

Tejas SteelWorks, Inc.

One Recipe to LS Swap Your '73-'87 2wd GM Truck



Tejas SteelWorks Square Body GM LS Swap Guide

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Tejas SteelWorks, Inc.

Hutto, Texas

Tejas-steelworks@austin.rr.com

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Purpose & Scope

The purpose of this guide is to provide a comprehensive list of elements required to perform a factory like installation, and the scope of the details here is limited to 2wd GM trucks, ½ ton-1 ton. Four wheel drive trucks are less flexible, due to the extensive number of changes that might come from attempting to relocate the transmission and transfer case. While motor mounting can be moved to accomplish many of the objectives outlined here, 4wd LS swaps are more complex, so will not be addressed here. If you have a 4wd, please contact us to discuss options.

Some of the elements described are taken from 1987 models, as this was the first of the factory fuel injected models. Generally speaking, it is possible to retro-fit parts from the 1987 models to earlier models. This is intended to accomplish various objectives with less effort, while taking advantage of factory engineering.

Most of the elements described here are aimed at a very “factory stock” installation. For this reason, the OE engine management will be the only fuel injection and transmission control outlined here. Other parts, such as cooling fans, are hard to beat with aftermarket parts, so we like to harvest those from the yards

Some may intend to make significant performance upgrades. Many of those upgrades may well be compatible with the approach outlined here, there are simply too many combinations to say so. Additionally, it is a well proven method to avoid adding complexity of changes to an already challenging task. Once up and running, performance upgrades can be approached like any factory vehicle, with far less complication.

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Sources

Most of the components detailed are sourced from OE applications, across various years. Aftermarket parts are only employed when more suitable than OE parts. Priority has been placed on suitability of parts, rather than price.

The most used suppliers for various components should be familiar: RockAuto.com, Summit Racing, Auto Zone, O'Reilly , etc.

Price comparisons using EBay and Amazon are very beneficial in controlling costs. Part numbers and brands listed are what we have used successfully. Interchange and substitution is certainly possible.

Some components are best when well seasoned, and a good relationship with your local Pick & Pull is very helpful.

Choices

What engine and trans do you want? Any LS engine is a good basis to hotrod later. Even the little 4.8L can easily make 450 HP.

Plan on towing? The 6.0L is king, but they all can manage.

What trans? Thinking you might keep your original? Don't. Your 700r4 compares to a 4L60e about like a 283 compares to an LS9. The 4L60e can hold 700 HP, built right, and the 4L80e makes it look like a sissy. Either is capable of 20+ mpg, with a 3.08 gear. Both will tow just fine. Both can last 200k miles. Ever install a shift kit? Both use those, too, but now you can tune every aspect of transmission behavior with a laptop. Seriously, EVERYTHING.

You can mix and match engine and trans combos, some adapters required...

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Engine and Transmission mounting

The variety of engine mount adapters is amazing. This can create a lot of confusion for anyone taking on their first LS swap. Part of the confusion stems from the reference point for “stock” location. The “stock” location referenced here is based on the position of the mating surface between the engine and transmission.

Two wheel drive trucks enjoy a lot of flexibility in engine placement because the only limits are imposed by the position of the radiator and the rear axle. Four wheel drive trucks are not so easy to get along with. Transfer case mounting and shifters, plus the complexity of managing two sets of driveline angles, make for a single best position.

One of the best attributes of the LS based engine is the weight. There can be as much as 150 pounds difference between an iron block/iron head 350, and an aluminum block/aluminum head LS. The iron head LS is noticeably lighter, than a 350 SBC, but another 80 pounds is lost with aluminum heads. For this reason, the LS motor can be mounted forward of the stock position without adverse effects on handling and weight distribution.

Most of the references here are about the LS truck engines, as they are the most common candidate for a swap. Passenger car LS engines enjoy a more compact height, with shallower pan and shorter intake, but are wider in places. While side clearance isn't an issue, we have not verified accessory fit with the mounts used here. Truck mount accessories work quite well.

The Tejas SteelWorks mount adapters work with OE clamshell mounts, requiring a notch in the lower front corner of the clamshell cover to clear a protrusion on the engine block.

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Position

The mounting position used in this outline is approximately three inches forward of “stock”. This position was derived by mocking up the engine and transmission so that two objectives could be met:

1. retain the LS truck A/C compressor mounting on the lower right side, (aftermarket relocation brackets are expensive)
2. ensure adequate clearance at the cross-member to retain the LS truck oil pan, (aftermarket swap kits pushing oil pans are unnecessary)

The Tejas SteelWorks LS motor mount adapter plates achieve this. Others may, as well. Most sacrifice the A/C mounting.

The placement of the engine provides for sufficient space between the radiator and block to install LS truck or 5th Gen Camaro (2010+) waterpump, with room for typical electric fans. Engine driven fans with a hydrostatic clutch will not fit.

The rear of the truck intake clears the firewall by about 5 inches. The engine rides fairly high in the chassis, placing the oil pan very near flush with the underside of the cross-member. Trucks lowered more than four inches should look closely at ground clearance, and substitute a shallower pan if appropriate. “Laying Frame” was not a consideration in this installation. The LS truck intake will just brush the hood insulation with the cosmetic cover in place. Passenger car type intakes would offer several inches of clearance.

The engine sits a little steeper than usual, at 4-6 degrees, depending on transmission used, and transmission mount. This should be considered when setting up driveline angles. (more later) No particular countermeasures were required in the pilot build, which was lowered four inches.

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Driveline

Driveline angles are very important, and often misunderstood. LS swaps in a '73-'87 GM truck are no exception, but trouble is easy to avoid with a little awareness.

Engine position and transmission mount position are what determine driveline angle. Some of you may have heard that it **MUST** be 3 degrees. Not quite. What is more important is the relationship of the Drivetrain (engine & trans) to the Driveline (driveshaft and rear axle).

The objective is to make sure that the operating angles of each u-joint are as low as possible (but not zero -EVER), and that the operating angle of the front joint and rear joint are as close to equal as possible. LS truck engines have little room to move in. The truck oil pan should be flush with the cross-member, and that will put the decorative cover on the truck intake very close to the hood insulation. The drivetrain angle will be determined by transmission mounting. The stock transmission cross-member tends to work fine, but crowds dual exhaust, as usual. If adjustment is required, you can shim the transmission mount upward. Downward is bad.

Depending on how much your truck might be lowered, no particular adjustment to pinion angle should be required, but make sure to check it with a digital level or angle finder. Keep the objectives above in mind. Wedge shims can be used to adjust the pinion angle, if needed.

Lastly, the mounting position here normally requires a longer driveshaft. That is money well spent, since you're about to add all that power! Longer shafts usually need to be larger. Look at the one that comes in your donor truck. It's a good candidate.

Exhaust System

Engine mounting position also affects exhaust fitment. While it is possible, with very particular engine position, to use the LS truck exhaust manifolds, they will not fit in this installation. The manifold collectors are splayed way out to the sides, placing the driver's side within the space of the right frame rail, and the passenger side requiring a substantial notching of the top flange on the right side frame rail. **Cutting away any part of the frame rail behind the front wheels is highly discouraged.**

The manifolds used here are Hooker cast iron manifolds designed of the GM E-Rod crate motors. They are about three inches more narrow, at the collector flanges, when installed. Fifth Gen Camaro exhaust manifolds may fit almost as well, but will be somewhat wider. Other applications have been used, as well as some aftermarket tubular headers, but none have been confirmed with this engine placement. Two points to address: LS engines notoriously break exhaust manifold bolts due to rapid thermal expansion and contraction. GM did release improved bolts, but they are quite expensive. We have found that ARP offers bolts, slightly longer than stock, that will hold up much better. We also use braided stainless flex joints in the exhaust pipes to allow each manifold to move independent of the exhaust system.

Exhaust pipe for stock engines should be modeled after the engine donor vehicles, with respect to flow. Dual 2.5" or single 3" exhaust is just fine. Long tube headers do offer power gains, but usually at the expense of torque production. Peak power will often be moved too high to be of use to most drivers.

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Cooling System

The stock radiator used in the '73-'87 GM trucks is adequate for cooling an LS engine. Our preference is the radiator for the HD Cooling to fit a 454 c.i. application. This offers max cooling that fits the core support as GM intended. The pilot build runs at 200 degrees, no matter how hot or cold the weather is.

Electric fans are required due to the space limitations of the engine's forward mounting position. The most direct approach is to use twin fans, about 12 inches in diameter, staggered high and low. Simply hanging a fan against the back of the radiator core is not advised. A proper shroud allows air flow from the entire core to reach the fans.

One of the most challenging parts of installing an LS engine is finding the correct radiator hoses. This task is greatly simplified, and the engine compartment greatly cleaned up, by swapping the truck waterpump out for a 2010 Camaro pump. This also facilitates easier intake air routing (see below). The 2010 Camaro waterpump is available as an assembly, with the belt tensioner and pulley, thermostat and thermostat housing/water neck. The top water neck is on the driver's side of the engine, and uses the top hose from a '05-'08 Corvette. The lower hose is easier to connect, with the thermostat housing pointed lower, and comes from any 2wd LS truck. Both hoses will require minor trimming to length. The 2010 Camaro waterpump requires relocation of the idler pulley, using a \$30 kit from Dirty Dingo, or a longer bolt and spacer, to position the idler between the alternator and power steering pump. The accessory drive belt used is from a Hummer H1 with 6.5L diesel.

Fuel System (1 of 2)

EFI fuel systems are another area where a variety of solutions exist, but some are more suitable than others, depending on the mission goal. Unlike a dead-end, low pressure arrangement used in a carb application, where fuel is accumulated in the carb, available for use as demand varies, EFI systems move high volumes of fuel, at high pressure. The “return-less “ system is something of a myth. Every system returns excess fuel to the tank, whether it makes a full loop from the injector rails, an abbreviated loop from filter/regulator midway in the system, internally within a frame mounted pump, or within the tank. This is because the system must lift enough fuel for sustained high throttle operation, without benefit of a reservoir on the intake, like a carb. In an OE application, the excess fuel is returned to the tank so that it will shower the in-tank pump, cooling it when the fuel levels are low. This cooling is key to longevity of the pump. In-tank pumps also run more quietly, with noise dampened by fuel, in an enclosure, hanging on brackets, from the frame. A frame mounted pump will amplify noise through the frame rail, only camouflaged by loud music or mufflers.

Another important part of OE EFI fuel systems is the baffle in the tank. Again, without that reserve of fuel at the engine, like a carb, an EFI system must never suck air while accelerating, turning or stopping , when fuel levels are low. The baffle keeps fuel from running away in these maneuvers. While there are aftermarket modifications for non-EFI tanks, the low cost of a new EFI tank makes it impractical to keep existing tanks.

Fuel System (2 of 2)

For trucks with dual tanks, the tank selector valve is rated for 75 psi, but must have six ports for the return fuel if the regulator is retained on the fuel rail. The correct valve is found in 1987+ models.

Fuel Lines

If you happen to have an '87 model, you already have almost everything needed. Hard lines are a must for both supply and return lines. If you don't have them, you can order replacements for an '87 easily enough, or get lucky in the salvage yards. In any case, minimize the amount of soft line used.

When selecting fuel hose, be very wary of what's being marketed as fuel line. One online performance supply offers a blue push-lock compatible hose that is not compatible with gasoline (their catalog page even says so!). It is just high grade air hose, and incompatible with fuels. Our preference is Gates Barricade Fuel Injection hose. It is good for ALL FUELS and 250 psi. It is not push-lock compatible, so use quality clamps, or check out a tool called Clamp-Tite on YouTube.

Stock fuel rails work fine until you really up the horsepower, so just look to Russell Fittings for the adapters to connect –AN fittings to the rail and hard lines at the frame. TBI applications have a metric connector on the hard lines, 16mm for the supply, 14mm for the return.

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Electrical (1 of 3)

The factory electrical components are usually located on the left fender, in LS trucks. Taking advantage of this can simplify underhood wiring in your LS swap. Battery cables, which include the alternator charge wire and fuse, ECM, fuel and A/C relays, cruise control, etc., all can be positioned on the driver side fender. A driver side battery tray was used in '73-'87 diesel applications, and makes a great addition. Additionally, the top radiator hose and battery, now on the left, has cleared a path to the right for the air intake tube. With about a foot of 4" tubing, an elbow and a couple of rubber couplers, the air filter can rest in the original battery tray, on the right.

Like the battery, the ECM was originally on the left fender in most LS trucks. Placing it near the battery is easy on the left fender. If desired, it can also be mounted under the dash, passing through the firewall just to the right of the intake, although this will require a number of long wire runs, depending on where relays and fuses are mounted. It is typically helpful to extend the harness by 12" to 24", allowing more flexibility in ECM placement.

ECM harness selection is another choice where everyone has an opinion and, seemingly, no two are alike. A new harness typically runs about \$500, with fully customized versions as high as \$1000. Cheaper options usually have basic features omitted, so read the fine print. A "rebuilt" or converted OE harness is our preference. You get OE quality wire and components, and retain whatever options you desire to keep. It can be challenging to rework a harness, so leaving it to a pro is recommended. The time and frustration saved is well worth the money spent.

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Electrical (2 of 3)

This is also an opportunity to determine what features you want to keep. For a factory like installation, we like to keep the ECM controlled A/C relays, compressor and cruise control. With careful attention to detail, the LS systems can be fully integrated with the OE truck wiring so that everything looks and works like original from behind the wheel.

Gauges are easier than you think. In 1997-2000 GM models, factory gauges still used resistance type instruments, while also providing 5 vdc reference signals to the ECM. This means that correct selection of sensors enables your original dash to work quite well. Use a 3 wire temp sensor from '98 Camaro, with the matching pigtail. (tell your harness builder). Connect the OE gauge to the third wire, while the other two feed the ECM. Pick up a 16mm to 1/8" NPT adapter to install your OE oil pressure sensor on the LS block at the back of the intake. That '87 fuel sender/pick-up assembly mentioned earlier feeds your stock fuel gauge. Your OE volt gauge wire just needs a "key-on" power source near the battery. Reroute this from the old alternator connector. The ECM has a processed tach signal output that is compatible with most OE and aftermarket tachometers. The speedometer permits options. Easiest: keep the cable, and spend some bucks on a Speedo drive module (not cheap, but simple); Or, swap an electric speedo from a '89+ Suburban into the dash. You might find it easier to swap the whole cluster, but that comes with reorganizing all the wires in the cluster plug. (another write-up) This is one way to get a factory MIL (malfunction indicator lamp), also known as "check engine" light.

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Electrical (3 of 3)

Cruise Control requires a little work, but is easy enough. Cable operated throttles should use a servo module from '89-'94 model GM vehicles, with some under-dash re-routing of wires. (that's another write-up, too) Electronic throttle engines can simply feed the cruise stalk wiring to the correct wires on the ECM, which manages cruise without an external servo/module.

Tuning

Success in any LS engine swap is measured in the driving experience. When you get done, you either have a seamless experience, very much like the late model truck that donated it's engine, or you have a drive fraught with bugs and hiccups, with reliability issues that do nothing to inspire confidence. Here are some considerations.....

Many harness makers offer a "base tune" or ECM re-flash. Don't confuse this for all the tuning you will need. This is just enough to get you running, and even if every other aspect is a very close match to your needs, there are too many improvements to be made in tuning to your particular case. Budget \$500 for this, after your swap is complete. Here's why..

The donor truck had 31" or larger tires, a 3.73 gear ratio, and weighed 5000-6000 pounds. Your truck has 28" tires, 3.08 gears, and weighs 3900 pounds. Shift points? Firmness? How much of the transmission tune will work properly? (from experience, not much!)

The donor ran a factory air intake, and a really, really long 3" exhaust, dual cats, and a huge, restrictive muffler. Your truck has what amounts to a VERY high flow air intake, and 2.5" duals, no cats, and a pair of VERY high flow mufflers, dumping ahead of the rear wheel. Do you think there are tuning opportunities? Oh, yeah!

Ever heard of "Torque Management"? This is the factory Nanny. It's only job is to ensure you don't over-stress the powertrain with your maniac driving. Yeah, you turned off traction control, but you have NO IDEA how much power can be unleashed with skilled tuning of Torque Management settings. 15

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Air Conditioning

There are many opinions about the best way to execute Air Conditioning. Most seem to hinge on engine placement. If a stock engine and transmission location are used, relative to the firewall, the right side engine mount will interfere with the LS Truck compressor mount on the lower right side of the block. This will require an aftermarket bracket to move the compressor up higher on the right side. Both the OE R4 compressor and Sanden compressors are commonly used in this position. The brackets can range in cost from \$160, to well over \$300.

One of the original objectives of the Tejas SteelWorks engine mount adapter plates was to retain the low mount compressors, as it comes with the LS Truck engine assemblies. Our mounting plates position the engine far enough forward to clear the interference between the mounting stand and the compressor, and high enough to allow the compressor to tuck inside the frame rail, with reasonable clearance for hoses. A very minor notch in the top edge of the frame permits the hoses to exit straight away from the compressor. They should have 4" to 6" of hard line, before going to rubber hose. The outlet line (smaller) should bend forward at 90-120 degrees. The inlet line (larger) should just have a straight line, with a large loop in the hose to relieve any strain before heading back to the evaporator case. Our installation uses a Denso **10S17F** type compressor, like those used on a 2003 LS Truck, with two separate port fittings.

Compressor controls can be managed by the early OE system, or by the LS ECM. High and Low pressure switches will be OE, for whichever method you choose.

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Parts List (1 of 6)

❑ Engine – 1999+ 4.8L, 5.3L, 6.0L or 6.2L

Any LS engine can be used. Truck engines are preferred for better availability, lower cost, and torque production

❑ Engine gaskets – Fel-Pro or GM

Unless you score a real cherry, take time to reseal everything but the heads. Easier now than later! **Make sure you get the o-ring on the oil pick-up in the pan.**

❑ Transmission – 4L60e, 4L80e, 6L80e, and their derivatives, T-56

Any GM manual or automatic can be used. It is the 21st century, and we have 85 mph speed limits, so get with the program. The ECM already manages a transmission.

❑ Torque converter & Flex-Plate (included with engine/trans)

If you bought a complete take-out, skip this. If you need to mate an early automatic, you have some homework to do. There is a spacer kit from GM Performance that makes it easy: **12563532K**

❑ Transmission seals, gasket and filter

You are about to put \$100 of fluid into this thing. Do the filter and seals. **Valvoline Max-Life transmission fluid** is great.

❑ ECM – Best if it matches engine and trans, less tuning

The biggest unknown is tuning. Keep it to a minimum by using the ECM that came with the engine & trans. There are two states of tune: a BASE tune deletes stuff you don't want, and unlocks any anti-theft features. It will get you up and running. A full tune will include tire diameter, gear ratio, torque management, shift behavior, air/fuel ratios, timing maps, etc. This is where power and fuel economy come from. \$500, make sure they work on a dyno.

Parts List (2 of 6)

ECM Harness – reworked original, keep A/C, cruise, etc.

Many will advise a new harness, or a simple kit, even DIY. You will save yourself a lot of heartache by letting a pro handle it. If full factory integration is what you have in mind, your harness supplier will need to know what you plan to keep. A/C, cruise and full instrumentation are easy enough, with some planning. Beware adverts claiming low prices. They usually add on \$50 for each box you check, use cheap plastic loom, and the lowest cost wire. GM wire and terminals are what you want. Braided loom makes a huge difference in appearance and longevity. This is the nervous system for your pride and joy. Spend some money! \$450-\$650 reworked, \$1000+ new. We use Lone Star Dyno!

Slip Yoke & Driveshaft – get this from engine donor, should be larger and longer, cut to size & rebalance. Other engine mounts allow you to reuse your stock shaft. So the money can be spent on expensive A/C brackets, leaving you with a 30+ year old, undersized driveshaft; Or keep the stock A/C bracket and spend some money beefing up the driveshaft.

Motor Mounts & adapters – factory clamshell mounts and covers; When used with Tejas SteelWorks adapter plates, the covers require a clearance notch to accommodate a square protrusion on the side of the block. This protrusion interferes with the cover on the lower, forward corner, on both sides.

Transmission mount – The stock mount for any 2wd LS application is a single stud biscuit. This works with the majority of installations.

Parts List (3 of 6)

☐ **Transmission cross-member – Stock or aftermarket**

Factory cross-members work fine, but may need relocation, depending on transmission used. The pilot build was developed with the factory cross-member in the rear most location, and mounted a 4L80e. The Tejas SteelWorks cross-member was developed specifically to simplify dual exhaust installation. Other aftermarket solutions range in cost and complexity.

☐ **Radiator – Stock types, HD option recommended**

Our preference is the OE 454 HD cooling option. In '87 models, it happens to be the same construction used with the LS engine. It has an aluminum core and plastic tanks. This design is well proven, and works wonderfully in the pilot build. Copper/Brass radiators are our second choice, but come with quite a price tag. All aluminum radiators are all the rage, but cost a good deal more than the OE types, and the less expensive offerings have been known to react with coolant and coolant additives. Again, buy quality. In this case, it's also the least expensive. **Spectra Premium!!!**

☐ **Radiator mount** – stock types, if 454 HD option above is desired, radiator mountings should match. The one piece top plate for the 454 applications requires a shroud to anchor the rear edge. The Tejas SteelWorks fan shroud is designed to attach here, and support twin fans. **LMC Truck**

☐ **Electric fans** – various factory or aftermarket

Any number of OE fans can be fitted. The Tejas SteelWorks fan shroud can accommodate most. Our favorite is the **'93-'97 Camaro/Firebird V8** fan.

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Parts List (4 of 6)

Upper hose - Varies by waterpump used, minor trimming req.

With LS Truck pump: [Gates 22436](#)

Or with 2010 Camaro pump: [Gates 23080](#)

Lower hose - [Gates 22437](#), minor trimming req.

Heater hose – 5/8” & 3/4” standard heater hoses ~36”

Hose clamps - typical for engine application

Waterpump – [AC Delco 251734](#) , [add steam vent fitting](#)

Routing radiator hoses, Air intake pipe and accessory drive belts in the same space can be tricky. The LS truck waterpump works, but creates some clutter all around the front of the engine. A 2010 Camaro waterpump moves the top water neck to the driver’s side, and allows a shorter hose that costs less. It does require relocating the idler pulley down and out, to position it between the alternator and power-steering pulley. This can be accomplished with a spacer and longer bolt on the center of the accessory bracket, or with a small kit from Dirty Dingo, \$30.

Thermostat – stock for LS

Included with 2010 Camaro pump in AC Delco kit.

Tensioner and pulley – for Camaro pump, [AC Delco 12628025](#)

Cooling Fan relays, A/C Compressor relay – [AC Delco 12167112](#)

These are the best, period. They are pricey, so shop Ebay and Amazon. Replacement relays are readily available at any parts store, and at half the cost of this kit, which includes a weatherproof pigtail. It mounts with one screw.

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Parts List (5 of 6)

Transmission cooler lines – factory, modified

In the pilot build, we utilized the stock cooler lines for a TH400, cut and flared just behind the torque converter for inverted flare fittings, adapted to –AN fittings. We replaced the quick connect fittings on the transmission case with –AN fittings, and made up short soft lines in the same fashion as the fuel lines, using transmission cooler hose.

Shifter linkage– Lokar ACA-1800

Exhaust manifolds – Hooker Cast Iron Manifolds 8501-?

Available raw for \$300, ceramic coated for \$400

Bolts- [ARP 134-1102](#)

Collector studs- [10mm-1.5](#) (4) w/ nuts & lock washers

Collector gasket- [GM 92202326](#) (2)

Exhaust gaskets – stock LS, [Felpro MS92467](#)

Exhaust system – Various The pilot build has a full stainless system, 2.5” duals w/ X-pipe, custom down-pipes, 6” flex joints

Mufflers – DynoMax Super Turbo [17629](#) (2.5” stainless)

Alternator - stock

Power steering pump – stock LS truck

swap metric check valve on back of pump with SAE valve from your early pump

Power steering hoses – stock ‘73-’87

A/C compressor- [DENSO 4710315](#), or equivalent (10S17F type)

A/C relay - [AC Delco 12167112](#), again

A/C hoses – Custom

Accy brackets – LS truck, w/ LS3 waterpump, use Dirty Dingo LS Truck Idler Relocation Bracket kit ([DD-LS-IRB](#))

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Parts List (6 of 6)

- Accy drive belt** – w/ 2010 Camaro pump, [Gates K061015](#)
May vary slightly with optional power-steering pulley
- A/C drive belt**- LS truck, [Gates K040378HD](#)
- Air intake tube & elbows, clamps** - [intakehoses.com](#)
3.75" to 4" bushing, 4" 90* elbow, 4" 22.5* elbow, clamps
- Air Filter** – Spectre cone filter, [8132-L](#), [8136-L](#), [9732-L](#) or [9736-L](#)
- Fuel Tank** – '87 GM truck, [Spectra Premium!!!](#)
- Fuel pickup assembly** – '87 GM truck, [Spectra Premium!!!](#)
- Fuel Pump** – Walbro 255 LPH, high pressure, [5CA400HP](#)
- Fuel Filter** – stock '87 (matches '99 truck)
- Fuel Lines** (hard & soft) – OE steel, [Gates Barricade EFI hose](#)
- Fuel Line Adapters** – [Russell 611203 & 611253](#) at fuel rail, [640820 & 640830](#) at frame rail (with TBI hard lines)
- Battery Tray** – driver side OE type, LMC Truck
- Temp sensor** – '98 Camaro V8 (3 wire), and pigtail
[Sensor- 12551708, tx111, or tu280](#)
[Pigtail- pt2319, s619, or 1p1065](#)
- Oil pressure sensor** – '73-'87, [AC Delco 19244932](#)
with metric adapter [Autometer 2268](#)
- Speedometer** – '91 Suburban (cluster swap) '81+ only
- Cruise Module/Servo** – '89-'94 GM truck
This is easiest to interface with OE cruise switches on turn signal stalk. Enquire for more info.
- Plugs & Wires** – stock LS
- MAF Sensor, IAT sensor, O2 sensors, MAP sensor, VSS sensor**