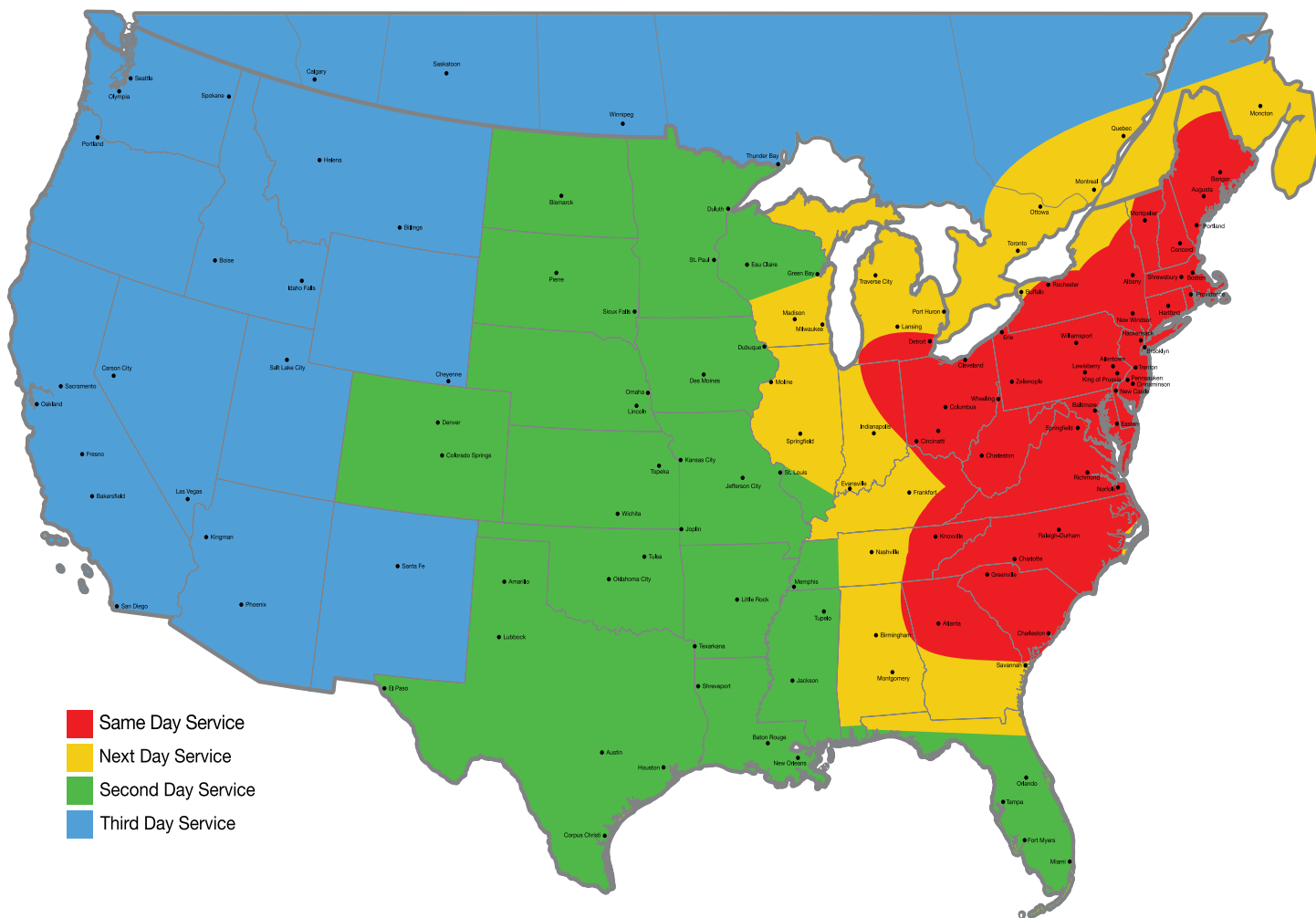


Remanufactured  
**Allison Transmission**  
Teardown/Competitive Analysis

Conducted By



# Delivery Service



*Regional Sales Manager - North*

**856.793.5778**

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# TRC vs. The Competition

TRC only sells Allison remanufactured transmissions produced by us at our locations in Pennsauken, NJ and Charlotte, NC.

Both facilities are Authorized Allison Overhaul Dealers and remanufacture units in strict compliance with Allison policies and procedures. Our objective is to remanufacture transmissions to the latest blueprint specifications, following the procedures dictated by the original manufacturer.

As part of our ongoing quality process, we have purchased and disassembled Allison transmissions rebuilt by our competition to demonstrate the differences in workmanship and quality in their product. This document will highlight how during the rebuilding process our competitors take advantage of the numerous corners that can be cut to save time and money—all of which serve to lessen the quality of the unit you have purchased.

While we will not “name names,” it is important that you are aware that not all transmissions are remanufactured to the same rigid specifications as ours. TRC believes the use of only OE components and strict adherence to remanufacturing processes spelled out by the OE manufacturer will produce the best combination of quality and cost over the life of your vehicle.

# Competition

The competitor's transmission is strapped to a standard shipping pallet. One of the straps is broken, allowing the unit to move extensively during transit.

Competitor's transmission is sitting directly on the pallet with the oil pan and the filter bearing the full weight of the unit.

The pallet is oil-soaked and broken. The cling-film wrap barely remains intact which offers minimal protection during storage and shipment.



The competitor is using a refurbished torque converter (see the heavy weld seam around the perimeter and wear marks). This is not allowed by Allison.

Given the high instances of failures with refurbished torque converters, the specification is for only new converters on every unit.

Also note the lock retainer is not secured. This will allow excessive movement during transit and cause wear on internal parts and seals.



Signs of visible wear and distortion on the competitor's torque converter's knurled edges which can cause adaptation issues and premature failure.





Our transmissions use specially-designed pallets to protect the transmission. Note that no weight is borne by the oil pan.

We also use 7 mil shrink wrap and standardized straps to ensure no damage during shipment.



The TRC torque converter is brand-new, per Allison spec. Also note that the transport retainer is properly installed.

Historically, we have seen up to 50% of failures to be in the torque converter, so new is the only logical choice, even if the initial cost is slightly more.



The knurled edges of a new torque converter are clearly in better condition for longer life.

# Competition

Inspection confirms that torque on their bolts varied from 10-12 ft/lbs.



Their pump bushing is in poor shape with the bronze base metal showing through. This component should not have been salvaged.



Their forward clutch and friction plates have visible burn marks, scoring and wear.

These wear components have been salvaged and re-used.





Our remanufacturing process incorporates state-of-the-art torque tools to ensure consistent torque values. Our torque station not only electronically sets appropriate torque values, but also tracks all bolts so that none are missed during the process.

The Allison spec call for torque between 18-24 ft./lbs. Improperly torqued bolts can lead to vibration based failures and leaks.



Our transmissions always replace pump bushings with Genuine Allison new parts. Excessive clearance can lead to premature pump wear and low main pressure.



We 100% replace friction plates in the forward clutch with Genuine Allison parts, given the high application pressures.

Slipping or worn plates will lead to premature clutch failure.

# Competition

Their fourth piston spring assembly is an obvious job of mismatched spring components.

Allison designates various spring tensions by color. This application specifies all "red" springs.

Mixing springs of various tension will lead to performance issues, premature wear and eventual component failure.



Used clutch plates in their unit are not Genuine Allison and show signs of previous wear.



Looking at their oil pan, you can clearly see metal shavings that are beyond what is considered normal break-in wear for a remanufactured transmission. This unit is already destined for premature failure.

Debris in the unit can lead to shift quality issues, sticking valves and premature failure.







Our fourth piston spring assembly utilizes the approved springs/tension to ensure proper application.



Clutch plates in our units are all genuine Allison OEM parts as shown by their logo stamped on the ear.

You can also see the obvious difference in quality between genuine OE equipment and used/aftermarket parts. Sub-par used and replacement parts can lead to premature failure.



Our units are thoroughly cleaned as part of the ISO9001:2008 controlled process.

# Competition

The valve in this body was sticking and the body had a burr which caused the valve to not move freely in the bore.

Sticky valves will lead to shift quality issues and performance problems.

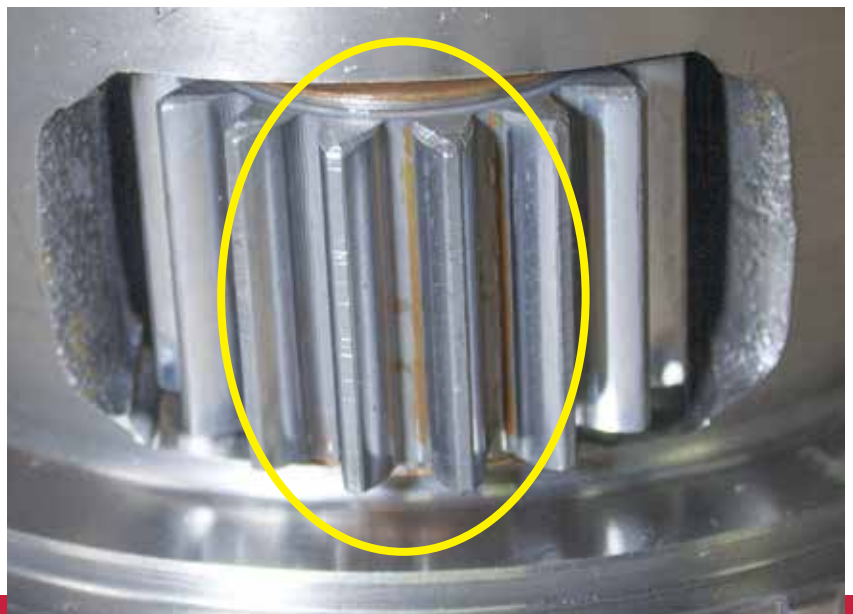


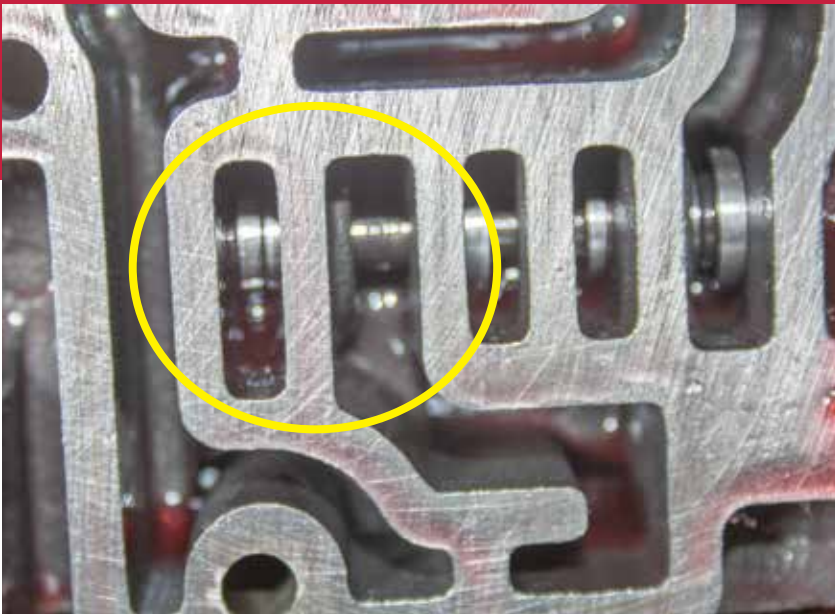
Note the retaining clips used in their transmission. These star clips are not per the Allison spec.



Their transmission included re-used rear carrier gears showing wear.

Also, only one gear on this unit was replaced.





Great care is taken on our units to remove all burrs and imperfections.



Note the Genuine Allison OE retaining clips used on our transmissions. Sub-par retaining clips have been known to break apart, leading to contamination within the units.

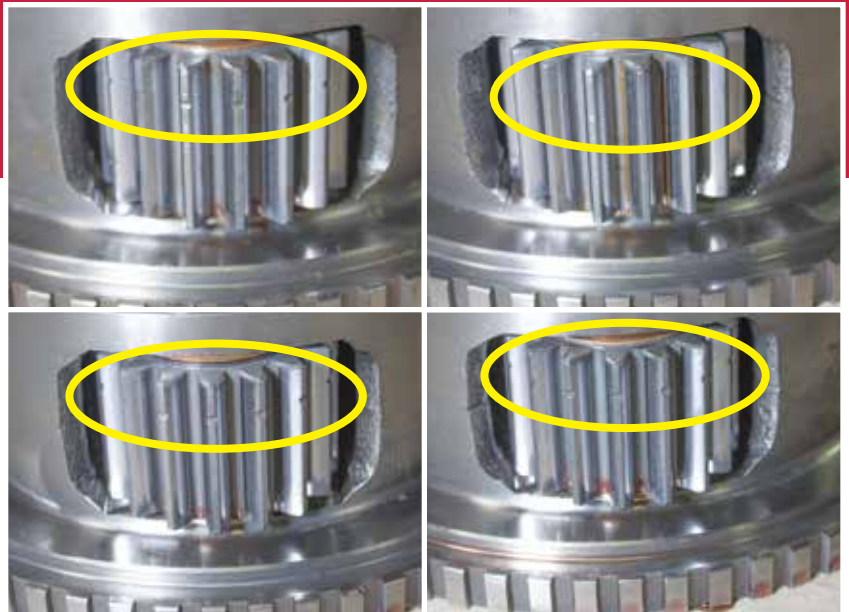


Allison OE spec is that all four (the full set) should be replaced during a reman. This will minimize gear whine and excessive noise.

# Competition

A closer look at all four gears shows that this is not a matched set. While the entire assembly may be salvaged as part of the reman process, these gears would not pass QC inspection at TRC.

**NOTE:** Notches are machined into each set of gears to identify them as a matched set. This is an unmatched set of gears.



Their transmission rear carrier gear shaft has a shim ring added to compensate for wear instead of using an Allison-approved one-piece sleeve.

This is not an approved part or fix.



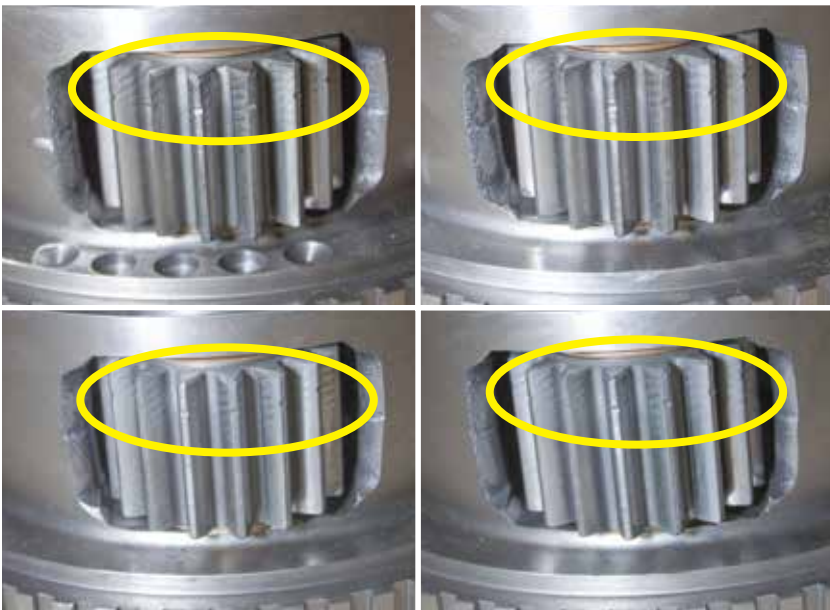
Shown here is one of the more unforgiving aspects of their transmission.

The transmission was ordered with a Reduced Modulator Calibration Kit (RMC) installed.

Upon review, you can see that the valves are regular spec and not the ones for the optional kit that were specified.

By not replacing a transmission with a “like-for-like” model, the user will notice shift-related deficiencies.





An example of a salvaged rear carrier set of gears that has passed QC inspection.

Note that all four gears have the same "matched set" notches.



Shown here is the oversized sleeve that is approved per the Allison spec.



These are the valves that should have been installed with the RMC kit.

# The TRC Difference

At TRC we understand and appreciate the trust you place in us each time you decide to rely on us. Quality is not an accident.

Our recipe for quality includes the following:

## Quality Planning

Starting with information—TRC makes a concerted effort to align ourselves with the premier OE manufacturers in our respective markets. This allows us access to OE specifications, engineering level information and the experts we need to ensure the best available information as an input to our work.

Proper organization and information sharing ensure the information is applied consistently across products. The quality plan lays out rigid metrics against which our results can be measured. Using the latest technology, we continuously train all of our employees to ensure they are up to speed and knowledgeable. From our technicians and counter people to regional sales people—our goal is to be able to solve your issues—not simply sell you a component.

One example of our quality plan is the ISO9001 certification achieved by our Allison remanufacturing center. We have had this quality system in place since 2004.

## Quality Control

At TRC this refers to the gauging, unique tooling and fixtures that are deployed to allow our technicians to accurately determine if a given component meets our defined quality standards. Over 30 years, we have developed numerous techniques and gauging for the specific products that we remanufacture.

## Quality Assurance

The use of statistical analysis and interactive communication on all quality related issues allows for open and honest discussion with the sole purpose to build a better product. Close coordination with our suppliers ensures that they are applying similar techniques to ensure our raw material is of sufficient quality.

## Quality Improvement

We employ numerous methods to ensure we are continuously improving the products and process—eliminating mistakes, waste and rework. One of the primary methods we employ is Kaizen. Having completed 26 week-long, Kaizen events in the last three years has allowed all of our employees to understand the benefits of this methodology. Kaizen (kai = change and zen = wisdom) is an approach to effect positive change on the shop floor while leaving the individuals feeling better about their surroundings and contributions. We have used it to streamline operations, improve quality of output, improve employee safety and reduce customer turn around time.

## Testing

All units are dynamometer tested to insure they meet the strictest standards. Company-wide we have ten electronically controlled dynamometers to ensure a universal standard of quality across products and locations. Testing is based on OEM specs for each unit.



One of our Dynamometers in the process of testing an Allison transmission reman.



## What is the Difference Between Remanufactured and Rebuilt?

Today's fleet equipment is increasingly sophisticated & expensive. It's imperative that the components used in repair are of sufficient quality to return the vehicle to original equipment (OE) performance levels.

Many customers question the difference between remanufactured and rebuilt. An excellent perspective comes from Jim Morrow, former president of Detroit Diesel Remanufacturing Corp. "First of all, let's clarify the difference between a remanufactured transmission and one that is rebuilt. TRC transmissions are totally remanufactured, returning them to the latest blueprint specifications and tested to original equipment standards," explains Morrow. "The typical rebuilt transmission is only repaired to the level of failure. That means any components beyond this level are left intact. Additionally, testing procedures often vary among individual rebuilders. Having been exposed to TRC's process, I can attest that they have a robust remanufacturing and testing process—they are not a rebuilder"

**Jim Morrow**  
*Former President*  
Detroit Diesel Remanufacturing Corp.



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**1-855-5TRCREM**  
(1-855-587-2736)