CPC COOPERATIVE PATENT CLASSIFICATION

G01M TESTING STATIC OR DYNAMIC BALANCE OF MACHINES OR STRUCTURES; TESTING STRUCTURES OR APPARATUS NOT OTHERWISE PROVIDED FOR {(devices for testing the performance of portable percussive tools with fluid-pressure drive B25D 9/005)}

NOTE

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

WARNING

Subject matter covered by these groups is classified in the following CPC groups: - G01M/38 covered by G01M 1/14 and G01M 1/30 and subgroups

G01M 1/00 **Testing static or dynamic balance of machines or structures** (balancing rotary bowls of centrifuges B04B 9/14 ; apparatus characterised by the means for holding wheels or parts thereof B60B 30/00 ; determining the stability factors of ships B63B; stabilising of aircraft B64C 17/00 ; control systems for balancing automatically in operation G05; balancing rotors of dynamo-electric machines H02K 15/16)

G01M 1/02 . Details of balancing machines or devices

G01M 1/04 . . Adaptation of bearing support assemblies for receiving the body to be tested {(tyre chucks in general G01M 17/021)}

G01M 1/045 . . . { the body being a vehicle wheel }

G01M 1/06 . . Adaptation of drive assemblies for receiving the body to be tested

G01M 1/08 . . Instruments for indicating directly the magnitude and phase of the unbalance (measuring electrical variables in general G01R)

G01M 1/10 . Determining the moment of inertia

G01M 1/12 . Static balancing; Determining position of centre of gravity (by determining unbalance G01M 1/14)

G01M 1/122 . . { Determining position of centre of gravity }

G01M 1/125 . . . { of aircraft }

G01M 1/127 . . . . { during the flight }

G01M 1/14 . Determining unbalance (G01M 1/30 , G01M 1/38 take precedence)

G01M 1/16 . . by oscillating or rotating the body to be tested

G01M 1/18 . . . and running the body down from a speed greater than normal

G01M 1/20 . . . and applying external forces compensating forces due to unbalance

G01M 1/22 . . . and converting vibrations due to unbalance into electric variables (measuring vibrations in general G01H ; microphones or like acoustic electromechanical transducers H04R)

G01M 1/225 . . . . { for vehicle wheels (in situ G01M 1/28)}

G01M 1/24 . . . performing balancing on elastic shafts, e.g. for crankshafts

G01M 1/26 . . . with special adaptations for marking, e.g. by drilling

G01M 1/28 . . . with special adaptations for determining unbalance of the body in situ, e.g. of vehicle wheels

G01M 1/30 . Compensating unbalance (G01M 1/38 takes precedence; counterweights F16F 15/28)

G01M 1/32 . . by adding material to the body to be tested, e.g. by correcting-weights (correcting-weights per se F16F 15/32)

G01M 1/323 . . . { using balancing liquid }

G01M 1/326 . . . { the body being a vehicle wheel }

G01M 1/34 . . by removing material from the body to be tested, e.g. from the tread of tyres

G01M 1/36 . . by adjusting position of masses built-in the body to be tested

G01M 1/365 . . . { using balancing liquid }

G01M 3/00 **Investigating fluid-tightness of structures** (investigating permeability of porous material, investigating the presence of flaws in general G01N) { membrane leak detection in blood dialysis A61M 1/1692 ; detecting infusion flow leakage A61M 5/16831 }

G01M 3/002 . { by using thermal means }

G01M 3/005 . { using pigs or moles (G01M 3/246 , G01M 3/2823 take precedence)}

G01M 3/007 . { Leak detector calibration, standard leaks (G01M 3/207 takes precedence)}

G01M 3/02 . by using fluid or vacuum

G01M 3/022 . . { Test plugs for closing off the end of a pipe (means for stopping flow from pipes F16L 55/10)}

G01M 3/025 . . { Details with respect to the testing of engines or engine parts }

G01M 3/027 . . { Details with respect to the testing of elastic elements, e.g. gloves, condoms }

G01M 3/04 . . by detecting the presence of fluid at the leakage point

G01M 3/042 . . . { by using materials which expand, contract, disintegrate, or decompose in contact with a fluid (G01M 3/12 takes precedence)}

G01M 3/045 . . . . { with electrical detection means }

G01M 3/047 . . . . . { with photo-electrical detection means, e.g. using optical fibres }

G01M 3/06 . . . by observing bubbles in a liquid pool

G01M 3/08 . . . . for pipes, cables or tubes; for pipe joints or seals; for valves; { for welds }

G01M 3/081 . . . . . { for cables }

G01M 3/083 . . . . . { for tubes }

G01M 3/085 . . . . . { for pipe joints or seals (G01M 3/088 takes precedence)}

G01M 3/086 . . . . . { for valves }

G01M 3/088 . . . . . { for welds }

G01M 3/10 . . . . for containers, e.g. radiators

G01M 3/103 . . . . . { for flexible or elastic containers }

G01M 3/106 . . . . . { for radiators }

G01M 3/12 . . . by observing elastic covers or coatings e.g. soapy water

G01M 3/14 . . . . for pipes, cables or tubes; for pipe joints or seals; for valves; { for welds; for

containers, e.g. radiators }

G01M 3/141 ..... { for cables }

G01M 3/142 ..... { for tubes }

G01M 3/143 ..... { for pipe joints or seals }

G01M 3/144 ..... { for valves }

G01M 3/145 ..... { for welds }

G01M 3/146 ..... { for containers, e.g. radiators }

G01M 3/147 ..... { for flexible or elastic containers }

G01M 3/148 ..... { for radiators }

G01M 3/16 ... using electric detection means (G01M 3/06 , G01M 3/12 , G01M 3/20 , G01M 3/24 , G01M 3/26 take precedence) { G01M 3/045 takes precedence }

G01M 3/165 .... { by means of cables or similar elongated devices, e.g. tapes (construction of cables in general H01B)}

G01M 3/18 .... for pipes, cables or tubes; for pipe joints or seals; for valves; { for welds; for containers, e.g. radiators }

G01M 3/181 ..... { for cables }

G01M 3/182 ..... { for tubes }

G01M 3/183 ..... { for pipe joints or seals }

G01M 3/184 ..... { for valves }

G01M 3/185 ..... { for welds }

G01M 3/186 ..... { for containers, e.g. radiators }

G01M 3/187 ..... { for flexible or elastic containers }

G01M 3/188 ..... { for radiators }

G01M 3/20 ... using special tracer materials, e.g. dye, fluorescent material, radioactive material

G01M 3/202 .... { mass spectrometer detection systems (mass spectrometers H01J 49/26)}

G01M 3/205 ..... { accessories and associated equipment, pump constructions (pumps F04)}

G01M 3/207 .... { calibration arrangements }

G01M 3/22 .... for pipes, cables or tubes; for pipe joints or seals; for valves; { for welds; for containers, e.g. radiators }

G01M 3/221 ..... { for cables }

G01M 3/222 ..... { for tubes }

G01M 3/223 ..... { for pipe joints or seals }

G01M 3/224 ..... { for valves }

G01M 3/225 ..... { for welds }

G01M 3/226 ..... { for containers, e.g. radiators }

G01M 3/227 ..... { for flexible or elastic containers }

G01M 3/228 ..... { for radiators }

G01M 3/229 ..... { removably mounted in a test cell (test cells also in G01M 3/3281 and G01M 3/363)}

G01M 3/24 ... using infrasonic, sonic, or ultrasonic vibrations

G01M 3/243 .... { for pipes }

G01M 3/246 . . . . . { using pigs or probes travelling in the pipe }

G01M 3/26 . . by measuring rate of loss or gain of fluid, e.g. by pressure-responsive devices, by flow detectors

G01M 3/28 . . . for pipes, cables or tubes; for pipe joints or seals; for valves { for welds (not used)}

G01M 3/2807 . . . . { for pipes (G01M 3/2892 , G01M 3/30 take precedence)}

G01M 3/2815 . . . . . { using pressure measurements }

G01M 3/2823 . . . . . { using pigs or moles traveling in the pipe }

G01M 3/283 . . . . . { for double-walled pipes }

G01M 3/2838 . . . . { for cables (G01M 3/30 takes precedence)}

G01M 3/2846 . . . . { for tubes (G01M 3/30 takes precedence)}

G01M 3/2853 . . . . { for pipe joints or seals (G01M 3/30 takes precedence)}

G01M 3/2861 . . . . . { for pipe sections by testing its exterior surface }

G01M 3/2869 . . . . . { for seals not incorporated in a pipe joint }

G01M 3/2876 . . . . { for valves (G01M 3/30 takes precedence)}

G01M 3/2884 . . . . { for welds (G01M 3/30 takes precedence)}

G01M 3/2892 . . . . { for underground fuel dispensing systems (G01M 3/30 takes precedence)}

G01M 3/30 . . . . using progressive displacement of one fluid by another

G01M 3/32 . . . for containers, e.g. radiators

G01M 3/3209 . . . . { Details, e.g. container closure devices }

G01M 3/3218 . . . . { for flexible or elastic containers }

G01M 3/3227 . . . . { for radiators }

G01M 3/3236 . . . . { by monitoring the interior space of the containers }

G01M 3/3245 . . . . . { using a level monitoring device (G01M 3/3272 takes precedence)}

G01M 3/3254 . . . . . { using a flow detector (G01M 3/3245 , G01M 3/3272 take precedence)}

G01M 3/3263 . . . . . { using a differential pressure detector (G01M 3/3245 , G01M 3/3272 take precedence)}

G01M 3/3272 . . . . . { for verifying the internal pressure of closed containers }

G01M 3/3281 . . . . { removably mounted in a test cell }

G01M 3/329 . . . . . { for verifying the internal pressure of closed containers }

G01M 3/34 . . . . by testing the possibility of maintaining the vacuum in containers, e.g. in can-testing machines

G01M 3/36 . . by detecting change in dimensions of the structure being tested

G01M 3/363 . . . { the structure being removably mounted in a test cell }

G01M 3/366 . . . { by isolating only a part of the structure being tested }

G01M 3/38 . by using light (G01M 3/02 takes precedence)

G01M 3/40 . by using electric means, e.g. by observing electric discharges

G01M 5/00 **Investigating the elasticity of structures, e.g. deflection of bridges, air-craft wings** (G01M 9/00 takes precedence; strain gauges G01B)

G01M 5/0008 . { of bridges }

G01M 5/0016 . { of aircraft wings or blades }

G01M 5/0025 . { of elongated objects, e.g. pipes, masts, towers or railways (G01M 5/0058 takes precedence)}

G01M 5/0033 . { by determining damage, crack or wear }

G01M 5/0041 . { by determining deflection or stress }

G01M 5/005 . . { by means of external apparatus, e.g. test benches or portable test systems }

G01M 5/0058 . . . { of elongated objects, e.g. pipes, masts, towers or railways }

G01M 5/0066 . { by exciting or detecting vibration or acceleration (vibration testing of structures G01M 7/00)}

G01M 5/0075 . { by means of external apparatus, e.g. test benches or portable test systems (G01M 5/005 takes precedence)}

G01M 5/0083 . { by measuring variation of impedance, e.g. resistance, capacitance, induction }

G01M 5/0091 . { by using electromagnetic excitation or detection }

G01M 7/00 **Vibration-testing of structures; Shock-testing of structures** (G01M 9/00 takes precedence; { generating vibrations B06, G10, H04R; vibration measurement G01H; material testing G01N 3/00 })

G01M 7/02 . Vibration-testing { by means of a shake table }

G01M 7/022 . . { Vibration control arrangements, e.g. for generating random vibrations }

G01M 7/025 . . { Measuring arrangements }

G01M 7/027 . . { Specimen mounting arrangements, e.g. table head adapters }

G01M 7/04 . . Monodirectional test stands

G01M 7/045 . . . { in a circular direction }

G01M 7/06 . . Multidirectional test stands

G01M 7/08 . Shock-testing

G01M 9/00 **Aerodynamic testing; Arrangements in or on wind tunnels** (building aspects Section E; investigating properties of materials in general G01N)

G01M 9/02 . Wind tunnels

G01M 9/04 . . Details

G01M 9/06 . Measuring arrangements specially adapted for aerodynamic testing

G01M 9/062 . . { Wind tunnel balances; Holding devices combined with measuring arrangements (measuring components of force in general G01L 5/16)}

G01M 9/065 . . { dealing with flow (measuring volume flow G01F ; measuring speed of fluids G01P 5/00)}

G01M 9/067 . . . { visualisation }

G01M 9/08 . Aerodynamic models

G01M 10/00 **Hydrodynamic testing; Arrangements in or on ship-testing tanks or water tunnels**
(building aspects Section E; investigating properties of materials in general G01N; { methods for designing, building, maintaining, converting, refitting, repairing or determining properties of vessels, not otherwise provided for and using towing tanks or model basins for designing B63B 9/02 ; for determining vessel properties with respect to stability or balance B63B 9/08 ; apparatus for indicating vessel attitude, e.g. inclination or duration of roll B63B 39/00 })

G01M 11/00 **Testing of optical apparatus; Testing structures by optical methods not otherwise provided for**

WARNING

Groups **G11M 11/30** - **G11M 11/39** do not correspond to former or future IPC groups. Concordance CPC : IPC for these groups is as follows: - G01M 11/30 - **G01M 11/38** : G01M 11/00

G01M 11/005 . { Testing of reflective surfaces, e.g. mirrors }

G01M 11/02 . Testing of optical properties { of lenses }
G01M 11/0207 .. { Details of measuring devices }
G01M 11/0214 ... { Details of devices holding the object to be tested }
G01M 11/0221 .. { by determining the optical axis or position of lenses }
G01M 11/0228 .. { by measuring refractive power }
G01M 11/0235 ... { by measuring multiple properties of lenses, automatic lens meters }
G01M 11/0242 .. { by measuring geometrical properties or aberrations }
G01M 11/025 ... { by determining the shape of the object to be tested (measuring contours or curvatures by optical means G01B 11/24)}
G01M 11/0257 ... { by analyzing the image formed by the object to be tested }
G01M 11/0264 .... { by using targets or reference patterns }
G01M 11/0271 ... { by using interferometric methods }
G01M 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)}
G01M 11/0285 .. { by measuring material or chromatic transmission properties (G01M 11/0292 takes precedence)}
G01M 11/0292 .. { of objectives by measuring the optical modulation transfer function (photometry G01J)}
G01M 11/04 .. Optical benches
G01M 11/06 .. Testing of alignment of vehicle head-light devices
G01M 11/061 ... { Details of the mechanical construction of the light measuring system (G01M 11/064 takes precedence)}
G01M 11/062 ... { using an indicator mounted on the head-light }
G01M 11/064 ... { by using camera or other imaging system for the light analysis }
G01M 11/065 .... { details about the image analysis }
G01M 11/067 ... { Details of the vehicle positioning system, e.g. by using a laser }

G01M 11/068 . . . { with part of the measurements done from inside the vehicle }

G01M 11/08 . Testing of mechanical properties {(G01M 11/005 takes precedence)}
G01M 11/081 . . { by using a contact-less detection method, i.e. with a camera }
G01M 11/083 . . { by using an optical fiber in contact with the device under test (DUT) }
G01M 11/085 . . . { the optical fiber being on or near the surface of the DUT }
G01M 11/086 . . . { Details about the embedment of the optical fiber within the DUT }
G01M 11/088 . . { of optical fibres; Mechanical features associated with the optical testing of optical fibres (material testing in general G01N)}

G01M 11/30 . { Testing of optical devices, constituted by fibre optics or optical waveguides (measuring a given physical parameter of optical fibres, see the relevant subclasses, e.g. G01B, G01N; equipment for monitoring, testing or fault measuring in optical transmission systems H04B 10/07)}
G01M 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 }
G01M 11/3109 . . . { Reflectometers detecting the back-scattered light in the time-domain, e.g. OTDR }
G01M 11/3118 . . . . { using coded light-pulse sequences }
G01M 11/3127 . . . . { using multiple or wavelength variable input source }
G01M 11/3136 . . . . { for testing of multiple fibers }
G01M 11/3145 . . . . { Details of the optoelectronics or data analysis }
G01M 11/3154 . . . . { Details of the opto-mechanical connection, e.g. connector or repeater }
G01M 11/3163 . . . . { by measuring dispersion }
G01M 11/3172 . . . { Reflectometers detecting the back-scattered light in the frequency-domain, e.g. OFDR, FMCW, heterodyne detection }
G01M 11/3181 . . . { Reflectometers dealing with polarisation }
G01M 11/319 . . . { Reflectometers using stimulated back-scatter, e.g. Raman or fibre amplifiers }
G01M 11/33 . . { with a light emitter being disposed at one fibre or waveguide end-face, and a light receiver at the other end-face }
G01M 11/331 . . . { by using interferometer }
G01M 11/332 . . . { using discrete input signals (G01M 11/333 takes precedence)}
G01M 11/333 . . . { using modulated input signals }
G01M 11/334 . . . . { with light chopping means }
G01M 11/335 . . . { using two or more input wavelengths }
G01M 11/336 . . . { by measuring polarization mode dispersion [PMD] }
G01M 11/337 . . . { by measuring polarization dependent loss [PDL] }
G01M 11/338 . . . { by measuring dispersion other than PMD, e.g. chromatic dispersion }
G01M 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)}
G01M 11/37 . . { in which light is projected perpendicularly to the axis of the fibre or waveguide for monitoring a section thereof }
G01M 11/39 . . { in which light is projected from both sides of the fiber or waveguide end-face }

G01M 13/00 **Testing of machine parts** (investigating the cutting power of tools, G01N, e.g. G01N 3/58)

G01M 13/005 . { Testing of sealing rings }

G01M 13/02 . Testing of gearing or of transmission mechanisms (measuring efficiency G01L)
G01M 13/021 . . { of gearings }
G01M 13/022 . . { of power-transmitting couplings or clutches }
G01M 13/023 . . { of power-transmitting endless elements, e.g. belts, chains }
G01M 13/025 . . { Test-benches using a rotational drive and loading means; Load/drive simulation }
G01M 13/026 . . . { of the mechanical closed-loop type }
G01M 13/027 . . { Test-benches using force applying means, e.g. loading of drive shafts along several directions }
G01M 13/028 . . { Acoustic or vibration analysis }

G01M 13/04 . Testing of bearings
G01M 13/045 . . { by acoustic or vibration analysis }

G01M 15/00 Testing of engines

NOTE

Informative note
References listed below indicate IPC places which could also be of interest when carrying out a search in respect of the subject matter covered by the preceding group:
Measurement of mechanical vibrations in general G01H
Analysing gases in general G01N
Arrangements for testing electrical properties; Arrangements for locating electric faults; Arrangements for electrical testing characterised by what is being tested not provided for elsewhere G01R 31/00 .

G01M 15/02 . Details or accessories of testing apparatus

G01M 15/04 . Testing of internal-combustion engines, e.g. diagnostic testing of piston engines

NOTE

Informative note
References listed below indicate IPC places which could also be of interest when carrying out a search in respect of the subject matter covered by the preceding group:
Monitoring or diagnostic devices for exhaust-gas treatment apparatus F01N 11/00
Indicating or supervising devices of internal-combustion engines F02B 77/08
Running in of internal-combustion engines F02B 79/00
Controlling combustion engines F02D
Apparatus for testing, tuning or synchronising carburettors, e.g. carburettor flow stands F02M 19/01
Testing fuel-injection apparatus F02M 65/00
Testing internal-combustion engine ignition, e.g. timing F02P 17/00
Devices for determining the value of power, e.g. by measuring and simultaneously multiplying the values of torque and revolutions per unit of time, by multiplying the values of tractive or propulsive force and velocity G01L 3/24
Determining the characteristic of torque in relation to revolutions per unit of time

G01L 5/26
Devices for detecting or indicating knocks in internal-combustion engines
G01L 23/22
Devices for measuring pressure in inlet or exhaust ducts of internal combustion engines G01L 23/24
Means for indicating positions of pistons or cranks of internal-combustion engines by measuring pressure G01L 23/30 .

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

G01M 15/042 . . { by monitoring a single specific parameter not covered by groups G01M 15/06 to G01M 15/12 }

G01M 15/044 . . . { by monitoring power, e.g. by operating the engine with one of the ignitions interrupted; by using acceleration tests }

G01M 15/046 . . . { by monitoring revolutions (for detecting misfire G01M 15/11)}

G01M 15/048 . . . { by monitoring temperature }

G01M 15/05 . . by combined monitoring of two or more different engine parameters

G01M 15/06 . . by monitoring positions of pistons or cranks

G01M 15/08 . . by monitoring pressure in cylinders

G01M 15/09 . . by monitoring pressure in fluid ducts, e.g. in lubrication or cooling parts

G01M 15/10 . . by monitoring exhaust gases { or combustion flame (analyses of gases per se G01N)}

G01M 15/102 . . . { by monitoring exhaust gases }

G01M 15/104 . . . . { using oxygen or lambda-sensors (testing catalytic converters F01N 3/18 , **F01N 7/00E**)}

G01M 15/106 . . . . { using pressure sensors }

G01M 15/108 . . . . { using optical methods }

G01M 15/11 . . by detecting misfire

G01M 15/12 . . by monitoring vibrations

G01M 15/14 . Testing of gas-turbine plants or jet-propulsion plants

NOTE

Informative note
References listed below indicate IPC places which could also be of interest when carrying out a search in respect of the subject matter covered by the preceding group:
Rocket-engine plants characterised by specially adapted arrangements for testing or measuring F02K 9/96 .

G01M 17/00 **Testing of vehicles** (G01M 15/00 takes precedence; testing fluid tightness G01M 3/00 ; testing elastic properties of bodies or chassis, e.g. torsion testing G01M 5/00 ; testing alignment of vehicle head-lighting devices G01M 11/06 ; { testing brakes G01L 5/28 })

G01M 17/007 . { of wheeled or endless-tracked vehicles (G01M 17/08 takes precedence)}

G01M 17/0072 . . { the wheels of the vehicle co-operating with rotatable rolls (G01M 17/022 , G01M 17/045 , G01M 17/065 take precedence)}

G01M 17/0074 . . . { Details, e.g. roller construction, vehicle restraining devices }

G01M 17/0076 . . . { for two-wheeled vehicles }

G01M 17/0078 . . { Shock-testing of vehicles (shock-testing of structures in general G01M 7/08 , G01N 3/30)}

G01M 17/013 . . of wheels

G01M 17/02 . . of tyres

G01M 17/021 . . . { Tyre supporting devices, e.g. chucks (for balancing G01M 1/04)}

G01M 17/022 . . . { the tyre co-operates with rotatable rolls }

G01M 17/024 . . . . { combined with tyre surface correcting or marking means (compensating unbalance G01M 1/30 ; marking location of unbalance G01M 1/26)}

G01M 17/025 . . . { using infrasonic, sonic or ultrasonic vibrations (for material testing in general G01N 29/00)}

G01M 17/027 . . . { using light, e.g. infra-red, ultra-violet, holographic techniques (for material testing in general G01N 21/00)}

G01M 17/028 . . . { using X-rays (for material testing in general G01N 23/00)}

G01M 17/03 . . of endless-tracks

G01M 17/04 . . of suspension or of damping

G01M 17/045 . . . { the vehicle wheels co-operating with rotatable rollers }

G01M 17/06 . . of steering behaviour; of rolling behaviour (measuring steering angles G01B ; measuring steering forces G01L)

G01M 17/065 . . . { the vehicle wheels co-operating with rotatable rolls }

G01M 17/08 . of railway vehicles

G01M 17/10 . . of suspensions, axles or wheels

G01M 99/00 Subject matter not provided for in other groups of this subclass

G01M 99/001 . { Testing of furniture, e.g. seats or mattresses }

G01M 99/002 . { Thermal testing (flaw detection G01N 25/72)}

G01M 99/004 . { Testing the effects of speed or acceleration }

G01M 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 31/02)}

NOTE

This group covers mechanical testing of complete machines

G01M 99/007 . { by applying a load, e.g. for resistance or wear testing (**G01M 19/00A** takes precedence; testing the elasticity of structures G01M 5/00)}

G01M 99/008 . { by doing functionality tests }