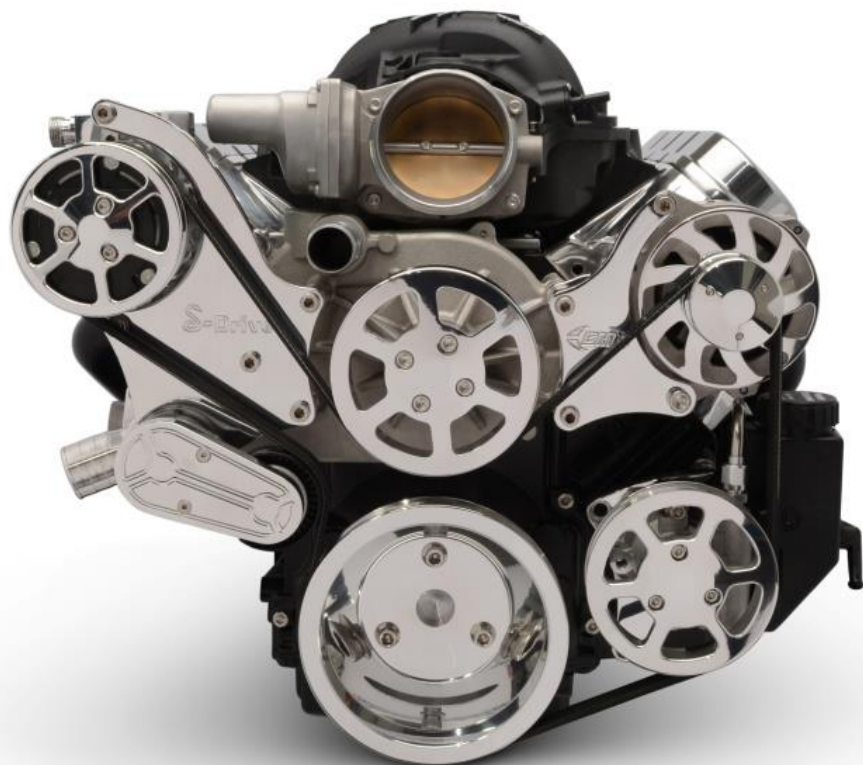




## **LS Chevy**

**With Variable Valve Timing (VVT)**

### **S-Drive Pulley Kit INSTALLATION INSTRUCTIONS**



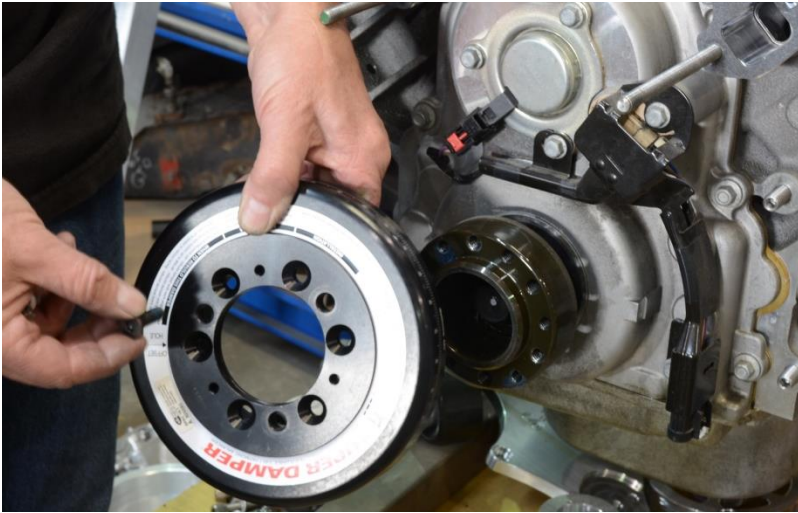
**Before beginning the installation,  
please note:**

- Please read all of the instructions thoroughly before beginning the installation. If you do not feel that you have the mechanical aptitude to complete the job in a safe manner, Eddie Motorsports strongly recommends that you employ the services of a knowledgeable technician to perform the installation.
  - Your car must be equipped with an electric cooling fan(s). The LS S-Drive kit will not work with a mechanical fan.
  - If you have not done so already, verify that the S-Drive will fit in your vehicle. Pay close attention to the power steering tank to A-arm and crank pulley to cross-member/rack & pinion clearances. Dimensions are available on [www.eddiemotorsports.com](http://www.eddiemotorsports.com). There are no returns for kits that have been installed.
- \* To prevent galling of stainless steel fasteners, apply anti-seize compound to any threads not calling for other sealer. Fasteners that have seized will not be warranted.

**1) Engine Prep**

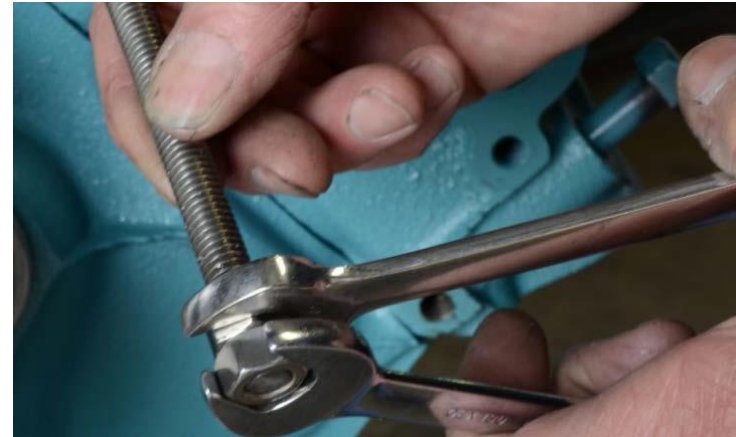
1. If the engine is in your car, disconnect the battery
2. Remove your existing accessories, brackets, water pump, and water pump housing.
3. Clean the front of your block.
4. Clean all of the threads on your block using an 8mm thread chaser. Do not use a tap.
5. Inspect the front crank seal and replace if necessary.

## 2) Install the Hub & Damper



Follow the instructions from the manufacturer to correctly install the balancer hub and damper assembly that is supplied with the kit. **NOTE:** While your crankshaft does not have a keyway, the balancer hub will. The keyway in the hub is to be used to "pin" the crank in the case of high horsepower applications. This is NOT required on lower horsepower applications. Also, if you are using the LS electronic ignition, once the hub and damper are correctly assembled, it does not matter what the position of the new damper and timing marks are on your crankshaft.

## 3) Install Water Pump with Spacers

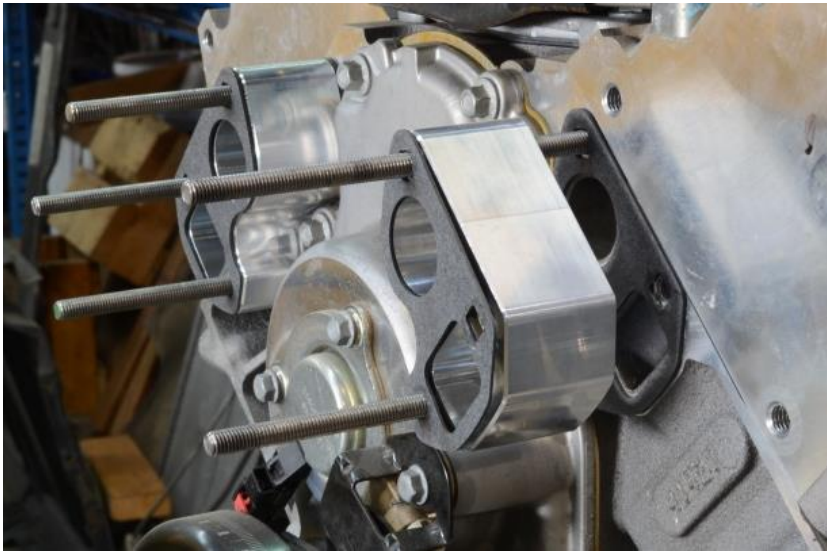


1. Install three M8 studs x 140 mm with anti seize to the passenger side of the block. They should stick out 4-1/2". Use the double nuts provided to help with the install if needed.

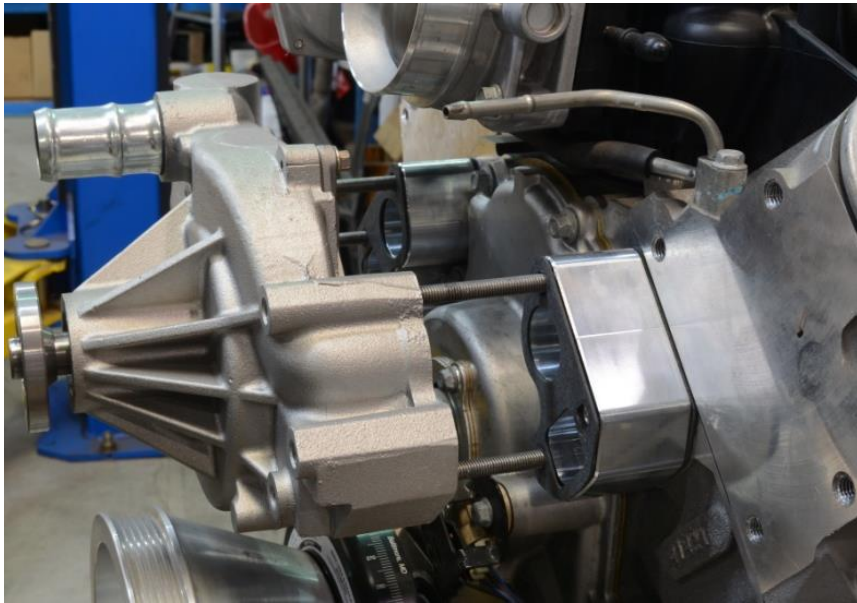


2. Install two M8 studs x 165 mm with anti seize to the driver side of the block. They should stick out 5-3/4". Apply a thin coat of RTV sealant to both sides of the gaskets and install them over the water pump studs.



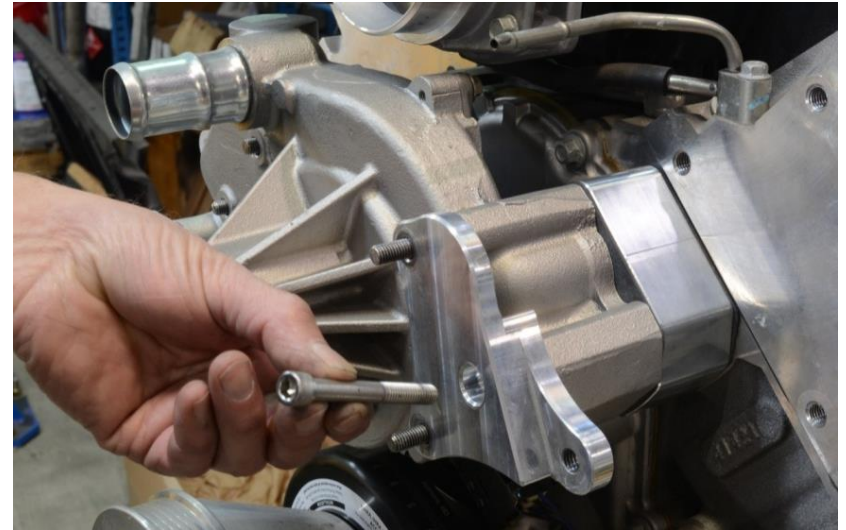


3. Install both of the water pump spacers over the studs (one on the driver side and one on the passenger side) along with another set of water pump gaskets. Apply a thin coat of RTV sealant to both sides of the gaskets.

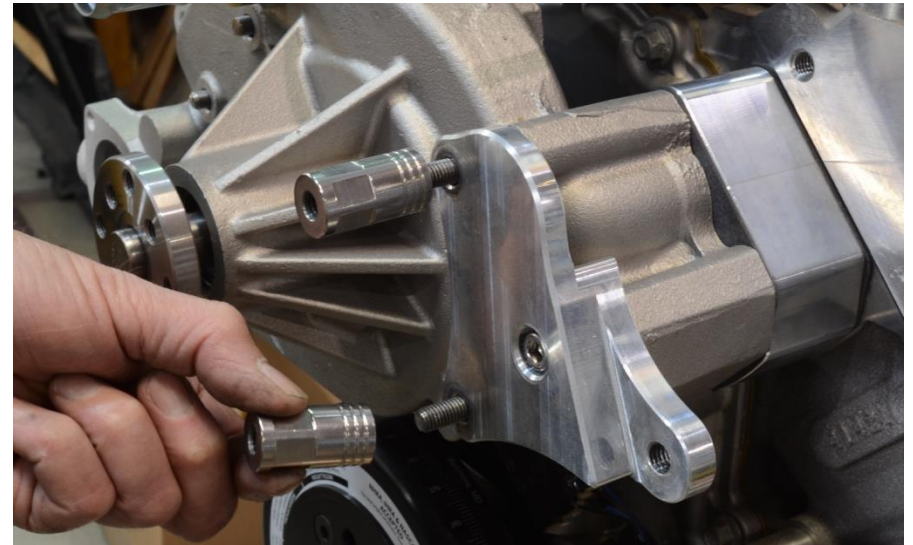


4. Install the water pump over the studs.

#### 4) Install Rear Alternator Bracket



1. Install the rear alternator bracket over the driver side studs and secure with one M8 x 140mm socket cap screw. Tighten this bolt fully while using caution to prevent over torquing.



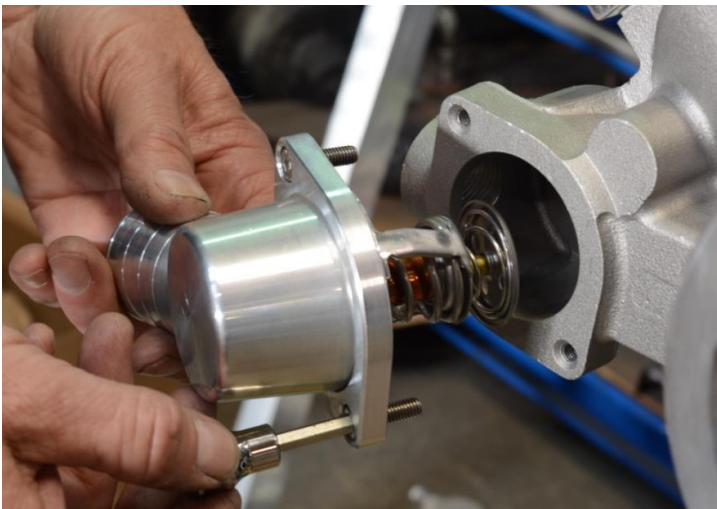
2. Using anti-seize, install two 3/4 x 1.41 stainless steel stand-offs to the driver side studs. Do not fully tighten at this time. The end of the stand-off with the hex closest to it goes AWAY from the engine.

## 5) Install A/C Bracket Stand-offs

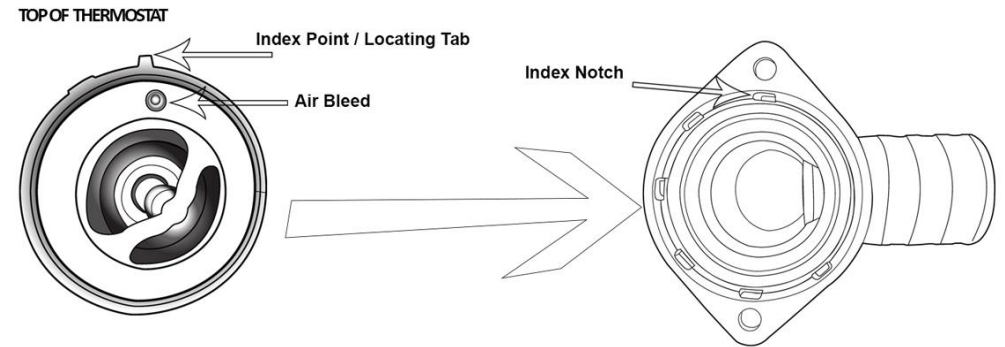


1. Using anti-seize, install three 3/4 x 2.55 stainless steel stand-offs to the passenger side studs. Do not fully tighten at this time.

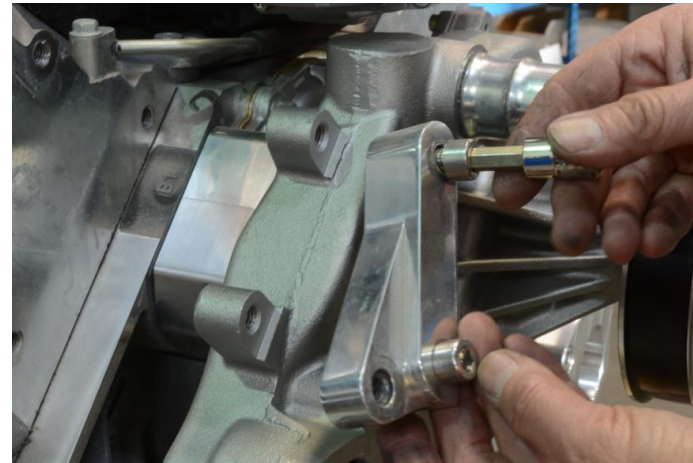
## 6) Install Thermostat & Housing



1. Place the thermostat into the housing and install onto the water pump with two M6 x 16mm socket cap screws. **NOTE: After rotating the thermostat housing to its final installed position, it is imperative that you place the locating tab on the thermostat in the approximate index notch on the housing so that the air bleed valve is installed facing "up," as close to the 12 o'clock position as possible. Failure to do so could cause overheating. SEE BELOW**



## 7) Install Rear A/C Bracket



1. Attach rear compressor bracket to the passenger side of the water pump using two M10 x 20mm cap screws with anti-seize. Fully tighten these bolts using caution to prevent over torquing.



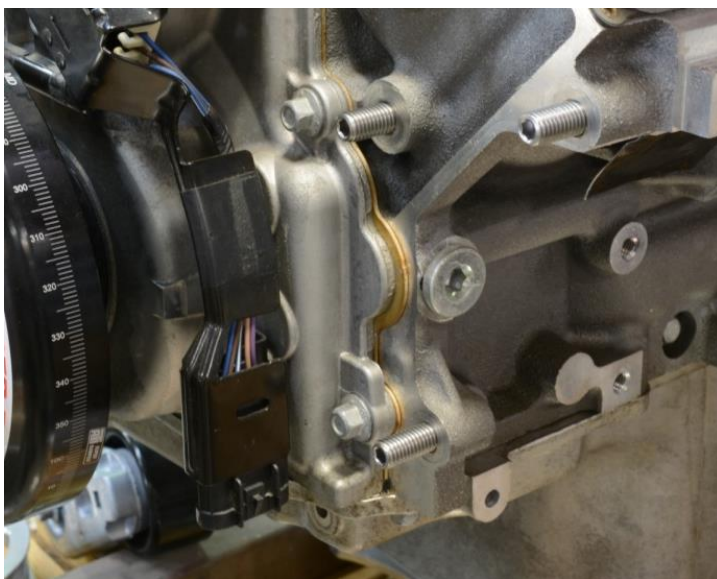
## 8) Install Water Pump Pulley



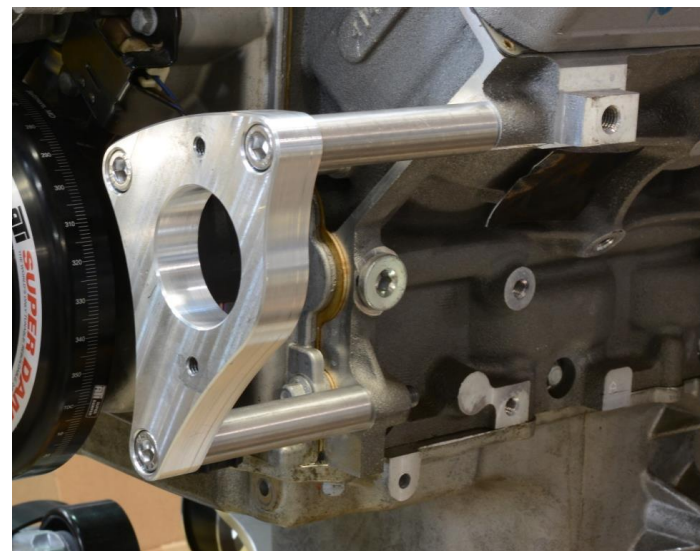
1

Install the water pump pulley using four 5/16-24 x 1" cap screws. Apply Loctite to the threads and tighten fully while using caution to prevent over torquing.

## 9) Install Power Steering Bracket



1. Install three M10 x 40mm set screws into the lower driver side of the engine block. Apply Loctite to the threads and tighten, leaving 1/2" of the threads sticking out.

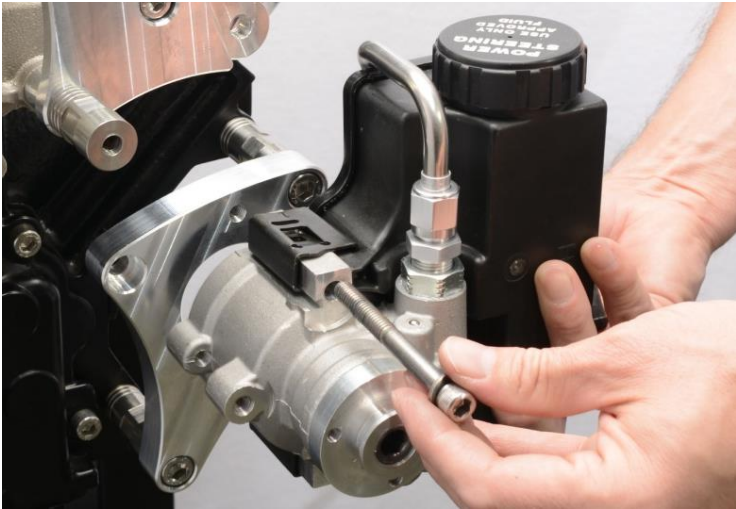


2. Using anti-seize, install three 3/4 x 3.39 stainless stand-offs onto the M10 studs and leave finger tight.
3. Install the power steering bracket using three M10 x 20mm cap screws and leave finger tight.
4. Once all of the cap screws have been started, go back and fully tighten the stand-offs and then the socket cap screws.

## 10) Install Power Steering Pump

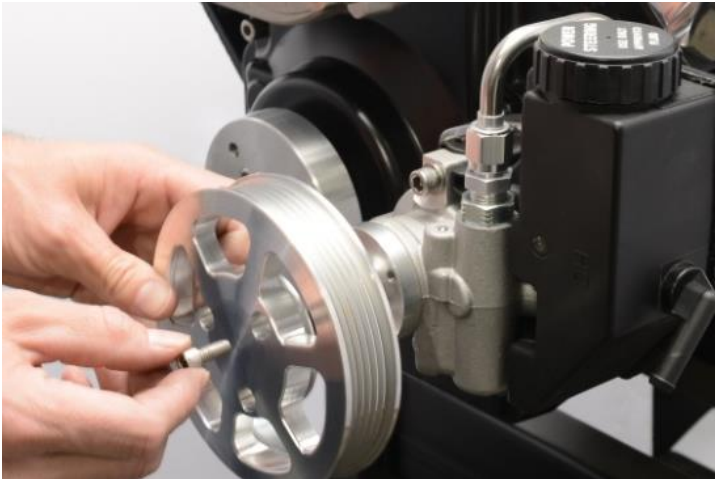


1. If you purchased our kit with a power steering pump with an attached reservoir, install the pressure fitting and hard line onto the pump and tighten them both.



2. Install the pump onto the power steering bracket using two 5/16-18 x 3" socket cap screws and lock washers. Tighten fully while using caution to prevent over torquing.

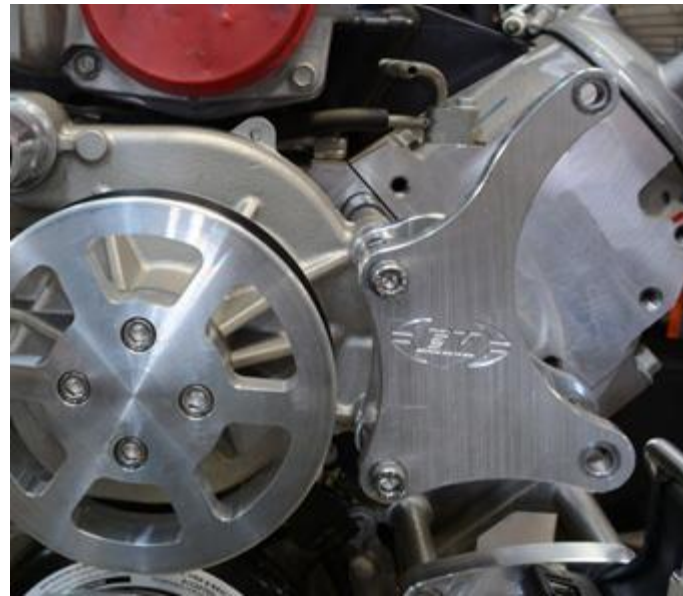
## 11) Install Power Steering Pump Pulley



Apply a small amount of Loctite to the three 1/4-20 x 5/8" cap screws provided and install the power steering pulley. Tighten fully while using caution not to over torque.

**WARNING! Do not start the engine until all power steering hoses are permanently installed and the power steering system is filled with fluid. Running the pump dry will void the warranty. See the enclosed instructions for details on bleeding the system.**

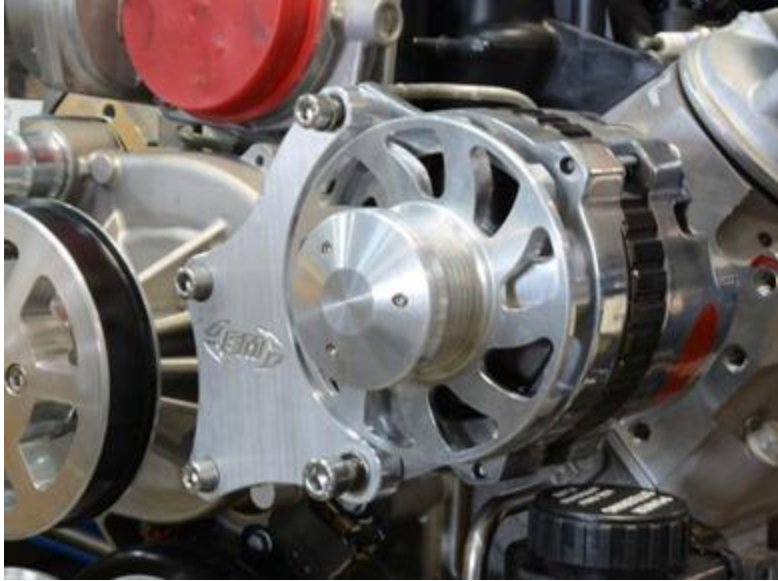
## 12) Install Alternator Bracket



Install the alternator bracket to driver side stand-offs with two M8 x 25mm cap screws and AN washers; leave finger tight. Make sure to use anti-seize on the threads.



### 13) Install Alternator



1. Install alternator using one M10 x 80mm socket screw with AN washer through the bottom bolt hole and one M8 x 25mm socket screw with AN washer through the top hole and tighten fully using caution not to over torque.
2. Go back and fully tighten the two stainless stand-offs from Step 4 and then fully tighten the two M8 x 25mm cap screws installed in Step 12.

### 14) Install Crank Pulley



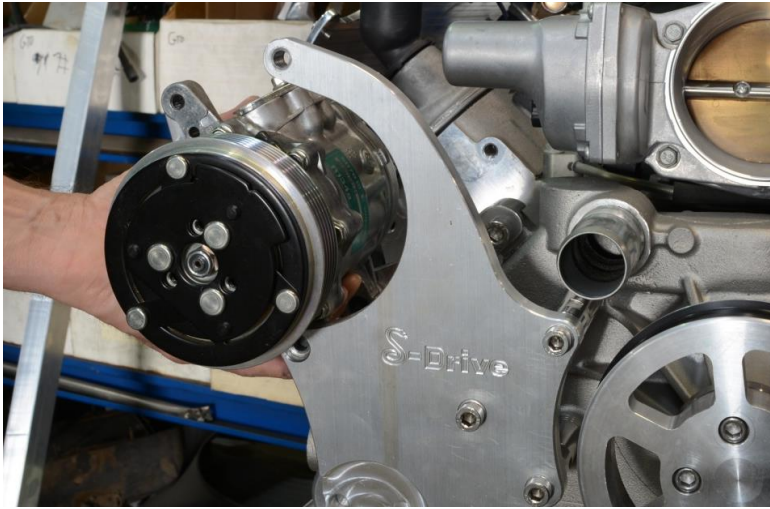
Install crank pulley using three 3/8-16 x 1-1/4" cap screws and Belleville washers. Apply Loctite to the threads and tighten fully while using caution not to over torque.

### 15) Install A/C Bracket

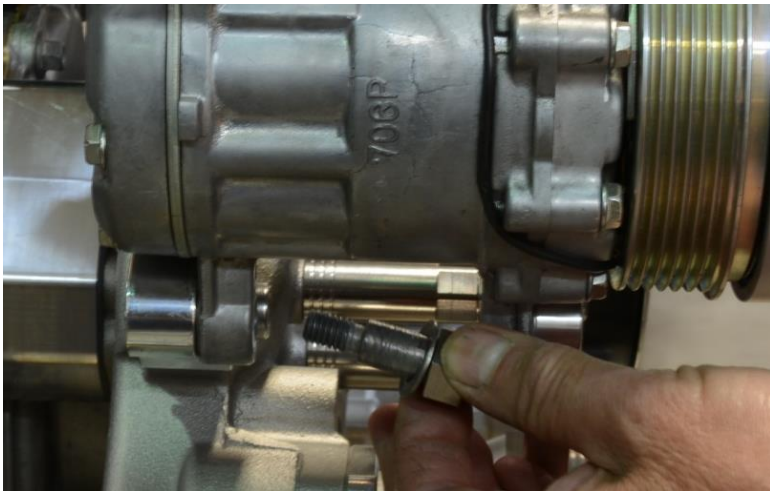


Using anti-seize, install the A/C compressor bracket using three M8 x 25mm cap screws with AN washers. Leave finger tight at this time. **Note: Make sure you have already installed the thermostat and housing before mounting this bracket.**

## 16) Install the A/C Compressor

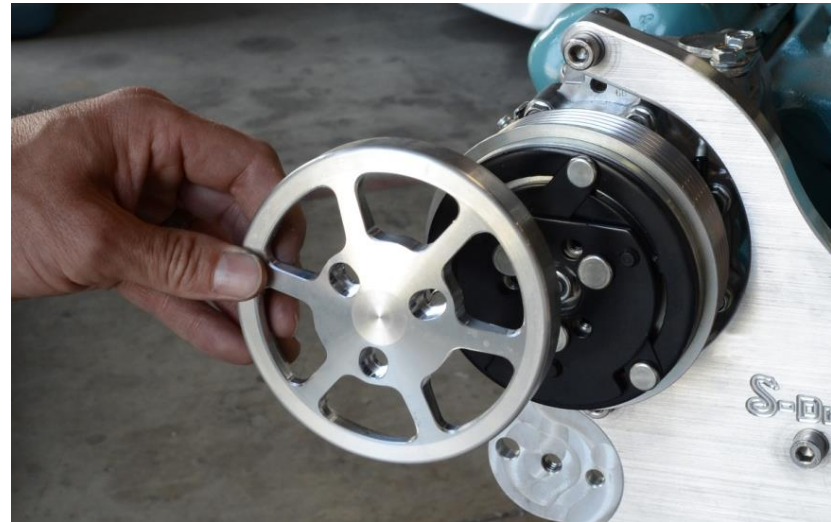


1. Install the A/C compressor using two M8 x 25mm cap screws and leave finger tight for now.



2. Install the 1/2" shoulder bolt with AN washer through lower rear mounting tab of A/C compressor and tighten fully using caution not to over torque.
3. Go back and fully tighten the three stainless stand-offs from Step 5. Then fully tighten the three M8 x 25mm cap screws installed in Step 15 and the two installed in Step 16.

## 17) Install A/C Compressor Cover



Apply Loctite to the threads of the three 1/4-20 x 3/4" socket cap screws and install the compressor cover against the compressor pulley. Tighten fully using caution not to over torque.

**Note: To insure the proper electrical connection of your compressor, make sure to run a separate ground wire from the screw that holds the wire clamp on the compressor to your engine block.**

## 18) Install A/C Compressor Manifold

**\*\* IMPORTANT \*\***

**Do not perform this step until you are ready to install the AC lines and charge your system! Doing so can permanently damage the compressor and void the warranty!**

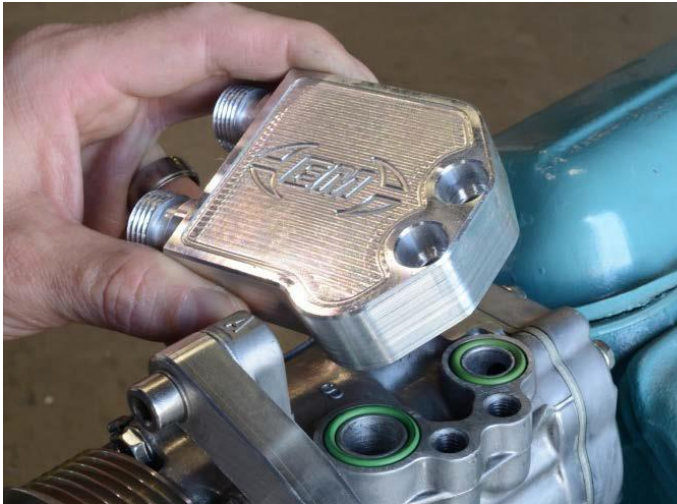
**Do not connect power to the AC clutch wire without first connecting hoses and fully charging the system.**

**Please follow all of the enclosed instructions for charging your system. Use of improper charging methods could cause serious damage to your compressor and will void the warranty!**



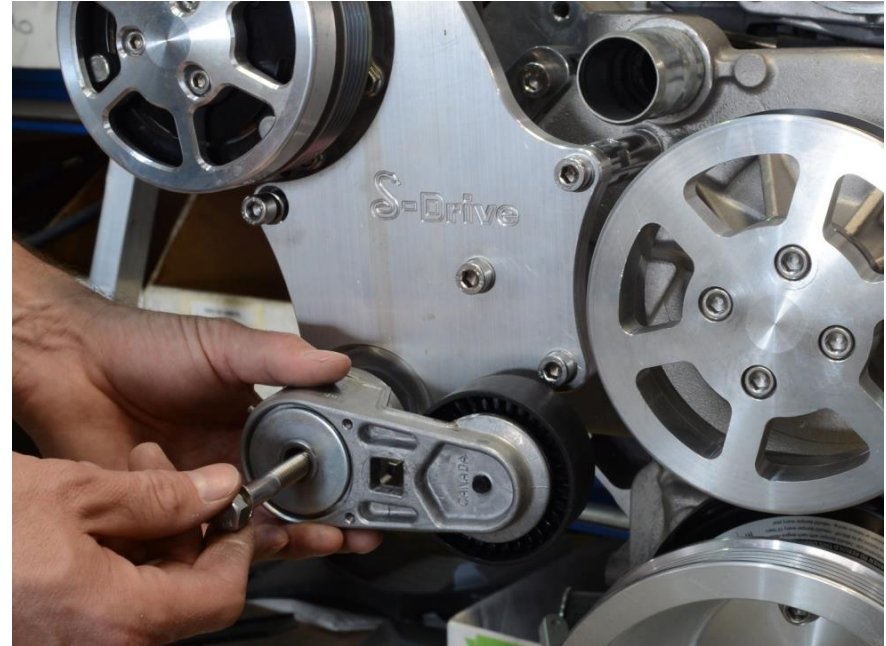


1. Remove the plate from the top of the compressor body. The compressor is charged with Nitrogen to insure lubrication of all components during transport. You will hear the gas escaping when you loosen the fasteners.



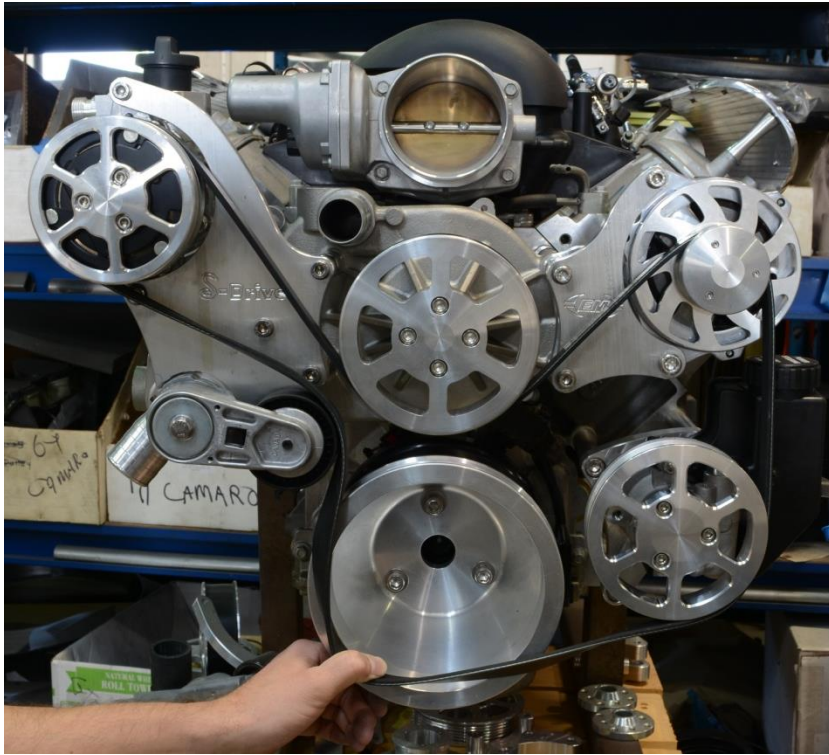
2. With the plate removed, you will see the two sealing o-rings. Leave these on the compressor and be careful not to disturb them.  
3. Using caution so as not to damage the o-rings, install the compressor manifold to the compressor using two M8 x 25mm socket head cap screws. Apply anti-seize to the threads and tighten fully while using caution to prevent over torqueing.

## 19) Install the Spring Loaded Belt Tensioner

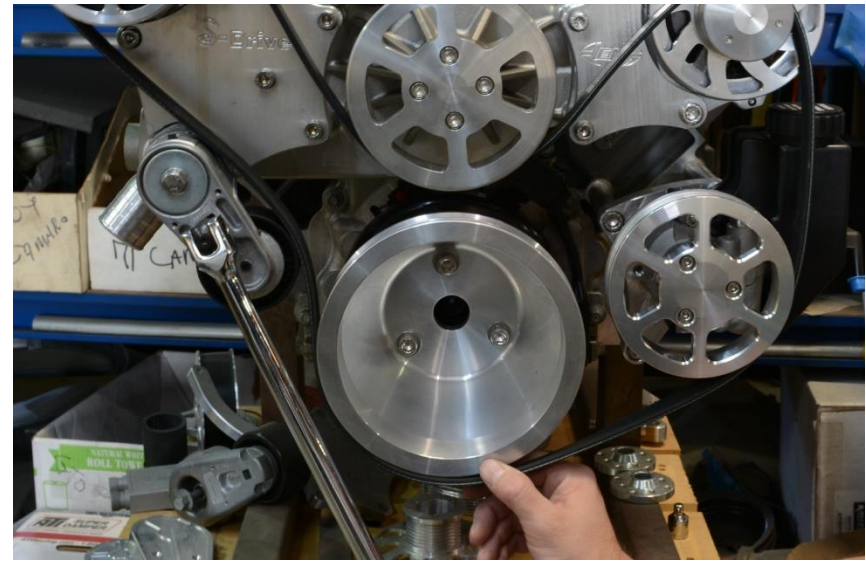


1. Install the tensioner on the A/C bracket using the 3/8-16 x 2 1/4" hex head bolt. Apply Loctite to the threads and tighten fully while using caution not to over torque.

## 20) Install Belt & Tensioner Cover



1. Route the belt onto the pulleys as shown installing over the crank pulley last.



2. Using a 1/2" drive breaker bar, rotate the tensioner down and finish installing the belt around the crank pulley. Slowly release the tensioner until it rests against the belt and tensions the system. **NOTE: In order to achieve an optimum operating position for the tensioner, some applications may require a belt length that appears to be too short and will be difficult to install.**



3. Install the aluminum tensioner cover using two 10-32 x 3/4" socket head flat head screws. Tighten fully while using caution to prevent over torquing.



## YOUR INSTALLATION IS COMPLETE!!

PLEASE THOROUGHLY READ ALL OF THE INSTRUCTIONS FOR FILLING AND BLEEDING THE POWER STEERING SYSTEM AND FOR CHARGING THE AIR CONDITIONING **BEFORE STARTING YOUR ENGINE.**

**FOR ANY QUESTIONS PLEASE CALL: 888-813-1293**

### **IMPORTANT INFORMATION ABOUT YOUR AIR CONDITIONING COMPRESSOR**

**WARNING:** Do not connect power to the AC clutch wire without first connecting hoses and charging the system. Serious damage to your compressor can occur and the warranty will be voided.

All charging procedures should be performed by a licensed and certified technician. Installer and technicians should read this sheet and all component instructions carefully before starting work. Please call if you have any technical questions before, during or after the installation. Our knowledgeable staff will be glad to assist you with any of your questions.

The Sanden A/C compressor supplied with your Eddie Motorsports S-Drive kit is pre-filled with oil and Nitrogen charged from the factory to insure proper lubrication of the internals during storage and transport. Do not remove the block off plate on top of the compressor until you are ready to install the hoses and charge the system.

#### **Refrigerant**

The Sanden A/C compressor supplied with your Eddie Motorsports S-Drive kit is compatible with 134a refrigerant which is commonly used in late model and aftermarket A/C systems. All part warranties are voided if any refrigerant other than R134a is used. If your car is equipped with its original A/C system and components, it will be necessary to convert your system to use 134a. Consult a reputable A/C system manufacturer for details on this conversion. We recommend the factory air experts at Classic Auto Air 877-342-5526 [www.classicautoair.com](http://www.classicautoair.com)

EDDIE MOTORSPORTS IS NOT RESPONSIBLE FOR CUSTOMER APPLICATIONS THAT ARE OUTSIDE THE NORMAL INTENDED USE OF OUR PRODUCTS, INCLUDING SPECIFIC MODEL AND YEAR APPLICATIONS, ENGINES EQUIPPED WITH SUPER CHARGERS, & LATE MODEL EMISSIONS EQUIPPED VEHICLES.

### **Air Conditioning System Charging Tips & Warnings PLEASE READ CAREFULLY BEFORE CHARGING YOUR A/C!**

1. Please keep in mind that regardless of you or your technician's experience, the charging processes for your Sanden compressor will vary greatly from stock OEM systems. Failure to follow these steps and proper charging procedures will result in an improper installation or damaged item and **WILL VOID YOUR WARRANTY!**
2. **DO NOT ADD OIL!** All new Sanden compressors contain a full system charge of oil.
3. Before charging the system and putting power to the compressor, it is necessary to clear the oil from the compressor head. With the belt removed and the lines hooked up, manually turn the compressor clutch hub (not the pulley) a minimum of 10 complete revolutions to clear the oil.
4. **DO NOT CHARGE THE SYSTEM IN LIQUID FORM.** Unlike later model vehicles, doing so will direct liquid refrigerant into the compressor piston chamber, causing damage to the compressor reed valves and/or pistons, as well as potentially seizing the compressor. Doing so voids all warranty claims.
5. Use a charging station to evacuate and charge your system. **DO NOT TILT, SHAKE OR TURN REFRIGERANT CAN UPSIDE DOWN DURING THE CHARGING PROCESS WHILE THE ENGINE IS RUNNING!** Evacuate the system for a minimum of 45 minutes before charging, longer if possible. When using a charging station, meter the refrigerant into the system with the vehicle turned off. Then allow a minimum of 30 minutes for liquid to "boil off," or hand turn the compressor hub (not the pulley) a minimum of 10 complete revolutions to clear liquid refrigerant from the compressor piston chamber.
6. **DO NOT CHARGE THE SYSTEM THROUGH THE HIGH (DISCHARGE) SIDE OF THE SYSTEM!** Refrigerant should be administered through the low (Suction) side of the system.

**WARRANTY:** All compressors carry a 1-year limited warranty.

## POWER STEERING FILLING/BLEEDING INSTRUCTIONS

**\*\* PLEASE READ! \*\***

### IMPORTANT INFORMATION ABOUT YOUR POWER STEERING PUMP

Failure to read and follow these instructions ***THOROUGHLY AND COMPLETELY*** will void any warranty and possibly cause severe damage to your power steering components.

### BLEEDING AIR FROM POWER STEERING SYSTEMS

When bleeding air from a power steering system, please follow these bleeding Instructions only. We have found the following method is the only way to properly bleed a power steering system using a GM Type II Pump.

**\*\* IMPORTANT \*\***

**Do not start the engine until the power steering system is fully bled!**

Doing so may cause damage to the power steering components. Any air in the system can cause metal to metal contact and damage. If using a Hydro Boost system, follow the Hydro Boost bleeding procedures from the original manufacturer.

### Power Steering Fluid

Use only clear, name brand, premium, racing or synthetic power steering fluid with anti-foaming characteristics such as Valvoline, Royal Purple or Red Line. ***DO NOT use brake or transmission fluid! These are NOT an acceptable substitute!*** These fluids do not contain the same friction inhibitors and additives and tend to breakdown and overheat. Use of fluids other than power steering fluid will void the warranty.

**NOTE: Eddie Motorsports Billet Aluminum Power Steering Reservoirs** are not recommended for use in high usage or high performance applications or with Hydroboost systems. The reservoirs should also be used in conjunction with a high quality power steering fluid cooler.

Before Bleeding, carefully inspect the steering system.

Hoses must not touch any other part of the vehicle. Steering system noise could be caused by the hose touching the frame, body, or engine.

All hose connections must be tight. Loose connections might not leak but could allow air into the system. Do not over tighten O-ring hoses as the O-ring might be crushed. Check flare seat type connections for exact fit.

### Bleeding your Power Steering System

1. Raise the front wheels off the ground, or remove the pitman arm or tie rod.
2. Turn the steering wheel fully to the left.
3. Fill fluid reservoir to "full cold" level and leave the cap off.
4. With someone checking the fluid level and condition, turn the steering wheel slowly and smoothly lock to lock until the fluid level drops in the pump reservoir. ***Do not turn the steering wheel fast as this will cause the fluid to overflow the reservoir.***

If fluid level has not dropped, no fluid has moved through the system. This normally indicates a large air bubble in the reservoir or pump. Until this bubble passes, no fluid will circulate through the system.

On some systems, especially those with coolers, winches, or Rock Ram assist, you may need to cycle the system in excess of 40 times. Trapped air may also cause fluid to overflow. Thoroughly clean any spilled fluid to allow for leak check.

5. Check fluid constantly to ensure proper level and that no bubbles exist. If you see any signs of bubbles, recheck all connections then repeat the steps above. Fluid level should be steady (Rock Ram's level will vary slightly).

6. Once the fluid level is steady, disable the engine from starting and crank the engine for several revolutions. If fluid level drops, there is compressed air trapped in the system. Repeat the above steps until fluid level is stable.



If fluid foams while cranking, wait 10 minutes or more until dispersed air has time to accumulate and purge through the reservoir.

7. Continue the above steps until fluid level remains constant and no air bubbles are visible.

8. Reinstall reservoir cap and return wheels to center.

9. Lower the front wheels to the ground or reinstall pitman arm or tie rod if removed in Step 2.

10. Run the engine for two minutes, turning the steering wheel in both directions. ***DO NOT HOLD THE STEERING WHEEL***

***AGAINST THE STOPS!***

11. The following conditions should now exist:

- Smooth power assist • Noiseless operation • Proper fluid level • No system leaks • Proper fluid condition
- No bubbles, foam, or discoloration

12. If all of these conditions are satisfied, the bleeding procedure is complete.

13. If any problem exists, turn off the engine and see Special Conditions below.

### **Troubleshooting:**

The following symptoms indicate that there is still air in the system:

- Foam or bubbles in fluid (fluid must be completely free of bubbles).
- Power steering fluid level in the reservoir rises when the engine is turned off.
- Periodic bubbles in the power steering fluid.
- Discolored fluid (milky, opaque, or light tan color).
- Whining or groaning noise originating from the power steering pump

#### **Eliminating Air in the Power Steering System**

Follow the steps below to eliminate air in the power steering system.

1. Turn ignition off and wait thirty minutes. Recheck hose connections. Repeat start up procedures.

If problem still exists, replace or check for possible causes including:

- Return hose clamps
- Return hose O-ring or flare seat
- Pressure hose O-ring or flare seat
- All other connections

2. Eliminating Noise in the Power Steering System

If you are sure that all of the air has been eliminated from the system and the power steering pump is still noisy, do the following:

1. Check belts for slippage.

2. Mark the power steering pulley and make sure that it is not slipping on the shaft.

3. With the engine running, recheck hoses for possible contact with frame, body, or engine. If no contact is found, allow the fluid to cool and re-pressurize the system.

4. Once the fluid has cooled, start the engine to allow fluid to come up to operating temperature and recheck.

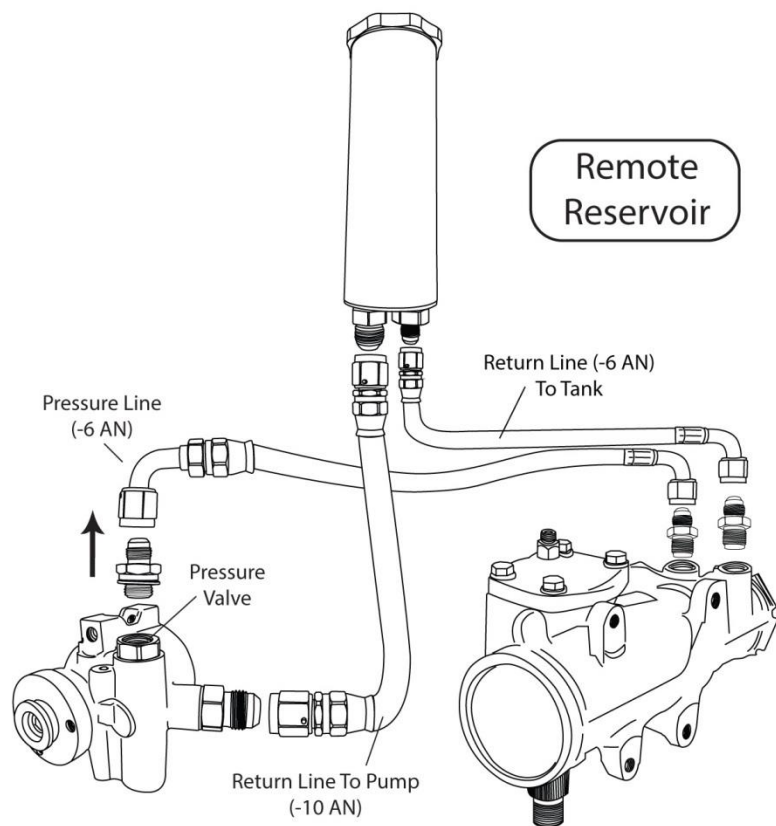
### **Eddie Motorsports**

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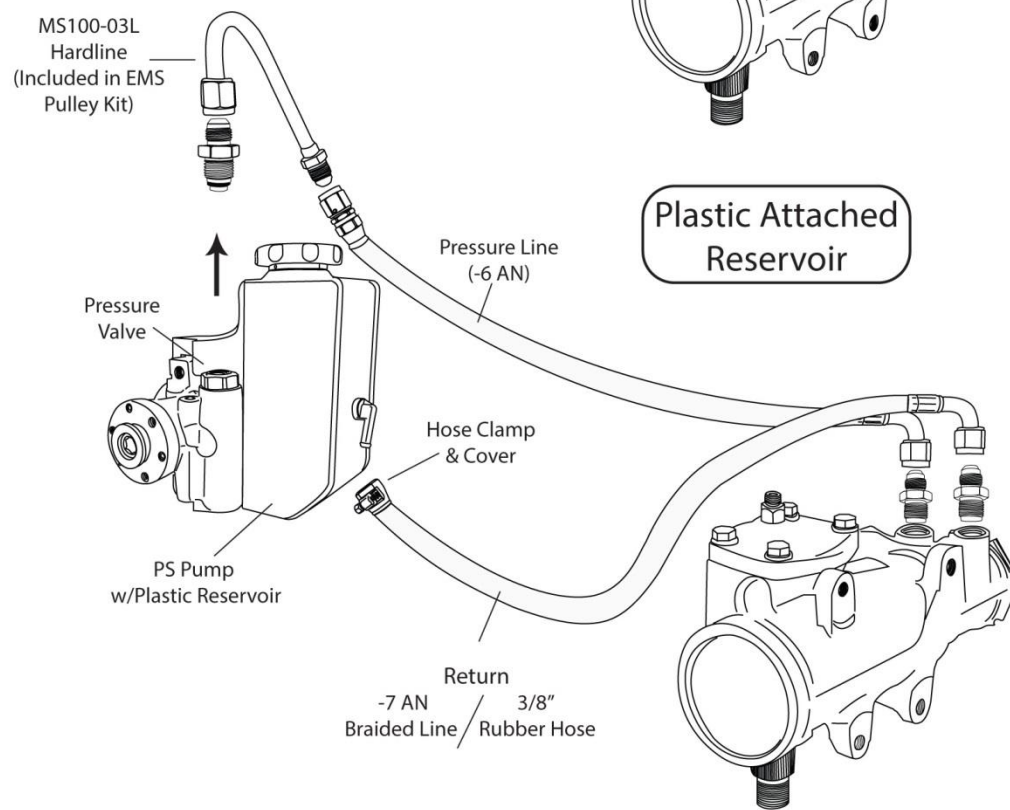
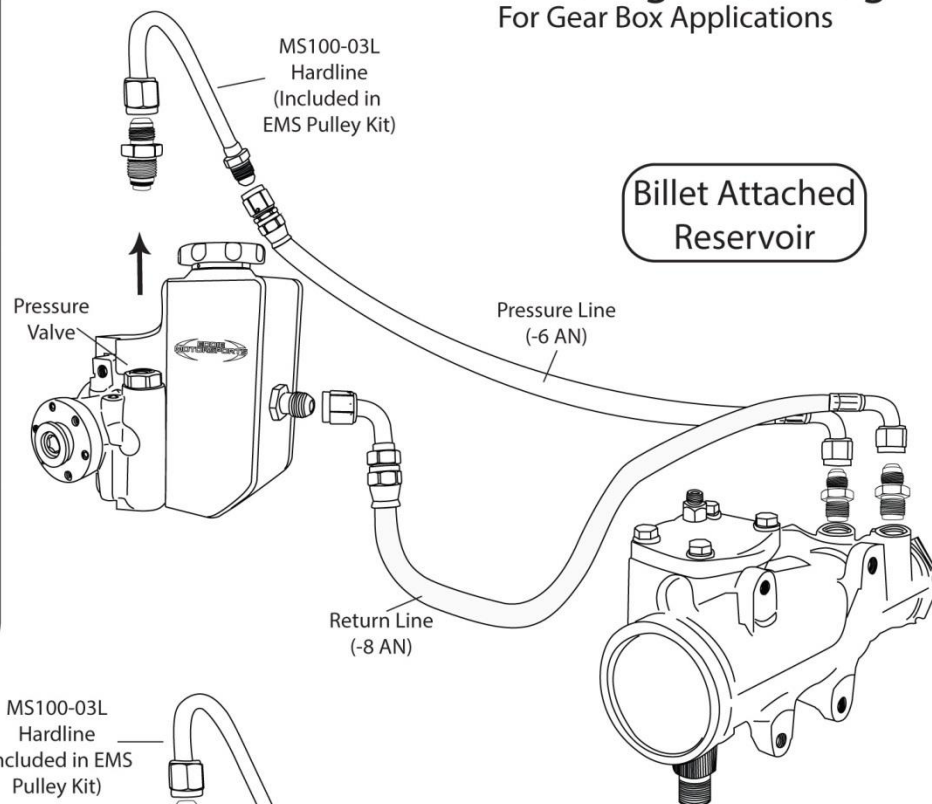
888-813-1293 ph • 909-945-9293 fax

[www.eddiemotorsports.com](http://www.eddiemotorsports.com)

- When using a **Remote Reservoir** make sure that the power steering reservoir is mounted so that the fittings in the bottom of the tank are higher than the power steering pump.
- **Billet Aluminum attached Steering Reservoirs** are not recommended for use in high usage or high performance applications or with Hydroboost systems. These reservoirs should be used in conjunction with a high quality power steering fluid cooler.
- Identify the pressure and return ports on your steering box, install the fittings, and connect the power steering lines.
- In most cases, the port on the gear box that is the tallest and farthest from the firewall is the high pressure line and the port closest to the firewall is the low pressure return line. Often, there are arrows cast into the valve body to show the fluid direction. But this is not always the case. **NOTE: It is the installer's responsibility to make sure that the hose connections are correct! CONNECTING LINES TO THE INCORRECT PORT CAN DAMAGE YOUR STEERING BOX OR RACK!**
- Hoses must not touch any other part of the vehicle. Steering system noise could be caused by the hose touching the frame, body, or engine.
- Make sure all hose connections are tight. Loose connections could leak and could allow air into the system. Do not over tighten O-ring fittings as the O-ring could be damaged.
- **Do not start your engine until the system is filled with fluid and fully bled.** Doing so may cause damage to the power steering pump components.
- For proper operation, read and follow the Eddie Motorsports power steering bleeding instructions THOROUGHLY AND COMPLETELY before beginning your installation.



## Power Steering Hose Diagram For Gear Box Applications



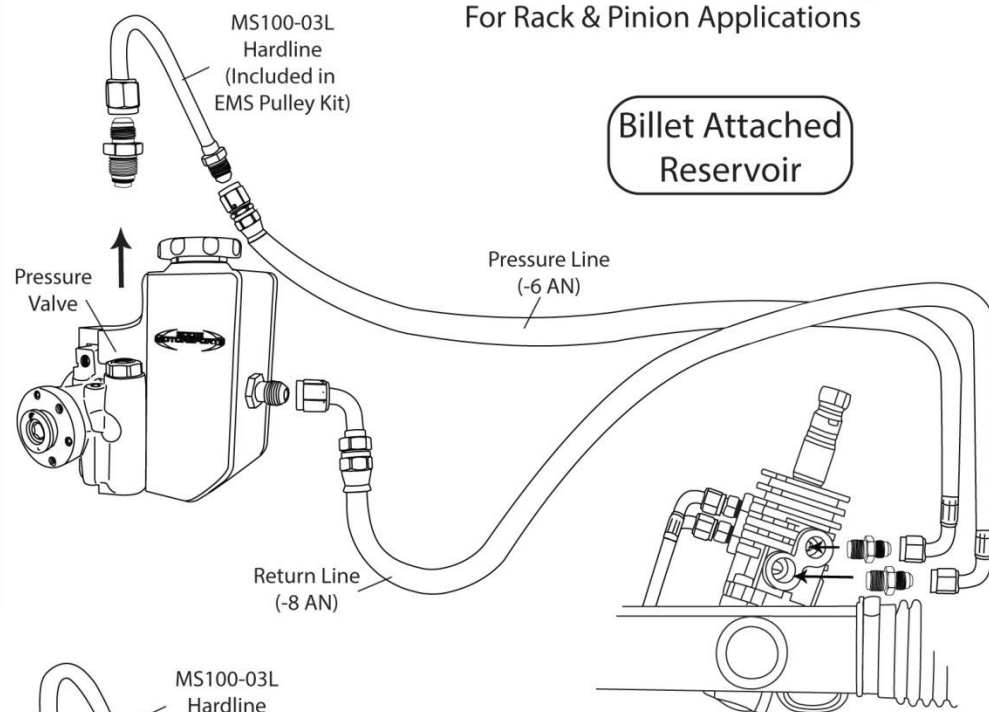


- When using a **Remote Reservoir** make sure that the power steering reservoir is mounted so that the fittings in the bottom of the tank are higher than the power steering pump.
- **Billet Aluminum attached Steering Reservoirs** are not recommended for use in high usage or high performance applications or with Hydroboost systems. These reservoirs should be used in conjunction with a high quality power steering fluid cooler.
- Identify the pressure and return ports on your rack and pinion, install the fittings, and connect the power steering lines.
- In most cases, the port on the rack and pinion that is higher/closer to the steering shaft is the return line and the port lower/closer to the rack is usually the pressure line. Often there is a "P" cast into the body of the rack that confirms the pressure port. But this is not always the case. **NOTE: It is the installer's responsibility to make sure that the hose connections are correct! CONNECTING LINES TO THE INCORRECT PORT CAN DAMAGE YOUR STEERING BOX OR RACK!**
- Hoses must not touch any other part of the vehicle. Steering system noise could be caused by the hose touching the frame, body, or engine.
- Make sure all hose connections are tight. Loose connections could leak and could allow air into the system. Do not over tighten O-ring fittings as the O-ring could be damaged.
- **Do not start your engine until the system is filled with fluid and fully bled.** Doing so may cause damage to the power steering pump components.
- For proper operation, read and follow the Eddie Motorsports power steering bleeding instructions THOROUGHLY AND COMPLETELY before beginning your installation.

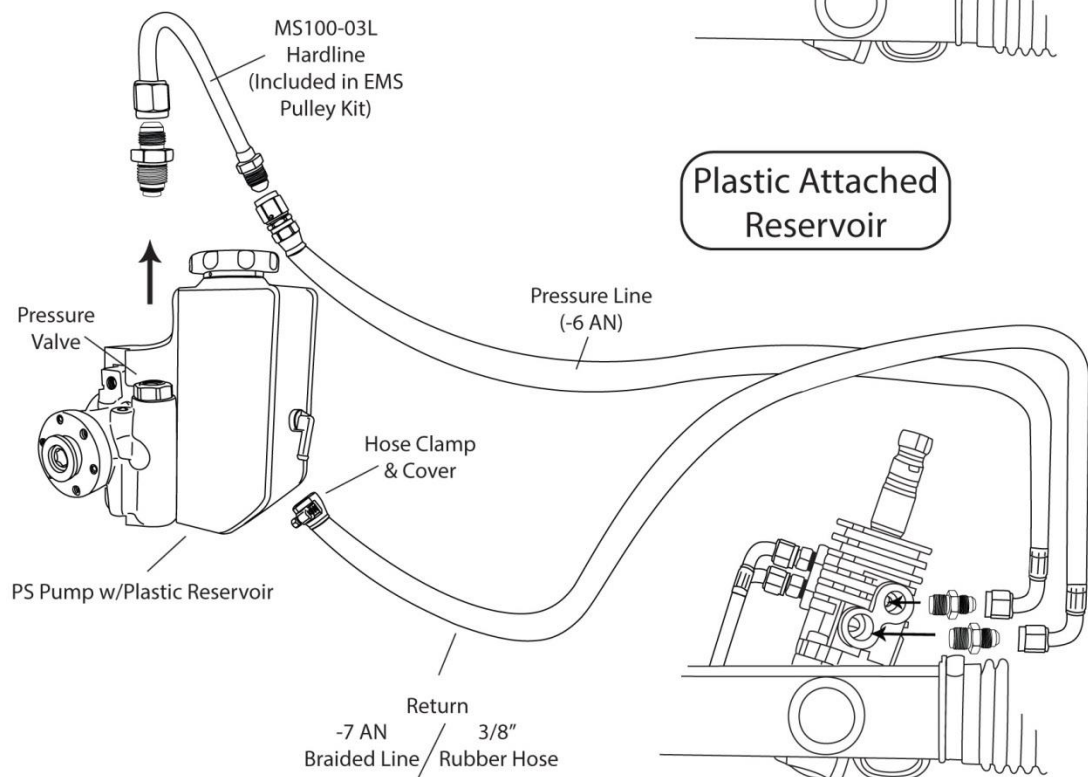
## Power Steering Hose Diagram

For Rack & Pinion Applications

### Billet Attached Reservoir



### Plastic Attached Reservoir



### Remote Reservoir

