Neon Performance

Last update February 13, 2002.

The Neon aftermarket is growing rapidly. New products seem to come out everyday. You can build anything you want. From a 9 second quarter- mile to a "nice" street performer that can blow the doors off cars costing two or three times as much.

There's a lot to update so let's get started, shall we?

The 2001 Mopar Performance catalog (P5007601) is a good starting point. The 2002 catalog should be out soon, but the 2001 version features many Neon parts for both first and second generation Neon. First I think there's some reading you might like to start with:

- December 2001 of Sport Compact Car *Beginning of Project Neon Series*
- December 2001/January 2002 of Mopar NOW! Neon suspension upgrades
- *All issues of Mopar NOW! Feature Neon how-to articles

You might want to pick up a few back issues of Mopar Action also. E-mail me for a list of back issues with Neon-related stories.

P4876667 - Neon Performance Modifications

I would seriously consider Mopar Performance parts for some of your upgrades. I don't want to get into how important it is to do your part for the environment but I don't think making a few more hp here or there is worth polluting the air even further.

Stage One -- The Basics

Neon's ('95-'99) suffer from a poorly designed, from a performance standpoint air intake system. Performance, for relatively small amount money can be improved by installing a K&N Filter. They are available both from Mopar Performance and your local auto parts store. Usually found for about $30, it's worth about a 3-4 hp improvement over the paper filter. Some owners have reported an "aggressive" sound coming from the engine (by removing the top of the air box on 2000-up Neon). If you are thinking about any modifications, you should start here first. (Note: for '97-'99 owners, I would **not** remove the intake scoop from the engine compartment of your Neon, unless you like that "open element" filter noise. You don't gain any performance from removing it, only a filter that gets dirty faster)

If your Neon has more than 60,000 miles, then you should also replace your plugs and plug wires. Stock OEM wires are 7mm, which isn't bad. You can replace them for around $25, but for a little more MP 7.5mm competition wires are a better choice:

- P4876546 1995 2.0L SOHC
- P4876510 1996-2001 2.0L SOHC
- P4876511 All 2.0L DOHC

Magnecor wires are considered by many to be the best ignition wire you can buy. I would consider these if you don't mind paying a little more money:

- PN#40223 - 1995-1998 SOHC (#45223 for 8.5mm)
- PN#40381 -- 1999-2001 SOHC (#45381 for 8.5mm)
- PN#40231 -- 1995-1999 DOHC (#45231 for 8.5mm)

Crane, MSD, Accel and Moroso are available for both SOHC and DOHC engines. Check with the manufacturer for availability.

There have been many debates over the years about which spark plugs work best in Neon engines. I suggest the OEM Champions (RC9YC) for anything but the highest boosted or nitrous injected engine. There is one spark plug I do recommend for nitrous users however, which I'll get into later.

For those that have a little more money to burn, the best upgrade so far dollar for dollar, is a CAI (short for Cold Air Intake). These are the best available on the market:

- ICEMAN Competition Intake
- AEM Competition Intake
- Mopar Performance Cold Air Intake (ICEMAN, available in black only)
- K&N Generation 2 FPK kit ('95-'99 SOHC only)
- Volant Cold Air Intake (2000-up only)

The ICEMAN and AEM intakes are available for 2000-up Neons. ICEMAN will have an intake by the end of the year for 2001-up Neon R/T and ACR's.

All these intakes carry a CARB E.O number, which makes them legal for use on smog control vehicles. There are some others out there such as the Kirk that requires the relocation of your stock battery and doesn't carry a CARB number.

**If you're serious about performance stay away from those chrome-plated "hot air" intakes*

For SOHC owners, you can add about 8-10hp from changing your muffler to a high-flow unit. Any good straight-though design muffler will work well. This muffler design produces the best hp and torque numbers. It shouldn't cost more than $120-$140 installed. Also make sure your muffler size is around 24" or roughly the size of your stock muffler. This will keep the sound low enough for you to enjoy your exhaust without the police ruining your fun. If you live in an area where you get a lot of snow and salt on the road, I would really consider a stainless steel muffler from Dynomax (Ultra-flow), Magnaflow or Edelbrock (RPM series). Those that live in a more weather friendly part of the US, I would also consider the Flowmaster (PN#42452) or any other high performance BRAND NAME muffler.

I suspect that an even bigger improvement can be gained from installing a high-flow muffler on 2000-up standard Neons. The factory reduced exhaust pipe diameter from 2.25 inches on 95-99 cars to 2.0 inches on basic Neon models. This change was made in an effort to make the current Neon appear more mature than the previous generation (i.e. quieter).

* *Thermal R&D and Borla both make a cat-back exhaust for 2000-up Neon. The R/T and ACR Neons already have a 2.25 exhaust system and Thermal will be offering a new dual outlet rear section by early next year.*

Instead of running down to your local muffler shop, you can always order a simple bolt-on rear section exhaust. 15-20 minutes and your done!

1995-1999 (SOHC/DOHC)

- Thermal R&D (PN#M501)
- Ravin (PN#VP1706)
- Borla (PN#14856)
- Brospeed (PN#248-315)
- Genie (PN#413194)
- Vibrant (PN#1706)
- Mopar Performance (PN#5249861)

2000-up SOHC (not including RT/ACR models)

  - Ravin (PN#VP1718)
  - Brospeed (PN#112-262)
  - Vibrant (PN#1718)
  - Mopar Performance (PN#5007559)

The reason I left DOHC owners out of this is because out already have a nice muffler from the factory, thank Dodge for wanting a good exhaust system for the stock classes in SCCA Showroom Stock competition. If you can find one, cheap, it's a nice upgrade for SOHC Neons also. DOHC owners should move on to Stage 2 upgrades before changing the exhaust.

For weekend warriors that drag race, Neons are known for suffering from wheel-hop during hard acceleration from a standing start. If you want to knock-off about .2-.3 tenths off your ET and another .3 tenths off your 60 ft. times, try the MP Motor mount (P5007027-All) and Bobble Strut (P5007028-All).

The new motor mount is stiffer than the OEM unit, but still can suffer from tearing. To combat this and to further stiffen your engine mounts you can install these inserts:
Prothane Motor Mount Inserts *(The mounts are available in red or black):*

- PN#4-501 Front mount
- PN#4-502 Right mount
- PN#4-503 Rear mount
- PN#4-1901 All three mounts

Engine mount inserts are also available from:

- Energy Suspension
- Rex Inserts

Your final option is to fill your mount(s) with various hard compounds. Click here to visit his instructions. Deyeme Racing makes filled motor mounts in varies stages of stiffness.

2000-up Neons don't suffer as badly as 1st generation Neons do. You can still get some wheel hop. To prevent this Energy Suspension and REX inserts are available.

This is by far the best low cost modification you can make to your Neon. Wheel hop is prevented and the stiffer mounts allow smoother, crisper shifting. You also gain a more "solid" feel under braking and cornering. The additional vibration is well worth the improvement in performance.
[Gary Howell sells solid steel AFX mounts (check out http://www.afxmfg.com]

With these modifications, I've seen many SOHC and DOHC Neons in the low 15's in the 1/4 for less than $500!

Not bad, huh? Now go scare some 4.6L SOHC Automatic Mustangs ('97-'98) and some of those pesky imports! Up next is part two.

Stage 2 - bolt-on modifications

With the stage one completed, you should be making around 118+hp at the wheels with the SOHC ('96-'99 will make slightly less in some RPM ranges do to the camshaft change after the '95 model year) and around 122+hp at the wheels with the DOHC. More importantly your torque should be over 120lbs at the wheels.

These modifications are a little more involved, but not beyond a good novice mechanic:
Adding a larger throttle body from an automatic Neon (52mm vs. 49mm) or boring your stock throttle body out will help boost output on a DOHC Neon by about 5 hp or more across the whole RPM range. RC Engineering and Howell Automotive can bore your stock throttle body out to about 57mm. You can also purchase billet throttle bodies from Modern Performance up to 60mm. Having a throttle body too big can hurt overall performance, so unless you seriously changed the air flow characteristics inside your engine, I wouldn't use anything bigger than 55mm throttle body.

> Gary Howell wrote:
>
> "49mm TB flows 252 cfm
> 52mm TB flows 283 cfm
> 55mm TB flows 317 cfm
> 60mm TB flows 377 cfm
>
> At 8200 RPM a 122 cubic inch engine will need 290 cfm at 100% volumetric effiency, using the formula ((Max RPM/2)*Displacement)/1728. Rule of thumb is to go 10% over because a naturally aspirated engine can go above 100% volumetric efficiency because of cam overlap, header design, etc. Go above that and you kill low end because of reduced velocity, go below that you starve the engine for air at top end. 110% is volumetric efficiency is 319 cfm."
>
> Based on this, 55 mm does seem to be the option for naturally aspirated (non-turbo) engines.

As for automatic Neon throttle bodies, you can find them easily at most junkyards for around $70 or less. When you perform this swap be sure to replace the new throttle body's sensors and cams with the ones from your stock unit, if you want to retain stock drivability. You also want to pay attention to placement of the throttle-body on the manifold. You might gain a little more if you push it closer toward the center of the intake manifold. Make sure you port-match the throttle body to your intake manifold for best performance.

In the past I have stated that this modification helps DOHC owners the most and should really be avoided by SOHC owners. I have recently learned that a 57mm throttle body on a mostly stock SOHC Neon gained about 5hp overall. Again, you really need to port-match throttle body to the intake manifold for best performance. That seemed to make the difference from before when the average was about 1hp over stock.

Look for the full story and dynojet results in an upcoming issue of Sport Compact Car magazine

Underdrive pulleys have been used on V8s with success for many years. No reason why it wouldn't also work on a Neon right? Using one of these releases drag causes by your water pump and other accessories. By slowing down your accessories you gain hp and torque. It's really noticeable off the line. The increase in horsepower and torque is dependant on how much power the engine was making in the first place. The more power you have, the more effective the pulley. On mostly stock SOHC or DOHC engines however, the increase is about 5-7hp depending on model year
Here are some underdrive pulleys on the market:

- Unorthodox Racing Street Pulley (PN#201001)
- A/FX (PN#AFXNP95S)
- TTI Racing (PN# Coming Soon)
- Mopar Performance (PN#P5007361 *Drives alt. only)

For serious racers all of these pulleys are available for single belt use, which would only turn the alt. For those that want the best of both worlds can get an Unorthodox Racing convertible Street/Race pulley (PN#30100100). The center pulley comes off for racing and can be re-installed when you're ready to drive home.

Another area that can be addressed on the DOHC engine is cam timing. Seldom does the factory use the optimum centerline the cam(s) when building the engines. You can index them yourself for next to no money with a simple degree wheel, but I've found that cam sprockets make life a lot easier. They are marked clearly and are easy to adjust quickly, unlike the factory cam sprockets.
Here are the available cam sprockets: (*The SOHC sprockets work on 2000-up Neons)*

- AEM (PN#23-651 SOHC, PN#23-650 DOHC)
- Unorthodox Racing (PN#501001 SOHC, PN#501002 DOHC)

(Again for serious racers Unorthodox makes a lighter version of their sprocket)
AEM has tested their cam sprockets on a DOHC Neon, which also had the AEM cold air intake and a prototype of the new Mopar Performance exhaust system. Before the cam sprockets, this DOHC Neon made 124+hp at the wheels. After the sprockets were adjusted for 4 degrees retarded (on both cams), the Neon responded with 131+hp. But that's not all...

The DOHC engine instead of falling on its face after 6500 rpm pulls up to Redline strong! With this setting it made more power from 4750 to redline than the stock cam timing did. You might not get the same gains on your Neon, but it's worth looking into.

With your Stage One modifications and the few upgrades here, your DOHC Neon should be in the 130+ area and maybe as high as 140 hp at the wheels. That's about 150 hp, the factory rating.

*DOHC owners - Want 12hp the easy way? All you need is a stock automatic Neon throttle body and some elbow grease.

1. Starting with only new plugs and a K&N drop-in filter -- *114hp and 111ft of torque*
2. We added the automatic throttle body and got -- *120hp and 113ft of torque*
3. Finally we removed the AC/PS drive belt from the stock pulley. Result -- *126hp and 117ft of torque*

If you gasket-match the throttle body to the intake manifold, you'll gain a bit more. See how easy that was?

*These are repeatable results and done in the heat of the day at SHO Shop in Huntington Beach, CA over 4 years ago.

I haven't forgotten about you SOHC owners... Being one myself (twice over), I searched for some easy and cheap gains for us too.

Installing a cam sprocket is only worthwhile if your stock cam timing wasn't correct to begin with. It should be set at 110 degrees straight up. The DOHC engine is more sensitive to cam timing. You might want to check to see if your OEM cam sprocket has skipped a tooth. I would only do this if I were going to replace the timing belt (DC recommends 100,000 miles).

Adding a header is the next logical step and is worth about 4-6 hp. Most of this power is added to the mid-range and top end of the rev range. Currently the only CARB legal headers on the market come from Mopar Performance (street header- P5249856 SOHC, P5249973 DOHC) Borla (2000-up only) and Hedman (uncoated PN#36050-DOHC #36060-SOHC). Pacesetter also makes a header, but is not smog legal in some states. Check with your local smog inspection station before purchasing this header.

Most of these headers require a minor modification to the exhaust pipe, but can still be installed in about 3-4 hours.

A few Neon owners have opted to have their header ceramic coated by Jet-Hot or HPC, it's a worthwhile investment that saves headers from rusting and improves there performance. Hedman and Pacesetter also offer coated versions of their headers.

To take full advantage of your Stage 1 and 2 modifications, pickup a Mopar Performance PCM for about $200. These replace your OEM power train module, are emissions exempt in all 50 states and require the use of 92-93-octane premium fuel. The rev-limit is moved up (about 7200 in the SOHC and 7400 in the DOHC engine), along with more advanced timing that improves low-end torque and throttle response.

- SOHC Manual Transmission P5007033 1995, P5007035 1996, P5007037 1997-99
- DOHC Manual Transmission P5007034 1995, P5007036 1996, P5007038 1997-99

There are no aftermarket power train modules for 2000-up Neon yet.

All of these modifications could be installed in less than an afternoon. At this point SOHC powered Neons should fall around 125-130hp and DOHC Neons should fall between 130-135hp at the wheels. With some minor weight reduction (which I will cover in Stage 3) and drag radials high 14's are not out of the question for DOHC Neon. For SOHC Neon however, you will need a little more.

The next round

For your next round of modifications if you own a DOHC or '96 SOHC with a aluminum intake manifold, I would recommend having your cast intake manifold modified by GUDE/Bullfrog Performance or any competent cylinder head service. It should run around $200 for port-matching and smoothing out the casting as much as possible without cutting the manifold. If you haven't got your throttle body done yet, then you can get it bored and port-matched to the intake for an additional cost. This is good for those handy with a dermel or similar tool and for those on a limited budget. You

can also make some of the same modifications to the composite (plastic) SOHC intake manifold with less dramatic results.

The Extrude Honed process works great on cast aluminum Neon intake manifolds. Air flow testing of a stock intake should be around 810 cfm. That's with most of the casting "flash" taken out by hand. After the Extrude Hone process, that same intake pushed out 1013 cfm. What's so great about the EH process is that it can do what human hands can't, which is port/polish the entire intake manifold's upper runners and make air flow in each runner as even as possible. Before EH process, the manifold showed various cfm readings from each intake runner. Each runner varied as much as 10%. After the process, all runners where within 2-3cfm of each other or less than 2%.

Both of these manifolds give you much improved low-end and allows more power (the hand ported manifold to a lesser degree of course) to be made beyond the original 6500rpm “flat spot” in DOHC Neons. With either manifold, the torque band was much wider and flatter. The DOHC engine now wants to scream on the top-end! You get strong pull right up to the fuel cut-off (7200 rpm). This is a very worth while modification for any DOHC Neon. A few cars with this and some of the mods listed earlier are making well over 130 hp or 150+ hp at the flywheel (most fall into the 132hp -138hp area at the wheels).

Many people think this is the “real” bottle-neck in the prevention of gaining additional hp from the DOHC engine.

To take full advantage of your bolt-ons and Stage 2 mods, pick a Mopar Performance computer for about $200. The computers work best with a header and free-flow exhaust system. These are also emissions exempt in all 50 states and requires the use of 92-93 octane premium fuel. The rev-limit is moved up, along with more advanced timing that improves low-end torque and throttle response.

Here are some of the features -

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A/FX Manufacturing also sells reprogrammed PCMs for all years, except 1995. They are available at Howell Automotive, but are not smog-legal. It gives you all the features of the Mopar units and produce a little more hp in upper rpm range. There are race only versions available with more advanced timing and ignition curves. They are available for '96-99 DOHC and SOHC Neons. The Race version is just that because it allows you to remove your catalytic converter and requires the use of a header for best results. Some people with the “street” A/FX computer say they have passes smog with the unit installed, but I don't think the extra 2-3hp the A/FX makes over the Mopar is worth the additional cost. But it's up to you....

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The next round

This is where the gains from bolt-on performance stop. Some of the parts or modifications mentioned here might be beyond the novice enthusiasts but are still considered Stage 2 modifications.

For your next round of modifications if you own a DOHC or '96 SOHC with a aluminum intake manifold, I would recommend having your cast intake manifold modified by GUDE/Bullfrog Performance or any competent cylinder head service. It should run around $200 for port matching and smoothing out the casting as much as possible without cutting the manifold. If you haven't got your throttle body done yet, then you can get it bored and port-matched to the intake for an additional cost.

This is great modification for those handy with a dremel or similar tool and for those on a limited budget. This is not an over-night type of modification. It will take a minimum of 12-15 hours of work to get same results, if done over a few weekends or couple of hours a day. Some of the same modifications can be made to the composite (plastic) SOHC intake manifold with less dramatic results.

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Changing the camshaft(s) is the next step. Stock Neon camshafts are very mild when compared to other engines in its class. More aggressive cam timing is needed to take full advantage of the 420a's well-designed cylinder head.

Crane makes excellent camshafts for both engines.

For internally stock engines I would recommend:

- CHR-242-2S-6 for SOHC engines
- CHR -- 242 for DOHC engines

The other grinds require increased compression and additional work on the cylinder head. If you don't plan on any further modifications to your engine I would stick to these camshafts.

SOHC owners might be lured by the turbo grind specs. Please read this very carefully --
The SOHC engine makes most of its power between 4000 and 5600 rpm. The stock camshaft makes peak power around 5500-5600rpm and then falls rapidly. Crane's non-turbo cam adds power across the rev range and extends power pass the stock peak. It also makes more power from 5500 to

6500rpm where the engine needs it most. Even with the rev- range allowed by the Mopar or A/FX PCM, the turbo grind makes most of its power well pass 6500rpm where the cylinder head doesn't offer any additional flow. It's simply the wrong choice for your application.

DOHC owners have an option here. If you plan on using nitrous oxide injection, I recommend --

- CHR-246-8

We are now running into the limits of the stock cylinder head, intake manifold and short-tube headers. SOHC engines at this point should be around 135-140hp with DOHC engines checking in around 140-145hp. You can pick up some additional power by cleaning and balancing your fuel injectors. This process will allow each cylinder to produce the most horsepower by equalizing fuel flow.

For East Coast Neon owners --

- Marren Motor Sports

For West Coast Neon owners --

- RC Engineering

You can pick up 4-5hp for about $100. Not bad...

Neons are tuned to run conservative for non-enthusiasts. To get the most out of your modifications, you need some control over fuel flow and ignition timing. While aftermarket PCMs are tuned more aggressively than stock, they still aren't tailor made for your car and the changes you have made. Adding a Crane or MSD ignition will increase ignition output, but you cannot change the ignition timing. MSD makes a programmable version of the DIS-2, but you can only increase timing up to the maximum the PCM will allow. The stock ignition will do fine with internally stock engines. Installing an ignition amplifier will increase power between 3-4hp overall and allow the engine to run smoother.

**For drag racing and Solo 2 both basic ignitions offer Stage 2 rev control for better launches.*

Adjusting fuel flow can increase power by decreasing or leaning out the fuel mixture. This can be done two ways --

- Manually with a fuel pressure regulator
- Electronically with a fuel management computer

Using a fuel management computer like the Apex'i Super AFC, HKS Super AFR or Split Second ARC1, you have far more control over tuning that what an adjustable fuel pressure regulator will give you. On average you can pickup 6-8 additional horsepower using one of these devices. It also leaves the door open for any modifications you might make later.

Stage 3

With both engines were at the crossroads of performance... All Natural or Forced Inducted?

If you haven't installed at least an Air/Fuel ratio gauge or Exhaust Temp (EGT) gauge at this point you risk running your engine lean. You need the proper gauges to aid in tuning and to let you know of a potential problem with your engine.

- Auto Meter
- Defi
- VDO

Programmable Engine Management:

To get the most out of any modification you for here on, you need control of the ignition and fuel systems. Electromotive has a TEC-II unit that is designed for use in the Neon, with the factory PCM in operation. There are others on the market, but none have been designed with the Neon in mind like the TEC-II has. You can even leave the factory PCM in place. You are only taking control of the fuel and ignition timing. It even comes with a default program to get your Neon running soon after it's installed and now programmable in Windows. Price you ask? Around $1200 and you use the factory ignition coils. Additional cost come from the need of a voltage regulator and thermal control unit for the fans (available at your local dealer or auto parts store). That may be too costly for most, but you can now add ANY performance mod to your Neon. Any engine modification becomes a snap and very easy to dial-in and control. Gains are minimal with the stock intake and cams are in place in either engine.

**The TEC-II can be tuned with new WinTec software*

Naturally Aspirated:

Blueprinting alone will pick up a few more ponies, but with the additional cost of machine work, I don't think it's worth it. I would do this in addition to what other changes that would be made to the engine while it was apart. It's not worth doing if your not going to make any changes.
Depending on how far you go, you might be reaching the point where your OEM fuel injectors are not supplying enough fuel. If you have installed a fuel computer to help dial-in your bolt-ons from Stage 2, then you can also use larger injectors and not cause a "rich" tuning condition. The biggest injectors any factory or aftermarket PCM are 24lbs or about 270cc.

You need to increase your compression ratio to run any of the "hotter" camshafts that Crane and Crower (for DOHC Neons) offer. Increasing compression is also a fairly cheap modification and is usually a win-win proposition. The only downside to higher compression is using higher-octane fuel. The stock compression ratio in the SOHC engine is 9.8:1 and it's 9.2:1 in the DOHC. 11:1 is a good compression ratio for either engine if you plan on running it mostly on pump gas. You might need to install an MSD or Crane ignition if you haven't already. Detonation is bad for any engine. Even a bad tank of gas can spell doom for your modified engine. These ignitions can prevent this by allowing you to retard the timing a few degrees. In most cases you'll only retard after 4000rpm in both engines and only about 2-3 degrees at the most.

For a really hot street engine, 12:1 compression is ideal. At this point I would consider replacing your stock pistons with better units from KB. Hypereutectic pistons are stronger and lighter than cast pistons, although not as strong as forged pistons. They also cost less than forged pistons or brand new replacement pistons from the dealer. This can provide a solid foundation for your high output engine. You also don't have to mill your head any further than .030 with a 10.8:1 piston. This will achieve

close to 12:1 compression. You will now need either programmable engine management or an aftermarket ignition to fire your high compression engine. You'll have to run about 5-6 degrees of retard to keep your engine together, but for the money it's a solid power increase.

The best thing for owners that want to go "all motor" is the TEC-II TPK kit from Electromotive. It features a TEC-II, (4) Hillborn throttle bodies and a new intake manifold. This system has added as much as 40hp at the wheels to a mostly (only other mod was a header) stock DOHC Neon. The cost alone will stop most people from doing this at $3000. But if you want reach the 200+hp area without nitrous or a turbo, this is the only way to fly.

In addition to the TPK kit, you might want to follow some of the tips I have below.

SOHC Owners -

If you haven't installed a new cam into your SOHC, this would the time to do it. There aren't a lot of valve-train options for SOHC Neons so your pretty much limited to the 7400rpm rev-limit that a Mopar Performance PCM would give you. The Crane cams are designed to work best in this area so drastic valve-train changes aren't needed. To get the most out of that new camshaft, you'll need to port the cylinder head and install bigger valves. You can skip this process if you're lucky enough to find one of the new '01 Neon R/T's in a wrecking yard. Chrysler has done most of the work for you. '01 2.0L Magnum engine uses bigger intake valves and has been slightly ported on the exhaust side. Another option is the SOHC IT cylinder head. The head comes bare, it has been milled down to .025 and gasket matched up to 1" inside each port. DC makes a set of oversized valves for both the intake and exhaust. Bigger valves are available from CNNP Racing.

Otherwise I would seek out an experienced racing cylinder head service. Using the Crane "turbo grind" SOHC camshaft and a ported head featuring larger titanium valves (by CNNP Racing), Bill Starnes has turned the best ET of 14.3@96 (on drag radials) in his '96 base model coupe (no A/C). A ported cylinder head is needed for any kind of serious output. Unfortunately for the SOHC engine to really make power, you need to spin it faster and unless you have a lot of money to burn or have an urge to be the first at something, you're better off getting a DOHC if you're goal is higher than 180-190hp at the wheels (with the stock intake manifold). The SOHC with a 7400rpm rev-limit just isn't going to do it.

DOHC Owners -

DOHC Neon on the other hand doesn't really need a ported head. In fact the world fastest stock intake manifold Neon belongs to Scott Mohler. His best ET so far is 12.82@105 (he's now running low 11's with the Neon TPK and CNNP Racing Stage 3 cylinder head). He's very competitive in the Comp 4 class in NIRA competition (placed 2nd in final points standings). Comp 4 doesn't allow engine swaps, turbo or nitrous. As long as you use the OEM installed engine anything else goes. Running 12:1 compression and Crane cams and stock head (with very minor bowl work) he's making over 180hp at the wheels. Just imagine what he would do with a TPK kit installed! He still drives on the street from time to time, even though the 12:1 compression ratio makes it hard to do so. With stock compression he was still running high 13's with just bolt-ons and some slicks.

**For the 2001 season Scott is now a member of Team CNNP Racing and has moved up to the Pro Stock class in NIRA competition. His Neon now features a Neon TPK kit; CNNP Stage 3 ported cylinder head, special Crane race grinds and a lighten chassis. His Neon is still overweight for the class by about 200lbs, but he still managed to win one event and place 2nd in two others to claim 2nd place in the final point standings. He also won an IDRC event in Florida and is currently 2nd in the point championship with 2 races to go.*

Short-tube headers are not great horsepower producers. The Neon engine needs a real header. A properly designed long tube header for either the SOHC or DOHC engine is worth over 12hp on an otherwise stock engine. There are two on the market current. The Kirk Racing header is an older design but still produces good power numbers. However the Blackdog Motorsports header is the best choice.

**Some of maybe think, "How come you didn't suggest this earlier?" It's because NONE of these headers are smog legal and to get the most out of them, you really need to use some bigger camshafts and ported cylinder head. These are purely racing headers.*

This is also where your stock 2.25" exhaust piping becomes an obstacle in the quest for horsepower. There are a couple of cat-back exhaust systems for Neons available.

- Dynomax
- Pacesetter
- Rhino
- Flowmaster

Unfortunately, these exhaust system come with outdated turbo style mufflers. The Dynomax cat-back is by far the most popular exhaust for Neons and uses I think the best of the turbo style mufflers (Super Turbo) but if you were serious about power output, I would use the piping (2.5) and use a better muffler like a Dynomax Ultra-flow, Edelbrock, Magnaflow or some other type of straight-though muffler.

For more information on building a high horsepower SOHC or DOHC engine --
Neon Specific Tuners:

- CNNP Racing
- Howell Automotive
- Forward Motion
- Modern Performance

Turbochargers -

There are a few Neon turbo kits available now. They are available for both SOHC and DOHC engines from -

- Hahn Racecraft (95-99, 2000-up coming soon)
- Turbo Performance (95-up)
- Blue Ribbon (95-up)
- CNNP Racing (95-up)

Turbo manifolds are available from Turbo Performance, CNNP and TTI Racing if you want to design your own turbo system.

You can run between 8-12psi on a stock Neon engine if the proper precautions are taken. If you buy one of these kits, slap it on your Neon and run 12psi, you'll sure to break something sooner if not later. At the VERY minimum, this is what I would add to my turbo system --

- MSD or Crane ignition (to retard the timing under higher boost levels)
- Electronic boost Control unit (Blitz, HKS, Apex'i or Greddy)

- Clutchmasters Stage 3 clutch or something similar
- Driveshaft Shop Stage 2 axles (Drag racing? Get Stage 3's!)
- Dynomax cat-back intermediate pipe and straight-though muffler ('95-'99 Neons only)
- Upgrade your blow-off valve if you're using a Hahn kit

Adding these will add to the life and performance of your turbocharged Neon.

Len Ayala's Neon is one of the fastest in the world with a top time of 9.55@150 He still uses the same exhaust manifold from the Hahn kit only with a 20G turbocharger on his 2.0L DOHC engine. His Neon also features a unique induction/intercooler system.

Darrel Cox currently owns the fastest and quickest Neon in the world at 9.07@154mph. His 2.4L DOHC turbocharged engine was built with help from Forward Motion. The engine is controlled by Speed Pro engine management system.

Nitrous Oxide -

Many people think using nitrous oxide as cheating. While I won't jump on my soapbox about this, I will say that more and more Neon owners are looking toward the "throttle in a bottle" for cheap performance. You can run anywhere from 50hp-100hp on a stock Neon engine in good running condition.

A 50hp shot on a 5spd stock SOHC or DOHC Neon will run high to mid 14's on street tires easy. If you could use it in first gear, you should be able to get low 14's. To do that, you need slicks. On a '96 and later Neon you'll need to upgrade the clutch to use slicks and nitrous together (when using more than a 75hp shot).

With only Stage 1 modifications and a 75hp kick from nitrous oxide, you can have a very quick car for less than $1,000 invested. One of these days, I'll have a build up of a 12 second Neon for less than $2,000 total investment. Stay tuned for that.

Nitrous kits range from $400-$1300 and they come complete. But you need to add a couple of options to have a safe, yet very quick system. A Neon Nitrous FAQ is being constructed and will be available soon.

**Here's a tip for both nitrous and turbo Neons. Use these spark plugs for best performance.*

There are four Neon-specific nitrous-oxide kits available --

- Nitrous Express Neon EFI kit
- Nitrous Works Neon EFI
- Nitrous Oxide Systems Neon EFI kit
- Venom VNC-1000 and 2000

All things nitrous-related can be found here -- http://www.n20.org/

**Both of the world's fastest Neons use turbo charging and nitrous injection*

Going 2.4L!

Everybody thought it was possible. Everybody said it could be done, but nobody has tried to until about 8 months ago. Now it's one of the hottest topics on neons.org. Yes! You can swap a 2.4L DOHC cam engine into the Neon. What are the advantages? More cubic inches, more torque and almost all the 2.0L DOHC parts work making it one of the easiest engine swaps around. One of the best ways to get more power is to increase engine size. By adding almost half a liter to the 2.0L DOHC engine, it gained over 30 addition pound feet of torque and only lowered the rev-limit by a little.

Swapping in just a 2.4L DOHC engine into DOHC Neons will drop your ET's into the low 15-second area. All of the performance modifications that work in the 2.0L work even better in the 2.4L engine. The 2.4L is also ideal for racing. Darrell Cox's 9-second turbo Neon uses a 2.4L engine. Scott Mohler briefly used a bored 2.4L DOHC engine in his ACR this season and is looking forward to using it again for the 2002 season.

The only downside to this swap is you might lose your air conditioning and power steering. With some additional work, you can use these options on the 2.4L, but I only know of one person that has done it so far. He uses the screen name of "Duke" on the neons.org message boards. You might want to contact him.

Swapping the 2.4L is still fairly new, so there aren't a lot of dynojet results, but there are some low 14-second and one 12-second 2.4L Neon using nitrous oxide that I know of. If you're considering this swap, CNNP Racing makes a kit making installation a snap. TTI Racing also offers the special side mount needed to install the engine. Currently this swap only works in '95-'99 Neon with the DOHC engine. SOHC owners can make this swap also, but you need to find a DOHC PCM and all the other necessary bits needed to make the swap possible.

Rumor has it that the 2.4L engine bolts right into the PL2000 (2000-up) Neon chassis without changing any of the motor mounts. Your accessories are also installed in the same place as the 2.4L in the new Neon. So far only DC has tried and succeeded. If the rumor of the upcoming Neon SRT with the 2.4L turbo engine are true, then all you'll need is that special intake manifold they will have to use to make the swap possible. More information on this sway is coming soon, so say tuned!

If you have any of these modifications, we would like to hear from you and so would many other readers of this page. You can contact either the Webmaster or me. More updates to come.

Next update I'll provide some dyno results from new '01 Neon R/T before and after some modifications and I'll give you a preview on my '95 Highline Street/Strip car. I also will be posting a lot of dyno results from other people to give you an idea of the kind of output you can get with the parts I've listed. And finally, I'm going to show you automatic Neon owners how to get better performance from your slow shifting transmission.
Until then, good hunting!

Illustrations

- allowen.gif shows Owen's DOHC ACR after all the mods listed on the dyno sheet
- barryrun.gif shows the gain with the underdrive pulley
- scottsrun.gif is his first run (222 hp)
- scottsrun3.gif is the 228hp run

Links

- www.electromotive-inc.com/neonpage.htm- Electromotive TPK Neon kit
- http://www.turbosystem.com/Neon/World_s_Quickest/world_s_quickest.html - Neon turbocharger kit
- NeonSpeed
- Swain Tech High Performance coatings
- Jet Hot High Performance header coatings
- Other Neon links with more performance info - investigate before you upgrade!

Ref: http://www.allpar.com/neon/performance.html
Archived by: SilverBullet