



Adding AC/Rad Protector Mesh to C8 Corvette

Revised 3/2023 (Included info from Forum Member *bluan* Posted July 2022)
(Also Splitter Install for C8 and C7 Z51)

Since I was installing a larger Splitter from “C7 Carbon” on my C8 Z51, decided to also install a mesh screen others had added to protect the AC Condenser from damage and large bugs. Had added similar to my C6 after the Chevy Service Manager said GM would not cover the repair of the hole in the AC Condenser in my 6-month-old Vette as it “*could have been caused by a rock. Paid the dealer \$800 replacement cost. Ultimately “proved” it was a manufacturing defect!*

Was initially concerned that adding mesh, would not allow the use a vacuum to clean bugs, but two forum comments made me realize the mesh would help:

Russ M05 noted: Only small bugs can go through the small mesh and can't damage the AC condenser fins. That the bugs hitting the mesh and are either stopped or their velocity reduced so less likely to imbed in the AC condenser fins and will drop to the bottom.

Phil1098 noted bugs can be washed away with a water stream.

Used the same black powder coated aluminum mesh from Custom Car Gills others had installed.

My install is “*very detailed*” for those who are not avid DIYers. It provides options to consider. The ideas came from those posted by *Russ_M05, Phil1098, RocketDNA (used his detailed template design,)* and *balun*. There are other posts and appreciate all the prior work done, making my task easier.

Since the Mesh Install is more complex than the Splitter and is covered first.



Pic left: Finished install of Custom Car Grill, ¼ inch Hex Black Power Coated Aluminum mesh AC Condenser protector.

Install used plastic ties hidden by removing the Grill Bar & Bezel and placing the wire ties where they are not visible.

The several install choices you can make are outlined in this PDF.

NOTE: There are other options to the Custom Car Grill product, like the GM ‘approved’ mesh. A comparison is in the Mesh Protection Appendix

Photo Sequence Of Protective Mesh Install

First decision you'll need to make is **do you want to remove the Grill Bar and Bezel to hind the plastic ties that hold the mesh in place?** Saw this video of a gal installing a Carbon Fiber Grill Bar option. Wondered why they had a gal doing the install? Found out! If you have very small hands, you might do what the video showed, BUT likely you'll drop the wrench!

Don't consider removing the Grill Bar until you remove the Bottom Panels that is necessary to install the mesh!



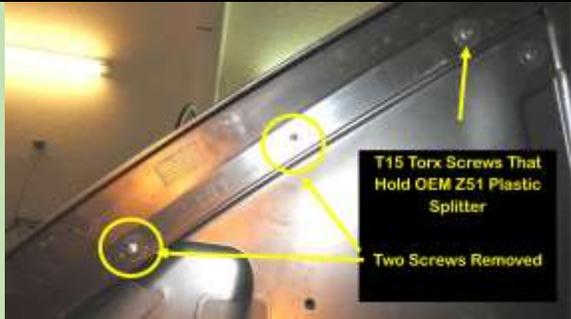
It's not essential to have the car lifted but makes the job easier. In my case installing the Splitter can also be done without jacking. But I have stanchions I fabricated for ~\$10 worth of wood and have used on my C7's when changing oil etc. Also have several jacks and jack pads so lifted only the small amount needed.

These are the main wrenches you'll need. I found the hand ratchet is very fast and easier to use than my right-angle drill. Used it to install most fasteners as well.

Since I removed the Grill Bar and Bezel, I also used a drill with 1/8-inch bit, a 7 mm open end wrench, a screwdriver and pliers. I used a small dental pick to help pull the wire ties through the 1/4 inch Hex mesh screen. You'll also need thin wire ties that will fit through an 1/8-inch drilled hole in the ends of the Grill Bars. Long ones preferred.

Note: Removing the Grill Bar is NOT needed if you are satisfied with several small black wire ties being visible. Then just follow the Custom Car Grill install video!



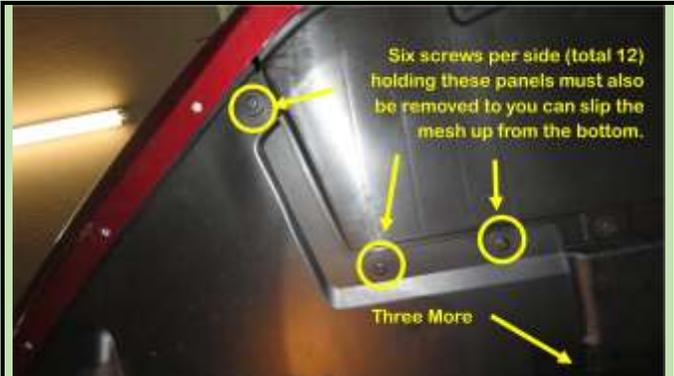


If you have a Z51 you must remove the splitter as the panels behind the splitter must be partially removed and the Splitter screws are part of those requiring removal. They are T15 Torx and came out easily with a hand ratchet.

Same aero panels must be removed with Base C8.

To gain access to the AC Condenser and place the mesh behind the grill you have to remove two bottom panels.

You can just remove 6 screws per side and leave the rear screws attached and let it hang down.



Once the 6 screws are removed on the front and side of the panels you will have to pull it out from the under the front lip. You'll have to tug, but it's like rubber so easily bends and can drop as shown.

That provides the access in front of the AC Condensers so you can insert the mesh. Also, so you can reach the Grill Bar Screws *IF* you plan to remove.



Bought the same mesh as others have used. It's from Custom Car Grills. Although they sell precut mesh to fit the C8, I elected to buy their 16-inch X 48-inch mesh and cut my own grill protective covers.

Suggest buying from the Company website NOT cheap copies from China that have appeared on Amazon and eBay. In fact, CCG have reduced their prices to compete!

<https://www.customcargrills.com>





There are three screws that hold the Grill Bar and the Bezel on left. The horizontal Bar and vertical Bezel are one plastic piece.

You can only access the screws from the rear. I found it easiest to use a hand ratchet and a 7 mm socket. You have to reach up through the slot you will put the mesh through. **Consider this extra step is more complicated than needed to install the mesh IF YOU ARE WILLING to have two black wire ties remain visible.**

The screw end and clip it screws into are visible in this view.

It is more work, and you might consider not removing as it's not necessary IF YOU ACCEPT HAVING SEVERAL BLACK WIRE TIES VISIBLE.

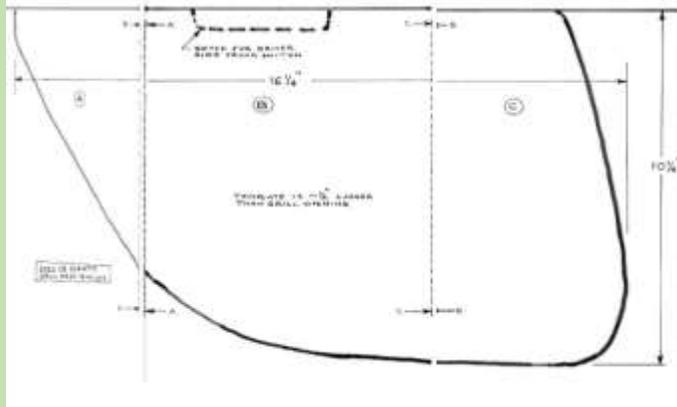


These are the Grill Bars removed. Note there are not typical body clips as some referred to the Plastic Tabs on the Bezel.

They are simply plastic Tabs that fit into slots in the grill body. Once the three screws are removed tilt the bar up about 30 degrees and the Tabs will be in a position to just pull out from the slots.

This is the AC Condenser with the bar and Bezel removed. Note there are three tabs on the Grill that the screws you removed went through.





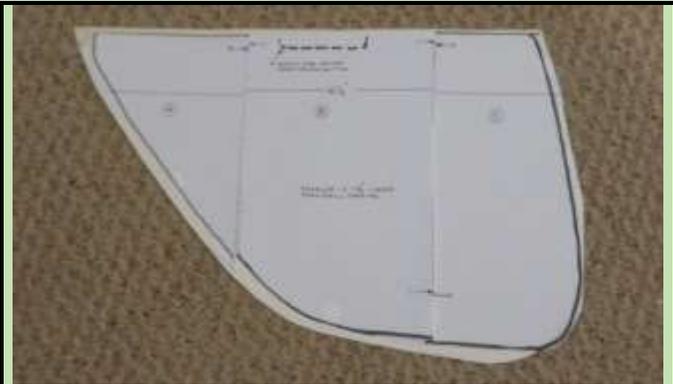
RocketDNA provided 3 PDF's (see Post #26 of below Thread Link) you can print, match up the arrows and make a template (left.) It worked. At least with my printer the 10 1/4 inch and 16 1/4 dimensions were very close. You can adjust if necessary.

I didn't bother with the cutout for the left side Frunk Button, preferring to mark the mesh when it was in position.

[DIY C8 radiator protection mesh installation - Page 2 - CorvetteForum - Chevrolet Corvette Forum Discussion](#)

I followed the advice of using Posterboard to make the Template as it is also used to protect the AC Condenser fins when you put the aluminum mesh in place.

Posterboard is NOT as thick as cardboard. Would say it's like the thickness of "shirt cardboard" BUT that's not used today!



Tape the template on the mesh and using metal snips cut close to the edge. I left about 1/4 inch extra and it fit fine!

For the Right Side, I left another ~3/4 inch near the outside top to use the OEM hole available to tie the mesh. Turned out more work than that was worth to get the wire tie installed so for the Right Side just drilled the same 1/8-inch hole in the edge of a cross bar to use to tie the mesh. That was used on the bottom Right side and on both Top and Bottom of the Left.



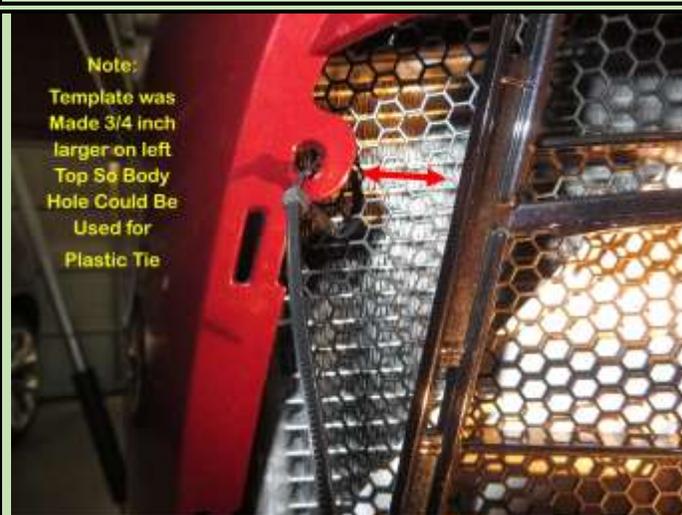
Slip the template in first so the AC Condenser fins are protected when you slip the aluminum mesh in next in front.

You can position the mesh with your hands from the access slot on the bottom. BUT you'll need both hands, and I used a small dental pick to help pull the black wire ties though the small 1/4 inch Hex openings.

Although you can move the mesh with your hands it slips. You also need both hands to attach wire ties. *Can't do both!*

A member posted this help to position the mesh where it fits flat with the back of the grill. Note it cannot go further to the car center as that part of the grill is in a different plan so a small amount of the Condenser in the center is not covered. Need another small screen to cover the exposed center area.

Putting this loosely tied wire tie will help hold it in position. When finished just cut it off and remove.



Note, saw a pic that showed the mesh tied using a hole in the body. Thought that was a good idea so made the mesh on the side longer than the Template. Although it worked it was difficult getting behind the mesh to thread the wire tie!

In fact, for the left (driver's) side side, decided to just do what was done on the bottom of the right side, drill a small hole in the end of a gill horizontal bar! That is shown in the next pic. Did NOT use this body hole on the left side.

To fasten the bottom on the right-hand mesh used what others have done, drilled an 1/8-inch hole at the end of a lower grill bar. The bar is plastic, so it drills readily. Take your time and be sure to not slip! Used a long thin wire tie that fit the small, drilled hole.

Again, if you are willing to have two small black wire ties visible this is not needed. We're drilling the holes, so the wire ties are under the Bezel and out of view.



For Lower Plastic Tie an 1/8 inch Hole was Drilled in End of Cross Grill Bar



Holds Mesh to Grill Bar

To Hold Mesh in Center, Two Large Plastic Ties Attach Mesh to Grill Bars That Are Not Visible So Ties Are Hidden

With the top and bottom of the right side held loosely with wire ties (*don't tighten at this point*) the center side of the mesh needs to be fastened. Note, for the two ties on the outside it's best to use long thin plastic ties so it's easier to thread through the mesh and particularly the bottom drilled hole in the grill bar.

There are grill bars in the center that can be used to tie the mesh, no drilling required. You have to reach in from the bottom and fasten the ties. I used larger ties that make it easier to install.

NOW TIGHTEN EACH WIRE TIE SO THE MESH SAYS IN PROPER POSITION.

Before reinstalling the Grill Bar, remove the threaded clips with pliers.

To reinstall the Grill Bar and Bezel just slip the Tabs back in the body Slots holding the bar at ~30-degree angle. Once the Tabs are in the Slots, tilt the bar back in place and insert the removed screws from the front. I held the removed clips as if they were nuts and screwed in by hand. To tighten there was no room for a 7 mm socket so used an open end 7 mm wrench. Held the threaded clip with pliers were needed.

Note, thought I might install the clips on the grill openings but would have required a lot of material removal so just used as if they were nuts, holding by hand and pliers.



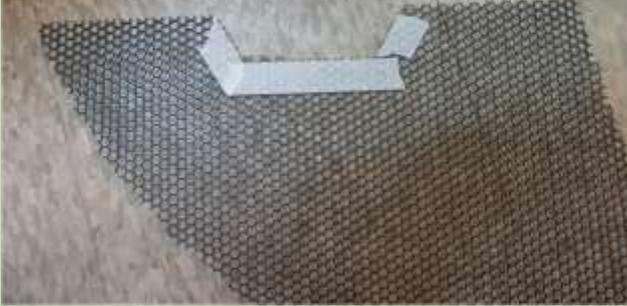
To Use Clips Would Require Removing A Lot of Material to Have Hole Centered

???

A Forum Member Broken Hole, Suggested A "Threadsert," etc, Could Be Used. Might Work

Member suggested using a "Threadsert," etc. It might work with small, short screw.

Same Template Used For Left Side, But No Extra Material Left For Use of OEM Hole (More Work Than Worth The End Result.) Drilled 1/8 inch Holes in Top and Bottom Grill Bars for Ties. Hole Cut So Frunk Opening Switch Is Not Blocked



The left side follows the right except as mentioned rather than use the OEM hole and making the mesh wider in the top area, decided it was better to just drill two grill bars at the end with an 1/8-inch bit and thread the wire ties through the mesh and drilled holes. Picked one near the top and another near the bottom.

The other difference is marking the mesh and cutting out an area for the Frunk opening switch (shown left.)

To cover the raw cut edge, used 1/4 inch ID plastic hose. Cut it lengthwise following the natural bend. Made it longer than needed and trimmed after inserting over the raw cut mesh edge. Same metal snips used to cut the mesh, worked find.

1/4 inch Black Plastic Hose Cut as Raw Edge Protector



To secure the hose raw edge cover I used a number of wide black wire ties like you would thread!

One other difference on the Left (driver's) side is because of the angles of material "covering" the Grill Bar Screws it was difficult to get a 7 mm wrench on the OEM Screw. Managed to get one to work but the others would not tighten properly.



OEM Screw Inserted from Front; Clip Held By Hand As a Nut Would Be Used

OEM Screws Where Used On Right Side But Because of Limited Space for a Wrench, They Where Harder to Use on Left. Had Some Wide Head Stainless Screws So Used a Lock Washer and Large Washer. Used a Screwdriver and Held OEM Metal Clip Where With Pliers.



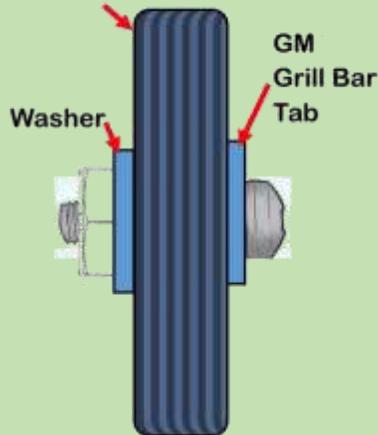
The solution was to use another type of screw. Had Stainless Steel screws with a broad head that used a Phillips screwdriver.

Used a large washer with a lock washer between it and the screw head. It was easy to get screwdriver access.

Just another thing that is no concern IF NOT REMOVING THE GRILL BAR!

Your Choice!

Custom Car Grill
1/4" Hex Power
Coated Aluminum.



IDEA:

Since some appear to like the use of fasteners versus wire ties and had this thought:

Could have used the OEM Grill Bar tabs to install the mesh! Use bolts from the front, as I did screws with clip behind, just use a longer bolt that goes through the Hex mesh. Then with a washer and nut, perhaps a lock washer, bolt the mesh to the OEM tabs.

If anyone tries, please send pics!



Finished Right and Left Sides!

MESH PROTECTION APPENDIX:

Forum Member '*blaun*' posted excellent full details of his install of Custom Car Grills using the 16" X 48" sheet. He also has details of the smaller inner front protectors as well as how he added mesh to his two rear fender scoops. Links Below.



blaun included these two links with a great deal of detail and pics. It also includes Links to patterns for 4 screens. Two for the small front Four (*use links page 5 for the two large front*) two for the fender scoops

[Install the front grills](#)

[Install the side scoop grills](#)

Note *blaun* covered the full exposed AC Condensers. Unlike the GM "approved" expensive mesh that only covers the outer area!



He made patterns and cut from the same ~\$60 mesh sheet! He provides Links to all 6 patterns. Like the one provided on page 5 above, put on poster board after printing and matching letters.

Note, poster board also protects rad fins.

These are the rear fender scoops installed.



Compare Custom Car Grill to Scrape Armor "GM Approved" Mesh

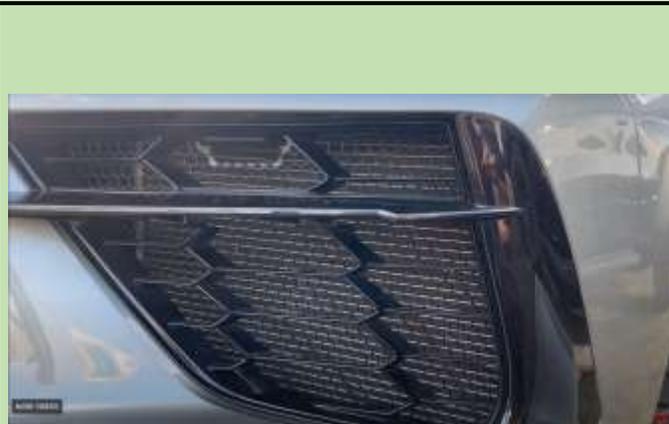
Having a Scrape Armor Splitter Protector for my 2017 Grand Sport it was 5-star packaging and product. So is the C8 AC Condenser Protective Mesh. Like the C8 mesh the splitter protector is also expensive, ~\$550 for the C8.



Scrape Armor does require removing the 3 bolts that hold the OEM Grill Guard. Don't have to remove the Grill Guard (*which is trivial once the bolts are removed as it just slips out of slots in the body*) they install a bracket (pic left) securing it with the removed bolts.

To secure the lower mesh they use 3M tape to secure brackets to the car. Then have tabs that insert into the provided mesh. *Of interest ties are suggested as a back-up!*

As noted in my CCG install, I hide the outside bottom tie under the vertical Grill Bar section and drilled a 1/8 hole in a low OEM grill bar and used a thin wire tie to secure it permanently and hidden. Pretty easy and no risk of tape coming loose.



The Scrape Armor mesh is held in place with push pins in the holes in the screen and bracket installed in the 3 OEM tabs.

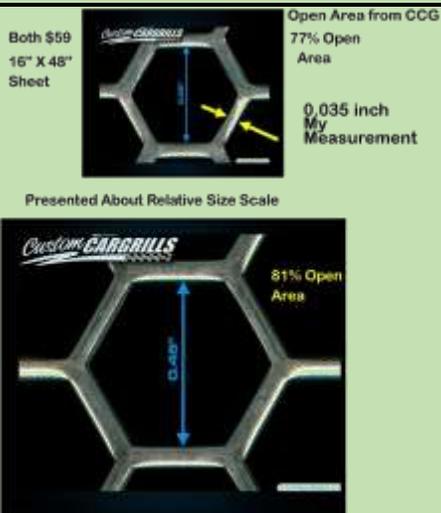
The bottom is held by clips attached to the plastic interior panel with 3M tape. Ties are suggested as back-up.

What I find somewhat humorous is some have commented that the Scrape Armor mesh is protected on all edges. BUT that protective edge (just like mine and many others with CCG mesh) is hidden behind the OEM grill bars. Finished look is very similar in both.

Some comment the fact that Scrape Armor only supplies the outer screens, that installing mesh to protect the small amount of AC Condenser screen exposed in the center grill is not needed.

But as I have said, it may not be a high percentage BUT it's not Zero. Jokingly have mentioned that Achilles was killed by an arrow striking is only unprotected area on his body- his heels. LOL And frankly bugs come in from angles not like stones!

Radiator Grill Store supplies all 4 screens. BUT they are made from plastic that cannot achieve the 77% open area as CCG shows their 1/4 inch mesh provides using only 0.035 width thickness aluminum for the hex.



Custom Car Grill Offers Two Sizes

They now offer two size hex mesh.

What most of us have installed, since 2020, 1/4" mesh. A 0.45" mesh is also available.

I have commented that the 0.45" mesh is similar to the Scrap Armor size. Foosh measured and said the SA was only 0.357 inch hex.

It will allow larger bugs to enter!

These are calculations of size and area difference. The SA 0.357" is closer in size to the 0.45" CCG mesh that the 1/4 inch mesh most of us have used.

In two NE SC summers with 100F days the coolant temps have not increased. Still just under 180F on average as they are in winter.

Custom Car Grill Versus Scrape Armor Mesh

CCG Hex = 0.25
 CCG Hex = 0.45
 Scrape Armor = 0.357 (Foosh measurement)
 Area 0.25 = 0.054
 Area 0.357 = 0.11
 Area 0.45 = 0.17

Size Difference: CCG 0.25 vs SA 0.357 = 0.107"
 Size Difference: CCG 0.45 vs SA 0.357 = 0.093"

Area Difference: CCG 0.25 vs SA 0.357 = 0.107"
 Area Difference : CCG 0.45 vs SA 0.357 = 0.060"

THAT ROCK IS TOO LARGE. I CAN LIFT A SMALLER (SPHERICAL) ONE.

Assume a circular opening and spherical rock.
 r_1 =radius of mesh opening
 r_2 =radius of spherical rock
 To pass through without hitting the edge, the center of the rock must be within the small dashed circle, radius r_1-r_2 .

Probability of passing through without hitting the edge is ratio of area of dashed circle to the area of the opening.

$$P = \frac{\pi(r_1-r_2)^2}{\pi r_1^2}$$

Let d_1 be diameter of the mesh opening, which will be 0.25 in or 0.357. And d_2 will be the diameter of the offending rock. So $r_1=d_1/2$ and $r_2=d_2/2$.

Substituting d_1, d_2 for r_1, r_2 , and simplifying gives $P = \frac{(d_1-d_2)^2}{d_1^2}$.

If we want to see what diameter rock will be passed with a probability of 5%, set $P=.05$ and solve for d_2 in terms of d_1 . This gives $d_2=d_1*(1-\sqrt{.05})$.

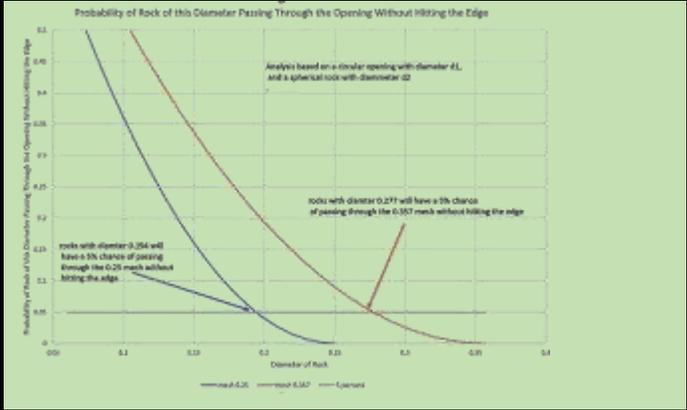
If the $d_1=0.25$, a rock of $d_2=0.194$ will slip through with a 5% probability.
 If the $d_1=0.357$, a rock with $d_2=.277$ will slip through with 5% probability.
 Note the surface area of the rock will go as the square of the diameter, and in this case the cross-section area of the larger rock is about twice that of the smaller rock, but dimension-wise the larger rock is $.277/.194=1.428$ or about 43% larger.

Andybump, Corvette forum member, made rigorous calculations to find the size of the rock that can get through a ¼ inch mesh versus 0.357!

As noted he shows 43% larger.

He made graphs of the probability of certain size rocks getting through. You can decide on what risk you want to take! His 5% chance of a rock passing without touching the mesh is A 0.194" inch rock with 0.25" mesh and 0.277" for the 0.357" mesh or $(.277-.194)/.194 = 42\%$ less!

And frankly the area difference (noted above) of ~double (0.11 vs 0.054) may be the issue re the number of bugs that will get through! They come in from all angles unlike a stone!



Whatever you buy, need something IMO. Probability of a rock causing a hole in the AC Condenser is not zero. This is what happened to my 6 month old C6. Was told GM won't cover, like a paint chip was probably caused by a rock. Did an analysis, showed it was a manufacturing defect and got my \$800 back in full!

GM Said, My 6 Month Old C6 Condenser Leak Was Probably Caused by a Rock and Just Like a Paint Chip—NOT Covered on warranty. Paid \$800 For New Condenser And Bought Aftermarket Protector For It!

Taking the old Condenser home to look at the hole discovered it was bent as if dropped on a shape object prior to being installed.

Have experience with interval pressure causing breaks, in gas pipe. Wrote report, \$800 refunded.

Condenser Was Bent

DON'T WANT TO CUT YOUR OWN MESH?
 CCG sells precut screens. Two Outer for \$69 and all 4 for \$99. Folks report having dealers install.

There are a number of options, *Your Car Your Choice*

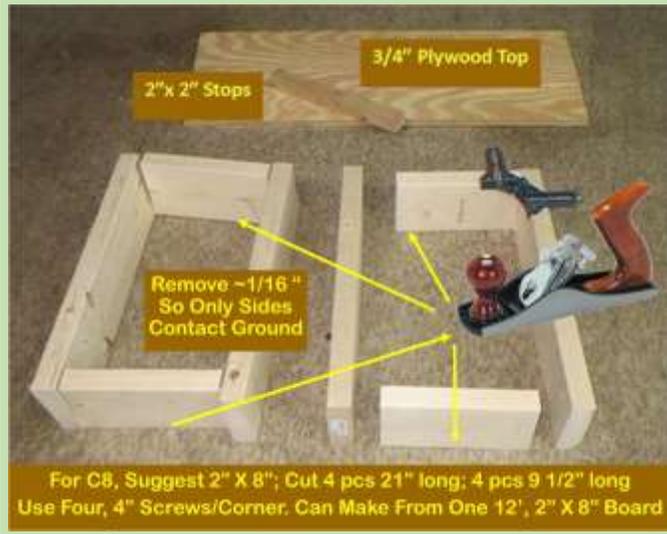


Member "Tadda" provided his pics of 4 front Custom Car Grill's precut screens proving 100% protection. Some argue the GM Approved Screens that ONLY cover the outer openings are sufficient. Perhaps, but bugs will easily get in.

Also Achilles Mom held him by his heels when he was a baby and dipped in a magic solution to protect him. Didn't that dam arrow find that uncoated spot where she was holding his feet and kill him! LOL

Some may be interested in his purchased wheel stanchions versus my home made wood ones seen on page 2.

These are the tops of the 2 part 12 inch high stanchions from Race Wraps. A pair is ~\$250. Here all that was needed is the top part to make install easier.



I made my wood stanchions in 2014 when I got my C7. They are simple construction and very sturdy. Have had questions about suitability and IF you can make square cuts, use the 4 inch screws I did and are careful during construction you should be fine. But only a suggestion, you're responsive for safety.

Remember Engineers said the Titanic could not sink!

I made mine from a 12 foot 2X6 (had Lowes cut in two to fit in our SU. But suggest a 2X8 would be better if you want to use for C8 oil changes etc.

The top plywood also provides structural support so used 2 inch long screws.

I added 2" X 2" wheel stops because I had the wood! Not really needed but can't hurt. Use 4 inch screws for those as well.

Why Splitters? - They Increase Downforce



At the speeds I mostly travel a Splitter is not doing much other than looking good! John Bednarchik, GM's top aerodynamicist was interviewed about the C7. He said, *"Shapes for improving fuel efficiency typically begin to have an effect at highway speed. However, lift and drag components become critical from 150 mph to maximum velocity."*

Aerodynamics is complex; NASCAR, F-1, manufacturers etc., spend thousands of hours and

millions of dollars in wind tunnels because it is not intuitive!

Added a larger splitter than the plastic small one that comes with my C8 Z51 as well as a carbon fiber "C7 Carbon" splitter on my C7 Z51 Both have what GM (and others) call "End Plates."

Splitter and Air Dam – What They Do

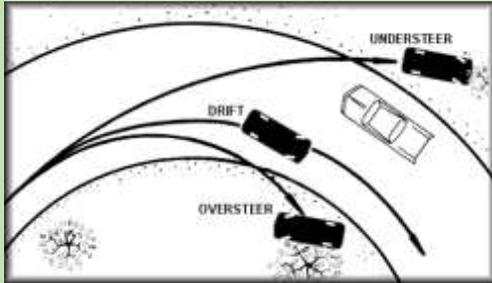
The main aim of a front Splitter and Air Dam is to optimize of the flow of air to the rest of the car, reduce drag, and create downforce. The desired balance is to achieve minimum drag and maximum downforce, aiding the front tires in achieving more grip.

SPLITTER: The front Splitter serves to increase the amount of downforce at the front of the car. Air flow is brought to stagnation above the Splitter causing an area of high pressure. Below, the front Splitter air is redirected away from this stagnation point and accelerates under the car, which in turn causes a low-pressure area (*google Bernoulli who outlined the principle in 1750 that defines how airplanes fly!*). High pressure over the Splitter and the low pressure caused by the airflow under the car creates downforce.

This helps minimize the effects of understeer and gives the front end more turn in response on entering corners at speed.

AIR DAM: An Air Dam's purpose is to reduce the amount of air flowing underneath the car, which has a number of benefits. Most cars do not have smooth underbodies--exhaust, drivetrain, and suspension hang down, creating considerable additional drag. In this situation, a front Air Dam reduces the air pressure underneath the car. Any air remaining under the car is turbulent, just like air behind the rear of a vehicle. (*The C8 is an exception as it has what GM calls Aero Panels that cover most area and make a smooth bottom.*)

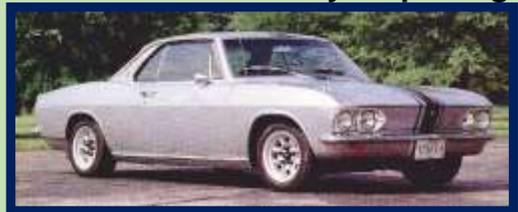
For the car to perform properly there must be a balance of forces at the front and back. If too much downforce is applied to the front, the rear might get light; conversely, too much rear downforce may result in the front having reduced downforce. Most front-engine, rear-wheel-drive cars with correctly balanced suspensions work best with slightly more downforce at the rear than at the front. This raises an interesting issue, why was the center section Air Dam removed from the C7 Z51? It had been planned but in final testing was eliminated. John Bednarchik was



quoted in 2014 interview indicating it was to improve handling, but no specifics were mentioned. A recent comment made by Tadge Juechter, Chief Corvette Engineer, may provide some insight. He was discussing the Z06. Paraphrasing his comments, he indicated that the front Air Dam was providing more than the desired front downforce at speeds around 150 mph promoting oversteer. He said, *“It is better to have slight understeer at high speeds.”*

Although he didn’t say “safer,” those of us with Corvairs or early Porsches understand cars with excess oversteer, for which both cars were criticized by the likes of Ralph Nader! As a modified Corvair owner, there was a saying often quoted, *“If you are traveling at excessive speed into a turn you’re going off the road. With oversteer, as when driving the rear heavy Corvair, it was better to hit a tree with the rear than plow into it with the front!”*

There is a natural tendency with an understeer car to turn the wheel more when it is sliding to the outside of the turn. If there is some traction left it may help bring the car back on the road. With a rear engine car when the rear “starts to come around” you must steer into the direction of the skid, not as intuitive of a reaction. To reduce the Corvair’s front end grip and therefore oversteer, GM specified inflating the front tires to a low 16 psi reducing front traction. Unfortunately, few followed their specified low pressure.



Note an Air Dam reduces drag even at highway speeds. It provides less drag by reducing the air that goes under the car. A good example is the Chevy Volt. Quoting GM, *“With the Air Dam the Chevy Volt has one of the lowest front-end ground clearances of any production automobile-as low as some Corvettes. The main purpose for the Air Dam in the Volt is to decrease drag at highway speeds, thus increasing the overall battery range.”*



My own experience with adding a large Air Dam was my 260Z. At speeds from 70 to 100 mph the car shape created significant lift. A number of automotive magazines discussed tests to increase downforce.

I added a rear spoiler and large from Air Dam, similar to that shown above on my 260Z. It was much more stable at speed. One day I bumped into a parking curb and shattered the Fiberglass Air Dam. I removed the broken Air Dam and ordered a new one. While I waited for the new part to be delivered, painted and I had time to install, the car was definitely less stable at highway speeds. The added rear spoiler probably made the lower front downforce even more an issue. At 100 mph it was concerning. Once the Air Dam was reinstalled it returned to being very stable even at 120 mph.

SPLITTER END PLATES: End Plates help trap more of the high-pressure air on top of the Splitter giving more downforce at the front of the car. The End Plates help stop the high-pressure air on the top of the wing from being encouraged to roll over the end of the wing to the low-pressure air beneath, causing induced drag. They also change the shape of the vortices that occur at the end of the Splitter and help reduce drag caused by the turbulences that are generated by the front wheels.



A Z07 has the option of using the supplied smaller or larger End Plates so they, along with the adjustable wicker bill on the rear spoiler can be used to adjust the cars downforce balance at various tracks.

Of interest, airplanes use wing End Plates and are seen, especially on many newer passenger jets. The initial concept dates back to 1897, when English engineer Frederick Lanchester patented wing endplates as a method for controlling wingtip vortices. In the United States, Scottish-born engineer William Somerville patented the first functional winglets in 1910. Somerville installed the devices on his early biplane and monoplane designs.

Controlling the size of wing tip vortices with the addition of winglets, as they are also called, increased the 747-400's range by 3.5 percent over the 747-300, which is otherwise aerodynamically identical but has no winglets.

THE FOLLOWING IS A PICTURE REVIEW OF THE INSTALLATION OF THE C8 SPLITTER FROM "C7 CARBON." It is a replica of what GM offered when the C8 was introduced as part number 5W8 for Side Skirts and Splitter. The GM product had a MSRP of \$3850 for the carbon flash painted parts. The "C7 Carbon" copy had a special price when I purchased of \$1148 shipped for the 3 pieces! Like the Splitter and Side Skirts I had on my 2017 Grand Sport that was carbon fiber, painted carbon flash. Part # 5W8 was constrained before the C8 pricing was finalized in favor of the \$1000 higher priced product, #5VM in visible carbon fiber.

Following the C8 Splitter Install is that of "C7 CARBON" GTX visible carbon fiber Splitter with end plates.

Photo Sequence

This is a pic of the C8 Z51 OEM plastic splitter sitting on top of the box holding the new Splitter. It's 3 pieces connected together. Although at the speeds I typically travel the larger "C7 Carbon" carbon flash painted splitter in the box is mostly cosmetic, it matches the side skirts also on order. They are needed to stop debris hitting the lower sides of the C8. Expect those to be shipped soon.



As with other products received from "C7 Carbon" the Splitter was carefully wrapped in thin foam padding and bubble wrap. Zero damage in shipping.

The Splitter unwrapped looks great, much better than the OEM Plastic! Note inset of "End Plate."

The OEM plastic Splitter is held by many screws on the outside perimeter. There are removed and the "C7 Carbon" larger Splitter is held with the same screws.





Install was straight forward. Since I had the car raised, I had to raise one end up while I installed the screws starting on the other.

“C7 Carbon” predrilled holes are smaller than those on the OEM plastic splitter. They fit very well BUT a few did not line-up perfectly. Loosely install the screws that lined up and skipped a few that did not. Went back, and using an awl lined up the hole and the threaded metal clip that is attached to the rubber like bottom panel. It aligned the threaded clip with the hole. Inserted the screw and tightened all. Hand ratchet was all that was used- don't overtighten.



C8 Equivalent to GM 5W8 Carbon Flash Splitter



Install of Visible Carbon Fiber Splitter on C7 Z51

The "GTX Splitter w/Side Splitters," (which GM calls "End Plates") was very well packaged and arrived in perfect condition. This is the large box delivered by FedEx.



On the inside was a very well wrapped Splitter. It had an outer layer of bubble wrap. The separate End Plates were carefully wrapped as well. They come with the hardware to install them.

Inside the bubble wrap was a double layer of packaging foam sheet material covering the CF Splitter.



This is a view of the Splitter unwrapped. The gloss finish matched our OEM CF roof, our added CF Side Shirts and added CF Hood Vent.

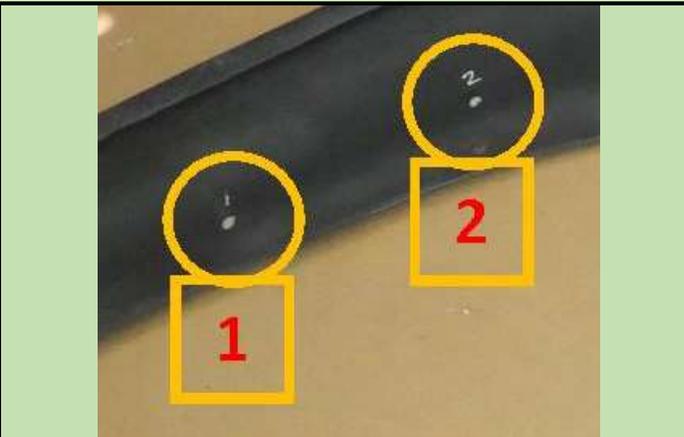
Hard to get a good color comparison because of the lighting but note the CF pattern is the same as the OEM roof. They are both identically black. This is one of the End Plates sitting on the OEM roof.





Similarly, the CF pattern on the Hood Vent matches the End Plate, which matches the Splitter exactly. Differences that appear in this pic are due to lighting and the different depth.

Decided to add some rivets between the OEM attachment bolts. Probably not needed but a number of Splitters use extra supports. Can't hurt! The locations where to be drilled and rivets inserted were marked on the back of the Splitter.

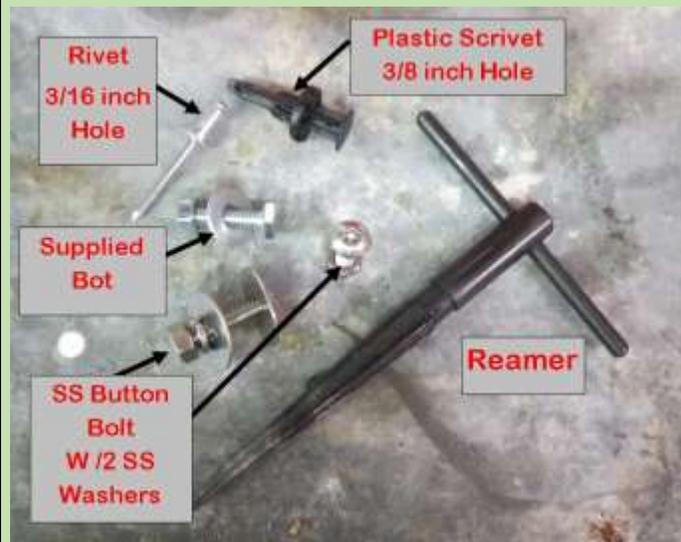


Of the 6 rivets that will be added, 2, 3, 4 and 5 are located 1 ½ inches toward the front of the spoiler, where there is the room for added support. They were marked with a silver ink Sharpie. Numbers 1 and 6 are placed in an area that has a wide space between the OEM screws.

The End Plates were attached to the inside of the Splitter with the stainless steel (SS) button bolts and SS fender washers we thought looked better and were a better choice than the 1/4 x 20 carbon steel hex head bolts supplied. We also used SS washers on the inside as well as SS lock washers.

This is a view from the understand, the washers are not visible from the top side





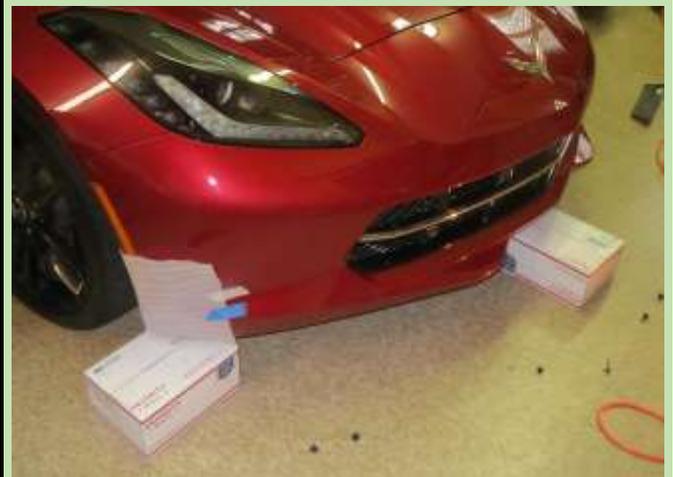
As noted above we used SS Button Head Bolts, SS Fender Washers, SS Lock Washers and SS Nuts instead of the supplied carbon steel hex head bolts washers and nuts. We also bought some black Plastic Scivets for use for the added fastener locations. However, the smallest we could get that would have the required support meant drilling a 3/8 hole. Using the same rivets employed when installing the side skirts only required a 3/16-inch drill. We decided as with the side skirts to use rivets with the addition of SS Fender Washers.

The Reamer was used to slightly enlarge the End Plate holes and matching holes in the Splitter to make room for the bolts.

INSTALLATION: First remove the existing screws holding the front bumper to the plastic flat panel with a 7 mm socket. They can be identified by the hole locations in the Splitter. Note only 1 screw holding the side air dam will be used to secure the splitter, the outer most; you'll need to remove all three to cut a slit it to clear the splitter edge.

Packing foam was taped to the bumper to avoid the End Plates scratching the car during the installation.

Empty boxes were placed as supports to position the splitter.



To clear the Splitter with End Plates and to provide more access room we found it was desirable to jack up the front slightly. To clear the side skirts used our 2-inch-high x 2 1/2 inch diameter jack pads and low-profile hydraulic jacks.

With the boxes in position, the Splitter was put in the final location. Several boards were placed under the center box to raise it to the desired height to install screws near the center. These first screws held the Splitter in position. We used stainless steel fender washers under the OEM screws to provide a larger surface area and reduce the local force on the splitter.



The OEM screws are easy to install as they are going thru holes in the Splitter into plastic so don't over torque. However, we found two that were not holding with enough force, so we used larger diameter sheet metal screws that held well. Like the OEM screws with use a stainless-steel fender washer to spread the load.

The side Air Dams hit the Splitter and must be slit to fit. The slit was marked where the clearance was needed. However, the bottom has no support, and it would probably be as good to remove the whole corner section. Can always to that while it is in position.

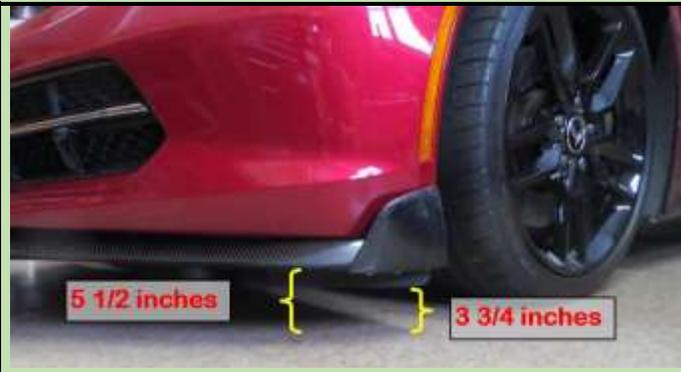


We found the alignment of the end hole was off perhaps $\frac{1}{4}$ inch. However rather than elongate the mounting hole we just angled the screw and used our ratchet to pull it in alignment. The Splitter is flexible and fit tightly as the screw was tightened.

Slit Air Dam to Clear Splitter and End Plate



Placed rivets in the 6 extra fastening locations mentioned above. #2 and #5 were moved toward the outside when it was determined there was not intimate contact between the Splitter and the bumper in the original location. As mentioned, we also found two areas where the OEM #8 screws were not tightening fully so they were replaced with #10 screws, one of which is visible in this view.



Was concerned about clearance issues when adding the Splitter. Was pleased to see it was 1 3/4 inches higher than the bottom of the Air Dam. Unlike the Air Dam in my Z51 C6 I seldom scrape the Air Dam in the C7. Didn't scrape on my driveway BUT did several times in the 3 years I had the car. Very glad I bought the Lift Option on My C8!



Checked the Splitter and OEM rubber Air Dam clearance at the end of our driveway. That is where we occasionally hear the Air Dam scrape if leaving fast. We moved forward in increments to locate the least amount of clearance. This pic shows the Air Dam would hit before the Splitter. It appeared the minimum extra clearance was about 2 inches,

Carbon Fiber Splitter w/End Plates, Carbon Fiber Hood Vent and Carbon Fiber Side Skirts match the OEM Carbon Fiber Roof.

Got "hooked" on Carbon Fiber! Ordered OEM Visible CF Roof. Then added CF Side Skirts, Splitter, Hood Vent and an expensive real CF cover for the Chrome Grill Bar!

Expensive! But once you start...!



Airplanes use wing End Plates and are seen on many newer planes. The initial concept dates back to 1897, when English engineer Frederick Lanchester patented wing endplates as a method for controlling wingtip vortices. Controlling the size of wing tip vortices with the addition of winglets, as they are also called, increased the 747-400's range by 3.5 percent over the 747-300, which is otherwise aerodynamically identical but has no winglets.



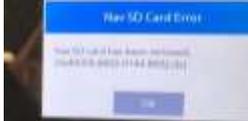
“60” C8, 2017 Grand Sport & 2014 Z51 Stingray Mods or Info Available As PDFs:



60 PDFs discuss improvements or info about a C8, 2017 Grand Sport, 2014 Z51 Stingray function and/or esthetics. Some are minor and others, like the installing “Low Dust Brake Pads” on C8 & C7s, have detailed information.

Below are the PDF's available. Click on picture or Blue PDF link or copy and paste the PDF link (Blue type) into your browser. Or email me at GUtrachi@aol.com and state the title desired, shown in Yellow:

C8 Install High Wing <i>How To Remove Rear Bumper- Install Wing</i> http://netwelding.com/C8_High_Wing.pdf	
C8 Bigger Brakes <i>C8 Brakes Are Anemic Compared to Other MEs</i> http://netwelding.com/C8_Big_Brakes.pdf	
C8 PDR SD Card Selection <i>Things to Consider When Buying SD Card</i> http://netwelding.com/PDR_SD_Card.pdf	
C8, C7 eLSD vs Positraction <i>eLSD is a Modern Dif; Positraction is from 1960s</i> http://netwelding.com/eLSD_VS_Pos.pdf	
C8 FWD Hybrid <i>WFWD Hybrid Provides More Power & MPG</i> http://netwelding.com/C8_FWD_Hybrid.pdf	
C8 Edge Red Engine Cover <i>Engine Cover Matches Valve Covers</i> http://netwelding.com/Engine_Cover.pdf	
C8 Engine Compartment Lights <i>Multicolor Lights Remote operated</i> http://netwelding.com/Engine_Lights.pdf	

<p>C8 Side Skirts & Splitter <i>Install C7 Carbon side skirts & splitter on C8</i> http://netwelding.com/Side_Skirts.pdf</p>	
<p>C8 Z51, GS/C7 Z51 Ceramic Brake Pads <i>Performance Vettes have dusty brakes. These help!</i> http://netwelding.com/Ceramic_Pads.pdf</p>	
<p>C8 Low Restriction Air Intake <i>Low Restriction Air Filter Why & How To</i> http://netwelding.com/C8_Air_Intake.pdf</p>	
<p>C8 & C7 Splitter & C8 Condenser Mesh <i>Mesh Protects AC Condenser & Splitter Install</i> http://netwelding.com/CF_Splitter.pdf</p>	
<p>C8 NAV SD Card Removed Error <i>Error When SD Card and Reader Are Fine</i> http://netwelding.com/NAV_SD_Card.pdf</p>	
<p>C8/GS/C7 Splash Guards <i>GM splash guards. ACS Best Front Guards for GS.</i> http://netwelding.com/Splash_Guard.pdf</p>	
<p>Jacking a C8/GS/C7 Vette <i>Safely jacking either front only or back & front</i> http://netwelding.com/Jacking_A_C7.pdf</p>	
<p>C8 & C7 Plates & Frame; <i>Must Meet South Carolina Law</i> http://netwelding.com/License_Plate_Frame.pdf</p>	
<p>Change GS/C7 Oil <i>WHY change your own oil and C7 Lifting Methods</i> http://netwelding.com/Changing_Oil.pdf</p>	
<p>C8/GS/C7 Mirror Proximity Alarm <i>Limit switch alarm warns when close to door frame</i> http://netwelding.com/Mirror_Proximity_Alarm.pdf</p>	
<p>Jacking Pads for C8/GS/C7 <i>Manual says Jacking Pads 2 1/2-inch max OD..</i> http://netwelding.com/Jacking_pads.pdf</p>	
<p>C8/GS/C7 Radar Power <i>For C7 tapped rear fuse panel. For GS tapped mirror</i> http://netwelding.com/Radar_Detector_Power.pdf</p>	
<p>C8 & C7 Wheel Chatter/Hop <i>Why sharp, low speed turns with cold tires causes the front tires to chatter/hop.</i> http://netwelding.com/Wheel_Chatter.pdf</p>	
<p>C8/GS/C7 Wheel Locks <i>Wheel locks, help protect your expensive wheels.</i> http://netwelding.com/Wheel_Locks.pdf</p>	

<p>Deer Whistle Installed on C8/GS/C7 <i>Do they work? Plus Install Info</i> http://netwelding.com/Deer_Whistle.pdf</p>	
<p>C8 & C7 Splitter Protector <i>Scrape Armor Protection for Splitter</i> http://netwelding.com/Splitter_Protectors.pdf</p>	
<p>C8 & C7 Cargo Area <i>Rear cargo area storage device and rear protector</i> http://netwelding.com/Rear_Cargo_Area.pdf</p>	
<p>C8 Coilover Tower Covers <i>Prevent water from filling Cast aluminum cavities</i> http://netwelding.com/Tower_Covers.pdf</p>	
<p>C8.R Info & GS Rear Diffuser (Fits Any C7) <i>Rear Carbon Flash Composite Diffuser</i> http://netwelding.com/Rear_Diffuser.pdf</p>	
<p>GS/C7 Belt Rattle <i>Passenger seat belt rattles against the seat back.</i> http://netwelding.com/Eliminate_Rattle.pdf</p>	
<p>Aluminum C7 Chassis and Weld Repair <i>The C7 aluminum chassis. Includes weld repair info.</i> http://netwelding.com/Aluminum_Chassis.pdf</p>	
<p>Manage GS/C7 Spilled Gas & Door Lock <i>Protect when filling gas. Preventing door lock failure.</i> http://netwelding.com/Manage_Spilled_Gas.pdf</p>	
<p>GS/C7 License Plate & Cargo Lights <i>LED license plate light & cargo area bulbs</i> http://netwelding.com/License_Plate_Light.pdf</p>	
<p>GS/C7 Door Panel Protector <i>Black plastic protector prevents scuffing of door</i> http://netwelding.com/Door_Panel_Protector.pdf</p>	
<p>GS/C7 Improved Cup Holder <i>A solution to the cup holder spilling</i> http://netwelding.com/Improved_cup_Holder.pdf</p>	
<p>C7 Carbon Fiber Grille Bar <i>Install genuine carbon fiber grille bar overlay</i> http://netwelding.com/CF_Grille_Bar.pdf</p>	
<p>Replacing C7 Battery <i>Tricks for installing battery!</i> http://netwelding.com/Battery_Issues.pdf</p>	

GS/C7 Window Valet

Lower Windows With FOB Helps Latch Hatch

http://netwelding.com/Hatch_Latch.pdf



GS/C7 Blind Spot Mirror

Smaller rear and side windows cause C7 blind spots. Small "blind spot mirrors" help

http://netwelding.com/Blind_Spot.pdf



GS/C7 Skid Pad Protector

After the air dam, the aluminum "skid pad" hits

http://netwelding.com/Skid_Pad_Protector.pdf



GS/C7 OnStar Lights

Rear view mirror OnStar LED's, at a quick glance, look like a police car flashing light! This is a fix.

http://netwelding.com/OnStar_Lights.pdf



GS/C7 Skip Shift Eliminator

Skip Shift Eliminator install

http://netwelding.com/Skip_shift_Eliminator.pdf



GS/C7 Catch Can & Clean Oil Separator

What is Coking and how to reduce the potential

http://netwelding.com/Catch_Can.pdf



GS MGW Flat Stick Shifter

The MGW shifter shortens throw and is more precise

http://netwelding.com/MGW_Shifter.pdf



GS/C7 Round Shift Knob

A round shift knob shortens throw on OEM shifter

http://netwelding.com/Shift_Knob.pdf



GS/C7 Stingray Sill Plate

Stingray sill plate replaces original.

http://netwelding.com/Sill_Plate.pdf



GS/C7 Nylon Bra

Nylon Bra Stops Bugs. Fits with Stage 3 Winglets

http://netwelding.com/Nylon_Bra.pdf



GS/C7 Clutch Fluid Change

Clutch fluid after 3000 miles gets dirty

http://netwelding.com/Clutch_Fluid.pdf



C7 Carbon Fiber Hood Vent

Replaces Plastic Hood Vent

http://netwelding.com/Hood_Vent.pdf



GS/C7 Cold Air Intake

Low Restriction Air Filter & Duct

http://netwelding.com/Cold_Air_Intake.pdf

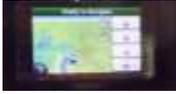
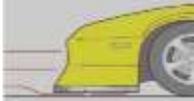


GS/C7 Soler Modified Throttle Body

For Improved Throttle Response

http://netwelding.com/Soler_Mod_TB.pdf



<p>Garmin GPS for GS Cubby <i>Garmin Mounts in GS Cubby & Apple CARPLAY</i> http://netwelding.com/GPS_In_Cubby.pdf</p>	
<p>GS Splitter Stage 3 Winglet <i>Stage 3 Winglets Integrate with Spats</i> http://netwelding.com/Stage_3_Winglets.pdf</p>	
<p>C7 Removing GM Plastic Film <i>How To Remove The Rocker Panel Film</i> http://netwelding.com/Rocker_Panel_Film.pdf</p>	
<p>GS 2LT to 2.5 LT <i>Red Upper Dash Pad Like 3LT</i> http://netwelding.com/Red_Dash_Pad.pdf</p>	
<p>Jake Emblem/Decals for GS <i>Jake Symbols Support GS Racing Image</i> http://netwelding.com/Jake_Embles.pdf</p>	
<p>Rusty GS/C7 Muffler <i>Why the C7 muffler rusts way to turn matte black.</i> http://netwelding.com/Muffler_Rust.pdf</p>	
<p>GS Engine Compartment Mods <i>Cosmetic Additions in Engine Compartment</i> http://netwelding.com/Engine_Compartment.pdf</p>	
<p>GS Vitesse Throttle Controller: Fits All C7s <i>Adjustable Throttle-by-Wire Control</i> http://netwelding.com/Throttle_Control.pdf</p>	
<p>Boomy Bass Solution <i>Use Presets to Adjust Bass etc. Tone/Balance</i> http://netwelding.com/Boomy_Bass</p>	
<p>GS/C7 Air Dam, Functions <i>Why Missing from Z51, Some GS & Z06</i> http://netwelding.com/Air_Dam.pdf</p>	
<p>Rusty GS/C7 Muffler <i>Why the C7 muffler rusts way to turn matte black.</i> http://netwelding.com/Muffler_Rust.pdf</p>	
<p>Engineering a ProStreet Rod <i>How Our '34 ProStreet Rod Was Designed and Built</i> http://netwelding.com/Engineering%20Street%20Rod%203-08.pdf</p>	
<p>Motorsports Welding Article <i>Wrote Article on NHRA and NASCAR Chassis Design</i> http://netwelding.com/Motorsports_Welding_2018.pdf</p>	