Guidance for Enhanced Pre-operational Checks on Plant Following Post COVID-19 Site Lockdowns

Introduction

With construction sites returning to work following a close-down or restrictions due to the coronavirus spread, some items of plant have been 'trapped' on locked-down sites where shut-down abruptly and may not have been sufficiently prepared for extended non-operational periods. Most modern plant is reliable and can cope with extended periods without requiring actions by a maintenance team, however a period of non-use can have small but noticeable effects when placing plant back into service after an extended period. It is important for both safety and machine efficiency that the operator or maintenance team undertake an enhanced pre-operational check and basic maintenance regime in additional to the normal daily pre-use checks specified by the manufacturer.

This guidance is focussed on the primary areas of machine components that require checks that are **over and above normal manufacturer-derived pre-operational activities** and are applicable for common mobile-type plant and divided into two parts, pre-start checks and running checks. All enhanced checks must be in accordance to manufacturer's requirements and takes place within an exclusion zone, free of non-essential personnel.

The main message is that for most plant, normal but enhanced checks - which are predominately visual - should be carried out prior to operation and that employers and supervisors should allow sufficient time for operators and/or maintenance teams to carry them out, ensuring the machine's safety and productivity and minimises future issues and breakdowns. If any doubt exists on the machine's functionality when being checked, then expert advice should be sought.

This guidance is not intended to be comprehensive or apply to all plant types but provide an overview of what should be taken into account when re-instating plant left for an extended period due to site shutdown or restrictions. Compliance needs to be maintained at all times with relevant regulations such as the Provision and Use of Work Equipment Regulations 1998 (PUWER) and the Lifting Equipment and Lifting Operations Regulations 1998 (LOLER).

PART 1

Pre-start Checks Considerations – Engines

Fuel - Apart from the usual fluid level checks, the fuel system may require additional checking. Fuel tanks that were partially full when shut down may have been subject to condensation build up due to the seasonal warm days and cool nights, with excess water forming within the fuel tank. This will require draining at the tank and/or water separator unit.

Modern diesel fuel further cause condensation when unused for long periods due to the addition of bio-diesel, causing the formation of bacteria and fungi within the system. This can deteriorate the quality of the fuel and creates internal sludging. If this is suspected, the system will require a level of internal cleaning and expert advice should be sought. Fresh fuel should be added to partially-filled tanks.

Batteries – Where unused and/or not isolated when left for long periods, batteries may have become discharged or have insufficient cranking power either through age, poor condition, lack of maintenance, or where a potential drain of power has taken place. This could include power required for tracking devices, monitoring or data upload systems. Initial checks include checking terminal tightness and condition. Further inspection work on batteries and/or boost starting should be in accordance with correct procedures and safe systems of work.

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Air Filtration and Exhaust – Air filter intakes and exhaust outlets should be checked that they are clear of debris and obstructions such as where wildlife may have been present. This further applies to radiators/heat exchangers inlet and extraction points.

Drive belts and pulleys – Checked that they are clear of debris and visually appear in good condition.

Pre-start Checks Considerations – Transmissions and Chassis

Transmission components – Static checks of lever and pedal free movement should be undertaken and ensure debris is cleared. The area around the breathers on transmission and axles casings should be clear of dirt and debris.

Brakes – External braking systems such as disc or band-type brakes may have the frictional clamping component/caliper 'stuck' to a rotating disc, and/or where mechanically applied such as a transmission parking brake, linkages may have increased resistance because of partial corrosion. Where possible, component should be applied and released, with full movement checked. Where applicable, moving components should be lubricated or re-greased as a matter of course.

Pulleys, Winches, Belts, Chains and Ropes - Dirt, debris and corrosion are the main results of extended non-use periods. Where possible, rotating components such as belt drives should be rotated by hand to ensure free and quiet movement. Excess dirt and debris on ropes, chains and belts can cause premature failure and should be cleaned wherever possible. Where components are showing signs of excess corrosion, expert advice should be sought.

All components that require external greasing with a grease gun e.g. pulley bearings should be undertaken on all relevant components as dust and dirt can contaminate old grease. Automatic greasing systems should be checked for functionality and condition of the grease.

Wheels and Tracks – Apart from normal tyre condition and pressure requirements, some heavily-laden machines may have suffered from tyre flat spots. Track components should be inspected with emphasis on sprockets, idler wheels and drive chain (steel tracks) or sprocket lugs (rubber tracks) for debris and condition. Hardened mud should be removed from critical areas e.g. track chain and sprockets.

Steering systems – On mobile plant with mechanical linkages that have greasing points, these should be replenished with fresh grease. Where equipped, this would include oscillating axles lubrication points. Hydraulic steering rams should be free of dirt and debris and rods checked for signs of corrosion and re-greased at relevant greasing points.

Pre-start Checks Considerations – Operational Components/Equipment

Hydraulic and Pneumatic Components – Hydraulic and pneumatic cylinder rams should have any exposed rods cleaned, removing all debris, dirt and residual oil. Signs of corrosion on exposed cylinder rods should be referred to expert advice. The area around hydraulic tank breather components should be clear and cleaned. All required greasing points at each end of the cylinder/rod coupling points should be undertaken.

Sliding Components – Equipment such as booms, outriggers, carriages etc. and the relevant wear pads, sliders should be free from debris and dirt and have free movement. Sliding components should be lubricated using the requisite approved lubricant after cleaning.

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Attachments/Adjustable/Locking Components – Components that are manually adjusted or locked e.g. forks on carriages, quick-release componentry should be checked for cleanliness and free movement, including latches, locking pins, adjusting wheels etc.

General machine condition

Emphasis on visually inspecting all around the machine including behind inspection panels, air intakes or outlets and underneath the machine on a wheeled or tyre-suspended chassis. Although checking for fluid leaks is normally part of a daily inspection regime e.g. coolant, fuel, hydraulic, engine, transmission etc, extended non-use periods can highlight small but potentially worsening leaks and expert advice should be sought.

Statutory Inspections

Plant and equipment that requires statutory inspections under relevant regulations may be outside of the statutory test or thorough examination period. The Health and Safety Executive (HSE) have issued guidance on considerations that owners and users need to take into account where inspectors may not be in a position to examine a machine prior to restarting work. The HSE are advising a risk-based process to determine the whether there are steps owners can take to safely continue to use equipment outside of the statutory periods or leave it out of service until inspected accordingly. The HSE guidance can be downloaded at https://www.hse.gov.uk/news/work-equipment-coronavirus.htm

PART 2

Functional Checks: Engines

Starting – All services, drivelines and ancillary equipment including electrical items not needed for starting should be isolated/disconnected or placed in the neutral position. The engine's cold starting system should be activated and the throttle setting set to minimum/idle. When operating the starter motor, under normal conditions the engine should readily start. In the unlikely event of the engine failing to start within approx. 10 seconds, cease operating the starter motor and re-activate the cold start system. If the engine still fails to re-start, then seek expert advice. If the battery cranking speed is low or decreases when being turned over, the use of booster/jump starting batteries should be employed.

On engine start up, additional or unusual emissions from the exhaust, if not clearing soon after start up should be investigated immediately.

Once the engine has started, engine speed should be left at idle for a reasonable period of time to allow components such as turbochargers, hydraulic pumps, compressors etc. to reach normal operating pressures, flows etc. and that warning lights have been extinguished and that the engine is running evenly and correctly.

Functional Checks – Transmission and Chassis

Transmissions – Each gear (or speed range) where possible should be activated whilst the machine is stationary (and braked) to allow lubricating and operational oil flow/pressure to reach the various components. Subsequently, transmission function inc. selection of ratios and direction should be checked during travel whilst under no load conditions.

Braking Systems – Parking and service brakes should be applied and disengaged several times to check engagement and disengagement before travelling the machine at low speed to check retarding functionality, free movement when disengaged, unusual sounds and holding function when stopped.

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Steering – Steering function should be checked firstly whilst static by (where achievable) by cycling the steering from lock-to-lock and then whilst travelling at slow speed to check for steering accuracy and ease of use.

Tracks – The travel function should be applied and the machine travelled in a straight line to ensure effective track chain function, that the machine travels straight and halts when the travel function is placed in neutral in both directions.

Tyres – During travel, the tyre rotation should be checked to ensure consistent rotation and that no flat spots have occurred during storage.

Functional Checks – Operational, Safety and Ancillary Equipment and Attachments

Operational Components and attachments - Hydraulic, pneumatic and electrically-driven components such as cylinders, motors, pumps, winches etc. should be for linear components, cycled through their full travel in several successions. For rotational equipment, activated for a period to time and/or the travel limits of the service. All initial checks should be under no load conditions to ensure free, consistent movement and effective function. Electrical ancillary equipment should further be operated for correct functionality, as part of normal daily checks. Equipment able to be operated by a remote control unit should undergo the same procedure in addition to manually-operated controls.

Safety aids – Static and functional checks on safety aids such as overload, stability and visual aid equipment should be checked in accordance with normal pre-use checks requirements. Extra vigilance is required during no-load checks and when starting operational activities, that safety aids are performing to normal expectations

Situational Checks

Temporary works and platforms – If an item of plant was placed out of service and left on or nearby to a temporary works and/or raised platforms, and is to continue delayed work on the platform, this should be thoroughly inspected for integrity by appropriate expertise before working operations commence.

Post-Checks Monitoring

Extra vigilance should be undertaken by the operator and supervisory staff following the resumption of in-service activity until satisfied that the machine is performing to all normal parameters. Any deviation from normal parameters should be reported to the owner or hirer at the earliest opportunity and as is the case with any machine operation, defects that affect safety means that the machine is placed out of service until repairs are completed.

Sources of Information

The machine's correct operator's manual should be the primary source of checks, operation and maintenance requirements. Further guidance can also be downloaded from the CPA whose specialist interest groups and plant safety group produce industry wide guidance for a number of machine types. All guidance documents can be downloaded free-of-charge from https://www.cpa.uk.net/publications/.

A catalogue detailing all publications can be downloaded at https://www.cpa.uk.net/safetytechnicalpublications/

NOTE: Whilst every care has been taken to ensure the accuracy of the material contained within this publication, no liability is accepted by the Construction Plant-hire Association in respect of the information given.

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Operator's Enhanced Pre-Use Check List – Post COVID-19 Lockdown

Note: To accompany the standard daily pre-use items as specified by the manufacturer and any organisational documentation.

Operator's Name:	***Date:***
Machine Make and Model:	
Machine Fleet/Serial No:	
Operator's Signature:	

	Item	***OK (✓)***	***N/A (✓)***	***Defect Reported***
Pre-start Checks - Engine				
1.	Fuel system inc. checking for water in system			
2.	Battery condition and charge			
3.	Air filtration and exhaust – Clear of debris			
Pre-start Checks – Transmissions and Chassis				
4.	Transmission components – Free lever movement and clear of debris			
5.	Brakes – Free of debris, unstuck, pedal/lever operational			
6.	Pulleys/Winches/Belts/Chains/ Ropes – Free movement, clean, clear of debris			
7.	Wheels/tracks – Condition, clear of debris, hardened mud etc.			
8.	Steering Systems – Free movement, hydraulic rams clean			
9.	Greasing points greased for all transmission/chassis components			
Pre-start Checks – Operational Components/Equipment				
10.	Hydraulic/pneumatic – Clean cylinder rods, clear of debris,			
11.	Sliding components – Free movement, clear and clean, lubricated			
12.	Attachments/Adjustments/Locking Components – clean, clear & functional			

	Item	OK (✓)	N/A (✓)	Defect Reported
13.	Greasing points greased for all relevant components			
General Machine Condition				
14.	Enhanced visual check all round machine, internal and external for debris accumulation			
Functional Checks - Engine				
15.	Engine start up, warm-up period under no load conditions, no issues encountered			
Functional Checks – Transmission and Chassis				
16.	Transmissions – Gear and direction selection, drive take up			
17.	Braking systems – Parking and service brake functional, free and holds as required			
18.	Steering – Functional. free movement and accuracy			
19.	Tracks – Travel function effective, equal tracks speed, holds when in neutral			
20.	Tyres – Consistent rotation, no flat spots			
Functional Checks – Operational, Safety and Ancillary Equipment and Attachments				
21.	Cylinder rams, motors – Free, consistent movement and full travel			
22.	Safety Equipment (overload, stability and visual) – Functional and accurate			
Situational and Monitoring				
23.	Temporary Works platforms – Arrangements for inspection ensuring integrity and suitability			
Statutory Requirements				
24.	Statutory inspections and examinations – Agreed procedures if out-of-date			