Air-to-Oil Oil Cooler – Mk5 Toyota Supra

Install Manual

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Document Revisions

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01	2025/06/10	M. Deckard	Initial release of install manual

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Air-to-Oil, Oil Cooler, Mk5 Toyota Supra – Install Manual

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Introduction

Overview: Detailed instructions on installing the Verus Engineering Air-to-Oil Oil Cooler for the Mk5 Toyota Supra.

Difficulty: Moderate

Time Required: 5 - 5.5 hours

Tools Needed: (power tools may be used in place of hand tools)

- Ratchets (1/4”, 3/8”, and 1/2” drive)
- 18mm Socket
- 16mm Socket
- 10mm Socket
- 8mm Socket
- 1” Socket
- Socket for your lug nuts (aftermarket lug nuts vary in size)
- 3/8” universal joint
- T30 Torx
- T47 Torx
- 4mm Allen Wrench or Socket
- 1/4” Allen Wrench or Socket
- Assortment of adjustable wrenches
- Assortment of 3/8” drive extensions
- Assortment of flat blade screw drivers
- Pick
- Side Cuts
- Scissors
- Drain pan
- New oil
- New Coolant

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Air-to-Oil Oil Cooler Kit Components

- Air-to-oil Oil Cooler
- Pre-made Stainless AN Hoses
- Engine Adapter plate
- High-Temp Adhesive foam Strip – 24”
- Oil Cooler Mounting Bracket
- (2) 90-degree Fitting
- (2) 90-degree, -10 AN ORB to Flare Fitting
- Hardware Bag
    - -10 AN ORB to Flare Fitting
    - -6AN ORB Plug
    - M6 x 1.0, 16mm Long, Button Head Cap Screw (BHCS), Stainless
    - (6) M6 x 12mm OD Washer, Stainless
    - M6 x 1.0, Nylon Locking Nut, Stainless
    - 3/4” hose – 12”
    - Hose Clamp, Stainless
    - (6) Zip Tie

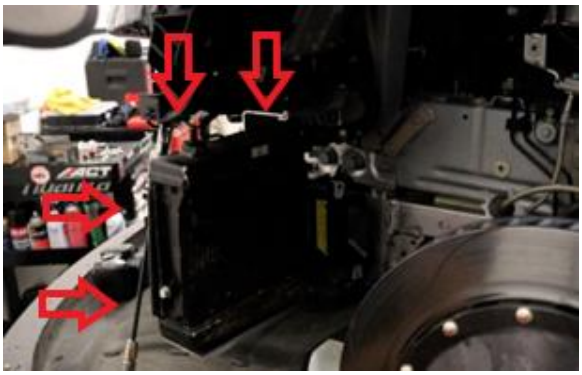
Mk5 Toyota Supra Air-to-Oil oil cooler Install

1. Verus Engineering is not responsible for damage to you or your vehicle by following this manual and/or installing Verus Engineering products. Please seek professional service/guidance if you are uncomfortable/incapable of installing this in a safe manner. Contact us at support@verus-engineering.com if you have any questions/concerns.

2. The car, at minimum, will need to be jacked up in the front. A lift would be beneficial as well, choose which route you want to take and begin this project by getting the car safely in the air.

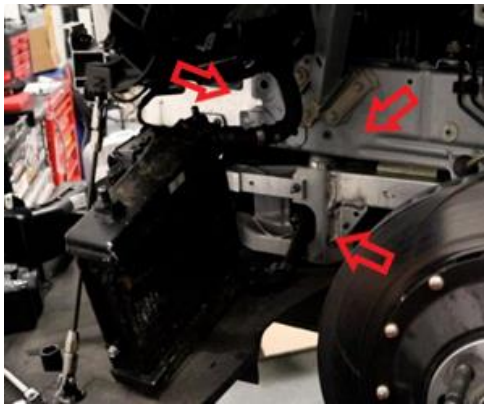
3. We can then remove the Left (Driver's) side front wheel.

4. Next, remove the front and rear section of the wheel liner. You should now be able to see the oil cooler as shown below. **Note: We removed the front bumper which allowed for more space to work. This was not a necessary step.**

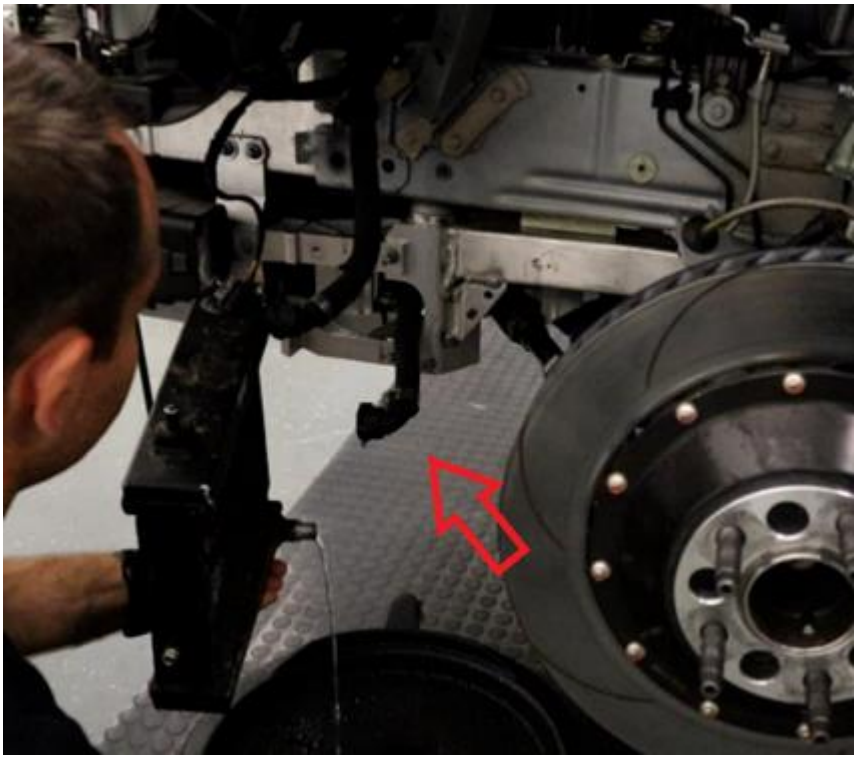


5. We will now undo (3) T47 bolts and (3) 19mm bolts to remove the mounting bracket from the auxiliary cooler assembly. **Disclaimer: The vehicle shown in the images had an aftermarket oil cooler installed. The OEM unit may look slightly different.**

6. The OEM duct will be removed at this time as well (OEM clips for duct will be reused later). You should be left with something similar to the image below.

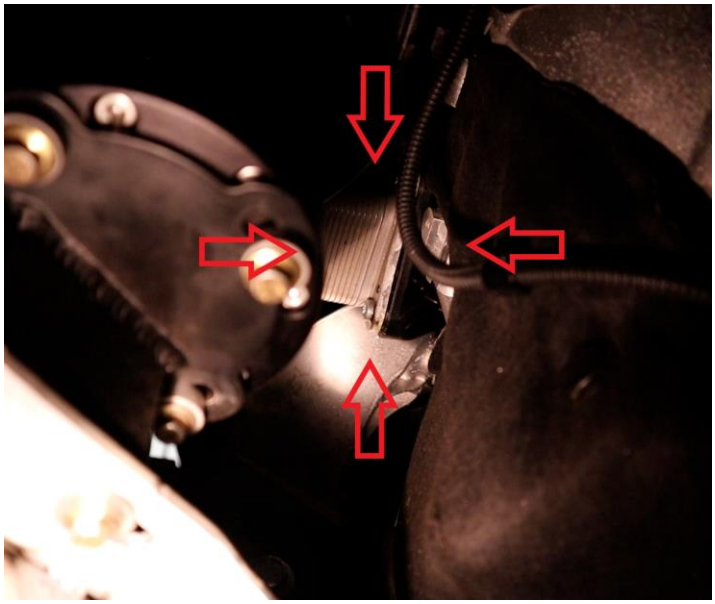


7. It's now time to drain some coolant. We chose to drain what was necessary by removing the lower coolant line to the cooler (shown below).

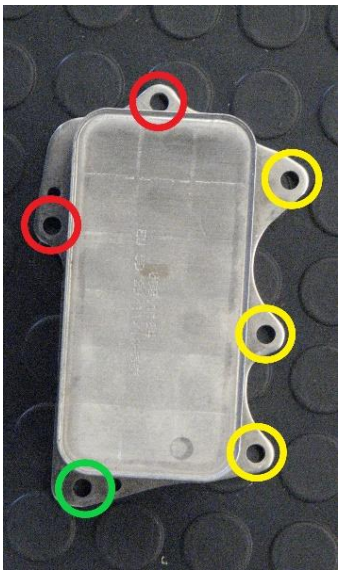


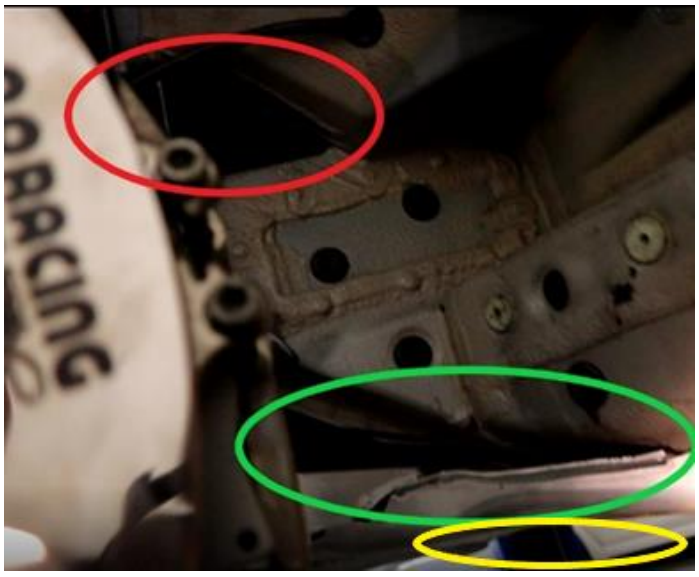
8. While the coolant drains, move under the car. Remove the aluminum engine shield and fabric transmission cover so we can access the factory oil to coolant heat exchanger. With the shields removed, it should look like the image below.

9. At this point, we can remove the factory oil to coolant heat exchanger on the engine block using the T30 Torx socket. **Note: The heat exchanger can be accessed through an opening through the frame in the wheel well and/or from underneath the car as shown below.**



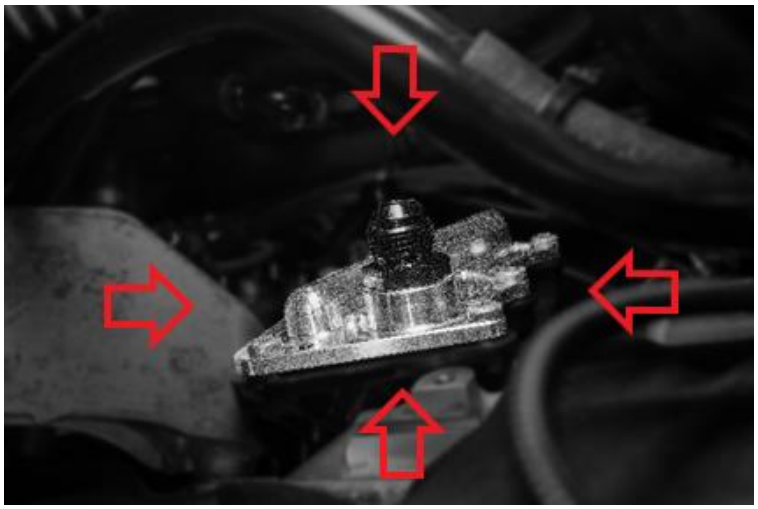
10. Getting to the bolts for this was a little tricky. The (3) bolts, furthest to the rear, were accessed from under the car (circled in yellow below). The lower front bolt was accessed through an opening below the frame rail (circled in green). The remaining (2) upper bolts were removed through the triangular opening above the frame rail using a combination of long extensions and wobbly/u-joint (circled in red). **Note: Color of circle for hardware corresponds to location in which they were accessed from.**



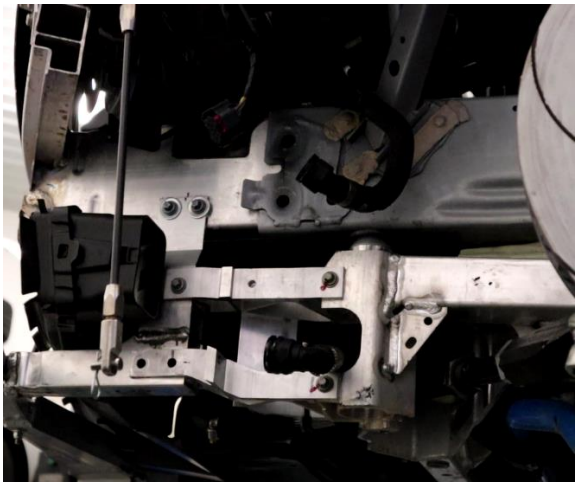


11. With the old unit removed, you can now preassemble the new plate for installation. This assembly will include the engine adapter plate, (2) -10 AN ORB to Flare fittings for the oil lines and (1) -6AN ORB Block off plug. The fully assembled plate shown below is a raw pre-production unit, yours will be black anodized (as shown in 1.5, pg. 4). Use the 1” socket to tighten the fittings on and the 1/4” Allen wrench for the -6 AN ORB plug.

12. Clean the sealing surface before installing the new plate. Then, tighten the new plate using the OEM hardware to 6-8 ft lbs. Below is an image of our new plate installed on the car. **Note: We were able to access all mounting hardware from the bottom when installing the new plate.**



13. Now that the plate has been installed, we can go back out to the fender well area and remove the auxiliary radiator we disconnected earlier.



14. Pre-install the (2) 90-Degree, 10 AN ORB to flare fittings onto the new Air to Oil Cooler so that the fittings can still move freely, and are pointing towards the car when installed (left on the image below). They will be fully tightened down later.

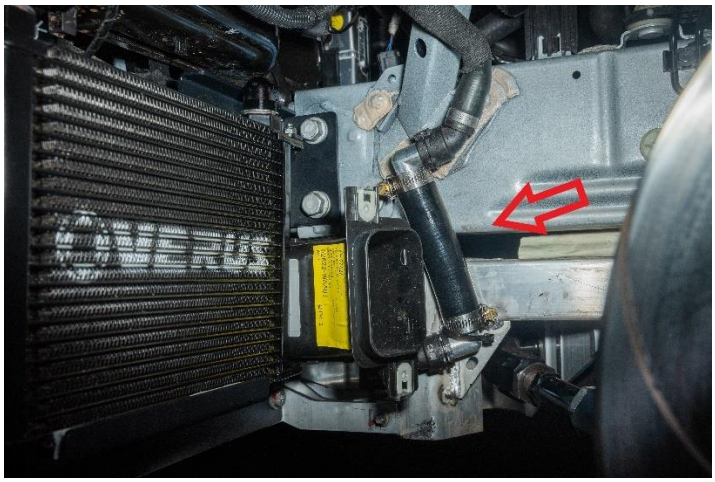
15. Install the protective foam on the mounting bracket as shown below.

16. Install the cooler in the mounting bracket while keeping in mind that the tabs on the cooler face inwards, towards the car. Tighten the cooler to the mounting bracket using the provided M6 hardware, 4mm Allen wrench, and 10mm wrench.

17. It is now time to install the air duct. Install the bottom section of the duct first and then use a small screwdriver or plastic pry tool to work the duct seal up over the cooler (image below for duct install reference). The duct should fully cover the oil cooler's core face and look really nice.

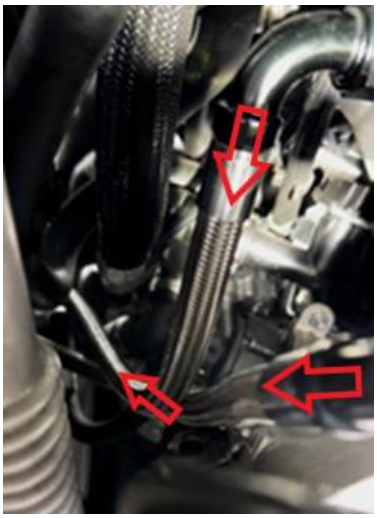
18. The cooler assembly is now put together and ready to go on the car. The bracket now only requires 3 of the original mounting bolts, but the remaining hardware should be reinstalled where they were originally.

19. Now it's time to loop the factory coolant lines. This will be done using the remaining (2) 90-degree fittings, (2) hose clamps and the section of 3/4" hose. This looped section should be zip tied up out of the way. The completed loop can be seen behind the brake duct in the image below.



20. Prefill the oil cooler with new oil, it will take roughly ½ a quart.

21. It is now time to route the oil lines. Both 90 – degree AN ends will attach to the plate we installed on the engine. The lines then point towards the front of the car and run between the engine and steering shaft. Both lines will then run past the ABS pump, under the coolant reservoir and on the frame rail with the A/C lines. The lines will go over the frame rail once they are past the angled frame support. The line with the 45 – degree end will attach to the inner most fitting and the straight end will connect to the outer most fitting. Below are some images of our routing of these oil lines.



22. The oil lines and fittings on the oil cooler can now be tightened (8 locations total, (4) AN line fitting to flare fittings, (2) 90-degree fittings (oil cooler), and the (2) 90-degree ORB to flare fittings (adapter plate).

23. Oil lines should be zip tied away from moving parts (steering shaft or engine pulleys) and hard or sharp components (frame support or sharp mounting tabs/brackets).

24. Before we begin putting the rest of the car back together, we will perform the coolant bleed procedure and check that our oil lines are not leaking. Below is the process for bleeding with the coolant both hot and cold. We only opened the high temp side of the system, so that is all we should have to bleed.

High Temp Bleed Procedure:

(b) Open the bleeder screw on the radiator reserve tank assembly for the high-temperature coolant circuit and close it again after approx. 10 s.
(1) You can close the bleeder screw prior to expiry of the 10 s once coolant escapes.
(c) Close the reserve tank cap sub-assembly on the radiator reserve tank assembly of the high-temperature cooling circuit.
(d) Make sure the bonnet is closed. [*1]
(e) Make sure that the wheels touch the ground. [*2]
(f) Engage the parking brake. [*3]
(g) Engage into both "P" or "N" automatic transmissions. [*4]
(h) Press the START-STOP button (engine switch) 3 times within 0.8 seconds to enter Diagnostic (PAD) Mode. [*5]
(i) Turn on low-beam headlight and the hazard warning light. [*6]
HINT: If the low-beam headlights and hazard warning lights are not switched on, the engine switch off automatically after a certain period of time and interrupt the bleeding procedure.
(j) Adjust the heating to maximum temperature and adjust the blower to the lowest stage. [*7]
(k) Hold the accelerator pedal down for at least 10 s at limit position and do not step onto the brake pedal. [*8]
(l) Start engine. [*9]
(m) The cooling system bleeding routine has been started, pay attention to the display on the instrument cluster (KOMBI). ("Service function started") [*10]

Low Temp Bleed Procedure:

(d) Press the START – STOP button (engine switch) 3 times within 0.8 seconds to enter Diagnostic (PAD) Mode. [*1]
(e) Turn on low – beam headlight and the hazard warning light. [*2]
HINT: If the low-beam headlights and hazard warning lights are not switched on, the engine switch off automatically after a certain period of time and interrupt the bleeding procedure.
(f) Adjust the heating to maximum temperature and adjust the blower to the lowest stage. [*3]
(g) Hold down the accelerator pedal down for at least 10 s at limit position and do not step onto the brake pedal. [*4]
(h) Do not start engine.

(i) The cooling system bleeding routine will start. [*5]

25. After the coolant is bled and you have confirmed that the oil lines are not leaking, you may reinstall the fender liners and under car shields (also the bumper if you removed it).

26. Congratulations on installing the Verus Engineering Air to Oil Cooler kit on the Mk5 Toyota Supra!

27. Please send any questions, comments, concerns, or photos to Verus Engineering via e-mail; **support@verus-engineering.com**.