

**I.E.S. INTERNATIONAL EXPANDING SHAFTS S.R.L.**

PRODUZIONE E COMMERCIO DI ALBERI ESPANSIBILI E AFFINI PER CARTIERE, CARTOTECNICHE, INDUSTRIE TESSILI

Sede Amministrativa e Stabilimento: Via Bergamo 1 - 20098 San Giuliano Milanese (MI)  
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Rev\_4 on 19/11/2012

## CLEV12 OPERATION AND MAINTENANCE HANDBOOK

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### SUMMARY

<b>SUMMARY</b>	
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## CLEVI2 OPERATION AND MAINTENANCE HANDBOOK

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### I. CLEVI2 SHAFT GENERALITY

CLEVI2 by I.E.S. production it's a full mechanical expanding shaft manufactured as a rewinder and unwinder .

CLEVI2 shaft needs any accessory inflating or deflating pneumatic device, the core engaging is a Torque-Activation type (torque sensing activation), core locking happens by radial expansion of a steel balls set moved thanks to an outer sleeve with a drag function, this balls generate a pressure and then a torque on the inner core surface engaged on the shaft.

Every type of CLEVI2 shaft works with entire cores made of any materials (cardboard, plastic, metal, ecc).

With multiple cores (slit), the only allowed material is cardboard; using of rolls with metal or plastic cores is possible only with the multi-rings shaft version (CLEVI2-T mod. RWU, RWB).

On this kind of shaft some outer rings of variable length, it's depends form customer need, are able to lock each single roll .

Shortly, CLEVI2 supports every web tension thanks to a torsional rigidity realised by a mechanical expansion. This system cuts off definitely every kind of inflating and deflating pneumatic system.

CLEVI2 set is composed by rewinder and unwinder shafts with many sizes and features.

Below there are the three main trading models :

- **CLEVI2 - RWU** : unidirectional rewinder shaft ;
- **CLEVI2 - RWB** : bidirectional rewinder shaft ;
- **CLEVI2 - UN** : bidirectional unwinder shaft ;



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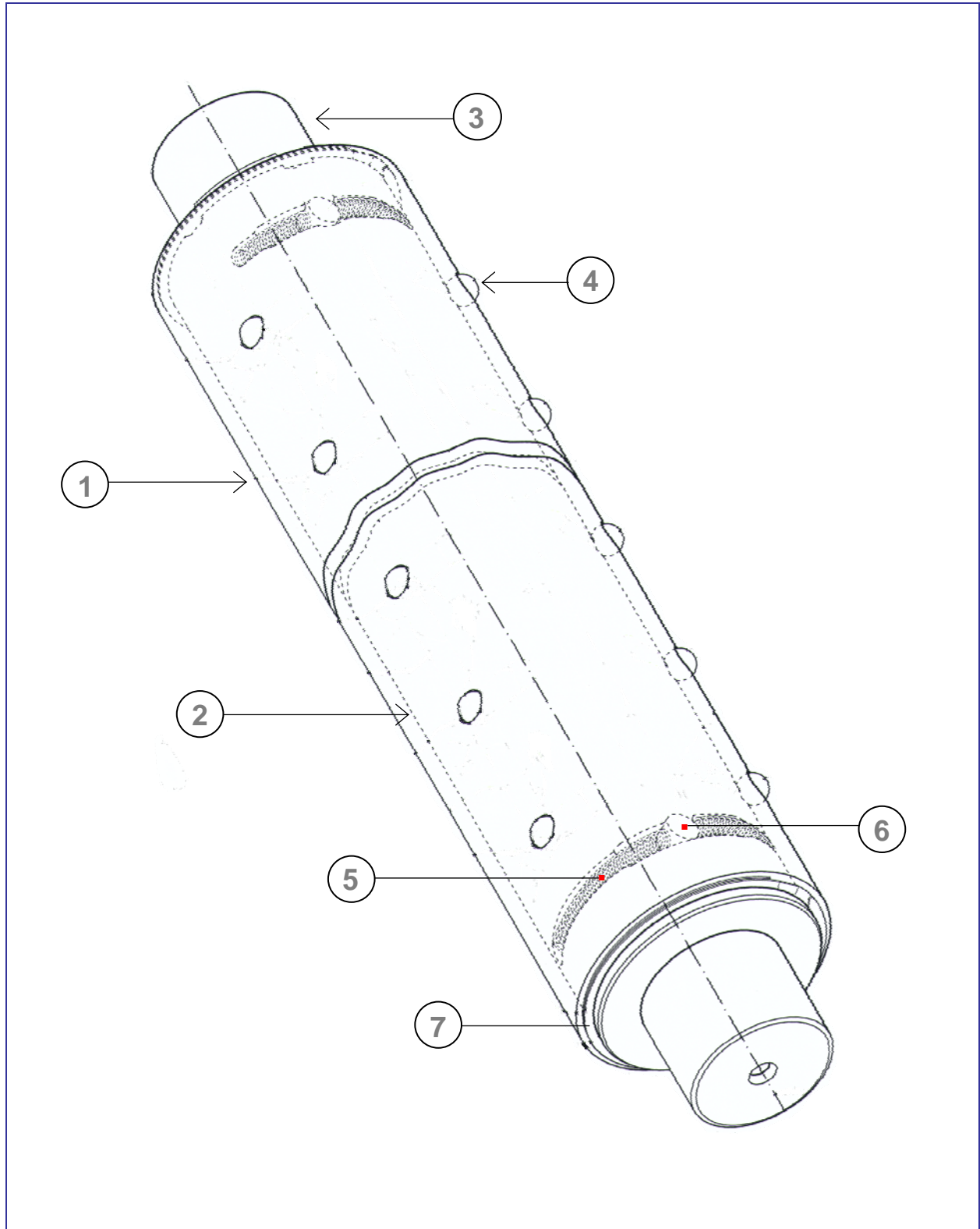


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**CLEV12 OPERATION AND MAINTENANCE HANDBOOK**

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**I.1. GENERAL DETAIL**



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### 1.2. LIST OF COMPONENTS

COMPONENT N°	COMPONENT
1.	ALUMINIUM OUTER SLEEVE
2.	ALUMINIUM INNER SHAFT
3.	STEEL JOURNALS
4.	INOX STEEL BALLS
5.	RETURN GARTER SPRING (only on mod. RWU and RWB)
6.	PIN OR DOWEL LOCKING SPRING (only on mod. RWU and RWB)
7.	CIRCLIP RING and SPACER



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## CLEV12 OPERATION AND MAINTENANCE HANDBOOK

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### 2. METHOD OF USE

Below there are the main steps to locking and unlocking the core or the roll for each kind of CLEV12 the operator is using.

The next instructions are intended just like an operational handbook that helps the operator to a correct use of the CLEV12 shaft, avoiding dangerous work conditions or components damaging.

#### 2.1. CLEV12-3 RWU

##### LOCKING CORE STEPS (see on page 6)

Using of RWU model involves **the presence of symmetrical journals, in this way it's allowed the shaft rotation of 180° between the two safety chucks in according to the machine rotational direction.** In the rest configuration all the balls are expanded thanks to the single spring return system, so the external shaft diameter reaches its maximum.

To inserting the core follow the next steps :

<b>STEP 1</b>	Keep the shaft lifted from the ground with the help of supports (* rif. page 11) or manually.
<b>STEP 2</b>	Before inserting core pay attention to the <b>red identification point on one of the two shaft ends, this mark represents a visual reference to be observed during the next locking phases</b> of the shaft between the two safety chucks.
<b>STEP 3</b>	Insert the core slowly <b>with short twists in according with the only direction which sends the balls in their rest position.</b> Accompany the core torsion movement also an axial thrust to inserting the core until the wanted position.

##### UNLOCKING ROLL STEPS (see on page 6)

To unlocking the roll after rewinding operations follow the next steps :

<b>STEP 1</b>	Forcing a relative motion between inner shaft and core/roll, holding steady one of the two components and rotating the other one in according with the only allowed direction.
<b>STEP 2</b>	Withdraw shaft or roll by progressive rotation (torsion) until complete removal of the component.



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### CLEVI2 OPERATION AND MAINTENANCE HANDBOOK

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#### LOCKING CORE OPERATIONS ON CLEVI2 - RWU / ROTATIVE DIRECTION I



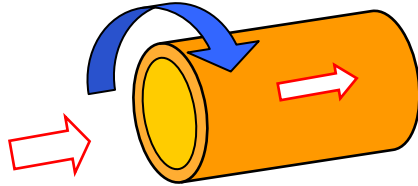
INSERTING CORE DIRECTION



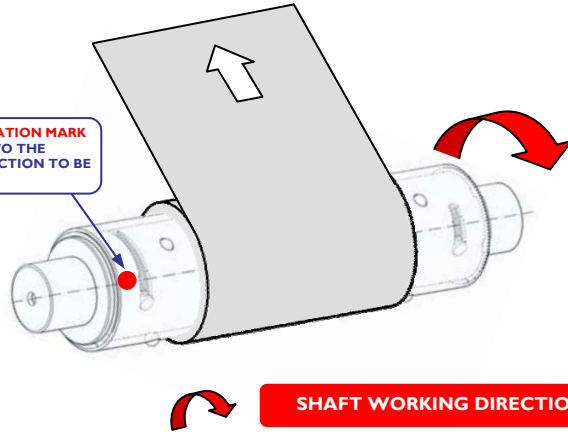
AXIAL THRUST APPLAIED ON THE CORE



TENSION DIRECTION



I.E.S. IDENTIFICATION MARK  
IT'S REFERRED TO THE  
ASSEMBLY DIRECTION TO BE  
OBSERVED



SHAFT WORKING DIRECTION

#### LOCKING CORE OPERATIONS ON CLEVI2 - RWU / ROTATIVE DIRECTION II



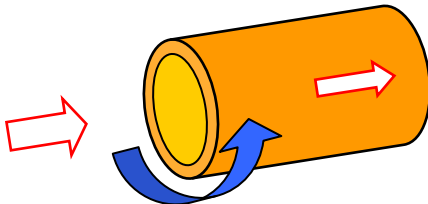
INSERTING CORE DIRECTION



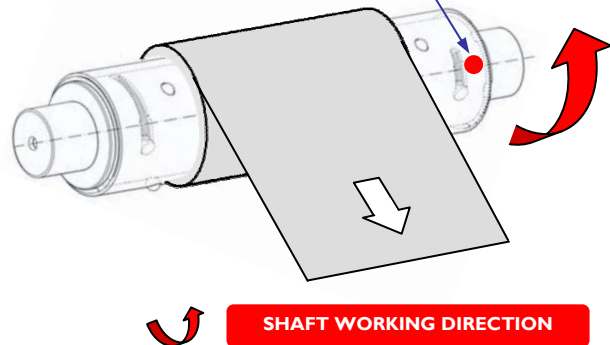
AXIAL THRUST APPLAIED ON THE CORE



TENSION DIRECTION



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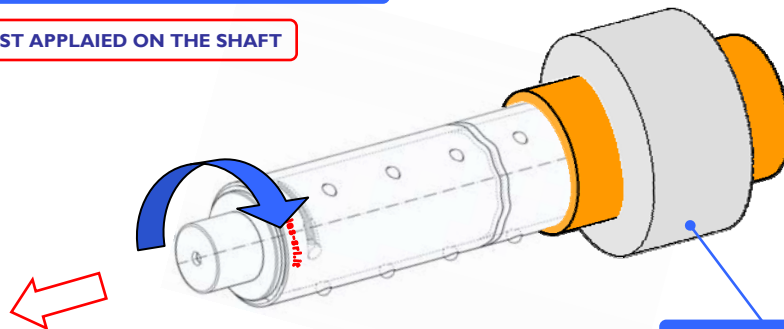
#### UNLOCKING ROLL OPERATIONS ON CLEVI2 - RWU



REMOVING SHAFT DIRECTION (ONLY ALLOWED)

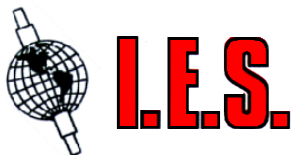


AXIAL THRUST APPLAIED ON THE SHAFT



HOLD THE ROOL FIXED

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## 2.2. CLEV12-3 RWB

### LOCKING CORE STEPS (see on page 8)

As said at point 2.1. also CLEV12-RWB shaft has an expanded balls configuration in its rest position, on this shaft the return springs are two for side.

Notice that using of a bidirectional rewriter allows either the clock-wise rotation and anticlock-wise rotation without turning the shaft between its two chucks, this application is very suitable with asymmetrical journals.

To inserting the core follow the next steps :

<b>STEP 1</b>	Keep the shaft lifted from the ground with the help of supports (* rif. page 11) or manually.
<b>STEP 2</b>	Shaft rotational sense and web-tension direction don't influence the rewinding working, <b>however with an engaged core the torque transfer can happen only in one direction.</b> When the core is going to be inserted follow the instructions reported on STEP 3.
<b>STEP 3</b>	Holding the shaft fixed. <ul style="list-style-type: none"> <li>▪ If the <b>shaft working direction is clock-wise</b>, to inserting the core <b>twist it</b> over the shaft <b>with clock-wise sense</b>. The <b>web-tension will be anticlock-wise</b>, opposite then shaft rotation.</li> <li>▪ If the <b>shaft working direction is anticlock-wise</b>, to inserting the core <b>twist it</b> over the shaft <b>with anticlock-wise sense</b>. The <b>web-tension will be clock-wise</b>, opposite then shaft rotation.</li> </ul>

### UNLOCKING ROLL STEPS (see on page 8)

To unlocking the roll after rewinding operations follow the next steps :

<b>STEP 1</b>	Forcing a relative motion between inner shaft and core/roll, holding steady one of the two components and rotating the other one in according with the only allowed direction.
<b>STEP 2</b>	Withdraw shaft or roll by progressive rotation (torsion) until complete removal of the component.



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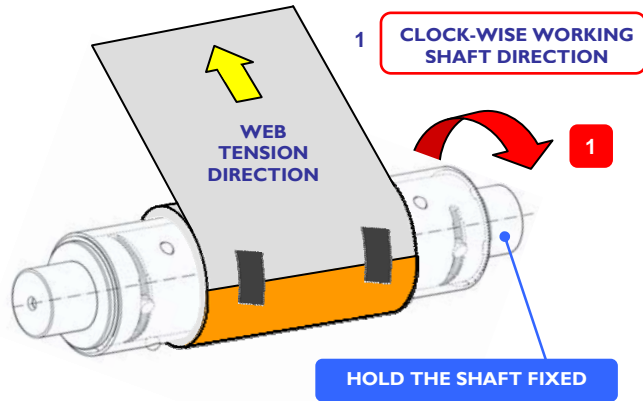
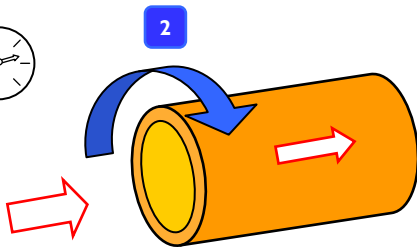
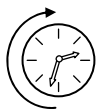
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### CLEVI2 OPERATION AND MAINTENANCE HANDBOOK

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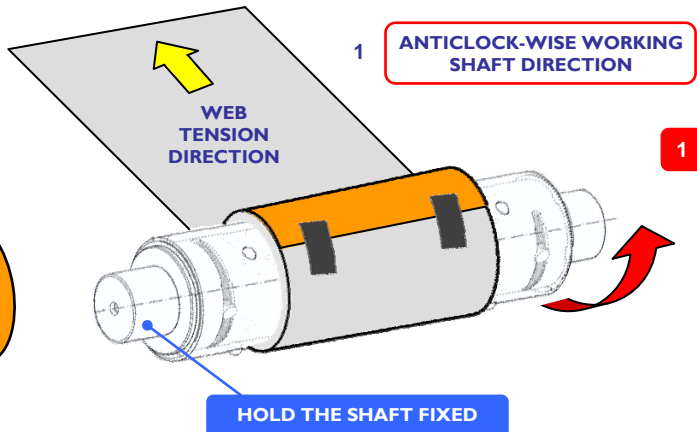
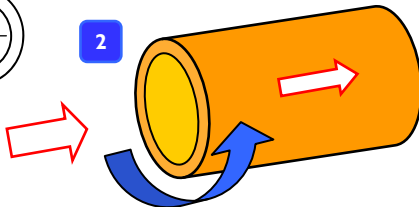
#### LOCKING CORE OPERATIONS ON CLEVI2 - RWB / ROTATIVE DIRECTION I

2 INSERT THE CORE PUSHING AND TURNING IT CLOCK-WISE



#### LOCKING CORE OPERATIONS ON CLEVI2 - RWB / ROTATIVE DIRECTION II

2 INSERT THE CORE PUSHING AND TURNING IT ANTICLOCK-WISE



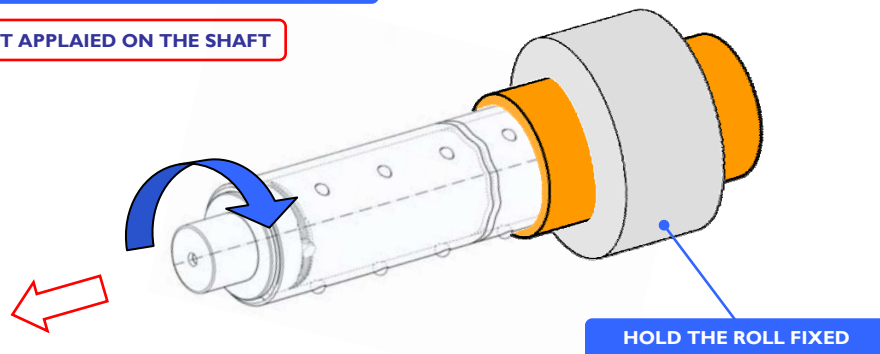
#### UNLOCKING ROLL OPERATIONS ON CLEVI2 - RWB



REMOVING SHAFT DIRECTION (ONLY ALLOWED)



AXIAL THRUST APPLIED ON THE SHAFT



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## CLEV12 OPERATION AND MAINTENANCE HANDBOOK

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### 2.3. CLEV12-3 UN

#### LOCKING ROLL STEPS (see on page 10)

Bidirectional unwinder shaft hasn't any return springs, so when the shaft is unloaded all the balls are in their rest position and the external diameter is minimum.

To inserting the shaft follow the next steps :

<b>STEP 1</b>	Keep the roll arranged on the ground or on a support plane. Avoiding every type of cantilevered shaft operation.
<b>STEP 2</b>	Inserting gradually the shaft inside the roll, <b>the rest balls allow the axial motion</b> without need any twist on the components. The bidirectionality of the shaft permits any rotational working sense and any assembly direction.
<b>STEP 3</b>	After the shaft inserting, <b>rotate it toward left or right for locking the shaft inside the core in the correct position.</b> In this way it will avoid possible shifting from the right position of the roll.

#### UNLOCKING CORE STEPS (see on page 10)

To unlocking the core after unwinding operations follow the next steps :

<b>STEP 1</b>	Being CLEV12 a torque sensing activation system, when there is no web tension the balls came back in their rest position, the core is now free to moving along the shaft.
<b>STEP 2</b>	Withdraw the core by progressive axial movement until complete removal of the component.



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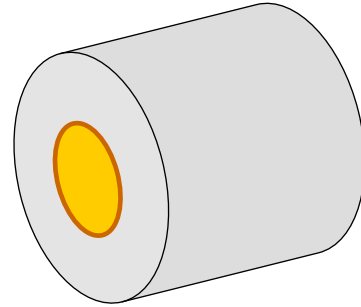
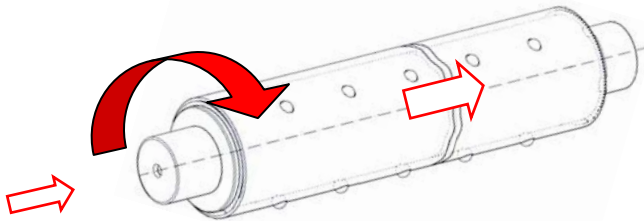
### CLEV12 OPERATION AND MAINTENANCE HANDBOOK

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#### LOCKING ROLL OPERATIONS ON CLEV12 - UN / ROTATIVE DIRECTION I



INSERTING SHAFT DIRECTION/THRUST

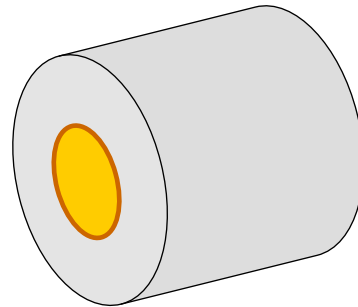
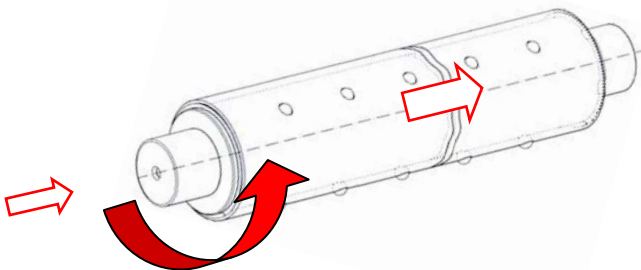


SHAFT WORKING DIRECTION

#### LOCKING ROLL OPERATIONS ON CLEV12 - UN / ROTATIVE DIRECTION II



INSERTING SHAFT DIRECTION/THRUST

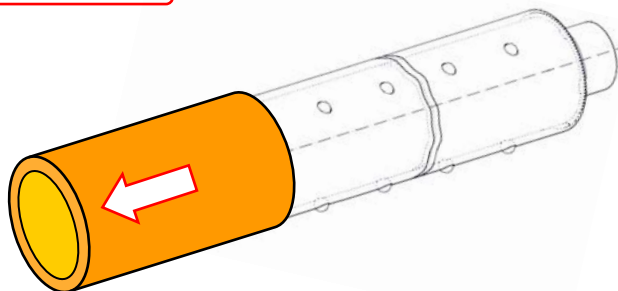


SHAFT WORKING DIRECTION

#### UNLOCKING CORE OPERATIONS ON CLEV12 - UN



REMOVING CORE DIRECTION



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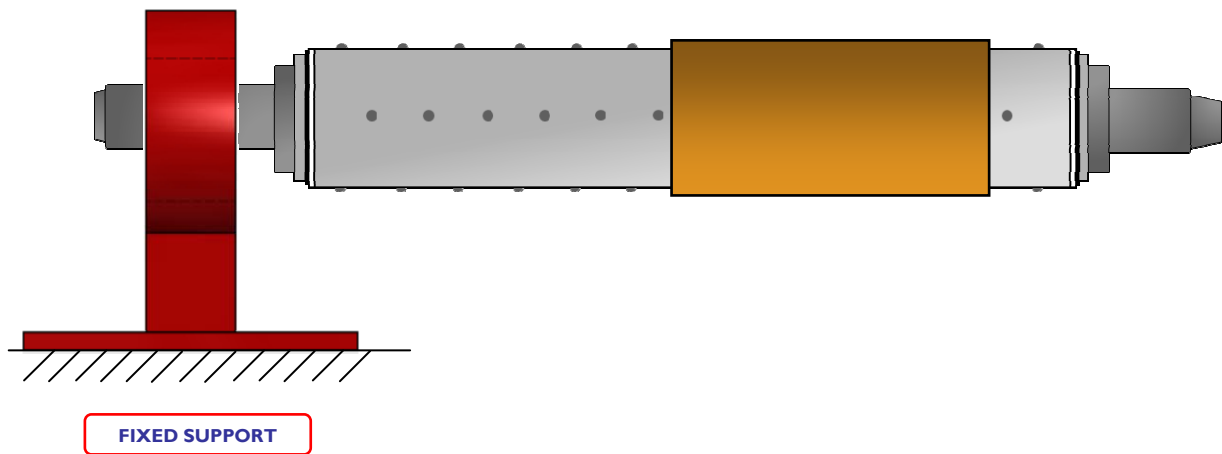
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**RIF. ) FIXED SUPPORTS LOAD FOR REWINDER SHAFTS**

I.E.S. provides, on demand, fixed supports for rewinder shafts to use during core loading phases.

Is shown below a generic view of the support.

**CLEV12 SHAFT REWINDER DURING CORE LOADING**



### 3. MAINTENANCE

Being CLEVI2 a full mechanical shaft, the routine maintenance is referred to the rules for a correct use of the component, while the overtime maintenance is just about for the return springs.

#### 3.1 ROUTINE MAINTENANCE

For a correct shaft maintenance over the time it's recommended to follow the next points :

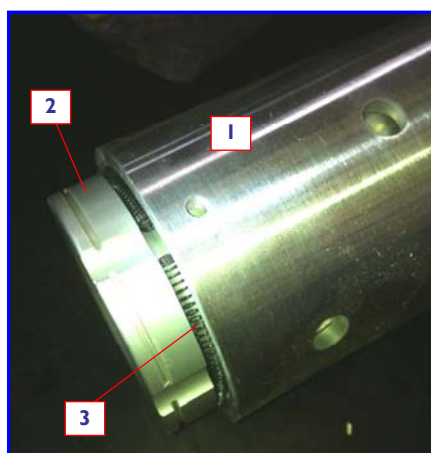
- After the standard using, blow daily dehumidified compressed air on the outer shaft surface, with most attention for the balls seats.
- After blowing compressed air, clean daily the outer shaft surface by dry cloth.
- Check usually that the balls run free along the whole expanding and resting race.

#### 3.2 OVERTIME MAINTENANCE

With CLEVI2 - RWB or RWU shaft, the only components need overtime maintenance could be the return springs mounted in 2 pieces for the unidirectional rewinder and in 4 pieces for the bidirectional rewinder.

For a correct replacing of the springs proceed as follow :

- A) Pull out the elastic circlip rings.
- B) Pull out the spacers.
- C) Unscrew the locking dowel (4) from the allen head fixed on the outer sleeve (1).
- D) Unthread the outer sleeve (1) from the inner one (2).
- E) Remove the single spring (3, RWU version) or the pair of springs (3, RWB version) from their seats (5).
- F) Replace the new spring (3) or the new pair of springs (3) in a symmetric position, left free the center for the dowel locking (4).
- G) Realign outer sleeve (1) with inner shaft (2) taking care to maintain the centering of the dowel (4) with the springs (3) middle (only on RWB version).
- H) Screw the dowel (4) and reassemble the pair of spacers and circlip rings.



Sample image referred to a bidirectional rewinder



Sample image referred to a bidirectional rewinder



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**4. WARNINGS and RESIDUAL RISKS**

- **DON'T USE THE SHAFT TO LIFT AND/OR MOVING ROLLS.**
- **SHAFT MUST NOT BE LEFT CANTILEVERED DURING LOADING AND UNLOADING ROLLS OPERATIONS.**
- **TO AVOID THE SLIDING AND THE FOLLOWING RELEASE OF THE ROLLS, THE SHAFT MUST ALWAYS REMAIN PARALLEL TO THE GROUND, OR RATHER IN HORIZONTAL POSITION, DURING ANY LOADING OR UNLOADING OPERATION.**
- **THE SHAFT SHOULD NOT BE USED IN WORKING CONDITIONS OTHER THAN THE ONES INDICATED IN THE SALES OFFER, OTHERWISE THE WARRANTY WILL BE VOID.**