



Vale of Rheidol 2-6-2



Owners Handbook

For the Vale of Rheidol 2-6-2 tank
Locomotive

Operating Instructions

IMPORTANT: Read these instructions carefully before operating the locomotive

The following items are required for running this engine and are not included with the model.

Fuel Butane gas. See 'Gas System' on page 21

Water See 'Filling the boiler' on page 9

General Lubricating oil See 'Lubrication' on page 10

SAFETY PRECAUTIONS

This is a working model locomotive using steam under pressure and highly flammable fuel. Provided it is operated with reasonable care and attention, no problems should arise.

It is intended for use out of doors and must only be operated in a well-ventilated area.

Whilst the locomotive is in use, hot gasses are exhausted up the chimney and excess steam frequently blows off through the safety valve even when stationary, so operator and spectators should not bend over the model.

As you will appreciate, this is not a toy and is therefore unsuitable for young unsupervised children.

Follow manufacturer's recommendations regarding the safe storage of Butane gas canisters.

Some areas of the model will get quite hot whilst it is operating, so a pair of gloves is provided in the tool kit for your protection.

Always have to hand either a fire extinguisher or wet cloth when operating the model.

VoR Instruction Booklet



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TOOL KIT

The following items are included with your locomotive.

One 60ml bottle of special steam oil for use in the cylinder lubricator.

One 60ml syringe with plastic tube for filling the boiler with water.

One water top up pump bottle. One gas filling adapter.

One set of spare washers and 'O' rings. One spare gas jet.

One Allen key for cylinder socket cap screws.

One set of etched brass name and number plates.

One set (4 items) of dummy fire irons and shovels.

One set (4 items) of dummy brake pipes

One pair of protective gloves. One cleaning duster.

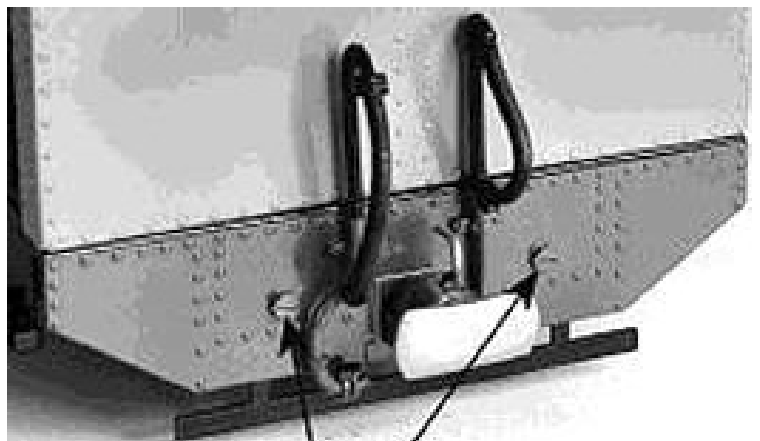
UN-PACKING THE MODEL

To prevent damage during transit, certain items are removed and packed separately. Carefully lift out the locomotive and fit the loose items as follows using the photographs in this booklet for reference.

1) The dummy steam dome sits over the boiler filler plug/top-up valve on top of the boiler and is a push fit over the 'O' ring fitted round the outside of the filler plug. The dome also has a separate polished brass plug that sits in the hole on top. This is to give access to the water top-up valve during service.

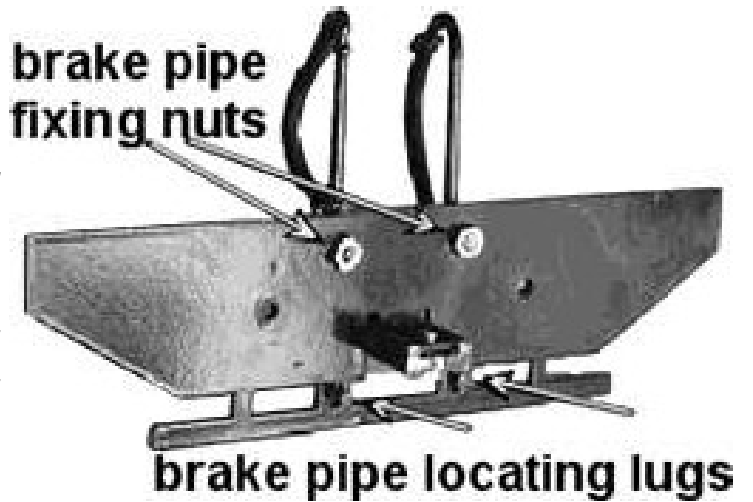
2) The polished brass safety valve bonnet sits over the safety valve just in front of the cab.

3) The two dummy coal loads sit in the coal bunkers in front of the cab. They have cut-outs on their underside to sit over the lubricator cap on the left hand side and the gas filler valve (if the large capacity tank is fitted) on the right. If the small gas tank is fitted, the filler valve is much lower in the cab. Note that they are handed and have a locating boss on their underside, the curved edge of which sits against the curved side of the dummy firebox top. The one with the longer locating boss fits in the left hand bunker, over the lubricator.



Buffer beam fixing screws

4) A set of dummy brake pipes are supplied and you will need to decide which, if any, you would like to fit. The fitment of them to the prototype locomotives varied over the years and if you require your model to represent a particular locomotive or era, check which pipes it carried. There are two



straight pipes and two with curved feed pipes. The curved ones go on the left of the centre buffer and the straight ones on the right. To fit them, you will need to remove the front and rear buffer beams. These comprise of a steel buffer beam with etched brass overlay and are fastened to the chassis by a pair of brass cheese head screws and nuts. The brake pipes are lost wax brass castings and are already painted red for you, but will require the hoses and, for some versions, the upstand pipe, painting black. To fasten them to the buffer beams, the lug at the bottom fits into a hole in the bottom of the buffer beam and the threaded stud fits through the hole with a nut on the inside. Once the brake pipes are fitted, carefully replace the buffer beams with the original fixing screws.

5)The dummy fire irons and shovels can be painted as required and were normally kept on the tank tops, just in front of the coal bunkers. They can be glued in place if required and the use of an epoxy adhesive such as 'Devcon' is recommended.

6) A set of etched brass name and number plates are supplied, and these should be painted before fitting. The paint should be applied to the background and left to dry fully. Once dry, snip the required plates from the etch with a pair of sharp tin snips, and clean up the edges with a fine file or wet and dry paper. Finally, lay a sheet of fine wet and dry paper on a flat surface and lightly rub the front face of the plate onto it. This will remove any traces of paint from the raised lettering and edges. The shed code and smoke box number plates, both of which fit on the smoke box door, have the raised letter and numbers, painted white.

For fixing the plates to the locomotive, we recommend a light

smear of 'Devcon' or similar, epoxy adhesive and the plate should be held in position with Sellotape until the adhesive has fully cured. As the positioning of the plates on the locomotives varied over the years, you should check with pictures or reference books for the particular era you wish to depict. The loco's were numbered as follows.

No.7 Owain Glyndwr, No.8 Llewellyn and No.9 Prince of Wales.

RUNNING IN

All locomotives are test run before leaving the factory, but will require several hours of running in, when new, to overcome initial tightness and allow valves etc. to 'bed in' completely. It is recommended that the model is run with light loads for the first few hours of operation. Also, the loco will waste a proportion of it's water and steam until 'run in' due to leaking slide valves, a tendency to prime more, and simply overcoming the initial tightness of the moving parts. As the model heats up and cools down each time you raise steam, screws and nuts have a tendency to stretch and loosen a little so you will also need to make regular checks and 'nip up' any that become loose. Most are quite visible and easy to get to however if there is any steam leaking from the valve chests on top of the cylinders, refer to the Trouble Shooting section.

ACCESS TO THE CONTROLS

For normal operation, all main controls are accessible without the need to remove any part of the locomotive, however, for ease of servicing, the cab roof hinges up. Lift the front of the roof vertically, then it will hinge forward, over to the front of the cab.

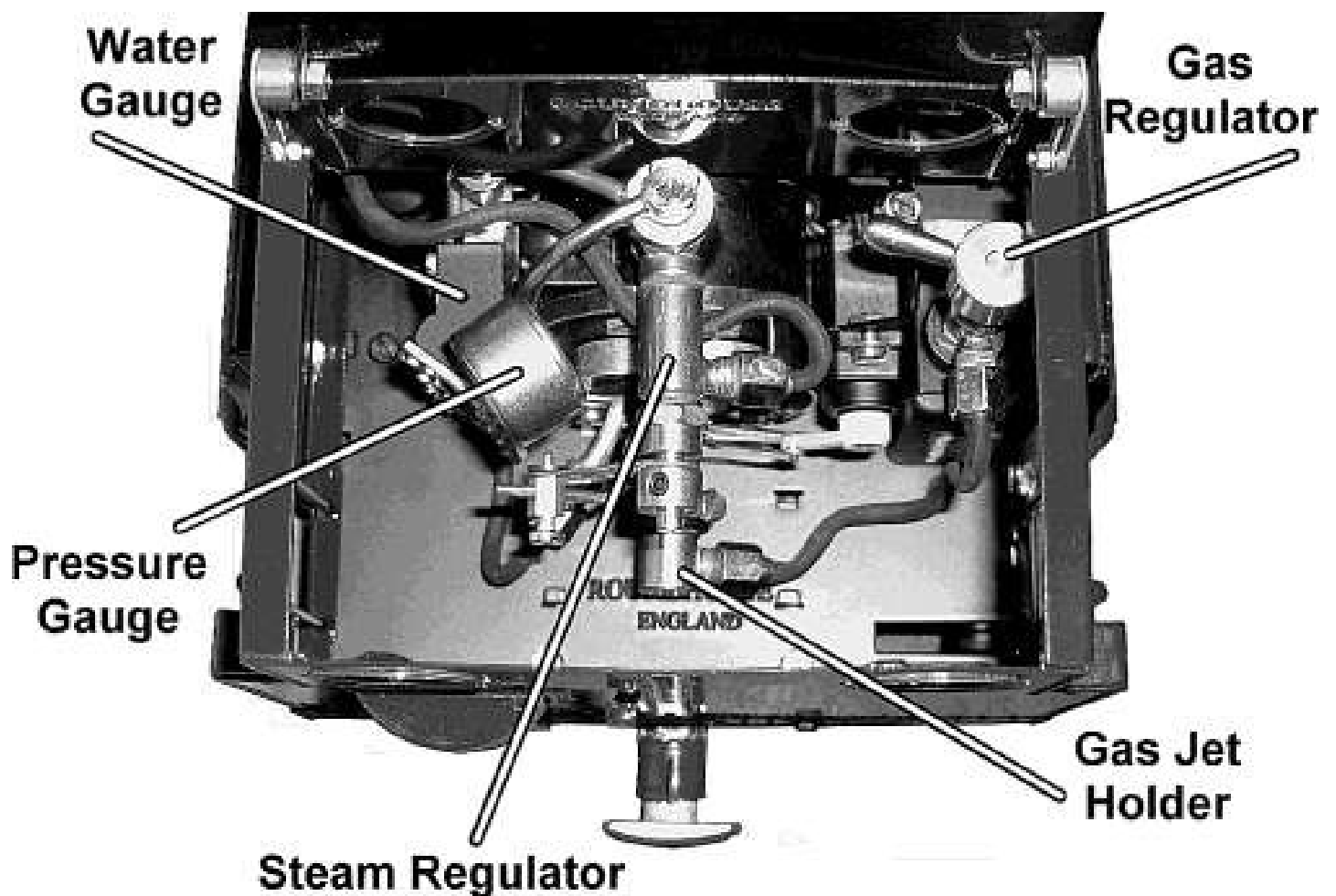
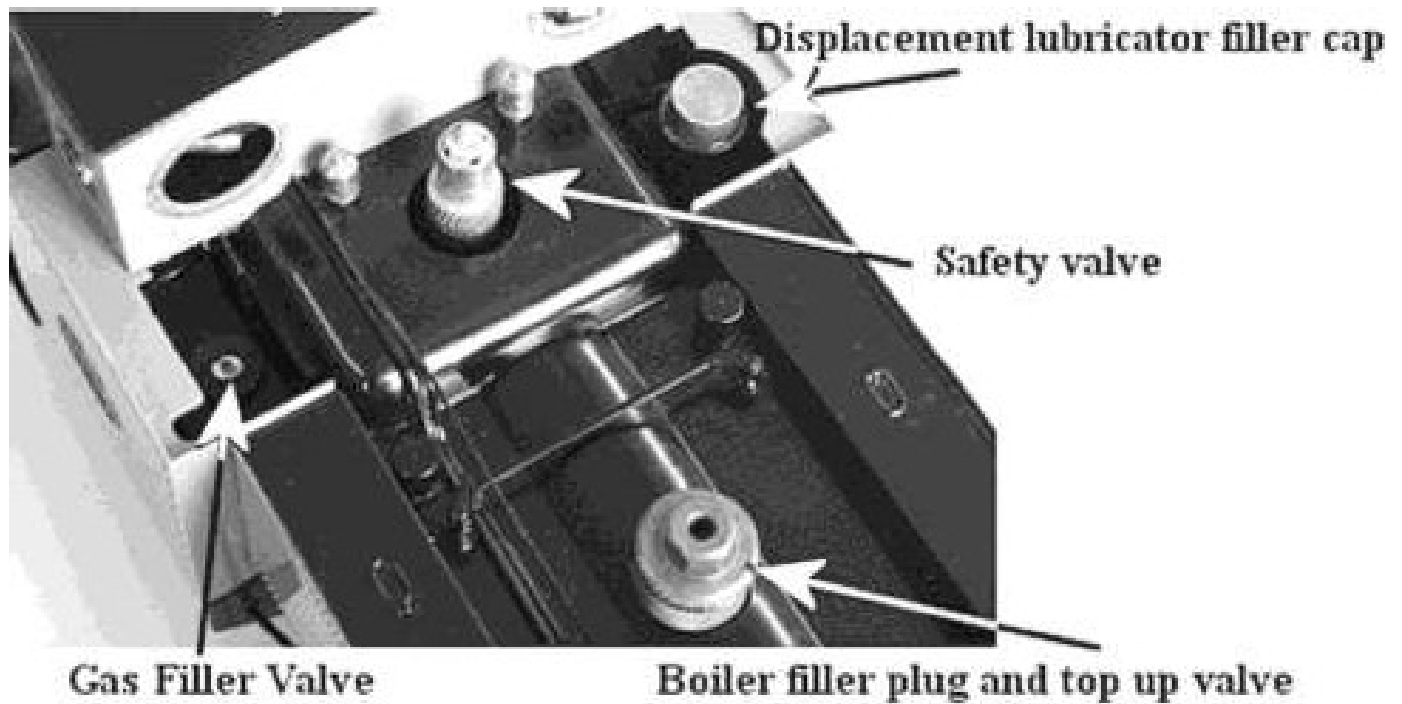
The gas regulator is located in the right hand side of the cab.

The displacement lubricator is positioned in the left hand coal bunker under the dummy coal load.

The gas filler valve is situated in the right hand coal bunker under the dummy coal load.

The switch for the locomotive R/C equipment is on the underside of the right hand side tank, just in front of the bunker.

IDENTIFICATION OF PARTS OF THE LOCOMOTIVE



PREPARING FOR OPERATION

The locomotive must be serviced before being operated. It is important to perform all the following operations.

NOTE, check that the batteries in both the R/C transmitter and the locomotive are in good condition before attempting to operate the model - see the Radio Control section later on.

1) FILLING THE GAS TANK

The filling of the gas tank should only be carried out in a well-ventilated area, where there are no naked lights or other lighted locomotives close by. Ordinary Butane or Iso-butane gas (as used in gas cigarette lighters) is the preferred fuel, though for economy, the larger canisters as used for blowlamps or camping stoves etc. are better. The larger canisters have an EN417 threaded self sealing valve on top and require a special adapter to couple up to the filler valve on the locomotive and one is supplied in your tool kit. Mixed gasses are also available and may be used if ordinary butane or iso-butane are not available, but see the 'Gas System' section for more information on this subject.

Before attempting to fill the gas tank, make sure that the gas control valve is closed by turning it clockwise and that there are no other operating locomotives or naked flames nearby.

The filler valve for the gas tank is the coal bunker on the right hand side and is accessed by lifting out the dummy coal load. Ensure that the gas canister is fitted with a correct adaptor then invert it and place its nozzle over the gas filler valve. Support the locomotive from underneath in the area of the tank, and press the canister down. The gas will be heard hissing as it enters the tank and a small amount will escape around the valve. This is quite normal and is the tank venting as the liquid enters. After about 20 to 30 seconds on the small tank and 40 to 50 seconds on the large tank, liquid gas will emerge from the valve showing that the tank is full. Remove the canister immediately. Filling times will vary depending on the temperature of the locomotive and are for guidance only.

2) FILLING THE BOILER

There are two methods of filling the boiler

1/ Quick filling when cold.

The dummy steam dome on top of the boiler can be lifted completely off to access the filler plug.

The dome is a substantial and heavy item, being machined from solid brass. Take care not to drop it onto the locomotive, as the weight of it may damage the model. There is also a separate, removable plug in the top of the dome which is used when operating the top up system. Take care not to lose it.

Remove the filler plug/filler valve assembly by unscrewing it with the large knurled body. Using the 60 ml syringe and plastic tube supplied, fill the boiler right to the top with clean water. Distilled water is recommended if available. As an alternative to distilled water if this is unavailable, clean tap water can be used in soft water areas. Also, rain water or water from a dehumidifier can be used provided that it is adequately filtered. Many people now use rain water passed through a coffee or wine making filter to remove any particles or debris in the water.

Do not use deionised water as this may cause long term damage to the boiler and fittings.

There has to be a space above the water to allow steam to be raised so, insert the end of the plastic pipe into the boiler and withdraw 30 ml of water with the syringe. Replace the filler plug finger tight then place the dummy steam dome over it. Note that there is a rubber 'O' ring around the body of the filler plug. This is to retain the dome during normal operation.

2/ Pump bottle when hot or cold.

Lift out the brass plug in the top of the steam dome, to give access to the top up valve. Fill the plastic pump bottle with clean water and pass the end of the plastic tube down through the hole in the dome and into the socket in the top of the top up valve. The socket has a slight taper in it, and a little downward pressure on the tube will ensure a good seal.

Pump the handle on the bottle to inject water into the boiler whilst maintaining this downward pressure. Keep pumping until the water level in the water gauge is almost at the top of the glass.

Remove the plastic tube and replace the brass plug in the top of the dome. Note that a small amount of water will remain in the top of the valve but will evaporate away as the valve heats up.

3) LUBRICATION

Regular lubrication of all working parts is important and should be carried out before each operating session. There are two types of lubrication required: The external moving linkages and bearings are lubricated with a medium oil such as motor engine oil, and the internal steam mechanisms such as cylinders, pistons and valves are lubricated with a special steam oil that is mixed with the steam. Infrequent external lubrication will allow parts to run dry, and over oiling can form pools around operating parts that attract dirt and grit. If too thin an oil is used it will evaporate very quickly as the loco gets hot – leading to dry running. We recommend the use of a 20-50 motor oil for external lubrication. When carrying out general lubrication, do not forget the regulator spindles (see Trouble Shooting section for further details of oiling the regulators).

Internal lubrication is achieved by steam oil that is mixed with the steam in the displacement lubricator, housed in the left-hand side bunker. Lift out the dummy coal load and remove the knurled cap from the top. Slacken the knurled drain screw, located on the bottom of the lubricator beneath the foot plate, two or three turns but do not remove it. Any water in the lubricator will run out through the drain screw. Tighten the drain screw and refill with the steam oil supplied, then replace the cap and finally, the dummy coal load. Take time filling the lubricator, especially when cold, as the oil takes time to run down and may trap an air bubble. Both cap and drain screw are fitted with 'O' rings and need only be closed finger tight.

NOTE: Only special steam oil as supplied should be used in the lubricator and under no circumstances should ordinary oil be substituted, or damage may result.

4) LIGHTING THE BURNER

WARNING: Before lighting read the section on the gas system under Troubleshooting later on and be aware of potential problems. If the gas system is not operating correctly, **shut it off immediately** or damage may result.

Move the locomotive to another location before lighting. Butane is heavier than air and small pockets of gas can collect around the locomotive during filling.

To light the burner, hold a lighted match or cigarette lighter over the top of the chimney and **slowly** open the gas regulator by turning it anti-clockwise. The gas should ignite almost immediately with a pop as the flame travels down the chimney and into the boiler tube. The burner should be audible but not too loud.

NOTE as stated above, the gas regulator should be opened slowly until the burner ignites. If opened too quickly or too far, particularly when the engine is cold or if the gas tank has just been filled, it is possible that the flame may not ignite correctly, or may not travel back into the boiler flue but stay in the smoke box. If this should happen, the burner will sound quite different to normal and the blue flame will be visible in the smoke box if viewed down the chimney from a safe height. Should this happen, turn off the gas immediately or damage may result and then re-light it. If the problem persists and it is not possible to ignite the burner correctly, then a dirty jet should be suspected and cleaned as detailed in the Troubleshooting section.

For the first couple of minutes keep the burner on low. This is important, as until it warms up, the flame will be a little unstable and turning it up too much could cause it to go out. Also, with a completely full tank, liquid gas could be drawn off instead of vaporized gas, which can also extinguish the flame.

After a couple of minutes, the gas control valve can be opened more to speed up steam raising. Open the gas regulator slowly. The full range of adjustment (closed to fully open) is achieved within the **first half to three quarters of a turn** of the gas regulator knob any more is unnecessary.

RUNNING THE LOCOMOTIVE

When full working pressure has been reached (between 35 and 40psi), the safety valve will start to blow off steam. Steam generation can be controlled by the gas valve in the right hand cab doorway.

If the safety valve blows off frequently during running, then too much steam is being produced, which wastes water and gas. Turning down the burner will decrease the amount of steam created. Conversely, if steam pressure is not maintained during a run, then the burner should be turned up.

After a few minutes of running it may be noticed that the gas pressure through the burner has increased. This is due to the gas tank becoming warmer and so increasing the gas pressure. Simply turn the gas down – this may need to be performed several times during a run.

The art of balancing steam generation to the operational requirement by the adjustment of the gas control valve will quickly be learned.

The standard gas tank has a duration of about 25 minutes, though this will vary depending on the gas valve setting. The boiler should not be allowed to run dry, and the gas tank capacity is such that the gas should run out before the water but it is good practice to keep an eye on the water gauge as a check.

When the gas is fully used up, the steam pressure in the boiler will be seen to gradually drop until the loco comes to a halt. Should the water expire before the gas is fully used, the pressure will drop rapidly and the loco will stop.

Check the pressure gauge and water gauge – if there is no steam pressure or visible water, turn off the gas. No damage will result if the gas is turned off immediately and the engine left to cool. Never add cold water to a hot, empty boiler in an attempt to cool it and never re-fill the gas tank without first checking the water level in the boiler. Ensure that the gas valve is completely turned off before refilling the gas tank.

RADIO CONTROL SYSTEM

The locomotive is operated by a four channel radio control system. There are two main control levers on the radio transmitter, each of which is bi-directional and controls two functions.

Speed and direction are controlled by the left hand lever. Left to right for forward or reverse (mid gear in the centre position) and up and down for regulator open or close.

The right hand lever operates the steam whistle and drain cocks if fitted. Left to right for drain cocks open or closed (both drain cocks and chimney exhaust together in the centre position) and up and down for whistle valve open or close. Each control lever has two smaller trimmer levers, three of which (items 3, 4 and 6 in the illustration) should not be altered though the steam regulator trimmer (item 1), may require adjustment as referred to in a later chapter.

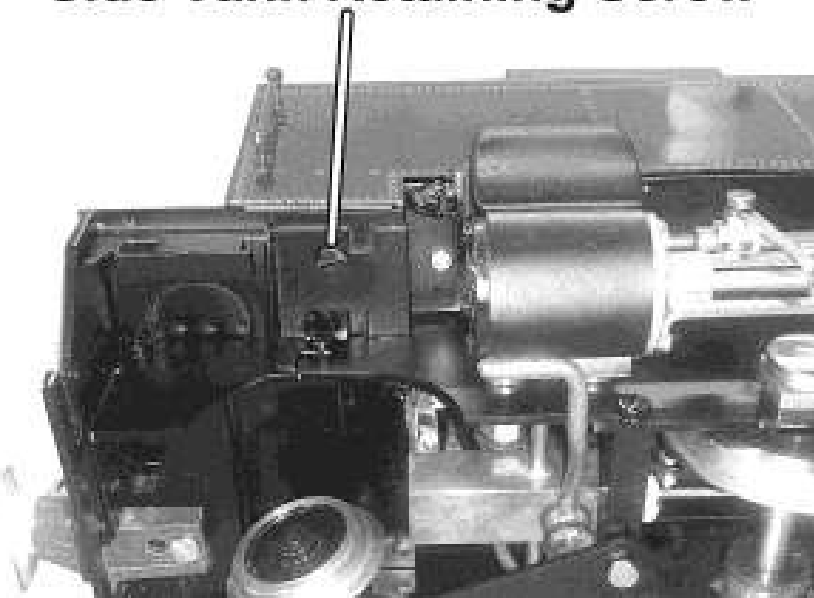
For more information on using the Radio Control equipment, see the manufacturer's instruction booklet supplied with the Radio Control Set.

INSERTING THE BATTERIES

Batteries must be fitted to the locomotive before it can be run. To do this we need to remove the Left-Hand Side Tank. It is held in position by a single screw (the Side Tank Retaining Screw) which is located under the front footplate in front of the

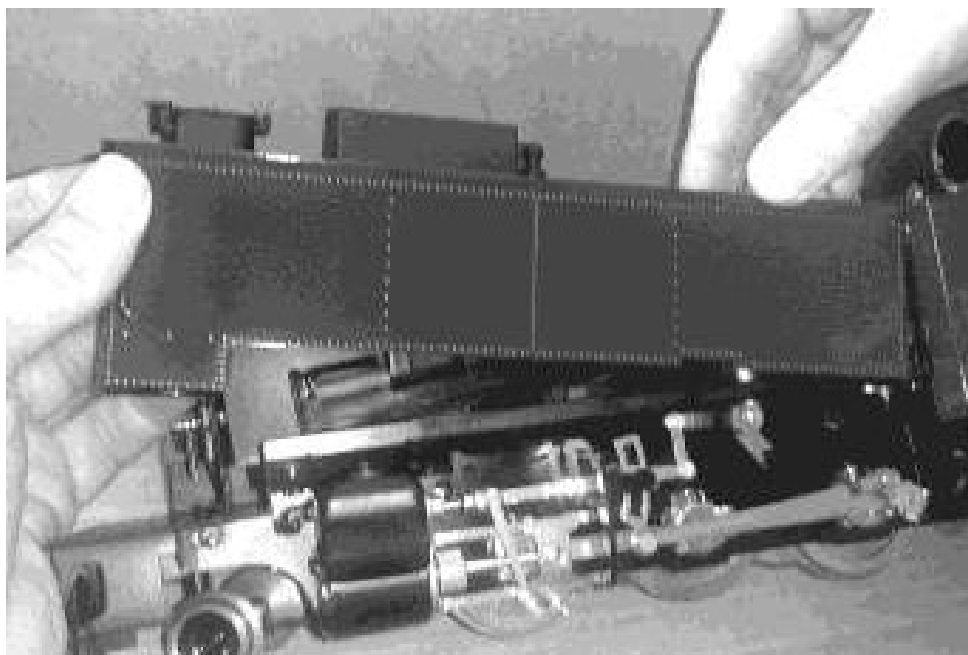
Side Tank Retaining Screw

Using a small screwdriver, carefully remove this screw and place it safe. There is a weight in the front of the side tank that you need to be aware of before removing the side tank. Gently lift the side tank

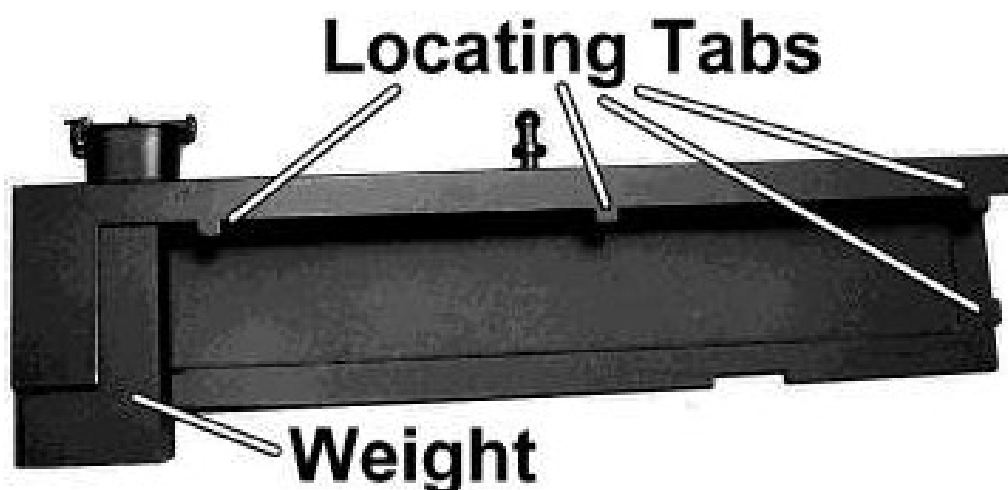


up at the front and then ease it forward, taking care to hold onto the weight that is located in the front of the side tank. Batteries can now be fitted into the battery holder.

The side tank can now be replaced. Hold the side tank as shown in the



picture above. First, locate the tab at the upper rear of the side tank into its corresponding slot.



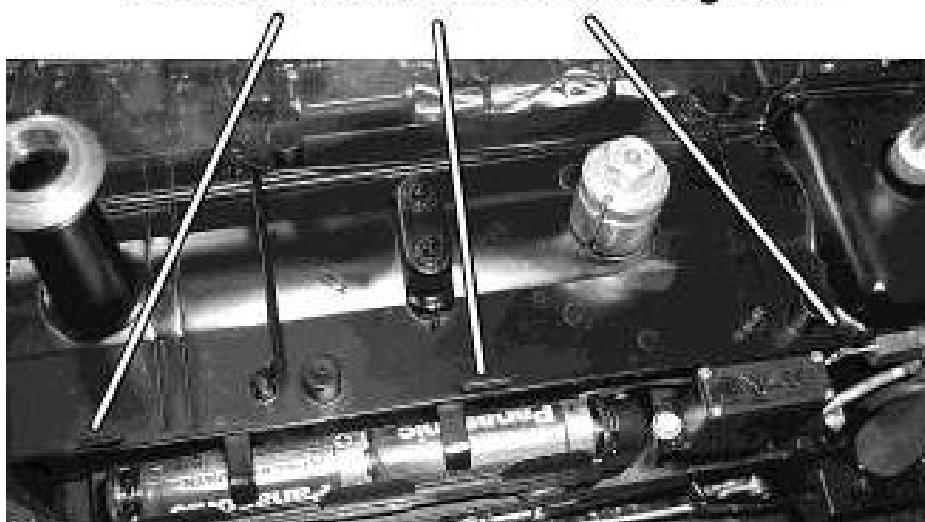
You will then be able to gently sit the side tank down onto the three top slots and then into the remaining rear, bottom slot. Finally, replace the Side Tank Retaining Screw.

DRIVING THE LOCOMOTIVE

First, turn on the transmitter and then switch on the receiver on the locomotive with the switch under the right hand side tank.

Open the drain cocks

Slots for the Side Tank Locating Tabs



if fitted, by moving the right hand control lever fully over to the left. This will direct all exhaust out of the two pipes, facing forward, below the cylinders

Select the desired direction of travel by moving the left hand lever fully over to either the left for forward or the right for reverse, and then slowly open the regulator a little by moving the left hand lever upwards. The locomotive will now move slowly off and the speed can be controlled by moving the lever slowly up or down. The regulator is quite sensitive and should be used with care.

When the cylinders are cold, there will be a certain amount of water in the steam pipes and cylinders that will cause the locomotive to be a little jerky on initial movement. This is condensed steam and is a condition commonly known as priming and is quite normal. After a few moments, this will clear from the system as the cylinders quickly warm up and running will become smooth. The drain cocks can now be closed and the exhaust will exit from the chimney.

If drain cocks are not fitted, the condensate will exhaust inside the chimney and drop down between the rails from a vent hole in the base of the smoke box.

During the run, there will always be a small amount of condensate and oil dropping down through this vent hole whether drain cocks are fitted or not. Some of this will fall onto the hot super-heater inside the smoke box and can be heard as occasional spitting and popping and is quite normal.

The art of fine control will soon be learnt with a little practice.

The drain cocks, if fitted, can be opened and closed at any time, but it is good practice to open them before moving off, whenever the locomotive has been stationary for any length of time. With the right hand lever in the mid position, steam will exhaust from both the drain cock pipes beneath the cylinders and up the chimney at the same time.

NOTE: Always keep the reversing lever fully over in the required direction when the engine is moving. The model is fitted with a

simple reversing valve gear and is not capable for 'notching up' (altering the valve cut off).

Always bring the locomotive to a halt by closing the regulator before changing direction.

Always ensure that the regulator is closed and the reversing lever is in the middle position (mid gear) before switching off the transmitter.

Always switch off the receiver and transmitter when not in use to preserve battery life.

It is good practice to switch on the transmitter before the receiver and switch off the receiver before the transmitter. In this way, the radio receiver is never on when the transmitter is switched off and so should always be under your control.

When the batteries are getting low, a poor signal between transmitter and receiver will result and control of the engine will become erratic. The batteries should be replaced immediately.

WATER TOP UP SYSTEM

A water top up system is fitted to this model. This enables the water level in the boiler to be monitored and topped up to keep the engine in steam for long periods.

Once the locomotive is in operation as detailed in the previous sections, water can be added to the boiler at any time during the run as follows.

Fill the water pump bottle from your usual water supply.
Bring the locomotive to a halt in a convenient place and carefully remove the brass plug from the top of the steam dome.

NOTE: this will be hot and a pair of cotton gloves is provided in the tool kit.

Push the end of the plastic tube down through the hole in the top of the steam dome and into the socket in the top of the water filling

valve. Whilst still holding the pipe in position and exerting slight downward pressure, pump the handle and this will inject water into the boiler.

You will sometimes see water and air bubbles passing through the sight glass as you pump so allow the level to settle after a few pumps. Carefully pull the plastic pipe out of the water filling valve whilst steadying the engine.

Sometimes, small particles of dirt will find their way in with the water and may cause the water filling valve to leak back a little when the pipe is removed. If this should happen, re-connect the pipe and give a further pump or two of water to clear it.

As the filler valve sits vertically on top of the boiler, a small amount of water will remain in the socket once the plastic pipe has been removed and will boil off as the fittings return to normal operating temperature. This is quite normal.

Replace the brass plug in the steam dome.



Once you start running your loco you will see the water level in the gauge slowly dropping. Note that air bubbles may sometimes form in the gauge giving a false reading but these can be pushed out by connecting the pipe from the water pump to the water filling connector – and injecting some water.

It is better to pump small amounts of water into the boiler at frequent intervals as this maintains a more even boiler pressure and prevents long waits while the cold water heats up and pressure returns to normal operating level.

Aim to keep the water level between $\frac{1}{2}$ and $\frac{3}{4}$ up the gauge and re-fill the gas tank as detailed earlier whenever it is empty. In this way, you can keep the loco in steam and at working pressure as long as you like.

Don't forget to re-fill the displacement lubricator about every 45 minutes.

STEAM WHISTLE

The radio controlled steam whistle, if fitted, is mounted under the left hand side of the cab footplate and is operated by the right hand control stick on the transmitter. The control stick is normally at the bottom of its movement and pushing it up will open the whistle valve. It can be operated at any time provided there is sufficient steam pressure in the boiler, and the locomotive can be stationary or moving.

The whistle incorporates a restrictor valve to keep the volume and pitch reasonably consistent over a wide range of boiler pressures and to reduce steam consumption.

TROUBLESHOOTING & MAINTENANCE

On a working model of this nature, it is important to keep all working parts well lubricated as detailed in the lubrication section.

With constant heating up, cooling down and the stresses of hard work, screws etc. can work loose so, it is good practice to check all fixings and cylinder screws regularly, particularly when the model is new, but remember, never over tighten.

STORAGE BETWEEN OPERATING SESSIONS

At the end of an operating session, it is good practice to clean the locomotive carefully with a clean soft cloth, and to oil all bright metal parts.

- * Do not leave fuel or water in the tank or boiler for long periods.
- * Do not store in places where the temperature may drop below freezing as water may still be present in the pipework.
- * Ensure all controls are closed and the valve gear in mid gear.
- * Ensure that radio control equipment is switched off.
- * Remove batteries from the locomotive and the transmitter.

Periodically it may be necessary to wash off all traces of dirt and old oil from the moving parts with paraffin (not thinners). This will remove any accumulations of dirt or grit. After washing with paraffin, leave to dry thoroughly overnight before re-oiling. It is most important that clean oil is applied and allowed to penetrate fully into all moving parts before the locomotive is run again. Manually moving the locomotive back and forth will assist in distributing the oil fully. Under normal operating conditions this procedure should not be required more than once or twice per year.

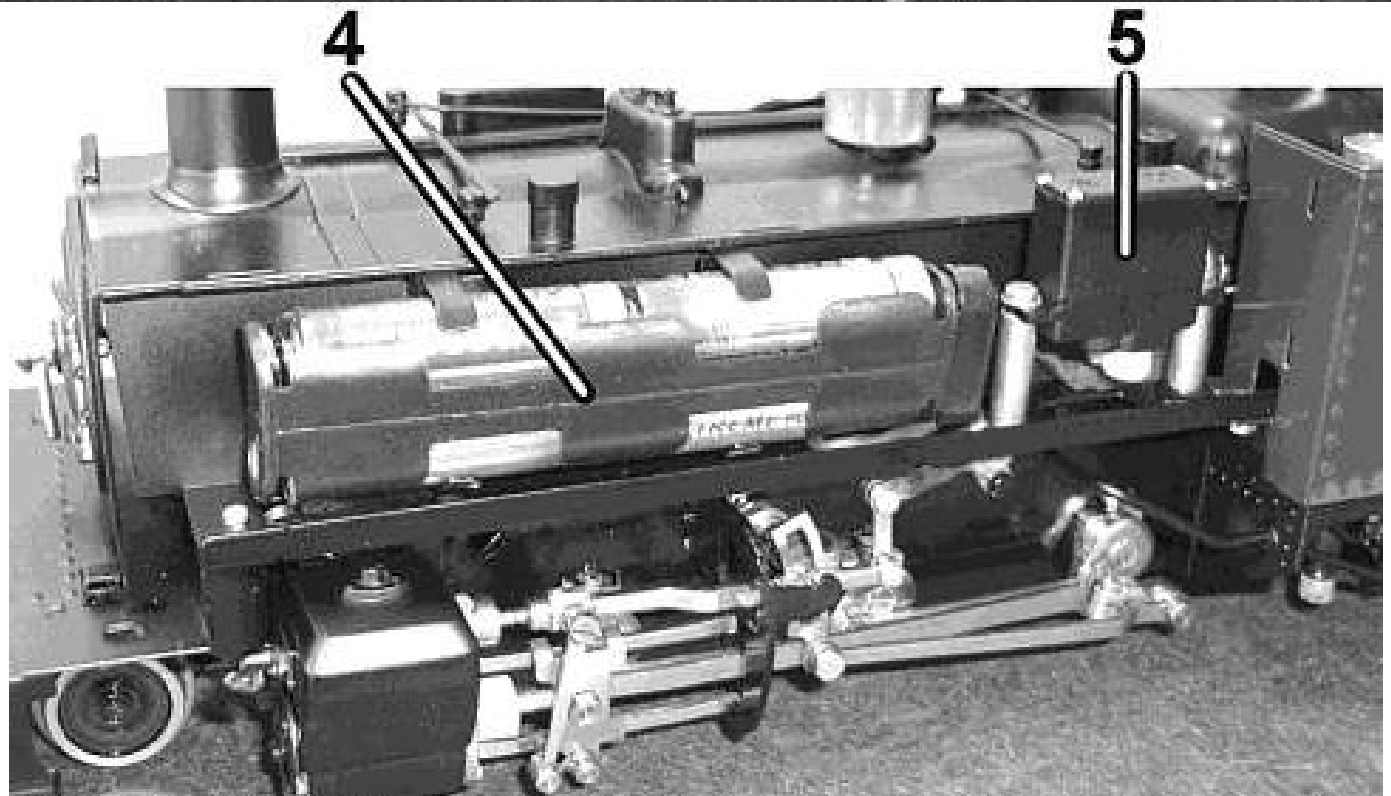
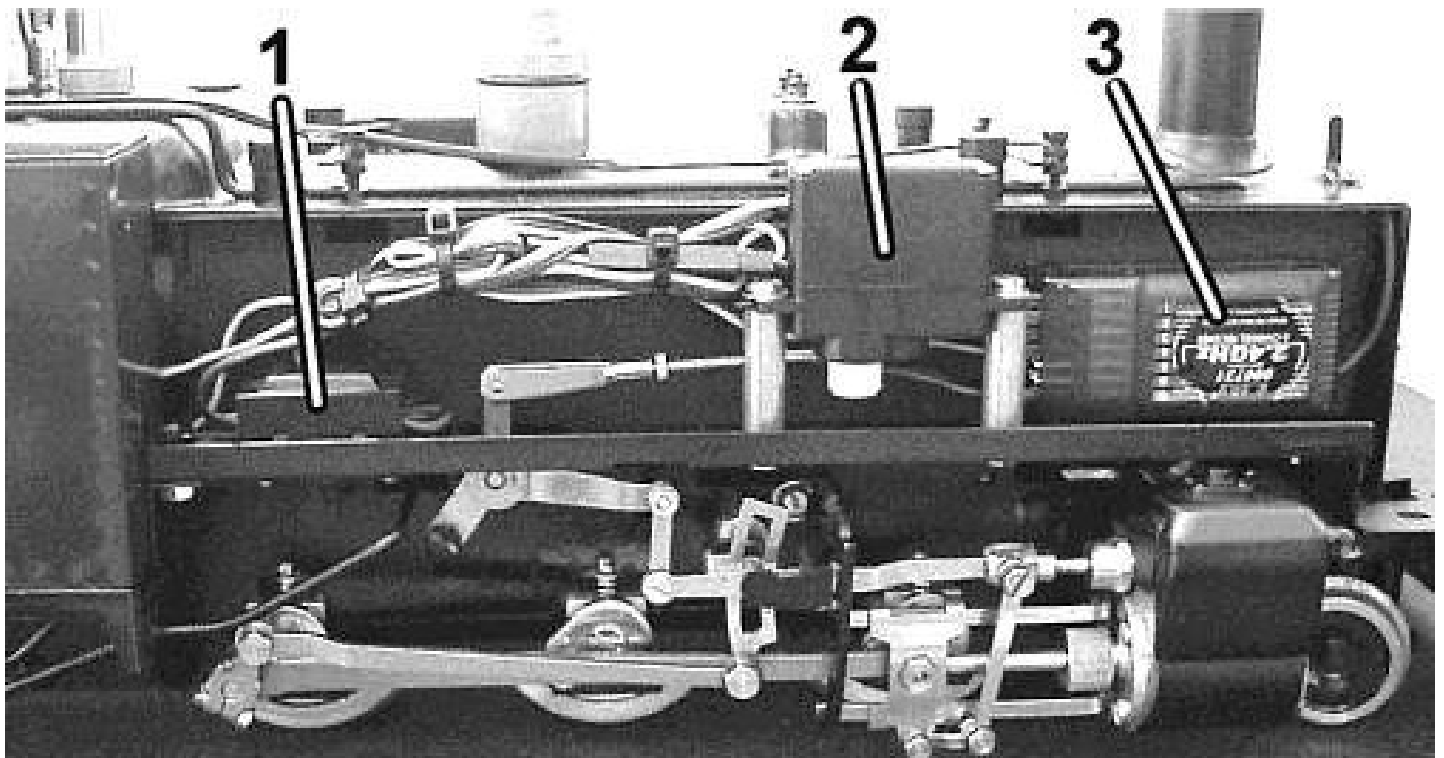
STEAM LEAKS

The cylinders are fitted with 'O' rings in the glands sealing the piston and valve rods. These can be adjusted with a spanner if steam leaks develop. They should only be tightened just enough to stop the leak, as over tightening will affect the running of the model.

Cylinder front and rear covers are retained by small brass cheese head screws (4 per cover) and these can be lightly 'nipped' up from time to time, if steam can be seen leaking past the gaskets that seal them.

The cylinder valve chests are sealed by 'O' rings and should not require attention however, in the unlikely event of a leak developing at the joint, proceed as follows.

Remove the relevant tank side as detailed in the radio control section.



Inside the side tanks.

Right hand side.

- 1) radio control on/off switch.
- 2) reversing servo.
- 3) receiver.

Left hand side.

- 5) batteries.
- 6) whistle valve servo.

Remove the dummy cylinder cover by springing it gently outwards from the bottom then lifting the top off the back side of the valve chest. You will now see the four countersunk brass screws that fix the valve chest to the cylinder block. Carefully 'nip' these down. There are access holes in the side tank base panels above, for access to the inside screws but it may be necessary to remove the battery pack or receiver first.

REGULATOR NOT SHUTTING

The steam regulator seating and seal can, after a period of time become worn or compressed so that when the lever on the radio control is fully closed, the locomotive still moves. To overcome this, a trimmer is fitted to the transmitter. This is the small lever at the side of the main control lever (see diagram earlier) and is set at the factory to the top of its slot. As wear takes place in the regulator, it can slowly be moved down the slot to compensate. When it reaches the bottom, it is time to reset it to the top and adjust the linkage between the servo and the regulator in the cab. If adjustment does not cure this problem, the internal 'O' ring is probably damaged and requires replacement. Contact the factory for further advice. Periodic oiling of the gland will help keep the regulator working freely. Place a spot of motor oil between the gland nut and the regulator arm and work the regulator a few times.

RADIO CONTROL

The radio control equipment is housed in the side tanks. To access it, the outer side tank must be removed. Lay the locomotive on its side on a protective cloth with the side to be removed uppermost. Remove the cheese head screw that passes up through the front footplate, between the cylinder and the front step. It locates by tags, three along the top and two into the front of the coal bunkers. Carefully slide the outer side tank cover forward then upwards about 3mm then lift it clear. There is a large and heavy brass block in the front of the side tank, into which the retaining screw fastens and this sits loosely in the tank. Take care as you lift the tank away, not to drop this out as it may cause damage to the model.

If the radio control gives problems, always check the batteries first and replace if necessary.

The radio control system is carefully set up during assembly of the locomotive. Do not alter any of the factory settings and ensure all trimmers are in the correct position as detailed in the Radio Control System section earlier.

If problems occur whilst running the locomotive near other R/C engines, check that yours is on a different frequency.

For more information on using the radio control equipment, see the manufacturer's instruction booklet supplied with the Radio Control Set.

GAS SYSTEM

Internally fired locomotives are fitted with our 'FG' type gas burner, which is set up and fully tested at the factory.

This system is designed for use with Butane or Iso-Butane gas. Mixed gasses, i.e. Butane with a proportion of Propane mixed in, are available, and may be used if straight Butane is unavailable. These come in a variety of mixes ranging from 90/10 to 60/40 with one of the most common being 70/30. The figures refer to the proportions of the mix i.e. 70/30 contains 70% butane and 30% propane. If using mixed gasses, always choose the one with the largest proportion of butane. The addition of propane slightly alters the gasses properties. This can make the burner a little more difficult to light when cold or after filling the gas tank. Always open the regulator very slowly when lighting, and only just sufficient for ignition to take place. Opening too much too soon may extinguish the flame until the burner reaches normal operating temperature.

The tiny jet in these units can become blocked by small particles of dirt making the burner difficult to light, burn weakly at normal operating temperatures*, burn in the smokebox or fail completely. If any of these should happen, clean out the jet as follows.

(* On very cold days, a burner may start off burning weakly due to the temperature of the gas but should increase to its normal level as the engine warms up. This is quite normal)

Carefully, disconnect the gas pipe from the gas jet holder using a

2BA spanner.

Note when connecting or disconnecting the gas pipe and gas jet holder, do not use excessive force. Always hold the end of the gas burner near the air holes to support it otherwise it is possible to cause damage by bending the body. Slacken the screw retaining the gas jet holder and slide it out to the rear. Remove the jet from the jet holder using a 4BA spanner. Wash out the jet in fast evaporating thinner (Cellulose or similar). Blow through the jet from the front, which should clear most blockages. Although the hole through the jet is tiny, if you hold it up to the light you should be able to see quite clearly if it is blocked or not. If in doubt, fit a new jet. A spare gas jet is included with the toolkit.

Do not use wire to clean the jet as this can damage the precision hole and may upset the delicate balance of the gas system. Re-assemble in the reverse order, putting a small amount of PTFE tape round the thread of the jet. Ensure all connections are tight. When re-positioning the gas jet holder in the burner, ensure that it is pushed in as far as it will go.

The gas regulator has a spindle 'O' ring housed inside the body which may need lubrication from time to time if the control becomes 'spongy' in operation, making precise gas control difficult.

As stated in the lighting instructions earlier, the full range of adjustment for normal burner operation is achieved within the first full rotation of the regulator knob, and it should only be unscrewed more than this for maintenance purposes and when the tank is empty, and there are no naked lights nearby.

To lubricate it, remove the knurled knob which is retained by a M3 socket grub screw (M1.5 AF Allen key required) in the side. This grub screw is accessed by first removing the brass lever which is screwed into the same hole.

Beneath the knob is a back-lash spring which will slide off the spindle.

Unscrew the hexagon retaining nut then screw the spindle out of the body.

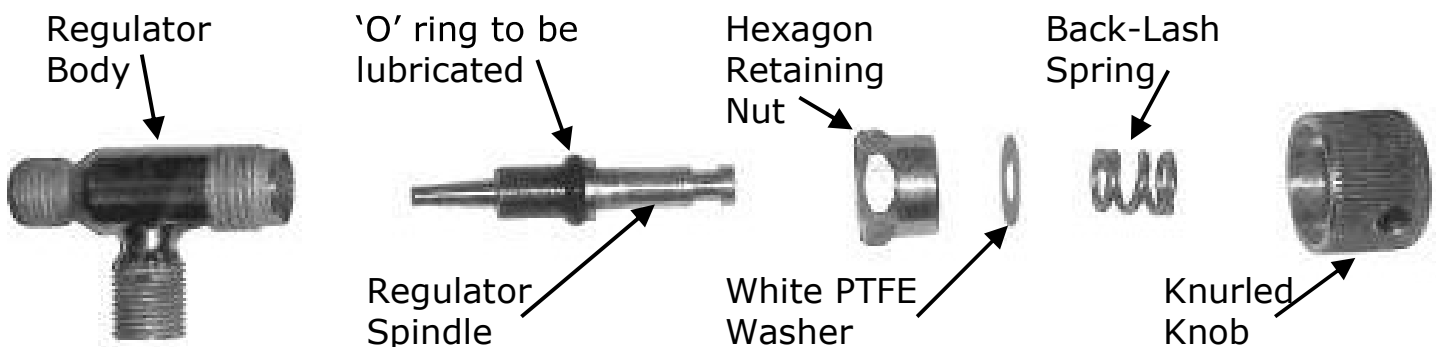
The 'O' ring can now be lubricated.

Replace the spindle followed by the retaining nut. Slide the backlash spring over the spindle and replace the knob. Note that the grub screw that holds the knob in place tightens into a groove near the end of the spindle and should be in a position that allows the side handle to be screwed in and operate the regulator without fouling other controls or the cab side.

WATER TOP-UP SYSTEM

Over a period of time the end of the plastic filling tube that pushes in the boiler top-up valve will become a loose fit due to the heat of the fitting. To cure this, simply cut approximately 6mm from the end of the tube when necessary.

Gas Regulator (Internal Parts)



Please refer to the 'owner's handbook' for your particular model of locomotive, for details on correct use of these pressure vessels.

Pressure vessel care and maintenance

Gas tank

The gas tank is used for the storage of LPG (liquefied petroleum gas) in the form of butane, iso-butane or as set out in the 'owners handbook'.

The tank is fitted with a self-venting filler valve which contains no serviceable parts. Should the filler valve become defective in any way, it must be replaced with a new item.

It is recommended that the gas tank should undergo the following checks, carried out by a 'competent person', club, society or pressure vessel manufacturer, every year:-

- 1) thorough visual inspection.

And every five to ten years:-

- 1) hydrostatic pressure test to not less than 1.5 and not more than 2 times the maximum working pressure.

Boiler

The boiler is fitted with a safety valve to prevent the steam pressure rising above the maximum allowable working pressure. This is pre-set to open at between 2.38 bar (35 psi) and 2.72 bar (40 psi) and must not be adjusted to increase this value.

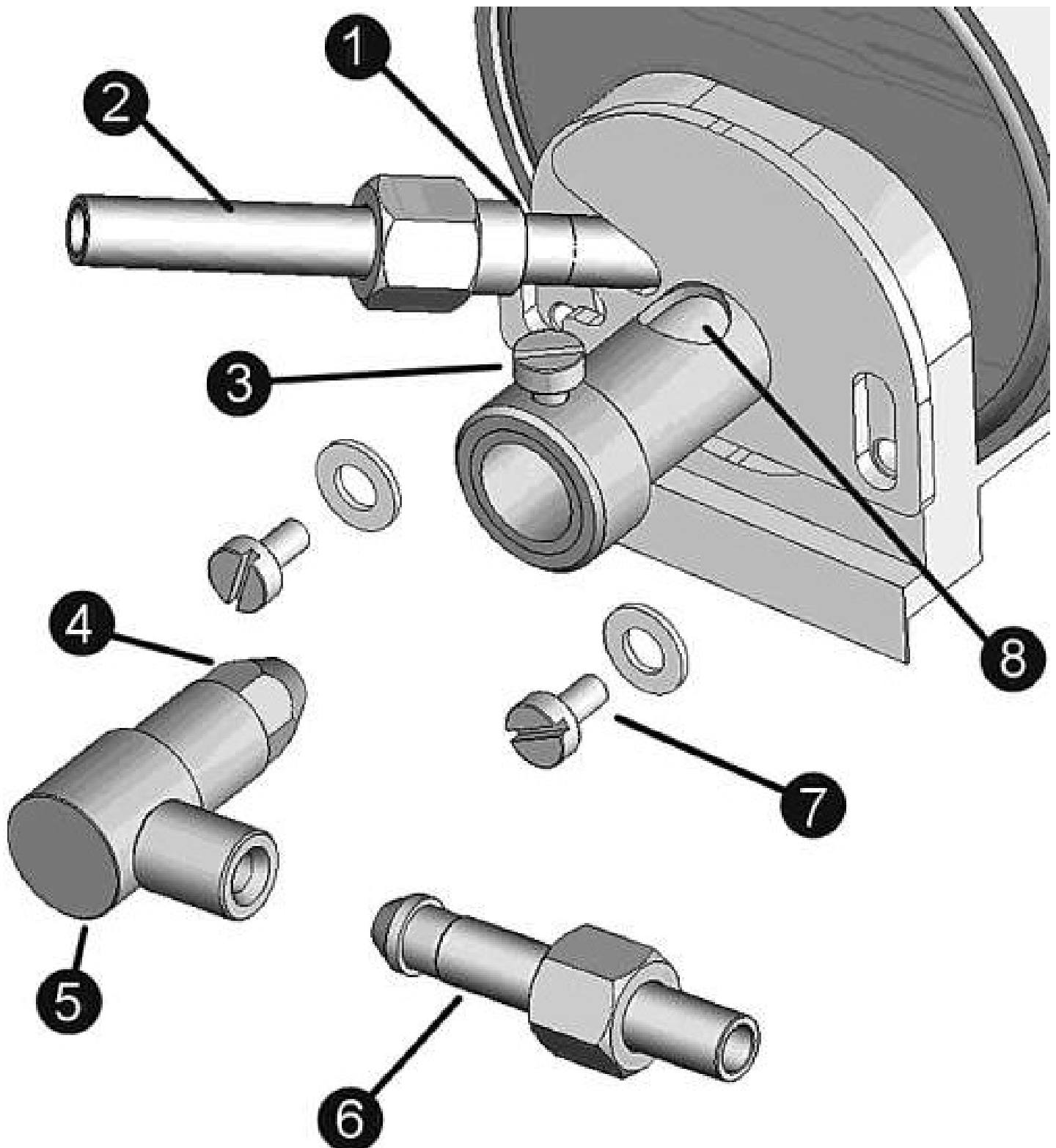
If the safety valve becomes defective in any way, it should be replaced or returned to the factory for service and calibration.

It is recommended that the boiler should undergo the following checks, carried out by a 'competent person', club, society, or pressure vessel manufacturer, every one to two years:-

- 1) thorough visual inspection.
- 2) hydrostatic pressure test to not less than 1.5 and not more than 2 times the maximum working pressure.
- 3) steam test to check the correct functioning of all steam controls, gauge and safety valve.

Gas Burner

- 1). Superheater Pipe. 2). Lubricator Pipe.
- 3). Gas Jet Holder retaining screw. 4). Gas Jet.
- 5). Gas Jet Holder. 6). Gas Pipe.
- 7). Gas Burner fixing screw. 8). Air Inlet Holes.



SERVICE AND PARTS

If any problems arise with this model which are not covered in these operating instructions or, spare parts are required, owners should first contact their local dealer. Your **ROUNDHOUSE** dealer is;



If your dealer is unable to help, you may contact the Factory directly:

ROUNDHOUSE ENGINEERING CO. LTD.

Units 6-9 Churchill Business Park. Churchill Road.

Wheatley. Doncaster. DN1 2TF. England

Telephone 01302 328035 Fax 01302 761312

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