

Component Procedures: Valve Cover

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Component Procedures: Valve Cover

Parts and Labor (itype_189)

Parts

Qualifier	Part #	Name	Price	Note
Valve Cover > Right	12653691	3 - Valve Cover	157.60	
Valve Cover > Left	12653688	3 - Valve Cover	176.98	
Right	12653691	3 - Valve Cover	157.60	
Left	12653688	3 - Valve Cover	176.98	

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Replace	One Bank	B	2.0	1.4
Replace	Both Banks	B	3.7	0.0

Camshaft Cover Replacement - Left Side (Article 12158)

Special Tools

EN 46101 - Spark Plug Tube Seal Guide

For equivalent regional tools, refer to Special Tools .

Removal Procedure

- Remove the intake manifold cover (2). Refer to Intake Manifold Cover Replacement - Front . Click for full-size image
- Remove the rear intake manifold cover retainers (1). Click for full-size image
- Remove the rear intake manifold cover (2).
- Disconnect the battery ground cable from the battery. Refer to Battery Negative Cable Disconnection and Connection .
- Remove the positive crankcase ventilation tubes. Refer to Positive Crankcase Ventilation Hose/Pipe/Tube Replacement .
- Remove the intake manifold (2). Refer to Intake Manifold Removal . Click for full-size image
- Unlock the ignition coil electrical connectors before disconnecting from the ignition coils.
- Do not damage the ignition coil electrical connectors.
- Disconnect the ignition coil electrical connectors (2) from the ignition coils. Click for full-size image
- Detach the engine wiring harness (1) from the left bank camshaft cover.
- Reposition and secure the wiring harness (1) away from the camshaft cover in order to provide clearance for removal of the camshaft cover.
- Do not disconnect the engine front cover electrical connectors.
- Use a suitable tool to detach the wiring harness (1) from the camshaft cover (2) and lift the wiring harness (1) upwards to detach the wiring harness from the camshaft cover (2).
- Remove the wiring harness (1) from the front of the camshaft cover (2). Click for full-size image
- Reposition and secure the wiring harness (1) away from the camshaft cover (2) in order to provide clearance for removal of the camshaft cover (2).
- Remove the ignition coil to camshaft cover retaining bolts (1). Click for full-size image
- Remove the ignition coils (2) from the camshaft cover.
- Remove the camshaft cover retaining bolts (1). Click for full-size image
- Remove the camshaft cover from the engine (3).
- Disassemble the camshaft cover as necessary. Camshaft Cover Disassemble
- Install the spark plug tube plugs EN 46101 - spark plug tube seal guide (1) to the spark plug tubes to prevent dirt and other contaminants from entering into the cylinders. Click for full-size image

Installation Procedure

- Assemble the camshaft cover as necessary. Camshaft Cover Assemble
- Wipe the camshaft cover sealing surface on the left cylinder head with a clean, lint-free cloth.
- Place a bead 8 mm (0.3150 in) in diameter by 4 mm (0.1575 in) in height of RTV sealant on the engine front cover split lines (1). Refer to Adhesives, Fluids, Lubricants, and Sealers for recommended sealant. Click for full-size image
- Place the left camshaft cover into position onto the left cylinder head. Click for full-size image
- Loosely install the left camshaft cover bolts. Click for full-size image
- Tighten the left camshaft cover bolts in the sequence shown. Click for full-size image

- Tighten the left camshaft cover bolts in the sequence to 10 Nm (89 lb in) .
- Tighten the left camshaft cover bolts a second pass in the sequence to 10 Nm (89 lb in) .
- Remove the EN 46101 - spark plug tube seal guide (1) from the spark plug tubes of the left cylinder head. [Click for full-size image](#)
- Install the ignition coils (2) to the camshaft cover. [Click for full-size image](#)
- Install the ignition coil to camshaft cover retaining bolts (1) and tighten to 10 Nm (89 lb in) .
- Ensure the wiring harness (1) is located on the locating lugs of the camshaft cover (2).
- Listen for an audible click to confirm the correct installation of the wiring harness (1) to the camshaft cover (2).
- Install the wiring harness (1) to the front of the camshaft cover (2). [Click for full-size image](#)
- Ensure the wiring harness (1) is located on the locating lugs of the camshaft cover.
- Listen for an audible click to confirm the correct installation of the wiring harness (1) to the camshaft cover.
- Install the engine wiring harness (1) to the left bank camshaft cover. [Click for full-size image](#)
- Connect the ignition coil electrical connectors (2) to the ignition coils.
- Install the intake manifold (2). Refer to [Intake Manifold Replacement](#) . [Click for full-size image](#)
- Install the positive crankcase ventilation tubes. Refer to [Positive Crankcase Ventilation Hose/Pipe/Tube Replacement](#) .
- Install the rear intake manifold cover (2). [Click for full-size image](#)
- Install the rear intake manifold cover retainers (1).
- Install the intake manifold cover (2). Refer to [Intake Manifold Cover Replacement - Front](#) . [Click for full-size image](#)
- Connect the battery ground cable to the battery. Refer to [Battery Negative Cable Disconnection and Connection](#) .

Camshaft Cover Replacement - Right Side (Article 12159)

Special Tools

EN 46101 - Spark Plug Tube Seal Guide

For equivalent regional tools, refer to [Special Tools](#) .

Removal Procedure

- Disconnect the battery ground cable from the battery. Refer to [Battery Negative Cable Disconnection and Connection](#) .
- Remove the intake manifold cover (2). Refer to [Intake Manifold Cover Replacement - Front](#) . [Click for full-size image](#)
- Remove the rear intake manifold cover retainers (1). [Click for full-size image](#)
- Remove the rear intake manifold cover (2).
- Remove the positive crankcase ventilation tubes. Refer to [Positive Crankcase Ventilation Hose/Pipe/Tube Replacement](#) .
- Remove the intake manifold (2). Refer to [Intake Manifold Removal](#) . [Click for full-size image](#)
- Unlock the ignition coil electrical connectors before disconnecting from the ignition coils.
- Do not damage the ignition coil electrical connectors.
- Disconnect the ignition coil electrical connectors (4) from the ignition coils. [Click for full-size image](#)
- Disconnect the wiring harness (2) from the camshaft cover.
- Reposition and secure the wiring harness (2) away from the camshaft cover in order to provide clearance for removal of the camshaft cover.
- Do not disconnect the engine front cover electrical connectors.
- Use a suitable tool to detach the wiring harness (1) from the camshaft cover (2) and lift the wiring harness (1) upwards to detach the wiring harness from the camshaft cover (2).
- Remove the wiring harness (1) from the front of the camshaft cover (2). [Click for full-size image](#)
- Reposition and secure the wiring harness (1) away from the camshaft cover (2) in order to provide clearance for removal of the camshaft cover (2).
- Remove the ignition coil to camshaft cover retaining bolts (1). [Click for full-size image](#)
- Remove the ignition coils (2) from the camshaft cover (3).
- Remove the camshaft cover to cylinder head retaining bolts (1). [Click for full-size image](#)
- Remove the camshaft cover (2) from the cylinder head (3).
- Install the spark plug tube plugs EN 46101 - spark plug tube seal guide (1) to the spark plug tubes to prevent dirt and other contaminants from entering the cylinders. [Click for full-size image](#)
- Disassemble the camshaft cover as necessary. [Camshaft Cover Disassemble](#)
- Inspect the camshaft cover. Refer to [Camshaft Cover Cleaning and Inspection](#) .

Installation Procedure

- Assemble the camshaft cover as necessary. Camshaft Cover Assemble
- Wipe the camshaft cover sealing surface on the right cylinder head with a clean, lint-free cloth.
- Place a 3 mm bead of GM approved sealant (1) on the join line between the engine front cover and the cylinder head. [Click for full-size image](#)
- Place the right camshaft cover (2) into position onto the right cylinder head (3). [Click for full-size image](#)
- Loosely install the right camshaft cover bolts (1).
- Tighten the right camshaft cover to cylinder head retaining bolts in the sequence to 10 Nm (89 lb in) . [Click for full-size image](#)
- Remove the spark plug tube plugs EN 46101 - spark plug tube seal guide (1) from the spark plug tubes of the right cylinder head. [Click for full-size image](#)
- Install the ignition coils (2) to the camshaft cover (3). [Click for full-size image](#)
- Install the ignition coil to camshaft cover retaining bolts (1) and tighten to 10 Nm (89 lb in) .
- Ensure the wiring harness (1) is located on the locating lugs of the camshaft cover (2).
- Listen for an audible click to confirm the correct installation of the wiring harness (1) to the camshaft cover (2).
- Install the wiring harness (1) to the front of the camshaft cover (2). [Click for full-size image](#)
- Install the engine wiring harness (2) to the camshaft cover. [Click for full-size image](#)
- After connecting the ignition coil connectors ensure that the ignition coil electrical connectors are locked to the ignition coils.
- Connect the ignition coil electrical connectors (4) to the ignition coils.
- Install the intake manifold (2). Refer to Intake Manifold Replacement . [Click for full-size image](#)
- Install the positive crankcase ventilation tubes. Refer to Positive Crankcase Ventilation Hose/Pipe/Tube Replacement .
- Install the rear intake manifold cover (2). [Click for full-size image](#)
- Install the rear intake manifold cover retainers (1).
- Install the intake manifold cover (2). Refer to Intake Manifold Cover Replacement - Front . [Click for full-size image](#)
- Connect the battery ground cable to the battery. Refer to Battery Negative Cable Disconnection and Connection .