

## ROUNDHOUSE

### 'Millie' R/C Fittings Kit

This pack contains the following parts:-

- 1 Regulator servo mounting bracket.
- 1 Regulator control rod (Push rod).
- 2 Pushrod connectors, screws & Starlock washers.
- 1 Steam regulator (R/C type) & washers.
- 1 Regulator arm & Allen Key.
- 2 M3 x 6 CH screws, Nuts & Washers.

### **You will need to supply:-**

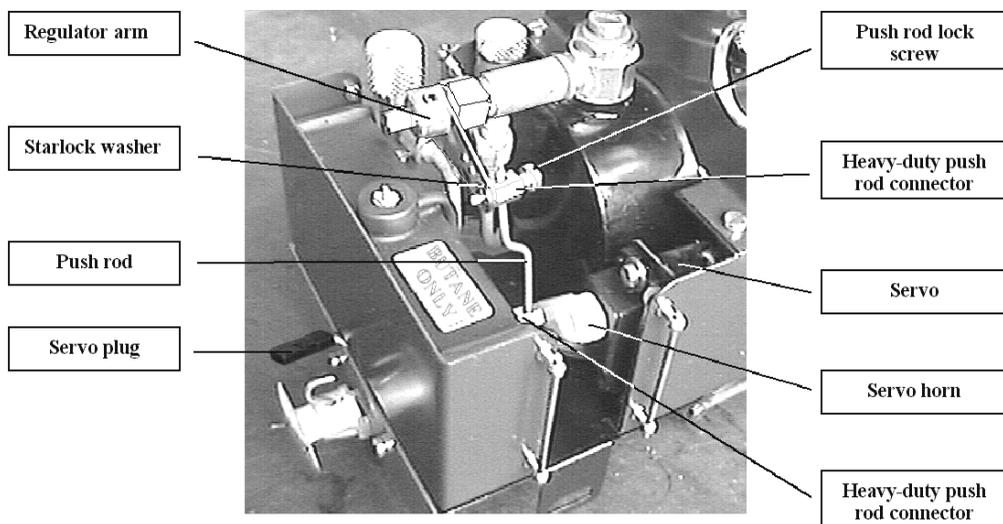
*A radio control set complete with transmitter, receiver, switch harness and one micro Servo. You may also require a servo extension lead.*

*If multi-channel equipment is used, only one channel will be required for this locomotive.*

*A tender, truck or other suitable wagon in which to house the radio receiver, switch and batteries.*

### **Fitting Instructions.**

If you have a full cab fitted, remove the cab roof and back for better access. If you have a boiler top up system fitted, remove the gauge glass for safety.



A replacement R/C type regulator is supplied with this kit. Although externally it looks the same as the manual type fitted to the loco, internally it is quite different. It is designed to operate with a servo where a small amount of movement must give full control from closed to fully open. It also relies on an internal 'O' ring to ensure that it closes fully with the minimum of force.

Disconnect the steam pipe from the regulator using a 2BA spanner and then remove the regulator from the turret by unscrewing it. This is fitted with a small amount of thread sealer so may be a little tight to start off.

Using one or two of the new fibre washers fit the new regulator in place of the old one. Ensure that the steam take off from the regulator ends up pointing down to line up with the steam pipe connector. Two fibre washers are provided. You may have to fit either one or both of these. It may be necessary to file one of the fibre washers thinner by rubbing on a file or emery paper until the correct position to line up with the steam pipe is achieved.

Re-connect the steam pipe.

Fit a micro servo to the servo mounting bracket using the M3 x 6 screws, nuts and washers as shown in the diagram. Note that the spindle and cable of the servo should be at the top.

Temporarily, connect the servo, switch and battery holder to the receiver as detailed in the manufacturer's instructions. If necessary, remove the spring which self centres the left hand control arm (usually channel 2) on the transmitter (see manufacturer's instructions). Fit batteries and switch on both transmitter and receiver.

Moving the left hand control arm on the transmitter up and down should now cause the servo spindle to rotate. Set the left hand control lever on the transmitter to the bottom and ensure that the trimmer at the side of it is at the top. This will park the servo in its normally closed position.

Prepare a servo horn with a single arm and a connector hole about 15mm from the centre of the mounting boss and then fit the servo horn so that it is pointing to roughly halfway between 7 and 8 on a clock face and fix it in place with its retaining screw. When the left hand control lever is moved upwards, the servo horn should rotate clockwise. If it travels anti-clockwise, use the servo reverse switch on the transmitter then reset the horn as above.

Push one of the brass heavy-duty push rod connectors through the hole in the arm from the opposite side to the mounting boss that fits

over the servo spindle. Push a star lock washer on from the back to retain it then fit the push rod locking screw from the front.

Fit the push rod into the connector, making sure that the bend is positioned as in the diagram, and tighten the lock screw.

The servo cable can be fixed to the side of the servo with insulating tape so that when fitted, it sits in the space between the servo and cab side.

Remove the front right hand cab handrail (two 8BA nuts) and sit the servo and bracket into that side of the cab. There is a mounting lug on the bottom of the bracket that fits into a short slot on the footplate and the handrail knobs and nuts fix it to the cab side. The bottom nut is a little tricky, but if you fit that one first and use a pair of tweezers to place the nut, it will be much easier.

Pass the cable under the servo, across the top of the footplate and down through the hole with the gas pipe. Remove the rear buffer beam and file a small notch in its top edge, about 10mm left of centre, so that the servo lead will sit in it with the plug on the outside. Re fit the buffer beam.

Fit the second heavy-duty push rod connector, 'Starlock' washer and lock screw to the regulator arm on its 4<sup>th</sup> hole, once again on the opposite side to the mounting boss.

Turn the regulator spindle clockwise with your fingers to close it, but do not force it. Fit the regulator arm to the spindle with the heavy duty push rod connector pointing to the front of the loco, placing it between 4 and 5 o'clock on a clock face, and nip up the grub screw using the Allen key provided.

With the radio control switched on so that the servo is held in the fully closed position, connect the regulator arm to the servo horn as shown in diagram and nip up the push rod lock screw.

When the left hand control lever on the transmitter is moved upwards, the servo horn will rotate upwards (clockwise) and push the regulator arm up (anti-clockwise).

Re-fit the pressure gauge if applicable.

Re-fit gauge glass if applicable.

Setting and adjustment of the regulator is best done with the locomotive in steam and with the chassis supported on two wooden blocks to raise the wheels off the bench. Ensure that the regulator is closed when raising steam.

With full working pressure raised, switch on both transmitter and receiver and move the locomotive into gear by carefully rotating the wheels one full revolution. Open the regulator by slowly moving the left hand lever upwards and find the position at which the engine starts to run. Move the arm backwards and forwards a few times to establish the position at which it closes and leave it there. If the regulator does not open or fails to close fully, slacken the grub screw holding the regulator arm in place, remove the arm and turn the spindle manually (careful as its hot!) to find the point at which it just closes.

Move the control lever on the transmitter to the bottom and replace the regulator arm. Proceed as before to find its closing position and leave it there. Carefully slacken the grub screw and move the control lever to the bottom without moving the spindle. Nip up the grub screw. You can make fine adjustments to the linkage now until the regulator closes fully with the control lever at the bottom. Because of the 'O' ring used in the R/C type regulator, you should aim for the wheels to start moving when you have moved the control lever on the transmitter about halfway up. This is because the 'O' ring will compress slightly into its seat when fully closed. You may need to adjust the position of the arm on the spindle, the control rod in the push rod connector, or both to achieve this. When satisfied that all is adjusted correctly, tighten all screws, switch off the gas burner and R/C equipment and disconnect battery clip.

The trimmer at the side of the control arm can be used in the future to compensate for wear and compression of the 'O' ring. As time passes, you may find that the regulator does not fully close when the control lever is at the bottom. As this happens, the trimmer can be moved down a little at a time to compensate.

When you are happy that all is well, the cab back and roof (if applicable) can be re-fitted.

The receiver, batteries and switch should be housed in a suitable truck or tender of your choice and the use of a servo extension lead may be required depending on the length of the cable on the servo used.

Take care when positioning the aerial wire so that a good signal is received. Do not place the aerial inside any metal shielding.

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