CCS OIL CATCH CAN KIT FOR LS ENGINES

PART NO. CCS-GM-101/102

MADE IN USA

Important: Read these instructions in their entirety prior to installation.

For contact information, visit www.improvedracing.com

Rev 230713

CCS-GM-101 APPLICATIONS

- 3rd and 4th generation LS / Vortec engines with a PCV outlet on the front of the valley cover connecting to the front of the intake manifold.
    - The hoses supplied with the kit are specific to this configuration.
- Does not fit V8 GM trucks with factory air box resonator chambers.
- Does not fit 2010-2014 Chevrolet Camaro SS with heater hoses routed over intake manifold.

CCS-GM-101 PARTS LIST

Item	Qty	Part Number	Description
1	1	CCS-80	Catch Can Top
2	1	CCS-71	7 fl oz Reservoir
3	1	CCS-GM-101-01	Engine Bracket
4	1	CCS-GM-101-02	Engine Bracket Spacer
5	1	CCS-31	Catch Can Bracket
6	3	HSC-1040	M6 Mounting Screws
7	2	OQ-06-M10	Catch Can Fittings
8	1	CCS-GM-101-50	Hose: Engine Outlet to Can Inlet
9	1	CCS-GM-101-51	Hose: Can Outlet to Intake
10	1	CCS-41-01	Catch Can Lock
11	1	HSC-1066	M10x1.50x70 Mounting Screw (with spacer)
12	1	HSC-1071	M10x1.50x20 Mounting Screw (without spacer)

CCS-GM-102 APPLICATIONS

- 2005-2013 Chevrolet Corvette (All Trims)
    - It may be necessary to rotate the water pump clamps to easily install and remove the reservoir for service.

CCS-GM-102 PARTS LIST

Item	Qty	Part Number	Description
1	1	CCS-80	Catch Can Top
2	1	CCS-73	3.5 fl oz Reservoir
3	1	CCS-GM-101-01	Engine Bracket
4	1	CCS-GM-101-02	Engine Bracket Spacer
5	1	CCS-31	Catch Can Bracket
6	3	HSC-1040	M6 Mounting Screws
7	2	OQ-06-M10	Catch Can Fittings
8	1	CCS-GM-101-50	Hose: Engine Outlet to Can Inlet
9	1	CCS-GM-101-51	Hose: Can Outlet to Intake
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EXTRA CLAMPS & FITTINGS?

Additional clamps and quick connect fittings are supplied with this kit to support continual updates to the LS / Vortec engines. Refer to the section in the manual, GM PCV Hoses & Tubes, for instructions on how to use these parts.

MOUNTING CONFIGURATIONS

The billet bracket can install onto left and right cylinder heads. This is shown in Figure 1. The spacer only installs onto the right cylinder head. The spacer will not install onto the left cylinder head. This is shown in Figure 2. The lines supplied with this kit support installation onto the right cylinder head only. Contact us if you need help creating the lines for a left cylinder head installation.

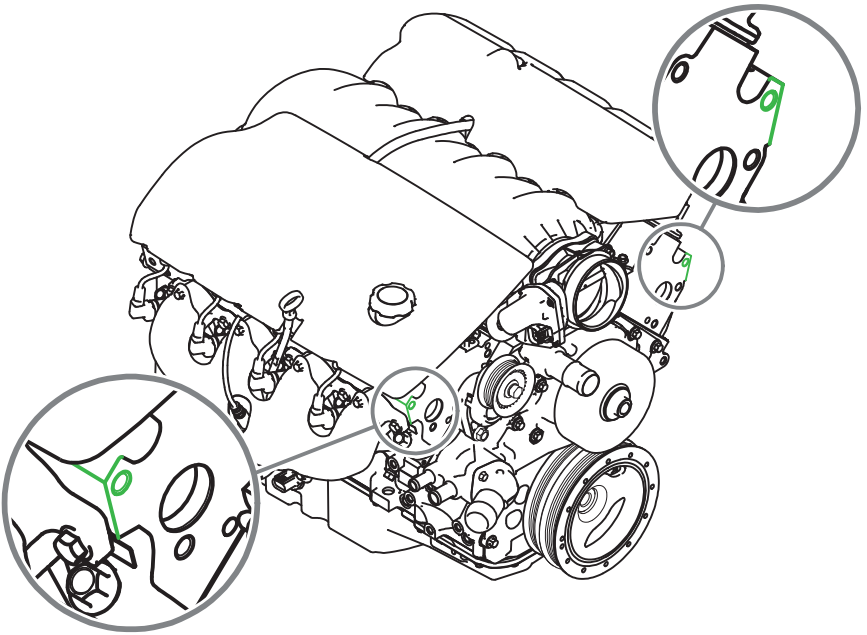


Figure 1 - Bracket Locations on Cylinder Head

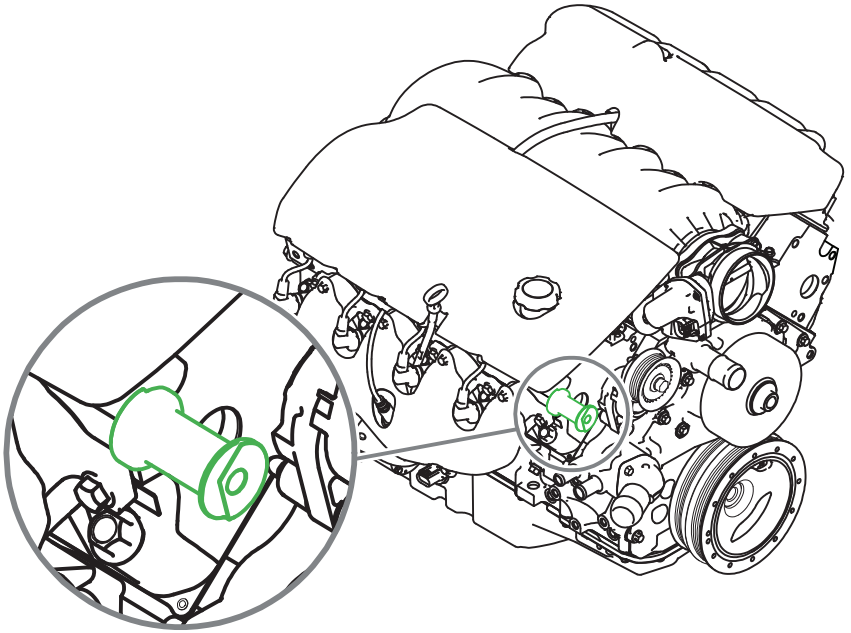


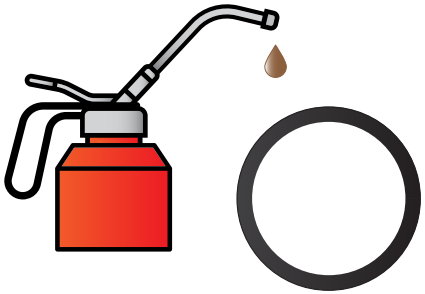
Figure 2 - Spacer on Right (Passenger) Cylinder Head

BEFORE YOU BEGIN

WARNING: This product should only be installed by a qualified mechanic. Improper installation could result in severe engine damage.

Lubricate all quick connect fitting barbs before connecting the hoses.

Lubricate all visible O-rings prior to installation to prevent damage and ensure a leak-free seal.



Use aluminum tools to avoid damaging the aluminum fittings.

INSTALLATION INSTRUCTIONS

PREPARING THE CAR

1. Open the hood to access the engine compartment.
2. Remove the right-hand (passenger) engine cover.
3. Disconnect the battery if there is a ring terminal fastened to the right-hand (passenger) cylinder head, shown in Figure 3.

Use zip-ties to secure battery wires from contacting the terminals.

Figure 3 - Ring Terminal on Cylinder Head

4. Remove the screw from the cylinder head and relocate the ring terminal to the hole shown in Figure 4.

Figure 4 - Relocating Ring Terminal on Cylinder Head

5. Remove the original PCV hose from the intake and valley cover:
   a. Unfasten EVAP or EGR systems to permit clearance.
   b. Remove the vent line from the air intake.
   c. Remove the vent line from the engine valley connection.
   d. Remove the original PCV tube.
   e. Leave components detached until reassembly so that your hands have space to work.

INSTALLING THE BRACKET & CAN

1. Review the included CCS product manual.
2. Assemble the 90° catch can bracket onto the LS engine bracket using all three M6 flange screws.
3. Torque the M6 screws to 120 lb-in (13,000 N-mm).
4. Determine if your install requires the spacer:
   a. The spacer is sometimes required when using plastic engine covers.
   b. The spacer is generally required when EVAP or EGR is present.
   c. Test fit to determine if the spacer is required for your install.
5. Install the engine bracket, or engine bracket and spacer onto the left cylinder head.
   a. Use the short screw with the engine bracket alone.
   b. Use the long screw with the spacer and engine bracket.

The bracket and spacer interlock with each other, and to the corner of the cylinder head, shown in Figure 5.

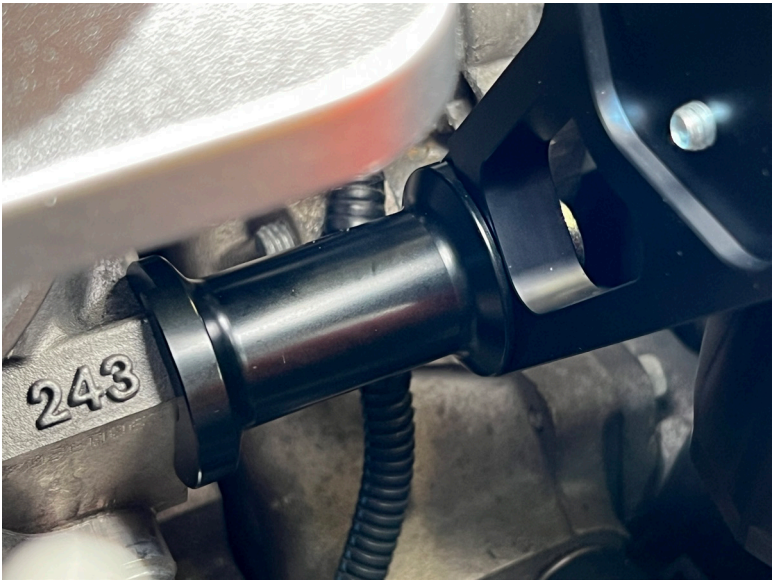


Figure 5 - Bracket & Spacer Interlock

6. Install the catch can onto the engine bracket and position as shown in Figure 6.

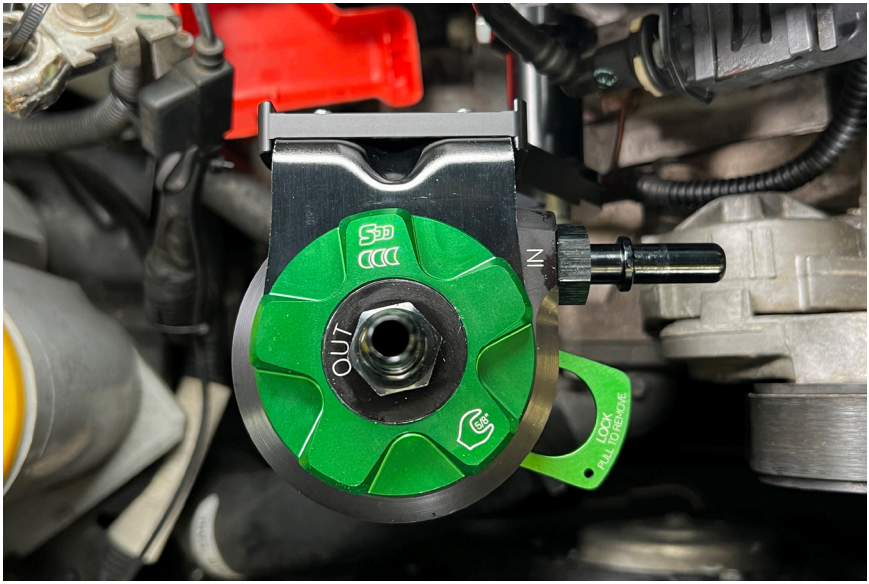


Figure 6 - Catch Can Orientation in Engine Bay

7. Firmly tighten the green nut once the catch can is positioned as shown in Figure 7.

Apply anti-seize onto the threads when hand-tightening the green nut because this increases the clamping force and properly secures the can.

Figure 7 - Using an Aluminum Wrench to Tighten the Green Nut

8. Thread each adapter fitting into the catch can and torque to 13 to 16 lb-ft (17 to 22 N-m).

GM PCV HOSES & TUBES

The PCV hose / tube will vary between LS / Vortec engines. This section explains how to connect the kit for each variety of PCV connection.

- Engines with the Style #1 PCV hose shown in Figure 8 can immediately install the included hoses.

Figure 8 - Style #1 PCV Hose: Included Hoses Directly Adapt

- Engines with the Style #2 PCV tube shown in Figure 9 require splicing the PCV valve into the new hose or adding a restrictor fitting.
    - Contact us if you need further assistance adapting the parts.

Figure 9 - Style #2 PCV Tube: Splice PCV into Included Lines

- Engines with the Style #3 PCV tube shown in Figure 10 require installing the extra quick-connect fittings included in the kit onto the lines.

- Test fit, adjust, then insert and clamp the included quick-connect fittings to the hose.

Figure 10 - Style #3 PCV Tube: Insert & Clamp Extra Fittings into Included Lines

CONNECTING THE LINES: STYE #1

1. Engines with the Style #1 PCV hose should connect the shorter hose as follows:
   a. Slide-on a worm-drive hose clamp and connect the hose to the metal PCV outlet on the engine valley cover.
   The worm-drive clamp is optional but recommended.
   b. Connect the 45° fitting to the catch can “IN” port.
2. Next, connect the longer hose as follows:
   a. Connect the 90° fitting to the catch can “OUT” port.
   b. Slide-on a worm-drive hose clamp and connect the hose to the intake manifold.
   The worm-drive clamp is optional but recommended.
3. Hand-tighten all hose clamps using a 7 mm tool.
4. See Figure 11 for an example of a completed installation of this type.

CONNECTING THE LINES: STYLE #2

1. Splice the PCV valve into one of the included lines. One way this can be done by cutting the hard pipe, then sliding the new hose over the hard pipe and securing with the worm-drive clamp. Another alternative option is to install an adjustable restrictor fitting in place of the PCV valve (such a fitting is currently in development).

⚠ **WARNING: Confirm the PCV valve flow direction is correct.**

2. Engines with the Style #2 PCV hose should connect the shorter hose as follows:
    a. Slide-on a worm-drive hose clamp and connect the hose to the metal PCV outlet on the engine valley cover.

    The worm-drive clamp is optional but recommended. Confirm the hose clamp screw is accessible for tightening.

    b. Connect the 45° fitting to the catch can “IN” port.
3. Next, connect the longer hose as follows:
    a. Connect the 90° fitting to the catch can “OUT” port.
    b. Slide-on a worm-drive hose clamp and connect the hose to the intake manifold.

    The worm-drive clamp is optional but recommended. Confirm the hose clamp screw is accessible for tightening.
4. Hand-tighten all hose clamps using a 7 mm tool.

CONNECTING THE LINES: STYLE #3

1. Install the quick-connect fittings onto the valley cover and intake manifold.
2. Push the hose onto the fittings and determine whether the included hoses require shortening.
3. Remove the hoses and fittings. If necessary, trim the hoses for an optimal fit.
4. Crimp the fittings to the hose using the extra Oetiker clamps.

Wire cutters can be used to crimp the Oetiker clamps if crimping pliers are not available.

5. Engines with the Style #3 PCV hose should connect the shorter hose as follows:
    a. Connect the 45° fitting to the catch can “IN” port.

b. Connect the straight fitting to the metal PCV outlet on the engine valley cover.

6. Next, connect the longer hose as follows:
   a. Connect the 90° fitting to the catch can “OUT” port.
   b. Connect the straight fitting to the intake manifold.

COMPLETING THE INSTALL

1. Reinstall any vent lines, EVAP and EGR removed for installation.
2. Reconnect the battery.
3. Replace the engine covers.
4. See Figure 11 for an example of a completed installation on a 2006 Pontiac GTO.
5. Start the vehicle and check for signs of a vacuum leak. Check all connections and troubleshoot if necessary.
6. Install the safety lock clip into the can before closing the hood.

Installation is now complete. Thank you for purchasing an Improved Racing product!

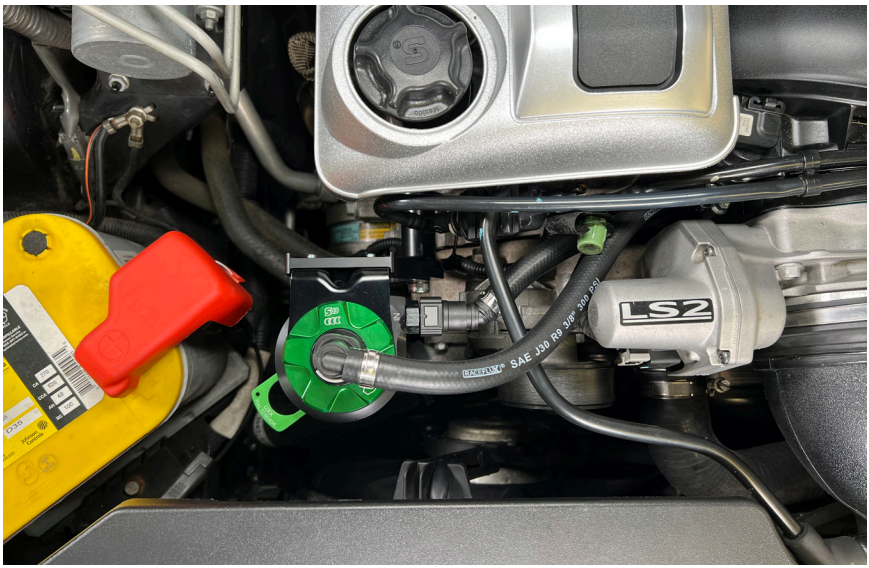


Figure 11 - Completed Installation Example, 2006 Pontiac GTO