# CPC COOPERATIVE PATENT CLASSIFICATION

## G PHYSICS
*(NOTES omitted)*

## INSTRUMENTS

## G01 MEASURING; TESTING
*(NOTES omitted)*

## G01M TESTING STATIC OR DYNAMIC BALANCE OF MACHINES OR STRUCTURES; TESTING OF STRUCTURES OR APPARATUS, NOT OTHERWISE PROVIDED FOR

**NOTE**

Attention is drawn to the Note following the title of Class G01.

**WARNINGS**

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   G01M 1/38 covered by G01M 1/14 and G01M 1/30 and subgroups
2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

**1/00 Testing static or dynamic balance of machines or structures**
1/02 . Details of balancing machines or devices
1/04 . . Adaptation of bearing support assemblies for receiving the body to be tested
1/045 . . . {the body being a vehicle wheel}
1/06 . . Adaptation of drive assemblies for receiving the body to be tested
1/08 . . Instruments for indicating directly the magnitude and phase of the imbalance
1/10 . Determining the moment of inertia
1/12 . Static balancing; Determining position of centre of gravity (by determining imbalance G01M 1/14)
1/122 . . {Determining position of centre of gravity}
1/125 . . . {of aircraft}
1/127 . . . . {during the flight}
1/14 . Determining imbalance (G01M 1/30 takes precedence)
1/16 . . by oscillating or rotating the body to be tested
1/18 . . . and running the body down from a speed greater than normal
1/20 . . . and applying external forces compensating forces due to imbalance
1/22 . . . and converting vibrations due to imbalance into electric variables
1/225 . . . . {for vehicle wheels (in situ G01M 1/28)}
1/24 . . . Performing balancing on elastic shafts, e.g. for crankshafts
1/26 . . . with special adaptations for marking, e.g. by drilling
1/28 . . . with special adaptations for determining imbalance of the body in situ, e.g. of vehicle wheels
1/30 . Compensating imbalance
1/32 . . by adding material to the body to be tested, e.g. by correcting-weights
1/323 . . . {using balancing liquid}
1/326 . . . {the body being a vehicle wheel}
1/34 . . by removing material from the body to be tested, e.g. from the tread of tyres
1/36 . . by adjusting position of masses built-in the body to be tested
1/365 . . . {using balancing liquid}

**3/00 Investigating fluid-tightness of structures**
3/002 . {by using thermal means}
3/005 . {using pigs or moles (G01M 3/246, G01M 3/2823 take precedence)}
3/007 . {Leak detector calibration, standard leaks (G01M 3/207 takes precedence)}
3/02 . by using fluid or vacuum
3/022 . . {Test plugs for closing off the end of a pipe}
3/025 . . {Details with respect to the testing of engines or engine parts}
3/027 . . {Details with respect to the testing of elastic elements, e.g. gloves, condoms}
3/04 . . by detecting the presence of fluid at the leakage point
3/042 . . . {by using materials which expand, contract, disintegrate, or decompose in contact with a fluid (G01M 3/12 takes precedence)}
3/045 . . . . {with electrical detection means}
3/047 . . . . . {with photo-electrical detection means, e.g. using optical fibres}
3/06 . . . by observing bubbles in a liquid pool
3/08 . . . . for pipes, cables or tubes; for pipe joints or seals; for valves; {for welds}
3/081 . . . . . {for cables}
3/083 . . . . . {for tubes}
3/085 . . . . . {for pipe joints or seals (G01M 3/088 takes precedence)}
3/086 . . . . . {for valves}
3/088 . . . . . {for welds}
3/10 . . . . for containers, e.g. radiators

3/103 . . . . . {for flexible or elastic containers}
3/106 . . . . . {for radiators}
3/12 . . . by observing elastic covers or coatings, e.g. soapy water
3/14 . . . . for pipes, cables or tubes; for pipe joints or seals; for valves; {for welds; for containers, e.g. radiators}
3/141 . . . . . {for cables}
3/142 . . . . . {for tubes}
3/143 . . . . . {for pipe joints or seals}
3/144 . . . . . {for valves}
3/145 . . . . . {for welds}
3/146 . . . . . {for containers, e.g. radiators}
3/147 . . . . . {for flexible or elastic containers}
3/148 . . . . . {for radiators}
3/16 . . . using electric detection means ({G01M 3/045,} G01M 3/06, G01M 3/12, G01M 3/20, G01M 3/24, G01M 3/26 take precedence)
3/165 . . . . {by means of cables or similar elongated devices, e.g. tapes}
3/18 . . . . for pipes, cables or tubes; for pipe joints or seals; for valves; {for welds; for containers, e.g. radiators}
3/181 . . . . . {for cables}
3/182 . . . . . {for tubes}
3/183 . . . . . {for pipe joints or seals}
3/184 . . . . . {for valves}
3/185 . . . . . {for welds}
3/186 . . . . . {for containers, e.g. radiators}
3/187 . . . . . {for flexible or elastic containers}
3/188 . . . . . {for radiators}
3/20 . . . using special tracer materials, e.g. dye, fluorescent material, radioactive material
3/202 . . . . {using mass spectrometer detection systems}
3/205 . . . . . {Accessories or associated equipment; Pump constructions}
3/207 . . . . {calibration arrangements}
3/22 . . . . for pipes, cables or tubes; for pipe joints or seals; for valves; {for welds; for containers, e.g. radiators}
3/221 . . . . . {for cables}
3/222 . . . . . {for tubes}
3/223 . . . . . {for pipe joints or seals}
3/224 . . . . . {for valves}
3/225 . . . . . {for welds}
3/226 . . . . . {for containers, e.g. radiators}
3/227 . . . . . {for flexible or elastic containers}
3/228 . . . . . {for radiators}
3/229 . . . . . {removably mounted in a test cell}
3/24 . . . using infrasonic, sonic, or ultrasonic vibrations
3/243 . . . . {for pipes}
3/246 . . . . . {using pigs or probes travelling in the pipe}
3/26 . . by measuring rate of loss or gain of fluid, e.g. by pressure-responsive devices, by flow detectors
3/28 . . . for pipes, cables or tubes; for pipe joints or seals; for valves {; for welds}
3/2807 . . . . {for pipes (G01M 3/2892, G01M 3/30 take precedence)}
3/2815 . . . . . {using pressure measurements}
3/2823 . . . . . {using pigs or moles traveling in the pipe}
3/283 . . . . . {for double-walled pipes}
3/2838 . . . . {for cables (G01M 3/30 takes precedence)}
3/2846 . . . . {for tubes (G01M 3/30 takes precedence)}
3/2853 . . . . {for pipe joints or seals (G01M 3/30 takes precedence)}
3/2861 . . . . . {for pipe sections by testing its exterior surface}
3/2869 . . . . . {for seals not incorporated in a pipe joint}
3/2876 . . . . {for valves (G01M 3/30 takes precedence)}
3/2884 . . . . {for welds (G01M 3/30 takes precedence)}
3/2892 . . . . {for underground fuel dispensing systems (G01M 3/30 takes precedence)}
3/30 . . . . using progressive displacement of one fluid by another
3/32 . . . for containers, e.g. radiators
3/3209 . . . . {Details, e.g. container closure devices}
3/3218 . . . . {for flexible or elastic containers}
3/3227 . . . . {for radiators}
3/3236 . . . . {by monitoring the interior space of the containers}
3/3245 . . . . . {using a level monitoring device (G01M 3/3272 takes precedence)}
3/3254 . . . . . {using a flow detector (G01M 3/3245, G01M 3/3272 take precedence)}
3/3263 . . . . . {using a differential pressure detector (G01M 3/3245, G01M 3/3272 take precedence)}
3/3272 . . . . . {for verifying the internal pressure of closed containers}
3/3281 . . . . {removably mounted in a test cell}
3/329 . . . . . {for verifying the internal pressure of closed containers}
3/34 . . . . by testing the possibility of maintaining the vacuum in containers, e.g. in can-testing machines
3/36 . . by detecting change in dimensions of the structure being tested
3/363 . . . {the structure being removably mounted in a test cell}
3/366 . . . {by isolating only a part of the structure being tested}
3/38 . by using light (G01M 3/02 takes precedence)
3/40 . by using electric means, e.g. by observing electric discharges

**5/00 Investigating the elasticity of structures, e.g. deflection of bridges or air-craft wings** (G01M 9/00 takes precedence)

5/0008 . {of bridges}
5/0016 . {of aircraft wings or blades}
5/0025 . {of elongated objects, e.g. pipes, masts, towers or railways (G01M 5/0058 takes precedence)}
5/0033 . {by determining damage, crack or wear}
5/0041 . {by determining deflection or stress}
5/005 . . {by means of external apparatus, e.g. test benches or portable test systems}
5/0058 . . . {of elongated objects, e.g. pipes, masts, towers or railways}
5/0066 . {by exciting or detecting vibration or acceleration (vibration testing of structures G01M 7/00)}
5/0075 . {by means of external apparatus, e.g. test benches or portable test systems (G01M 5/005 takes precedence)}
5/0083 . {by measuring variation of impedance, e.g. resistance, capacitance, induction}

5/0091 . {by using electromagnetic excitation or detection}

**7/00 Vibration-testing of structures; Shock-testing of structures** (G01M 9/00 takes precedence)

7/02 . Vibration-testing {by means of a shake table}
7/022 . . {Vibration control arrangements, e.g. for generating random vibrations}
7/025 . . {Measuring arrangements}
7/027 . . {Specimen mounting arrangements, e.g. table head adapters}
7/04 . . Monodirectional test stands
7/045 . . . {in a circular direction}
7/06 . . Multidirectional test stands
7/08 . Shock-testing

**9/00 Aerodynamic testing; Arrangements in or on wind tunnels**

9/02 . Wind tunnels
9/04 . . Details
9/06 . Measuring arrangements specially adapted for aerodynamic testing
9/062 . . {Wind tunnel balances; Holding devices combined with measuring arrangements}
9/065 . . {dealing with flow}
9/067 . . . {visualisation}
9/08 . Aerodynamic models

**10/00 Hydrodynamic testing; Arrangements in or on ship-testing tanks or water tunnels**

**11/00 Testing of optical apparatus; Testing structures by optical methods not otherwise provided for**

11/005 . {Testing of reflective surfaces, e.g. mirrors}
11/02 . Testing optical properties
11/0207 . . {Details of measuring devices}
11/0214 . . . {Details of devices holding the object to be tested}
11/0221 . . {by determining the optical axis or position of lenses}
11/0228 . . {by measuring refractive power}
11/0235 . . . {by measuring multiple properties of lenses, automatic lens meters}
11/0242 . . {by measuring geometrical properties or aberrations}
11/025 . . . {by determining the shape of the object to be tested (measuring contours or curvatures by optical means G01B 11/24)}
11/0257 . . . {by analyzing the image formed by the object to be tested}
11/0264 . . . . {by using targets or reference patterns}
11/0271 . . . {by using interferometric methods}
11/0278 . . . {Detecting defects of the object to be tested, e.g. scratches or dust (investigating the presence of flaws or contamination on materials by optical means G01N 21/88)}
11/0285 . . {by measuring material or chromatic transmission properties (G01M 11/0292 takes precedence)}
11/0292 . . {of objectives by measuring the optical modulation transfer function (photometry G01J)}
11/04 . . Optical benches therefor
11/06 . . Testing the alignment of vehicle headlight devices
11/061 . . . {Details of the mechanical construction of the light measuring system (G01M 11/064 takes precedence)}
11/062 . . . {using an indicator mounted on the head-light}
11/064 . . . {by using camera or other imaging system for the light analysis}
11/065 . . . . {details about the image analysis}
11/067 . . . {Details of the vehicle positioning system, e.g. by using a laser}
11/068 . . . {with part of the measurements done from inside the vehicle}
11/08 . Testing mechanical properties {(G01M 11/005 takes precedence)}
11/081 . . {by using a contact-less detection method, i.e. with a camera}
11/083 . . {by using an optical fiber in contact with the device under test [DUT]}
11/085 . . . {the optical fiber being on or near the surface of the DUT}
11/086 . . . {Details about the embedment of the optical fiber within the DUT}
11/088 . . {of optical fibres; Mechanical features associated with the optical testing of optical fibres}
11/30 . {Testing of optical devices, constituted by fibre optics or optical waveguides}
11/31 . . {with a light emitter and a light receiver being disposed at the same side of a fibre or waveguide end-face, e.g. reflectometers}
11/3109 . . . {Reflectometers detecting the back-scattered light in the time-domain, e.g. OTDR}
11/3118 . . . . {using coded light-pulse sequences}
11/3127 . . . . {using multiple or wavelength variable input source}
11/3136 . . . . {for testing of multiple fibers}
11/3145 . . . . {Details of the optoelectronics or data analysis}
11/3154 . . . . {Details of the opto-mechanical connection, e.g. connector or repeater}
11/3163 . . . . {by measuring dispersion}
11/3172 . . . {Reflectometers detecting the back-scattered light in the frequency-domain, e.g. OFDR, FMCW, heterodyne detection}
11/3181 . . . {Reflectometers dealing with polarisation}
11/319 . . . {Reflectometers using stimulated back-scatter, e.g. Raman or fibre amplifiers}
11/33 . . {with a light emitter being disposed at one fibre or waveguide end-face, and a light receiver at the other end-face}
11/331 . . . {by using interferometer}
11/332 . . . {using discrete input signals (G01M 11/333 takes precedence)}
11/333 . . . {using modulated input signals}
11/334 . . . . {with light chopping means}
11/335 . . . {using two or more input wavelengths}
11/336 . . . {by measuring polarization mode dispersion [PMD]}
11/337 . . . {by measuring polarization dependent loss [PDL]}
11/338 . . . {by measuring dispersion other than PMD, e.g. chromatic dispersion}
11/35 . . {in which light is transversely coupled into or out of the fibre or waveguide, e.g. using integrating spheres (G01M 11/31 takes precedence)}
11/37 . . {in which light is projected perpendicularly to the axis of the fibre or waveguide for monitoring a section thereof}

11/39 . . {in which light is projected from both sides of the fiber or waveguide end-face}

**13/00 Testing of machine parts**

13/003 . Machine valves (testing valves for fluid tightness G01M 3/00)
13/005 . Sealing rings
13/02 . Gearings; Transmission mechanisms
13/021 . . Gearings
13/022 . . Power-transmitting couplings or clutches
13/023 . . Power-transmitting endless elements, e.g. belts or chains
13/025 . . Test-benches with rotational drive means and loading means; Load or drive simulation
13/026 . . . Test-benches of the mechanical closed-loop type, i.e. having a gear system constituting a closed-loop in combination with the object under test
13/027 . . Test-benches with force-applying means, e.g. loading of drive shafts along several directions
13/028 . . Acoustic or vibration analysis
13/04 . Bearings
13/045 . . Acoustic or vibration analysis

**15/00 Testing of engines**

15/02 . Details or accessories of testing apparatus
15/04 . Testing internal-combustion engines

**NOTE**

Group G01M 15/05 takes precedence over groups G01M 15/042 and G01M 15/06 - G01M 15/12.

15/042 . . {by monitoring a single specific parameter not covered by groups G01M 15/06 - G01M 15/12}
15/044 . . . {by monitoring power, e.g. by operating the engine with one of the ignitions interrupted; by using acceleration tests}
15/046 . . . {by monitoring revolutions (for detecting misfire G01M 15/11)}
15/048 . . . {by monitoring temperature}
15/05 . . by combined monitoring of two or more different engine parameters
15/06 . . by monitoring positions of pistons or cranks
15/08 . . by monitoring pressure in cylinders
15/09 . . by monitoring pressure in fluid ducts, e.g. in lubrication or cooling parts
15/10 . . by monitoring exhaust gases {or combustion flame}
15/102 . . . {by monitoring exhaust gases}
15/104 . . . . {using oxygen or lambda-sensors (testing catalytic converters F01N 3/18, F01N 11/007)}
15/106 . . . . {using pressure sensors}
15/108 . . . . {using optical methods}
15/11 . . by detecting misfire
15/12 . . by monitoring vibrations
15/14 . Testing gas-turbine engines or jet-propulsion engines

**17/00 Testing of vehicles** (testing fluid tightness G01M 3/00; testing elastic properties of bodies or chassis, e.g. torsion-testing, G01M 5/00; testing alignment of vehicle headlight devices G01M 11/06; testing of engines G01M 15/00)

17/007 . Wheeled or endless-tracked vehicles (G01M 17/08 takes precedence)
17/0072 . . {the wheels of the vehicle co-operating with rotatable rolls (G01M 17/022, G01M 17/045, G01M 17/065 take precedence)}
17/0074 . . . {Details, e.g. roller construction, vehicle restraining devices}
17/0076 . . . {Two-wheeled vehicles}
17/0078 . . {Shock-testing of vehicles}
17/013 . . Wheels
17/02 . . Tyres
17/021 . . . {Tyre supporting devices, e.g. chucks (for balancing G01M 1/04)}
17/022 . . . {the tyre co-operating with rotatable rolls}
17/024 . . . . {combined with tyre surface correcting or marking means}
17/025 . . . {using infrasonic, sonic or ultrasonic vibrations}
17/027 . . . {using light, e.g. infrared, ultraviolet or holographic techniques}
17/028 . . . {using X-rays}
17/03 . . Endless-tracks
17/04 . . Suspension or damping
17/045 . . . {the vehicle wheels co-operating with rotatable rollers}
17/06 . . Steering behaviour; Rolling behaviour
17/065 . . . {the vehicle wheels co-operating with rotatable rolls}
17/08 . Railway vehicles
17/10 . . Suspensions, axles or wheels

**99/00 Subject matter not provided for in other groups of this subclass**

99/001 . {Testing of furniture, e.g. seats or mattresses}
99/002 . {Thermal testing (flaw detection G01N 25/72)}
99/004 . {Testing the effects of speed or acceleration}
99/005 . {Testing of complete machines, e.g. washing-machines or mobile phones (testing of machine parts G01M 13/00; testing of electric apparatus or components G01R 31/50)}

**NOTE**

This group covers mechanical testing of complete machines

99/007 . {by applying a load, e.g. for resistance or wear testing (G01M 99/001 takes precedence; testing the elasticity of structures G01M 5/00)}
99/008 . {by doing functionality tests}