

## 5.4 Swap Write-Up

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### 4.6 2V to 5.4 2V

#### Power Returns:

For those wondering the swap can be done for cheap, and has the "Budget Builder" in mind. You will see a greater gain in Performance when swapping a 5.4 (Rated at 260hp/350tq) to a say 1997 Mustang Gt (Rated at 215hp/290tq) than a 99-04 but both deliver considerable SOTP and dyno gains. A gain of 45hp/60tq right off the bat is common for NPI, stock for stock; not to mention the added cubes make the power earlier in the RPM band. With a 99-04 Mustang Gt (Rated as 260hp/300tq) your gaining ~50ft/lbs or more, usually a little bit of HP (depending on MANY factors) and the added cube effect.

#### HPS intake vs. Adapter plates:

If you use the HPS intake then the top end picks up quite a bit and you can see gains of 15-30hp or more. Each engine is different so there's no guarantees but these are numbers that are not uncommon and won't set you up for disappointment. The current record NA that we've been able to find is 340/340 to the tires on ported PI heads. The HPS intake allows better underhood clearance and helps stretch the power band on the 5.4 back out to a useful point. Adapter plates move the injector up higher and fuel no longer sprays unimpeded at the back of the valve. This results in higher fuel consumption and a requirement for a good bit more fuel in the tune. The plates are simply a band-aid that has been superseded by the HPS intake. Adapter plates average about 250-375 bucks depending on which brand you get. The HPS intake is 695 and ADDS on average 20-30hp. When's the last time you were able to make an honest 30hp from a bolt-on part for 400 bucks? Exactly. It's worth it and it's stupid easy to bolt up.

#### Just to give you an idea of cost:

1. motor (330CubeGt) complete from top to bottom with all pulleys, belts, wiring harness, computer, ECU, etc with 40k miles on a "tested" motor got dropped off at my house freight for \$1400.
2. motor (r3dn3ck) complete (550) + complete forged rebuild incl. parts (2400) + cams (400) + heads (400) + tuning (500) + injectors (100 used) + fuel system (350 rails,pump,hoses)+ install (1000 ) = \$5700.
3. motor (former member) complete (200) + adapter plates (200) + misc (probably around 300 for gaskets, bolts, etc...) and installed himself =

#### Technical:

#### Difficulty:

It's pretty much a direct swap besides the intake needing the 5.4 to 4.6 adapter plates to use the PI style mustang intake or the use of the HPS intake.

#### Oil Pan:

With the oil pan you need to use the 4.6 oil pan along with the 4.6 pickup tubes, both bolt directly to the 5.4 with only MINOR modification to the pan. The 4.6 pan has two fins on the shallow side of the pan they need to be bent over about 1/4". Just take a rubber hammer and whack at em' a couple times. Check your crank throw clearance before you install permanently. This needs to be done in order to clear the crank throw. If you don't do this your crank&rods will hit them and could damage something severely.

Before you put the 5.4 in the car if you're going to use stock manifolds, you need to grind down the passenger side manifold on the flange that the mid pipe bolts up to. (The side that's closest to the frame rail)

If you don't do this the header/exhaust manifold will hit the frame rail especially if you're using the stock rubber mounts. You don't want to have to fix it. Do it or get the bang-rattle-bang.

## Motor Mounts:

While the motor is out it would not hurt to upgrade to polyurethane motor mounts or a set of solid motor mounts. The 4.6 motor mounts need to be used because the 5.4 truck mounts will not work and yes the 4.6 mounts bolt right to the 5.4 block they share the same bolt pattern.

## Exhaust:

The 4.6 and 5.4 are basically the same motor, besides the added deck height (hence the extra stroke). Due to the added deck height the pipes are spread apart a little more and they don't line up in the stock humps (In the transmission cross-member) but they're close. Look at it like this the motor is a V shape so the taller the deck height the further away the two points become therefore making the motor wider and taller and making your existing pipes effectively shorter. It can get the pipes kinda close to the floor-pan which is a good reason to add some length to the down angled portion of the mid-pipe. When you put the mid pipe on you have to fuss with it a little to get it in the right spot, so be patient. Sometimes simple persuasion will get it there, sometimes you have to cut and weld in a bit of tube and often you'll need to extend the crossover in the stock H-pipe. Not always but often enough. I (330CubeGt) was able to run my Mac pro-chamber and Cat-back with no modification, so any Mustang Mid Pipe or Cat-Back will work with minor modification at worst. Muffler shops can do this for 50-100 bucks if it becomes necessary for your case. Just letting you know because I have heard some people saying you always have to cut/hack/weld your exhaust to make it work and you don't always have to.

Just an FYI: 4.6 long tube headers will absolutely not fit with a 5.4 simply because of the added height/width it will put the headers up into the floor and they would hit all kinds of stuff. 5.4 Long Tube headers are made by FTP. PM Myillwillinc for contact info for FTP. For shorty headers you can use JBA or FRPP right out of the box. BBK's have never fit well without being modded that anyone has reported. Custom longtubes can easily cost several thousand dollars so save the time and money and just call up FTP and get theirs.

## Heads:

As far as the heads the 4.6 and 5.4 are the same, so you can use your 4.6 heads if needed.

## Clutch/TC:

You will need an 8 bolt flywheel/flexplate. 96-01.5 cars have 10.5" clutches. 01.5-04 have 11" clutches. As far as I (r3d) know the TR3650 trannies are the ones with 11" clutches. You can buy an 8-bolt flywheel for 10.5 clutches, and a 10.5" clutch of your liking, a new TOB and a new pilot bearing (5.4's usually DO NOT come with them) and it'll connect right up. 10.5" clutches are cheaper and easier to find but the 11" will work just as well. This is only really a matter of decision for 01.5-04 cars. r3dn3ck retro-fitted his 11" to a 10.5 and it was stupid easy. Auto's will need the correct flex plate. Details on which one for that should be updated in this post soon.

## Fuel System:

Stock rails fit the HPS intake most times. If the crossover tube is too short you can chop it off and replace it with a longer section of high-pressure fuel line. Cost for that fix is usually about 10 bucks. You can buy aftermarket fuel rails for a 4.6 and use those just as easily but for substantially more cost. You get EXACTLY what you pay for in fuel rails. Buy nice ones with screw on brackets. No half-round hold-downs, real brackets. I (r3dn3ck) recommend aeromotive.

Most cars can technically use the stock 19lbs yellow top or 21lbs pink top injectors but they tend get to 100% duty cycle around 5000rpm which is bad. 24lbs is plenty for most applications but 30's are fine as well. If you have heads and cams and headers and bolt-on's then you should definitely step up to a minimum of 24's and really, get the 30's. If you use a power adder, get an injector that can feed it. If you need help figuring out your fuel delivery needs, then ask in the big 5.4 thread.

Your stock fuel pump is enough for direct swaps. If you're doing anything more than that (big heads, cams, nitrous, etc...) then you really need to start with an SVT focus pump and possibly go much larger depending on what power level you're looking at. Don't underestimate the need for fuel delivery. 5.4's are thirsty at high RPM's. A failure to provide enough fuel will stack harm up on your motor.

#### Tune:

A tune is really a must; just a little mail order street tune to dial in the air fuel ratio is fine (If you have a wide band air/fuel gauge). Or you can put the car on the dynamometer and make a few pulls and get a dyno sheet with your RWHP/RWTQ and AFR read out. Original ECU/computer can be used along with the original engine harness. Use all the sensors from your 4.6 as some of the 5.4 sensors are different even though they share a connector (usually the signal voltage range is different when they're different). Save the hassles and use ALL of your stock 4.6 sensors. Crank position, cam position, FRPS, O2's, water temp, oil pressure, etc...