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OPERATING INSTRUCTIONS

“TASMANIAN K1 GARRATT LOCOMOTIVE”

**PRODUCED EXCLUSIVELY, FOR ANYTHING NARROW
GAUGE AND GARDEN RAILWAY SPECIALISTS, BY
ACCUCRAFT UK LTD**

SAFETY FIRST

All our locomotives are safe to run, and will give many hours of pleasure, providing the following safety procedures are followed: -

1. Please read the instructions thoroughly before running for the first time.
2. Always do a complete refill of gas, oil and water. Never refill just the gas to prolong the run.
3. Never let the engine run out of water.
4. When refilling the gas, do not have any naked flame present, and **NO SMOKING!**
5. Do not pick up the engine by the bodywork, chimney or boiler, especially when hot.
6. Pick the locomotive up carefully, supporting the power bogies and, when hot, use the gloves supplied or a cloth.
7. Do not stand over the chimney. Ejected boiling water or steam may cause serious injury.

General Hints

As with all operating machinery, whether model or full size, wear will occur. In the model steam locomotive much can be done to help prolong its life and decrease the amount of time required in the workshop for servicing.

Keep the engine as clean as possible, and the motion free from dirt and garden debris. The valve gear, axles and crank pins should be oiled sparingly with light oil, e.g. "3-in -1 Oil". Over-oiling attracts dirt and grit, which will increase wear.

Regularly check that all screws and motion bolts are firm. Do not over-tighten, as this strips threads and shears bolts. **When filling the lubricator, always use a high temperature steam oil; this is available from other retailers. FAILURE TO USE THE CORRECT GRADE OF OIL CAN LEAD TO BLOCKED STEAM PIPES, AND WILL INVALIDATE THE GUARANTEE.**

When running your engine avoid excessive speed and acceleration, both will cause premature wear in the valve gear. Prototypically, narrow gauge locomotives ran at a speed of between 10 and 20 M.P.H., and rarely exceeded 25 M.P.H.

Positions of Fillers and Drains, etc

The cab roof lifts up and hinges over to the right hand side of the locomotive to give access to the interior of the cab.

The gas inlet valve is on its own filling turret on the gas tank, which is situated in the rear bunker. To access the filler remove the bunker cover plate or coal load. The gas control valve is also situated in the bunker, attached to the filler turret.

The lubricator is in the left hand side cab doorway. The filler cap has a "T" bar in it to aid removal. The lubricator drains directly down beneath the cab floor. The drain valve is halfway along the boiler cradle footplate and protrudes down on the left hand side. The drain tap has a small crossbar in it. To drain, unscrew the drain valve anticlockwise. To blow down the lubricator you must also have steam in the boiler and open the steam regulator, ensuring that first you have placed the locomotive in mid gear.

The boiler water filler is on top of the steam turret on the boiler in the middle of the cab. Undo the knurled cap to fill with water. The main steam regulator valve is on the rear of the boiler-filling turret.

The direction control is the wheel in the centre of the cab floor. To put the model into forward gear turn the wheel to the left (anti-clockwise). To put the model into reverse gear you must turn the wheel to the right (clockwise). Turn the wheel until the rods travel fully to the top and bottom of the expansion links (vertical slotted rods).

Preparation for Running

Your Garratt is fitted with a water gauge; this allows the driver to keep the model in steam continuously for longer periods of time than the usual single fill system. This is done using the Goodall Valve provided with your model. The initial fill up with gas, oil and water is the same as for a basic run, but then to carry on and run for longer periods requires supervision of the boiler water level, topping up of the lubricator and refilling of the gas. These procedures will be explained in another section after the Running section instructions. **Always service the engine in the following order; first gas, oil then water.**

To fill the gas tank: invert the gas can and apply the nipple to the gas inlet valve on the top of the tank turret. You will know when the tank is full; gas will blow back from the inlet valve in a strong jet. A small amount of gas and air will escape during filling, but the difference between this and when the tank is full is always clear. Always keep the gas can vertical when filling the gas tank. Having filled the gas tank you may now add hand-hot water to the water bath surrounding its base to the level of the weir. This must **NEVER** be boiling water!

Filling the lubricator: as you will read in the instructions for the end of the run, the lubricator should be empty of oil and water with the valve left in the open position. Now close the valve and remove the lubricator filler cap. Fill up the lubricator with steam oil to about $\frac{1}{4}$ of an inch below the top. Leave the filler cap off for the present, so that any trapped air can escape. It can be refitted after you have filled up the boiler.

To fill the boiler: remove the filler cap. Fill up the boiler to about $\frac{2}{3}$ to $\frac{3}{4}$ the way up the water gauge – ideally use filtered rainwater or distilled water using the large syringe provided. Replace the boiler filler cap, check that the lubricator does not need topping up, and then replace its filler cap also. Filler caps should be firm finger tight. They are sealed with a trapped ‘O’ ring and, therefore should not be over-tightened.

Lighting Up

Open the smoke box door; just pull it open by the door handle. Light your lighter/match etc. and gently open the gas control valve until a gentle hiss is heard in the burner. Apply your light into the smokebox and the flame should ‘pop’ down the fire tube and ignite the burner inside the fire tube. Alternatively you can leave the smoke box door shut and light the engine via the chimney.

If the gas valve is opened too much the flame will not pop back; it will either fail to ignite, will roar in flame out of the smokebox, or there will be a ball of flame around the front of the engine, which will then blow the whole fire out (after giving the driver a fright)!

When the fire sound has stabilised, after about 30 seconds the gas can be turned up until a healthy roar is heard. The smoke box door may be shut after about two minutes. Now leave the locomotive to raise steam.

Running

When the engine has raised about 60 psi, you are ready to start running. Before commencing your first run of the day, it is advisable to put a cloth loosely over the chimney for a few minutes, as condensed water may be ejected from the chimney. This will help to keep your model cleaner. This is quite normal; the motion of the engine will be jerky until all condensate has been ejected.

DO NOT stand over the chimney as ejected boiling water/steam could cause serious scalding.

Turn the direction wheel in the desired direction and ensure the engine is in full gear, and then open the main steam valve. The engine should start to move. When starting from cold it can be jerky, this is normal, as it has to clear the condensate from the system. The more the main steam valve is opened, the faster the engine will go; our advice is to start slowly and learn the road with your engine

After a minute or so, remove the cloth and continue running. In running it is correct practice to balance the boiler pressure against the load being pulled and the track conditions. With a light load and level track the pressure may need to be only 50 p.s.i. therefore, turn the gas control down to keep this pressure. When running a heavy train with steep gradients, increase the pressure by turning up the gas.

The ideal running pressure can be learnt by experience and is one of the pleasures of running a live steam engine. There is no need to have the safety valve constantly blowing off (it is what its name implies – a safety vent for excess steam pressure). In all our designs, the gas has been programmed to run out just before the water, thus it is important not to refill with gas alone in order to lengthen the run by a few minutes. When the gas runs out a complete gas, oil and water service must be done (remember GOW, also remember to shut the gas regulator before refilling, and **DO NOT** refill with gas near any other live steam loco). When the locomotive slows as the pressure falls at the end of a run, stop the engine. Gently open the lubricator valve and blow out any condensed water. If you intend to continue running, close the drain when you see oil coming out of it and carry out a general refill. If it is the last run of the day, leave the lubricator drain valve open and blow the lubricator completely clean.

Continuous Running

To run for longer periods of time than the normal “one fill” system you will require a Boiler Top Up bottle which can be purchased from your retailer. The Top Up valve (Goodall Valve) is supplied with your loco.

For the first fill, service in the normal way. Then run for about 15 minutes, now have a look at the water level. You will probably need to pump some water into the boiler. Lift up the cab roof and push the tube from the pump bottle into the Goodall Valve and pump water into the boiler until the gauge

glass is showing about $\frac{3}{4}$ full. Keep an eye on the water gauge and try to run between $\frac{1}{2}$ and $\frac{3}{4}$ of a glass.

After another 15 minutes running you may need to refill the lubricator and top up the gas tank. Also check the water level and top up if necessary. Stop the loco in a convenient location, away from other locomotives and turn off the gas. Ensure the fire is completely out and then top up the gas tank.

Blow around the engine so there is no residual gas about, then re-light the fire. To refill the lubricator, first put the loco in neutral (mid gear). Open the drain valve then gently open the steam regulator. When the lubricator has been blown clean, close the regulator and remove the lubricator cap. Now close the drain valve and refill with superheat steam oil to the correct level. Re-fit the lubricator cap. All this time the engine has had the fire alight and will have a good head of steam, so now carry on running.

Keep an eye on the water level at all times and try to refill the gas tank and lubricator every 20 minutes to half an hour.

End of Run

As previously mentioned, the locomotive will slow (due to pressure dropping), when the fire has gone out, stop at a convenient place and open the lubricator drain valve. Blow out all condensed water and the remaining oil. Leave the drain valve open and allow all the remaining steam to blow out. The locomotive should be allowed to cool. When cool, clean the engine, check the motion and oil if necessary. The locomotive should always be put away in a clean condition as it attracts less dust and is always ready for the next run (or to be shown to an admiring friend). Always leave the lubricator drain valve and the boiler blow down valve open, so that the boiler will not be strained if subject to any temperature change. It is advisable to store the locomotive where any residual drips of oil or water do not matter.

Blocked Gas Jets

If a gas jet becomes completely blocked with particles of dirt within the gas, the jet will have to be removed and cleaned. Pulling gently backwards remove the pipe and jet holder assembly from the burner.

Holding the jet holder gently in a pair of pliers, unscrew the jet. To clear, place the jet nozzle against the inverted gas can nozzle and clear the jet with a blast of gas. Under no circumstances use a pricker wire, this will damage the jet hole. Replace the jet in the holder, ideally using a thread sealant sparingly on the threads. Ensure it is tightened up firmly. Now test **CAREFULLY** for gas leaks, first with a 50/50 mixture of washing up liquid and water, and then if no bubbles are showing, with a flame and the gas “just on”. Tighten if required. Now replace the jet assemblies back into the burners.

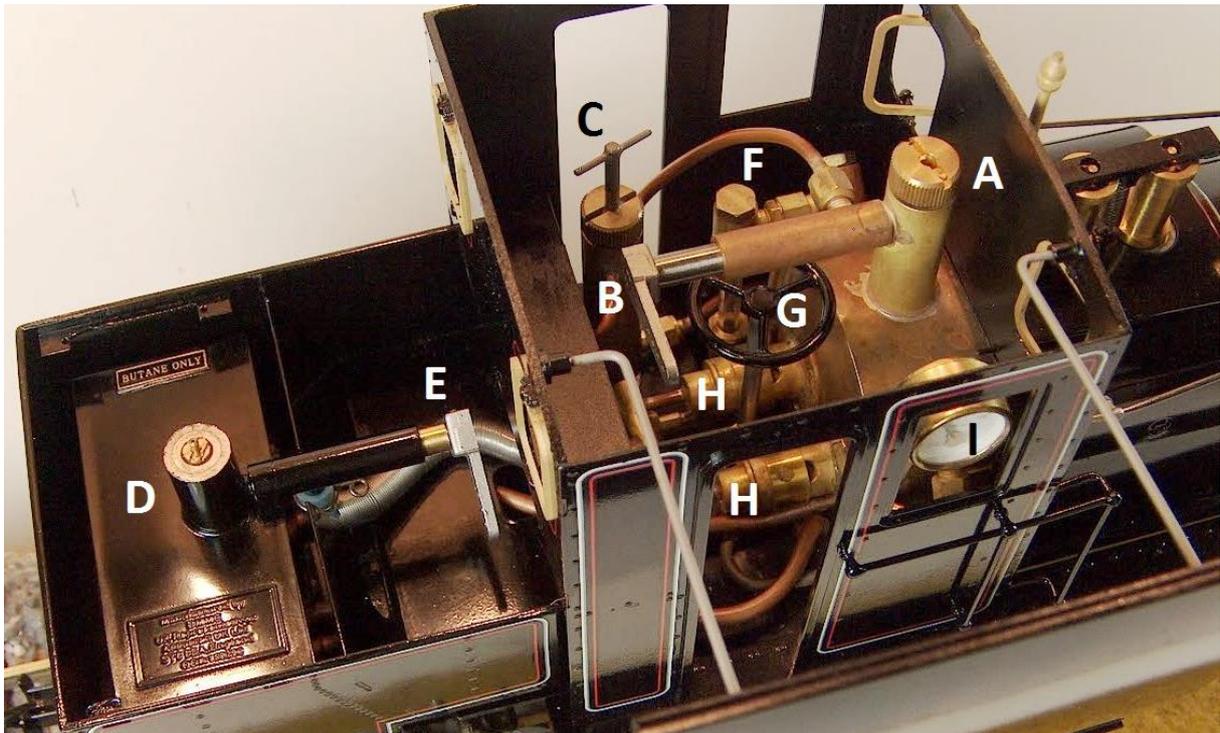
Gauge Changing: All Garratt locomotives are supplied set to 45mm gauge, but a “gauge change” kit is supplied with each engine. This will allow you to run on either 32mm or 45mm gauge track. All wheels are insulated as standard. To change the gauge, lay the engine gently on its side, on a thick cloth, loosen all the grub screws in the boss on the back of the wheels using the Allen key provided. The axles are dimpled for each gauge, so you do not have to measure for the right gauge. Slide the wheels to the gauge required and tighten up the grub screws. **These should be checked as a routine at the start of each running session.**

As with all comprehensive models, we strongly recommend a full demonstration (by our agents) before purchase, enabling you to get the best out of your model right from the start.

HAPPY STEAMING!

IMPORTANT NOTICE! – This K1 Garratt has been fitted with a water bath for the gas tank to promote vaporisation of the fuel prior to ignition. This is particularly beneficial in designs where the tank is remote from a source of heat, however, the water in the bath must never be more than hand hot! It is sensible to fill the gas tank first before adding the warm water otherwise you may find you are unable to fill the gas tank effectively. At the end of a run the water bath can be emptied using the large syringe and tubing supplied.

Cab Operational Controls:



A: Water filler.

C: Lubricator, drain under footplate.

E: Gas Control valve.

G: Reverse lever.

I: Pressure gauge.

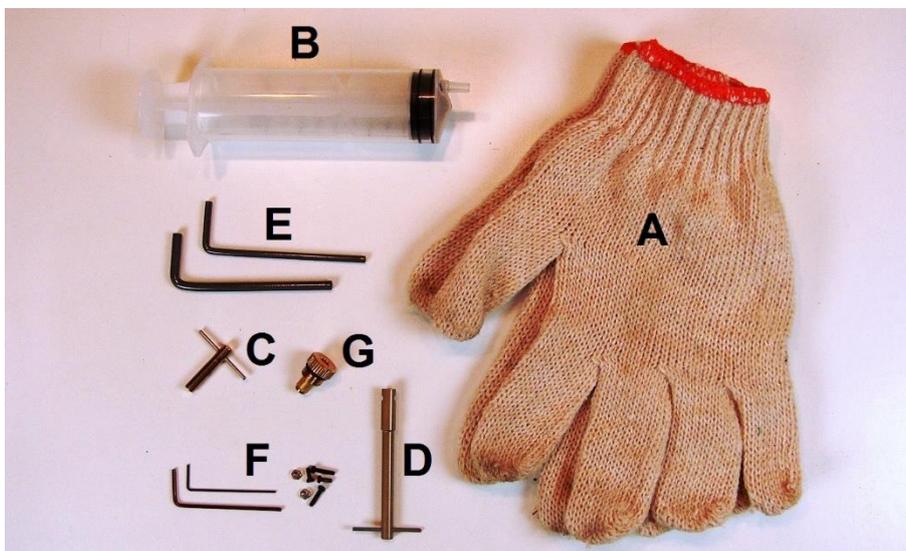
B: Steam regulator.

D: Gas Filler valve.

F: Water gauge.

H: Burner jet.

Accessories Illustrated.



A. Protective gloves

B. Boiler filling syringe

C. Drain valve key

D. Special tool for the lubricator cap removal

E. Hex nut spinners for 2mm and 3mm hex bolts

F. Allen keys and spare nuts and bolts

G. Replacement water top up valve

A Bit of History.

Assembled in 1909, K1 was the first locomotive built to the Garratt Patent (No 12079) granted in 1907. K1 (and sister engine K2) were delivered to Tasmania in 1910 to work on the 2ft gauge North East Dundas Tramway where they hauled silver-lead ore for twenty years. By 1929 both engines were withdrawn from service following loss by the tramway of its major traffic. K1 and K2 were placed in storage but in 1947, Beyer Peacock purchased K1 as a museum piece. By this time the loco was a combination of the power units of K1 and the boiler frame of K2; the resultant locomotive (now known as K1) was shipped from Burnie (on Tasmania's North coast) to Manchester (England). K2 was later dismantled and K1's original boiler sold on for stationary use in a sawmill.

In 1947 K1 returned to Gorton Foundry, the Beyer Peacock works in Manchester where it was placed on display as a museum piece. After a failed initiative to steam the loco in 1955 and offering it to the Narrow Gauge Railway Museum in 1961, Beyer Peacock surveyed the locomotive with a view to selling it in 1963. In 1966 it was bought by the Ffestiniog Railway and stored at Boston Lodge for nearly a decade before being placed on loan to the National Railway Museum in 1976. The prospect of a restored Welsh Highland Railway sparked the start of K1's restoration in 1995, a process that took nearly a decade at a number of different sites and involved the construction of a new boiler. K1 finally entered traffic on the reborn WHR in 2006 and became a popular performer on the line. Currently withdrawn for a 'heavy general' overhaul, the locomotive's return to traffic is eagerly awaited.



HINTS ON GAS FIRING CONTROL

CONTROLLING THE GAS FIRING OF YOUR LOCO MUST BE DONE WITH CARE AND ATTENTION. TURNING THE FIRE UP TOO MUCH CAN CAUSE GREAT DAMAGE TO YOUR MODEL SUCH AS BURNING OFF THE PAINT, MELTING THE INSULATION OFF THE WHEELS, AND CARBONIZING THE STEAM OIL IN THE SUPERHEATER WHICH BLOCKS IT. NONE OF THE ABOVE DAMAGE WILL BE COVERED BY WARRANTY AS IT IS ATTRIBUTED TO OPERATOR ERROR.

AT ACCUCRAFT WE GIVE YOU THE ABILITY TO RAISE A GOOD HEAD OF STEAM BUT IT IS UP TO THE OPERATOR TO CONTROL THE GAS FLOW SO THE FIRE DOES NOT ROAR OUT OF CONTROL AND BURN IN THE SMOKE BOX. IT IS VERY MUCH LIKE THE ACCELERATOR OF YOUR CAR, HOW YOU USE IT IS UP TO THE USER, DRIVE SENSIBLY AND YOU WILL NOT HAVE AN ACCIDENT; PUT YOUR FOOT DOWN AND YOU WILL PROBABLY END UP IN THE HEDGE. HARDLY THE CAR OR THE MANUFACTURER'S FAULT!

NEVER LEAVE THE LOCO UNATTENDED WHEN RAISING PRESSURE, AS THE HEAT INCREASES THE PRESSURE IN THE GAS TANK ALSO RISES AND YOU WILL HAVE TO TURN THE GAS DOWN. IF THE GAS CONTROL VALVE SPINDLE IS A BIT STICKY IT COULD NEED LUBRICATION WITH STEAM OIL. WHEN YOU UNSCREW THE NEEDLE VALVE TO OIL IT ALWAYS DO IT WHEN THE GAS TANK IS EMPTY.

KEEP LOCOMOTIVE ORIGINAL PACKAGING

WE WISH TO ADVISE YOU THAT IT IS IMPERATIVE THAT ALL ORIGINAL LOCOMOTIVE PACKAGING, BOTH OUTER AND INNER BOXES AND ANY OTHER TYPES SUCH AS SHAPED POLYSTYRENE, SHOULD BE RETAINED.

SHOULD YOU NEED TO RETURN YOUR MODEL FOR ANY REASON, EITHER FOR SERVICE OR WARRANTY WORK, IT MUST BE SECURELY PACKED IN ITS ORIGINAL PACKAGING SO AS TO PREVENT DAMAGE IN TRANSIT.

IF THE MODEL IS PACKED IN ANY OTHER WAY WE CANNOT BE HELD LIABLE FOR ANY DAMAGE CAUSED BY IMPROPER PACKING. ALL ITEMS COVERED BY OUR TWO YEAR WARRANTY WILL BE COVERED BUT ANY PARTS AND LABOUR ATTRIBUTED TO RECTIFYING DAMAGE CAUSED BY IMPROPER PACKING WILL BE CHARGED FOR.

GUARANTEE

Accucraft UK Ltd will remedy any defect or malfunction occurring with this product during a two year guarantee period from date of purchase. This guarantee does not extend to malfunctions or defects caused by damage or unreasonable use, including the failure to provide the correct types of lubrication and water or by not controlling the gas correctly.

If a claim is to be made within the two year guarantee period, in the first instance, return both the product and guarantee card to your dealer. In the event of your problem not being able to be fixed by your dealer, he will contact us for advice. If necessary we will arrange for the product to be returned to our service department for repair.

This guarantee is quoted in addition to all legal rights of the purchaser under the Sale of Goods Act, and shall expire two years from the date of purchase. Under no circumstances shall Accucraft UK Ltd be responsible for any consequential damages arising in regard to any Accucraft UK Ltd product.

CARE OF YOUR LOCOMOTIVE

- **Proper lubrication is most important, but must not be overdone.**
- **Care should be taken when removing the loco from its packaging, as any levering action using projecting parts (e.g. buffers) may result in damage.**
- **Check with your dealer that these locomotives wheel standards are compatible with your track system. Ensure that your track is in good condition and well maintained.**
- **Keep the engine free of dust and dirt. Debris such as earth and gravel in the motion will lead to premature wear and failure.**
- **Always use steam oil in the lubricator, never ordinary household oil.**
- **Never light the burner without water in the boiler.**
- **Always control the gas correctly and do not have the fire too high so it goes into the smoke box and damages materials, paint, or wheel insulation.**

SAFETY

- **Always use this product in a well-ventilated area. Never get directly above the chimney, boiling water can sometimes be ejected from it.**
- **When in steam, and for some time afterwards the engine will be very hot. HANDLE WITH CARE.**
- **This model has many small parts and should be handled with care. It is not suitable for children under the age of 14 years old.**

**ACCUCRAFT UK LTD, UNIT 4, LONG MEADOW INDUSTRIAL ESTATE, PONTRILAS,
HEREFORDSHIRE. HR2 0UA.**

LOCOMOTIVE LOG BOOK

Loco Serial No: Boiler Serial No:

Gas Tank Serial No:

First Registered Owner:

Date Purchased:

Second Registered Owner:

Date Purchased: