

**Detroit Speed**  
**Detroit Tuned Steering Rack**  
**1998-2002 Camaro/Firebird**  
**P/N: 090224DS**

Detroit Speed's 1998-2002 Camaro/Firebird power rack and pinion uses "Detroit Tuned" valving to provide an exceptional modern performance feel on the street and on the track. It is a direct bolt-in, factory fast ratio power steering rack with 2-1/4" turns lock to lock. The DSE rack and pinion can also be used to update the LT1 and V6 applications using a LS1 steering shaft.



The Detroit Tuned Steering Rack features:

- 'Detroit Tuned' valving specifically designed to optimize effort and performance.
- All new components.
- Every rack undergoes a rigorous quality check and is performance tested prior to being packaged.
- Connects to OEM power steering lines or use P/N: 090206SDS and 090206LDS fittings for -6 AN hose connections.
- New outer tie rods available from DSE as P/N: 092330DS

<b>Detroit Speed Steering Rack Specifications</b>	
Inner Tie Rod Ball to Ball Width	728mm (28.7")
Overall Width	1338mm (52.7")
Linear Rack Travel	120mm (4.7")
Number of Turns Lock to Lock	2-1/4
Mounting Bolt Span	350.5mm (13.8")
Mounting Bolt Size	12mm
Outer Tie Rod Thread Length	62mm (2.4")
Outer Tie Rod Thread Size	M14-1.5
Input Shaft	OEM Asymmetrical 15mm-DD
Recommended Pump Flow Rate	1.85 gal/min
Maximum Peak System Pressure	1232 psi
High Pressure Fitting Thread	M18-1.5
Low Pressure Fitting Thread	M16-1.5

Fastener Torque Specifications - Detroit Tuned Steering Rack	
Application	Torque (ft-lbs.)
Rack and Pinion Mounting Bolts	63
Steering Coupler Pinch Bolt	35
Outer Tie Rod Nut	35

**NOTE:** Before the rack and pinion is installed, verify that the rack is centered by lining up the yellow mark on the flat of the input shaft with the yellow alignment mark on the housing (Figure 1).



Figure 1 - Center Rack & Pinion

#### Installation:

1. Begin, by disconnecting the battery. (The power cable is close to the hose fittings on the rack and pinion).
2. Make sure the steering wheel is straight and lock it in place so it can't turn.
3. Remove the pinch bolt on the steering coupler connected to the rack input shaft using a 11mm socket (Figure 2).

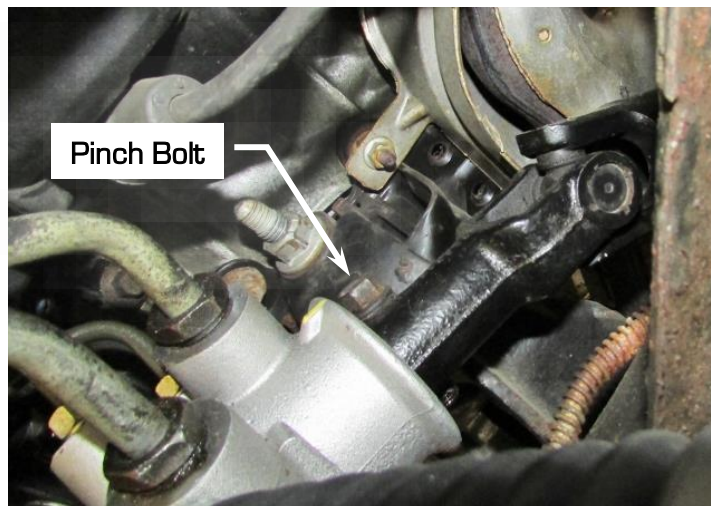


Figure 2 - Remove Pinch Bolt

4. If you plan on using your outer tie rods, you can remove the tie rod from the outer tie rod end by using a wrench on the flat spots on the tie rod to loosen them out of the tie rod end. DSE recommends removing the small clamps from the boots at the tie rod (Figure 3). **NOTE:** Count the number of turns to remove the tie rod or make a reference measurement so when you re-install the tie rods you can be close to your current toe setting. If you are replacing the outer tie rods, skip to the next step, if not, skip to Step 6.



Figure 3 - Remove Tie Rods

5. If you are replacing the outer tie rods, remove the outer tie rod end from the steering arm on the spindle by removing the cotter pin and castle/hex nuts (Figure 4). Use a pickle fork, tie rod separator, or hammer the side of the steer arm to break loose the outer tie rod end from the steering arm.

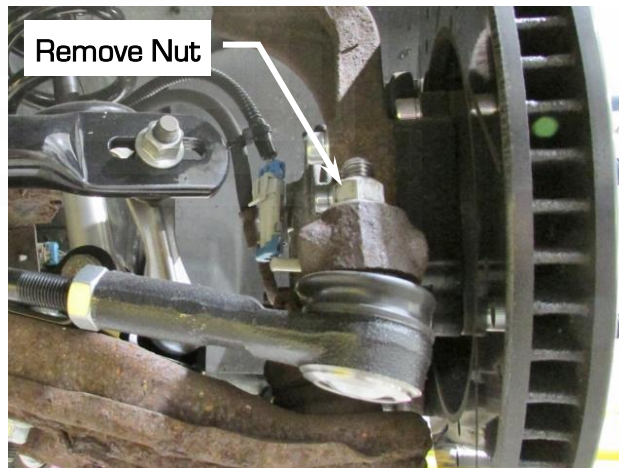


Figure 4 - Remove Outer Tie Rod End

6. Locate the rack bolts in the cross member. From the factory, the bolts point down with the nuts on the bottom side of the cross member (Figure 5).



Figure 5 - Locate Rack Hardware

7. Next, loosen the two rack and pinion bolts using a 18mm wrench/socket on the hex nuts and a 15mm wrench/socket on the bolts (Figure 6). Remove the nuts and leave the bolts in place for now. **NOTE:** Your driver's side bolt may be installed from the bottom side, pointing up. If so, Skip to Step 9.



Figure 6 - Loosen Bolts

8. To get the driver side bolt out, you have the following options:
  - a. You can lift the engine up. Remove the air intake and then remove the engine mount bolts and raise the front of the engine.
  - b. You can lower the cross member down to allow the bolt to be removed.
  - c. You can carefully cut the head off the bolt and replace it with a new bolt.
9. Remove the power steering lines from the rack & pinion using a 18mm wrench (Figure 7). Inspect the O-rings and replace if needed.

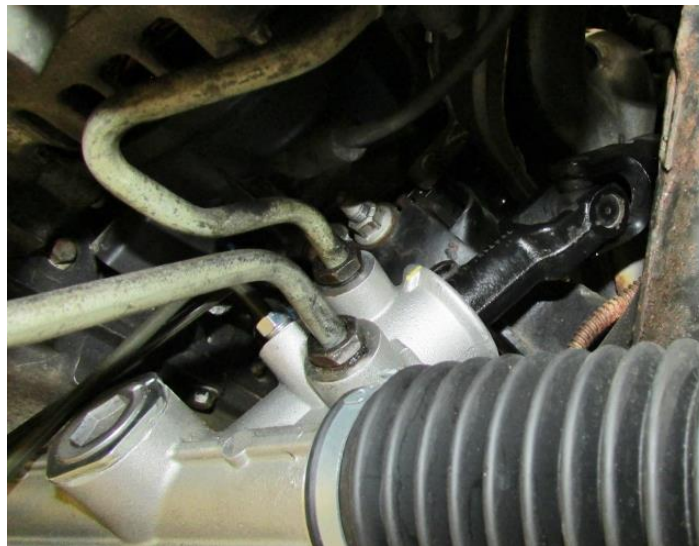


Figure 7 - Remove Lines

10. Remove the rack and pinion bolts and begin to remove the rack from the cross member. You will need to pry the steering coupler off the input shaft as you remove the rack and pinion.
11. You can now set the engine down and re-install the engine mount hardware or raise the cross member back into position (Figure 8 on the next page). When installing the new rack and pinion, you will install the driver's side rack and pinion bolt from the bottom side of the cross member.



Figure 8 - Remove Rack & Pinion

12. Slide the DSE rack and pinion into the cross member. Carefully slide the steering shaft coupler onto the input shaft of the rack and pinion, keeping it from rotating. Use a dead blow if needed to line up the rack mounting holes in the cross member. Make sure you hit the rack at the bracket on the housing (Figure 9).

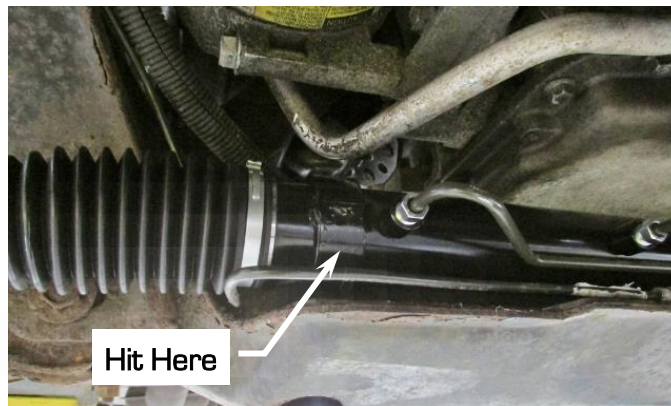


Figure 9 - Install DSE Rack & Pinion

13. With the rack and pinion lined up with the mounting holes in the cross member, install the passenger's side bolt from the top, pointing down. Place a washer on the driver's side bolt and install the bolt from the bottom, pointing up. Use a locking nut on the driver's side bolt. Thread the hex nuts onto the bolts and tighten. Torque the bolts to 63 ft-lbs.
14. Re-install your power steering hoses into the DSE rack and pinion using an 18mm wrench and tighten. Make sure you locate the pressure and return ports correctly (Figure 10).

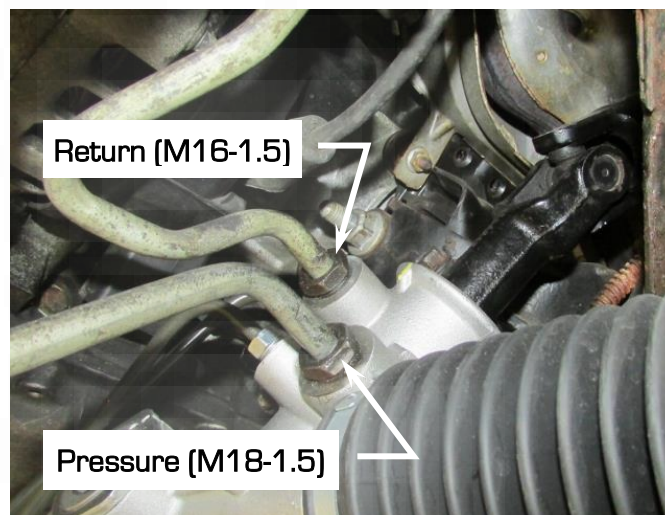


Figure 10 - Pressure & Return Port Locations

15. Re-install the pinch bolt into the steering coupler using medium strength blue Loctite 242 on the threads of the bolt and tighten. Torque to 35 ft-lbs.
16. Install the provided M14-1.5 jam nuts onto each of the tie rods. Remove the small clamps from the boots at the tie rods.
17. If you are re-using your outer tie rod ends, use a wrench on the flats on the tie rods to install them into the tie rod ends and skip to Step 19. **NOTE:** Use your reference measurement from Step 4 to install the tie rods to the same location as where they were removed. If you are installing new outer tie rod ends, thread them onto the tie rods. Use anti-seize on the threads.
18. Place the outer tie rod ends into the steering arms. Install the castle nut onto the outer tie rods and tighten. Torque the castle nuts to 35 ft-lbs. and then turn the castle nuts until new cotter pins can be installed.
19. Adjust the tie rods so there is an equal thread length on each side and the spindles are straight. Adjust the jam nuts and tighten them against the outer tie rod ends (Figure 11). Re-install the small clamps back onto the boots.



Figure 11 – Adjust Tie Rods

20. Installation is now complete. Lower the vehicle to the ground and adjust your toe so the wheels are straight. Re-connect the battery. Have a professional alignment completed to the factory specifications.

If you have any questions before or during the installation of this product, please contact Detroit Speed at [sales@detroitsspeed.com](mailto:sales@detroitsspeed.com) or 704.662.3272