

G01M

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

Definition statement

This place covers:

Testing characterised by the objects investigated:

- Machines or machine parts – see definitions for [G01M 1/00](#), [G01M 9/00](#), [G01M 10/00](#), [G01M 13/00](#), [G01M 15/00](#), [G01M 17/00](#)
- Structures – see definitions for [G01M 1/00](#), [G01M 3/00](#), [G01M 5/00](#), [G01M 7/00](#)
- Apparatus not provided elsewhere – see definitions for [G01M 11/00](#), [G01M 99/00](#)

Testing characterised by the properties investigated:

- Balance – see definition for [G01M 1/00](#)
- Fluid tightness – see definition for [G01M 3/00](#)
- Elasticity, deflection – see definition for [G01M 5/00](#)
- Vibration resistance – see definition for [G01M 7/00](#)
- Aerodynamic properties – see definition for [G01M 9/00](#)
- Hydrodynamic properties – see definition for [G01M 10/00](#)
- Optical properties – see definition for [G01M 11/00](#)

Relationships with other classification places

Subclass [G01N](#) covers investigating, i.e. testing or determining, the properties of materials, as opposed to testing or determining the properties of structures or apparatus, machine parts, which is covered by subclass [G01M](#).

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for testing the performance of portable percussive tools with fluid-pressure drive	B25D 9/005
--	----------------------------

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Calibrating	means ascertaining the quality of a measuring or testing device, or checking, adjusting graduations of measuring or testing device.
Monitoring	means maintain a continuous or periodical watch (human or instrumental) on, to enable action to be taken or initiated, or a signal to be given, if undesired conditions occur.
Investigating	means testing or determining.
Testing	means determination of the presence, quality, or genuineness of object to be tested.

G01M 1/00

Testing static or dynamic balance of machines or structures

Definition statement

This place covers:

Methods and apparatus for:

- determining and compensating static or dynamic imbalance of machines or structures;
- determining the moment of inertia of machines or structures;
- static balancing of machines or structures;
- determining position of centre of gravity of machines or structures;
- combined machines or devices for both determining and correcting imbalance of machines or structures.

Relationships with other classification places

Subclass [G01H](#) covers the combination of generation and measurement of mechanical and other vibrations while subclass [G01M](#) covers determining imbalance by oscillating or rotating the body to be tested.

Subclass [G01R](#) covers instruments for measuring electrical variables, which can be used for balancing machines or devices but not specially adapted for this purpose.

Subclass [H04R](#) covers electromechanical transducers producing acoustic waves or variations of electric variables (current or voltage) while subclass [G01M](#) covers determining imbalance by converting vibrations due to imbalance into electric variables.

The testing of vehicles is covered in group [G01M 17/00](#), but nontrivial methodological details of such testing can justify also assigning groups [G01M 1/02](#) - [G01M 1/14](#) and [G01M 1/30](#).

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Balancing rotary bowls of centrifuges	B04B 9/14
Equipment to decrease pitch, roll or like unwanted vessel movements; Apparatus for indicating vessel attitude	B63B 39/00
Determining vessel properties with respect to stability or balance	B63B 79/00
Aircraft stabilisation not otherwise provided for	B64C 17/00
Preventing or reducing imbalance or noise	D06F 33/48
In assembly, mounting or commissioning of wind motors, balancing static or dynamic imbalances	F03D 13/35
Centring the rotor within the stator; Balancing the rotor	H02K 15/16

Informative references

Attention is drawn to the following places, which may be of interest for search:

Means for holding wheels or parts thereof	B60B 30/00
Balancing machines or engines for liquids	F03B 11/04
Balancing non-positive-displacement pumps	F04D 29/66

Counterweights; Attaching or mounting same	F16F 15/28
Correcting- or balancing-weights or equivalents means for balancing rotating bodies, e.g. vehicle wheels	F16F 15/32
Measuring vibrations in general	G01H
Measuring electrical variables in general	G01R
Control of mechanical oscillations	G05D 19/00
Microphones or like acoustic electromechanical transducers	H04R

G01M 1/04

Adaptation of bearing support assemblies for receiving the body to be tested

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Test of wheels	G01M 17/013
Uniformity test of tyre	G01M 17/02
Tyre chucks for testing purposes	G01M 17/021
Uniformity test of tyre and surface correction	G01M 17/024

Informative references

Attention is drawn to the following places, which may be of interest for search:

Means for holding wheels or parts thereof	B60B 30/00
---	----------------------------

G01M 1/12

Static balancing; Determining position of centre of gravity (by determining imbalance [G01M 1/14](#))

References

Limiting references

This place does not cover:

Determining unbalance by dynamic methods	G01M 1/14
--	---------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Levelling, stabilizing of vehicles transporting loads	B60P 1/045
---	----------------------------

G01M 1/14**Determining imbalance ([G01M 1/30](#) takes precedence)****References*****Application-oriented references***

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Arrangements for detecting or measuring imbalance in washing machines, washer-dryers or laundry dryers	D06F 34/16
--	----------------------------

G01M 1/22**and converting vibrations due to imbalance into electric variables****References*****Application-oriented references***

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Measuring vibration in general	G01H
Vibration transducers per se	H04R

G01M 1/30**Compensating imbalance****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Counterweights	F16F 15/28
----------------	----------------------------

G01M 1/32**by adding material to the body to be tested, e.g. by correcting-weights****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Correcting-weights per se	F16F 15/32
---------------------------	----------------------------

G01M 1/34

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

Definition statement

This place covers:

Devices for compensating unbalance by removing by grinding or drilling.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Uniformity test of tyre and surface correction	G01M 17/024
--	-----------------------------

G01M 1/36

by adjusting position of masses built-in the body to be tested

Definition statement

This place covers:

Devices for:

Hydraulic positioning of balancing weights.

Electric, magnetic positioning, like solenoids, motors.

Mechanical positioning.

Balancing with free moving parts, like balls,

Balancing by using eccentric discs.

G01M 3/00

Investigating fluid-tightness of structures

Definition statement

This place covers:

Investigating fluid-tightness of structures:

Like cables, tubes, pipes, welds, pipe joints, seals, valves, containers, radiators.

By using thermal means, pigs or moles, fluid or vacuum, tracer materials, infrasonic, sonic, or ultrasonic vibrations, pressure or flow or level detector, light or by using other electric means, e.g. by observing electric discharges.

With leakage calibration devices and standard leak

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Detection of leak in washing machines	A47L 15/4212
---------------------------------------	------------------------------

Informative references

Membrane leak detection in blood dialysis	A61M 1/1692
Detecting medical infusion flow leakage	A61M 5/16831
Detecting or repairing leaks in apparatus using semi-permeable membranes	B01D 65/10
Leak detection in membrane	B01D 65/102
Testing for leaks in apparatus for blow-molding	B29C 49/80
Monitoring, testing or servicing air conditioning in vehicles	B60H 1/00585
Leakage-indicating devices for large containers	B65D 90/50
Locating fluid leaks in boreholes or wells	E21B 47/10
Leakage detectors for rocket-engine plants	F02K 9/54
Leak detection in pumps	F04B 43/009
Means for stopping flow from pipes	F16L 55/10
Preventing, monitoring or locating loss in the pipe-line and networks	F17D 5/02
Leak detection in steam boilers	F22B 37/421
Leakage detection in pressure sensors	G01L 19/0672
Investigating material strength by pressure test	G01N 3/12
Investigating the permeability, pore volume, or surface area of porous materials	G01N 15/08
Investigating the presence of flaws or irregularities of material by mechanical methods	G01N 19/08
Investigating the presence of flaws, defects or contamination by the use of optical means	G01N 21/88
Investigating the presence of flaws by the use of microwaves	G01N 22/02
Investigating the presence of flaws by wave or particle radiation, e.g. X-rays	G01N 23/18
Investigating the presence of flaws by the use of thermal means	G01N 25/72
Investigating the presence of flaws by the use of electric, electro-chemical or magnetic means	G01N 27/00
Investigating the presence of flaws by the use of ultrasonic, sonic or infrasonic waves	G01N 29/04
Leakage detection for insulated conductors or cables characterised by their form	H01B 7/32
Mass spectrometers per se	H01J 49/26
Leak testing of cell or batteries	H01M 10/4228

G01M 3/005

{using pigs or moles ([G01M 3/246](#), [G01M 3/2823](#) take precedence)}

References**Limiting references**

This place does not cover:

Leak detection using sonic vibration in pipe using pigs moles	G01M 3/246
---	----------------------------

Leak detection using pressure, flow or level detector in pipe using pigs moles	G01M 3/2823
--	-----------------------------

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Pig moles per se	F16L 55/26
General pipeline inspection	F17D 5/00

G01M 3/007

{Leak detector calibration, standard leaks ([G01M 3/207](#) takes precedence)}

Definition statement

This place covers:

Dummy leakage generators for sensitivity check.

Standard volume tanks for leakage test.

Changing means of fine volume for calibration.

Fine leakage bulb.

Standard leak bodies controlling probe gas flow.

References

Limiting references

This place does not cover:

Calibration of leak detection using tracermaterials	G01M 3/207
---	----------------------------

G01M 3/022

{Test plugs for closing off the end of a pipe}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Means for stopping flow from pipes	F16L 55/10
------------------------------------	----------------------------

G01M 3/025**{Details with respect to the testing of engines or engine parts}****References*****Informative references****Attention is drawn to the following places, which may be of interest for search:*

Failures in purge control systems	F02M 25/0809
-----------------------------------	------------------------------

G01M 3/202**{using mass spectrometer detection systems}****References*****Informative references****Attention is drawn to the following places, which may be of interest for search:*

Mass spectrometer per se	H01J 49/26
--------------------------	----------------------------

G01M 3/205**{Accessories or associated equipment; Pump constructions}****References*****Informative references****Attention is drawn to the following places, which may be of interest for search:*

Multistage pump, specially adapted to production of high vacuum, like molecular pumps	F04D 19/04
---	----------------------------

G01M 3/24**using infrasonic, sonic, or ultrasonic vibrations****Definition statement***This place covers:*

Systems for:

- Locating leak in underground pipes.
- Signal processing in the time and frequency domain.
- Signal processing using correlation techniques.
- Passive detection (no active source is used).

References***Informative references****Attention is drawn to the following places, which may be of interest for search:*

Leak detection using pig-moles	G01M 3/005
--------------------------------	----------------------------

G01M 3/2892**{for underground fuel dispensing systems ([G01M 3/30](#) takes precedence)}****References*****Informative references****Attention is drawn to the following places, which may be of interest for search:*

Leakage-indicating devices for large containers	B65D 90/50
---	----------------------------

G01M 3/3209**{Details, e.g. container closure devices}****Definition statement***This place covers:*

Also container closure devices.

G01M 3/3236**{by monitoring the interior space of the containers}****Definition statement***This place covers:*

Tightness of tanks, bottles, cans and methods or apparatus:

Using introduction of overpressure into interior space;

Using vacuum pump and controlling vacuum pressure and also by measuring on/off of vacuum pump or by measuring pressure change while pump cycles have predetermined on/off cycles.

References***Informative references****Attention is drawn to the following places, which may be of interest for search:*

Leak testing of cell or batteries	H01M 10/4228
-----------------------------------	------------------------------

G01M 3/3281**{removably mounted in a test cell}****Definition statement***This place covers:*

Test cells, testing pockets, test chambers, seal chambers, testing bells.

G01M 5/00

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

Definition statement

This place covers:

Investigating the elasticity of structures, e.g. deflection of bridges, aircraft wings.

Testing elastic properties of bodies or chassis, e.g. torsion-testing.

Relationships with other classification places

[G01B](#) covers apparatus, which can be used for investigating the elasticity of structures but not specially adapted for this purpose, e.g. strain gauges. [G01H](#) covers measurement of mechanical vibrations in general.

References

Limiting references

This place does not cover:

Aerodynamic testing; Arrangements in or on wind tunnels	G01M 9/00
---	---------------------------

References out of a residual place

Examples of places in relation to which this place is residual:

Investigating the properties of solids material by application of mechanical stress	G01N 3/00
---	---------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Strain gauge	G01B
Investigating the ductility of materials	G01N 3/28
Measuring speed of fluids, e.g. of air stream; Measuring speed of bodies relative to fluids, e.g. of ship, of aircraft	G01P 5/00

G01M 7/00

Vibration-testing of structures; Shock-testing of structures ([G01M 9/00](#) takes precedence)

Definition statement

This place covers:

Vibration testing or shock testing of structures.

Relationships with other classification places

[G01B](#) covers apparatus, which can be used for investigating the elasticity of structures but not specially adapted for this purpose, e.g. strain gauges. [G01H](#) covers measurement of mechanical vibrations in general.

References

Limiting references

This place does not cover:

Aerodynamic testing; Arrangements in or on wind tunnels	G01M 9/00
---	---------------------------

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Testing gearings or transmission mechanisms by acoustic or vibration analysis	G01M 13/028
Testing bearings by acoustic or vibration analysis	G01M 13/045

Informative references

Attention is drawn to the following places, which may be of interest for search:

Strain gauge	G01B
Investigating the ductility of materials	G01N 3/28
Measuring speed of fluids, e.g. of air stream; Measuring speed of bodies relative to fluids, e.g. of ship, of aircraft	G01P 5/00

Special rules of classification

This group has some overlap with [G01M 5/0066](#) (testing of structure using vibration or acceleration detection or excitation). It is possible to classify in both main groups ([G01M 7/00](#) and [G01M 5/00](#)): a classification in [G01M 5/00](#) are suited for documents making the emphasis on the testing of the structure, and documents making emphasis on the vibration testing are suited to be classified in [G01M 7/00](#).

G01M 7/02

Vibration-testing {by means of a shake table}

Definition statement

This place covers:

Environmental testing.

G01M 7/022

{Vibration control arrangements, e.g. for generating random vibrations}

Definition statement

This place covers:

Overload protection.

G01M 7/025

{Measuring arrangements}

Definition statement

This place covers:

Measurement data analysis of vibration testing.

G01M 7/027

{Specimen mounting arrangements, e.g. table head adapters}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Producing shaped articles by using vibration	B28B 1/08
Producing shaped articles by using vibration tables	B28B 1/0873
Details of apparatus for testing material with sonic waves	G01N 29/22

G01M 7/08

Shock-testing

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Shock testing of vehicles	G01M 17/0078
Measuring force due to impact	G01L 5/0052
Shock-testing of solid materials	G01N 29/045
Anatomic models	G09B 23/00

G01M 9/00

Aerodynamic testing; Arrangements in or on wind tunnels

Definition statement

This place covers:

Aerodynamic testing and arrangements therefore.

Also covered is parachute canopy testing, testing using infrared camera, chimney testing, space conditions, simulation, testing of autopilots, heat conversion, balancing of propellers.

Relationships with other classification places

[G01B](#) covers apparatus, which can be used for investigating the elasticity of structures but not specially adapted for this purpose, e.g. strain gauges. [G01H](#) covers measurement of mechanical vibrations in general.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Strain gauge	G01B
Investigating the ductility of materials	G01N 3/28
Measuring speed of fluids, e.g. of air stream; Measuring speed of bodies relative to fluids, e.g. of ship, of aircraft	G01P 5/00

G01M 9/02

Wind tunnels

Definition statement

This place covers:

Complete arrangements as well as simulations.

G01M 9/04

Details

Definition statement

This place covers:

Partial details of wind tunnels, measurements arrangements, investigation properties, like acoustic or wind distribution, wall arrangements, wind or smoke or hot gas production, production of environmental conditions, supersonic flow generators, high speed plasma generators, holding or support devices of the object under test, vibration absorbers, isolation, high pressure wave generator.

G01M 9/06

Measuring arrangements specially adapted for aerodynamic testing

Definition statement

This place covers:

Theoretical arrangements for aerodynamic measuring, constructions in combination with visualisation methods of flow profiles, simulation, space conditions, turbulators on airfoils for transient simulation, balances incorporated in test object.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring volume flow, flow rate	G01F
Measuring multiple component of the force	G01L 5/16

G01M 9/08

Aerodynamic models

Definition statement

This place covers:

Theoretical models and model construction for aerodynamic measurements or observing or form creation.

G01M 10/00

Hydrodynamic testing; Arrangements in or on ship-testing tanks or water tunnels

Definition statement

This place covers:

Hydrodynamic testing and arrangements therefore, e.g. means for studying the flow of fluid about the object to be tested.

Relationships with other classification places

[G01B](#) covers apparatus, which can be used for investigating the elasticity of structures but not specially adapted for this purpose, e.g. strain gauges. [G01H](#) covers measurement of mechanical vibrations in general.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Monitoring properties or operating parameters of	B63B 79/00
Strain gauge	G01B
Investigating the ductility of materials	G01N 3/28
Measuring speed of fluids, e.g. of air stream; Measuring speed of bodies relative to fluids, e.g. of ship, of aircraft	G01P 5/00

G01M 11/00

Testing of optical apparatus; Testing structures by optical methods not otherwise provided for

Definition statement

This place covers:

Testing of optical apparatus, e.g. testing of fiber, testing of mirror, testing of optical properties of lenses (measuring refractive power, geometrical properties or aberrations, material or chromatic transmission properties, the optical modulation transfer function of optical apparatus and etc.) or mechanical properties. Testing of headlights. Testing structures by optical methods not otherwise provided for.

This group also covers theoretical articles, calibration arrangements not otherwise provided, parts of testing systems, like power meters, testing resistance to radiation, end face monitoring, photo acoustic methods.

Relationships with other classification places

This group is residual place for classifying testing of optical devices or apparatus not provided for in any other subclass of the CPC. Testing of particular optical devices or apparatus is often covered by the respective subclass provided for that optical devices or apparatus.

Testing of optical devices or apparatus is classified in [G01M 11/00](#) only if there is no appropriate place for that subject matter elsewhere.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for testing or checking weapon sighting devices	F41G 1/54
Devices for testing or checking aiming and laying means	F41G 3/32
Interferometers	G01B 9/02
Measuring arrangements characterised by the use of optical means	G01B 11/00
Calibrating optical contour or curvature measuring devices	G01B 11/2504
Photometry	G01J 1/00
Investigating or analysing materials by the use of optical means	G01N 21/00
Testing electrical properties of light emitting diodes, laser diodes or photodiodes	G01R 31/2635
Testing electrical properties of lamps	G01R 31/44
Optical elements, systems or apparatus	G02B
Devices or arrangements for the control of the intensity, colour, phase, polarisation or direction of light arriving from an independent light source, e.g. switching, gating, or modulating	G02F 1/00
Repairing of testing liquid crystal displays	G02F 1/1309
Testing correct operation of photographic apparatus	G03B 43/00
Testing and control of apparatus for microlithography	G03F 7/70483 – G03F 7/70541 , G03F 7/70558 , G03F 7/70591 – G03F 7/70683
Inspection of images for flow detection	G06T 7/0002
Electronic inspection or testing of displays, like LED or LCD	G09G 3/006
Testing electrical properties of solar cells	H02S 50/10
Diagnosis, testing or measuring for television systems or their details	H04N 17/00
Diagnosis, testing or measuring for television cameras	H04N 17/002
Monitoring or testing of lasers	H04S 3/008

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

FBG	Fibre Bragg Grating
LCD	Liquid Crystal display

LED	Light Emitting Diode
OFDR	Optical Frequency Domain Reflectometry
OTDR	Optical Time Domain Reflectometry
PDL	Polarisation Dispersion Loss
PMD	Polarisation Mode Dispersion

G01M 11/005

{Testing of reflective surfaces, e.g. mirrors}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Optical means to measure roughness of a surface	G01B 11/30
---	----------------------------

G01M 11/0221

{by determining the optical axis or position of lenses}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Testing the alignment of axes using optical means	G01B 11/27
---	----------------------------

G01M 11/0242

{by measuring geometrical properties or aberrations}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring contours or curvatures by optical means	G01B 11/24
Measuring geometric parameters required to locate ophthalmic lenses in spectacles frames	G02C 13/005

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](#))}

Definition statement

This place covers:

This group also covers the detection of marks on lenses

References

Limiting references

This place does not cover:

Investigating the presence of flaws or contamination on materials by optical means	G01N 21/88
--	----------------------------

Informative references

Attention is drawn to the following places, which may be of interest for search:

Inspecting transparent materials	G01N 21/958
----------------------------------	-----------------------------

G01M 11/06

Testing the alignment of vehicle headlight devices

Definition statement

This place covers:

Systems mainly projecting the light beam on a surface.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for automatically correcting headlights in vehicle	G01B 11/30
---	----------------------------

G01M 11/08

Testing mechanical properties {(G01M 11/005 takes precedence)}

References

Limiting references

This place does not cover:

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

Special rules of classification

This sub-group has some overlap with [G01M 5/00](#) (testing of mechanical properties of structures). It is possible to classify in both main group ([G01M 11/00](#) and [G01M 5/00](#)): a classification in [G01M 5/00](#) is suited for documents having the emphasis on the testing of the structure, and documents having the emphasis on the optical testing should be classified in [G01M 11/00](#).

G01M 11/088

{of optical fibres; Mechanical features associated with the optical testing of optical fibres}

Definition statement

This place covers:

Also thermal testing, in flight testing, testing pay-out of a canister.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mechanical testing of thin elongated materials, like filament, web, tape or non-optical fibres	G01N 2203/028
--	-------------------------------

G01M 11/30

{Testing of optical devices, constituted by fibre optics or optical waveguides}

Relationships with other classification places

In general, this group covers the testing of optical by measuring one or more given physical parameters; however, if it concerns the use of fibre for determining one or more physical parameters, see the corresponding fields (for instance [G01L](#) for force measurement, [G01K](#) for temperature measurement ...).

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring a length, thickness, angle with an optical fibre	G01B 9/00
Measuring a non-specific physical parameter with an optical fibre	G01D 5/353
Measuring force with an optical fibre	G01L 1/242
Monitoring or testing optical transmission line	H04B 10/07
Monitoring or testing optical amplifier	H04B 10/0731
Monitoring or testing optical transmission line in use	H04B 10/075
Optical multiplexing system	H04J 14/00
Spatial multiplexing	H04J 14/05
Orbital angular momentum [OAM] multiplex systems	H04J 14/07

Special rules of classification

There is an overlap between [G01M 11/30](#) and [H04B 10/07](#) (testing of optical transmission line) and double classification is possible. Documents for [G01M 11/30](#) should have an emphasis on the default detection method.

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}

Definition statement

This place covers:

Testing of light fibers with light source and detector on the same end, measuring connectors, optical switches, splitter in optical transmission lines, measuring end shape of fiber backscatter of cw for power measurements.

For localisation of faults, local monitoring of fibers see subgroups of [G01M 11/31](#).

G01M 11/3109

{Reflectometers detecting the back-scattered light in the time-domain, e.g. OTDR}

Definition statement

This place covers:

Localisation of attenuation or faults by use of single pulses and direct detection of delay-time and intensity, like OTDR, averaging, box-car, references fibers, dummy fibers, photon counting.

G01M 11/3118

{using coded light-pulse sequences}

Definition statement

This place covers:

Devices using pseudo-random signals, correlation techniques, Golay-code.

G01M 11/3172

{Reflectometers detecting the back-scattered light in the frequency-domain, e.g. OFDR, FMCW, heterodyne detection}

Definition statement

This place covers:

Local oscillators, frequency shifting interferometers.

G01M 11/3181

{Reflectometers dealing with polarisation}

Definition statement

This place covers:

Measurements or compensation of polarisation backscatter.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Polarization Mode Dispersion measurement in transmission	G01M 11/336
Polarization Dependent Loss measurement in transmission	G01M 11/337

G01M 11/319

{Reflectometers using stimulated back-scatter, e.g. Raman or fibre amplifiers}

Definition statement

This place covers:

Measurements on doped fibers, measurements using stimulated Raman or Brillouin scattering, or using laserloops or ringlasers for generating stimulated backscatter.

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)}

Definition statement

This place covers:

Also light injection by microbending.

G01M 11/37

{in which light is projected perpendicularly to the axis of the fibre or waveguide for monitoring a section thereof}

Definition statement

This place covers:

Also refractive index profile measurements of fibers, fiber core diameter or shape or excentricity measurements, and also transversal camera monitoring.

G01M 13/00

Testing of machine parts

Definition statement

This place covers:

Testing of machine parts, such as: sealing rings, gearings, power-transmitting couplings or clutches, power-transmitting endless, e.g. belts, chains, bearings.

Relationships with other classification places

[G01L](#) covers instruments which can be used for testing of machine parts, e.g. gearing, transmission mechanisms, of steering or rolling behavior of vehicles, e.g. measuring efficiency, steering angles, steering forces, but not specially adapted for these purposes.

Relationships with other classification places

[G01N](#) covers investigating, i.e. testing or determining, the properties of materials, as opposed to testing machine parts, which is covered by [G01M 13/00](#).

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for measuring, signaling, controlling, or distributing tyre pressure or temperature, specially adapted for mounting on vehicles	B60C 23/00
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
Rocket-engine plants characterised by specially adapted arrangements for testing or measuring	F02K 9/96
Apparatus for testing, tuning or synchronising carburettors, e.g. carburettor flow stands	F02M 19/01
Testing fuel-injection apparatus	F02M 65/00
Testing of ignition installations peculiar to internal-combustion engines	F02P 17/00
Testing of wind motors	F03D 17/00
Testing machines, pumps, or pumping installations	F04B 51/00
Testing fluid-pressure actuator systems or apparatus, so far as not provided for elsewhere	F15B 19/00
Monitoring wear or stress of gearing elements	F16H 57/01
Detecting malfunction or potential malfunction of change-speed- or reversing-gearings	F16H 61/12
Detecting malfunction or potential malfunction of hydrostatic gearings	F16H 61/4192
Arrangements for monitoring the condition or operation of elastic sealings	F16J 15/3296
Special means in or on valves indicating or recording operation thereof	F16K 37/00
Testing of ignition installations of combustion apparatus	F23Q 23/00
Devices for determining the value of power, e.g. by measuring and simultaneously multiplying the values of tractive or propulsive force and velocity	G01L 3/24
Measuring wheel side-thrust	G01L 5/20
Measuring the force applied to control members, e.g. control members of vehicles, triggers	G01L 5/22
Determining the characteristic of torque in relation to revolutions per unit of time	G01L 5/26
Testing brakes	G01L 5/28
Devices or apparatus for measuring tyre pressure or the pressure in other inflated bodies	G01L 17/00
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 or pistons or cranks of internal-combustion engines by measuring pressure	G01L 23/30
Testing or calibrating of apparatus for measuring force, torque, work, mechanical power, or mechanical efficiency	G01L 25/00
Testing or calibrating of apparatus for measuring fluid pressure	G01L 27/00
Pressure-testing of materials	G01N 3/12
Investigating machinability by cutting tools; Investigating the cutting ability of tools	G01N 3/58

G01M 13/02

Gearings; Transmission mechanisms

Definition statement

This place covers:

Also testing of power transmitting rotating elements, like gearings, driveshaft, differentials, vehicle power transmissions, coupling, belt drives, temperature or pressure or other adaptation means, gear shifting, control tests of automatic transmission, life usage, shaft adjustments, rotation angle measurements, tests of synchronizers.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Transmission coupling, clutches in general	F16D
Transmission means using belt, cables, ropes in general	F16G
Contour measurements on gear teeth with mechanical means	G01B 5/202
Distance measurements on gear teeth	G01B 7/146
Contour measurements on gear teeth with electrical or magnetic means	G01B 7/283

G01M 13/025

Test-benches with rotational drive means and loading means; Load or drive simulation

Definition statement

This place covers:

Also devices with electrical or hydraulic drive means, simulation of combustion engines, brake and inertial forces, measuring power transmitting characteristics, of vehicle transmission, driveshaft.

G01M 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

Definition statement

This place covers:

Also devices with power circulation type, ring connected multiple gearbox driveshaft.

G01M 13/027

Test-benches with force-applying means, e.g. loading of drive shafts along several directions

Definition statement

This place covers:

Also devices with application or measurement of different component measuring steering forces on drive, steering trains, radial or vertical forces on vehicle axels, driveshaft.

G01M 13/04

Bearings

Definition statement

This place covers:

Also devices for monitoring bearing with temperature sensor.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Vibration testing of structures in general	G01M 7/00
Bearing with rolling contact in general	F16C 19/00
Force sensor associated with a bearing	G01L 5/0009

G01M 15/00

Testing of engines

Definition statement

This place covers:

Testing of engines, e.g. by monitoring different engine parameters: pressure, temperature, velocity, vibration, and power, detecting misfire, exhaust gases, combustion flame.

Relationships with other classification places

[G01L](#) covers instruments which can be used for testing of machine parts, e.g. gearing, transmission mechanisms, of steering or rolling behavior of vehicles, e.g. measuring efficiency, steering angles, steering forces, but not specially adapted for these purposes.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for measuring, signaling, controlling, or distributing tyre pressure or temperature, specially adapted for mounting on vehicles	B60C 23/00
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
Rocket-engine plants characterised by specially adapted arrangements for testing or measuring	F02K 9/96
Apparatus for testing, tuning or synchronising carburettors, e.g. carburettor flow stands	F02M 19/01
Testing fuel-injection apparatus	F02M 65/00
Testing of ignition installations peculiar to internal-combustion engines	F02P 17/00
Testing of ignition installations of combustion apparatus	F23Q 23/00
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
Measuring wheel side-thrust	G01L 5/20
Measuring the force applied to control members, e.g. control members of vehicles, triggers	G01L 5/22
Determining the characteristic of torque in relation to revolutions per unit of time	G01L 5/26
Testing brakes	G01L 5/28
Devices or apparatus for measuring tyre pressure or the pressure in other inflated bodies	G01L 17/00
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
Testing or calibrating of apparatus for measuring force, torque, work, mechanical power, or mechanical efficiency	G01L 25/00
Testing or calibrating of apparatus for measuring fluid pressure	G01L 27/00
Pressure-testing	G01N 3/12
Investigating machinability by cutting tools; investigating the cutting ability of tools	G01N 3/58

G01M 15/04

Testing internal-combustion engines

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

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

G01M 15/14

Testing gas-turbine engines or jet-propulsion engines

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Rocket-engine plants characterised by specially adapted arrangements for testing or measuring	F02K 9/96
---	---------------------------

G01M 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](#))

Definition statement

This place covers:

Testing of different parts of vehicles, e.g. wheels, tyres, endless-tracks, suspension, or of damping as a part of wheeled or endless-traced vehicles or suspension, axles, wheels suspension, or of axles as a part of railway vehicles.

Relationships with other classification places

[G01L](#) covers instruments which can be used for machine parts, e.g. gearing, transmission mechanisms, of steering or rolling behavior of vehicles, e.g. measuring efficiency, steering angles, steering forces, but not specially adapted for these purposes.

References

Limiting references

This place does not cover:

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 of engine	G01M 15/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for measuring, signalling, controlling, or distributing tyre pressure or temperature, specially adapted for mounting on vehicles	B60C 23/00
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
Rocket-engine plants characterised by specially adapted arrangements for testing or measuring	F02K 9/96
Apparatus for testing, tuning or synchronising carburetors, e.g. carburetor flow stands	F02M 19/01
Testing fuel-injection apparatus	F02M 65/00
Testing of ignition installations peculiar to internal-combustion engines	F02P 17/00
Testing of ignition installations of combustion apparatus	F23Q 23/00
Devices for determining the value of power, e.g. by measuring and simultaneously multiplying the values of tractive or propulsive force and velocity	G01L 3/24
Measuring wheel side-thrust	G01L 5/20

Measuring the force applied to control members, e.g. control members of vehicles, triggers	G01L 5/22
Determining the characteristic of torque in relation to revolutions per unit of time	G01L 5/26
Testing brakes	G01L 5/28
Devices or apparatus for measuring tyre pressure or the pressure in other inflated bodies	G01L 17/00
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 or pistons or cranks of internal-combustion engines by measuring pressure	G01L 23/30
Testing or calibrating of apparatus for measuring force, torque, work, mechanical power, or mechanical efficiency	G01L 25/00
Testing or calibrating of apparatus for measuring fluid pressure	G01L 27/00
Pressure-testing	G01N 3/12
Investigating machinability by cutting tools; investigating the cutting ability of tools	G01N 3/58

G01M 17/0072

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

Definition statement

This place covers:

Devices with dynamometers, associated flywheel assemblies, constructions (for search see also [G01L 3/16](#), rotary absorption dynamometers), roller assemblies (without specific roller construction), measuring or calculation arrangements, endless belts, flat belts, dynamometer control arrangements, like system using feedback.

References

Limiting references

This place does not cover:

The tyre co-operates with rotatable rolls	G01M 17/022
The vehicle wheels co-operating with rotatable rollers	G01M 17/045
The vehicle wheels co-operating with rotatable rolls	G01M 17/065

Informative references

Attention is drawn to the following places, which may be of interest for search:

Rotary-absorption dynamometers, e.g. of brake type	G01L 3/16
--	---------------------------

G01M 17/0074**{Details, e.g. roller construction, vehicle restraining devices}****Definition statement***This place covers:*

Automatic shifters of gears, brake, gas pedal, devices for applying a variable load on the vehicle, safety arrangements, vehicle lifting devices, vibrators (for search see also [G01M 7/04](#)) and special applications, like testing of remote controlled toy car.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Monodirectional test stands	G01M 7/04
-----------------------------	---------------------------

G01M 17/0078**{Shock-testing of vehicles}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Shock testing of structure	G01M 7/08
Measuring force due to impact	G01L 5/0052
Anatomic models	G09B 23/00

G01M 17/013**Wheels****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Railway wheel testing	G01M 17/10
Testing of wheel alignment by optical means	G01B 11/275

G01M 17/02**Tyres****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Tyre tread bands and tread patterns	B60C 11/00
-------------------------------------	----------------------------

Tyre tread bands and tread patterns wear indicating arrangements	B60C 11/24
Measuring profile depth	G01B 21/18

G01M 17/021

{Tyre supporting devices, e.g. chucks (for balancing [G01M 1/04](#))}

Special rules of classification

Wheel testing is not to be classified in this group but mainly testing tires with adjustable chucks, two rims, etc.

G01M 17/022

{the tyre co-operating with rotatable rolls}

Definition statement

This place covers:

Measuring uniformity, concentricity, tread problems, radial forces, elastic deformation, rolling resistance, cornering resistance, yaw attitude, drag force, side-wall deformation, tire air pressure, impact resistance, conicity, with a flat belt, single roller, multiple rollers, hydraulic motor, endless belt, dynamic load, grooved drum, suspension simulation, vibration exciters, setting means for slip, camber angle, rubber removing brush, water jets.

G01M 17/024

{combined with tyre surface correcting or marking means}

Definition statement

This place covers:

Compensation by grinding the shoulders, by grinding the tire tread, by compensating radial, lateral or tangential forces.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Marking location of unbalance	G01M 1/26
Compensating balance by removing material	G01M 1/34

G01M 17/06

Steering behaviour; Rolling behaviour

Definition statement

This place covers:

Vehicle diagnostic devices, side slip, axel vibrations, toe-angle, wheel alignment, tire tread, caster trail, cornering.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring steering angles	G01B
Measuring steering forces	G01L 5/221

G01M 17/08

Railway vehicles

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Testing of railways brake system	B60T 17/228
----------------------------------	-----------------------------

G01M 99/00

Subject matter not provided for in other groups of this subclass

References

References out of a residual place

Examples of places in relation to which this place is residual:

Testing static or dynamic balance of machines or structures	G01M 1/00
Investigating fluid tightness of structures	G01M 3/00
Investigating the elasticity of structures, e.g. deflection of bridges, aircraft wings	G01M 5/00
Vibration testing of structures; Shock-testing of structures	G01M 7/00
Aerodynamic testing; Arrangements in or on wind tunnels	G01M 9/00
Hydrodynamic testing; Arrangements in or on ship-testing tanks or water tunnels	G01M 10/00
Testing of optical apparatus	G01M 11/00
Testing of machine parts	G01M 13/00
Testing of engines	G01M 15/00
Testing of vehicles	G01M 17/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Testing instrument for artificial joints	A61F 2/468
Testing of non-implantable prostheses	A61F 2/76
Testing the effectiveness of sterilization	A61L 2/28
Measuring golf clubs, bats or rackets	A63B 51/005 , A63B 60/42 , A63B 60/46

Informative references

Filter condition indicators	B01D 46/0086
Testing of membranes or membrane apparatus	B01D 65/10
Controlling or analyzing typewriter or other selective printing mechanism	B41J 29/393
Testing or monitoring air-conditioning of vehicles	B60H 1/00585
Testing of parachutes	B64D 21/00
Testing foundations or foundations structures	E02D 33/00
Testing characteristics of the spark in internal combustion engine ignition	F02P 17/12
Calibrating optical contour or curvature measuring devices	G01B 11/2504
Calibration of coordinate measuring apparatus	G01B 21/042
Testing, calibrating, or compensating of compasses	G01C 17/38
Detection of malfunction of sensor per se	G01D 3/08
Calibrating of sensor per se	G01D 18/00
Testing or calibrating apparatus for measuring volume, volume flow or liquid level or for metering by volume	G01F 25/00
Testing or calibrating of weighing apparatus	G01G 23/01
Testing or calibrating of thermometers	G01K 15/00
Testing or calibrating calorimeters	G01K 19/00
Testing or calibrating force, work or torque apparatus testing and calibrating fluid pressure sensorArrangements for testing electric properties;	G01L 25/00
Arrangements for locating electric faults;	G01L 27/00
Arrangements for electrical testing characterized by what is being tested not provided for elsewhere	G01R 31/00
Testing or calibrating meteorological apparatus	G01W 1/18
Testing correct operation of photographic apparatus or parts thereof	G03B 43/00
Quality surveillance of production	G05B 19/41875
Testing or monitoring of control systems	G05B 23/00
Registering or indicating the condition or the working of machines or other apparatus	G07C 3/00
Checking or monitoring of signalling or alarm systems	G08B 29/00
Monitoring; Testing of fusion reactors	G21C 17/00
Testing or measuring during manufacture or treatment of semiconductor devices	H01L 22/00
Testing of electrical properties of sparking plugs	H01T 13/60
Calibration or testing of analogue/digital or digital/analogue converters	H03M 1/10
Monitoring; Testing of line transmission systems	H04B 3/46
Monitoring or testing of relay systems	H04B 17/40
Diagnosis, testing or measuring for television systems or their details	H04N 17/00
Monitoring arrangements; Testing arrangements of acoustic electromechanical transducers	H04R 29/00

Special rules of classification

This group is residual place for classifying testing of structures or of apparatus, not provided for elsewhere.

Testing of particular devices or apparatus is often covered by the respective subclass provided for that devices or apparatus. Testing of particular devices or apparatus is classified in [G01M 99/00](#) only if there is no appropriate place elsewhere for that subject matter.