

Remove Rebuild Replace Starter on Mercedes W203 C Class vehicles 2001-2007 M111 M271 Engine

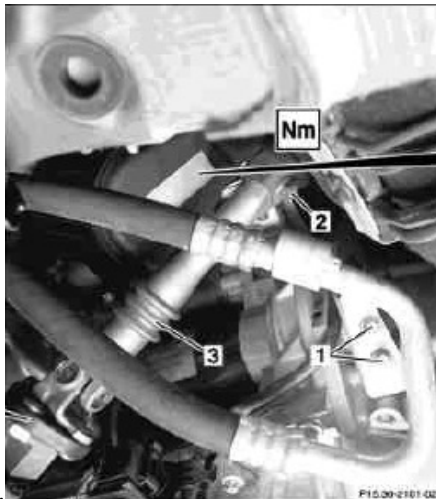
By C230 Sport Coup

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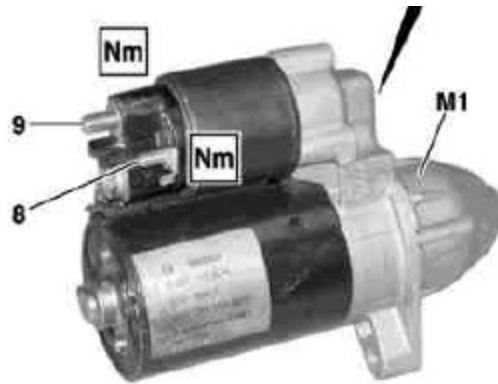
Special thanks to Karo for providing much needed documentation

1. Tool s- You will need a set of Inverted Torx sockets, and torx drivers. A ratchet, ½” or 3/8” doesn’t matter. You will also need an approx 3.5’ total socket extensions. I bought a 20” ½” extension, but added to it the 1’ I had already + a ½ to 3/8 converter and a couple of short 3/8” ones. At the point where you put the socket on the bolt, it helps to have 3/8” vs. ½” and the little bit of slop in the extensions helps to get it straight on the bolt so you don’t strip the head, which would be a disaster. Seriously, you’d be screwed....uh gee a punny.
2. So, jack the car waaaaay up on all 4 corners, or if you have a lift available, that would be best. You’ll be spending some time under there so get comfortable. In fact, you may wasn’t to consider replacing the tranny fluid & replacing the filter, or changing the oil while you’re at it.
3. Remove the bottom plastic pans.
4. Note the position of the starter on the left side of the car (drivers side here in the US) directly under the intake manifold.
5. If you have electric seats, move the steering column to the fully extended position, per the WIS. With manual seats, just pull it back, lock it.
6. REMOVE THE KEY! Never leave the key in the car with the battery disconnected, you might end up needing a new ignition/ security switch. It’s called the EIS and is not a DIY job, only authorized dealers and indies can do, and it costs a lot, at least 500. **So just take the key out.**
7. Make sure the wheels are facing straight forward and make sure the steering column locks. Remove the left front wheel to get a little more room to move, but not necessary, just seemed a little less claustrophobic to me.
8. Climb under the car, and note the steering column coupler. And note the one bolt #2 that holds it to where the column goes into the passenger compartment. If the bolt is not accessible, turn the wheel or try using your hand to turn it by grabbing the column. You’ll get a little bit of movement. DO NOT TURN THE STEERING WHEEL INSIDE THE CAR ONCE THE COLUMN IS DISCONNECTED. According to the WIS, you will “Destroy the clockspring contact.”



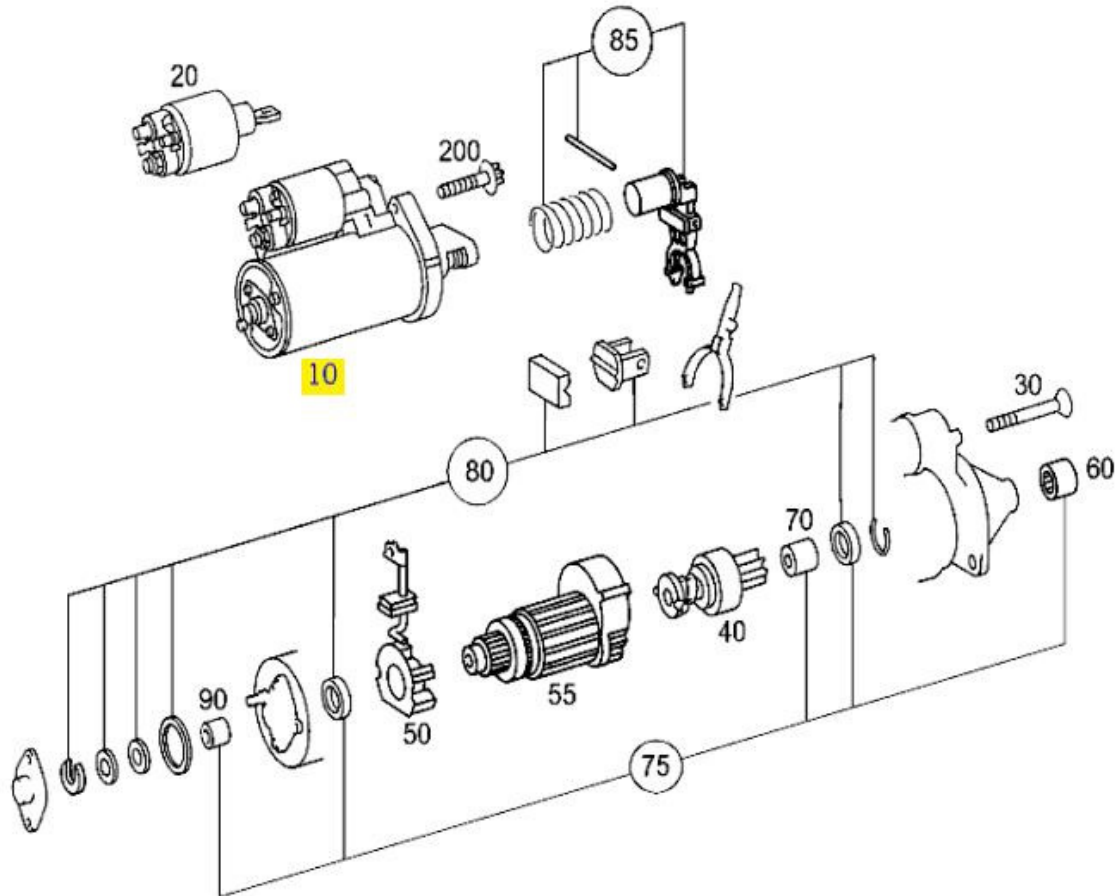
9. Once you are sure you can access the bolt (13mm I recall) disconnect the battery ground at the chassis. Make sure it can’t make contact with the chassis, use a little electric tape around the grommet to be sure.
10. Remove the bottom bolt from the starter. This can be done without extention, just a 3/8” ratchet and an inverted torx socket (sorry didn’t notice what size).
11. “Dismount the refrigerant line”. Remove the bottom bolt from the starter, and the clip from the bracket that hold the 12V power wire, and the wire for the O2 sensor. Supposedly you can unbolt the lines from the bracket that’s not how I did it

12. Move the reframe lines out the way. Put the bottom bolt back in finger tight to support the starter when you pull the top bolt out so the top bolt will turn easily, not supporting the weight of the starter.
13. Remove the bolt where the column goes into the passenger compartment #2 above. Grasp the rubber boot where the steering column goes into the passenger compartment and push UP. This is where I went crazy. **Even once I got the WIS documents, it failed to mention to PUSH UP. It just isn't obvious.** I made a video of this and will post it later on.
14. Push the steering column extension aside. Now that there's room to get your hand in. WITH THE BATTERY DISCONNECTED, disconnect the 2 nuts holding the wires to the starter. It's not necessary to disconnect the bottom one, that just send the power from the solenoid to the motor.



15. Here's a pic.
16. Now to the top bolt holding the starter in. With your hand, reach up and find the head of the bolt. This is your target. Get all your extensions, ratchet and the inverted torx you used for the bottom bolt. From the rear of the transmission, near the driveshaft, fish the extensions up towards the top of the trans tunnel, and push them all the way to the front of the car.
17. Reach up with one hand to guide the socket to the bolt and add or subtract additional extensions as needed to get it just right, so you can work the wrench. Now comes the fun part, holding the socket to the bolt with one hand, and then 3-4' away, working the wrench. Make sure the socket is squarely on the head of the bolt, stripping the head would spell disaster. I used a 3/8 adapter, and a 4" extension right at the point where the socket reached the head to give a little wiggle room to push the whole mess up and straight onto the head.
18. Success! You got the bolt loose and it's coming out! YEAH!!!!
19. Remove the loose bottom bolt with your fingers while supporting the starter with your hand, and fish it out.
20. Woo Hoo! I just saved you from the misery that I went through, and the crappy WIS document that so poorly explained the process.
21. It is not necessary to remove the intake manifold, and from I can see, it would not be necessary to remove the supercharger intake muffler as shown in the WIS for M271 1.8L cars, but I guess we'll find out when someone tries to do it. Everything is accessible once the reframe lines and the steering column are out the way.
22. At this point, it's up to you as to whether just throw a rebuilt starter in (easiest) or to work with the one you have (less expensive). In my case, I took the thing apart, and it was incredibly filthy. The carbon from the brushes had just caked up and was pressed into every nook and cranny tight. I took some electrical contact cleaner (open a window, this shit stinks) and cleaned it up. I had attempted to buy some brushes in advance to solder myself, but they were not the right size. I also had planned to replace the solenoid, but once I had it cleaned up, it seemed fine, new one didn't fit either.

23. Take it to an electrical repair shop, like Pacific Auto Electric in Sunnyvale, Ca. PAECO put new brushes in my starter for \$15, tested it, and gave it a clean bill of health.
24. Here is a breakdown the starter from the [Mercedes EPC](http://epc.startekinfo.com/epc/). <http://epc.startekinfo.com/epc/>



Here is follows a recommended procedure for disassembly as recommended by Herr Glyn of South Africa, where *live* parrots come from. This isn't entirely accurate, there was no circlips or anything like that I needed to remove, so don't. Mine was actually mfg'd by Magnetti Marelli but most are Bosch.

Rebuild procedure:

1. Unscrew the two small screws on the commutator housing (back) this releases the brush holder.
2. Unbolt the two studs in the back. Now the commutator end comes off after removing a circlip on the end of the shaft, and the rotor is loose, but don't pull it off yet.
3. Loosen the 3 screws holding the solenoid to the front housing.
4. Between the solenoid and the starter motor is a small rubber piece. See if you can loosen it. Carefully wiggle and separate the front housing.
5. Solenoid and starter can be separated at the solenoid end. Take off the solenoid. (To prevent binding wipe off any dirt or corrosion on the solenoid plunger before reassembly)
6. Determine shape of bushings. The gear end bushing is in the bellhousing on starters for transverse engine models, and in the front housing on longitudinal engines. Replace front and rear bushings if worn.
7. To get at the middle bushing remove the ring and c-clip in front of the gear. Slide off gear assembly. Take out plate holding middle bushing. Replace if worn.

8. Check brushes. New brushes have about 8mm between the tip and the copper braid. I'd replace them if they are more than half worn. Also if the bushings were really bad the starter shaft has been riding out of center, and the brushes have been wearing irregularly and need replacement.
9. Snip off the braided copper holding the old brushes. Don't lose the springs! File off any remains from the brush holder. Solder on new brushes. Make sure they are soldered well. Each brush will pass 100's of amps at startup!
10. Inspect the commutator. If pitted (from arcing) file down until clean copper. If out of round use a lathe.
11. Assemble the parts. Grease bushings and gears lightly. You don't want grease on the commutator or too much so that it can spatter on the clutch. Your choice on Solenoid replacement. Check it out. Obviously check all other components for breakage or undue wear. If you don't mind the effort you can do this really cheaply & effectively
25. Also, there is a very good DIY for rebuilding a starter from a honda on Alldatadiy.com in the sample data area, where they try to sell you a subscription. I subscribed and no such document existed for the W203 Mercedes, and I got a refund. There are some good similarities. The brushes and brush holder are nearly identical, and it's a great guide you can adapt. I used some 1500 grit to light sand the commutator as they suggested.
26. Copy and past the link below, or surf to their sample vehicles and drill down.
<http://www.alldatadiy.com/alldata/AFI~G~C40355~R0~OD~N/0/41746505/41746506/41746536/41746537/34853741/34863246/34863686/34863822/34850021/142223203>
27. I highly recommend using some threadlocker, or loctite on the bolts on reassembly. The nut on the steering column is supposed to be replaced, but I just used loctite and it seems fine. Of course there are recommended torques on each bolt, but good luck getting a torque wrench in there.
28. Replace everything in reverse order. Make margarita's with some good tequila. Pocket \$685 (\$700 was quote I got) savings, throw a party and invite me! Woo Hooooooooooooo!!!!!!!



2002 C230 2002 C7 Orion Blue 2.3L C230 Coupe 240HP
 Auto-Pano-Oyster Leather-Audio 10
 AMG Front bar 22mm-17" Wheels- C32 Brakes- H&R 19mm rear sway
 ASP Pulley-Supercharger Muffler Deleted- NGK BCPR7EIX-11
 Supersprint Header-Magnaflow Cat- AR20 Resonator- Remus Muffler
 MAF Screen Delete- TB Screen delete
 TEIN SS Coilovers -
 Clear sides- 2005 tails, Blinkers & Grill- Tinted Windows
 Bi-Xenons-Clear Fogs- Clear Side/Stealth Bulbs
 Renntech Spoiler