

Submitted by:- Adam Gorski

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## Driving Locomotives- The Butch Way

*I have written this article because it is the sort of information I wish I could have read before my initiation into the pleasures and problems of operating a small locomotive some years ago. It attempts to be a fuller description of what it is like to prepare and drive a steam engine than is usually published, and so be of greater use to those who have not yet had a go. Naturally one cannot learn to drive a steam locomotive from a set of written instructions since it is a job which needs to be learnt from practical experience. However this detailed treatise can provide a source of reference which can be used to compliment the practical work. My thanks to Jim Macdonald and Tom Luxford for their reassuring and practical advice and John Squire who encouraged, accompanied and instructed me on my first trip on the Tyttenhanger main line with a locomotive.*

The various aspects of the hobby which come under the general title of railways are so varied it's no wonder we become such ardent enthusiasts and no wonder it is often difficult to pin point exactly why. Stations, the track and areas through which it passes, rolling stock, goods yards, shunting, railway owned road vehicles – the list is as long and tenuous as you like and can hopefully persuade those who are not interested (yet) that there is more sense in it than the commonly held view of 'grown men playing trains'

Some preserved railways have education officers with good reason as history and geography, to name but two subjects, are inextricably linked with railways and their offshoots.

But if this is 'a long preamble of a tale', to quote a dimly remembered line from school, the main focus for most is the steam locomotive and operating it – a more acceptable description than the commonly held view referred to previously.

The Club loco Butch, acquired from the late Arthur Marsh whose name it bears, is a good type to learn on. A Kennion design now marketed by GLR, it is of manageable size yet quite a powerful 5" gauge 0-6-0T, often used at fetes. A number are owned or are under construction by members and details such as cab layout may vary according to builder's preferences.

### **Water**

To run on the main line at Colney Heath, one of the longer steaming bays, if vacant, is useful for moving the loco up and down. Check the boiler has water in it – the water gaugeglass, situated on the boiler backhead, right hand side and set at an angle should be two thirds full. The water level will bob up and down if you move the loco to and fro by hand, indicating a true reading as the water surges in the boiler. Ensure the side tanks are full of water and use the hand-pump, situated in the bunker at the rear of the loco, to obtain the correct boiler level if necessary. Exercise care as the handle works from side to side and rocks the loco somewhat. An axle-pump fills the boiler whilst running and is so efficient as to render the hand-pump mostly redundant when in motion. The axle-pump can be seen functioning by opening the by-pass (under the large pressure gauge on the left of the backhead). Turn a few times anticlockwise to open; temporarily move the gauze filter from the left side tank filler hole, whilst pushing the engine a few feet. Water will be seen squirting rhythmically from the end of the bypass pipe. Now close the by-pass (clockwise).

## Cylinder Lubrication

Open the draincocks if not already done (The lever is on the left side of the cab floor and should be pulled back.) and if you push the loco hissing noises will be heard as the pistons alternately draw in and expel air through the draincocks, which will also squirt out a residue of thick steam oil signifying the cylinders were manually oiled at the end of the previous run. It is not unusual for this oil to be opaque, orange-brown due to the presence of condensed water and a little rust, as the cylinders are cast iron.

The cylinders' mechanical lubricator is the large running board-mounted box to the right of the smokebox. Take out the brass filler cap and see if there's any oil inside, dull green in colour. Top up to about ½ inch below the top of the filler and, cap replaced, prime the pipes to the cylinders by pressing the two push buttons down on the front of the lubricator. About a dozen times should suffice. Note, the oil should be proper 'steam oil'. Most people prefer heavy grade available from, amongst other sources, NLSME member Terry Baxter. It also appears dull green in the bottle, while a small drop is amber and of syrupy consistency.

## Chassis Lubrication

It only remains to go round the loco with a traditional oil can of conventional lubricating oil, attending to the various bearings of the Walschaert's valve gear on each side of the chassis. Oiling of the axles is taken care of by a pair of drip feed lubricators mounted on the front of each side tank, so flip open their lids and fill them with oil. This should be quite thin and light in colour as it is drawn into the six axlebox feed pipes by wicks clearly visible inside each drip feed lubricator. A suitable oil is also available from Terry.

Though most people are conscientious about steam oil, which 'conventional lubricating oil' to use is more vague. 'Car engine oil' is often referred to in books but one of our members stated this only starts lubricating at the high temperature generated in cars and is unsuitable for loco bearings. The pioneer of small locomotives, LBSC recommended Etna Medium as used for his workshop machinery, 'but a good grade of motor oil will do such as Castrolite, Mobiloil A or similar'. This is quoted from his loco design articles for 'Mona' in Model Maker magazine, 1954, so their composition and properties doubtless differ from today's products.

Maxitruk Ltd, however, recommend SAE 30 (4 stroke lawnmower) oil for their loco bearings and this is also mentioned by Myfords for certain parts of their lathes. It is slightly thinner than the stuff car engines consume, as is the most interesting recommendation by another NLSME member –chain oil sold by garden machinery dealers. Intended for chain saws and sprocket chains, its anti-fling properties prevent it from migrating from where it is needed and spraying off to coat, for example, the underside of running boards as in the case of coupling rods/wheel crankpins. A visible test of this can be contrived if a drop of chain oil is placed between the thumb and forefinger which are then successively closed together and opened; the oil will string like glue, unlike other oils which spatter tiny droplets.

## Paraffinised Charcoal and Cleaned Flues

At last the most exiting part of operating a locomotive, building up a good fire whence the loco will raise steam and come alive. A supply of charcoal should have been soaked in paraffin for a few days beforehand in say a tightly lidded jar, tin or plastic container. Kerosene (central heating fuel) or barbecue lighting fluid are to all intents and purposes the same as paraffin. Strain off and store the soaked charcoal in a closed tin. I use a round travel sweet tin which holds enough for a loco the size

of Butch. In fact better carry two or three such tins and have some spare charcoal.

Before loading the firebox it is as well to see that the ashpan and grate have been cleaned and replaced and that the boiler tubes are clean. Open the smokebox door (a few turns anti-clockwise of the outer handle followed by turning the inner handle through 90 degrees). Then open the firehole door and at least some of the tubes should be sufficiently illuminated by daylight to give an idea of whether they need sweeping. Alternatively use a small torch or just go ahead and gently poke a flue-brush through. Clean unblocked tubes are CRUCIAL to good steaming. On many locos the ashpan is meant to be removed together with the grate, but not on this one as the firebox lies above the obstructing trailing axle, so the ashpan has to be screwed to the chassis frames. Cleaning is effected by carefully raking out the ashes through the open back of the ashpan, a long narrow strip of metal with the last inch bent at right angles, or even a flue brush can be pressed into use for this.

Assuming the grate was cleaned at the end of the previous run, as it always should be (instructions will come later) one can now cover it with a layer of paraffin charcoal. The grate is about four inches long by about two and a half wide. With a shovel about an inch wide and two inches long, six doses should do and it is more convenient if the shovel's handle is bent at an angle to the blade to enable it to negotiate the cab rear and coal bunker which, on this engine, are not cut away down to footplate level.

### **Fanning the Flames**

Put an electric fan blower in the chimney and plug it into the 12-volt DC socket under the end of the steaming bay track. Balance a lump of paraffin charcoal on the bottom edge of the firehole. Apply a lighted match to it and poke it into the firebox. Ensure the smokebox door is closed firm and switch on the blower, whereupon the charcoal will leap into flame or perhaps go out! Only a few attempts should be necessary. Judicious use of a poker (made from 3/16" diameter steel rod with a slightly angled, pointed end) to distribute the flame round all the charcoal should help, as will a slight delay in switching on the electric blower. Add a few more shovelfuls of paraffin charcoal and close the fire door.

Now may be the last chance to double check the steam valves are shut while the boiler still has zero pressure in it: The regulator in the centre of the backhead is closed when fully closed ANTI-clockwise. The steam blower handwheel, next to the pressure gauge, and the injector steam valve, above the water gauge, are closed when turned fully clockwise, as is the water gauge blowdown valve, the little white handle beneath the gauge glass. You might like to check the boiler blowdown valve is closed, also clockwise:– Lift out the removable segment of footplate under the firedoor and the blowdown knob is on the bottom left of the backhead and is gently turned with the aid of a thin rod or nail inserted into one of the holes. Most importantly and for obvious reasons make sure the reversing lever by the right hand cab door is in mid-gear position.

### **Making a Hot Charcoal Bed**

You should also have a tub of dry charcoal which can now be added to the fledgling furnace, a couple of shovelfuls at a time, in order not to smother it. If the fire seems to be waning, add some more paraffin charcoal, otherwise try to use the dry charcoal as the dense and rather odourful paraffin smoke deposits much more soot than the clean burning dry charcoal. Incidentally, the charcoal should be of the lumpwood variety and broken up into pieces between half an inch and an inch in size, with the dust sifted out. Add some more paraffin charcoal then dry charcoal until almost level with the firehole and close the firedoor. The fire should be burning quite well now. In fact the crackling and roaring noises from the firebox and the occasional flurry of embers from the noisy blower are a little startling after the relative peace of the initial preparation stages.

With the charcoal forming a nice hot bed for the coal to lie on, put a couple of shovelfuls on now, evenly distributed. Genuine steam coal is provided for use in Club locos (a charge is made if it is for your own loco) at Colney Heath and it is well worth sieving it beforehand to remove as much dust and small particles which would otherwise accumulate in the bottom of the smokebox and add to the burden of cleaning, or worse, find their way up the chimney, covering the top of the engine and, at best, just the driver. This will inevitably occur to a certain extent when the coal breaks down as it burns, but why add to it? A few years ago 'BUTCH' sported a rudimentary smokebox fitted spark arrestor but this fouled free access to sweeping some of the tubes unless removed. Currently its chimney cap has a removable spark arrestor. More about these devices later.

### **Coal and the Walking Needle**

Gradually add more coal aiming for even distribution, not just a heap, and look at the pressure gauge, the needle of which should be 'walking round the clock' as LBSC would say. As soon as it reaches 20 or 30 pounds per square inch the blower can be removed and switched off (mind it's hot) and the loco's blower switched on – the handwheel next to the pressure gauge. The noise emanating from the chimney can be varied from a whisper to a fierce roar, and towards which extreme depends on the state of the fire: If the top of the freshly applied coal is still black, adjust the blower towards the 'roaring' end of the scale. If the top of the fire is burning bright, only a whisper is necessary. Remember a roaring steam blower wastes steam and coal, so always aim for the lowest quietest setting while maintaining an even, reasonably deep fire.

### **A Full Head of Steam**

It's all very well watching someone else operating a steam loco and making it seem easy by way of their relaxed manner, but this belies the extreme concentration required. By the time the pressure gauge shows 30 pounds you will have begun to feel that the process of steaming up has taken on an air of urgency to say the least; the level in the water gauge, which you must always keep an eye on – LBSC called it the 'engineman's nightmare' – will not only have started RISING, due to expansion of water as it heats up, but will bob up and down like the waves on the sea, or worse, develop a bubble and make reading the true water level difficult. Operate the water gauge blowdown valve (just a brief open-and-close) but don't be alarmed when the water level momentarily disappears below the bottom of the glass (or the 'bottom nut'). It should immediately return when the blowdown valve is closed, minus the bubble.

At this stage with the coal burning in the firebox and the engine's own steam blower at work, one can really appreciate the descriptive truth of the term 'live steam', which whenever it appears in print, always grabs the attention and immediately conjures the image of a sizzling, steam enshrouded locomotive, invitingly waiting for one to get behind the controls and drive away down a country railway line. The driver's eye view of rails and sleepers wending forth to some unseen idyll of a rural station is arguably unrivalled by any path or roadway.

If you wait any longer the pressure gauge needle will be at the working pressure of 80 pounds and the safety valves will lift and hiss satisfyingly, a white plume rising forth – a full head of steam! Not only will excess boiler pressure be relieved, but so will one's anxiety about whether or not the safety valves are working at the correct boiler pressure. Turn down the blower to the merest whisper, pop a couple of shovelfuls on the fire and get ready to take to the rails.

**To be continued**

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*Adam Gorski*