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# PURPOSE

The purpose of this standard is to harmonize equipment a condition audit results and to classify equipment condition for five classes (Grades).

# APPLICATION

A grade can be assigned to the device in accordance with this standard when the equipment condition audit is performed. The grade can be given for part, module and for whole equipment. The tables presented in this standard describe the most important inspection points, which may give rise to interpretative differences in the condition assessment. This standard does not include all the checkpoints whose condition is easy to classify as either broken or new. The Audit Tool Database includes inspection cards, which includes the inspection points and required measurements.

# RESPONSIBILITY AND AUTHORITY

Service Engineer is responsible to inspect the equipment and give grading in accordance with this standard. Service Manager is responsible to monitor that the Service Engineers are trained to use this standard and the grading’s given in the context of the equipment condition audit are in line with this standard and that there are no differences between inspectors.

# REFERENCED DOCUMENTS

Audit Database tool

National Equipment Appraisal Condition definitions (www.nationalequipmentappraisal.com)

# GRADE SUMMARY

|  |  |  |
| --- | --- | --- |
| GRADE | Description | exception |
| Grade 5 | **Equipment or part is equal to new.**  | 1st assembly or part does not have to be new by manufacturing date. Max. 50 h usage is accepted. Found no faults what so ever. |
| Grade 4 | **Equipment or part is rebuilt or refurbished by OEM** | 1st assembly or part can be inspected by Normet authorized 3rd party |
| grade 3 | **Good working conditions. Many parts can be worn, but still in acceptable working condition.** |  |
| grade 2 | **Equipment or part is qualified to be repaired.** |  |
| grade 1 | **Equipment or part is equal to unusable and cannot be repaired, scrap.** |  |

# GRADE CRITERIAS AND APPLICABILITY

## Definitions

**OEM** New (max. 50 hours), inspected by Normet OEM or defined authorities. Specifications must be approved by Normet OEM or defined authorities.

**VG (very good)** Equipment or part is rebuilt, remanufactured or refurbished. Fair wear and tear is accepted. Free of all dirt or any kind of defects. Inspected by Normet OEM or defined authorities. Specifications must be approved by Normet OEM or defined authorities.

**GC (Good condition)** Visual check and required measurements are performed. Is completely maintained by Normet OEM or defined authorities by using Normet Original spare parts. Any repairs, modifications or welding must be inspected and approved by Normet OEM or defined authorities. Wear on paint and rust may appear, but deep corrosion on any structure is unacceptable. Specifications must be approved by Normet OEM or defined authorities. All functions works and are safety to use.

**PC (Poor condition)** Items of equipment which can only be used at some point well below their fully specified utilization, and it is not possible to realize full capability in their current condition without extensive repairs and/or replacement of major elements in the very near future. Not applicable for all items. Check from table inspection target specific requirement. Inspected by Normet OEM or defined authorities. Specifications must be approved by Normet OEM or defined authorities.

**Scrap Condition (X)** Items of equipment which are no longer serviceable and which cannot be utilized to any practical degree regardless of the extent of the repairs or modifications to which they may be subjected. This condition applies to items of equipment which have been used for 100% of their useful life or which are 100% technologically or functionally obsolescent. Inspected by Normet OEM or defined authorities.

## General Checkpoints

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| GENERAL CHECKPOINTS | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Cleanliness | OEM. Must be clean. | VG. | GC. Wear and dirt can appear | PC. Cleaning is possible. | X. Cleaning is not possible. |
| Leakages | OEM. No leaks | VG. | GC. Leaks not detected | PC. Leaks can be repaired | X. No possible to repair. |
| Nuts, bolts, securing flanges and mounting fixture tightness | OEM.  | VG. | GC. | PC. Tighten is possible. | X. Tighten is not possible, item is damaged. |
| Electrical connections | OEM.  | VG. | GC. | PC | X. |
| Oil condition condition and level | OEM.  | VG. | GC. | PC | X. |
| Other fluids condition and level | OEM.  | VG. | GC. | PC | X. |
| Sounds | OEM.  | VG. | GC. | PC | X. |
| Smells | OEM.  | VG. | GC. | PC | X. |
| Filters | OEM.  | VG. | GC. | PC | X. |
|  |  |  |  |  |  |

## Chassis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CHASSIS | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Frame (front and rear) | OEM.Found no bends, cracks or corrosion | VG.Found no bends, cracks or corrosion | GC. Wear on paint and rust may appear. | PC. Must not have any deformation. Welding’s has to be intact. | X. Found bends or deformation / cracked or have deep corrosion. |
| Pivot Joint | OEM. Found no bends, cracks or corrosion. | VG.Found no bends, cracks or corrosion. | GC.  | PC. Metal structure must not have any deformation. | X. Found bends or deformation / cracked or have deep corrosion. |
| Bearings and shims | OEM | VG. | GC.  | Not applicable | X. |
| Cabin structure | OEM. Found no bends, cracks or corrosion. FOPS/ROPS approval applicable if originally any. | VG.Found no bends, cracks or corrosion. FOPS/ROPS approval applicable if originally any. | GC. Wear on paint and rust may appear. | PC. Must not have any deformation. Deep corrosion is not allowed. Cabin structure must not have any non OEM welding´s or holes drilled | X. Found bends or deformation / cracked or have deep corrosion. |
| Gates, doors and locks | OEM.  | VG.  | GC.  | PC. Welding structure must be intact. With Locks grade 2 is not applicable. | X. Found bends or deformation / cracked or have deep corrosion. |
| Windows | OEM. Found no cracks or scratches. | VG.Found no cracks or scratches. | GC.  | Not applicable. | X. Found bends or deformation / cracked or have deep corrosion. |
| Sealing | OEM. Found no leaks or weakening of any kind. | VG. Found no leaks or weakening of any kind. | GC. | Not applicable. | X. Found leaks and weakening |

## Engine and auxiliary equipment’s

| ENGINE | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| --- | --- | --- | --- | --- | --- |
| Engine | OEM. | VG. Operating hours shall not exceed 4000 h. No excessive oil or coolant leaks, abnormal sound or excessive smoke or blow-by. | GC. | PC. Engine has to run, no abnormal sounds or heavy smoking. | X. Engine does not run or have abnormal sounds or heavy smoking. |
| Mounting pieces | OEM.  | VG. | GC. | Not applicable. | X. |
| Alternator | OEM | VG. | GC. | PC. The core has to be intact. Wearing on charger coals are accepted. | X. The core is broken. |
| Starter motor | OEM.  | VG. | GC. | PC. Core has to be intact, wearing on coals or solenoid problem is accepted. | X. The core is broken. |
| Turbo | OEM.  | VG. | GC. | PC. Charger core needs to be flawless. Mechanical wearing is not accepted. | X. The core is broken. |
| Charging hoses (hot & cold) | OEM.  | VG. | GC. | Not applicable. | X.  |
| Auxiliary belts | OEM.  | VG. | GC. | Not applicable. | X.  |
| Fuel system (pump, injectors and valves) | OEM.  | VG. | GC. | Not applicable. | X.  |
| Fuel hoses | OEM.  | VG. | GC. | Not applicable. | X.  |
| Water pump | OEM.  | VG. | GC. | Not applicable. | X.  |
| Radiator | OEM.  | VG. | GC. | Not applicable. | X.  |
| Water hoses (hot & cold) | OEM.  | VG. | GC. | Not applicable. | X.  |
| Expansion tank | OEM.  | VG. | GC. | PC. Must not have any deformation or leaks. Cap can be missing | X. Found deformation or leaks. |
| Air filter housing | OEM.  | VG. | GC. | Not applicable. | X.  |
| Air filters (inner & outer) | OEM.  | VG. | GC. | PC. Element can be cleaned with air if max. 50 hours in use. | X.  |
| Air hoses (inner & outer) | OEM.  | VG. | GC. | Not applicable. | X.  |
| Exhaust piping | OEM.  | VG. | GC. | Not applicable. | X.  |
| Exhaust heat covers | OEM.  | VG. | GC. | Not applicable. | X.  |
| Exhaust catalytic purifier | OEM. | VG. | GC. | PC. Can be cleaned according Normet instructions. Must not have any deformation and free of all damages. | X.  |
| ENGINE PERFORMANCE VALUES |  |  |  |  |
| Idle rpm. | According Normet default values and settings. |
| High rpm. | According Normet default values and settings. |
| Stall rpm. | According Normet default values and settings. |
| Pulling test | According Normet default values and settings. |
| Emission test | According Normet default values and settings. |

## Transmission & driveline

| TRANSMISSION AND DRIVELINE | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| --- | --- | --- | --- | --- | --- |
| Transmission | OEM | VG | GC. | PC. The casing must be 100% intact and must be free of all damages. | X. The casing is broken  |
| Axles | OEM | VG | GC. | PC. The casing must be 100% intact and must be free of all damages. | X. The casing is broken  |
| Propeller shaft | OEM | VG | GC. | Not applicable. | X. |
| Support bearings | OEM | OEM. With max 50 h. bearing type must be having approval of Normet OEM or defined authorities. | GC. | Not applicable. | X. |
| Propeller shaft lattice | OEM | OEM. With max 50 h. lattice type must be having approval of Normet OEM or defined authorities.  | GC. | Not applicable. | X. |
| All transmissions, planetaries, clutches, drive mechanisms | OEM | VG. Shall function properly with no binding, grabbing, unintended slippage, overheating or excessive sound | GC. | Not applicable. | X. |
| Retarders where installed | OEM | VG. Shall operate within manufacturer's specifications | GC. | Not applicable. | X. |
| TRANSMISSION AND DRIVELINE PERFORMANCE VALUES |  |  |
| Brake test | According Normet default values and settings. | Not applicable.  | X. |
| Pulling test | According Normet default values and settings. | Not applicable. | X. |
| propeller shaft alignment | According Normet default values and settings. | Alignment must be repairable. | X. Alignment is nor repairable. |
| Brake disc thickness | According Normet default values and settings. | Not applicable.  | X. |

## Tires and rims

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| TIRES AND RIMS | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Tires | OEM | VG. Fair wear and tear is accepted. Tyre side walls shall be free of all cuts deeper than 2 mm, bumps or any type of damages. | GC. No side cuts > 2 mm or visible bumps or any type of damages. | Not applicable. | X. Found side cuts > 2 mm or visible bumps / other damages. |
| Rims | OEM | VG. Rims shall not have any cracks or deformations. Rims can be sand blasted and repainted. | GC. Rims shall not have any cracks or deformations.  | PC. Rims shall not have any cracks or deformations. Rims shall be sand blasted and repainted. | X. Found cracks or deformations. |
| TIRE MEASUREMENT VALUES |  |  |
| Tread depth in mm. | OEM | VG. 80 % from Normet default values. | GC. 50% from Normet default values. | Not applicable.  | X. Is this under 50 % default value? |

## Electrics

| ELECTRICS | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| --- | --- | --- | --- | --- | --- |
| Wiring harness | OEM | VG.  | GC.  | PG. Connectors and pins are allowed to have damage. Wiring must be 100% intact and free of all damages. | X. Wiring damaged |
| Terminal boxes | OEM | VG.  | GC.  | PG. Screws can be missing. Terminal box must have no any deformation. | X. Terminal box have deformation. |
| Sensors | OEM | VG.  | GC.  | Not applicable. | X. |
| Lights | OEM | VG.  | GC.  | PG. Bulb is allowed to be broken. Light casing must be 100% intact. | X. Light casing broken. |
| Remote control unit | OEM | VG.  | GC.  | PG. Casing must be free of all damages. Symbols are allowed to be missing. Electrical components are allowed to have malfunctions. | X. Casing is damaged. |
| Batteries | OEM | VG.  | GC.  | Not applicable. | X. |
| Switches and buttons, horns and alarms | OEM | VG.  | GC.  | Not applicable. | X. |
| Covers and markings | OEM | VG.  | GC.  | Not applicable. | X. |
| HV cable  | OEM | VG.  | GC. Wear may appear on cable condition, fastening pieces and cover spirals. Functionality 100%. | PG. Minor cuts on rubber insulation are allowed. Must not have any deformation. Must pass insulation resistance test. | X. Cable damaged or does not pass insulation resistance test. |
| HV cable reel and slip ring unit | OEM | VG.  | GC.  | PG. Wearing on slip rings and brushes are allowed. Cable reel can have deformation, welding´s must be intact. | X. Cable reel injured or welding´s are not intact. |
| Electric motors | OEM | VG.  | GC.  | Not applicable. | X. |
| Displays and I-O modules | OEM | VG.  | GC.  | Not applicable. | X. |
| Retarders | OEM | VG.  | GC.  | Not applicable. | X. |
| ELECTRICS MEASURED VALUES |  |  |
| Insulation resistance measurement | Inspected by Normet OEM or defined authorities. Found no faults. | Found no faults. |  |

## Boom

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| BOOM | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Boom structure | OEM | VG.  | GC.  | Not applicable. | X. Määrittely? |
| Joints, Pins, Bearings and Bushings | OEM | VG.  | GC.  | Not applicable. | X. |
| Rollers | OEM | VG.  | GC.  | Not applicable. | X. |
| BOOM PERFORMANCE VALUES |  |  |
| Brake hold and release | According Normet default values and settings  | X. |
| Movements up, down, left, right, telescope in & out. | According Normet default values and settings | X. |

## Hydraulics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| HYDRAULICS | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Hydraulic pumps | OEM | VG.  | GC. Hydraulic pumps (power pack & diesel) visually checked and adjusted to meet correct values. | Not applicable. | X. Doesn’t meet correct values |
| Hydraulic motors | OEM | VG.  | GC.  | Not applicable. | X. |
| Hydraulic hoses | OEM | VG.  | GC. Test pressurized and visually checked. | Not applicable. | X. Test pressurized and visually checked. If any damage or visual wear hoses are changed to new. |
| Hydraulic fittings | OEM | VG.  | GC. Test pressurized and visually checked. | Not applicable. | X. Test pressurized and visually checked. If any damage or visual wear fittings are changed to new. |
| All hose covers | OEM | VG.  | GC.  | Not applicable. | X. Functionality < 100% |
| All fastening pieces | OEM | VG.  | GC.  | Not applicable. | X. Functionality < 100% |
| Valve blocks | OEM | VG.  | GC. Clean and checked | Not applicable. | X.  |
| Hydraulic cylinders | OEM | VG.  | GC.  | PG. Piston rod corrosion is allowed. Seal can be broken. Casing must be 100% intact. | X. Casing broken |
| HYDRAULIC SYSTEM PERFORMANCE VALUES |  |  |
| Hydraulic pressures | According Normet default values and settings  | X. |
| Cylinder movements | According Normet default values and settings | X. |

## Concrete pump / line

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CONCRETE PUMP / LINE | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Wearing plate | OEM | VG.  | GC.  | Not applicable. | X.  |
| Seals | OEM | VG.  | GC.  | Not applicable. | X.  |
| S-valve / Rock valve | OEM | VG.  | GC.  | Not applicable. | X. |
| Bearings | OEM | VG.  | GC.  | Not applicable. | X. |
| Concrete line | OEM | VG.  | GC.  | Not applicable. | X. |
| Hydraulic system | OEM | VG. | GC. No wear or leaks allowed | PG. Wear and leaks can occur | X. |
| Accelerator pump | OEM | VG. | GC. No air leek allowed in accelerator dozing system | PG. Mechanically 100% intact, working condition must be achieved by cleaning. |  |
| Clamps | OEM | VG.  | GC.  | PG. Mechanically 100% intact, working condition must be achieved by cleaning. | X. Not working properly |
| Nozzle | OEM | VG.  | GC.  | PG. Mechanically 100% intact, working condition must be achieved by cleaning. | X. Not working properly |
| Mass tube | OEM | VG.  | GC.  | PG. Mechanically 100% intact, working condition must be achieved by cleaning. | X. Not working properly |
| Nozzle rotation elements | OEM | VG.  | GC.  | PG. Mechanically 100% intact, working condition must be achieved by cleaning. | X. Not working properly |
| CONCRETE PUMP PERFORMANCE VALUES |  |  |
| Accumulator gas pressure test | According Normet default values and settings |  |
|  |  |  |

## Compressor

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| COMPRESSOR | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Air filters | OEM. | VG. | GC.  | PG. Cooling air filter and return filter can be dirty. | X. |
| Air valves | OEM. | VG. | GC. Free of dirt. | PG. Return valves are allowed to be dirty. | X. |
| Casing |  |  |  |  | X. |
| Cooler | OEM. | VG. | GC. Cooler and the compressed air after cooler should be free of dirty.  | PG. Cooler and the compressed air after cooler are allowed to be dirty. | X. |
| COMPRESSOR PERFORMANCE VALUES |  |  |
| Air pressure tests | According Normet default values and settings |  |
| Valve max. pressure | According Normet default values and settings |  |
| Max. temperature | According Normet default values and settings |  |

## Optional equipment’s

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| OPTIONAL EQUIPMENTS | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| High pressure washer | OEM | VG.  | GC.  | PG. Leakage from seals is allowed. Gauge can be broken. Casing must be 100% intact and free of damages | X. Casing damaged |
| Generator | OEM | VG.  | GC.  | Not applicable. | X. Leaks, dirt or faults found |
| Welding generator | OEM | VG.  | GC.  | Not applicable. | X. Leaks, dirt or faults found |
| Form oil system | OEM | VG.  | GC.  | PG. ?? | X. |
| Heating and AC system | OEM | VG.  | GC.  | PG. ?? | X. |

## Surface treatment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SURFACE TREATMENT | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Paint | OEM. No dents, scratches, rust or any faults | VG. No dents, scratches, rust or any faults | GC. Wear on paint and rust may appear. | Not applicable. | X. Dents, scratches and deep corrosion found. |

## Man lifting baskets and platforms

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| BASKETS | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Basket or platform structure | OEM. FOPS / ROPS approval must be valid. | VG. FOPS / ROPS approval must be valid. | GC. No bends or cracks on hand rails. Working area should be clean. FOPS / ROPS approval must be valid. | PG. Bends or cracks on hand rails are accepted. FOPS / ROPS approval must be valid. | X. FOPS / ROPS approval invalid. |

## Scaling hammer, claw and tool

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SCALING HAMMER, CLAW AND TOOL | Grade 5 | Grade 4 | Grade 3 | Grade 2 | Grade 1 |
| Hammer | OEM. | VG.  | GC. Hydraulic oil temperature should be according OEM. Tool shank and bushing and hydraulic hoses wear are not allowed. Hoses should not rub against anything in any boom position. | PG. Hammer casing must be 100% intact. Wearing and malfunction is allowed. | X. Hammer casing damaged. Hoses are damaged. |
| Scaling tool | OEM. | VG. | GC. | Not applicable. | X. |
| Scaling claw unit | OEM. | VG. | GC. | Not applicable. | X. |
| SCALING HAMMER, CLAW AND TOOL PERFORMANCE VALUES |
| Hydraulic pressures | According Normet default values and settings  | Not applicable. | X. |