



Eric Loose &lt;turbosax2@gmail.com&gt;

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**MVS question**

9 messages

**Eric Loose** <turbosax2@gmail.com>

Tue, Jul 6, 2021 at 11:55 AM

To: tech@tialsport.com

Hi,

I have an MVS wastegate on my '99 Eclipse that I use for HPDE track days. I initially ran it without water cooling and ruined the diaphragm quickly, so I started water cooling it. Since then, I've constantly had the water fittings loosen up slightly and start leaking. I have plenty of venting in my hood so I can start to see the water misting on the windshield when they've loosened. I tried blue loctite, red loctite, and I recently tried JB-welding the fittings in place (on the outside, not the threads) which worked for a few sessions but then failed again since it couldn't handle the heat. The last time I went to reseal the fittings, the threads in the wastegate actually stripped out completely. At this point I'm considering purchasing aluminum fittings to weld in the holes. Short of that, do you have any other suggestions for how to keep the fittings from loosening? If I don't weld the fittings, I'll have to get a new lower housing anyway due to the stripped threads.

Best regards,

Eric

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**Tech Support** <tech@tialsport.com>

Wed, Jul 7, 2021 at 9:14 AM

To: Eric Loose &lt;turbosax2@gmail.com&gt;

Hi, Eric,

I'm sorry you've experienced this issue. If you could please send some photos of exactly how everything is installed on the engine, I can probably help with some insight as to why the issue has occurred, and possibly help prevent it from happening again.

Typically, when threaded fittings continue to loosen, even after actions like you've taken have been put into place, vibration is the root cause, and on a robust 4-cylinder engine, this would not be uncommon. So, isolating or mitigating that vibration is key to preventing recurrence.

If you can also provide the SN for the unit (if one of your photos just show that number, that's fine), I will also set up a special link on our Spare Parts website with a reduced price for a replacement lower housing for you.

Best Regards,

Mike Franke

Tech Support

TiALSport, Inc.

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**Eric Loose** <turbosax2@gmail.com>  
To: Tech Support <tech@tialsport.com>

Wed, Jul 7, 2021 at 10:21 AM

Hi Mike,

Thanks for getting back to me, I attached some pictures.

Best regards,

Eric

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**3 attachments**



**20170727\_235755.jpg**  
344K



**20210309\_203359.jpg**  
372K

**20210707\_093841.jpg**  
2815K



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**Tech Support** <tech@tialsport.com>  
To: Eric Loose <turbosax2@gmail.com>

Wed, Jul 7, 2021 at 4:07 PM

Hi, Eric,

Thanks for the photos, as this is helpful. Since it appears you're using flexible -AN lines, this should help with any vibration, but the one thing I cannot see could be a factor.

Could you either describe or send a photo of how the outlet of the wastegate path looks?

One thing we often encounter, if vibration-related issues occur, is that outlet connections that terminate in a recirculation to the downpipe should be isolated from vibration through the use of a flex- or slip-fit connection, as a rigid tube connection to the downpipe, especially if that item isn't also braced directly to the drivetrain, can create problems. As well, a 'dump tube' can cause the same issue, as the mass of the tube, fighting the natural vibration signature of the engine, can also create problems.

If a 'dump tube' is used, it should be braced to the drivetrain, or to the downpipe (if braced to the drivetrain), so that you can mitigate any vibration.

Since the coolant port threads are only M8x1.0, that's likely the weakest link if vibration is an issue. I've also noticed that on high-vibration applications, the original aluminum washers that we provide with the MV Series can be damaged more easily than, say, copper or bonded-steel washers. One specific Motorsport team actually uses a bonded washer (sometimes called a 'dowty seal') and they've reported that it works very well, and that engine fights a terrible vibration signal.

The SN refers to a silver MVS unit originally produced in May 2013, so it's been in service for a bit of time. I checked with our Assembly Lead, and she confirmed that she could locate a 'cosmetically blemished' lower housing in silver for me, and we can send that to you as a courtesy to that you can return this unit to service.

Just let me know of your address, and I'll get that into the works for you.

Best Regards,

Mike Franke  
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**Eric Loose** <turbosax2@gmail.com>  
To: Tech Support <tech@tialsport.com>

Wed, Jul 7, 2021 at 4:16 PM

Hi Mike,

This is the setup I have. Hopefully these pictures help. There is no flex pipe in the O2 housing but there is one on the downpipe further downstream.  
<https://www.punishment-racing.com/product/punishment-racing-tial-mvs-wastegate-recirculated-o2-housing-package-for-eclipse-talon/>

I did have to reseal it a few times and always used aluminum crush washers. They weren't TiAL products since I couldn't find just those for sale, but an identical replacement. I have not tried copper or steel washers. I'm used to dowty seals that have a rubber ring for sealing, is that what you mean? I'm surprised to hear that recommended with the temperatures the wastegate sees.

That would be great if you guys could get me a replacement housing, thanks! My address is below. Appreciate the help!

Best regards,

Eric Loose  
1010 Hauck Rd.  
Mechanicsburg, PA 17055  
(717) 395-4188

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**Tech Support** <tech@tialsport.com>  
To: Eric Loose <turbosax2@gmail.com>

Wed, Jul 7, 2021 at 4:34 PM

Hi, Eric,

While this design is quite compact, it provides for no variance in expansion and contraction between the two main components. That won't typically translate into fastener issues, though, rather, it would usually manifest in clamping issues, or fatigue at the v-flanges, if it even became an issue. I don't think this is a smoking gun.

I would suggest making sure the downpipe is rigidly mounted to the drivetrain prior to the flex joint, just to tie the vibration signature directly to the drivetrain and to isolate the different signature that the chassis could impart upon the rest of the exhaust system. Again, though, this would not really be an issue as it relates to the wastegate.

I don't see a significant vibration issue here.

There is one other factor:

You mentioned that the housing had been run without coolant for a bit of time, and that resulted in a diaphragm (and likely a lower actuator housing o-ring) failure. If the lower housing was subject to enough of a temperature increase to allow damage to those 'soft' parts, it could also have affected the actual aluminum material. A deep-dive into the characteristics of 6061-T6AL is probably not necessary here, but I can tell you that we've tested these effects on our gas test stand, and there's a video on our server that shows two heat sources applied to a working wastegate actuator (the valve temp is held at 1950degF) to monitor the effects of heat from both the lower valve casting and from radiant sources typically found in the engine compartment.

From that testing, we know, for example, that the anodized finish (if applicable) will begin to fade at around 350degF, and the diaphragm and lower o-ring seal, both of which are rated for 425degF, will begin to fail shortly after. The actual aluminum will not 'melt' until ~650degF, but it will begin to anneal (soften) at a lower temperature rate, and this could be the case; the metal could simply have become fatigued. I have seen units returned for inspection that had no coolant flow, and the diaphragm and lower seal were 'powdered' due to heat, and the lower housings were notably fatigued.

This is exactly why the MV Series has a water-cooling feature, as, with coolant flow, the lower housing temperature stabilizes to something much close to the engine temperature, typically between 180-210degF, which is, of course, a very safe range for all of the materials used.

This is why the use of a bonded washer (and yes, you are correct with your description) isn't really a problem; the washer is sealing a fitting that coolant flows through all the time, and unless there's an issue with radiant heat being excessive (which doesn't appear to be the case with your current setup), I would not be concerned at all about using such a washer on the wastegate.

I will get a courtesy order into place for a lower housing, lower o-ring seal, and corresponding hardware, and we'll get that out to you as soon as possible. Hopefully, this issue will not reoccur for you.

Best Regards,

Mike Franke  
Tech Support  
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**Eric Loose** <[turbosax2@gmail.com](mailto:turbosax2@gmail.com)>  
To: Tech Support <[tech@tialsport.com](mailto:tech@tialsport.com)>

Wed, Jul 7, 2021 at 4:53 PM

Mike,

I have had the wastegate apart a few times replacing and inspecting diaphragms. I know in the past I've had the o-ring in place, but I just went to double check and it's not there. I don't think it fell out on my shop floor and it's not stuck to the bottom of the lower housing. I don't see any gooey remnants of a melted o-ring so I guess there's the potential it wasn't in there, I'm not sure what this would lead to. The diaphragm was a little more charred than in the past this time opening it, but I did run three 20-minute sessions without the water once the threads stripped out. It's getting replaced with an older decent spare I have.

Pictures attached for reference. Could I purchase a couple extra o-rings from you just to have on hand for the future?

I'll look into getting some Dowty washers then, thanks for the recommendation!

Best regards,

Eric

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## 2 attachments



20210707\_164244.jpg  
3255K



20210707\_165015.jpg  
3402K

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**Tech Support** <tech@tialsport.com>  
To: Eric Loose <turbosax2@gmail.com>

Wed, Jul 7, 2021 at 5:16 PM

Hi, Eric,

Those pictures certainly do tell the story, don't they? I'm going to hang on to those photos to show the value of the coolant flow, if you don't mind. For what it's worth, the damage to the left-hand photo is consistent with what we see at 450+degF during testing.

I'm happy to include some spare o-rings with that lower housing. These are SAE 015 rings, but we do use a flourosilicon (FKM) material for the higher temperatures. When installing that, use a dab of silicon o-ring lube, and try to avoid using petroleum products near that o-ring or around the diaphragm, as they're technically solvents and can harm the material.

I will also send new screws and some extra M8 aluminum washers. When you install that lower housing, use Loctite 271 or 272 (red and red/hi-temp, respectively), as those higher temps probably cooked that original application, and you don't want those to come loose. For the diaphragm set screws, use Loctite 242 (blue) for both locking and sealing.

The lower o-ring is really designed to keep dust and dirt out of the lower chamber, but it also does provide some level of sealing to the chamber. Typically, if that fails, or isn't installed, you'll find that a higher WG duty cycle will be necessary to maintain the same boost levels, as the air loss has to be accounted for in order for the diaphragm chamber to lift the valve.

We'll get this stuff on the way to you, and keep me posted.

Best Regards,

Mike Franke  
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**Eric Loose** <[turbosax2@gmail.com](mailto:turbosax2@gmail.com)>  
To: Tech Support <[tech@tialsport.com](mailto:tech@tialsport.com)>

Wed, Jul 7, 2021 at 5:24 PM

Mike,

Feel free to use the pictures as you see fit! Now that you mention it, I did have to crank up the wg duty cycle slightly somewhat recently since the boost dropped off a bit. Thanks again for all of the tips and the support you have provided. Top notch customer service!!

Best regards,

Eric

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