

AREA DIESEL SERVICE NEWSLETTER Q4-2020

Area Diesel Service, Inc. is proud to announce that it has achieved ISO 9001:2015 certification. This is an internationally recognized standard that ensures that our products and services meet the needs of our customers through an effective quality management system.

To achieve ISO 9001:2015 certification, we completed a thorough analysis of our product quality processes and underwent a rigorous evaluation process including the development of a quality management system and several audits.

We have developed and implemented this quality management system to incorporate our company's existing philosophy of providing high levels of customer service and satisfaction into a consistent standard for the entire business operation. Our decision to pursue ISO 9001:2015 certification demonstrates our commitment to providing high-quality and consistent products and services to our existing and future customers.

"The process of getting a 47-year-old company compliant with today's most current quality standards has been a challenging, and now rewarding, endeavor," said Area Diesel Service, Inc.'s Vice President, Von Leefers.

He continued, "The journey is not over, nor should it ever be, with continual updates and progress while improving our processes through the ISO system."

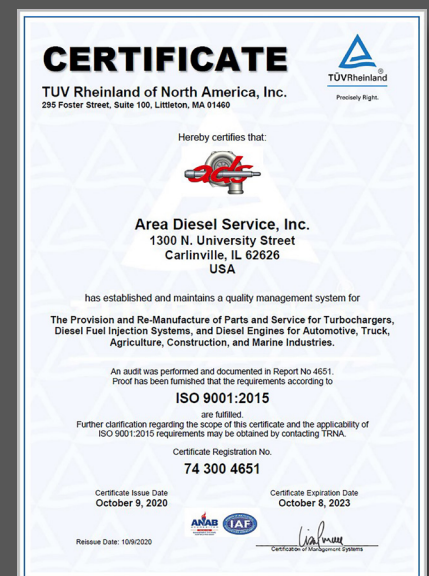
By achieving ISO 9001:2015 certification, we are better positioned to anticipate the demands of our customers. Additionally, we are also able to demonstrate our commitment to providing quality service and timely delivery.

We want to take this opportunity to extend our sincere thanks to our customers and suppliers for their continued loyalty. Area Diesel Service will always strive to meet and exceed your expectations. With our goals focused on the emphasis of quality assurance, we look forward to bringing the business to new heights in the months and years to come.

To learn more about our journey to ISO 9001:2015 certification, you can check out the interview with Vice President, Von Leefers and Quality Systems Manager, Linda Leefers on The News Hour - Insight on Business podcast. Find it [HERE](#) or search for it on your favorite podcast player.



Certified to
ISO 9001:2015





2020 3.0L ECODIESEL

P/N 20240



2020 2.8L DURAMAX

P/N 21600



- ☒ **PLUG AND PLAY INSTALLATION**
- ☒ **DOES NOT FLASH ECM**
- ☒ **LIFETIME WARRANTY**
- ☒ **MADE IN THE USA**
- ☒ **DOES NOT DEFEAT OR DELETE EMISSIONS EQUIPMENT**



GTA45 Replacement Turbo for Series 60 Applications



BorgWarner and Area Diesel Service are pleased to announce the release of the GTA45 turbocharger* for Detroit Series 60 EGR engines. This value-driven model features a Forged Milled Compressor Wheel (FMW) for increased turbo life and durability.

Contact your Area Diesel Service representative for further details and secure your order today!

Your BorgWarner turbo is equipped with

FMW

• FORGED MILLED WHEEL •

TECHNOLOGY

For greater compressor wheel strength and longer turbocharger life

*APPLICATION LIST BELOW

GTA45 Replacement Turbo for Series 60 Applications

BorgWarner Part Number	57849882000	57849882001	57849882004	57849882005
Description	Turbocharger	Turbocharger	Turbocharger	Turbocharger
Model	GTA45	GTA45	GTA45	GTA45
Reference Part Numbers	23534774	23534775	23534360	23534361
	R23534774	R23534775	R23534360	R23534361
	758160-5006S	758160-5007S	758204-5006S	758204-5007S
	758160-9006	758160-9007	758204-9006	758204-9007
	758160-0006	758160-0007	758204-0006	758204-0007
Model Years	2002 - 2006	2002 - 2006	2002 - 2006	2002 - 2006
Engine	Series 60 EGR	Series 60 EGR	Series 60 EGR	Series 60 EGR
Displacement	12.7L	14.0L	12.7L	14.0L
Power Rating	430HP	500HP	455HP	515HP
Application Notes	Includes turbocharger speed sensor <u>with</u> signal amplifier	Includes turbocharger speed sensor <u>with</u> signal amplifier	Includes turbocharger speed sensor <u>without</u> signal amplifier	Includes turbocharger speed sensor <u>without</u> signal amplifier
Installation Position	Mid Set Back	Mid Set Back	Mid Set Back	Mid Set Back

FMW
 • FORGED MILLED WHEEL •
TECHNOLOGY

Up To **213%**
 More Wheel Life Over
 Cast Aluminum

Up To **66%**
 More Wheel Life Over
 Milled Aluminum



BorgWarner

AreaDiesel...

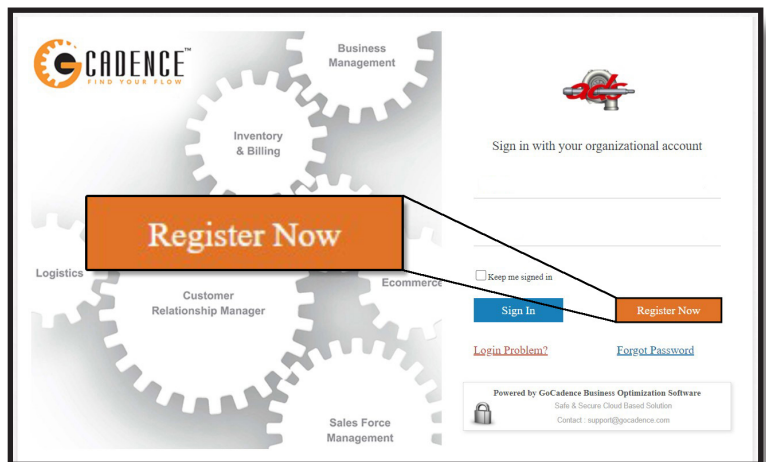
...is now on YouTube! Check out our channel for an inside look at our shop, staff and rebuilding procedures. Do you have ideas for content you'd like to see us feature? Drop us a line at parts@areadiesel.com and let us know!

Click on the
image to check
out our channel!



Are you signed up yet?

We've made it easier than ever to find current pricing, inventory, tracking information, core reports, invoices and much more! All dealer accounts are encouraged to take advantage of our convenient online portal. To get signed up, simply navigate to areadiesel.gocadence.com and click on the orange "Register Now" button. And for you end user customers, we haven't forgotten about you. Check out our all new ecommerce platform at shop.areadieselservice.com.



Area Diesel Service will be altering our business hours for Christmas and New Years. We will be closed the following days / times to give our employees time with family:

- > Thursday, December 24th - Closing at 3pm
- > Friday, December 25th - Closed
- > Thursday, December 31st - Closing at 3pm
- > Friday, January 1st - Closed



MERRY CHRISTMAS!



Turbocharger Misapplication

Article by Dave Keiner

Turbochargers, like many other parts, can fail for a variety of reasons. However, the most common causes for failure are dirty oil due to contamination, lack of oil lubrication and foreign object damage. That being said, there is another common cause for failure that is often overlooked; misapplication. Misapplied turbochargers are units that are not properly spec'd, and therefore not designed, to operate on a given engine platform. This can lead to a variety of different turbo failures including wheel bursts, shaft breakage, turbine housing cracks, thrust bearing failure, compressor bore distortion, stressing of the compressor back wall and journal bearing failure. An improperly spec'd turbocharger may help an engine run well for a given amount of time but ultimately, end up detrimental to the engine and the turbo itself.

When an undersized turbocharger is bolted up to an engine, a condition commonly referred to as "over boosting" can occur. Over boosting oftentimes leads to wheel fatigue and shaft breakage. Installing a turbocharger that is too small for a given engine causes the unit to work outside of its intended operational range resulting in premature failures such as a broken shaft, fractured compressor wheel or broken compressor wheel blades. Each wheel is designed specifically for a given RPM range. Running the wheel above its rated speed induces stress on the back face of the wheel and in the blades. There are a few "band aid" measures that can be taken, such as "hipping" (hot isostatic pressure or pressing) where the foundry applies pressure to enhance the micro-structure of the metal whereby improving the fatigue qualities of the wheel. However, while this is a minor enhancement to the overall structure of the wheel, the failure point is only slightly extended and the wheel is still prone to failure in over-speed situations. The blades of a compressor wheel are engineered to withstand high vibrational frequencies. However, they are still bound by the laws of physics and therefore subject to a finite lifespan. This is referred to as their B10 life. Billet or forged milled wheels are a more robust alternative to cast wheels. However, they are still subject to life cycle issues as well.



PHOTO 1



PHOTO 2

As we mentioned above, another common failure mode in a misapplied turbocharger is shaft breakage. During the engineering process, a turbine shaft is matched to a given turbine wheel based on size requirements. Shaft breakage can occur when an improperly spec'd turbocharger is pushed beyond its designed limits. This breakage can occur at either the turbine end or at the stub shaft shoulder on the compressor end. It's oftentimes confusing for operators when their turbocharger seems to work so well for a few

months, or more, and then, seemingly out of nowhere, they experience a broken turbine shaft. In the majority of cases, this occurs because they have been pushing their turbocharger past its limits either because the actual horsepower is higher than the turbocharger is rated for, the turbocharger is too small for the displacement of the engine, or both.

Turbochargers are developed through an advanced engineering process including aerodynamic performance with wheel design, material selection, mechanical design in bearing size, shape and type, fixed or variable geometry, material hardness, and so on. Then they move over to the application engineering team for matching to a given engine and the application for that engine (it is possible to have the same engine in an on highway vehicle, off road vehicle, and stationary application). The turbocharger is then matched and applied to the specific engine configuration and demand. Extensive testing is performed to determine duty cycles and durability.

Let's look at a common example of misapplication. A turbocharger that has been designed for a 12.7L engine rated at 400HP may work well on a 14L engine rated at 400HP. It's also possible to add more fuel to the original 12.7L, 400HP engine and push upwards of 550HP out of it. Sounds good, right? Sure, it may run great for a time but will it last? Short answer, no. Pushing this turbocharger beyond its original intended operational range will likely lead to premature failure from over speeding and/or fatigue. In competition, engineers and crews push their engines well past normal parameters. However, they're not intending for that configuration to last for 500k miles.

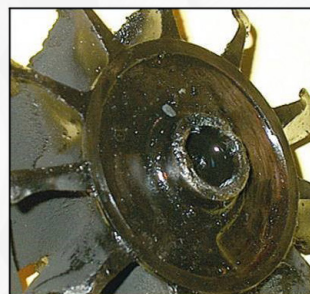


PHOTO 3A

Oftentimes they're looking for maybe 500 miles or even just a few passes down the track. Durability is sacrificed on the altar of great performance.

Turbochargers, when they fail, tell a story. A technician with a trained eye can identify the reason for failure by inspecting the individual parts of the unit. Indicators such as an orange peel texture (See photo 1) or compressor back face distortion (See photo 2) are telltale signs of an over-speed condition. Wheel and shaft separation is another common mode of failure that occurs when exhaust gas pressure is too high and over time, literally spins the wheel off the shaft. (See photos 3A/3B/3C)



PHOTO 3B



PHOTO 3C

Bottom line, it pays to consult the experts in turbocharging BEFORE upgrading your turbocharger. Take the time to make sure that it's a proper match so that, in the end, not only will it give you great performance but also the durability you need to keep your equipment running for years to come. The last thing you want to do is sacrifice your warranty by installing an improperly spec'd turbo on your engine. At Area Diesel Service, we have the experts and knowledge, with

decades of experience in the turbocharger world, to help you properly size a turbocharger for your next repair, upgrade, or competition. And as BorgWarner Franchise Distributors, we work closely with some of the world's leading experts in turbocharger design and engineering. We offer a full line of stock and performance turbochargers for ag, truck, industrial, and marine applications with many application specific performance options available. To find out more about Area Diesel Service, check us out online at www.areadieselservice.com or give us a call at 1-800-637-2658. (All photos courtesy of BorgWarner North American IAM)

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