

Installation Instructions for
Model LTA-SM-15 and BMU-LTA-15
(Linkage Trim Actuator)

The LTA Oxygen Trim actuator is intended to be applied to single burner boilers with single point positioning fuel/air ratio systems. The Model LTA-SM-15 is controlled by a PCC-III Controller with Blockware Logic PC3-10353TA or PC3-10363TA. The Model BMU-LTA-15 is controlled by a BMU-xZx0 controller.

WARNING

Only qualified Combustion Control Technicians should install or commission this equipment. These Instructions are only guidelines. Each Burner arrangement is different. The Technician must use his knowledge of Burners and Combustion Control Systems to adapt these instructions to the particular installation. Failure to follow all instructions could result in equipment damage, Injury, or Death.

CAUTION

The LTA is intended to be controlled by a Preferred Instruments PCC-III Controller or by a BMU controller with logic that provides Firing Rate Adaptive Gain, and provides logic to prevent Fan Damper Lever Arm over travel.

If the LTA is controlled by a different controller, this logic must be provided in that controller. Failure to provide this logic could result in damper arm over travel which could damage the LTA or the burner linkage.

Before the LTA Trim Actuator is installed:

Inspect the existing burner fuel and damper linkage and replace all worn swivel or ball joints. For multi-blade burner dampers, inspect the mechanism to determine if it needs to be repaired or replaced.

Using a portable Oxygen / CO / Opacity / Smoke Spot analyzer, run the burner (on each fuel) from Low Fire to High Fire to verify that the burner is adjusted for minimum Oxygen levels while not producing excessive CO or Opacity at any Firing Rate. Consult the Burner Manufacturer for acceptable Oxygen, CO and Opacity levels. Adjust the burner as required.

NOTE: The Burner MUST be adjusted for best combustion BEFORE an Oxygen Trim System is installed. Oxygen Trim Systems CAN NOT improve burner performance beyond what the burner is capable of doing WITHOUT an Oxygen Trim System. Oxygen Trim Systems are designed to maintain a burner at it's previously established peak performance when ambient air density and minor fuel quality variations occur.

With the burner shutdown, and BEFORE installing the LTA:

Provide a means to move the Burner Modulating Motor from Low Fire to High Fire, with the Burner shutdown (use jumpers, a 135 ohm pot, a 4-20 signal generator, or other appropriate method to move the burner jackshaft).

Measure the fan damper lever arm linkage movement distance from Low Fire to High Fire (see sketch).

Select a desired Damper Trim +/- % based on the burner manufacturers recommendation. For Natural Gas and #2 fuel oil fired burners, +/- 10% trim is typical.

Multiply the measured Damper Stroke by the desired Trim % to determine the LTA Stroke.

Example: Damper Stroke = 5.5", and the desired trim is +/-10%, therefore:

Set the LTA Stroke = 0.55" (= 5.5 * 0.1)

Using the chart below, determine the LTA Operating Thrust for the desired LTA Stroke.

Example: For a 0.55" LTA Stroke, the LTA is rated for approximately 84 pounds thrust.

LTA Stroke (+/- Inches)	LTA Thrust (Pounds)
0.2	230
0.3	154
0.4	115
0.5	92
0.6	77
0.7	66

Before Installing the LTA, measure the existing burner damper linkage thrust to determine if the LTA rated thrust at the desired trim stroke is greater than the required thrust, as follows:

Obtain an in-line weighing scale.

Position the burner modulating motor at low fire.

Carefully mark the damper lever arm linkage so that it can be re-installed at it's original length and position.

Temporarily remove the linkage from the fan damper lever arm .

Attach the scale to the damper lever arm.

Insure that **all** burner main fuel and pilot shutoff valves are closed.

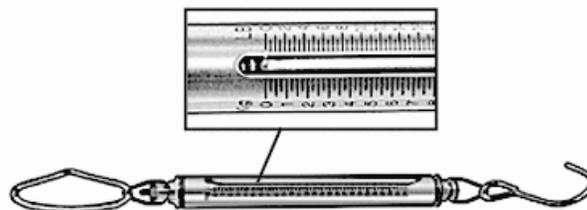
Start the burner fan ONLY (Do not allow the pilot or main fuel valves to open).

Align the scale to pull in the same direction as the original linkage would have.

Gradually pull on the scale until the damper lever arm starts to move, and note the pounds of thrust indicated on the scale.

Shutdown the Burner Fan.

Re-install the damper lever arm linkage in it's original configuration.



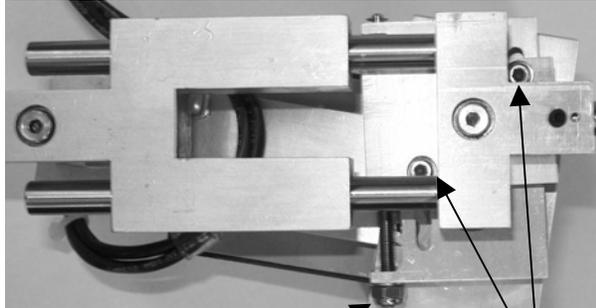
Typical Scale used to measure linkage thrust

Installing the LTA Actuator

Loosen the Pivot Block Clamp Screws $\frac{1}{2}$ turn with a $\frac{9}{64}$ " Allen Key wrench. DO NOT REMOVE THESE SCREWS.

Rotate the nut on the end of the Adjustment Screw until the edge of the Pivot Block is aligned with the desired LTA Stroke distance (see above to determine the LTA Stroke distance). Retighten the Pivot Block Clamp Screws.

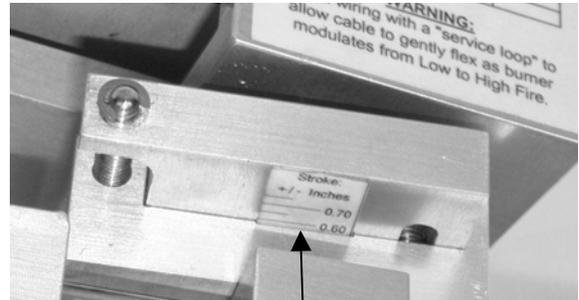
LTA Bottom View:



Stroke Adjustment Screw

Pivot Block Clamp Screws

LTA Lower Side View:



Stroke Distance Label

Determine where the LTA should be installed in the link that connects the fan damper lever arm to the jackshaft or modulating motor.

The LTA will move with the damper link as the burner modulates from Low to High Fire. Make sure that the LTA will not hit anything as the burner modulates from Low to High Fire.

For $\frac{5}{16}$ " or $\frac{3}{8}$ " diameter linkage rods, cut out a $5 \frac{3}{8}$ " long section from the existing linkage rod where the LTA will be installed.

For $\frac{5}{16}$ " linkage rods, slide the $\frac{3}{8}$ " OD bushings over the ends of the linkage, and then insert the ends into the LTA with the bushing holes aligned to allow the set screws to tighten on the $\frac{5}{16}$ " rod.

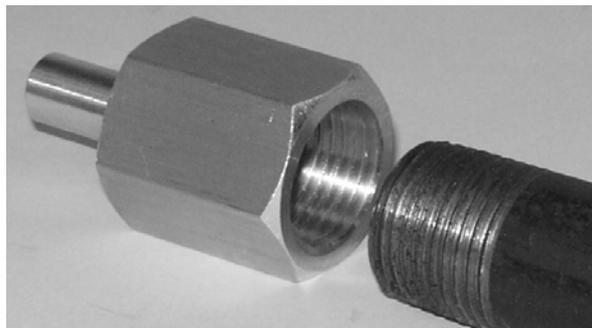
For $\frac{1}{2}$ " NPT threaded pipe linkage, cut out a $8 \frac{1}{8}$ " long section from the existing linkage pipe where the LTA will be installed, and then thread the ends of the pipe.

Thread the pipe ends into the $\frac{1}{2}$ " NPT adapters supplied with the LTA, and then insert the $\frac{3}{8}$ " OD end of the adapter into the LTA.

$\frac{5}{16}$ " rod adapter:



$\frac{1}{2}$ " NPT adapter:

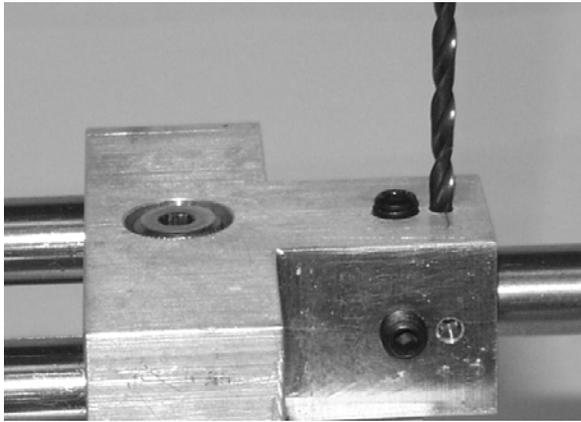


Tighten all 4 setscrews on the ends of the LTA with a 3/32 Allen Key wrench to firmly attach the LTA to the linkage.

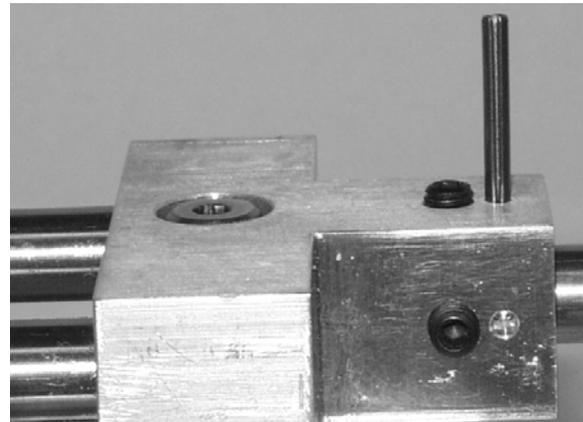
Using the pilot holes in the ends of the LTA drill a 3/32" diameter hole thru the linkage on each end of the LTA.

Press a 3/32" roll pin into the hole on each end.

drill linkage with 3/32" drill



press 3/32" roll pin into LTA and linkage



Wiring

BMU-LTA-15: Wire per the wiring diagrams in the BMU Instruction Manual, the same as any other BMU Servo. Follow the normal BMU Servo setup, zeroing, and limit seek instructions. Removing J11 on the BMU-SM-15 positioner board (when the burner is off-line) activates the CW and CCW pushbuttons for manual positioning during installation.

LTA-SM-15: Wire per the sketch below:

