

Service Bulletin

File in Section: 06 - Engine

Bulletin No.:

Date: June, 2016

08-06-01-011K

TECHNICAL

Subject: Malfunction Indicator Lamp On – Check Engine Light, DTCs P0011, P0014, P0021,

P0024, P0341, P0346, P0366 or P0391 Set (Check Camshaft End Play and Perform

Action as Outlined)

Models: 2007-2009 Buick LaCrosse, Allure (Canada Only)

2007-2010 Buick Enclave 2010 Buick LaCrosse

2007-2010 Cadillac CTS Sedan, CTS Sport Wagon, SRX, STS

2008-2010 Chevrolet Equinox, Malibu

2009-2010 Chevrolet Traverse

2010 Chevrolet Camaro 2007-2010 GMC Acadia 2007-2010 Pontiac G6

2008-2009 Pontiac G8, Torrent

2007-2010 Saturn AURA, OUTLOOK

2008-2010 Saturn VUE

Equipped with 2.8L or 3.6L High Feature V6 Engine (VINs D, T, V, 7 – RPOs LP1, LLT,

LY7)

Attention: This Bulletin also applies to any of the above models that may be Export from North

America vehicles.

This Bulletin has been revised to update the Note in Step 7 of the Correction table. Please discard Corporate Bulletin Number 08-06-01-011J.

Condition

Some customers may comment that the check engine light is on.

Upon investigation, the technician may find one or more of the following DTCs stored:

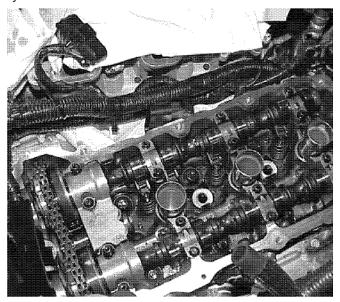
- P0011
- P0014
- P0021
- P0024
- P0341
- P0346
- P0366
- P0391

Correction

Step	Action	Yes	No
1	Is the vehicle an Acadia, Enclave, Traverse or Outlook with P0011, P0014, P0021 or P0024?	Go to Step 2	Go to Step 3
2	Reprogram the ECM. Refer to Service Bulletin 08-06-04-011 for further information. Do P0011, P0014, P0021 or P0024 still set?	Go to Step 3	Return vehicle to customer
3	Important: The set DTC will determine which camshafts (bank 1 or bank 2) should be checked. Remove the camshaft cover and check camshaft end play on both camshafts in the suspect head using one of the methods listed below. Is camshaft end play equal to or over 0.40 mm (0.016 in)?	Go to Step 5	Go to Step 4
4	Continue diagnosis using SI and call GM Technical Assistance, if necessary.	-	-
5	Check the gap between BOTH camshaft position actuators and the front camshaft cap using the Camshaft Position Actuator to Front Camshaft Cap Measurement Procedure listed below. Does the 2.0 mm (Delphi 4 screw actuator) or 2.5 mm (Aisin 5 screw actuator) hex (allen) wrench fit between the position actuator and cap?	Go to Step 7	Go to Step 6
6	Install the camshaft thrust washers using the Camshaft Thrust Washer Installation Procedure listed below. See parts table for correct trust washer part number: Delphi vs Aisin design.	-	-
7	Note: There are two generations of replacement service cylinder heads. New design cylinder heads do not use the thrust washers. Reference the parts catalog or Bulletin 16-NA-085 for identification. A instruction sheet is also provided with the new design cylinder head.		
	Replace the cylinder head and install thrust washers using the Camshaft Thrust Washer Installation Procedure listed below. See parts table for correct trust washer part number: Delphi vs Aisin design.	-	-

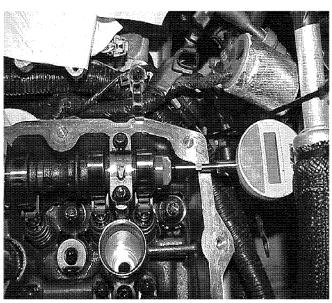
Camshaft End Play Measurement Procedure

Remove the camshaft cover from the suspect cylinder head.



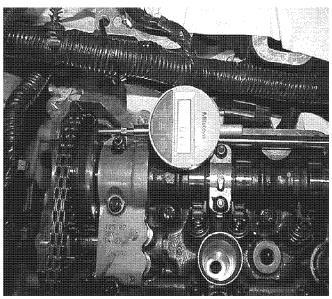
Two methods for measuring camshaft end play:

Method 1: Dial Indicator



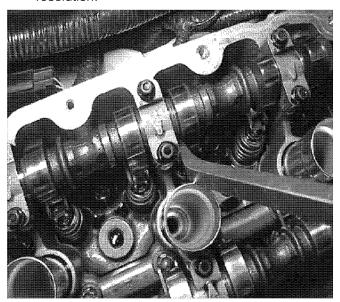
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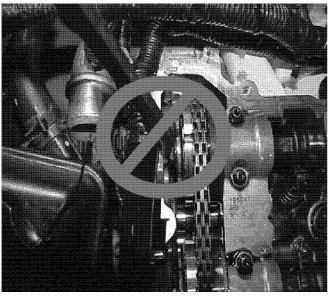


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 Set-up a dial indicator on the camshaft to be measured. Set the dial indicator to measure the axial movement of the camshaft. To minimize measurement error, the dial indicator needs to be on the same axis as the camshaft. A magnetic mount can be placed on the frame rail or a piece of steel plate can be bolted to the top of the head as a reference surface for the dial indicator. The dial indicator should have 0.1 mm (0.001 in) of resolution.



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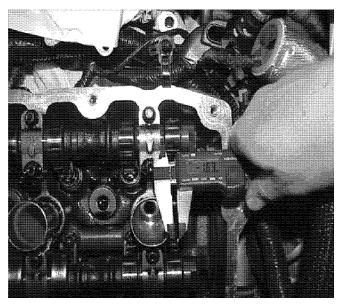
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- Position a screwdriver or small pry bar between the camshaft cap and camshaft lobe. Apply force to move the camshaft rearward.
- Be cautious not to damage the camshaft lobe while applying this force.
- · Zero the dial indicator.
- Apply force to move the camshaft forward (towards the camshaft phasers).
- Read the dial indicator. This is the end play of the camshaft shaft.

Notice: Do not use the phaser bolt as a pry point. This may cause damage to the camshaft sensor target wheel or the head to camshaft cover sealing surface.

Method 2: Caliper

The caliper should have 0.1 mm (0.001") of resolution.



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- Position a screwdriver or medium pry bar between the camshaft cap and camshaft lobe. Be cautious not to damage the camshaft lobe while applying this force.
- Apply force to move the camshaft rearward.
- Measure and record the distance between the camshaft cap and the camshaft lobe.
- Re-measure and record the distance between the camshaft cap and camshaft lobe. Subtract the two readings; this is the camshaft shaft end play.

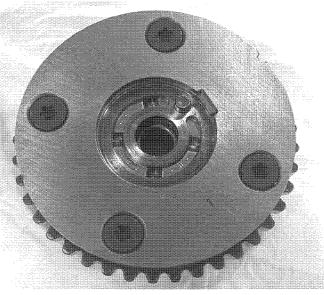
Camshaft Position Actuator to Front Camshaft Cap Measurement Procedure

Important: Before performing this procedure, inspect the rear of the camshaft position actuator. Refer to the pictures below to determine which actuator is installed on the vehicle. Use the appropriate procedure listed below.

Aisin Actuator (5 Screw Design, Use 2.5 mm Hex Wrench)



Delphi Actuator (4 Screw Design, Use 2.0 mm Hex Wrench)

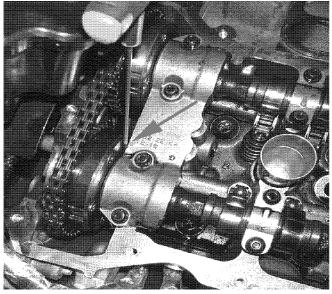


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5 Screw Aisin Design Actuator

Use a 2.5 mm hex (allen) wrench as a determination gauge to measure the gap between the rear of the camshaft position actuator and the front camshaft cap of both camshafts of the suspect head.

- 1. Position a screwdriver or medium pry bar between the camshaft cap and camshaft lobe.
- Apply force to move the camshaft FORWARD. Be cautious not to damage the camshaft lobe while applying this force.



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3. With the camshaft moved fully FORWARD, try to insert the 2.5 mm hex (allen) wrench between the intake camshaft position actuator and the front camshaft cap. It may be necessary to turn the wrench to align the flat sides of the wrench with the gap between the actuator and the cap.

- 4. If the wrench fits between the camshaft position actuator and the front camshaft cap, it will be necessary to replace the cylinder head assembly. WHEN REPLACING THE CYLINDER HEAD, ALSO INSTALL A THRUST WASHER BETWEEN EACH CAMSHAFT POSITION ACTUATOR AND THE FRONT CAMSHAFT CAP. See parts table for correct trust washer part number: Delphi vs Aisin design.
- 5. If the wrench DOES NOT fit between the camshaft position actuator and the front camshaft cap, install the camshaft thrust washers between BOTH camshaft position actuators and the front camshaft cap on the suspect head. Follow the Camshaft Thrust Washer Installation procedure below. See parts table for correct trust washer part number: Delphi vs Aisin design.

4 Screw Delphi Design Actuator

Use a 2.0 mm hex (allen) wrench as a determination gauge to measure the gap between the rear of the camshaft position actuator and the front camshaft cap of both camshafts of the suspect head.

- Position a screwdriver or medium pry bar between the camshaft cap and camshaft lobe.
- Apply force to move the camshaft FORWARD. Be cautious not to damage the camshaft lobe while applying this force.



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- With the camshaft moved fully FORWARD, try to insert the 2.0 mm hex (allen) wrench between the intake camshaft position actuator and the front camshaft cap. It may be necessary to turn the wrench to align the flat sides of the wrench with the gap between the actuator and the cap.
- 4. If the wrench fits between the camshaft position actuator and the front camshaft cap, it will be necessary to replace the cylinder head assembly and replace both actuators. It is not necessary to replace the camshaft position actuators on the cylinder head that is not being replaced. WHEN REPLACING THE CYLINDER HEAD, ALSO INSTALL A THRUST WASHER BETWEEN EACH

- CAMSHAFT POSITION ACTUATOR AND THE FRONT CAMSHAFT CAP. See parts table for correct trust washer part number: Delphi vs Aisin design.
- 5. If the wrench DOES NOT fit between the camshaft position actuator and the front camshaft cap, install the camshaft thrust washers between BOTH camshaft position actuators and the front camshaft cap on the suspect head. Follow the Camshaft Thrust Washer Installation procedure below. See parts table for correct trust washer part number: Delphi vs Aisin design.

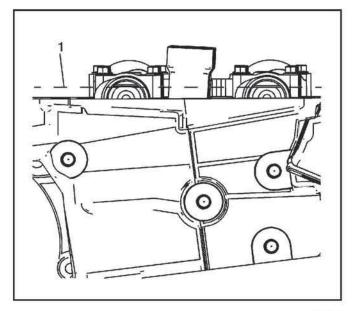
Camshaft Thrust Washer Installation Procedure

Special Tools

- EN 48313 Timing Chain Retention Tool (2009 and Prior – Both Heads, 2010 LAU Engine – Both Heads, 2010 – Left Head Only)
- EN 49982 Timing Chain Retention Tool (2010 Right Head Only)

Tip: The cylinder head gasket kit contains all the gaskets and seals necessary to perform this repair.

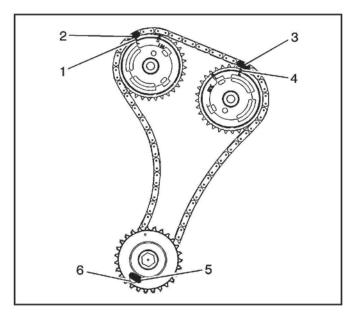
- Disconnect the engine wiring harness electrical connectors from the intake and exhaust camshaft position (CMP) actuator solenoid valves and sensors.
- Remove the intake and exhaust CMP sensor bolts and sensors.
- Remove the intake and exhaust CMP actuator solenoid valve bolts and valves.



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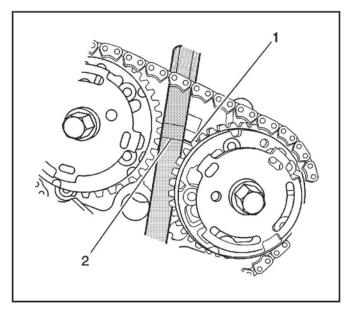
Important: Rotate the crankshaft balancer bolt in a clockwise direction ONLY.

 Rotate the crankshaft balancer using the balancer bolt until the camshafts are in a neutral (low tension) position. The flats on the rear of the camshafts will be parallel with the camshaft cover rail (1).



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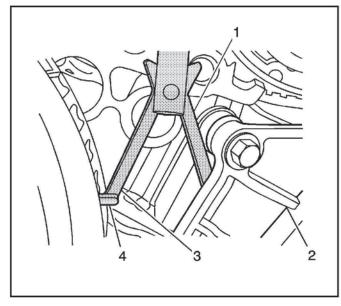
- 5. Use a paint stick to create an alignment mark on one of the timing chain links (2) and the adjacent tooth on the exhaust camshaft position actuator (1).
- 6. Use a paint stick to create an alignment mark on one of the timing chain links (3) and the adjacent tooth on the intake camshaft position actuator (4).
- Use an open end wrench on the hex cast into the camshaft in order to prevent engine rotation when loosening the camshaft position actuator bolts. Slightly loosen the camshaft position actuator bolts. DO NOT remove the bolts.



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- 8. Unscrew the Timing Chain Retention Tool so that the legs of the tool are retracted.
- Insert the Timing Chain Retention Tool between the camshaft actuators, rearward of the timing chain until the bottom line that is scribed in the

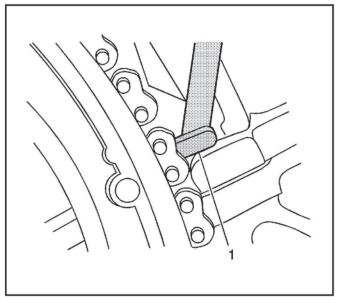
body of the tool (2) is adjacent to the top surface of the cylinder head (1). This is the approximate installed position.



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Important: The engine front cover is removed for clarity in the following graphics, but NOT required to perform the procedure.

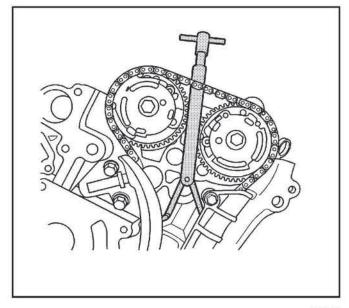
- 10. Ensure that the feet (4) on the legs of the tool are facing the front of the engine.
- Partially expand the legs (1, 3) of the Timing Chain Retention Tool by turning the T-shaped handle clockwise.
- 12. Insert the leg of the tool (1) behind the timing chain guide (2).
- 13. Continue expanding the Timing Chain Retention Tool until the legs (1, 3) contact the timing chain. Do not tighten at this time.



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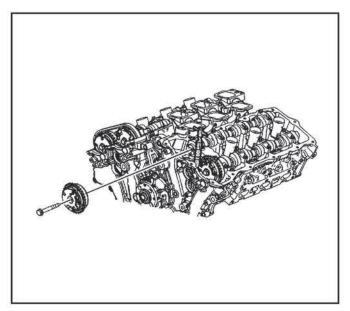
Important: Ensure that the foot (1) of the Timing Chain Retention Tool is engaged into one of the link pockets to prevent tool slippage during tightening of the Timing Chain Retention Tool.

 Hand tighten the Timing Chain Retention Tool. If installed correctly, there should be a small amount of slack in the timing chain between the camshaft position actuator sprockets.



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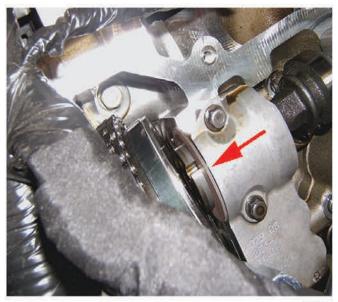
15. The Timing Chain Retention Tool is now properly installed to hold the timing chain in position.



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Tip: It is not necessary to completely remove the camshaft actuator from the engine in order to install the thrust washers.

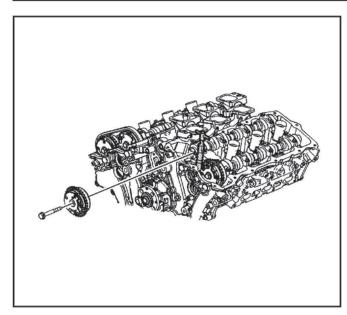
16. Remove the intake camshaft position actuator bolt.



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- 17. Move the camshaft position actuator forward enough to slip the camshaft thrust washer over the front of the intake camshaft and position it against the cylinder head.
- Position the intake camshaft actuator to the camshaft and install the actuator bolt hand tight. If necessary, slightly rotate the camshaft to engage the timing pin.
- Remove the exhaust camshaft position actuator bolt.
- Move the camshaft position actuator forward enough to slip the camshaft thrust washer over the front of the exhaust camshaft and position it against the cylinder head.
- 21. Position the exhaust camshaft actuator to the camshaft and install the actuator bolt hand tight. If necessary, slightly rotate the camshaft to engage the timing pin.
- Remove the Timing Chain Retention Tool EN-48313.

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1858699

23. Tighten the intake and exhaust camshaft position actuator bolts. Use an open end wrench on the hex cast into the camshaft in order to prevent engine rotation when tightening the camshaft position actuator bolts. Verify that the paint marks on the timing chain and camshaft position actuators are aligned.

Tighten

Tighten the bolts to 58 N·m (43 lb ft).

 Install the intake and exhaust camshaft position actuator solenoid valves and bolts.

Tighten

Tighten the bolts to 10 N·m (89 lb in).

 Install the intake and exhaust camshaft position sensors and bolts.

Tighten

Tighten the bolts to 10 N·m (89 lb in).

 Connect the engine wiring harness electrical connectors to the intake and exhaust camshaft position (CMP) sensors and actuator solenoid valves.

Parts Information

Please check your part catalog for the cylinder head replacement part number and order accordingly, based on the year, model and applications.

Part Number	Description
12630941	
(Aisin Actuator 5 Screw Design)	Washer, Camshaft Thrust
12632859	(2 required per head)
(Delphi Actuator 4 Screw Design)	

Part Number	Description
12609249 (LY7 High Output Enclave, Acadia, Traverse, OUTLOOK,)	Camshaft Assembly, Exhaust (Left)
12609250 (LY7 High Output Enclave, Acadia, Traverse, OUTLOOK)	Camshaft Assembly, Intake (Left)
12604375 (LY7 High Output Enclave, Acadia, Traverse, OUTLOOK)	Camshaft Assembly, Exhaust (Right)
12609252 (LY7 High Output Enclave, Acadia, Traverse, OUTLOOK)	Camshaft Assembly, Intake (Right)
11518863	Cylinder Head Bolt (8 required per head)
12591003 (LLT Only)	Fuel Injection Fuel Rail Crossover Tube
12591197 (LLT Only)	Fuel Feed Intermediate Pipe

Important: When ordering the cylinder head gasket for cylinder head replacement, the kit does not include the M11 head bolts or exhaust manifold gaskets, which will need to be ordered separately.

For part numbers and usage of necessary gaskets, refer to Group 00 6-Cylinder Engine of the appropriate Parts Catalog. Saturn Retailers should refer to the appropriate Parts & Illustration Catalog for the vehicle.

Warranty Information (Thrust Washer Installation) (Buick LaCrosse/Allure)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7534*	Check Camshaft End Play Right Bank	1.8 hrs**
Add	To Install Thrust Washer Right Bank	0.4 hr
J7535*	Check Camshaft End Play Left Bank	2.4 hrs**
Add	To Install Thrust Washer Left Bank	0.4 hr
J7536*	Check Camshaft End Play Both Banks	3.0 hrs**
Add	To Install Thrust Washer Both Banks	0.8 hr

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

Warranty Information (Cylinder Head Replacement) (Buick LaCrosse/Allure)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7528*	Check Camshaft End Play Right Bank	1.8 hrs**
Add	To Replace Complete Cylinder Head Assembly Right Bank	5.5 hrs
J7529*	Check Camshaft End Play Left Bank	2.4 hrs**
Add	To Replace Complete Cylinder Head Assembly Left Bank	6.9 hrs
J7530*	Check Camshaft End Play Both Banks	3.0 hrs**
Add	To Replace Complete Cylinder Head Assembly Both Banks	7.6 hrs

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Warranty Information (Thrust Washer Installation) (Cadillac CTS/SRX/STS, Pontiac G8)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7534*	Check Camshaft End Play Right Bank	2.0 hrs**
Add	To Install Thrust Washer Right Bank	0.4 hr
J7535*	Check Camshaft End Play Left Bank	2.0 hrs**
Add	To Install Thrust Washer Left Bank	0.4 hr
J7536*	Check Camshaft End Play Both Banks	2.4 hrs**
Add	To Install Thrust Washer Both Banks	0.8 hr

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Warranty Information (Cylinder Head Replacement) (Cadillac CTS/SRX/STS, Pontiac G8)

Labor Operation	Description	Labor Time
J7528*	Check Camshaft End Play Right Bank	2.0 hrs**
Add	To Replace Complete Cylinder Head Assembly Right Bank	7.4 hrs
J7529*	Check Camshaft End Play Left Bank	2.0 hrs**
Add	To Replace Complete Cylinder Head Assembly Left Bank	7.9 hrs
J7530*	Check Camshaft End Play Both Banks	2.4 hrs**
Add	To Replace Complete Cylinder Head Assembly Both Banks	8.2 hrs

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

^{**}This time includes R&R cam cover.

Warranty Information (Thrust Washer Installation) (Chevrolet Equinox, Pontiac Torrent)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7534*	Check Camshaft End Play Right Bank	1.4 hrs**
Add	To Install Thrust Washer Right Bank	0.4 hr
J7535*	Check Camshaft End Play Left Bank	1.1 hrs**
Add	To Install Thrust Washer Left Bank	0.4 hr
J7536*	Check Camshaft End Play Both Banks	1.7 hrs**
Add	To Install Thrust Washer Both Banks	0.8 hr

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Warranty Information (Cylinder Head Replacement) (Chevrolet Equinox, Pontiac Torrent)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7528*	Check Camshaft End Play Right Bank	1.4 hrs**
Add	To Replace Complete Cylinder Head Assembly Right Bank	5.1 hrs
J7529*	Check Camshaft End Play Left Bank	1.1 hrs**
Add	To Replace Complete Cylinder Head Assembly Left Bank	5.2 hrs
J7530*	Check Camshaft End Play Both Banks	1.7 hrs**
Add	To Replace Complete Cylinder Head Assembly Both Banks	5.5 hrs

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Warranty Information (Thrust Washer Installation) (Chevrolet Malibu, Pontiac G6, Saturn AURA)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7534*	Check Camshaft End Play Right Bank	2.1 hrs**
Add	To Install Thrust Washer Right Bank	0.4 hr
J7535*	Check Camshaft End Play Left Bank	1.3 hrs**
Add	To Install Thrust Washer Left Bank	0.4 hr
J7536*	Check Camshaft End Play Both Banks	2.3 hrs**
Add	To Install Thrust Washer Both Banks	0.8 hr

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

Warranty Information (Cylinder Head Replacement) (Chevrolet Malibu, Pontiac G6, Saturn AURA)

Labor Operation	Description	Labor Time
J7528*	Check Camshaft End Play Right Bank	2.1 hrs**
Add	To Replace Complete Cylinder Head Assembly Right Bank	5.1 hrs
J7529*	Check Camshaft End Play Left Bank	1.3 hrs**
Add	To Replace Complete Cylinder Head Assembly Left Bank	5.2 hrs
J7530*	Check Camshaft End Play Both Banks	2.3 hrs**
Add	To Replace Complete Cylinder Head Assembly Both Banks	5.5 hrs

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

^{**}This time includes R&R cam cover.

Warranty Information (Thrust Washer Installation) (Buick Enclave, Chevrolet Traverse, GMC Acadia, Saturn OUTLOOK)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7534*	Check Camshaft End Play Right Bank	2.1 hrs**
Add	To Install Thrust Washer Right Bank	1.6 hrs***
J7535*	Check Camshaft End Play Left Bank	2.3 hrs**
Add	To Install Thrust Washer Left Bank	1.6 hrs***
J7536*	Check Camshaft End Play Both Banks	2.6 hrs**
Add	To Install Thrust Washer Both Banks	2.0 hrs***

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

Warranty Information (Cylinder Head Replacement) (Buick Enclave, Chevrolet Traverse, GMC Acadia, Saturn OUTLOOK)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7528*	Check Camshaft End Play Right Bank	2.1 hrs**
Add	To Replace Cylinder Head Right Bank (Includes Build Up and Transfer of Necessary Parts)	8.6 hrs
J7529*	Check Camshaft End Play Left Bank	2.3 hrs**
Add	To Replace Cylinder Head Left Bank (Includes Build Up and Transfer of Necessary Parts)	8.5 hrs
J7530*	Check Camshaft End Play Both Banks	2.6 hrs**
Add	To Replace Cylinder Head Both Banks (Includes Build Up and Transfer of Necessary Parts)	12.5 hrs

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

Warranty Information (Thrust Washer Installation) (Saturn VUE)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7534*	Check Camshaft End Play Right Bank	1.5 hrs**
Add	To Install Thrust Washer Right Bank	1.2 hrs***
J7535*	Check Camshaft End Play Left Bank	0.8 hr**
Add	To Install Thrust Washer Left Bank	1.2 hrs***
J7536*	Check Camshaft End Play Both Banks	1.8 hrs**
Add	To Install Thrust Washer Both Banks	1.6 hrs***

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

Warranty Information (Cylinder Head Replacement) (Saturn VUE)

Labor Operation	Description	Labor Time
J7528*	Check Camshaft End Play Right Bank	1.5 hrs**
Add	To Replace Complete Cylinder Head Assembly Right Bank	7.7 hrs
J7529*	Check Camshaft End Play Left Bank	0.8 hr**
Add	To Replace Complete Cylinder Head Assembly Left Bank	7.7 hrs
J7530*	Check Camshaft End Play Both Banks	1.8 hrs**
Add	To Replace Complete Cylinder Head Assembly Both Banks	8.0 hrs

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

^{**}This time includes R&R cam cover.

^{***}This time includes R&R underhood electrical center and engine mount.

^{**}This time includes R&R cam cover.

^{**}This time includes R&R cam cover.

^{***}This time includes R&R engine mount.

^{**}This time includes R&R cam cover.

Warranty Information (Thrust Washer Installation) (Chevrolet Camaro)

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J7534*	Check Camshaft End Play Right Bank	1.6 hrs**
Add	To Install Thrust Washer Right Bank	0.4 hr
J7535*	Check Camshaft End Play Left Bank	1.6 hrs**
Add	To Install Thrust Washer Left Bank	0.4 hr
J7536*	Check Camshaft End Play Both Banks	2.0 hrs**
Add	To Install Thrust Washer Both Banks	0.8 hr

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

Warranty Information (Cylinder Head Replacement) (Chevrolet Camaro)

Labor Operation	Description	Labor Time
J7528*	Check Camshaft End Play Right Bank	1.6 hrs**
Add	To Replace Complete Cylinder Head Assembly Right Bank	3.4 hrs
J7529*	Check Camshaft End Play Left Bank	1.6 hrs**
Add	To Replace Complete Cylinder Head Assembly Left Bank	4.6 hrs
J7530*	Check Camshaft End Play Both Banks	2.0 hrs**
Add	To Replace Complete Cylinder Head Assembly Both Banks	5.0 hrs

^{*}This is a unique Labor Operation for Bulletin use only. It will not be published in the Labor Time Guide.

^{**}This time includes R&R cam cover.

^{**}This time includes R&R cam cover.