

# Wood Lathe Replacement Proposal

## Background

Makespace has a Draper WTL 100 Wood Lathe. This is a good quality hobbyist lathe. It is solidly built. The lathe is capable of producing high quality work. However it does not meet the Makespace standard of better quality and capability than members could expect at home in a number of ways:

## Maintenance

This lathe model has been discontinued for some years, which has limited availability of spare parts. In the past couple of years the headstock has been replaced with spares from a second-hand lathe of the same type. Wear is requiring frequent maintenance by the owners and other members, the following repairs have been necessary in the past year:

- Gear pulleys came loose from spindle, this required disassembling headstock to clean up spindle and re-attach gear pulleys.
- Banjo locking bolts became loose due to worn threads. This is a safety hazard since if the banjo moves during turning, it may collide with the workpiece. It has been repaired with replacement locking handles and re-tapping the threads, but is likely to recur at some point. The design of the banjo means the threads and holes are exposed, and without regular, careful cleaning, wood dust will be trapped and can cause wear or sticking.
- Tailstock locking bolt regularly becomes stuck and requires un-sticking, sometimes by disassembling the tailstock. The locking bolt is meant to insert into a machined groove in the tailstock spindle. If the spindle rotates in the tailstock, the groove is not aligned with the bolt. When this happens, the bolt does not hold the spindle well. Some users attempt to compensate by over-tightening the bolt, which risks breaking the (small) handle, and can also damage the tailstock spindle.

The maintenance burden of this tool is higher than any other tool in the workshop at present, with the possible exception of the CNC router. User training is not believed to be a realistic solution to the above issues. Makespace equipment should not fail if users do not deep-clean after every use. A more professional-standard lathe would prevent or be more robust to minor abuse such as users attempting to over-tighten bolts or being less diligent with cleaning.

## Performance / Ease of Use

### Electronic Variable Speed Control

High quality wood turning requires adjustable speed, based on the size of the workpiece and the operation being performed. Our current lathe supports 5 speeds, adjustable by opening the headstock and manually shifting a belt between pulleys. This is time-consuming and

fiddly, to the extent that some users do not adjust the speed at all. A common feature on modern lathes is electronic variable speed control, allowing the speed to be varied by a knob. This would benefit all users. An additional benefit for advanced users is that many lathes support very low speeds, which is useful for e.g. applying finishes on the lathe.

## Capacity / Safety

The lathe is theoretically capable of turning items up to 30cm in diameter by rotating the headstock. Larger or unbalanced items require a more powerful motor and more stability. The lathe is mounted on a homemade wooden workbench which limits its stability, and turning larger items (over 15cm in diameter) can cause the whole assembly to vibrate, which could be hazardous.

A lathe with a complementary metal stand, bolted to the floor, would have much better stability, and hence would be both safer and produce better results.

Modern lathes also often have a soft-start feature, where they start slowly before ramping up to the set speed. This means that the user has time to see if a workpiece is vibrating before it reaches full speed, and can turn the lathe off before damage is done.

The current [Risk Assessment](#) covers the risks identified for the proposed replacement lathe.

## Training

A number of areas of training would be more straightforward with an easier to use lathe:

- The components described above requiring care and regular checking due to wear would not need to be checked so frequently. E.g. the alignment of the tailstock bolt.
- Manual speed change would not need to be taught with an electronically variable speed lathe.

A modern lathe would benefit from availability of manufacturer's training videos. Overall it is expected that the training programme, particularly the in-person component, could be reduced. Hopefully the reduced burden on trainers would translate into more training being available.

## Survey

A survey was done to establish interest in the lathe and desired features. This was open to both members and non-members. 20 members and 2 non-members responded (total 22). Half were trained on the lathe already.

Key findings were:

- Almost all respondents (9 of 11) who are not already trained on the lathe reported lack of training as a limitation. If the lathe were easier to train on, we could expect to see some increase in the amount of training available.

- A quarter of (3 of 11) trained users reported maximum diameter as a limitation on their use of the lathe.
- Over half of trained users (6 of 11) reported difficulty in using the lathe as a limitation. 9 of 11 reported they would use the lathe more if it were easier to use.
- No respondents reported maximum length as a limitation. There is no demand for a longer lathe.
- 14 of 21 respondents reported they would be happy for the lathe to occupy the same same or had no opinion. 6 of 21 would be happy for the lathe to occupy more space. 1 respondent reported they would prefer the lathe to take less space.

## Proposal

The existing trainers/maintainers will take the lead on purchasing and installing the lathe, they are:

- Allen Kaye
- Stefan Ross
- Matt Jaworski

## Location and Services

The replacement lathe will be sited in the same location as the old lathe. It is 240V, so has no new requirements for power. We will re-use the existing ducting for extraction. It will be bolted to the floor for additional stability, this will take place after 1-2 months, so any questions of precise location can be addressed during that time (e.g. exact distance from the wall / radiator).

We propose to:

- Purchase a new lathe (and accessories) as detailed below.
- Remove the existing lathe table and lathe. Dispose by gifting to appropriate charity / community workshop etc.
- Set up new lathe in the same location
- Bolt lathe to floor for additional stability (after 1-2 months, to check floor position is satisfactory)
- Assess and update extraction piping around the lathe to ensure good extraction
- Re-locate tools currently mounted on lathe table
- The legs have supports for building a shelf underneath, this may be desirable for storing tools / materials etc.
- Update training material and create a conversion programme for members trained on the old lathe

## Choice of Lathe

The recommended lathe is: Axminster Trade AT406WL

<https://www.axminstertools.com/axminster-trade-at406wl-floor-standing-woodturning-lathe-720759>

Cost: £1,775 exc VAT

Alternatives from Record Power and Hope were considered and the selection made following discussion with internal and external experts.

## Accessories

Recommended accessories:

Item	Use	Link	Cost exc VAT
Chuck Set	Holds workpiece	<a href="https://www.axminstertools.com/axminster-clubman-sk100-woodturning-chuck-package-m33-x-3-5mm-106867">https://www.axminstertools.com/axminster-clubman-sk100-woodturning-chuck-package-m33-x-3-5mm-106867</a>	£158
Bed Extension	Turning larger pieces, or longer. Can be removed when not in use	<a href="https://www.axminstertools.com/axminster-bed-extension-for-at1628vs-lathe-502704">https://www.axminstertools.com/axminster-bed-extension-for-at1628vs-lathe-502704</a>	£164
Live Centre	Supporting workpiece from tailstock	<a href="https://www.axminstertools.com/axminster-ring-centre-point-live-centre-2mt-340139">https://www.axminstertools.com/axminster-ring-centre-point-live-centre-2mt-340139</a>	£25
Button Jaws	For reverse-chucking bowls (working on the bottom)	<a href="https://www.axminstertools.com/axminster-button-jaws-250mm-340956">https://www.axminstertools.com/axminster-button-jaws-250mm-340956</a>	£70
Sundries	Mdf for shelf, mounting brackets for tools etc		£50

## Costs

Estimated total cost, including accessories and contingency for e.g. brackets for mounting tools etc., is £2,400