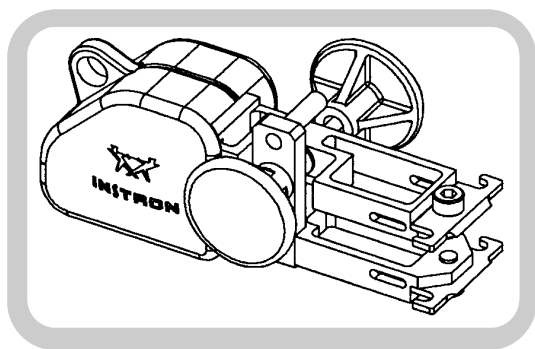




2630-100 Series Clip-On Extensometer



Reference Manual - Equipment
M20-52630-1 Revision H

The difference is measurable ®

Electromagnetic Compatibility

Where applicable, this equipment is designed to comply with International Electromagnetic Compatibility (EMC) standards.

To ensure reproduction of this EMC performance, connect this equipment to a low impedance ground connection. Typical suitable connections are a ground spike or the steel frame of a building.

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General Safety Precautions



Materials testing systems are potentially hazardous.



Materials testing involves inherent hazards from high forces, rapid motions, and stored energy. You must be aware of all moving and operating components in the testing system that are potentially hazardous, particularly force actuators or a moving crosshead.

Before operating the system, ensure you gain a thorough understanding of the equipment by:

- receiving training on the safe operation of the system.
- reading and understanding the general hazards associated with materials testing systems as detailed on pages 5 to 11.
- carefully reading all relevant manuals and observing all Warnings and Cautions. The term Warning is used where a hazard may lead to injury or death. The term Caution is used where a hazard may lead to damage to equipment or to loss of data.
- carrying out your own safety risk assessment on the use of the test system, test methods employed, specimen loading and specimen behavior at failure.

General Safety Precautions



Instron products, to the best of its knowledge, comply with various national and international safety standards, in as much as they apply to materials and structural testing. We certify that our products comply with all relevant EU directives (CE mark).

Because of the wide range of applications with which our instruments are used, and over which we have no control, additional protection devices and operating procedures may be necessary due to specific accident prevention regulations, safety regulations, further EEA directives or locally valid regulations. The extent of our delivery regarding protective devices is defined in your initial sales quotation. We are thus free of liability in this respect.

At your request, we will gladly provide advice and quotations for additional safety devices such as protective shielding, warning signs or methods of restricting access to the equipment.

Warnings



Crush Hazard - Allow only one person to handle or operate the system at all times.

Operator injury may result if more than one person operates the system. Before working inside the hazard area between the grips or fixtures, ensure that no other personnel can operate the computer or any of the system controls.



Crush Hazard - Take care when installing or removing a specimen, assembly, structure, or load string component.

Installation or removal of a specimen, assembly, structure, or load string component involves working inside the hazard area between the grips or fixtures. Keep clear of the jaws of a grip or fixture at all times. Keep clear of the hazard area between the grips or fixtures during actuator or crosshead movement.

Ensure that all actuator or crosshead movements necessary for installation or removal are slow and, where possible, at a low force setting.

Warnings



Hazard - Press the Emergency Stop button whenever you consider that an unsafe condition exists.

The Emergency Stop button removes hydraulic power or electrical drive from the testing system and brings the hazardous elements of the system to a stop as quickly as possible. It does not isolate the system from electrical power, other means are provided to disconnect the electrical supply. Whenever you consider that safety may be compromised, stop the test using the Emergency Stop button. Investigate and resolve the situation that caused the use of the Emergency Stop button before you reset it.



Flying Debris Hazard - Wear eye protection and use protective shields or screens whenever any possibility exists of a hazard from the failure of a specimen, assembly or structure under test.

Wear eye protection and use protective shields or screens whenever a risk of injury to operators and observers exists from the failure of a test specimen, assembly or structure, particularly where explosive disintegration may occur. Due to the wide range of specimen materials, assemblies or structures that may be tested, any hazard resulting from the failure of a test specimen, assembly or structure is entirely the responsibility of the owner and the user of the equipment.

Warnings



Flying Debris Hazard - Make sure that test specimens are installed correctly in grips or fixtures in order to eliminate stresses that can cause breakage of grip jaws or fixture components.



Incorrect installation of test specimens creates stresses in grip jaws or fixture components that can result in breakage of these components. The high energies involved can cause the broken parts to be projected forcefully some distance from the test area. Install specimens in the center of the grip jaws in line with the load path. Insert specimens into the jaws by at least the amount recommended in your grip documentation. This amount can vary between 66% to 100% insertion depth; refer to supplied instructions for your specific grips. Use any centering and alignment devices provided.



Hazard - Protect electrical cables from damage and inadvertent disconnection.

The loss of controlling and feedback signals that can result from a disconnected or damaged cable causes an open loop condition that may drive the actuator or crosshead rapidly to its extremes of motion. Protect all electrical cables, particularly transducer cables, from damage. Never route cables across the floor without protection, nor suspend cables overhead under excessive strain. Use padding to avoid chafing where cables are routed around corners or through wall openings.

Warnings



Hazard - Set the appropriate limits before performing loop tuning or running waveforms or tests.

Operational limits are included within your testing system to suspend motion or shut off the system when upper and/or lower bounds of actuator or crosshead travel, or force or strain, are reached during testing. Correct setting of operational limits by the operator, prior to testing, will reduce the risk of damage to test article and system and associated hazard to the operator.



High/Low Temperature Hazard - Wear protective clothing when handling equipment at extremes of temperature.



Materials testing is often carried out at non-ambient temperatures using ovens, furnaces or cryogenic chambers. Extreme temperature means an operating temperature exceeding 60 °C (140 °F) or below 0 °C (32 °F). You must use protective clothing, such as gloves, when handling equipment at these temperatures. Display a warning notice concerning low or high temperature operation whenever temperature control equipment is in use. You should note that the hazard from extreme temperature can extend beyond the immediate area of the test.

Warnings



Electrical Hazard - Disconnect the electrical power supply before removing the covers to electrical equipment.

Disconnect equipment from the electrical power supply before removing any electrical safety covers or replacing fuses. Do not reconnect the power source while the covers are removed. Refit covers as soon as possible.



Hazard - Do not place a testing system off-line from computer control without first ensuring that no actuator or crosshead movement will occur upon transfer to manual control.

The actuator or crosshead will immediately respond to manual control settings when the system is placed off-line from computer control. Before transferring to manual control, make sure that the control settings are such that unexpected actuator or crosshead movement cannot occur.

Warnings



Rotating Machinery Hazard - Disconnect power supplies before removing the covers to rotating machinery.

Disconnect equipment from all power supplies before removing any cover which gives access to rotating machinery. Do not reconnect any power supply while the covers are removed unless you are specifically instructed to do so in the manual. If the equipment needs to be operated to perform maintenance tasks with the covers removed, ensure that all loose clothing, long hair, etc. is tied back. Refit covers as soon as possible.



Hazard - Shut down the hydraulic power supply and discharge hydraulic pressure before disconnection of any hydraulic fluid coupling.

Do not disconnect any hydraulic coupling without first shutting down the hydraulic power supply and discharging stored pressure to zero. Tie down or otherwise secure all pressurized hoses to prevent movement during system operation and to prevent the hose from whipping about in the event of a rupture.



Hazard - Shut off the supply of compressed gas and discharge residual gas pressure before you disconnect any compressed gas coupling.

Do not release gas connections without first disconnecting the gas supply and discharging any residual pressure to zero.

Warnings



Hazard - Ensure components of the load string are correctly pre-loaded to minimize the risk of fatigue failure.

Dynamic systems, especially where load reversals through zero are occurring, are at risk of fatigue cracks developing if components of the load string are not correctly pre-loaded to one another. Apply the specified torque to all load string fasteners and the correct setting to wedge washers or spiral washers. Visually inspect highly stressed components such as grips and threaded adapters prior to every fatigue test for signs of wear or fatigue damage.

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Chapter 1

Introduction

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About the Extensometers

The 2630-100 series extensometers convert the mechanical displacement of a strained test specimen into an electrical signal. When used with the current range of Instron testing machines, each extensometer is automatically recognised, and can be calibrated at the touch of a button.

The displacement is transmitted by a light rigid frame to strain gauges bonded to a flexural element. The gauges are arranged in a fully active four-arm Wheatstone Bridge circuit.

The 2630-100 series of extensometers includes different gauge lengths/strain range options to suit a wide range of specimen characteristics.

The robust construction of the extensometer provides accuracy and reliability.

When not in use, the extensometer should be stored in the case supplied with it.

Extensometer Features

- Ergonomic, lightweight, cross-braced design with overload protection.
- Easy attachment and release from the specimen facilitate single-handed operation.
- Simple, cone latch gauge-length setting method with automatic disengagement.
- Precise, fixed gauge-lengths with automatic recognition and calibration capability.

- Available in metric and U.S. Customary versions to meet ISO 9513 and ASTM E83 standards of accuracy.
- Low operating-force arms with single-bevel, interchangeable knife edges.
- Suitable for a wide range of specimen materials, geometry and size with a choice of attachment methods.
- Combined cable cleat and extensometer holder with provision for retaining cord attachment to the extensometer.
- High impact plastic storage case with a contour moulded insert to securely retain the extensometer and accessory parts together with its Calibration Certificate and manual.

Equipment Supplied

See [Figure 1](#).

1. Extensometer
2. Cable cleat and extensometer holder
3. 1.5 mm hexagon wrench
4. 11 pairs of wire clips
5. Specimen centering stops
6. This manual
7. Calibration certificate
8. Foam lined case

For optional accessories and spares, see [Appendix B](#).

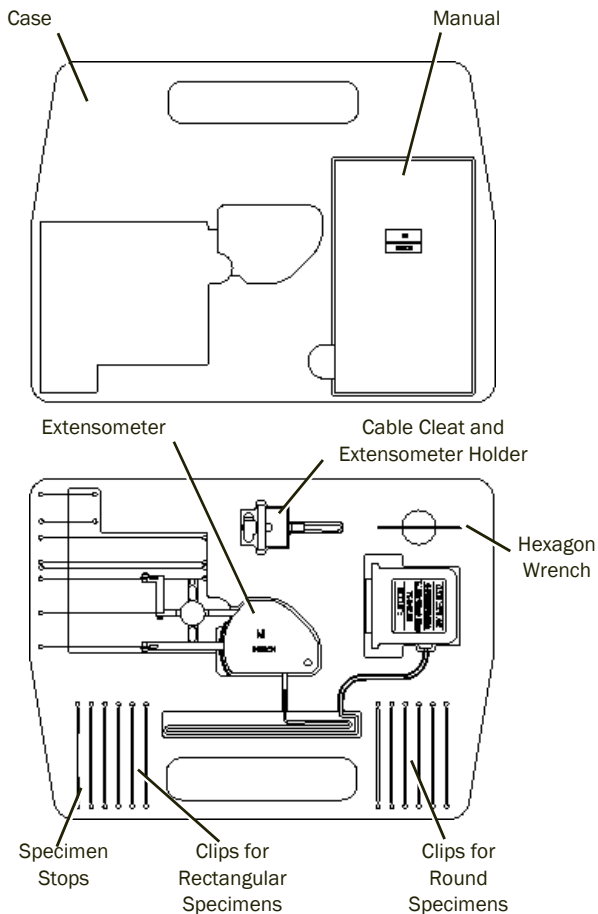


Figure 1. Case Layout

Chapter 2

Preparation for Testing

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About Preparation

Preparation for testing comprises:

- Configuring the extensometer with the correct sized clips, changing the knife edges to suit the specimen and setting the specimen stops if required.
- Attaching the extensometer by setting the gauge length and mounting the extensometer on the specimen.
- Calibrating the extensometer. This needs to be done at the start of a test session or if you change specimen type.

This preparation chapter also covers care of the extensometer.

Configuring the Extensometer

Fitting Wire Clips

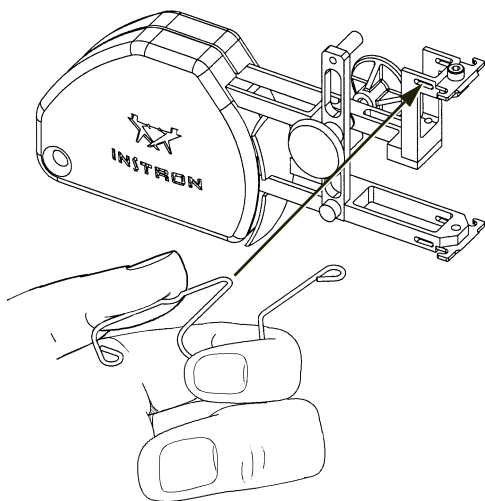


Figure 2. Insertion of Clips

Clips are available in two profiles to accommodate round and rectangular specimens. It is important for good results to select the clip that best suits the specimen. [Appendix B](#) gives full size scale diagrams of the available clips with

information on the optimum working range for each clip. The clips mount into the extensometer arms from either side, using the technique shown in [Figure 2](#). [Figure 3](#) shows the wire clip in operation holding the extensometer to a typical specimen.

Once the wire clip is selected and a test specimen is correctly installed in the testing machine grips the extensometer can be attached.

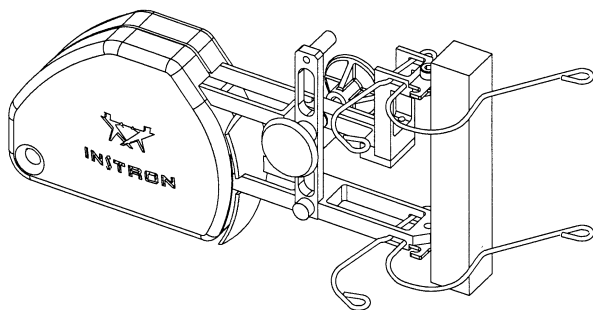


Figure 3. Wire Clips in Use

Knife Edge Changing

See [Figure 4](#):

1. Loosen the socket head cap screw using the supplied allen key.

2. Position replacement knife edge with the bevel side of the knife edge furthest from the cut-out in the extensometer arms.
3. Secure with socket head cap screw ensuring alignment faces of the knife edge and extensometer touch.

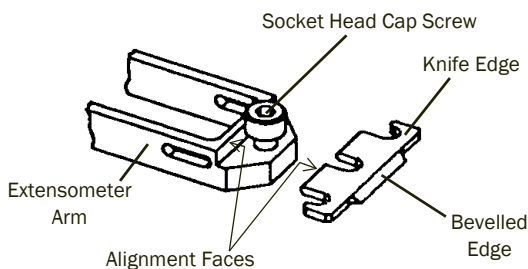


Figure 4. Knife Edge Replacement

Specimen Centering Stops

Precise alignment of the extensometer is necessary to ensure the correct measurement of strain in a specimen and to enable rapid, precise attachment to the specimen. To achieve this a pair of optional stops are supplied to assist with aligning the extensometer relative to the specimen. Graduations are marked on the surface of the stops to allow equal setting.

The installation of a specimen stop is shown in [Figure 5](#).

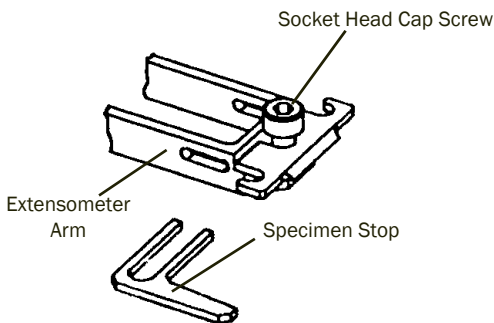


Figure 5. Specimen Stops

Attaching the Extensometer

Gauge length setting and mounting the extensometer on the specimen are done at the same time, but are described as two sections in this text.

Gauge Length Setting

Before strain can be accurately measured the extensometer arms must be spaced to set the knife edges at gauge length. The extensometer features an integral cone latch arm locating system.

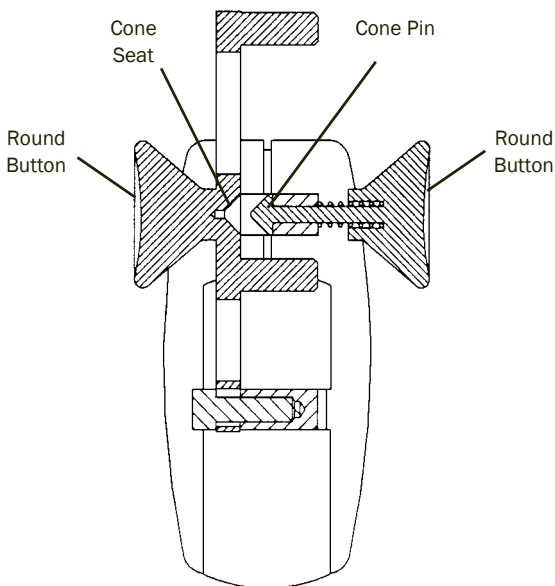


Figure 6. Gauge Length Setting with the Cone-Latch Released

To set gauge length:

1. Press the two round buttons with index finger and thumb of either left or right hand.
2. Ensure the cone locates in the cone-seat.

The extensometer knife edges are now held at the correct gauge length. The

extensometer is ready for attaching to a test specimen (see [Figure 6](#) and [Figure 7](#)).

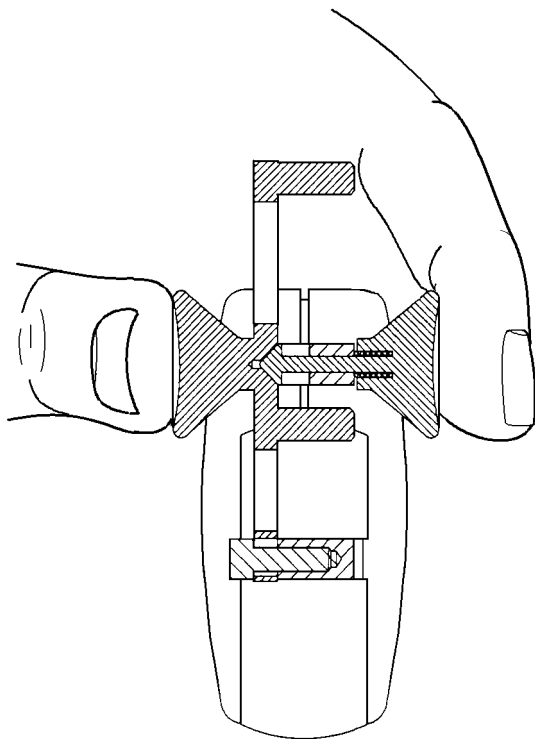


Figure 7. Gauge Length Setting with the Cone-Latch Engaged (Gauge Length Set)

Verification of gauge length may be confirmed by engaging the gauge length

cone latch and checking the distance between the knife edges using either calipers or a slip gauge.

About Mounting to Specimen

Normally, we recommend that you install the specimen in your grips and then attach the extensometer. Refer to your system documentation for specimen installation details.

For accurate results, effective attachment of the extensometer to the specimen is essential. Test results may be altered if the knife edges press too firmly into the specimen. A sign of excessive knife edge pressure is breaking of the specimen at the knife edge point of contact. At the other extreme, with low knife edge pressure, slippage may occur. This can be identified from a stress v. strain graph by a rapid change in strain for a small change in stress. If a test is to involve strains greater than 10%, a higher clamping force may be required. A number of different attachment methods are available to suit a wide range of testing conditions. Care during attachment should avoid any difficulties and permit the optimum knife edge pressure to be achieved. Knife edges should be replaced if blunt, as described on page [24](#).

Mounting to the Specimen using Both Hands

When testing soft or delicate materials, two-handed installation reduces the possibility of marking the specimen.

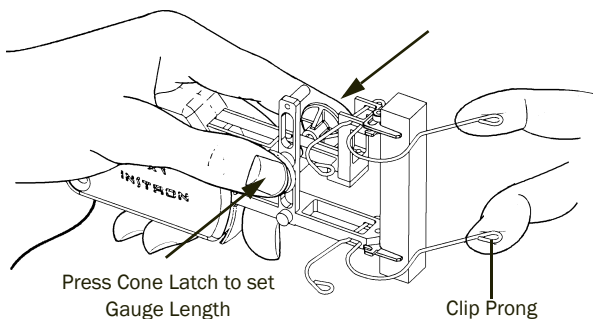


Figure 8. Two-Handed Installation

1. Hold the extensometer with either hand and engage the gauge length cone-latch.
2. Using the other hand open the wire clips to clear the specimen, as shown in [Figure 8](#).
3. Position the extensometer in line with the specimen and gradually release the clips.

4. Once the extensometer is attached to the specimen, release the gauge length cone-latch.

If the extensometer is not held firmly onto the specimen select a smaller clip.

Mounting to the Specimen using One Hand

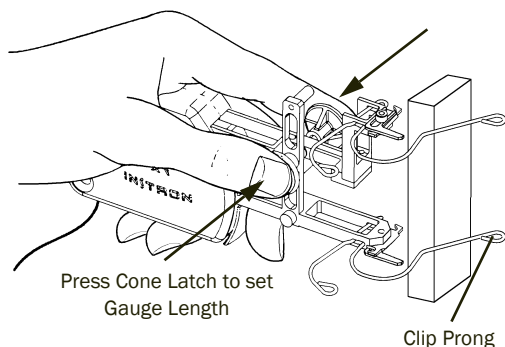


Figure 9. Single-Handed Installation

Single handed installation is useful for working in temperature cabinets where access is limited.

1. Hold the extensometer with either hand and engage the gauge length cone-latch.

2. Hook the wire clip prongs behind the specimen as shown in [Figure 9](#).
3. Pull the extensometer to open the wire clips to clear the specimen.
4. Slide the clip against the specimen bringing the extensometer in line with the specimen and gradually release the clips so the knife edges gently touch the specimen.

Do not slide the knife edge against the specimen as the specimen may be marked or the knife edge blunted.

5. Once the extensometer is attached to the specimen, release the gauge length cone-latch.

If the extensometer is not held firmly onto the specimen select a smaller clip.

Elastic Bands or O-Rings

Hooks for elastic bands or O-rings are an integral part of the knife edges, although elastic bands and O-rings are not supplied with the extensometer. See page [58](#) for O-ring details.

1. Hold the extensometer with the gauge length cone latch engaged and position the knife edges on the test specimen.
2. Stretch good quality elastic bands or O-rings around the specimen and loop the ends over the two knife edge hooks, as shown in [Figure 10](#).

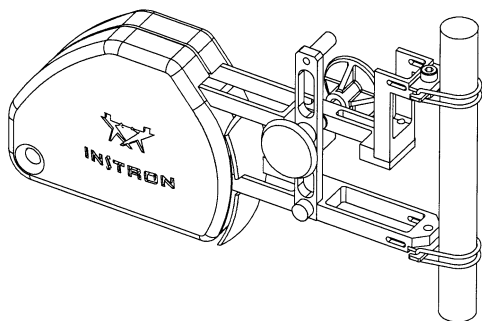


Figure 10. Specimen Attachment Using Elastic Bands

Variable Pressure Specimen Clamp

If preferred, the instrument may be changed to use variable pressure specimen clamps. See [“Variable Pressure Specimen Clamp”](#) on page 58 for details.

To attach the extensometer using variable pressure clamps:

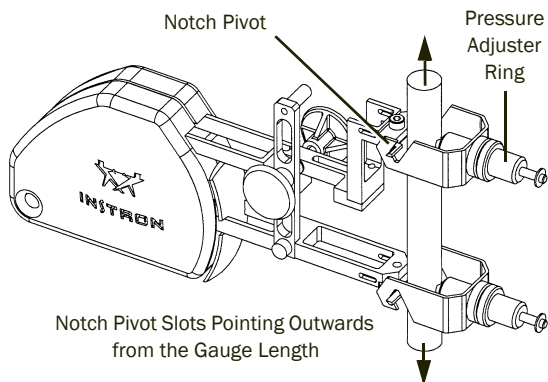


Figure 11. Specimen Attachment Using the Variable Pressure Specimen Clamps and Pivot Knife Edges

1. Hold the extensometer with the Gauge Length cone-latch engaged and position the knife edges against the test specimen.
2. Holding a specimen clamp, straddle the specimen above the knife edges of the extensometer.
3. Press the clamp against the specimen to compress the spring loaded plunger and hook the specimen clamp on the knife edges.

Ensure that the knife edge seats properly in the specimen clamp notch pivot.

4. Repeat the same operation on the lower specimen clamp.

When testing round specimens, align the “V” groove of the spring-loaded plunger before straddling the specimen.

Note that the notch pivot slots in the specimen clamp should always point away from the gauge length, as shown in [Figure 11](#).

Calibration

The extensometer and machine conditioning electronics must be calibrated before use. Three parameters must be defined: full scale, calibration point and gauge length.

Three methods of calibration are possible:

Automatic Electrical Calibration

This is the normal method of calibration for current Instron testing machines. The extensometer is self-identifying via its code resistors. These are interrogated by the testing machine which has the calibration parameters stored within its memory. If the extensometer is to be used on an older

Instron machine check its compatibility with automatic calibration on page [50](#).

To operate the automatic electrical calibration, refer to the operating instructions or user's guide supplied with the testing machine.



Before starting the calibration, ensure that the extensometer is set at gauge length, and is correctly attached to the test specimen. See page [25](#) to [33](#).

Manual Electrical Calibration

This method can be used if your testing machine is unable to use the self-identifying feature or if you wish to modify the calibration parameters.

To operate manual electrical calibration refer to the operating instructions or user's guide supplied with the testing machine.



Before starting the calibration, ensure that the extensometer is set at gauge length, and is correctly attached to the test specimen. See page [25](#) to [33](#).

Manual Mechanical Calibration

This method must be used on older testing machines that are unable to perform any other type of calibration.

A calibration fixture is required for manual mechanical calibration. Contact your local Instron representative for details of manual mechanical calibration and appropriate calibration fixtures.

Verification

The achievable ISO or ASTM classification is given in “[Gauge Lengths and Travel](#)” on page 48. Certification of the strain measurement system which includes the extensometer, conditioning electronics and readout to the international standards should be arranged through accredited calibration services. Your local Instron area office will be able to arrange verification.



It is advisable to check the accuracy of the automatic/manual electrical calibration at least once per year.

Care of the Extensometer

Routine Maintenance

To extend the life of your extensometer and to prevent compromising the calibration, avoid:

- Rough handling.
- Contamination with dirt and moisture.

Depending upon the testing conditions and frequency of use:

- Clean your extensometer by wiping it with a dry, lint free cloth.
- Inspect the knife edges for wear or damage and replace as appropriate (see [page 23](#)).
- Inspect the cable and connector for wear or damage.

Storing your Extensometer

When the extensometer is connected to the controller, but not being used for testing, use the holder provided (see [“Extensometer Holder”](#) on [page 38](#)).

When the extensometer is completely removed from the testing system, always store it in the case in which it was supplied.

Repair

There are no field serviceable parts in your extensometer. Return faulty extensometers to the factory for evaluation and repair. Contact your local Instron representative for details.

Extensometer Holder

A combined cable cleat and extensometer holder is provided, and is shown in [Figure 12](#) and [Figure 13](#).

The magnetic base of the cleat can be attached to steel parts of the testing machine e.g. the column covers. For “T” slot machines with aluminium column covers, the special keeper assembly will slide into the “T” slot and then the cleat will attach to the keeper.

The slot in the base of the cleat is used to support the extensometer cable. The cleat should be positioned to reduce the effects of cable tension on the extensometer.

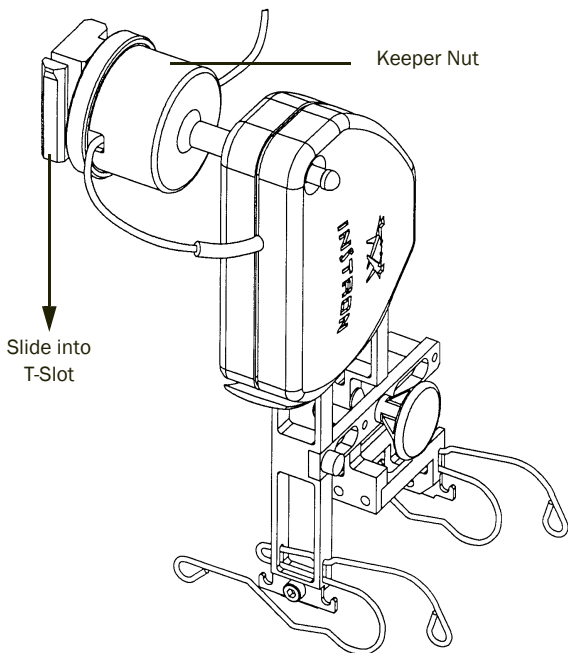


Figure 12. Extensometer Suspended from Cleat Post - T-Slot Machines

When the extensometer is not in use but is still required to be connected to the testing machine, it may be secured to a cleat post using the hole provided in the extensometer cover.

Ensure the cleat is returned to the protective case, with the magnet attached to the keeper plate when not in use.

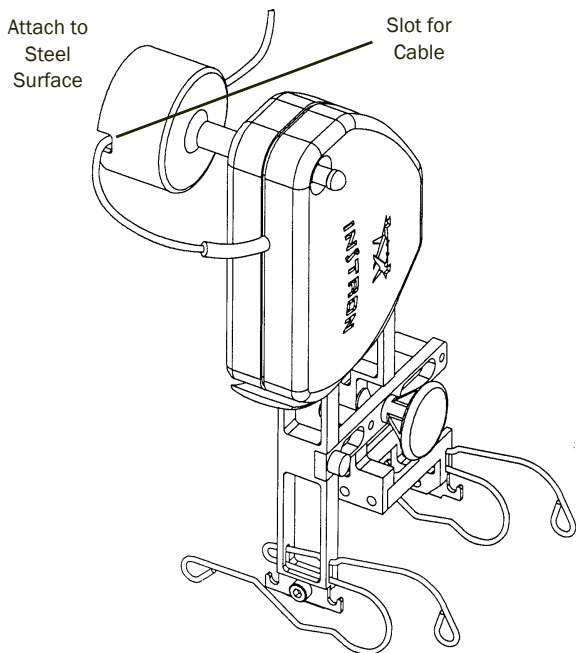


Figure 13. Extensometer Suspended from Cleat Post - Steel Covered Machines

Chapter 3

Testing

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About Testing

Once you have set the gauge length, attached the extensometer, and calibrated the extensometer (see [Chapter 2](#)), you can perform a test on your specimen.

Refer to your system operating instructions for details on how to run a test.

Your extensometer can be used for measurement or monitoring of extension or strain. If you want to use your extensometer channel for controlling the test, you need to be aware of the potential hazards (see [“Working in Strain Control”](#) on page [44](#)).

Working in Strain Control

Before using your extensometer for strain control, it is our strong recommendation that you carry out your own risk assessment.

Warning



Hazard - The test machine may become unstable in strain control if the extensometer becomes detached during testing.

Once the extensometer becomes detached from the specimen, the capacity to measure changes to the specimen is removed. The controller continues to apply the test parameters without receiving feedback signals thus leading to an unstable system.

Before the extensometer is used in strain control:

- Ensure that the extensometer is securely attached to the specimen.
- Ensure that the extensometer is calibrated.
- Set Position, Load and Strain limits.

- Ensure that the testing machine loop-shaping parameters are set correctly.

Warning



Crush Hazard - Do not attach or remove the extensometer while the system is in strain control.

Before attaching or removing the extensometer from the specimen:

- Ensure that the machine is not in strain control.
- Apply specimen protect (or load protect) if your system has that feature.

Appendix A

Specifications

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Gauge Lengths and Travel

GL mm mm (in.)	Strain %		Travel mm (in.)		Cat No 2630-	Class 1 ISO 9513 (ASTM E83) Strain %		Overall Dimension mm (in.)			Operating Force g (lbs)	Weight 2 g (lbs.)	Code Type
	+ve	-ve	+ve	-ve		Class 0.5 (B-2)	Class 1 (C)	Length	Width	Height			
8	50	50	4	4	120	0, +50	30, +50	67 (2.64)	39 (1.5)	25 (1)	20 (0.04)	27 (0.06)	Dual
(0.3)	50	50	(0.15)	(0.15)	121	0, +50	30, +50	67 (2.64)	39 (1.5)	25 (1)	20 (0.04)	27 (0.06)	Dual
10	10	10	1	1	101	-10, +10		67 (2.64)	39 (1.5)	25 (1)	160 (0.35)	27 (0.06)	Single
10	50	50	5	5	102	0, +50	30, +50	67 (2.64)	39 (1.5)	25 (1)	20 (0.04)	27 (0.06)	Single
(0.5)	10	10	(0.05)	(0.05)	103	-10, +10		67 (2.64)	39 (1.5)	25 (1)	170 (0.37)	27 (0.06)	Single
(0.5)	50	50	(0.25)	(0.25)	104	0, +50	30, +50	67 (2.64)	39 (1.5)	25 (1)	20 (0.04)	27 (0.06)	Single
25	10	10	2.5	2.5	105	-10, +10		100 (4)	39 (1.5)	52 (2)	55 (0.12)	56 (0.12)	Single
25	50	10	12.5	2.5	106	0, +50		115 (4.5)	39 (1.5)	58 (2.3)	75 (0.17)	58 (0.13)	Single
25	100	10	25.0	2.5	107	0, +70	0, +100	132 (5.2)	39 (1.5)	69 (2.7)	45 (0.1)	60 (0.13)	Single
(1)	10	10	(0.1)	(0.1)	108	-10, +10		100 (4)	39 (1.5)	52 (2)	56 (0.12)	56 (0.12)	Single
(1)	50	10	(0.50)	(0.1)	109	0, +50		115 (4.5)	39 (1.5)	58 (2.3)	75 (0.17)	58 (0.13)	Single
(1)	100	10	(1)	(0.1)	110	0, +70	0, +100	132 (5.2)	39 (1.5)	69 (2.7)	45 (0.1)	60 (0.13)	Single

GL mm (in.)	Strain %		Travel mm (in.)		Cat No 2630-	Class 1 ISO 9513 (ASTM E83) Strain %		Overall Dimension mm (in.)			Operating Force g (lbs)	Weight ² g (lbs.)	Code Type
	+ve	-ve	+ve	-ve		Class 0.5 (B-2)	Class 1(C)	Length	Width	Height			
50	10	10	5	5	111	-10, +10		100 (4)	39 (1.5)	72 (2.8)	45 (0.1)	60 (0.13)	Single
50	50	5	25	2.5	112	0, +35	0, +50	132 (5.2)	39 (1.5)	72 (2.8)	45 (0.1)	60 (0.13)	Single
50	100	10	50	5	113	0, +70	0, +100	181 (7.1)	39 (1.5)	72 (2.8)	37 (0.08)	70 (0.15)	Dual
(2)	10	10	(0.2)	(0.2)	114	-10, +10		100 (4)	39 (1.5)	72 (2.8)	45 (0.1)	60 (0.13)	Single
(2)	50	5	(1)	(0.1)	115	0, +35	0, +50	132 (5.2)	39 (1.5)	72 (2.8)	45 (0.1)	60 (0.13)	Single
(2)	100	10	(2)	(0.20)	116	0, +70	0, +100	181 (7.1)	39 (1.5)	72 (2.8)	37 (0.08)	70 (0.15)	Dual
75	10	1	7.5	0.75	123	0, +10		181 (7.1)	39 (1.5)	101 (4)	37 (0.08)	70 (0.15)	Dual
80	10	1	8	0.8	117	0, +10		116 (4.6)	39 (1.5)	101 (4)	60 (0.13)	60 (0.13)	Dual
80	50	5	40	4	118	0, +35	0, +50	181 (7.1)	39 (1.5)	101 (4)	45 (0.1)	70 (0.15)	Dual
100	50	5	50	5	119	0, +35	0, +50	181 (7.1)	39 (1.5)	121 (4.8)	37 (0.08)	70 (0.15)	Dual

1. When calibrated using appropriate calibration apparatus these extensometers are guaranteed to meet the stated classification. Outside these stated ranges the extensometers in compressive mode generally perform to ISO 1.0 or ASTM C classification.
2. Weight excludes cable and connector.

System Compatibility

Machine series	Automatic Electrical Calibration	Manual Electrical Calibration	Manual Mechanical Calibration	Comments
8000	All	Not Available	All	Via user-defined transducer setup using first code only
8500 prior to V21	Single Code Only	Single Code Only	Single Code Only	Versions may be identified via the front panel or MDC board label
8500 V21	All except 2630-119, 120, 121, 122, 123	All except 2630-119, 120, 121, 122, 123	All except 2630-119, 120, 121, 122, 123	
8500 Plus	All	All	All	
6000	All	Not Available	All	Via user-defined transducer setup using first code only
4500 prior to V2.25MS04	Single Code Only	All	All	Versions may be identified via the master board label
4500 post V2.25MS04	All except 2630-120, 121, 122, 123	All	All	
4500 Post V2.25MS05 or later	All	All	All	
4200/4300 CPU card with PROMs prior to A474-717, 718, 719, 720	Single Code Only	All	All	Check CPU card



The 2630-100 series of clip-on extensometers is compatible with all current Instron test system controllers. The table lists older systems that may not support all calibration methods.

Machine series	Automatic Electrical Calibration	Manual Electrical Calibration	Manual Mechanical Calibration	Comments
4200/4300 CPU card with PROMs A474-717, 718, 719, 720	All except 2630-120, 121, 122, 123	All	All	Check CPU card
4200/4300 CPU card with PROMs A474-736, 737, 738, 739 or later	All	All	All	
2180/2160	Not Available	All	All	-
1100	No	All	All	-
4400	All except 2630-120, 121, 122, 123	All	All	-
4400 PROM A474-740 or later	All	All	All	-
5500 Pre Dec 1993	All except 2630-120, 121, 122, 123	All	All	-
5500 Post Dec 1993	All	All	All	-
Current Test System Controllers	All	All	All	-



The extensometer connector plug contains codes which are used by the system controller to define gauge length, travel and calibration points. The extensometers are fitted with either a single code or dual codes, as shown in the tables above

General Specifications

Creep (3 mins - 5 secs)	$<\pm 0.15\%$ of FS ^a
Repeatability	$<0.1\%$ of FS
Hysteresis	$<0.3\%$ of FS
Modulus extension measurement accuracy requirements to ISO527-1	$\pm 1.5\mu\text{m}$ for 2630-123 only.
Balance	$<\pm 2.5\%$ of FS
Excitation	1 to 5 Vrms, d.c. to 5 kHz
Sensitivity (full scale)	$2.5 \pm 20\%$, mV/V
Overtravel limit	Mechanical stops
Electrical calibration accuracy	$\pm 0.06\%$ of FS
Bridge resistance (nominal)	350 Ω
Gauge length accuracy	$\pm 0.5\%$ of GL
Temperature range	-100 to +200 °C
Temperature effect on zero	$\pm 0.005\%$ / °C
Effect of Temperature on sensitivity - % / °C	-0.006, 20 to 100 °C (typical) % / °C -0.008, 100 to 150 °C (typical) % / °C -0.01, 150 to 200 °C (typical) % / °C
Method of attachment to Specimen	11 types of wire clips Elastic bands (not supplied) Optional specimen clamps (see page 32)
Immersibility	Non-conductive / non-corrosive fluids, i.e. acetone, mineral and silicone oils, alcohol, etc.
Gauge length setting	Cone latch with automatic release
Round specimen sizes	15 mm (0.6 in.) and 20 mm (0.8 in.)
Rectangular specimen sizes	Width 40 mm (1.6 in.), Thickness 15 mm, (0.6 in.)
Knife edge gripping force	300 to 600 grams (0.66 to 1.32 lbs), subject to the correct selection of clips
Maximum width of specimen with specimen stops fitted	18 mm (0.71 in.)

- a. FS = Full Scale. All values relate to a temperature of 22 °C unless otherwise stated.

Environmental Conditions

The simple and easy attachment method of the extensometer make it ideal for use in a temperature chamber. Its temperature capability is stated in “[General Specifications](#)” on page 52.

High relative humidity may alter calibration and it is advisable to confirm the calibration using a suitable calibration fixture at the test condition.

Caution

Contamination by condensation, electrically conducting fluids, dirt or corrosive substances may damage your extensometer.

Caution

To avoid damaging your extensometer, do not operate the temperature chamber outside -100 to +200 °C. Refer to chamber specifications for details of minimum or maximum operating temperatures.

Table 1. Extensometer Physical Compatibility with 3199 Series Temperature Chambers

Chamber Cat. No.	Suitable Extensometers
3119-005, 3119-405	All except 2630-113, 2630-116, 2630-118 and 2630-119
3119-006, 3119-406, 3119-506	All except 2630-113, 2630-116, 2630-118 and 2630-119
3119-007, 3119-407	All
3119-008, 3119-408	All
3119-009, 3119-409	All except 2630-113, 2630-116, 2630-118 and 2630-119
3119-410	All

Appendix B

Options and Accessories

- Optional Accessories and Spares 57
 - Variable Pressure Specimen Clamp . 58
 - Clips for Round Specimens 60
 - Clips for Rectangular Specimens 62
-

Optional Accessories and Spares

- Variable pressure specimen clamps.
See page [32](#) for how to use the clamp and page [58](#) for clamp sizes.
- **Cat No. 2601-077:** Replacement knife edges, one pair, straight profile. All purpose use on round and rectangular cross section specimens.
- **Cat No. 2601-078:** Replacement knife edges, one pair. Three point contact for flat specimens that are not truly flat.
- **Cat No. 2601-079:** Replacement knife edges one pair. Radiused edge for flat specimens that are not truly flat.

- Wire clips (see page 60 and page 62).



All clips supplied in pairs.

Illustrations in this appendix are full size.

- **Part No. T1351-1034:** O-Rings, internal diameter 11 mm unstretched.

Variable Pressure Specimen Clamp

If preferred, the instrument may be changed to use variable pressure specimen clamps. This requires optional notch pivot knife edges to permit the use of specimen clamps.

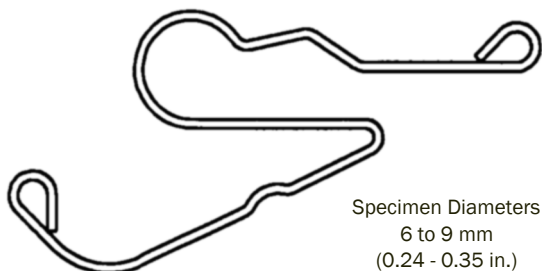
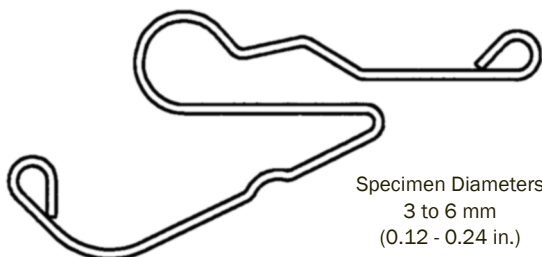
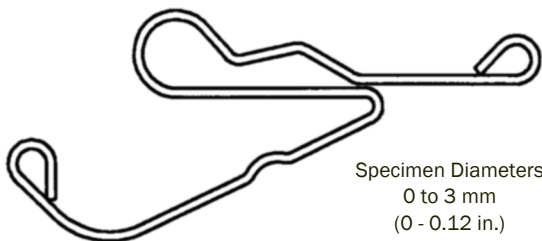
Specimen clamps are an optional extra and can be ordered from Instron using the following Catalogue Numbers:

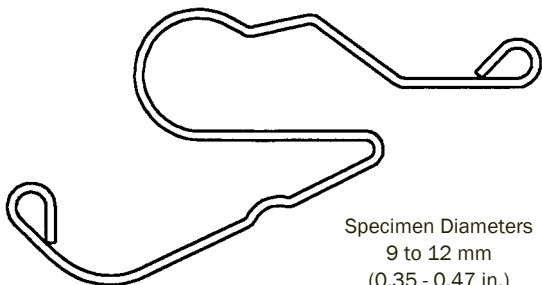
- **Cat No. 2601-081:** Specimen clamp and knife edges – Small, minimum gauge length 10 mm. Accommodates round specimens 1 to 9 mm in diameter or flat specimens to 9 mm wide and 1 to 10 mm thick.

- **Cat No. 2601-082:** Specimen clamp and knife edges – Medium, minimum gauge length 25 mm. Accommodates round specimens 1 to 15 mm in diameter in diameter or flat specimens to 14 mm wide and 1 to 18 mm thick.
- **Cat No. 2601-083:** Specimen clamp and knife edges – Large, minimum gauge length 25 mm. Accommodates round specimens 1 to 10 mm in diameter or flat specimens to 25 mm wide and 1 to 10 mm thick.

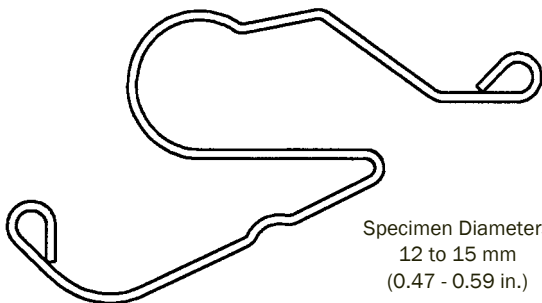
Clips for Round Specimens

SET A1696-1013

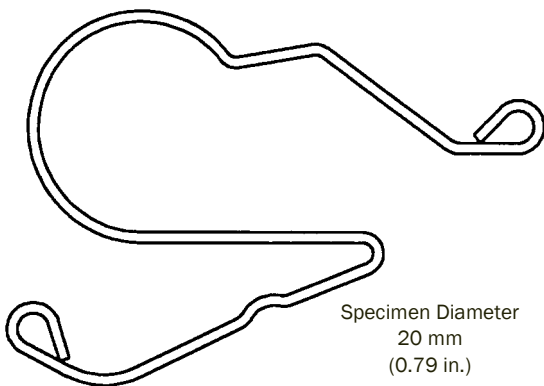




Specimen Diameters
9 to 12 mm
(0.35 - 0.47 in.)



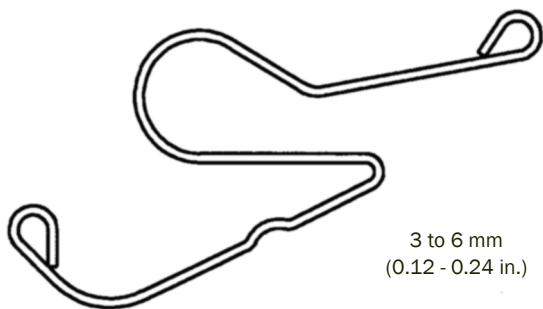
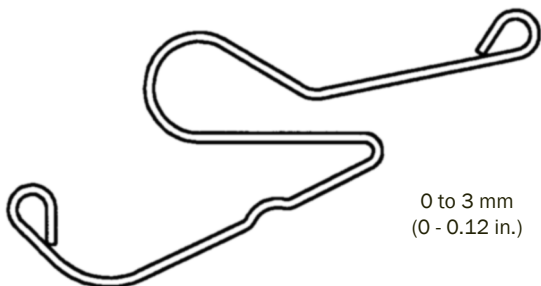
Specimen Diameters
12 to 15 mm
(0.47 - 0.59 in.)

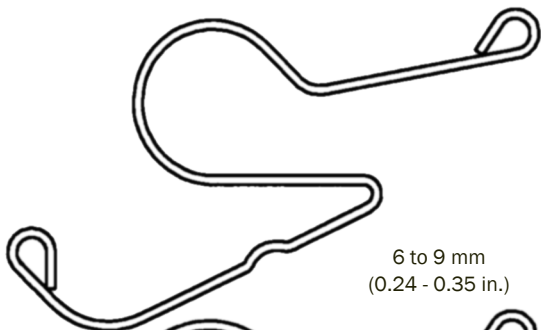


Specimen Diameter
20 mm
(0.79 in.)

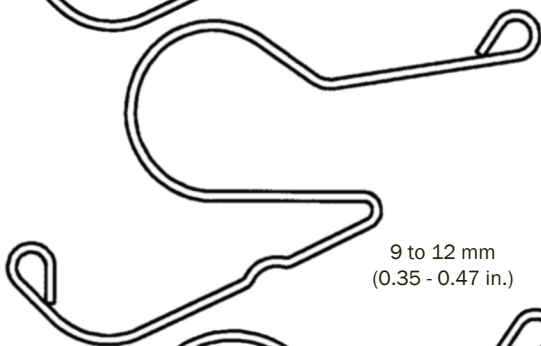
Clips for Rectangular Specimens

SET A1696-1014

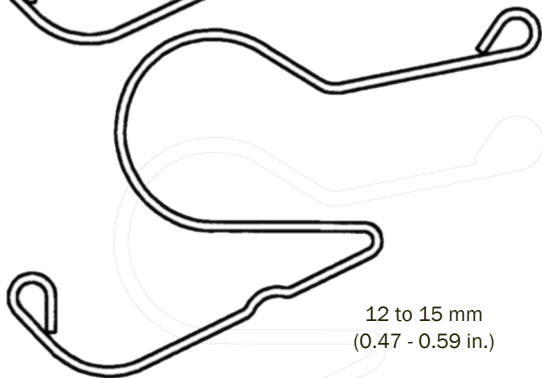




6 to 9 mm
(0.24 - 0.35 in.)



9 to 12 mm
(0.35 - 0.47 in.)



12 to 15 mm
(0.47 - 0.59 in.)

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