

MULTI-SCREEN® System Daily Checkout

To be Performed at Every Power-up, Shift Change, and Machine Setup.

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 intervals not to exceed 24 hours. A copy of checkout results should be kept on or near the machine: see OSHA 1910.217(e)(1).

The *designated person* must:

- 1) Verify that access to the dangerous parts of the guarded machine is not possible from any direction not protected by the MULTI-SCREEN® System, hard guarding, or supplemental guarding, and verify that all supplemental guarding devices and hard guarding are in place and operating properly.
- 2) Verify that the minimum separation distance from the closest danger point of the guarded machine to either defined area is not less than the calculated distance. See Figure 1 below.
- 3) Ensure that it is not possible for a person to stand between either defined area and the dangerous parts of the guarded machine. Or, verify that supplemental presence sensing devices, such as safety mats, are in place and functioning properly in any space between the defined area and any danger point which is large enough to allow a person to stand undetected by the MULTI-SCREEN System.
- 4) Verify that the MULTI-SCREEN control box is latched and locked. The key or combination to the control box latch lock should be in the possession of a qualified person.



WARNING. . .

A shock hazard exists while the lockable enclosure is open. Before continuing, verify that the enclosure is closed and latched.

The formula used to calculate the separation distance is:

$$D_s = K \times (T_s + T_r) + D_{pf}$$

where:

- D_s** = the separation distance;
- K** = the OSHA-recommended hand speed constant of 63 inches per second (NOTE 1, below);
- T_s** = the overall stop time of the machine measured from the application of the "stop" signal to the final ceasing of all motion (including stop times of all relevant control elements, and measured at maximum machine velocity). See NOTE 2, below.
- T_r** = the response time of the MULTI-SCREEN System:

Determine the value of *T_r* for each of the two sensor pairs and use the **GREATER** value in the separation distance formula.

T _r	MINI-SCREEN Sensors	MACHINE-GUARD Sensors
.048 sec.	4.5 in. to 16 in. sensors	6 in. to 24 in. sensors
.060 sec.	20 in. to 32 in. sensors	30 in. to 48 in. sensors
.072 sec.	36 in. to 48 in. sensors	54 in. to 72 in. sensors

D_{pf} = the added distance due to depth penetration factor, as prescribed in OSHA 1910.217 and ANSI B11 standards:

Blanking Program	MINI-SCREEN 9 m (30 ft) Sensors	MINI-SCREEN 18 m (60 ft) Sensors	MACHINE-GUARD
Floating Blanking "Off"	D _{pf} = 1.6 in	D _{pf} = 2.5 in	D _{pf} = 4.0 in
One-beam Blanking	D _{pf} = 3.3 in	D _{pf} = 4.2 in	D _{pf} = 7.0 in
Two-beam Blanking	D _{pf} = 5.0 in	D _{pf} = 5.9 in	D _{pf} = 9.0 in

The value for *D_{pf}* may be different for each of the two sensor pairs.

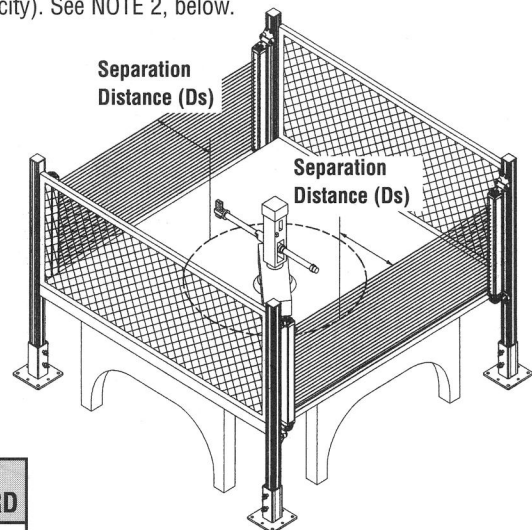
NOTES:

- 1) The OSHA-recommended hand-speed constant K has been determined by various studies, and although these studies indicate speeds of 63 in/sec to over 100 in/sec, they are not conclusive determinations. The employer should consider all factors, including the physical ability of the operator, when determining the value of K to be used.
- 2) *T_s* is usually measured by a stop-time measuring device. If the specified machine stop time is used, we recommend that at least 20% be added as a safety factor to account for clutch/brake system deterioration.
- 3) Use of floating blanking will always cause the required *D_s* to increase.



WARNING. . .

Calculate the separation distance carefully. Failure to maintain appropriate separation distance can result in serious bodily injury or death.



- 5) Test the effectiveness of both MULTI-SCREEN light screens with system power "on", as described in steps (a) through (e), below. The MULTI-SCREEN control box includes eight specified test pieces. Select the proper test piece based on system configuration, per the following chart:

Sensor Type	Floating Blanking	Specified Test Piece	
		Model	Size
MINI-SCREEN 9 m (30 ft) range	None (off)	STP-2	19.1 mm (0.75 in)
	1-beam	STP-4	32.0 mm (1.25 in)
	2-beam	STP-3	44.5 mm (1.75 in)
MINI-SCREEN 18 m (60 ft) range	None (off)	STP-7	25.4 mm (1.00 in)
	1-beam	STP-1	38.1 mm (1.50 in)
	2-beam	STP-8	50.8 mm (2.00 in)
MACHINE-GUARD	None (off)	STP-1	38.1 mm (1.50 in)
	1-beam	STP-5	57.1 mm (2.25 in)
	2-beam	STP-6	76.27 mm (3.00 in)

- a) Verify that the MULTI-SCREEN System is in the RUN mode (green and yellow Status Indicator LEDs "on"). See Section 4.3 of the MULTI-SCREEN manual (p/n 42492) for RESET procedure.
- b) With the guarded machine at rest, pass the appropriate specified test piece downward through the defined area at three points: close to the receiver column, close to the emitter column, and midway between the emitter and receiver columns (see Figure 2 below). In each case, the red status indicator should come "on" and remain "on" for as long as the test piece is within the defined area. When the test piece is withdrawn from the defined area, the green status indicator should come on. If the green indicator comes "on" at any time when the test piece is within the defined area, check for reflective surfaces and do not continue until the cause is discovered and situation is resolved.
- c) Initiate machine motion of the guarded machine and, during motion, insert the appropriate specified test piece into the defined area (at right angles to the defined area). Do not attempt to insert the test piece into the dangerous parts of the machine. Upon insertion of the test piece into the defined area at any time during machine motion, the dangerous parts of the machine should come to a stop with no apparent delay. Upon removal of the test piece from the defined area, verify that the machine does not automatically restart, and that the initiation devices must be engaged to restart the machine.
- d) With the guarded machine at rest, insert the appropriate specified test piece into the defined area and verify that it is not possible for the guarded machine to be put into motion while the specified test piece is within the defined area.
- e) Repeat steps a through d for the second light screen.
- 6) Check carefully for external signs of damage to the MULTI-SCREEN System, the guarded machine, and their electrical wiring. Any damage found should be immediately reported to management.

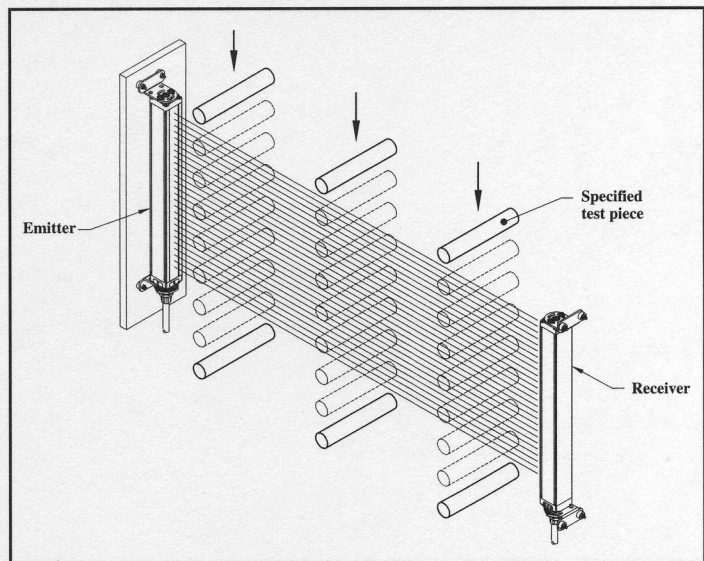


Figure 2. Use of Test Piece



WARNING. . .

If *all* of the above checks cannot be verified, the MULTI-SCREEN System/guarded machine should not be used until the defect or problem has been corrected (see Section 5). Attempts to use the guarded machine under such conditions could result in serious bodily injury or death.