

Crooked Willow Composites (CWC) Racing Dual Oil Cooler Kit Installation Instructions

1. Flip up headlights (use dash switch, not column lever)
2. Disconnect and remove battery, battery box (2X 10mm hex), and battery shelf (3X 10mm hex)
3. Remove covers (black) from around the headlights (Phillips head screwdriver)
4. Remove intake duct and air box (OEM)
5. Remove intercooler (move AST to the side, no need to disconnect)
6. Remove intercooler support rail
7. Remove intake elbow (4X 10mm hex)
8. Disconnect cruise control cable from throttle body (if equipped w/ CC)
9. Elevate front end of car and support with jack stands
10. Drain engine oil

STEPS 11-16 [OEM oil hard pipe removal]

** Necessary to remove the OEM oil hard pipe in cars equipped with p/s and a/c. If you have already removed your a/c and p/s, skip to step 17.**

11. Remove a/c – p/s idler pulley (17mm hex)
12. Remove a/c – p/s belt
13. Remove p/s pulley (requires SST or ingenious removal method, call if you need suggestions – CAUTION: p/s pulley is plastic and will CRACK or BREAK if not removed carefully)
14. Remove p/s pump from bracket (5X 14mm hex) and wire or zip tie it out of the way. It is not necessary to disconnect any of the p/s lines.
15. Remove a/c compressor from its bracket (4X 12mm hex, top two are easy, get the bottom/aft one from above and the bottom/fwd one from the front between the a/c pulley and the chassis.) Wire or zip tie it out of the way. It is not necessary to disconnect any of the a/c lines.
16. Remove the a/c – p/s bracket from the motor (5X? 14mm hex, 1X 17mm hex)

STEPS 17-22 [OEM oil system removal]

17. Remove the snap rings at the oil line connections to allow them to swivel (below intercooler support rail and at the oil cooler(s)).
18. Disconnect oil lines at junction below intercooler support rail. (Be ready for oil to leak out of both ends)
19. Remove oil pipe banjo bolt (21mm hex) at oil inlet port (oil filter.)
20. Slide oil pipe out toward front of car.
21. Remove all OEM lines from oil cooler(s) and oil outlet port (oil pump housing)
22. Remove OEM oil cooler(s) (3X 10mm hex, two on top through headlight cover, one on bottom) If you purchased a single cooler add-on kit. Leave your left-side cooler in place as-is.

STEPS 22-49 [CWC dual cooler kit installation]

23. Install M18/AN10 adapters in oil inlet (oil filter) and oil outlet (oil pump housing) ports. These fittings should already have a copper crush-washer on the M18 side. If not, locate it in the packaging and make sure it is in place before installation into the motor.
24. Install inlet hose to inlet port (oil filter). This is the third longest hose provided.
25. Install outlet fitting assembly to outlet port (oil pump housing) This assembly has been loosely pre-assembled for identification purposes. It contains one 90deg male to female elbow and one female to female swivel coupling.
26. Install the MOCAL oil thermostat. As per its instructions (which are included in its box), orient the thermostat such that the (4) small screw heads on the thermostat body face the engine. The mounting bracket should be facing up. For ease of installation, fasten the oil outlet fitting assembly to the thermostat first, then connect the oil inlet hose.
27. Remove the lower two bolts (12mm hex) from each of the two tow brackets hanging from the chassis frame, this will be mounting location for the lower oil cooler bracket.

Crooked Willow Composites (CWC) Racing Dual Oil Cooler Kit Installation Instructions

28. The kit comes with (4) brackets for mounting the oil coolers, two for each cooler. Locate the two brackets with one 90deg bend in each. The upper leg of this bracket has two holes that will match up with those in the tow brackets. These brackets have a right and left-hand version. To install properly, the leg of the bracket parallel to the ground will have a diagonal cut that will point toward the front of the car. Re-install the (2) bolts through the tow brackets (and lower cooler brackets) back to the chassis frame.
29. Next install the upper mount bracket to each of the oil coolers. The oil coolers may be mounted on either side and face either direction so long as the inlet and outlet ports face downward. The upper brackets have two horizontal surfaces and one vertical surface. Place the large horizontal surface (with 2 holes) of the bracket parallel to the top of the cooler. The two holes should match those on the cooler and the bracket should extend inboard along the cooler surface. Mount the brackets to the coolers using two M6 x 16mm long bolts and accompanying lock washers and nuts.
30. The CWC kit is supplied with (4) pieces of damping material that isolate the oil coolers from the chassis. Locate these pieces in the kit- there should be two rectangular bits and two trapezoidal bits. The rectangular damper pieces should be pressed on to the existing upper/aft chassis stud. The trapezoidal pieces will sandwich between the cooler and the lower/inboard cooler brackets.
31. Install the oil coolers into the cavity below the headlights. For ease of installation, angle the outboard end up and in to the cavity first and then rotate the inboard side up until level. The pre-mounted bracket on the oil cooler should drop on to the existing upper/aft chassis stud and damper piece.
32. Once the coolers are in place, install the trapezoidal damper bits between the oil cooler mount flange and the lower oil cooler bracket.
33. Press (2) of the M6 x 25mm bolts up through the cooler bracket, damper material, and cooler mount flange. Thread on the accompanying flange nut and lock washer. The bolts should be torqued until the damper material is compressed to AT LEAST half its original thickness.
34. Install and torque the nut and lock washer on the upper bracket in the same fashion. Make sure the damper material is compressed accordingly.
35. Take the shortest remaining hose and install it from the MOCAL thermostat (driver's side, forward port) to the driver's side oil cooler, OUTBOARD port.
36. Take the shorter of the two remaining hoses and install it between the remaining port in the oil thermostat to the passenger side oil cooler, OUTBOARD port.
37. Take the remaining hose (longest of the group) and install it between the right and left side coolers. The hose should run below the radiator as it travels from one side of the car to the other. Be sure that the hose runs ABOVE the power steering hard pipe as it passes under the chassis frame on the passenger side of the car.
38. The CWC oil cooler kit comes with (4) rubber mount clamps to fix the hose to the chassis as required. We strongly recommend that you drill holes for, and mount two of these clamps to the lower radiator brackets. The radiator brackets, when viewed from below, each have a "tongue" that extends forward. Drill a 5/16 or 8mm hole in each of these tongues and mount the rubber clamps and hoses to each. Once properly mounted the hose clamps may be bend upward to tuck the hose close to the radiator face.
39. Install the other rubber hose mount clamps as required. A least one of them should fix the hose that travels under the intercooler support rail to the rail itself.
40. Check and re-check all hose fittings to make sure all connections are secure.
41. Check the hose fittings again.
42. Inspect all lines and note areas that the braided hose may rub against the chassis, other hard lines or wiring. At a minimum, wrap these regions of the oil lines with high temperature tape. For even better protection, use a piece of heater hose as a sheath around the oil lines in locations where rubbing may occur. Protecting the hose is very important as the braided line will saw through just about anything under the vibration of normal vehicle operation..
43. Fill the engine with oil (5 quarts) and check for leaks.
44. Assemble the a/c – p/s bracket, a/c compressor and p/s pump back to the motor.
45. Install the battery plate and battery.
46. Start the motor and let idle attain normal operating temperature. You can run the motor without the intercooler or intercooler piping attached, just make sure that nothing can be drawn into the intake or fall into the turbos at any time.
47. As the engine comes up to temperature, check for leaks at all of the connections and tighten as required.

Crooked Willow Composites (CWC) Racing
Dual Oil Cooler Kit
Installation Instructions

48. Once the system is determined to be leak-free, install the rest of the components (intercooler, intercooler piping, intake, intake elbow) and test drive the car, carefully monitoring the oil pressure. If any abnormal drop is seen, pull over immediately and check for leaks.
49. After the car has been run under load for a few miles, re-check all connections for leaks. Repeat this check after the first 5-10 drives after the installation as the connections can become loose under thermal and mechanical loading.