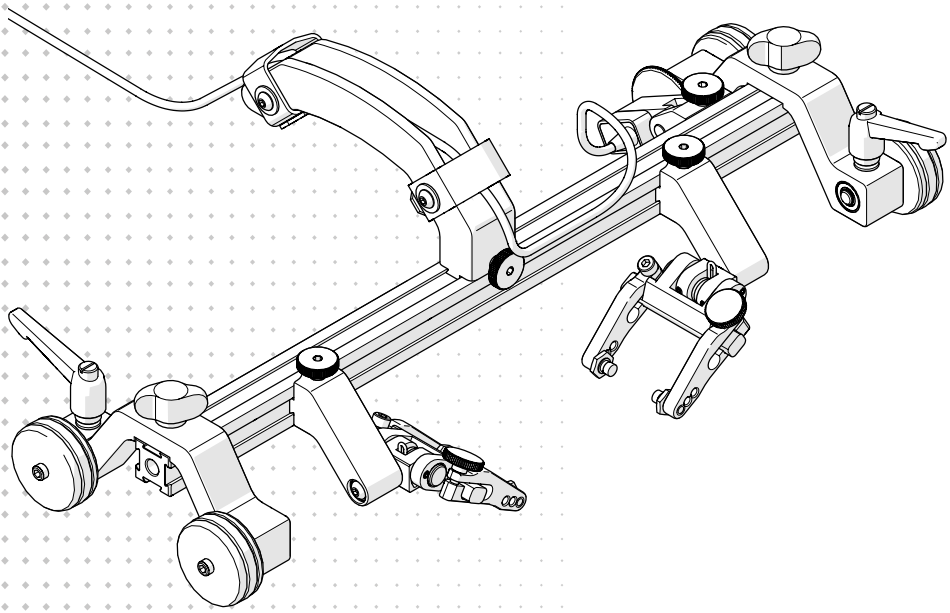
STX



User Manual

Manual Magnetic TOFD Scanner

JIREH

design • create • innovate

KEEP THIS MANUAL – DO NOT LOSE

THIS MANUAL IS PART OF THE ***STIX*** AND MUST BE RETAINED FOR THE LIFE OF THE PRODUCT. PASS ON TO SUBSEQUENT OWNERS.
Ensure any amendments are incorporated with this document.

DANGER! The ***STIX*** is designed for a specific use. Using the ***STIX*** outside of its intended use could cause damage to the product. Read and understand this manual before using.

WARNING! Can be harmful to pacemaker and ICD wearers. Stay at least 25 cm *(10")* away.

WARNING! Do **NOT** operate scanner in an explosive environment. Do **NOT** operate scanner in the presence of volatile substances.

The **WEEE** symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately.

DISTRIBUTOR:

MANUFACTURER:

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Table of Contents

1. Introduction

1.1. Product information

1.1.1. Intended use

The ***STIX*** is a manual magnetic scanner with trailing encoder and magnetic wheels. It is designed to translate two TOFD probes around ferrous piping and vessels.

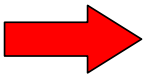
1.1.2. Performance specifications

	Minimum	*Maximum*
Pipe/Tube Range Outer Diameter	10.16 mm *(4")*	Flat
Pipe/Tube Range Inner Diameter	Flat	152.4 cm (60")
Umbilical Length *(Standard Kit)*	5 m *(16.4")*	
X Axis Encoder Resolution	9.06 counts/mm *(230.0 counts/inch)*	

1.1.3. Operating environment

The ***STIX*** is designed for use in industrial environments that are between -20°C and 50°C.

1.2. Definition of symbols

	Instructions to 'look here' or to 'see this part'
	Denotes movement. Instructing user to carry out action in a specified direction.
	Indicates alignment axis, can also indicate insertion or movement of parts.
	Alerts user that view has changed to a reverse angle.

1.3. Hardware

1.3.1. Included tools

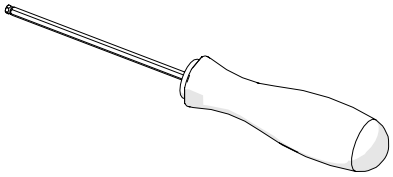


Fig. 1 - 3 mm hex driver

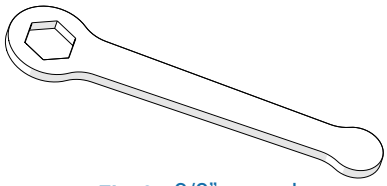


Fig. 2 - 3/8” wrench

The 3 mm hex driver *(Fig. 1)* is sufficient for all typical operations and adjustments of the ***STIX***. The 3/8” wrench *(Fig. 2)* is used to remove and install buttons on the probe holders.

1.3.2. Optional tools

Some specialized adjustments require tools that are not included with this kit.

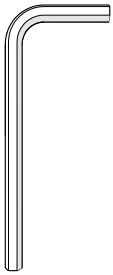


Fig. 3 - 1.5 mm hex wrench

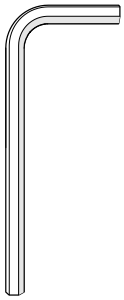


Fig. 4 - 2 mm hex wrench

Fig. 5 - 2.5 mm hex wrench

Fig. 6 - 3 mm hex wrench

1.3.3. Maintenance

General cleaning of components is important to keep your system working well. All components that have no wiring or cables are completely waterproof. Components can be washed with warm water, dish soap and a medium bristle brush.

Before using the scanner, ensure all connectors are free of water and moisture.

NOTE: *All components with wiring, cables or electrical connections are splash proof. However, these components are* ***NOT*** *submersible.*

NOTE: *Never use strong solvents or abrasive materials to clean your scanner components.*

2.1. Two Probe TOFD

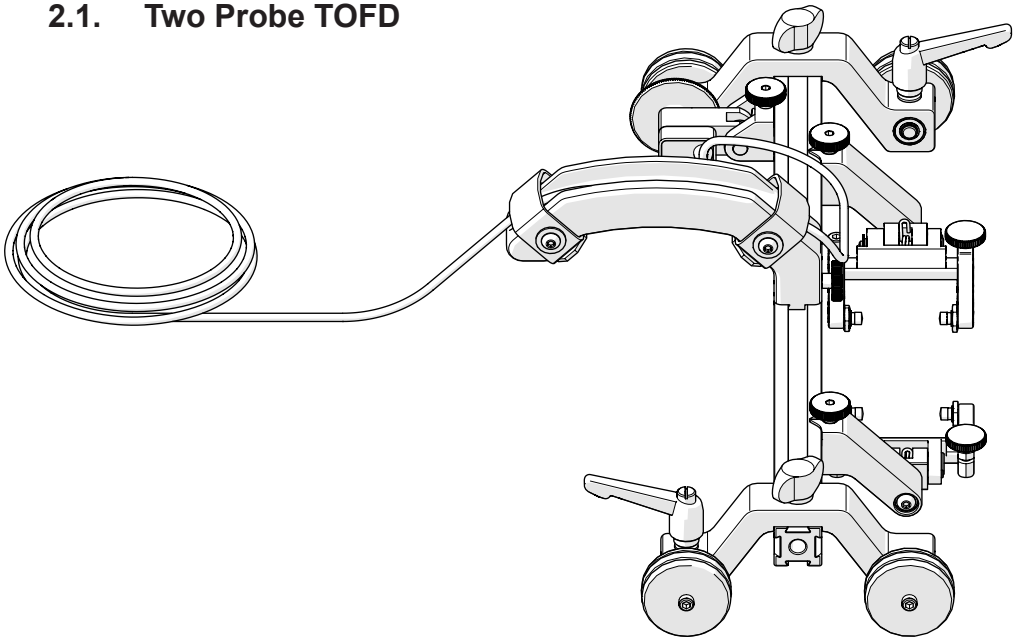


Fig. 7 - Two probe TOFD configuration

2.2. Two Probe TOFD Cantilever

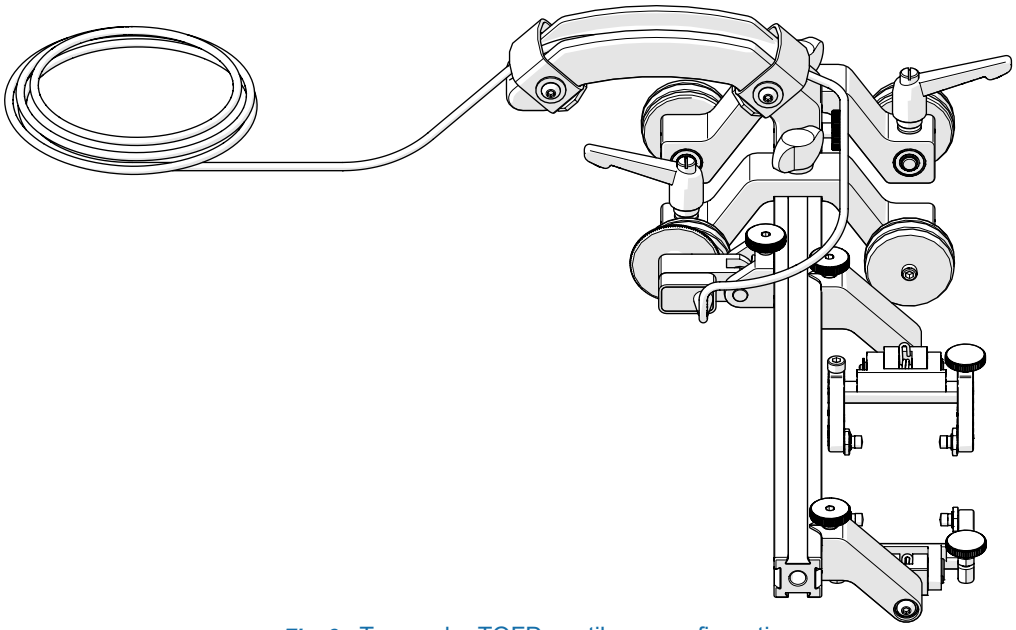


Fig. 8 - Two probe TOFD cantilever configuration

3.1. STIX setup on a scan surface

1. Mount TOFD wedges to the probe holders *(see Spring Loaded Probe Holder on page 11)*.

> ***TIP:*** *Mounting the wedges to the spring loaded probe holders can be easier when the probe holders are separate from the **STIX** frame bar.*

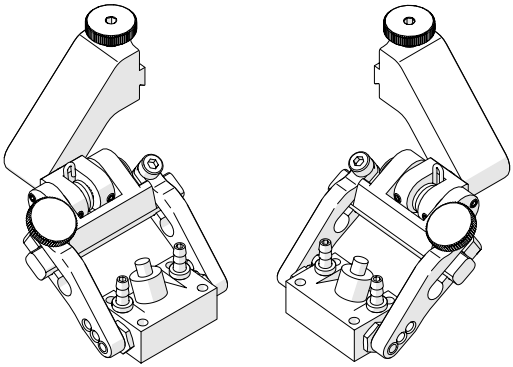


Fig. 9 - Mount wedges to probe holders

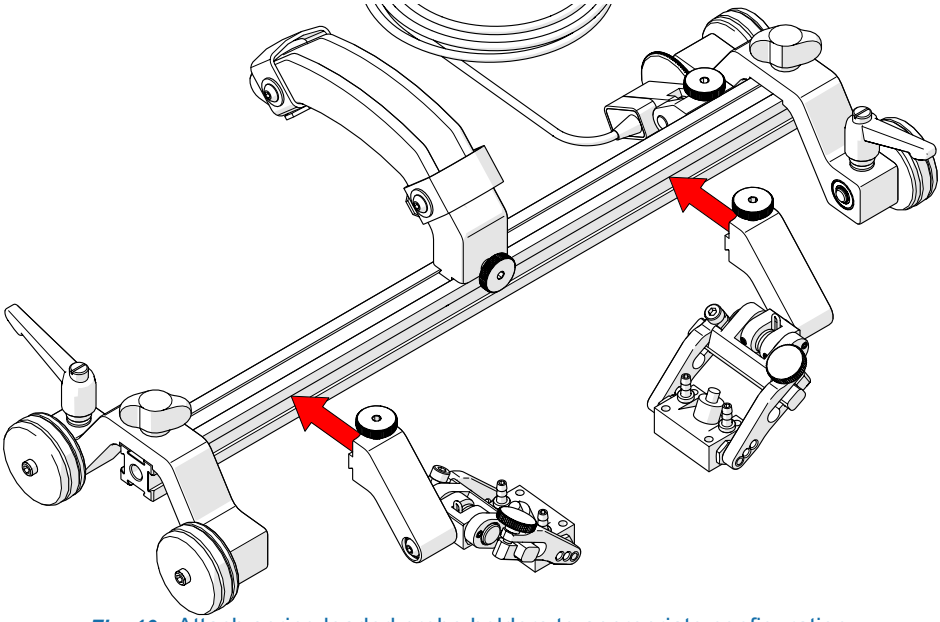


Fig. 10 - Attach spring loaded probe holders to appropriate configuration

2. Assemble the appropriate configuration *(Fig. 10)*. Attach the spring loaded probe holders to the frame bar where appropriate.
3. Ensure the brakes are locked on the wheel blocks *(see Ratchet Lever on page 9)*.

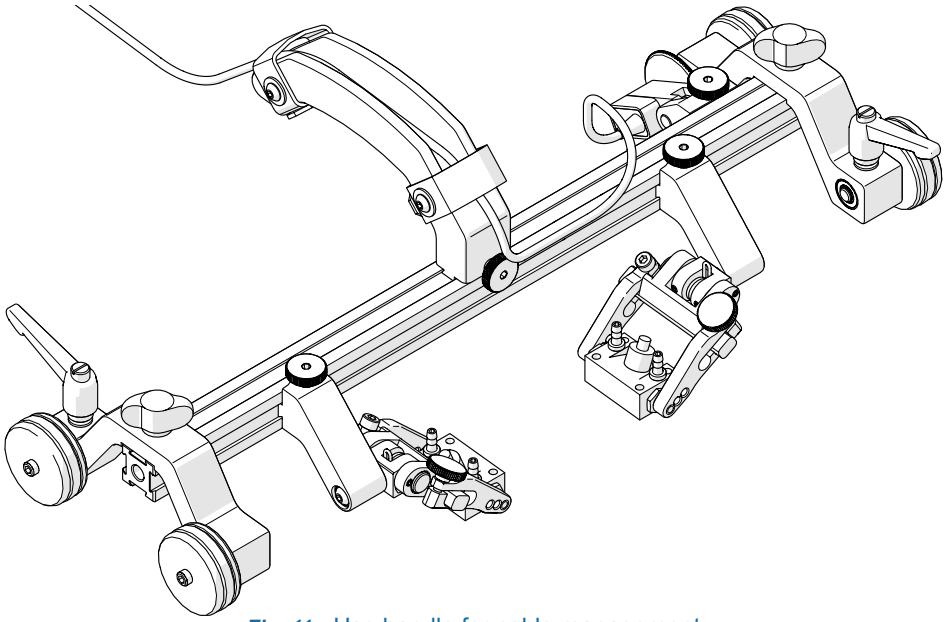


Fig. 11 - Use handle for cable management

4. Route cables and hoses through the handle *(Fig. 11)*.

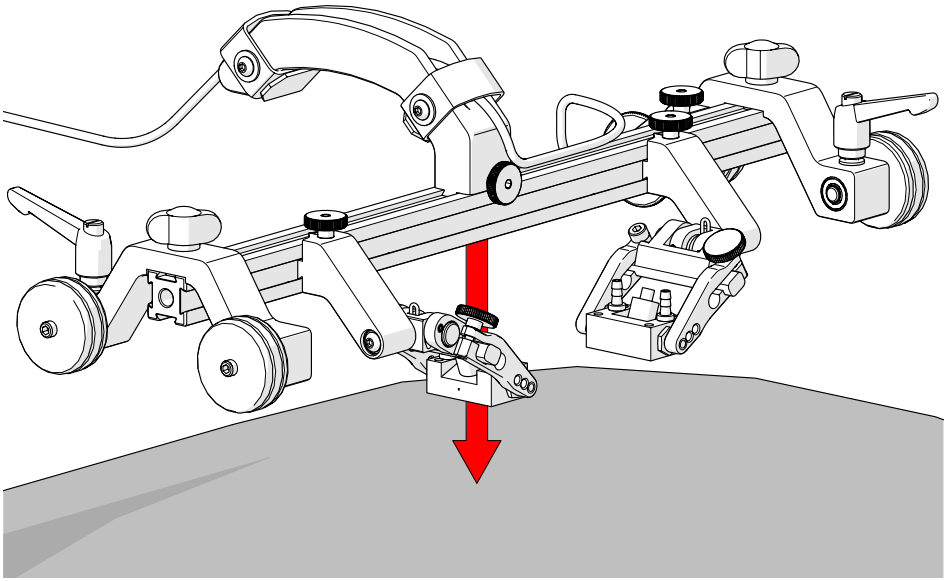


Fig. 12 - Place on scan surface

5. Place the configured ***STIX*** on the scan surface *(Fig. 12)*.

> ***TIP:*** *Use caution when placing equipment on the scan surface. The magnetized wheels can cause the assembly to lurch towards the metal suddenly.*

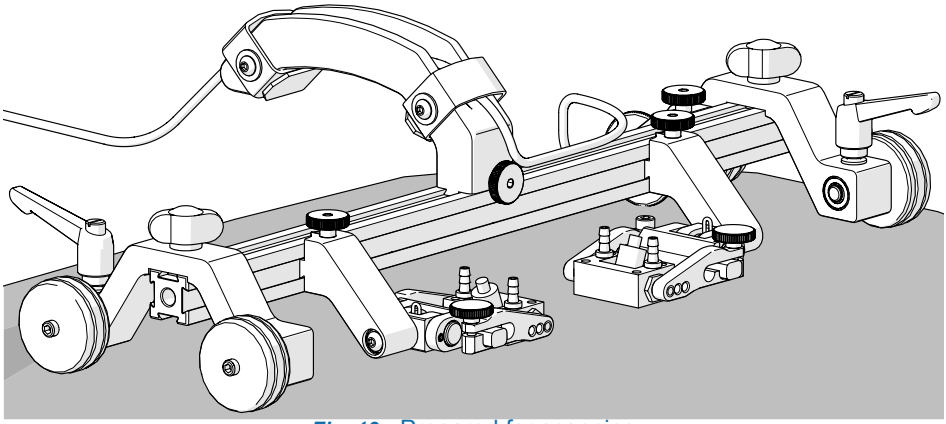


Fig. 13 - Prepared for scanning

6. The spring loaded probe holders are designed to maintain wedge contact with the scan surface *(Fig. 13)*, as well, the encoder is designed to maintain contact pressure on the scan surface for accurate reading.
7. Release the both brakes to begin scanning procedure.

4.1. Handle

Used to operate the scanner as well as provide a means of cable management. To install and setup the handle, follow these steps:

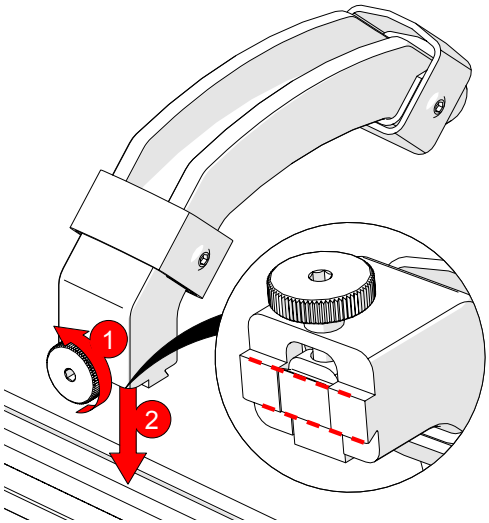


Fig. 14 - Attach handle to frame bar

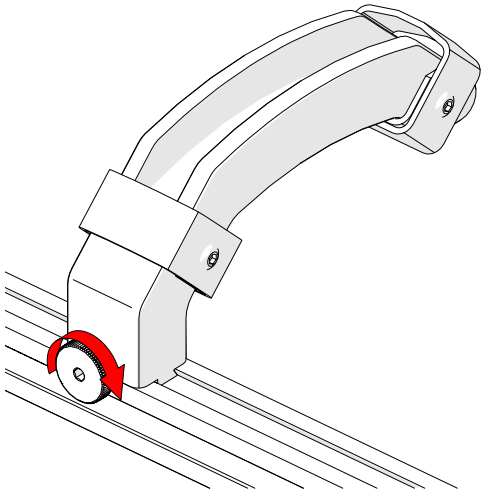


Fig. 15 - Tighten handle knob

1. Loosen the handle's knob and mount to a frame bar *(Fig. 14)*.
2. Tighten handle knob to fasten handle to the frame bar *(Fig. 15)*.

> ***TIP:*** *Slightly loosen handle knob and slide handle along frame bar for alternate placement when required.*

4. Open velcro straps and place cables and hoses in the handle *(Fig. 16)*. Reattach the velcro straps to secure cables and hoses within the handle.

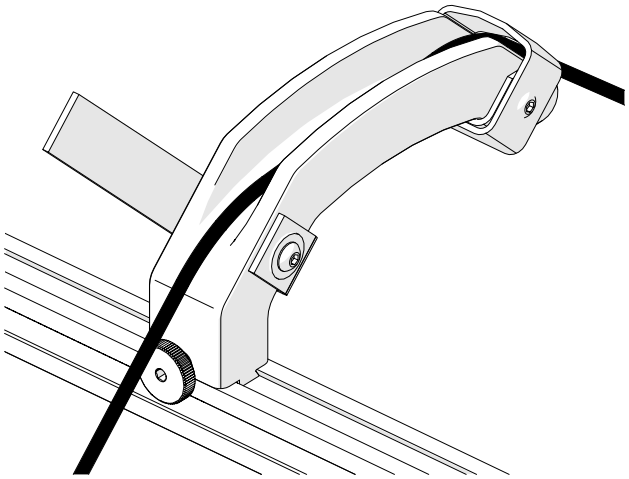


Fig. 16 - Handle provides cable management

4.2. Wheel Block

The wheel block provides stability and braking to the ***STIX*** system.

The ratchet lever located on the wheel block operates a brake *(see Ratchet Lever on page 9)*.

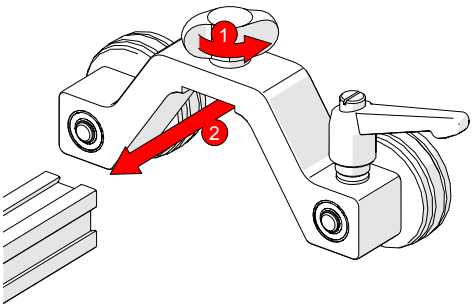


Fig. 17 - Attach to frame bar

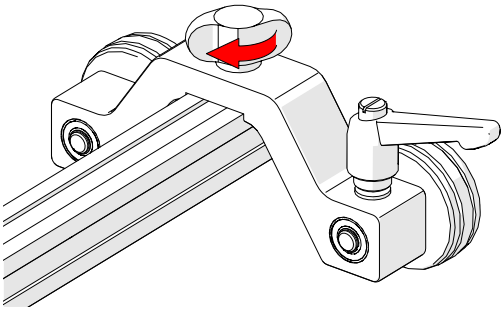


Fig. 18 - Tighten wing knob

Attach a wheel block by loosening the black wing knob and sliding the wheel block's dovetail nut onto a frame bar *(Fig. 17)*. Tighten the black wing knob *(Fig. 18)*.

4.2.1. Wheel Installation

1. Locate and position the threaded side of the magnetic wheel to the outside of the scanner.
2. Screw the magnetic wheel along the entire length of the axle.
3. Grip the magnetic wheel by hand and using the supplied 3mm hex driver *(Fig. 1)*, tighten the magnetic wheel to the axle *(Fig. 20)*.

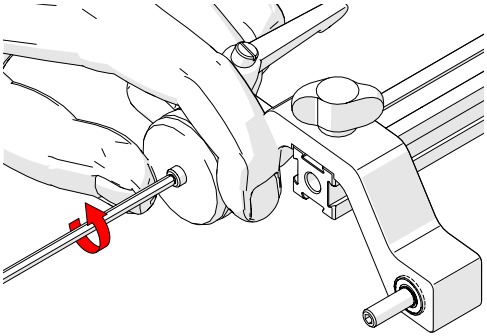


Fig. 20 - Wheel installation

4.2.2. Wheel Removal

1. Tightly grip the magnetic wheel to be removed. Using the 3mm hex driver, loosen the magnetic wheel from the axle *(Fig. 19)*.

TIP: *When the brake is engaged and the scanner is moved, the wheels may loosen from the axle. Grip the magnetic wheel tightly and retighten the axle with the 3 mm hex driver.*

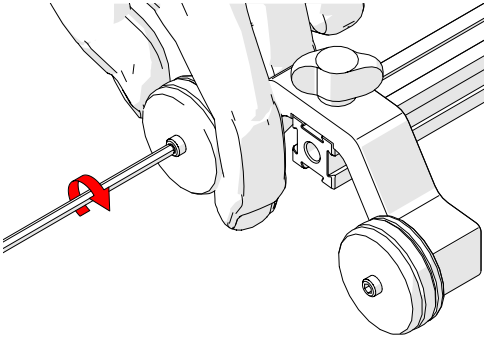


Fig. 19 - Wheel removal

WARNING! MAGNETIC MATERIAL. The stabilizer wheel uses a magnetic wheel. People with pacemakers or ICD's must stay at least 25 cm *(10")* away.

4.2.3. Ratchet Lever

The rachet levers lock the brakes of the ***STIX*** system. Occasionally, movement of the lever's locking position is required. The lever placement can be adjusted by following these steps:

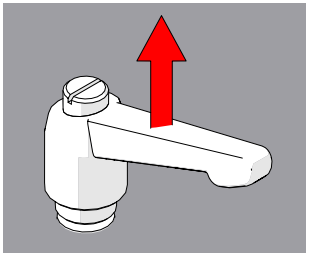


Fig. 21 - Pull ratchet handle

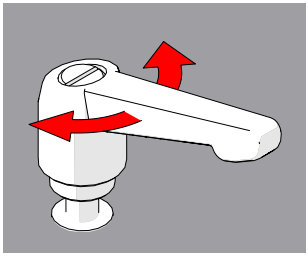


Fig. 22 - Rotate handle

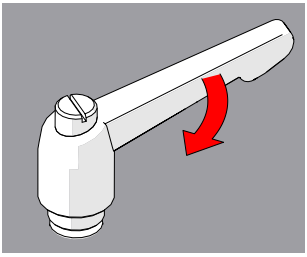


Fig. 23 - Tighten handle

1. Pull the ratchet lever away from the base of which it is connected *(Fig. 21)*.
2. Continue to pull while rotating the lever in the appropriate direction *(Fig. 22)*.
3. Release the lever and utilize the new tightening position *(Fig. 23)*.

4.3. Frame Bar

Frame bars *(Fig. 24)* are used to mount probe holders, probe positioning systems and other accessories *(see Frame Bars on page 23)*.

Frame bars are available in a variety of lengths.

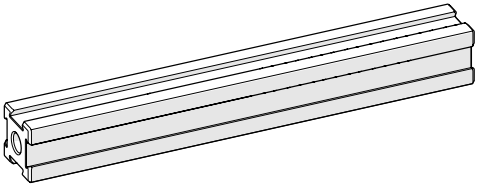


Fig. 24 - Frame bar

4.4. Encoder

The spring loaded encoder wheel provides vertical travel while maintaining contact pressure to the scan surface. To install the encoder follow these steps:

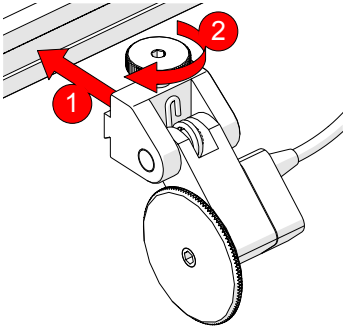


Fig. 25 - Attach to frame bar

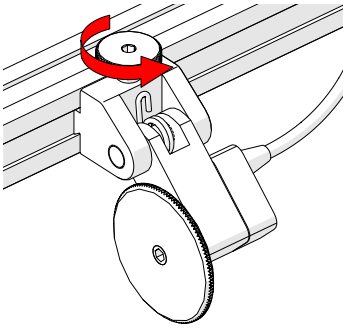


Fig. 26 - Tighten knob

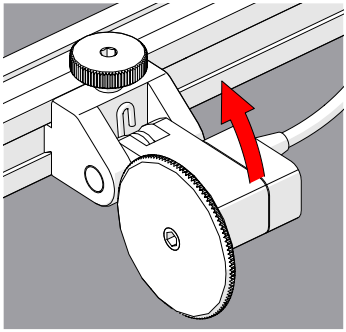


Fig. 27 - Place on scan surface

1. Loosen the encoder's dovetail jaw and mount to the frame bar *(Fig. 25)*.
2. Tighten the encoder knob *(Fig. 26)*.
3. Spring tension maintains encoder contact with the scan surface *(Fig. 27)*.

4.5. Pivot Buttons

Available in a variety of shapes and sizes fitting various wedge dimensions.

Use the supplied 3/8" wrench *(Fig. 2)* to remove and install pivot buttons *(Fig. 28)*.

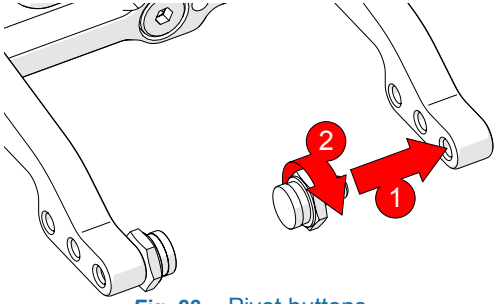


Fig. 28 - Pivot buttons

4.6. Spring Loaded Probe Holder

A	Frame Bar
B	Probe Holder Adjustment Knob
C	Yoke
D	Probe Holder Arm Adjustment Knob
E	Probe Holder Arm
F	Pivot Button
G	Arm Clamp Screw

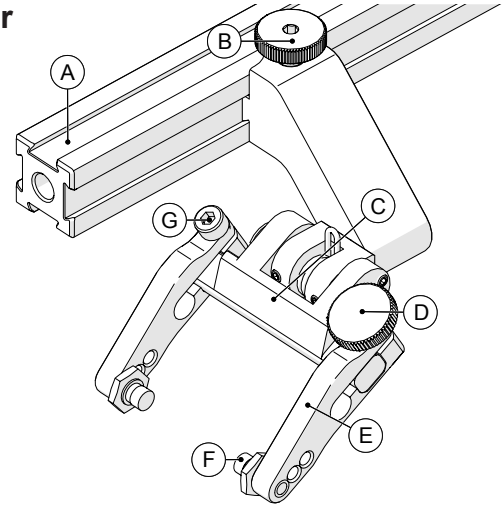


Fig. 29 - Spring loaded probe holder

4.6.1. Probe Holder Setup

To mount a TOFD wedge in the spring loaded probe holder, follow these steps:

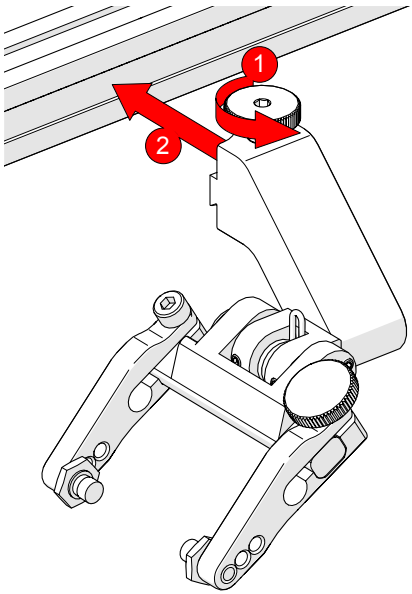


Fig. 30 - Attach to frame bar

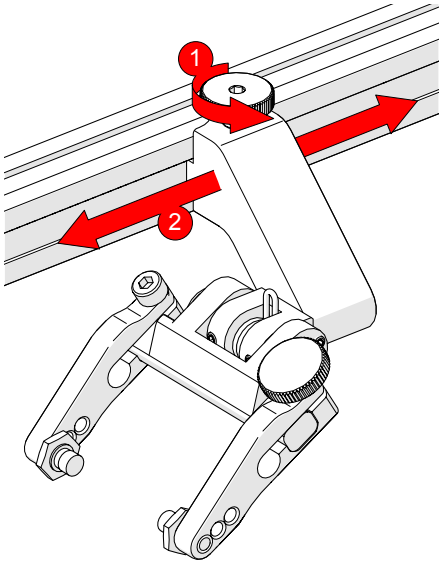


Fig. 31 - Position on frame bar

1. Rotate the probe holder adjustment knob and attach the probe holder to a frame bar *(Fig. 30)*.
2. Use the probe holder adjustment knob to position the probe holder along the frame bar *(Fig. 31)*.

TIP: *Wedge pivoting may be impeded when utilizing pivot buttons closer to the yoke. (see Pivot Buttons on page 10)*

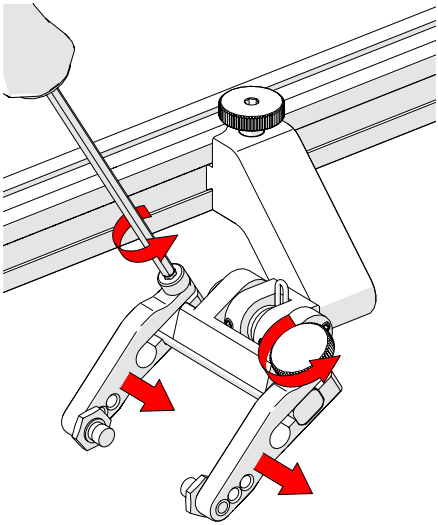


Fig. 32 - Adjust inner probe holder arm

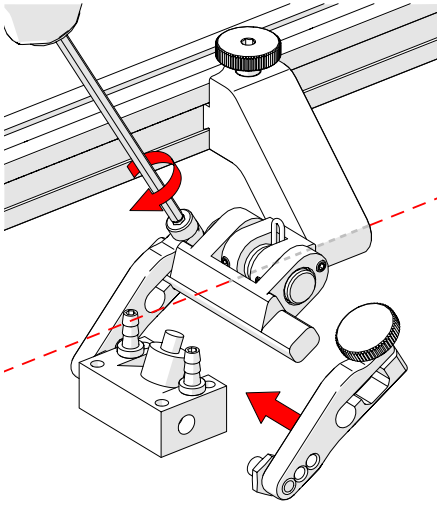


Fig. 33 - Place wedge and outer arm

4. Loosen the probe holder arm adjustment knob *(Fig. 32)* and remove outer probe holder arm from the yoke.
5. Adjust inner probe holder arm as required to best centre the probe on the yoke's pivot axis *(Fig. 32)*.

TIP: *The probe holder yoke can accommodate different probe and wedge sizes of varying widths. It is best to centre the wedge with the yoke's pivot axis to reduce wedge tipping when scanning. Position the inner probe holder arm accordingly with the centre of the yoke (Fig. 33).*

6. Position the wedge on the inner probe holder arm *(Fig. 33)*.
7. Slide outer probe holder arm along the yoke pinching the wedge in place *(Fig. 33)*.
8. Tighten the probe holder arm adjustment knob *(Fig. 34)*.

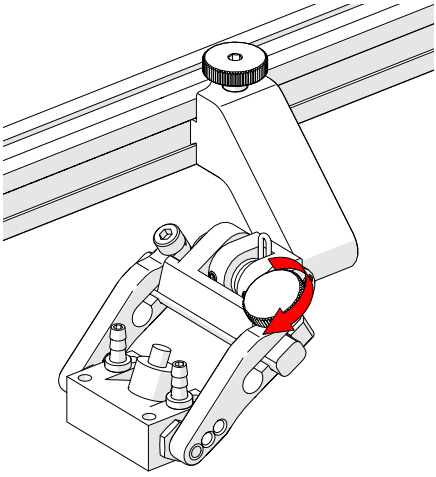


Fig. 34 - Tighten probe holder knob

4.7. Magnetic Wheel Kit

WARNING! MAGNETIC MATERIAL. The magnetic wheel kit produce a magnetic field which may cause failure or permanent damage to items such as watches, memory devices, CRT monitors, medical devices or other electronics. People with pacemakers or ICD's must stay at least 25 cm *(10")* away.

Two sets of the magnetic wheels can be used with the ***STIX***, thus doubling the magnetic force.

NOTE: *Magnetic wheels may lose their magnetic properties if heated above 175°F (80° C).*

To install additional magnetic wheels, follow these steps:

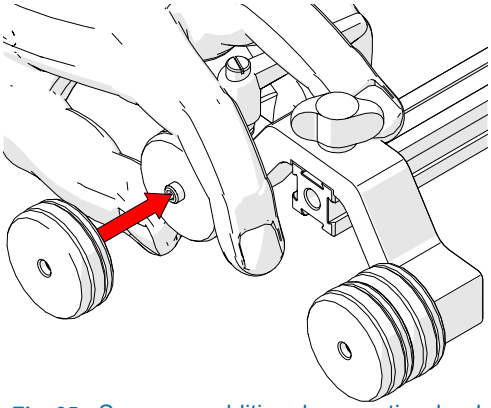


Fig. 35 - Screw on additional magnetic wheel

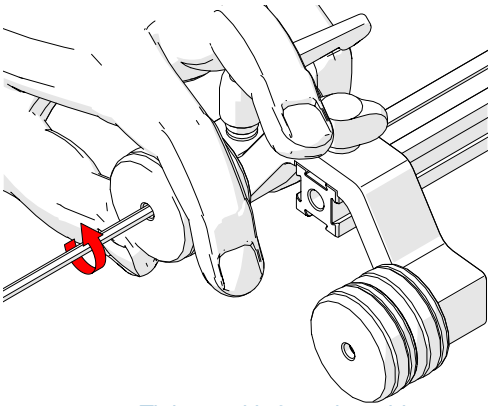


Fig. 36 - Tighten with 3mm hex driver

1. Ensure the four existing wheels are tight *(see Wheel Installation on page 8)*
2. On the magnetic wheel to be attached, locate the threaded side of the magnetic wheel, orient this threaded side towards the scanner.
3. By hand, grip the wheel already attached to the wheel block. Overcome the magnetic resistance to screw the additional wheel to the axle of the wheel block *(Fig. 35)*.
4. Hold steady the magnetic wheel closest to the scanner body, insert the 3mm hex driver into the axle and tighten the additional wheel *(Fig. 36)*.

TIP: *To remove additional wheels, reverse these steps.*

4.8. Pre-Amp Bracket

The pre-amp bracket mounts to any dovetail groove to hold a pre-amp. Compatible with most standard pre-amps, use the adjustable screw mounting channel on the bottom of the bracket to attach a pre-amp. The pre-amp bracket may also be ordered with velcro straps which are used to hold the pre-amp.

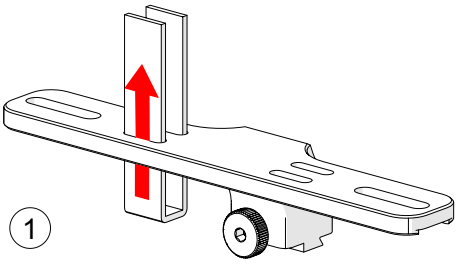


Fig. 37 - Insert velcro straps

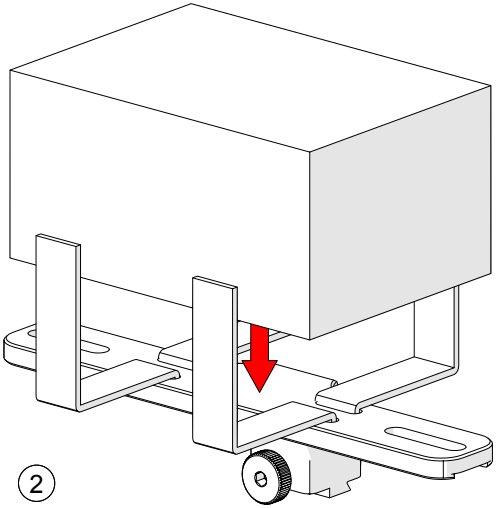


Fig. 38 - Place pre-amp and wrap velcro

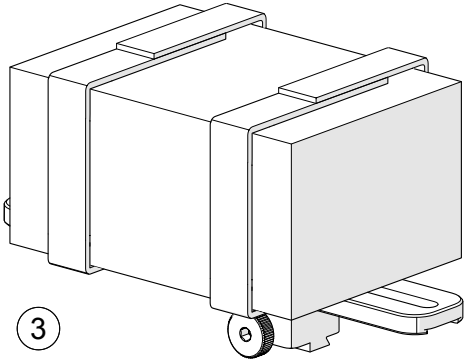


Fig. 39 - Mount bracket on a frame bar

5. Troubleshooting

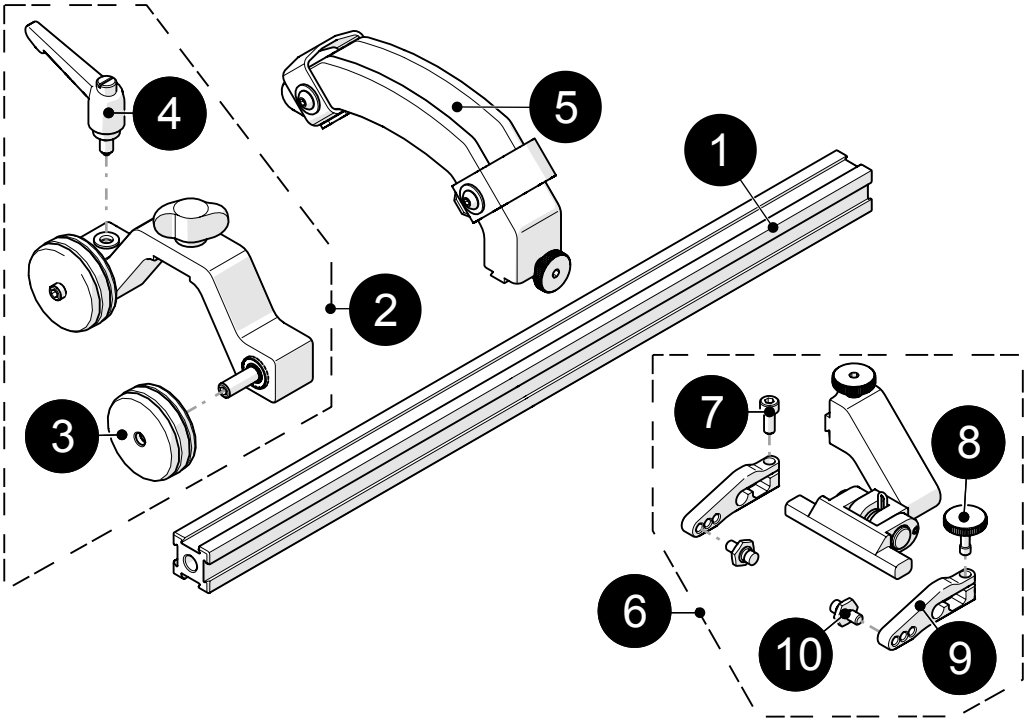
Problem	Possible Cause	Solution
1. Encoder not functioning.	Instrument not properly setup.	Refer to instrument's documentation regarding proper setup.
	Issue with encoder.	Contact Jireh Industries for repair *(see Jireh Industries Ltd. on page i).*
2. Insufficient probe contact.	Scanner not set properly.	Reconfigure the scanner as per instructions *(see Spring Loaded Probe Holder on page 11).*
3. Magnetic wheels become loose.	Brakes are engaged.	Ensure the brakes are unlocked when using the scanner *(see Wheel Block on page 8).*

6. Spare Parts

To order accessories or replacement parts for your ***STIX*** system.
(contact Jireh Industries Ltd. on page i)

NOTE: *These drawings are for parts order. This is not a list of kit contents.*

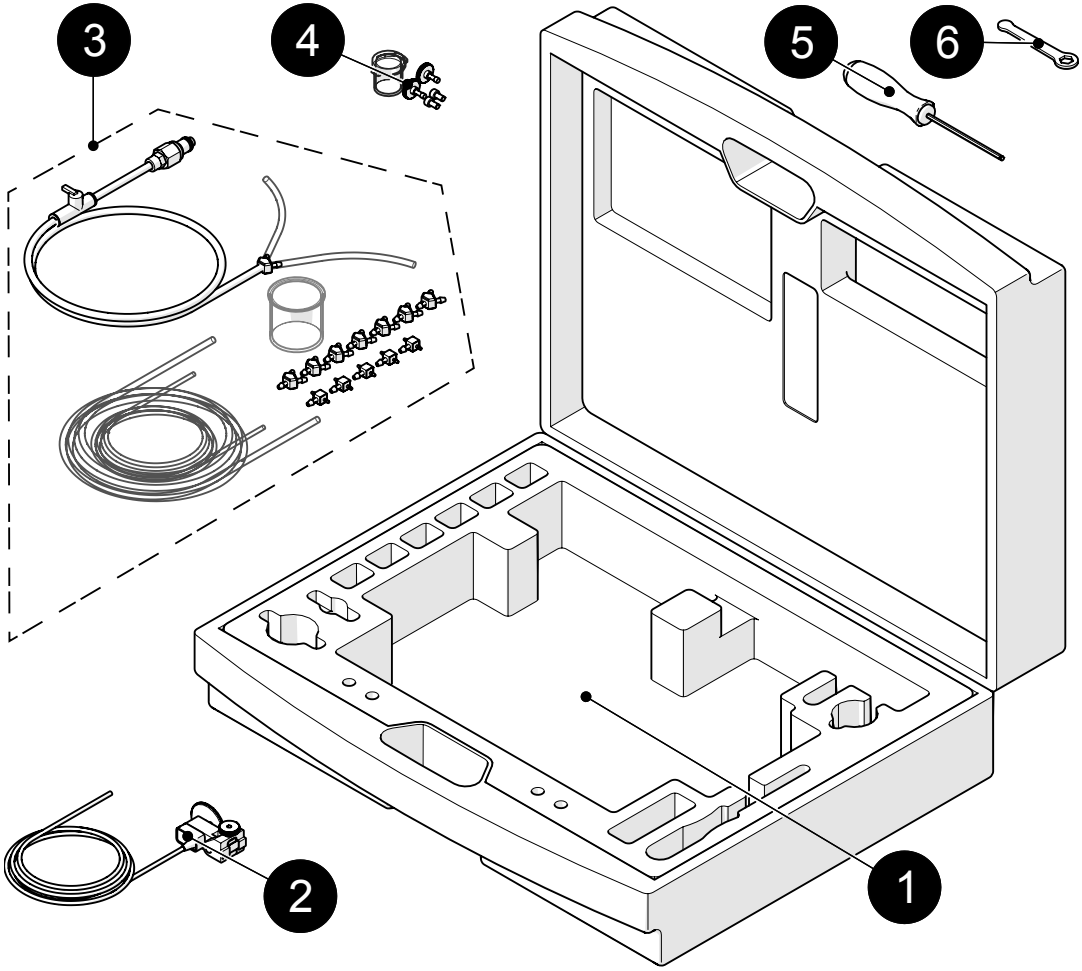
6.1. Scanner



BOM ID	Part #	Description
1	BG0038-35	Frame Bar, 35cm
2	BGS056	Wheel Block
3	BTS031	Magnetic Wheel
4	BTS018	Brake Handle
5	BGS054	Handle
6	PHS033-X-Y	Spring Loaded Probe Holder *(see 6.5.4, Y=L,R)*
7	MD050-010	Arm Clamp Screw, SHCS, M4x0.7 X 10mm, SST
8	PH0082	Probe Holder Arm Adjustment Knob
9	SEE 6.5.1	Arm Style
10	PH0011-X	Pivot Button Style *(see 6.5.4)*

Fig. 40 *- Scanner body parts*

6.2. Kit Components



BOM ID	Part #	Description
1	BGA010	Stix Case, TOFD
2	BGS053-X	Encoder *(see 6.2.1)*
3	CMG007	Irrigation Kit, 2-4 Probe
4	PHG014	Probe Holder Spare Parts
5	EA414	3mm Hex Driver
6	EA470	3/8'' Wrench

Fig. 41 - Stix kit components

6.2.1. Encoder Connector Style

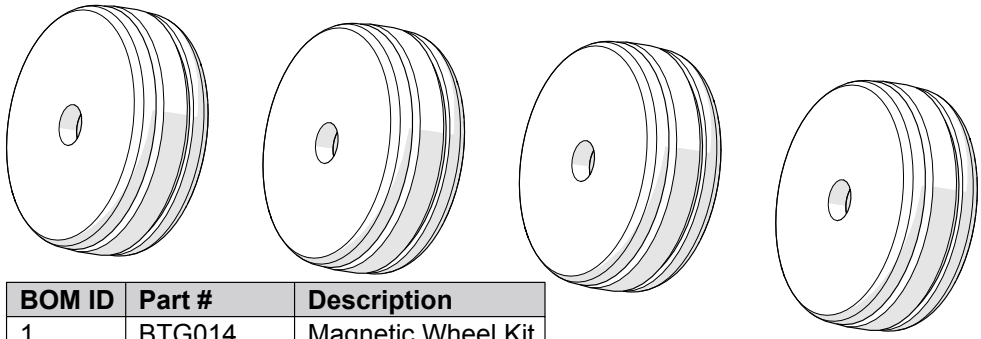
Connector Type	Company/Instrument	Connector Type	Company/Instrument
B	Olympus - OmniScan MX / Zetec - ZIRCON, TOPAZ	G	Sonotron - Isonic
C	Olympus - Focus LT / Zetec Z-Scan	M	GE - USM Vision
D	Olympus - OmniScan MX2, OmniScan SX	U	Sonatest - VEO, PRISMA
F	TD - Focus Scan, Handy Scan, Pocket Scan	V	Pragma PAUT 16/128, PragmaLite

Fig. 42 - Umbilical style

***NOTE:** Additional encoder connector styles available. (contact Jireh Industries Ltd. on page i)*

6.3. Accessories

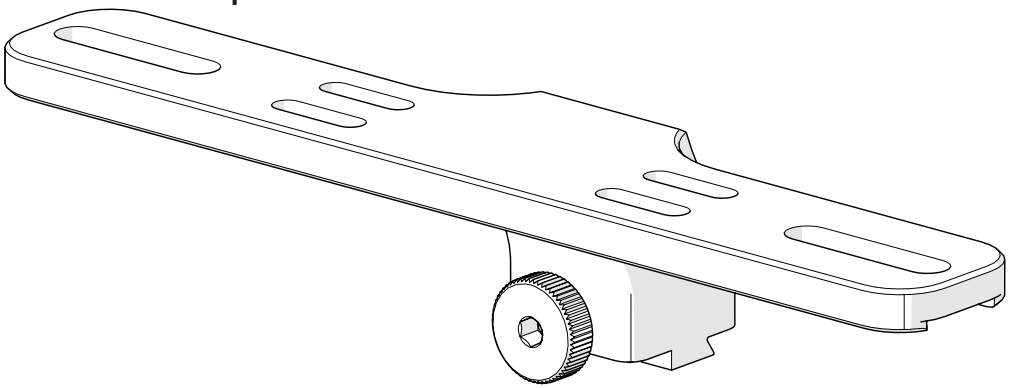
6.3.1. Magnetic Wheel Kit



BOM ID	Part #	Description
1	BTG014	Magnetic Wheel Kit

Fig. 43 - Magnetic wheel kit

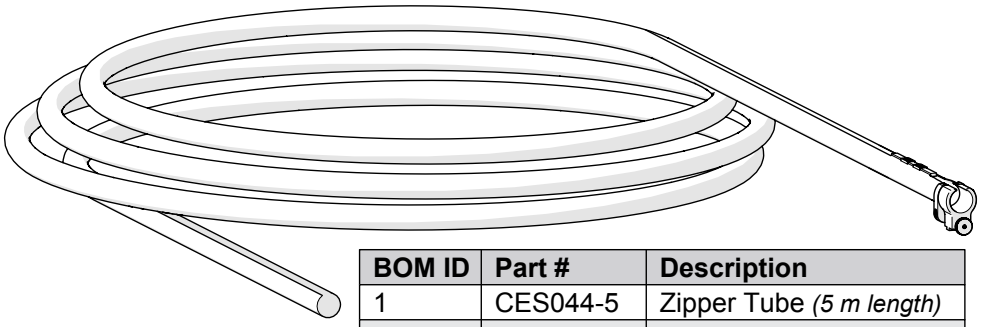
6.3.2. Pre-Amp Bracket



BOM ID	Part #	Description
1	CES029	Pre-Amp Bracket
2	CES029-V	Pre-Amp Bracket with Velcro

Fig. 44 - Pre-amp bracket

6.3.3. Zipper Tube

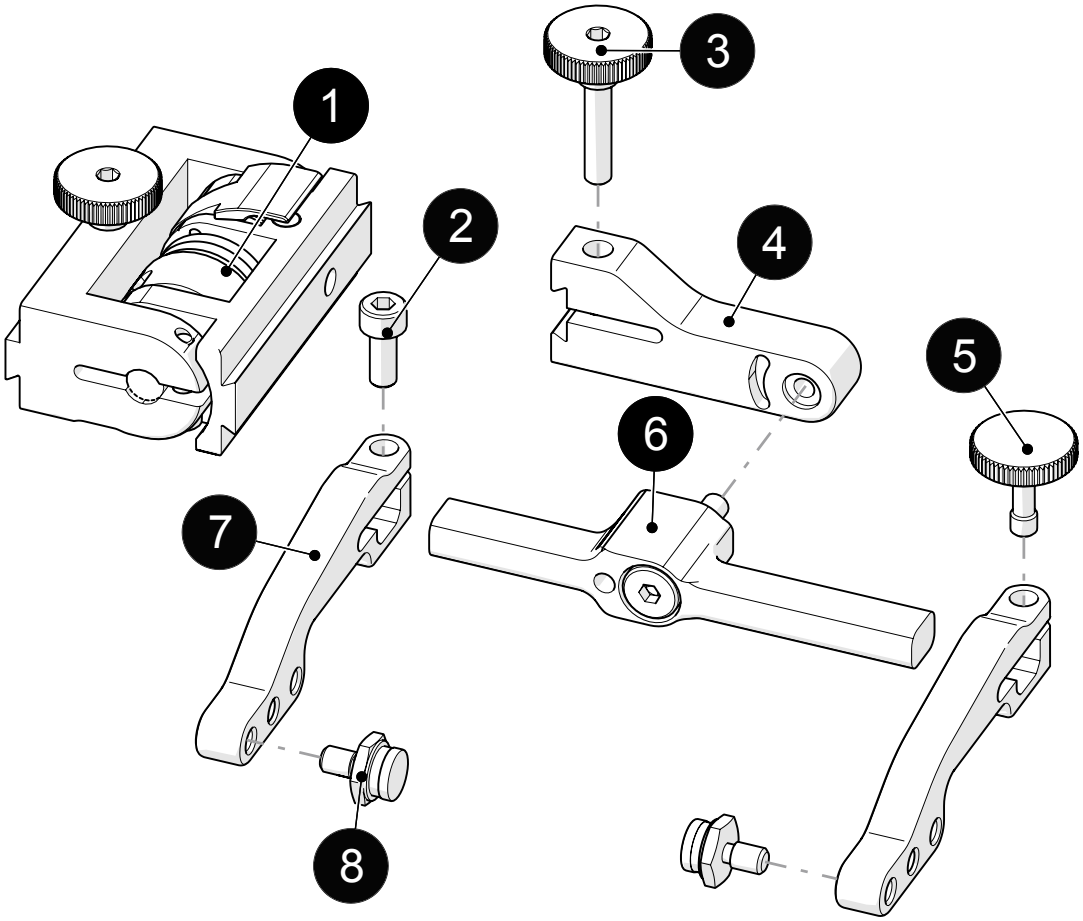


BOM ID	Part #	Description
1	CES044-5	Zipper Tube *(5 m length)*
1	CES044-10	Zipper Tube *(10 m length)*

***Fig. 45** - Zipper tube*

6.4. Probe Holders

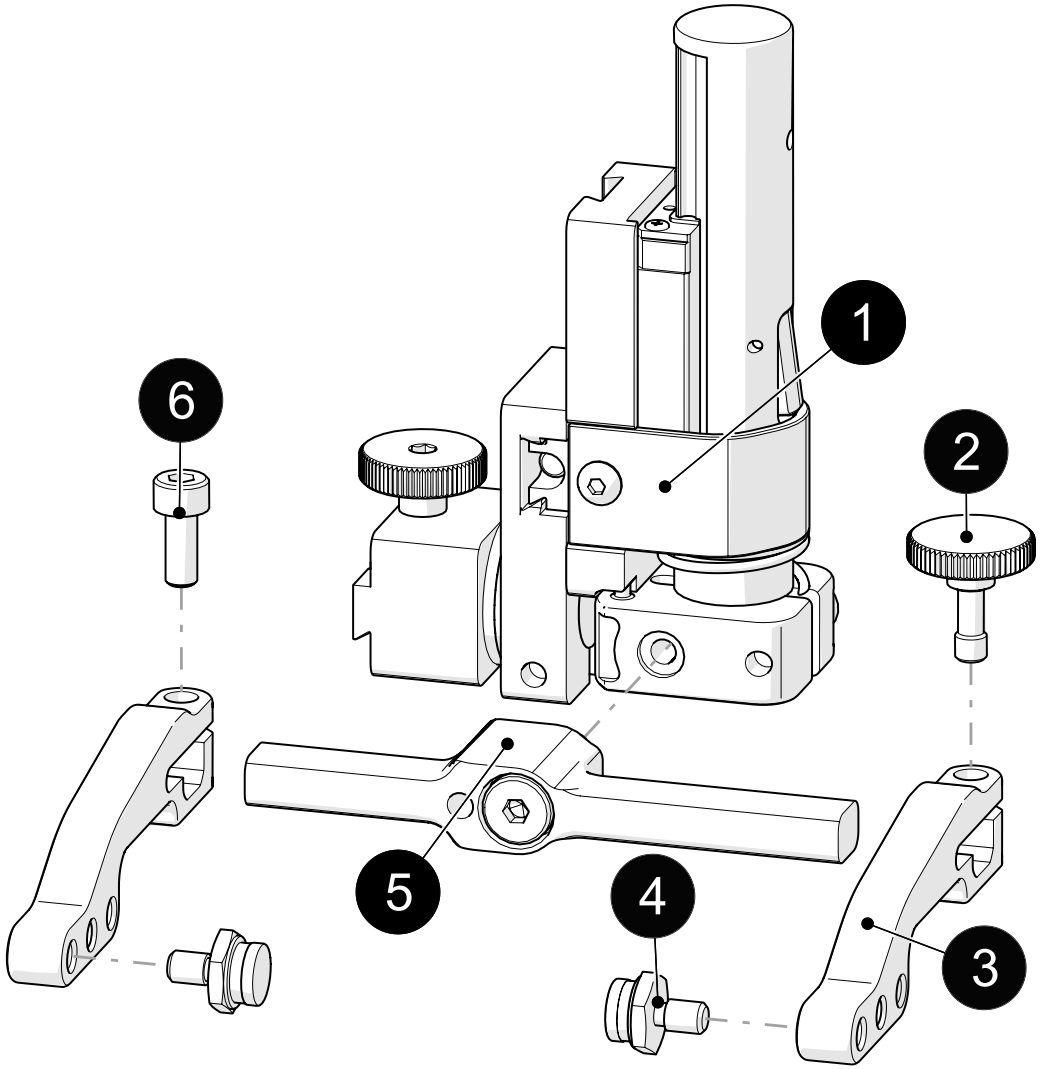
6.4.1. Slip Joint Probe Holder Parts



BOM ID	Part #	Description
1	PHS022	Slip Joint Probe Holder Subassembly
2	MD050-010	Arm Clamp Screw, SHCS, M4x0.7 X 10mm, SST
3	PH0104	Swing Arm Knob
4	PH0100	Swing Arm
5	PH0082	Probe Holder Arm Adjustment Knob
6	SEE 6.5.3	Yoke Style
7	SEE 6.5.2	Arm Style
8	PH0011-X	Pivot Button Style, (*See 6.5.4)*

***Fig. 46** - Slip joint probe holder parts*

6.4.2. Vertical Probe Holder Parts



BOM ID	Part #	Description
1	PHS028	Vertical Probe Holder Subassembly
2	PH0082	Probe Holder Arm Adjustment Knob
3	SEE 6.5.2	Arm Style
4	PH0011-X	Pivot Button Style, (*See 6.5.4)*
5	SEE 6.5.3	Yoke Style
6	MD050-010	Arm Clamp Screw, SHCS, M4x0.7 X 10mm, SST

***Fig. 47** - Vertical probe holder parts*

6.5. Probe Holder Components

6.5.1. Spring Loaded Arm Style

	Arm Style	Part #			Arm Style	Part Number	
A	Standard	PH0090		B	Short	PH0089	

Fig. 48 - Spring loaded probe holder arm selection

6.5.2. Slip Joint and Vertical Probe Holder Arm Style

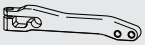
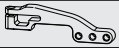
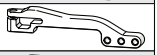
	Arm Style	Part #			Arm Style	Part Number	
A	Standard	PH0090		B	Short	PH0089	
C	Long	PH0099		D	Standard, Drop	PH0093	
E	Short, Drop	PH0092		F	Long, Drop	PH0094	
G	Standard, Extra-Drop	PH0096		H	Short, Extra-Drop	PH0095	

Fig. 49 - Slip joint and vertical probe holder arm selection

6.5.3. Slip Joint & Vertical Probe Holder Yoke Style

	Yoke Style	Part #	Length			Yoke Style	Part #	Length	
S	Standard	PHS017	6.27cm (2.470")		W	Wide	PHS027	7.78cm (3.064")	

Fig. 50 - Slip joint and vertical probe holder arm selection

6.5.4. Pivot Button Style

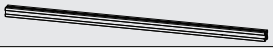
	Pivot Hole Size	Wedge Type			Pivot Hole Size	Wedge Type	
01	8.0mm (0.315")	Olympus PA		02	5.0mm (0.197")	Olympus TOFD	
03	2.7mm (0.106")	Sonatest DAAH PA		04	9.5mm (0.375")	-	
06	3.0mm (0.118")	-		07	2.3mm (0.090")	-	
08	Conical Head	-		09	5mm (0.197") Internal	Zetec PA/TOFD	

Fig. 51 - Probe holder button selection

***NOTE:** Additional probe holder pivot button types available. (contact Jireh Industries Ltd. on page i)*

6.6. Variable Components

6.6.1. Frame Bars

Part #	Length	
BG0038-05	5cm (1.969”)	
BG0038-15	15cm (5.906”)	
BG0038-25	25cm (9.843”)	
BG0038-35	35cm (13.780”)	
BG0038-45	45cm (17.717”)	
BG0038-55	55cm (21.654”)	

Part #	Length	
BG0038-10	10cm (3.937”)	
BG0038-20	20cm (7.874”)	
BG0038-30	30cm (11.811”)	
BG0038-40	40cm (15.748”)	
BG0038-50	50cm (19.685”)	

Fig. 52 - Frame bar selection

7. Limited Warranty

WARRANTY COVERAGE

Jireh Industries warranty obligations are limited to the terms set forth below: Jireh Industries Ltd. (“Jireh”) warrants this hardware product against defects in materials and workmanship for a period of THREE (3) YEARS from the original date of purchase. If a defect exists, at its option Jireh will (1) repair the product at no charge, using new or refurbished replacement parts, (2) exchange the product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product, or (3) refund the purchase price of the product. A replacement product/part assumes the remaining warranty of the original product or ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you. When a product or part is exchanged, any replacement item becomes your property and the replaced item becomes Jireh’s property. When a refund is given, your product becomes Jireh’s property.

OBTAINING WARRANTY SERVICE

To utilize Jireh’s warranty service you must ship the product, at your expense, to and from Jireh Industries. Before you deliver your product for warranty service you must phone Jireh and obtain an RMA number. This number will be used to process and track your product. Jireh is not responsible for any damage incurred during transit.

EXCLUSIONS AND LIMITATIONS

This Limited Warranty applies only to hardware products manufactured by or for Jireh Industries. This warranty does not apply: (a) to damage caused by accident, abuse, misuse, misapplication, or non-Jireh products; (b) to damage caused by service (including upgrades and expansions) performed by anyone who is not an Jireh Authorized Service Provider; (c) to a product or a part that has been modified without the written permission of Jireh.

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