

D. S. T.

INSTALLATION
OPERATION AND
MAINTENANCE INSTRUCTIONS.

for
'VICEROY' METAL TURNING LATHES.

DENFORD MACHINE TOOLS LTD.,

incorporating

DENFORD SMALL TOOLS LTD.,

Victoria Works, Birds Royd,
Brighouse, Yorkshire.

Tel: Brighouse 2264-6

EXPORT OFFICE:

A. J. Chapman,
Export Office,
12/13 Robinson Row,
Hull.

Tel: 36304

'THE VICEROY'

TDS 1/1 GB
TDS 1/1 PCS
TDS 1 BC
TDS 5 DG
TDS 3 Combination Wood & Metal

METAL TURNING LATHES

INTRODUCTION

Once delivery of a 'Viceroy' Lathe has been effected the first thing to do is to clean the machine thoroughly with paraffin or similar, wiping dry afterwards with a clean cloth. The unpainted surfaces should be covered with a film of good quality machine oil to protect against rust.

The standard and extra equipment should all be inspected and cleaned and carefully put away until required. At this stage installation can be started.

INSTALLATION AND FOUNDATION

The 'Viceroy' Metal Turning Lathe base plates are of large area, especially designed to be mounted on rubber or felt pads. Holes are also provided for bolting down in the traditional manner.

Installation drawing and details of the anti-vibration pads or mats are available on request. Whichever method is chosen for the foundation of the lathe, it is essential that the floor under the machine is level and if it is wood, adequate steps should be taken to ensure that it is secure. If it is decided to bolt the lathe down it is essential that the locking nuts of the foundation bolts are not over-tight - finger tight only. To ensure the lathe is accurately installed a precision level should be used across the lathe bed at both the headstock and tailstock ends. Twist in the bed should not exceed $.064 \text{ in}/0.0025''$ if the works tested accuracy is to be transmitted to work done. Special adjustment screws under each of the lathe feet are provided, but under no circumstances should these be touched until the cabinet base has been correctly levelled in relationship to the floor by using precision level across the bed, as each are carefully set up at works prior to shipping.

OPERATION - contd ...

Spindle Speeds. Details of these are shown on the speed chart on the headstock.

Link 'V' Belt Speed Change. This is effected by opening the cabinet door, which will automatically isolate the electrics through the safety electro-micro switch, the belt tension is then released by moving the tension lever inside the cabinet base from the vertical to the horizontal position. The required speed is then obtained by moving the 'V' belt to the position on the motor and counter shaft pulleys required. The cabinet door cannot be closed until the lever is in the vertical position, and the lathe will not start until the cabinet door is in the closed position.

Link 'V' Belt Tension. The correct tension for the driving belt is obtained by adjusting the locking nuts on the motor platform tension lever. Should it be necessary to increase the tension on the main spindle belt, remove the rear panel from the headstock and then turn the belt from the spindle pulley and remove one link until the tension required is achieved.

Toolrest Cross-Slide. This unit is fully universal and the clamping arrangement is by a quick action screw type which ensures maximum rigidity and is located under the bed. The tightening handle is a tommy bar which is always clear of any working positions. The 12" and 6" handrests have been specially designed to allow a parallel movement of the hand along the rest. They are also interchangeable for turning from the outer rigger and the saddle cross-slide position.

Outrigger. The patented radial slotted platform enables work to be turned from any position on the included angle for turning of 205° , which includes working behind the faceplate with 6" toolrest.

Tailstock. The Tailstock can be positioned on any part of the lathe bed and is locked in position by the quick action lever operated clamp. The adjustment of the clamp is effected by tightening or slackening the nut under the tailstock shoe, when adjusted and in the locked position the clamping lever should be in the Vertical Position.

Tailstock Barrel Lock. The Barrel of the tailstock can be locked by a conveniently placed single ball handle in any position desired, and must be locked when turning between centres.

Compound Swivel Slide. To enable the swivel slide to rotate to the correct angle for screwcutting et c., release the two square head screws that clamp the slide, these are located at each side of the compound slide. BEFORE COMMENCING OTHER OPERATIONS THE SCREWS MUST BE TIGHTENED, BUT NOT OVER-TIGHTENED.

Saddle Jib. This part is located under the saddle behind the bed and is the means of adjusting the saddle to the bed; the two socket headscrews should be tightened against the spring washers, sufficiently to allow easy traversing of the carriage with the apron handwheel - DO NOT OVER-TIGHTEN.

Saddle Anti-Lift Sliding Clamp. This is located underneath the bed-ways and has been pre-set at works, should require no further adjustment unless saddle is removed.

Cross-Slide and Tool-Slide Jibs. Adjustment to these jibs is effected by releasing the lock-nuts and applying equal pressure to each of the grub screws so that all play is taken up on the slides, which should be free to allow the 3-ball handle to turn without applying too much pressure, the locknuts must then be tightened before use.

Micrometer Dials. The graduation of the friction micrometer dials fitted to the cross-slide and tool-slide each represent a movement of .02 MM. (METRIC) or .001" (English)

OPERATION OF THE TAILSTOCK.

By tightening the eccentric clamp via the lever the tailstock can be locked in any position on the lathe bed. Adjustment can be effected by tightening or slackening the nut under the tailstock shoe. When adjusted and in the locked position the clamping lever should be in the vertical position.

Barrel Lock. The barrel locking handle must be tightened when it is desired to lock the tailstock barrel i.e. Turning Between Centres.

Adjusting the Tailstock. When the tailstock is set over for taper turning, release the tailstock clamp and screw the square head adjusting screws in the direction required.

Be sure to release the opposite screw, tighten (Not overtighten) after setting.

MOTOR PLATFORM ADJUSTMENT FOR BELT TENSIONING.

Adjustment for belt tensioning is made by the lock nuts on the motor platform support spindle until belt tension is adjusted correctly. For shortening or lengthening link V belts, if not able to obtain correct tension by this method, remove or add links as required.

Link Belt. The use of this type of belt means spindles etc., do not have to be removed removed for repairing or replacing belts.

Cabinet Micro-Switch. When adjustments have been effected inside the cabinet base a test run can be made by LIFTING and PULLING LIGHTLY the toggle of the micro-switch fitted to the cabinet door into the maintenance position.

LUBRICATION AND MAINTENANCE

Once the lathe is cleaned and set up it is essential to ensure all bearings and surfaces are correctly lubricated.

A lubrication plate is fixed to all machines and shows the recommended lubricants.

The lathe does not require too much oil/grease, this caused dirt to accumulate and impede the running.

OILING CHART

1. Headstock Spindle Bearings, Adjustable Tinker Taper - grease with good quality regularly, do not overgrease.
2. Back Gear - oil with gun daily, through nipple below head-stock spindle.
3. Selector Levers - oil monthly.
4. Headstock Sliding Gear - apply a little oil monthly through spring loaded oilers in Head-Stock.
5. Reverse Gear Bracket and Gears - oil daily.
6. Leadscrew Brackets - oil daily.
7. Countershaft - no attention required - propped.
8. Tailstock - oil one hole daily, clean and lightly oil square thread
9. Leadscrew and half-nuts - oil regularly when in use.
10. Apron - oil two positions daily.
11. Carriage 'V' Way, Dovetails and Bushes - oil daily.
12. Motor Bearings - oil annually,

Recommended Lubricants - Esso Oil Company or equivalent

Grease	- Firmax 2	"	"
Oil	- Corey 45		

Spindle Chucks. All chucks are supplied fitted to the backplate ready for screwing onto the spindle nose of the lathe. No chips, burrs or small particles of dirt must be allowed to lodge in the spindle or backplate screw threads. These and the register should be well cleaned. It is advisable to clean all thread and faces of the backplate and spindle nose, then smear a film of oil before fitting chucks etc., to the spindle nose. This facilitates removal of chucks etc.

Types of Chuck The 3-jaw self centring chuck will grip round work quickly since the 3-jaws move simultaneously and centre the work automatically. Two sets of jaws are supplied, one for internal gripping and one for external.

The 100 III.(4") 4-jaw self centring chuck is ideal for square and hexagon bar, and the 4-jaw independent chuck is used for irregular shaped work which has to be machined, and centred to run dead true, the jaws on these chucks are reversible. The drill chuck is used to hold drills, reamers, taps etc., in both the headstock and the tailstock of the lathe. Capacity is 0-12 III (0-1") or 0-3 III (") to 19 III (5") diameter with keys for tightening.

Lathe Tools and their Applications. The correct sharpening and type of lathe tool must always be used if the lathe is to turn efficiently and accurately. The tool must have a keen and well supported cutting edge which has been ground for the particular material which is being machined.

Three types, Left Hand, Right Hand and Straight Turning Toolholders are usually used in conjunction with the single way (standard) type of toolpost and the 4-way, 2-way and American Toolpost (Extras). We manufacture and supply a range of general purpose American and English III Lathe Toolholders. Many types of work cannot be readily executed with these tools and for such work it is necessary to use the boring tool, parting-off tool, threading tool and knurling tool etc., see list enclosed.

ColletChuck. For precision and repetition work it is advisable to use a collet attachment, which is the most accurate of all types of chuck manufactured. Work to be machined in a collet should be no more or less than a few thousandths of an inch than the normal collet size, which are available up to 0.12 III (1/2") capacity.

Thread Dial Indicator. This is used to save time, particularly when cutting long screw threads. When the lathe is set up for cutting screw threads, the thread dial indicates the relative positions of the leadscrew, spindle and carriage of the lathe. This permits the half-nuts to be disengaged from the leadscrew at the end of a cut, returning the carriage quickly to the starting point by hand without reversal of the lathe spindle and re-engaging the half-nuts with the leadscrew at a point to ensure that the tool follows exactly the original cut.

Fixed Steady. The purpose of the fixed steady is to support long shafts of small diameter when being turned, and for boring and threading spindles. The steady is fitted to the lathe bed and is adjustable.

TRAVELLING STEADY. The purpose of the travelling steady is to support work of a small diameter which might otherwise spring away from the cutting tool. The steady is fitted to the lathe saddle and is set with the jaws to bear directly a finished diameter of work - adjustments are effected in the same way as a fixed steady.

Plain or Adjustable Carriage Stops. These are used for facing shoulders to an exact length and are clamped to the lathe bed in the position required to act as a stop for the carriage.

Fine Feed Attachment In order to provide for an extra fine feed two compound gears and 100T Change Wheels are supplies. Not required on TDS 1/1GB and TDS 1/1 PCS Lathes, as an extra fine feed is incorporated in the gearing.

Coolant Equipment. Machines can be supplied with a coolant pump and complete with reservoir sediment tank. Pressure for the pump is re-set at the works. The small tap on the outlet pipe fitted to the cross-slide adjusts the flow of coolant required. For cleaning the tank fitted inside the cabinet it can be removed easily by releasing the self-tapping screws at the rear of the cabinet.

MISCELLANEOUS EQUIPMENT. A full range of accessories are available and are shown on the enclosed list i.e. faceplate, centres, toolholders, carriers, drill sets etc., as well as other items of equipment which are available on request and special prices can be quoted for alternative or additional items of non-standard design.

'VICEROY' TDS 1/1 GB LATHE

FOR METHOD OF OPERATION GEAR-BOX FITTED

SEE SEPARATE INSTRUCTIONS

'VICEROY TDS 1 LATHE

All screwcutting and power longitudinal feeds - sliding only - is through the 3/8" Lead-Screw. For metric threads - or 8 T.P.I. Leadscrew for Whitworth Threads see Charts fitted to end-drive guard.

Auto-adjustable traverse trip fitted to TDS 1/1 GB & TDS 1/1 POS Feed Shafts. This is a SAFETY FEATURE eliminating any risk of over-run if set correctly.

Setting Method

To predetermine the position of COLLAR (1) for auto-traverse longitudinal feed trip-

- a) Release grub screw (4)
- b) Set COLLAR (1) to position required.
- c) Lock Collar (1) in position by means of grub screw (4)
- d) The apron (3) will then be moved automatically against collar (1), and push feed shaft (2) until the gears in the feed box or gear box disengage.

Approx. 1/2" lateral movement.

- e) To re-engage the gears in the feed box or gear box, simply wind the apron (3) away from the Headstock.

IMPORTANT.

When SCR SCREWING or using the LEADSCREW, the COLLAR (1) MUST be RELEASED so as not to interfere with apron movement.

SERIAL NUMBER: Always quote the code and serial number of the machine when entering into any correspondence or when ordering spares. This number will be found clearly marked on the foot, if electrical state phase. Should any difficulty be experienced with our 'Viceroy' lathes or any of our other products - 'Home or Overseas' - please bring the matter to the attention of your supplier or direct to our 'Service after Sales' Department, who will treat the complaints or queries with the necessary URGENCY.

We hope these instructions have been helpful and will help to ensure that your 'Viceroy' Lathe will give you many years of efficient service.

In conclusion, remember that we are at your service, whether in an advisory or technical capacity - please do not hesitate to contact us.

POINTS TO REMEMBER

Maintenance: ALWAYS clean the lathe or any other machine tool and equipment after use, or each day.

- ALWAYS oil and grease regularly.
- ALWAYS be sure the driving belts are correct tension.
- ALWAYS be sure that the change wheels are correctly in mesh, if too tight in mesh you risk damage to the gear wheels.
- ALWAYS adjust the jib strips at regular intervals.
- Regular maintenance of your lathe or any other machine tool ensures trouble free running, accuracy and finish.

NEVER.

- NEVER put spanners, tools etc., on the bedways.
- NEVER knurl without oiling work piece or knurls.
- NEVER use centres which are badly worn.
- NEVER insert centres in hollow spindles without cleaning centres or spindles.
- NEVER centre drill without facing the work piece.
- NEVER tighten toolpost compound slide and tool tailstock locking screws tighter than required.
- NEVER transfer concentric chucks from one lathe to another and expect accuracy.
- NEVER leave the chuck key in the chuck and leave the lathe unattended.
- NEVER try to engage the half nut whilst the lead screw is stopped.
- NEVER file or polish work near the chuck jaws without rolling up your sleeves.
- NEVER put fingers in a bore to feel the smoothness of the finish whilst the chuck is revolving.