

Federal Wage System Job Grading Standard For Artillery Repairing, 6605

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WORK COVERED

This standard covers nonsupervisory work involved in repairing, rebuilding, and modifying mounted, towed, motorized, or ship-board artillery. This includes work on major components such as gun tubes, mounts, turrets, and carriages. This work requires detailed knowledge of mechanical, and a practical working knowledge of hydraulic, electrical, and pneumatic systems; the ability to recognize improper operation, locate the cause and determine the best method for correcting defects; and the skill to fit and adjust parts and assemblies.

WORK NOT COVERED

Not covered by this standard is work primarily involving:

- Repairing, rebuilding, and adjusting small arms including machine guns, mortars, recoilless rifles, and rocket launchers. (See [Small Arms Repairing, 6610.](#))
- Repairing, rebuilding, modifying, and testing fluid systems and fluid systems components of equipment such as artillery, combat vehicles, aircraft, and weight handling equipment. (See [Fluid Systems Maintenance Family, 8200.](#))
- Repairing and overhauling engines, transmissions, and similar systems of combat vehicles. (See [Heavy Mobile Equipment Mechanic, 5803.](#))

TITLES

Jobs graded by this standard are to be titled *Artillery Repairer*.

GRADE LEVELS

This standard does not describe all possible grade levels for this occupation. If jobs differ substantially from the skill, knowledge, and other work requirements described in the grade levels of the standard, they may be graded above or below these grades based on sound job grading methods.

HELPER AND INTERMEDIATE JOBS

Helper and intermediate artillery repair jobs are graded by the [Job Grading Standards for Trades Helper and Intermediate Jobs](#). (Grade 9 in this standard is to be used as the Ajourney level@ in applying the Intermediate Job Grading Table.) The grade 7 level in this standard does not cover

jobs that are part of a planned program of training and development of skills for advancement to a higher grade.

ARTILLERY REPAIRER, GRADE 7

General: Grade 7 artillery repairers apply established work methods to dismantle, clean, and reassemble various artillery subassemblies such as the cupola traversing mechanisms of tank turrets, the hydraulic piping and controls on artillery chassis, or the air heads and oil heads of equilibrator mechanisms. They locate worn or damaged parts by visual check, measurement, or operational tests. After reassembly he makes operational checks and necessary adjustments. They receive clear-cut instructions which outline the work to be done and the methods to be used.

Skill and Knowledge: Grade 7 artillery repairers apply knowledge of the makeup, operation and installation of a variety of artillery subassemblies and components. For example, they disassemble, check, reassemble, and adjust turret race rings. They check surfaces, make sure the proper number and size of ball bearings and spacers are used, and adjust the assembly for friction drag. They are able to recognize worn or damaged parts by measurement, such as strength of springs or dimensions of parts, or visual check for such things as rust, pitting, wear, or damage. They report unsatisfactory items for replacement and disposal.

Grade 7 artillery repairers refer to blueprints and diagrams in order to determine the location of parts or order of assembly when reassembling subassemblies; installing wiring harnesses, piping, and valves in turrets or gun mounts; or performing similar duties. They use knowledge of subassembly operation to make operational tests of completed work and perform adjustments to match specifications set out in the work assignment. Work at this level requires skill in the use of common hand tools and a few measuring instruments such as calipers, micrometers, torque wrenches, and spring weighing machines.

Responsibility: Grade 7 artillery repairers are responsible for repairing subassemblies using established methods and procedures. They select tools, determine work sequence, replace worn or damaged parts from stocks on hand, and assure that adjustments and settings meet requirements specified in work orders and instructions. They receive work assignments orally or through written work orders. They receive clear and specific instructions about the work to be performed and methods to be used. A higher grade worker or supervisor is available for assistance on unusual problems and to spot check work for compliance with specified methods.

Physical Effort: Grade 7 artillery repairers bend, stoop, crouch, and kneel. They work in confined spaces and in awkward positions. Most parts and assemblies which they lift or carry average 7 to 11 kilograms (15 to 25 pounds). Some may weigh as much as 23 or 27 kilograms (50 or 60 pounds). Weight handling equipment or the assistance of other workers is available for heavy lifts.

Working Conditions: Most work at this grade is done in large shop areas that are drafty and noisy. Grade 7 artillery repairers frequently stand on hard surfaces for long periods of time. Dirt,

dust, and grease are usually present. Repairers are frequently exposed to the possibility of cuts, bruises, and sprains as well as to falls on slippery and inclined surfaces.

ARTILLERY REPAIRER, GRADE 9

General: Grade -9 artillery repairers perform a wide variety of rebuilding and repairing tasks using well-proven parts, equipment, and work processes. They rebuild and assemble weapons or a variety of major components that are more complex than the equipment which is assigned to grade 7 artillery repairers. The weapons and components are composed of a number of subassemblies like those covered at the lower level, not only mechanical systems but hydraulic, pneumatic, and electrical systems as well. They have a greater variety of complicated components and parts. The location and repair of troubles as well as final alignment and adjustment of equipment requires the grade 9 repairers to balance the effects of changes in one area against the effects that these changes will cause in other systems.

The jobs of grade 9 artillery repairers are more responsible than those of the grade 7 repairers because they make more difficult and frequent decisions on a greater variety of more complex equipment such as what adjustments are necessary and whether parts should be replaced or repaired. Also, they receive general review to assure that work performed meets accepted trade standards. In comparison, grade 7 artillery repairers are checked to assure that they use the methods and procedures which were specified in their work orders and instructions.

Skill and Knowledge: Grade 9 artillery repairers apply a greater knowledge of assembly, installation and operation of complex artillery systems than that required by grade 7 artillery repairers. Grade 7 repairers apply knowledge of a variety of subassemblies and components. In addition to this, grade 9 repairers work on a number of complete artillery pieces or a wide variety of major components and complex assemblies and systems. For example, grade 9 repairers work on major assemblies such as gun tubes, breeches, carriages, mounts, turrets, elevating, traversing (training), loading, and control systems. They decide what parts and mechanisms can be reworked and refitted or should be replaced by new parts. They perform the adjustment and alignment required. Grade 9 repairers use more skill with tools and equipment than grade 7 repairers. They assemble, adjust, install, align, and mesh recoil systems, hydraulic rammers, traversing mechanisms, and similar major components which have more numerous and complicated parts and assemblies than the subassemblies on which grade 7 repairers work.

Grade 9 artillery repairers use a working knowledge of electricity, pneumatics, and hydraulics in order to install, locate defects, and repair auxiliary systems. They are able to read specifications, blueprints, and wiring diagrams to determine clearances, torque pressures, and proper meshing and adjustment of assemblies. They apply skill in fitting bearings and parts using reamers, bearing scrapers, and lapping and polishing equipment. They know how to make measurements of greater precision and complexity such as determining the amount of wear inside a gun tube or recoil cylinder using star gages or pullover gages or using a baroscope to check a gun tube for defects where he must make the distinction between normal heat checks and cracks showing the start of structural failure.

Grade 9 artillery repairers apply knowledge of many complete artillery weapons or a wide variety of major components, assemblies, and systems. They determine whether to repair or replace parts. They refit the assemblies to close tolerances, assemble the units, test fire them, and perform final adjustments. In comparison, grade 7 artillery repairers apply knowledge of a number of subassemblies, replacing parts as instructed, assembling, and making preliminary adjustments.

Responsibility: Grade 9 artillery repairers receive general assignments for work on developed and proven weapons. The assignments specify type of equipment and work to be done. The complete weapons and major assemblies which are assigned to grade 9 artillery repairers contain more parts and more complex interconnections. Therefore, they must make more difficult and more frequent decisions than grade 7 artillery repairers. For example, grade 9 artillery repairers determine the type and extent of repair needed and determines whether parts must be replaced or can be reworked at the worksite. They work in accordance with technical manuals and similar published material, locating and interpreting pertinent data and instructions.

In comparison to grade 7 artillery repairers whose work is clearly covered by specific guidelines and instructions, and whose work is reviewed to insure that it complies with specified methods, the grade 9 artillery repairers receive general assignments. They are responsible for determining the extent of repairs needed on a wider variety of more complex equipment. The work is spot checked to see that it meets accepted trade standards.

Physical Effort: The physical effort is similar to that described at the [**grade 7 level**](#).

Working Conditions: The working conditions are similar to those described at the [**grade 7 level**](#). In addition, grade 9 repairers work outdoors when test firing artillery and are exposed to loud noises and muzzle blasts.

ARTILLERY REPAIRER, GRADE-11

General: Grade 11 artillery repairers work with new and different equipment which often requires them to modify work methods and procedures. In comparison, grade 9 repairers rebuild and repair a wide variety of accepted, well-proven weapons. Grade 11 repairers use parts, equipment, and work processes that are well established and need few changes. Grade 11 repairers, however, modify, repair, and service experimental and prototype artillery and artillery components which are in process of development or test. They install test instrumentation, fabricating brackets and test jigs. They test fire the weapons. They trace and analyze defects, work with engineering personnel to develop changes, and perform modifications or repairs. They plan and complete their work with little or no guidance after the initial assignment.

Skill and Knowledge: Grade 11 artillery repairers, in addition to knowing a wide variety of well-established weapons and major components, locating defective parts, and repairing or replacing them, adapt standard practices to fit changed conditions and modifies specifications, methods, and equipment to achieve objectives. For example, they apply broad practical

experience and knowledge of the construction and operation of artillery, support equipment, and control systems, such as gun tubes and breech mechanisms, mounts, turrets, traversing (training) and elevating controls, and loading systems to determine the methods of operation, reasons for deficiencies, and corrective measures needed to repair or improve the operation of experimental weapons. In addition to an extensive knowledge of mechanical systems, grade 11 artillery repairers use extensive practical knowledge and experience in the application of hydraulics and electricity to artillery, in order to develop and recommend changes to weapons, changes in specifications for adjustment and synchronization of auxiliary systems, and changes to or completely new methods of maintenance. The repairers know the operation of test instrumentation and are able to install and operate such items as strain gages, thermocouples, and displacement indicators, developing, and constructing special jigs and mounting fixtures to provide accurate readings.

Grade 11 artillery repairers use ability to work with blueprints and sketches in order to plan changes to equipment and devise jigs and fixtures. They determine information such as shape, size, and clearances from other parts and lay out the contours and dimensions of the new part. They use a general knowledge of the work of other trades. For example, they use knowledge of machine tool operation to develop shapes which are practical to machine. They specify materials, surface preparation, heat treating, etc., which will create the needed strength, hardness and durability. When a number of works process or close tolerances are needed, they give the requirements to workers in other trades.

Responsibility: In comparison to grade 9 artillery repairers who receive general assignments for work on developed and proven weapons and are responsible for determining the extent of repairs needed, using trade knowledge and well-established blueprints and specifications, grade 11 artillery repairers exercise greater responsibility and initiative. For example, they are given the objectives desired and the general approach to follow, to work on new and untried weapons. They are then expected to modify previous practices or develop new operating methods to achieve these objectives.

At the grade 11 level, the supervisor assigns work orally and through written instructions, which outline the purpose of the work and the test approach to be followed. Grade 11 artillery repairers determine materials and equipment needed, lay out the work and perform the work operations. They usually work with engineers and scientists, including those with contractors, in the preparation and conduct of tests. They refer critical technical problems to them, for example, available instrumentation cannot produce the data needed from the test. They are responsible for solving operational problems, such as which available test instruments will give the most accurate readings or how to mount instruments to prevent false readings. Work is reviewed by occasional spot checks and by analysis of test data.

Physical Effort: The physical effort is similar to that described at the **grade 7 level**.

Working Conditions: The working conditions are similar to those of **grade 7** artillery repairers. In addition, grade 11 artillery repairers are frequently required to work outdoors or in unheated shelters when working with artillery on the test ranges. They are exposed to loud noises and muzzle blast when observing or participating in test firing of weapons.