



**MODERN - CLEAN - POWER**  
 Rick Gordon of Princeton IL. wanted something a little different than other '68 Camaro's. He decided to install a LS-1 with a Magnuson Super Charger to provide him with the Power, driveability and looks that he wanted.

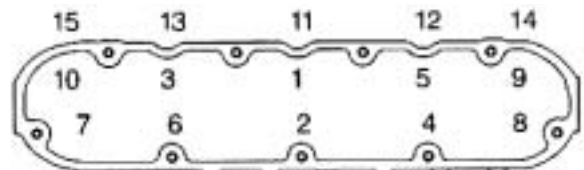
Rick brought his Camaro to Street & Performance with the engine a 4L60E transmission setting in the car.



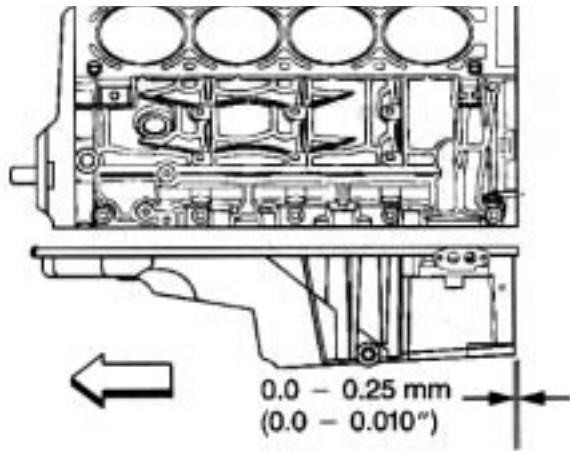
Everything on this car was clean and detailed, but the guys at S&P pulled the engine and trans to perform their special touch which wins so many car show awards.



Adam Gunn & Mark Kinkiadof of the S&P engine dept. were in charge of the installation of the drivetrain into the '68. Adam painted the block and began to install the heads.



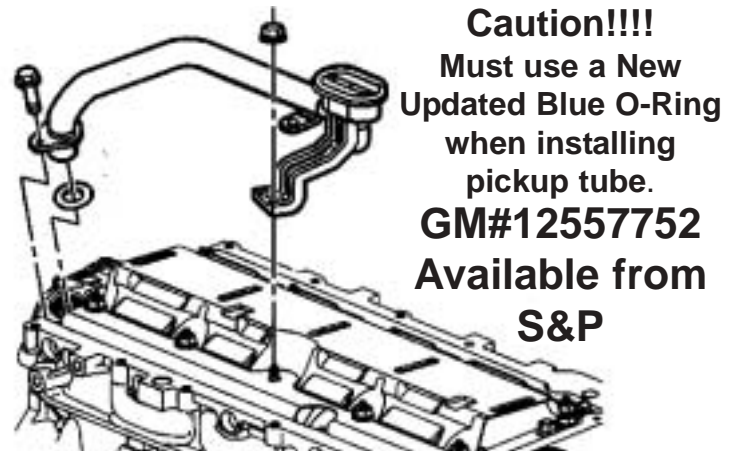
First pass tighten head bolts to 22 lb ft. Second pass to 90 degrees using a torque angle gauge. Tighten 1,2,3,4,5,6,7,8 to 90 degrees and 9,10 to 50 degrees. Tighten bolts 11,12,13,14,15 to 22 lb ft. begin with center bolt 11 and work outward from side to side.



**The installer must insure that the pan and oil passages are clean of any contaminants Important:** Be sure to align the oil galley passages in the oil pan and engine block properly with the oil pan gasket. Go to [www.hotrodlane.cc](http://www.hotrodlane.cc) under ONLINE TECH and LS-1/LS-6 for a complete oil pan installation instruction sheet.

Adam installed the S&P motor plates which will allow the engine mounts to move forward and set on the factory stands. He then installed the S&P modified oil pan to clear the rack and pinion steering that Rick had in the Camaro.

**S&P motor plates installed with rubber motor mounts.**



**Caution!!!!**  
Must use a New Updated Blue O-Ring when installing pickup tube.  
**GM#12557752**  
Available from **S&P**

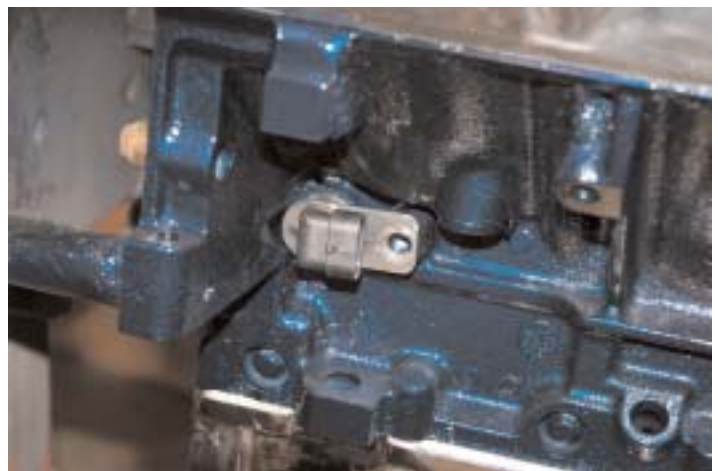
**IMPORTANT!** Push the oil pump screen tube completely into the oil pump prior to tightening the bolt, do not allow the bolt to pull the tube into the pump. Tighten the oil pump screen bolt to 106 lb in. Tighten oil crank shaft deflector nuts to 18 lb ft.



This photo show the two knock sensors under the intake on the LS-1. There is a harness that attaches to the sensor and exits the rear of the engine.



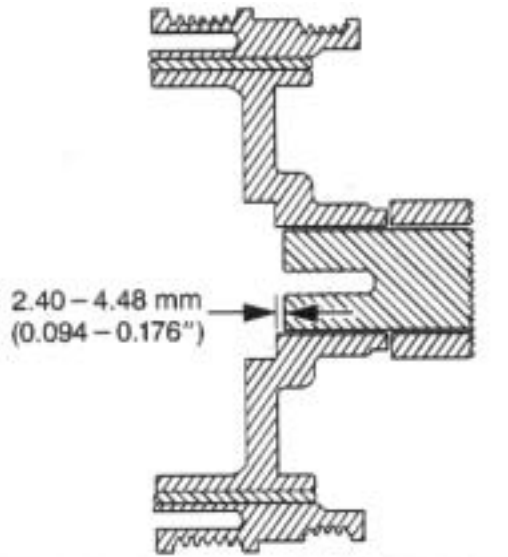
The right photo shows the crank sensor which is located behind the starter on the passenger side.





The LS cam sensor is at the back of the block just behind the intake manifold. Picture shown is with the manifold removed.

### Wiring harness from knock sensors that exits the rear of the engine



To install the balancer, use the old crank shaft bolt and tighten to 240 ft lbs. Remove the old bolt. The nose of the crankshaft should be recessed .094-.176 into the balancer bore as shown in the photo to the right.



Magnuson provides a kit with drill, ream, jig and dowel pins to pin the balancer to the crankshaft. Instructions come with the kit that guides you through the process of drilling and reaming a hole which is half in the crank and half in the balancer. The instructions and drill jig simplifies the operation.



With the balancer properly placed on the crank, Adam uses the jig and drill provided in the kit to drill the holes in the balancer and crank.



After drilling the holes, remove the jig and use the provided ream to ream the hole for the dowel pins. Shown here is how the holes are half into the crank and half into the balancer.



After inserting the dowel pins into the reamed holes, install a new balancer bolt that comes with the super charger, (GM#12557840) and torque to 37 ft. lbs. with a torque wrench and then use a torque angle gauge to tighten the bolt to 140 degrees.



Adam attaches the painted 4L60E transmission to the engine and lowers it into the engine bay of the Camaro.



The right photo show how the S&P motor plates perfectly align the motor mounts with the factory Camaro stands. Left photo shows the engine in place waiting for the Super Charger to be installed. Please be sure to completely read the instruction manual provided with the Magnuson Super Charger. S&P has tech support with the knowledge and parts to help with a Super Charger application.



The Super Charger comes with a stainless steel steam line.

Placing the Super Charger onto the LS-1. Notice the super charger comes with a plastic idler pulley. S&P offers aluminum pulleys in different sizes for the drive pulley and the idler pulley. The stainless steam line will be connected to the water pump later in this story.



S&P makes these Chromex coated headers to clear the steering rod for rack & pinions set up among many other special applications.



We mounted the AC, alternator brackets and crank cover being sure to use anti-seize on all bolt threads. The crank cover comes with instructions on how to drill and tap the Camaro balances. The Vette balancer only needs to be tapped in the existing holes.



The balancer that is on your engine is what will determine what type of brackets and Super Charger that you will have to use. You can see the visual difference in the photo to the left.

1. Vette Balances (shortest)
2. IROC/TA Balances (3/4" longer than Vette)
3. C/K Truck Balances (1.5" longer than Vette)

The power steering bracket is mounted to the block first, then the pump will be mounted to the bracket with the bolts provided. S&P also has a power steering kit that places the pump high for applications such as G body and Vettes to clear the gear box or rack.



The steam line from the heads can be run to a "T" in the upper radiator hose or to a fitting in the upper tank of the radiator, however we choose a cleaner option of running a short hose from the water pump to the steam line. This is done by drilling and tapping the water pump for a 1/4" pipe x 90 degree slip on hose bib fitting as shown in the photos above. S&P offers this fitting as well as the radiator fitting and stainless "T" for the inline upper radiator hose application.

The steam line is connected to the fitting on the water pump.





Installing the S&P fuel pressure gauge. This is a very useful tool when starting the engine for the first time or to see if you are having fuel pump problems throughout the life of the engine.



Putting the LS-1 throttle body onto the Super Charger. The PCV line has to be rotated forward and down. This can be done using an adjustable wrench.



The Griffin radiator came with an aluminum shroud and Spal electric fan already mounted. Using a Goodyear 61331 upper hose and a Goodyear 60374 lower hose, that we connected to a S&P 360/45 degree waterneck to simplify the install. S&P chrome aluminum hose end covers were used to give a cleaner appearance to the installation. The cross flow radiator provides the inlet and return hoses on the passenger side which also makes the radiator hose installation easier.



We used Areo-Quip power steering hoses for the pump to the rack and reservoir. We used a GoodYear Gatorback belt # KO61203. Make sure that the return line from the reservoir to pump is rated for 27 inches vacuum. We then filled the reservoir with GM power steering fluid #12345867 which is recommended for use with the GM type three pump.



Adam is double checking all of the fuel line connections from the super charger to the Rock Valley stainless steel tank for leaks before activating the intank electric fuel pump which will provide the 50-55 lbs of pressure that the LS-1 will need to run. The super charger comes with a dual fuel line system with a feed and return. S&P provided the Tube Tech stainless fuel line kit and a stainless fuel filter kit from tank to engine.

**BESURE to check for leaks in the fuel system before starting the engine for the first time.**

Lokar's '67-'69 Camaro gas pedal was used along with a Lokar braided LS-1 throttle cable. A 6 cylinder Camaro gas pedal can be used since they pull from the inside of the firewall were a V8 Camaro pedal has a lever on the outside of the firewall. Notice that we also used a Lokar 4L60E floor shifter.

**BESURE to check the entire throttle assembly for any possible interference or binding that could cause a stuck or hung throttle. SYSTEM means from the pedal all the way to the throttle body.**

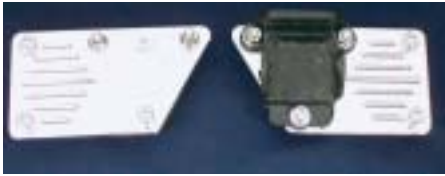


Notice the aluminum 90 degree elbow between the manifold and the K&N filter. This elbow kit is available from S&P for a three pin or five pin Mass Air Flow applications.

This LS-1 Super Charger package makes for a powerful and dependable application for any vehicle without sacrificing drivability and fuel mileage.

To program the LS-1 computer, S&P will need to know the Cubic inches, Cam Specs, Auto or Stick Trans, Gear ratio, Tire Diameter and Emission or Non Emission.

**S&P can also do DRIVE BY WIRE Super Charger Applications.**



S&P motor mount adapters allow you to use the frame stands and stock motor mount and will locate the LS-1 in the proper location. If using rack and pinion steering or stock suspension, the oil pan will need to be modified.



S&P engine harness with 4 wire hook-up plugs into the engine and the transmission. Red wire to key, orange wire to starter, black to ground and brown to the fuel pump. All wires are labeled and color coded with instruction sheet. The harness also includes relays, vats by pass, and diagnostic link.



Factory LS-1 harness.



S&P offers a new straight and a 360-45 degree swivel water neck.



98 IROC/TA & 97-98 Vette  
**Service # 16238212**



99-2002  
IROC/Vette/C/K Truck Computer  
**99-00 Service # 09354896**  
**2001 Service # 52369718**  
**2002 Service #12200411**

S&P can reprogram your LS-1 computer on an exchange basis. We must know tire diameter, gear ratio and transmission type and cam or engine mods.



T-56 Manual Speedometer Tail Housing Kit. Exchange



96-up 4L60E 6 Bolt to 4 Bolt Tail Housing Adapter for Manual Speedometer. Kit includes elec VSS and proper Gear Drive  
Gear ratio and tire rollout is needed when ordering.



**New S&P 99-UP LS-1/LS-6 Aluminum Valve Covers for remote coil applications. Smooth, Z06, LS1 designs in stock. With or without PCV Breather Holes. Comes complete with stainless steel bolts and GM gaskets. Will Clear Roller Rocker Arms. Custom Designs are available.**



S&P offers modified oil pans out right or exchange basis to clear stock type suspension, drag link and rack and pinion. S&P can send you an oil pan and you return yours after installation. S&P also makes custom pans for other applications such as a 55-57's.

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