

How To Remove Power Steering on a 1g DSM

By
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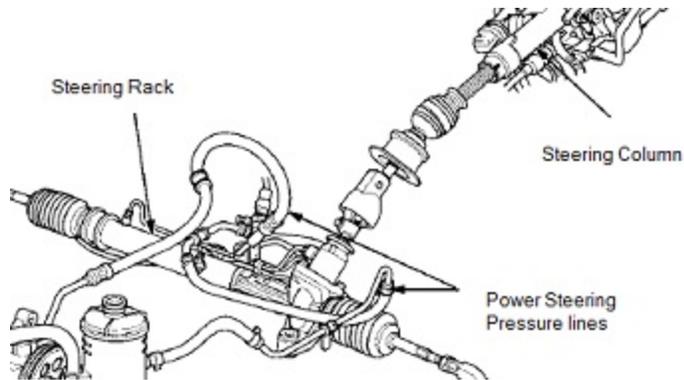
Power Steering isn't for everyone and for those wanting the benefits of a lighter curb weight and the added feel of manual steering in a 1g DSM, we've got the writeup for you! This How To Remove Power Steering guide is taking place on a 1991 Mitsubishi Eclipse GSX, and we'll be taking you step by step through the install process.

- *Parts-* Manual steering rack, new tie rod ends, passenger side manual steering rack bracket
- *Tools-* 12mm, 14mm, 17mm sockets and wrenches; 14mm Flare Wrench, Pickle Fork
- *Time-* 4 – 6 Hours
- *Cost-* \$100 – \$200

1. Raise the car up and jack stands as high as possible, and remove the front wheels. 2. I found it easier to remove all the stuff up top first. I put a cup underneath the power steering reservoir and drained most of the fluid into that. There will still be lots of fluid

in the lines and the rack, so be prepared to make a mess.

2a. Take a look at our handy diagram below to see what exactly you are dealing with.



3. After all the fluid is out of the reservoir, you can then unbolt it from the body and remove any lines attached to it. The reservoir can now be removed.



4. I removed the power steering cooling lines next, they are held on by 1 bolt that bolts into a vertical cross member behind the bumper. Assuming you don't have a FMIC they will be visible from the front.



5. If you follow the big line from the PS pump down into the rack, you will see where it gets unbolted. A flare wrench works the best so you don't strip the fitting.



6. It's now time to remove the PS pump, since you will be eliminating the pump, you can go ahead and cut the belt off. The pump is held on to a bracket with 2 14mm bolts that can be accessed by putting a socket into the holes of the PS pump pulley. You may have to rotate the pulley to get to both of them. There is also a 1-wire connection going to the side of that, which must be removed. Once loose, the pump will wiggle itself out.

You can then undo the bolts that hold the bracket to the block, as you will not need this bracket anymore. Hold the big line up as you pull the pump, there may still be plenty of fluid in there. You are halfway done with our How To Remove Power Steering article, raise the vehicle and check to make sure it's secure.

7. Once all of the stuff up top is removed, its time to work underneath. You will need to remove the transfer case (AWD Only) in order to have enough room to drop the PS rack down. Drain the transfer case, and then unbolt the 5 17mm bolts. The transfer case can then be wiggled out of place, it isn't that heavy, but it will drop quick once removed from the spline. As you lower it down, you can remove the drive shaft from the end.



8. The sway bar is next to be removed. I did not have to completely remove the sway bar, but you will have to get the drivers side portion totally out of the way. If the bar remains in the way at all, you will not be able to remove the PS rack; there is hardly any room to work with. The sway bar is held on with 1 14mm bolt on each side, with a rubber bushing and bracket. If I could remember the exact way to maneuver the bar out of there I would tell you, your just going to have to play around with different ways of movement to see if it you budge at all.

I had to remove the bolts that hold the one side of the control arm on. That allowed me some more movement in the suspension to try and get the sway bar out of the way. The side of the control arm is bolted in with 1 17mm bolt on one side, and 1 17mm bolt & 2 14mm nuts on the other side.

9. After the sway bar is completely out of the way, you will then want to remove the tie rod ends. If they are still the stock tie rod ends, then they use a 14mm crown bolt with a cotter pin. Remove the bolt and use the pickle fork to bang the tie rod end off. Just jam the fork between the tie rod and knuckle, and hammer the fork in, since the forks

are get thicker as you go further up, this will put pressure on the tie rod, forcing them to fall out.



10. Once the tie rod ends are off, the last thing to do before you remove the rack mounts is to remove the bolt holding the steering shaft assembly to the steering rack gear box/spline.

There is 1 12mm bolt connecting the shaft to the spline. You can get to this bolt from up top, just shine a light down and follow where the steering column ends.

This bolt will have to come COMPLETELY out in order for the rack to drop; there is a channel that this bolt rides along which helps prevent the rack spline from moving. You will see this once the rack is out and understand why the bolt needed to come completely out.



11. Now is time to remove the rack. The rack is held on by 2 brackets each using 2 17mm bolts, remove the bolts and the rack is ready to drop. It isn't that heavy, but if the rubber mounts aren't stuck to the body, then it will drop quick.

The rack can only be removed from the driver's side; it will take a lot of twisting and turning of the rack to get it out. After the rack is out, its time to take a brake. The rest is down hill from here.

12. After you slammed a few beers, bottles of water, or soda, and its time to install the manual rack. The manual rack is lighter then the PS rack so it should be easier. It also isn't as bulky as the PS rack so it will go in easier.

There is no sure way to make certain that the rack is centered and not turned too much to one side. What I did to kind of get it centered was make a mark on the spline and the gear box of the manual rack, turn the spline all the way to the right, then turn the spline all the way to the left and count the number of turns it makes by using the mark

you made, mine was like 4 turns.

Once you determine the number of turns it took, just cut that number and half, and turn the rack back to the right that many times. This will make the rack just about centered. The rest of the adjustment can be done at the alignment shop.



13. The manual rack will go in just like the PS rack came out. Remember you will need to use the new rack mount on the passenger side. You will see that the passenger side mount is a different shape for the PS rack then it is for the manual rack. Make sure the steering wheel is centered and you greased up the spline of the manual rack a bit, and then slide the rack in the same way.

At this point you will have to hold the rack in place, get a bolt, and screw it in all by yourself unless you have a partner.

Align the teeth on the rack gearbox spline up with the teeth in the joint assembly, and sit the rack in there. While holding the rack in place, try to get at least one of the

brackets hand tight, then you can let go and the rack will stay in place. Finish tightening the rack mount bolts (spec is like 48 ft-lbs), and then make your way into the engine bay.

14. You will want to tighten the joint assembly bolt (12mm) that holds it to the spline of the manual rack gearbox. Be careful not to strip the bolt out like I did, I had to go inside the car and move the whole column in order to get the assembly out, to get the stripped bolt out.

15. Now it is time to install the tie rod ends. Most likely you ruined the ends on the PS rack when taking them off, if not it is still a good idea to replace them. The cost \$23 each from AutoZone.

The just screw onto each end of the rack, and will stop turning once they reach the locking bolt. Slide the other end into the knuckle and tighten it down. I'm not sure of the torque spec for these bolts, but since you are trying to wedge the tie rods into the knuckle, it will take a lot of hard turning to do so. Crank them until there are about 2-3 threads fully showing (*See Figure 8.*)

16. Once the tie rods are on, you can then adjust them and set the wheels as straight as you can by eye. Tighten the locking nut so they don't back themselves out. Test your steering by turning the wheel all the way to both sides and make sure there are no weird noises or problems. If you had removed the control arm bolts, you would want to reinstall them before testing your steering.

17. If all checks out, its time to put back everything you took out. Start by reinstalling the sway bar. Then reinstall the transfer case, don't forget to fill it back up with fluid. Replace anything else you had to remove. Tighten everything up and do a final check.

Also make sure you clean up and spilled PS fluid that got on the car. It will eventually eat your paint away. Put the wheels back on, drop the car to the ground, tighten the lugs to 80 ft-lbs and fire her up. You will want to get an alignment ASAP, you will see why once you pull it out of the garage.

18. You will notice that it is much harder to turn then before, that's the price you pay

for going with manual steering. Think of the weight and belt you removed, and also all the extra room you have.

You have just completed our How To Remove Power Steering guide. Congratulations!

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