

Energy Absorbers Length of Fall Plan

Length of Fall (LOF) 6ft Free Fall Example

All components of a fall protection system are subject to stretch, elongation and deceleration when subjected to a free fall. To prevent striking a lower level, the ground below, or exceeding PPE performance specifications, the LOF plus ground or obstacle clearance, must be calculated as accurately as possible. The examples shown in this catalog apply to equipment mfg. by SAS only and are intended to be more of a guideline than a rule.

Personnel responsible for project safety are required to draft their own Length of Fall Plan LOFP.

Qualified or competent* person or a safety consultant see OSHA definitions.

Fig.1



6ft Free Fall Exposure

A free fall (6ft/72") is calculated using two primary factors:

- 1) The D-ring height above the leading edge, (52") Fig.1.
- 2) The E/A's service length when in tension as shown at Fig.1. Note: The free fall will include any length of the E/A or accessory lanyard that falls over the leading edge.

Rigging the E/A

- 3) The E/A's max. service length of 33", that can be included in the free fall is calculated by subtracting the D-ring height from the free fall length: $72" - 52" = 20"$. See Fig.4.
- 4) If the E/A hangs vertically from the D-ring at the leading edge, as shown at Fig.4, the free fall will be $52" + 33" = 86"$.
- 5) The free fall can be limited to 72" by positioning the rope grab 13" from the leading edge as shown at Fig.5. Formula: E/A's Max. Service Length = $33" - 20" = 13"$.

Performance Factors Example

Energy Absorber(E/A) No. 6180

- Max. user weight of 310lb (140kg),
- Max. free fall 6ft(1.8m).
- Avg. arresting force 900lb(4kN)
- Max. deployment length 66"(1.6m)
- SuperGrab™ No.4015
Max. deceleration 24"

WARNING!

Slack in the lifeline at the leading edge will increase the free fall and LOF by the length of the slack. Free falls greater than 6ft can result in failure of the PPE to arrest a fall exposing the worker to serious injury or death.

6ft E/A Service Length

SAS specified service lengths include only the factory attached connectors at the time the E/A was shipped. Free fall calculations need to include the lengths of any additional components supplied by the end user, such as carabiners, rope grabs or aux. lanyards. Shown here, No.6180 E/A is attached to No.4015 SuperGrab™ rope grab.

Note: Lengths are measured from their contact point with other components when in tension and may vary +/- 2".

Fig.2

Fall Arrestor Deceleration 6"

"C" = 20"
E/A Length over the LE

"A" = 52"
D-ring Height

72" Free Fall
6" Rope Grab Deceleration = 78"

Rope Grab Deceleration
"B" = 24"

Free Fall

Fall arrest is accomplished in 2 different phases. In Fig.2 the worker

free falls over the leading edge the D-ring height 52" + the E/A's length of 20" = 72"(6ft). Phase 1 Rope Grab

Lock: The rope grab is manually positioned by moving it up or down on the lifeline. When subjected to a force the rope grab locks onto the lifeline and holds position. In a free fall it will decelerate a max. of 24".

Limiter Knot: A termination or figure 8 knot as shown at Fig.6, can be used to gauge a workers position on the lifeline and stop the rope grabs deceleration.

Leading Edge Swing Fall Hazard

Horizontal travel along the leading edge exposes the worker to a swing fall hazard. The free fall length will not be increased provided the E/A and lifeline remain in tension. The LOF will be increased by the angle of the lifeline off-center from the anchor point above.

E/A No.6180

Fig.4

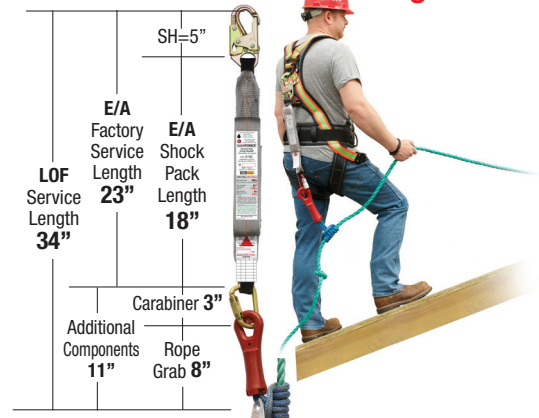


Fig.3

LOF Factors

"B" = 6"
SuperGrab™ Rope Grab w/Limiter Knot

"D" = 66"
E/A Deployment

"E" = 14"
Harness Stretch

"A+C" = 72"
Free Fall

Net LOF Ground Clearance not Included 158"/ 13'-2"

Ground/Obstacle Clearance Minimum 24"

"D" = 66"
E/A Maximum Deployment

"E" = 14"
Harness Stretch

72"
Free Fall

Fall Arrest

Phase 2 E/A Deployment: When the

Fall Arrestor locks onto the lifeline, the E/A's tear

webbing gradually deploys reducing the free fall velocity to

a complete fall arrest limiting the average fall arrest force to 900 lb. The tear webbings maximum deployment for a 6ft E/A is 66".

Harness Stretch: The weight of a suspended worker takes up any slack in the harness webbing causing the D-ring D-Plate to slide upward. Harness stretch is approx. 14" provided the harness has been properly adjusted to fit the worker, reducing webbing slack to a minimum.

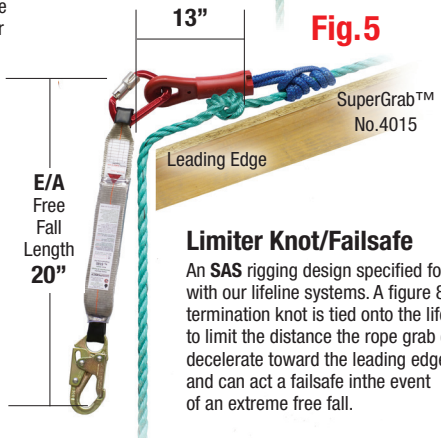
Ground Clearance: 2ft should be added to the net LOF as a safety margin for obstacle or ground clearance.

Length of Fall Calculation

"A" = D-ring height above LE	52"
"B" = SuperGrab™ deceleration	6"
"C" = E/A length over the LE	20"
"D" = E/A Max. Deployment	66"
"E" = Harness stretch	14"
Net LOF Total	158" [13'-2"]
Min. Ground Clearance	24"
Length of Fall Plan (LOFP)	182" [15'-2"]

Limiter Knot

Fig.5



Limiter Knot/Failsafe

An SAS rigging design specified for use with our lifeline systems. A figure 8 or termination knot is tied onto the lifeline to limit the distance the rope grab can decelerate toward the leading edge and can act a failsafe in the event of an extreme free fall.

Fig.6

Limiter Knots

Figure 8 Knot

Termination Knot

WARNING PROMPT RESCUE

Suspended workers must be rescued promptly to avoid serious injury or death resulting from Suspension Trauma. Equip and train workers to use SAS Trauma Strap No.6060