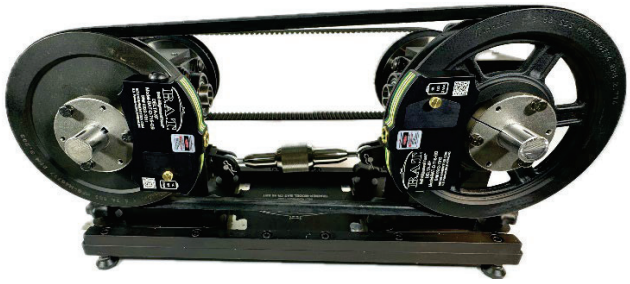
B.A.T.
BELT ALIGNMENT TOOL®

B.A.T. TR-16 SBT

Multi-Skills Trainer

Belt Alignment – Belt Tension – Laser Shaft Alignment
Precision Training Simulator



B.A.T. TR-16 SBT
Shaft – Belt – Tension
Multi-Skills Trainer Manual

The TR-16SBT multi-skills trainer has three (3) primary functions: belt alignment, belt tension and shaft alignment. The Trainer is designed with components like those found in actual industrial environments. In belt alignment mode, the Trainer allows you to perform "V"-belt and timing belt alignments, plus belt tensioning. In shaft alignment mode, the Trainer allows you to perform shaft alignment, soft foot, foot lock, full 360° sweep, and more.

The TR-16 SBT has easy-to-use adjustment knobs for belt and shim adjustment(s), as well as the return springs on the bearing tower slide tables, which allow you to focus on training.

The Trainer has been adjusted and calibrated. The shaft alignment solution has been solved for horizontal and vertical measurements. A calibration document is included with each trainer and the shim solution for each foot is engraved on the underside of the trainer.

The bearings, pulleys, shafts, coupling, and taper locks are actual industrial components. In addition to alignment and tensioning, training can be done for skills like taper lock installation, coupling installation, and shaft installation.

Unique features:

- Shaft brakes are installed on top of the bearing posts, preventing freewheeling of laser heads in shaft alignment training mode.
- Square holes on slide base feet, reducing circular steering of a bolt-bound condition.

Although designed to pair perfectly with the B.A.T. suite of tools, the Multi-Skills Trainer can be used with any belt alignment tool, shaft alignment tool, or belt tension tool.

B.A.T. TR-16 SBT
B.A.T. Belt Alignment Tool™
Shaft – Belt – Tension
Multi-Skills Trainer Manual

Table of Contents

B.A.T. TR-16 SBT
Instructions

Assembling the Trainer depends on the training desired. Please see each function:

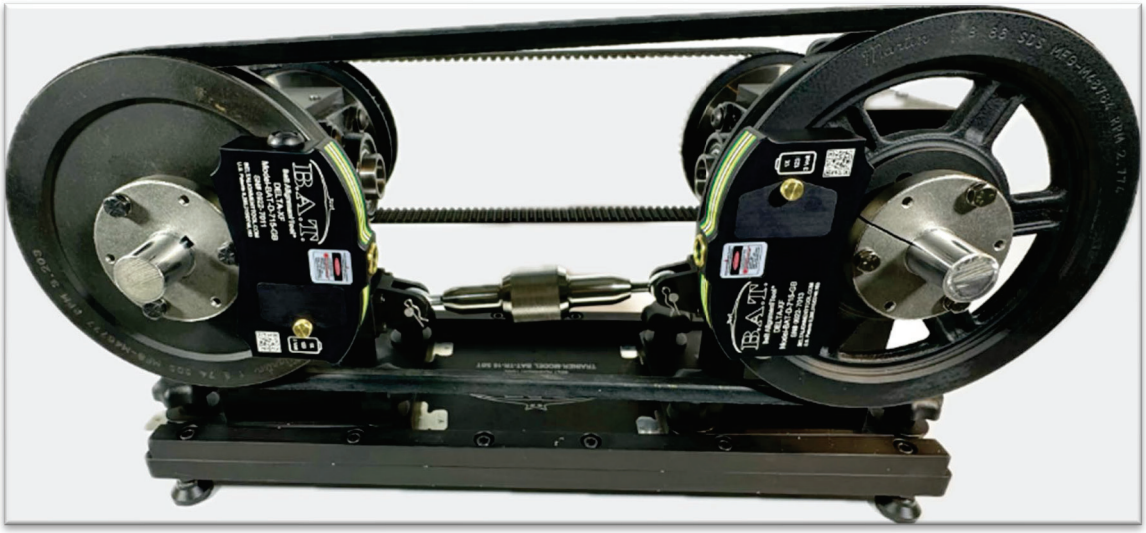
NOTE: DO NOT OVER-TIGHTEN KNOBS and SET SCREWS!!! The trainer may be damaged under excessive tightening forces!!! The hardware used is selected specifically to prevent damage to the trainer. All setscrews used are "CUSHION DOG POINT" and they will not damage the shafts unless excessively tightened. Use enough tightening and tension force to train and demonstrate the use of your alignment tool.

B.A.T. and DELTA "V"-Belt Alignment

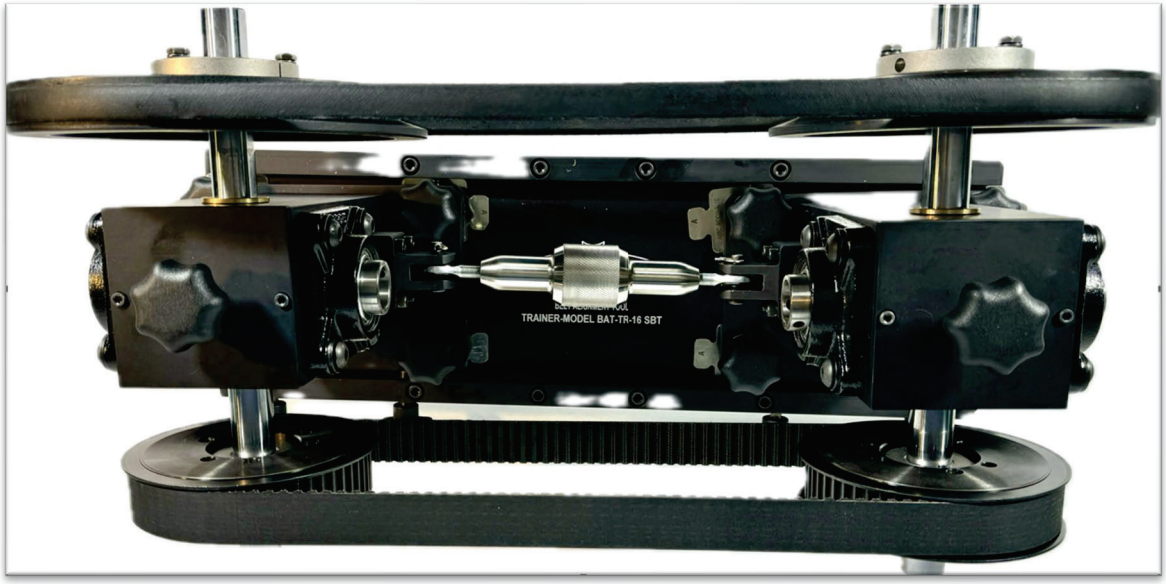
1. Belt Alignment:
   a. Insert the 13" shafts into the bronze sleeve bearings on the front of the bearing posts.
   b. **Note**: Shafts are marked S & M install in the Towers marked S & M. See pictures and diagrams at the end of this manual.
   c. Loosen the taper locks on the supplied pulleys, and place onto the shafts.
   d. Tighten the taper locks as per best practices (snug is good as there is no rotational dynamic forces exerted).
   e. Using the turnbuckle, turn it to bring the moveable post closer to the stationary.
   f. Install the belts, "V"-Belt or Timing Belt, or both.
      i. When installing both "V"-Belt and Timing Belt, install on opposite sides of the bearing posts.
   g. Rotate the turnbuckle to relieve tension on the belts, as this will allow for movement of the pulleys on the shafts and the sliding of the shafts in the sleeve bearings.
   h. Install belt alignment tools and align the pulleys as per instructions.

i. Picture of B.A.T "V"-Belt Alignment:

j. Picture of DELTA "V"-Belt Alignment:



k. Picture of Trainer Top View showing “V”-Belts and Timing Belts installed:



DELTA Timing Pulley Alignment
Inside the Timing Pulleys

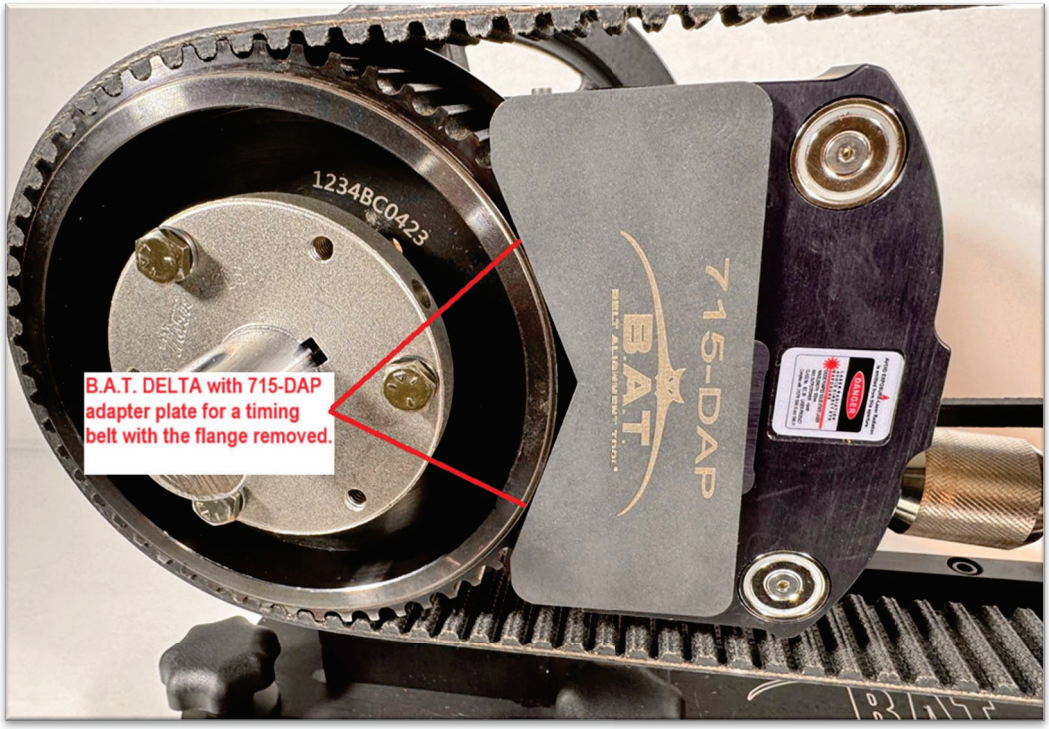
1. DELTA Timing Pulley - Belt Alignment:
   a. Install the 13” shafts into the bronze sleeve bearings on the front of the bearing posts.
   b. Loosen the taper locks on the supplied pulleys, and place onto the shafts.
   c. Tighten the taper locks as per best practices (snug is good as there is no rotational dynamic forces exerted).
   d. Rotate the turnbuckle, to bring the moveable post closer to the stationary.
   e. Install the belts, “V”-Belt or Timing Belt, or both.
      i. When installing both “V”-Belt and Timing Belt, install on opposite sides of the bearing posts.
   f. Rotate the turnbuckle to relieve tension on the belts, as this will allow for movement of the pulleys on the shafts and the sliding of the shafts in the sleeve bearings.
   g. Install belt alignment tools and align the pulleys, as per instructions.
   h. Picture of B.A.T. DELTA Timing Belt Alignment:

DELTA Timing Pulley Alignment
Inside the Timing Pulleys
With
715-DAP – "DELTA ADAPTER PLATE"

1. Use the 715-DAP for timing pulleys where there is no flange, if the flange has fallen off, or if it is missing.
   a. Install the 715-DAP to the flat side rear magnets.
   b. Place DELTA, as shown, with the DAP-715 on the timing belt pulley.
   c. Place the overhanging adapter plate on the rim face of the pulley.
   d. Place the opposing B.A.T. DELTA against the flange surface.
   e. Install belt alignment tools and align the pulleys as per instructions.
   f. **NOTE:** If both flanges are missing, or if the pulleys are flangeless, you will need to use two (2) 715-DAP adapter plates.
   g. Picture of B.A.T. with 715-DAP installed:

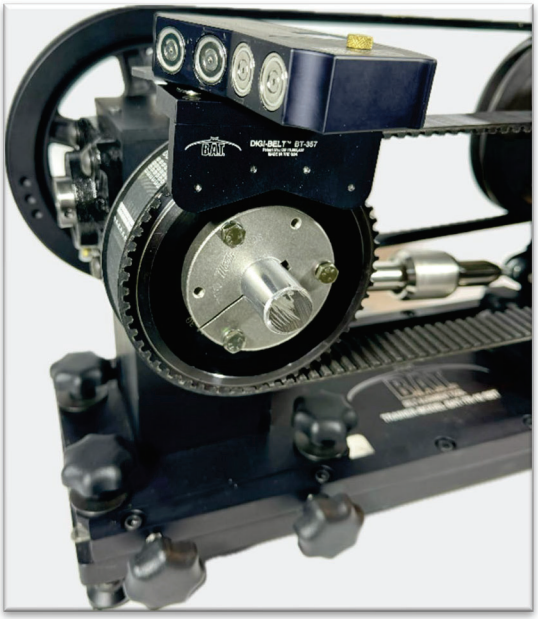
(Continued on next page)

2. Close-up of DELTA with 715-DAP mounted and aligned to the flange rim:

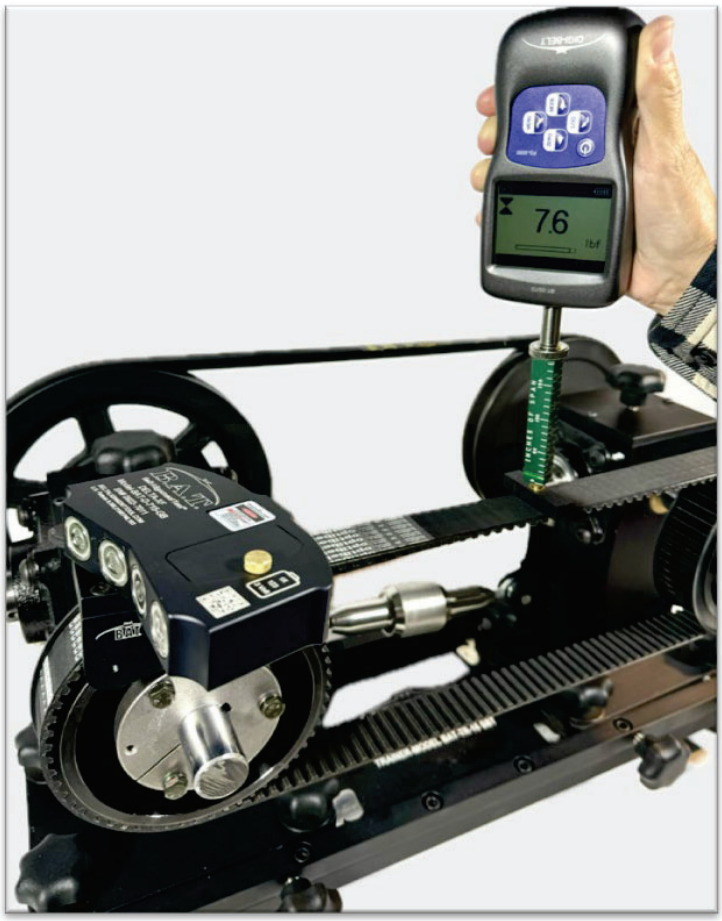


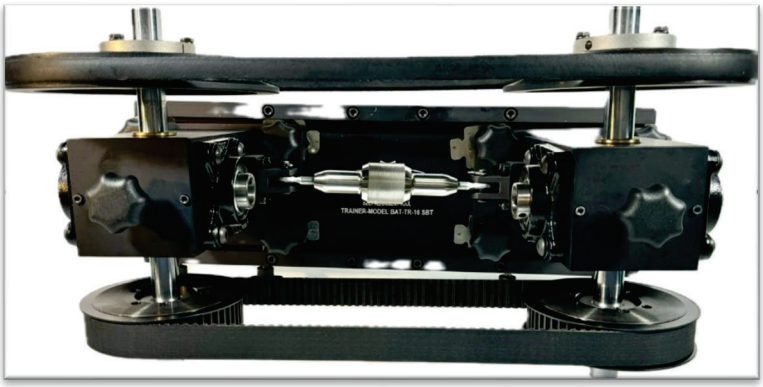
DIGI-BELT™ Belt Tension Measurement

3. Belt Tension Measurement
   a. **NOTE**: DO NOT OVER-TENSION THE BELTS!!! The trainer may be damaged and can bend under excessive belt tension!!! Use enough tension to train and demonstrate the use of your tension tool.
   b. Make sure both the "V" and Timing belts are installed when tension training. Failure to do so will result in excessive cocking of the pulley bearing posts.
   c. Install the one B.A.T. Laser, BT-357 90° Angle Adapter and the 715-DAP Adapter Plate, as shown.
   d. Zero the laser to the measurement scale.
   e. Rotate the turnbuckle to provide adequate tension to train and demonstrate your tension tool and procedure.
   f. Recommended deflection forces for included belts:
      i. B-56 V-Belt 6-8 lbs
      ii. 30 mm Timing Belt 7-9 lbs
   g. Picture of B.A.T. DELTA, mounted with angle bracket and adapter plate:



h. Pictures of DIGI-BELT Tension Checker with B.A.T. DELTA with “V”-Belt and Timing Belts installed for belt tension training.

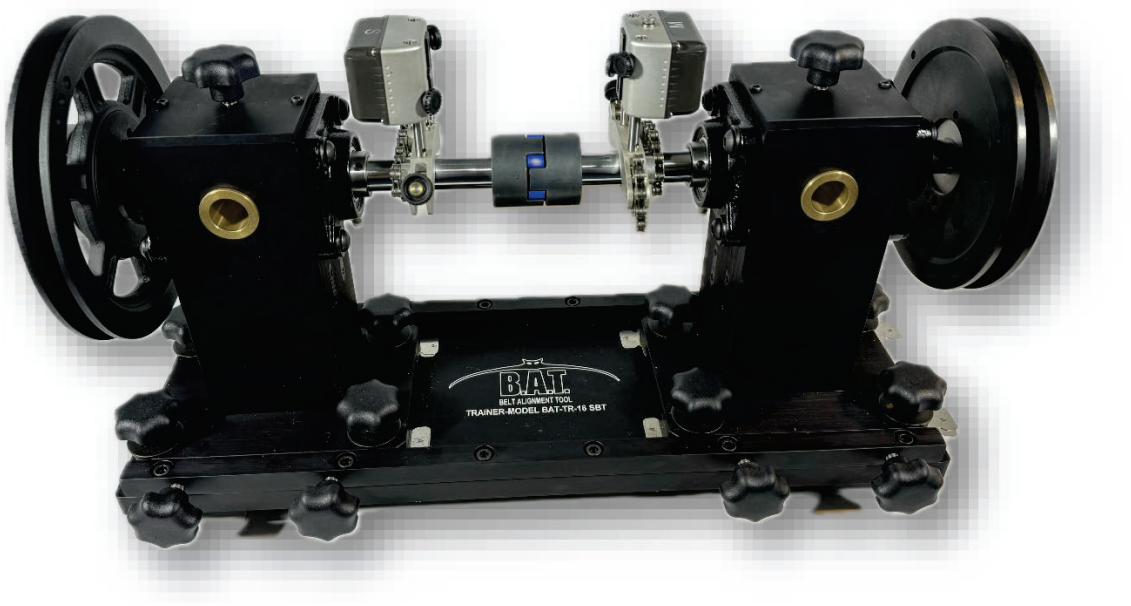




TR-16 SBT
Shaft Alignment
Laser and Dial Indicator

4. **NOTE**: DO NOT OVER-TIGHTEN KNOBS AND SET SCREWS!!! The MST is a TRAINER!!! All of the setscrews provided are "CUSHION DOG POINT", and they will not damage the shafts unless excessively tightened. Use enough tension to train and demonstrate use of the belt tension measuring tool. There are BRAKES installed on top of the bearing posts. These brakes allow for moderate force to be applied to the shafts to inhibit shaft freewheeling during alignment training.
   a. Raise the brake knobs to highest position.
   b. Loosen or remove all set screws.
   c. Insert the shafts into the rolling element flange bearings of the bearing posts.
   d. Remove the turnbuckle and, if needed, remove the turnbuckle mounts.
   e. Install the coupling on the shafts.
   f. Visually rough in the shafts, shimming vertically and horizontally adjusting the bearing position with the adjusting knobs.
   g. Install the couplings on to the shafts, insert the coupling spider, then slide the coupling halves together.
   h. Moderately tighten the setscrews.
   i. Install the shaft alignment hardware, as per tool instructions.
   j. Perform shaft alignment task or training as per your instrument's instructions.
   k. Pictures are shown on the next page:

i. Picture of Laser Shaft Alignment with turn buckle hardware removed:



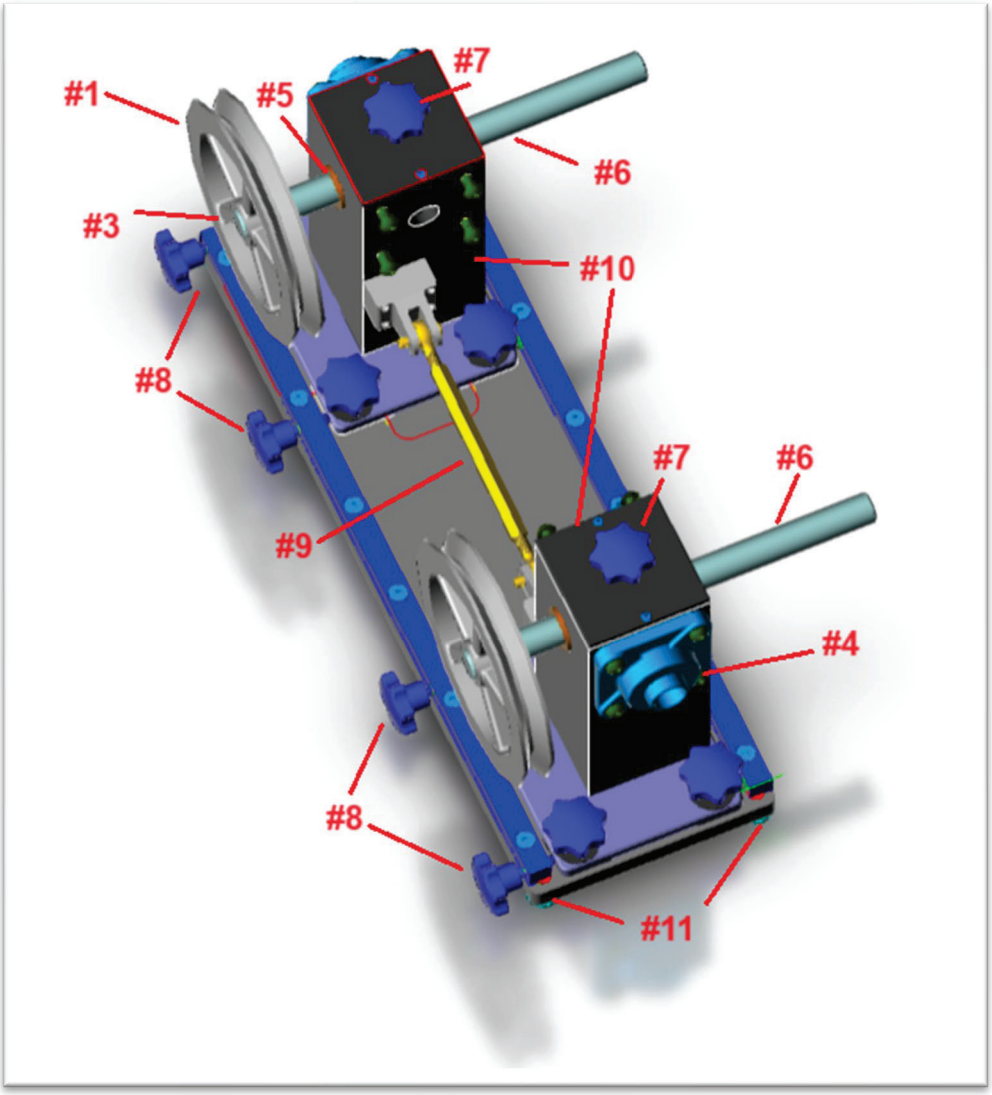
ii. Picture of Laser shaft Alignment at 6 o'clock position full 360° sweep:

B.A.T. TR-16-SBT

Trainer Components and Features

1. V-Belt Pulleys
   a. 1- Martin 6.25” Solid Pulley
   b. 1- Martin 9” Spoked Pulley
   c. 1- B 56 V-Belt
2. Timing Belt Pulleys
   a. 2- Martin 6” x 30 mm Timing Belt Pulleys
   b. 1- Optibelt 1280 – 8M-30mm Timing Belt
3. Taper Lock Bushing
   a. 4- Martin 1” Bore SDS Style Quick Disconnect Taper Lock Bushings
4. Roller Bearings for Shaft Alignment
   a. 4- 1” 4 Bolt Flange Bearings
5. Sleave Bearings for Pulley Alignment
   a. 4- 1” Self-Lubricating Bronze Sleave Bearings
6. Shafts S & M
   a. 2- 1” X 13.5” Chromed case-hardened carbon steel shafts
7. Brakes
   a. 2- Brass-Tipped Rotary Shaft Brakes
8. Alignment Adjusters
   a. 4- Horizontal Alignment Adjustment Knobs
   b. 8- Vertical Alignment Adjustment Knobs
   c. 4- Hands-free Horizontal Return Springs
9. Belt Tension Adjuster
   a. 1- Heavy-Duty Easy Turnbuckle Belt Tension Adjuster
10. Bearing Towers S & M
    a. 2- Moveable Multi-Purpose Bearing Towers
    b. 8- Square Hole Tower Bores
11. Alignment Base
    a. 4- Adjustable Leveling Feet
12. Coupling
    a. Woods L095 3 Jaw Coupling Halves and Insert

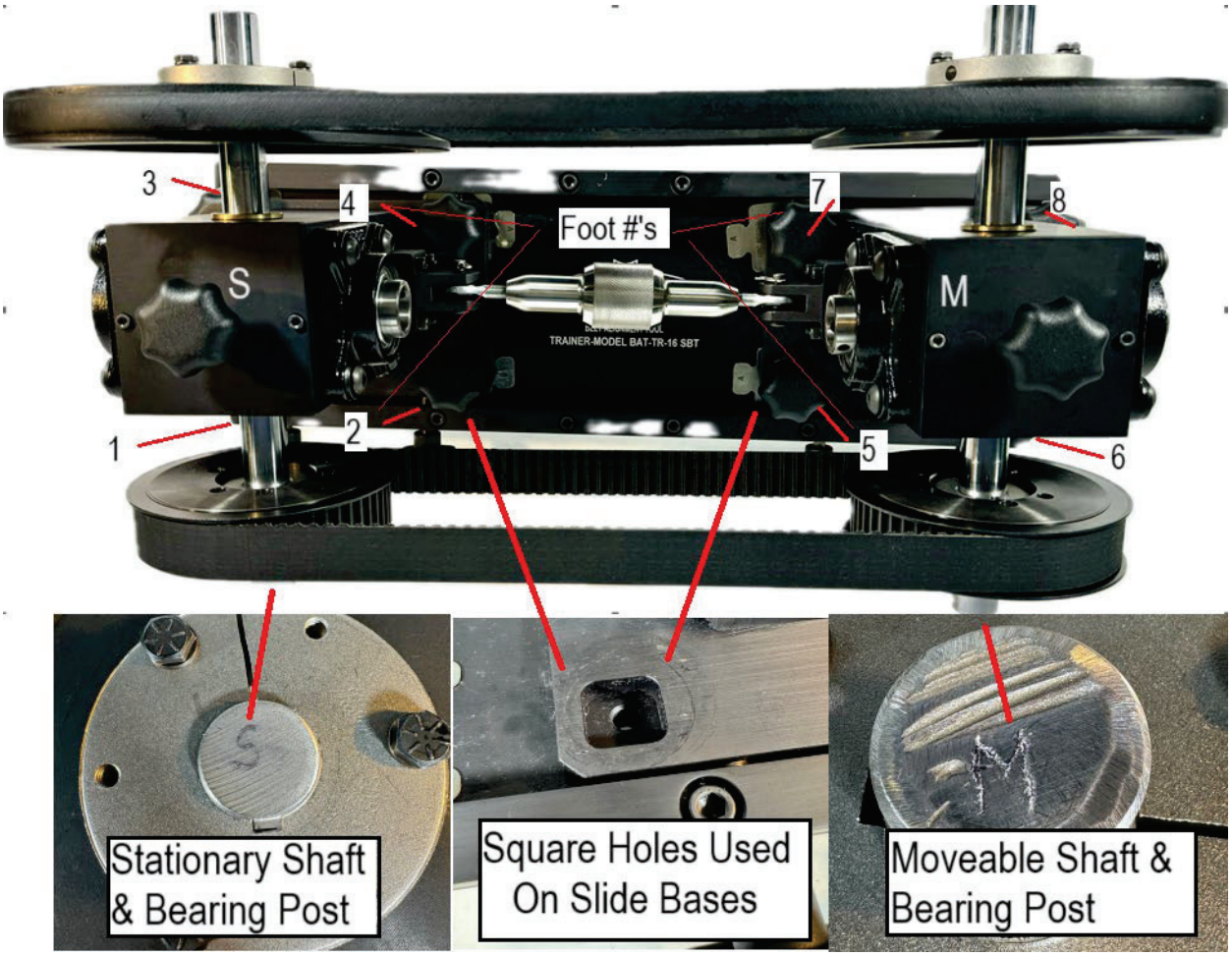
B.A.T. TR-16 SBT
Component Diagram



B.A.T. TR-16 SBT
Components and Detail:
Pulleys and Shafts

6.a - Qty. 2 - 1"x 15.5 Chromed Shafts

B.A.T. TR-16 SBT
Components and Detail:
Stationary and Moveable
Bearing – Posts – Shafts – Foot Numbers



B.A.T. TR-16 SBT
Components and Detail:
Turnbuckle Tension Adjuster