S4B Safety Light Curtain Daily Checkout

Procedure

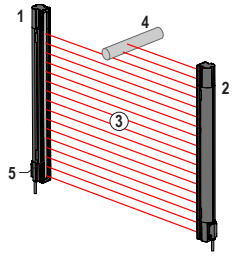
Banner Engineering highly recommends performing the System checkouts as described. However, a Qualified Person (or team) should evaluate these generic recommendations, considering their specific application, and determine the appropriate frequency of checkouts. This will generally be determined by a risk assessment, such as the one contained in ANSI B11.0. The result of the risk assessment will drive the frequency and content of the periodic checkout procedures and must be followed.

Daily checkout and checkouts after tooling and machine changes must be performed by a Designated Person (appointed and identified in writing by the employer). During continuous machine run periods, this checkout must be performed at regular intervals. A copy of the checkout results should be kept on or near the machine: see OSHA 1910.217(e)(1).

The Instruction Manual is p/n 230287.

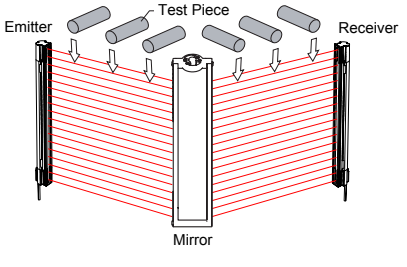
Perform at every power-up, shift change, and machine set up.		
☐	1	**Verify** that: • Access to the guarded area is not possible from any area not protected by the S4B. Hard guarding or supplemental presence-sensing devices must be installed, wherever needed, to prevent any person from reaching over, under or around the defined area or entering into the hazard area. • All supplemental guarding devices and hard guarding are in place and operating properly.
☐	2	**Verify** that the Safety Distance from the closest hazard point of the guarded machine to the defined area is not less than the distance calculated in the Instruction Manual. **Safety Distance: _____**
☐	3	**Verify** that it is not possible for a person to stand inside the guarded (dangerous) area, undetected by the S4B or other supplemental guarding (as described in ANSI/RIA R15.06, or other appropriate standards).
☐	4	If used, **verify** that: • The Reset switch, if used, is mounted outside the guarded area, out of reach of anyone inside the guarded area. • The means of preventing inadvertent use (for example, rings or guards) is in place.
☐	5	Once all Zone indicators are green, **test** the effectiveness of the S4B with the power on, using the trip test. Select the appropriate piece: 30 mm Models: STP-14 14 mm Models: STP-13
	5a	Trip Test: With the power on, **verify** that the S4B is in Run mode; receiver status indicators should be as follows: Status indicator: Green All Zone indicators: Green
	5b	**For non-cascade models:** *With the guarded machine at rest*, pass the test piece downward through the defined area in three paths: near the receiver, near the emitter, and midway between them. • If the emitter and receiver are far apart, a second person may be needed to monitor the indicators while the test piece is used near the emitter or in the midway position. • If corner mirrors are used in the application, the beams must be tested in three places on each leg of the beam path (between emitter and mirror, and also between mirror and receiver). **For cascade models:** *With the guarded machine at rest*, pass the test piece downward through the defined area of emitter/receiver **pair #1** in three paths: near the receiver, near the emitter, and midway between them. • If the emitter and receiver are far apart, a second person may be needed to monitor the indicators while the test piece is used near the emitter or in the midway position. • If corner mirrors are used in the application, the beams must be tested in three places on each leg of the beam path (between emitter and mirror, and also between mirror and receiver).

Trip test



1 = Receiver
2 = Emitter
3 = Defined area
4 = Specified test piece
5 = Location of the status indicators

Trip test for corner mirror applications



Continued on page 2

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Continued from page 1

		Perform at every power-up, shift change, and machine set up.
		WARNING: • **Trip test failure** • Using a system that has failed a trip test can result in serious bodily injury or death. If the trip test has failed, the system might not stop dangerous machine motion when a person or object enters the sensing field. • Do not attempt to use the system if the system does not respond properly to the trip test. **WARNING:** • **Clear the guarded area before applying power or resetting the system** • Failure to clear the guarded area before applying power could result in serious injury or death. • Verify that the guarded area is clear of personnel and any unwanted materials before applying power to the guarded machine or before resetting the system.
	5c	**For cascade models:** With the guarded machine still at rest, pass the test piece downward through the defined area of emitter/receiver **pair #2** in three paths as described in the previous step. Repeat for each emitter/receiver pair in the cascade.
	5d	**Verify** that when the test piece is interrupting the defined area: • At least one Zone indicator must be red. Different red Zone indicator(s) will be lit, according to the position of the test piece. **NOTE:** If beam 1 is blocked, Zone 1 indicator will be red and all other Zone indicators will be off because beam 1 provides the synchronization signal for all the beams. • **For cascade models:** Emitter/Receiver pairs #2, #3, etc.— At least one Zone indicator on the unit through which the test piece is being passed must be red. Different red Zone indicator(s) will be lit, according to the position of the test piece. The status LED on the Master unit will be red. • Trip Output Operation – The Status indicator must turn red and remain red while the test piece remains in the defined area. If not, the installation has failed the trip test. **If all Zone indicators are green or do not follow the position of the test piece, or if the Status indicator turns green while the test piece is interrupting the defined area,** the installation has failed the trip test. **WARNING:** • **Do not use the system until the checkouts are verified** • Attempts to use the guarded/controlled machine before these checks are verified could result in serious injury or death. • If all these checks cannot be verified, do not attempt to use the safety system that includes the Banner Engineering Corp. device and the guarded/controlled machine until the defect or problem has been corrected. **Check** for correct sensor orientation, for the presence of reflective surfaces (see below), or for unguarded areas created by the use of blanking. **IMPORTANT:** Do not continue with this checkout procedure or operate the guarded machine until the situation is corrected and the indicators respond properly as described above.
	5e	**Verify** that when the test piece is removed from the defined area, the Status indicator and all Zone indicators turn green, the machine does not automatically restart, and that the initiation devices must be engaged to restart the machine.
☐	6	**Initiate** machine motion of the guarded machine, and while it is moving, **insert** the optional test piece into the defined area. **Do not attempt to insert the test piece into the dangerous parts of the machine.** **Verify** that, when the test piece is in the defined area, the dangerous parts of the machine come to a stop with no apparent delay. Remove the test piece from the defined area and verify that: • The machine does not automatically restart, and • Initiation devices must be engaged to restart the machine.
☐	7	With the guarded machine at rest, **insert** the test piece into the defined area and verify that the guarded machine cannot be put into motion while the test piece is in the defined area.
☐	8	**Check** carefully for external signs of damage or changes to the S4B, the guarded machine, and their electrical wiring. Any damage or changes found should be immediately reported to management. **IMPORTANT:** Do not continue operation until the entire checkout procedure is complete and all problems are corrected.
		Eliminating Problems with Reflective Surfaces If possible, relocate the emitter and/or receiver to move the defined area away from the reflective surface(s), being careful to maintain adequate separation distance (see step 2). Otherwise, if possible, paint, mask or roughen the surface to reduce the reflectivity. Where these are not possible (as with a shiny workpiece), include a means of restricting the receiver's field of view or the emitter's spread of light in the sensor mounting. Repeat the trip test to verify that these changes have eliminated the problem reflection(s). If the workpiece is especially reflective and comes close to the defined area, perform the trip test with the workpiece in place.

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