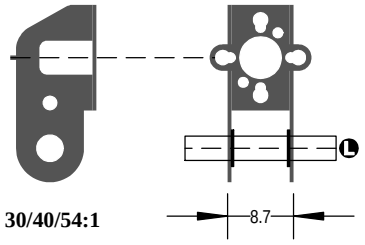
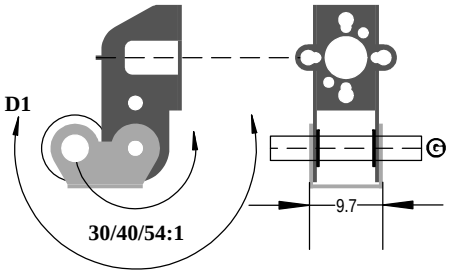
HIGH LEVEL GEAR PLANNER

Final drive gear fixings: **L** = *'Loctite' fit brass slab gear* **G** = *Grubscrew fit brass gear* **P** = *Push-fit nylon gear*

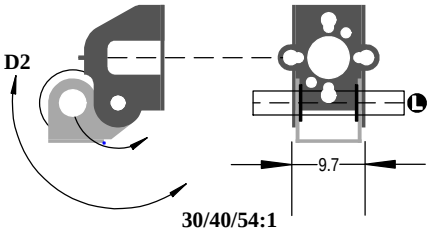
RoadRunner



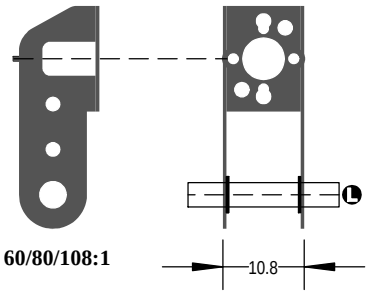
RoadRunner+



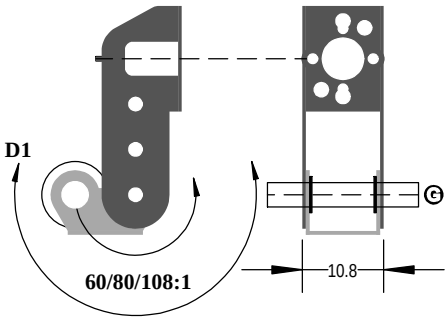
RoadRunner Compact+



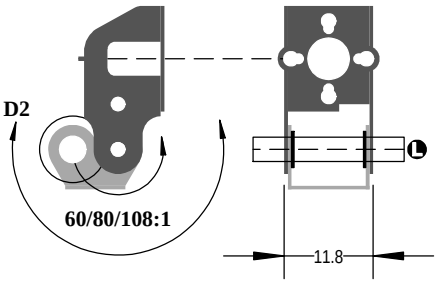
LoadHauler



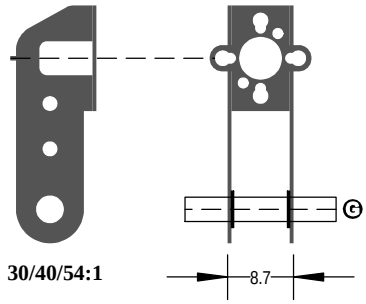
LoadHauler+



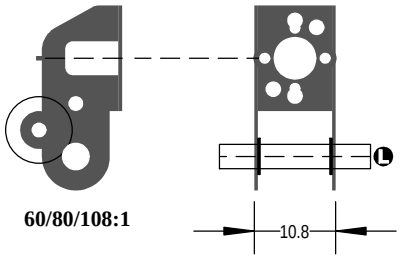
LoadHauler Compact+



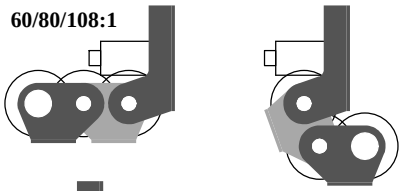
HighFlier

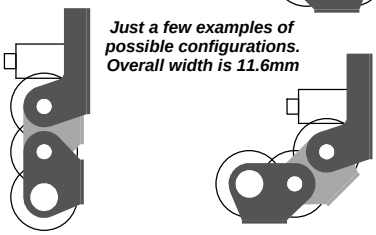


HumpShunter



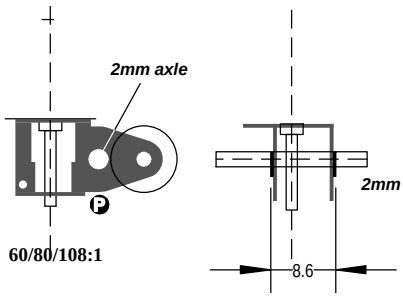
LoLoader L



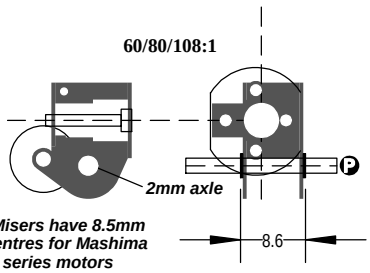


Just a few examples of possible configurations. Overall width is 11.6mm

Vertical MicroMiser

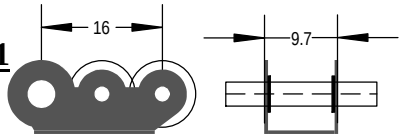


Horizontal MicroMiser

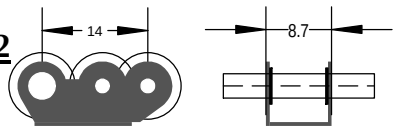


MicroMisers have 8.5mm hole centres for Mashima 10 series motors

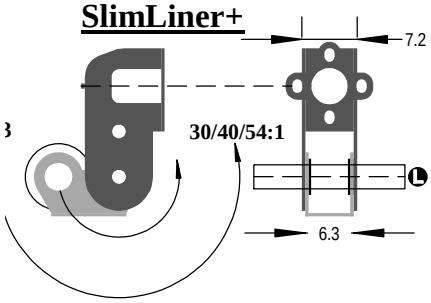
DriveStretcher



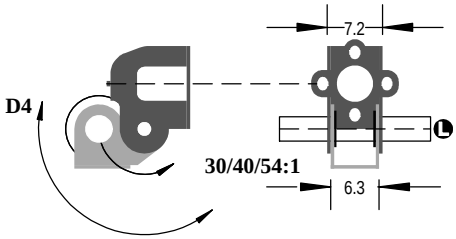
Extended final drives supplied with one idler gear



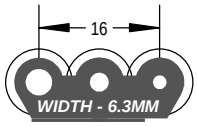
SlimLiner+



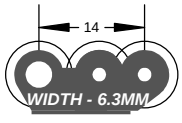
SlimLiner Compact+



DriveStretchers for SlimLiners only

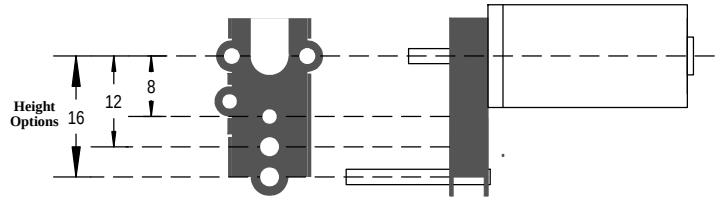


D3

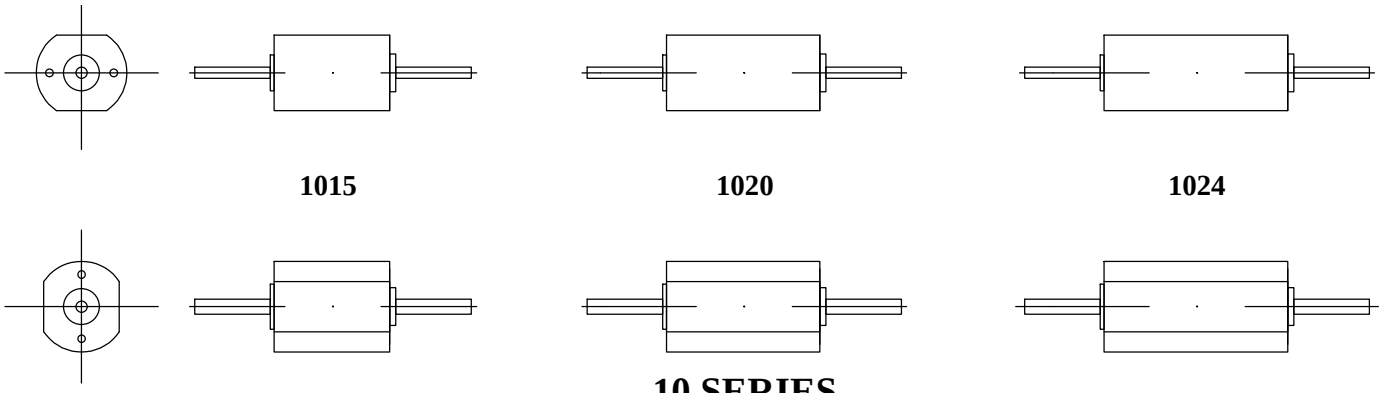


D4

TendeRiser 1:1 Spur Box



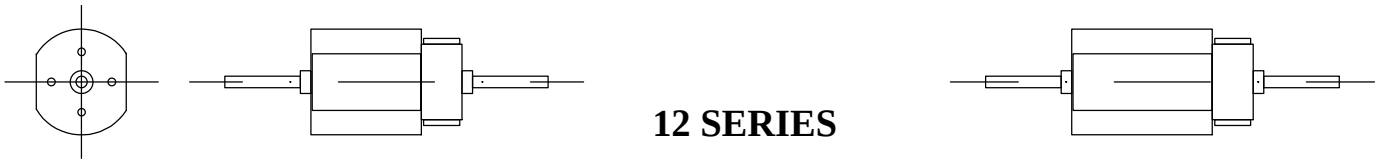
CHECK THIS SCALE - IT SHOULD BE 150MM LONG



1015 **1020** **1024**

1.5mm Dia shaft
Fixing screws M1.4 at 8.5mm centres

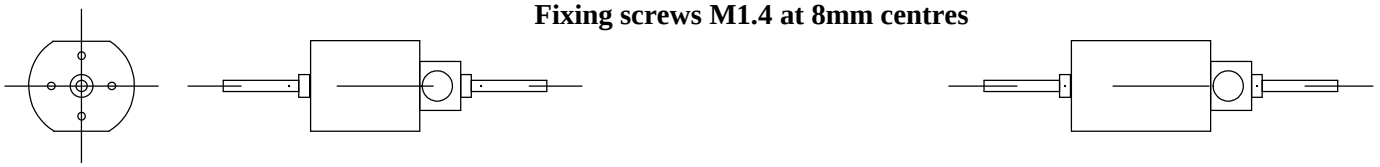
10 SERIES



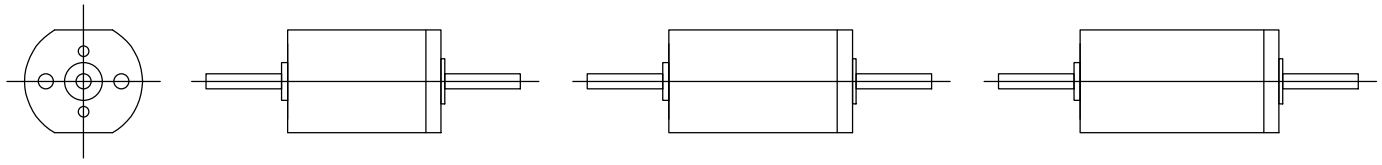
1220 **1224**

12 SERIES

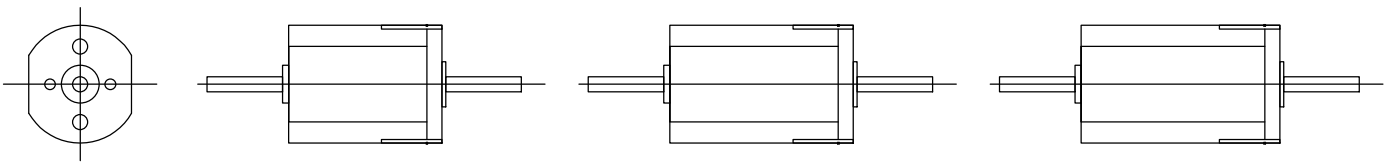
1.5mm Dia shaft
Fixing screws M1.4 at 8mm centres



MASHIMA MOTOR PROFILES

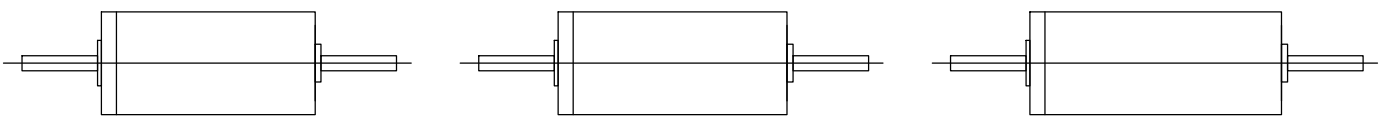


1420 **1424** **1426**

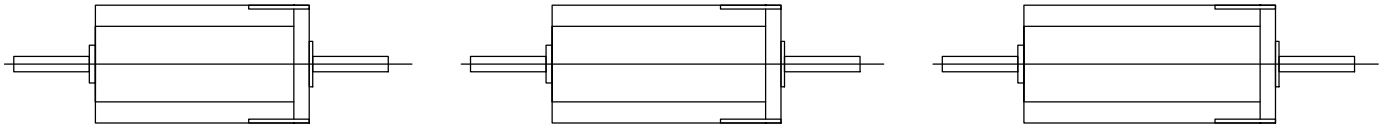


2mm Dia shaft
Fixing screws M1.4 at 8 mm centres
and M2 at 10mm centres

14 SERIES



1428 **1430** **1433**



CHECK THIS SCALE - IT SHOULD BE 150MM LONG

Planning Guidelines

The Drawing
For accurate planning, a decent line drawing of your loco is essential, and it must be to scale. You can check this by taking a sample, known dimension from the prototype (the bigger the better) e.g. length over the bufferbeams, and compare this with the same dimension on the drawing. A loco measuring 30ft 6ins from beam to beam should be 30.5 x4(mm) so this dimension on the drawing should be 122mm.

If you don't have a drawing you can still use the planner by laying it over the actual model, although this is not as accurate. If your kit is unbuilt, arrange the chassis frames on paper and draw in lines to represent key features of the structure, such as the boiler, firebox etc.

The Kit
Take the kit's material thickness into account, allowing 0.4mm inside the loco outline for etched kits, and about 1.2mm for whitemetal. It's a good idea to draw this material onto the drawing, along with other castings and spacers.

Study your model's instructions and assembly sequence. Take into account things like chassis spacers, crosswires, fixing screws, cab details, or any other obstructions that might get in the way of the drivetrain, or features you particularly want to preserve, or are prepared to sacrifice in favour of better performance, should it come to that…

Some kit manufacturers give little thought to how the models will be motorised, so you may consider making modifications to the kit itself, which is best done before it's assembled. A simple alteration can be effective, like moving a frame spacer to make room for a bigger motor or higher-ratio box. On small prototypes, we sometimes suggest making saddle tanks removable to allow the motor to be fitted into the boiler space, like in our own kits. This kind of forward-thinking approach, combined with the number of motor/gearbox options we offer, allows you to make the drivetrain an integral part of the overall design.

Key points
The Symbols at the top of the planner show the type of fixing method used to secure the final drive gear to the driven axle. MicroMisers use a 2mm axle with push-fit gear only so, for bigger diameters, you'll need to bush the wheel bores and frames to suit this. All other boxes come with 1/8in diameter final drive (axle) gears by default, but can be supplied with 2 or 3mm on request.

All of our motors will fit all the boxes but, if you can, aim to use the outer or diagonal fixing-screw holes to allow for easy removal of the motor. For articulated boxes, you can position the axle anywhere on the inner radius shown on the diagrams. The larger, outer arc shows how a DriveStretcher can increase the throw of the box, and states which one to use (D1, 2, 3 or 4).

All boxes, (apart from the LoLoader) include etches so they can be driven them remotely, with the motor mounted away from the gearbox. You'll need to source the bearings, shafts and other bits and pieces for this yourself.

When ordering your gearbox, specify which one of the three available reduction ratios you require, along with the worm bore (1.5 or 2mm bore to suit the motor shaft diameter). The higher the ratio (108:1 is the highest) the faster the motor turns for every rotation of the wheels, giving smoother performance, particularly at shunting speeds, but with a lower top speed. Large motors run more smoothly at low revs, so a smaller reduction ratio (e.g. 40:1) can be used to give a faster road-speed without having a significant effect on slow-speed performance. Wheel diameter is also a factor, so check using the downloadable Speed Calculator before making a decision.

Using The Gearbox Planner

Print the Gear Planner onto acetate, making sure you select to print at ‘full size’ and check the scale at the bottom of the print-out is 500mm long. If you’ve read the gearbox guide and studied the motor specifications, you’ll probably have some idea of the type of box and ratio you wish to use. Which axle you choose to drive can depend on a lot of things, for example, do you intend to compensate the loco and, if so, will it be fully sprung or have a rigid axle? Frame width is also a consideration, as some of our gearboxes may not fit between the frames of some OO chassis.

Lay the transparency over the side view of the loco and try the images for size. If you think you have one that will fit, project the motor centreline from the gearbox across to the end (front) elevation of the loco. Now lay the end view of the gearbox over this view of the engine. Don’t overlook this stage; the inside of a round-topped firebox may catch the top corners of the gearbox, whereas the Belpaire version won’t, even though they both look the same size in side elevation!

Once you have an idea where the front face of the gearbox will be sited, try a motor profile in place, again, in both elevations. If the motor has to fit into a confined space, it may be easier to choose the motor first, then select a suitable gearbox to span between this and the driven axle. Remember also that, in most instances, the motor/gearbox unit must be able to pass up into the body/boiler space as you offer up the chassis, unless there is special provision for the motor to be uncoupled from the gearbox (e.g. removable boiler or saddletank or backhead).

Don’t forget to allow some clearance around the motor/gearbox and consider the possibility that the drawing (or kit) may not be 100% accurate. In other words, don’t cut it too fine unless you have to and, if you do, have the burr-grinder handy!

The Final Choice

In many cases, you could end up with a number of options, involving different combinations of motor size, gearbox type/ratio and driven axle location, and there’ll be even more if you’re prepared to modify the loco in favour of a better drive system. At this stage, it’s up to you to make a decision based on your own preferences, weighing up the trade-offs and benefits for each combination.