

Starting an Engine That Hasn't Been Started in Years

by SK Staff

There's a right way and there's a wrong way. The right way can save an engine. The wrong way can ruin it!

Call it a 'Barn Find' or 'Prolonged Storage' or just an old car or truck that hasn't been started in a number of years. What is the best way to start the engine without doing any further damage to it?

Wrong way: prime the carburetor, put in a new battery and crank it over. You are almost certain to make any existing problems considerably worse, or you may create some new and extensive problems.

Right way: go through each and every system in the engine, and be sure that everything is working properly. Let's go through the entire procedure step-by-step. Please don't take shortcuts.

The very first thing that you have to do is determine if the engine is free or if it has seized. Start by removing all of the spark plugs. Examine each plug as you remove it. If the tips are a light tan, that's a good sign. It means that the engine was tight and running well when shut down. If they (or any one or more of them) are black, determine if the black is a chalky black (indicating a too rich fuel mixture) or an oily black (indicating a possible problem with the rings or valves). Write down the condition of each spark plug so that you can refer to it later. Don't rely on memory.



Left: a normal spark plug in good condition. Tip is a dry, light tan color.
Center: Too rich a fuel mixture. Tip is a dry, chalky black color.
Right: An oil leak in valves or rings. Tip is an oily wet black.

Next, put a combustible rust dissolver into each cylinder. Sitting for years, it is possible that the rings have rusted to the cylinder walls. About two tablespoons of WD-40 or kerosene in each cylinder is all that is necessary. Let it sit for several hours or overnight before doing anything further. It will seep into any rust and help to break it up as well as provide a little lubrication for each piston.



After having given the rust dissolver adequate time to work, gently try turning the engine over by hand. On an older car, use the crank; on a newer engine, fit a socket to the crankbolt and use a breaker bar. Be sure to turn the engine over in the right direction. With the plugs still out, turn the crank or breaker bar about 90 degrees. Let the lubricant in the cylinders sit for another half hour or so, and then repeat the cranking. The first time that you crank it over by hand you do not want to turn the engine over more than one full revolution. All you



are doing is checking to see if the engine is free or seized. After turning the engine over one full revolution, put about a tablespoon or two (no more) of Marvel Mystery oil into each cylinder. Again, with the plugs still out, try turning the engine by hand. If it turns freely (with the plugs out, there should be very little resistance), you are on your way to getting the engine started.

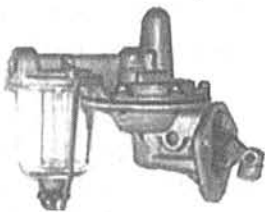
If the engine doesn't crank by hand, or stops after a partial revolution, it is an indication that there are more serious internal problems. You would be well advised to tear down the engine to determine what the problem is. If you force the engine, you could damage the valves, push rods, or break the timing belt or timing gears.

Assuming that the engine cranks by hand, we can proceed by preparing other systems for starting.

Let's start with the fuel system. Drain the old gas. If it is gummy or smells sour, you would be well advised to remove the gas tank and have it flushed professionally to remove the old gas and gum. Often a radiator shop can provide this flushing service.



While the tank is out being flushed rebuild the fuel pump. It is almost a certainty that the diaphragm is hard, cracked, brittle or rotted. Rebuild the carburetor. Carburetor rebuilding kits are available for virtually any carb from Daytona Parts Co (see ad page 22). The kits



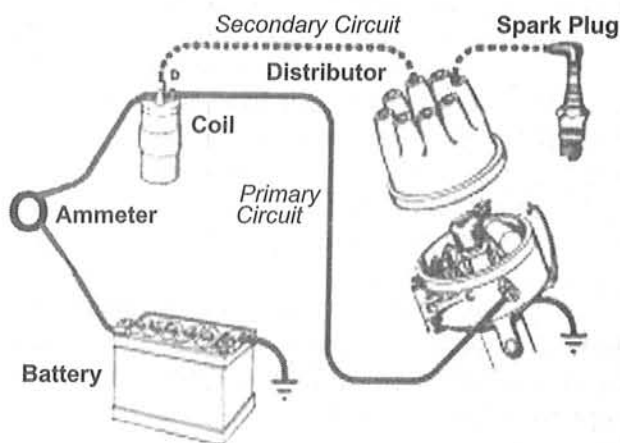
contain all of the gaskets and parts necessary to do a thorough job. Clean the carburetor, being sure that all of the jets and internal passages are open and clear. Wire brush the inside of the carb to re-



move any rust. Soak the disassembled parts in a commercial carburetor cleaner bath (available at any large auto parts store. CAUTION: Wear rubber gloves and eye protection; the cleaner is caustic). Follow the instruction on the can about use and neutralizing. After soaking, clean the parts, dry them, and blow compressed air through all passages to remove any residual cleaner or neutralizer.

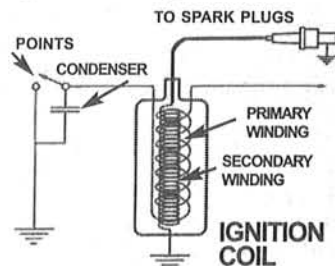
When the fuel tank is reinstalled, use fresh gasoline. Check all connections to be sure that there are no leaks.

Next, the electrical system. Naturally the battery is going to have to be replaced. Check the ignition system. It consists of two separate circuits: the primary (low voltage) and the secondary (high voltage). The primary circuit consists of the wiring that goes to the points. The wires are smaller than in the secondary system. They carry only the battery voltage. The current comes from the battery to the coil. The coil separates the circuits into the two segments. There will be two small connectors on the top of the coil, on either side of the center tower. One is for the current in, the other for low voltage current out. It goes to the distributor, then to the points and condenser. Check each wire for broken or worn insulation, bad or corroded connectors, and for continuity using a multimeter. Be safe, and change the points and the condenser. Chances are good that they are bad, leaking or corroded.



The secondary (high voltage) circuit also gets its power from the battery. The battery current passes through a series of coils which boost the voltage into the thousands of volts. A thick wire fits into the center tower of the coil taking the high voltage from the coil to the distributor cap. The distributor is actually a rotary switch, allowing the current to pass through to the correct spark plug wire.

The rotor under the distributor cap rotates and transmits the current from the center tower of the distributor cap to each spark plug wire, and then to



the spark plug. Again, check each wire from the coil to the distributor and then each spark plug wire for cracked insulation, bad, corroded or broken connectors.

Check the distributor cap. Be sure that there are no cracks in the cap and that each terminal is clean and corrosion-free. Check the rotor for corrosion.



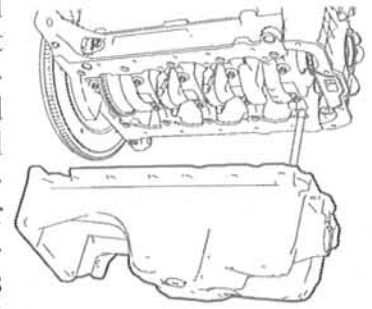
With the distributor cap off, rotate the engine by hand while watching the rotor. If the rotor moves in a smooth rotary motion, it is an indication that the gear at the bottom of the distributor is meshing properly with the camshaft. If there are any signs of corrosion inside the distributor, it is recommended that the distributor be rebuilt. The centrifugal advance weights may be stuck or the springs rusted or broken. If the spark plugs were a nice light tan color, they can be cleaned, gaped and reused. If they are covered in a black film, whether wet or dry, replace the plugs with new ones.

Check the distributor and starter motor to be certain that they are not 'frozen' by turning them by hand. You might have to remove the starter motor to test it; you will have to remove the belt to check the generator. Failure to check that the starter motor is free could result in a broken or chipped flywheel tooth.

Both the generator and starter motor have oil cups for lubrication. Use a grade 30 motor oil and fill the oil cups, and then rotate the motors by hand to spread a little oil on the bushings. It makes sense, while the starter motor is out, to rebuild it. It will save the labor of removing it again at a later date. Make sure the brushes are good and that the bushings are not sloppy. A professional starter/generator shop can test the motor for open circuits or broken field or armature windings. The shop will also check for missing segments of the commutator.

Next is the lubrication system. Remove the oil pan. It is probably loaded with sludge that has to be removed. Examine it carefully for any signs that water has gotten into it. A blown head gasket,

for example, will allow water to get into the combustion chamber and flow into the oil pan. If there is evidence of water (either as condensation or rust) it is recommended that



the crankshaft bearings be examined for rust or corrosion, or that the engine be torn down and rebuilt. That same moisture could easily have gotten into the bearings and rusted them. The rust could easily ruin a crankshaft. Have a friend slowly crank the engine over by hand while you watch the bearings and crankshaft. Examine the bearings looking for signs of rust or corrosion. If any is evident, this is the time to remove the bearing caps and examine the bearing faces and crank shaft.

Check the transmission - whether automatic or manual - for fluid. Once the engine starts, the gears in the tranny will be operating. Transmission leaks are common, and dry gears can ruin an expensive transmission.

After cleaning the oil pan and re-installing it with new gaskets, change the oil filter, and refill the crankcase with fresh clean oil. You can often use an old distributor shaft (from a model the same as your vehicle) operated with a power drill (with the spark plugs removed) to engage the oil pump and get a prime. It will begin to distribute fresh oil throughout the engine.

If evidence of moisture/water was found in the cylinders, bearings or in the cylinder bores, you may want to remove the head(s) and check for a blown head gasket.

Next is the cooling system. Don't assume that all is well. Remove and have the radiator professionally flushed. Remove the hoses; using a garden hose, back flush through the



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