Master Service and Parts – Disc 1 2005

Dodge SRT-4
Owner Modifications and Warranty

Since its introduction, Dodge SRT-4 has developed quite a reputation for delivering outstanding performance: 230 horsepower and 250 pound-feet of torque in a subcompact car. It's also a superb value, making it popular with younger "tuner" customers.

Many enthusiastic owners modify their vehicles, trying to get even more performance out of them. While these modifications may work to some degree in the short term, they often detract from the long-term durability of the vehicle. And warranty repairs are not the corporation's responsibility if an owner's modification caused the damage.

This document describes some modifications that are commonly made to SRT-4, to help you recognize modifications that you may want to investigate further, if not question the owner about. These modifications could lead to powertrain warranty restriction.

Often, these modifications will have been removed before the vehicle enters your Service department. But if you know what to look for, you can recognize the telltale signs.

Increasing Boost and Changing Other Engine Parameters

Most owner modifications are intended to increase power in some way – by increasing the turbo boost, increasing fuel delivery, modifying the controller, and so on.

Wastegate Actuator

Perhaps the most popular method is to modify the turbo's wastegate actuator to keep it closed longer, increasing the amount of boost. The engine will want more fuel – but the system may not be able to keep up. This can result in spark knock, which the engine controller will attempt to compensate for.

Wastegate actuator modifications can often result in catastrophic engine failures such as burned pistons, blown head gaskets, turbo overspeeding, and bearing damage. They often set certain fault codes (P1188, P0234, P0068).

Aside from simply replacing the stock actuator (fig. 1) with a different one, there are a few ways to modify the operation of the stock unit.

Figure 1 – Stock SRT-4 wastegate actuator.

Owners have been known to install a tee connection in the wastegate actuator hose to bleed off pressure. It can be either an adjustable version (fig. 2), which may even have a cable attached for remote control, or a homemade one, created by simply piercing a pinhole in a plastic connector that can be bought in any hardware store (fig. 3).

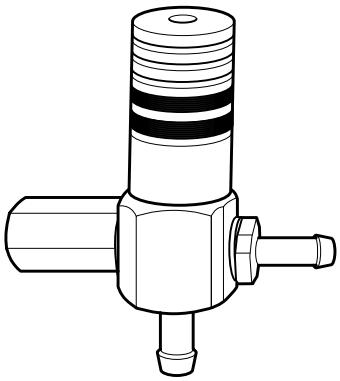

Figure 2 – Adjustable metal tee used to bleed the wastegate actuator hose.

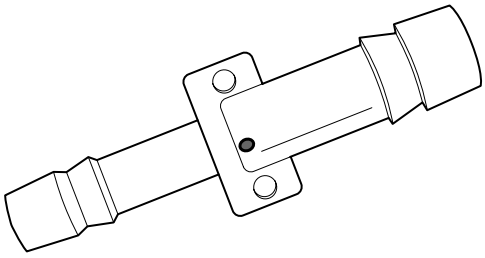

Figure 3 – Homemade tee used to bleed the wastegate actuator hose, created by piercing a pinhole in a plastic hose connector.

Bleeding the wastegate actuator hose can also be controlled electronically. Some systems have a black box that mounts under the hood, with an electronic readout and controller that mounts inside the cabin where the driver can adjust it (fig. 4).

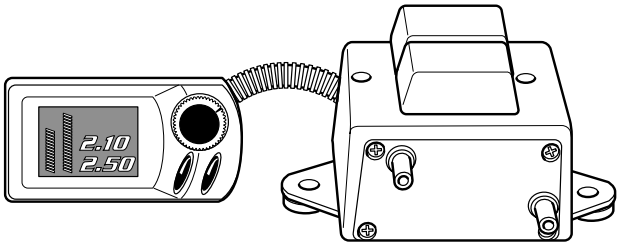

Figure 4 – Example of an electronic driver-adjustable wastegate system.

Another way is to change the rod that moves the wastegate actuator. The rod on the stock actuator is not threaded. On modified versions, the rod is often replaced with a threaded one, along with a nut to make adjustments and effectively change the length of the rod, which changes the preload on the wastegate (fig. 5).

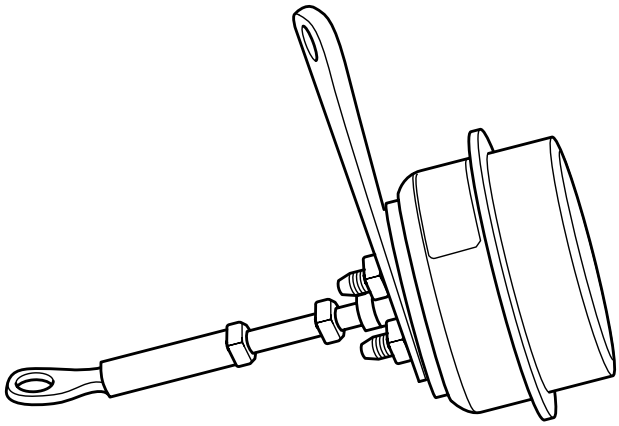

Figure 5 – Wastegate actuator modified with a threaded rod and nuts to make it adjustable.

It's even easier for owners to do a "spring mod" by simply attaching a spring to the rod to increase the preload on the wastegate (fig. 6).

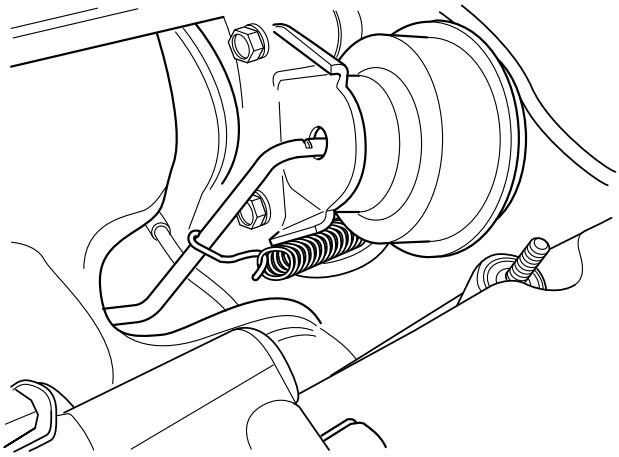

Figure 6 – A spring can be used to increase preload on the wastegate.

Aftermarket Turbos and Kits

Another method of increasing power is to replace the factory turbo unit with a larger aftermarket one, or a kit to increase the power of the existing turbo. The idea is the same: to increase boost, and therefore, power.

Aftermarket turbo units can cause the same types of engine damage: burned pistons, blown head gaskets, turbo overspeeding, and damaged connecting rod bearings. Fault codes P1188, P0234 and P0068 will typically be set.

Figure 7 shows one example of an aftermarket turbo kit for the SRT-4. As you can see, these are easier modifications to spot. In general, you want to keep an eye out for fabricated parts and items that

look different from the stock equipment from the factory.

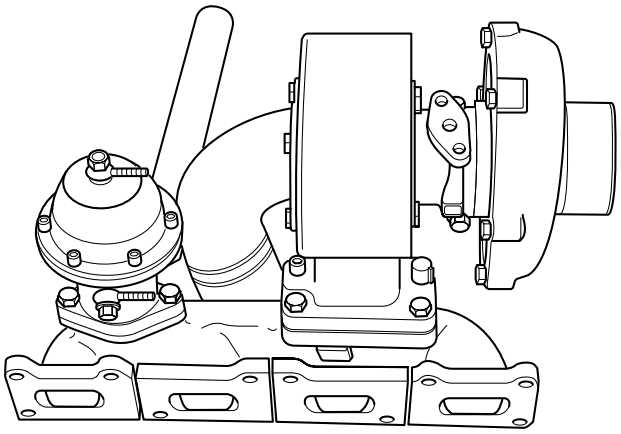

Figure 7 – Example of an aftermarket turbo for SRT-4.

Note that Mopar sells turbo upgrade kits for the SRT-4, and they're very popular. The Mopar "Stage 1" kit is a low-risk modification if it's installed correctly and when used by itself, with no other engine modifications. However, if owners combine the Mopar Stage 1 kit with the other modifications in this document – and this is popular, because using the Mopar kit helps keep the "Check Engine" light off – they're much more likely to experience the same types of serious engine problems.

Mopar also sells Stage 2 and Stage 3 kits that provide even more power – up to 355 horsepower and 365 pound-feet of torque! They are reliable, but the extra power can reduce the durability of the driveline – the clutch, transmission, half-shafts, etc. In any event, all three Mopar turbo kits are intended for racing, not for on-road use, and customers who install them should understand the implications.

The Mopar kits look very similar to the stock setup, but there are two clues that one is installed.

A SKIM-related fault code (P0633) will be set, because the Mopar kits don't have the Sentry Key secret code programmed into their engine controller. And you can compare the mileage stored in the engine controller with that stored in the instrument cluster. If they don't match and the difference is significant, someone has likely been swapping engine controllers on the vehicle.

Piggyback Harnesses

The next category of engine modification is the use of a "piggyback harness." A piggyback harness includes a black box, that's spliced into the engine's wiring (fig. 8). On SRT-4, it modifies signals from the MAP sensor and TIP sensor to fool the engine controller into providing more boost.

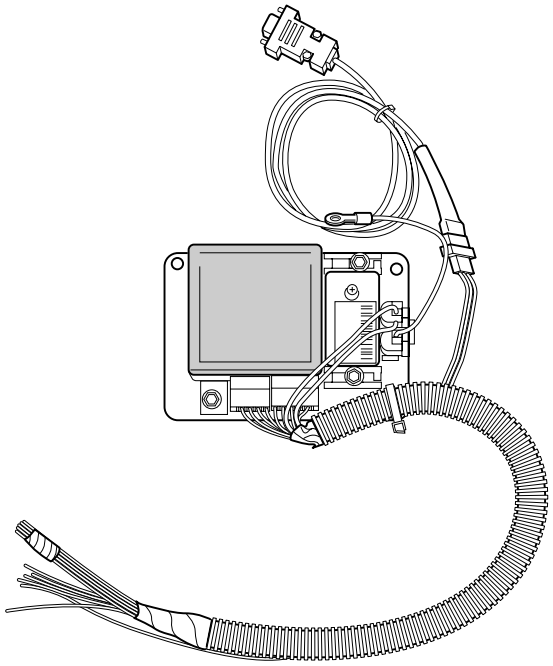

Figure 8 – A piggyback harness is spliced into the engine's wiring.

Once again, this can cause the same types of engine damage: burned pistons, blown head gaskets, damaged connecting rod bearings and turbo overspeeding. However, fault codes may not set, because the controller isn't receiving accurate sensor information.

In general, piggyback harnesses may have a "black box" module that's not part of the stock engine controller. You may see evidence of wire splicing, particularly near the MAP and TIP sensors and the engine controller harness. And you may see Velcro® fasteners or double-stick tape, which are commonly used to hold a black box while allowing easy removal.

Those are the common techniques for increasing power by increasing turbo boost or other engine parameters. But there are other methods used as well.

Intake and Exhaust

One is to install a low-restriction exhaust system – basically a larger diameter set of pipes, such as the 3-inch example shown in figure 9. Sometimes owners will remove the catalytic converter, as well.

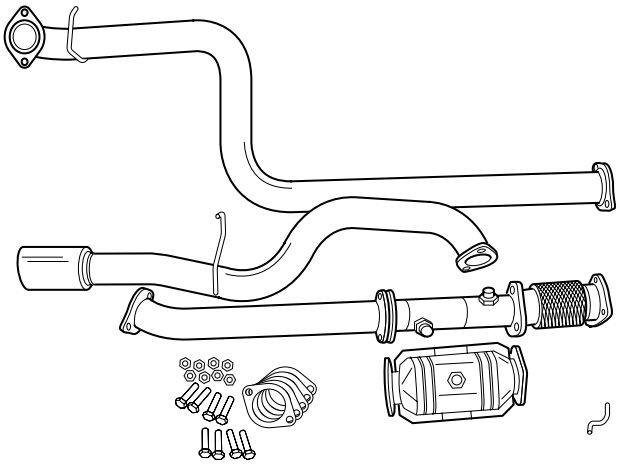

Figure 9 – Low-restriction exhaust.

The customer might come in with a Check Engine light on, which could be O2 sensor fault codes, often because they've removed the downstream O2 sensor or the catalyst is removed between the two O2 sensors.

While this could lead to lean fueling issues such as burned pistons or exhaust turbine damage, a low-restriction exhaust doesn't usually cause serious problems in and of itself. (In fact, all it usually accomplishes is to make the car sound louder.) But anyone who has changed the exhaust has likely made other modifications as well, so keep your eyes open.

Reducing restriction on the intake side of the engine can also improve performance. (The stock intake system can be seen in figure 10.)

Figure 10 – Note the air intake path in the stock SRT-4 engine compartment.

Intake modifications can take several forms.

Owners may install a "short ram" intake to provide a shorter, straighter path for incoming air (fig. 11). This is actually counterproductive, though, because it's drawing in hot air from behind the radiator.

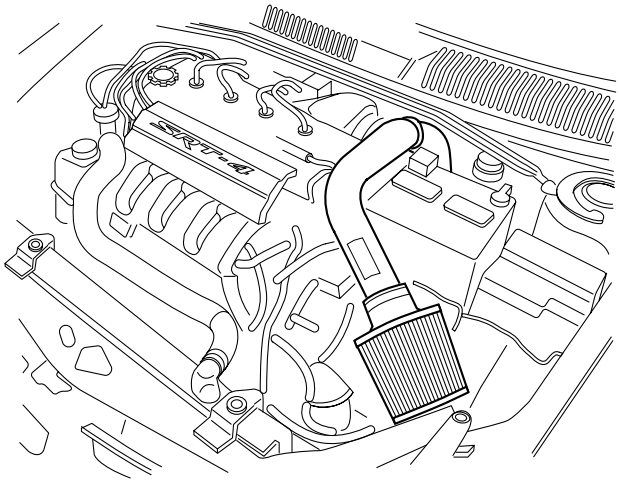

Figure 11 – "Short ram" intake.

Others will modify the stock SRT-4 cold air intake that already draws from the wheelwell (fig. 12). This may look impressive, and it will probably sound louder, but it really doesn't provide a significant power improvement over the stock system.

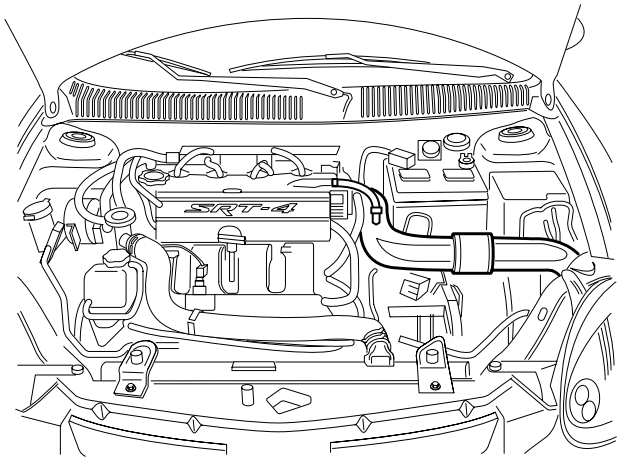

Figure 12 – Modified cold air intake.

Modifying the engine intake in these fashions can result in driveability problems due to compressor surge – the turbo is accelerating so quickly that it stalls the airflow in the compressor turbine.

Another approach is to install a larger intercooler. Figure 13 shows an example of a stock SRT-4 intercooler and an aftermarket unit that's twice as tall. But in order to make it fit owners need to remove the front bumper beam, which reduces the car's structural rigidity. That reduces its handling ability and its crashworthiness.

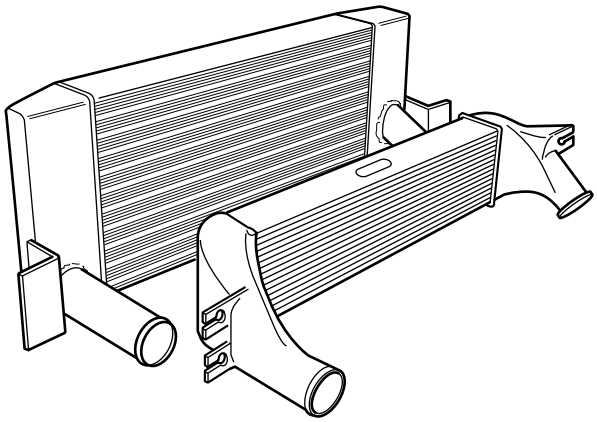

Figure 13 – An aftermarket intercooler can be twice as tall as the stock SRT-4 unit.

You can easily spot a larger intercooler on an SRT-4 by looking directly through the front grille. As seen in figure 14, the stock intercooler is visible through the lower grille openings, but not the upper ones. A larger intercooler will be visible through the upper grille openings as well.

Figure 14 – The stock SRT-4 intercooler is only visible in the lower half of the grille.

A larger intercooler usually doesn't hurt engine durability in and of itself. Once again, however, anyone who has installed one has probably made other modifications as well. And the performance improvement isn't worth the necessary trade-off in handling and safety.

Nitrous Oxide (NO2)

One of the more dangerous modifications owners can make, particularly on a turbocharged engine, is to inject nitrous oxide (NO2). NO2 oxidizes combustion, allowing the use of more fuel, which produces a higher energy charge in each cylinder.

Just a few drag strip runs with an improperly tuned nitrous system can cause serious engine damage, including burned pistons or exhaust valves, blown head gaskets and melted catalyst bricks. Worn connecting rod bearings can also result, along with wear to driveline components, which are not designed to reliably handle these levels of power.

Keep your eyes open for signs that an owner may be injecting nitrous. Look for a nitrous bottle, or perhaps the mounting brackets for a bottle (fig. 15). These are typically kept in the trunk.

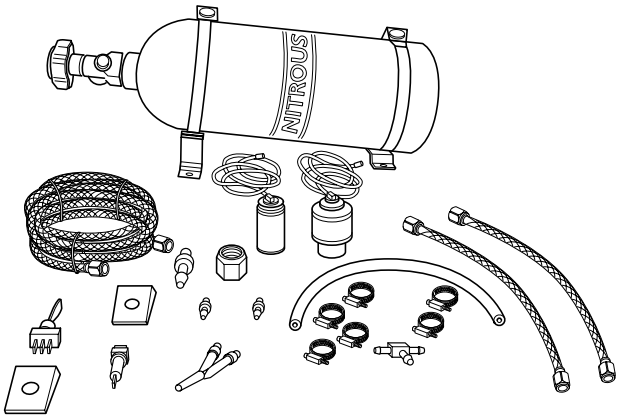

Figure 15 – Typical Nitrous Oxide (NO2) kit.

Watch for steel braided hose running to the engine compartment, or one or two nozzles installed in the intake or the hose from the intercooler to the throttle body (fig. 16). Also keep an eye out for extra switches or controls in the cabin, within easy reach of the driver.

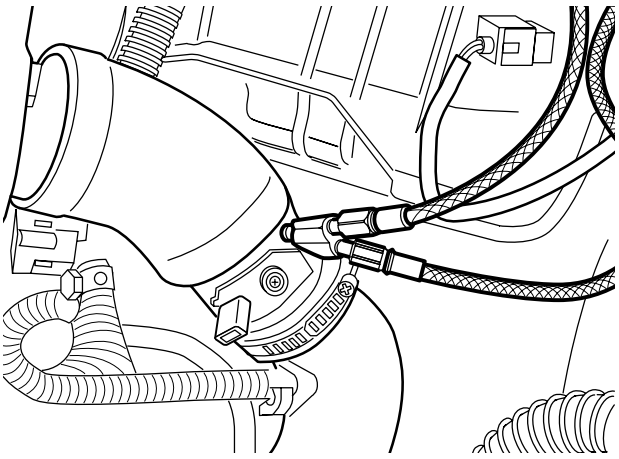

Figure 16 – One or two hoses installed in the intake or the hose from the intercooler to the throttle body are an indicator that NO2 may have been used.

Another type of modification involves the engine mounts and torque struts. SRT-4 has relatively soft mounts and struts designed to minimize noise,

vibration and harshness to make the car suitable for everyday driving.

But some owners want stiffer mounts that reduce engine motion to maximize performance feel. They buy inserts to fill the voids found in softer mounts and struts. Or they'll purchase stock mounts that have the voids filled with material (fig. 17).

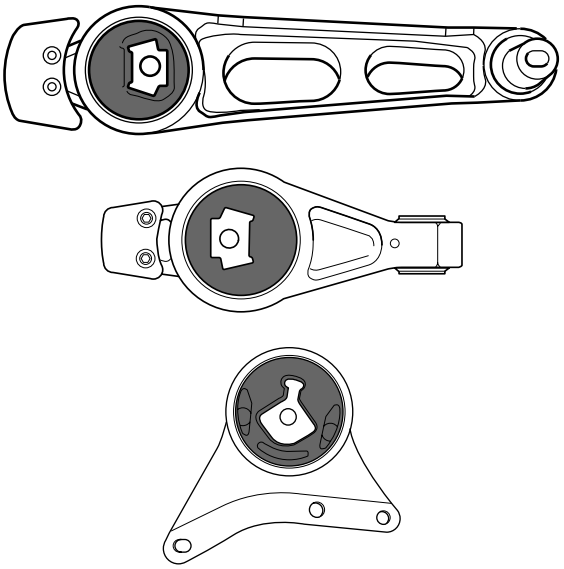

Figure 17 – Stock engine mounts with inserts and filled voids to make them stiffer.

Some even replace the stock mounts with solid upper and lower torque struts (fig 18).

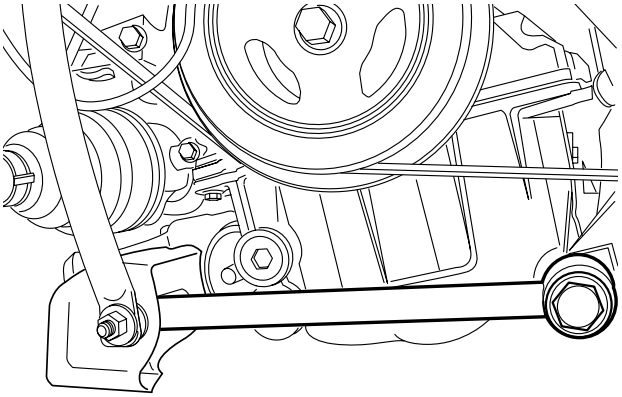

Figure 18 – Torque struts are sometimes installed in place of engine mounts. The lower A/C bracket can bend and crack the oil pan.

These modifications increase noise, vibration and harshness. More importantly, the higher loads can bend or break the mounts or attachment points.

Also, the lower A/C compressor bracket is connected to the lower torque strut. When that strut has been modified, the bracket can often end up bending so far that it hits the oil pan and cracks it, causing an oil leak.

If you encounter one of these – and chances are that you will – look for signs that the mounts and struts have been replaced or filled in, even if they're not on the vehicle when it reaches your dealership.

Lowering Kits

Some SRT-4 owners install a "drop springs" kit to lower their car (fig. 19). Some of these kits increase the spring rates and damping rates as well. They change the car's suspension geometry and depending on how low the car is dropped, change the half-shafts angles and lengths. The result can be premature wear to the inner tripods and damage to the CV joints.

Note: Mopar offers lowering kits with a stop-ring that helps prevent these problems by limiting how far the car can be lowered.

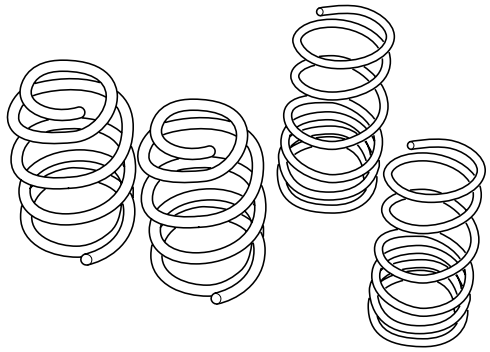

Figure 19 – "Drop springs" kits can lower the vehicle so much that the suspension geometry is affected.

Modular Clutch

The final common issue on SRT-4 involves the clutch. It was extensively tested, and it's a robust design that can handle the stock engine's power – if drivers are good with a stick. If drivers are not good (and many SRT-4 owners may be new to driving a stick), they're more likely to damage the clutch. The stock clutch comes with a 12-month/12,000-mile warranty, although it will last much longer if not abused.

Also, attempting burnouts by revving the engine to 6000 RPM and then slowly letting the clutch out is another good way to destroy it. That smoke they're creating could very well be the clutch, and not the tires!

Look for signs of abuse, such as badly worn tires, or pieces of the tires in the front wheelwells – these might tip you off to some potentially abusive driving activity. The vehicle warranty does not cover racing.

What You Should Do

Technicians and service managers who find evidence of any modifications or customer abuse that may have damaged a vehicle brought in for warranty work should gather as much information as possible about the car from vehicle inspection and from conversations with the owner. Then contact the Regional Tech Advisor and District Manager and provide them with this information. They'll review it and make any decisions on Powertrain Warranty Restriction.

For more information, refer to the Owner's Warranty Manual.