

How To Prepare Your Motorcar For A Long Trip

by Keith Mackey, Webmaster

Most of us began the hobby by making one day runs in our local areas. These short runs gave us an opportunity to try out our motorcars without worrying much about the consequences of a breakdown. After all, we're close to home, and if we or someone else can't fix it on the spot, it's easy to get a tow to the setoff. We'll have lots of time until the next run to fix the car. Most operators aspire to make the longer, more exotic runs in Canada, Mexico, or remote portions of the USA. A ten-day, 2,000-mile run is expensive. So is travel to and from the run. On many of these runs, we are away from our tow vehicle for the entire event and must be self-contained in our motorcars. A breakdown on a long run that cannot be easily fixed can turn the trip from a fun packed adventure to a disaster. Many railroads and excursion coordinators will set off a car with problems that can't be repaired, possibly in a remote location that is not secure and difficult to reach with a tow vehicle.

The philosophy of waiting until something breaks before fixing it has never worked out well because it isn't a question of **if** your motorcar will break down, only **when** it will break down. The answer is "preventive maintenance" - determining what component is likely to fail and at what interval and then fixing it before it breaks. This is the key to reliability. As an excursion coordinator, I place some operators into one of two categories: Those that are part of the problem and those that are part of the solution. Most "problem" operators feel that since their motorcar has performed well in the past, it will continue to do so. They generally have little mechanical ability and/or do not carry sufficient spare parts. When their car breaks down, they are generally unable to troubleshoot or repair the problem. They immediately become dependant on the "solution operators". The "solution operators" are easy to recognize. They are the ones who have motorcars that are extremely reliable because they have been properly maintained and almost never break down. A true "solution operator" is willing to share his knowledge and sometimes even his spare parts to rescue an operator that has joined the "problem" list. We have a great bunch of folks in our hobby, many of whom are capable and willing to help with a problem, but no one goes on a long run with the desire to spend their sight-seeing time fixing your motorcar or towing you for long distances because you were unprepared for the trip.

A long trip requires the capability of dealing with whatever mechanical emergency occurs. We do this on several levels. We properly perform preventive maintenance to be sure that everything likely to fail has been replaced or repaired before beginning the trip. We carry sufficient spare parts to be able to replace the high failure rate components, or those that fail suddenly and without warning. We carry the proper tools to perform these repairs and we acquire the mechanical skills to be able to identify, diagnose and repair these problems. If we can't fix the problem ourselves, we carry a good mechanic as a passenger or travel with another operator who has agreed in advance to solve our problems. The less mechanical skill an operator has, the more important it becomes that his motorcar be properly prepared prior to setting on the rails.

I'm sure I've gotten your attention by now. It isn't my purpose to scare you away from making the longer trips, but only to warn you of the problems you will encounter if you're not properly prepared. Proper preparation really isn't as difficult as it sounds. It is not expensive compared to the cost of the trip and can be lots of fun. Probably 95% of motorcar mechanical problems either will not occur or can easily be fixed on a long trip if we properly prepare. Let's examine the most common problems and their solutions. Since most cars are Onan CCKB powered Fairmonts, we'll deal with them specifically, but the same problems can occur with others.

1. Carburetor Ice

Cause: Outside air temperature 75°F. or below with precipitation, fog or even high humidity. The air entering the carburetor passes through a venturi which accelerates the speed of the air lowering the pressure which results in a temperature drop of as much as 40°F. This temperature drop together with the high humidity causes ice to form in the venturi restricting the flow of air.

Symptom: The engine seems to loose power. The throttle must be opened further and further to maintain speed. Under severe conditions, the engine can stop. The ice may cause the spark plugs to foul. Almost always, the right plug fouls first. (Possibly due to the less efficient design of the exhaust piping on the right cylinder as opposed to the left.) After the car stops, you can quickly slap each exhaust pipe (be careful not to burn your fingers) If the right plug is fouled, there will be a noticeable difference in temperature between the two header pipes. If the right plug is fouled, I change both with new properly gapped plugs (CCKB plug gap is 0.025") and don't save the old ones. They are cheap enough and a new one will produce known results. Carb Ice is not the only thing that can foul a plug (improper fuel mixture, bad rings, low compression, ignition problems, etc.), but in my opinion, is the most often misdiagnosed cause of plug fouling.

Fix: A few MT14's, particularly Canadian cars had a full time carburetor heater. The rest do not. Fairmont supplied a piece of canvas that was to be placed over the engine air intake grill on the front of the car. The theory was that this caused the inlet air to pass over the cylinders and exhaust before reaching the carb and helped to prevent ice by raising the inlet air temperature. Over the years, the canvas for most cars has been lost. I carry a piece of cardboard that I have cut to fit. When it's cool and damp, I just fasten it over the inlet grill and have no ice problems. In my opinion, carb ice is the most common and misunderstood causes of break-downs and can easily be prevented with no expense or mechanical skill required. Just carry canvas or cardboard that can be used as an air deflector and use it during icing conditions.

2. Contaminated Fuel

Cause: The fuel supply to the carburetor has become contaminated from either the external fuel supply (very rare - filter fuel with a chamois if in doubt) or from the motorcar fuel system itself. The most common source of contamination is the fuel tank. The steel Fairmont tank is at least 30 years old, and has probably been stored for much of its life partially filled with old fuel. A partially filled tank causes condensation which rusts the steel and the old fuel turns to varnish which further messes the tank up.

Fix: The best solution is to replace the tank with a freshly manufactured stainless-steel tank, powder coated, painted red, available from motorcar parts after-market sources. These tanks are almost exact duplicates of the original and can be replaced in well under an hour. The second best solution would be to remove the tank, partially fill it with chain or clean pebbles and vigorously shake it until the inside again looks shiny. This is a temporary fix at best, as you still have a steel tank which will easily rust. If the tank has ever been coated on the inside with a "protective" solution, I would throw the tank away as the coating will in time flake off and cause real problems. Stainless is the way to go. If you do nothing else, a new tank is the single most important thing to keep contamination out of the fuel system. If you don't replace the tank, the tiny bits of rust and dirt will damage any other components downstream. Might as well upgrade the 4.5 gallon tank to a 6 gallon for a few bucks more if you have sufficient space.

While you're at it, replace (or install if you don't have one) the glass filter bowl that threads into the tank and connects to the fuel line. The car was designed to use this bowl as the only fuel filter in the system. Do not use in-line fuel filters as they are designed to have pressurized fuel flow not gravity flow. At 6,000 feet on a hot day, you can have a problem with an in-line filter. The in-line filters will not remove water, and contamination in them can be difficult to see. If the tank is clean, no extra filtering is needed. The fuel bowls can be ordered with the tank or are available from NAPA. Get a spare glass bowl, screen and gasket in case you break or lose these. I also carry a 90° fitting that threads into the tank and connects to the fuel line. In an emergency I can use this to eliminate the bowl completely if it is damaged. Make sure you have a functioning vented fuel cap. Locking vented caps are available. Order with the tank or buy from NAPA.

If you pass by a small airport, pick up a 1/8" npt fuel quick drain. Thread this into the second fitting on the bottom of the tank so you can drain any condensation on a daily basis. Replace the fuel line between the tank and the pump. Old rubber fuel lines deteriorate and can clog the pump or carb. Fuel hose is cheap and can be purchased at NAPA. Be sure the fuel line has a gradual uphill slope from the filter bowl to the pump with no dips or unnecessary curves. Plan on replacing the hose at five-year intervals. Be careful to keep the fuel line away from anything hot.

The next item in the fuel system is the engine driven pump. We just barely need a pump to provide fuel flow. If the tank were only a few inches higher and we never ran up hill, we could throw it away. Unfortunately, this is not the case. The Onan pump is very reliable. Overhaul kits are available from Onan and are inexpensive. The pump can be overhauled on the kitchen table, but can't be easily repaired during a run. The best solution may be to replace the original mechanical pump with an electric pump. You can remove the mechanical pump and blank off the mounting pad. Be careful as many electric pumps put out way too much pressure and need a pressure reducer. A few pounds of pressure is all that is required. More pressure can cause the carburetor not to function properly. These pumps are available at any auto parts store. Consider buying two (one as a spare) and configuring them with quick electrical disconnects and the same hose fittings so that they can be changed quickly. Install the pump in an easy to reach location like on top of the transmission cover. Trouble-shooting is easier with an electric pump if the output hose can be quickly disconnected to verify a steady stream of fuel. This eliminates the problem coming from everything upstream of the pump. The downside of an electric pump could be an alternator failure. If you shut off everything electrical except the ignition, the car will run a long time on the battery. It won't run as far if the battery is used to operate a fuel pump as well.

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Last in line is the carburetor. It is a Zenith # 013262. Next to the tank, this causes the most fuel problems. Most CCKB carbs are worn out. The available overhaul kit does not contain all the parts needed to properly complete the repair. New carbs from Onan are very expensive, but the identical carb is available at a much lower price from Les King (who also has stainless tanks). Replacing the carb will probably do more for the proper operation of the CCKB than anything else. If your car is running fine and you are planning a long trip, replace the carb and carry the old one as a spare. The new one will last many years and, together with the stainless tank, will eliminate many problems. Replace the carburetor air filter. Do this at the beginning of each season.

Okay, so if you've followed all the recommendations listed above, you've replaced the entire fuel system with new and improved components that should last for many years and have a spare carburetor, fuel pump, fuel bowl and fuel line in your parts kit. To keep the fuel system in new condition, do the following:

- At the last refueling on each run, add a fuel stabilizer (my favorite is called Sea Foam) to the fuel to prevent the formation of varnish and keep the fuel usable for several months.
- After completion of the run, shut off the valve on the fuel bowl and run the carburetor out of fuel. This will also help to prevent varnish formation.
- Keep contamination out of the system by refueling through a funnel with a paint filter or chamois placed inside. It is much better to catch dirt in this manner before it enters the fuel system. Be aware of any red plastic you may find in the paint filter. Old plastic fuel cans deteriorate and new ones can have trash from the molding process inside.
- At the end of the season, either fill the tank with fuel that has been stabilized or drain the tank. Be sure to run the fuel out of the carburetor first. If I've filled the tank, I drain it and replace with fresh fuel at the beginning of the new season. I add the drained, stabilized fuel to my truck gas tank a couple of gallons at time when the tank is more than half full.

3. Ignition Problems

Cause: It can be difficult to quickly determine if a malfunctioning engine has a fuel or ignition problem. One "trick" that is not completely reliable, but may give the answer is when an Onan CCKB begins to run rough or loose power, pull the choke out a little. If this helps, it is probably a fuel problem, if not, it is usually ignition. An ignition problem is caused by a lack of electricity or a failed or misadjusted component. I carry an ignition test lead that can be connected between the plug wire and the spark plug in a few seconds. It has a neon light which illuminates if high voltage is present. The engine will run with the tester installed, so a quick determination can be made as to the presence of a spark. These can be obtained at any small engine shop for less than \$10.

Fix: Let's do as we have done with the fuel system. We'll replace the entire system and assemble sufficient spares to correct common failures. We'll start by replacing the wiring between the battery and the ignition switch. We will need #10 wire, a good wire stripper and terminal crimper with the proper terminals for the wire size. To be sure we have a good connection, we can solder the wire to the crimp-on terminal to delay the effects of corrosion. We'll replace the wiring from the battery to the ignition switch and from the switch to the ignition coil and from the coil to the points box.

The ignition switch can cause hard to diagnose problems. They seldom fail completely, but usually only when moving when the heat and vibration makes them occasionally fail intermittently. Replace the switch with a 75 amp push-pull switch available from the usual suspects. The kind found in most auto stores are cheap, low capacity and failure prone. Carry several small jumper wires with alligator clips on both ends (available at Radio Shack) to bypass any suspected bad wiring or switches.

Next in line is the coil. Most CCKB's came with a can shaped 12 volt coil. Some have a square 6 volt coil that is matched with a voltage dropping resistor. I prefer the "can" style as there is only one component to fail instead of a resistor or a coil. If yours is working fine, great! Remove it, carry it as a spare and install one of the new Onan coils which are smaller and coated in black plastic. While you're at it, order new plug wires from Onan. They are the proper lengths for the engine and use the proper wire. Carry the old wires in the spare kit.

I replace my plugs once a year and carry six spare plugs. There are many opinions on which is the best spark plug. I have had good luck with Autolight 216's in CCKB's.

Let's open the points box and look inside with the engine running. If the engine is running well, note how the spark across the points looks. Remember this for times when the engine isn't running well. If the spark is

different then you probably have an ignition problem. The inside of the points box should be very clean. If you find oil, you have a problem with the seal on the plunger that operates the points. The gasket on the cover should be in good shape to keep dust and moisture out. If the points and condenser have not been replaced recently, go ahead and change them both. Change them at the beginning of each season and learn how to replace and gap the points (CCKB point gap .020) yourself when not under the pressure of a breakdown. Don't forget to put a drop of oil on pivot point. It can be tedious and it is easy to drop the small screws, but with a little practice, it's easy. Carry a spare set of points and a spare condenser. Always replace them as a pair. Obtain and carry a copy of the engine service (p/n 927-0754) and parts (p/n 927-0404) manuals. Take the time to read them and understand the procedures and specifications for setting the point and plug gaps and ignition timing.

If you've done all of the above, you have a new ignition system and are carrying spare plugs, points, condenser, coil, plug wires and jumper wires. You have a complete spare system.

4. High Oil Consumption/Low Compression

Cause: Your engine needs an overhaul. The "core" engine itself is unlikely to fail completely but as it wears out, the rate of oil consumption will increase and the compression will decrease. This is true for any engine not just those used in motorcars. An engine failure is not a likely cause of a breakdown, but the compression should be taken and recorded annually to measure any decrease. The time to discover poor compression is before you buy the car.

Fix: The CCKB compression at sea level should be 100 - 120 psi. It is easy to check using a compression gauge available at any auto parts store. Be sure the engine is warm before checking compression. If your compression is down, you may want to consider a "top" overhaul which consists of overhauling the cylinders and rods only. Usually an engine will be able to be "topped" at least once and maybe twice before a complete overhaul is required. When you open the engine crankcase by removing the oil pan to begin the top overhaul, you can look at the rod bearings and measure crankshaft wear. If the crankshaft is worn out of limits, it may be time to consider another CCKB or changing to a Briggs or Honda. Since the CCKB has no oil filter, it is advisable to change the oil every 300 to 400 miles of operation. You can't change the oil too often. While Onan does not give specs for oil consumption, you probably should not be adding more than a quart between oil changes. If your engine has blue exhaust smoke, you probably have high oil consumption. Changing the oil and air filter frequently will do more for long engine life than anything else.

If you've never done so, it would be a good idea to check the intake and exhaust valve clearance. Wouldn't hurt to recheck it annually. CCKB Valve Tappet Clearance is: Exhaust 0.015" to 0.017" - Intake 0.006" to 0.008". Be sure and clean the steel mesh breather filter once a year.

5. Clutch Rod Failure

Symptom: You push in your MT19 clutch pedal to change gears and nothing happens. Next to a rear axle failure, the MT19 clutch rod is probably the "most likely to fail" part on the car.

Fix: If your clutch rod has not failed yet, it probably will. Carry a spare. They are available from Les King. Other than the clutch rod problem, the transmission system is very reliable and not field repairable. Be sure it is serviced properly with 140 weight oil. Keep the oil level up and watch for leaks.

6. Chain Failure

Symptom: Your moving along well when suddenly the engine speeds up and the car slows down. Takes a little while, but pretty soon you realize what has happened. Everyone behind you stops and finally finds your chain in the ballast. If you have spare links, maybe you can fix it.

Fix: Carry a spare chain of the proper length for your car. This is particularly important if you have a Canadian car with dual #40 chain. You won't find this in the hardware store. Carry master links and half links for your chain type. Learn how to install and adjust your chain. It's a dirty job at best. Check chain tension frequently and adjust as needed. Make sure the nylon whip blocks are properly installed. Oil the chain daily on the inside of its run - not on the outside where it is easy to reach. Consider using a much heavier motorcycle O-ring chain. It is much stronger than the standard chain and can be lubricated with the "no sling" O-ring spray-on oil to help keep the engine tunnel clean. Because it is an O-ring chain, it can be lubricated on the outside of its run as it passes over the rear sprocket.

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7. MT19 Rear Axle Failure:

Symptom: You're enjoying the scenery when you notice the car is riding differently. It seems less stable. The car behind calls on the radio to advise that your rear axle seems to be sagging. You stop and find the rear axle has broken at the keyway. You are in the middle of nowhere and must be set off on a small dirt road miles from your tow car because your motorcar can't be safely towed with a broken axle. You get to finish the trip in the bed of the RR's hy-rail amongst the spare fuel cans, spikes and tie plates where you have plenty of time to plan a way to retrieve your motorcar.

Fix: Don't even think of taking an MT19 on a long trip (or even a short one where you can't easily recover your car from any point) without being sure that it has either the second idler sprocket modification or the keyless axle and sprocket modifications. Better yet, both of them. They have been described in "The Setoff" in a number of articles. I am unaware of any MT19 having a rear axle failure after these modifications. If you don't have the mods, you will eventually break the axle because of the laws of physics working on a poor design. "Nuff said - get the mod done.

8. Worn out wheels:

Symptom: Beautiful day, high speed run on tangent (straight as an arrow) welded rail, concrete ties. Problem is your car is suddenly "hunting" (slapping back and forth between the rails). You can't understand what is wrong. This has never happened before even on much worse track. Your wife says the motion is making her sick so you slow down to try and get a better ride. Now there's a big gap ahead of you and the cars behind are upset because your only doing 20 m.p.h. and have 150 miles to go. The EC is upset and wants the gap closed. What to do?

Cause: Your wheels are worn out and/or out of gauge.

Fix: Your wheels can be well within NARCOA limits and still be worn enough to cause hunting particularly on high speed track that may be slightly over gauge because of the RR's engineering policies. Obtain wheel profile gauges from Hank Brown's ad in "The Setoff". Check the profile of your wheels for wear. The wheel profile also has the gauge line scribed on it. By using the two wheel profiles and a tape measure, you can measure your car's actual gauge. Alternatively, measure through the triangular holes in each wheel from the outside face of one wheel to the face of the opposite wheel. It should be 62 3/4" if it is at track gauge. Fairmont recommends a tolerance of 1/8" to 1/4" under track gauge. If your gauge is correct and wheel profiles are good, you should not have a hunting problem. If you are under gauge, you can shim the wheels using 1/8" or 1/16" spacers from Les King. Do not shim one side only - keep the shims equal on each side. If you are over gauge, you'll have to remove the wheels and hubs to ream the insulating cones. You'll need some expert help doing this. A new set of wheels (and brake shoes) is good for about 10,000 miles. If you've got a lot of wear, replace wheels before a long trip. They are available from Harsco (Fairmont) for \$108 each plus shipping. If your only buying two, put them on the solid rear axle so you have wheels of exactly equal diameter. The split front axle can tolerate slightly different wheel diameters caused by wear.

9. Other potential problems and solutions :

A. Lubrication: It's important to grease your car on a regular basis. To facilitate lubrication, many owners have routed flexible rubber grease gun hoses from the idler sprocket, wheel and center rear axle bearings to the outside frame of the car. In this way, they can be easily greased with a small grease gun without going under the car. The idler sprocket should be greased daily since it turns faster than any of the other bearings. The wheel and center axle bearing should be purged of grease and water anytime they are submerged or have a high pressure stream of water directed at them. There are grease fittings on the MT19 clutch linkage and the brake rod assembly. Be sure and frequently grease the fitting on the collar of the front split axle. Don't forget the daily chain lubrication.

B. Loose hardware: On your annual inspection check and if possible, properly torque every nut and bolt on the car.

C. Electrical failure: I replace my battery every three years with a new one from Walmart or NAPA because they are everywhere and can quickly replace a bad battery under warranty. Select one that requires no service and mounts in a manner that prevents the fuel tank or other structure from contacting the terminals in the event of a collision. I installed a heavy duty battery switch in the ground wire that is easily accessible from the

rear of the car. Many circuits are not fused. Electrical smoke coming from a motorcar is not good and means at least a fried component or even a fire. With the master switch, the entire electrical system can be down powered while the trouble is located. Turn it off when leaving the car overnight to keep things left on from discharging the battery. I have installed the "one wire" alternator because it is easy to troubleshoot as it does not require a separate voltage regulator circuit. With the engine running, check the voltage at the battery. It should be 13 to 14 volts if the alternator is working. If less, the alternator has probably failed. A set of motorcycle jumper cables are light and easy to carry. In the event of an alternator failure, the battery can be charged from the car ahead or behind while stopped. If you'll be doing a lot of night or tunnel running, consider a spare headlight bulb. Carry a spare alternator belt.

D. Communications: On many long trips, a two-way radio is required that is capable of operating on at least the NARCOA frequency. Mount a good antenna outside the car and use an intercom with headsets to cut down on the fatiguing noise levels and aid in communications.

E. Closed cab cars: It is a matter of personal preference, but for a long trip, I prefer a closed cab car to protect against bad weather and be lockable at night. Petty thieves find it easier to steal from the open cars. Some rugged outdoor types don't even like curtains on their open cars, so it's up to you, but it deserved being called to your attention if you plan a long trip.

F. Modifications: Many owners have "improved" their cars by adding luggage racks, protection bars, rewired electrical systems or other things that make the car hard to work on and can cause real problems during a breakdown. Try and keep everything at least as accessible as originally designed. If something major has been highly modified, you'd better understand how it works because no one else will know.

If you want to make a modification that really helps, replace the two 1/4" bolts that secure the "hood" to the front of your car with plastic knobs on a 1/4 - 20 thread available at your local hardware store. These can be removed by hand without using a wrench. This will make engine access much faster.

G. Unusual cars: An "Unusual car" would be a homemade car, or something like a Beaver Car, Portec, Tamper, etc. Unless you are an excellent mechanic with knowledge, sufficient spares, tools and enough experience with your car to know that it is capable of performing under conditions to be encountered, it is best to stick with an MT14 or 19 type of car on a long trip, especially if you're new to the hobby, because you will probably be completely on your own with anything that is not familiar to the "solution" operators on the trip.

H. Everything else: You can never be completely immune from a breakdown. Although we've covered the common failures in this article, unforeseen things can happen. If you follow the suggestions included herein, you've probably insulated yourself from more than 90% of the common potential failures and have certainly taken due diligence to insure successful trips.

The suggestions made are based on my personal experiences on long trips noting the causes of breakdowns. These experiences have formed the basis for my opinions. Since there are no shortage of opinions in our hobby, I'm sure others may have differing ideas. Just be sure anyone offering advice has the knowledge and experience to provide accurate information.



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