REED
INSTRUMENTS

Hardness Tester

1 YEAR
WARRANTY
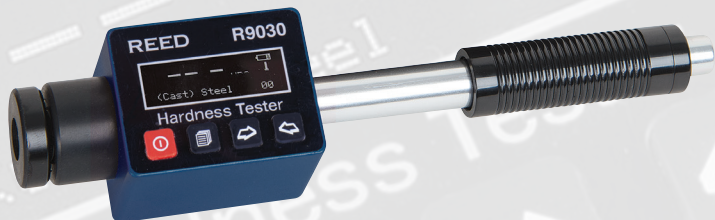
Instruction Manual

Table of Contents

Introduction

Thank you for purchasing your REED R9030 Hardness Tester. Please read the following instructions carefully before using your instrument. By following the steps outlined in this manual your meter will provide years of reliable service.

Product Quality

This product has been manufactured in an ISO9001 facility and has been calibrated during the manufacturing process to meet stated product specifications. If a certificate of calibration is required please contact the nearest authorized REED distributor or authorized Service Center. Please note an additional fee for this service will apply.

Safety

Never attempt to repair or modify your instrument. Dismantling your product, other than for the purpose of replacing batteries, may cause damage that will not be covered under the manufacturer's warranty. Servicing should only be provided by an authorized service center.

Features

- Measures a wide range of materials including; cast steel, alloy steel, stainless steel, aluminum, bronze, copper and cast irons
- Measures 7 types of hardness scales; Rockwell (HRC, HRB, HRA), Brinell (HB), Leeb (HL), Vickers (HV) and Shore (HS)
- Compact pen style design
- Bright OLED display
- Real-time clock and internal memory stores up to 350 measurements
- USB connectivity and software allows for further measurement analysis
- Rechargeable lithium battery
- Low battery indicator

Included

- D Impact Device
- Leeb Test Block
- Small Supporting Ring
- Nylon Brush
- AC Adapter
- USB Cable
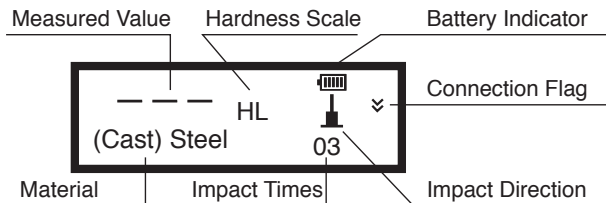- Software
- Hard Carrying Case

Specifications

Hardness Scales:	Rockwell (HRA, HRB, HRC)
	Brinell (HB)
	Leeb (HLD)
	Vickers (HV)
	Shore (HS)
Measuring Ranges:	HRA: 59 to 85
	HRB: 13 to 100
	HRC: 20 to 68
	HB: 19 to 651
	HLD: 170 to 960
	HV: 80 to 967
	HS: 30 to 100
Measuring Direction:	360°
Sampling Time:	Less than 1 second (when triggered)
Display:	Dot Matrix OLED
Battery Life:	Approx. 40 hours
Low Battery Indicator:	Yes
Power Supply:	Rechargeable Lithium Ion Battery
Charge Time:	Approx. 2 hours
Internal Memory:	Yes (up to 350 readings)
Product Certifications:	CE
Operating Temperature:	32 to 104°F (0 to 40°C)
Storage Temperature:	-4 to 140°F (-20 to 60°C)
Operating Humidity Range:	0 to 90%
Dimensions:	5.7 x 1.3 x 1" (146 x 32 x 26mm)
Weight:	5.6oz (160g)

Instrument Description
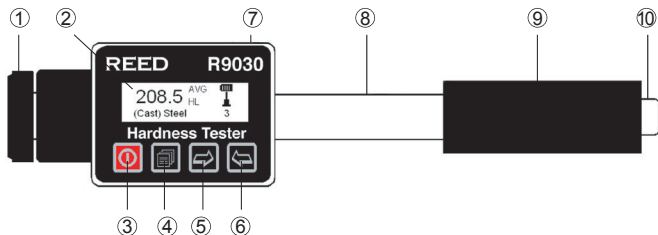
1. Support Ring
2. LCD Display
3. POWER/Exit Button
4. Menu/Enter Button
5. Measurement set up shortcut/Right/Down/Increase Button
6. Scan/Delete/Left/Up/Decrease Button
7. USB-C Port
8. Impact Device
9. Coding Sheath
10. Release Button

Display Description

Measured Value · Hardness Scale · Battery Indicator · Connection Flag · Impact Direction · Impact Times · Material

— — — HL

(Cast) Steel

03

Battery Indicator: Displays battery capacity and charge status when plugged in.

Impact Direction: Set impact direction.

Hardness Scale: Set hardness scale.

Measured Value: Current measured value (without average value indicator), or current average value (with average value indicator).

Material: Set material.

Impact Times: The total number of impact times will be displayed. Impact times set through the menu will also be displayed here.

Connection Flag: The connection flag will blink when the instrument is trying to connect to the PC. A solid flag means successful connection.

Hardness Testing Principle

The hardness value comes from the rate of rebound velocity and impact velocity at 1mm distance from the testing surface. Using the Leeb hardness scale as an example, the following calculation is used to calculate the hardness value:

$HL = 1000 \times VB / VA$
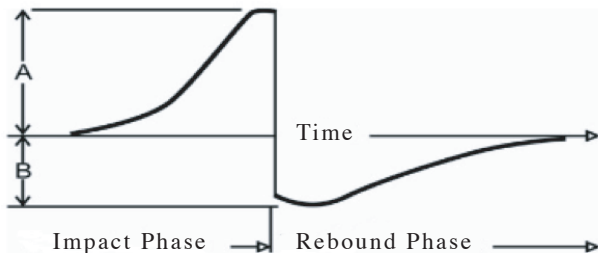
Operating Instructions

Power On/Off

Turn the meter on by pressing the POWER button. To turn the meter off, press and hold the POWER button for 2 seconds.

Preparation of Test Piece

Please note that measurement values may be affected if the material under test is exposed to extreme temperatures.

If the tested material is too rough, a measuring error will appear. The surface of the sample must have metallic luster and the surface must be flat and smooth. No oil or dirt should be present.

Curved surface: It is better that the testing surface of the test piece is flat. When the curvature radius (R) of the curved surface to be tested is less than 30mm (for D and DL type impact device), a small support ring (included with the R9030) should be used.

Self-magnetism of the test piece should be less than 30 Gauss.

Prior to First Measurement

Before first use or if unused for an extended period of time, 5 measurements should be performed using the included test block. If the average values from the charts at the end of this manual are exceeded, the internal calibration is required (see *Calibration Procedure* section for details).

Loading Impact Device

Push down the loading sheath to load and lock the impact body in place.

Taking Measurements

1.   Press down on the release button located at the top of the impact device to take a measurement.

The reading will appear on the display matching the selected material, hardness or strength testing and impact direction (see *Menu Navigation/Setup Mode* section for details).

Note: While taking a measurement, the test piece, impact device and operator are all required to be stable.

2.   Five measurements should be performed of the test piece. The divergence of data should be not exceed ±15HL of the required value.

3.   The distance between any two impact points, or from the center of any impact point to the edge of the test piece should be in accordance with the following specifications:

Type of impact device	The distance of two indentations center	The distance between indentation center and edge of test piece
D, DC, DL, D+15	No less than: 3mm	No less than: 5mm
C	No less than: 2mm	No less than: 4mm

Viewing Measurement Values

1. When testing is complete, press the ⬅ button to enter the recorded data mode.
2. Press the ➡ button to scroll through the recorded data taking during the measurement process.
3. To delete the displayed data, press the ⬅ button.
4. Press the ➡ or ⬅ buttons to select between Yes or No.
5. Press the ▤ button to confirm selection, or press the ⓪ button to exit and resume normal operation.

Storing Average Value

1. When testing is complete, the meter displays the average value taken during the measurement process.
2. Press the ⓪ button to enter storing average value mode.
3. Press the ➡ or ⬅ buttons to select between Save & Exit or Quit.
4. Press the ▤ button to confirm selection, or press the ⓪ button to exit and resume normal operation.

Auto Power OFF

To preserve battery life, the meter is programmed to turn itself off after 5 minutes of inactivity. Prior to shutting off, the display will begin a 10 second countdown that can be cancelled by pressing the ⓪ button. To disable this feature, see *Enabling/Disabling Auto Shutoff in Menu Navigation/Setup Mode* section for details.

Menu Navigation/Setup Mode

1. Press the ▤ button to enter the menu screen.
2. Press the ➡ and ⬅ buttons to scroll through the following parameters.

Parameter	Description
Test Set	Setting up your meter
Memory Manager	View/Delete/Transfer Data

Parameter	Description
System Set	Setting automatic preferences
About	View Firmware Version/Serial Number

3. Press the 🔲 button to enter the appropriate parameter and follow the setup instructions below.

Note: At any time, you can press the ⓪ button to exit the Menu Screen/ Setup mode and resume normal operation.

Test Set

While in the Test Set function, press the ➡ and ⬅ buttons to scroll through the following list of sub parameters:

a) Impact Direction

b) Average

c) Material

d) Hardness Scale

e) Tolerance Limit

f) Hard/σb

g) Probe Type

h) Standard

Follow the instructions below to adjust each setting.

a) Impact Direction

1. Press the 🔲 button when "Impact Direction" is highlighted.
2. Press the ➡ and ⬅ buttons to scroll through the 360° measuring direction list.
3. Press the 🔲 button to confirm selection.

b) Average

1. Press the 🔲 button when "Average" is highlighted.
2. Press the ➡ and ⬅ buttons to select the number of measurements to be used to calculate the average value between 1 and 32.
3. Press the 🔲 button to confirm selection.

c) Material

1. Press the 🗐 button when "Material" is highlighted.
2. Press the ⇨ and ⇦ buttons to select the appropriate material being tested.

> For hardness testing, you can select between the following materials: Cast Steel, Cold Work Tool Steel, Stainless Steel, Gray Cast Iron, Nodular Cast Iron, Cast Aluminum Alloys, Copper-Zinc Alloys Copper-Aluminum Alloys, Wrought Copper and Wrought Steel.
>
> For strength testing, you can select between the following materials: Mild Steel, High-Carbon Steel, Cr Steel, Cr-V Steel, Cr-Ni Steel, Cr-Mo Steel, Cr-Ni-Mo Steel, Cr-Mn-Si Steel, Super Strength Steeland Stainless Steel.

3. Press the 🗐 button to confirm selection.

d) Hardness Scale

1. Press the 🗐 button when "Hardness Scale" is highlighted.
2. Press the ⇨ and ⇦ buttons to select the appropriate hardness scale for the material under test.

Note: The material under test must first be selected before selecting the hardness scale.

3. Press the 🗐 button to confirm selection.

e) Tolerance Limit

1. Press the 🗐 button when "Tolerance Limit" is highlighted.

Note: In this function, the Min/Max Tolerance Limits must be set according the meters measuring range capabilities for each available scale.

2. Press the 🗐 button to skip to the required digit.
3. Press the ⇨ and ⇦ buttons until the desired value is reached.
4. Press the 🗐 button to confirm and skip to the next digit.
5. After each value has been selected and confirmed, it will automatically exit the "Tolerance Limit setup" screen.

f) Hard/σb (Hardness/Strength Testing)

1. Press the ▤ button when "Hard or σb" is highlighted between hard (hardness testing) or σb (strength testing).

2. Press the ➡ or ⬅ buttons to skip to the next function when complete.

g) Probe Type

1. Press the ▤ button when "Probe Type" is highlighted to select the appropriate probe.

2. Press the ➡ or ⬅ buttons to skip to the next function when complete.

h) Standard

1. Press the ▤ button when "Standard" is highlighted to select the appropriate standard.

2. Press the ➡ or ⬅ buttons to skip to the next function when complete.

Memory Manager

This function allows a user to view, transfer, and delete a file/group previously saved in memory.

Press the ➡ and ⬅ buttons to scroll through the following parameters within the Memory Manager function.

a) View From No.1

b) View From End

c) View From No.

d) Transfer

e) Delete By No.

f) Delete All

Follow the instructions below to adjust each setting.

Note: If there is no data in the memory, it will display "No Memory!", and return to the menu screen.

continued…

a,b) View from No.1/View from End

The data group displays test results, average result, sample material and impact direction.

1.   Press the 🔳 button to enter the selected parameter.
2.   Press the 🔳 button again to activate files to view.
3.   Press the ➡ and ⬅ buttons to scroll the list of saved files.
4.   Press the 🔳 button see details of the measurement data.
5.   Press the ➡ and ⬅ buttons to scroll through the details of the measurement data.
6.   Press the 🔳 button to return to the previous screen at any time.

c) View from No.

This function allows a user to search within a specific group of data files.

1.   Press the 🔳 button to enter the selected parameter.
2.   Press the 🔳 button again to skip to the required digit.
3.   Press the ➡ and ⬅ buttons until the desired value is reached.
4.   Press the 🔳 button to confirm and skip to the next digit.
5.   After each value has been selected and confirmed, it will automatically search for the data files matching the search criteria.

d) Transfer

Allows a user to transfer saved data files to the included software by pressing the 🔳 button.

e) Delete by No.

This function allows a user to delete files within a specific group.

1.   Press the 🔳 button to enter the selected parameter.
2.   Press the 🔳 button again to skip to the required digit.
3.   Press the ➡ and ⬅ buttons until the desired value is reached.
4.   Press the 🔳 button to confirm and skip to the next digit.
5.   After each value has been selected and confirmed, the meter will ask to confirm deletion of the specific groups.

6. Press the ⇨ and ⇦ buttons to select between "Yes" or "No".
7. Press the 🗐 button to confirm selection.

f) Delete All

1. Press the 🗐 button to enter the selected parameter.
2. Press the ⇨ and ⇦ buttons to select between "Yes" or "No".
3. Press the 🗐 button to confirm selection.

System Set

Press the ⇨ and ⇦ buttons to scroll through the following setup parameters.

1. Auto Save: Off/On
2. Auto Delete: Off/On
3. Auto Transfer: On/Off
4. Auto Off: On/Off
5. Time Date Set

Follow the instructions below to adjust each setting.

Enabling/Disabling Auto Save

1. Press the 🗐 button to turn Auto Save On or Off.
2. Press the ⇨ or ⇦ buttons to skip to the next parameter when complete.

Enabling/Disabling Auto Delete

1. Press the 🗐 button to turn Auto Delete On or Off.
2. Press the ⇨ or ⇦ buttons to skip to the next parameter when complete.

Enabling/Disabling Auto Transfer

1. Press the 🗐 button to turn Auto Transfer On or Off.
2. Press the ⇨ or ⇦ buttons to skip to the next parameter when complete.

Enabling/Disabling Auto Shutoff

1. Press the 🔲 button to turn Auto Shutoff On or Off.
2. Press the ➡️ or ⬅️ buttons to skip to the next parameter when complete.

Setting the Time and Date

1. Press the 🔲 button to enter the selected parameter.
2. Press the ➡️ and ⬅️ buttons to adjust the month as indicated by "mm."
3. Press the 🔲 button to confirm and skip to the next digit.
4. Repeat steps 2 and 3 to set the day, year, hour and minutes as indicated by (dd/yyyy/h/m).
5. After each value has been selected and confirmed, it will automatically exit the Setting the time and date setup screen.

Quick Setup Mode

1. While in normal operation, press the ➡️ button to enter the Quick Measurement Setup Mode.
2. The meter will automatically default to the previously selected Hardness Scale preset.
3. Press the 🔲 button to select the appropriate hardness scale for the material under test.
4. Press the ➡️ button to confirm selection and jump to the next parameter (Impact Direction).
5. Press the 🔲 button to scroll through the 360° measuring direction list.
6. Press the ➡️ button to confirm selection and jump to the next parameter (Material).
7. Press the 🔲 button to select the appropriate material being tested.
8. Press the ➡️ button to confirm selection and jump to the next parameter (Average).
9. Press the 🔲 button to select the number of measurements to be used to calculate the average value between 1 and 32.

10. Press the $\boxed{0}$ button to exit Quick Setup Mode and resume normal operation.

Calibration Procedure

1. While the meter is off, press and hold the $\boxed{目}$ button while turning the meter on.
2. Release the $\boxed{目}$ button until the meter enters the calibration mode as indicated on-screen by "Calibration 0/5 times".
3. The required number of measurements to be used to complete calibration is automatically set to 5.

Note: The selected impact direction should be vertically down on the Leeb hardness test block.

4. The average value will appear on the screen at the end of the 5 measurements.
5. If the value exceeds the standard value, press the $\boxed{\Rightarrow}$ and $\boxed{\Leftarrow}$ buttons to adjust the nominal value.
6. Press the $\boxed{目}$ key to finish calibration and resume normal operation.

Note: Calibration range is ±15HL.

Connecting to a Computer

The instrument is equipped with a USB-C Port. Using the included cable, the hardness tester has the ability to connect to a computer, or external storage device/mini-printer. Measurement data stored in the memory of the gauge can be transferred to the computer through the USB-C Port.

Launching the R9030 Software

1. Visit www.REEDInstruments.com/software & drivers to download the R9030 software.

2. Double click on the software labeled DV-R9030 located in the REED Hardness Tester Dataview folder to launch.

3. If the meter fails to connect, it may require that the driver be installed separately.

4. The application can be saved to your computer by Extracting all the files to a specific folder.

Full specifications and Operating System compatibility can be found on the product page at www.REEDInstruments.com. If you have specific questions related to your application and/or questions related to software setup and functionality please contact the nearest authorized distributor or Customer Service at info@REEDInstruments.com or 1-877-849-2127.

Battery Charging and Replacement

When the lithium rechargeable battery is empty, it's time to recharge it. Connect the USB battery cable to the USB-C port, then plug the other end of the cable into an AC power source or computer.

The battery's lifespan with regular use is approximately 3 years. If you require a replacement battery, please reach out to the nearest authorized distributor or contact Customer Service at info@REEDInstruments.com or 1-877-849-2127.

Applications

- Ideal for hardness testing of large and heavy objects
- In production lines of mass produced components
- Materials identification in stores and warehouses
- In locations with difficult access, or in confined spaces

Appendix A: Hardness Scale Tables

The R9030 includes D impact device. Please note that impact devices DL, DC, D+15 and C can be ordered seperately. For more information please contact us at 1-877-849-2127 or info@REEDinstruments.com.

Non conventional impact devices	DC(D)/DL	D+15	C
Impacting energy	11mJ	11mJ	2.7mJ
Mass of impact body	5.5g/7.2g	7.8g	3.0g
Test tip Hardness	1600HV	1600HV	1600HV
Diameter of test tip	3mm	3mm	3mm
Material of test tip	Tungsten carbide	Tungsten carbide	Tungsten carbide
Impact device Diameter	20mm	20mm	20mm
Impact device Length	86(147)/75mm	162mm	141mm
Impact device Weight	50g	80g	75g
Max. hardness of workpiece	940HV	940HV	1000HV
Mean roughness of workpiece surface of the Ra	1.6μm	1.6μm	0.4μm
Min. weight of sample: Measure directly	>5kg	>5kg	>1.5kg
Need support firmly	2-5kg	2 to 5kg	0.5 to 1.5kg
Need coupling tightly	0.05-2kg	0.05 to 2kg	0.02 to 0.5kg
Min. thickness of sample: Coupling tightly	5mm	5mm	1mm
Min.layer thickness for surface harden	≥0.8mm	≥0.8mm	≥0.2mm

continued…

Non conventional impact devices		DC(D)/DL	D+15	C
Hardness 300HV	Indentation diameter	0.54mm	0.54mm	0.38mm
	Indentation depth	24μm	24μm	12μm
Hardness 600HV	Indentation diameter	0.54mm	0.54mm	0.32mm
	Indentation depth	17μm	17μm	8μm
Hardness 800HV	Indentation diameter	0.35mm	0.35mm	0.35mm
	Indentation depth	10μm	10μm	7μm
Available type of impact device	D: General test DC: Hole or hollow-cylindrical test DL: Slender narrow groove or hole test		D+15: groove or reentrant surface	C: small, light, thin parts or surface of hardened layer

Type of impact device	Hardness value of standard Leeb hardness block	Error of displayed value	Repeatability of displayed value
D (included)	760±30HLD	±6HLD	6HLD
	530±40HLD	±10HLD	10HLD
DC (optional)	760±30HLDC	±6HLDC	6HLD
	530±40HLDC	±10HLDC	10HLD
DL (optional)	878±30HLDL	±12HLDL	12HLDL
	736±40HLDL		
D+15 (optional)	766±30HLD+15	±12HLD+15	12HLD+15
	544±40HLD+15		
C (optional)	822±30HLC	±12HLC	12HLC
	590±40HLC		

continued…

Material	Hardness Test Method	Impact Device			
		D/DC	D+15	C	DL
Steel and Cast Steel	HRC	17.9~68.5	19.3~67.9	20.0~68.2	20.6~68.2
	HRB	59.6~99.6			37.0~99.9
	HRA	59.1~85.8			
	HB	127~651	80~638	80~638	81~646
	HV	83~976	80~937	80~996	80~950
	HS	32.2~99.5	33.3~99.3	31.8~102.1	30.6~96.8
Hammered Steel	HB	143~650			
Cold Work Tool Steel	HRC	20.4~67.1	19.8~68.2	20.7~68.2	
	HV	80~898	80~935	100~941	
Stainless Steel	HRB	46.5~101.7			
	HB	85~655			
	HV	85~802			
Gray Cast Iron	HB	93~334			
Nodular Cast Iron	HB	131~387			
Cast Aluminum Alloys	HB	19~164		23~210	
	HRB	23.8~84.6		22.7~85.0	
Brass (Copper-Zinc Alloys)	HB	40~173			
	HRB	13.5~95.3			
Bronze (Copper-Aluminum/ Copper-Tin Alloys)	HB	60~290			
Wrought Copper Alloys	HB	45~315			

No.	Material	HLD	Strength Ơb
1	Mild Steel	350~522	374~780
2	High-Carbon Steel	500~710	737~1670
3	Cr Steel	500~730	707~1829
4	Cr-V Steel	500~750	704~1980
5	Cr-Ni Steel	500~750	763~2007
6	Cr-Mo Steel	500~738	721~1875
7	Cr-Ni-Mo Steel	540~738	844~1933
8	Cr-Mn-Si Steel	500~750	755~1993
9	Super strength Steel	630~800	1180~2652
10	Stainless Steel	500~710	703~1676

Accessories and Replacement Parts

• **R8888** Medium Hard Carrying Case

Don't see your part listed here? For a complete list of all accessories and replacement parts visit your product page on www.REEDInstruments.com.

Product Care

To keep your instrument in good working order we recommend the following:

• Store your product in a clean, dry place.

• Change the battery as needed.

• If your instrument isn't being used for a period of one month or longer please remove the battery.

• Clean your product and accessories with biodegradable cleaner. Do not spray the cleaner directly on the instrument. Use on external parts only.

• After using the impact device 1000 times, it is recommended to use the nylon brush provided to clean the guide tube and the impact body of the impact device. To clean the guide tube, unscrew the support ring and then take out the impact body. Use the nylon brush to clean in a counter-clock direction. Repeat this 5 times and remount the impact body and the support ring.

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- Remember to release the impact body after use.
- It is strongly recommended to not use any lubricant agent to clean the impact device.
- The tester should be stored at room temperature, away from vibration, strong magnetic field, corrosive medium, dampness and dust.

Product Warranty

REED Instruments guarantees this instrument to be free of defects in material or workmanship for a period of one (1) year from date of shipment. During the warranty period, REED Instruments will repair or replace, at no charge, products or parts of a product that proves to be defective because of improper material or workmanship, under normal use and maintenance. REED Instruments total liability is limited to repair or replacement of the product. REED Instruments shall not be liable for damages to goods, property, or persons due to improper use or through attempts to utilize the instrument under conditions which exceed the designed capabilities. In order to begin the warranty service process, please contact us by phone at 1-877-849-2127 or by email at info@REEDInstruments.com to discuss the claim and determine the appropriate steps to process the warranty.

Product Disposal and Recycling

Please follow local laws and regulations when disposing or recycling your instrument. Your product contains electronic components and must be disposed of separately from standard waste products.

Product Support

If you have any questions on your product, please contact your authorized REED distributor or REED Instruments Customer Service by phone at 1-877-849-2127 or by email at info@REEDInstruments.com.

Please visit **www.REEDInstruments.com** for the most up-to-date manuals, datasheets, product guides and software.

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REED
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TEST & MEASURE
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Over 200 portable test and measurement instruments

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