



United States
Office of Personnel Management

**FWS Job Grading Standard
for
Industrial Equipment Mechanic**

5352

TS-40, 11/80

Workforce Compensation and Performance Service
Classification Programs Division
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COVERAGE OF STANDARD

This standard covers nonsupervisory work involving the dismantling, repairing, relocating, modifying, maintaining, aligning, and installing of general nonproduction industrial plant machinery, equipment, and systems such as bridge cranes, towveyor/conveyor and pneumatic tube systems, sandblasting machines, and other industrial plant support machinery and equipment; service, industrial waste and flood control equipment such as compressors, pumps, and valves; and engraving machines, aircraft test block equipment, and fire extinguishing systems.

The work requires a practical knowledge of the mechanical, hydraulic, and pneumatic systems and components of diverse industrial plant support machinery and equipment, and other equipment that control industrial waste and provide service to establishments such as industrial plants, machine tool repair shops, and hospitals. This includes detailed knowledge of the operating characteristics of the involved systems and equipment, and of the applicable installation and repair procedures, methods, and trade practices.

WORK NOT COVERED

This standard does not cover work that primarily involves:

- Installation, maintenance, repair, and modification of production machinery, equipment, and systems such as standard and numerically controlled machine tools, woodworking and metalworking machines used in the production of goods (see [Job Grading Standard for Production Machinery Mechanic, 5350](#));
- Installation, maintenance, and repair of marine machinery and equipment such as propulsion machinery, propellers, rudders, and anchor handling gear (see [Job Grading Standard for Marine Machinery Mechanic, 5334](#));
- Installation, maintenance, and repair of electrical wiring systems, fixtures, controls, and equipment such as generators, electric motors, and transformers requiring an in depth knowledge of circuitry, theories, and their practical application (see [Job Grading Standard for Electrician, 2805](#) or [Electrical Equipment Repairer, 2854](#));
- Manufacture and repair of parts and items of equipment using various types of standard and special machine tools, and their attachments, to machine metals, metal alloys, and other materials (see [Job Grading Standard for Machinist, 3414](#) or [Machine Tool Operator, 3431](#));
- Welding metals and alloys when such trade skills are paramount and constitute the primary purpose of the position (see [Job Grading Standard for Welder, 3703](#));

- Fabrication, repair, and installation of sheet metal parts, items, and assemblies such as wing patches and flaps, metal furniture, drying ovens, and air frames (see [Job Grading Standard for Sheet Metal Mechanic, 3806](#));
- Repair, modification, and installation of a variety of locking devices typically found on doors, safes, vaults, and other secured locations (see [Job Grading Standard for Locksmith, 3817](#));
- Installation, maintenance, and repair of water, air, steam, gas, oil, and sewer pipelines and systems (see [Job Grading Standard for Pipefitter, 4204](#) or [Plumber, 4206](#));
- Installation, modification, test, and repair of various medical, laboratory, and dental equipment such as X-ray units, operating tables, sterilizers, and cardiac monitors (see [Job Grading Standard for Medical Equipment Repairer, 4805](#));
- Cleaning, making minor repairs, oiling, and greasing custodial equipment such as waxing machines, vacuum cleaners, and power scrubbing machines (see [Custodial Equipment Servicing Series, 4808](#));
- Installation, maintenance, and repair of major appliances such as automatic washers and dryers (see [Domestic Appliance Repairing Series, 4855](#));
- Repair and modification of a variety of refrigeration and air conditioning equipment and systems that achieve regulated climatic conditions (see [Job Grading Standard for Air Conditioning Equipment Mechanic, 5306](#));
- Installation, maintenance, repair, and modification of equipment such as coal, gas, oil fired heaters and hot air furnaces, high and low pressure steam boilers, hot water boilers, power generating equipment, and similar systems (see [Job Grading Standard for Heating and Boiler Plant Equipment Mechanic, 5309](#));
- Installation, repair, and alteration of commercial kitchen and/or bakery equipment such as gas and electric ranges, fryers, steam tables, potato peelers, dishwashers, and other food equipment used in cafeterias, hospitals, etc. (see [Kitchen/Bakery Equipment Repairing Series, 5310](#));
- Repair of laundry, dry cleaning, and related equipment (see [Laundry and Dry Cleaning Equipment Repairing Series, 5317](#));
- Constructing, installing, and repairing electric and gas furnaces used for melting and refining metals and for annealing and heat treating blanks and dies (see [Industrial Furnace Building and Repairing Series, 5341](#));

- Installation, maintenance, and repair of door operating equipment including fully automatic and semi-automatic hydraulic, pneumatic, electrical, and spring-loaded mechanical operators and controls (see [Door Systems Mechanic Series, 5364](#));
- Modification, maintenance, and repair of hydraulic and/or pneumatic systems and components that actuate mechanisms or produce, control, and regulate fluid flow (see [Job Grading Standard for Pneumatic Systems Mechanic, 8255](#));
- Repairing and testing small gasoline engines such as those found in lawn mowers, power saws, and other similar equipment (see [Small Engine Mechanic Series, 8610](#)).

TITLES

Jobs covered by this standard at the grade 10 level and above are to be titled *Industrial Equipment Mechanic*. Jobs covered by this standard below the grade 10 level (other than Helper and Intermediate jobs) are to be titled *Industrial Equipment Repairer*.

GRADE LEVELS

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

HELPER AND INTERMEDIATE JOBS

Helper jobs are graded by the Office of Personnel Management [Job Grading Standard for Trades Helper Jobs](#). The grade 8 level in this standard does not apply to jobs that are part of a planned program of training and development of skills for advancement to a higher grade. Such trainee jobs are covered by the Office of Personnel Management [Job Grading Standard for Intermediate Jobs](#). (Grade 10 in this standard is to be used as the "journey level" in applying the Intermediate Job Grading Table.)

NOTE TO USERS

Coverage--Industrial equipment mechanics, covered by this standard, typically perform work on a variety of industrial plant equipment and systems. However, some jobs may specialize in work on only one type of equipment or system, for example, a conveyor and/or towveyor system. Such jobs are also covered by this standard unless the specialized work is specifically recognized in [Part 3, Definitions of Trades and Labor Job Families and Occupations](#) as a separate occupation. Thus, jobs specializing in the repair, installation, and maintenance of utility service systems, pumps, and valves only are graded in the Plumber occupation. Similarly, jobs concerned only with the repair,

installation, and maintenance of automatic and manual doors and windows, locks, furnaces, furniture and fixtures, sterilizers, hydraulic beds, wheel chairs, kitchen and baking equipment, automatic washers and dryers, vacuum cleaners, pneumatic and hydraulic control systems, or power house equipment are graded to the particular occupations involved.

Incidental Work--In working on the mechanical, hydraulic, and pneumatic mechanisms and components of industrial plant support machinery, equipment, and systems, industrial equipment mechanics typically must have sufficient knowledge of the electrical/electronic mechanisms and devices involved to be able to distinguish mechanical, hydraulic, or pneumatic failures from those which are electrical or electronic. (Defects requiring in depth knowledge of electricity or electronic principles are referred to other personnel, e.g., electricians and electronic industrial controls mechanics.) In addition, industrial equipment mechanics may perform other incidental work operations such as machining parts using portable and fixed machine tools, checking and replacing electrical wiring and connections, and welding. Therefore, such work operations are mentioned at different grade levels in this standard. However, this standard is not directly applicable to such incidental work. If such incidental work operations are the primary function of a position, it should be graded by the appropriate specialized standard or by cross-series comparison using sound job grading methods. Similarly, the presence or absence of such incidental duties in a job covered by this standard does not affect the grade level of the industrial equipment mechanic work performed.

5352-8 INDUSTRIAL EQUIPMENT REPAIRER, GRADE 8 5352-8

General: Grade 8 industrial equipment repairers apply specific maintenance and repair procedures to install, maintain, and repair general industrial plant machinery and equipment such as sandblasting machines, degreasers, chain hoists, hydraulic jacks, fire fighting equipment, steam cleaners, and other nonproduction machinery and equipment of similar complexity. They also install and repair foundations for industrial nonproduction machinery, using impact drills and building materials such as wood, cement, and steel; bolt down parts and accessories to foundations; and connect steam lines, fair hose couplings, fuel lines, lubricating systems, and any other power source prior to operation. Grade 8 industrial equipment repairers may assist higher grade equipment mechanics on assignments involving major systems or machinery of greater complexity by disassembling and assembling the simpler components and assemblies, locating and repairing or replacing defective parts and components.

Skill and Knowledge: Grade 8 industrial equipment repairers are skilled in the use of test equipment and measuring devices such as levels, feeler gauges, dial indicators, micrometers, tachometers, and calipers to repair, adjust, and test machinery and equipment such as rotary blast machines, acid vats, fume separators, fire escapes, guard rails, ladders, catwalks, paint mixing machines, pots, and sprayers. They are also skilled in the use of various portable machine and hand tools, for example, flange facing machines, drills, grinders, punch presses, and cutting machines to make routine cuts, shapes, bores, and grinds in the installation and repair of these and other equipment and machinery of similar complexity. Repair operations involve the removal of old or damaged parts and rematching, boring, realigning, and refitting. The work requires the ability to interpret blueprints, diagrams, and other drawings, and the use of arithmetic and standard handbook formulas in performing dimensional measurements and maintaining required tolerances.

Grade 8 industrial equipment repairers are knowledgeable of the mechanical, pneumatic, and hydraulic operating characteristics of a variety of equipment and machinery and are familiar with the various metals needed for a given repair job as specified in the job order or bill of materials. Incidental to their work, repairers also may machine small parts using portable or fixed machine tools such as small lathes or milling machines, check and replace electrical wiring and connections, and spot weld.

Responsibility: Grade 8 industrial equipment repairers receive assignments from their immediate supervisor, either orally or in writing. They work from simple plans, sketches, and detailed specifications and are held responsible for completion of routine tasks and adherence to instructions and accepted trade practices. On routine work, they determine the proper standardized methods, techniques, and procedures required; tools to use; and complete assignments that are subject to review in progress and upon completion. On new or unusual

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assignments, the supervisor explains in detail the steps to follow and checks frequently for adherence to instructions. In contrast to grade 10 industrial equipment mechanics who have responsibility for independently troubleshooting, diagnosing, planning, and completing projects or work orders involving major systems, grade 8 industrial equipment repairers are subject to close supervision on such assignments or are usually responsible for only specified segments of major systems.

Physical Effort: Grade 8 industrial equipment repairers frequently handle objects weighing 20 kilograms (45 pounds) and occasionally carry objects weighing 20 kilograms (45 pounds) and over for considerable distances. They are required to push, pull, reach, walk, stand, crawl, kneel, bend, and work in cramped positions over and under machinery of all types for sustained periods of time.

Working Conditions: Grade 8 industrial equipment repairers usually perform work inside areas that are adequately lighted, ventilated, and heated. Floor and deck surfaces are sometimes uneven, oily, and slippery. They are frequently exposed to moving objects and sharp edges with the possibility of cuts and bruises, and to noise and vibration from machines. Occasionally they climb and work from ladders and stagings exposing the repairers to the possibility of serious injury from slipping and falling. Dirt, grease, and dampness are frequently encountered. Various protective devices such as hard hats, gloves, safety shoes, and glasses are used.

5352-10 INDUSTRIAL EQUIPMENT MECHANIC, GRADE 10 5352-10

General: Grade 10 industrial equipment mechanics apply a variety of methods, procedures, and techniques to lay out, install, align, repair, overhaul, and maintain various types of nonproduction industrial plant machinery, equipment, and systems that are technically more complex than types described at the grade 8 level, i.e., the equipment and machinery have complex interrelationships among components and diagnosis of trouble is more difficult due to various possible causes and combinations of factors that may be the source of trouble.

Grade 10 industrial equipment mechanics disassemble and repair general industrial plant machinery, equipment, and systems such as towveyor and conveyor systems, bridge cranes, air compressors, engine and hydromatic dynamometers, and aircraft test blocks. They determine the nature and extent of repairs necessary and make needed repairs by replacing, reworking, or refinishing worn or damaged parts and components. The mechanics reassemble and install the equipment, connect the power sources. perform operational and functional tests and make required adjustments in order to ensure proper operation of the entire system. They also install, replace, adjust, and set various regulating or safety devices such as meters, gauges, governors, and automatic alarms.

Skill and Knowledge: In comparison with grade 8 industrial equipment repairers, grade 10 industrial equipment mechanics apply a greater knowledge of installation and repair of more complex equipment and machinery such as engraving machines, exhaust units, caissons, ozalid print masters, reducing valves, and pneumatic tube systems.

Depending on the specific nature of the equipment and machinery, grade 10 Industrial Equipment Mechanics examine and troubleshoot to determine the extent of repairs required, materials or parts needed, and to estimate the time required to complete repairs. They disassemble, repair, and rebuild component parts of general industrial plant machinery and equipment such as towveyor and conveyor systems, cable drums and pulleys, reduction gears, monorails, pumps, and sluice gates. The work requires the ability to interpret and apply the requirements contained in technical manuals, shop directives, multiview blueprints, and other documents in determining critical dimensions and key reference points.

Industrial equipment mechanics at this level independently dismantle, move, and relocate various types of industrial plant machinery and equipment or install new machinery and equipment. They anchor machinery to foundations, assemble, and connect accessory or auxiliary components including steel ladders, platforms, and guard rails; make precision alignment and adjustments for balance; and conduct operational tests of the entire system.

Grade 10 industrial equipment mechanics are more skilled than grade 8 industrial equipment repairers in the use and application of standard formulas, shop mathematics, trade theories, and industry practices in calculating needed materials and problem solving; and in the use of various test equipment and measuring devices such as alignment scopes, verniers, micrometers, precision

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levels, transits, strobe tachometers, bearing bridge gauges, flow meters, hydrostatic testers, and vibration analyzers. They make the necessary templates, jigs, and other fixtures required for repair or installation utilizing a knowledge of materials and their versatility.

Incidental to their work, mechanics at this level may be skilled in setting up and operating machine tools such as small lathes, milling machines, drill presses, and precision grinders to manufacture component parts or remachine existing parts such as bushings, bearings, seals, couplings, and pistons. They are also skilled in the independent use of machine tools for onsite milling, grinding, boring, facing, and drilling, and the use of various other portable machine tools to accomplish repairs.

Responsibility: Grade 10 industrial equipment mechanics work alone or as part of a team under general supervision of the immediate supervisor, who makes assignments orally or in writing. They troubleshoot equipment to determine the area of difficulty; what parts or materials are required; and the methods, techniques, and procedures to use in completing repairs. They plan and layout their work using blueprints, sketches, work orders, and other specifications. The supervisor reviews work for adherence to specifications and accepted trade practices. Grade 10 Industrial Equipment Mechanics have the responsibility for independently diagnosing, planning, and completing projects or work orders involving major systems in their entirety, whereas grade 8 industrial equipment repairers are subject to closer supervision on such projects or are responsible for only specified segments of major systems.

Physical Effort: Physical effort at this level is the same as that described at the [grade 8 level](#).

Working Conditions: Working conditions at this level are the same as those described at the [grade 8 level](#).