IAG Competition Series Air / Oil Separator (AOS) For 2008-14 WRX & 2005-09 Legacy GT

Part# IAG-ENG-7251

Tools Required: Ratchet, torque wrench, extensions, needle nose pliers, hose cutter, snips/scissors, flat head screw driver, hose clamping pliers
Sockets: 10mm, 12mm, 13mm, ¾” allen, 19mm
Wrenches: ⅞”, 8mm, 10mm, 13mm, 11/16”, 3mm allen, 5mm allen, pry bar,
Other: Electrical Tape

Congratulations on the purchase of your Air/Oil Separator (AOS) and thank you for choosing IAG Performance. This installation manual is intended to guide you through the removal of the factory PCV system and the installation of the IAG AOS. If you already have an aftermarket catch can or AOS installed, please consult the specific instructions for your hardware to aid in its removal.

Parts List

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<td>Air/Oil Separator</td>
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<tr>
<td>Oil Drain Hose Assembly</td>
<td>1</td>
<td>26” Hose Length</td>
</tr>
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<td>1</td>
<td>20” Hose Length, ¾” I.D., -8ORB</td>
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<tr>
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<tr>
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<td>Block Breather Fitting</td>
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<td>Coolant Hose Spring Clamps</td>
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<td>6x10mm Bolt</td>
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<td>Mounting bracket hardware</td>
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<td>½” High Temp Rubber Cap</td>
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<tr>
<td>7/8” High Temp Rubber Cap</td>
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<tr>
<td>8” Zip Tie</td>
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</tr>
<tr>
<td>11” Zip Tie</td>
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<td></td>
</tr>
<tr>
<td>¾” NPT Plug</td>
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<td></td>
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</table>
**For 2008+ Installs (Included in packaging) also 2005-09 Legacy GT**

<table>
<thead>
<tr>
<th>Part</th>
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<th>Description</th>
</tr>
</thead>
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<tr>
<td>M6x12mm Bolt</td>
<td>2</td>
<td>08+ Install &amp; 2005-09 Legacy GT</td>
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<tr>
<td>Harness Relocation Bracket</td>
<td>1</td>
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**Removal - Please read through the entire removal instructions before proceeding**

1. The engine needs to be completely cool before beginning work.

2. Disconnect the negative battery terminal using a 10mm wrench.

3. Using a 10mm socket, extension and ratchet remove the (2) 10mm bolts from the bypass valve.
4. Using a 12mm socket, extension and ratchet remove the (3) 12mm bolts that secure the intercooler.

5. Using a flat head screw driver, loosen the hose clamp at the intercooler outlet silicone coupler.
6. Grab the intercooler by the sides and carefully wiggle it out of the engine bay. Be cautious to not damage the A/C line that runs along the fire wall or the intercooler fins.

7. Remove the passenger side valve cover breather line (the one that is closest to the front of the car). If there is a clamp securing it, use a flat head screw driver or hose clamp pliers to remove the clamp. Remove the hose off the valve cover port. Repeat this process on the driver side forward most valve cover breather line hose. Remove the driver side hose from the engine bay as well.
8. Next unplug the crankcase blow-by sensor by pressing the gray clip in and pulling outwards. Pull the gray electrical connector off the sensor housing.

9. Remove the jumper from the white portion of crankcase blow-by sensor using needle nose pliers. Pull outwards from sensor until it is free. Then insert the jumper into the gray blow-by sensor connector using needle nose pliers. Tape the connector end with electrical tape to prevent exposure to the elements and tuck it out of the way.

10. Using a 10mm socket and ratchet, remove the (3) 10mm bolts that secure the crossover pipe. * The bolts are different sizes. Note there location, the long 10mm bolt will be reinstalled into its OEM location in a later step.
11. Unplug the knock sensor connector and throttle body electrical connector. Pull the crossover pipe free from the inlet. (It attaches to the hose on the inlet).
12. Reconnect the electrical connectors to the knock sensor and the throttle body. Finally reinstall the (1) 10mm long bolt back into its original location (Blow off valve recirc) on the intake manifold.
13. **Early Model**: Remove the clamp from the remaining blow-by sensor hose at the turbocharger inlet. Use a flat head screw driver to pry the clamp apart. Then remove the hose and sensor housing from the inlet.
Late Model Install (If you have and Early Model skip to step 14)

13.a **Late Model**: Remove the clamp from the remaining blow-by sensor hose at the turbocharger inlet. Use a flat head screw driver to pry the clamp apart. Remove the hose from the sensor by pulling the black plug out from the white housing. Remove the hose from the vehicle.
Resume Install for Early & Late Models

14. Using the supplied ½” vinyl cap, cover the hole in the inlet and secure it with a zip tie. Trim the excess of the zip tie with snips or scissors.

15. Remove the breather hose from the inlet that is normally located under the OEM Boost Control Solenoid Valve.
16. Install the supplied ⅝” cap on the open inlet port. Secure the cap with a zip tie and trim the excess.
Early Model Install (If you have a Later Model skip to Step 18)

17. **Early Model**: Remove the small pinch clamp that holds the hose to the PCV valve using pliers. Then remove the hose from the PCV valve.

17.a **Early Model**: Remove the PCV valve assembly from the engine. It may come out with the ¾” drain hose.
17.b *Early models* only with “S” style drain hose: Cut a ½” off each end of the OEM ¾” drain hose as shown.

17.c *Early models*: install the plastic “Y” fitting into the hose and secure it with original clamps. Install the drain hose assembly back onto the engine.
Late Model Install (If you have an Early Model skip to Step 19)

18. **Late Models**: Remove the clamp from the remaining blow-by sensor hose at the turbocharger inlet. Use a flat head screwdriver to pry the clamp apart. Remove the hose from the sensor by pulling the black plug out from the white housing. Remove the hose from the vehicle.

18.a **Late Models**: Remove the clamp that holds the hose to the PCV valve using a small flat head screwdriver. Then remove the hose from the PCV valve.
18.b **Late Models**: Remove the PCV valve assembly from the engine. It may come out with the ¾” drain hose.

18.c **Late Models**: Install the supplied 3” drain hose onto the “Y” fitting as shown. Install the drain hose assembly back onto the engine use zip ties to secure the fitting and hose to the engine. Trim the excess when done.
19. Remove the small pinch clamp and hose from the PCV vacuum nipple located by the throttle body on the intake manifold using needle nose pliers.

20. Using a 19mm socket, unscrew the PCV nipple and replace it with the ¼” NPT plug using a ¼” allen socket. The plug comes with thread sealant on it. Torque the plug to 15 lb/ft. Do not over torque as the intake manifold can be damaged.
21. Remove the main engine harness from its mounting bracket located on the passenger side strut tower. Using a flat head screw driver pry the harness-clip outwards and lift up. Remove the plastic clamp holding the main harness to the strut tower. Refer to picture.
22. Using a 10mm socket, extension and ratchet remove the (2) 10mm bolts that hold the main wiring harness bracket to the passenger side strut tower. Remove the bracket from the vehicle.

23. Next install the (2) AOS coolant lines onto the AOS (Lines come pre-assembled). Thread them on by hand and tighten using a ¾” open end wrench.

24. Install the ½” drain hose onto the AOS drain port fitting. Secure with a zip tie and trim the excess off.

25. Using a rag and a pry bar carefully pry up each brake line on the strut tower as shown.
26. Locate the two mounting holes indicated on the picture to the right. Using one of the included M6x12mm bolts, thread the bolt through each hole to remove any foreign media. Remove the hardware after cleaning the threads.

(Note: if the bolt will not thread through, then the threads may be severely rusted. In this case, we recommend running a chaser tap through it.)
27. Install the bracket onto the AOS using the (3) small allen bolts as shown. The fourth hole from the bottom of the AOS should be oriented to the lowest allen bolt hole on the bracket. Tighten the three allens.

*Note in April 2016 the mounting bracket for the AOS was changed. Some pictures after “Step 30” may show the older mounting solution. The older images will not affect the install of AOS’s with the most current mounting bracket.

28. Locate the Competition Series upper breather fitting and O-ring. Fit the O-ring onto the fitting as shown. Then insert the fitting on the top of the AOS.

29. Clock the upper breather fitting so that is matches the picture. Locate the (2) supplied 4mm x 8 allen bolts and using a 3mm allen wrench thread the bolts thru the breather fitting into the AOS and secure the port fitting.

30. Install the AOS using the two holes on the strut tower shown in the picture. Guide the lower coolant hose underneath the main wire harness while installing the AOS. Start the upper M6x12mm bolt first then start the lower M6x12mm bolt. Once both bolts have been slightly threaded finish tightening them.
31. Using a 10mm socket and ratchet, remove the (1) 10mm bolt from the power steering line bracket located on the passenger side strut tower.

Next install the supplied harness relocation bracket using the same 10mm bolt. Do not completely tighten the bolt yet. Slide the harness onto the relocation bracket until it clips into place. Then adjust the position of the main harness for clearance and fitment. Then finish tightening the 10mm bolt.
32. To minimize coolant loss, pinch off the lower coolant hose that connects the turbo to the cylinder head using hose clamping pliers.

33. The upper IAG AOS coolant line will attach to the OEM coolant hardline on the turbo. Trim the upper AOS coolant line to the correct length making sure when the line is routed there are not any kinks or obstructions. Once cut, using pliers pinch and slide the supplied pinch clamp onto the AOS coolant line.
34. Using pliers remove the OEM clamp off the turbocharger’s upper coolant hardline.

35. Next remove the OEM clamp off the coolant expansion tank. Remove the OEM hose as shown.
36. Install the upper AOS coolant hose onto the turbocharger hardline and secure the hose with the pinch clamp.

37. Locate the AOS lower coolant hose. The hose should be routed under the main harness and lead to the coolant expansion tank. Trim the AOS line to fit onto the upper coolant expansion tank port. Make sure the line is free of kinks or obstructions. Slide the new supplied pinch clamp onto it using pliers.
Next slide the IAG AOS coolant line onto the coolant expansion tank port and secure the hose with the supplied clamp. *If done correctly minimal coolant should be lost. If substantial coolant is lost, bleeding the coolant system is required to avoid overheating.*

38. Remove the hose clamping pliers from the turbocharger coolant drain line.

39. Locate the AOS oil drain line. The line will route over the transmission and finally lead to the ½” port on the plastic drain fitting located on the engine block. The hose is supplied long to allow for various turbochargers, intercoolers and downpipes. Make sure when trimming the length that the hose is free of heat sources and the line is not kinked. Once the hose is in place install a zip tie to secure the hose and trim the excess.
40. (OEM TMIC) Locate the supplied ⅝” breather hose and the plastic 90° fitting. Cut 2” off the breather hose. Slide the 2” length of breather hose onto one side of the 90° fitting, then slide the other side of the 2” breather hose onto the ⅝” port on the plastic drain fitting.
41. Slide the long ⅝” breather hose onto the other side of the 90° fitting. Route the breather line to the ⅝” port on the AOS can. The line should route over top of the heat shield. Trim the line to fit. Leave enough room so the line is free of obstructions and not kinked. Secure all the hose connections with zip ties and trim the excess off.
42.a (LARGE TMIC) Locate the ⅝” breather hose and the plastic 90° fitting included with the AOS kit. Cut 2” off the breather hose. Slide the 2” length of breather hose onto one side of the 90° fitting, then slide the other side of the 2” breather hose onto the lower ⅝” port on the AOS Can.
43.a Slide the long ⅝” breather hose onto the other side of the 90° fitting. Route the breather line to the ⅝” port on the AOS can. The line should route by the intake manifold as shown. Trim the line to fit. Leave enough room so the line is free of obstructions and not kinked. Secure all the hose connections with zip ties and trim the excess off.

Resume Install For OEM & Large TMIC’s

44. Locate the ½” breather line included in the AOS kit. Route one side of the line to the driver side most forward valve cover breather port. The line should pass inside the AC line and over top the fuel injector cover bracket until it meets the valve cover port. Slide the hose onto the port and secure it with a zip tie.
45. Route the remaining length of hose following the AC line to the passenger side where the AOS located. Trim the hose to fit the center port on the AOS. Make sure the line is free of kinks and any obstructions; then install the hose onto the port and secure it with a zip tie.
46. Using the remaining length of ½” hose, route the hose between the main harness and over top of the fuel injector cover bracket. Finally slide it onto the passenger side valve cover breather port and secure it with a zip tie and trim the excess off.
Next route the remaining portion of the ½” hose up to the ½” AOS breather port. Make sure the line is free of kinks or any obstructions. Trim the line to fit and secure it with a zip tie trimming off the excess.

47. Locate the 1” breather line and route it down the passenger side transmission tunnel starting behind the firewall ac lines. Push the line down as far as it can go. You may need to get under the car to help guide the hose. Attach the upper portion of the line to the upper AOS breather port and secure it with a zip tie trimming the excess.
48. Place the vehicle on a lift or on jack stands, route the remainder of the 1” breather line overtop the transmission cross-member and along the side of the transmission. The line should rest on top of the center exhaust heat shield. Make sure the line is free of any kinks then secure the line using an 11” zip tie to the heat shield as shown. Snip the excess of the zip tie off.
49. Reinstall the intercooler and bypass valve using the OEM hardware and gaskets. Reattach the negative battery terminal.

50. Before proceeding, please look over the check list below:

Check Over List

Are all coolant fittings tight?

Are (2) coolant clamps correctly fitted on the turbo coolant pipe and the expansion tank?

Was any coolant spilled in the engine bay cleaned up?

Are the hose clamps on the silicone couplers tight?

Are the following connections zip tied:

- ½” valve cover ports
- Both connections on the Y-fitting that is attached to the block
- All 3 side ports on the AOS
- The top breather port
- 90° ¾” Fitting
51. After you have reviewed the check list, proceed to start the vehicle and check for leaks. After the engine has heat cycled, you can check the coolant level and replace any coolant that was lost during installation.