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(Repair Station# MAMR190K)

Maintenance Tip
November 3, 2008

To: Director of Maintenance or Chief Inspector

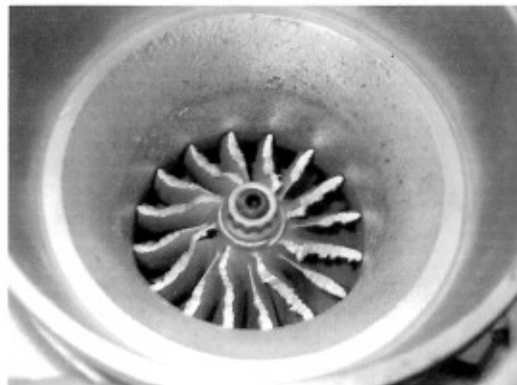
Subject: Low Boost

When it comes to low boost and low critical altitude, most trouble shooting guides will suggest looking the induction system over first. We have found this to be the cheapest to fix but the hardest to find. Usually requiring a way to pressurize the intake system and checking with a soapy solution to find the leak. Exhaust systems usually give all kinds of evidence of a leak so we don't need to discuss them here. Pressure Relief Valves that are relieving too early are also a possibility but rare. By pressure testing the induction system high enough, with high enough pressure, close to red line manifold pressure, the pressure relief valve can be tested for early release of pressure accurately enough.

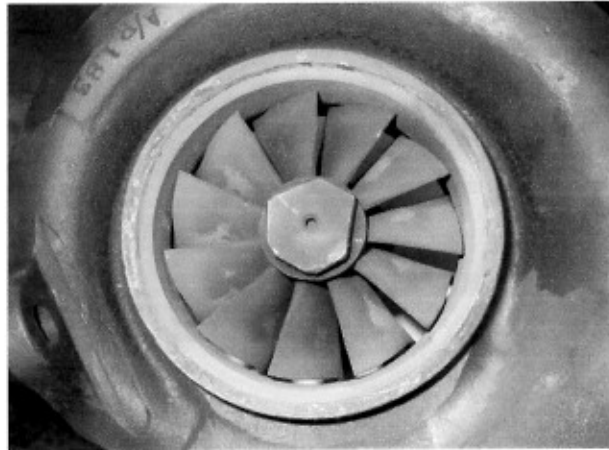
The trouble shooting guides will also talk about proper fuel flows and ignition systems, but then they move on to the turbocharger before controllers and wastegates.

So how do you know if you have a good turbocharger? We have found the quickest way to really check out the turbocharger is.

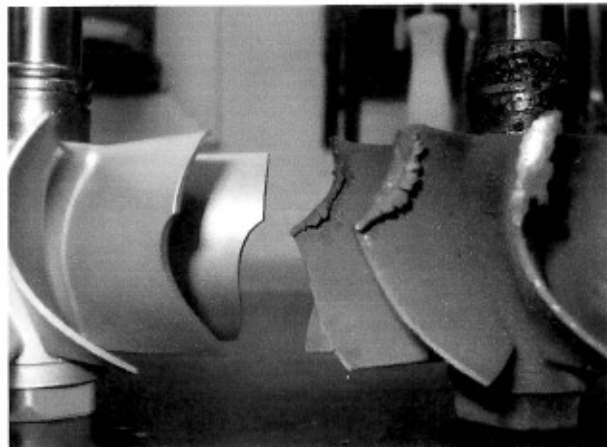
1. Remove the air induction piece feeding fresh air into the (cold side) of the compressor housing. Look at the compressor wheel for foreign object damage to the blades and check for contact or rubbing between the compressor wheel and compressor housing. Give the shaft a turn and a wiggle. Expect to find a little play because there is no oil pressure in the main bearings. And the shaft will have a little resistance in it during the turn, but should turn freely. It will not free spin if you "Flip It". This is all pretty straight forward and I'm sure you have done it hundreds of times before.



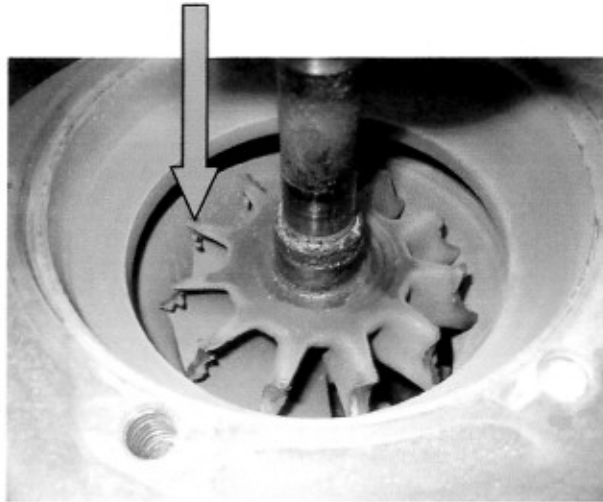
2. But on the other side, the hot side or the turbine side is a different story. When you take the tail pipe off of the turbocharger this is what you see, right?



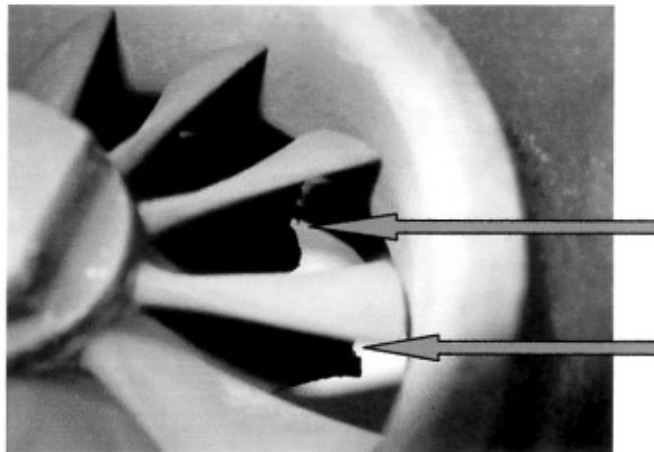
The important thing to know of here is that this view is of the Trailing Edge of the turbine wheel! The leading edge (the working end) is down inside of the turbine housing. And if any foreign object damage has taken place, that's where it happens! Not out at the trailing edge of the turbine wheel that is starring you in the face.



This picture shows the damage that has removed the driving end of the wheel. But notice how nice the trailing edge or visible end of the turbine wheel looks. Not a nick, scratch, or chip. We have seen hundreds of wheels in the last twenty years of doing this that look just this way!



3. This damage can be seen through a normal inspection if you just look for it. Take your flash light and look diagonally down into the turbine housing. Past the now defined trailing edge of the turbine wheel. You can see the full blade profile down to the leading edge of the blade. See that the blades are still nice and squared off. If it's been fodded, it will be obvious to you!



If the intake side or compressor side of the turbocharger checks out. And the turbine side of the turbocharger checks out. Usually the turbocharger is fine and you can move on to other components in the trouble shooting guides such as controller and wastegates, Ect.

We can go over some of them in another maintenance tip later, hopefully before the end of the year.

Again if you have any questions or comments regarding any of this just give us a call, and we'll talk you through it.

Sincerely,
Gary Main

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