

Operation and Maintenance Manual

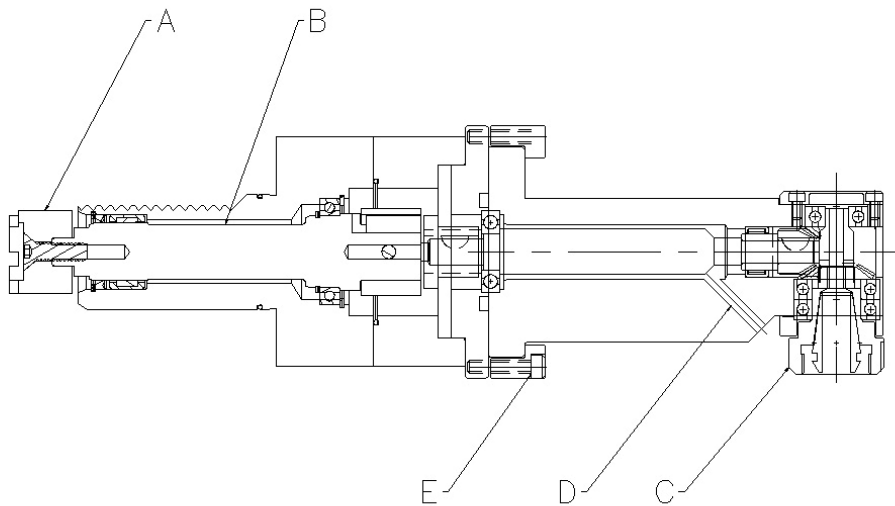
Titespot® Livetool® Angle Heads

Eltool Corporation

General

The Eltool Livetool® Angle Heads can provide years of service if properly used and maintained. The Livetool uses a patent pending liquid cooled bearing assembly that allows for continuous operation at high spindle speeds and high tool loading conditions.

Major Components



Basic Operation

The machines drive tang is coupled to the drive tang on the Livetool drive module(A). The Livetool drive tang is coupled to a drive shaft (B), which in turn drives the spindle (C). Exhausted coolant (D) is directed at the cutter. By loosening the four screws on the clamp collar (E) the head can be oriented to any position desired.

Before Installing Your Titespot® Livetool ® Angle Head

1. Coolant Filtration: It is essential that coolant delivered to the angle head be free of contaminant. We recommend a 50 micron pre-filter then **10 micron filtration or less.**
2. Coolant Type: Any high quality coolant is acceptable for use, provided it contains a rust preventative and lubrication agents.

Important! After Using Your Titespot® Angle Head

If the Livetool® is not going to be used for 2 days or more:

- Remove the Livetool from the turret and drain remaining coolant from the tool. Then use filtered, dry compressed air through the coolant port to blow all excess coolant from inside the Livetool.
- Spray WD-40™ or another water-displacing corrosion inhibitor into the coolant entry port of the tool while rotating the spindle. Then spray some additional WD-40 into the coolant exit port of the tool while rotating the spindle.

Safety

- Correct Usage – the tooling is intended for milling, drilling, slotting, and grooving operations within the mechanical limits of the tooling. **Note: The Livetool® cannot be used for tapping as it cannot be operated in reverse.**

- Personnel– this equipment must be installed, operated, and maintained by qualified and regularly trained personnel
- Precautions
 - Live tooling must be installed within an enclosed machine environment capable of containing any released parts, tooling, and components possessing the energy associated with the rotational speed being used. The machine enclosure must have properly operating safety interlocks.
 - Be sure to implement the necessary lockout/tagout procedures prior to working on any live tooling. Cutting tools mounted in the live toolholder may have sharp edges that must be guarded against.
 - Be observant and listen to the operation of equipment. Changes in vibration and/or sounds might be an indication of an unsafe condition. In this event, stop operation and investigate the causes of the change before continuing.

Operating Limitations

- **Coolant must be used with this tool**, and must meet the following conditions:
 - Coolant must be filtered to a 10-micron (or finer) level. If you are not sure if your machine filters the coolant to this level, consult your machine's operating manual or contact the machine manufacturer.
 - Coolant must be flowing through the live tool anytime the spindle is operating.
 - Coolant can be cutting oil or a water/oil emulsion. It cannot be straight water, compressed air, or carbon dioxide. It must

contain corrosion inhibitors. One suitable coolant is Tech Cool®¹ 35075 from Chemetall.

- Coolant must be mixed in the appropriate concentration recommended by the coolant manufacturer. Machining certain materials (including some grades of magnesium) reacts with the ingredients of the coolant, requiring that it be regularly replenished or replaced. The coolant manufacturer can identify the materials that react with their coolant, and offer suggestions for maintaining the coolant quality. Proper coolant will not only maintain the life of the live tooling, but it will also improve the life of your cutting tools as well.
- Speed
 - The rotational speed limitation for the live tool holder is 13,000 rpm. This may exceed the turret's speed capacity, and may exceed the cutting tool's rotational speed capacity that must be verified prior to operation.
 - The live tool should not be operated at a rotational speed greater than the capability of the machine tool enclosure's ability to contain tools or parts that may come loose from the live tool. A person trained in the calculations of physical sciences should verify the rotational speed capacity for the cutting tool and setup being used in the live tool.

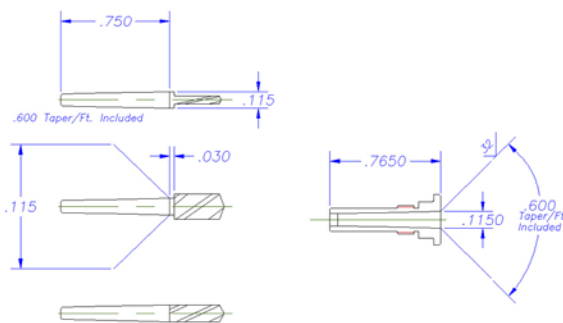
¹ This is a registered trademark of Chemetall

- Long slender tools may whip and break off at high rotational speed
 - An out-of-balance condition in tooling may cause unsafe operation
- The spindle bearing rating is a composite value that takes into account the combined loading in both the axial (thrust) and radial directions. The spindle bearings in the live tool are precision angular-contact bearings that are quite robust and should be adequate for the envisioned uses of the tool. The dynamic load rating for the Livetool tool modules is 3200 lbs (13.3 kN)
 - The torque capacity is based upon the ability of the gearing in the transmission to transmit torque. Livetool drive module continuous torque capacity is 35 Ft-Lbs (48 Nm). The torque capacity of the Eltool head will vary with head size:
 - Size 1: 25 in.lbs.
 - Size 1M: 35 in.lbs
 - Size 2: 95 in.lbs
 - Size 3: 125 in.lbs
- Lightly **grease drive tang** before installation of the tool into the turret. This will facilitate the engagement of the turret's drive coupling with the tang on the live tool. Use NLGI grade 2 multipurpose grease.
 - **Mounting the tool** on the turret
 - Insert the live tool into the turret, following the machine manufacturer's instructions in tightening the holding clamp
 - Check and verify tool clearances before operating the equipment:

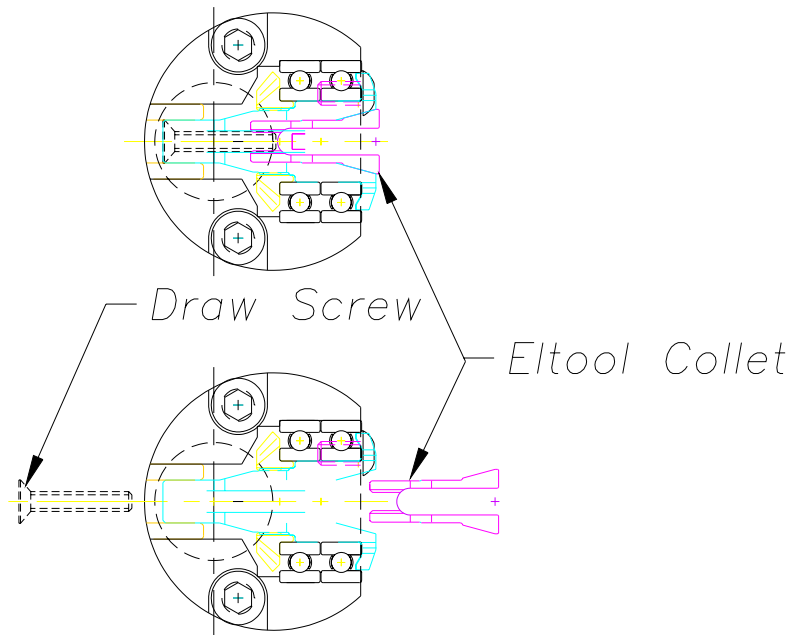
- Turret indexing – make sure the tool will not hit any portion of the machine structure during a turret index
- Clearance with tailstock and other machine components – check that the cutting path and traversing path will not cause the tool to collide with any component.
- Workpiece and workholding clearance – check that during the cut or traversing operations, neither the tool in the cutting position nor the tools in the adjacent turret stations will come into contact with the workpiece or the chuck. The methods for checking this should be included in the machine tool manufacturer’s tool clearance drawings and machine limitation drawings.

Selecting the Proper Spindle: If space restrictions are not a consideration, it is generally recommended that a standard spindle (ER-11 or ER-16) be selected. For **confined space applications**, **Eltool offers proprietary spindles** designed to minimize the profile of the angle head.

Taperlock Spindles (Size 1 Heads): Like a Morse taper, the shank of the cutting tool is held in place by the binding action of the tapered spindle. **Special geometry is required on the tool shank when using this spindle, as shown below.**



Draw Type (Eltool) Collet (Size 2, 2M, 3 Heads): the spindle accepts a tapered, internally threaded collet. The collet is drawn tightly into the spindle by a 6/32 draw screw (5/16 hex head) located on the back face of the angle head. A spanner wrench (supplied with the angle head) holds the spindle in place during the tightening process.



Modular Design: Titespot® Livetool® Angle Heads are modular, allowing **100% interchangeability** between heads and live modules, a potential cost savings where multiple applications for different heads or modules are contemplated. **Consult factory for pricing of heads or modules only.**

