

You bought a LT engine! What you need to know!

Overview

Fuel system

Cooling System

Transmission control

LS and LT Differences

AC System

Power steering

When I got my hands on my first LT engine I saw a bunch of new sensors and connections. I had to figure out what they were and what they did. One vital sensor that needs to be checked is the fuel rail sensor. This determines what model of engine you have. I classify this as an early and late model. The early model (2014-16) used a 4 pin fuel sensor.

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The late model (17-19) uses a 3 pin sensor.



Once this is determined we can make sure the proper wiring harness, ECU, and TCM combo is used.

To understand the rest of the engine sensors and connections please watch video

[Gen V LT1 engine harness overview \(L83 and L86\) on youtube](#)

Fuel System-

There is a lot of confusion on this and we want to make sure we do the correct thing here.

When the swaps first started to appear there was an article on one of the car magazine websites. In that article they stated that GM advises to use 74 psi of fuel pressure if not running a PWM fuel system. This is a lot of pressure to run at all times. This can cause fuel pump failure and heating of the fuel resulting in vapor lock. I started testing the standard LS fuel

system to see if it would work on the new LT engines. The results were great. I found no difference using a PWM variable pressure system versus the 57 psi regulated fuel system. It is now widely used. The pump must support the horsepower requirements.

PWM Fuel Systems-

Benefits and drawbacks

Benefits

Quiet and efficient. OEM reliability. Factory fuel pump assembly recommended only.

Drawbacks-

More complex, fuel pump fitment, and tank options limited

PWM Fuel System Information-

The PWM fuel system uses a GM controller and inline fuel pressure sensor that operates the fuel pump from 45 psi at idle to 74 psi at WOT. The fuel pump has a built in fuel pressure bypass set to 74 psi. This system is able to supply great volume at demand. This gives good pump life and only uses high pressure under heavy load. For the system to be installed you must fit a GM fuel assembly to your fuel tank. GM has several pump designs. Truck pumps are very deep. The camaro pump is shallower working in some classic car tanks. If an aftermarket pump is to be used a regulator will need to be installed and set to 74 psi. This will act as the bypass. The gm controller can not control fuel pressure at WOT without a bypass. It goes full power and uses the built in 74 psi bypass. If not used 100 psi+ pressures have been seen causing pump failure.

Non PWM Fuel System-

Choose your favorite brand of fuel pump. I prefer the aeromotive stealth 340 pumps. Quiet and great performance. Choose a regulator that suits your needs. Pressure can be set anywhere from 55 to 65 psi. I use 57 psi as a standard. I advise to never use an external pump. I have seen very high failure rates. In-tank is advised. Holley now has a great universal kit to mount in classic car tanks. This is the SNIPER DIECAST 340 LPH IN-TANK RETROFIT FUEL MODULE RETURNLESS SYSTEM.

Cooling System-

Radiator types needed-

The LT is a very efficient engine. Your temperature range when running a factory thermostat should be around 190 to 222f. When a stock engine is used a stock style radiator works great. Extra cooling capacity is only needed when making 600 plus hp or towing heavy loads. If temps routinely go above 225 extra cooling should be considered.

Cooling Fan Options-

PWM FANS-

The LT ECU is designed to control GM PWM fans only. PWM fans are affordable and work great. When using this technology you get the following benefits

1. Variable speed- Whisper quiet
2. AC controlled based of ac pressure
3. Fans shut off at highway speeds
4. Efficient with no large amp spikes
5. No relays to fail
6. Transmission ECT controlled

Brushed Fans(On/OFF)-

No benefits using these except if you already have them installed in your swap

I recommend using a standalone system for this.

(Ron Francis Wiring Dual Electric Fan Relay Systems AR79)

The wiring kits for this use a thermostatic switch to turn the fans on and off. The switch can be installed in the engine block using a ICTbillet adapter.

Transmission Info

Automatic transmissions-

The Gen V system is designed to use the 6L80, 8I90, and 10I80 transmissions. These have precise shifting control and support tow haul, sport mode, and manual shifting.

I now support 4I60 or 4L80 transmissions. These must use a standalone controller.

