



Supercharger Kit

• OWNER'S MANUAL •



# WARRANTY/LEGAL INFORMATION

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## LIMITATION OF WARRANTY

A&A Performance warrants this product to be free of defects in workmanship and materials for a period of ninety (90) days from the date of sale, and this warranty is limited solely to the parts contained with the product. A&A Performance will repair or replace, at its expense and at its option, any part of the product which in normal use has proven to be defective, provided that you return the product, shipping prepaid, to A&A Performance.

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A&A Performance will extend this Limited Warranty for one year from the date of purchase if you return the Extension of Limited Warranty card included herein within thirty (30) days of the date of purchase. The extended Limited Warranty will be subject to the same terms, conditions, and limitations as set forth herein.

The validity, construction and performance of this Warranty shall be governed by the laws of the Commonwealth of Pennsylvania, without regard to conflict of laws provisions of any jurisdiction.

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This is a high performance product. Installation of this product requires a degree of experience and skill in mechanics. Use at your own risk.

Do not use this product until you have reviewed all instructions included herein and the disclaimers and warnings included with the product. You will be subject to certain limitations of warranty and warnings upon installation of this product.

Before installing this product, consider the following:

- Installation of this product requires a degree of experience and skill in mechanics. It is your responsibility to determine if you possess the appropriate skills to install the product properly.
  - Failure to install, use and service the product properly presents a danger to you and others and may result in serious injury.
  - Failure to use this product consistent with federal, state and local statutes, laws and regulations may result in criminal or civil liability for you alone.
  - Failure to use this product consistent with manufacture specifications and operation guidelines present a danger to you and others and may result in serious injury.
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# GENERAL INFORMATION

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## *Congratulations on your purchase of an A&A Performance Supercharger Kit!*

You have chosen the ultimate in performance for your 1998-2001 VFR800; to ensure that this kit (and consequently your motorcycle) provides the utmost in long-lasting, dependable service, please familiarize yourself with this owner's manual, as it covers the installation procedure and recommended operational guidelines in great detail. Failing to adhere to the advice, warnings, and instructions listed on these pages could lead to serious harm for both you and your motorcycle.

### *Necessary Tools*

The following tools are used in the assembly/disassembly of this kit:

- Torque wrench capable of at least 103 N•m (76 lb•ft)
- 1 inch deep socket
- A full assortment of metric and SAE sockets, wrenches, & allen wrenches/hex keys
- A vacuum pump or compressed air line for Rotrex oil system priming
- Power drill with a  $\frac{7}{32}$ ", #2, or #1 (5.6mm, 5.7mm, or 5.8mm) drill bit
- Philips-head and straight-bladed screwdrivers
- Cutting shears, files, masking tape, and a Dremel (or similar) tool with cutoff wheel

### *Necessary Parts*

The following parts are not supplied with this kit, but will need to be obtained (if necessary):

- Dynojet Power Commander III
- Fresh oil, coolant, and gasoline (see Operating Guidelines section for recommendations)
- If found to be in poor shape – Clutch plates and Fuel filter

### *Common Terms*

The following acronyms are used throughout this manual for the sake of brevity:

- SHCS: Socket Head Cap Screw
- BHCS: Button Head Cap Screw
- FHCS: Flat Head Cap Screw
- OBSP: Outboard Bearing Support Plate
- BOV: Blow-Off Valve / Bypass Valve
- TB: Throttle Body
- LH / RH: Left-hand / Right-hand

If at any time you get lost, have a question or comment, or just need something clarified, feel free to call or email us. Our contact info is listed below:

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## NOTES:

- If you are hesitant to attempt the disassembly yourself and/or want to ensure everything is done exactly to Honda specs, be sure to purchase the Honda Service Manual, which has all the info you need
- It helps to have as little gas as possible in the tank when starting out
- Be sure to save all fasteners and components you remove

1. Remove the side fairings, lower center fairing, RH-side inner plastic panel, & seat

2. Drain the oil and coolant

3. Pump out the remaining gas in the tank

- A drill operated pump works great to remove leftover gas in the tank (shown at right)

4. Remove the front 2 bolts from the gas tank, flip it up, and unplug the wires going to the pump and fuel level sensor



5. Put some rags down & remove the fuel lines from the tank

6. Unbolt & remove the gas tank

7. Unbolt & remove fuel pump from underside of tank – it might be tricky to get out, but twist, turn, and firmly pull on the base of the pump until it comes out of the tank

- Note: If your bike has a lot of miles, you might want to replace your fuel filter and/or fuel pickup while you have the tank apart, especially if the pickup looks dirty



8. Remove the airbox lid & filter, then unscrew the base, removing all accessories attached to it

- Leave coils on bike, but detached from stock airbox (save nuts for reuse later on)



# DISASSEMBLY

9. Unbolt oil cooler from bracket



10. Remove the PAIR solenoid valve & related hoses

11. Remove oil cooler bracket & rubber sheet

12. Disconnect oil lines from engine (saving o-rings and bolts) & remove cooler assembly

13. Unbolt coolant overflow tank from left side of bike

- Note: We highly, HIGHLY recommend sending out the injectors for cleaning – to do so requires removing the throttle body

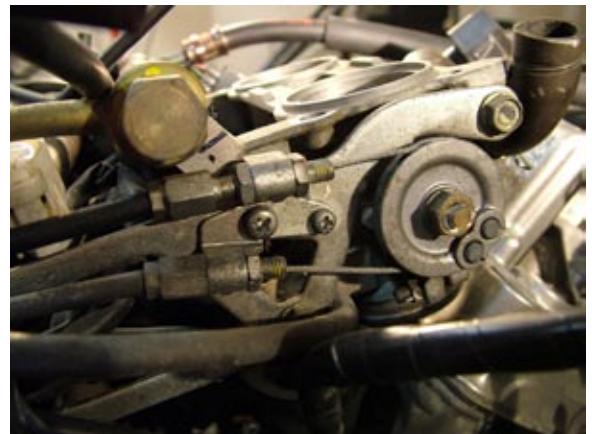


14. Using a long (12") Philips-head screwdriver, loosen the top clamp (gold screws) of each rubber boot connector holding the TB on (screws accessed via opening in frame on LH side of bike)

15. You might need to pry the throttle body off using a non-marring bar as it can be a tight fit in the rubber boots

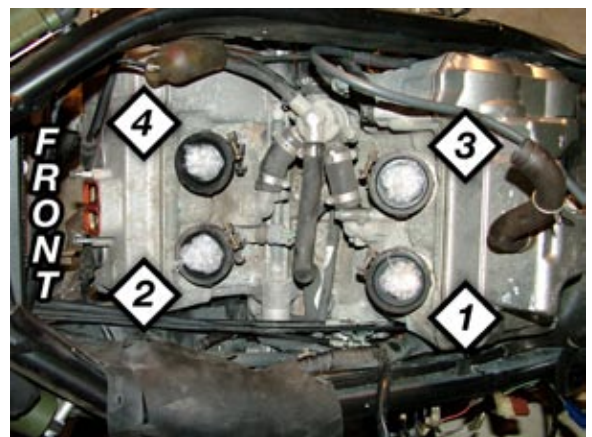
16. Unclip wiring harness & choke cable ('98-'99) or water hoses from wax unit ('00-'01)

17. When removing throttle cable bracket, tap the butt of a Philips-head screwdriver with a hammer while loosening screws (to ensure you don't strip out the heads)



18. Remove vacuum lines 1, 2, & 3 and unplug the line going to the one-way valve

19. Remove TB – make sure the runners are blocked off to keep debris out



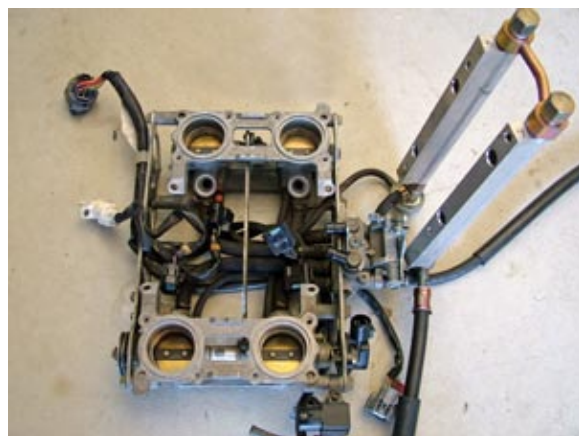
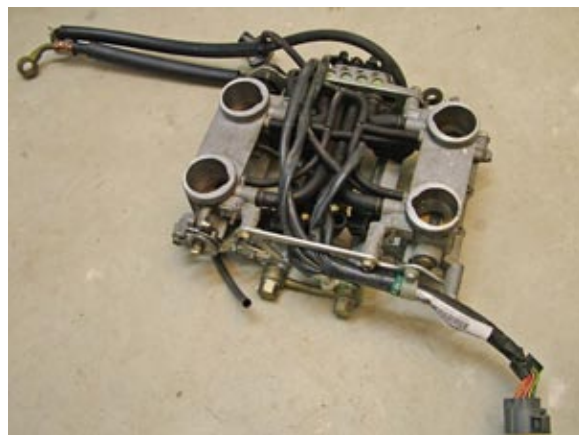


20. There are 4 bolts on the underside of the TB holding the fuel rails on – unbolt them

21. Rocking it back and forth, pull the fuel rail off and remove the injectors

- Note: We highly recommend that the fuel injectors are sent out for cleaning prior to installation. Partially clogged injectors or poor spray patterns can lead to inconsistent, stumbling performance or (even worse) a lean condition at high-RPMs, potentially giving way to detonation/pre-ignition. Marren Fuel Injection and RC Engineering are the two biggest companies in the US that do full-service injector cleaning, and it only takes about 2 days for the service to be completed.

22. Remove the stock fuel pressure regulator



23. Remove inner right fairing panel

24. Unbolt right radiator and disconnect hoses

25. Remove radiator grille from radiator

26. Remove lower coolant hose – be sure to save clamps

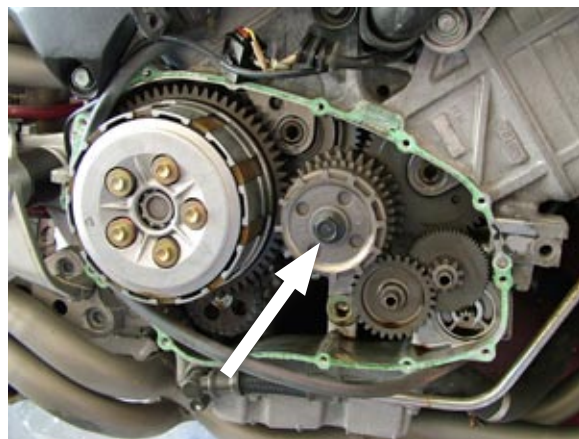
27. Remove timing cover from clutch cover – save o-ring for later



28. Unbolt & remove clutch cover (you may need to tap on the cover from the backside to break it loose) – be sure to scrape all gasket residue from mating surfaces

29. Using an impact driver or long handle wrench (with bike in 6th gear & rear brake applied), remove the bolt in the end of the crank

30. Remove stock clutch springs & inspect plates for wear & discoloration – fiber disc service limit is 2.5mm (0.10”) and metal plate service limit is 0.30mm (0.012”)



# INSTALLATION

## NOTES:

- If you are hesitant to attempt the installation yourself and/or want to ensure everything is done exactly to Honda specs, be sure to purchase the Honda Service Manual, which has all the info you need
- Before proceeding with the installation, please give yourself time to read and understand the official Rotrex manual, as it details specific guidelines of its own regarding the Rotrex C15-60 supercharger

1. Install spark plugs (torque to 12 N•m (9 lb•ft)) and Power Commander III (if necessary)

- On 2000-2001 models, if O<sub>2</sub> sensor eliminators have not already been installed, disconnect the O<sub>2</sub> sensor plugs on the left hand side of the bike (near the alternator cover, behind the overflow canister) and place a supplied 330Ω resistor into each of the plug connectors – install the end of a resistor into one of the leads on the side opposite the locking tab, and the other end into the other lead opposite the locking tab



2. Unbolt the PAIR housing covers and remove the reed valves

3. On each reed valve, remove the small screw (and nut) holding the reed to the plate

4. Insert the plates into the silicone gaskets and then place the plate/gasket combo into the housing with the perforated base plates already set in place

5. Install each block-off plate using (2) stainless 6mm FHCS



6. Install new clutch springs (if the old springs have been removed for a while, you might have to push the pressure plate in as the hydraulic clutch extends the pushrod over time). Also, if new clutch plates are needed, install them now.

Note: Torque spring bolts to 12 N•m (9 lb•ft) – **do not overtighten and strip out the basket!**





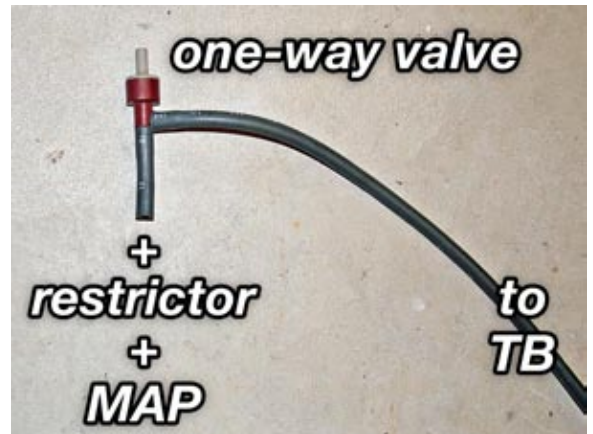
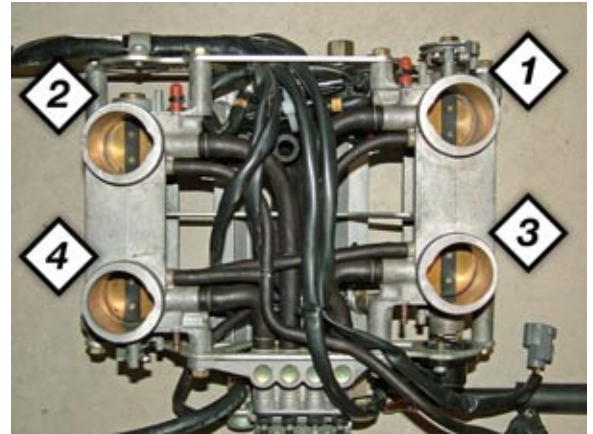
7. Apply blue Loctite to the end of the threads of the crank connector and install into end of the crank, torquing to 103 N•m (76 lb•ft) with a 1" deep socket and torque wrench – make sure bike is in 6th gear with the rear brake applied
8. Apply a thin film of grease to the clutch cover gasket and re-install clutch cover
9. Torque flanged M6 bolts to 12 N•m (9 lb•ft), tightening in a crisscross pattern
10. Coat the old timing cover o-ring with a thin film of oil, insert it into the new, modified timing cover, and place a small amount of blue Loctite onto the modified cover's threads
11. Slide timing cover over the end of the crank connector and proceed to screw into clutch cover
12. Using the supplied spanner wrench, tighten timing cover sufficiently
13. Slide 25T crank pulley onto end of crank connector and tighten M10x20 flanged hex bolt into end of connector (with a dab of blue Loctite on threads) – apply rear brake to tighten fully
14. Install K&N breather filter onto breather nipple sticking out of rear cylinder head



# INSTALLATION

## Throttle Body Prep

15. If the injectors were cleaned, lightly oil the o-rings and reinstall them back into the TB and fuel rails, then reinstall the electrical connectors
16. Install the new fuel pressure regulator and hook up the vacuum line that runs to it
17. Plug open vacuum ports 1, 2, & 3, as well as the port that used to connect to the one-way valve, with the supplied rubber plugs & zip ties
18. Attach the supplied silicone vacuum hose to #4 port – this will connect to the BOV – make sure it is held up out of the way so it can be easily reached later
19. Connect the previously removed one-way valve to the hose that runs to the MAP valve
20. Insert the .035" restrictor pill into the end of the short vacuum line and then plug into MAP sensor
21. Using the plastic strap and 10-32 SHCS (with locknut), attach MAP sensor to TB
22. Face the two big hoses on the TB upside down and move the temp sensor to the center – be sure all hoses and lines clear moving parts when throttle is rotated





22. Oil the boots and pop the throttle body back into place...

- Tighten boot screws with long Philips screwdriver
- Reconnect the throttle cables (use blue Loctite on bracket screws)
- Reconnect the fast idle mechanism

23. Get the rear coils ready for install...

- Loosely install the spacers, coil brackets, and M6-80 bolt in the order shown at right, reusing the flanged M6 nut that initially held the coils on the airbox
- Situate the coils right in front of the breather filter

24. Separate the temp sensor from its plug then bolt it into the airbox baseplate using (2) M5x14 Stainless SHCS (use blue Loctite on threads)

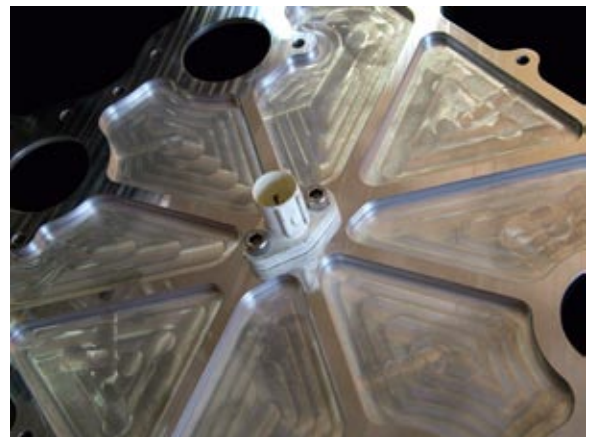
25. Insert o-rings into TB connectors and place onto TB – the side with the deeper groove sits on the TB

26. Slide sealing washers onto (8) M5x50 BHCS, reconnect temp sensor, place baseplate on top of TB connectors, and install screws being careful to not over-tighten them

- Note: Twist throttle and make sure the action is smooth, with no binding or TB parts hitting, before going any further

27. Take the airbox lid/carbon hat assembly and place it on top of the baseplate...

- Proceed to install (14) M5x14 SHCS, keeping open the two spots where the coils install
- Hold coils in place and thread the M5x25 SHCS through the airbox & coil bracket, then install locknuts to hold coil bracket in place (Note: to install locknuts, it is easier to hold nuts in place while tightening the SHCS so it threads through the airbox and nut at the same time – then just tighten the nut with a wrench)
- When the coil bracket is situated properly, tighten the M6 nuts holding the coil assembly together





# INSTALLATION

28. Install the Upper Rotrex Bracket using (2) M6x30 flanged SHCS into the spot where the oil cooler bracket used to reside – use blue Loctite on threads

29. Install OBSP adjuster rod onto OBSP with 1/4"-20x1" BHCS and locknut

30. Place the intake hosing & clamps on the rotrex outlet (lightly snug) and fit supercharger assembly onto bike – make sure clamps can be tightened once installed (see picture for positioning)

31. Slide 3/8"-16x6" hex bolt & washer through top, along with upper standoff (flat towards pulley side, facing downwards)

32. Slide M6x70 hex bolt & washer through bottom, along with lower standoff

33. Snake the intake tubing up to the airbox as you mount the supercharger/bracket assembly; slide the end of the hose over the carbon hat inlet, then lightly snug upper 3/8" bolt and *fully tighten* lower M6 bolt

34. Tighten hose clamps

35. Install BOV, filter, & rubber 45° hose onto nipple sticking out of aluminum elbow, and be sure to connect vacuum line coming from TB

36. Bolt radiator to radiator bracket as shown at right using an M6x20 BHCS



37. Slide radiator bracket through OBSP – make sure all hoses are behind brackets and not pinched

- Note: Use a metal grommet from the old oil-cooler to mount up the radiator – the radiator already uses one on the right side, but not one on the left – insert grommets from the outside so the BHCS can solidly bolt to the bracket and the grommet captures the radiator



38. Bolt radiator bracket to rotrex bracket with (2) M6x30 BHCS, and radiator bracket to frame boss with another M6x30 BHCS

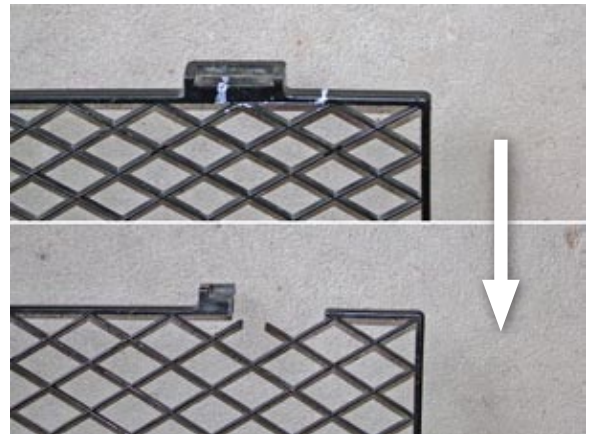
39. Bolt the other side of the radiator to the bracket using a M6x20 BHCS



40. Modify the radiator grille as shown in pic and reinstall onto radiator

41. Now that the supercharger is loosely bolted to the bike, go back and tighten all the bolts holding the bracket to the bike

42. Install belt onto pulleys



43. Remove front-right engine hanger nut and install the 7/8" stainless idler standoff nut, torque to 54 N•m (40 lb•ft)

44. Reinstall the coolant tank on the LH side of the bike and the radiator coolant hoses on the RH side

45. Bolt stainless bracket to end of OBSP adjuster rod

46. Place the M12x21 hex bolt through the idler bracket, the stainless bracket, and into the standoff nut, then lightly snug – make sure adjuster rod is extended enough to allow it to bolt up





# INSTALLATION

47. Rotate the OBSP adjuster rod until the stainless bracket is inline with the adjuster rod – once it's inline, rotate the rod the opposite direction until it becomes lightly loaded in compression, but don't make it too tight as you want to have the assembly just slightly loaded prior to torquing the M12 bolt. When you get it loaded properly, tighten the jam nuts on each end of the adjuster rod to lock it in place, and make sure the rod and stainless bracket are still inline with one another.

- Note: Groove on adjuster rods indicates **LH** thread

48. Replace the bolt that holds on the upper-left fairing bracket with an M6x30 BHCS and connect the idler rod end on the backside with the provided M6 locknut (as shown at right) – make sure fairing bracket is rotated the correct way

49. Install fairing spacers into the two main fairing brackets – use blue Loctite on threads

50. Tighten idler by rotating adjuster rod – proper tension can be set by placing a straightedge across the bottom of the pulleys and measuring the distance the belt can be deflected from its resting position

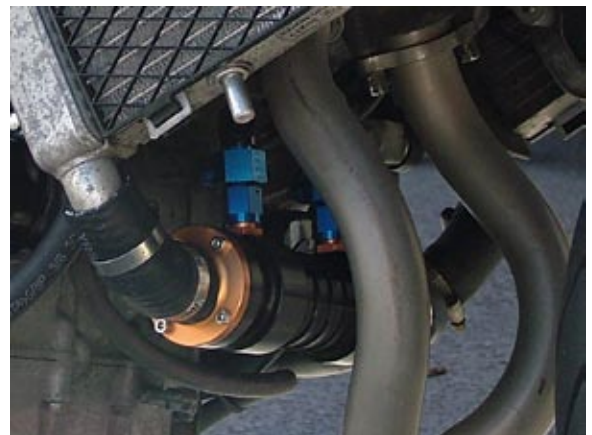
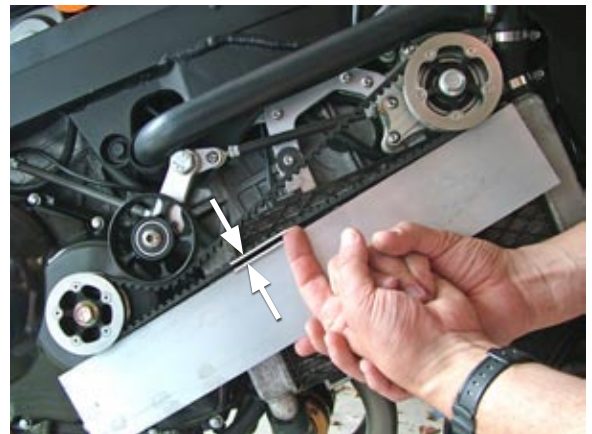
- When properly tensioned, belt should move no more than **0.220" (5.6mm)** from rest

51. After proper tension has been applied, torque idler bracket bolt (47 N•m / 35 lb•ft) and lock idler adjuster jam nuts

- Note: Groove on adjuster rods indicates **LH** thread

52. Install oil cooler between radiators at the bottom using provided 45° hoses

- Make sure the restrictor of the Laminova core is facing the entry (RH) side
- Push hoses on oil cooler so that there is no slop between the radiators – you want them snugly pulled together





53. Install oil line adapters on each side of engine, reusing original o-rings and bolts



54. Install oil lines – longer hose (13" / 33cm) goes on the RH side, shorter hose (12.5" / 32cm) goes on the LH side



55. Fit rotrex oil reservoir canister to frame...

- Attach clamps to canister, along with angle bracket for lower clamp, and lightly snug – the canister sits in-between the front of the airbox and the frame
- Drop into place and with a pencil/marker/punch, mark where the holes need to be placed in the frame – make sure the canister is not touching the airbox
- Remove canister and drill holes using a 5.6mm, 5.7mm, or 5.8mm (7/32", #2, or #1) drill



# INSTALLATION

56. Attach oil lines to supercharger, filter, and canister – see diagram at right for hose routing

57. Zip-tie oil filter to the main wiring harness

58. Bolt canister to frame using self-tapping screws, tighten clamps

59. Fill the Rotrex canister half-way with the SX100 traction fluid

- The oil system needs to be primed before the bike can be run, so either follow the directions detailed in the Rotrex manual (which involve using compressed air in the canister fill hole), or alternatively, hook up a vacuum pump to the return line of the Rotrex (the hose that enters the top of the canister) and siphon until fluid starts to flow in the line
- Once primed, make sure all lines are connected and reservoir canister is still half-full of fluid
- Run breather hose to front of canister and make sure it's fastened in place

60. Slide the K&N Precharger element over the air filter and attach the filter to the inlet of the Rotrex

- The filter may be a bit snug going on due to the PAIR valve housing, but slide it on there and then tighten clamp

61. Fuel Pump Replacement...

- Undo the metal band holding the pump in the housing, then remove the stainless steel mesh, the green retainer plastic holding the plug in, the plug itself, and the hose connected to the top of the pump.
- Slide the pump forward & out of the housing
- Replace the housing base gasket with the new Honda gasket provided in the kit



- Carefully pry the retaining clip off the pump (it will need to be reused) and remove the fuel pickup and rubber piece
- Swap the fuel pickup and rubber piece onto the new Walbro pump
- Press the clip back on to hold pickup in place (a 5mm socket makes for a nice tool to install clip)



- Slide pump back into housing, and using pliers, squeeze the strap around the body of the Walbro pump until the flats join together (the Walbro pump has a slightly larger body diameter than stock)
- Apply blue Loctite to the screw and reinstall along with the ground wire eyelet



- Hook up the hose, plug, plastic retainer, and stainless mesh.
- Bolt fuel pump assembly back into the tank

62. Reinstall the two bolts at the base of the fuel tank – leave the front two bolts out for the time being

63. With the tank propped up, reconnect the electrical connectors and fuel lines (using the new Honda sealing washers)



64. Lower the tank and add some gas – make sure the tank clears the newly installed components

65. Refill the engine with oil – we have had good results with Redline 20W-50 Synthetic in our supercharged VFR

66. Add coolant to the system – a 50/50 mix, with 4oz of Redline Water Wetter recommended for maximum cooling

67. Load the supplied fuel map onto the Power Commander III unit





# INSTALLATION

68. At this point, the bike is ready to be started. Fire it up, let it idle for about 15-30 seconds, and then turn it back off. Recheck all your fluid levels, remembering that the Rotrex canister needs to be halfway full.
69. Recheck belt tension, using method described on p. 11
70. Start the bike back up and check the belt tracking – the belt should run smoothly between the pulleys without any binding. It is normal for the belt to slightly ride on the outside of the pulleys, but if there is any noise, or if the pulleys are visibly misaligned, then you have a problem.
71. Bolt the front of the tank down, make sure you have enough gas in the tank, and if everything else is in order and the bike is roadworthy, take it out for a short test ride. Until the Rotrex unit is broken in, we highly recommend running the bike without the side & lower fairings so any problems can be diagnosed and changes can be made.



## Initial Riding Notes...

For the first 100km (65mi), no more than half throttle is to be used. Ride around lightly trafficked roads and be sure to listen for any out of place sounds emanating from the engine, exhaust, or supercharger unit itself. If you detect any pinging, loud whistling/whining sounds, or clunking/metallic/grinding noises that were not present before, stop riding the bike until the source of the noise is found. Also be sure to check for leaks present in the bike's oiling system, cooling system, and the Rotrex oiling system.

Under normal operation, the Rotrex unit is nearly silent; it produces a very faint whistle at idle that grows into a whooshing as RPMs increase. On deceleration and part throttle conditions, excess air can be heard exiting the BOV, and in-between gears, a short *psst* can be heard from pressurized air quickly leaving the valve. All these sounds are normal and to be expected during operation.

During the break-in period, feel free to vary the engine speeds but, once again, do not give the engine more than half-throttle. If the bike stumbles, hiccups, smells overly rich, runs noticeably hotter than normal, or quite simply does not run right once it is at operating temperature, further tuning will need to be performed, especially before full throttle operation is attempted. Tuning can be accomplished with the aid of a dynamometer or with a wideband O2 system (preferably with datalogging capability). We here at A&A offer free fuel map tuning for anyone who has access to either system and can provide us with a datalogger recording and/or dyno chart with O2 reading.

Assuming everything goes well for the break-in period, recheck all fluid levels and the belt tension before going any further. Once the initial 100km/65mi is up, feel free to explore what the system is capable of, but take it in easily managed steps, applying more throttle in controlled situations and always be conscious of any potential problems forming.

## Fairing Modifications...

72. Now that the bike is running, the final steps in the project are the bodywork modifications. For most modifications to the plastic, tin snips/shears work well for cutting, a file can round out sharp corners, and a razor blade can clean the edges of stringers.

73. The first piece to be modified is the right-side inner plastic panel. It must be cut to clear the supercharger. About 1.25" (32mm) needs to be cut away from the portion that sits above & next to the supercharger.

74. Next, you will need to modify the lower center fairing to clear the radiator. The best way to do this is to place the plastic in its correct location, but situated behind the radiator, and then using a grease pencil, crayon, or paint marker, trace around the radiator to mark where it needs clearance. Take the fairing back off and cut out the marked area.





# INSTALLATION

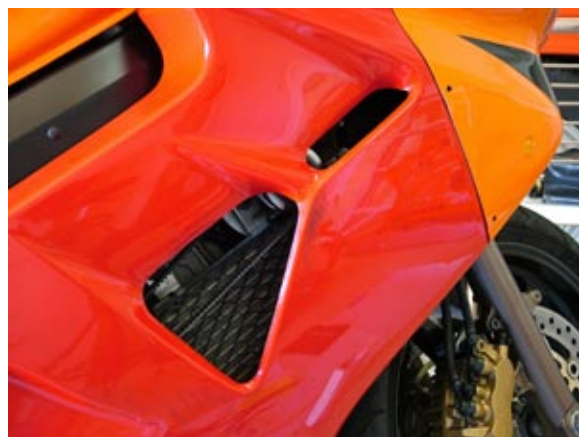
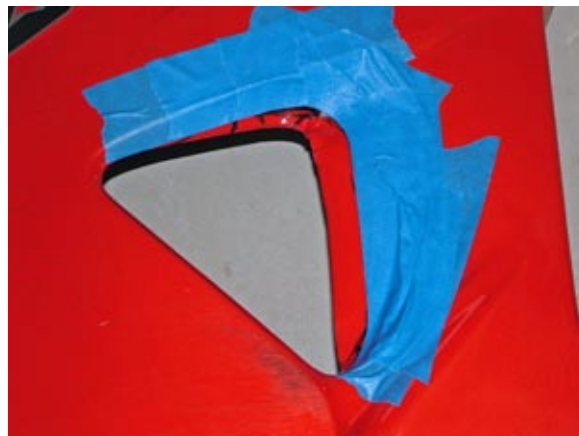
75. Finally, the right-side fairing will need to be modified. Any foam on the inside of the panel that resides near any part of the drive has to be removed. Temporarily mount the panel up to the bike and see where clearance is needed for the belt and supercharger pulley. To keep the vent profile the same shape, offset the profile with masking/ painter's tape (the tape also helps protect your paint from getting chipped/scratched). A good tool to use for cutting is a Dremel tool with cut-off wheel attachment -- this allows for fine control, smooth radii generation, and minimal to no paint distortion. If you take your time, a seamless job can be accomplished. Finish with files and sandpaper.

76. After the panel has been modified, bolt it back onto the bike using the shorter, modified fairing bolts provided with the kit.

That's it – ***you're done!***

Now ***go out and ride!***

Be safe, and please read the next page for further instructions on how to properly enjoy & maintain your supercharged ride.





The following are some important points to remember:

- We **HIGHLY** recommend sending your injectors out for cleaning. After many years and many miles, your injectors have most likely seen better days (the flow pattern will suffer). This in turn leads to improper fueling, and in the worst case scenario, severe detonation/pre-ignition.
- Detonation/pre-ignition must be avoided at all costs. This situation can fatally damage your engine if left unattended or ignored. While riding, always listen for audible signs of pinging or knocking – if these sounds are heard, higher-octane fuel must be used and/or you will need to vary your riding style.
- This kit was designed to run on 93 octane (R+M)/2 or equivalent gasoline. If you intend on spending a considerable amount of time in boost (racing situations, an extended dyno session, etc.) or do not have access to high-octane gasoline, you might want to use an MMT-based octane booster. We have had good results with Lucas Oil Racing Formula Octane Booster.
- It is not recommended to stay under full boost for more than 10 seconds at a time. Think of boost as a candle flame – you can run your fingers through the flame without getting burned time after time, but hold your hand stationary for too long and you'll be in a world of pain.
- In other words, be smart when you ride. Realize that your engine is seeing greater thermal and inertial loads than normal, so do not expect that you can run flat out, all the time, without any adverse effects. Treat your bike, and this kit, with respect and you should be trouble free for years to come.
- For the utmost in cooling efficiency, we highly recommend adding 4oz. of Redline Water Wetter to your engine coolant.
- Always stick to the recommended oil maintenance schedules for your engine and the Rotrex supercharger. The recommended oil change interval for the Rotrex is 80,000km / 50,000mi or 2 years, whichever comes first.
- Completely familiarize yourself with the Rotrex Setup and Maintenance Manual before attempting the installation.
- If you see coolant temps rise above 215°F / 102°C, do not enter into boost until the bike cools down below that temp.
- Check the belt every once in a while to make sure it is at the proper tension -- a belt that is too loose is prone to snap, and a belt that is too tight will wear out quickly. There should be no noise associated with the belt drive – if there is, you have a problem somewhere.
- Remember that this kit adds *significant* performance to your VFR. As a result, you must learn to brake earlier, practice exceptional throttle control, and by all means learn to test the bike's limits in a safe location, in a safe manner before attempting to ride spiritedly.
- If you would like to add a boost gauge, run the vacuum pickup line to one of the ports blocked off on the underside of the throttle body.

