MAINTENANCE OF LOGGING EQUIPMENT

by

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MAINTENANCE OF LOGGING EQUIPMENT

Proper maintenance and operating procedures may add 50% to the effective life of equipment, and the equipment will operate more efficiently and with smaller costs for replacement of parts.

Cooling System

The cooling system of an engine must operate at the proper temperature for efficient operation and long engine life. The normal operating temperature is from 170 to 180 degrees Fahrenheit.

Overheating

When an engine overheats there is always a cause. Some of the causes of engine overheating are: 1. Obstructions in front of the radiator such as bugs, brush, or a damaged radiator core from careless cleaning. 2. Insufficient liquid in the cooling system. 3. Internal trouble with engine such as improper timing, burnt valves, or a damaged water distribution tube. 4. Loose pump impeller, or broken pump shaft. 5. Frozen radiator. 6. Loose or broken fan belt.
Thermostat

The thermostat is in the cooling system to keep the temperature normal. The thermostat is a bimetal valve which restricts the flow of water to the radiator when the engine is cool. When the engine is at working temperature the thermostat allows free passage of water from the engine block to the radiator. It is just as important to prevent overcooling as it is to prevent overheating. Operating an engine cooler than the regular operating temperature causes excessive wear and formation of sludges. For minimum wear and maximum life, operate the engine at the proper temperature.

Rust and Scale Prevention

Soft or treated water should be used in the radiator to prevent rust or scale from forming. Scale from minerals in hard water forms on the water jacket of the engine and the cooling tubes of the radiator core. The mineral deposits are highly heat resistant and do not allow the proper circulation of water in the radiator or the proper heat exchange between the cylinder walls and the cooling system. Heavy rust deposits in the water jacket hold in heat and create local hot spots, especially around the exhaust valve seats. Under these conditions, the metal may get so hot that the valves will stick or burn, or the cylinder block and head may be damaged by heat cracking.
The cooling system should be drained and flushed occasionally. Refill with soft or treated water to prevent mineral deposits. To eliminate rust, use a reliable rust inhibitor. The rust inhibitor will also retard the formation of scale.¹

Radiator cores should be externally cleaned with compressed air and a wire brush. Radiator cores can be easily damaged by using a wire instead of compressed air to remove obstructions. The use of a good winterfront, which will cover the lower portion of the radiator, is recommended in order to maintain an engine temperature between 170 and 180 degrees Fahrenheit. During freezing weather, if anti-freeze solutions are not used, the entire cooling system must be drained when the equipment is not in use. Be sure to open both drain cocks.

Fan Belt

Keep fan belt at proper tension to prevent slippage of the water pump and generator. The proper tension is obtained when the belt can be depressed approximately one half inch halfway between the fan pulley and the generator.

¹William H. Crouse, Automotive Mechanica, II, 341-347
Fuel and Fuel System Care

It is important to keep fuel clean. The very best of fuels can become unsatisfactory through careless handling or poor storage. It is practically impossible to keep drums, cans, and funnels clean.

Here are a few good storage and fuel handling practices:

1. Before refilling storage tanks, drain off sediment and water.
2. Contaminants can be settled out of fuel by letting it stand for 24 hours.
3. Fill tank from oil truck hose and use a hose to draw off fuel when filling equipment.
4. Have large enough openings in storage tanks that they can be occasionally cleaned.

Fuel Tanks

The fuel tanks on the individual pieces of equipment need periodic attention. The fuel tanks should be checked and filled at the end of each day. The reason for filling the tanks at the end of each day is to eliminate the sweating and condensation of moisture that collects on the inside of the fuel tank. The moisture drops into the fuel and collects on the bottom of the tank, rusting the tank, and going throughout the fuel system.
Fuel Filters

Water in a diesel fuel system causes the filter elements to become soggy and swollen, resulting in a restricted flow of fuel.

Installing ceramic gas filters on gasoline equipment is an effective way to prevent water from getting into the float chambers of carburetors and corroding the carburetor.

Fuel Pump

The fuel pump should be periodically cleaned. Check the fuel pump bowl for dirt, moisture, and rust accumulation. The sediment bowl, filter unit, or screen prevents the entry of these troublesome elements into the carburetor and thus prevents eventual engine failure.

Always clean the parts worked on so no dirt enters the fuel system. Use cleaning solvent or kerosene. Do not use gasoline.

Air Intake and Exhaust Systems

Air passes through the engine by entering the air filter and passing along the intake manifold to the cylinders, and then out the exhaust manifold to the exhaust pipe.

Air Cleaner

A properly functioning air cleaner filters abrasive
materials from the air thus insuring long life for vital parts. There are three types of air cleaners in general use: 1. Gravity cleaners to remove larger dust particals. 2. Oil dipped wire gauze air cleaners. 3. Oil bath air cleaners.

The conditions under which the engine is operated will determine how often the air cleaner must be cleaned. Gravity cleaners should be emptied when the jar gets three-quarters full. Wire gauze air cleaners should be cleaned by washing with solvent as soon as the pores show signs of filling. The oil, in the oil bath air cleaners, should be changed when it shows evidence of being murky, cloudy, or thicker than usual.

Accumulated dirt should be removed from the inside of the air intake pipe. The dirt restricts the opening causing a reduction in the horsepower output.

Whenever possible, place generators, air compressors, and other stationary engines up wind when operating in a dusty atmosphere. Use extension pipes to get the air intake away from the dust. Keep all connections tight to prevent the entry of abrasive dust.

Exhaust Pipes

Where engines require long exhaust pipes, use large diameter pipes and flexible connections to prevent vibration breakage.
Avoid sharp bends which create back pressure and reduces the horsepower and may cause burnt valves.

Never connect the gasoline starting engine exhaust system to the diesel exhaust system. There is danger of the diesel exhaust gases condensing into the starting motor exhaust lines and causing serious damage to starting engine, if the two exhaust systems are hooked together.

Valve Clearance

Valve clearance should be checked and adjusted after every 500 engine hours of operation. The engine can not operate satisfactorily or economically unless the clearances are correct. The proper clearances are given in the operators manual for the equipment.

Clean valve covers before removing to keep from dropping dirt and grease into the engine.

When the valve clearance is too great the valve closes with excessive impact causing the valve seats to become "beat in" and valve faces to become worn. Equipment in this condition requires reseating and replacement of parts.

When the clearance is too small, the valves do not seat properly resulting in loss of compression and burned or guttered valve seat surfaces.
Electrical System

There are times when minor troubles are encountered on the logging operation, and these are due generally to loose connections or defective terminals in the wiring system.

If the engine runs but misses at times, check for:
1. Loose or corroded battery terminals. High and low tension cables grounding or loosely connected. 2. Contact points in distributor not set right. 3. If misfiring is not confined to one cylinder, check coil, wiring and distributor. If engine misses regularly on one cylinder, the trouble is usually due to the spark plug in that cylinder being dirty, broken or improperly adjusted.

If the starting motor turns the engine but no spark or a weak spark is obtained at the spark plug, look for:
1. High and low tension cables may be grounded or loosely connected. 2. Distributor contact points either do not open or close. 3. Ignition switch does not make contact. 4. A weak battery will give a weak spark. 4. Examine all cable connections between the battery and the starting motor. Connections must be clean and tight.

If the starting motor will not turn over or turns slowly when the starting switch is closed, check for:
1. Weak or completely discharged battery. 2. Loose or dirty battery connections. 3. Starting switch contact points burned or cable loose at terminal points.
If the ammeter does not show that the generator is charging, check for: 1. Commutator and brushes dirty or greasy in generator. In an emergency use No. 00 sandpaper. Never use emery cloth as it will score the commutator and cause arcing. 2. Cable connections at the ammeter may be grounded or loosely connected. Also check the cable connections at the starting switch and the battery. 3. Check the regulator to determine whether it is well grounded.

Spark Plugs

The proper method to clean fouled spark plugs is to use a reliable spark plug cleaner. When changing the gap, always bend the outer electrode; never bend the center electrode for it will chip or loosen the ceramic part. Use a round-wire feeler gauge for accuracy.

Generator and Regulators

Lightly oil the generator each time the piece of equipment is greased.

If the regulator or generator wires are disconnected, or when changing the battery, do the following in order to avoid reversing the polarity of the generator, thus burning the cut-out relay contacts. To polarize the generator, momentarily touch a lead from the generator to the battery terminals on the regulator. The surge of the battery current to the generator will polarize the generator.
Starting Motor

Lightly oil the starting motor each time the piece of equipment is greased.

Do not run the starting motor more than approximately 30 seconds at any time because it can be seriously damaged if held too long in contact. Remove the cover band on the starting motor and inspect the brushes and commutator at least once a year.

Storage Battery

Examine the battery at least twice a month during warm weather and once a month in cold weather to see that the solution is kept to the proper level. It is advisable to keep the battery fully charged in the winter to prevent freezing.

Battery cable terminals must be clean and tight. Use hot water and common soda for removing terminal corrosion and for cleaning the top of the battery. Brighten the terminals, apply a coat of vaseline, and reassemble. Be sure the terminals are tight and that the battery is clamped securely in the battery box.

Engine Tune-up

In general, the operating efficiency of an engine decreases so gradually that it escapes detection until good engine performance has been restored by correct tune-up.
A good engine tune-up should reveal and correct such faults as:

1. Battery low on charge.
2. Spark plug insulator cracked.
3. Primary ignition cables loose.
4. Fan belt loose.
5. Coil or condenser defective.
6. Windshield wiper line broken.
7. Air filter dirty, choke partly closed.
8. Fuel pump erratic in operation.
9. Distributor timing incorrect, cap cracked, rotor burned or cracked.
10. Carburetor float level too high.
11. Breaker points incorrectly gapped.

Axles, Wheels and Bearings

To guard against excessive tire wear, have the front wheel alignment inspected occasionally for toe-in, camber and axle caster.

Toe-in

Front wheel toe-in is necessary to assure that the front wheels will run parallel to each other when the vehicle is in motion and under a load.

Camber

The purpose of front wheel camber is to distribute the load more evenly between inner and outer wheel bearings and to offset the wear and deflection of the front axle parts.

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Caster

The backward tilt at the top of the king pin provides steering stability to help in holding the wheels in a straight forward position, and to help in bringing the wheels out of a turn or curve. The caster helps to control front wheel shimmy by counteracting vibration and the gyroscopic motion of the front wheels.

Front Wheel Bearings

Bearings should never be allowed to have either a loose or a tight adjustment. Repack bearings every 10,000 miles.

Steering Gear and Springs

The steering gear and steering mechanism should always be kept in good condition and properly adjusted for safety and ease of operation. Adjustments are provided to compensate for wear at the worm bearings and at the lever arm. Neglect of the steering gear has contributed to many accidents. Hard steering or excessive wheel play usually indicates the need for attention. Do not fail to keep the steering gear housing filled with gear oil.

Spring breakage can be materially reduced by proper loading and keeping the spring U-bolts and clips tight. Examine the spring U-bolts and rebound clips and periodically tighten the nuts. Lubricate every 500 to 1000 miles.
BIBIOGRAPHY


