

Instructions
For the
Care and Management



of
Milwaukee Automobiles

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When possible, we strongly advise purchasers to either visit our factory or our nearest agent, to receive instructions.

If that cannot be done, the following pointers will assist one to clear understanding of the machine, and any engineer in the neighborhood can be consulted if new problems present themselves.

SETTING UP.

On arrival of your vehicle at freight station, and its removal to your premises or some adjacent shop, take off the seat, which is tied on to the crated carriage, then the canvas and side holders; and the blocks and bolts that hold the carriage on the skids. The wheels should now be detached and cleaned, and the vehicle is ready for assembling.

Raise it off the skids by a man at each corner, and rest it on four horses or blocks, high enough so that the front wheels can be put on.

Front Wheels: These have the ball bearings and steering axle in place, and are lubricated with solid oil, which obviates the necessity of further lubrication for several months.

Place the steering axles in their positions as shown by the marks on each piece, and insert the through bolts which hold them in place, afterwards securely locking these bolts with their nuts underneath, and riveting over the ends of the bolts.

These axles have right and left hand threads respectively, and it must be remembered that in the forward motion of the carriage the friction of the balls should always *unscrew* the cone.

Make up the steering linkage by swinging each rod into its attachment with the axle, insert bolts, screw on nuts carefully, and rivet over the ends.

This is a vital part of the carriage, and must be closely watched, for if part of this linkage proves defective in operation, the ensuing damage would be serious. We do not use split pins on these bolts as they rattle unpleasantly, and may drop off.

Place steering bar in its head in the steering stem, and secure with a bolt and nut furnished for that purpose.

Rear Wheels: These are keyed on to the rear axle, and (as they propel the vehicle) must be held very securely. We use a tight fitting key that cannot drop out. Place this in the groove in the axle, and force the hubs on, up to the shoulder, by a few easy blows of a hammer against a wood buffer. Put on the nut on the end of this axle, and rivet over the axle end.

On both rear and front hubs, screw on the dust caps, and prick punch the thread so that they cannot drop off.

Remove the blocks and pump up the tires, and you are now ready for the next step in the operation.



PRELIMINARY.

- (1) Fill gasoline tank, within 1 inch of top, and be sure there is no fire near. Gasoline supply valve (tagged) must always be shut when carriage is not under steam, and its gland must be kept tight. Gasoline of 74 per cent. Sp. Cr. is preferred, although other can be burned. Use filter cloth in funnel, and be careful that gasoline is clear and will not clog burner. Filling plug must afterwards be screwed down tight, to prevent air leakage.
- (2) PUMP UP AIR TO 50 LBS. For this purpose we advise the use of a large stationary pump, which is usually attached to post or floor in room, and which has a long hose. The pump on the carriage is only for use on the road, and can be used without the reserve tank, directly unto the gasoline. In operation the air should not drop more than one pound per mile unless there are leaks in the system, which can be detected by soap water, and then soldered. Be sure the glands and unions are tight. Air pressure should never be less than 20 lbs.
- (3) FILL RESERVOIR TANK, with water. Rain water is preferable, although any clear water will answer. It is well to occasionally use different water.
- (4) FILL BOILER through the blow-off valve with hose, or pump up by hand and open safety valve to release air, as steam forms.

- (5) SHUT THROTTLE VALVE, and stop valve, and place cut-off lever in mid position.
- (6) FILL CYLINDER LUBRICATOR; the oil for this purpose must be of standard quality, suitable for high temperatures, and also which will not freeze.
- (7) OIL ENGINE, and compensating gear. This oil must be of good quality for machine purposes. The ball bearings need not be oiled.
- (8) GENERAL INSPECTION. Ball bearings should be adjusted (if necessary) to take up wear. Holding nuts must be watched to ensure their tight lock. All glands must be snug and tight; while the chain should occasionally be adjusted to take up ordinary wear. The tires need not be pumped up more than once a month, but do not use them when soft, or they will be ruined. Be certain that torch is about half full of gasoline and that oil cans are full.

RAISING STEAM.

- (1) LIGHT UP TORCH. To do this give the pump half a dozen strokes, then fill the spoon either from a separate tank, or its own receiver, and light with a match. Do not pump too much air into the torch or it may leak. Be certain that no free gasoline is near. This gas in fluid is only dangerous when a quantity of it has evaporated into gas in a closed space. It is then explosive. If any time some is spilled or escapes it will soon evaporate and disappear. In the city gas can be used with a Bunsen burner.

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- (2) SHUT GASOLINE SUPPLY VALVE (which is tagged) and both pilot and main atomizer valves. Be sure boiler is about half full, and that there is no free gasoline from leakage in burner or about valves. If there is, stop leakage and let it evaporate.
- (3) HEAT ATOMIZER CASTING, for two minutes with torch. When in operation, the gasoline is vaporized into gas, as it passes through the hot system, and should never be present in burner.
- (4) HEAT VAPORIZING PIPE, in burner for one minute, leaving torch in burner.
- (5) OPEN GASOLINE SUPPLY VALVE, a half turn, thus admitting gasoline into the hot system, where it instantly flashes into a gas, and is then ready for burner.
- (6) OPEN PILOT VALVE, thus lighting the pilot light, and then withdraw torch, turning it out. Flame must not blow nor smoke, and must never burn in the mixer tube. In that case turn it off, and relight.
- (7) OPEN MAIN VALVE slowly, thereby starting the main burner. The flame should be a purple blue color, tipped with yellow. It should not lift off burner, nor smoke. It must never burn in mixer tube, as this will soon melt the copper tubes, and destroy the burner. In that case turn it out and relight. Let the flame burn slowly until steam is about 25 lbs. pressure, then turn it on full, but shut off the pilot light. In very strong winds the pilot light can remain lighted while in operation.

As soon as steam blows through safety valve shut it, and let steam raise. Always try safety valve by hand, to insure its proper working. When tightening water glass glands always shut valves communicating with boiler, so that if glass breaks the damage will not be serious.

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ROAD OPERATION.

- (1) OPEN CYLINDER OILER, slightly, and inspect burner to see that fire is burning properly.
- (2) AS THE PRESSURE REACHES 175 LBS. the regulator shuts off the supply and automatically closes fire down, but opens it again on the dropping of the pressure when in use, thus maintaining a constant working pressure of approximately 150 lbs. In case the regulator does not control the fire, it can be turned on its holder by loosening at its head. Unscrewing it opens valve, increasing the fire and conversely. For small adjustments turn the nut in the body of the regulator thus changing tension of spring inside, which presses against diaphragm.
- (3) IF THE VEHICLE IS TO STAND, more than 5 minutes after steam is at 175 lbs., turn on the pilot light, and close the main burner. In a strong wind always face the carriage against it, and if the fire blows out close both pilot and main burner valves, and wait until all gas is out of burner before relighting the pilot light. A pressure of 50 lbs. in boiler supplies enough heat to vaporize the gasoline and avoid the use of the torch. Never allow safety valve to blow from excess pressure. A stop valve is placed under the seat to be closed when leaving vehicle a long time.
- (4) ALWAYS START THE CARRIAGE SLOWLY, until the cylinders are heated, unless this is done there is danger of cracking them.
Use the "full gear" until fairly in motion, then "hook up" the reverse lever to the early cut off. Do not open throttle valve to the full limit or you will empty the boiler of steam and choke up the engine.

- (5) WATER FEED. The next important point after care in the use of gasoline is the adequate supply of water to the boiler. When vehicle is level there should be two-thirds of a glass of water. The supply is constant from the pump on the engine, and if in excess of what is required, its flow to the boiler is regulated by the by-pass valve under the seat. When this is closed, all water is forced into boiler, and when open, none is so forced, but is all passed back to the tank. The supply may be insufficient from (a) empty water tank, (b) stoppage in suction pipe, (c) poor packing of the pump gland or (d) dirt in the check valves, preventing their seating. The glands must be made tight and the checks cleaned until they seat securely, and water must flow securely to the pump.

The water in the glass must always be free to change its level with that in the boiler. In case the glass breaks shut the valves inside the body and insert a new one. If the glass is dirty close these valves remove plug, and blow steam through to clean it.

- (6) ON THE ROAD WE ADVISE SLOW TRAVELING, until operator is finally convinced he can handle carriage safely. Always "overtake" to the left and ring, but "pass" to the right. When making a stop travel with other teams, never *against* them. Do not ring bell continually, but have carriage under absolute control at all times. Do not make turns at high speed.
- (7) ALWAYS TRY BRAKE, before descending hills, adjusting it, if necessary, and also be certain you have sufficient steam and water before ascending a long or steep grade.

- (8) In very cold weather open valve near steam gauge occasionally and drain off cold water, but do not blow steam through as it may ruin the gauge.
- (9) AFTER A RUN shut off gasoline supply valve, and cylinder lubricator and blow off the steam by opening the safety valve. When pressure has dropped to 25 lbs. shut safety valve, and open blow-off valve, thus draining all impure water and scale material from the boiler. The carriage is then ready to stand until again wanted.
- (10) IN CASE THE BOILER BEGINS TO "SCALE" we advise the addition of boiler solvent to the water in the tank, and a rewashing of the boiler after blowing off. It is best to obtain this solvent from engineers in the neighborhood who use the same water in their boilers and know by experience what is required to precipitate the scale.

Don't make yourself obnoxious in your community by fast driving or ignoring the rights of the public, and finally, don't blame the vehicle or its makers for faults that should perhaps be attributed to the "personal" equation of the operator, and which a little experience or care would have avoided.

The vehicle is a machine and must be treated as such. When so handled it will give complete satisfaction.

Water in tank.

Water in boiler.

Gasoline valves.

Gasoline in tank. stream
tap.

Air tank valve.

Five small cups with gas
and turn off valve when
full.

Turn out before relighting
open main valve.

Oil in cylinder.

Oil engine.

Open up specimens in boiler
open valves in cylinder oil.

Turn off steam valve.

" " " main valve 3

Close " " " " " " " " " "

Blow off once a week

Clean section box

Wash foot oil on air pump

**Handwritten Notes on Back Cover
of
Milwaukee Automobile Company
Instruction Manual.**

Water in tank.

Water in boiler.

Gasoline valves.

Gasoline in tank. Screw on Ta??

Air tank valve.

**Fill small cups with gasoline and turn off
valve when full.**

Burn out before relighting.

Open main valve.

Oil in cylinders.

Oil engine.

**in burner open valves in
cylinder oiler.**

Shut off steam valve.

Shut off main five valves 3.

Shut off valve cylinder oiler.

Close air tank valve.

Close air tank bypass valve.

Blow off once a week.

Clean ction box.

Neats [sic] foot oil on air pumps.