GMCWestern States

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Technical Information from Bert Curtis

Pictured: Fay and Burt Curtis

As winter and spring slowly morph (at least in our part of the world) into summer, thoughts turn to being out and about more with our GMCs. Most of us tend to be good about checking tire pressures, fluid levels, and doing ordinary maintenance -- oil changes, trani fluid changes, etc., and hopefully everyone is keeping track of wheelbearing greasing. Yet there are a couple of items that should not be ignored as they can at best leave you stranded or at worst in the hospital with a wrecked GMC.

The first is your cooling system. When was the last time you checked your radiator, hoses, water pump, etc., for leaks? Small seeps might be hardly noticeable, but could be sign of greater problems ahead. A leaky water pump can be a signal of a potential failure that could leave you stranded in the most inopportune place. Hoses that are cracked or collapsing under running temperatures can lead to overheating or complete engine meltdown. You can check them visibly for signs of problems and by gently squeezing them -- they should be pliable, but offer some resistance -- you can usually catch potential problems. Another item to check is your radiator cap. The low pressure caps we are to use - 9 lb, can have a very short lifespan. Many auto stores can check them for you, along with radiator repair shops. And if your radiator shows signs of rotting fins, seeps, or bluish green stains on the tubes, it might need repair or replacement. It is easier to do this at home, on your schedule, instead of in Boondocks, USA. And you are changing your coolant on schedule -- right? Besides helping with preventing overheating and freezing, it protects the engine and radiator from rust and decay. If you can't remember the last time it was changed, it is most likely time to get it done! If you are frugal and in doubt, there are specially treated strips of paper that you dip into the coolant and compare the color change coolant needs to be changed.

While you have the engine cover off to check the water pump, be sure to check your belts for wear and proper tension, the air cleaner (dirty filters suck power and fuel economy) and other things, i.e., bolts for tightness, wires for chafing.

The other often forgotten item to check and/or change is your brake fluid. The coach's brakes are only as good as the weakest part of the system. New pads, shoes, switching to rear disks, etc., all fail if your brake fluid is no longer doing its job.

Most of us know that if you overheat your brakes (have brake fade - the feeling of no stopping power) - usually when going down a long steep grades improperly - you must bleed your brakes to remove the "cooked" fluid to prevent future problems, but most of us do not

realize that brake fluid has a lifespan of its own. We have been told that brake fluid absorbs water and that this causes all of the internal corrosion to the braking system. While this is partially true, the absorption happens through all the rubber parts in the system including the brake hoses and every time the reservoir cap is removed to check or add fluid. It had been proven that this moisture content in the brake fluid is NOT the only cause of corrosion: it is only a contributing factor. A special task force, consisting of members of the autos service industry, equipment manufacturers, parts manufacturers, education and the scientific community discovered that even with improved reservoir design, brake fluids and brake hose materials, corrosion was still being found. That is, corrosion was found without significant amount of moisture present! Like engine coolant, your brake fluid is made up of corrosion inhibitors, pH stabilizers and antioxidants, among other things, to improve the long term corrosion protection of your braking system. Over time, these become depleted (just as they do in the engine coolant) and leave the system vulnerable to decay. There are, of course, many variables that affect how long it takes for this to happen, such as the brake fluid chemistry, chemical and thermal stability, brake system design, driving habits, frequency of maintenance, temperature and road surfaces. One study found that the buffer capacity and inhibitor concentrations "drop to less than 10% of their initial levels after only 30 months of service". (Jackson, SAE paper 971007, Corrosion Prevention SP-1265, 1997) Not unexpectedly, the rate of degradation is affected by many factors, as stated above. And the rate tends to be higher at the wheels where the fluid is exposed to the highest degree of heat.

What the task force found, also, was that copper is the first principle contaminate that appears in brake fluid. They hypothesized that the copper in the lines corrodes at a slow rate over several months or years, which then acts as an oxidizer and plates out when the inhibitors can no longer prevent corrosion of the ferrous components. This copper comes from the brake lines as most lines have an inside coating consisting of a copper brazing alloy and the brake lines represent the largest surface area in the brake system. Of course, the rate of corrosion of the copper is dependent on the level of corrosion inhibitors in your brake fluid. Therefore, the copper corrosion acts as an early warning for the next type of corrosion that will appear in the system, usually dissolved iron. By this time, severe corrosion is already present and the copper acts as a catalyst to speed corrosion.

The task force suggests testing your brake fluid at the recommended inspection service intervals -- 6 months or 6,000 miles for a GMC - to insure that the copper level is below 200 PPM. And it recommends that the brake fluid be replaced if it exceeds 200 PPM.

So how do you determine accurately the level of the copper content in your brake fluid? Fortunately, there is a fast (40 -130 seconds) and simple method. In a manner similar to coolant strip tests, the brake industry has developed test strips that one dips into the brake fluid in the reservoir for one second. Remove and wait for 30 - 120 seconds for a color change in the reaction zone. Compare the color to the key and follow the recommendations.

By keeping your brake fluid clean and fresh, the rest of the brake system will stay in better shape and failures will be reduced.

Editor's note: Testing kits for coolant and brake fluid are not always available at your local auto parts store, but can be found or ordered through a more complete store such as NAPA or a truck parts shop. They are not cheap and they have more strips than an individual would likely need. Maybe an idea for a rally tech session? Engine oil analysis strips or kit can also be found. Mike Cherry

Casa de Fruta Seminar Notes by Frank Condos

Quadrabag Installation for the GMC Motorhome

Jim Kanomata and Jim Bounds provided an introduction to the actual installation. The development of the improved 4 bag rear suspension began with an analysis of the shortcomings of the original 4 bag system developed by Ken Rose and C.O. Richards. The new design is significantly beefed up to preclude flexing. It uses a larger set of airbags that are readily available at RV and truck supply stores. Additionally the kit is designed to simplify installation. An additional design consideration included making the bag location adjustable to accommodate rear weight differences between 23 ft. through stretched coaches. The benefits of the Quadrabag as presented by Jim Bounds include the ability to travel short distances with only one good wheel, facilitating moving off of busy highways, even negating the need for carrying a spare. Of more benefit to most of us are the improved handling, reduced roll, and sports car like handling. After the sales pitch, attendees moved to the Condos coach that was prepared for the installation demonstration.

Each side consists of an inner and outer support bracket fabricated from 3/8 steel and two end plates that attach the twin air bags to the bogie arms. An air manifold and isolation valves are provided. The first step was the removal of the four side bolts that mount the bogie t support to the frame members. The bogie support is still attached by the 2 bolts through the underside. The inner bracket is attached to these four points using new bolts. The outer bracket is attached to the bogie pins using a special sleeved nut that locates the outer bracket around the pin and maintains the correct preload on the bogie pin hats. The hardest part of the installation is removing and installing the four bogie support bolts on the right side behind the exhaust pipe, especially with a 3 in. exhaust. A 3/8 drive ¾ flex socket with a short extension works best.

We experienced minor installation problems requiring a metal file on this, the second unit ever fabricated. These problems have been corrected on later units and installation should be straight forward.

How was the ride home? I have a nice straight driving coach, but on the way home it performed like a sports car. I experienced absolutely neutral steering on the curves and no steering wheel reaction to rough roads. I even dropped the right side off the pavement and returned with no steering fight.

Using an O2 Sensor and Vacuum Gauge

Frank Condos provided a way to gather information for checking the state of engine tuning using a vacuum gauge along with an oxygen sensor added to the exhaust stream. The vacuum gauge is useful for checking for vacuum leaks including a cracked intake manifold, worn engine, or misfiring. The oxygen sensor installed close to the exhaust manifold or header will determine if the engine is running lean or rich, or if correct fuel conditions exist for the various driving conditions. Careful observations for driving conditions such as hill climbing or full acceleration will help determine if the power piston in the carburetor is operating properly and if the secondaries are opening when expected.
More detailed information can be obtained from Frank Condos.

Servicing the Front Wheel Bearings

Chuck Aulgur provided a demonstration of servicing front wheel bearings by using his portable coach A-frame and steering knuckle assembly. Chuck demonstrated both the on vehicle bearing removal and replacement as covered by the GM maintenance manual and the alternative method of removing the steering knuckle and hub as an assembly and removing and replacing the bearings on the bench.

Chuck demonstrated the use of the various special tools that are needed to make the removal and assembly of the unit easy. Other important factors are the fit of the bearing on the hub which should be a slight interference fit and the fit of the bearings in the knuckle, which should be snug but not a press. The knuckle should be inspected to be sure the inner bore is not worn or damaged at the bearings settings.

Chuck also demonstrated a method of slotting the ends of the bearing retainer bolts and using a clever spoon shaped tool to hold the bolts in place while turning them into the housing with a screwdriver from the inside.

Finally, the inner seal that bears against the CV joint shaft location is critical since the CV joint registers against the inner bearing and the seal in turn must be located relative to the bearing and CV joint. On Chuck's demo unit this resulted in the seal being located 0.050" out of the knuckle. This dimension may vary on other knuckles because the knuckle surface is not a controlled surface.

Note: Technical seminars and other technical articles printed in this newsletter are provided for information only. What you do to your coach and how you do it is your responsibility.

Please send your comments and ideas for the Tech Center to:

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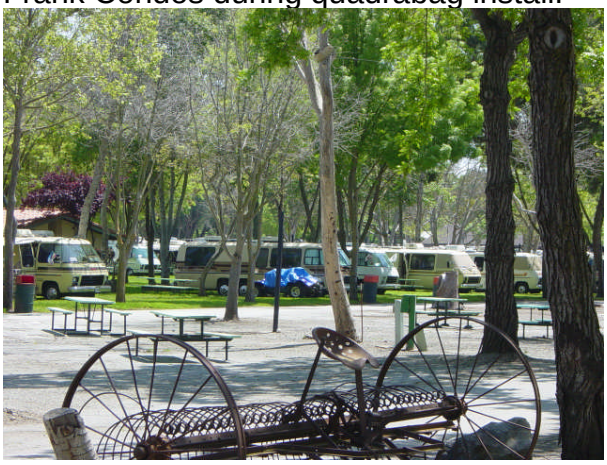
Frank Condos during quadrabag install.



Scenes at Casa de Fruta