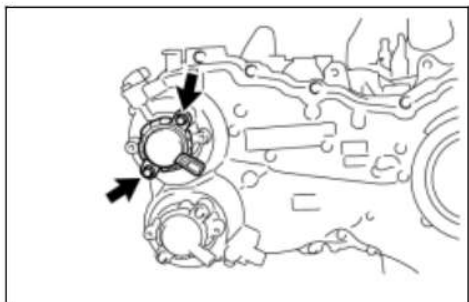


(a) Install the back-up ring to the camshaft timing oil control valve.

Text in Illustration

*1	O-ring
*2	Back-up Ring

(b) Apply a light coat of engine oil to a new O-ring and install it to the camshaft timing oil control valve.



(c) Install the camshaft timing oil control valve with the 2 bolts.

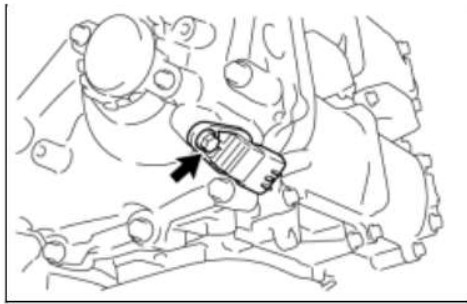
Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

NOTICE:

- If a component has been dropped or subjected to a strong impact, replace it.
- Make sure that the O-ring is not damaged or does not jump out of position during installation.

5. INSTALL VVT SENSOR (for Exhaust Side of Bank 2)

(a) Apply a light coat of engine oil to the new O-ring of the VVT sensor.

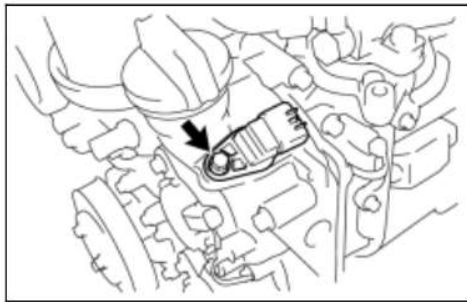


(b) Install the VVT sensor with the bolt.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

6. INSTALL VVT SENSOR (for Intake Side of Bank 2)

(a) Apply a light coat of engine oil to the new O-ring of the VVT sensor.

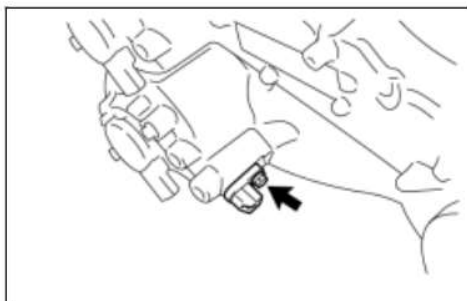


(b) Install the VVT sensor with the bolt.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

7. INSTALL VVT SENSOR (for Exhaust Side of Bank 1)

(a) Apply a light coat of engine oil to the new O-ring of the VVT sensor.

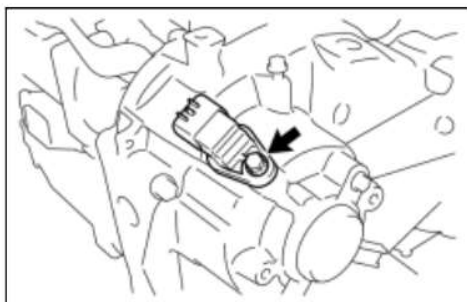


(b) Install the VVT sensor with the bolt.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

8. INSTALL VVT SENSOR (for Intake Side of Bank 1)

(a) Apply a light coat of engine oil to the new O-ring of the VVT sensor.

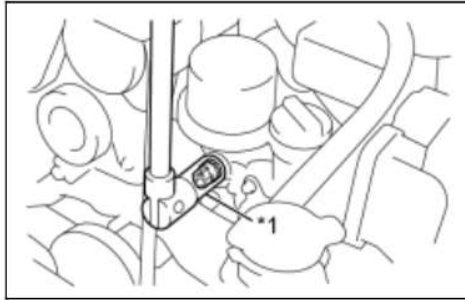


(b) Install the VVT sensor with the bolt.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

9. INSTALL ENGINE OIL TEMPERATURE SENSOR

- (a) Install a new gasket to the engine oil temperature sensor.



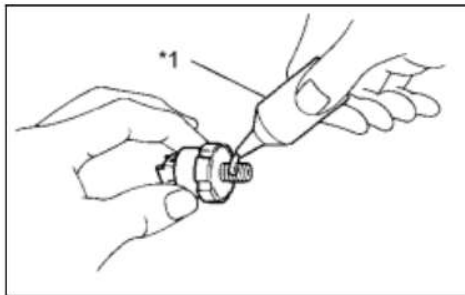
- (b) Using a 19 mm deep socket wrench, install the engine oil temperature sensor to the cylinder head sub-assembly.

Text in Illustration

*1	19 mm Deep Socket Wrench
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Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

10. INSTALL ENGINE OIL PRESSURE SWITCH ASSEMBLY



- (a) Apply adhesive to 2 or 3 threads of the engine oil pressure switch assembly.

Text in Illustration

*1	Adhesive
----	----------

Adhesive:

Toyota Genuine Adhesive 1324, Three Bond 1324 or equivalent



- (b) Using a 24 mm deep socket wrench, install the engine oil pressure switch assembly.

Text in Illustration

*1	24 mm Deep Socket Wrench
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Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

NOTICE:

Do not start the engine for at least 1 hour after installation.

11. INSTALL OIL FILTER UNION

INFO

12. INSTALL OIL FILTER SUB-ASSEMBLY

INFO



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000T5702RX
Title: FA20 LUBRICATION: OIL PUMP: REMOVAL (2013 FR-S)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL INFO

2. DRAIN ENGINE COOLANT INFO

3. REMOVE GENERATOR ASSEMBLY

INFO

4. REMOVE INJECTOR DRIVER INFO

5. REMOVE RADIATOR RESERVE TANK ASSEMBLY INFO

6. REMOVE WATER FILLER SUB-ASSEMBLY INFO

7. REMOVE EXHAUST MANIFOLD

INFO

8. DISCONNECT RADIATOR OUTLET HOSE INFO

9. DRAIN ENGINE OIL INFO

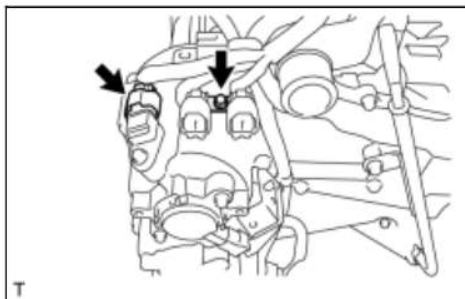
10. REMOVE WATER PUMP PULLEY INFO

11. REMOVE CRANKSHAFT PULLEY INFO

12. REMOVE INJECTOR COVER (for Bank 1) INFO

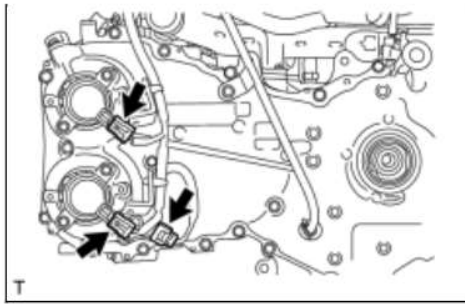
13. DISCONNECT ENGINE WIRE

(a) Remove the 2 bolts and disconnect the 2 wire harness clamp brackets from the engine assembly.

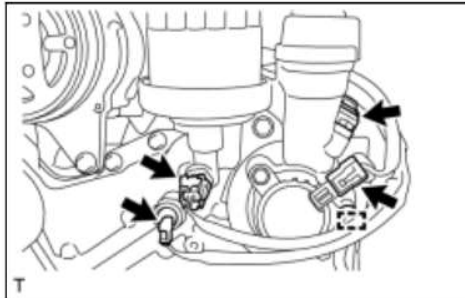


(b) Remove the bolts and disconnect the wire harness clamp bracket from the engine assembly.

(c) Disconnect the camshaft position sensor connector.

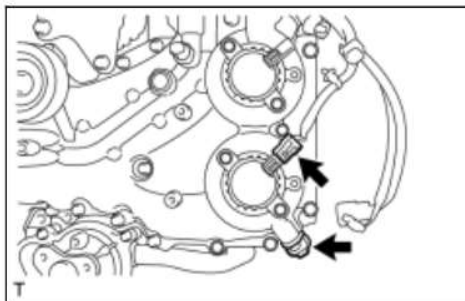


- (d) Disconnect the camshaft position sensor connector and 2 camshaft timing oil control valve connectors.

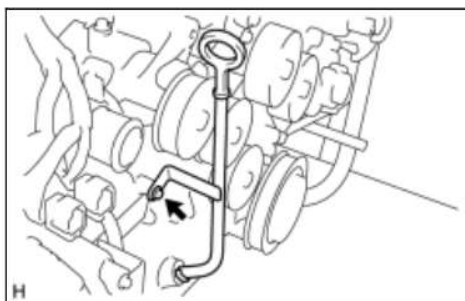


- (e) Disconnect the camshaft position sensor connector and camshaft timing oil control valve connector.

- (f) Disconnect the engine oil pressure switch connector and engine oil temperature connector.
(g) Disengage the clamp.



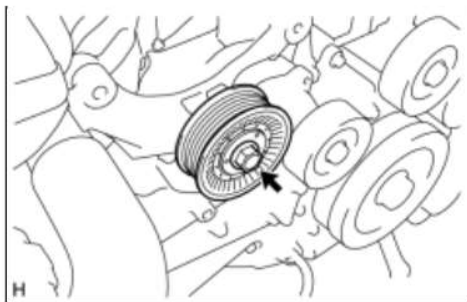
- (h) Disconnect the camshaft position sensor connector and camshaft timing oil control valve connector.



14. REMOVE OIL LEVEL DIPSTICK GUIDE

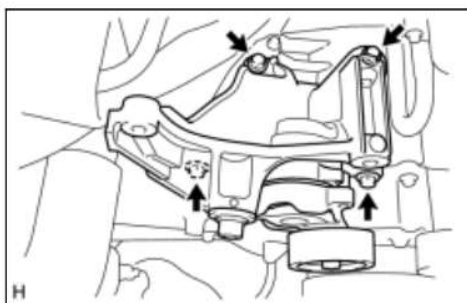
- (a) Remove the oil level dipstick sub-assembly.
(b) Remove the bolt and oil level dipstick guide.
(c) Remove the O-ring from the oil level dipstick guide.

15. REMOVE NO. 2 IDLER PULLEY SUB-ASSEMBLY



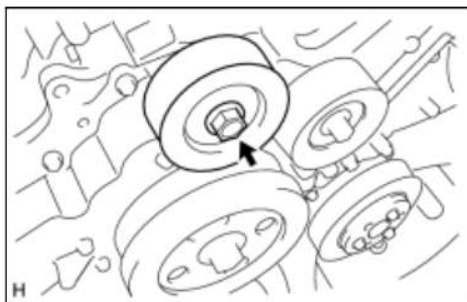
- (a) Remove the bolt, washer plate and No. 2 idler pulley sub-assembly.

16. REMOVE V-RIBBED BELT TENSIONER ASSEMBLY

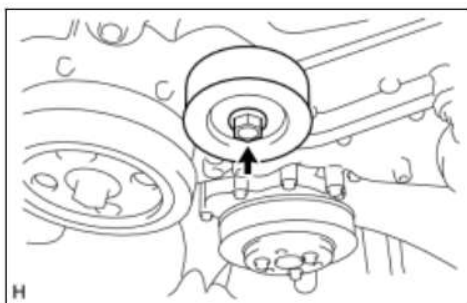


- (a) Remove the 4 bolts and V-ribbed belt tensioner assembly.

17. REMOVE NO. 1 IDLER PULLEY SUB-ASSEMBLY



- (a) Remove the bolt, washer plate and No. 1 idler pulley sub-assembly.



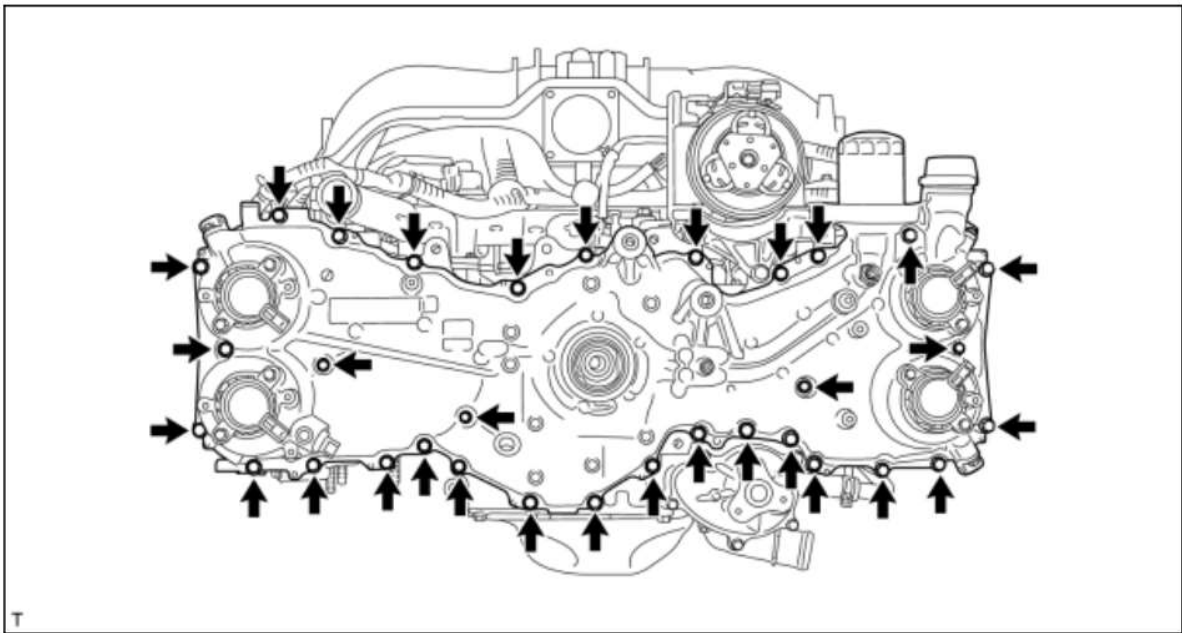
- (b) Remove the bolt, washer plate and No. 1 idler pulley sub-assembly.

18. REMOVE TIMING CHAIN OR BELT COVER OIL SEAL

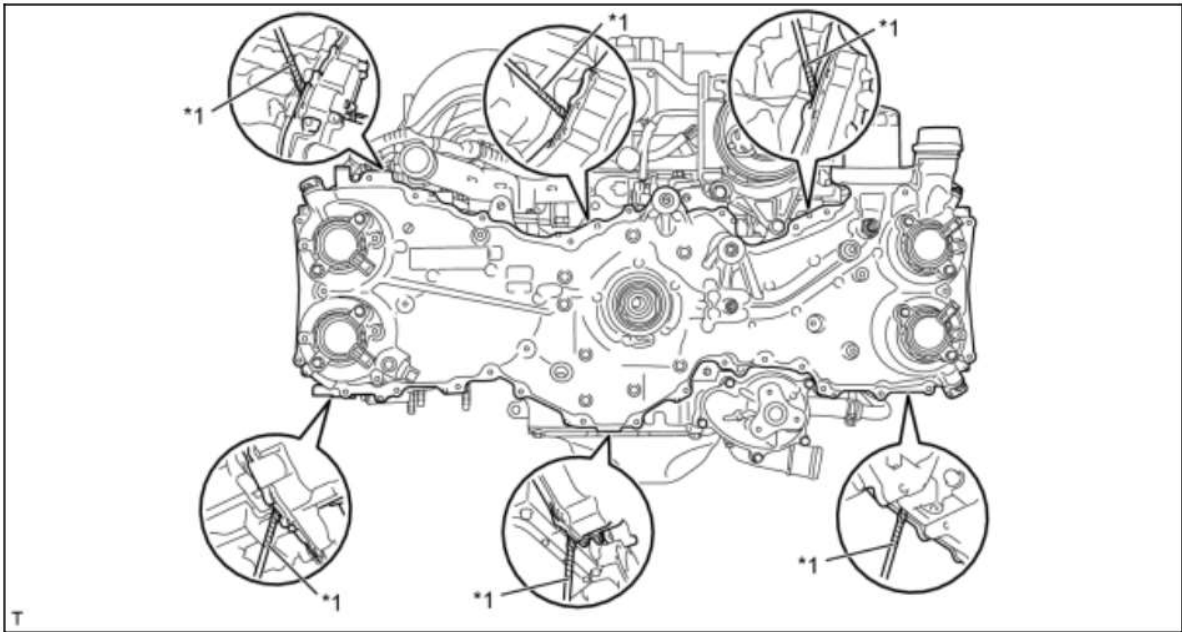
INFO

19. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSEMBLY

(a) Remove the 32 bolts.



(b) Using a screwdriver with its tip wrapped with protective tape, remove the timing chain or belt cover sub-assembly by prying between the timing chain or belt cover sub-assembly and cylinder head or cylinder block.



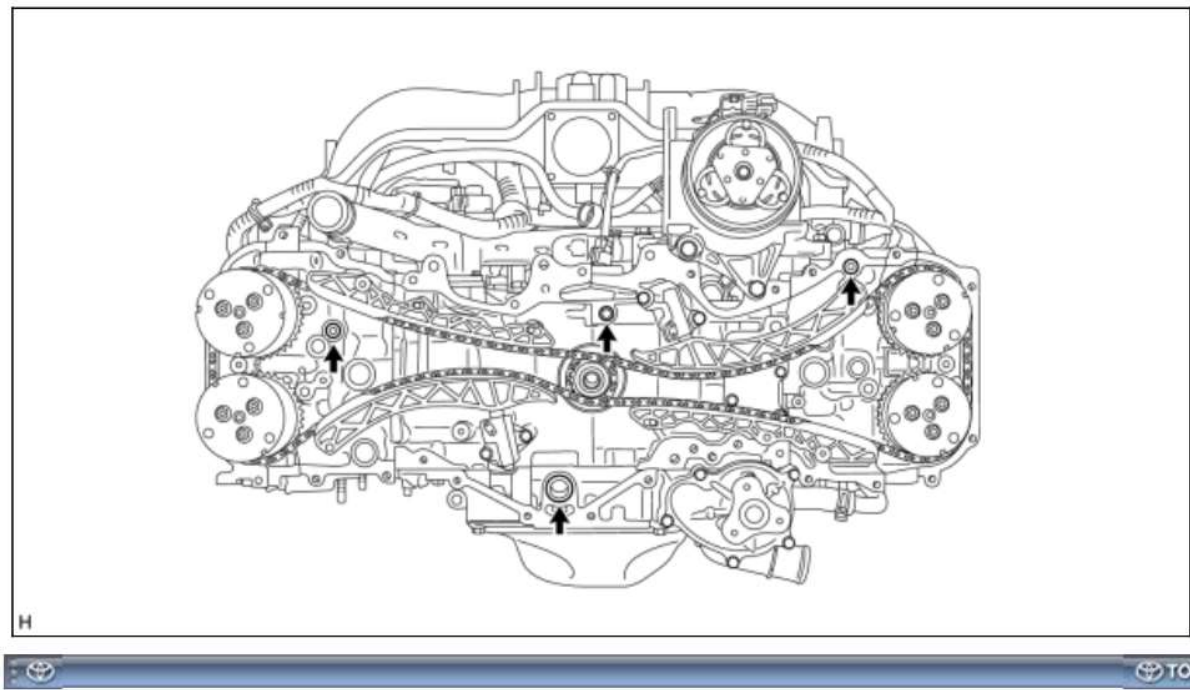
Text in Illustration

*1	Protective Tape	-	-
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NOTICE:

Be careful not to damage the contact surfaces of the cylinder head, cylinder block or chain cover.

(c) Remove the 4 O-rings.



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