



Information Note

Date:	December 2011
Title:	Use of FRS Aerial Appliances for Rope Access and Rescue
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1. Use of aerial appliance ladders:

- 1.1. The ladder attached to the booms on an aerial appliance is a temporary means of access and as such, fall protection is not a requirement for ascent/descent of this ladder.
- 1.2. Should personnel be required to work from a position on the aerial appliance ladder then the ladder should be treated as a work platform. In this case fall protection is required.
- 1.3. Where fall protection is utilised, it is acceptable to connect the lanyard attachment to a round of the ladder on the aerial appliance. As in any fall arrest system this should be connected as high as possible above the user to ensure that any fall distance and force exerted when the fall is arrested is minimised.
- 1.4. Whenever an aerial appliance is subjected to any shock loading due to arresting a fall the appliance must be fully inspected to ensure suitability for further use. Any inspection must only be undertaken by a competent person.

2. Use of Aerial Appliance for Rope Rescue / Access.

- 2.1. It is vital for aerial appliance operators to be able to calculate the loads that the appliance cage is being subjected to. Whenever loads are under-slung to the cage, the rating of the cage should be reduced by one person (that being calculated as 90kg). This reduction accounts for the additional loading of the appliance due to the potential swing of the suspended load. It should also be borne in mind that the wind speed is likely to be greater the higher the cage is sited and this will exert further loading on the cage and must be considered prior to commencing operations.
- 2.2. For non-live loads it is acceptable to suspend the load using only one system; however for all live loads there must be two individually anchored systems.
- 2.3. In many two-rope systems the load is held by one primary rope system and the secondary rope system acts as a backup that only takes the load in the event of a failure in the primary system.

In the event of the backup system being required there will be a shock loading to the system and anchor when the load is transferred from the failing primary system to the backup system.

2.4. This is not a desirable situation when using aerial appliances as the shock loading can affect the stability of the appliance.

2.5. As such, it is recommended that when using two rope systems for live loads on aerial appliances, the two rope systems should share the load.

2.6. Each system must be capable of bearing the total load and any shock loading generated should one system fail.



3. Simple under-slung live loads (see sec. 2.1)

3.1. Simple under-slung live loads should have two independent systems linking the load to the cage.

3.2. It is recommended that the total load is shared between the two systems used; however each system must be individually capable of bearing the load.

4. Rope Access/Rescue loads

4.1. Rope access and rescue systems should apply the following principles:

A load cell should be placed between the connection point on the cage and the rope system. This should be constantly monitored and have remote display to indicate if loading to the cage approaches the maximum load that the cage is rated for. It should have a safe working load rating high enough to allow both rope systems to be attached to it.

The total load on the Aerial Ladder Platform cage must be calculated as follows:

$$\text{Total Load} = \text{Load cell reading} + \text{any load within the cage}$$

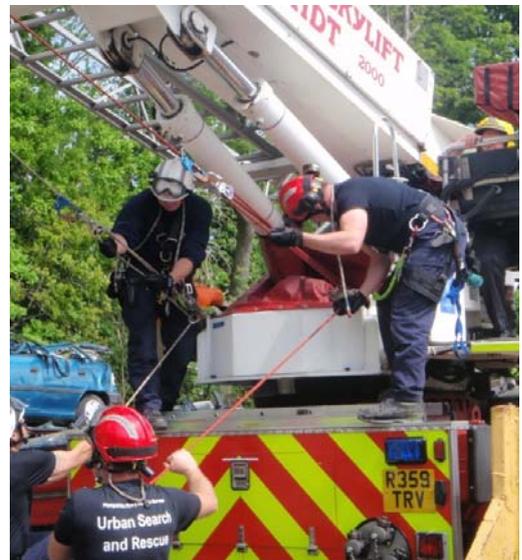
4.2. As detailed above, (sec 2.3) the standard method of employing one loaded primary system and one backup system that becomes loaded in the event of a failure in the primary system should be avoided. This is to prevent the aerial appliance being subjected to a shock loading in the event of a failure of the primary system. It is recommended that both systems share the load so that in the event of a failure in either system the shock load is minimised.

4.3. All systems should be anchored to the appliance in order not to place any lateral forces on the cage or the booms of the appliance. It is recommended that, where possible, the rope systems are anchored to suitable anchor points on the base of the turret as this will allow rotation of the turret without effect on the rope systems in use. Where this is not possible any suitable and risk assessed point on the appliance may be used (consultation with the manufacturer is



recommended to ensure identified points are acceptable for use as anchors) but care should be taken as rotation of the turret may alter the position of the suspended load or even sever ropes.

- 4.4. A suitable safe system of work should be put in place to safeguard rope operators working on or near the turret.



- 4.5. When employing mechanical advantage systems to raise a load anchored beneath the aerial appliance cage, it is vital to account for the increased loading this will place on the cage. To keep this additional loading to a minimum and still maintain an effective system it is recommended that a 6:1 mechanical advantage system is used. This will ensure that the system can be easily adjusted with a rescue load but still be effective with regard to equipment and rope use. It is important to have enough rope available to accommodate a 6:1 pulley system prior to commencing operations and, to minimise “Bounce” in the system and prevent peaks in the loadings, any hauling system should be tensioned in a smooth and controlled manner.



- 4.6. Where necessary the additional loading created by a raising system can be further reduced by diverting the route the ropes take through pulleys attached at the lower boom knuckle. This can also assist in situations when additional clearance is required.
- 4.7. FRS's may wish to restrict movement of the booms and cage whilst rope systems are attached to the appliance. In situations where this movement is allowed or necessary, extreme care must

be taken to understand the effect that the proposed boom/cage movement will have on the load and its position.

For example; extension of the booms will increase the height of the load and decrease the distance of the load from the cage.

- 4.8. During the initial 'sighting' stage of the incident, as booms are moved into position, consideration should be given to allowing ropes to 'free run' and any loads are then under slung during this phase of the operation (ref to sec 3.2). This will prevent rope control devices from auto-locking and imposing unknown loads to the rope systems and anchor points.
- 4.9. A safety officer should be positioned to ensure that any unloaded ropes do not become fouled within the moving parts of the ALP. This is especially pertinent in windy conditions

In all cases FRS's should consult with the manufacturer/supplier of the aerial appliance to ensure that all systems of work proposed are acceptable for use with the particular appliance.