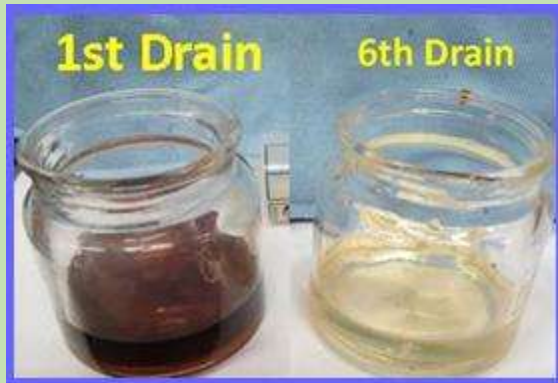


## Changing Clutch Fluid of C7 and Grand Sport



A forum Post reminded that the C7 is similar to the C6 and some prior Vettes. The clutch fluid gets dirty with use! The dirty fluid has been reported to cause the clutch pedal to be:

- Hard,
- Soft,
- Slow to return or lazy,
- Hung mid-way up, or
- Stuck to the floor

### What Causes Dirty Fluid?

It appears the clutch wear dust attaches itself to the part of the shaft that goes into slave cylinder, located in the bell housing. There are seals, but with heavy use clutch particles are found in the fluid. The other contaminate, as with all hydraulic fluids, is water. The 2014 Owner's Manual recommends changing every 30,000 miles or two years whichever occurs first. However the 2016 and the 2017 Owner's Manual that came with the Grand Sport states 45,000 miles or 3 years.

### Cleaning the Fluid:

A simply procedure, called the "Ranger Clutch Cleaning Procedure" by the poster, and referring to links that describe it, discuss what needs to be done and the tools needed. Bought both the DOT4 fluid and syringe for under \$8. It took about 1/2 hour and had clean fluid.

### Was It Needed?

Can't be sure! But looking at the color in the above picture after the 1<sup>st</sup> drain and with such a low cost and little time, why not! C7 had only ~3000 miles and although there were no maximum speed launches, it does get periodic max rev 1<sup>st</sup> to 2<sup>nd</sup> and 2<sup>nd</sup> to 3<sup>rd</sup> shifts.

NOTE, the 2014 and 2017 Owner's Manual it states:

***"The fluid will darken over time. See Maintenance Schedule on page 11-3 for when to replace the fluid."*** There are reports that some of the clutch parts, seals and tubing tend to discolor the fluid. It could be more discolored than dirty! Brake fluid will eat paint! No doubt it can pull some of the additives from seals and tubing! BE CAREFUL DON'T ALLOW ANY TO HIT A PAINTED SURFACE.

The following is a picture review of how I changed fluid in my C7:

## Photo Sequence

This info was posted on a forum: *“The C7 has the same issues as the C5 and C6 when it comes to clutch fluid. This is how bad mine looked (right) and this is with no track time and not a lot of aggressive driving...”*

However another forum member noted that the fluid darkens soon after it’s changed. Another performs the Ranger Method (detailed below) monthly to keep the fluid “looking cleaner.”

As mentioned GM states dark fluid may not indicate any problem! IMO performing every oil change is every oil change is sufficient, has worked with my C6 for over 6 years.

To follow the GM recommendation of changing fluid every 2 or 3 years requires bleeding from the slave cylinder. That requires removing a driver’s side exhaust pipe and CAT. Then removing some sheet metal to access. Then bleeding like brakes. NOT easy or cheap!



Many posters recommended and use a procedure called Ranger Clutch Care. You can search for the term. I found this link:

[http://www.rangeracceleration.com/Clutch\\_Care.html](http://www.rangeracceleration.com/Clutch_Care.html)

I highly recommend viewing as it also has a good video showing not only the cause but the simple procedure to clean the fluid.

The picture right is from the video which was taken after 6 hard launches and 18 shifts! The particles are clutch dust!



The solution is simple:

All that is needed is to drain the clutch fluid reservoir periodically. It describes a very simple procedure. The following covers what I did on my Z51 C7 and will perform on my Grand Sport at the OLM required oil change.

Bought these as recommend from Walmart, The DOT 4 Synthetic ~\$4 and the syringe (found as the video said near the gas cans) is for mixing oil for two cycle engines.



The small clutch fluid reservoir cap is labeled DOT 4, which is the fluid recommended. Be careful when you remove the cap, brake fluid will eat your paint! I put a towel around the reservoir and another from that towel draped over the fender so any drops would not touch the car!

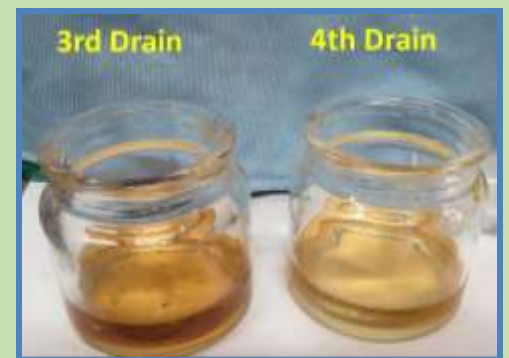
When I removed the cap, saw no visible level marks so I measured the current level from the rim, 1 inch. As the Owner's Manual states there should be no losses.



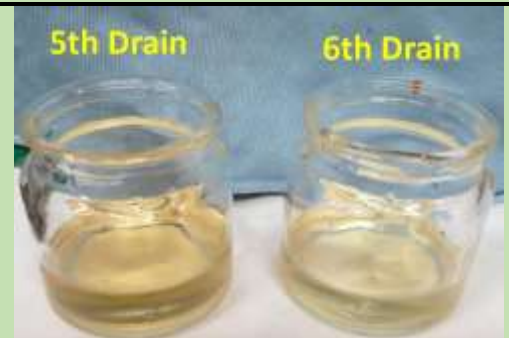
Procedure: 1) drained the reservoir with the syringe; 2) filled with new DOT 4; 3) depressed the clutch 30 times; 4) repeat as needed. That mixes the new fluid to some degree with the fluid in the line and slave cylinder. New clean fluid is mixed with old dirty fluid.

Pic on right was after the 2<sup>nd</sup> flush and clutch activation.

After the 3<sup>rd</sup> and 4<sup>th</sup> cycle the fluid is getting clean, not as clear as the new DOT 4 fluid, but close.



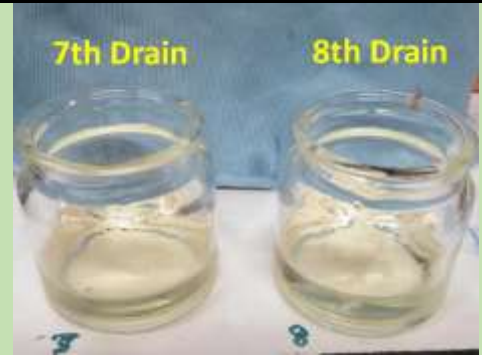
Even the 5<sup>th</sup> time still showed some discoloration compared to the 6th





Decided since reusing the fluid from an opened can is not recommended after a few weeks continued to a 7<sup>th</sup> and 8<sup>th</sup> change. They both look the same and close to new fluid.

**NOTE: Brake fluid is hygroscopic; it picks up water and water vapor from the air like a sponge! Water causes brake fluid to boil at a lower temperature and reduces its performance.**



The picture on the right is fluid directly from the DOT 4 can. This synthetic DOT 4 is what is recommended and in the Rodger procedure Prestone is what he used.

Be sure to extend and clean the inside of the cap, which takes up space to reduce the amount of humid air that will be in the reservoir. Brake fluid is hygroscopic (it picks up water) and its performance deteriorates.

As recommended do not use brake fluid from an open container and minimize the times you remove the reservoir cap to look at fluid levels.

For track and drag racing where more clutch dust is present, it is more prudent to use the Rodger procedure after every race!



This is the cap with the extender pushed back the way it was found. The fluid level was filled to where it was found, ~ 1 inch from the rim.

Note the 30,000 mile or two years max recommendation in the Owner's Manual may refer to bleeding the system. That appears to be a difficult procedure. Using this partial procedure, which appears to get essentially new fluid in ~6 drain cycles, it is simple and if done once per year should be satisfactory for "normal" driving-whatever that means with a Vette!

## Second Change After 2 Years

Thought perhaps if, as GM statement about darkening over time, if due to staining from the seals as some reports indicate, it would be better for this 2nd year change. As seen from the pic right, it's just as dark!

However I have never found particles in the removed fluid. I'm not concerned about the color, as GM states it will darken with time.

## 1st Removed



As a reminder, Brake fluid will remove paint! Note a towel was wrapped around the filler neck and another was placed on the fender.

This pic also shows the syringe we purchased for this task. As was done for the first change the cap rubber was extended and cleaned.

The 6<sup>th</sup> change looks identical to the 6<sup>th</sup> change in the one done after 1 year! The fact that it progressively gets lighter with each 30 clutch pumps shows that the fluid does circulate as the clutch is depressed.

## 5th Change



## 6th Change



The Owner's Manual and the label on the clutch fluid reservoir state DOT 4 is to be used. This Prestone 12 ounce bottle was ~\$4 at Walmart! We used  $\frac{3}{4}$  of the bottle and discarded the remainder. Don't use fluid from an opened container. It picks up water like a sponge!

## ***The Ranger Procedure is Not the Same as Bleeding the Clutch***

Some have pointed out that the “Ranger Procedure” is not as good a bleeding the system since it will not get particles that settle in the slave cylinder. However as shown in the video on page 2 of this report it will eliminate some particles that occur with aggressive use such as drag racing or tracking. I’ve used the procedure successfully for 6 years in my C6 with no clutch issues. I also have not seen any particles in fluid changes made with my ”normal,” occasionally aggressive driving.

If tracking or drag racing perhaps you’ll want to consider bleeding the system. However as one drag racer finds, using the Ranger Procedure after each race may be better than letting the excess clutch dust etc. accumulate. Your choice.

Some who have had the dealer perform the bleeding service say it cost ~\$200 plus. If you want to bleed the system or have a dealer perform the service, this is the procedure:

### ***Bleeding Procedure:***

Page 17-334 of the 2014 Service Manual, outlines the bleeding process that starts with ***Remove the left Catalytic Converter then get an assistant, etc.***

Those steps refer to page 9-890 that outlines a 5 step procedure to remove the left Catalytic Converter starting with, ***1) Remove the floor panel tunnel...2 & 3) Disconnect the heated Oxygen sensors,... 4) Place jack to support exhaust ... 5) Disconnect intermediate pipe from the exhaust....***

Step 5 is outlined on page 9-888, these are the key points: ***1) Remove fasteners and discard seals (note will need new ones. 2) Remove intermediate pipe, 3) Separate intermediate pipe from muffles.***

***At that point you can access the slave cylinder bleed valve and using an assistant with fresh fluid in the clutch reservoir press the clutch and have an assistant open the valve. Tighten the valve and per the Service Manual repeat 5 to 8 times keeping the reservoir full of new fluid.***

***Reinstall the exhaust pipes catalytic converter and floor tunnel panel.***

***If you have the dealer perform the service you can understand the cost.***

Other 2017 Grand Sport & 2014 Stingray PDF's Available:



*Some 40 items discuss improvements or information about a 2017 Grand Sport and 2014 Stingray function and/or esthetics. Some are minor and others, like the installing ceramic brake pads, include detailed install information.*

*Below are the PDF's available. Click on picture (may need Ctrl pressed.) Or just copy and paste the PDF info (Blue type) into your browser. Or email me at [GUtrachi@aol.com](mailto:GUtrachi@aol.com) and state the title desired, shown in Yellow:*

**Note:** GS indicates the info was updated from that available for the C7 Z51 PDFs.

### **Rusty GS/C7 Muffler**

*Why the C7 muffler is rusted and a simply way to make rust turn matte black.  
Bottom pic rusted, top pic treated*

[http://netwelding.com/Muffler\\_Rust.pdf](http://netwelding.com/Muffler_Rust.pdf)



### **Change GS/C7 Oil**

*WHY change your own oil and HOW to do it  
Revised, includes C7 Lifting Methods*

[http://netwelding.com/Changing\\_Oil.pdf](http://netwelding.com/Changing_Oil.pdf)



### **C7 Carbon Fiber Side Skirts**

*How to install side skirts with jacking information for  
DIY's without lifts*

[http://netwelding.com/Side\\_Skirts.pdf](http://netwelding.com/Side_Skirts.pdf)



### **C7 Carbon Fiber Splitter w/End Plates**

*How to install Splitter & Nylon bra fit*

[http://netwelding.com/CF\\_Splitter.pdf](http://netwelding.com/CF_Splitter.pdf)



### **C7 Removing GM Plastic Film**

*How To Remove The Rocker Panel Film*

[http://netwelding.com/Rocker\\_Panel\\_Film.pdf](http://netwelding.com/Rocker_Panel_Film.pdf)





### **GS/C7 Mirror Proximity Alarm**

*Limit switch alarm warns when passenger mirror is too close to door frame*

[http://netwelding.com/Mirror\\_Proximity\\_Alarm.pdf](http://netwelding.com/Mirror_Proximity_Alarm.pdf)



### **Jacking Pads for GS/C7**

*Jacking Pads must 2 1/2 inch max OD. Made four. Bought 2 1/2 inch OD x 2 inch high pads after installing side skirts; Bought pads right for the GS.*

[http://netwelding.com/Jacking\\_pads.pdf](http://netwelding.com/Jacking_pads.pdf)



### **GS/C7 Radar Power**

*For C7 tapped rear fuse panel. For GS tapped mirror*

[http://netwelding.com/Radar\\_Detector\\_Power.pdf](http://netwelding.com/Radar_Detector_Power.pdf)



### **GS/C7 Belt Rattle**

*Passenger seat belt rattles against the seat back. The solution, add a shoulder belt pad.*

[http://netwelding.com/Eliminate\\_Rattle.pdf](http://netwelding.com/Eliminate_Rattle.pdf)



### **Aluminum C7 Chassis and Weld Repair**

*The C7 has an all aluminum chassis, made from 117 welded pieces*

[http://netwelding.com/Aluminum\\_Chassis.pdf](http://netwelding.com/Aluminum_Chassis.pdf)



### **GS/C7 Ceramic Brake Pads**

*The Z51 has very dusty brakes. These pads help!*

[http://netwelding.com/Ceramic\\_Pads.pdf](http://netwelding.com/Ceramic_Pads.pdf)



### **GS/C7 License Plate Frame;**

*Must Meet South Carolina Law*

[http://netwelding.com/License\\_Plate\\_Frame.pdf](http://netwelding.com/License_Plate_Frame.pdf)



### **Manage GS/C7 Spilled Gas**

*Protect the side of the Vette when filling up with gas*

[http://netwelding.com/Manage\\_Spilled\\_Gas.pdf](http://netwelding.com/Manage_Spilled_Gas.pdf)



### **GS/C7 License Plate & Cargo Lights**

*LED license plate light & cargo area bulbs are brighter and whiter*

[http://netwelding.com/License\\_Plate\\_Light.pdf](http://netwelding.com/License_Plate_Light.pdf)



### **GS/C7 Rear Cargo Area**

*Rear cargo area needs storage device and rear protector*

[http://netwelding.com/Rear\\_Cargo\\_Area.pdf](http://netwelding.com/Rear_Cargo_Area.pdf)





### **GS/C7 Door Panel Protector**

*Black plastic protector added to prevent scuffing of door when exiting*

[http://netwelding.com/Door\\_Panel\\_Protector.pdf](http://netwelding.com/Door_Panel_Protector.pdf)



### **GS/C7 Improved Cup Holder**

*A solution to the cup holder spilling under hard braking or sharp turns.*

[http://netwelding.com/Improved\\_cup\\_Holder.pdf](http://netwelding.com/Improved_cup_Holder.pdf)



### **GS/C7 Wheel Chatter/Hop**

*Why sharp, low speed turns with cold tires causes the front tires to chatter/hop.*

[http://netwelding.com/Wheel\\_Chatter.pdf](http://netwelding.com/Wheel_Chatter.pdf)



### **C7 Carbon Fiber Grille Bar**

*Install genuine carbon fiber grille bar overlay*

[http://netwelding.com/CF\\_Grille\\_Bar.pdf](http://netwelding.com/CF_Grille_Bar.pdf)



### **Jacking a GS/C7 Vette**

*Safely jacking either front only or back & front*

[http://netwelding.com/Jacking\\_A\\_C7.pdf](http://netwelding.com/Jacking_A_C7.pdf)



### **Deer Whistle Installed on GS/C7**

*Do they work? Plus Install Info*

[http://netwelding.com/Deer\\_Whistle.pdf](http://netwelding.com/Deer_Whistle.pdf)



### **Replacing C7 Battery**

*After using a GM type charger and showing fully charged a voltage low, replaced battery with AGM!*

[http://netwelding.com/Battery\\_Issues.pdf](http://netwelding.com/Battery_Issues.pdf)



### **GS/C7 Window Valet**

*Lower Windows with FOB*

*Window Valet Helps 2014/2015 Latch Hatch*

[http://netwelding.com/Hatch\\_Latch.pdf](http://netwelding.com/Hatch_Latch.pdf)



### **GS/C7 Splash Guards**

*GM offers splash guards for the C7 Corvette. An easy DIY installation. ACS Best Front Guards for GS.*

[http://netwelding.com/Splash\\_Guard.pdf](http://netwelding.com/Splash_Guard.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](http://netwelding.com/Blind_Spot.pdf)



### **GS/C7 Skid Pad Protector**

*After the air dam, the aluminum "skid pad" hits driveway ramps etc. Plastic protector helps.*

[http://netwelding.com/Skid\\_Pad\\_Protector.pdf](http://netwelding.com/Skid_Pad_Protector.pdf)



### **GS/C7 Wheel Locks**

*Wheel locks, torqued to required 100 ft-lbs, help protect your expensive wheels from theft.*

[http://netwelding.com/Wheel\\_Locks.pdf](http://netwelding.com/Wheel_Locks.pdf)



### **GS/C7 OnStar Lights**

*The OnStar LED's in the rear view mirror, at a quick glance, look like a police car flashing light! This is a fix.*

[http://netwelding.com/OnStar\\_Lights.pdf](http://netwelding.com/OnStar_Lights.pdf)



### **GS/C7 Skip Shift Eliminator**

*Skip Shift Eliminator install with suggestions on jacking a C7.*

[http://netwelding.com/Skip\\_shift\\_Eliminator.pdf](http://netwelding.com/Skip_shift_Eliminator.pdf)



### **C7 Catch Can & Clean Oil Separator**

*Direct inject engines like the LT1, are particularly subject to "coking." What is Coking and how to reduce the potential?*

[http://netwelding.com/Catch\\_Can.pdf](http://netwelding.com/Catch_Can.pdf)



### **GS/C7 Round Shift Knob**

*A round shift knob shortens throw.*

[http://netwelding.com/Shift\\_Knob.pdf](http://netwelding.com/Shift_Knob.pdf)



### **GS/C7 Stingray Sill Plate**

*Stingray sill plate replaces original.*

[http://netwelding.com/Sill\\_Plate.pdf](http://netwelding.com/Sill_Plate.pdf)



### **GS/C7 Nylon Bra**

*Nylon Bra Stops Bugs on Front and Grill. Fits with Stage 3 Winglets*

[http://netwelding.com/Nylon\\_Bra.pdf](http://netwelding.com/Nylon_Bra.pdf)



### **GS/C7 Clutch Fluid Change**

*Clutch fluid after 3000 miles gets dirty*  
[http://netwelding.com/Clutch\\_Fluid.pdf](http://netwelding.com/Clutch_Fluid.pdf)



### **C7 Carbon Fiber Hood Vent**

*Replaces Plastic Hood Vent*  
[http://netwelding.com/Hood\\_Vent.pdf](http://netwelding.com/Hood_Vent.pdf)



### **GS/C7 Cold Air Intake**

*Low Restriction Air Filter & Duct*  
[http://netwelding.com/Cold\\_Air\\_Intake.pdf](http://netwelding.com/Cold_Air_Intake.pdf)



### **Garmin GPS for GS Cubby**

*Garmin Mounts in GS Cubby*  
[http://netwelding.com/GPS\\_In\\_Cubby.pdf](http://netwelding.com/GPS_In_Cubby.pdf)



### **GS Splitter Stage 3 Winglet**

*Stage 3 Winglets Integrate with Spats*  
[http://netwelding.com/Stage\\_3\\_Winglets.pdf](http://netwelding.com/Stage_3_Winglets.pdf)



### **GS 2LT to 2.5 LT**

*Red Upper Dash Pad Like 3LT*  
[http://netwelding.com/Red\\_Dash\\_Pad.pdf](http://netwelding.com/Red_Dash_Pad.pdf)



### **Jake Emblem/Decals for GS**

*Jake Symbols Support GS Racing Image*  
[http://netwelding.com/Jake\\_Emblems.pdf](http://netwelding.com/Jake_Emblems.pdf)



### **GS Splitter Protector**

*Rugged Plastic Protection for Splitter*  
[http://netwelding.com/Splitter\\_Protectors.pdf](http://netwelding.com/Splitter_Protectors.pdf)



### **GS: Vitesse Throttle Controller**

*Adjustable Throttle-by-Wire Control*  
[http://netwelding.com/Throttle\\_Control.pdf](http://netwelding.com/Throttle_Control.pdf)



*May Be Of Interest:*

### **Engineering a ProStreet Rod**

*How Our '34 ProStreet Rod Was Designed and Built  
8.2 Liter Engine, 4 Wheel Disk Brakes & Coilovers*  
<http://netwelding.com/Engineering%20Street%20Rod%203-08.pdf>

