

# 2AZ-FE Engine Oil Consumption

**Service Category** Engine/Hybrid System

**Section** Lubrication

**Market** USA

Toyota Supports  
 ASE Certification 

## Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2007 – 2011	Camry HV	Engine(s): 2AZ VDS(s): BB3EK, BB46K
2007 – 2009	Camry	Engine(s): 2AZ VDS(s): BE46K
2009	Corolla	Engine(s): 2AZ VDS(s): BE40E
2009	Matrix	Engine(s): 2AZ VDS(s): GE40E, KE40E, LE40E
2006 – 2008	RAV4	Engine(s): 2AZ VDS(s): BD31V, BD32V, BD33V, BD34V, BD35V, ZD31V, ZD32V, ZD33V, ZD34V, ZD35V
2007 – 2008	Solara	Engine(s): 2AZ VDS(s): CE30P

## Introduction

Some 2006 – 2011 model year vehicles equipped with the 2AZ-FE engine may exhibit engine oil consumption. The piston assembly has been changed to minimize oil consumption. Use the following repair procedure to address this condition.

## 2AZ-FE Engine Oil Consumption

### Production Change Information

This TSB applies to:

- ALL 2007 – 2008 MY Solara vehicles.
- Vehicles produced **BEFORE** the Production Change Effective VINs shown below.

MODEL	DRIVETRAIN	PLANT	PRODUCTION CHANGE EFFECTIVE VIN
Camry	2AZ-FE	TMMK Line 1	4T1BE46K#9U402467
		TMMK Line 2	4T1BE46K#9U916988
		SIA	4T4BE46K#9R131092
		Tsutsumi	JTNBE46K#93174340
Camry HV	2AZ-FXE	TMMK	4T1BB##K#BU138556
		Tsutsumi	JTNBB##K#B3054292
Corolla	2AZ-FE	NUMMI	1NXBE40E#9Z087463
Matrix		TMMC	2T1BE40E#9C026707
RAV4		TMMC	2T1#E40E#9C010829
		Tahara	JTM#D3#V#85209466
		Shokki	JTM#D3#V#86088135

### Warranty Information

OP CODE	DESCRIPTION	MODEL	ENGINE	DRIVE-TRAIN	TIME	OFF	T1	T2
EG9014	R & R Piston and Ring Set	Camry	2AZ-FE	-	14.8	13211-#####-#0	11	99
		Camry HV	2AZ-FXE	-	15.5	13211-28120-#0		
		Corolla	2AZ-FE	-	14.2	13211-#####-#0		
		Matrix		2WD	14.2			
				4WD	14.7			
		RAV4		2WD	15.6			
				4WD	16.3			
Solara	-	16.3						

#### APPLICABLE WARRANTY

- This repair is covered under the Toyota Powertrain Warranty. This warranty is in effect for 60 months or 60,000 miles, whichever occurs first, from the vehicle's in-service date.
- Warranty application is limited to occurrence of the specified condition described in this bulletin.

## 2AZ-FE Engine Oil Consumption

### Parts Information

MODEL	ENGINE	PREVIOUS PART NUMBER	CURRENT PART NUMBER	PART NAME	QTY
Camry, Camry HV, Corolla, Matrix, RAV4, Solara	ALL	11115-28040	Same	Gasket, Cylinder Head	1
		11213-0H010	Same	Gasket, Cylinder Head Cover	1
		13011-0H030	13011-0H031	Ring Set, Piston (NAP*)	1
		13011-28160	13011-28161	Ring Set, Piston (CBU**)	1
		15193-0H010	Same	Gasket, Oil Pump	1
		22271-0D051	Same	Throttle Body Gasket	1
		90080-31073	Same	Seal, Engine Rear Oil	1
		90520-A0004	Same	Ring, Hole Snap (for Piston Pin)	8
		96761-24020	Same	O-Ring, Cylinder Block to Crankcase Stiffener	1
		13251-0H030-#0	Same	Pin, Piston	As Needed
		13201-09790-#0 13201-29686-#0	Same	Rod Sub-Assy, Connecting	As Needed
		13281-0H030-0#	Same	Bearing, Connecting Rod	8 (As Needed)
		17173-0H020	17173-28010	Gasket, Exhaust Manifold to Head	1
		90915-YZZF1	Same	Filter, Oil	1
Camry, Corolla, Matrix, RAV4, Solara	2AZ-FE	13211-0H040-#0	13211-0H041-#0	Piston (NAP*)	4
		13211-28110-#0 13211-28111-#0	13211-28112-#0	Piston (CBU**)	4
Camry (Non-PZEV), Corolla, Matrix, RAV4, Solara	2AZ-FE	17177-0H010	Same	Gasket, Intake Manifold to Head, No. 1	1
Camry (PZEV)	2AZ-FE (PZEV)	17171-28020	Same	Gasket, Intake Manifold to Exhaust Manifold (Intake Runner)	1
		17177-28040	Same	Gasket, Intake Manifold to Head, No. 1	1

## 2AZ-FE Engine Oil Consumption

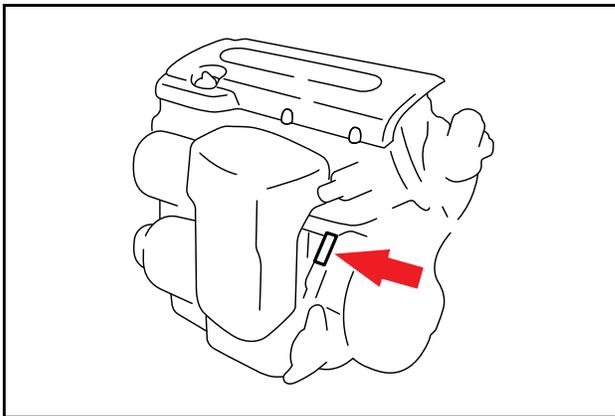
### Parts Information (Continued)

MODEL	ENGINE	PREVIOUS PART NUMBER	CURRENT PART NUMBER	PART NAME	QTY
Camry HV	2AZ-FXE	13211-28120-#0	13211-28121-#0	Piston	4
		17177-0H010	Same	Gasket, Intake Manifold to Head, No. 1	1

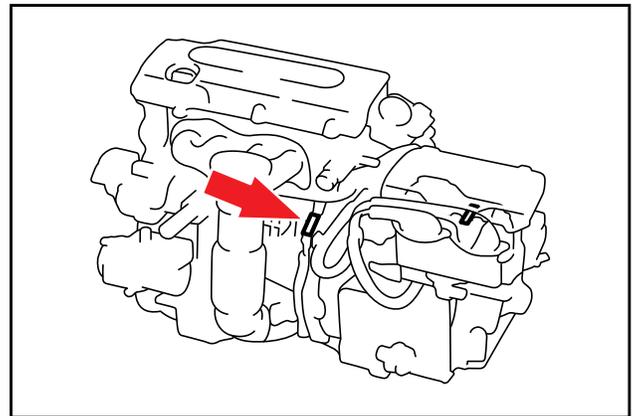
\* NAP engines have serial numbers starting with the numbers 7, 8, or 9.

\*\* CBU engines have serial numbers starting with the letters H, J, K, or numbers between 0 – 6.

**Figure 1. 2AZ-FE Engine Serial Number Location**



**Figure 2. 2AZ-FXE Engine Serial Number Location**



### Required Tools & Equipment

TOOLS & MATERIAL	PART NUMBER	QUANTITY	
Three Bond 1324 or Equivalent	–	As Needed	
FIPG Sealant or Equivalent	08826-00080	As Needed	
Super Long Life Coolant (SLLC)	00272-SLLC2	6.6 U.S. qts. (6.2 liters)	
ILSAC GF-4 Multi-grade SAE 0W-20 or 5W-20	–	Camry, Camry HV, RAV4, Solara	4.5 U.S. qts. (4.3 liters)
	–	Corolla, Matrix	4.0 U.S. qts. (3.8 liters)
Green Plastigage™	–	As Needed	
Cylinder Ridge Reamer	–	1	
Torque Yield Wrench	–	1	
Precision Straight Edge	–	1	
Piston Heater	–	1	

## 2AZ-FE Engine Oil Consumption

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### Required Tools & Equipment (Continued)

TOOLS & MATERIAL	PART NUMBER	QUANTITY
Piston Ring Compressor	–	1
Torque Wrench	–	1
Large Brass Punch	–	1
Piston Ring Expander	–	1
Thread Chaser	–	1
Feeler Gauge	–	1
Caliper Gauge	–	1
Micrometer	–	1
Vernier Caliper	–	1
Engine Stand	–	1

SPECIAL SERVICE TOOLS (SST)	PART NUMBER	QTY
Gasket Seal Cutter*	<a href="#">09032-00100</a>	1

\* Essential SST.

**NOTE**

Additional SSTs may be ordered by calling 1-800-933-8335.

## 2AZ-FE Engine Oil Consumption

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### Inspection Procedure

**NOTE**

In some cases, a P030# (cylinder # misfire detected) DTC may also be set as a result of oil consumption.

Perform an oil consumption test to determine the consumption rate.

1. Confirm the engine oil level is full.
2. Mark the oil dipstick to indicate the current level.
3. Replace the oil dipstick.
4. Mark the oil dipstick, oil drain plug, and oil fill cap to prevent/indicate tampering during the test.

**HINT**

Use tape, sealer, cable ties, or equivalent to mark the oil dipstick, oil drain plug, and oil fill cap.

5. Advise the customer to drive the vehicle normally for 1,200 miles and return for inspection.
6. Determine the quantity of oil that was consumed in 1,200 miles.

Was the oil level more than 1 quart low after 1,200 miles of normal driving?

- **YES** — Go to the Repair Procedure.
- **NO** — This TSB does NOT apply. Warranty guideline for acceptable oil consumption is 1 quart per 1,200 miles of operation. No warranty claim should be filed.

## 2AZ-FE Engine Oil Consumption

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### Repair Procedure

#### Replace the piston and piston ring set.

1. Remove the engine assembly and place on an engine stand.

Refer to the Technical Information System (TIS), applicable model and model year Repair Manual:

- [2007](#) / [2008](#) / [2009](#) Camry:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Assembly: Removal”*
- [2007 \(to 10/06\)](#) / [2007 \(10/06 & later\)](#) / [2008](#) / [2009](#) / [2010](#) / [2011](#) Camry HV:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FXE Engine Mechanical: Engine Assembly: Removal”*
- 2009 [Corolla](#) / [Matrix](#):  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Assembly: Removal”*
- [2006](#) / [2007](#) / [2008](#) RAV4:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Assembly: Removal”*
- [2007](#) / [2008](#) Solara:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Assembly: Removal”*

2. Remove the cylinder head assembly.

Refer to TIS, applicable model and model year Repair Manual:

- [2007](#) / [2008](#) / [2009](#) Camry:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Cylinder Head: Removal”*
- [2007 \(to 10/06\)](#) / [2007 \(10/06 & later\)](#) / [2008](#) / [2009](#) / [2010](#) / [2011](#) Camry HV:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FXE Engine Mechanical: Cylinder Head: Removal”*
- 2009 [Corolla](#) / [Matrix](#):  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Cylinder Head Gasket: Removal”*
- [2006](#) / [2007](#) / [2008](#) RAV4:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Cylinder Head: Removal”*
- [2007](#) / [2008](#) Solara:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Disassembly”*

## 2AZ-FE Engine Oil Consumption

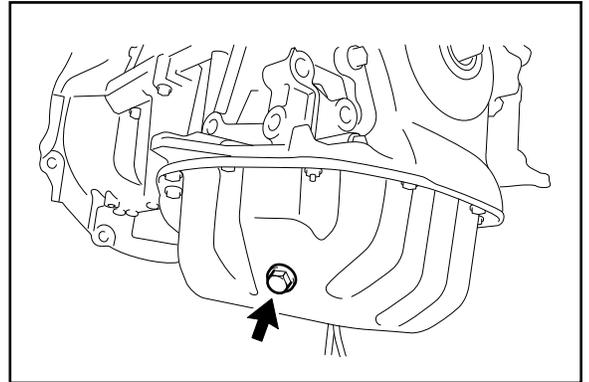
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### Repair Procedure (Continued)

3. Remove the pistons from the connecting rods.

A. Remove the oil pan drain plug and gasket.

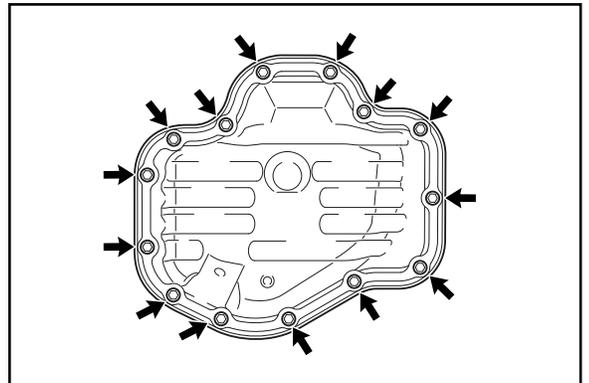
**Figure 3.**



B. Remove the oil pan sub-assembly.

(1) Remove the 12 bolts and 2 nuts.

**Figure 4.**



## 2AZ-FE Engine Oil Consumption

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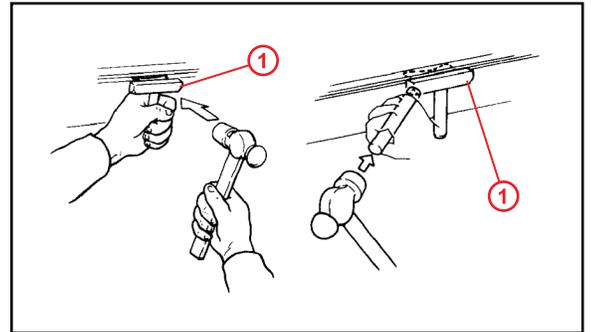
### Repair Procedure (Continued)

- (2) Insert the blade of the SST between the crankcase and oil pan. Cut through the sealer and remove the oil pan.

**NOTICE**

Be careful **NOT** to damage the contact surfaces of the crankcase, chain cover, and oil pan.

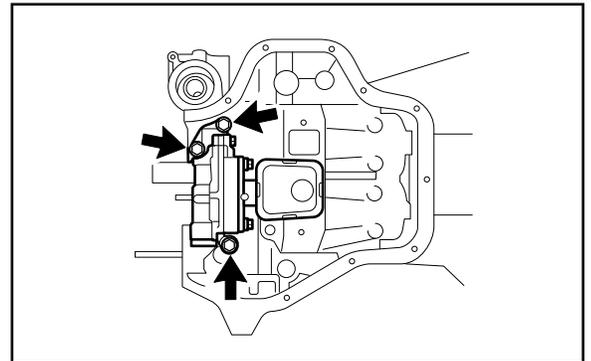
**Figure 5.**



<b>1</b>	<b>SST (P/N 09032-00100)</b>
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- C. Remove the oil pump assembly by removing the 3 bolts and gasket.

**Figure 6.**



## 2AZ-FE Engine Oil Consumption

### Repair Procedure (Continued)

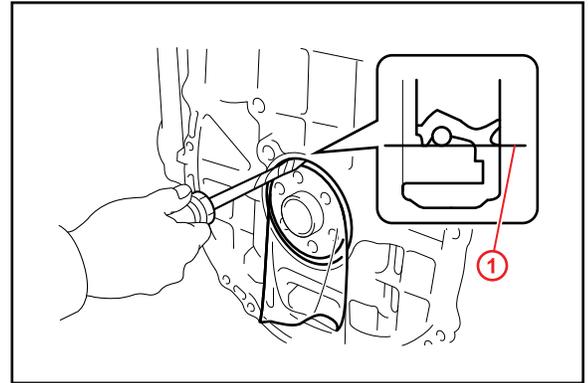
D. Remove the engine rear oil seal.

- (1) Using a knife, cut off the oil seal lip.
- (2) Using a screwdriver (with a taped tip), pry out the oil seal.

**NOTICE**

After removing the oil seal, check the crankshaft for damage. If the crankshaft is damaged, smooth the surface with 400-grit sandpaper.

Figure 7.



1 Cut Position

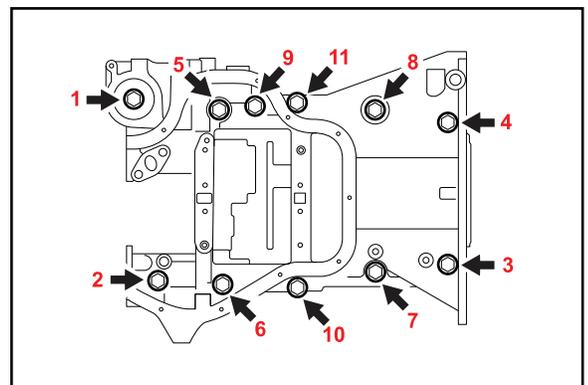
E. Remove the stiffening crankcase assembly.

**NOTICE**

Remove the stiffening crankcase as a unit. Do NOT separate the halves of the assembly, exposing the balance shaft bearings.

- (1) Uniformly loosen and remove the 11 bolts in the sequence shown in the illustration.

Figure 8.



## 2AZ-FE Engine Oil Consumption

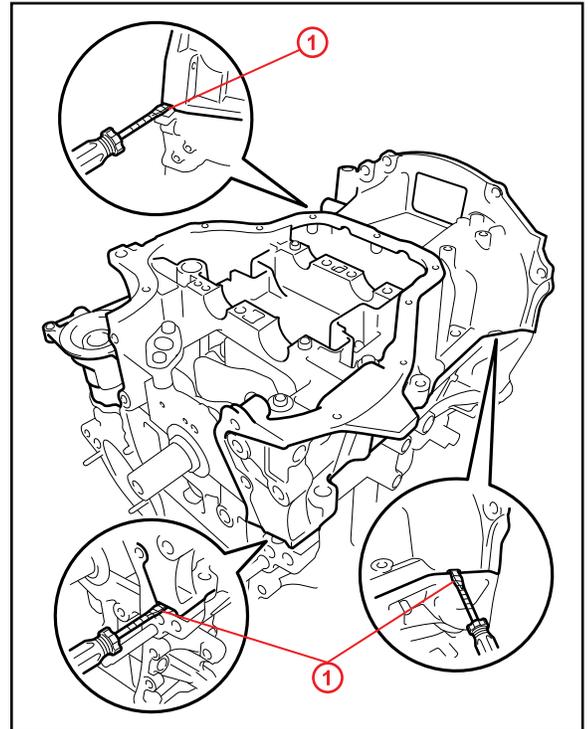
### Repair Procedure (Continued)

- (2) Using a screwdriver (with a taped tip), remove the crankcase by prying between the crankcase and cylinder block.

**NOTICE**

Be careful **NOT** to damage the contact surfaces of the crankcase and cylinder block.

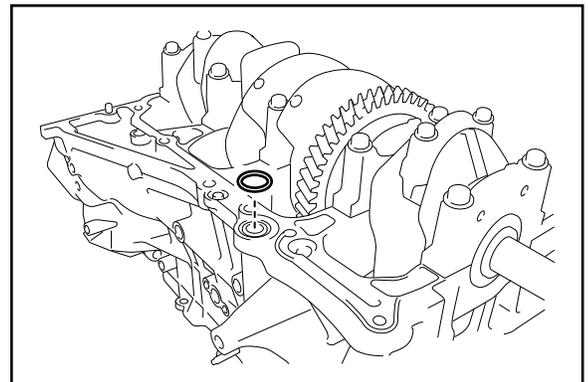
**Figure 9.**



**1** Protective Tape

- (3) Remove the O-ring from the cylinder block.

**Figure 10.**



## 2AZ-FE Engine Oil Consumption

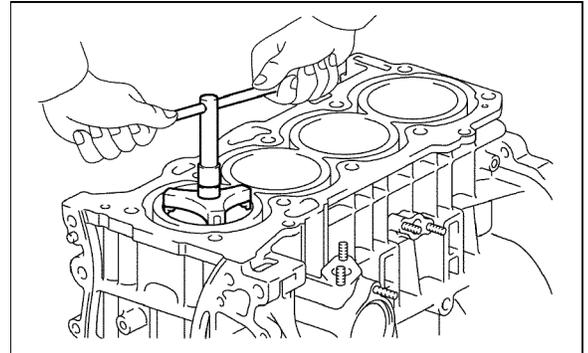
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### Repair Procedure (Continued)

F. Remove the piston sub-assemblies with connecting rod.

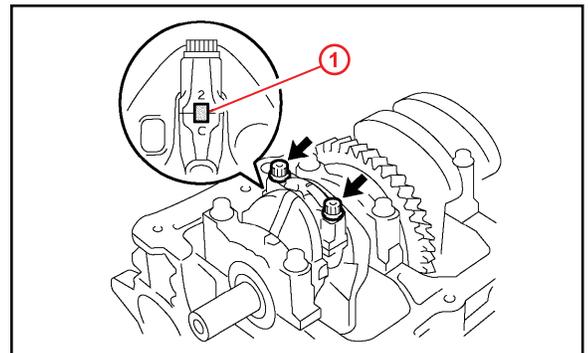
- (1) Using a ridge reamer, remove all the carbon from the top of the cylinder.

**Figure 11.**



- (2) Check that the matchmarks on the connecting rod and cap are aligned to ensure correct reassembly.

**Figure 12.**



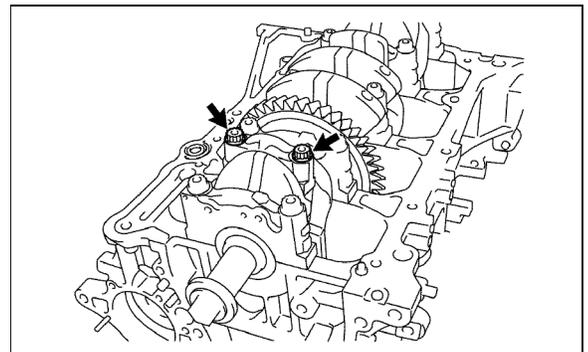
**HINT**

The matchmarks on the connecting rods and caps are provided for ensuring correct reassembly.

<b>1</b>	<b>Matchmark</b>
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- (3) Using a 12 mm socket wrench, uniformly loosen the 2 bolts.

**Figure 13.**



## 2AZ-FE Engine Oil Consumption

### Repair Procedure (Continued)

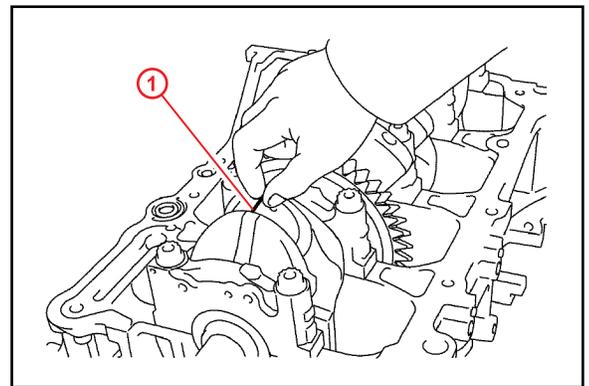
- (4) Using the 2 removed connecting rod cap bolts, remove the connecting rod cap and lower bearing by moving the connecting rod cap right and left.

**HINT**

**Keep the lower bearing inserted in the connecting rod cap.**

- (5) Inspect the connecting rod oil clearance.
  1. Clean the crank pin and bearing.
  2. Check the crank pin and bearing for pitting and scratches.
  3. Lay a strip of Plastigage™ on the crank pin.

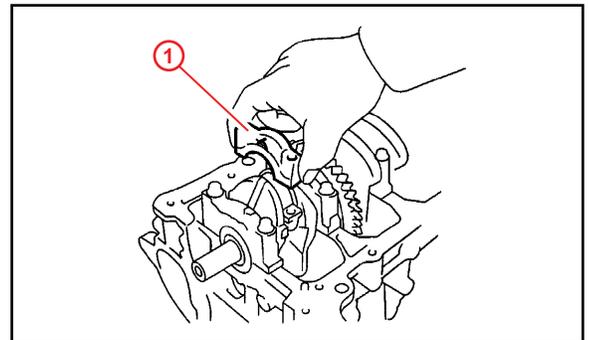
**Figure 14.**



**1** Plastigage™

4. Check that the front mark of the connecting rod cap is facing forward.

**Figure 15.**



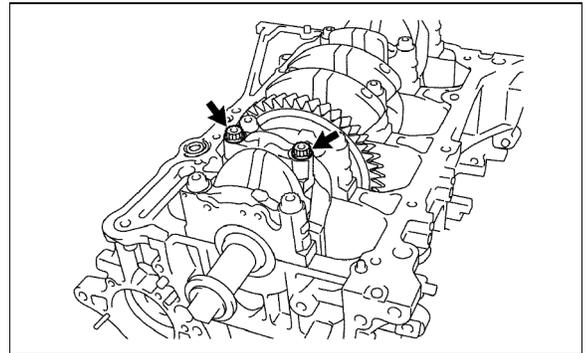
**1** Front Mark

## 2AZ-FE Engine Oil Consumption

### Repair Procedure (Continued)

5. Install and alternately tighten the bolts of the connecting rod cap in several steps.

**Figure 16.**



**Torque: 25 N\*m (250 kgf\*cm, 18 ft\*lbf)**

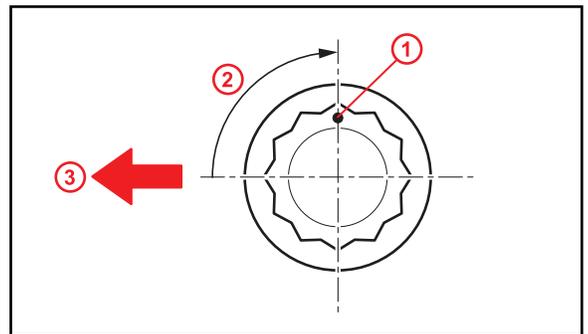
**NOTE**

**The connecting cap bolts should be tightened in 2 progressive steps.**

6. Mark the front of the connecting rod cap bolts with paint.

Retighten the cap bolts by 90° as shown in the illustration.

**Figure 17.**



<b>1</b>	<b>Paint Mark</b>
<b>2</b>	<b>90°</b>
<b>3</b>	<b>Engine Front</b>

## 2AZ-FE Engine Oil Consumption

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### Repair Procedure (Continued)

7. Remove the 2 bolts and connecting rod cap.
8. Measure the Plastigage™ at its widest point.

**Standard Oil Clearance: 0.024 to 0.048 mm (0.0009 to 0.0019 in.)**

**Maximum Oil Clearance: 0.08 mm (0.0032 in.)**

If the oil clearance is greater than the maximum, replace the connecting rod bearings. If necessary, inspect the crankshaft.

**NOTE**

**Completely remove the Plastigage™ after the measurement.**

## 2AZ-FE Engine Oil Consumption

### Repair Procedure (Continued)

**HINT**

If replacing a bearing, replace it with one that has the same number as its respective connecting rod cap. Each bearing's standard thickness is indicated by a 1, 2, or 3 mark on its surface.

**Standard Connecting Rod Large End Bore Diameter:**

MARK	SPECIFIED CONDITION
Mark 1	51.000 to 51.007 mm (2.0079 to 2.0082 in.)
Mark 2	51.008 to 51.013 mm (2.0082 to 2.0084 in.)
Mark 3	51.014 to 51.020 mm (2.0084 to 2.0087 in.)

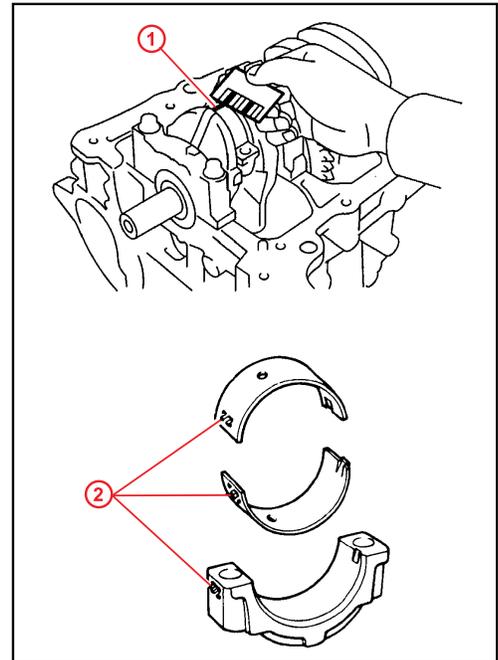
**Standard Connecting Rod Bearing Thickness:**

MARK	SPECIFIED CONDITION
Mark 1	1.485 to 1.488 mm (0.0585 to 0.0586 in.)
Mark 2	1.489 to 1.491 mm (0.0586 to 0.0587 in.)
Mark 3	1.492 to 1.494 mm (0.0587 to 0.0588 in.)

**Standard Crankshaft Pin Diameter:**

MARK	SPECIFIED CONDITION
Mark 1	47.990 to 48.000 (1.8894 to 1.8898 in.)
Mark 2	
Mark 3	

Figure 18.



1	Plastigage™
2	1, 2, or 3 Mark

## 2AZ-FE Engine Oil Consumption

### Repair Procedure (Continued)

- (6) Push the piston, connecting rod assembly, and upper bearing through the top of the cylinder block.

**HINT**

- **Keep the bearing, connecting rod, and cap together.**
- **Arrange the piston and connecting rod assemblies in the correct order.**

- (7) Repeat for the other 3 piston/connecting rod assemblies.

- G. Remove the connecting rod bearings.

**HINT**

**Arrange the removed parts in the correct order.**

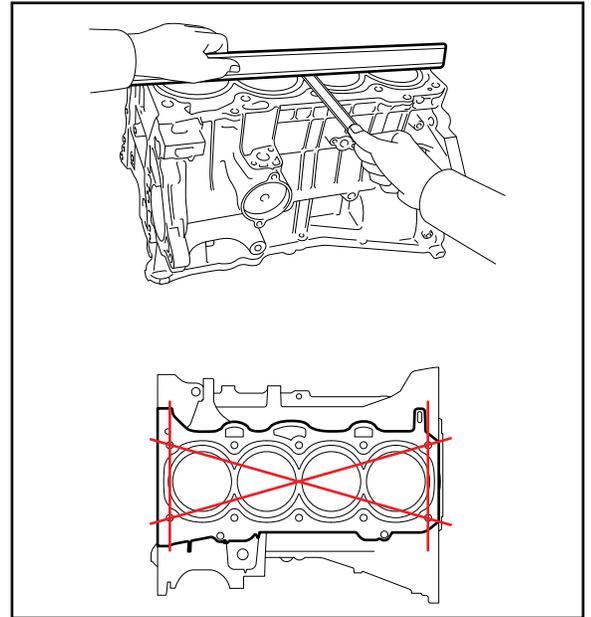
- H. Inspect the cylinder block for warpage.

Using a precision straightedge and feeler gauge, measure the warpage of the surface that is in contact with the cylinder head gasket.

**Camry, Camry HV, Corolla, Matrix, RAV4, Solara:  
Maximum Warpage: 0.05 mm (0.002 in.)**

If the warpage is greater than the maximum, replace the short block assembly.

**Figure 19.**



## 2AZ-FE Engine Oil Consumption

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### Repair Procedure (Continued)

I. Inspect the cylinder bore.

Visually check the cylinder bore for the presence of crosshatch and/or vertical scratches.

- If the cylinder bore has visible crosshatch and no vertical scratches, the cylinder block is OK to re-use.
- If vertical scratches are present and can be felt with a fingernail, or if the crosshatch is not visible, replace the short block assembly.

**Figure 20.**

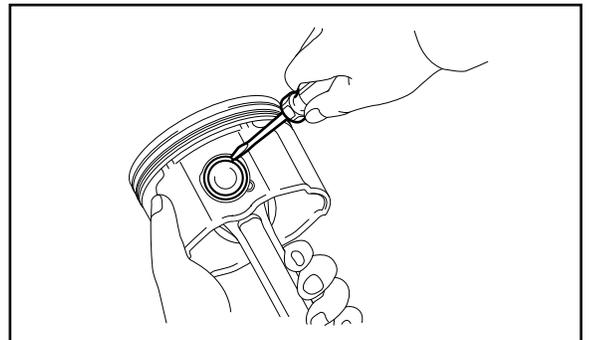


J. Using a screwdriver, pry out the 2 piston pin hole snap rings.

**HINT**

If necessary, subcontract the following specialized and precision operations to a local engine machining shop.

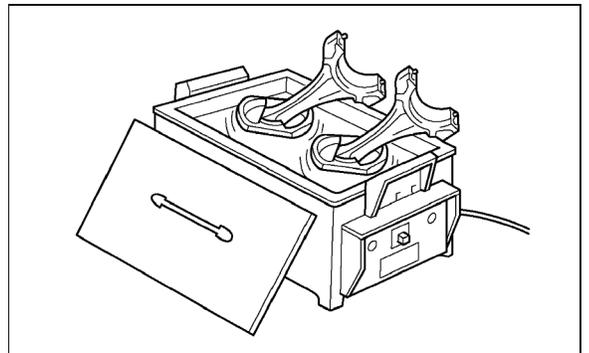
**Figure 21.**



K. Remove the piston.

- (1) Gradually heat the piston to approximately 176 to 194°F (80 to 90°C).

**Figure 22.**

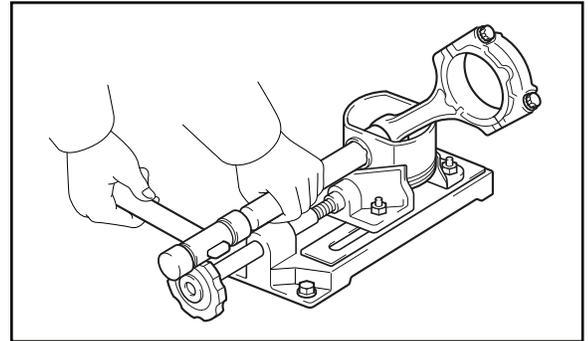


## 2AZ-FE Engine Oil Consumption

### Repair Procedure (Continued)

- (2) Using a plastic hammer and brass bar, lightly tap out the piston pin and remove the connecting rod.

Figure 23.



**NOTE**

- The piston and pin are a matched set.
- Arrange the pistons, pins, rings, connecting rods, and bearings in the correct order.

For additional information, refer to TIS, applicable model and model year Repair Manual:

- [2007](#) / [2008](#) / [2009](#) Camry:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Disassembly”*
  - [2007 \(to 10/06\)](#) / [2007 \(10/06 & later\)](#) / [2008](#) / [2009](#) / [2010](#) / [2011](#) Camry HV:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FXE Engine Mechanical: Engine Unit: Disassembly”*
  - 2009 [Corolla](#) / [Matrix](#):  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Disassembly”*
  - 2009 [Corolla](#) / [Matrix](#):  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Cylinder Block: Disassembly”*
  - [2006](#) / [2007](#) / [2008](#) RAV4:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Disassembly”*
  - [2007](#) / [2008](#) Solara:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Disassembly”*
4. Measure and inspect the piston pin, connecting rod, and bearings to determine replacement part numbers and if parts are suitable for re-use.

**NOTE**

The following steps are required to determine the correct replacement part numbers.

## 2AZ-FE Engine Oil Consumption

### Repair Procedure (Continued)

**HINT**

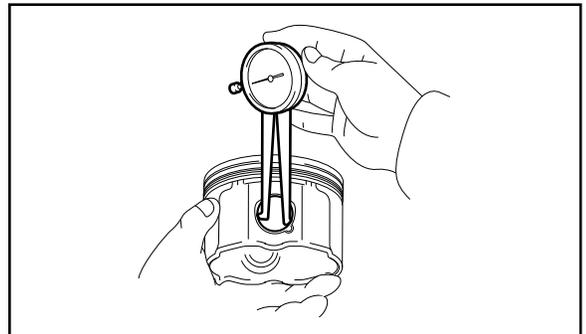
If necessary, sublet the following specialized and precision operations to a local engine machining shop.

A. Inspect the original piston pin oil clearance to determine the correct replacement piston part number below.

- (1) Using a caliper gauge, measure the piston pin bore diameter.

**Standard Piston Pin Bore Diameter:  
22.001 to 22.010 mm (0.8662 to 0.8665 in.)**

**Figure 24.**



PART NUMBER			SPECIFIED CONDITION
CAMRY, COROLLA, MATRIX, RAV4, SOLARA		CAMRY HV	
NAP*	CBU**		
13211-0H041-A0	13211-28112-A0	13211-28121-A0	22.001 to 22.004 mm (0.8662 to 0.8663 in.)
13211-0H041-B0	13211-28112-B0	13211-28121-B0	22.005 to 22.007 mm (0.8663 to 0.8664 in.)
13211-0H041-C0	13211-28112-C0	13211-28121-C0	22.008 to 22.010 mm (0.8665 to 0.8665 in.)

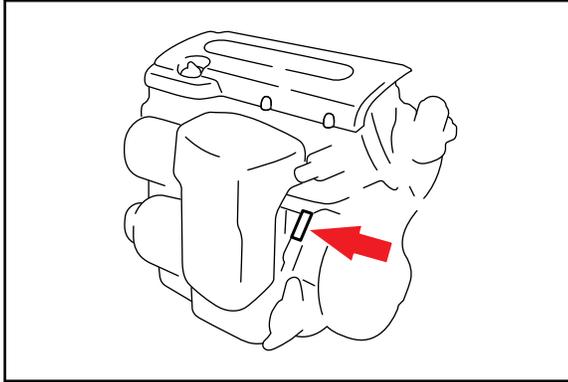
\* NAP engines have serial numbers starting with the numbers 7, 8, or 9.

\*\* CBU engines have serial numbers starting with the letters H, J, K, or numbers between 0 – 6.

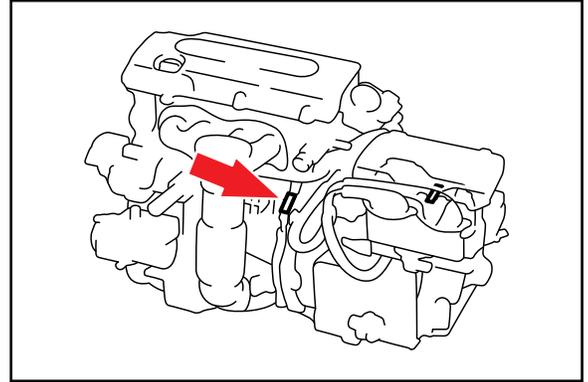
## 2AZ-FE Engine Oil Consumption

### Repair Procedure (Continued)

**Figure 25. 2AZ-FE Engine Serial Number Location**



**Figure 26. 2AZ-FXE Engine Serial Number Location**

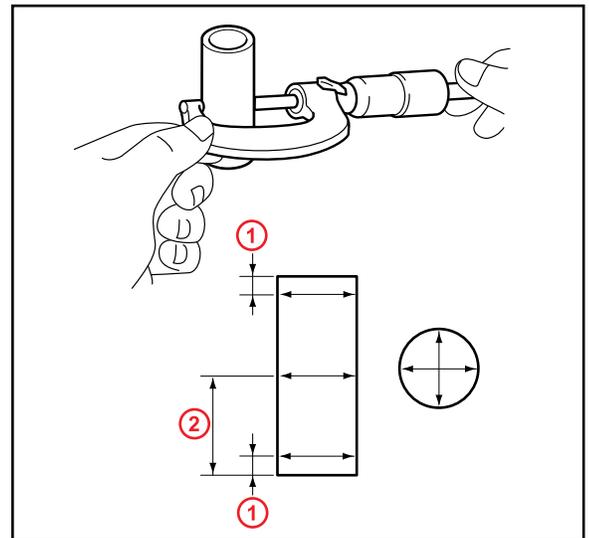


- (2) Using a micrometer, measure the piston pin diameter.

**Standard Piston Pin Diameter: 21.997 to 22.006 mm (0.8660 to 0.8664 in.)**

If the diameter is NOT as specified, replace the piston pin.

**Figure 27.**



<b>1</b>	<b>5 mm (0.20 in.)</b>
<b>2</b>	<b>30 mm (1.18 in.)</b>

PART NUMBER	SPECIFIED CONDITION
13251-0H030-A0	21.997 to 22.000 mm (0.8660 to 0.8661 in.)
13251-0H030-B0	22.001 to 22.003 mm (0.8662 to 0.8663 in.)
13251-0H030-C0	22.004 to 22.006 mm (0.8663 to 0.8664 in.)

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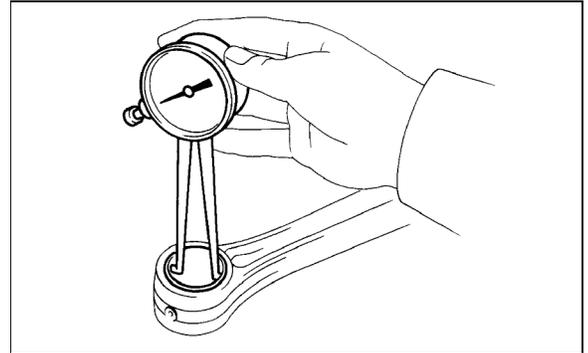
### Repair Procedure (Continued)

- (3) Using a caliper gauge, measure the connecting rod small end bore diameter.

**Standard Connecting Rod Small End Bore Diameter:**  
**22.005 to 22.014 mm (0.8663 to 0.8667 in.)**

If the diameter is NOT as specified, replace the connecting rod.

Figure 28.



PART NUMBER	SPECIFIED CONDITION
13201-09790-A0	22.005 to 22.008 mm (0.8663 to 0.8665 in.)
13201-09790-B0	22.009 to 22.011 mm (0.8665 to 0.8666 in.)
13201-09790-C0	22.012 to 22.014 mm (0.8666 to 0.8667 in.)

- B. Inspect the connecting rod bolt.

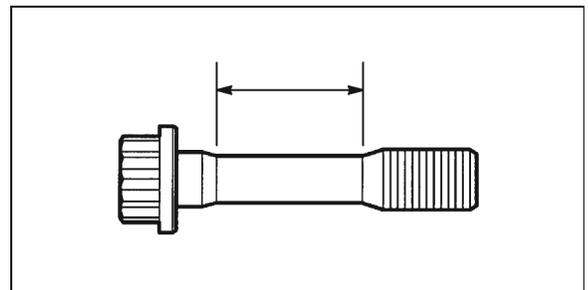
Using vernier calipers, measure the tension portion diameter of the bolt.

**Standard Diameter: 7.2 to 7.3 mm (0.283 to 0.287 in.)**

**Minimum Diameter: 7.0 mm (0.276 in.)**

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

Figure 29.



For additional information, refer to TIS, applicable model and model year Repair Manual:

- [2007](#) / [2008](#) / [2009](#) Camry:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Inspection”*
- [2007 \(to 10/06\)](#) / [2007 \(10/06 & later\)](#) / [2008](#) / [2009](#) / [2010](#) / [2011](#) Camry HV:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FXE Engine Mechanical: Engine Unit: Inspection”*
- 2009 [Corolla](#) / [Matrix](#):  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Cylinder Block: Inspection”*

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### Repair Procedure (Continued)

- [2006](#) / [2007](#) / [2008](#) RAV4:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Inspection”*
  - [2007](#) / [2008](#) Solara:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Inspection”*
5. Install the new pistons and rings and reassemble the engine in reverse order of disassembly.

For additional information, refer to TIS, applicable model and model year Repair Manual:

- [2007](#) / [2008](#) / [2009](#) Camry:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Reassembly”*
- [2007](#) / [2008](#) / [2009](#) Camry:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Cylinder Head: Installation”*
- [2007 \(to 10/06\)](#) / [2007 \(10/06 & later\)](#) / [2008](#) / [2009](#) / [2010](#) / [2011](#) Camry HV:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FXE Engine Mechanical: Engine Unit: Reassembly”*
- [2007 \(to 10/06\)](#) / [2007 \(10/06 & later\)](#) / [2008](#) / [2009](#) / [2010](#) / [2011](#) Camry HV:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FXE Engine Mechanical: Cylinder Head: Installation”*
- 2009 [Corolla](#) / [Matrix](#)  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Cylinder Block: Reassembly”*
- 2009 [Corolla](#) / [Matrix](#)  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Reassembly”*
- 2009 [Corolla](#) / [Matrix](#)  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Cylinder Head Gasket: Installation”*
- [2006](#) / [2007](#) / [2008](#) RAV4:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Reassembly”*
- [2006](#) / [2007](#) / [2008](#) RAV4:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Cylinder Head: Installation”*
- [2007](#) / [2008](#) Solara:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Unit: Reassembly”*

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### Repair Procedure (Continued)

6. Install the engine assembly.

Refer to TIS, applicable model and model year Repair Manual:

- [2007](#) / [2008](#) / [2009](#) Camry:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Assembly: Installation”*
- [2007 \(to 10/06\)](#) / [2007 \(10/06 & later\)](#) / [2008](#) / [2009](#) / [2010](#) / [2011](#) Camry HV:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FXE Engine Mechanical: Engine Assembly: Installation”*
- 2009 [Corolla](#) / [Matrix](#):  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Assembly: Installation”*
- [2006](#) / [2007](#) / [2008](#) RAV4:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Assembly: Installation”*
- [2007](#) / [2008](#) Solara:  
*Engine/Hybrid System – Engine Mechanical – “2AZ-FE Engine Mechanical: Engine Assembly: Installation”*

7. Test drive the vehicle to verify normal operation.