Restoring the A-12405 Champion 3X Original Spark Plugs

Another "How To" article by
Mark Maron, Illinois Region MARC
JSC Member/MAN Tech Advisor

Recently a friend of mine asked if I would restore his VE28 (Very Early 1928) spark plugs for the car he is restoring. Of course I would and thought it would be a good article to help others that are wondering about doing the same thing. I have done quite a few for others and it seems like what everyone asks about is restoring the base color correctly and ***"I'm afraid I'll brake them"***. I've got you covered so let me worry about that. First are the tools that I need to do this. Below you will see my layout of what I use.



I have a gap setting tool to use when just about completed, long nose pliers to hold items on the bench grinder, angled pic to remove the little copper washer inside the plug base, (did you know there was one there?), my 7/8 box wrench or deep socket, preferably 6 point used for disassembly, a 11/16 inch socket as needed which you will see how that is used as we progress and your rubber mallet. In addition you will need a bench grinder as mentioned and some GREEN Scotch-Brite pads. The base is black oxide and some people use a bluing solution. I have used both and prefer the black oxide solution. In the Nov/Dec 2022 Model A News edition there is a great article by Joe Fox on the Caswell solution for Raven finish. The other product below is Perma Blue; it works great but is much slower and I think can be a mess. The first step is take





them apart and you won't break them if you're gentle. This is the way I received the plugs to restore. You can see they are in bad shape for sure, even to the point of mold on them. Make sure you wear gloves always and a mask for your protection.

Place the plug in the vice and use your



7/8 open end to slowly unscrew the gland nut. That is the top nut of the plug. You might want to spray some "Kroil" or liquid wrench to make it a bit easier if the plugs have been sitting a long time and never touched. Go **SLOW!!** Once you remove the gland nut the porcelain body will lift out. Carefully lift the core out of the base and set aside on a soft cloth. Remove the base now and set that aside. Make sure that little copper washer is not damaged and remove the gland nut and then the copper washer over the top of the plug. Be careful with it because it can bend and get damaged very easily. I have also shown on



the opposite column using the box end of your wrench to remove the gland nut. When you remove the core and the gland nut from the base, look inside. You will see another copper washer. Look hard; many times it is filled with black carbon or crud. Now you know that little angle pick I had you put in your tools for this, well now is the time to use it. Use the pick to get that copper washer out of the base. Work it out gently and then put it to the side so not to damage it, They are very easy to bend. Make sure you have all the parts and now we begin







to clean. So you have a base, two copper washers, , core, gland nut and knurled top screw. You start by using your wire wheel on the base and on the gland nut, don't be afraid to use some force when cleaning these, there is 90 years of junk on them and if they are not clean it will show up when you do your black oxide finish and find you have to start over again. I make sure to get all the sides good and the bottom and top also. Use your long nose pliers to hold your parts from getting caught up on the wheel, you will loose them if they go flying.

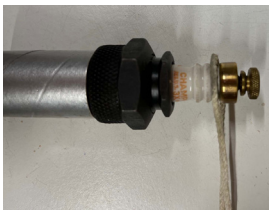






Trust me you don't want that to happen. Take it from someone who has done it!! I also wire brush the brass top "**CAREFULLY**". As far as the core, thats when I use the green Scotch-Brite pad, I have used the wire wheel also when there is a lot of buildup. Remember that part of the core is not seen. Be very careful not to go anywhere near the top of the core where the orange Champion 3X marking are. They cannot be replaced and are very delicate. Joe Fox gave me a great suggestion on the cleaning of the top of the core by using a piece of cord dipped in rubbing compound (or Simichrome or other polish) and just rub back and forth. Be sure to clean the contact pin at the base of the core also. Now it's time to prepare your black oxide; follow the instructions on the bottle and be sure you have the sealer product that will set the solution. You have 2 items to coat. Soak the parts in solution and let them sit for no more than 60 seconds, then rinse with clean water and look at them. IF You did not clean them properly you will see these imperfections on them. This is often due to silicone, oil or old sealer, that is why it's so important to clean them on the wire wheel good. So go back and do it again and then soak them. I usually turn them after 30 seconds before removing from the solution. In the pic below I have rinsed them and then again let them sit in the penetrating sealer for a good 15 minutes, the package states you can let them sit for 1 hour but I have not found the advantage. Remove them and dry them **GOOD!!!** Especially in the little knurls. Your finished product should look like below. A rich black finish. Your next step is to spray them with clear matte spray; this will also help seal them and is the reason you need to make sure they are really dry. Here is the product that I use. It dries fast and leaves no streaks.

















Once dry continue the assembly process. I also clean the little copper gaskets on my wire wheel, you can use the Scotch-Brite pad which is gentle and a bit easier for the

first timers, you can destroy the gasket very easily. Place the small round gasket inside the base where you took it out of. Set aside or place in your padded vice. Next is your copper gasket that came off the core. Place this on over the top and slide it down. You might find that this is a tight fit and got a bit distorted while you cleaned it. Now take the 11/16 deep socket over the top and tap with the rubber mallet until the washer hits bottom, then another 2-3 taps to seat it properly, this will put it back to the shape over the core and seat it. You can see in the photo how it fits over the core and positions the washer















properly Then place the gland nut over as in the final picture. Place the complete unit into the base and use your padded vice.



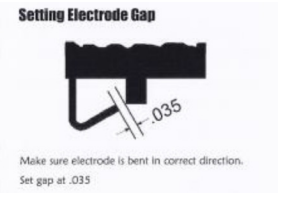
Carefully seat the unit into the base and hand screw it down, you might have to hold the core to be able to get in at first. Then, again use your 7/8 socket to slowly tighten to the base of the plug. Once you tighten the plug I like to give it a good snug turn again.

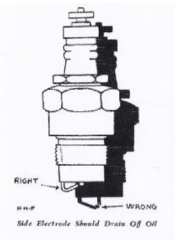


Your next step is more maintenance than restoration. Time to check and make sure the gap on the plugs are set. I use a simple gap setter which is available at almost every parts store. I set the gap at .032-.035;

The Champion directions called for .035 and the angle of the electrode is also very important which can also be seen on the Illustration at the top of the next column.

That's all there is to it. The entire process of all four spark plugs should take you about 3-4 hours. Your final finished plugs will end up something to be proud of and your ready for the show or a nice long tour with something that will work and look great! Remember this method can also be used for 3X reproduction spark plugs manufactured today.





I'm always available for any questions you have via email at a7191mark@gmail.com or 847-302-7900



A set of plugs you can be proud of

