TRAK® MACHINE TOOLS
SOUTHWESTERN INDUSTRIES, INC.

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White Paper

TRL 1840SX vs TRL 1845SX

As you all know, the TRL 1845SX will soon replace the TRL 1840SX. The latter has been an excellent product for SWI for many, many years but for several business reasons we needed to replace this iron. And we believe we have successfully done so.

We recently built up our first 1845 and just finished a series of aggressive side-by-side tests against the 1840. In general, there was no discernable difference between the two lathes in our cutting tests. Specifically,

Part-off Test

- Bar – 1020 steel
- 600 rpm
- 1.8 ipm federate
- No coolant

Results

Distance From Chuck	1840	1845
2”	No chatter	No chatter
3”	No chatter	No chatter
4”	No chatter	No chatter
5”	No chatter	No chatter

Note, even 2 inches is considered adequate.

Turning Test #1

- 4” bar – 1018 steel
- 450 surface feet per min.
- 0.01 ipr feed, depth of cut measured on radius
- Low gear, no coolant

Results

Depth of Cut	Stock Size	1840	1845
0.100”	3.8”	Good	Good
0.150”	3.5”	Good	Good
0.200”	3.1”	Good	Good

0.225”	2.65”	Bar slips in chuck	Bar slips in chuck

Note, the chuck and tool post are weaker than the lathes.

Turning Test #2

- 2.75” bar – 01 tool steel
- 225 surface feet per min.
- 0.0075 and .010 ipr feed, depth of cut measured on radius
- Low gear, no coolant

Results

Depth of Cut	Stock Size	1840	1845
0.100”	2.55”	Good	Good
0.150”	2.25”	.0075 ipr – Good	.0075 ipr – Good
0.150”	2.25”	.010 ipr – Good	.010 ipr – Good

Note, we could think of no reason to push this further.

There are a number of differences that are subjective or a matter of preference as well as those for cost containment. These are,

EHW and Jog Stick Position

On the 1845, these are located outside the door in a fixed position like they are on the TRL 1630SX. This allows DRO mode and TRAKing with the door closed but it forces the operator to be about 4 inches farther away from the chuck.

Pendant Location

The pendant is located on an adjustable arm over the headstock instead of on the top of the door like the 1840. Cost was one reason for this change but the other was the machine height. The 1845 is 2 ½ inches taller and so the ProtoTRAK SLX STOP-GO buttons would be nearly 74 inches from the floor. Shorter machinists would have to stand on their toes to operate the lathe. The STOP-GO buttons on the 1845 are a comfortable 67 inches from the floor. Having the pendant on the left is poorer because most people are right handed. However, there are two advantages to this location. Most machinists stand a little to the right of the chuck when machining in DRO mode (and this is where the EHW’s are) so it is easier to look back and forth from the part to the readout. On the 1840 the door is open in DRO mode so he has to look up and over his right shoulder to see the readout. Also, you’ll find that the edge of the head stock splash shield is a great place to rest your right elbow when programming.

Rapids

The Z rapid on the 1845 is 250 ipm instead of 150 ipm on the 1840. X rapid is the same.

Travels
The 1840 was designed with 13 inches of cross-slide travel to accommodate a larger number of tools for the gang-tool option. Unfortunately we only sold 1 or 2 of these options per year so we reduced the 1845 travel to an adequate 10.5 inches and the cross-slide itself is 9 inches shorter. On the positive side, the 1845 has an additional 5 inches of Z travel.

Chuck Key
Because the 1845 splash shield is taller, the chuck key shaft would have to be uncomfortably long or the handle too short. Consequently we will provide a long handle ratchet instead. It's different, so some will like it and some might not.

A Few Words About Cast Bases
The 1840 bed is attached to a one-piece cast iron base. The 1845 bed is attached to two cast iron pedestals under the head and tail stocks as are the TRL 1630 and TRL 2460.

It is important that there is cast iron (as opposed to welded steel like the TRL 1745) from the tool and part down to the ground. Cast iron has wonderful dampening characteristics relative to steel. However, whether or not the two pedestals are integrated into a one continuous piece base is not very material to this dampening. Instead, what a one-piece base provides is a higher level of stiffness over the two pedestal design.

But is this added stiffness important to us? The iron used on most CNC tool room lathes is derived from manual machines. This includes the 1840. It's bed and base are identical to Wey Yii's 16S manual lathe that they made for decades. And manual lathes need higher rigidity because they are commonly used with high speed steel form-ground tools that are plunged into the work piece at low surface speeds. If you have ever done this then you know it's very easy to generate a lot of chatter due to the high contact area between a form tool and the part. And lots of rigidity helps minimize machine/tool/part resonance.

With a TRAK TRL, people use single point inserts instead of form tools to cut simple and complex shapes in parts. And today's efficient machining with inserts, calls for higher speeds and lighter cuts. This in turn substantially reduces cutting forces and eliminates the need for wasteful heavy castings. So the answer to the question in the preceding paragraph is NO.

To summarize, heavy one-piece base castings have some value for manual machines but not TRAK TRL's. We're not in the 1950's.