# INTERNATIONAL STANDARD

ISO 6012

Third edition 1989-11-01

# Earth-moving machinery – Service instrumentation

# Engins de terrassement – Instruments pour l'entretien iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO 6012:1989 https://standards.iteh.ai/catalog/standards/sist/19b8a8aa-2c31-45cf-9926b0da9cda012b/iso-6012-1989



Reference number ISO 6012 : 1989 (E)

### Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at VIEW least 75 % approval by the member bodies voting.

International Standard ISO 6012 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*.

ISO 6012:1989

This third edition cancels and replaces the second edition (1SO 6012:1982); and incor-2c31-45cf-9926porates draft Addendum 1: 1986. b0da9cda012b/iso-6012-1989

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International Organization for Standardization

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# Earth-moving machinery — Service instrumentation

# **iTeh STANDARD PREVIEW**

### Scope 1

(standards.iteh.ai) can be easily extended to apply to other basic earth-moving machines such as graders, tractor scrapers and dumpers.

This International Standard sets forth, for guidance, a list of 012 diagnostic instruments to checklear/themovingimachiner/og/sthedards/sist/19b8a8aa-2c31-45cf-9926work-site. b0da9cda012b/iso-312Types of checks, instruments and scales

The main purpose of this International Standard is to ensure that earth-moving machines be designed with proper accessibility and necessary connections in order to make it possible to perform these checks in an easy way, using portable instruments.

### NOTES

1 Service instruments use of which involves major machine disassemblies or which are more suitable for use in the workshop are purposely excluded from this list.

Diagnostic checks are intended to be carried out by qualified personnel. Relevant specifications and instructions should therefore be included, preferably in the service manual, rather than in the operator's manual.

This International Standard applies to crawler and wheel tractors, crawler and wheel loaders and hydraulic excavators, but Table 1 specifies the corresponding instruments for each check. The letters in table 1 have the following meanings:

A = definitely required (when the machine uses these basic elements).

**B** = desirable, but not definitely required.

The instrument specified for each type of check has been selected from among those most commonly used. Other more sophisticated devices or instruments, if any, can be used as alternatives.

The instrument values or ranges presented in table 1 are intended to be indicative only and may change with technological progress.

### Table 1 – Guide list of diagnostic instruments to check

			Press	sure ç	gauge	9	Tyre pressure gauge	Vacuun	n meter	The	rmom	eter	Pyro- meter °C	electronic tester	Flow meter
Check			MPa <sup>1</sup>	)		MPa or mmHg	МРа	MPa or mH <sub>2</sub> O	MPa or mmHg 0,1 MPa or 760 mmHg		°C			g electron	l/s (I/min)
	0,3	1	5 10	25	40	0,2 MPa or 1 520 mmHg	0,1 to 1	0,01 MPa or 1 mH <sub>2</sub> O		– 40 to 100	50 to 130	50 to 200	900	Timing	3,3 (200) 8,3 (500)
Engine															
Valve clearance															
Diesel timing														В	
Cylinder compression							[								
Fuel injection pressure								1		1					<u> </u>
Engine oil pressure	1	Α													1
Intake manifold pressure (supercharged engines)						А									
Exhaust manifold pressure before and after turbine (supercharged engines)						А									
Exhaust manifold temperature before and after turbine (supercharged engines)		1	16	h	51 (s	ANI tand	ARI ards.	D PR	EVI ai)	ĽW			В		
Depression after the air cleaner							O 6012:19								
Cooling fluid temperature		https	i/stai	dard	s.iteh	avcatalog/	standards/	ist/19b8a8	aa-2c31-4	-5cf-99	<sup>26</sup> Ā				
Antifreeze concentration in cooling fluid						00009002	1 <del>012b/iso-</del> 1	012-1985							
Cooling system sealing					1										
Engine rotational frequency															
Cold starting cooling fluid temperature										в					
Power train															
Oil bath clutch luboil pressure	в														
Transmission luboil pressure		в													
Hydraulic reverser control oil pressure			A												
Torque converter oil pressure		A													
Power shift clutch control oil pressure			A												

1) 1 MPa = 10 bar

## earth-moving machinery at the work-site

Engine tacho- meter	ge	Spring scale	Steel tape	Steel rule	Cylinder com- pression gauge	Fuel nozzle tester	th gauge	Depth gauge 180 mm with 1/20 scale slider	Pump and gauge	ometer	Hydrometer-thermometer for fluid concentration	Vernier caliper	<b>tester</b> 5 000 Ω	Torque wren- ches	emplate	aliper
min - 1	Feeler gauge	N	m	m	MPa	MPa	Tyre tread depth gauge	gauge 18( /20 scale	MPa	Battery hydrometer	meter-the	mm	Electrical tester 40 V/500 A/5 000 $\Omega$	N∙m	Combined template	Outside caliper
5 000	_	300	10	1	1 to 4	25 to 40	Tyre	Depth 1	0,16	Ba	Hydro for f	160	6	140 420 750	ů	
	А															
					В											-
<i>.</i>					D	В					1					
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### Table 1 - Guide list of diagnostic instruments to check

		I	Press	ure g	jauge		Tyre pressure gauge	Vacuun	n meter	The	rmome	eter	Pyro- meter set 	nic tester	Flow meter
Check			MPa <sup>1</sup>	)		MPa or mmHg	MPa 0,1 to 1	MPa or mH <sub>2</sub> O	MPa or mmHg 0,1 MPa or 760 mmHg		°C		°C	j electronic	l/s (I/min)
	0,3	1	5 10	25	40	0,2 MPa or 1 520 mmHg		0,01 MPa or 1 mH <sub>2</sub> O		- 40 to 100	50 to 130	50 to 200	900	Timing (	3,3 (200) 8,3 (500)
Engine clutch control oil pressure			А												
Hydrostatic transmission oil pressure			А	A	А										
Oil flow (applicable to all preceding items															в
Torque converter oil temperature												A			
Oil bath clutch luboil temperature											в				
Hydraulic reverser oil temperature		<u>•</u>		L	<b>C</b> T			חח ח			А				
Transmission oil temperature			16	11		AN		D F K			А				
Bevel gear oil temperature					(2	tanu	ards.	iteh.	ai)		В				
Hydrostatic transmission oil temperature							SO 6012:1				А				
Brakes		https	//sta	ndard	s.iteh			sist/19b8a8	8aa-2c31-4	45cf-99	26-				
Brake oil control pressure			А	A		b0da9cda	a012b/iso-	6012-1989							
Braking servosystem control air pressure		А													
Vacuum boosted brake system under pressure									A				1		
Steering	1			1	· · ·					1			1	1	
Steering clutches control oil pressure			A												
Steering power assistance control oil pressure				A											
Oil flow (applicable to preceding items)	1														В
Undercarriage															
Wear of track components (links, rollers, idlers, etc.)											1				

1) 1 MPa = 10 bar

# earth-moving machinery at the work-site (continued)

Engine tacho- meter	Эe	Spring scale	Steel tape	Steel rule	Cylinder com- pression gauge	Fuel nozzle tester	th gauge	Depth gauge 180 mm with 1/20 scale slider	Pump and gauge	ometer	Hydrometer-thermometer for fluid concentration	Vernier caliper	tester 5 000 Ω	Torque wren- ches	emplate	aliper
min - 1	Feeler gauge	N	m	m	MPa	MPa	Tyre tread depth gauge	h gauge 180 mm 1/20 scale slider	MPa	Battery hydrometer	meter-the luid conc	mm	Electrical tester 40 V/500 A/5 000 Ω	N∙m	Combined template	Outside caliper
5 000	ũ	300	10	1	1 to 4	25 to 40	Tyre1	Depth 1	0,16	Bat	Hydro for fl	160	- 94	140 420 750	ů	
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Table 1 –	Guide list of	f diagnostic	instruments	to check
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			Press	sure ç	jauge		Tyre pressure gauge	Vacuun	n meter	The	rmome	eter	Pyro- meter	nic tester	Flow meter
Check			MPa <sup>1</sup>	)		MPa or mmHg	MPa	MPa or mH <sub>2</sub> O		°C		°C	g electronic	l/s (I/min)	
	0,3	1	5 10	25	40	0,2 MPa or 1 520 mmHg	0,1 to 1	0,01 MPa or 1 mH <sub>2</sub> O	0,1 MPa or 760 mmHg	- 40 to 100	50 to 130	50 to 200	900	Timing	3,3 (200) 8,3 (500)
Equipment							1								
Operation pressure and relief valve setting			А	A	A										
Pressure inside the oil tank		Α													1
Oil temperature											В				Ý
Oil flow															В
Wheels															
Tyre pressure <sup>2)</sup>							A	ļ							
Tyre tread depth															
Electrical plant															
Battery electrolyte density		i	<b>I</b> e	h	<b>SI</b>	ANI	JARI	<u> PR</u>	EVI	ĽW					
Battery voltage and various tests					<b>(S</b> <sup>*</sup>	tand	ards.	iteh.	ai)						
General															
Bolts and nuts torque				1 1			D 6012:19								
Various dimensions		nttps	:/star	ndard	s.iteh	ai/catalog/ b0da9cda	standards/s 1012b/iso-(		aa-2c31-4	43ct-99	26-				
Effort required on the control levers						00009008	120/180-0	012-1989							
Various clearances															

1) 1 MPa = 10 bar

2) The tyre pressure gauge may have a dual gauge, for example MPa and bar or psi, reflecting the local units. A tyre inflator can have the same range a 0,3 MPa to 1 MPa as the tyre pressure gauge.

## earth-moving machinery at the work-site (concluded)

Engine tacho- meter	gauge	Spring scale	Steel tape	Steel rule	Cylinder com- pression gauge	Fuel nozzle tester	th gauge	Depth gauge 180 mm with 1/20 scale slider	Pump and gauge	ometer	Hydrometer -thermometer for fluid concentration	Vernier caliper	al tester A/5 000 Ω	Torque wren- ches	mplate	liper
min <sup>-1</sup>	Feeler gau	N	m	m	MPa	MPa	Tyre tread depth gauge	h gauge 180 mm 1/20 scale slider	MPa	Battery hydrometer	ydrometer-thermomete for fluid concentration	mm	Electrical tester 40 V/500 A/5 000 9	N₊m	Combined template	Outside caliper
5 000		300	10	1	1 to 4	25 to 40	Tyre 1	Depth 1/	0,16	Bat	Hydror for fl	160	40 E	140 420 750	Cor	0
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							В	A								
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