

ESS INSTALL

The donor car..

1997 540/6

Cosmos Black/Sand

UUC Short Shifter

Brembo cross drilled rotors

Phillips Nav System 16:9



The install went in several stages.

Disconnect the battery

Stage 1

Remove all the parts that needed to be modified or replaced...

- a. Air Cleaner assembly
- b. Front bumper to remove air tube that feeds air cleaner
- c. Mass air flow sensor
- d. AC compressor and front line to the condenser
- e. Passenger side motor/AC bracket (replace with new bracket)
- f. Electrical harness to the top of the engine, coil packs and fuel injection
- g. Left and right air filter assemblies for the interior

- h. Fan assembly (remove this before the belts, it's reverse threaded)
- i. Drive belts
- j. Crank pulley
- k. ECU (engine computer) Send this out for reprogramming ASAP...



Stage 2

Removal of additional parts that needed attention or modification

- a. Valve covers. The valve covers were removed to repaint and install new gaskets, they were leaking on the interior seal filling up the well where the spark plugs go.. The paint was nasty and yellow so a new coat of paint was applied.
- b. Intake manifold. The intake was pulled to replace the seals. This would also make it easy to replace the injectors and the plate on the back of the manifold that comes with the kit. It turns out that this was a very good idea. The manifold was full of sludge from a failed PVC valve. The sludge extended into the opening in each cylinder intake port up to the point where the fuel spray from the injector hit. Each intake port and the entire manifold were carefully cleaned. The manifold is easy to remove:
 - a. pull the wiring harness for the injectors and coil packs
 - b. pull the fuel lines (make sure that you put a rag over the lines when you disconnect them)
 - c. remove all the hoses and wires from the throttle body assembly
 - d. remove the screws from the top of the manifold
 - e. tap the manifold with a rubber mallet

- f. carefully lift the manifold up and back to clear the pipe that connects to the bottom

Stage 3

Installation of new parts and supercharger

- a. Supercharger drive pulley. The new pulley attaches to the front of the old pulley with many cap screws. You need to align the new pulley on top of the old pulley and drill out the holes in the crank pulley. The new pulley aligns perfectly over the old pulley. Just drill and tap the first hole, mount the pulley and then drill out the rest of the holes. Pull the one bolt out and then tap out the rest of the holes. ESS includes a tap and drill set for this. I used a drill press; do not try this with a hand drill.
- b. Fan spacer. This is just a single machined piece about the size of a large socket.
- c. AC compressor and lines
- d. Install supercharger to the bracket
- e. ABS relocation bracket. The ABS unit needs to be moved back a bit to allow clearance for the supercharger hoses. There are brackets that are supplied but there is no template as to where to drill the holes. You need to line everything up and mark where the holes need to be. After the hole is drilled you may need to clean it up a bit with a dremel tool. This is an area that could be improved upon with a bracket that uses the original holes.
- f. Install the bracket with supercharger to the modified AC bracket
- g. Install the belt onto the supercharger. The belt is a very tight fit. At first I did not think that I had the right belt.
- h. Install the manifold vac plate
- i. Install the injectors
- j. Route the vac and bypass hoses from the back of the manifold to the supercharger
- k. Reinstall the wiring harness to the injectors and coil packs
- l. Route the air filter tube through the hole for the air duct feeding the original air cleaner assembly
- m. Connect the MAF and corresponding hose to the inlet of the supercharger
- n. Connect the hoses from the outlet of the supercharger to the throttle body assembly
- o. Connect the bypass valve to the supercharger. Use a bit of lube on the fittings to get them to go together.
- p. MAF recalibration wire. The harness needs to be modified to allow for the larger volume of air coming into the engine. There is a wire covered in shrink tubing that comes with the kit. This wire contains a resistor and diode I believe. This is used in conjunction with the reprogrammed ECU and larger injectors. The wire is spliced in line with the original sensor wire.
- q. Install the ECU
- r. Install the HVAC air filter assemblies
- s. Install all the other things that I forgot to mention!!! Hopefully there won't be many.

Stage 4

Initial start up

- a. Check your work. Make sure that all the bolts, hoses and bracket are tight.
- b. Check your work again....
- c. Check all the fluid levels
- d. Reconnect the battery
- e. Have someone start the engine while you look at the motor
- f. Check the alignment of the supercharger belt idler pulley. You will most likely need to place shims behind the pulley to get the belt to ride straight over the pulley
- g. Let the car warm up fully
- h. Shut it down and check for anything loose
- i. Put some gentle miles on the car. Keep it below 3k rpm for 100 miles or so..
- j. Make sure everything is tight
- k. Change the oil
- l. You should be boosted!!



Notes:

There are a few things that could use improvement:

- a. The ABS relocation bracket. This could be made to fit without all the drilling. A machined bracket is already supplied, it just needs to fit the existing bracket. I suspect the bracket is used universally on there kits for more than 1 vehicle.

- b. The supercharger idler pulley. The need to shim the pulley is a real pain in the butt. A pulley set up with some set screws would be great.
- c. Sending the ECU for reprogramming. This took way too long, don't ask. A US center for reprogramming would be ideal. I believe there Florida shop will address this.

All in all the complaints are minor.

Performance

Since I have only put about 200 miles on the car I can't say what the ultimate performance will be. I can say that it seems to get faster and pull harder every time I drive it. The upper RPM ranges 3.5K and up pull really hard. I have not tried a full on launch yet, I typically wait until the clutch is fully engaged before I give it the juice. I am trying to get used to the power, clutch and tire survival need to be considered. It is also extremely quiet. The only time you can hear the blower is with the windows down and the radio off. The drivability is also great, no surges or unexpected power.

Value

It's not a cheap mod but compared to the alternatives, M5, Dinan, new motor there is no comparison.

ESS interaction

I would like to thank Richard at ESS for helping me out with some good old fashioned tech support, he really knows his stuff. I was skeptical about ESS from the beginning but they put all my concerns to rest with there quick response and tech support.

Future upgrades:

1. Water injection kit. This will cool the intake temp making the car run like it would on a cool day. Simple to install and not too expensive.
2. Boost gauge. I'll be using an MKS instruments pressure transducer and digital local display module.
3. Exhaust system. I am running the full stock system so there is room for big improvement. I am a big fan of the car being quiet so I need to find the right combination that keeps things quiet but breathes better.
4. New Diff. I need some suggestions for this. Maybe the M5 diff would be good?
5. Suspension. The stock sport suspension is just not enough.
6. Wider wheels. The style 19's look great but I need something a bit wider out back.
7. Big break kit. The Brembo cross drilled rotors provide a bit more fade resistance but no more bite.

Regards,

Bob B

