VICTORIAN RAILWAYS

INSTRUCTIONS

FOR

Operating Standard Motor Trollies

FITTED WITH

Two Cycle Water Cooled Engines

J. M. ASHWORTH,
Chief Engineer of Way and Works.

Chief Engineer of Way and Works Office,
Melbourne, 1st May, 1929.

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WATER COOLING

Fill the hopper with water up to water line and keep it filled to this level.

MOTOR SPIRIT MIXTURE

Mix two (2) pints of medium cylinder oil to four (4) gallons of motor spirit, thoroughly mix together before filling the tank on the trolly. The piston, connecting rod and inside parts are lubricated in this manner. Use only the oil supplied.

CARBURETOR

The standard type of " Ford " Carburetor is used. The proper adjustment to start is to open one-and-a-half turns from the closed position. When the engine is warmed up the needle valve can be adjusted to a leaner mixture. Do not have the mixture too rich.

OPERATING ENGINE

To start, open carburetor lever as far as possible. Retard spark lever two notches to the right of centre, pull the choker wire, turn engine over two or three times

to fill the crank case with gas, then close the switch, and crank engine sharply. Repeat this operation until engine starts, then advance spark lever opposite the running direction of the fly wheel, and adjust carburetor until engine runs freely.

To reverse the engine, cut the electric circuit ; when the engine has slowed down to the last revolution, release the circuit and the engine will reverse itself.

OPERATING TROLLY

When the engine is running freely, open the throttle to give the engine more power. Release the belt tightening lever, permitting the engine to slide into the belt. To stop, release the belt, apply brake, and close the throttle. Do not race the engine.

When starting the Trolly by the push off method, the carburetor should be flooded and the stop cock shut off. The stop cock can then be opened when the car is under way.

TROLLY LUBRICATION

Fill grease cups and bearings and oil all moving parts at least once a week.

DO NOT RACE THE ENGINE

Which means do not run at high speed without a load. When the engine is running idle, it should be throttled down to low speed. The engine will heat less if the car on which it is installed is driven so the head end of the cylinder points in the direction in which the car is moving.

TO STOP THE ENGINE

Open the switch on the seat which disconnects the circuit to the batteries. To stop the car with the engine still running, release the belt tightening lever.

INSPECTION

After the car has been operated for one week, make a thorough inspection and tighten all bolts and nuts on car frame. At least once each week inspect the car thoroughly to see that all nuts and bolts are tight. Also examine brake lever, brake shaft and brake shoe links. All bolts are fitted with lock nuts and lock washers and must be kept tight. Keep caps on ends of lift bars tight so that they do not become lost. Keep the car clean and free from oil and motor spirits so as to reduce fire hazard. Safety first always.

PULLEY ON AXLE

That it may give the best service the pulley on car axle should be kept tight by the bolts provided, and keep it properly aligned with the pulley on the engine.

BRAKE SHOES

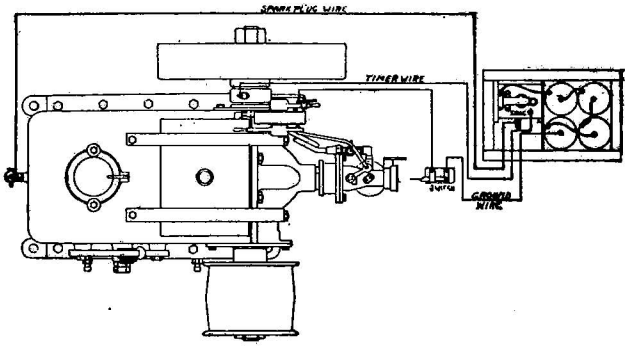
After hard service the brake shoes will become worn, and it will be necessary to reface them with old belting brake lining or replace with new shoes.

REMOVING CAR SEATS

When it is necessary to remove the car seat for adjusting or cleaning the engine, it can be easily done by removing two bolts on each end of car which hold the

four end posts of the seat. Disconnect electrical wiring and choker wire to carburetor and seat can be easily removed.

WIRING DIAGRAM AND INSTRUCTIONS.



VIBRATOR ADJUSTMENT ON COIL

Frequent adjustment of the vibrator is unnecessary and undesirable. See that it is properly adjusted and then let it alone.

To adjust the vibrator, first see that the contact points are smooth and bright, and that they come squarely together. Turn the engine fly wheel until contact is made in the timing device, so that the vibrator will buzz. Now turn the adjusting nut to the left until the points are separated, and the coil stops buzzing. Then slowly turn the adjusting nut to the right until the coil just starts. Give the nut about $\frac{1}{8}$ of a turn more and

the coil will be in proper adjustment. If the batteries are weak, a little more tension may be necessary.

Should trouble develop in the ignition system, investigate the following :—

Are the batteries exhausted ?

Is the spark plug dirty or the porcelain cracked ? Are all the electrical connections tight ?

Is there a break in any of the wires inside the insulation ? (This can easily be felt by bending the wire). Is there motor spirit in the tank ?

Test the dry cells occasionally with a pocket ammeter or battery tester. Each cell should test at least 10 amperes.

Throw in the battery switch and crank the engine slowly. Note if the spark coil buzzes properly.

POINTERS

When starting on any long run be sure that you have plenty of motor spirit and lubricating oil with you to complete the run, and mix your lubricating oil with the motor spirit before starting.

In crossing switches or crossings, coming into yards, etc., you can slow the car down by cutting out the engine. This will drift across. Then open the switch and engine again starts.

At no time allow anyone to run or tamper with your engine who does not know how to properly handle it. The engine can be ruined in an hour's time by someone who does not know how to properly operate it.

Remember, lubricating oil is cheaper than machinery.

If the motor is hard to start, it may be due to flooding. By flooding we mean that too much motor spirit has been allowed to enter the crank case and makes the mixture so rich it will not explode within the cylinder. A remedy for this is to close off the needle valve at the top of the carburetor, shutting off the motor spirit, open the priming cup at the end of the cylinder and turn the flywheel over several times until an explosion takes place. Then close the petcock, open the motor spirit valve and proceed in the usual manner to start.

DON'TS

Don't try to start on a cold morning without turning on plenty of motor spirit.

Don't forget, if you have a good spark, good compression, and get motor spirit into your engine, it cannot fail to go.

Don't imagine there is "something wrong on the inside" if your engine fails to run; nine chances out of ten it is some little thing right before your eyes that is causing your trouble.

Don't forget that ninety per cent. of all engine troubles are carburetor and ignition troubles, weak batteries, loose wires, dirty spark plugs, dirt or water in the motor spirit, etc.

Don't remove any part of the engine without first knowing how to replace it.

HARD OR IMPOSSIBLE TO START may result from :

1. Loose or broken wire connections.
2. Batteries wired wrong.
3. Batteries run down.
4. Open switch.
5. Dirty or broken spark plug.
6. Poor coil adjustment.
7. Short circuit in timer.
8. Motor spirit shut off.
9. Poor mixture.
10. Water in motor spirit.
11. Motor spirit pipe clogged with dirt.
12. Engine flooded.
13. Broken or leaky check valve.
14. Cylinder dry from lack of oil.
15. Poor compression.

MISSING—IRREGULAR FIRING—may be caused by :

1. Poor carburetor adjustment.
2. Water in motor spirit.
3. Partly clogged motor spirit pipe.
4. Weak batteries.
5. Loose or broken wire connections.
6. Poor connection in timer.
7. Poor adjustment of spark coil.
8. Sooted or broken spark plug.
9. Broken insulation or wiring.
10. Spark plug short circuited by water.
11. Pitted or poorly adjusted vibrator contact points.

REGULAR BUT WEAK EXPLOSIONS may be due to :

1. Poor compression.
2. Lack of Lubrication.
3. Mixture too rich.

SUDDEN STOPPING OF THE ENGINE may be the result of :

1. Broken wire or loose terminal.
2. Accidental disengaging of switch.
3. Sticking of coil vibrator
4. Broken spark plug or fouled one.
5. Dirt under circuit breaker.
6. No motor spirit.
7. Throwing in belt too fast.
8. Contact post sticking.

GRADUALLY SLOWING DOWN may be caused by :

1. Mixture too rich.
2. Air vent in tank closed.
3. Dirt in carburetor.
4. Car needs oiling.
5. Motor spirit valve partly closed.
6. Dirty spark plug.
7. Pulley slipping.
8. Weak Commutator contact spring.
9. Lost motion in commutator control rods.
10. Weak Batteries.
11. Overheated cylinder or shaft bearing.
12. Check valve leaking.
13. Check valve spring broken.
14. Too tight belt.
15. Belt out of line.

EXPLOSION IN CRANK CASE OR CARBURETOR may be due to :

1. Weak mixture.
2. Throttling too low.
3. Open throttle and retarded spark.

KNOCKING OR POUNDING IN ENGINE may be caused by :

1. Loose fly wheel key.
2. Loose connecting rod bearing.
3. Worn main bearings.
4. Broken piston ring.
5. Pre-ignition due to carbon in cylinder, lack of oil or water.
6. Spark too far advanced.
7. Mixture too rich.
8. Overloaded motor.
9. Spark plug defective.

HARD IN TURNING OVER may be due to :

1. Accumulation of gummy oil and dirt in cylinder.
2. Lack of oil.
3. Rusty or broken piston ring.
4. Tight bearings.
5. Overheated cylinder.

TOOLS, ETC.

The following tools, etc., are standard equipment, and this list should always be maintained :—

1 No. Screw Driver.
2 No. Clyburn Spanners.
1 No. Box Spanner.
1 No. Filling Funnel.
1 No. Pint Measure.
1 No. Pair of Plyers.
1 No. Spark Plug.
1 No. Set of Belt Fastenings.
1 No. Oil Can.

Defective tools, parts, etc., must accompany orders for replacements.