



Video Instructions

CSO MCLAREN V8 VALVE COVERS

INSTALLATION INSTRUCTIONS

Make

McLaren

Application

M838T

M840T

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THANK YOU!

“

There's a reason people ship their McLarens from all around to Cannonball Garage

Their team are highly trained individuals, it's not a revolving door... Great to build a relationship with guys you can trust and do an amazing job at keeping your McLaren running in top shape!

- Adam

Story:

The finding emerged early in our internal engine development program while I was performing a routine engine teardown. During inspection, we discovered unusual wear marks on the underside of a factory valve cover. Further investigation revealed that the marks were caused by intermittent contact between the intake camshaft lobes and internal structural ribs inside the valve cover.

Through our inspections, we've observed this same contact pattern consistently across every McLaren V8 engine we've disassembled. The same marks, the same wear patterns, and the same introduction of plastic debris into the oiling system.

Rather than treating the issue as an isolated curiosity, we incorporated the discovery into our engineering development program. The result is a purpose-built solution: the CSO Billet Aluminum Valve Covers.



Ivan Phipps
CSO LEAD



cannonball
GARAGE



The CSO McLaren Valve Covers Fix Three Major Issues

PLASTIC

The factory McLaren valve covers use internal plastic stiffening ribs. Due to the mirrored design of the covers and the geometry of the camshafts, one bank experiences contact between the intake cam lobes and the plastic rib structure. This introduces plastic into the engine.

WARPING

The OEM covers are molded plastic. After multiple heat cycles, crankcase pressure, and engine vibration, they begin to distort and lose their shape. This causes oil leaks, scavaging, and sealing issues.

SEALING

As the factory covers warp upward, the seals lose proper engagement around the spark plug tube openings. Crankcase pressure then pushes oil past the seals, allowing oil to drain down into the spark plug wells.

Cannonball Garage CSO Valve Covers

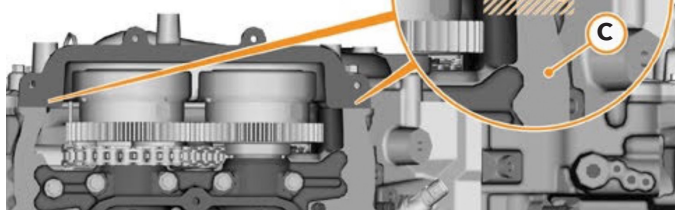
CSO Billet Valve Covers for McLaren
M838T & M840T Engines

What initially appeared to be isolated wear patterns eventually revealed a much larger issue affecting multiple generations of McLaren V8 engines.

Quick Start Guide

Use only RTV silicone. Apply fresh 2-3mm bead across T-Joint.

Apply RTV silicone bead to cam cover face (a) at joint of upper front cover (b) to heads (c).



Apply fresh 2-3 mm bead across T-Joint



Torque 6mm valve cover fasteners to 85 in./lbs



Follow the torquing sequence below



Follow the tightening sequence in three separate steps.

First: finger tighten all fasteners in sequence.

Second: tighten all fasteners in sequence until they make contact with the cover.

Third: tighten all fasteners in sequence to 85 in./lbs.

Scan to Learn More



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CRITICAL TORQUE NOTE: Valve cover fasteners are torqued to 85 inch-pounds (in-lb), NOT foot-pounds. Follow the torque-sequence sheet supplied on the preceeding page.

Scope and installation notes

These instructions are based on Cannonball Garage's recorded installation procedure for CSO billet valve covers on a McLaren V8 core engine.

The procedure is generally remove-and-replace, but harness routing, vacuum connections, and bolt lengths can vary by model and engine generation.

Tools and materials

- CSO billet valve covers, supplied with perimeter gaskets and spark-plug tube seals preinstalled
- Torque wrench capable of accurately measuring 85 in-lb
- Small pick for electrical-connector clips
- 15 mm tool for transferring the coil pedestals
- Plastic-safe scraper; clean rag and acetone if needed
- Engine-safe RTV silicone
- Side cutters or a razor blade for removing taped-on harness mounts
- Oil or grease for lightly lubricating cam-sensor O-rings
- Supplied threaded 'Christmas tree' harness retainers, zip ties, and flush-cut pliers

BEFORE YOU BEGIN:

Work on a cool engine and use normal shop safety procedures. Protect all exposed engine openings. Confirm that the supplied gaskets and tube seals are fully seated and undamaged before installation.

STEP 1:

Remove the original valve covers

1. Clear access. Remove the peripherals necessary to expose the valve covers. On earlier engines such as the 650S, this includes multiple vacuum lines.

2. Release the engine harness. Disconnect and move the harness away from the covers.

- Disconnect the camshaft position sensors.
- Disconnect the variable-valve-timing cam solenoids.
- Disconnect the fuel-pressure sensor where equipped.
- Use a small pick to release connector clips without damaging them.

3. Remove cover fasteners. Loosen and remove all valve-cover bolts. Keep track of fasteners carrying brackets and note each bracket's position.

4. Lift off each cover. Remove the original covers carefully. Expect a small amount of fresh oil to drain from the cover; prevent it from reaching connectors or open engine areas.



STEP 2:

Prepare the cylinder-head sealing surfaces

5. Remove old silicone. At each seam where the front cover meets the cylinder head, carefully scrape away the previous RTV silicone.

6. Protect the engine. Prevent silicone fragments or other debris from falling into the engine. Wipe away residue with a clean rag; acetone may be used on the rag when necessary.

7. Clean the gasket rail. Clean the entire sealing rail and the area inboard of the gasket path. The surface must be free of oil, silicone fragments, and debris before the new cover is installed.

IMPORTANT: A thorough cleaning removing all debris from the top of the cylinder head and front cam covers is critical before the new cover is fitted.



STEP 3:

Install each CSO billet valve cover

8. Inspect the assembled cover. Verify that the perimeter gasket and all spark-plug tube seals are preloaded, correctly seated, and free of damage.

9. Apply RTV at the seams. Place a 2-3 mm bead of RTV silicone at the two locations where the front-cover-to-cylinder-head seams cross the perimeter gasket path. Do not apply RTV around the full gasket rail. See “Quick Start Guide”

10. Position the cover. Lower the billet cover squarely over the spark-plug tubes and onto the head. Confirm that the tube seals engage the sides of the tubes and that the perimeter gasket remains in its groove.

11. Install all bolts and brackets. Return every fastener and bracket to its original location. Start every bolt by hand before tightening any of them.

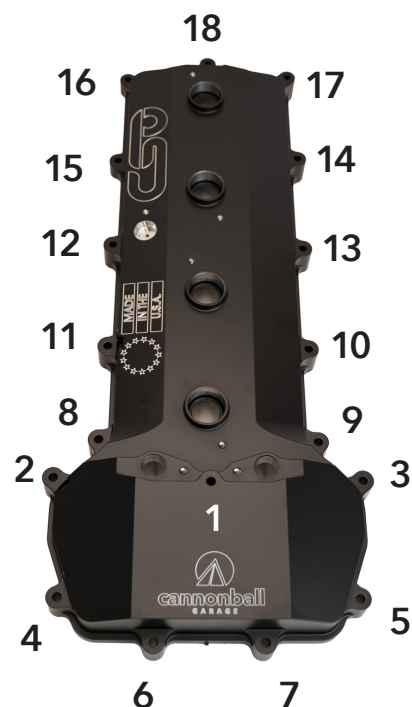
- Older engines may use equal-length bolts that thread farther into three locations.
- Later engines may use three short bolts in those locations.
- Confirm that the radiator-tube bracket and vacuum-spider bracket locate correctly in the machined cover features.

12. Seat the cover evenly. Run the bolts down gradually until they are nearly touching. Lightly snug them while working back and forth across the cover so the gasket compresses evenly. Do not fully tighten one area while other bolts remain loose.

13. Torque the fasteners. Using the sequence supplied. Work back and forth in a zigzag pattern and torque each cover bolt to 85 in-lb.

DO NOT SUBSTITUTE A GENERIC ORDER:

The exact numbered torque order is provided on the product's torque-sequence sheet. Use that sheet for the final tightening order.



STEP 4:

Transfer components and secure the harness

14. Install harness retainers. Push the supplied Christmas-tree retainers into the billet cover. The demonstration uses five locations: four across the top and one at the bottom.

15. Remove obsolete taped-on mounts. Cut or peel away the original harness mounts that are secured with electrical tape. Remove four taped-on mounts in the demonstrated configuration. Do not remove a retained mount used for the fuel-pressure connection where equipped.

16. Transfer the camshaft position sensors. Move the sensors from the original cover to the billet cover. Apply a small amount of oil or grease to each O-ring if needed to help it seat, then torque the sensor bolts to 85 in-lb.

17. Transfer the coil pedestals. Use the 15 mm tool to loosen the pedestals, spin them out by hand, install them in the billet cover, and lightly snug them into place.

18. Reinstall the engine harness. Route the harness neatly across the cover and press the mounts onto the new retainers. Reconnect all sensors and solenoids, and tighten the harness ground.

19. Install the CSO ignition coils *sold separately*. Seat each coil fully, connect the coil wiring, and position the harness so it is supported without tension.

20. Secure with zip ties. Cinch the zip ties, confirm the harness cannot move into an unsafe area, and trim the tails flush. Do not leave sharp angled ends that could cut the next technician servicing the spark plugs.

21. Reinstall remaining peripherals. Reinstall the vacuum spider, vacuum lines, radiator-tube bracket, and other removed components. The demonstrated vacuum-spider fastener is torqued to 85 in-lb.



STEP 5:

Final inspection

- Every electrical connector is fully seated and locked.
- The engine-harness ground is installed and tight.
- All coils are fully seated and connected.
- Harness routing is neat, supported, and clear of hot or moving components.
- All cover fasteners were tightened in the supplied sequence to 85 in-lb.
- RTV was applied only at the required front-cover/head seams.
- No tools, loose fasteners, silicone fragments, or debris remain in the work area.
- Removed vacuum lines, brackets, and peripherals have been restored to their original positions.

Enjoy your new CSO Valve Covers! Thank you!

Torque and fitment reference

Component	Specification	Notes
Valve-cover fasteners	85 in-lb	Use the supplied numbered torque sequence; tighten in a back-and-forth zigzag pattern.
Cam-position sensor bolts	85 in-lb	Lightly lubricate the sensor O-ring if needed before seating.
Vacuum-spider fastener	85 in-lb	Specification stated for the demonstrated installation.
Coil pedestals	Lightly snug	15 mm tool; no numeric torque was stated in the transcript.
RTV bead	2–3 mm	Apply only where the front-cover/head seams cross the gasket path.

Source note: Prepared from the Cannonball Garage McLaren valve-cover installation video transcript dated August 26, 2026. Where vehicle configuration or supplied product documentation differs, follow the current CSO product instructions for the exact application.