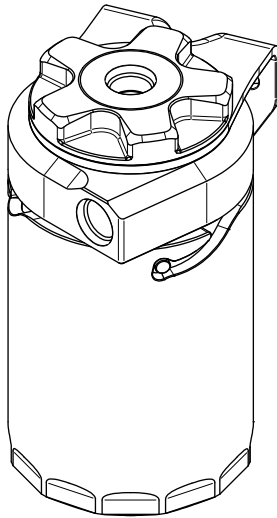




CATCH CAN SPORT

PART NO. CCS-351 & CCS-700

MADE IN USA



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

For contact information, visit www.improvedracing.com
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APPLICATIONS

- Gasoline direct injection engines seeking to combat carbon build-up on the engine intake valves.
- Factory and modified internal combustion engines experiencing:
 - Oil buildup inside the intake manifold.
 - Oil buildup on turbocharger/supercharger compressors.
 - Oil buildup on supercharger rotors, and at the base.
 - Tailpipe smoke from ingested oil inside the intake manifold.
 - Oil buildup on the throttle body from vented valve covers.
 - Oil buildup within charge air coolers.

PARTS LIST

CCS-351

Item	Qty	Part Number	Description
1	1	CCS-351	Catch Can Sport, 3.5 fl. oz. Capacity, w/Drain
2	1	CCS-31	90° Mounting Bracket
3	1	CCS-41	Safety Lock Clip
3	1	HSC-6000	Reservoir Plug, $\frac{3}{8}$ " Hex-Drive
4	1	HSC-6001	Reservoir Drain Plug, -6 ORB

CCS-700

Item	Qty	Part Number	Description
1	1	CCS-700	Catch Can Sport, 7 fl. oz. Capacity
2	1	CCS-31	90° Mounting Bracket
3	1	CCS-41	Safety Lock Clip

MOUNTING THE CATCH CAN

A 90° bracket is standard for all catch can kits. Three slots accept hardware up to M6 or $\frac{1}{4}$ " for secure mounting. The bracket has sixteen rotation positions for custom fitment to your specific application.

Improved Racing sells a universal flat bracket. The flat bracket also fits M6 or $\frac{1}{4}$ " hardware and has sixteen rotation positions. The part number is CCS-30 and is available for purchase on www.improvedracing.com.

RELEASING THE RESERVOIR

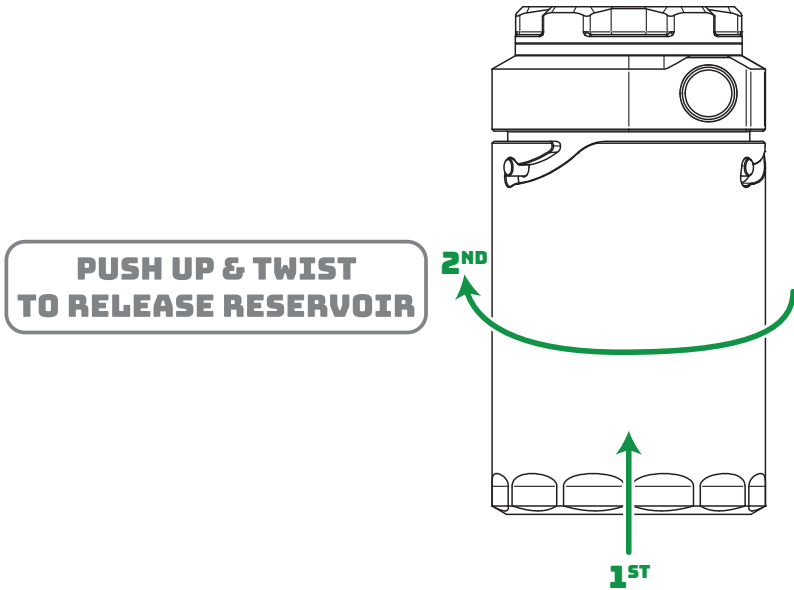


Figure 1 - Releasing the Reservoir

CATCH CAN FITTINGS

Catch cans have -6 SAE O-ring ports (ORB) for plumbing flexibility. The fittings in this section are available on www.improvedracing.com.

FACTORY QUICK CONNECT FITTINGS (SAE J2044)

- The -6 ORB to male quick connect adapters have the prefix OQ.
 - Available OQ angles are straight and 90°.
 - Available OQ sizes are 10mm, 12mm and $\frac{5}{8}$ ".
- The female quick connect fittings have the prefix BQF.
 - BQF fittings connect to the male barbs found on valve covers and PCV components.
 - BQF fittings must match the diameter of Factory barbs, and OQ fittings.
 - PH1 hose attaches and clamps to BQF fittings.

HOSE BARB FITTINGS & HOSE ENDS

- The -6 ORB to barb adapters have the prefix OB-06.

- OB-06 are straight adapters.
- Available OB-06 hose barb sizes are $\frac{5}{16}$ ", $\frac{3}{8}$ " and $\frac{1}{2}$ ".
- OM-06 adapters are required for angled barb and hose connections.
 - OM-06 are ORB to male flare adapters.
 - Barb hose ends install onto OM-06.
 - Barb hose ends have the prefix PL.
 - Standard angles are available for PL hose ends.
- PH1 hose attaches and clamps to OB adapters and PL hose ends.

AN/SAE HOSE ENDS & FITTINGS

- The -6 ORB to male flare adapters have the prefix OM-06.
 - Available OM-06 angle is straight only.
 - Available OM-06 sizes are -6, -8 and -10 SAE male flare.
 - Standard hose ends connect to OM-06.

EUROPEAN NORMA ADAPTERS.

- NORMA adapters are currently not available.

PLUMBING CONFIGURATIONS

 **WARNING: NEVER tee vent lines into the PCV circuit.**

 **Caution: This section only provides general advice.**

 **Note: The installer understands each engine is unique.**

FACTORY CONSIDERATIONS

This section presents general information for factory vehicles. The figures that do not vent to atmosphere are emissions compliant because the factory plumbing is kept the same. Use these figures to install a catch can on factory vehicles with naturally aspirated engines and forced induction engines.

PCV circuits usually route from the valve cover to the intake manifold. Most catch cans install into the PCV line because oil vapor is abundant here.

- Check PCV valves and PCV diaphragms before installing a catch can.
 - The ball/plunger inside a PCV valve should move freely when shaken.
 - Clean the valve when stuck or replace the valve.
- Check PCV diaphragms on European/newer engines for tears and replace when torn.

Oil vapor released from the engine crankcase vent(s) can justify adding a catch can to the vent line. V-engines might have two vents. Catch cans are most effective on the dirtier vent, and the plumbing figures show this.

AFTERMARKET CONSIDERATIONS

This section has general advice for aftermarket-tuned engines. Examples of aftermarket-tuned vehicles include:

- Increasing or adding forced induction to an engine.
- Converting to dry sump engine oiling.
- Swapping non-original engines into a vehicle.

NATURALLY ASPIRATED ENGINES

PCV systems remove positive pressure from the crankcase. Reducing positive pressure is important for aftermarket engines. Positive pressure in the engine crankcase is like a shock absorber, damping usable horsepower and torque.

Removing PCV systems is not advised unless an auxiliary vacuum pump replaces it. The same is true if the engine is converted to dry-sump engine oiling. *(Fun Fact: Vacuum in the crankcase helps piston rings seal better and reduces the damping from positive pressure. This increases compression, or usable horsepower and torque.)*

- Auxiliary vacuum pumps and dry sump oiling systems allow the installer to adjust gas scavenging from the crankcase when PCV systems are removed.

MEASURING MANIFOLD VACUUM

A quick test measures manifold vacuum for every engine out there. Measuring manifold vacuum tells the installer if a catch can is going to be effective.

- Tee a vacuum gauge into the PCV line.
- Warm-up the engine and measure the vacuum at idle
- Engines with vacuum less than 7 inHg should confirm the vacuum drop is no more than 1 inHg after installation.
 - This ensures the crankcase is properly scavenged by the intake manifold vacuum.
 - This also shows if auxiliary vacuum pumps are going to be needed.

BOOSTED CONSIDERATIONS

Pressure check the PCV valve/diaphragm when adding/increasing forced induction to an engine:

- Double the intended boost pressure and safely pressure check the valve/diaphragm.

- Upgrade failing PCV valves/diaphragms with in-line check valves to stop boost from going into the crankcase through the PCV circuit.

Improved Racing sells check valves suitable for this application.

- FCV-06 and FCV-12 check valves:
 - Cracking pressure = 0.05 psi (3.4 mb).
 - Checking pressure = 300 psi (20.6 bar).

Forced induction engines with vented crankcases require experimentation when choosing a recirculated vent versus venting to atmosphere. High boost, wet sump vehicles typically require vent to atmosphere setups.

- This plumbing immediately vents crankcase pressure from boost blowby,
- Blowby exists even when piston rings are designed for boost.
- Vent lines have to recirculate with non-boosted induction air, so the crankcase is not pressurized.
- Shop manuals and engine builders may provide this info. In general, tune the crankcase for vacuum conditions always.

PLUMBING FIGURES

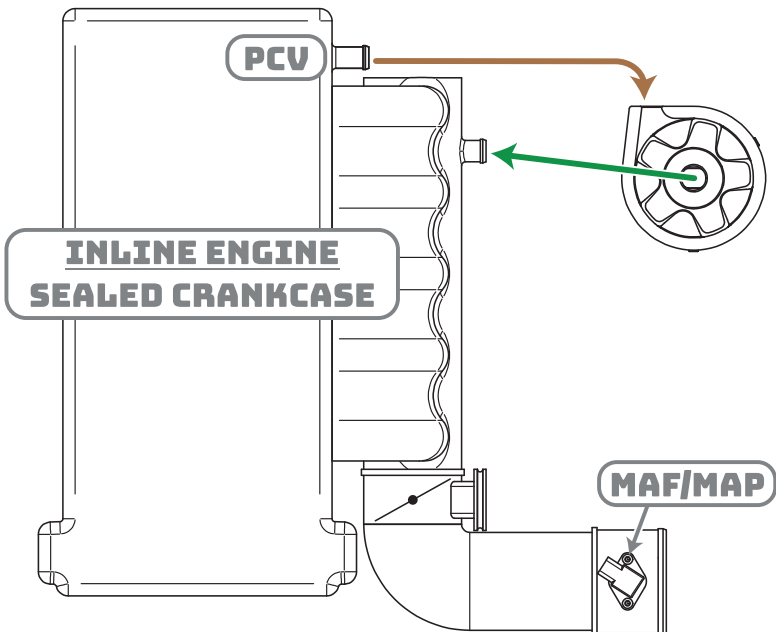


Figure 2 - N/A Inline Engine, Sealed Crankcase, PCV Filtered

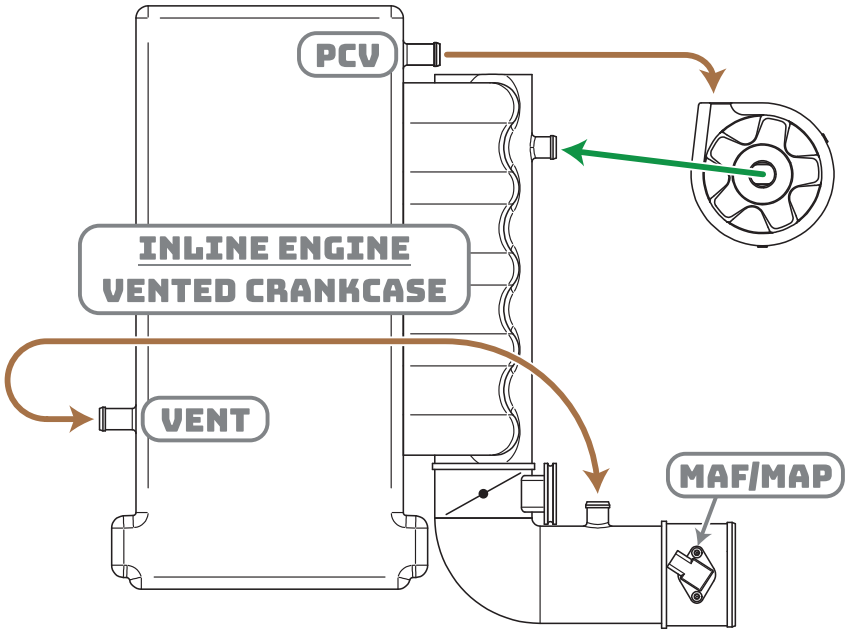


Figure 3 - N/A Inline Engine, Vented Crankcase, PCV Filtered

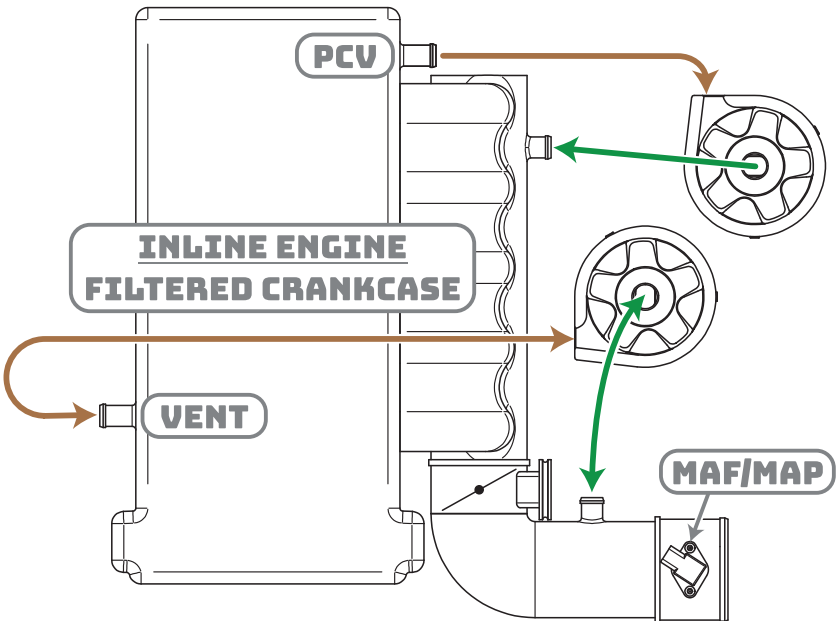


Figure 4 - N/A Inline Engine, PCV & Vented Crankcase Filtered

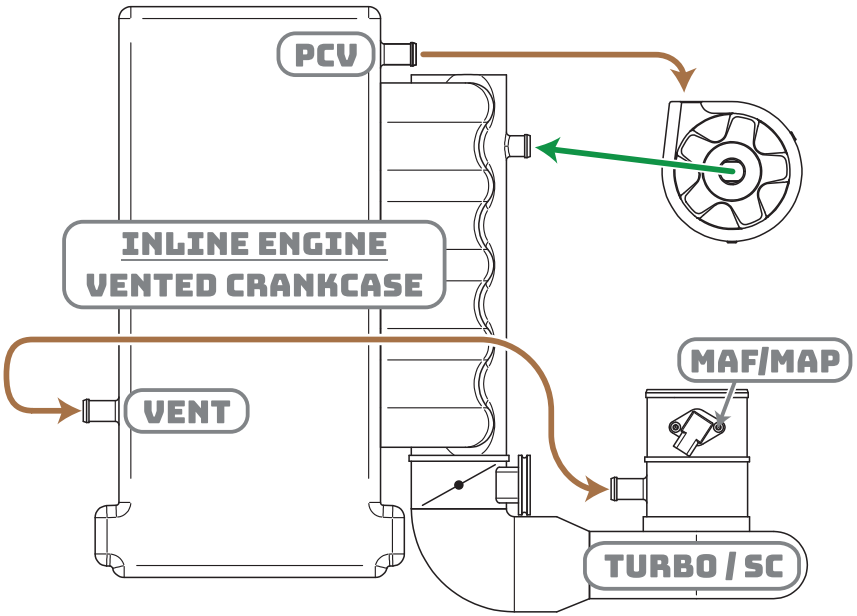


Figure 5 - Forced Induction Inline Engine, Vented Crankcase, PCV Filtered

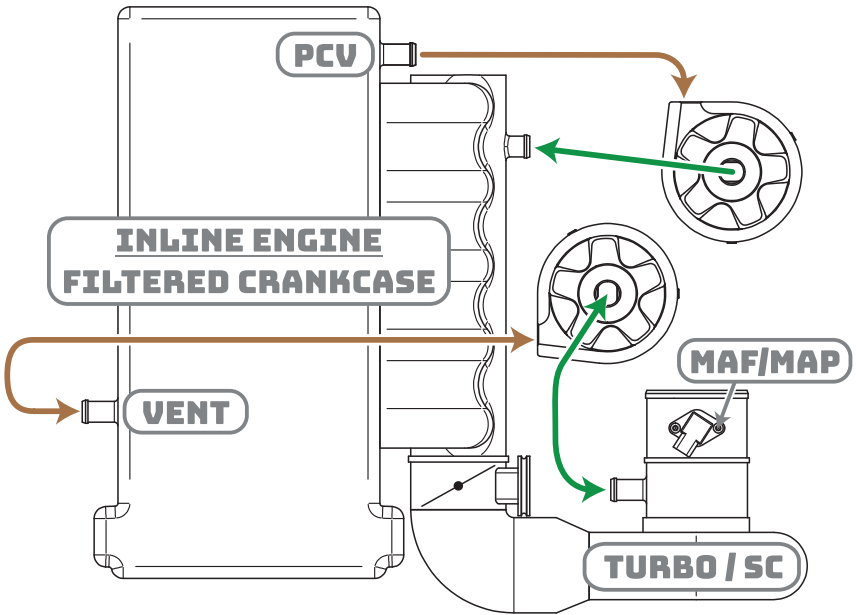


Figure 6 - Forced Induction Inline Engine, PCV & Vented Crankcase Filtered

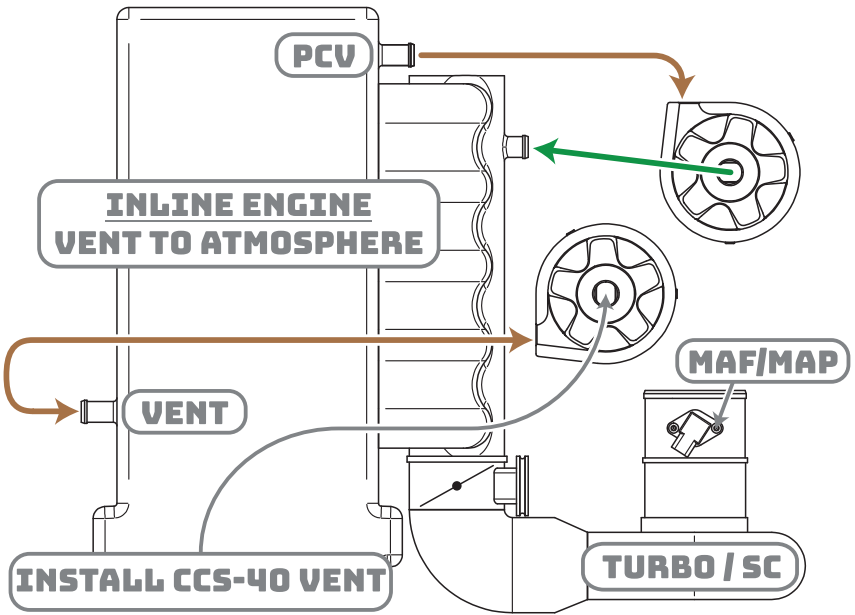


Figure 7 - Forced Induction Inline Engine, PCV Filtered & Vent to Atmosphere

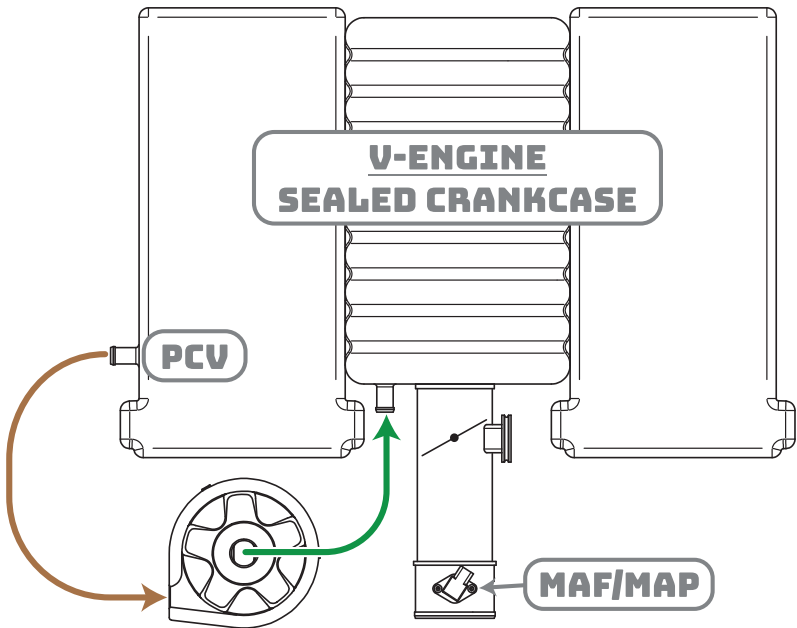


Figure 8 - N/A V-Engine Plumbing, Sealed Crankcase, PCV Filtered

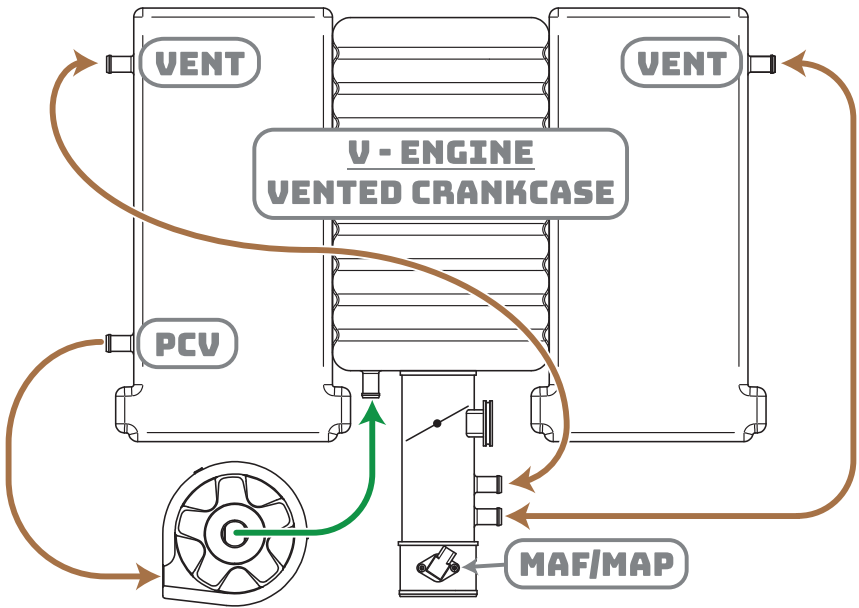


Figure 9 - N/A V-Engine, Vented Crankcase, PCV Filtered

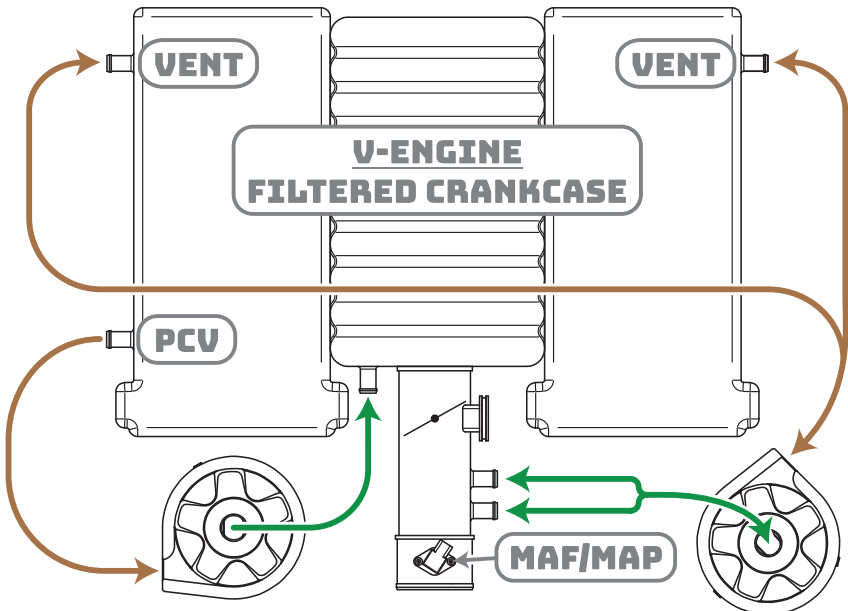


Figure 10 - N/A V-Engine, PCV & Vented Crankcase Filtered

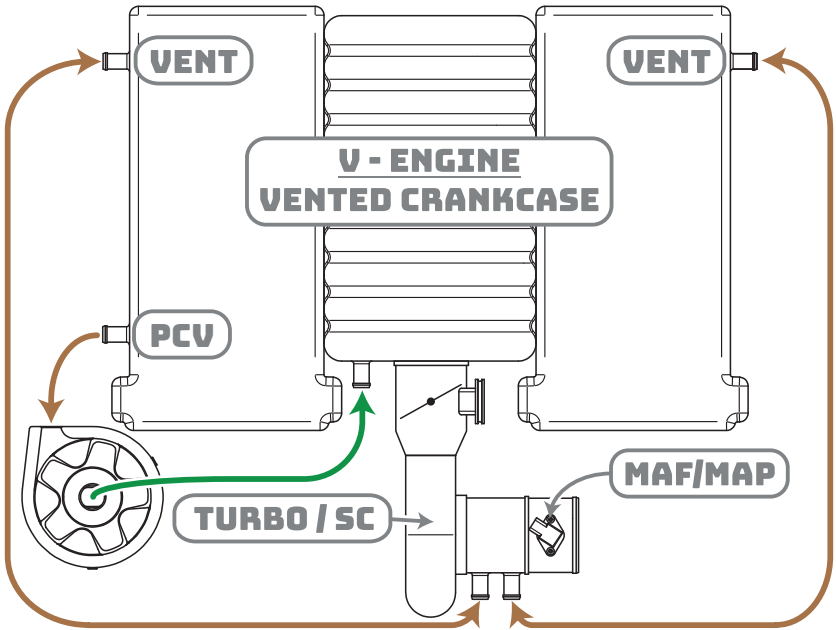


Figure 11 - Forced Induction V-Engine, Vented Crankcase, PCV Filtered

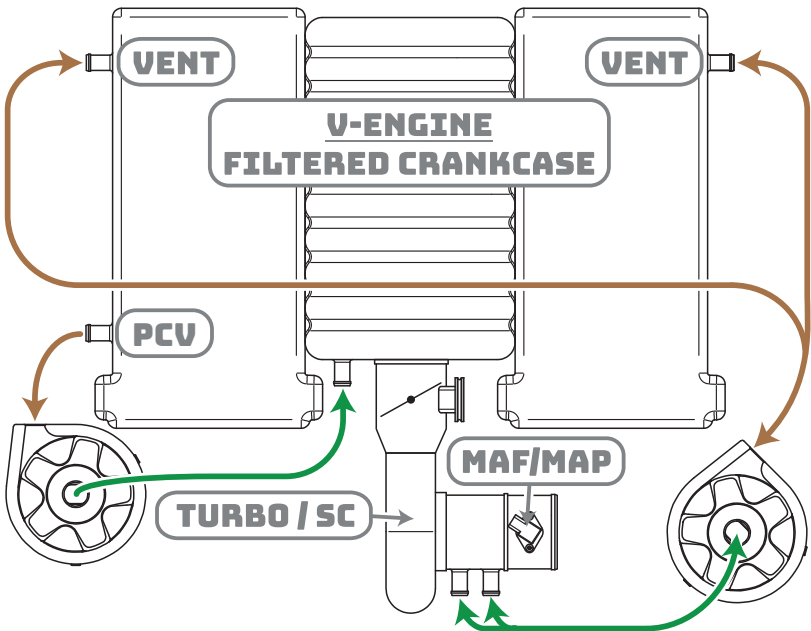


Figure 12 - Forced Induction V-Engine, PCV & Vented Crankcase Filtered

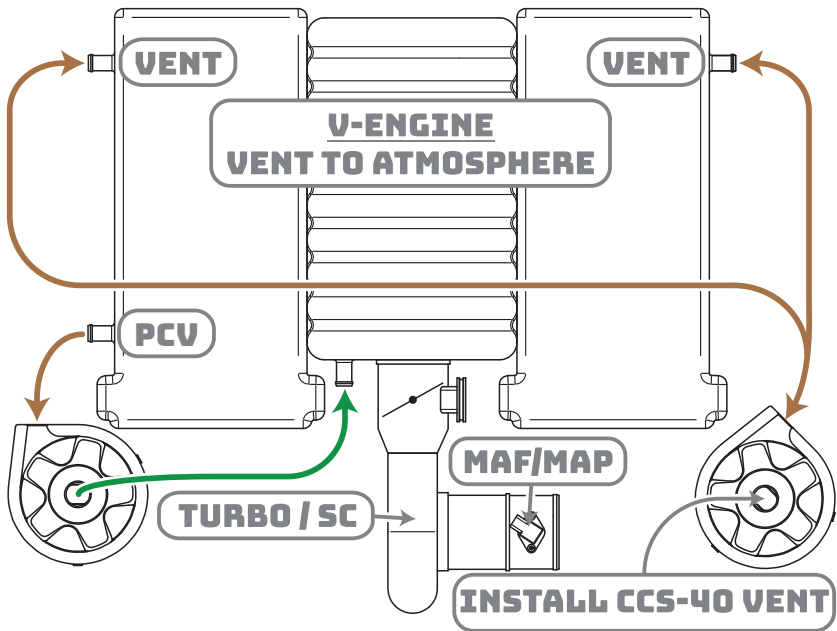
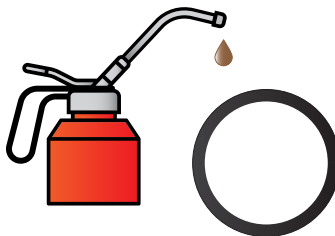


Figure 13 - Forced Induction V-Engine, PCV Filtered & Vent to Atmosphere


BEFORE YOU BEGIN

- ⚠️ WARNING:** This product should only be installed by a qualified mechanic. Improper installation could result in severe engine damage.
- ⚠️** Please verify the PCV system functions, or that a vacuum pump is installed on custom built engines before installing catch can(s).
- 💡** Refer to the Measuring Manifold Vacuum section of this manual when installing this on custom built engines.
- 💡** Lubricate O-rings prior to installation to prevent damage and ensure a leak-free seal.



INSTALLATION INSTRUCTIONS

1. Select a location to install the catch can(s) on your vehicle.
2. Use 2 to 3 mounting slots in the supplied bracket.
3. Install the catch can to your vehicle based on the plumbing configurations presented in Figure 2 through Figure 13.
4. Position the can ports as needed and tighten the green nut.
5. Torque the fittings in between 13 to 16 lb-ft (17 to 22 N-m).
6. Connect and tighten all the lines.
7. Start the vehicle and listen for a wandering idle (meaning there is a vacuum leak).
 - a. Shut the vehicle off when the idle is normal.
 - b. When the idle wanders, spray starting fluid at each connection to determine where the vacuum leak is occurring.
 - c. Retighten or remake lines as needed to stop the vacuum leaks.
 - d. Retest for a wandering idle to confirm the problems are gone.

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

PRODUCT SUPPLEMENT

TECHNICAL SPECIFICATIONS

Max. Operating Temp.	230°F (110°C)
Min. Operating Temp.	-30°F (-34°C)
Dimensions (W x H x D)	Refer to Figure 16 & Figure 17
Assembly Weight	Refer to Figure 16 & Figure 17
Aluminum Parts	Top, Funnel, Plenum, Bracket Nut, Bracket, Reservoir, Reservoir Plugs, Lock Clip
Aluminum Finish	Plain Metal or MIL-A-8625, Type II Anodizing Black & Green
Stainless Steel Parts	Pins, Filter, Spring, Retaining Ring
Seals	FKM and NBR Elastomer

SAFETY LOCK CLIP

Improved Racing includes a safety lock clip with all CCS catch can kits. This lock clip makes sure the can never opens in the harshest conditions, or under high idle vacuum. Install and remove as shown in Figure 14, and as instructed on the clip itself.

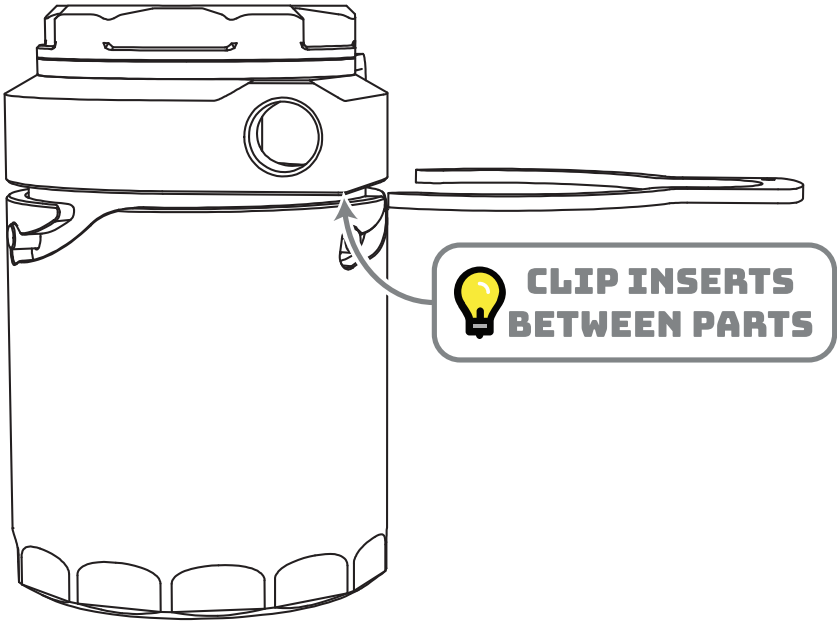


Figure 14 - Installing & Removing Safety Lock Clip

CCS-351 DIMENSIONS

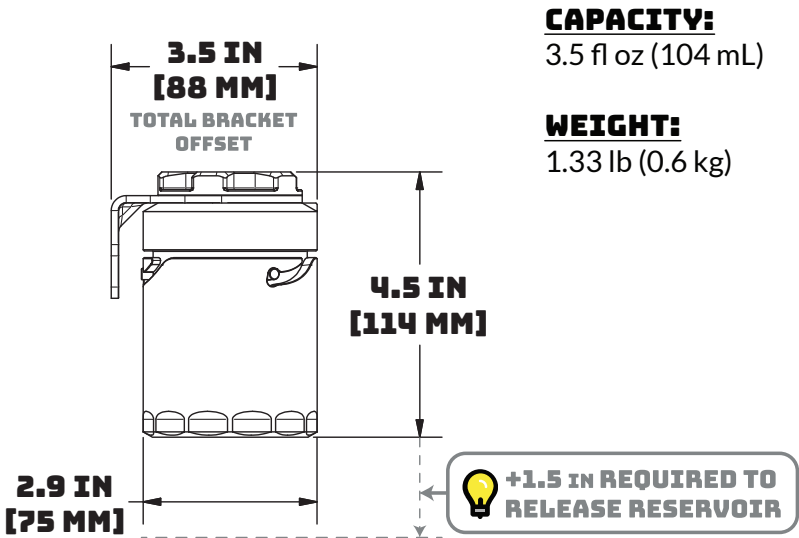


Figure 15 - CCS-351 Dimensions

CCS-700 DIMENSIONS

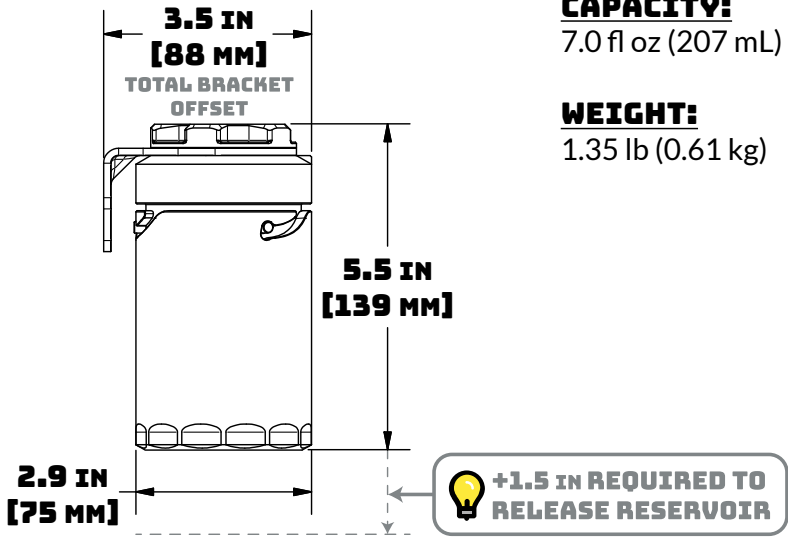


Figure 16 - CCS-700 Dimensions

D.I.Y. BRACKETS

We include our general bracket design and important dimensions in Figure 17 so installers can create custom brackets from 1/8" thick metal.

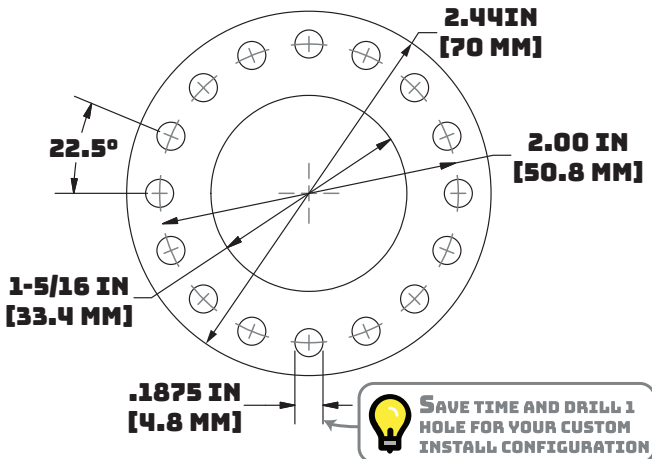


Figure 17 - CCS Bracket Hole Pattern for DIY Brackets (Not to Scale)

CLEANING THE FILTER

- 💡 Ensure the filter is installed in the same orientation it was removed, shown in Figure 18.
- CCS catch cans have a lifetime filter.
- 💡 Regular filter maintenance is important for optimum performance.
- 💡 Inspect the filter every six months to a year.
- Clean the filter with your favorite parts cleaner, degreaser, ultrasonic cleaner, etc.
- 💡 Dry the filter with compressed air.

REMOVING THE FILTER

Follow these steps while looking at Figure 18 to remove the filter from the catch can top for cleaning. ***We also have a video of this available here.***

- 💡 Take pictures for reassembly.
 - 💡 Reassembly is done in reverse order.
1. Remove the reservoir, bracket nut and bracket from the top.
 2. Use a small regular screwdriver to remove the retaining ring.
 3. Remove the funnel.
 4. Inserting the tool from the OUT port, remove the plenum with a 10mm hexagon key.
 - a. Ensure the small O-ring is removed with the plenum.
 - b. Loosen = Turn Right.
 - c. Tighten = Turn Left.
 - d. Reassembly Torque = 30 lb-in (3400 N-mm).
 5. Remove the filter from the plenum.
 - a. The small square O-ring remains on the plenum.
 - b. The large square O-ring remains in the top.

MANIFOLD SCHEMATIC

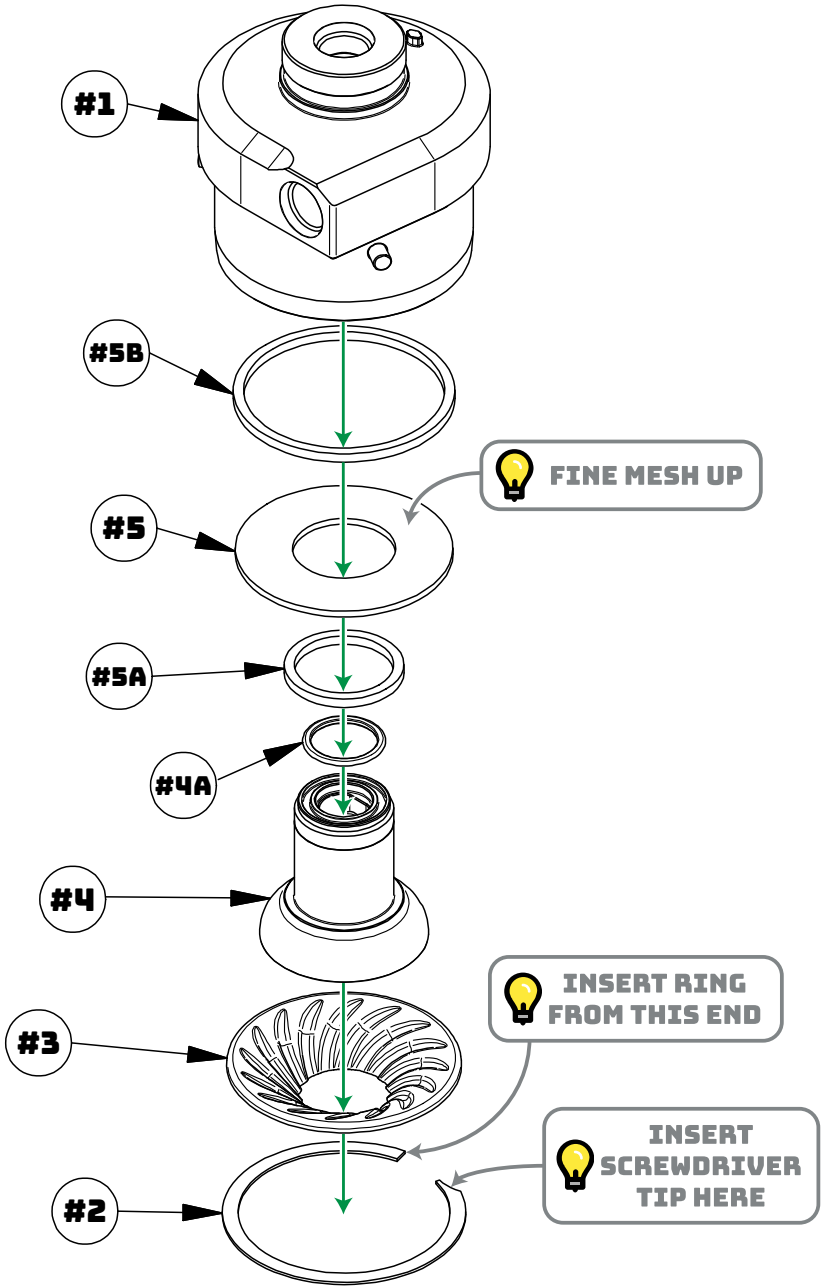


Figure 18 - Manifold Schematic