



Install Instructions for the Merc Racing TVS 1320 Ariel Atom Supercharger Kit

This kit is designed to work on the K20/K24 Ariel Atom 3, SRA and 3.5

DISCLAIMER: ALL MERC RACING SUPERCHARGER KITS AND ACCESSORIES ARE DESIGNED FOR OFFROAD/TRACK USE.

Base Kit Includes:

Harrop/Eaton TVS 1320 Supercharger

Merc Racing Blower Inlet

Merc Racing Throttle Body Adapter

3.5" Supercharger Pulley

Merc Racing Aftercooler Ready Manifold and Block Off Plate

Merc Racing Ariel Atom Specific Blower Mounting Plate

Merc Racing Serpentine Belt Tensioner for Ariel Atom

Hardware

Required Ancillary Items Needed For Install:

Injector Dynamics 1050x fuel injectors (you can use a different injector size/brand however this injector will work with the base kit and have plenty of room for growth into the 400+HP range using the stock atom fuel pump).

Plug and Play fuel injector adaptors (not necessary, but useful if you don't want to have to cut the factory harness clips and crimp on new clips) ***

Hondata flashpro purchased from TMI, don't purchase the normal Civic one, it won't work you have to order the flashpro directly through TMI or Ariel UK.

Four bar Hondata or Skunk2 MAP sensor

K tuned coolant bypass (If you have a SRA you will also need a 8 AN Male Hex Head Socket Port Plug as TMI deleted the coolant bypass tube to thermostat housing)

AEM intake air temp sensor

Serpentine belt part number 7pk1700

If you have a K24 Engine and want to run the base 3.5" pulley non aftercooled you will also need K20Z3 crank pulley part number **13810-RRB-A01**

If you have a K20 Engine You will need an Acura RSX-S thermostat and housing Thermostat Housing Part#: **19320-PNA-003**
Thermostat Part#: **19301-PNA-003**

Speed factory thermal intake manifold gasket part number sf-02-015

One stage colder spark plugs part number ilkr8e6

K&N air filter part number RU-1500

HondaBond for sealing the K tuned coolant bypass

1/8" male NPT to 1/8" brass barb

5' 1/8" vacuum Hose

Hardware for mounting throttle body to Merc Adaptor Plate

Zip Ties

Blue Loctite

This supercharger kit is designed to be installed by a mechanically inclined individual with basic automotive repair experience. Please review instructions in entirety prior to starting the install and contact us with any questions. If you do not feel confident in your ability to install the kit based on the install guide below, please have the kit installed by an experienced mechanic. There are video installs from customers that installed a similar kit on the civic platform that can also help orient you with the install process as the Atom install is similar in many aspects. Please contact us for the video links.

1. Disconnect battery, remove the rear tray/muffler cover. If your atom has a removable roll bar fitted, unscrew the four bolts on each side of the front of the rollbar, don't forget the hidden one underneath and remove the bolt on each of the heim joints on the back of the rollbar and have an assistant help with lifting

the rollbar off the vehicle. Raise the rear of the vehicle using the recommended factory lift point of driver's side rear frame and secure with jack stands, drain coolant by disconnecting the hose from the thermostat housing (circled in pic), this will keep coolant in the lines running to the front as well as in the radiator (bleeding will still be necessary but you won't lose as much coolant). It is not necessary to drain the entire coolant system unless you want to do a flush at this time, if so then disconnect the coolant hose at the lower connection where it slides over the pipe going to the front radiator.



2. Remove the rear snorkel cover held on by the 4 Dzus 1/4 turn fasteners, unscrew the three Allen bolts holding the air filter snorkel and remove the snorkel as well as the air filter and aluminum filter hold down bracket if equipped.



3. Unscrew the bolts holding the coolant reservoir to the engine cover and remove the hold down bracket and lift the coolant reservoir enough to loosen the hose clamp on tubing and pull off the tube and remove the coolant reservoir.

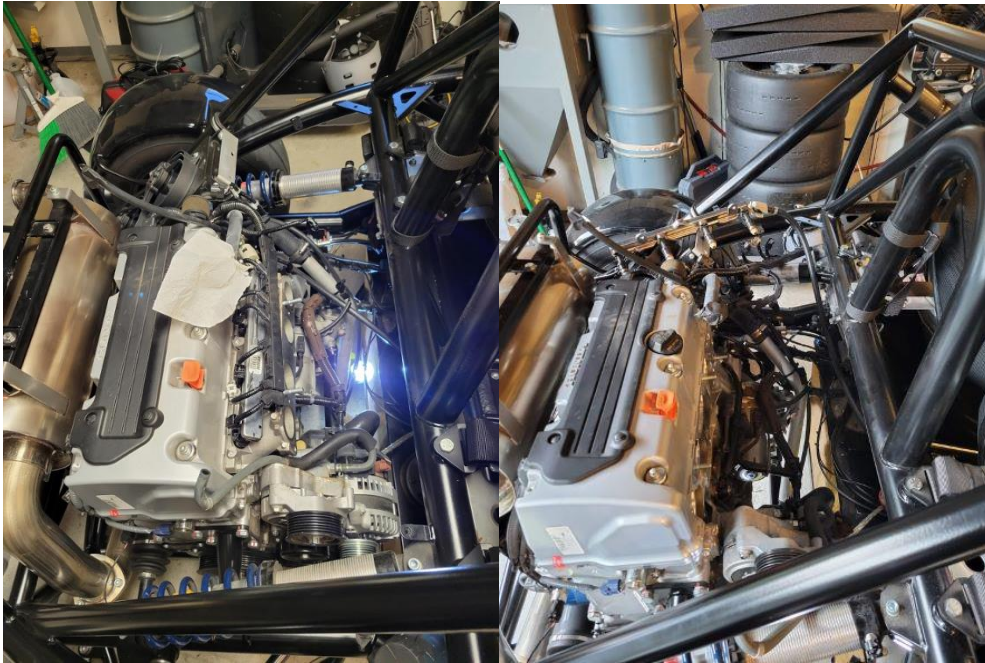
4. Remove all the bolts holding the engine cover on, there are 6 Allen bolts in the front and one large one in the back that holds it to the exhaust support hoop. Loosen the hose clamp that connects the fuel filler neck to the fuel cap and pull up on the engine cover to separate the filler neck from the fuel cap. Underneath the engine tray cover on the driver side, loosen the hose clamps holding the 180° silicone U pipe intake connector that connects the throttlebody to the snorkel intake. After loosening the clamps, remove the pipe. Disconnect the electrical connector from the MAF sensor on the snorkel intake. At this point, the rear engine cover/intake support should lift off. (If you have an SRA model Atom, remove the fuel filler cap and mount, place masking tape on the edges of the engine cover as well as wrap the rear tubes of the rollbar as it is a tight fit when removing the engine cover and if surfaces are not protected they can easily be scratched.



5. Disconnect the electrical connectors on the intake manifold for the MAP sensor, throttlebody and grounding wires.

6. K20 and K24 engines have different intake manifolds. The K20 is a single piece aluminum manifold and the K24 is a two piece aluminum/plastic manifold. On the K24 manifold, both the plastic and aluminum components of the manifold are removed. Unscrew and remove the throttle body and brackets from the manifold, unscrew and remove the metal support bracket on the bottom of the manifold that secures the manifold to the engine block. Unscrew the bolts holding the fuel rail and remove the fuel rail with the injectors. Keep the injectors in the fuel rail at this time. It is not necessary to completely remove the fuel rail from the fuel line, there is enough slack in the fuel line to set the hooked up fuel rail to the side. Disconnect the PCV line from the intake. Disconnect the coolant crossover tube from the manifold or from the thermostat housing if easier (SRA does not utilize a crossover coolant tube). Remove all nuts and bolts holding the intake manifold to the head. Check that all electrical wires have been

disconnected and any zip ties holding the wires to the intake manifold have been released. Remove the intake manifold from the head, remove the metal gasket from the head and place tape over the intake runners in the head for protection. Use the double nut method and remove studs from the head that were used to hold the intake manifold to the head.



7a. **FOR K20 MOTORS:** The block is shorter than the K24 which necessitates installing a different thermostat and thermostat housing which repositions the coolant pipe coming out of the thermostat housing in a downward position to allow clearance for the Merc Racing manifold. Remove and replace the thermostat and thermostat housing with an RSX Type S housing and thermostat (SRA atoms with a K20 do not have a thermostat so remove the thermostat from the RSX-S replacement for SRA models)

7b. **FOR K24 MOTORS:** due to the taller engine block, it is not necessary to replace the thermostat housing and thermostat.

8. Remove the zip tie wire holder holding the alternator wire to the thermostat housing. Use a Dremel or equivalent to cut off the plastic tab on the top of the thermostat housing for the wire holder. **DO NOT** use a pair of wire cutters/nippers as the pressure may crack the thermostat housing. Remove the part that's circled.



9. Remove the brown hard plastic protector around the engine wiring harness (circled), wrap the wires with electrical tape for extra protection if needed and either tap down flat the black mount/coolant line bracket (arrow pointing to it) that it connects to or cut it off with a Dremel before where it bolts to the block. This is to provide clearance for the Merc Racing Manifold.



10. Either bend down or remove the metal zip tie bracket for the starter wire.



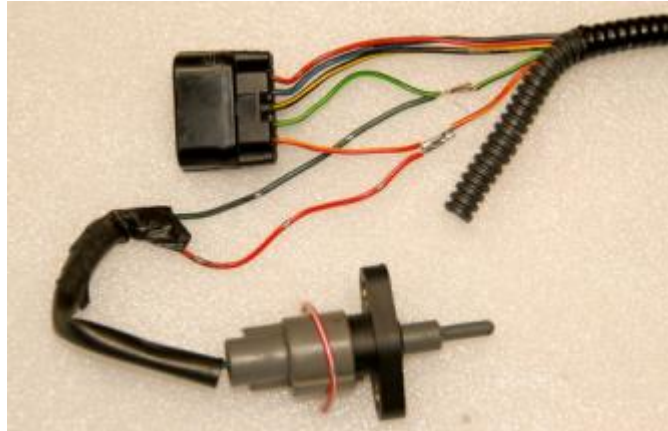
11. Remove the serpentine belt and top idler pulley with bracket.



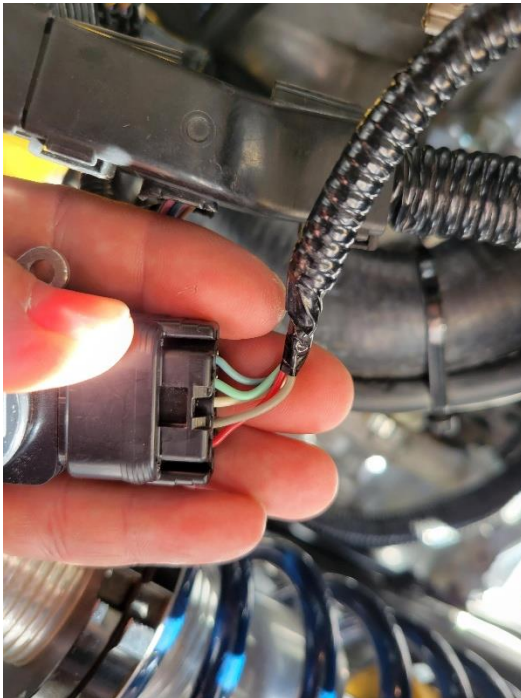
12. Locate the MAF sensor harness, the K20 and K24 have different wire colors but the pins are in the same location. Use the wires shown in the picture and hook up as indicated to the harness clip for the AEM intake temp sensor. **For the K20** you can tap onto the wires and leave the harness unconnected to a MAF sensor.

For the K24 the MAF sensor needs to remain hooked up but will not be used for reading and does not need to be in the intake. The wires used for the internal IAT on the MAF need to be cut about 2" from the connector and taped up, hook the cut wires from the vehicle side of the harness to the AEM intake temp sensor

harness. For storing the unused MAF sensor, you can wrap tape around the sensor and secure it to the coolant pipe with zip ties. For a more aesthetic finish, the MAF sensor fits perfectly into a short 1" diameter PVC pipe with an end cap on it that can be painted black and zip tied to the coolant pipe.

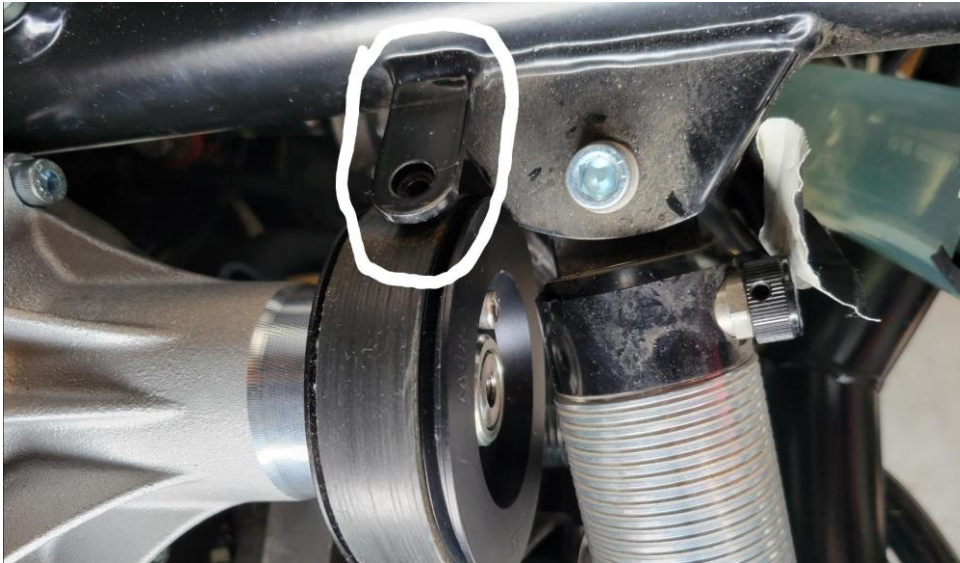


Wire color may differ, note this is looking at the bottom of the MAF connector.

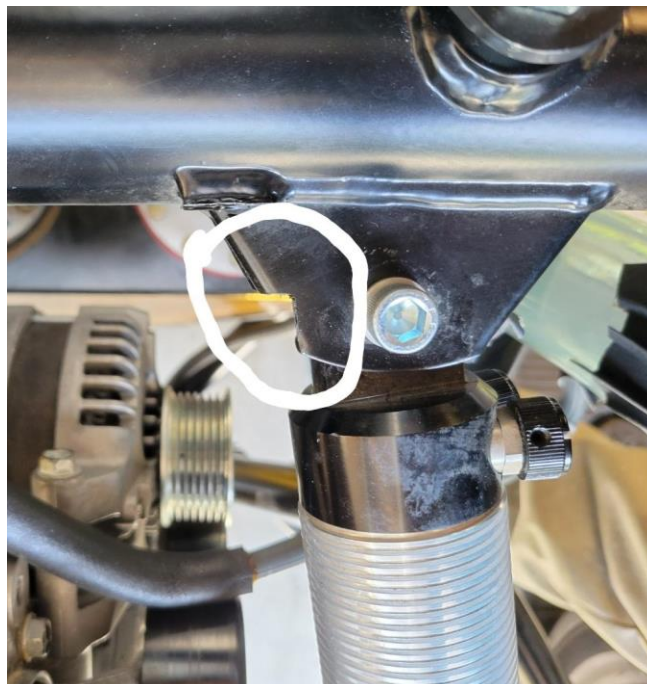


13. Remove the passenger side engine cover mounting tab to allow clearance for the blower pulley. This can be done using either an angle grinder or Dremel with a

cutting wheel. Make sure to cover the engine as well as anything else that can get damaged by flying sparks.



14. Next step required only if using the 3.5" 7 rib Merc Racing pulley (pic on next page). This is not required if you are using a 6 rib 3.5" pulley or a smaller diameter supercharger pulley. Cut a small triangular notch out of the shock brace as pictured. This will not affect the integrity of the brace but is needed for clearance when using the larger pulley. Please feel free to contact us regarding getting a six rib should you want the 3.5 inch pulley or a smaller pulley for increased boost.



15. Install the K-Tuned coolant bypass plate. When installing, the adapter gets mounted directly to the head (Do Not Install A Gasket Between The Head and The Adapter, use Hondabond) **SRA Models:** the lower elbow Barb is not utilized on the coolant bypass plate, it can be unscrewed and replaced with the 8AN plug mentioned in the required items for the SRA at the beginning of this install manual.

The Intake Manifold Adapter can be installed either using the included spring loaded tab or by tapping the head. We use Honda Bond or similar gasket maker as it provides a strong seal and when using the spring loaded tab when the adapter isn't under pressure there will be no chance of leak. The spring loaded tab holds the adapter down with constant spring pressure to ensure a tight fit and seal. The other option is using the provided blind hole you can easily tap the head for the second hole. Tapping the head will require a 6.5mm drill bit (to finish the blind hole in the adapter), 5mm drill bit (to drill the head), and M6x1.0 Tap.

Required Tools:

Drill

¼ or 6.5mm drill bit

13/64 or 5mm drill bit

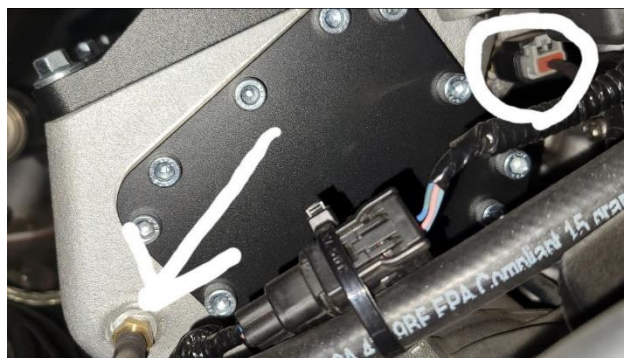
M6x1.0 tap (Standard and bottoming)

Begin by using the 6.5mm or ¼ drill bit to finish the blind hole in the adapter. You then want to install the manifold and adapter on the head. This will ensure you are properly positioning the hole. Once you have marked where you want to drill remove the manifold and adapter. Place tape or plug the holes on the head for intake and coolant to prevent anything from getting inside. You will use a 5mm or 13/64 drill bit to drill the head to a depth of at least 11mm (the depth of the bolt) but shouldn't need more than 14mm. You can apply tape on the drill bit to ensure not to drill too deep. Once you drill the hole you will run your tap. Use a M6x1.0 tap and lube and do it slowly. Be careful not to tap too deep. You can start the thread with a standard tap but you should finish it using a bottoming tap. This will allow the bolt to use most of the tapped hole. Slowly start to tap the head and check fitment of your adapter often. You want the adapter to hold snug but not tap the hole to far.

Use Hondabond on the mating surface of the adapter and hand tighten the mounting bolts and allowed a set up for a couple of hours and then perform a final tightening. This creates a better pressure seal to prevent leaks.



16. Prep the Merc Racing Manifold for install. Install the AEM temp sensor into the manifold in the hole to the right of the black block off plate (circled). Wrap the 1/8 NPT barb fitting with teflon tape and screw in the location shown with the arrow. Install the 4 bar map sensor into the hole above the IAT sensor and secure with the Allen screw.



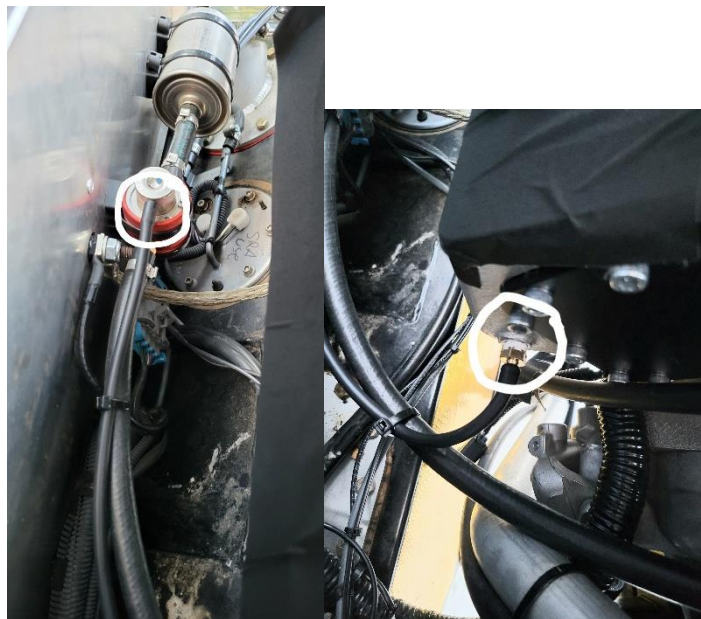
17. Remove the masking tape covering the inlets on the head. Verify correct orientation of the thermal gasket and mount the Merc Racing manifold to the Head with the thermal gasket in between. Using the hardware in the small bag labeled “Mani to head”, Install all hardware but do not tighten. Once all hardware that attaches the manifold to the head is installed ensure that the manifold is not being pushed up or out of place by any hoses, brackets or wires. The manifold should sit flush against the thermal gasket without having to tighten the hardware. If the manifold does not sit flush against the thermal gasket, this would indicate that something like a wire or hose underneath or behind the manifold needs to be moved. Once the manifold sits flush, tighten all the hardware.

18. Prep the supercharger for install. Place the supercharger on a soft surface so as not to scratch the mating surface. Mount Merc Racing blower inlet to the supercharger using the small Allen bolts included. Install the 1/8 NPT hose barb that’s included in the kit into one of the threaded inlet ports, make sure to use teflon tape on the threads. Install a short section of vacuum hose from the barb to the bypass valve. Flip the supercharger over and mount the blower plate to the bottom of the blower using the larger Allen bolts. Apply a small amount of loctite to each one of the Allen bolts that secure the blower plate to the bottom of the blower. Install the supercharger pulley using the four included Allen bolts. Have an assistant hold the pulley when tightening the bolts.



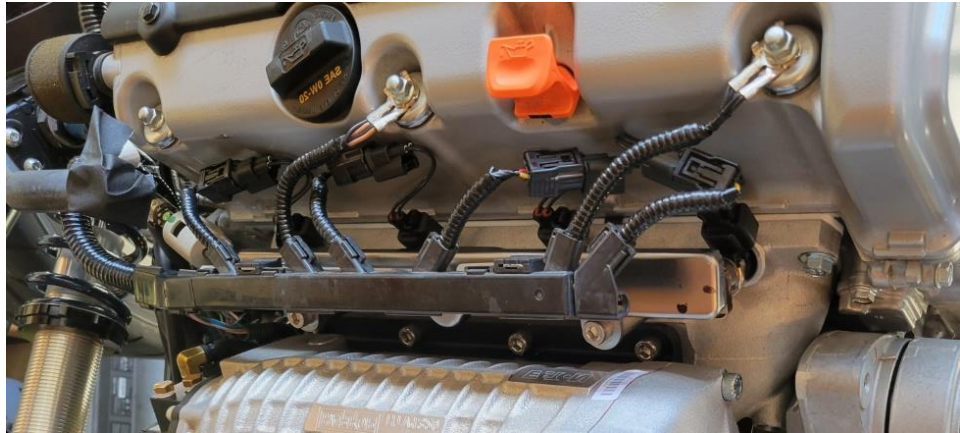
19. Make sure the large orange o-ring is in place on the bottom of the blower plate. Set the blower on top of the intake manifold and thread the 4 large hex head hardware into the front of the plate and 4 large Allen bolts into the back. Thread by hand to avoid cross threading. When tightening the Allen's, use of a long Allen wrench that has a domed swivel head will make it easier to tighten them as the clearance from the blower body is minimal.

20. Hook a vacuum hose from the barbed connector on the intake manifold to the fuel pressure regulator on the firewall. You may have to rotate the top of the fuel pressure regulator so the barb is facing towards the driver's side. Secure the vacuum hose with zip ties.



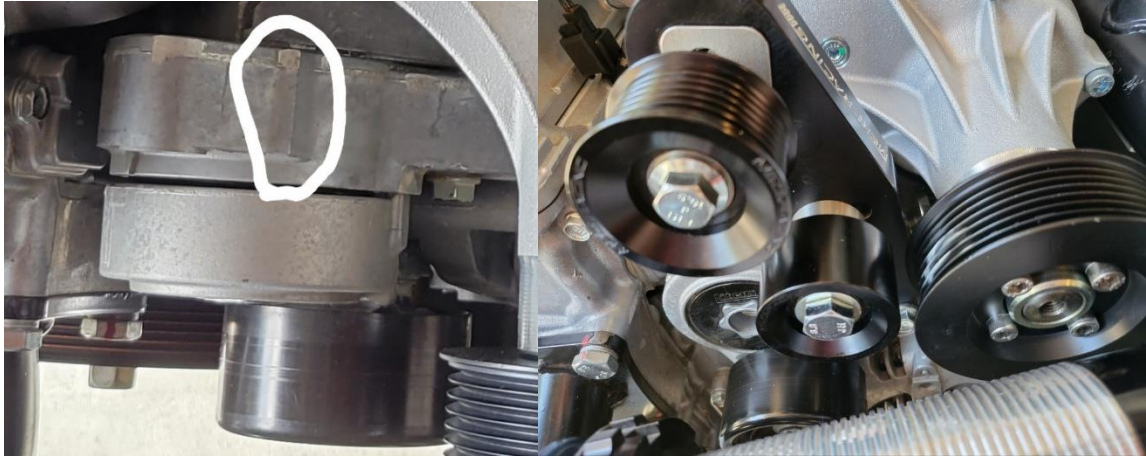
21. Remove the stock fuel injectors from the fuel rail after first removing the metal securing clips. Install the new injectors reusing the metal retaining clips. Use the plug and Play adaptors or cut and crimp on the new adapters. The fuel rail can now be installed onto the Merc manifold utilizing the machined cylindrical spacers and long Allen bolts. Place the two grounding straps under the valve cover nuts as shown in the image.

*** Important note the injector Dynamics injectors do not fit in the Merc manifold with the injector Dynamics lower o-rings that they come with, you have to take the o-rings off the top of the stock atom injectors and put them onto the bottom of the injector Dynamics injectors to get them to fit.***



22. Reconnect the electrical wires for the MAP sensor, MAF and any other harness clips that were previously disconnected. We will be connecting the throttle body connector after installing the throttle body in step 24.

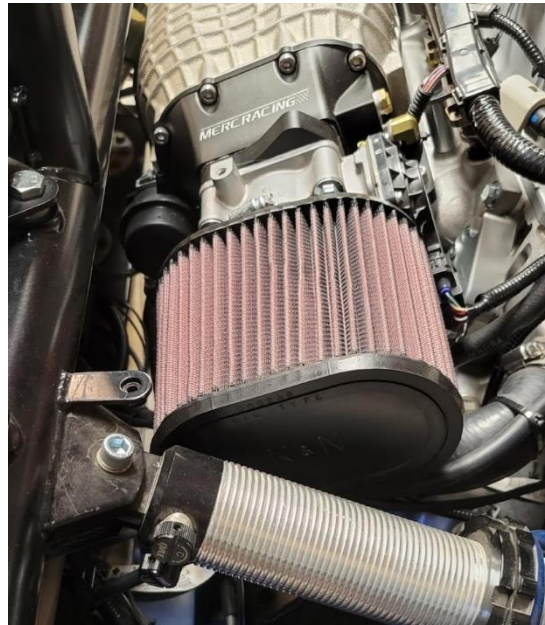
23. Test fit the Merc Racing Belt Tensioner to ensure that both of the mounting holes line up with the auto tensioner bracket. On some K24 models, the circled area will need to be sanded down with a file, Dremel or similar tool to allow the bolts to line up with the mounting holes in bracket. Once the bolts slide in and thread freely, tighten the Merc tensioner to the water pump housing.



24. Install the Merc Racing throttle body mounting plate onto the blower inlet. Ensure correct orientation prior to mounting and place a thin layer of hondabond on the inlet face. Now mount the throttle body to the adapter plate as shown in the pic on the next page. If your factory throttle body bolts are too long you can source shorter metric bolts from your local hardware store. Make sure to add a thin layer of hondabond to the back of the throttle body. Connect the electrical harness clip.



25. Install the K&N air filter onto the throttle body in the same orientation as shown in the pic below and tighten the hose clamp.



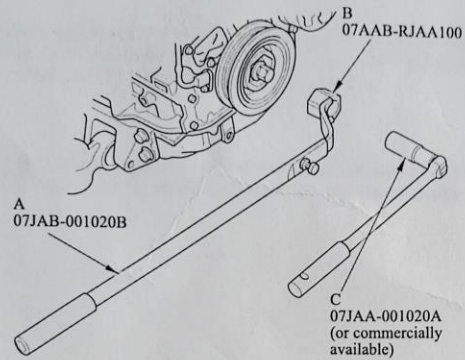
26. **For K24 Motors:** If you are planning on running the base non-aftercooled kit you need to change your crank pulley to the smaller K20Z3 crank pulley (Part number in the beginning of this manual) as the larger crank pulley will make too much boost for the non-aftercooled application. If you are having trouble removing the crank pulley bolt, the easiest way to remove the crank pulley is using a weighted crank pulley removal socket and an air impact wrench. An affordable socket is Lisle 77080 19mm Harmonic Balancer Socket, about \$20. **DO NOT USE THE SOCKET TO INSTALL THE CRANK PULLEY ONLY TO REMOVE IT!!!** Please review the factory service manual instructions on the following pages:

Special Tools Required

- Holder Handle 07JAB-001020B
- Crankshaft Pulley Holder 07AAB-RJAA100
- Socket, 19 mm 07JAA-001020A

Removal

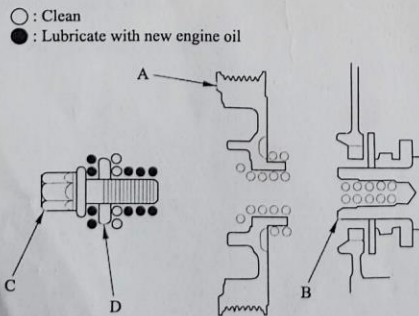
1. Remove the right front wheel.
2. Remove the splash shield.
3. Remove the drive belt.
4. Hold the pulley with the holder handle (A) and the crankshaft pulley holder (B).



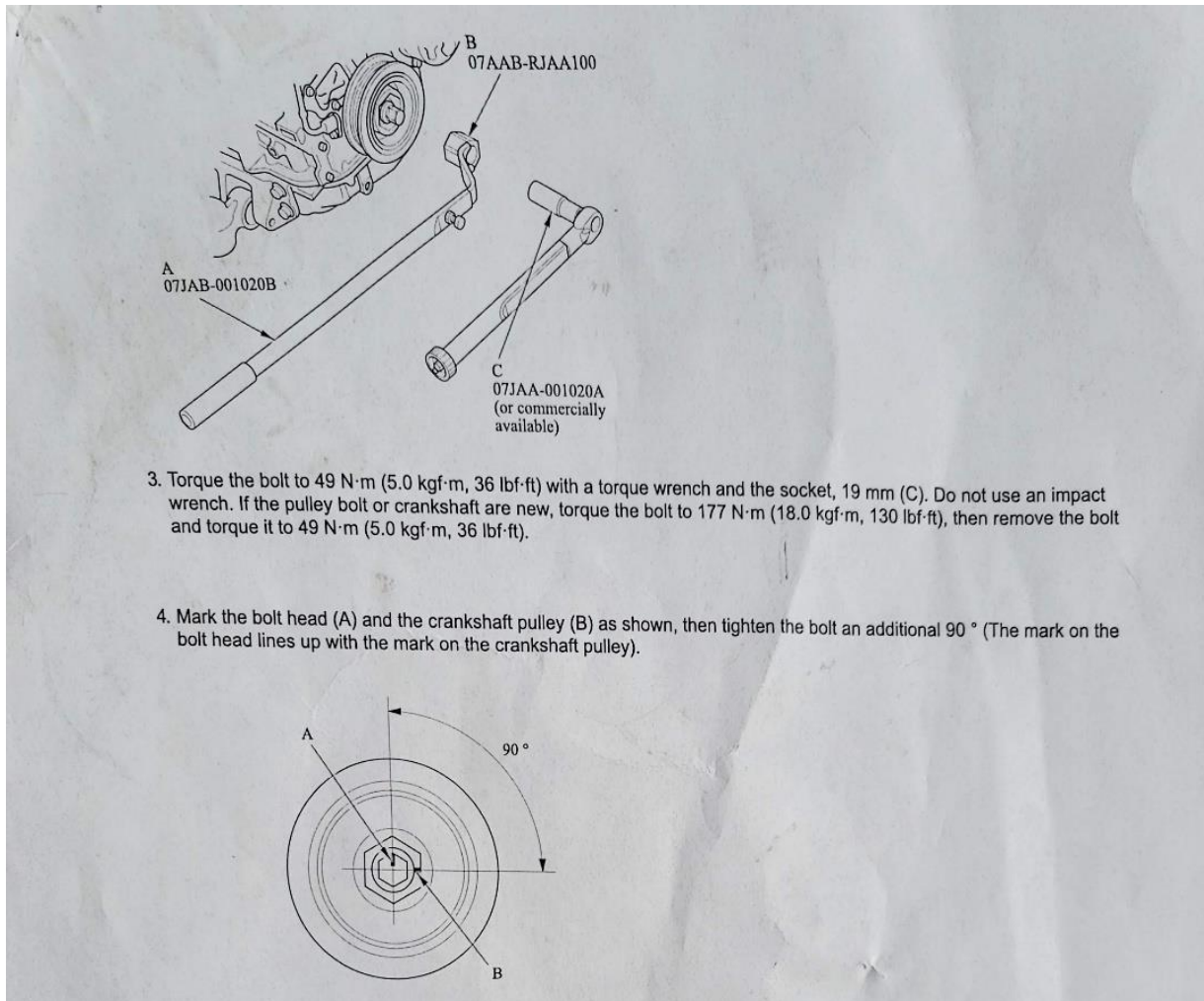
5. Remove the bolt with a socket, 19 mm (C) and a breaker bar, then remove the crankshaft pulley.

Installation

1. Clean the crankshaft pulley (A), the crankshaft (B), the bolt (C), and the washer (D). Lubricate with new engine oil as shown.



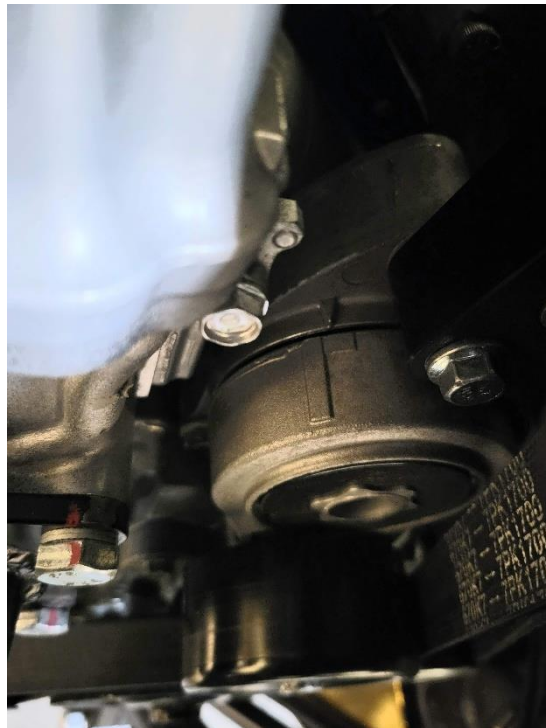
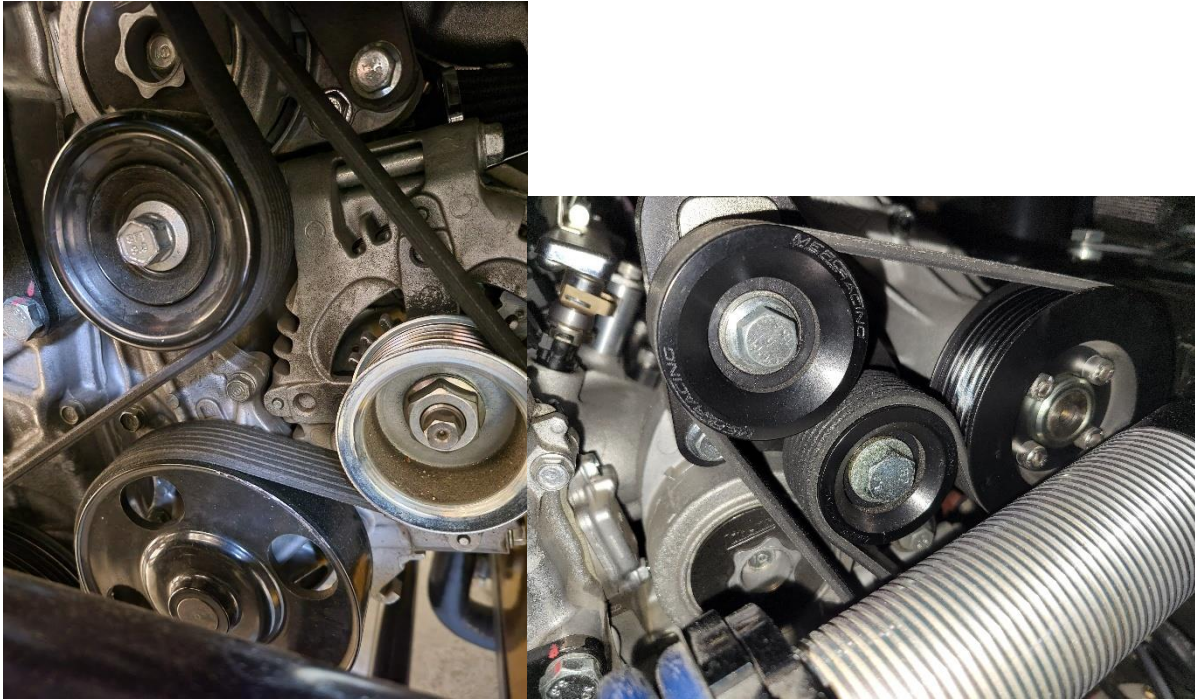
2. Install the crankshaft pulley and hold the pulley with the holder handle (A) and the crankshaft pulley holder (B).



27. Re-connect the PCV line. It is recommended that an oil catch can is utilized when hooking the PCV system back up. To do this, run a line from the PCV valve to a catch can then install a 1/8" NPT by 1/4" barb fitting in one of the ports of the blower inlet and run the other line from the oil catch can to the barb fitting. If you choose to vent the PCV system to open air instead of using a catch can, remove the PCV valve, drill/out and remove the spring and ball and install a filter on the end of the valve.



28. Install the serpentine belt as shown in the pics and use the Merc Racing tensioner to adjust tension so that the factory tension indicator looks like the picture.



29. Ensure all hose clamps are tight on the coolant hoses and install the coolant reservoir tube to the reservoir and tighten the hose clamp. Fill the coolant system. If you live in an area that reaches freezing temperatures you will need to add antifreeze, otherwise it is recommended to run distilled water and two bottles of Water Wetter. After you have filled the system up to the MAX line in the reservoir, leave the cap off the reservoir and squeeze all of the coolant lines repeatedly to let out any trapped air. Now bleed the radiator at the front, it is recommended to have an assistant help with this process. There is a small bolt in the top of the radiator, very slowly loosen and unscrew the bolt. As soon as the bolt is removed the air in the top of the radiator will be pushed out and coolant will start gushing out, put your finger over the hole to stop the flow and have an assistant wrap teflon tape around the bolt threads, if you don't do this it will leak. Have the assistant check the level in the reservoir to make sure it hasn't dropped below the MIN line, top off to MAX if necessary. Quickly remove your finger and re-thread the teflon wrapped bolt into the top of the radiator and snug it up. Top off the reservoir again if needed.



30. Replace the spark plugs with the new plugs that are 1 step colder (part number in the beginning of this manual). Don't forget to use anti-seize on the threads.

31. Reconnect the battery and using the Hondata Flashpro install a base tune or Merc Racing final tune. We can provide you with a base tune at no charge however base tunes should not be driven under boost and are merely a starting point just to start your car and assist your tuner with getting the car going. If you would prefer not to have to tune, complete final tunes **for the K24 engine** can be purchased

from Merc Racing. There is a 93 octane street tune and 95 octane race tune available for purchase.

32. Start the vehicle and monitor coolant and add as necessary. Allow vehicle to reach operating temperature and ensure the fans turn on and cool the vehicle properly. Additional coolant bleeding is usually not necessary. Check to make sure the bolt on the front of the radiator is not leaking.

33. Re-install engine cover, secure coolant reservoir to cover, re-install snorkel and intake cover with fasteners and fuel filler neck/cap. **Note: For K24 engines**, the supercharger sits higher than on the K20 and the engine cover will either need to be stood off from the mounts for clearance or a small window trimmed out the cover and the passenger side inner mounting hole sanded down from the back side for pulley clearance. Modifications shown in pic below.

