MAGTROL

ATK-25

ALIGNMENT TOOL KIT

USER MANUAL

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Please record all model numbers and serial numbers of your Magtrol equipment, along with the general purchase information. The model number and serial number can be found on either a silver identification plate or white label affixed to each unit. Refer to these numbers whenever you communicate with a Magtrol representative about this equipment.

Model Number : _____

Serial Number : _____

Purchase Date : _____

Purchased From : _____

1st English Edition rev. A | May 2025

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PREFACE

PURPOSE OF THIS MANUAL

This manual contains all the information required for the setup and general use of Magtrol's ATK-25 Alignment Tool Kit. To achieve maximum capability and ensure proper use, please read this manual in its entirety before use. Keep the manual in a safe place for quick reference whenever a question should arise.

WHO SHOULD USE THIS MANUAL

This is written for operators who are going to use the ATK-25 Alignment Tool Kit in conjunction with any Magtrol Hysteresis, Eddy-Current or Powder Brake Dynamometer.

MANUAL ORGANIZATION

This section gives an overview of the structure of the manual and the information contained within it. Some information has been deliberately repeated in different sections of the document to minimize cross-referencing and to facilitate understanding through reiteration.

The structure of the manual is as follows:

Chapter 1: INTRODUCTION – Contains the technical data sheet for the ATK-25 Alignment Tool Kit, which describes the unit and provides its technical characteristics.

Chapter 2: INSTALLATION / CONFIGURATION – Provides setup options for the ATK-25 Alignment Tool Kit.

Chapter 3: OPERATION – Provides operating instructions for the ATK-25 Alignment Tool Kit.

CONVENTIONS USED IN THIS MANUAL

The following symbols and type styles may be used in this manual to highlight certain parts of the text:

NOTICE

Indicates information considered important but not hazard related.

This is intended to draw the operator's attention to complementary information or advice relating to the subject being treated. It introduces information enabling the correct and optimal function of the product.

CAUTION

INDICATES A HAZARDOUS SITUATION THAT, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY.

THIS IS ALSO USED TO DRAW THE OPERATOR'S ATTENTION TO INFORMATION, DIRECTIVES, PROCEDURES, ETC. WHICH, IF IGNORED, MAY RESULT IN DAMAGE TO THE MATERIAL BEING USED. THE ASSOCIATED TEXT DESCRIBES THE NECESSARY PRECAUTIONS TO TAKE AND THE CONSEQUENCES THAT MAY ARISE IF THESE PRECAUTIONS ARE IGNORED.

WARNING

INDICATES A HAZARDOUS SITUATION THAT, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.

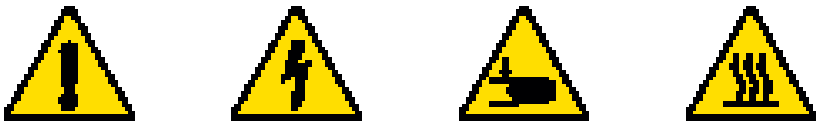
THIS INTRODUCES DIRECTIVES, PROCEDURES, PRECAUTIONARY MEASURES, ETC. WHICH MUST BE EXECUTED OR FOLLOWED WITH THE UTMOST CARE AND ATTENTION, OTHERWISE THE PERSONAL SAFETY OF THE OPERATOR OR THIRD PARTY MAY BE AT RISK. THE READER MUST ABSOLUTELY TAKE NOTE OF THE ACCOMPANYING TEXT, AND ACT UPON IT, BEFORE PROCEEDING FURTHER.

DANGER

INDICATES A HAZARDOUS SITUATION THAT, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY. THE SIGNAL WORD «DANGER» IS TO BE LIMITED TO THE MOST EXTREME SITUATIONS.

THIS INTRODUCES DIRECTIVES, PROCEDURES, PRECAUTIONARY MEASURES, ETC. WHICH MUST BE EXECUTED OR FOLLOWED WITH THE UTMOST CARE AND ATTENTION, OTHERWISE THE PERSONAL SAFETY OF THE OPERATOR OR THIRD PARTY MAY BE AT RISK. THE READER MUST ABSOLUTELY TAKE NOTE OF THE ACCOMPANYING TEXT, AND ACT UPON IT, BEFORE PROCEEDING FURTHER.

The safety symbol may subsequently vary depending on the source of the hazard. Below are examples:



Various safety pictograms according to ISO 7010

1. INTRODUCTION

1.1 DATASHEET

ATK-25
ALIGNMENT TOOL KIT

FEATURES

- Unique shaft alignment solution, specially designed for small equipment
- Works in crowded or constrained locations where other tools will not fit
- Measures parallel and angular alignment, for correction of pitch, yaw, vertical, and horizontal positioning
- For shaft sizes: Ø5 ... Ø25 mm (also suitable for Ø3/16 in ... Ø1 in)
- User friendly design

Fig. 1: ATK-25 Alignment Tool Kit

DESCRIPTION

Alignment is critical for rotating equipment. Poor alignment can cause:

- **Excessive Vibration:** Misaligned shafts lead to higher vibrations, which can result in mechanical failure or decreased performance
- **Increased Wear and Tear:** Bearings, seals, and couplings can experience premature wear due to the additional forces exerted by misaligned shafts
- **Equipment Failure:** Continuous operation with misaligned shafts can lead to mechanical failure, resulting in costly repairs and downtime
- **Reduced Quality:** In many industries, precision machinery is critical to maintaining product quality.

Fig. 2: ATK-25 Components

Proper alignment tools and techniques provide major benefits, and are essential to achieving:

- Smooth operation, with the lowest noise and highest performance
- Long lifespan of component parts and minimum maintenance costs
- Reliable Operation, with the minimum downtime
- High production quality

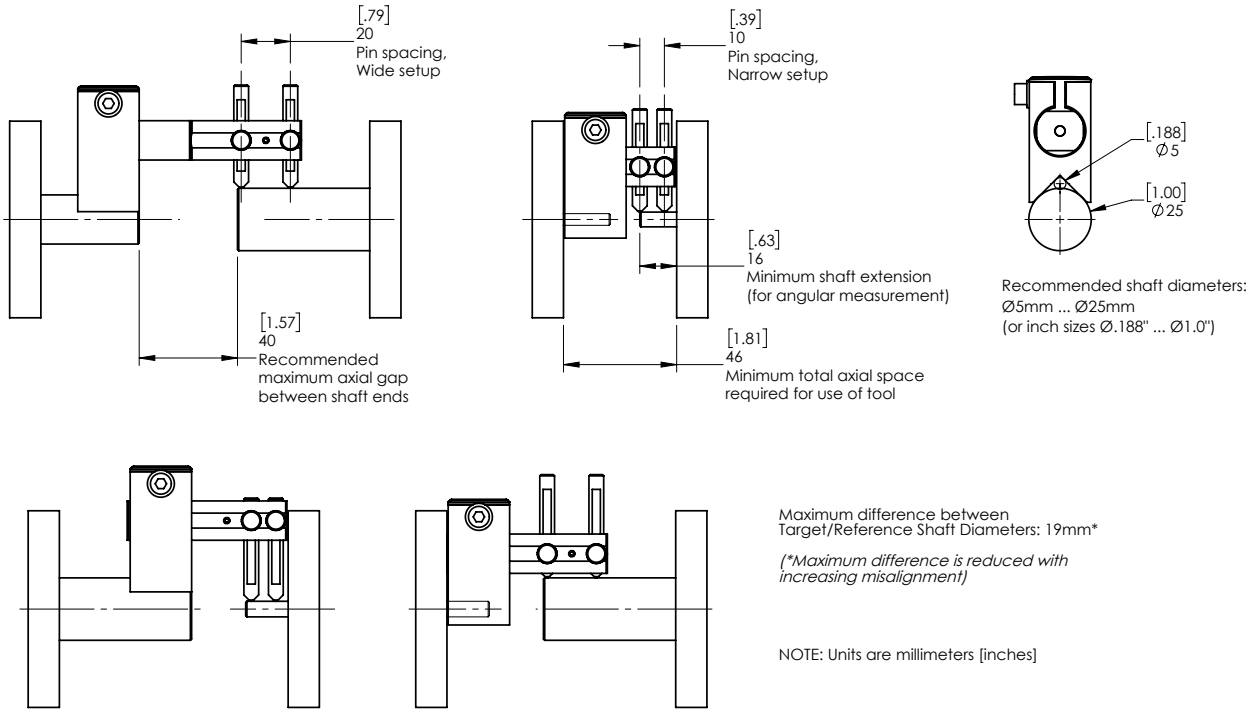
Motor testing also requires good shaft alignment to produce the most accurate and consistent results. Unfortunately, the shaft alignment solutions widely available are not designed for use with smaller equipment.

The ATK-25 is designed to solve shaft alignment issues for small to medium sized rotating equipment. The ATK needs little setup, does not clamp to the shafts, and easily fits into tightly constrained spaces.

Held on the V-block of one shaft, the ATK measures two tangent points on the target shaft. From those two measurements, angle can be determined from rise-over-run. Parallel position can be determined by measuring the target shaft on two sides, 180° opposite.

The ATK-25 includes attachments to accommodate a range of axial spacings between shaft ends. It includes a high-quality depth indicator, and is supplied in a durable, fitted case with all necessary tools.

MOUNTING EXAMPLES



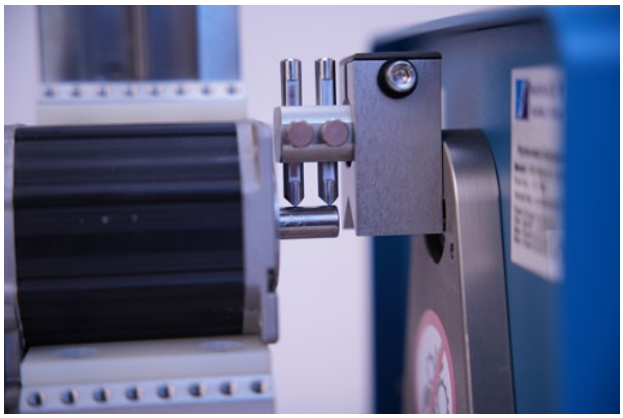


Fig. 3: Measuring alignment between an HD-500 Dynamometer and a small servo motor with a Ø3/8" output shaft.

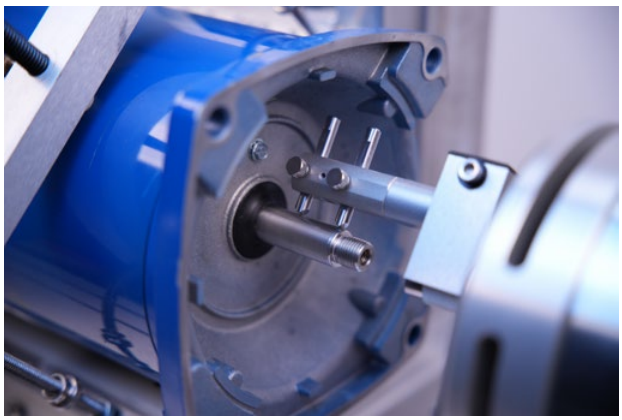


Fig. 4: Measuring alignment of a motor with an extended flange. The ATK can be used in tightly constrained spaces.

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ISO 9001 BUREAU VERITAS Certification

ATK-25 - US 05/2025

2. INSTALLATION / CONFIGURATION

2.1 COMPONENTS

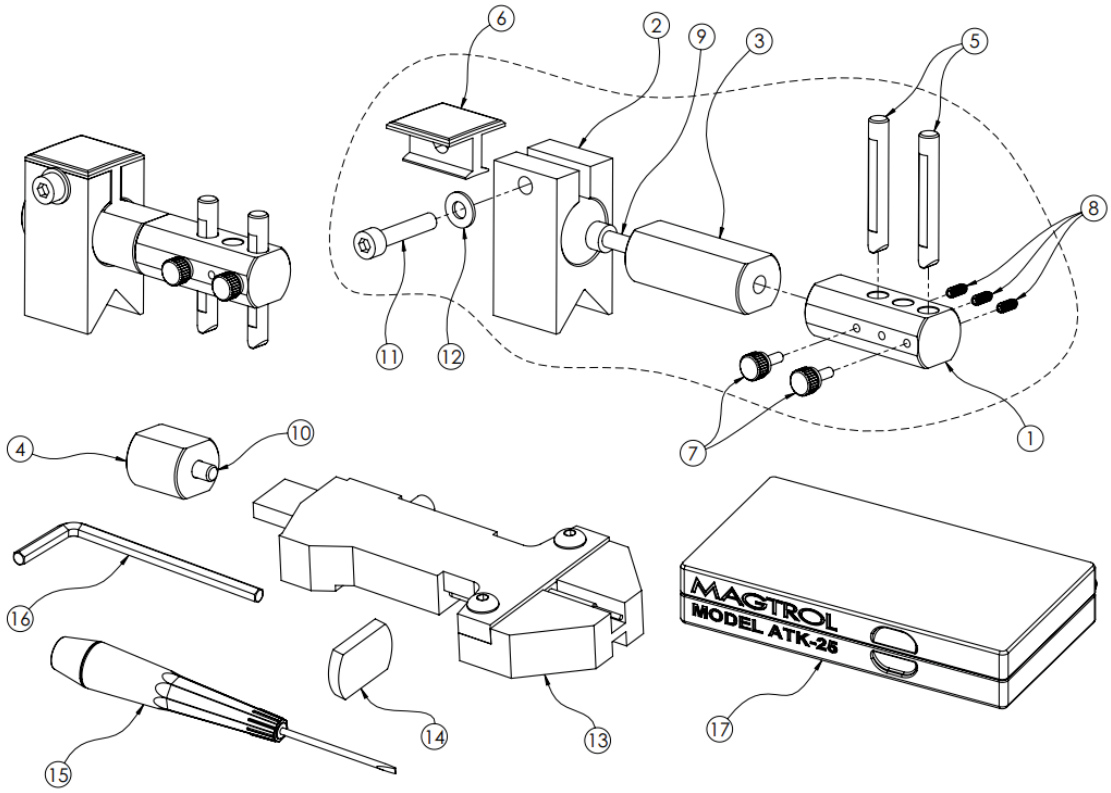

Fig.2-1 ATK-25 Components

1	Cross Post
2	V-Block
3	Long Extension
4	Short Extension
5	Measurement Pins
6	Finger Rest
7	Thumb Screws
8	Ball Springs
9	Socket Head Screw, M5 x 45mm
10	Socket Head Screw, M5 x 20mm
11	Socket Head Screw, M5 x 25mm
12	Washer
13	Depth Indicator w/Attachment
14	Battery tool for depth indicator
15	Screwdriver, 2mm Flat-blade
16	Hex key, 4mm
17	ATK-25 Case (not to scale)

CAUTION THE ATK-25 IS VERIFIED FOR ACCURACY AS A SET. IF YOU OWN MULTIPLE TOOLS, AVOID INTERCHANGING PARTS BETWEEN SETS, ESPECIALLY THE MEASUREMENT PINS (WHICH ARE MATCHED FOR LENGTH).

2.2 PIN SPACING

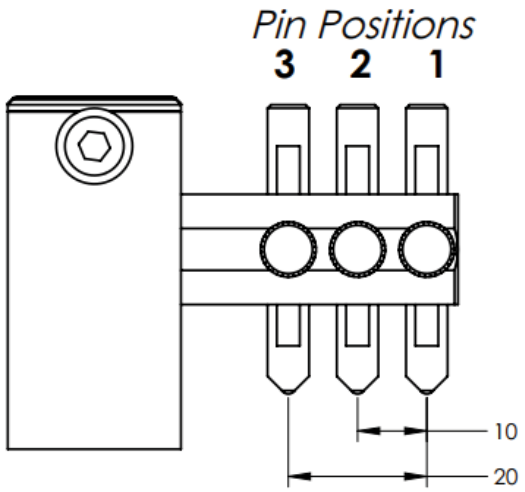

Fig.2-2 ATK-25 pin spacing

The ATK-25 has three cross-hole positions in the cross post for the two measurement pins. The second measurement pin can be installed in the second or the third cross holes.

Installed in the second cross-hole, the pin-to-pin spacing is 10 mm (0.394”). This setup is useful when the available shaft length for measurement is short, and/or when the tool must be setup in the most compact manner.

Installed in the third cross-hole, the pin-to-pin spacing is 20 mm (0.787”). When sufficient space exists, this setup will provide better accuracy on angular measurements.

2.2.1 CHANGING THE PIN SPACING

To change pin spacing, fully unscrew the thumb screw. Pull the pin all the way out. Insert the pin into the cross-hole. Thread the thumb screw into the new position.

NOTICE Ensure that the flat on the measurement pin is facing the thumb screw.

2.2.2 PIN RESISTANCE

The ball springs provide a slight resistance to keep the measurement pins in place during use. The amount of resistance can be adjusted by using the screwdriver. The measurement pins should slide smoothly in the extension, but should not otherwise shift.

2.2.3 PROTRUSION OF CROSS POST

The axial position of the cross post can be adjusted to fit the needs of the application. Use the hex key to slightly loosen the socket head screw in the V-block and shift the cross post. Retighten the socket head screw. Do not overtighten the socket head screw.

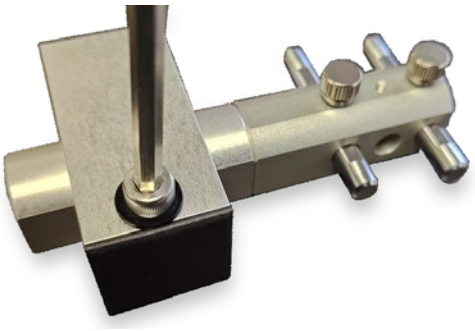

Fig.2-3 Adjusting the axial position of the cross post

NOTICE Recommended torque: 1.0 N·m.

2.2.4 THIRD BALL SPRING IN COMPACT POSITION

Note that when no extensions are used and the cross post is in the minimum-protrusion position (ATK is setup in the most compact arrangement), the third position ball spring can interfere with the insertion of the cross post into the V-block. Use the screwdriver to thread the ball spring slightly down; this will keep it clear so that the cross post can be fully inserted into the V-block.

Fig.2-4 For the most compact setup, thread the unused ball spring low enough to allow the Cross Post to insert further into the V-Block

2.3 EXTENSIONS

The ATK-25 is supplied with a short and a long extension. These increase the range of the tool. To install an extension:

1. Remove the cross post from the V-block.
2. Use the appropriate M5 socket head screw to loosely attach the extension to the cross post.
   2a. 45 mm screw for long extension
   2b. 20 mm screw for short extension
3. Insert the extension and cross post into the V-block so that they are both in the V-block. (The finger Rest will hold them in an aligned position).
4. Clamp the V-block lightly.
5. Tighten the extension socket head screw to securely fix the extension to the cross post. Do not overtighten.
6. Loosen the V-block, slide the extension/cross post to desired position, and re-tighten the V-block.

NOTICE Recommended torque: 1.5 N·m.

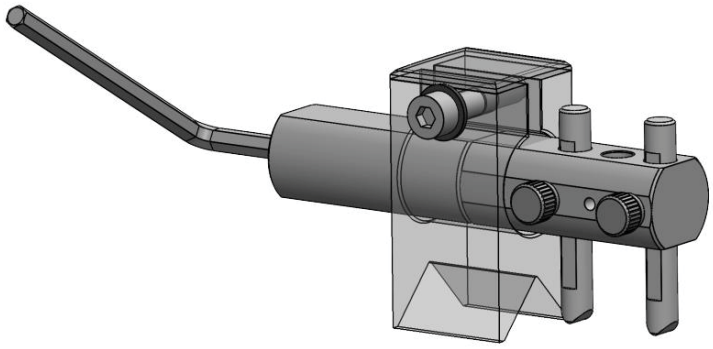

Fig.2-5 Secure the extensions while inserted into the V-block to keep the extension aligned with the cross post

2.3.1 LEFT HANDED/REVERSE SETUP

Depending on the setup, it may be useful to reverse the side on which the thumb screws face. The V-block is symmetrical front-to-back. The cross post is symmetrical vertically. The measurement pins can be removed, flipped upside-down, and reinstalled, and the cross post flipped around, to reverse the “handedness” of the tool.

3. OPERATION

The ATK is used by holding the V-block on the reference shaft, and pushing the measurement pins down to make tangential contact with the target shaft. The ATK can then be removed from the reference shaft, and the measurement pins locked in place using the thumb screws. The depth indicator is then used to measure the vertical extension of each of the measurement pins. By subtracting the difference between these two pin measurements, a rise/run measurement of angular alignment can be determined. Parallel alignment can be determined by measuring the target shaft on two sides, 180° opposite.

3.1 USING THE DEPTH INDICATOR

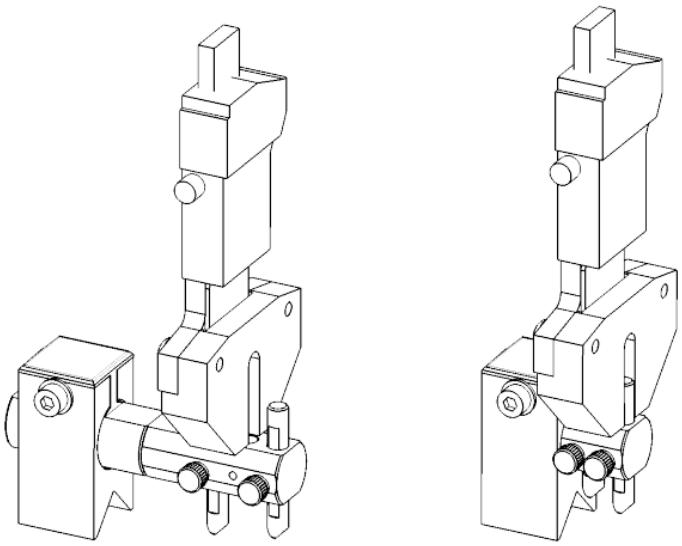

Fig.3-1 Depth indicator attachment on the ATK-25

The Depth Indicator is supplied with a special attachment installed that makes it easy to measure the protrusion of the measurement pins from the top flat of the cross post.

When taking the readings, place the Depth Indicator flat against the cross post and lower the probe to touch the top of the measurement pin. Avoid using excessive force.

NOTICE The depth indicator attachment has a channel on the opposite side from the probe. This is to provide clearance when taking measurements with the 10 mm pin spacing.

3.2 ANGULAR MEASUREMENT

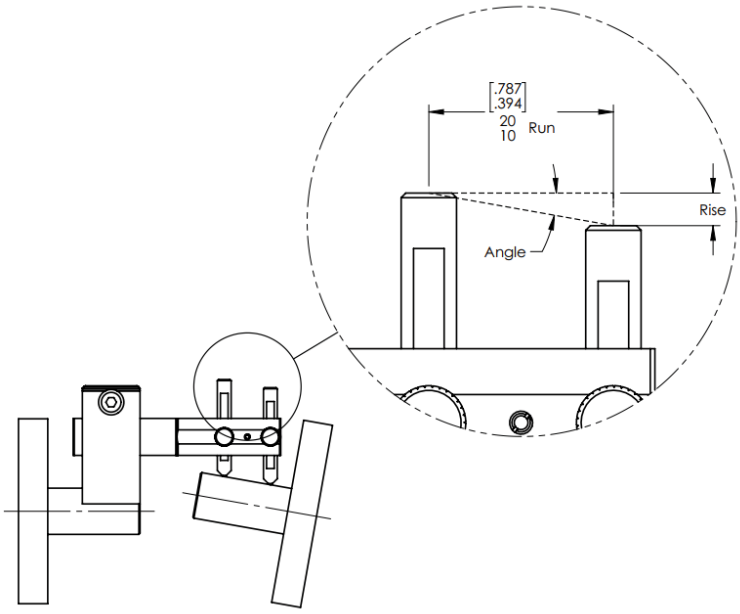

Fig.3-2 Angular measurement

The principle of angular measurement is simple: The difference between the pins is the rise, and the pin spacing is the run (Either 10 mm or 20 mm for the ATK-25).

In many instances, it is easiest to continue working in rise/run rather than converting values to degrees or radians. For example, when a downward pitch of 0.10 mm per 10 mm is measured on a motor with a base mount dimension of 180 mm, the pitch misalignment can be determined using the following formula:

$$\frac{0.10mm}{10mm} = \frac{shim\ thickness}{180mm}$$

To correct the misalignment, a 1.8 mm shim would be placed under the motor base on the shaft side. The angle value can be determined by calculating $\tan^{-1}$ (rise/run).

3.2.1 COMPENSATING FOR SYSTEMATIC ERROR ON ANGULAR MEASUREMENT

Irregularity in the shaft cylindricity can create errors in the angular measurement. For example, a cone-shaped or tapered shaft, on either the reference or target, will either under-measure or over-measure the centerline misalignment.

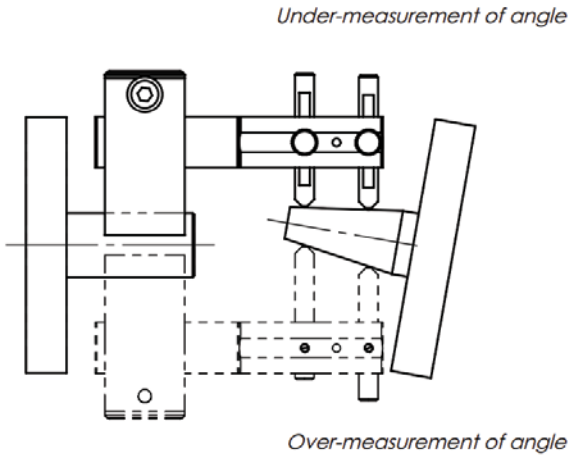

Fig.3-3 Systematic error on angular measurement

In the exaggerated example above, the target shaft has a taper. Measured from one side, this will under-measure misalignment. 180° opposite, the taper will result in an over-measurement.

NOTICE Measuring angle twice, from opposite sides, can help to identify and compensate for systematic errors.

3.3 PARALLEL MEASUREMENT

Typically, a measurement should be taken from either side, and the difference divided by two to calculate the parallel misalignment. Generally, you may use a single pin to make the measurements, as close to the same axial position as possible (reset the pin between measurements).

Using both pins can save time, provided that: 1.) angular misalignment is not present (already corrected); and 2.) the direction of parallel misalignment is observed. Use one pin to measure the closer-distance first, then rotate 180° and measure with the other pin (this ensures the first pin will not interfere during the second measurement).

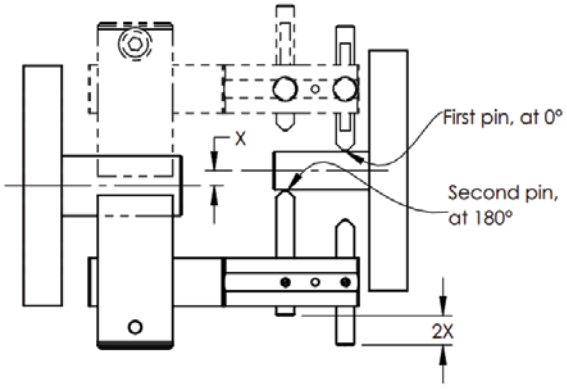

Fig.3-4 Parallel measurement

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2. An RMA number will be issued to you via e-mail. Include this number on all return documentation.
3. Ship your equipment to: **MAGTROL, INC.**
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   Buffalo, NY 14224 | USA
   Attn: Repair Department
4. After Magtrol's Repair Department receives and analyzes your equipment, a quotation listing all the necessary parts and labor costs, if any, will be e-mailed to you.
5. After receiving your repair estimate, provide Magtrol with a P.O. number as soon as possible. A purchase order confirming the cost quoted is required before your equipment can be returned.

CONTACT FOR AFTER SALES SERVICE AT MAGTROL INC.

After Sales, Repair & Calibration Services

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fax +1 716 668 3162
e-mail service@magtrol.com

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1. Visit the «Services/Return and Calibration» section of Magtrol's web site www.magtrol.com to initiate an RMA procedure; complete the RMA form online and submit.
2. After your request has been reviewed, you will receive an email containing an RMA number and dedicated return instructions including specifics about shipping details. The RMA number will be a Magtrol SA internal repair order (SR-xxxx) reference.

   Any **shipment sent without an RMA risks delays and possible rejection,** so please wait until you receive the email with the details you will need to properly return your equipment.

   Any **equipment returned for credit must be approved** prior to return and is subject to a re-stocking fee.

CONTACT FOR AFTER SALES SERVICE AT MAGTROL S.A.

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fax +41 26 407 30 01
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REVISIONS TO THIS MANUAL

The contents of this manual are subject to change without prior notice. The latest updated versions of our manuals are available and downloadable at any time on Magtrol's website www.magtrol.com in the « SUPPORT » section.

To ensure that you have the latest version, compare the issue date (on the back of this manual) with the last updated document available on our website.

The table of revisions below lists the significant updates that have been made.

REVISION DATES

DATE	EDITION	CHANGES	SECTION(S)
12/10/24	1st Edition	Release	All

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