VICTORIAN RAILWAYS

Instructions

FOR THE

Operation, Care and Maintenance

OF

Inspection Motor - Type "B"
Inspection Motor - Type "[illegible]"
Motorised Tricycle Type "M.T."
Gang Motor - Type "K.S."
Gang Motor - - Type "K"

August - - [illegible]

L. A. REYNOLDS,
Chief Civil Engineer

[illegible]

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Inspection Motor - Type "B"
Inspection Motor - Type "V"
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Gang Motor - Type "K.S."
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FOREWORD

The following instructions are supplementary to the instructions relating to the use of Track Machines, contained in the Book of Rules and Regulations, General Appendix and Branch Books of Instructions.

All precautions are to be taken by the operators of these track machines and under no circumstances must the maximum permitted speeds and loads of the machines be exceeded.

Always reduce speed on curves and over level crossings, and slow down to a crawling speed when passing over points and crossings.

REMEMBER - - SAFETY FIRST ALWAYS

GENERAL

REPLACEMENT OF TRACK MACHINES AND ENGINES.

When a track machine or engine is defective and thought to be in need of workshop attention, the employe in charge of the machine should advise the District Fitter, who will examine the machine and, if necessary, submit a report to the District Engineer stating the type and number of the machine, the nature of the defect and that a replacement is required as the repairs are beyond his capacity.

The District Engineer will forward the request for replacement to the Workshops Manager, Spotswood, and instruct the Supervising Officer to forward the machine or engine to the Workshops. Unless the machine is completely unserviceable or unsafe, it can be retained until the replacement is received, when it must be promptly returned.

Track machines and engines returned to the Workshops must be addressed to the Workshops Manager, Spotswood and must indicate the location from which they have been sent. Returned engines must also show the number of the machine from which they were removed.

All detonators, fuel and wooden lifting handles must be removed before the machine is despatched.

No tools, wooden lifting handles or spare parts are supplied with replacement machines and existing tools, etc., must be held by the employe in charge of the machine unless the machine is being returned as surplus.

SPARE PARTS.

Spare parts are available on requisition from the Local Storekeeper or from the Storekeeper, Spotswood Workshops Storehouse.

All parts which have been replaced on any machine or engine must be promptly returned to the local Storekeeper by the employe effecting the replacement.

INSTRUCTIONS

FOR THE

OPERATION, CARE, AND MAINTENANCE

OF

INSPECTION MOTOR TYPE "B"

GENERAL.

This machine is suitable for carrying a maximum of two men and in addition 1 cwt. in tray.
The engine is an air cooled four cycle type and must only be operated on **straight petrol.**

PREPARATIONS FOR STARTING.

Inspect the entire machine carefully and see that everything is in its correct place, and that all nuts and screws are tight.

Check the brake to see that it is operating correctly.

Always take particular care that the leading wheel is in proper adjustment, i.e., with a 3/16" "Toe In" towards the rail. This "Toe In" can be thrown out of correct adjustment by mishandling or by derailment and should be checked regularly. This is done by measuring the horizontal distance from the bottom timber of the motor frame to the edge of the machined tyre tread of the wheel on each side of the axle. The difference between these dimensions should be 3/16".

The leading wheel should point towards the running edge of the rail when viewed from above.

The outrigger wheels and driving wheel should be perfectly in line, or parallel with track.

Make sure that the tension in the belt is not too slack or too tight, i.e., it should have approximately 1/2" deflection from the straight when the centre of the slack side is pressed down lightly.

Fill the fuel tank with straight petrol to the bottom of the brass neck of strainer.
Fill the oil tank with cylinder lubricating oil (S.A.E. 50), Code VR-G, and give the engine two pump charges of oil.

STARTING AND RUNNING.

Open the petrol cock on the petrol pipe line.

Flood the carburettor by using the finger press button on the float bowl chamber.

Close the petrol cock on the petrol pipe line.

Shift the magneto control lever to approximately the middle position.

Set the carburettor controls so that the mixture lever is about half open and the air lever about a quarter open.

Open the exhaust valve by means of the valve lifter mounted on the top timber of motor frame.

With the above procedure completed the motor can be pushed along the track at running speed, and when sufficient momentum has been obtained, the engine should commence to fire when the exhaust valve is closed by dropping the Valve lifter.

After the motor has gathered speed, alter the carburettor control levers so that the engine is receiving as much air as possible with the least amount of petrol necessary to make the engine run smoothly.

Open the petrol cock on the petrol pipe line.

Advance the spark to a position which is suitable to the engine speed by using the magneto lever.

Adjust, during running, the carburettor and magneto controls to suit the varying load conditions to which the engine is subjected.

To stop the machine close the carburettor control levers and apply the brake. When stopped close the petrol cock.

ENGINE LUBRICATION.

The engine must only be lubricated with S.A.E. 50 cylinder oil, Code VR-G.

The pump on the oil tank is connected to the engine crankcase by means of a small pipe and should be operated once every 6 to 8 miles during running.

The correct method of operating this pump is as follows :—

Lift the pump plunger slowly to the top of its stroke to allow the oil to flow into the pump barrel, then depress the plunger and the oil will be injected into the engine crankcase.

Oil should be added to the engine more often during running when the conditions under which it is being used are heavy.

A new engine needs to be liberally lubricated.

Insufficient lubrication causes excessive wear of moving parts, resulting in poor performance of engine and eventual breakdown. It also causes the engine to overheat and, unless oil is introduced into the crankcase quickly under such conditions, engine seizure will occur causing serious damage.

Oil should be occasionally applied to the magneto chain to reduce wear.

LUBRICATION OF AXLE AND WHEEL BEARINGS.

Axle and wheel bearings on these machines are packed with grease when they leave the workshops and no further lubrication is required under 6 months. At the end of this period the bearings should be recharged with grease (Code VR–4) by removing the bearing caps. Care must be exercised when performing this service that dirt or grit does not enter the bearing.

CARE OF MACHINE.

When the machine is being placed on or removed from the track, care is to be taken that it is not dropped so that its wooden frame strikes the rails. Such a fall can break or crack the frame.

Never tow other vehicles with the machine.

Keep the machine thoroughly clean and free from oil and dirt.

When the machine is not in use it must be kept in the shed provided, but when this is not possible it should

be covered with the standard canvas cover. Do not place this cover over a hot engine because of the fire risk.

Never overfill the fuel tank as this can be a potential fire risk.

When the machine is left alongside the line, the driving wheel must be locked to the frame with the chain and padlock provided.

Always turn off the petrol cock on the petrol pipe line when the engine is stopped.

Stow the track tools correctly in the carrying tray of the machine to avoid accidents.

GENERAL ENGINE MAINTENANCE.

Engine.

The engine is of J.A.P. design and is manufactured at Spotswood Workshops. It is a 3½ horse-power, air cooled four cycle type and should only be operated on **straight petrol.**

Repairs of a major nature should not be undertaken by the operator and no part should be dismantled unless it is known how to replace it.

Valve timing.

When an engine is forwarded from the Workshops the valve opening is correctly timed and no attempt should be made by the operator to alter this setting.

Valve Tappets.

Wear will take place on the valve tappets and valve stems and adjustment may be necessary after a period of running. This adjustment should be carried out when the engine is warmed up after running. Loosen the back nut of the tappet caps and adjust the clearance between the bottom of the valve stems and tappet caps to 8 thousandths of an inch on the exhaust and 6 thousandths of an inch on the inlet valves.

Once the adjustment has been made the back nut must be retightened and the adjustment rechecked.

Magneto Timing.

A knowledge of the method to time the magneto is necessary to replace a magneto chain or magneto and the following procedure should be adopted.

Remove the magneto driving chain.

Remove the priming cock from the cylinder head and insert a length of stiff wire (about 9″ long) so that one end rests on top of piston.

Turn the crankshaft until the piston reaches the top of its compression stroke, i.e., with the piston at the top dead centre and the inlet and exhaust valves closed.

Move the magneto sliding cam to the fully retarded position, i.e., to its maximum travel in the opposite direction to the engine rotation.

Turn the magneto sprocket in the opposite direction to engine rotation until the breaker contact points just commence to open.

With the piston, valves and magneto contact points in the above positions place the chain on the sprockets. The magneto is then correctly timed.

Carburettor.

The supply of air and petrol can be independently controlled by means of the respective control levers.

The finger press on the top of the bowl is provided to flood the carburettor and quickly ascertain that petrol is available at that point.

Should the hole in the jet become choked with foreign matter, the jet can be easily removed and cleaned out by unscrewing the top of the carburettor. Care should be exercised so that the hole is not enlarged or damaged during the cleaning as poor engine performance will result.

HELPFUL HINTS FOR CORRECT RUNNING.

LOCATING FAULTS IN IGNITION.

Should any irregularity occur in the ignition, or firing of the engine disconnect the high tension cable

from the spark plug and hold the end about 1/16" away from some clean part of the engine cylinder. Now rotate the engine crankshaft and a bright spark should be seen to jump across the gap at each firing stroke.

If no spark is noticeable the trouble may be indicated at the make and break end of magneto. Remove the cover on the contact points of the magneto and examine the bell crank lever and assure yourself that it is working properly, also see that the contact points are flat and clean.

Do not file the contact points but these may be lightly scraped in order to remove any burnt metal.

Check the high tension cable at the magneto end and see that it is screwed in tightly.

If no obvious defect can be detected do not dismantle the magneto but arrange to have it replaced.

Assuming that a spark is obtained at the high tension cable the spark plug can be tested as follows :—

Remove the spark plug and check the gap between the electrodes which should be approximately 25 thousandths of an inch.

Never put any pressure on the centre electrode when altering the gap as this could crack the porcelain and destroy the spark plug. The earth electrode only should be altered.

Connect the high tension cable to the spark plug and then earth it by laying it on its side on some clean portion of the engine cylinder.

Turn the engine crankshaft and a spark should be noticed to jump across the gap between the electrodes.

Excessive carbon deposits on the electrodes can be a cause of spark plug failure and should only be removed by scraping lightly.

Always use a spark plug box spanner to remove and replace a spark plug and never overtighten when replacing it.

Be sure that the copper washer is always in place.

Excessive carbon is formed by running the engine with too rich a mixture or by too much oil being pumped into the engine crankcase. Dense black smoke is emitted from the exhaust in the case of the former and blue smoke in the case of the latter condition.

FAILURES IN RUNNING.

If an engine runs smoothly and then misfires intermittently a shortage of petrol could be the cause, possibly through a dirty carburettor or choked petrol pipe.

A dirty spark plug or dirty or loose high tension cable will cause an engine to misfire.

Never flood the carburettor when the engine is warm as difficulty may be experienced in starting. It is advisable to turn off the petrol a short distance before stopping at ones destination, so that the supply in the carburettor when restarting will be fresh.

If an engine lacks compression it could be caused by any of the following :—

(a) The valves being stuck in the open position.
(b) By a broken valve spring.
(c) Worn or defective piston rings.
(d) Leaking valves.
(e) The spark plug not being tightened.

Correction of these could be carried out as follow :—

(a) Remove valves and clean stems and guides.
(b) Replace with new spring.
(c) Remove cylinder and free piston rings of carbon or replace broken and worn rings.
(d) Regrind the valves.
(e) Tighten spark plug.

TOOLS AND SPARES.

When a new machine is sent out from the Workshops a complete kit of tools is supplied with it.

A list of these is given below, and the officer or employe in charge of the machine is held responsible for their care, and for seeing that they are maintained according to the list.

Tools.

Large Clyburn shifting spanner, 10″
Small " " " 6″
Magneto Spanner

Tappet adjustment spanner
Screw driver, 6″
Valve cap box spanner
Spark plug box spanner
Belt punch
Pliers, 6″

Spares.

Spark plug, 18 m.m.
Belt clip
Valve with cotter
Ambulance box
Padlock and chain

INSTRUCTIONS

FOR THE

OPERATION, CARE, AND MAINTENANCE

OF

INSPECTION MOTOR TYPE "V"

AND

MOTORISED TRICYCLE TYPE "M.T."

GENERAL.

The Inspection Motor, Type " V," is suitable for carrying a maximum of two men and in addition 1 cwt. in tray.

The Motorised Tricycle, Type " M.T.," is suitable for carrying one man and in addition 75 lbs. in tray.

The engines of both these machines are of the air cooled two stroke type fitted with a three speed gear box and clutch.

The only difference between the engines used in the two types of machines is their model and size, and the following instructions regarding the care and maintenance of the engine apply to both machines.

These engines must be operated on **pre-mixed petrol only.**

PREPARATION FOR STARTING.

Inspect the entire machine and see that everything is in its correct place and that all nuts and screws are tight. Check the brake and see that it is operating correctly.

The toe in of the leading wheel on both types of machines is 3/16″ and the instructions described under Inspection Motor, Type " B " for the checking of this dimension apply in both cases.

After placing a motorised tricycle on the track see that the leading and driving wheel flanges are over against the rail head before starting.

Make sure the tension in the chain drive is neither too slack nor too tight, i.e., it should have approximately ½″ deflection from the straight when the centre of the slack side is pressed down lightly.

Fill the fuel tank with **pre-mixed petrol** to the bottom of the brass neck of strainer.

Check oil level in gear box and chain case.

STARTING AND RUNNING.

Open the petrol cock on the petrol pipe line.

Open the carburettor air control lever if fitted about ¼ of travel and throttle lever nearly fully open.

Flood the carburettor by using the finger press button on the float bowl chamber.

Close the petrol cock on the petrol pipe line.

See that the gear lever is in "Neutral."

Stand at the side of the machine, depress the kick starter pedal once or twice and then give a quick kick downwards.

Once the engine starts, regulate the engine speed by means of the carburettor controls, and adjust these during running to suit the engine load conditions.

Open the petrol cock on the petrol pipe line.

Depress the clutch with the control lever and shift the gear lever to low gear and let in the clutch.

After momentum has been attained continue the procedure until the engine is in high gear.

Travel as much as possible in high gear, but do not allow the engine to labour up grades, but change to a lower gear and ease back the throttle control. To stop the machine depress the clutch and move the gear lever to neutral. Close the carburettor control levers and apply the brake. When stopped close the petrol cock.

ENGINE LUBRICATION.

This type of engine is lubricated by the oil in the pre-mixed petrol. The proportion of the oil to petrol in the mixture is 1 in 20, the oil being S.A.E. 40.

As pre-mixed petrol is supplied direct from the Oil Store, Newport ; the operator should not mix his own fuel unless circumstances make this absolutely necessary.

In such cases care should be taken to see that the oil is thoroughly dissolved in the petrol before being used in the engine.

The correct oil for the gear box and chain case is S.A.E. 140, Code VR-M. The oil level in these should be examined every 1,000 miles as described under gearbox and clutch and " topped up " if necessary.

After each 5,000 miles the oils should be drained out and replaced with fresh oil, care being taken to prevent any foreign matter getting in with the oil.

LUBRICATION OF AXLE AND WHEEL BEARINGS.

As described under Inspection Motor, Type " B." Grease—Code VR–4.

CARE OF MACHINE.

As described under Inspection Motor, Type " B." Do not race an engine when in neutral but throttle back to a reasonable idling speed.

GENERAL ENGINE MAINTENANCE.

Engine.

The engine is a " Villiers " air cooled two stroke and must only be operated on pre-mixed petrol.

The size of the engine used in the Inspection Motor, Type " V " is 197 c.c. and that in the Motorised Tricycle 125 c.c. or 145 c.c.

Repairs of a major nature should not be undertaken by the operator and no part should be dismantled unless it is known how to replace it.

Flywheel Magneto.

The magneto is built into the flywheel as its name implies and this simplifies the design of the engine.

The adjustment and cleaning of contact points can be carried out without removing the flywheel.

The removal of a flywheel by an operator should only be undertaken when it is evident that this is necessary to carry out a known minor adjustment.

The method to remove a flywheel is as follows :—

Remove the flywheel cover and turn the flywheel nut in an anti-clockwise direction. After about two turns

it will begin to tighten because the nut flange will be pulling at the back of the flywheel hub. At this stage a piece of wood should be placed against the face of the nut and hit sharply with a hammer. This will loosen the flywheel on the taper shaft. The nut can then be unscrewed until the flywheel is completely removed. When the flywheel is off, a piece of steel, such as a spanner should be placed across the pole shoes, to prevent the weakening of the magnetic field.

The various components of the armature plate are then readily accessible.

Armature Plate.

The armature plate is rigidly fixed to the engine crankcase by means of four screws, the heads of which are inside the magneto. By removing these screws the armature plate can be removed.

Magneto Timing.

Once the flywheel has been removed from the crankshaft, or has shifted on the shaft due to the loosening of the flywheel nut, re-timing of the magneto is necessary when replacing or retightening and the method to be followed is described below.

Remove the cylinder head by undoing the four bolts. Turn the crank shaft until the piston is at top dead centre, i.e., any further movement of the crank-shaft in the direction of rotation will cause the piston to commence the downward stroke.

Place the flywheel on the crank shaft so that the line or arrow marked on its circumference is in line with the corresponding mark on the crankcase, care being taken that neither the crank shaft nor piston has moved. The flywheel nut should then be tightened to lock the flywheel in place. If this is carried out accurately the magneto timing will automatically be correct, because the two marks are so arranged to make the opening of the contact points coincide with the suitable position of the piston.

To check the timing, turn the flywheel around until the contact points are just starting to open. When this

position is reached the piston should be approximately 5/32″ from top dead centre. If this is correct replace the cylinder head.

Carburettor.

As described under Inspection Motor " Type B."

Gear Box.

The gear box does not require much attention other than checking the oil level.

To do this remove the oil level dipstick, situated alongside the oil filler plug on top of the gear box. The full level is indicated by a groove about $\frac{3}{8}$″ from the end of the dipstick. If the oil level is found to be below this mark, top up with new oil, S.A.E. 140, Code VR–M.

The gear lever positions are as follows :—

1st —	Low Gear	right back
	Neutral	1st notch forward
2nd —	Middle Gear	2nd " "
3rd —	High Gear	3rd " "

The gear positions are indicated on the brass plate attached to the top of the timber frame adjacent to the gear lever.

Clutch.

The drive from the engine to the clutch is by an endless chain running in an oil bath chain case. The oil level for this is the filler hole on the chain case cover and this level must be periodically checked and oil added if necessary. S.A.E. 140, Code VR–M.

There should be no attention necessary to the clutch other than chain case lubrication and correct adjustment of the push rod.

When the clutch is engaged there must be clearance between the end of the push rod and the cable lever fitted on gear box, and a special adjuster having a knurled and slotted head is provided for hand adjustment. There should be approximately 1/16″ of free movement of gear box cable lever before commencing to depress the clutch springs.

HELPFUL HINTS FOR CORRECT RUNNING.

See under " Locating faults in ignition—Inspection Motor, Type ' B.' "

Loss of power is often caused by a choking up of the cylinder ports and exhaust with heavy deposits of carbon. The latter can readily be cleaned by the operator, but it is desirable for a fitter to clean the cylinder ports.

Wash the air cleaner periodically with pre-mixed petrol.

Failures in Running.

If an engine runs smoothly and then misfires intermittently a shortage of petrol could be the cause, possibly through a dirty carburettor or choked petrol pipe. A dirty spark plug, a dirty or loose high tension cable will cause an engine to misfire.

Never flood the carburettor when the engine is warmed as difficulty may be experienced in starting.

It is advisable to turn off the petrol a short distance before stopping at ones destination, so that the supply in the carburettor when restarting shall be fresh.

TOOLS AND SPARES.

When a new machine is sent out from the Workshops a complete kit of tools is supplied with it. A list of these is given below, and the officer-in-charge of the machine is held responsible for their care, and for seeing that they are maintained according to the list.

Tools.

Large Clyburn Shifting Spanner, 10″
Small " " " 6″
Spark Plug Box Spanner
Magneto Spanner
Screw Driver, 6″
Pliers, 6″

Spares.

Spark Plug (14 or 18 m.m.)
Chain Connecting Link
Padlock and Chain
Ambulance Box

INSTRUCTIONS

FOR THE

OPERATION, CARE, AND MAINTENANCE

OF

GANG MOTOR TYPE "K.S." GANG MOTOR TYPE "K"

GENERAL.

The " K.S." gang motor is suitable for carrying a maximum of four men or seven hundredweight and the " K " type eight men or half a ton.

The engines are of the horizontal two stroke water hopper cooled type and must only be operated on pre-mixed petrol.

The only difference between the engines used on the two types of machines is their size and the following instructions regarding the care and maintenance of the engine apply to both machines.

PREPARATIONS FOR STARTING.

Inspect the entire machine carefully and see that everything is in its place and that all nuts and bolts are tight. Check the brake and see that it is operating correctly and make adjustments to its linkage if necessary.

Make sure that the belt tension is correct, i.e., with the engine in a position for starting, the belt will allow the engine pulley to slip and when in the driving position it is of such a length as to allow the spring to retain tension on the belt.

Fill the fuel tank with pre-mixed petrol to the bottom of the brass neck of strainer.

Check and fill the cylinder water hopper with water to the line marked on its side for that purpose.

STARTING AND RUNNING.

Apply the brake.

Open the petrol cock on the petrol pipe line and allow the carburettor bowl to fill.

Adjust the needle valve on carburettor to one and a half turns open from its closed position.

Pull the engine out of tension with the belt by means of the engine shift lever.

Set the magneto by moving the control lever until the registering marks on the magneto body coincide.

Close the choke on carburettor and crank the engine two or three times.

Release the choke and then crank the engine sharply. The engine should then start, but if not, this procedure should be repeated.

After the engine has started the spark should be advanced by moving the magneto control lever in the same direction of the engine flywheel rotation.

Adjust the carburettor needle valve and throttle lever until the engine runs smoothly. Release the brake. Move the engine shift lever and allow the engine to gradually slide into the belt.

If an engine cannot be started after the above procedure for starting has been followed, it may be due to flooding of the crank-case. This term means having too much petrol in the crank-case which makes the mixture so rich that it will not fire in the cylinder. This excess petrol can be drained out of the crank-case by removing the plug under the crank-case cover.

After draining, replace the plug and open the blow off cock at the end of cylinder and turn the crank-shaft until ignition occurs. Close the blow off cock and carry out the starting procedure again.

During running, adjust the carburettor and magneto controls to suit the varying load conditions the engine is subjected to.

To stop the machine, pull the engine out of tension with the belt by means of the engine shift lever. Close the carburettor control lever and apply the brake. When stopped, close the petrol cock.

ENGINE LUBRICATION.

This type of engine is lubricated by the oil in the pre-mixed petrol. The proportion of the oil to petrol in the mixture is 1 in 20, the oil being S.A.E. 40.

As pre-mixed petrol is supplied direct from the Oil Store, Newport, the operator should not mix his own fuel unless circumstances make this absolutely necessary.

In such cases care should be taken to see that the oil is thoroughly dissolved in the petrol before being used in the engine.

Oil the magneto chain occasionally to minimise wear.

LUBRICATION OF AXLE AND WHEEL BEARINGS.

The axle bearings (5 No.) on these machines are packed with grease before they leave the Workshops and these should be given attention at least once per month.

The bearings must be charged with grease (Code VR–4) per medium of the grease gun until it is seen to ooze out of the bearings along the axles.

Both the K and K.S. machines are fitted with a loose wheel to facilitate removal of the machines from the track.

The bearings of these wheels should be given daily lubrication with grease, Code VR–2.

On K.S. machines which are fitted with ball bearing loose wheels, the lubrication need only be carried out once in six months. This bearing is hand packed with grease, Code VR–4, to only 2/3rd. full, by removing the bearing housing cover. Care must be taken to assure that no entry of foreign matter occurs during the service.

CARE OF THE MACHINE.

Keep the machine thoroughly clean and free from oil and dirt.

When the machine is not in use it must be kept in the shed provided, but when this is not possible it should be covered with the standard canvas cover.

When leaving the machine alongside a line, one wheel must be locked to the frame with the chain and padlock provided.

Always turn off the petrol cock on the petrol pipe line when the engine is stopped.

Stow the track tools correctly in the trays of the machine to avoid accidents.

Do not race the engine when the machine is stationary but throttle back to a reasonable idling engine speed.

Always check the water level in the cylinder water hopper and do not allow it to recede much below the line level before replenishing.

Periodically oil all brake linkages to prevent wear.

Never overfill the fuel tank as this can be a potential fire risk.

GENERAL ENGINE MAINTENANCE.

Engine.

The engines in these machines are known as a "K.S." or " K." and are of the horizontal water cooled two stroke design and are of 4 and 6 horse-power respectively.

Both size engines are manufactured at Spotswood Workshops.

Repairs of a major nature should not be undertaken by an operator and no part should be dismantled unless it is known how to replace it.

Magneto Timing.

A knowledge of the method to time the magneto is necessary to replace a magneto chain or magneto and the following procedure should be adopted.

Turn the engine crankshaft until the piston has reached the top of its compression stroke. This position is easily found by using the head of the small set screw on the crankshaft sprocket as a guide.

The piston is at top dead centre when the set screw is in the vertical position pointing towards the top of the hopper.

After the piston is correctly positioned, remove the cover from the magneto and move the magneto sliding cam to the fully retarded position. This is obtained by having the scribed line on top of the magneto sliding cam coinciding with a similar line marked on the body of the magneto.

Now revolve the magneto contact points per medium of the sprocket in the direction of the engine rotation until the points just commence to open.

With the piston, contact points and sprockets in these positions place the chain on the sprockets. The magneto should then be correctly timed.

Carburettor.

The carburettor fitted on this engine is the " Ford Holley " type and works on the same principle as the carburettors fitted on the other design of engines.

A finger press is not provided on this carburettor for flooding but should this happen during running, the following must be checked to ascertain the cause :—

1. Check the float level in the float chamber.
2. Check the float to see whether it has stuck in the down position.
3. Inspect the cut off valve in the body of the carburettor to see whether foreign matter has lodged under its seat.

The needle valve in the top of the carburettor body should not be screwed down too hard as this could enlarge the jet orifice and effect the correct running of the engine.

HELPFUL HINTS FOR CORRECT RUNNING.

See under—Locating faults in Ignition—Inspection Motor, Type " B."

Although this engine will run in either direction it will keep cooler if it is run with the head end of cylinder facing in the direction in which the machine is moving.

When starting always make sure that the magneto setting is correct and always place the thumb on the same side of the starting handle as the fingers so that if the engine backfires no injury will be caused when cranking it.

Failures in Running.

The possible failures in running likely to be encountered with these engines are similar to those described in the instructions for the Type " V " and Type " M.T."

TOOLS AND SPARES.

When a new machine is sent out from the Workshops a complete kit of tools is supplied with it.

A list of these is given below, and the officer or employe

in charge of the machine is held responsible for their care, and for seeing that they are maintained according to the list.

Tools.

Large Clyburn Shifting Spanner, 10″
Small " " " 6″
Spark Plug Box Spanner
Magneto Spanner
Screw Driver, 6″
Pliers, 6″
Belt Punch and Clip Spanner

Spares.

Spark Plug (½″ taper)
Belt Clip
Padlock and Chain
Ambulance Box.