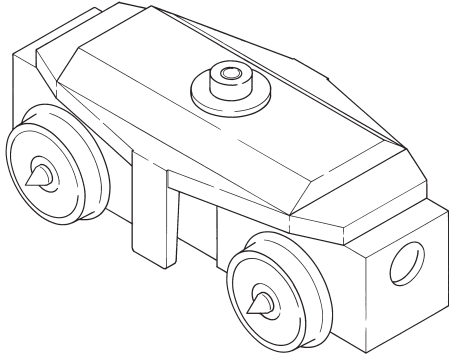


## Black Beetle Drive Bogie for HO/00/EM/P4 S and O Scale Traction



### Weight

As stated previously, the **Black Beetle** is relatively lightly constructed with 2mm diameter axles and should not be overloaded. To avoid premature wear of the bearing surfaces do not exceed a weight of about 100g on top of the centre pivot. This means that with one **Black Beetle** and the weight of the body equally shared between two bogies, the total weight should not exceed about 250g.

If this weight does not provide sufficient adhesion to haul the desired load, consideration should be given to adding a second **Black Beetle**. In this case the pickups of the two bogies should be wired together in parallel.

### Wiring

The **Black Beetle** is self contained and does not require any additional wiring to operate. Nevertheless, to improve operation, it is desirable to provide pickups on any additional wheels on the model. The motor leads emerge from the top cover at one end and are soldered to tags which form part of the pickups. Wires from other pickups can be run to these tags and soldered in place. Be sure to allow sufficient length in the wires so that the bogie can still pivot. When soldering to these tags make sure that the iron is hot enough to melt solder before starting and do not dwell with the iron. The top cover will melt if exposure to the heat of a soldering iron is prolonged.

### Command Control / Overhead Power Supply

To operate the **Black Beetle** on command control the motor leads should be unsoldered from the pickup tabs. Wires can then be run from the pickup tabs to the control chip and then back to the motor, as for any other locomotive.

A motor lead can also be separated from one pickup tab to provide an alternative supply from overhead wiring. If both rails are common, the wheel pickups can be wired together so all four wheels are providing a current path.

### Lubrication

As with any mechanical device, correct lubrication will extend the life of your **Black Beetle**. Use only plastic compatible lubricants such as Labelle #102 and #108 to lubricate the gears and bearings. Gears should be lubricated with grease. Apply a very small amount of oil to each axle where it runs in the gearbox. Use lubricant sparingly as any excess can enter the commutator of the motor and cause faulty operation.

## Black Beetle Drive Bogie for HO/00/EM/P4 S and O Scale Traction

The **Black Beetle** will provide quality performance in a small space and can also be offered in a wide range of wheelbases and wheel diameters, both disc and spoked centres, to suit different applications.

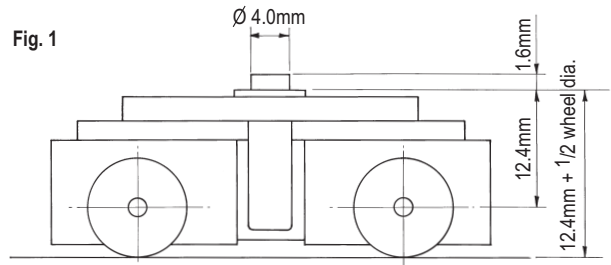
To achieve the small size of the **Black Beetle** the motor, gears and axles are relatively light and may not provide the robustness that some modellers require. Read these instructions carefully and keep them for future reference. The **Black Beetle** will, however, provide more than adequate power to drive a typical model rail motor hauling one or two trailers, as well as for multiple units and shunting locomotives.

### Operation

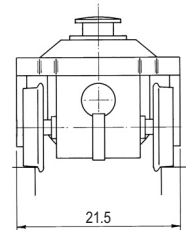
The **Black Beetle** is entirely self contained with its own electrical pickups. Try it out on the track. It will run, but intermittent operation may be a problem because of the units light weight. Adding the weight of a model will improve the operation. Wherever possible other wheels on the model should be used for electrical pickup as well.

### Installation

Fig. 1 provides the key dimensions of the **Black Beetle**. If the floor of the model is at a suitable height, simply drill a 4.1mm or #20 hole for the centre pivot and secure with the screw provided. On thick floors it may be necessary to make an insert of thinner material to cover the area of the centre pivot. The maximum thickness of the floor in the area of the centre pivot is 1.5mm or 0.060".



If the height does not suit, it may be necessary to cut an opening in the floor which is then filled with an adaptor plate made from 1.5mm or 0.060" polystyrene or brass sheet.



### Adding Sideframes

The top cover of the **Black Beetle** is moulded in ABS and incorporates brackets to which sideframes may be fixed. The overall width of these brackets is 21.5mm, which will suit HO/00 and On30". Support the sideframe with suitable packers so that it is level and glue it to the bracket with superglue or epoxy resin adhesive. For track gauges wider than 16.5mm it will also be necessary to interpose a suitable spacer between the support brackets and the back of each sideframe.