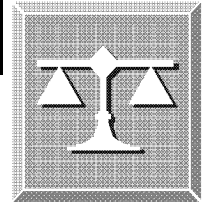


**TS-35 May 1977**

**Federal Wage System  
Job Grading Standards**



WCPS-2 August 2002

**FEDERAL WAGE SYSTEM  
JOB GRADING  
STANDARD  
FOR  
BOWLING EQUIPMENT  
REPAIRING,  
4819**



**Workforce Compensation  
and Performance Service**



# **BOWLING EQUIPMENT REPAIRING, 4819**

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## WORK COVERED

This standard covers nonsupervisory work involved in maintaining and repairing bowling equipment. The work includes making operational and test equipment checks, diagnosing malfunctions, disassembling, repairing and replacing parts, reassembling, adjusting, and making final operational tests. In addition, the work involves conditioning and minor repair of bowling lanes approaches and pins.

The work requires a knowledge and application of mechanical and electrical operating principles of the equipment, the ability to determine malfunctions, and the skill to repair and maintain a variety of bowling equipment.

## WORK NOT COVERED

This standard does not cover the following work:

- Maintenance and repair of utility systems such as air conditioning, heating, water, and electrical generation and distribution. (See [Utility Systems Repairing-Operating Series, 4742](#));
- Performance of a variety of limited maintenance work in a bowling center such as sweeping, dusting, removing trash, operating lane maintenance machines, replacing light bulbs, and clearing pin and ball jams. (See [Laboring Series, 3502](#), [Custodial Working Series, 3566](#), or other series as appropriate);
- Installing, repairing, maintaining, testing, and adjusting fixed or semifixed equipment and machinery. (See [Industrial Equipment Mechanic Series, 5352](#));
- Performance of day-to-day operating functions of a bowling center. (See [Recreation Aid and Assistant Series, GS-189](#));
- Business and operational management of bowling centers where a thorough knowledge of the business practices and methods of managing bowling centers is required (See [General Business and Industry Series, GS-1101](#)).

## TITLES

Jobs covered by this standard below the grade 7 level are to be titled *Bowling Equipment Worker*.

Jobs covered by this standard at grade 7 and above are to be titled *Bowling Equipment Repairer*.

## **GRADE LEVELS**

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

**4819-7****Bowling Equipment Repairer, Grade 7****4819-7**

*General:* Grade 7 bowling equipment repairers maintain, adjust, and repair a variety of bowling equipment having mechanical, electrical and electronic parts, components, and assemblies. Examples of typical equipment serviced include automatic pinplacing machines, automatic scorers, ball returns, telescope and telefoul units, ball drilling machines, pin finders, lane maintenance machines, and ball conditioners.

They apply standard trade practices in diagnosing equipment malfunctions by referring to manufacturer's diagrams and specifications, schematics, and wiring diagrams using test equipment such as continuity testers, voltmeters, ohmmeters and feeler gages. They perform operational checks, visually check for worn or damaged parts, trace wiring, disassemble, make necessary adjustments, repair or replace defective parts, clean, lubricate, and reassemble the equipment. They also follow preventive maintenance schedules.

*Skill and Knowledge:* Grade 7 bowling Equipment repairers must have a knowledge of the mechanical and electrical principles and operating characteristics of bowling equipment. They apply a knowledge of how the parts, components and assemblies are installed and how they work together to locate malfunctions through visual, operational, audio, and standard test equipment checks.

The Grade 7 bowling equipment repairers have the ability to determine which mechanical assemblies are malfunctioning, what parts and mechanisms can be reworked or should be replaced with new parts, and the types of adjustments and alignment required. The repairers have the skill needed to remove and tear down such assemblies as the gear box and detector assemblies, printer, table, rejector, deck, and sweep, and to rebuild, reinstall, and align them. They are skilled in making such repairs and adjustments as retiming cams and gears; measuring and regulating the sweep of rakes; replacing broken or worn pins, rods, brushes, bolts, belts, tension springs; filing contact points; and cleaning and lubricating parts.

In addition, the grade 7 repairers apply a fundamental knowledge of electrical principles and the operating characteristics of such electrical and electronic components as resistors, diodes, capacitors, motors, transformers, switches and relays in testing them and accomplishing repairs. They use wiring diagrams to locate defective parts and standard test equipment to check for open circuits, shorts, grounds, voltage and resistance readings. They are skilled in performing such repairs as soldering loose connections, burnishing contact points, making splices, insulating exposed wires, replacing defective printed circuit boards, and replacing faulty components such as transistors, transformers, switches and diodes.

In addition to the skills and knowledge described above, bowling equipment repairers are skilled in conditioning, maintaining and repairing bowling pins and lanes. For example, they repair cracks, chips and splinters using wood plastic and lane stock, sand the surfaces, and recoat

**4819-7****4819-7**

them with appropriate finishes. Bowling equipment repairers at this level are skilled in the use of standard electrical test equipment such as voltmeters, ohmmeters, continuity testers and test lamps to trace electrical circuit malfunctions and component defects. They use common handtools, electric drills, soldering irons and grinders and buffers in making repairs, as well as feeler gages for accomplishing mechanical adjustments.

The repairers at this level have the ability to read and understand schematics, wiring diagrams, block diagrams, and manufacturer's service manuals. They select replacement parts, components and mechanisms from a familiarity with electrical symbols, color codes, and manufacturer's numbers.

*Responsibility:* Grade 7 bowling equipment repairers receive assignments from the supervisor either orally or through work orders. They refer to manufacturer service manuals which typically contain wiring and block diagrams, schematics, specifications, parts numbers and troubleshooting charts which outline common equipment malfunctions and possible remedies. They select tools and equipment, determine whether parts can be repaired or must be replaced, make necessary adjustments, and complete assignments with little or no direction. They may be responsible for initiating requests for spare parts, supplies and equipment. They follow preventive maintenance schedules established by the manufacturer but make changes when factors such as time and lack of personnel make it necessary. Completed work is checked by the supervisor for timelines and proper operation of the equipment.

*Physical Effort:* Bowling equipment repairers at this level frequently lift and carry parts and assemblies weighing up to 18 kilograms (40 pounds). Occasionally may push or pull larger assemblies weighing up to 45 kilograms (100 pounds). The work at this level requires frequent bending, climbing, reaching, stooping, standing and working in awkward positions.

*Working Conditions:* At this level bowling equipment repairers typically work inside in areas that are usually well lighted, heated and ventilated. They are exposed to loud noises, dust, grease, chemical solvents, and to the possibility of cuts, bruises, abrasions and electrical shock.