

Daytona DS60 Mobile Stage ~ Risk Assessment

WORK ACTIVITY Erection and operation of Daytona DS60 Mobile Stage

VERSION V1 - 07 -2006
RA will be revised and developed to take account of operational experience of the unit in service

DATE 1st August 2006

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SPECIFIC LEGAL REQUIREMENTS	Provision and Use of Work Equipment Regulations 1998 Lifting Operations and Lifting Equipment Regulations 1998
APPROPRIATE STANDARDS AND GUIDANCE	Safe use of Work Equipment - ACOP L22 HSE Books Safe use of Lifting Equipment - ACOP L113 HSE Books The Event Safety Guide - HSG195 HSE Books Temporary Demountable Structures, Guidance on design, procurement and use. 2 nd Edition 1999

Description

The DS60 Mobile Stage has been developed as a small self contained stage for festivals and roadshows. When packed down for transit the stage trailer measures 11m long, by 2.55m wide and 4.1m high and opens out to a 10m x 6m stage with a deck height of 1.4m with PA wings either side extending the frontage to 14m.

Delivered to site as an articulated vehicle it can be positioned accurately and when the driving unit is detached the stage can be levelled to take account of sloping ground conditions (within reason). Each of main supporting legs is independently hydraulically adjusted to level the stage precisely.

The hydraulic system on the stage will raise and support the stage and roof even when fully loaded and has extensive redundancy built into it to ensure reliability. Although the 'lock-out' valves on the hydraulics are purpose designed to support the stage roof when power is disconnected, use is made of locking pins to provide a secondary means of support. In all cases the stage is adequately supported so that in the event of a complete loss of the hydraulic system the stage will remain standing and serviceable.

The extensive use of hydraulics has eliminated much of the manual handling normally associated with a stage of this kind.

To comply with the principals of the Working at Height Regulations 2005 work at height has been eliminated wherever practical. For example, integral to the design of the stage roof is a heavy duty truss system which can be hung with lights before being finally lifted to trim height.

To provide access to the raised truss the stage comes complete with a Zarges Sherpascopic Height Adjustable Work Platform which provides a guarded working platform and side braces for added stability.

The final calculations for the maximum windspeed the stage can withstand will be computed when the stage is complete and final modifications have been made. The minimum anticipated design speed is 25m/s (56mph), if gust speeds of this magnitude are experienced it is highly likely that the event will have been cancelled long before the stage safety is compromised.

The stage is intended for use throughout the year and at all times of day or night. It has a self contained generator located beneath the stage with fire resisting construction between the stage and the locker. Similarly the hydraulic compressor is self contained. Mounted on slides the generator can be pulled out and used in the open air. The generator is there to provide power for erection and removal and not for performance.

OPERATION	HAZARD	PEOPLE AT RISK	WORST OUTCOME	PRINCIPAL PRECAUTIONS	RESIDUAL RISKS	COMMENTS AND/OR ADDITIONAL PRECAUTIONS
Delivery to site	Contact with fixed structures	Crew Property damage	Serious	Minimum dimensions for site access are (4.2m height x 2.7m width) Visual inspection of venue on arrival to identify any low cables, structures or street furniture which may hamper delivery In tight locations and when reversing operations supervised by a banksman	Controlled	
	Contact with pedestrians	Crew Public	Catastrophic	Area cleared of public/crew on arrival, if necessary organisers stewards deployed to clear area. Reverse warning bleeper and flashing amber strobes on unit Reversing supervised by banksman	Controlled	
	Weak structures	Crew Property damage	Serious	Client advised in advance of maximum weights of stage and unit (18 tonne) and responsible for checking that bridges and floors can support total weight and axle weight If in doubt delivery will cease until clarification When access is required over very soft ground track panels provided to support unit and trailer Visual inspection of site to ensure that no drain or manhole covers will be beneath trailer legs when they are deployed	Controlled	Track panels - only required to support trailer and unit wheels Trailer legs have highest loading and should not be positioned over covers etc. Extension loadings less and can be positioned on heavy duty covers
Detaching unit	Collapse of trailer	Crew	Serious	Emergency brake applied on trailer to lock wheels Front legs lowered to support trailer (onto 500mm_ footpads) Cables and air lines detached and unit drawn forward Personnel kept clear of unit and trailer	Controlled	
Levelling stage	Collapse of trailer	Crew	Serious	Legs centrally located onto crane footpads (500x500x60mm) to distribute load evenly Foot attachment to legs connected with a swivel joint which allows the foot to accommodate sloping ground without exerting asymmetric forces on the joint When in place legs retained in position by pins (secured in place by R Clips) to ensure that in the event of a hydraulic failure the stage does not collapse 2 additional legs at the front of the trailer dropped into place and braced to provide additional stability if the load on the stage is	Controlled	

OPERATION	HAZARD	PEOPLE AT RISK	WORST OUTCOME	PRINCIPAL PRECAUTIONS	RESIDUAL RISKS	COMMENTS AND/OR ADDITIONAL PRECAUTIONS
				uneven		
Operation of hydraulic controls	Control failure	Crew	Serious	Controls comply with the Provision of Work Equipment Regulations 1998 and the Supply of Machinery (Safety) Regulations 1992 (as amended) as the controls are: - mounted on a hand held console which permits the operator to be in a position whereby they can clearly observe the operation and ensure that it is clear of people - clearly marked - fitted with an emergency stop - operates on a hold to run principal - alternative manual controls are fitted to the trailer	Controlled	
Donkey engine	Fumes	Crew	Serious	Donkey engine used to power hydraulic system - positioned in a compartment beneath the stage Donkey engine operated in well ventilated area with exhaust to the atmosphere Donkey engine only used whilst hydraulics are in use, not used during performances	Controlled	
Erection of stage canopy extension	Manual handling	Crew	Serious	Stage canopy extension securely stored within body of trailer Stage canopy extension truss pivoted so that it can be easily extended with minimal handling Stage canopy roof hinged and lowered onto truss frame and accessible from the ground (handling reduced)	Controlled	Stage canopy extension can be fitted with branding etc without any work at height
Erection of stage roof (first lift)	Manual handling	Crew	Serious	All manual handling connected with the raising of the roof eliminated by the use of hydraulics and remote operation	Controlled	
	Struck by falling objects	Crew	Catastrophic	Operation conducted by operator using hydraulic control and positioned where they can observe work in progress Stage and immediate area clear of people Hydraulic rams designed for loading and with non return valves to prevent failure of roof under load	Controlled	
Wind loadings	Collapse and overturning	Crew Performers	Catastrophic	Stage designed to a minimum upper wind induced loading of 25m/s Openings in rear stage wall to allow wind to vent and reduce build up	Controlled	

OPERATION	HAZARD	PEOPLE AT RISK	WORST OUTCOME	PRINCIPAL PRECAUTIONS	RESIDUAL RISKS	COMMENTS AND/OR ADDITIONAL PRECAUTIONS
		Public		of pressure		
Stage floor	Manual handling	Crew	Serious	Hydraulic powered operations, eliminates the requirement to construct scaffold or framework and move large ply floor panels	Controlled	
	Collapse of floor	Crew Performers	Catastrophic	Load evenly spread over legs Leg bases supported on crane pads to accommodate uneven and weak ground Lateral bracing to secure legs in position When stage levelled legs secured in position with pins ('R' clipped) Stage floor designed to point loadings of 3.6kNm ² and a u.d.l. of 5kNm ² Stage height approx 1.4m above ground, legs designed with sufficient rigidity to eliminate the need for further cross bracing	Controlled	
Stage floor - central well	Falls into well	Crew	Serious	Central well provides access to storage lockers , as soon as practicable after the lowering and levelling of the stage floor panels put into place over the lockers	Controlled	Small panels (2.5mx1m) easily lifted into place
Suspending lights etc	Falls from height	Crew	Catastrophic	Truss accessible from stage floor with Zarges SHERPASCOPIC podium stepladder, to BS EN 131, for the hanging of lights etc. Stepladder in condition, checked for damage and located on a level base Step ladders always used fully open and where practicable side braces on podium steps used When used on stage, steps located away from edge	Controlled	
Erection of stage roof (2 nd Lift)	Collapse of structure	Crew	Catastrophic	Stage roof lifted using hydraulics Stage clear of personnel Once at full height pins inserted into legs to provide fail-safe mechanism, stage roof lowered onto pins (pins held with 'R' clips) Front of stage roof tied to stage floor with heavy duty truss to ensure stage front cannot lift in very high winds	Controlled	First lift is to a height which enables the lights to be hung, the second lift is to operational height
Stage	Falls from	Performers	Serious	Full height walls on stage sides and back	Controlled	

OPERATION	HAZARD	PEOPLE AT RISK	WORST OUTCOME	PRINCIPAL PRECAUTIONS	RESIDUAL RISKS	COMMENTS AND/OR ADDITIONAL PRECAUTIONS
	height			Front of stage marked by raised aluminium edging nose which provides colour differentiation (access to front of stage normally restricted by monitors etc). Handrails fitted to stage steps		
Stage Roof	Struck by falling objects	Crew Performers	Serious	Roof load limits provided to PA/Lighting companies in advance Roof truss capable of supporting 4 tonnes uniformly spread Clients lighting team responsible for ensuring that all flown equipment attached with purpose built connectors (ie not cable ties) and a secondary means of support for flown equipment Daytona fixed lighting equipment and cables built into the roof structure	Controlled	
Erection and removal in darkness (inc PA and lights)	Trips, slips and poor practice	Crew	Serious	Stage fitted with fixed high powered halogen lights located in the truss, independently wired from any stage lighting Power for lights provided by generator located beneath stage Lights also provided for working areas beneath trailer	Controlled	
Manual handling general	- strain injuries	Crew	Serious	Hydraulics used to lift stage platform and roof Legs either built in and hinged or hydraulically operated Aluminium trussing in sections used for corner pillars Back and side walls constructed from pre-formed lightweight plastic sections	Controlled	
Electrical Distribution	Electric shock Fire	Crew	Catastrophic	Distribution system built into stage unit and fixed in place, cables run to prevent mechanical damage Power distribution system fitted with RCD and MCB protection Power distribution system constructed from armoured cable to minimise risks of damage Power distribution system inspected and tested annually Power distribution system only used to provide power for build and breakdown	Controlled	
Power generation	Electric shock Fire	Crew	Catastrophic	LPG powered generator built into fire proof locker beneath stage Generator mounted on slides and operated in the open air to ensure ventilation	Controlled	

OPERATION	HAZARD	PEOPLE AT RISK	WORST OUTCOME	PRINCIPAL PRECAUTIONS	RESIDUAL RISKS	COMMENTS AND/OR ADDITIONAL PRECAUTIONS
Fire Precautions	Fire	Crew Performers	Catastrophic	<p>Electrical equipment regularly tested and visually inspected during installation</p> <p>Electrical equipment constructed from armoured cable to prevent damage</p> <p>LPG used to power generator - located in ventilated area beneath stage and in separate compartment - generator use limited to providing power for working lights etc, not for use during performance</p> <p>Materials used in construction of stage meet BS476 Part 7:1971 with a surface spread of flame classification of Class 1</p> <p>Fabrics used for scrim meet BS5867Part 2:1980</p> <p>Electrical equipment maintained in good condition</p> <p>Under stage storage prohibited</p> <p>Combustible articles kept away from sources of heat ~ lights etc</p>	Controlled	Note - due to damage and regular theft, fire extinguishers are not provided by Daytona Stage Hire for this stage. Clients are reminded that it is their responsibility to provide them for performances
Transport	Contract with vehicles fixed objects or people	Crew Public	Catastrophic	<p>Stage fits compactly into a standard width articulated trailer</p> <p>Stage components secured during transit and external items including the stage canopy extension secured with wing nuts to the trailer sides (multiple nuts)</p>	Controlled	
RESIDUAL RISKS FOR THE INSTALLATION AND OPERATION OF THE DAYTONA DS60 MOBILE STAGE					Controlled	

PERSONS AT RISK		POTENTIAL WORST OUTCOME		ESTIMATION OF RESIDUAL RISK (TAKING INTO ACCOUNT CONTROL MEASURES)	
Crew	Employees of Daytona Stage Hire	Catastrophic	Fatality, multiple major injuries, major property damage or fire	High	Imminent danger exists and the work activity should be stopped immediately (or not started)
Performers	Artistes	Serious	Major injury, damage to health, serious property damage or fire	Medium	Additional actions required to control hazards fully
Public	Members of the Public, visitors, guests	Minor	Minor injury, minor property damage	Controlled	Hazards adequately controlled and minor injury unlikely

Risk assessment compiled by John Sursham and developed from information supplied by Daytona Mobile Stage Hire and from manufacturers operating instructions for the equipment.

Signed

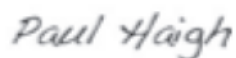


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Date 1st August 2006

Accepted by on behalf of Daytona Stage Hire

Signed



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Date 1st August 2006